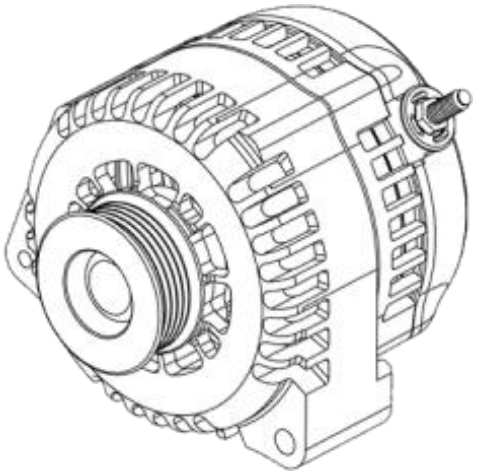
INSTR-GEN

Alternator Installation

PLEASE DO NOT RETURN THIS PRODUCT TO THE DEALER THAT YOU PURCHSED IT FROM!
First- contact Mechman technical support at: **mlogan@mechman.com**
1-(888)-MECHMAN or 865-522-6166



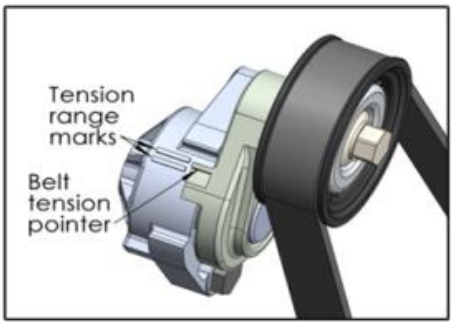
General

Eye protection must be worn when working on a vehicle.
Remove all jewelry before working on the vehicle to prevent the jewelry from shorting out a battery cable.

Installation steps:

1. **Turn off engine and let it fully cool.**
2. **Disconnect the negative cable from the battery/batteries.**
3. **Disconnect all other wiring from the alternator.**
4. **Note the belt routing before removing the belt.**
5. **Remove the alternator mounting bolts and alternator.**
6. **On some vehicles there may be slip bushings in the OEM alternator bracket that will have to be forced open with pliers or a pry-bar for the new alternator to slip into the OEM bracket. The bushings will center back to the original position when the alternator mounting bolts are tightened.**
7. **Mount the new alternator and torque the alternator mounting bolts to OEM specs. In most cases, the original alternator mounting bolts will be used. Use the MechMan mounting bolts if supplied.**
8. **You must replace the belt when installing a high output alternator. High output alternators require more effort to turn than OEM alternators, so belt grip is very important. Fresh drive belts grip much better than worn belts. Make sure that belt routing is correct, and that the belt is aligned to all pulley grooves. Also check that the belt tension is correct. BELT TENSION AND TENSIONER POSITION IS CRITICAL. If your vehicle is equipped with a spring type belt tensioner, make sure that the belt tensioner is in its proper position after the new belt has been fitted. There are usually marks on the belt tensioner to indicate that it is in its correct range of travel. See a vehicle specific repair manual for more info on the specific belt tensioner markings for your vehicle.**
   NOTE: A belt that is too tight will slip just as badly as a belt that is too loose.

Serpentine belt notes:
Your new MechMan alternator pulley MAY BE smaller or larger than the original pulley, depending on the application. If equipped, a smaller alternator pulley is supplied in order to put the new high output alternator in its proper RPM range for proper charging at engine idle RPM. It is NOT RECOMMENDED to put the stock diameter pulley on the alternator to avoid purchasing a shorter drive belt. This results in poor output at idle RPM.



9. **Install/replace the alternator charge wire. NOTE: It is critical that all cable ends on the positive and ground cables fit the bolt or stud that you are putting them on perfectly. This is the case for both battery and alternator connecting points. If the hole in the ring terminal is LARGER in diameter than the bolt or stud you are putting it on, you will not have full surface area contact, which will cause poor charging performance, and in extreme cases may melt the end of the cable off and cause a fire. We DO NOT EVER recommend using a billet cable adapter that facilitates multiple 1/0 gauge cables connecting to the positive output stud on the alternator. That much cable is not only un-necessary for peak alternator performance, but it also puts unnecessary weight strain on the output stud of the alternator. A single run of 1/0 gauge pure copper cable for positive and ground from alternator to the closest battery is sufficient up to 400 amps of alternator output. If there are batteries in the rear of the vehicle, you can run a single 1/0 gauge cable from the alternator to the closest under-hood battery terminal, and then run multiple runs of cable from the front battery terminal to the rear batteries.**

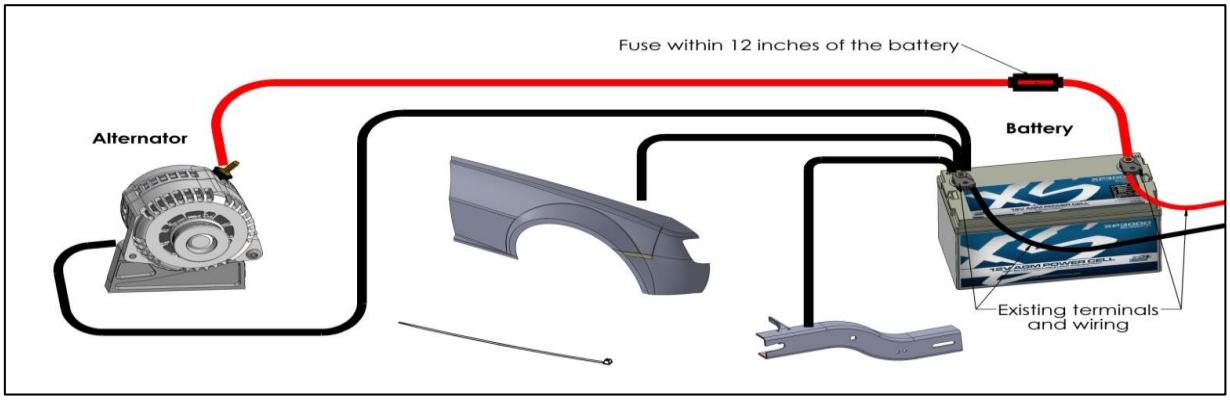
It is important that you increase the size of the battery charge wire to properly handle the higher amperage of your new alternator. In most situations the original charge cable can either be removed or can be left in place with an upgraded larger cable supplementing the stock charge cable. The larger supplemental charge wire can be fused within 12" of the battery terminal if desired for safety. Many OEM vehicles do not have any fusing in the OEM alternator charge cable.

Alternator rating	Primary battery location	Recommended ground and charge wire size	Recommended battery fuse size
Less than 200 amps	Engine compartment	4 gauge pure Copper or 2 gauge CCA	250 Amp
Less than 250 amps	Trunk compartment	1/0 gauge copper or 2/0 CCA	250 Amp
250-400 amps	Any location	1/0 gauge copper or 2/0 CCA	400 Amp

10. Upgrading the alternator grounds.

The alternator ground cable should be the same gauge size as the positive alternator charge cable. All OEM ground cables MUST be upgraded to the same size as the positive alternator charge cable for proper performance.

Uni-body warning: Many newer vehicles have a "uni-body" sheet metal frame construction without traditional frame rails. Due to spot-weld seams and adhesive attached body components, additional steps may be required for proper chassis grounding on uni-body applications. Choose the location on the sub-frame with the thickest metal possible. If there is lower than spec charging voltage at the battery, move ground connections or add additional ground cables to different frame components to improve the ground path for the alternator and battery(s).



11. Additional wiring of the alternator.

Single wire turn on alternators

If your alternator comes with a pigtail that plugs in to the alternator with a single loose wire coming out of it, that single exciter wire will need to be connected to an ignition switched source to turn the alternator on and off with the key switch. Connect the activation wire on the alternator plug to an ignition switched 12V+ circuit that is ON when the key is in the run position and has no voltage present when the key is in the OFF position. Alternators that come with this type of harness will also come with a specific instruction sheet explaining this.

Gauges

If your vehicle is an early model (pre 1975) and came with an ammeter gauge in the dash, it is highly recommended you add a dash mounted voltmeter to replace the ammeter. OEM ammeters are not rated to carry the amount of current that the high output alternator will produce, so you cannot connect the ammeter to the alternator charge cable without potentially causing a fire. A voltmeter is very easy to install, will indicate if the alternator is charging or not, and does not have to interrupt any of the primary alternator charge cables. Connect the voltmeter's voltage sensing wire to any ignition switched circuit, as close to the battery positive terminal as possible.

12. Final procedure before operation.

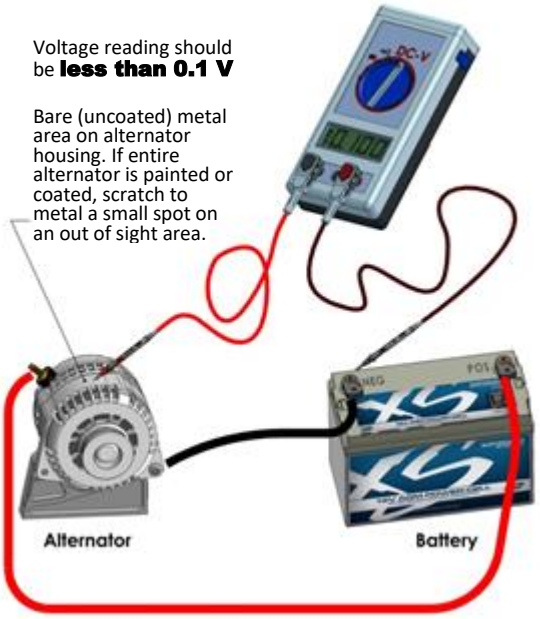
Before starting the vehicle, check to confirm that the battery is charged. Starting the vehicle with a discharged battery can easily overheat and damage the alternator. Use a battery charger to fully charge the battery BEFORE starting the vehicle.

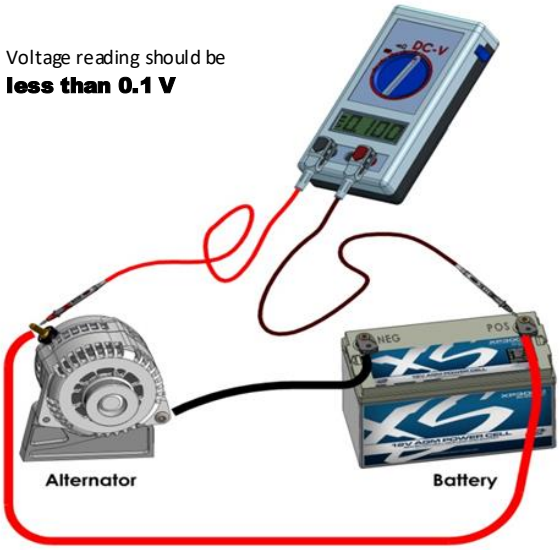
Start the vehicle and turn on the headlights and blower motor (or cooling fan) in order to load the battery. Keep any audio system and other electrical loads OFF during testing. Bring the engine RPM to 2000 RPM. Measure voltage with a handheld voltmeter at the battery terminals. The voltage of the battery should increase by at least one full volt to indicate that the alternator is charging.

Ground path test

If greater than 0.1V difference is measured, check:

- Ground connection surfaces. Confirm all paint, anodizing, and rust are removed and the connections are contacting bare metal.
- Make sure all cable ends are tight to the cable.
- Make sure the ground cable is the same size as the positive cable.





Charge path test

If greater than 0.1V is measured improve:

- Terminal is tight to alternator charge post.
- Make certain all terminals are tight to the wire.
- Make certain charge wire is of adequate size (see wire size chart page 2).

Pulley changing instructions (typically not recommended)

In a few situations, the alternator pulley may need to be changed. Keep in mind that the pulley on the high output alternator will often be a different diameter than the OEM alternator pulley, and the drive belt length may need to be adjusted to maintain proper belt tension. Changing the alternator pulley may cause the pulley ratio to be incorrect for the application. Always consult with the tech department before changing pulleys. NOT ALL ALTERNATOR PULLEYS ARE INTERCHANGABLE. The easiest and safest way to remove and reinstall the pulley is with an electric or air actuated impact driver. While wearing mechanics gloves, hold the pulley with one hand and use the impact driver to remove the pulley nut in a standard counterclockwise direction (most applications). Remove and install the replacement pulley. Double check to make sure that the back of the pulley does not contact the face of the alternator housing, and that the pulley offset is the same as the pulley that came off the alternator for proper belt alignment. Also be sure that there is enough threaded shaft protruding through the pulley for proper thread engagement. Start the pulley nut by hand, hold the pulley by hand, and then tighten clockwise with the impact wrench.

Torque the nut to 70 ft. lbs.

Help and Troubleshooting

Getting a shorter belt:

1. Install the original belt and check the belt tensioner to see if a different belt is needed. If the tensioner is in its proper operating range, a different length belt is not needed. It is recommended to always install a new drive belt even if the original belt is the correct length. New belts grip the alternator pulley much better than used belts.
2. It is easy to use the "guess and check" method by purchasing a couple different belts from your local auto parts store, fit them to the engine, and observe the placement of the belt tensioner. For more info, and a link to an online belt catalog, visit www.mechman.com and click on the "instructions" tab at the top of the home page.

Alternator will not turn on:

1. Make sure that the alternator charge cable is connected to the positive terminal of the nearest battery, and that there is a dedicated ground cable of equal size running from an alternator mounting bolt to the negative terminal of the battery.
2. Verify that the alternator regulator plug has been properly connected as per provided instructions.
3. On single wire turn on units, make sure you are using a 12V switched source to provide the turn on signal for the alternator. This wire needs full battery voltage present only when the key switch is in the "Run' position.

Low voltage:

1. An easy way to check for voltage drop between the alternator and battery(s) is with a voltage drop test. To perform this test, start the vehicle and allow it to warm up to operating temperature. Have someone hold the throttle to 2000 RPMS engine speed. Turn on all electrical components in the vehicle in order to create load against the battery. Using a known accurate handheld voltmeter take a voltage reading at the alternator output stud, with the multimeter grounded to an alternator mounting bolt that is free of rust or corrosion, or the alternator ground boss (If applicable). Use your handheld multimeter and then at the furthest away electrical component, there should be no more than .2V difference under the heaviest load. If the difference is more than .2V there is high resistance in either the charge or ground path.
2. Load test all batteries in the electrical system and replace any battery that does not completely pass a load test.
3. Check for possible belt slip. The alternator makes power by converting mechanical energy to electrical energy and it gets that mechanical energy from the drive belt turning the alternator. If the belt is slipping, then alternator performance will suffer. If there is heavy black residue on the front of the alternator or if the alternator pulleys coating is wearing off, then that is a good indication that you have a belt slip problem. Make sure that the belt is of high quality and proper length and that any tensioner is strong and in range. Also, check for any possible engine fluid leaks which could compromise the resistance between the belt and pulley.

Abnormal noise:

1 It is normal for a high output alternator to make more "generator" noise than an OEM alternator.
2 Improper belt tension will make the alternator make a "squealing" or "chirping" sound. This noise is not from a bearing failure. A bad bearing generally makes a low pitched "growling" sound.
3 An alternator can make a howling "supercharger" sound if there is something in the electrical system that has inadequate ground path, or if the alternator has been improperly installed and has damaged the rectifier.
4 An alternator can also make that howling "supercharger" sound if it is charging a sulfated / damaged battery.