

Detroit Speed
Electric Headlight Door Kit
1968-82 Corvette
P/N: 122009 & 122010DS

The Detroit Speed Electric Headlight Door Kit replaces the stock vacuum actuated system on all 1968-82 Corvettes. When installed, this kit operates the headlight doors more reliably, smoother and in sync than the stock vacuum system. The complicated, failure prone and bulky vacuum accessories can all be eliminated. Vehicles with large engine cams with low vacuum signals will also benefit from this system since they are electronically controlled.



Figure 1 - 122010DS Shown

WARNING: The electric headlight door kit will work best when the engine is running at idle. For everything to work the way it was designed, there must be over 12 volts through the electrical system to ensure it works correctly. For more troubleshooting information, please see page 19 of this instruction.

Thank you for your purchase of Detroit Speed's C3 Headlight Door Kit. This kit replaces the stock vacuum system on 1968-82 Corvettes. No cutting, drilling, or any permanent modifications of the vehicle is required to install this system. When installed, this kit will operate the headlight doors smoothly and reliably. The bulky and failure prone original vacuum operated actuators will no longer be a problem.

Item #	Description	Quantity
1	Actuator Assembly w/ Pitman Arm, Bracket & Gearbox – LH	1
2	Actuator Assembly w/ Pitman Arm, Bracket & Gearbox – RH	1
3	Pitman Arm Linkage	2
4	Headlight Kit Actuator Control Module w/ Mounting Bracket	1
5	Headlight Kit Harness Assembly	1
6	Packard Two-Terminal Connector	1
7	Rubber Grommet	1
8	Nylon Wire Tie	10
9	Square Spacer Pad	2
10	Round Bumper	2
11	Jumper Harness (122010 Only)	1
12	Hardware Kit	1
13	Instructions	1

Hardware Checklist – Detroit Speed C3 Headlight Door Kit			
Part Number	Description	Quantity	Check
	C3 Headlight Door Hardware Kit	1	
920001FS	7/64" x 3/4" L Cotter Pin	2	
950036FS	5/16"-18 x 1" L Hex Head Cap Screw	8	
960033FS	5/16"-18 Nylock Nut	8	
970027FS	5/16" SAE Flat Washer	16	

The actuators are pressure sensitive to reduce the chance of personal injury or damage to the vehicle in the event that something is caught in the door during operation. If the door comes in contact with a foreign object, it will stop its operation. The lights will need to be cycled on and off to reset the mechanism. **NOTE:** The pitman arms on the actuators will not be able to be moved by hand as that could cause permanent damage to the actuators.

Many convenience features are integrated into this system. When the headlight switch is pulled to the "park" position, the park lamps illuminate. The headlights stay off and the headlight doors remain closed. When the switch is pulled to the "headlamps" position, the park lights stay on, the headlight doors open, and the headlamps illuminate. When the switch is pushed back to the "park" position, the headlamps turn off, but the headlamp doors remain open. This is useful to clean or service the headlamps since the doors will be open and the lenses cool. When switched to the "off" position, the park lights go out and the headlight doors close.

The module that is included with the Detroit Speed Electric Headlight Door Kit has a unique integrated failsafe protection mode. The module is designed to protect itself from damage due to a short circuit in your wiring system. If a short exists, the module will click continuously. This means a short has been detected and the module has entered into its failsafe mode. For the system to operate again, correction of the short circuit is required followed by resetting the module. To reset the module, remove the fuse from the main power wire for 10 seconds and then reinstall the fuse. If the clicking reoccurs, the short has not been repaired and needs further investigation.

IMPORTANT: This kit is designed to work with properly installed and adjusted headlight doors. This system will not work correctly with doors that bind or do not have the stops adjusted properly. The doors must open and close without binding or resistance. Because the system is pressure sensitive, binding or sticking door assemblies will cause the actuators to stop prematurely. Detroit Speed suggests lubricating all pivot points.

DO NOT open or close the headlight doors by hand. When the doors are fully open the linkage is over center and locked in place. If the doors are not in the over center position and you try to force the doors open or closed by hand, this will cause damage to the gearbox requiring you to return the gearbox/motor assembly back to Detroit Speed to have repaired at your expense.

Detroit Speed has gone to great lengths to provide you with the highest quality, best engineered product available with straightforward installation requiring minimal modification to your vehicle.

NOTE: There is an installation video available through the Detroit Speed website in the tech/install video section shown here: <https://www.detroitsspeed.com/1963-82-corvette-installation-videos>.

Installation Instructions:

1. While it is not required, it is highly recommended to remove the hood for this installation. With the hood in place, access is extremely limited to install the new Detroit Speed electric actuators, and to route the new wiring harness. Have someone assist you to carefully remove the hood from the vehicle taking care not to damage the paint. Disconnect the battery power by removing the negative battery lead from the battery.
2. With the headlight doors in the closed position, use the following pictures and steps 3 through 6 to remove the vacuum actuators on both sides of the vehicle (Figure 1).

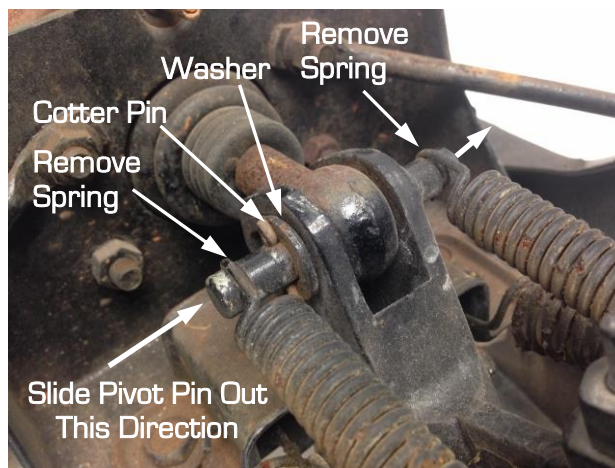


Figure 1 – Remove Actuator Springs, Cotter Pin and Linkage Pin

3. First, remove the inside pair of springs from the pivot pin with a pair of needle nose pliers (Figure 2). **NOTE:** Wear safety glasses when removing the springs.

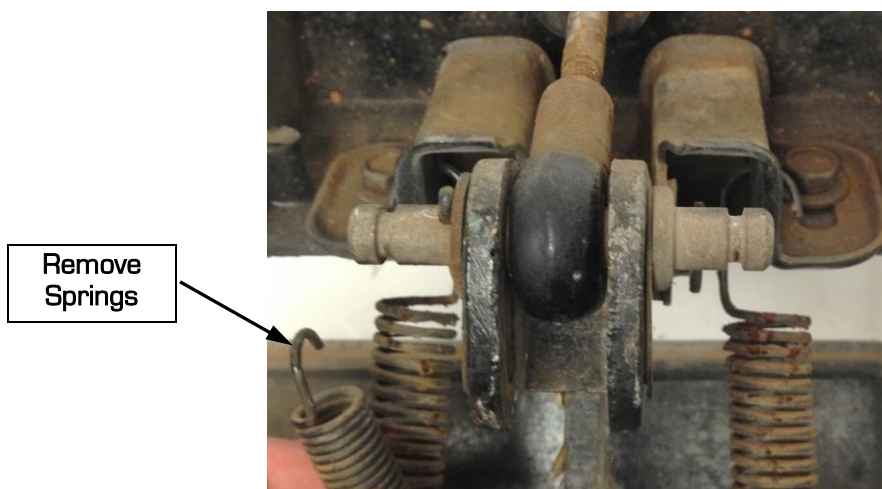


Figure 2 – Remove Springs

4. Remove the cotter pin and washer, set the washer aside as it will be used later. Slide the pivot pin out towards the center of the vehicle (Figure 3). **NOTE:** Be careful not to lose the pivot pin bushings when removing the pin as they will also be used later to install the Detroit Speed actuator kit (Figure 4).



Figure 3 – Remove the Pivot Pin



Figure 4 – Pivot Pin & Bushings

5. Remove the vacuum lines from the actuator. Remove the vacuum actuator from the headlight assembly by removing 4 hex nuts (Figure 5).

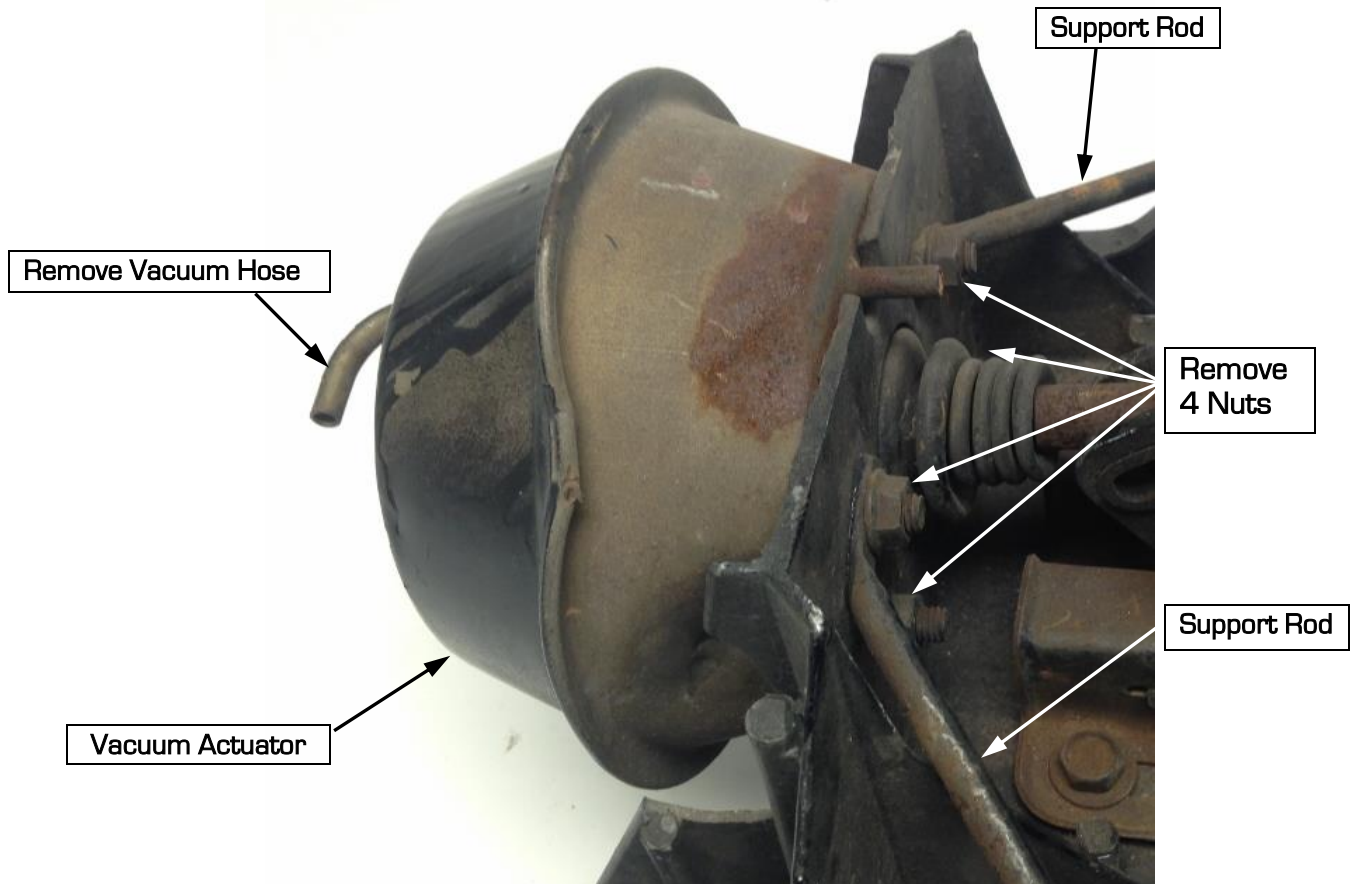


Figure 5 – Remove Vacuum Actuator

6. Remove the vacuum actuator system from the vehicle along with any tanks, hoses, etc. as they will no longer be needed. **NOTE:** If you have a 1968-72 Corvette and are still using the stock wiper system, you will still need to keep the wiper door vacuum hoses and tank to operate the wiper door. You will need to use vacuum plugs on the vacuum tank or tube where you have removed the hoses for the headlight actuators (Figure 6 on the next page).

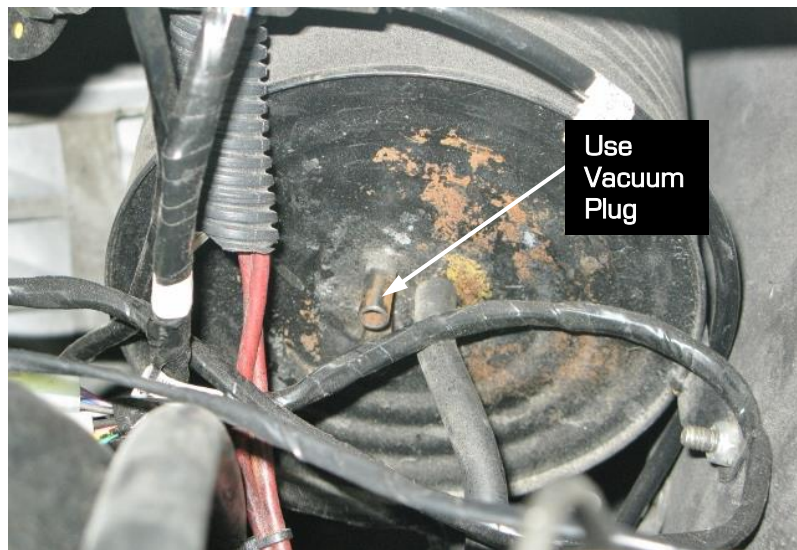


Figure 6 – Replace Hoses on Vacuum Tank with Plugs

7. Remove the clevis from the vacuum actuator by holding the vacuum pushrod with a pair of vise grips and remove the clevis from the pushrod. You will re-install this clevis onto the Detroit Speed electric actuators later on (Figure 7).



Figure 7 – Remove Clevis

8. Install the factory clevis that was removed in step 7 onto the threaded end of the pitman arm linkage. Thread the clevis on all the way until it bottoms out on the threaded rod. Loosen the jam nut on the ball joint to orientate the clevis so that it is perpendicular to the ball joint stud and re-tighten the jam nut.
9. Place the clevis end of the linkage back through the center hole on the headlight motor mount. Line the clevis up so that you can re-install the pivot pin that was removed in step 4. Once the pivot pin is installed with the bushings in place, position the washer over the cotter pin side of the pin and install the provided 7/64" x 3/4" L cotter pin. Bend the 2 halves of the cotter pin around the pivot pin in opposite directions to keep it from falling out of the pin.
10. Test the headlight doors by hand to make sure they are not in bind by pushing on the linkage to open the doors. **NOTE:** Once the door is full open, it will be over-center. To lower the door, you will need to pull the door assembly down from the bottom side of the door (Figure 8 on the next page). If the doors do not open and close smoothly, they will not work correctly once the electric motors are connected. If they are in a bind, replace or lube any worn out bushings or clear any components that could be interfering with the door operation.



Figure 8 – Manually Close Headlight Door

11. Install the actuator assembly into the correct side of the vehicle (Figure 9 & 10) with the provided 5/16"-18 x 1" L hex head cap screws, Nylock nuts and washers (Figure 11). Make sure the lower 2 bolts on each side go through the support rods on the lower front side of the mount. Torque the 5/16"-18 hardware to 20 ft.-lbs.

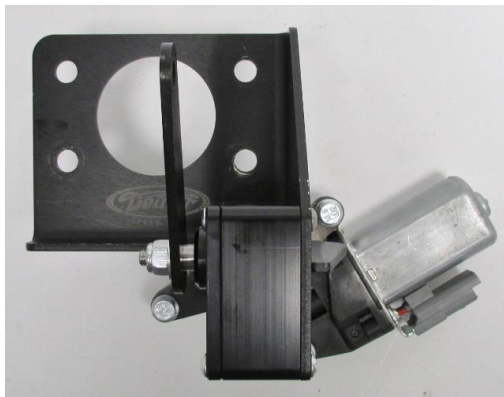


Figure 9 – LH or Driver Side Actuator



Figure 10 – RH or Passenger Side Actuator

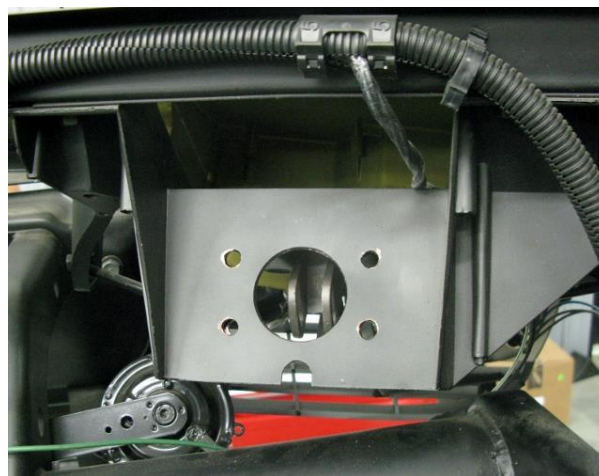


Figure 11 – Install Actuator Assembly

NOTE: Do not attempt to power up the headlight motors without the pitman arm linkage attached to the headlight doors. The headlight motors are shipped with the pitman arm in the "parked" position. If the headlight motors are powered and moved from the original "parked" position without the linkage attached, it may result in the pitman arm crashing into the bracket.

12. Install the pitman arm linkage to the pitman arm. Remove the 5/16"-24 Nylock nut and washer on the ball joint side of the linkage. Adjust the clevis end of the linkage so the ball joint stud lines up with the hole in the pitman arm. Install this end of the linkage into the pitman arm on the actuator and install the washer followed by the 5/16"-24 Nylock nut. Hold the hex nut on the ball joint with a 7/16" wrench and tighten the Nylock Nut with a 1/2" socket. Torque the 5/16"-24 Nylock nut to 20 ft.-lbs. (Figure 12).

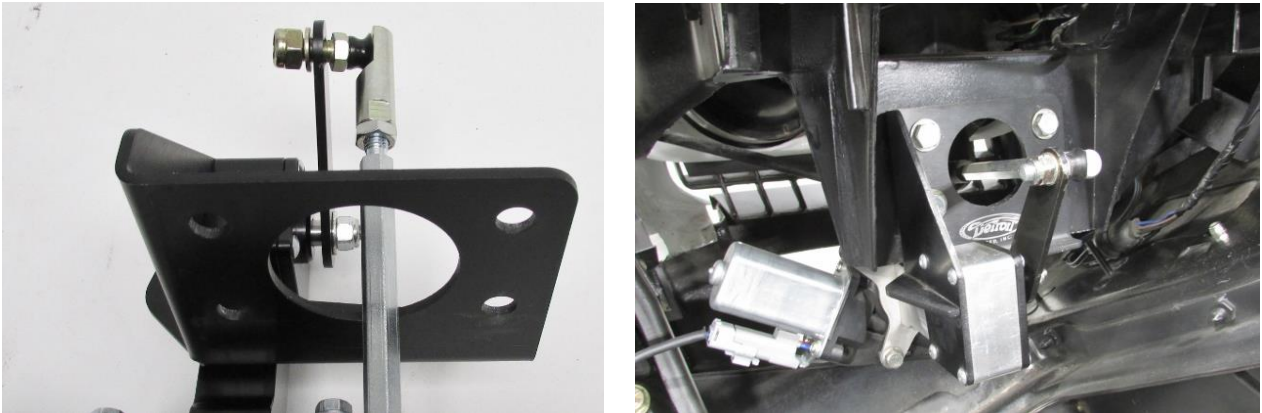


Figure 12 - Install Pitman Arm Linkage

13. Remove the adjustable stop from the arm on the headlight door assembly. Move the hex jam nut from the front side to the back side of the bracket and re-install the stop (Figure 13). This will give you more adjustment once the round bumper pad is installed. **NOTE:** The stop will need to be adjusted later when testing the opening height of the headlight door actuators.

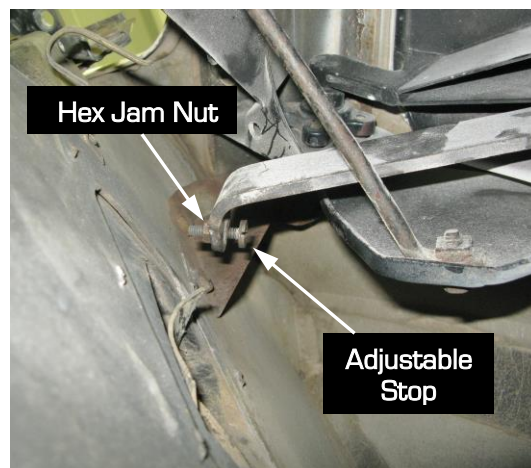


Figure 13 - Headlight Door Stop

14. Install the provided round bumper onto the adjustable stop on both sides of the vehicle (Fig. 14).

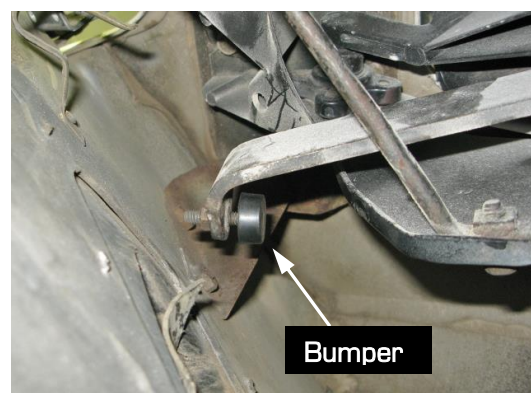


Figure 14 - Install Round Bumper

15. Adjust the clevis so it lines up with the mount to install the pivot pin that was removed in step 4. Once the pivot pin is installed with the bushings in place, position the washer over the cotter pin side of the pin and install the provided $7/64"$ x $3/4"$ L cotter pin. Bend the two halves of the cotter pin around the pivot pin in opposite directions to keep it from falling out of the pin.
16. Using a pair of needle nose pliers, re-attach the springs that were removed in step 3 back onto the pivot pin (Figure 15). **NOTE:** Wear safety glasses when re-installing the springs. Make sure the springs are in their grooves on both ends of the springs. Repeat steps 7 through 16 on the opposite side of the vehicle.

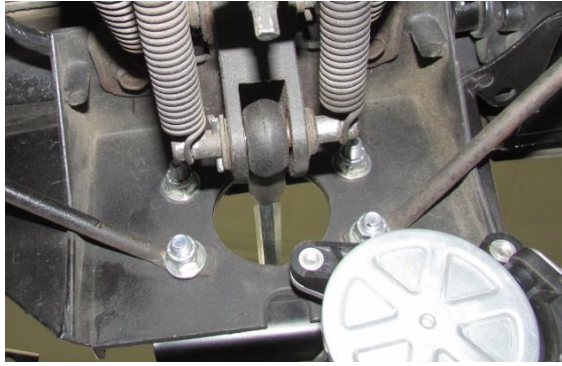


Figure 15 – Re-install Springs on Pivot Pin

17. Install the provided square spacer pads to the headlight door assembly on both sides of the vehicle (Figure 16). Make sure you clean the area with lacquer thinner or alcohol on the headlight assembly so the square pad will stick to the bracket.

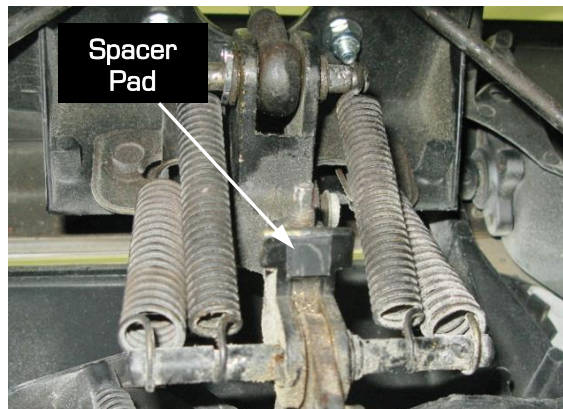


Figure 16 – Install Square Spacer Pad

18. Use a $7/32"$ wrench or socket to adjust the bolt to set the closed height of the headlight door so it is slightly below flush of the front end (Figure 17).

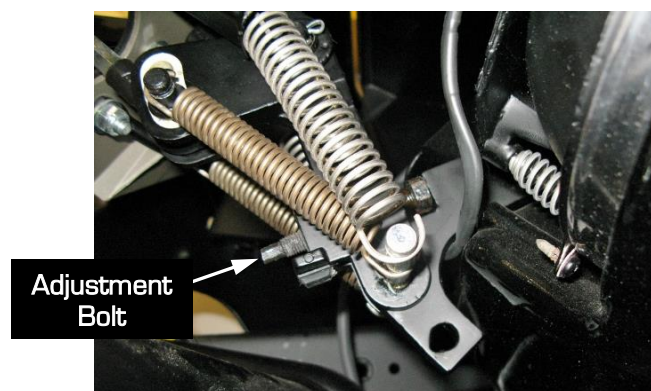


Figure 17 – Adjustment Bolt for Closed Headlight Door

19. Remove the left lower firewall insulation retaining plug from the firewall. It is located inside the vehicle just below the bottom right corner of the fuse block (the carpet may need to be pulled back slightly to gain access).
20. Drill out the existing hole using a Uni-bit or drill bit up to 1-1/8" (Figure 18). The new headlight harness can be routed through this hole, or you can drill a new hole on the side of the fuse box area. Using the included firewall grommet to protect the wiring, pass the headlight motor connectors through the firewall.

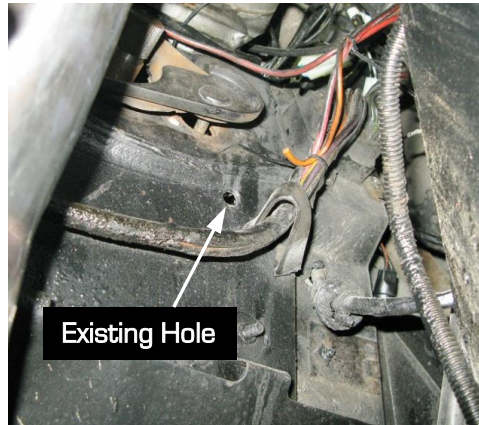


Figure 18 – Route Headlight Harness

21. The connector with the yellow and orange wires connects to the driver's side actuator and the connector with the purple and green wires connects to the passenger's side actuator. Route the harness along the front end of the vehicle through the core support. Connect the wiring harness to the headlight door actuators. (Figure 19).

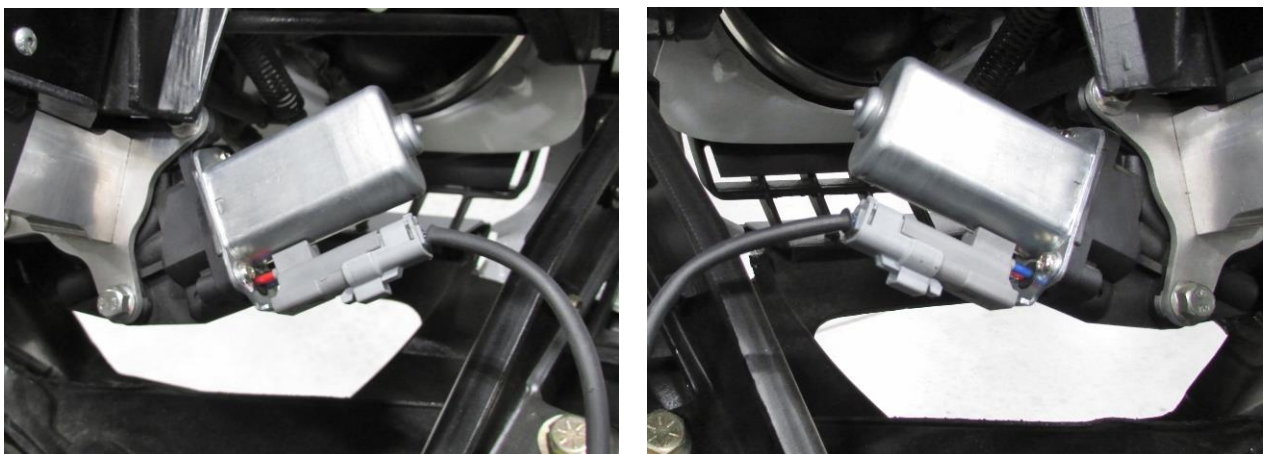
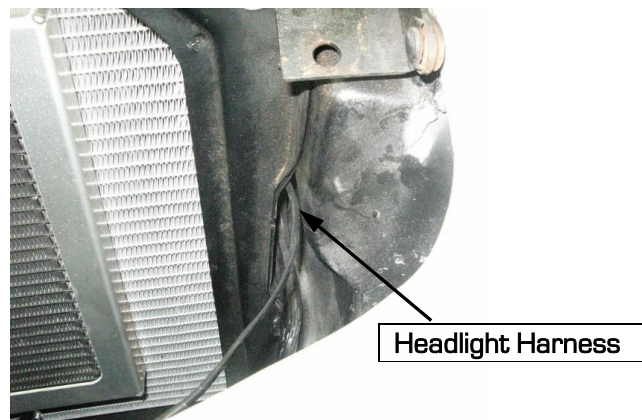


Figure 19 – Connect Harness to Actuators

22. Remove the headlight switch by removing the gauge cluster from the vehicle. **NOTE:** Detroit Speed recommends first removing the steering column. This is recommended to prevent damaging the gauge cluster while installing and removing the headlight switch. It is possible to remove the gauge cluster without taking out the column however it will make the job much more difficult. If you drop the steering column, the gauge cluster will sit on the column and distort the area around the lower collar. If you attempt to remove the headlight switch without removing the gauge cluster, it will break or crack the section of the gauge cluster between the speedometer and tachometer.
23. To remove the steering column, start by removing the 3 screws from the lower column cover. You may find the vacuum override switches and/or the wiper override electrical switch (1968-72) attached to the cover (Figure 20). Remove the lower left hand side dash vent duct.

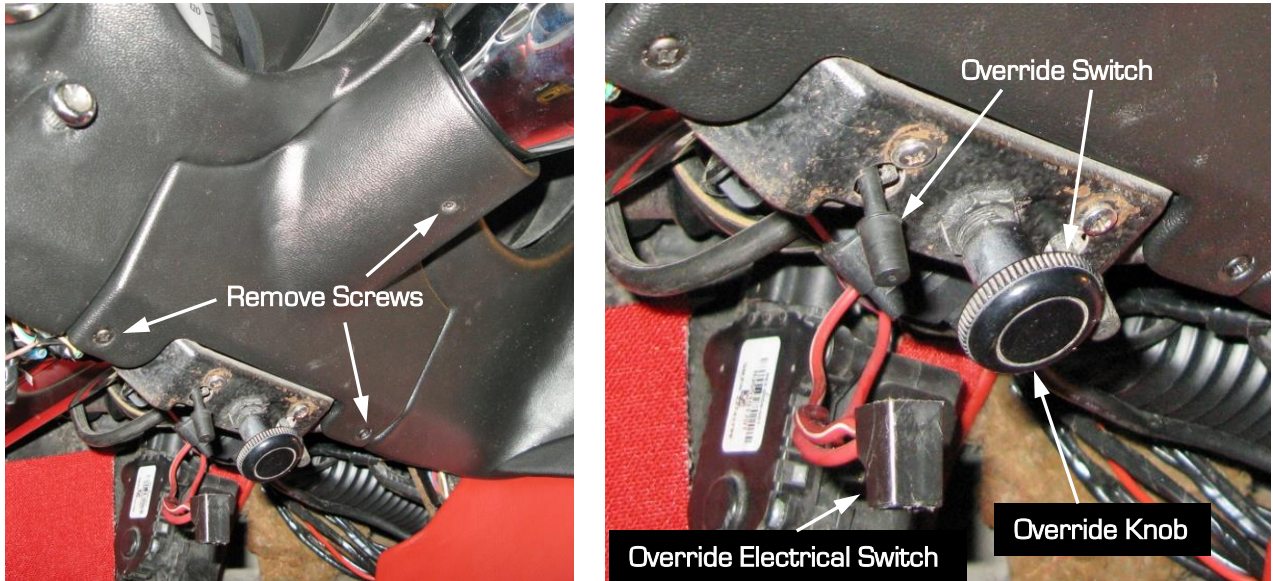


Figure 20 – Remove Lower Column Cover

24. Remove the 2 bolts holding the steering column to the support brace, Remove the 2 carriage bolts from the lower part of the column (Figure 21). **NOTE:** The steering column used in the pictures below is from an aftermarket column.

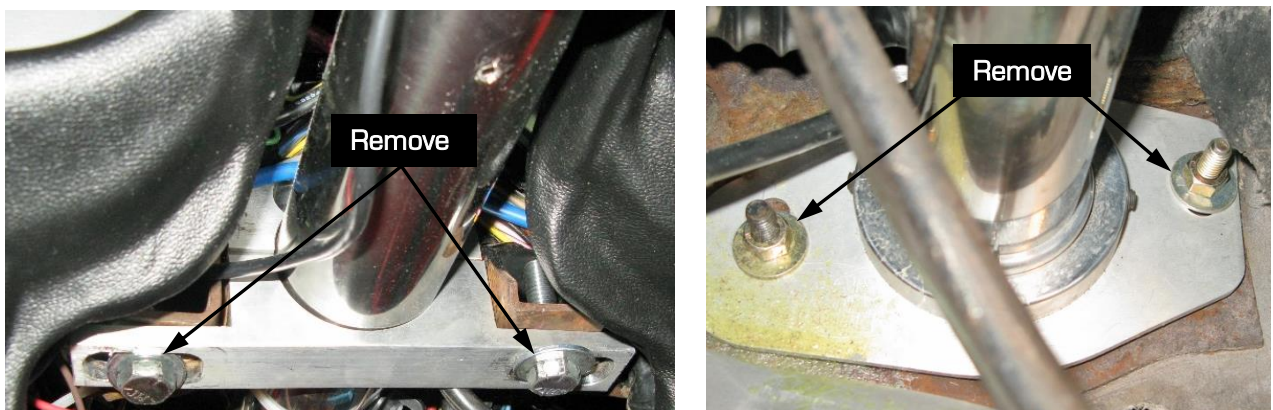


Figure 21 – Remove Steering Column Hardware

25. Remove the clips from the interlock cable pin and cable and remove the cable from the lower column. Remove the bolt holding the “tulip flange” coupler to the lower column and separate the 2 by carefully prying them apart with a screwdriver. If you have a splined U-joint, loosen the jam nut and set screw before removing the column.

26. Remove the electrical [ignition switch] switch connection from the lower part of the steering column. There are two halves to this connector however they will come out as one. Pull the steering column out of the car. You may need to continue to pry between the coupler and the column and wiggle the column loose. **NOTE:** With an aftermarket column you can pull the steering column out of the coupler while resting the steering wheel on the front seat (Figure 22). By not completely removing the column from the vehicle, you can leave the electrical switch connected to the column.



Figure 22 – Remove Steering Column

27. With the steering column out of the way, remove the gauge cluster. Remove the three screws around the top of the gauge cluster and two screws on each side. Once all the screws are removed, it should be ready to be removed from the vehicle (Figure 23). **NOTE:** For the 1968-74 application, you should remove the tachometer cable from the distributor. For all applications you should remove the speedometer cable from the transmission. You will be able to pull these cables out with the gauge cluster instead of having to reach behind the gauge cluster and unscrew or unclip them from the gauges.



Figure 23 – Remove Dash Pad

28. Unplug the headlight switch connector to have better access behind the gauge cluster. Remove the headlight switch knob by pulling the switch out as far as it will go. Pull the headlight knob out of the switch while holding down the release button on the top of the switch (Figure 24).

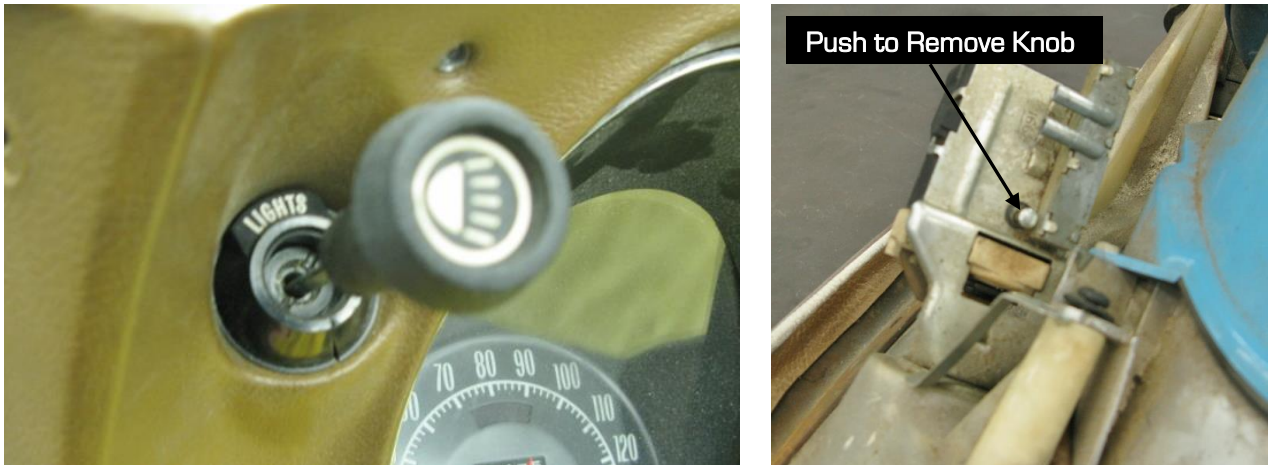


Figure 24 – Remove Headlight Knob

29. Remove the vacuum hoses from the back of the switch. Remove the headlight switch retaining nut using a large screwdriver or other suitable tool. Remove the headlight switch from the dash (Figure 25).



Figure 25 – Remove Retaining Nut

30. For the early & mid C3 applications, locate the light blue and brown wires and remove the terminals from the connector using a terminal removal tool or a small flat blade screwdriver (Figure 26 & 27 on the next page). For the later C3 applications, the yellow wire and the brown wire terminals will need to be removed (Figure 28 on the next page). **NOTE:** The brown wire is also in a different location between the early and mid to late C3 vehicles.

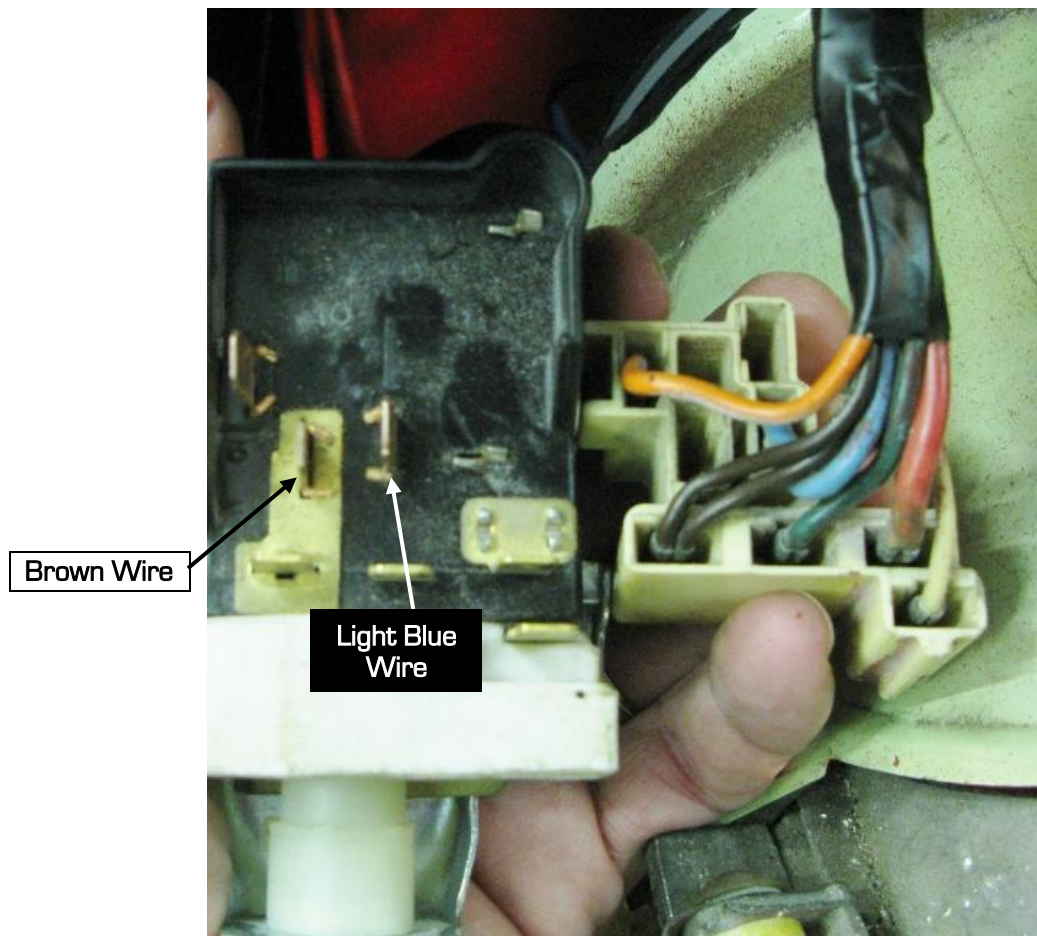


Figure 26 – Early C3 Stock Headlight Switch

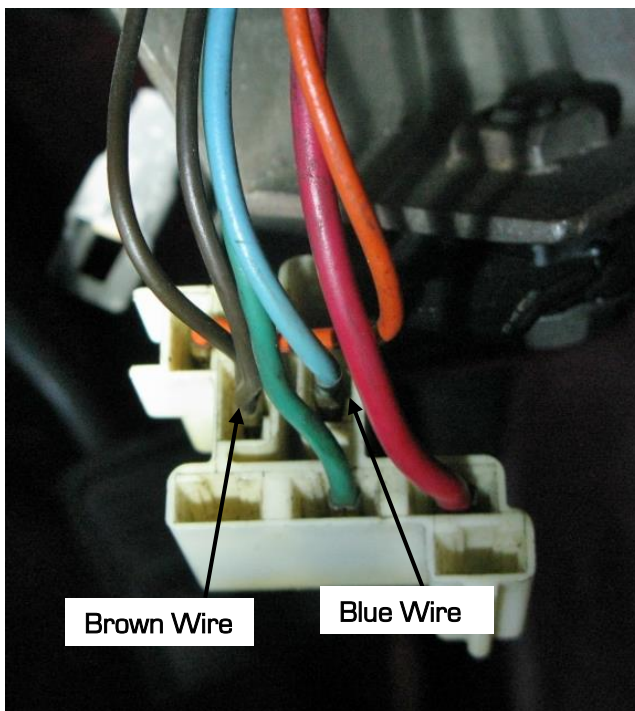


Figure 27 – Mid C3 Stock Headlight Switch

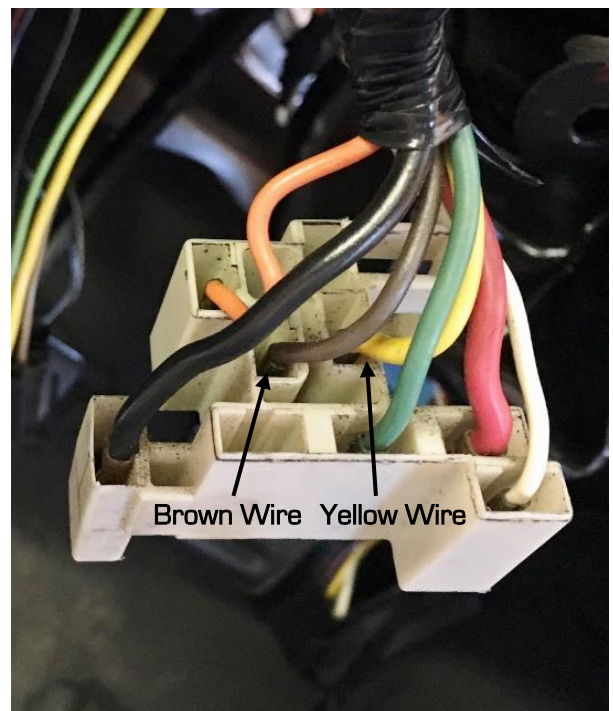


Figure 28 – Late C3 Stock Headlight Switch

31. The light blue or yellow wire is the 12-volt headlamp feed and the brown wire is the park lamp feed. There may be more than one brown wire in the connector so be sure to remove the correct one (Figure 29 on the next page).

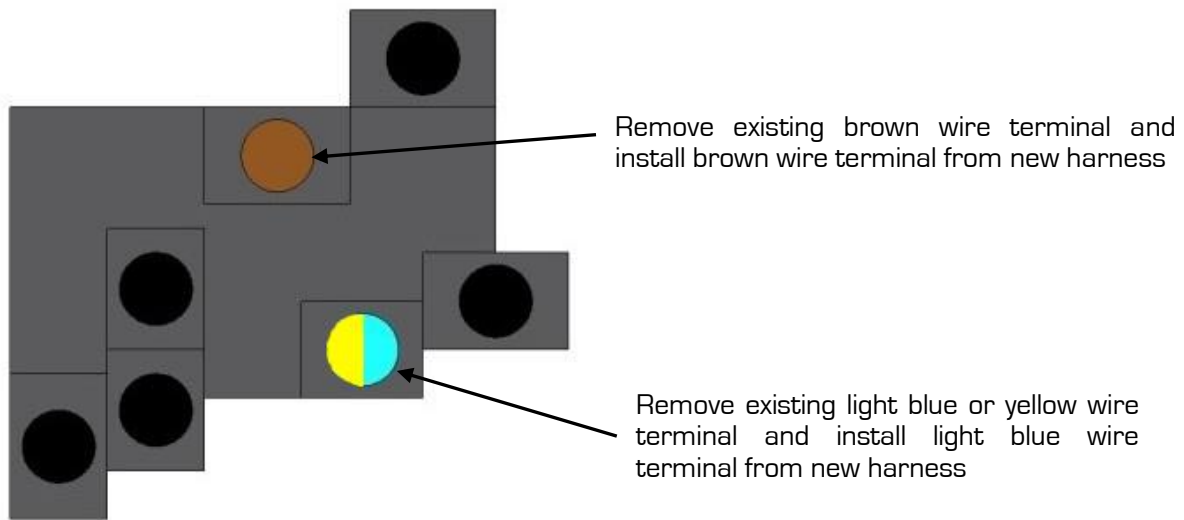


Figure 29 – End View (Harness Side)

NOTE: Depending on your application, the wire colors on your connector may not match the ones above. The spades on the headlight switch will have the same function on the switch even though the wire color may not match.

32. Insert the terminal of the light blue wire on the new headlight harness into the headlight connector location where the original light blue or yellow wire was removed. Insert the terminal of the brown wire on the new headlight harness into the headlight connector location where the original brown park lamp wire was removed (Figure 30).

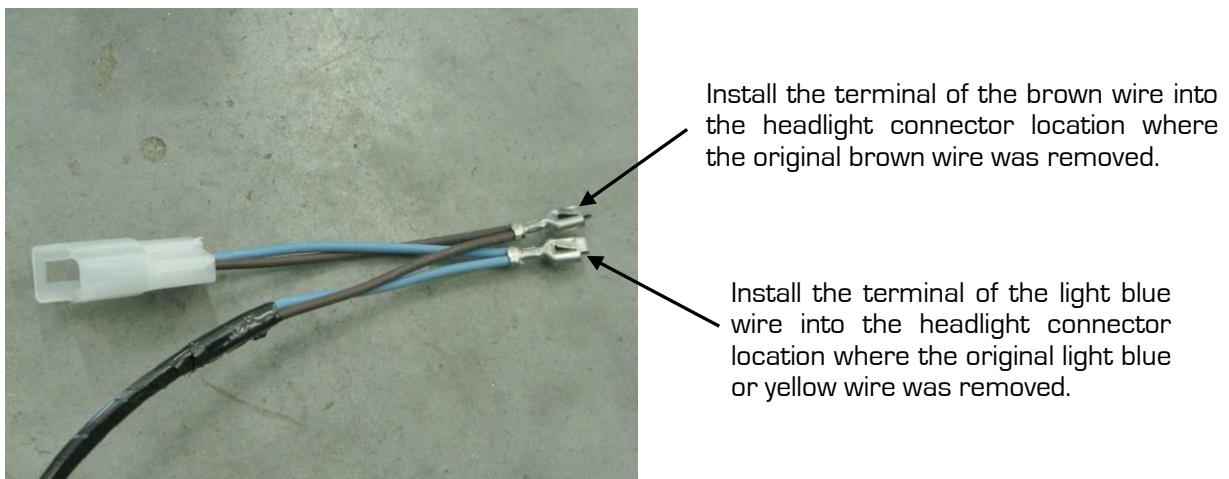


Figure 30 – New Headlight Harness

33. Install the wire terminals which were just removed from the original headlight harness connector into the included black two-terminal female Packard connector cavities (Figure 31).

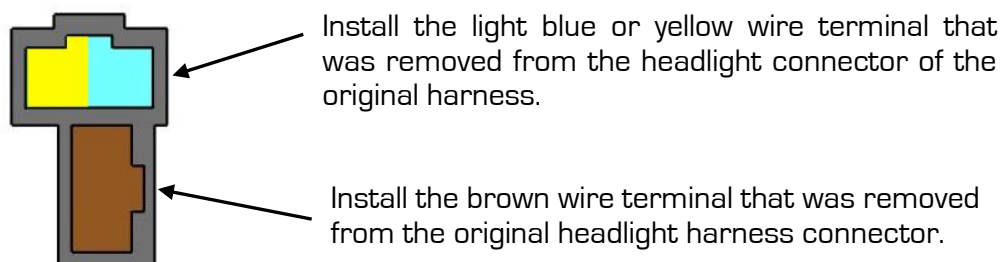


Figure 31 - End View (Harness Side)

34. Plug the black two-terminal female Packard connector into the clear two-terminal connector on the new harness (Figure 32). Make sure that the wire colors correspond with each other (light blue to light blue or yellow, brown to brown).

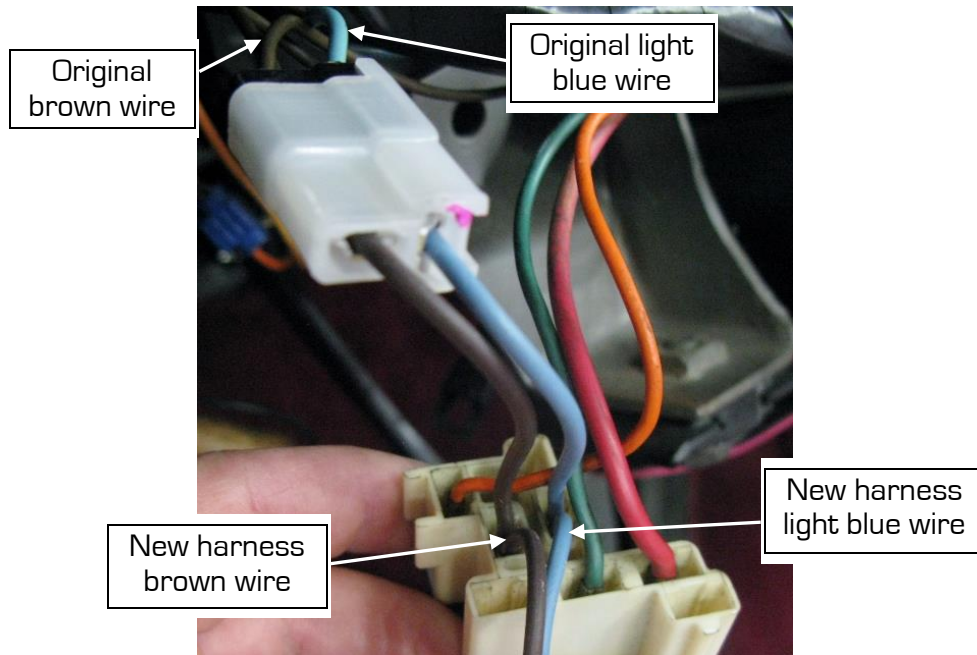


Figure 32 – Plug-In Headlight Connector (Mid C3)

35. Install the headlight control module onto the module mounting plate using the provided 8-32 hardware if not already assembled from Detroit Speed (Figure 33). Do not overtighten. **NOTE:** If you also have the Detroit Speed Wiper Kit, you can mount both control modules to the same mounting plate (Figure 34). Depending on your application, your module mounting plate may look slightly different than the pictures below.

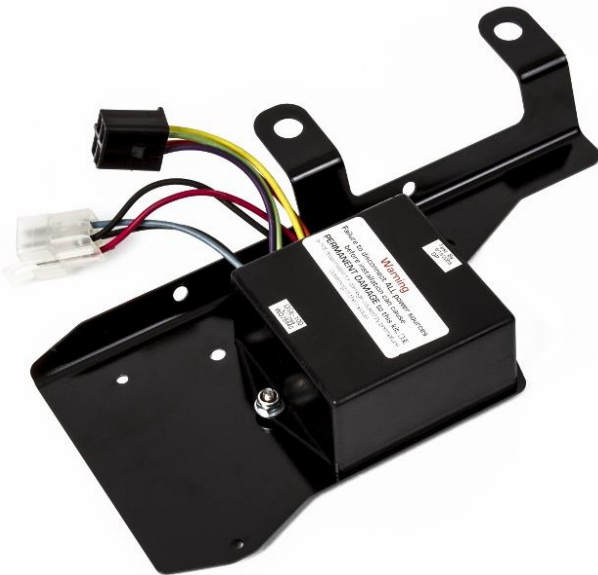


Figure 33 – Headlight Module



Figure 34 – Headlight & 1973-82 C3 Wiper Module

36. Mount the headlight control module and the mounting plate to the steering column support. Remove the two bolts from the column support and mount the module and mounting plate to the support using the two bolts that were removed (Figure 35 on the next page). There are extra holes in the mounting plate so you can wire tie your harness to the mounting plate. **NOTE:** For the 1968-69 vehicles that were equipped with an under dash cross brace, you may need to bend the module plate down slightly away from the brace.



Figure 35 – Mount Headlight Module (Wiper Module also Shown)

37. Once the module is secured, plug the black connector from the module into the clear connector with the corresponding orange, yellow, green, and purple wires. Plug the clear connector from the module into the black connector with the corresponding red, black, blue, and brown wires on the new harness (Figure 36).

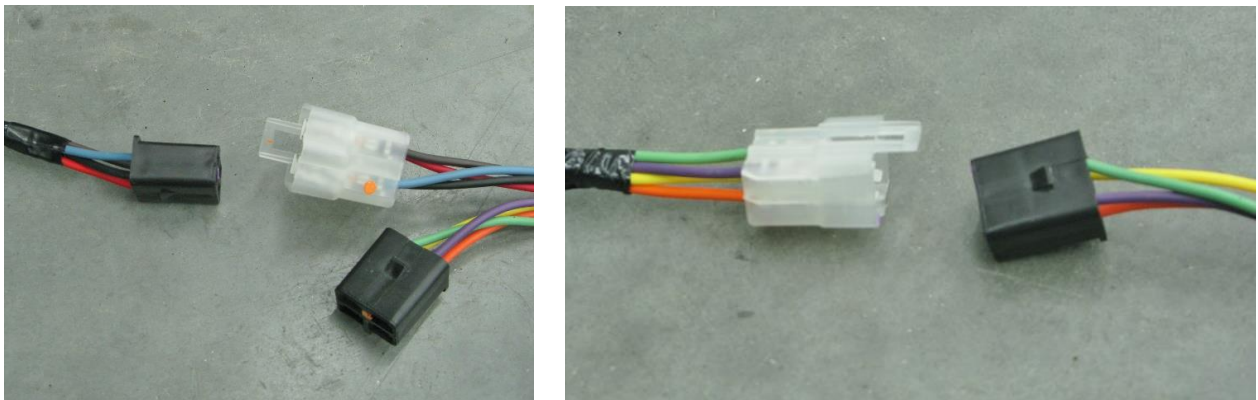


Figure 36 – Plug in Module to Harness

38. Plug the headlight switch connector back into the headlight switch. Do not install the switch back into the dash at this time. Install the headlight knob back into the unmounted switch.
39. For 1968-78 applications, attach a 12V constant power source to the module by installing the red wire with the black connector from the new harness into an open slot on the fuse block labeled "battery". For the 1979-82 applications, you will first need to plug in the provided jumper harness (Figure 37) into the black connector on the red wire from the new harness and then plug the jumper harness into the ATO style fuse block. Use an open slot labeled "battery". **NOTE:** Make sure the 10-amp fuse is installed between the power source and the module.

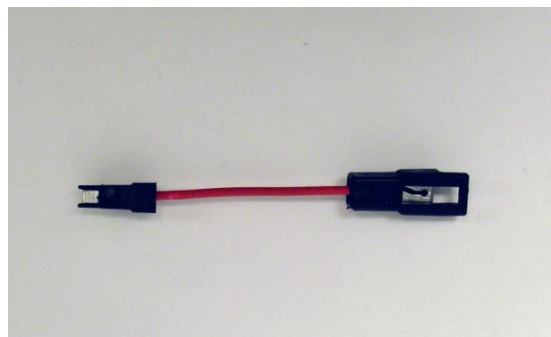


Figure 37 – 1979-82 Jumper Harness

40. Connect the black wire with the ring terminal on the new headlight harness to a suitable ground. Some vehicles have an existing ground connection behind the driver's side kick panel. Make sure to remove any paint or corrosion to ensure that a good ground connection is made.
41. Before powering the system, double-check all the wiring connections for continuity using a multi-meter. Incorrect wiring can cause serious damage to the system.
42. Reconnect the battery. The system will cycle at this point and the doors should open slightly and go back down to the closed position.
43. Once the system has cycled, check the operation of the system by turning the headlamps on and off. If the system is operating correctly proceed to the next step. If not, check all your wiring connections again and refer to the troubleshooting guide at the end of these instructions.
NOTE: If you are still having problems, one solution is to bypass the fuse block and run the power and ground wires directly to the battery.
44. Adjust the height of the stops on the doors as needed by adjusting the hex jam nut and moving the stop on the arm (Refer to Figure 13) for the opened height of the headlight door. That way the headlight doors will be open at the same height. Adjust the bolt on the door linkage as needed for the closed height of the doors (Refer to Figure 17). **NOTE:** If these stops are not adjusted correctly, the doors will not fully open and/or close.
45. If the doors are not closing, the headlight door bolt may be too tight. You can loosen this bolt with a 3/4" wrench just to the point where the doors will close (Figure 38).



Figure 38 – Loosen Headlight Door Bolt

46. Once the operation of the system has been verified, disconnect the battery again.
47. Remove the headlight switch knob and reinstall the headlight switch into the dash. **NOTE:** Make sure the anti-rotation tab on the switch lines up with the alignment slot on the dash (Figure 39 on the next page). Install the headlight switch retaining nut and install the headlight switch knob.

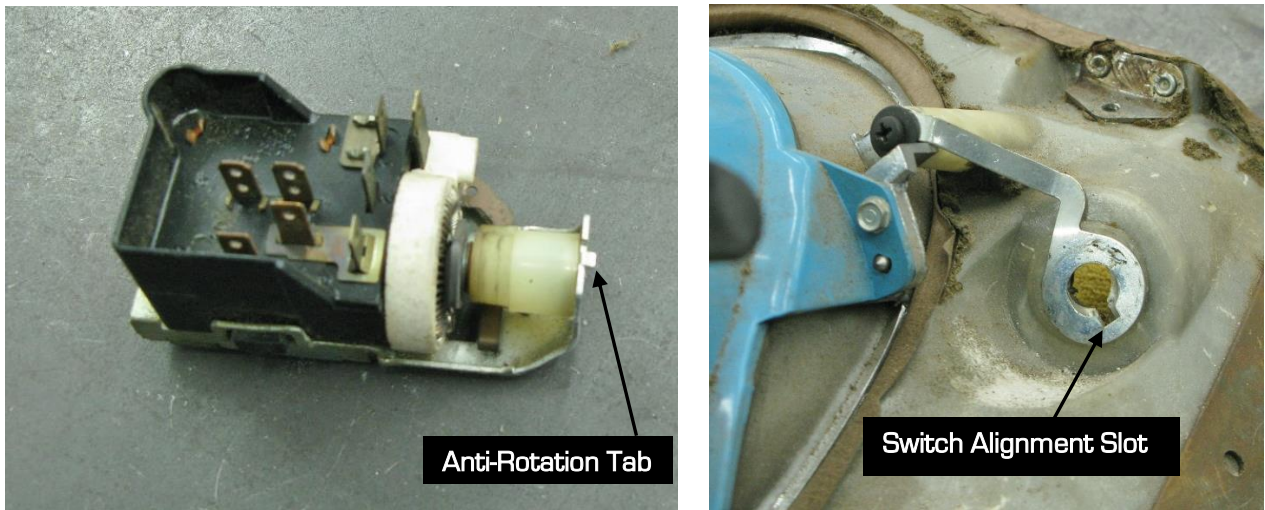


Figure 39 – Install Headlight Switch

48. Re-install the gauge cluster and the steering column by reversing the process described in steps 22 through 25. Secure the new wiring harness under the dash, in the engine compartment, and at the front of the vehicle with the included tie straps.
49. Reconnect the battery and install the hood. Enjoy your new Detroit Speed Electric Headlight Door Kit!

If you have any questions before or during the installation of this product, please contact Detroit Speed at sales@detroitsspeed.com or 704.662.3272

Headlight Troubleshooting

After all connections are made, connect the battery. The doors should go through a "power up" cycle. During this cycle, the doors will open partially, and then close. Anytime the current source to the module is disconnected and reconnected, the doors will go through the "power up" cycle. The module features a failsafe protection to protect the module from being shorted out. If a short exists, the module will beep and is followed by a series of clicks. This means a short has been detected and the module has entered into its fail safe mode. For the system to operate again, correction of the short circuit is required followed by resetting the module. To reset the module, remove the fuse from the main power wire for 10 seconds and then reinstall the fuse. If the clicking reoccurs, the short has not been repaired and needs further investigation. The following chart shows the expected voltages at the module input during typical operation. Use this to troubleshoot the wiring installation and headlight switch operation.

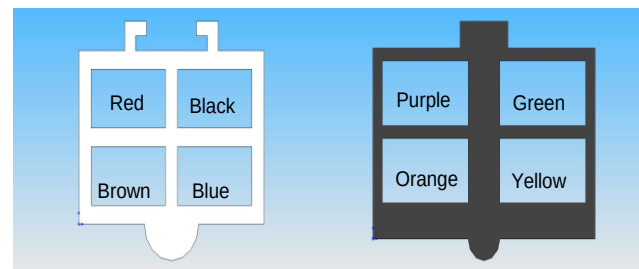
Headlight Switch Position	Wire Color				Door Operation	Light Operation
	Red	Black	Brown	Blue		
Off	+ 12 V	Ground (- 12V)	0 V	0 V	None	None
Park	+ 12 V	Ground (- 12V)	12 V	0 V	None	Park
Headlight	+ 12 V	Ground (- 12V)	12 V	12 V	Door Opens	Headlights*
Park (after headlights on)	+ 12 V	Ground (- 12V)	12 V	0 V	None (Door remains open w/ headlights off)	Park
Off	+ 12 V	Ground (- 12V)	0 V	0 V	Door Closes	None

* Park lights will turn off when headlights are on.

Condition	Cause
Module clicks continuously.	The module has entered into its failsafe mode. The module enters into this mode when it detects a short in the system. To correct, determine and repair the short that exists in the system. To return the module to its normal function, remove the 10 amp fuse for 10 seconds and reinstall the fuse. The system should go through its "power up" cycle. If it does not or the clicking continues, a short still exists in the vehicles electrical system and requires further investigation.
Doors only open or close partially.	Most issues with door operation are due to headlight door assemblies that have too much resistance, binding, or are out of adjustment. To check for correct operation of the module and actuators, disconnect the linkages from the pitman arms. With nothing attached to the motor pitman arm, have another person cycle the switch from off, to park, to headlight, and then back to off. The actuators should turn approximately one complete revolution in one direction, stop, and then turn one revolution in the opposite direction. If the actuators operate as described, intermittent problems are most likely due to doors that have too much resistance opening and/or closing.
One door opens faster/slower than the other.	One door has more/less resistance than the other. Lubricate pivot points and adjust the tension of fasteners at pivots points.
Doors do not operate at all.	Make sure the battery voltage is over 12 V. A low battery condition can result in inoperable doors. Check all connections. Make sure fuse is not blown and doors are not binding.
One or both doors close when the headlight switch is turned on. Door(s) open when the headlight switch is turned off.	On the driver's side, make sure the orange wire is inserted into cavity "2" and the yellow wire into cavity "1" of the connector body. The purple wire should be inserted into cavity "2" and the green wire into cavity "1" of the connector body for the passenger side. If the wires are terminated properly and the problem still exists, reversing the wires on the offending actuator(s) will solve the problem.
Doors do not go through "power up" cycle.	Check voltages at red, black, blue, and brown wires as described in above chart. If voltages are consistent with the chart, try disconnecting and reconnecting the red wire. If the doors do not operate or do not attempt to operate at this point, double check that the actuator harness is plugged into the module and the actuators. Check continuity between the actuator wires at the module pigtail and at the actuator connector.

Module Connector Pin-out (back of connector)

Red Wire	Constant 12V Battery Voltage
Black Wire	Ground
Brown Wire	Park Lamp Feed
Blue Wire	Headlight Feed
Orange Wire	LH Actuator +
Yellow Wire	LH Actuator -
Green Wire	RH Actuator +
Purple Wire	RH Actuator -



*looking from back side of connector

*If none of these suggestions solve your particular issue, please call Detroit Speed at (704) 662-3272.