



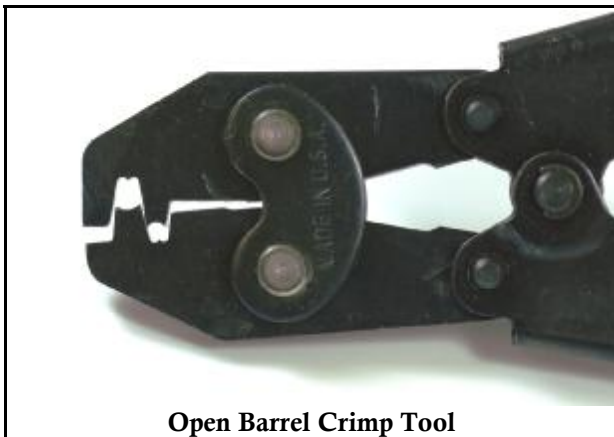
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INSTRUCTIONS COACH-1 UNIVERSAL WIRING KIT INSTALLATION

1. IMPORTANT – READ ALL INSTRUCTIONS BEFORE YOU BEGIN

The electrical system is a critical component affecting both the operation and safety of your vehicle. It is important to have the proper tools and equipment to install your wiring kit, but it is equally important that you have knowledge and experience with automotive electrical systems. You should be familiar with voltage, current, and resistance, and how to use a volt/ohm meter and clamp-on current meter to measure these basic parameters. If you do not feel you have the necessary tools, knowledge, and experience, Coach Controls strongly recommends that you get professional assistance with your wiring project.

SPECIAL TOOLS REQUIRED



Open Barrel Crimp Tool



Proper Open Barrel Crimp



Proper Closed Barrel Crimp



Closed Barrel Crimp Tool

Proper wire terminations are essential for the safety, operation, and long term durability of your vehicle's electrical system. To install this wire kit you will need a heat gun and quality crimp tools. The open barrel crimp tool(s) have dies for crimping both the conductor wings as well as the insulation wings of the Delphi Packard open barrel terminals. It is important to lightly crimp the insulation wings of these terminals in order to help support the wire and prevent bending and breakage of the conductor.

A closed barrel crimp tool such as the one shown should be used to crimp the non-insulated closed barrel terminals provided in this kit. Note that the wire insulation butts up firmly against the terminal and that the crimp tool creates a dimple in the terminal, securing the conductor without breaking any strands. Use a heat gun and a piece of heat shrinkable sleeving included in the kit to insulate each crimped closed barrel terminal. Once the sleeving is heated and shrunk it should be tight around the terminal and the wire insulation. In this way the sleeving acts not only as an insulator but also as a strain relief to minimize bending of the conductor at the crimped connection.

2. HEADLIGHTS AND FRONT PARKING LIGHTS

The Coach-1 Power Center provides automatic headlights using a light sensor to determine daylight or dark, turning the low beam headlights on full bright in dark conditions. In the daytime, low power Daytime Running Lights (DRL) are automatically turned on whenever the Ignition Switch is on, but can be permanently disabled by cutting jumper J6 labeled "DRL" located to the right of the terminal strip on the Power Center's Control Board. DRL is an important safety feature that makes you more visible to other drivers so disabling DRL is NOT RECOMMENDED. Note that the automatic headlight feature does not affect switching between low beams and high beams. As with most new factory vehicles, high beams are controlled manually using a Dimmer Switch.

Even though the low beam headlights will normally be controlled automatically, a Headlight Switch is still required for manual control. For example, there may be times when you want to turn on just the parking lights, or you may want to turn on the headlights when the Ignition Switch is off. Since the Headlight Switch only activates relays and other circuits on the Power Center and does not carry any heavy current, a wide variety of quality switches can be used for the function, including standard headlight switches or small, simple toggle switches with at least a 1 amp rating. The same low current, 1 amp rating also applies to other switches including the Ignition, Headlight Dimmer, Turn Signal, and Power Window control switches.

The Power Center headlight control system can be operated automatically or manually. For automatic operation, the manual Headlight Switch must be in the off position when the Ignition Switch is turned on. Anytime the Headlight Switch is turned on for parking lights or headlights, the headlights will switch to manual mode and will remain in manual mode until the Ignition Switch is turned on the next time.

For some vehicles, particularly early models, front parking lights may not be desirable when the headlights are on. To disable front parking lights when headlights are on, cut jumper J5 labeled "FRONT PARK LAMPS" located to the right of the terminal strip on the Power Center's Control Board. When this jumper is cut, front parking lights will still turn on if the Headlight Switch is put in the Parking Light position, but will turn off in the Headlight position.

3. KEYLESS ENTRY AND APPROACH LIGHTING

A keyless entry system offers quick and convenient means of locking and unlocking the car doors. It has become so popular that it's standard equipment on virtually every new car being sold. Although keyless entry equipment is not included with this kit, the Power Center has been designed to connect to commonly available systems. Wiring details can be downloaded and printed from our website: www.coachcontrols.com.

When properly connected, the Coach-1 Power Center will control vehicle lighting in response to the door lock and unlock signals generated by the keyless entry system. At night, when a door unlock signal is received, the Power Center will activate headlights, signal lights, and dome lighting to illuminate the area around the car as well as the interior as you approach the vehicle. These lights will be automatically turned off in approximately 30 seconds unless a door is opened, but can be reactivated by another door unlock signal. In daylight, the approach lighting will not be activated but the signal lights will flash to let you know the unlock signal was received.

When locking the doors, day or night, the signal lamps are flashed to indicate the signal was received. However, in bright daylight it may be difficult to see the lamps flash, so if you press the lock button on the key fob a second time, the horn will chirp in addition to flashing the signal lights.

4. MOUNTING AND GROUNDING

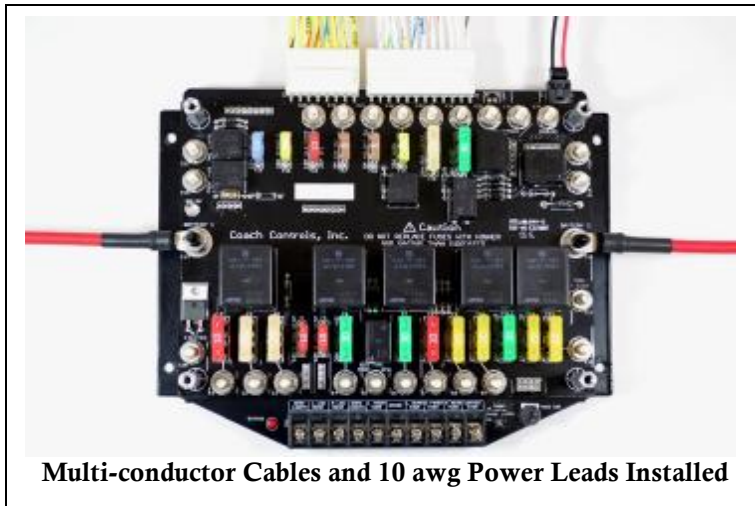
The Coach-1 kit includes a light sensor cable assembly used for the automatic headlights. This cable assembly has been specially calibrated and any modifications will void the warranty on the cable. The sensor should be mounted in the center of the dash, close to the windshield for maximum daylight. Be sure there is enough room under the dash for the sensor and cable and that the cable will reach the sensor connector on the Power Center. In the center of the dash drill a 0.257 inch hole (ANSI drill size F, or metric 6.5mm) for a snug fit. Install the sensor retainer from the top of the dash. Slide the clamp ring over the sensor onto the cable, then insert the sensor into the bottom of the retainer underneath the dash. To hold the sensor in place, slide the clamp ring up and press it firmly around the sensor retainer until it's flush with the bottom of the dash.



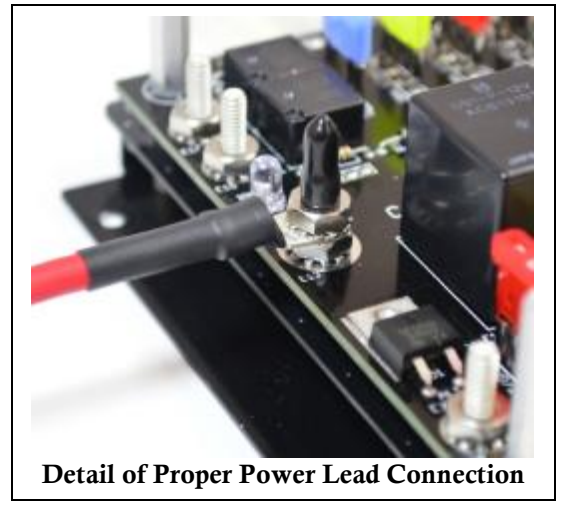
Detail of Light Sensor with Mounting Retainer and Clamp Ring

MAKE SURE THE BATTERY IS DISCONNECTED BEFORE PROCEEDING. The Power Center, 100 amp fuse holders, steering column, battery, lights, HVAC, all switches and other electrical equipment should be mounted before you begin installing the wiring. The Power Center must be mounted in a dry location, usually under the dash. It is normal for relays to get a little warm during continuous use so the Power Center should be mounted where air can circulate around the unit.

Connect the negative side of the battery to the engine block if possible as well as to the chassis using battery cable (not supplied) and at least 3/8" bolts and tooth washers. If grounding the battery to the engine block is not practical, connect both the battery and engine to the chassis with battery cable, bolts, and tooth washers. Metal must be clean, free from rust and paint where the connection is made. If the body of your vehicle is metal, it too must be grounded to the chassis using at least 8 awg wire and 1/4" bolts and tooth washers. If you have a fiberglass body, mount one or more ground studs and terminal blocks inside the cabin for convenient ground points. Use at least 8 awg wire to connect all your ground points to clean steel chassis.



Multi-conductor Cables and 10 awg Power Leads Installed



Detail of Proper Power Lead Connection

Two 100 amp MIDI fuse holders and fuses are included with this kit. They can be mounted under the hood or to the chassis, but must be at least 6" away from exhaust. One of the 100 amp fuses protects the wires connecting the battery and alternator, the other protects the Power Center. Two separate 10 awg wires supply battery power to the Power Center. **BE SURE TO CONNECT ONE FROM EACH SIDE OF THE POWER CENTER TO THE 100 AMP FUSE AS SHOWN IN THE WIRING DIAGRAM.**

5. WIRING THE CAR

Refer to the wiring diagram supplied with this kit as well as the wiring information supplied with all your various electrical equipment and accessories. Supplemental detail wiring diagrams are also available on our website to assist you in correctly installing the system.

Route all wires, including grounds, before making any final connections. Plug the multi-conductor Power Center cables and light sensor cable into the receptacles located at the top of the Power Center Control Board. Route the cable leads to all the various switches and equipment as indicated on the diagram. Be sure to protect the ends of any wires that aren't used by doubling the wire and installing a piece of heat shrinkable tubing or electrical tape. Use rubber grommets whenever wires pass through metal openings and don't allow wires to touch sharp corners. Heater/Ventilator/Air Conditioner (HVAC) systems can be complicated so pay special attention to the manufacturers instructions and note that the Power Center includes relays for the HVAC unit and blower motor (high speed) as recommended by leading manufacturers.

Dress your harness by starting in the middle and working your way toward the ends of cable bundles, keeping wires parallel for a neat appearance. Dress the wires to each accessory working from the cable bundle, making sure to leave some slack (service loop) when you make the final terminations. The Power Center has backing nuts on all stud terminals. Be sure that all nuts, including the backing nuts, are properly tightened as you complete the connections.

6. TESTING

Once you have completed installation of your wire kit, make sure the Ignition Switch and all accessories are turned OFF. The battery should be disconnected and fully charged to at least 12.5 volts. You may want to use a battery charger or maintainer during testing. **IF YOU BLOW A FUSE ALWAYS REPLACE THE FUSE WITH THE SAME AMP RATING.**

- 6.1 With the fully charged battery disconnected, use an ohm meter to check for shorts between the positive and negative battery cables. Resistance should be greater than 100 ohms. A reading of less than 100 ohms indicates a possible serious short or wiring error that must be investigated and corrected before proceeding. Otherwise, connect your battery to begin testing the system.
- 6.2 Check circuits that do not require the ignition key as follows.

- 6.2.1 Verify all brake lights, including the center (third) brake light, illuminate when the brake pedal is depressed. Note that the third brake light will flash the first time the brake is depressed but won't flash again unless the brake is released for 30 seconds.
- 6.2.2 Turn on the parking lights (Headlight Switch). Verify dash lights, taillights, and front parking lights are on. Set the dash lights for desired brightness using the built-in dimmer control located on the Power Center's Control Board to the right of the terminal strip.
- 6.2.3 The red Status LED on the Power Center will flash about once every 2 seconds whenever any switch input is active. Rapid flashing indicates an output fault (short or overload) that should be investigated and corrected.
- 6.2.4 Headlights should turn on with the Headlight Switch and the Dimmer Switch should operate the high beams.
- 6.2.5 Turn on emergency flasher (hazard lights) and verify all four front and rear signals flash.
- 6.2.6 Verify the horn sounds when the horn button is depressed.
- 6.2.7 Verify the keyless entry (electric) door locks operate (if equipped). Approach lighting should function as described in the Keyless Entry section.
- 6.2.8 Verify the dome light is gradually illuminated when a door is opened and dims to off when doors are closed.

- 6.3 Check accessory circuits. Turn the Ignition Switch to the Accessory position.
- 6.3.1 Verify the wipers and radio operate. Accessory power should also be available at the power point receptacle (if equipped).
- 6.3.2 Stay clear of the windows and window mechanisms while verifying the power windows operate up and down correctly. Verify the automatic (1-touch) down function works by momentarily pressing each window down switch. If the up and down switches work backwards, either the window switch OR window motor wires are reversed.
- 6.3.3 Using a keyless entry system connected to the Door Lock and Unlock inputs to the Coach-1 Power Center (12 pin white connector) allows you to use special power window control features. Pressing the Lock button on the keyfob TWICE will cause BOTH windows to be automatically fully raised. If the Unlock button is pressed TWICE only the driver's side window will be lowered automatically. If these automatic functions cause either window to work backwards, then the wires to the window switch AND the window motor are reversed. Correct any window switch or motor wiring as required and repeat these tests until both windows operate correctly.
- 6.3.4 Close the doors then turn the Ignition Switch to the off position. Accessory power will remain on (radio and power windows will operate) until a door is opened. If a door is not opened, accessory power will turn off automatically in a few minutes. Depending on light conditions, the headlights may come on when the key is turned off. In dark or low light conditions, the system is designed to turn on the headlights and illuminate the surrounding area for exiting the vehicle. When a door is opened, the signal lamps will also turn on for additional lighting. This exit lighting will automatically turn off in about 30 seconds. The headlight turn-off delay can be changed, see section 7 below.

- 6.4 Check Ignition circuits. Make sure the headlight switch is turned off, then turn the Ignition Switch to the Ignition position, but do not start the engine.
- 6.4.1 Cover the dash mounted light sensor and wait a few seconds. Verify the headlights are on, full brightness and the Dimmer Switch operates the high beams.
- 6.4.2 Uncover and shine a flashlight into the light sensor to simulate daylight conditions. Wait about 10 seconds and verify the headlights switch to low power Daytime Running Lights (DRL) with an orange-like color.
- 6.4.3 Use the Headlight Switch to manually override the automatic headlight system and turn on the parking lights. Verify the headlights turn off and the parking lights remain on. Turn off the Headlight Switch and verify the headlights and parking lights are off.
- 6.4.4 Verify the electric fuel pump.
- 6.4.5 Verify the left and right turn signals operate. Lane change signaling works by momentarily activating a turn signal switch. In this case you get 3 automatic flashes.
- 6.4.6 Verify the heater blower motor operates at all speeds.
- 6.4.7 The electric radiator cooling fan (if equipped) can be tested by jumpering the fan thermostat switch or connecting a temporary jumper from Power Center FAN T-STAT stud terminal to the GROUND stud terminal.

- 6.5 CAUTION: Make sure the engine and transmission are properly filled with all required fluids and the engine is ready to run. Engage the parking brake and make sure the transmission is in Park or Neutral.
- 6.5.1 Apply the brakes. Be ready to disconnect the battery in the event the starter solenoid should stick when activated. This is commonly caused by a defective starter or starter solenoid, or an improperly rebuilt starter.
- 6.5.2 Without starting the engine, very briefly turn the ignition switch or press the start button to “bump” the starter a couple of times to verify the starter motor engages and disengages.
- 6.5.3 Now start the engine and allow it to warm up.
- 6.5.4 Verify gauges are working properly and adjust the radiator fan thermostat (if equipped) to turn on the cooling fan at the desired engine temperature.
- 6.5.5 Turn on the Air Conditioning and verify the AC compressor is operating.
- 6.5.6 Turn off the Ignition switch and all accessories. Verify the engine stops. Disconnect the battery.

Install the Power Center cover with 4 thumb screws and reconnect the battery. Use of a battery maintainer is recommended if the car is not going to be driven for several weeks. As with most new factory vehicles the Power Center uses a small amount of power when the battery is connected.

Congratulations! Enjoy your ride!

7. CHANGING THE HEADLIGHT TURN-OFF DELAY

In low light or dark conditions, the headlight control system is designed to turn on the headlights when the Ignition Switch is turned off in order to illuminate the surrounding area for exiting the vehicle. They will also turn on when the doors are unlocked with a connected keyless entry system as described earlier. In both cases the headlights will automatically turn off after a programmed delay. The same delay is used for door unlock approach lighting as well as ignition turn-off exit lighting. It is factory preset for 30 seconds but can be changed in 15 second increments with a range of 0 to 60 seconds. Note that if a delay of 0 is selected the headlights will not be turned on for approach lighting (door lock) or exit lighting (Ignition Switch off). Follow this procedure to change the delay:

- 7.1 Open a door and leave it open.
- 7.2 Turn the Ignition Switch to the Accessory position (not Ignition).
- 7.3 Depress and hold the brake pedal.
- 7.4 Momentarily activate the Left Turn signal to decrease the delay by 15 seconds or the Right Turn signal to increase the delay by 15 seconds. The dash turn indicators will flash to let you know the change was accepted.
- 7.5 You can continue to use the Left and Right Turn signals to adjust the delay up or down in the 0 – 60 second range. The possibilities are: 0 <=> 15 <=> 30 <=> 45 <=> 60
- 7.6 When you reach 0 or 60 seconds the horn will chirp to let you know you’re at the end of the adjustment range.
- 7.7 Release the brake and turn off the Ignition Switch when you’re finished. The new delay will remain in effect until changed.

8. OPTIONS

8.1 Security Alarm

If the vehicle is locked by Keyless Entry key fob and a door is opened, the security alarm will be activated. When the alarm is activated the horn will chirp as a warning to allow the security system to be disarmed. If the alarm is not deactivated within a few seconds, the horn will sound and headlights and signal lights will flash. The alarm can be deactivated by using the unlock button on the key fob or by turning on the Ignition or Accessory key.

8.2 Traditional Signaling

Our standard turn signal operation is a unique Flash, Flash, Pause, Flash, Flash, Pause sequence, and the third high-mounted brake light will flash 3 times when first activated. The Traditional Signaling option provides world-wide compliant 90 flashes/minute turn signals and hazard lights, and no flashing third brake light.

8.3 Euro Style Signal Lamps

This option provides compatibility with European style rear signal lamps that have separate brake lights and turn signals. Simply connect all rear brake lamps to the Center Stop Lamp output of the Power Center and connect the rear turn signal lamps to the appropriate outputs labeled on the Power Center.

8.4 Power Window Drop Down for Weather Seal Clearance

This option provides compatibility with vehicles where the windows fit into a weather seal along the top, preventing the doors from opening without dropping the windows slightly for clearance.

Entering a locked vehicle with windows raised: When the doors are unlocked by Keyless Entry key fob both driver and passenger windows will be dropped slightly to allow the doors to open. When both doors are closed and the Ignition Key is turned on, the windows will automatically raise into the weather seal.

Exiting the vehicle: When the Ignition Key is turned off the windows will automatically drop slightly to allow the doors to open. After exiting the vehicle, use the key fob to lock the doors and the windows will automatically raise completely into the weather seal.

8.5 Independent Power Window Drop Down for Weather Seal Clearance

This special option is similar to the Power Window Drop feature described above where the windows fit into a weather seal along the top, preventing the doors from opening without dropping the windows slightly for clearance. However, this option allows the windows to be operated independently and automatically, OEM style, and does not rely on use of the keyfob or Ignition switch. If you need one of these two options order only one, not both.

IMPORTANT: This option requires the driver and passenger Dome Light door switches to be integrated into the door latch mechanisms so that the Dome Light switch closes as soon as the door is unlatched. The driver and passenger door switches are wired separately to the Power Center and used to trigger the Dome Light and Power Window independent operation.

9. TECHNICAL SUPPORT

Free 24/7 tech support is provided online at: www.coachcontrols.com
or call 423-790-7905 M-F, 9am-5pm eastern.

10. WARRANTY

We at Coach Controls, Inc. warrant to the original purchaser the products manufactured by us to be free from defects in material and workmanship under normal use and service, for which it was intended, but only if it has been properly installed and operated. We offer a Lifetime Warranty to the original purchaser on the Power Center and all other parts and accessories that we manufacture. For all other parts and accessories the warranty period is One Year from date of purchase. Our obligation under this warranty shall be limited to the repair or replacement of any product or products which may thus prove defective under normal use and service, for which it was intended, and which our examination shall disclose to our satisfaction to be thus defective. Any defect affecting operation of the unit will be repaired or replaced at no charge. You will be billed only for shipping. **Damage caused by improper circuit fusing or replacement of original fuse(s) with a higher amp rated fuse(s) is NOT covered.**

Before returning any product, a Return Material Authorization (RMA) number must be obtained from Coach Controls, Inc. and conspicuously printed on the outside of the box. Any item(s) returned without an RMA will not be accepted.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE AND OF ALL OTHER OBLIGATIONS OR LIABILITIES ON OUR PART, AND WE NEITHER ASSUME, NOR AUTHORIZE ANY OTHER PERSON TO ASSUME FOR US, ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF THIS PRODUCT. THIS WARRANTY SHALL NOT APPLY TO THIS PRODUCT OR ANY PART THEREOF WHICH HAS BEEN SUBJECT TO ACCIDENT, NEGLIGENCE, ALTERATION, ABUSE, OR MISUSE. WE MAKE NO WARRANTY WHATSOEVER IN RESPECT TO ACCESSORIES OR PARTS NOT SUPPLIED BY US. THE TERM "ORIGINAL PURCHASER" AS USED IN THIS WARRANTY, SHALL BE DEEMED TO MEAN THAT PERSON OR ENTITY WHO ORIGINALLY PURCHASED THE PRODUCT. THIS WARRANTY SHALL APPLY ONLY WITHIN THE BOUNDARIES OF THE CONTINENTAL UNITED STATES.

Original Purchaser must notify Coach Controls, Inc. of a breach of warranty within thirty (30) days after discovery thereof, but not later than the guarantee period; otherwise, such claims shall be deemed waived. No allowance will be granted for any repairs or alterations made by the Original Purchaser without Coach Controls, Inc.'s prior written consent. No person, firm, or corporation is authorized to assume for us any other liability in connection with the sale of these goods.

This warranty shall not apply to any Coach Controls, Inc. product, or part thereof, which has been repaired or altered, without Coach Controls, Inc.'s written consent, outside Coach Controls, Inc.'s manufacturing facility, or altered in any way so as, in the judgment of Coach Controls, Inc. to affect adversely the stability or reliability of the Coach Controls, Inc.'s product, or has been subject to misuse, negligence, or accident, or has not been operated in accordance with Coach Controls, Inc.'s printed instructions, or has been operated under conditions more severe than, or otherwise exceeding, normal use for such product.

Coach Controls, Inc. shall not be liable for any injury, whether to person or property, or for any damages, whether direct, indirect, consequential, or special, or any other damage resulting from the use, or misuse, of this product. Any injury or damage so incurred will be limited to the original purchase price of the product.

11. MISSING ITEMS POLICY

Every Coach Controls kit is precisely inspected and weighed in accordance with a packing list prior to shipment to ensure all components are included. It is the customer's responsibility to immediately inspect and verify package contents upon receipt. Coach Controls can only be responsible for items missing from shipments directly from our facility to the purchaser. Missing item claims must be submitted within 30 days of purchase, and Coach Controls reserves the right to challenge such claims through review of its inspection and shipping records.