



Cruise Control Installation Instructions

For MGB

PART # 366-350

MOSS MOTORS, LTD.

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Tools required: jack, jack stands, ratchet, 7/16" and 1/2" sockets, 7/16" and 1/2" combination wrenches, Phillips and flat blade screw drivers, center punch, hammer, wire strippers and crimpers, voltmeter.

Note: Please read and understand all of these instructions before installing this kit.

1) On a flat and level surface, jack the car up and put it on jack stands. You need to have access to the rear of the transmission and front of the driveshaft. Never attempt to work on a vehicle that is not supported by jack stands or ramps.

2) Gather the Cruise control servo motor, two 5/16" x 1 1/2" bolts, two 5/16" nuts, two 5/16" lock washers and two 5/16" flat washers. Remove the two fender bolts closest to the radiator support on the right side of the car using a 1/2" socket and ratchet. Replace the bolts with the two 1 1/2" bolts supplied. Install the servo to the under side of the fender flange using the 5/16" flat washers lock washers and nuts. The cable should point toward the fire wall. If the servo comes in contact with anything, carefully bend the bracket. If your MGB has air conditioning you will need to mount the servo on the left side of the car in front of the radiator support as the engine compartment is very cramped. Illustration 2.

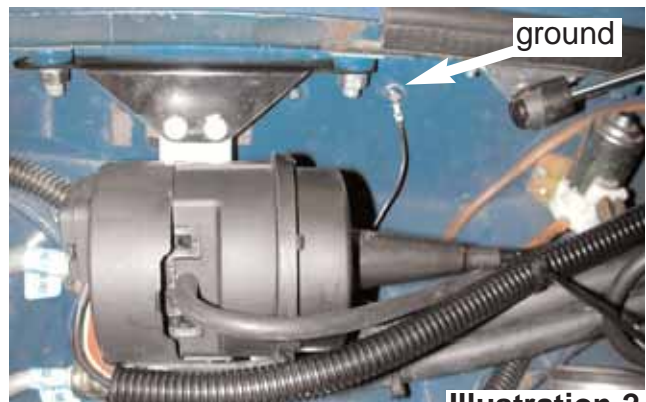


Illustration 2



3) HS Carburetors: You will need to connect the cable from the cruise control servo to the throttle. Place one of the 1/4" flange nuts from the end of the cable on top of the heat shield that the throttle cable runs through and mark the area you will drill. Center punch and drill a 1/4" hole. This provides a cable mount for the cruise control cable. This can be done with the heat shield on or off the car. Hint: if you choose to drill the bracket on the car use a shop vacuum to suck up the metal shavings as you drill. Install the cruise control cable through the newly drilled hole and replace the nut.

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Attach the cable adapter to the cable as pictured. Remove the cotter pin and washer from the throttle cable trunnion and attach the cruise control cable to it. Replace the washer and cotter pin. Adjust the cruise control cable so that there is minimal slack and tighten the flange nuts. Skip to step 5. Illustration 3.



Illustration 3



4) HIF Carburetors: You will need to connect the cable from the cruise control servo to the throttle. Measure $5/16$ " over from the edge of the throttle cable retainer bushing and center punch. Drill the center punch with a $1/4$ " drill. This provides a cable mount for the cruise control cable. This can be done with the bracket on or off the car. Hint: if you choose to drill the bracket on the car use a shop vacuum to suck up the metal shavings as you drill. Remove one of the flange nuts from the cruise control cable. Install the cruise control cable through the newly drilled hole and replace the nut. Attach the cable adapter to the cable as pictured. Remove the nut which is holding the throttle cable in place at the trunnion using $7/16$ " wrenches. Slip the cruise control cable over the end of the trunnion and replace the nut. Make sure the cables are approximately parallel in between the throttle linkage and the accelerator cable bracket. Adjust the cruise control cable with the two flange nuts so that there is minimal slack. Tighten the flange nuts using $1/2$ " wrenches. Illustration 4.



Illustration 4



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Illustration 4 cont.



5) HS and HIF Carburetors: Attach the included rubber vacuum line to the servo unit. Run the line to the intake manifold. Cut one of the vacuum lines on the intake manifold and install a vacuum tee. Cut the vacuum hose from the servo to length and attach it to the vacuum tee. Use a self tapping screw or one of the existing screws in the vehicle to ground the servo unit. The ground wire is the black wire with the ring connector. Separate the blue, red, and purple wires from the rest of the wires. Run the blue wire to the negative side of the coil. There is a red tag on this wire which reads "NOISE SUPPRESSOR DO NOT REMOVE". The blue wire can be shortened to about 2" before the tag. Do not cut the noise suppressor out. Crimp the supplied blue spade connector to the blue wire. Attach the connector to the negative (-) side of the coil. Run the red and purple wires over to the brake master cylinder and brake switch. Use the t-taps to connect the purple wire to the brake signal wire (green/purple in our car), and the red wire to the constant battery voltage wire (green in our car). Run the rest of the wires from the cruise control harness to the large rubber grommet in

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the right side of the firewall. Remove the grommet and cut a 9/16" hole in it so the harness can pass through it into the passenger compartment. You will notice there is a lot of extra blue wire. Run the blue wire with the rest of the harness to the firewall and then double it back on its self until it splits off to the coil. Use the electrical tape to wrap the harness in several places to keep it tidy. Install the 1/2" split loom over the major part of the harness and the 1/4" split loom over the red and purple wires. Run the harness and the 1/2" split loom through the rubber grommet and into the passenger compartment. Reinstall the grommet in the fire wall. Use some of the supplied zip ties to secure cable, harness, and vacuum line to each other, and to other hoses under the hood. Skip to step 12. Illustration 5.



Illustration 5



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Illustration 5 cont.



6) Zenith Carburetors: Remove the two flange nuts from the cruise control cable. Thread one of the supplied regular hex 5/16" coarse thread nuts onto the cruise control cable. Run the nut up to the base of the cable and then back it off three turns. Next install the cruise control cable bracket onto the cable through the hole without the

slot. Thread on another regular hex 5/16" coarse thread nut and run it up to pinch the bracket in place, finger tight only. Loop the cable from the servo, out to the radiator, up over the valve cover to the throttle cable/carburetor area. Illustration 6.



Illustration 6



7) Zenith Carburetors: Remove the throttle return spring(s) from the bell crank using needle nose pliers. Use a 7/16" combination wrench to loosen the bottom throttle cable nut. Spin the nut all the way off the cable housing. Free the throttle cable from the throttle cable bracket and bell crank. Slip the throttle cable through the cruise control cable bracket and reinstall the throttle cable to the throttle cable bracket. Align the cruise control cable with the unused cable run on the bell crank. Use the 7/16" combination wrench to tighten both cables. The bottom nut of the cruise control cable should be held in place by the throttle cable bracket. Illustration 7.



Illustration 7

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Illustration 7 cont.

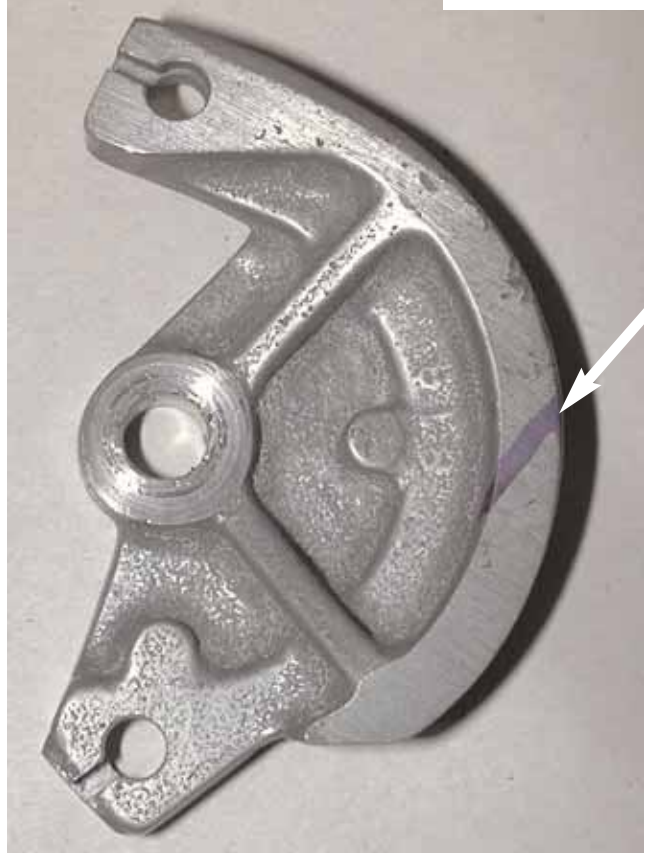


8) Zenith Carburetors: Notice the bell crank has an unused cable run in it. Unfortunately, this extra cable run is designed to rotate the throttle in the wrong direction. You need modify it so that it can be used. After modification the ball on the end of the cruise control cable will rest on the back side of the cable run giving it a place to attach to the bell crank. The cable will pass through the bell crank into the cable run and operate the throttle in the correct direction. The first step is finding the location that the cable needs to pass through. Slightly bend the cruise control cable bracket down on the cruise control cable side to aim the cable toward the unused cable run. Pull down on the cruise control cable and route it along side of the unused cable run. Hold the ball at the end of the cable so that it is on the backside of the cable run. The cable should not pass directly across the radius of the

bell crank. Instead, make it angle in the direction of the cable housing. With a felt tipped marker, mark where the cable crosses from the front to the back side of the cable run. Remove the bell crank from the throttle shaft using a 7/16" combination wrench. Illustration 8.



Illustration 8



9) Zenith Carburetors: Use a c-clamp to hold the bell crank to your workbench. Use a hacksaw to cut a slot where the cable will

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pass from the outside to the inside of the cable run. Only cut down half way across the cable run. **DO NOT CUT ALL THE WAY THROUGH THE BELL CRANK!** The goal is to create a space for the cable to pass that does not allow the cable to fall out. Drill a 1/16" hole through the middle of the cable run from inside to the outside of the cable run. This will give the cable an area to rest in. Test fit the cable to see if it will fit in the hack saw groove. Use a small flat blade screw driver to gently push the cable into the groove. If the cable will not fit into the groove use a small file, sand paper or the hack saw blade to widen the groove ever so slightly until the cable can be coerced into place. Use a small file, or sand paper to deburr any sharp edges. If the cable can be easily lifted in and out of the groove, it is too big and you must start from scratch using a new bell crank Moss part# 366-160. Illustration 9.



Illustration 9



Illustration 9 cont.



10) Zenith Carburetors: Take the bell crank over to the vehicle. Install the throttle cable and then the cruise control cable to the bell crank. Make sure to use the original star washer and nut, a lock nut or thread locker, to secure the bell crank on the throttle shaft. Reattach the throttle return springs. You will need to adjust the cruise control cable to be the same as the throttle cable. There should be a little slack in it with the throttle closed. Open and close the throttle with your hand several times to make sure the cables are operating correctly. The cable should retract into the cable housings without binding, falling out of the bell crank, hanging up or holding the throttle open. If the cruise control cable is not retracting in to the housing, bend the cruise control cable bracket until it operates correctly. If the throttle cable is binding, you may need to lube it. Also, check the operation at the pedal. It is very important to take your time and get it right to insure proper throttle operation. Illustration 10.

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Illustration 10

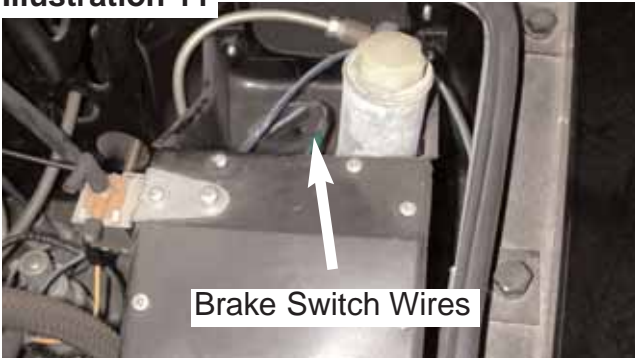


11) Zenith Carburetors: Use zip ties to secure the cruise control cable to the upper radiator hose and the smog pump hose. Trim the zip ties with side cutters. The cable should have a large gradual loop from the servo to the throttle without touching the radiator or any moving parts. The cruise control servo needs "manifold vacuum". Use one of the supplied tees and tap into a vacuum line. Trim the vacuum hose from the servo and connect it to the tee. Route the blue wire from the harness to the coil. There is a red tag on this wire which reads "NOISE SUPPRESSOR DO NOT REMOVE". The blue wire can be shortened to about 2" before the tag. Do not cut the noise suppressor out. Crimp the supplied blue spade connector to the blue wire. Attach the connector to the negative (-) side of the coil. Run the red and purple wires to the brake master cylinder and brake switch. Use the t-taps to connect the purple wire to the brake signal wire (green/purple in our car), and the red wire to the constant battery voltage wire (green in our car). Trim the wires as necessary. Run the rest of the wires from the cruise control harness to the large rubber grommet in the left side of the firewall. Remove the grommet and cut a 9/16" hole in it so the harness can pass through it into the passenger compartment. Use the electrical tape to wrap the harness in several places to keep it tidy. Install the 1/2" split loom over the major part of the harness and the 1/4" split loom over blue wire. Run the harness and the 1/2" split loom through the rubber grommet and into the passenger compartment. Reinstall the grommet in the fire wall. Use some of the supplied zip ties to secure the harness to the car. Illustration 11.

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Illustration 11



Brake Switch Wires



12) Gather the Vehicle Speed Sensor (VSS), the VSS magnet, the two sided tape and the safety wire. The first step is finding a location for the VSS magnet. The magnet must be attached to the driveshaft and within 12" of the front (transmission) end of the driveshaft. The closer the magnet is to the u-joint, the better. Clean/degrease the drive shaft before temporarily attaching the magnet to the driveshaft with the supplied two sided tape. The second step is to find a location for the magnetic pick up. The magnetic pick up must be installed along side and inline with the driveshaft centerline and about 3/8" from the magnet. If it is closer than 1/4" to the magnet, you risk contact. If it is farther than 1/2" the pick

up may not sense the magnet. Remember; in a live axle vehicle the driveshaft travels up and down with the axle and suspension. Remove the drivers' seat, peel the carpet back off of the transmission tunnel. Use the seat belt anchor as a reference point that can be seen from both inside and outside the car. We measured 13 1/2" from the center of the seat belt anchor to the magnet on the drive shaft, and 3 1/2" up from the bottom of the floor board up. Transfer your measurements from outside the car to inside. Note: make sure you measure before drilling any holes; all vehicles will be different depending on the year and any accessories (5 speed conversion, overdrive, ect...). Center punch and drill a 1/4" hole. Install the VSS and make sure it is lined up with the magnet. Use the safety wire to secure the magnet to the driveshaft permanently. Leave the seat out of the vehicle for now. Illustration 12.



Illustration 12



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13) Remove the trim from around the shifter. Route the harness from the firewall to the back of the center console. Run the grey and black wires (they are taped together and have spade connectors attached) from the main harness under the center console, out through the shifter opening to the VSS and attach the spade connectors to the VSS (polarity doesn't matter). You need to pick a spot to mount the cruise control switch that is easily accessible and visible. Also, the wires from the harness must be able to reach the switch. We chose a spot on the center console. Before drilling any holes, make sure there is room behind the switch location for the wires to run out. Use the provided template and a 1/4" drill to make a location for the wires to run out of the back of the switch. Clean the surface of the switch location with alcohol to allow adhesion of the two sided tape. Run the wires through the hole, peel the backing from the two sided tape and attach the switch to the center console. Match up the red, green, brown and yellow wires from the switch to the appropriate location on the empty connector and attach the wires. Attach the green, brown and yellow wires from the main harness to the other half of the connector, with the fuse attached to it. Make sure the wires are in their proper place and that they snap into the connectors securely. Now the connectors may be joined together. Run the black and grey wires from the switch and the orange wire with the fuse in it up behind the dash. Attach the black wire with the ring terminal to one of the gauge hold downs or any chassis ground. Use a t-tap to attach the grey wire to the parking light wire (red/green in our car) at the back of the headlight switch. This will allow the cruise control switch to be backlit any time the lights are on. Use a t-tap to attach the orange wire to an "ignition on" battery voltage source (we found a green/purple wire). Make sure to test the wires in your car with a volt meter. Do not just assume your car will be the same as ours. Reinstall the shifter trim, the transmission tunnel carpet and the drivers' seat. Use the remaining zip ties and electrical tape to secure the cruise control harness away from any hot spots or moving parts in the car. Illustration 13.



Illustration 13



14) Go over the system once more to make sure everything is installed correctly and all wires are out of harms way. Remove the jack stands and test drive the vehicle as described in the "How Cruise Control Works section". Do not attempt to test drive your vehicle on a lift or jack stands. If you're having trouble getting your cruise control to work, see the "Trouble Shooting" section. Enjoy your new cruise control!

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How Cruise Control Works

The cruise control module monitors several vehicle sensors, makes a decision and executes its decision using a vacuum operated servo motor and a cable attached to the throttle. The module uses a vehicle speed sensor, a tachometer signal, a brake switch signal and your input to make decisions. It looks at the speed sensor and tach signals to maintain a constant speed, resume a speed, or accelerate and coast if desired. There is a vehicle speed sensor (VSS) supplied in this kit that uses a magnet that you will attach to the driveshaft and a magnetic pickup to sense drive shaft RPM. You need to splice into an existing tach signal wire or the negative side of the coil for engine RPM. It compares the speed sensor and tach signals as a failsafe to disengage the cruise control if the clutch is suddenly pushed in. This should not be relied on as a primary way to turn your cruise control off. It does not have a RPM limit and severe engine damage could accrue in certain situations. You must splice into your vehicle's existing brake switch. The brake switch is used to disengage the cruise control.

Vehicle Speed Sensor

Operation

The cruise control module needs a reference for the speed of your vehicle. One way of getting this information is to count the revolutions of the driveshaft. In order to do this we supplied a magnetic pickup and a magnet. The magnet will be attached to the driveshaft and give the magnetic pickup reference point to count driveshaft RPM. Modern vehicles have a vehicle speed sensor (VSS) built into the transmission, differential, or they use wheel speed sensors to calculate vehicle speed.

Installation

The first step is finding a location for the VSS and magnet. The magnet must be attached to the driveshaft and within 12" of the front (transmission) side of the driveshaft. The closer the magnet is to the u-joint, the better. Attach the magnet to the driveshaft temporarily with the supplied two sided tape. The second step is to find a location for the magnetic pick up. The magnetic pick up must be installed along side and inline with the axle centerline and about 3/8" from the magnet. If it is closer than 1/4" to the magnet, you risk contact. If it is farther than 1/2" the pick up may not sense the magnet. Remember; in a live axle vehicle the driveshaft travels up and down with the axle and suspension. With an independent rear suspension system (IRS) driveshaft movement is not a concern. After finding locations for both magnet and pickup, secure the magnet to the drive shaft using the supplied safety wire.

Tachometer (Engine RPM)

Operation

The cruise control module needs a tach signal primarily to disengage the cruise control if the engine and wheels begin to accelerate at different rates. Example: If you're driving down the road with the cruise control set and you step on the clutch, the engine will start to accelerate because there is less load on it, and the road wheels will start to decelerate because they no longer are being supplied power. If the cruise control module did not have an engine rpm signal, it would only see the deceleration of the vehicle and open the throttle more trying to compensate. Your engine would suffer severe engine damage. That being said, you should never rely on this method to disengage your cruise control and this is why: This cruise control

kit is designed to work on many different applications such as vehicles with automatic transmissions. In a manual transmission the input shaft and output shafts are linked together with a solid coupling, a clutch. In an automatic transmission the input and output shafts are linked with a fluid coupling, a torque converter. This means that an automatic transmission output shaft can spin at different RPM compared with the input shaft. Example: If you were to put an automatic transmission into 1st gear with your foot on the break the engine (and input shaft) maybe turning at 800 RPM. The wheels and output shaft would not be turning at all. Now if you were to step on the accelerator pedal with your foot still on the break, the engine RPM maybe 2000 RPM but the wheels are still not moving. If you were to try this with a manual vehicle you either stall the engine or the wheels would begin turning. This means that the cruise control module must allow for some variation between engine speed and vehicle speed. It may allow a 2500 RPM jump before disengaging the cruise control. This is potentially damaging to your engine depending on what the RPM was before you stepped on the clutch.

Installation

Hook the blue tack signal wire from the cruise control harness to the negative (-) side of the coil. As an alternative you can splice into an existing tach wire.

Brake Switch

Operation

The cruise control module must be hooked into the vehicles brake switch so that it disengages anytime the brake is engaged. If you're stopping, you're not going.

Installation

Splice the red wire from the cruise control harness to the battery voltage side of the vehicles brake switch. Splice the purple wire from the cruise control harness to the signal side of the brake switch.

Operating the Cruise Control

Turning the cruise control on and off

To turn the cruise control unit on, push the **ON** button. Nothing should happen; it simply turns the unit on and prepares it for operation. To turn the cruise control unit off; push the **OFF** button. Any time the ignition is switched off, the unit is turned off. The unit can be left on all of the time while driving if desired without damage.

Setting a speed

Turn the cruise control on and wait at least three seconds before pushing the **SET/COAST** button. Your *set speed* has now been programmed by the cruise control unit and your speed should remain within 2MPH of that speed. The cruise control should not be operated at speeds less than 35 MPH or above the legal speed limit.

Stopping and setting a lower speed

At any time the cruise control can be disengaged by stepping on the brake pedal or by pushing the **OFF** button. If desired, you can coast to a lower speed by pushing and holding the **SET/COAST** button. When you let off the button your new *set speed* will be programmed.

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You can also tap the **SET/COAST** button to gradually reduce your speed. Each time you tap the button your **set speed** should decrease by 1/2 MPH.

Accelerating and setting a higher speed

Press the accelerator pedal at any time to increase your speed. When the accelerator pedal is released your vehicle will return to the previous **set speed**. If you wish to maintain a higher **set speed**, accelerate to the desired speed and push the **SET/COAST** button. As an alternative you can hold the **RESUME/ACCEL** button, releasing the button reprograms your **set speed**. The final way to increase your **set speed** is to tap the **RESUME/ACCEL** button. Each time you tap the button your **set speed** should increase by 1/2 MPH.

Resuming a set speed

If you used the brake pedal to slow or stop you can resume your **set speed** by pushing the **RESUME** button, however you must be above 35MPH and in the same gear your **set speed** was programmed in.

Road test

Make sure to road test the vehicle after installing the cruise control. Find an area void of other vehicles and pedestrians. Try all of the operating procedures at speeds between 35MPH and the legal speed limit. If the cruise control is inoperative see the trouble shooting section.

Trouble Shooting

Make sure system is set and operating correctly

Remove the two Phillips screws on the back of the servo unit and set the switches as follows:

SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7
ON	OFF	ON	OFF	ON	OFF	ON

If there is a jumper wire to the left of the switches remove it. There is an LED just above the jumper wire position. Have someone sit in the car and turn the ignition to the on position, but do not run the engine. Look at the LED and instruct the person to:

- 1) Press the **SET** button
- 2) Press the **RESUME** button
- 3) Step on the brake

The LED should light each time. If the LED does not light check the wiring.

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Wire colors and functions

Wire Color	Pos.	Component	Function	Test With
Black	9	System Ground	System Ground	Ohm Meter
Red	3	System Power	Battery Voltage	Volt Meter
Brown	1	Switched Battery Voltage	Battery Voltage With Ignition & Cruise Control Switch On	Volt meter
Purple	4	Brake Switch	0 Voltage With Ignition or Cruise Control Switch Off Battery Voltage With Brake Depressed 0 Volts With Brake Pedal Released	Volt Meter
Green	8	SET	Battery Voltage With SET/Coast Button Depressed 0 Volts With SET/Coast Button Released	Volt Meter
Yellow	6	Resume	Battery Voltage With SET/ACCEL Button Depressed Battery Voltage With SET/ACCEL Button Released	Volt Meter
Blue	10	Tach	Engine Tachometer Signal	Tachometer
Grey	2	VSS	Vehicle Speed Sensor (Hall Effect, Square Wave)	Digital Storage Oscilloscope