

MULTI-BATTERY ISOLATOR

RNG-BATT-ISO200



 **RENOGY**

FEATURES

1. Eliminates multi-battery drain when two or more battery banks are in a charging system
2. Isolates each battery circuit and allows each battery to discharge and charge according to its own needing
3. Solid-state electronics. More efficient and reliable than mechanical and solenoid systems
4. Full current in either post
5. Anodized aluminum heatsink
6. Sealed to protect against oil, gas, salt, water and harsh environments
7. Designed to exceed OEM specifications. The most comprehensive line of Battery Isolators on the market
8. CE certified

SPECIFICATIONS

- System voltage: 0-50 Vdc
- Current: up to 200Amp
- Voltage drop: 0.90Vdc max
- System ground: negative
- Mounting hardwares included

Suitable for boats, ships, Rvs, trucks, police, fire, emergency vehicles and industrial equipment

WHY ISOLATE YOUR BATTERIES

- Many vehicles have multiple batteries: one to start the engine and others to power accessories. Without a Battery Isolator (BI), a battery with a lower charge will rob power from a battery with a higher charge, until the batteries equalize. This problem is known as multiple battery drain and could leave you with dead batteries.

THE SOLUTION

- To eliminate the multi-battery drain problem, a Battery Isolator acts as a check valve between the batteries, preventing the current from flowing from one battery to another. Each battery is isolated and acts as an independent power source. So no matter how drained your accessory batteries become, they will never drain power from the battery you're depending on to start your engine.
- When the alternator is charging, current can only flow from one direction, from the alternator to the batteries. Each battery then determines the amount of current which flows into it by its own state of charge based on the voltage regulator setting.
- With this system, the alternator is protected, the batteries are protected. The balanced circuit electronic isolator is the absolutely the best way that proper isolation and control can be accomplished, solving every multi-battery drain problem.

MULTI-BATTERY ISOLATOR APPLICATION & INSTALLATION INSTRUCTIONS

The installation of a Multi-Battery Isolator is quite simple as long as you carefully read and understand these instructions, and most importantly review the application chart below, before you begin.

First, make sure you have **all** the tools, wire, connectors and circuit breakers you will need. A range of installation wiring kits is available to help make the job a snap. See the table that follows for the recommended wire size and circuit breaker for your installation.

For optimum system performance it is recommended that a battery labeled "Deep Cycle" be used in the auxiliary position.

Finally, Multi-Battery Isolators are designed for alternator systems with negative ground, and batteries of the same nominal voltage. Batteries of differing voltages cannot be used.

PLEASE READ INSTRUCTIONS COMPLETELY PRIOR TO STARTING INSTALLATION

GROUP 1	General Motors (Delco-tron)	Except Delco-tron CS series alternators (CS series used on most 1985 and newer GM vehicles).
	Ford	Up to 1996.
	Chrysler	All models, all years including Nippondenso externally regulated alternators.
	Jeep	Equipped with Nippondenso externally regulated alternators.
	Japanese Imports	With alternators using external voltage regulator or external sensing.
	Motorola	Load Handler Series or OEM Remote Sense Series.
A Group 1 Isolator will have an alternator post and up to four battery posts. There are no colored terminals.		

GROUP 2	General Motors (Delco-tron)	Equipped with Delco-tron CS series (most 1985 - 1993) or CS130-D series alternators (most 1993 and newer**).
	Jeep	Vehicles equipped with Delco-tron CS series alternator (most 1985-1990).
	Toyota, Honda & Some Imports	1985 and newer equipped with Nippondenso alternator with internal regulators or alternators with an "S" (sense) terminal.
	Ford	Many 1986 and newer.
<p>Unplugging the plug-in connector from the alternator and counting the number of holes in the connector can identify the CS series alternator. The CS series will have three small and one large hole. The CS130-D alternator has four pin terminals all the same size. The SI series will have two slotted holes in the connector. ***Delco CS series alternators require a separate sense wire which is included with the connector kit. The connector kit may or may not be included with the Isolator, but is available as an accessory.</p> <p>All Group 2 Isolators may be used in Group 1 applications. Simply disregard the additional excitation ("E") terminal. A Group 2 Isolator will have a colored fourth terminal indicating the "E" terminal.</p>		
GROUP 3	Motorola	Other than Load Handler Series.
	Bosch	Requiring regulator sensing.
<p>A Group 3 Isolator will have a colored fourth terminal indicating the "R" terminal.</p>		
GROUP 4	<p>Battery Isolators are not compatible with these alternators. A Battery Separator is recommended for these applications. Alternators with internal voltage sensing, e.g., some Mitsubishi and Hitachi, or single wire self exciting Delco alternators/Isolators may be used if the alternator is modified.</p>	

MAXIMUM ALTERNATOR RATING	RECOMMENDED WIRE SIZE / CIRCUIT BREAKER			
	Up to 15ft	Up to 15ft	Up to 55ft	Up to 15ft
70 Amps	#8 ga. / 50 Amp	#8 ga. / 50 Amp	#6 ga. / 50 Amp	#6 ga. / 50 Amp
95 Amps	#8 ga. / 50 Amp	#6 ga. / 50 Amp	#4 ga. / 50 Amp	#4 ga. / 50 Amp
130 Amps	#6 ga. / 80 Amp	#4 ga. / 80 Amp	#2 ga. / 80 Amp	#1 ga. / 80 Amp
160 Amps	#4 ga. / 120 Amp	#2 ga. / 120 Amp	#2 ga. / 120 Amp	#0 ga. / 120 Amp
240 Amps	#000 ga. / 150 Amp	#000 ga. / 150 Amp	#0000 ga. / 150 Amp	#0000 ga. / 150 Amp

INSTALLATION INSTRUCTIONS

RELEVANT TO ALL SIZES AND TYPES OF ISOLATORS

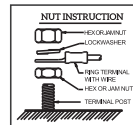
CAUTION: If you are installing an Isolator on a Toyota (alternator group type #2) or a Motorola/Bosch (alternator group #3) see special instructions before disconnecting any part of the existing system.

WHAT YOU WILL NEED

- Screwdriver • Drill with 1/8" bit • Wire Crimper • Open end wrench set
- Nut driver set
 - Terminal Boot Covers
 - Automotive grade wire
 - Appropriately sized circuit breaker
 - Ring terminals Butt connectors

1. Remove the wires from negative terminals of all the batteries on your vehicle. Do not run the engine, extinguish all burning material and do not smoke near the engine. **FOLLOW VEHICLE MANUFACTURER'S RECOMMENDATIONS FOR DISCONNECTING BATTERY.**

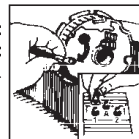
2. Mount the isolator in a convenient location as near to the alternator as possible and away from the exhaust manifold. Allow for proper ventilation. Do not mount on the engine. Drill 1/8" holes and mount with the screws provided.



3. Install hardware to the studs in the order shown in diagram, being careful not to over torque the bottom hex or jam nut. Failure to install bottom hex or jam nut will void warranty and result in poor electrical connections.

4. Locate the "BAT" terminal at the rear of the alternator. It is usually the largest connection. Disconnect ALL the wires (including the voltage regulator sensing wire if present) from the "BAT" terminal of the alternator. Reconnect these same wires to the "1" terminal of the battery isolator. Lengthen the wires, if necessary. Be sure you follow proper splicing techniques.

NOTE: DISCONNECTING OR CUTTING THESE WIRE IN A LOCATION OTHER THAN AT THE ALTERNATOR MAY RESULT IN IMPROPER FUNCTIONING OF THE CHARGING SYSTEM.

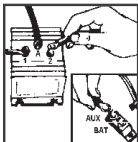


5. Connect one end of a new wire of the proper size (see Application Chart - Recommended Wire Size) to the battery "BAT" terminal of the alternator and the other end to the "A" terminal of the isolator. This should now be the only wire connected to either of these terminals.



CAUTION: 1985-1990 Ford or 1998 and newer Ford vehicles may require special instructions (see pages 2 and 3 for specific instructions).

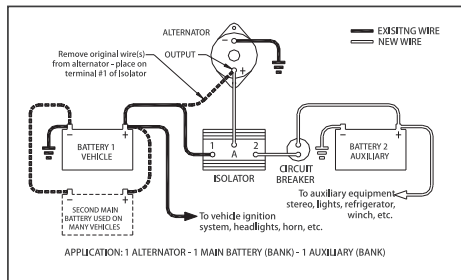
6. Mount a circuit breaker as near to the auxiliary battery as practical, and away from engine or exhaust heat (see application chart for proper size). Connect one end of a new wire of the proper size to the "2" terminal of the Isolator. Run the wire to the circuit breaker and connect it to the "AUX" terminal. Run another wire from the circuit breaker to the auxiliary battery, connecting one end to the "BAT" terminal of the circuit breaker and the other to the positive "+" terminal of the auxiliary battery. Repeat for three and four battery bank Isolators.



7. IF YOUR INSTALLATION FALLS IN ALTERNATOR GROUP TYPE #2 OR #3, PROCEED TO SPECIFIC INSTRUCTIONS FOR THAT RELEVANT GROUP, OTHERWISE PROCEED TO STEP #8.

8. Connect all of the auxiliary loads (phone, lights, stereo, refrigerator, winch etc.) to the positive post of the auxiliary battery(ies). Reconnect the ground cables removed in step 1. Also, make sure the negative (-) terminals of the auxiliary battery(s) are properly grounded with a conventional ground strap. Protect with circuit breakers as required.

9. Perform the electrical tests (page 4) to assure proper operation.

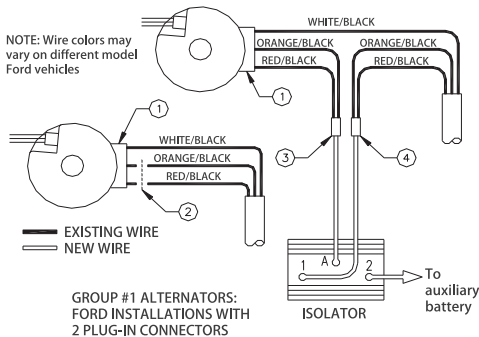


HELPFUL HINT FOR FORD INSTALLATIONS (1985 & LATER)

This section applies to Ford alternators with 2 plug-in connections. If your alternator has an output bolt, return to Step 6 of general instructions on Page 2.

CAUTION: Disconnect battery before proceeding with modification and installation.

1. Locate the connector on the side of the alternator that has one light wire and two heavy black wires with orange or red trace.
2. Cut both black/orange wires close to the alternator, allowing enough length to attach a splice (approximately 2 to 3 inches). Do not cut the smaller wire. Damage to vehicle may occur if wires are cut beyond the factory cabling splice (approximately 6 inches from the alternator).
3. Splice an extension wire to both wires that are attached to the alternator and connect the other end to the "A" terminal of the isolator.
4. Splice an extension wire to both wires extending from the vehicle wire harness and connect the other end to the "1" terminal of the isolator.
5. Return to Step #8 of general instructions, on Page 2.



If the mating side of the connector looks like this:
Refer to Instruction 180064, page 1.CS-130D Most common on 1993 and later vehicles.



If the mating side of the connector looks like this:
Refer to Instruction 180064, page 2. CS Series Most common on 1986 and later vehicles.



Please follow steps 1-4 below after completing page 1 or page 2 of Instruction 180064.

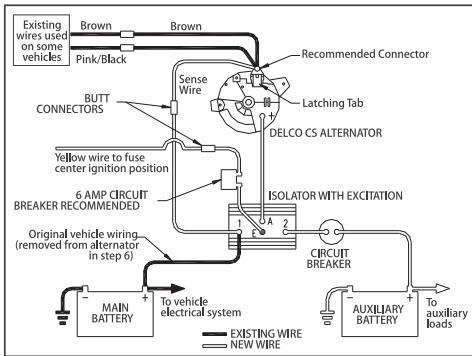
1. Reconnect the new plug into the alternator.
2. Route the remaining sense wire of the plug-in connector to terminal #1 of the battery isolator. Cut to the correct length, strip and crimp on the 1/4" ring terminal supplied. Now connect to terminal #1 of the isolator along with wires from step 4 of general installation instructions. This becomes the voltage sense wire.
3. External excitation connection. The "E" post of the isolator requires connection to an ignition switched source such that power is applied only in the ignition/run position. BE SURE POWER IS NOT APPLIED WHEN IGNITION IS SWITCHED TO ACCESSORY POSITION. On most late GM vehicles this point may be one of these spare ignition terminals marked "IGN" on the fuse center. Connect one end of the yellow wire supplied to one of these spare ignition terminals. Route the other end of the yellow wire to the "E" terminal of the isolator. (If using the recommended 6 amp circuit breaker insert the circuit breaker in the yellow wire as show in the diagram.) Cut the correct length, strip and crimp on the supplied ring terminal. Now connect the yellow wire to the "E" terminal of the isolator with the lock washer and nut. Colored terminal indicates "E" post on the Isolator.
4. Now proceed to Step 8 of the GENERAL ISOLATOR INSTALLATION INSTRUCTIONS.

SPECIAL INSTRUCTIONS FOR GROUP 2 ALTERNATORS

GENERAL MOTORS DELCOTRON

When installing an isolator on a GM "CS" series alternator equipped vehicle the general isolator installation instructions on page 2 of this instruction sheet must be followed in addition to Group 2 instructions. However, this alternator requires external excitation and external sensing. An isolator with an excitation terminal "E" and a plug connector kit are required. There are two styles of Connectors used on GM vehicles after 1985. These are CS and CS-130D.

Note: If the existing Delco connector has a wire in the "S" position of the standard CS alternators or a wire in the "D" position on the CS-130D connector, the replacement of this plug is not necessary. Proceed to step 3 below. If these positions on the connectors are vacant, proceed as follows:



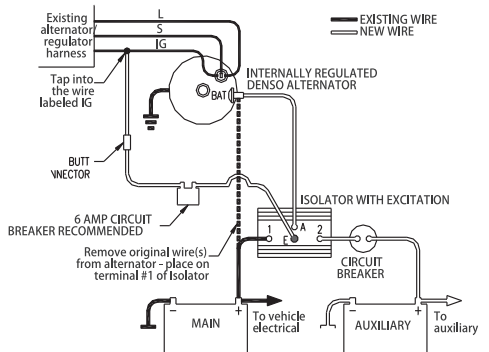
TOYOTA, SOME HONDAS & IMPORTS

Using internally regulated Nippondenso alternators. When installing an isolator to a Toyota alternator, follow general installation instructions in addition to the following steps.

1. Locate the small ignition wire terminal labeled "IGN" that runs from the alternator to the wiring harness. Check that you have the right wire by stripping a small section of wire and then determining that voltage is present only when the key is in the "run" position but not in the "accessory" position. Do not interrupt wire.
2. After completing Steps 1-9 of general instructions, connect an excitation wire from the point located in Step #1 above, to the "E" terminal of the Isolator.

Colored terminal indicates "E" post. We recommend a 6 amp circuit breaker be inserted in this line.

NOTE: The Group #2 isolator may be used in applications not requiring the excitation by not connecting the "E" terminal.

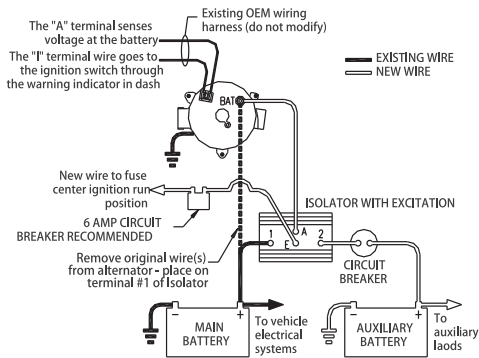


1998 & LATER FORDS

NOTE: This procedure is an additional step for some 1998 and newer Ford applications. Group 1 general instructions on page 2 of instruction sheet 180012 must be followed in addition to this instruction.

After completing steps 1-9 of the general instructions, connect a new wire from the "E" terminal of the Isolator to a 6 amp circuit breaker, then to an ignition run connection in the fuse center. Colored terminal indicates "E" post. We recommend a 6 amp circuit breaker be inserted in this line.

NOTE: The Group #2 isolator may be used in applications not requiring the excitation by not connecting the "E" terminal.

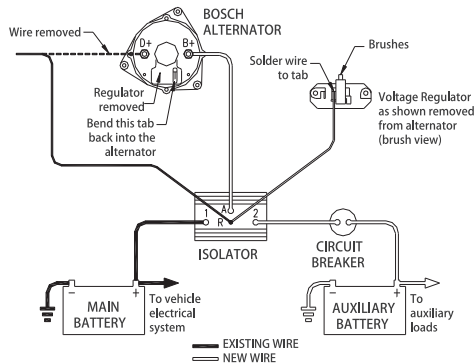


GROUP #3 ALTERNATORS: Carefully review the individual schematics shown below and then follow the specific installation instructions relative to the type of alternator and vehicle with which you are working.

FOR BOSCH ALTERNATOR USING ALTERNATOR MOUNTED REGULATOR SYSTEM (AS USED ON VOLKSWAGON VANAGONS),FOR ALTERNATOR EQUIPPED VOLKSWAGON VANS USING AN EXTERNAL MOUNTED REGULATOR, CONSULT FACTORY.

1. After completing Step #4 of standard instructions, remove the two screws attaching the regulator. With great care, remove the regulator. Use a downward, rolling motion to prevent breaking off the brushes.
2. Bend the connector prong of the alternator, as illustrated, so that it will no longer mate with the internal connection strap of the regulator. (The regulator connector may need to be bent also to insure no contact.)

3. Solder an appropriate length of #14 wire to the regulator connector prong, as was bent in step #2 (see illustration).
4. Replace regulator, Note: suggest a flat blade to hold the brushes in the holder until regulator is in place. Replace mounting screws (route wire so it will not be pinched or in the way).
5. Connect the other end of the wire that was soldered on the regulator to the "R" terminal on the isolator. Colored terminal indicates "R" post.
6. Disconnect the wire(s) going to the D+ terminal of the alternator.
7. Reconnect these same wire(s) to the "R" terminal of the isolator with the wire connected in Step #5 above.
8. Now proceed to Step #5 of the GENERAL ISOLATOR INSTALLATION INSTRUCTIONS on Page 2.



ELECTRICAL TEST:

- 1.Engine not running: #1 terminal of isolator should read vehicle battery voltage. #2 terminal should read auxiliary battery voltage. The "A" terminal may read from zero to 13 volts. The "E" terminal on 3A series isolators (group 2) should read zero volts, the "R" terminal on "R" series isolators (group 3) should read from zero to 13 volts.
- 2.Engine running and alternator charging: #1, #2 and "E" terminal on 3A isolators (group 2) should read voltage regulator setting or less approximately 13.8 to 14.5 volts. The "R" terminal on "R" series isolators (group 3) should also read voltage regulator setting or less. The "A" terminal voltage should read 0.8 to 1 volt higher than the reading of the #1, #2 terminals and "E" terminals on 3A series isolators (group 2) and "R" terminals on "R" series isolators (group 3).
- 3.For 12 volt systems the "A" post should read approximately 14.8 to 15.5 volts. The #1 and #2 terminal should read 13.8 to 14.5 volts. If the "A" terminal reads 13.8 to 14.2 volts the regulator may be sensing the alternator output rather than the main battery.This situation needs to be corrected for proper charging of batteries.
- 4.Colored terminal indicates "E" post on group 2 isolators and "R" terminal on most group 3 isolators.

INSTRUCTIONS FOR TESTING A MULTI BATTERY ISOLATOR WITH OHMMETER*:

1. Remove all wires from the isolator.
- 2.Using a needle movement ohmmeter Rx-1 scale or a digital ohmmeter diode scale, hold the Red* probe on terminal "A" and with the Black* probe touch terminal #1 and #2, and the "E" terminal for 3A isolators (Group #2), and the "R" terminal for (Group #3) isolators. A good isolator will show a current flow from "A" to #1, #2 and "R",and no current flow to "E".

- 3.Next, hold the Black* probe on terminal "A" and with the Red* probe touch terminal #1 and #2 (Terminal "E" and "R", if used). A good isolator will allow no current flow from "A" to #1, #2 or "R" and will show a current flow from "E" to "A".
- 4.Hold one probe on the aluminum heatsink,being sure there is contact by scratching through the protective coating.Then touch with the other probe, terminals "A", #1, #2 (the "E" terminal for 3A isolators [Group 2], the "R" terminal for Group 3 isolators). A good isolator will show no current flow.
- 5.Colored terminal indicates "E" post on Group 2 isolators and "R" terminal on most Group 3 isolators.

*On some import ohmmeters, the red and black probes are reversed for these tests.

**If using a digital ohmmeter, a diode scale MUST be used.