



Multi-Battery Isolator Installation Guide

CONGRATULATIONS

Thank you for choosing a Phoenix Gold "Power Flow" product. The latest state-of-the-art low-voltage engineering plus years of experience in the low-voltage field have gone into each "Power Flow" product.

The attached instructions are provided to assist you with step-by-step installation. Test procedures are also provided and should be kept with your vehicle for future reference.

Every effort has been made to combine fine workmanship with the best materials. In the event that service is ever needed or if you have questions regarding the product, its installation or its performance, please call us at 1-503-288-2008.

MULTI-BATTERY ISOLATORS

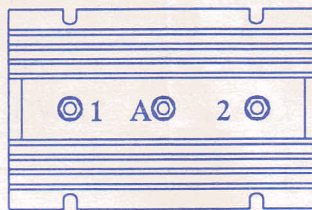
Phoenix Gold's multi-battery isolators are designed to operate at a full-rated load over an ambient temperature range of -40F to +200F. These solid-state isolators provide automatic charge distribution and load isolation for batteries. They eliminate operator intervention or unreliable mechanical solenoids. Phoenix Gold isolators can be used in a broad range of vehicles and marine applications. We offer six (6) different sizes from 70A to 240A. The choice of isolator to use in a vehicle is determined as follows:

The isolator should be matched to the size (amperage) of the alternator,

If the stock alternator is 60A, use a 70A isolator our MBG70.

If the stock alternator is 80A, use a 95A isolator our MBG95, etc...

All our isolators are negative ground for one alternator systems utilizing 1 main battery and 1 auxiliary battery bank, which could consist of one or more batteries in the bank. **Note: The isolators may not be compatible with Hitachi, Nippon-Denso or Mitsubishi alternators.** Please feel free to request our Gold Papers on the Power Flow system and Multi-Battery Isolators. These papers will ensure a full understanding of our products for all demanding installations.



INSTALL INSTRUCTIONS

Prior to starting the isolator installation, start engine and run at a fast idle. Measure voltage at the battery terminal. It should be about 14 volts. After installation, recheck above to confirm the same voltage.

1. Disconnect negative cable from the starting battery.
2. Mount isolator in a location away from maximum engine heat and in a location that will allow the isolator to receive maximum air flow.
3. Physically remove all the wires

connected to the stud on the original alternator (typically a 1/4 inch threaded stud) and move these wires to the #1 battery post on the isolator.

4. Install a new, at minimum, 4 gauge wire (our PS4R or PRO 4 Ruby) from the output stud on the alternator to the "A" stud on the isolator.
5. Attach the auxiliary battery(s) to the #2 stud on the isolator. **Note:** It does not matter which outer stud is assigned #1 or #2. Again, we suggest you use a minimum 4 gauge power wire. Typically, use a 2 gauge wire run from the isolator to the batteries in the trunk of the vehicle.

6. If a circuit breaker is to be used, it should be installed near the Aux. Battery and on the Aux. Load. NO circuit breaker is to be installed from alternator to isolator or from isolator to main starting battery. Use our 100A (VB100) circuit breakers on any battery smaller than a "4D" type.

7. Connect all the auxiliary loads to the auxiliary battery. **For best results, use a Phoenix Gold Thermo Oil Battery.** Remember to use 22.5 amps (in amp hour or reserve current rating) for every 100 watts RMS. **For example, 500 watt system (22.5 x 5) requires 112.5 continuous amps.**

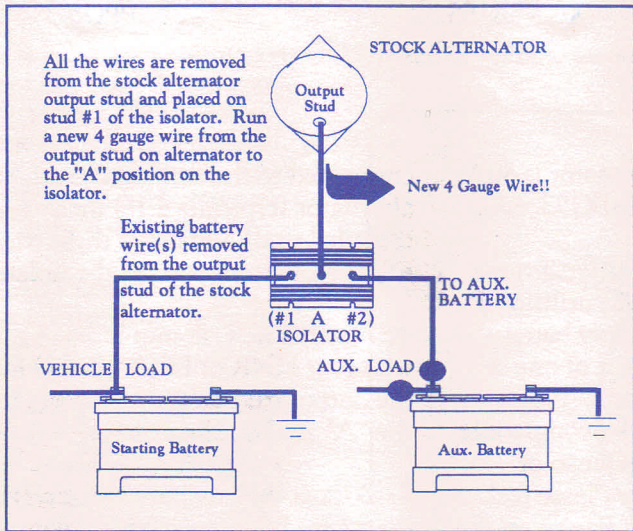
8. Reconnect the negative cable to the starting battery.

Note: A high output alternator may be required to handle the increased electrical loads above 500 watts & keep your battery charged.

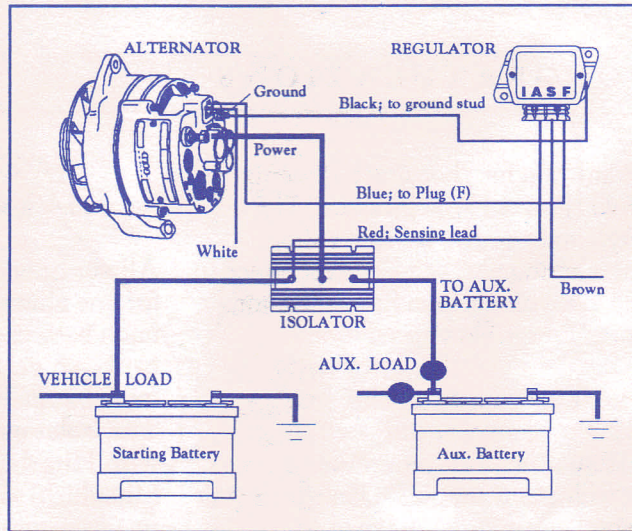


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(A) Wiring Diagram for Isolator Installation with Stock (Original Equipment) Alternator



(B) Wiring Diagram when Multi-Battery Isolator is Used with "Power Flow" Alternator (Regulator 3 Wire Harness)



Control Wiring

Power/Ground Cable

Circuit Breaker or Fuseholder

Wire Size Chart

Alternator Rated Output in Amps

Minimum Charging Wire Size for Wire Length in Feet

Up to 70A
70A to 90A
95A to 120A
130A to 240A

	0-5ft.	6-10ft.	11-20ft.	21-25ft.
Up to 70A	7AWG	7AWG	7AWG	6AWG
70A to 90A	7	7	4	4
95A to 120A	4	4	4	2
130A to 240A	4	4 or 2	2 or 1/0	1/0

Test Instructions for Isolator with Ohmmeter*

1. Remove all wires from the isolator to read impedance of the diodes.
2. Using a needle movement ohmmeter Rx-1 scale or a digital ohmmeter diode scale, hold the Red* prod on terminal "A", and with the Black* prod touch terminal #1 and #2. A good isolator will show a current flow from "A" to #1, #2.
3. Next hold the Black* prod on terminal "A" and with the Red* prod touch terminal #1 and #2. A good isolator will allow no current flow from "A" to #1, #2.
4. Hold one prod on the aluminum heat sink, being sure there is contact. Then touch with the other prod terminals "A", #1, #2. A good isolator will show no current flow. Note: * On some import ohm-meters, the Red and Black prods are reversed for these tests.

Test Information for Electrician

1. Engine not running: #1 terminal of isolator should read starting battery voltage. #2 terminal should read auxiliary battery voltage. The "A" terminal may read from zero to 10 volts.
2. Engine running and alternator charging: #1, #2 should read approximately the same voltage, which will be the voltage regulator setting or less, a minimum of 14V. The "A" terminal should read .8 to 1 volt higher than the reading of #1, and #2 terminals (typically over 15V DC).
3. For 12 volt systems, the "A" post should read approximately 15 volts. The #1 and #2 post should read 13.8 to 14.2 volts. If the "A" post reads 13.8 volts to 14.2 volts, the regulator is sensing the alternator output rather than the main battery. This situation needs to be corrected for proper charging.

Test Points

	IGNITION OFF	IGNITION ON ENGINE NOT RUNNING	ENGINE RUNNING
Alt. Battery	12.6V	12.6V	14V
# Alt. Battery	0	0	14.5 - 15V
# Iso. A Term.	0	0	14.5 - 15V
# Iso. B1 Term.	12.6V	12.6V approx.	14V
# Iso. B2 Term.	(#B2 battery voltage if battery connected)		14V

Test points when Isolator is used. See Diagram B.

If the approximate voltages are not at the test points, check source for that test. All voltages at regulator, except field terminal (Term. F) are from other sources. Field voltage will appear at regulator terminal F if you have voltage on "A" and "S" terminals per the above chart. If no voltage appears at field terminal with key on and all other voltages are as per the above chart, the regulator is defective.



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INSTRUCTIONS FOR 1985 OR NEWER GM/DELCO W/"CS-100" SERIES ALTERNATORS OR NIPPON DENSO.

1. **Caution:** Disconnect negative cable from the starting battery.

2. Mount the isolator in a location away from engine heat and in a location allowing maximum air flow.

3. Remove all wire(s) connected to original alternator output post. Move these wires to the #1 battery post on the isolator.

4. Install a new 4 gauge wire from alternator output post to the alternator post (A) of the isolator.

5. Attach auxiliary battery to the #2 battery post of the isolator using a #4 gauge wire or refer to chart for appropriate gauge wire.

6. Plug yellow wire into ignition slot on fuse panel. Run other end thru firewall and connect to "E" terminal (smaller stud) on the isolator.
Note: If using a 10A circuit breaker, place it in line with the yellow wire between ignition and "E" terminal on isolator.

7. Remove control plug from the alternator. **Note:** Plug can be removed using a small screwdriver by prying under the locking tab.

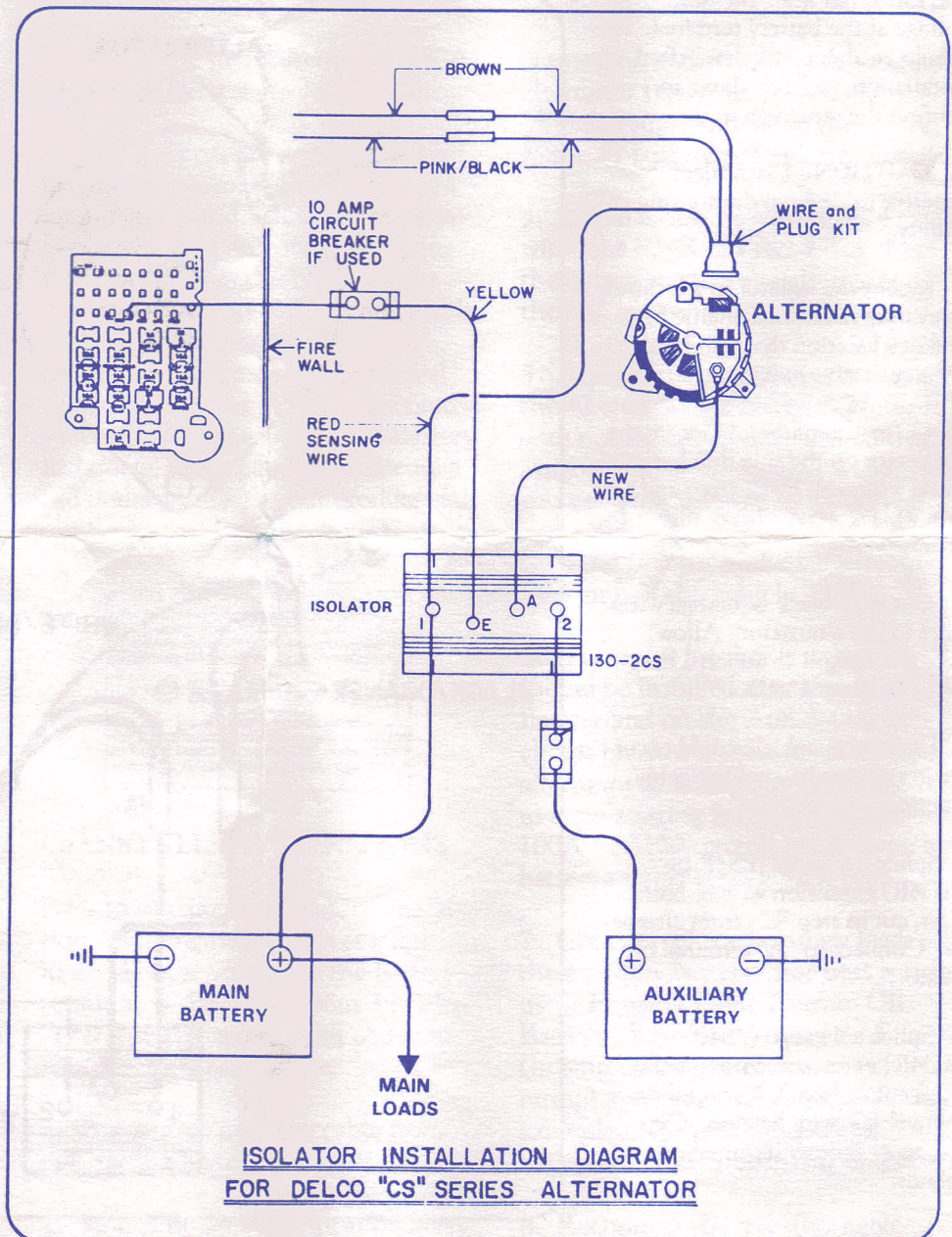
8. Install a new control plug, which is provided with our GM version isolator.

9. Connect the red sensing lead to the #1 battery post on isolator.

10. Cut the old plug wires approximately 6 inches from the plug and strip the harness side wires 3/16" to 1/4" from the end. Using supplied butt connectors, splice new plug to wires, (Brown to Brown, Pink/Black Strip to Pink/Black Strip if used).

11. Connect all auxiliary loads to the auxiliary battery. For best results, use a Phoenix Gold Thermo Oil Battery.

12. Reconnect the negative cable to the starting battery.





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ISOLATOR INSTALLATION INSTRUCTIONS FOR FORD - 1985 & NEWER

Isolator installation instructions for 1985 and newer Ford products using a "plug-in" connection alternator. Prior to starting isolator installation, start engine and run at fast idle. Measure voltage at the battery terminal. It should be about 14 volts. After installation, recheck above to confirm the same voltage.

A. **CAUTION:** Disconnect negative cable from the starting battery.

B. Mount the isolator in a location away from maximum engine heat and in a location that will let the isolator receive maximum air flow.

C. Go to alternator and locate the connector on the side that has one white wire with black trace and two heavy black wires with orange trace.

D. Cut both black & orange wires close to the alternator. Allow sufficient length to attach a butt splice (approx. 2"-3").

E. Damage to vehicle could occur if wires are cut beyond the cable junction.

F. Splice a 4 gauge (PS4R or PRO4R) extension wire to both wires, cut in step "C", from alternator. Connect to "A" terminal of isolator.

G. Splice a 4 gauge (PS4R or PRO4R) extension wire to both wires, cut in step "C", extending from vehicle wire harness. Connect to #1 battery terminal of isolator.

H. Auxiliary battery is connected to #2 isolator terminal using a 4 gauge wire or refer to chart for appropriate gauge wire.

I. If circuit breaker is going to be used, it should be installed near the Aux. Battery and on the Aux. Load. NO circuit breaker is to be installed from alternator to isolator or from isolator to main starting battery.

J. Connect all auxiliary loads to the auxiliary battery. For best results, use a Phoenix Gold Thermo Oil Battery.

K. Reconnect the negative cable to the starting battery.

