



Smart Battery Charger

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Installation Guide for SBC High Output Alternators

This installation guide covers general installation procedures that apply to all SBC alternators. Should you require further installation assistance for your specific application please contact Smart Battery Charger directly. Proper installation of your new alternator is imperative to ensure proper and reliable operation.

Step 1: Remove negative (-) battery cable.

Step 2: Verify the charge state of all batteries.

It is imperative that all batteries are fully charged before any load is applied to your SBC alternator. Using a Digital Multi Meter, verify that the standing voltage of each battery is 12.6 – 13.0 volts. Anything lower will require battery replacement. Please fully charge all batteries while performing installation. Please refer to the battery manufacturer's instructions for proper charging procedures for your specific battery.

Step 3: Remove the belt from the OEM alternator.

Serpentine Belts:

Release tension on the belt by disengaging the tensioner pulley. Remove the belt from the alternator pulley and lower it out of the way.

V-Belts:

Note the tension on the alternator belt before removing it. After installation of the new SBC alternator, belt tension should be the same to discourage belt slippage. Loosen the alternator mounting bolts so that the alternator can pivot towards the motor and release tension on the belt. Remove the belt from the alternator pulley and lower it out of the way.

Note: You may have to refer to the vehicle's owners or service manual for specifics on proper removal procedures.

This is an excellent time to inspect any belt. If your belt shows signs of unreliability (such as cracks, missing sections, exposed cords or excessive wear) it is a highly recommend that it is replaced.



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Step 4: Remove the OEM alternator.

Depending on the year, make and model of your vehicle, the connections from the alternator to the vehicle will vary.

You should note that the charge lead will typically be a 10 AWG* or larger wire and will run from the alternator output to the positive (+) battery terminal OR from the alternator output to a power distribution point, which is typically connected to the positive (+) battery terminal (this is very common in many Ford Vehicles). It is important to determine proper cable routing and connections prior to removing the OEM alternator.

Note the location of the charge lead and all plugs and wires connected from the vehicles wiring harness to the OEM alternator before removing them. Taking pictures are a good way to do this. Disconnect all plugs and wires from the OEM alternator. Remove the bolts that hold the OEM alternator in place. Put them in a safe place. These bolts will be reused to install the SBC alternator. Remove the OEM alternator from the vehicle.

Step 5: Remove the charge lead and plugs from your OEM alternator. Remove the entire alternator from the vehicles engine compartment.

Step 6: Install the SBC Alternator.

Mount the SBC alternator in place of the OEM unit and re-install the belt. Connect all plugs and wires to the SBC alternator as they were on the OEM unit **including the OEM charge lead.**

Step 7: Upgrade the charge lead.

All SBC high output alternators are capable of far greater output current than the OEM alternator that you are replacing. Therefore, it is necessary to upgrade the stock charge lead appropriately.

If the stock charge lead on your vehicle makes a direct run from the alternator output stud directly to the battery positive (+) OR to a power distribution point which later connects to the battery positive (+) lead then we recommend that you replace the entire cable. If the stock charge lead goes into a wiring harness and it is difficult to trace, then we recommend that you leave it and add a larger charge lead in addition to it. If you have questions in regards to this step please contact SBC directly.

For more specific information on what wire to use please review our wire sizing chart.

Make a new charge lead with the appropriate sized cable to go from the alternator output stud to the positive (+) battery terminal. Solder or crimp ring terminal(s) to the end of the charge lead.



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Connect the charge lead from the alternator output stud and run it to the battery positive (+). The use of aftermarket battery clamps will facilitate these connections. Ring terminals can be terminated on the cables and used to connect to OEM style clamps.

Upgrade the lead from the under hood fuse box to the battery positive (+) to a 4 AWG* cable. Note that the OEM charge lead remains in place. This may vary based on your vehicle.

Step 8: Upgrade the return path.

This is equally critical as upgrading the charge lead. Keep in mind, as you are installing a high output alternator that is capable of more current than the stock unit, you will likely have many current demanding accessories to install as well. This will require an upgrade to the charging system return path for BOTH the alternator and the accessories. The below procedures cover both.

Full frame vehicles: vehicles like trucks, SUVs, or older cars that sit on a full steel frame.

1. Choose an existing bolt on the frame near the OEM battery location, remove it, and clean the metal surface of any paint or rust with a wire brush or die grinder. If you cannot locate an existing bolt, then locate an existing hole in the frame and tap for at least a 5/16 - 18 bolt.
2. Use white lithium grease on the bare metal to prevent rust or corrosion. Using cable the same size as the upgraded charge lead, connect a cable from the case of the alternator (mounting bracket bolts work great for this) to the bolt on the frame. Repeat this process to connect the negative (-) battery cable to the same bolt. The easiest way to do this is to terminate the ends of the cable with ring terminals. Use star washers between the ring terminals and connection points to promote low resistance connections.
3. Locate the smaller diameter cable from the negative (-) battery cable to the chassis of the vehicle and add an 8 AWG* cable from the negative (-) battery cable to this same point using a star washer.

Note: When adding high current accessories, connect their grounds to the frame rail on the same side of the vehicle with the above connections in the same fashion as above.



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Unit-Body (Uni-body) Vehicles: modern cars and smaller SUVs that do not have a full frame

1. Choose an existing bolt on the frame near the OEM battery location, remove it, and clean the metal surface of any paint or rust with a wire brush or die grinder. If you cannot locate an existing bolt, then locate an existing hole in the frame (preferably a location with double wall metal) and tap for at least a 5/16 - 18 bolt.
2. Use white lithium grease on the bare metal to prevent rust or corrosion. Using cable the same size as the upgraded charge lead, connect a cable from the case of the alternator (mounting bracket bolts work great for this) to the bolt on the frame. Repeat this process to connect the negative (-) battery cable to the same bolt. The easiest way to do this is to terminate the ends of the cable with ring terminals. Use star washers between the ring terminals and connection points to promote low resistance connections.
3. Locate the smaller diameter cable from the negative (-) battery cable to the chassis of the vehicle and add an 8 AWG* cable from the negative (-) battery cable to this same point using a star washer.

Connect the return path cable to the negative (-) battery terminal. Use an aftermarket battery clamp to facilitate this.

Connect the return path cable to one of the mounting points of the alternator. Use a star washer under the ring terminal.

Connect the return path cables from the alternator and from the negative (-) battery terminal to the sub-frame. Use star washers between the sub-frame and ring terminal and between multiple ring terminals to ensure a low resistance connection. Tighten this bolt securely with a long handled ratchet. This step is **VERY** important!

Upgrade the OEM accessory ground lead from the negative (-) battery terminal to the chassis with an 8 AWG* lead from the battery negative (-).

Upgrading the return path is extremely important. This is not an optional step!

STEP 9: Reconnect the negative (-) battery cable to the battery.

The installation of your SBC high-output alternator is now complete. You are now ready to test it for proper operation.

***AWG stands for American Wire Gauge. We only recommend using cable that is AWG rated.**



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Testing Your SBC Power High Output Alternator

Before closing the hood and driving you must test your newly installed SBC High Output Alternator for proper operation. Remember, you can only do so with a fully charged battery. If you elected not to do this during the installation process, refer to **STEP 2** in the installation instructions.

1. Connect a Digital Multi Meter to the positive (+) and negative (-) battery terminals. Set it to read DC voltage. It should indicate at least 12.6 Volts DC.
2. Turn all accessories OFF, start the vehicle, and let the engine run.
3. The Digital Multi Meter should indicate between 14.2 and 15.0 Volts DC at idle. (If the vehicle has a diesel engine the voltage may take longer to come up due to the glow plugs cycling on and off.)

If the voltage is lower in either case, you may need to:

- Re-charge the battery and re-check.
- Double check that all cables are in good condition, are making good connection, and all terminations are either crimped or soldered correctly – hammers, vises, and pliers are NOT crimp tools!
- Double check that the belt is tight and is not slipping – it takes power to make power and our high-output alternators require that the belt is in good condition and properly tensioned.



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NOTES:

Multiple Battery Installations

In the case of multi-battery installations, is important to note that additional batteries actually increase the load on the alternator when it is in use – approximately 7 to 10 amps for each fully charged battery. Therefore it is vitally important to maintain the batteries per the instructions of the battery manufacturer and NEVER run them flat. Alternator failure can occur in a multi-battery installation if the batteries are low and an additional load is applied on top of the discharged batteries!

High Powered Car Stereo Systems

We do not recommend using high-powered car stereo systems for any length of time without the engine running. This will quickly drain the battery (or batteries) and cause excessive load on the alternator. SBC high output alternators are designed to maintain fully charged batteries and are **NOT** battery chargers!