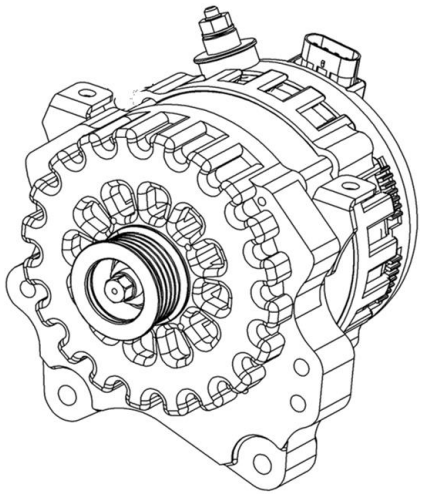
INSTR-11434

Alternator Installation

(For Ford 4.6L, 5.4L, 6.8L and Similar engines)

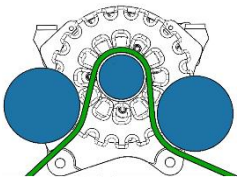


If you are experiencing problems upon installation - DO NOT RETURN THIS PRODUCT! **Most installation problems can be easily solved.**
First contact technical support at: **support@mechman.com**
1 (888) MECHMAN or 865-522-6166

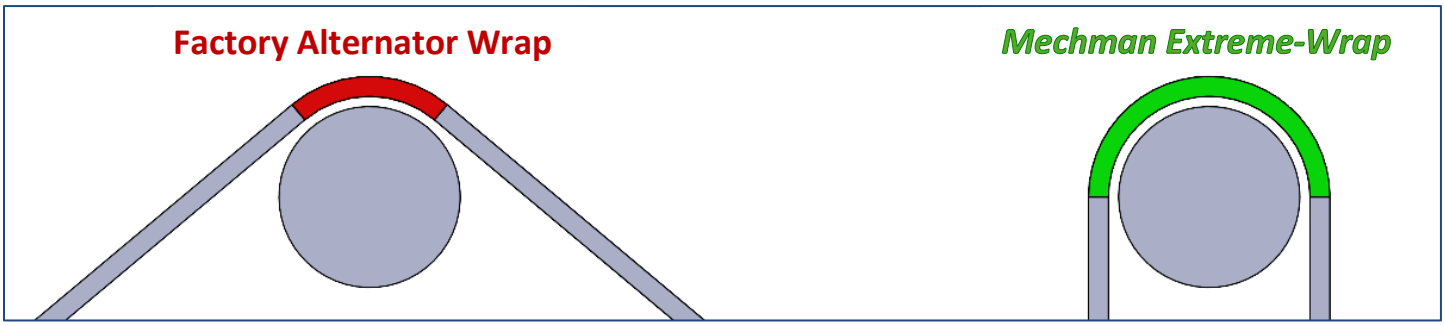
General

- **Eye protection must be worn when working on batteries.**
- Remove all jewelry before working on the electrical system.
- Always refer to a service manual for specifics about your vehicle's alternator installation and electrical system.
- Fully read these instructions before beginning the installation process.

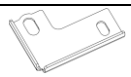
Mechman Extreme-Wrap



Ford engines are known for having poor alternator pulley belt wrap, typically with only 25% contact. Furthermore, aftermarket alternators use *smaller* overdrive pulleys, which further decreases that contact. High-output alternators need adequate pulley-to-belt contact to sustain their increased loads. An industry first, Mechman offers a solution. With the Extreme-Wrap feature, the original idlers are moved closer to the alternator pulley, effectively doubling belt contact.



Hardware Included:

Picture	Quantity	Description / Type	Size	Application
	2	FLANGE HEAD BOLT	M10 X 60MM	IDLER TO ALTERNATOR
	2	FLANGE HEAD BOLT	M8 X 50MM	ALTERNATOR TO BLOCK
	2	SOCKET HEAD BOLT	M6 X 15MM	L / U - BRACKET TO ALTERNATOR EAR
	2	FLANGE HEAD BOLT	M6 X 16MM	L / U - BRACKET TO TOP SUPPORT BRACKET
	2	NYLOC FLANGE NUT	M6	L / U - BRACKET TO TOP SUPPORT BRACKET
	2	L - BRACKET	SMALL	ALTERNATOR TO ORIGINAL TOP SUPPORT
	1	U - BRACKET	SMALL	ALTERNATOR TO FLAT BRACKET
	1	FLAT - BRACKET	LARGE	U - BRACKET TO THERMOSTAT HOUSING BOLT
	2	STEP SPACER	24MM ROUND	IDLER TO ALTERATOR

RPM Note: Because this alternator is overdriven for optimal amperage output, it should NOT be used in high RPM performance applications, or the alternator may be overspun and damaged.

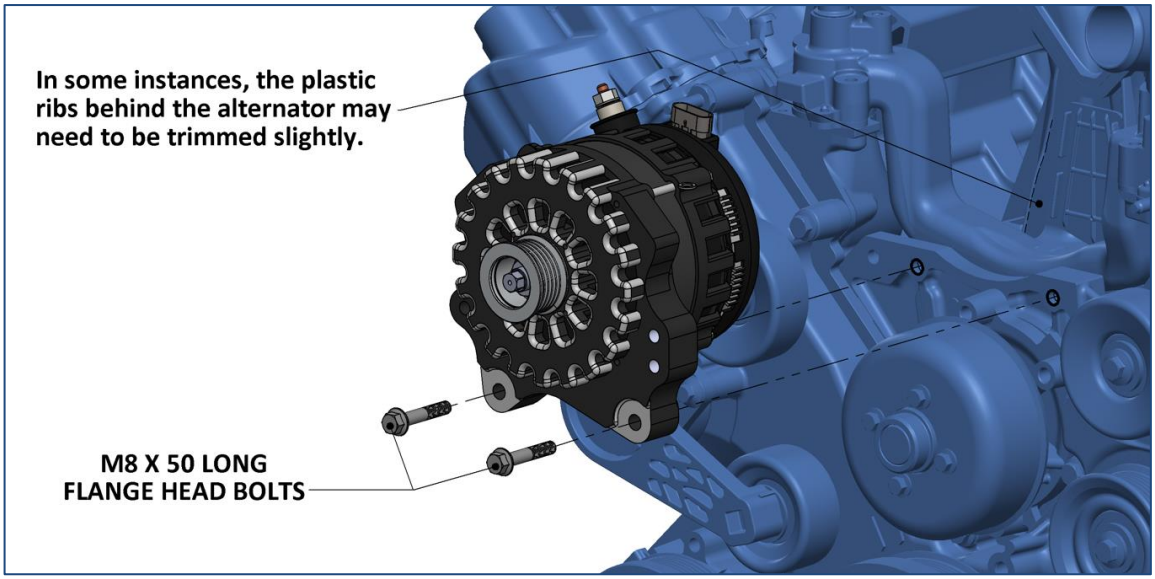
Application Note: This alternator is designed to work on several applications with different belt paths. See below guide for your application's instructions.

INSTALLATION STEPS:

1. **Read instructions completely before beginning.**
2. **Go ahead and determine your original alternator's category (STEP 10), and your vehicles belt route pattern (STEP 12). Mark each of these down for later use.**
3. **Turn off the engine and let it fully cool.**
4. **Disconnect the negative cable from the battery/batteries.**
5. **In some cases, your application will require removal of the air intake tube. If removal process details are needed, refer to your vehicle's specific service manual.**
6. **Disconnect all wiring from the alternator.**
7. **Note the belt route. Take pictures of the belt path if a diagram is not included on your vehicle.**
8. **Remove the alternator / bracket bolts and original alternator.**

Note: Make certain the engine block surfaces where the alternator mounts are clean and bare metal to promote a good ground path.

9. **Mount the new Mechman alternator using the supplied bolts.**

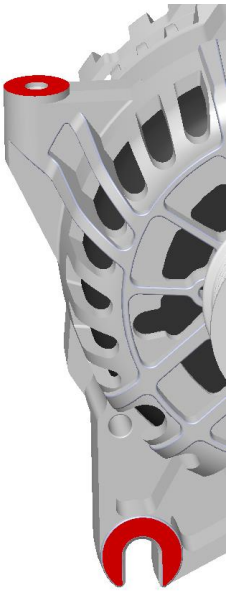


Apply blue Loctite® or equivalent retainer to threads. Torque M8 bolts to 18 ft./lbs.

10. **DETERMINE YOUR ORIGINAL ALTERNATOR'S CATEGORY BELOW:** Next, compare your original alternator to the below pictures to determine which category it is in. Follow your applications instructions for installing the top support.

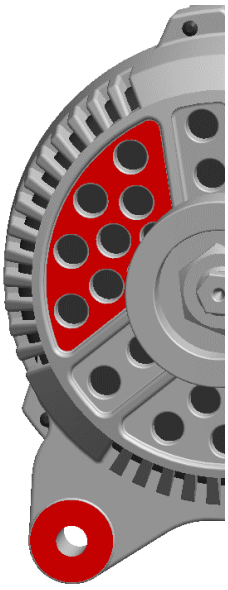
CATAGORY 1

These alternators have two incorporated top mounts and open slotted bottom mounts.



CATAGORY 2

These alternators have closed bottom mounts and distinctive round openings in the front.



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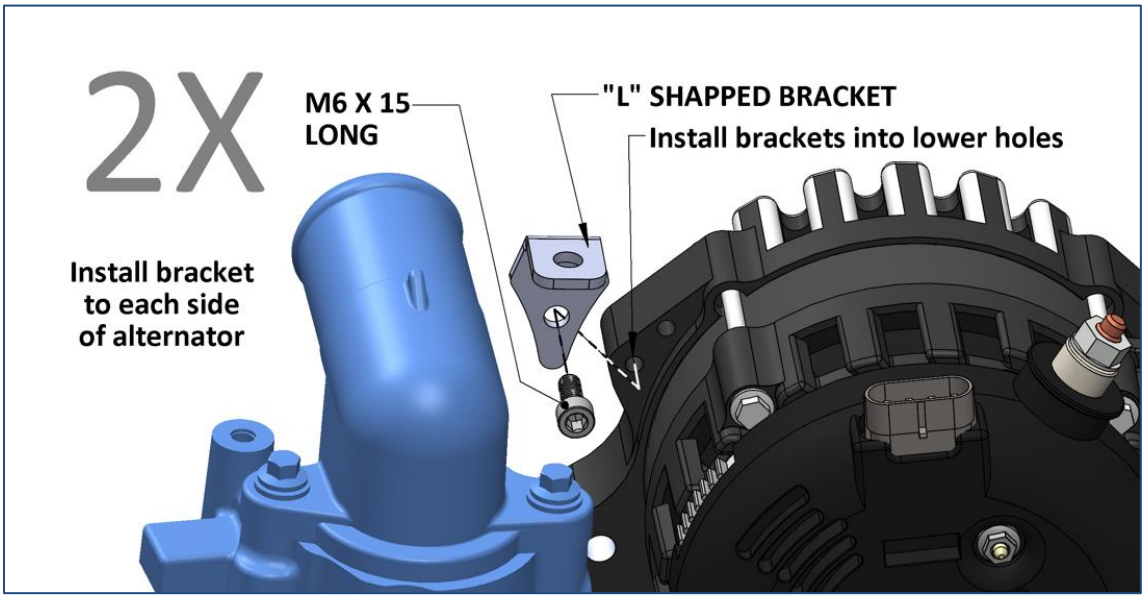
11. **TOP SUPPORT BRACKET:** Follow the top support assembly instructions for your original alternator's category.

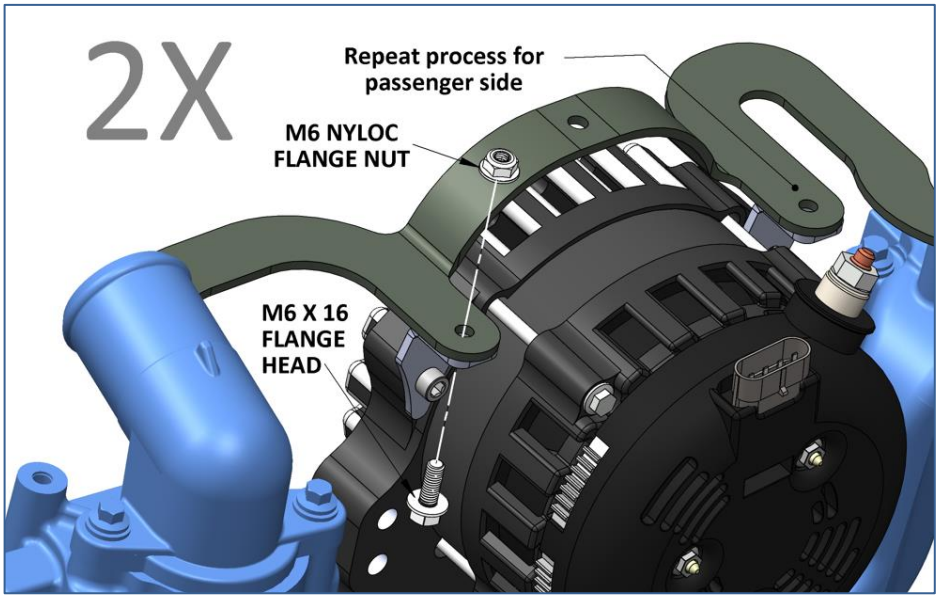
Note: It will be easier to install your application's bracket(s) to the Mechman alternator before installing the alternator to the engine. The step order here is for instruction clarity.

CATAGORY 1



Torque M6 bolts to 85 in./lbs.

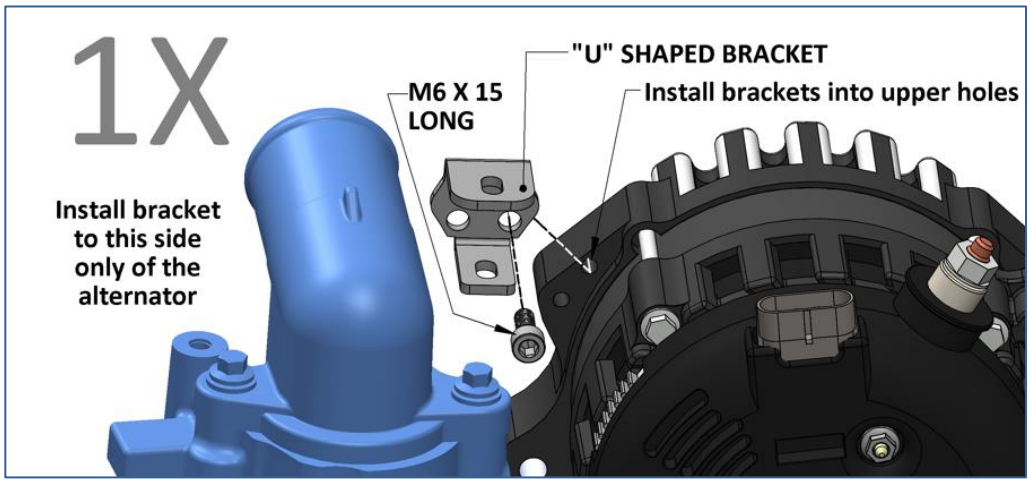
NOTE: There are many different vehicle top support brackets. The one on your application will likely not look like the one pictured, however this alternator will assemble to your bracket. Install the original top support bracket using the supplied hardware.



Torque M6 bolts to 85 in./lbs.

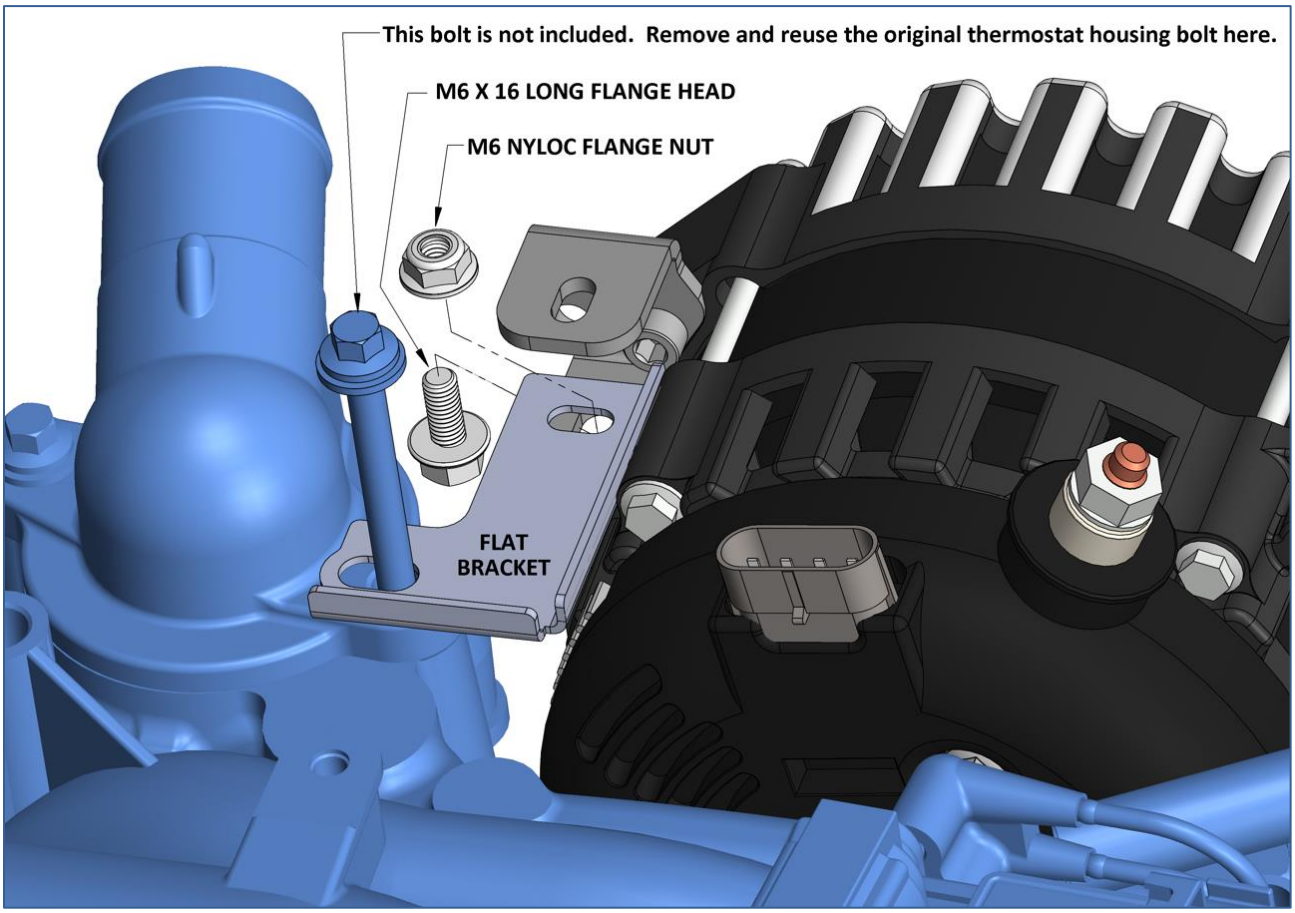
WARNING: A top bracket is required to structurally secure the alternator and minimize vibration. Not installing a top support bracket WILL VOID YOUR MECHMAN ALTERNATOR'S WARRANTY!

CATAGORY 2



Torque M6 bolts to 85 in./lbs.

Note: Thermostat housing heights vary on applications. The "U" shaped bracket above allows for both common heights. Choose the "U" shaped bracket's tab that is the correct height. Reuse the original thermostat bolt. Make certain not to over torque.



Torque M8 bolts at 16 to 18 ft./lbs. and M6 bolts to 85 in./lbs.

WARNING: A top bracket is required to structurally secure the alternator and minimize vibration. Not installing a top support bracket WILL VOID YOUR MECHMAN ALTERNATOR'S WARRANTY!

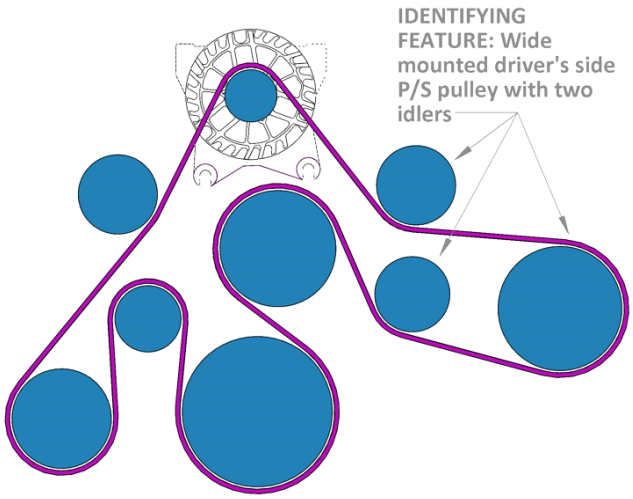
12. FIND YOUR VEHICLE'S ORIGINAL BELT ROUTE BELOW: Compare your vehicle's original belt route to the below diagrams on the left to determine which pattern it is. Once found, see your Mechman Extreme-Wrap options on the right.

Idler Note: If an original idler is available to be moved, this solution allows it to be reused. In some cases, there is no original idler and one will need to be purchased. See your vehicles pattern Notes for required idler part numbers.

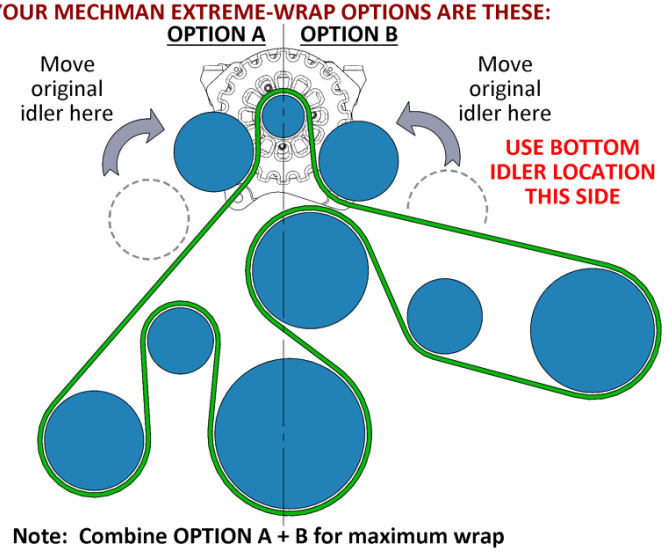
Configuration Options: In most cases, either or both original idlers can be relocated to the alternator's housing. Combining options A and B is optimal, but configuring only A or B will increase contact by nearly 15%.

PATTERN A

IF YOUR ORIGINAL BELT ROUTE LOOKS LIKE THIS:



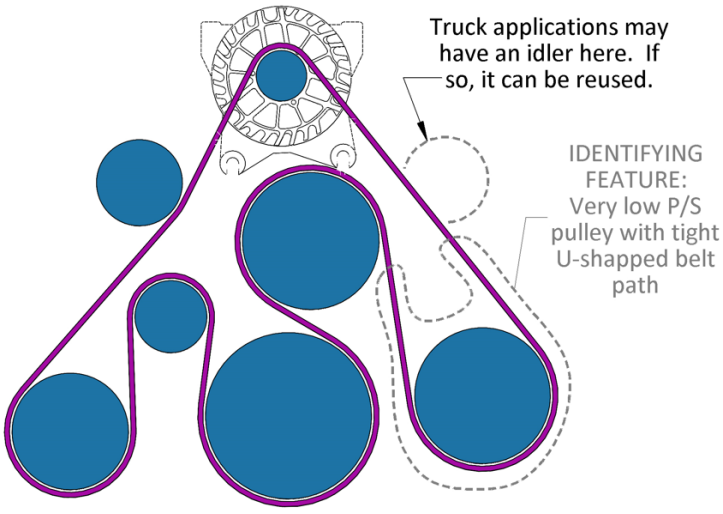
YOUR MECHMAN EXTREME-WRAP OPTIONS ARE THESE:



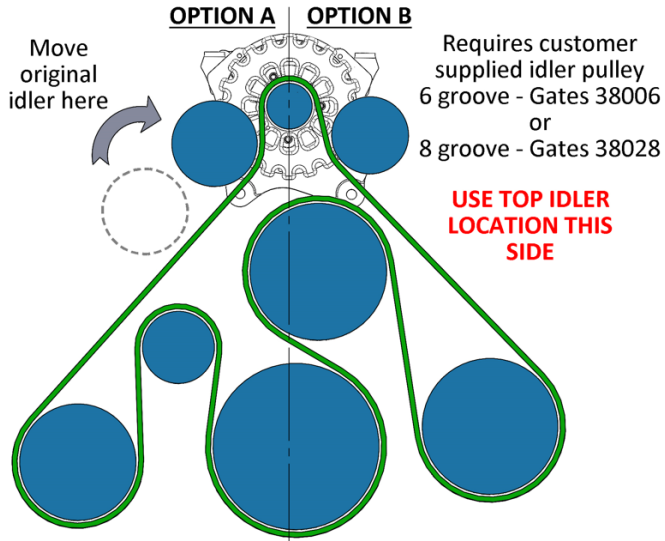
Note: Combine OPTION A + B for maximum wrap

PATTERN B

IF YOUR ORIGINAL BELT ROUTE LOOKS LIKE THIS:



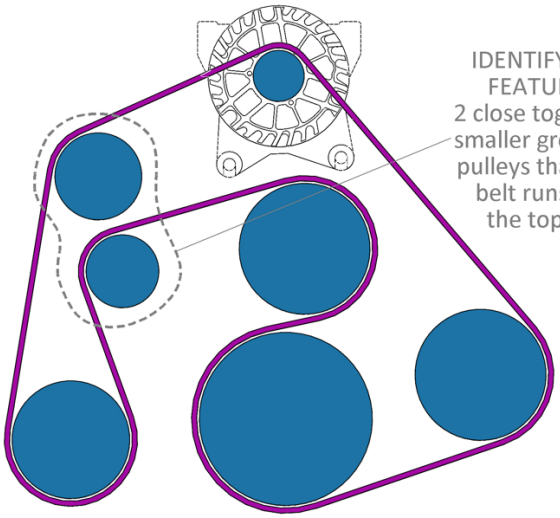
YOUR MECHMAN EXTREME-WRAP OPTIONS ARE THESE:



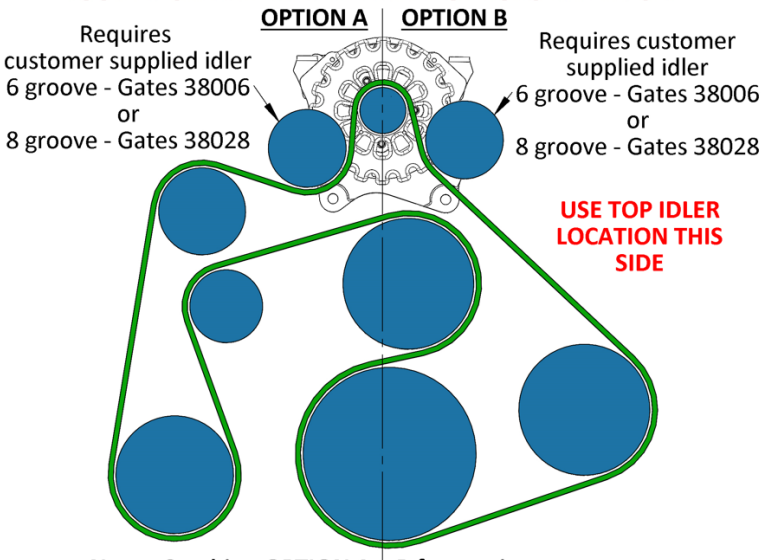
Note: Combine Option A + B for Maximum Wrap

CATEGORY C

IF YOUR ORIGINAL BELT ROUTE LOOKS LIKE THIS:



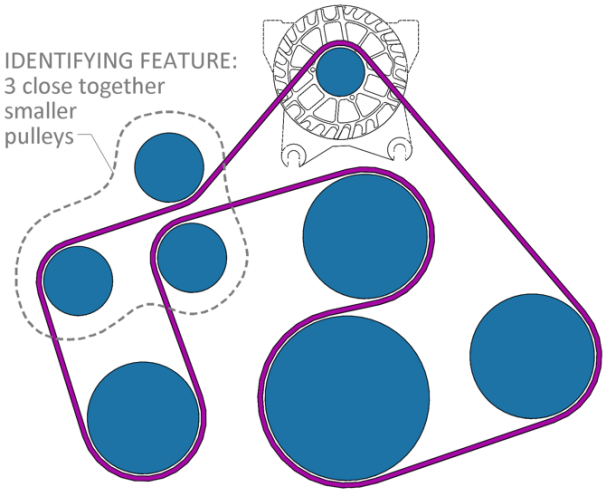
YOUR MECHMAN EXTREME-WRAP OPTIONS ARE THESE:



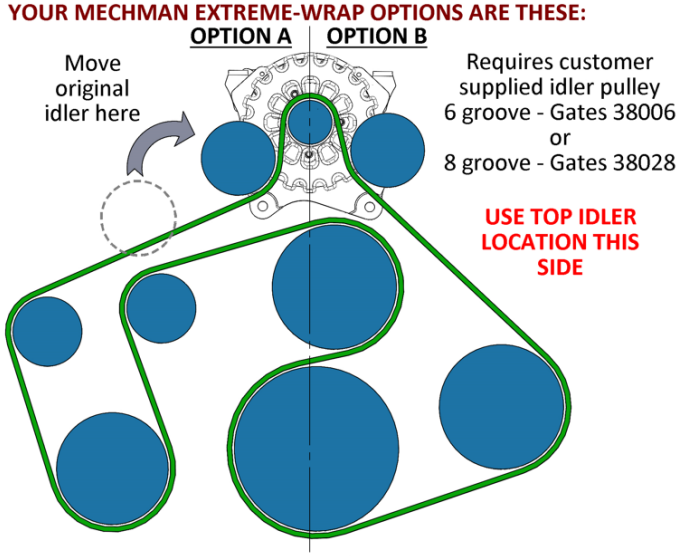
Note: Combine OPTION A + B for maximum wrap

CATEGORY D

IF YOUR ORIGINAL BELT ROUTE LOOKS LIKE THIS:



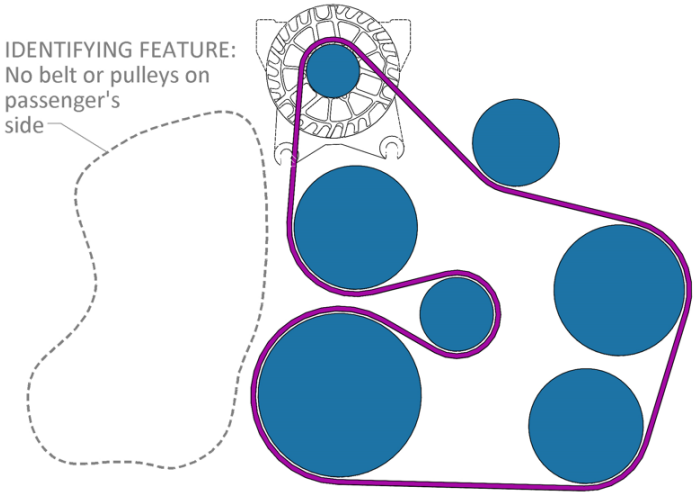
YOUR MECHMAN EXTREME-WRAP OPTIONS ARE THESE:



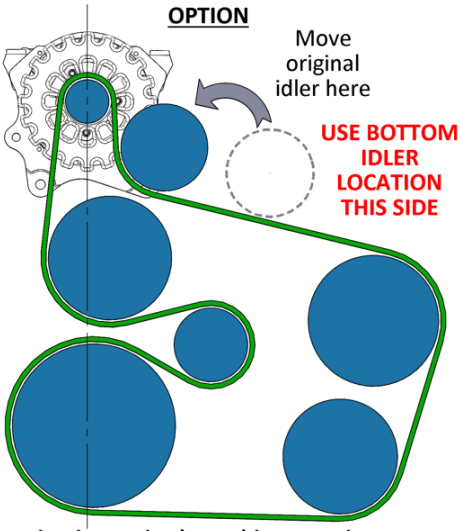
Note: Combine OPTION A + B for maximum wrap

CATEGORY E

IF YOUR ORIGINAL BELT ROUTE LOOKS LIKE THIS:

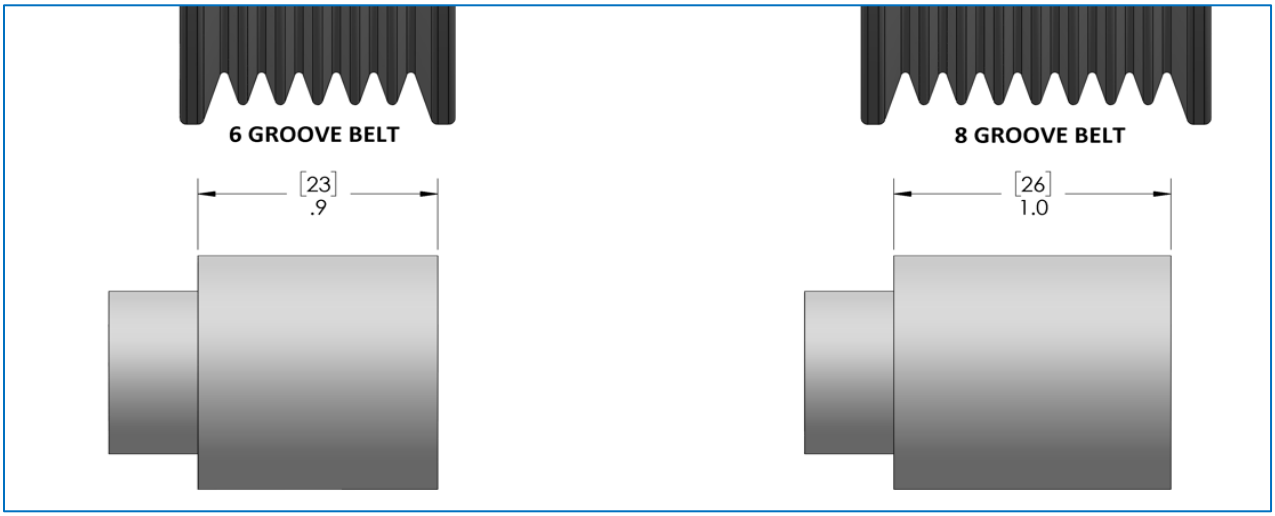


YOUR MECHMAN EXTREME-WRAP OPTIONS ARE THESE:



Note: Only one idler relocation is required to achieve maximum wrap

13. Double-check that the alternator you purchased is the correct one for your application. The alternator pulley and included spacer you received should be correct for your original six or eight groove belt.



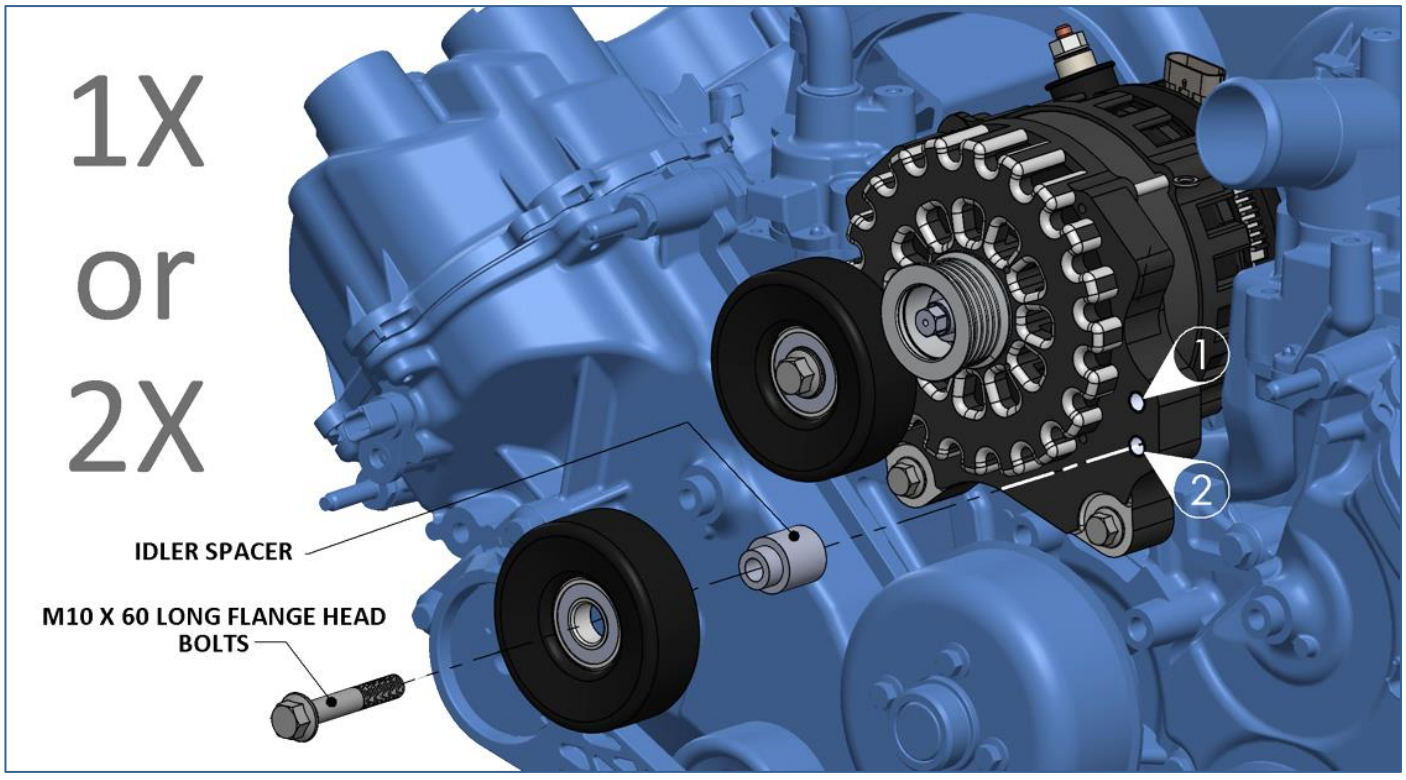
14. DETERMINE YOUR IDLER PULLEY POSITION(S) AND INSTALL THE IDLER(S):

Note: If relocating the passenger's side idler, there is only one position option.

If relocating the driver's side idler:

- Use top location **1** for patterns B, C, and D.
- Use bottom location **2** for patterns A and E.

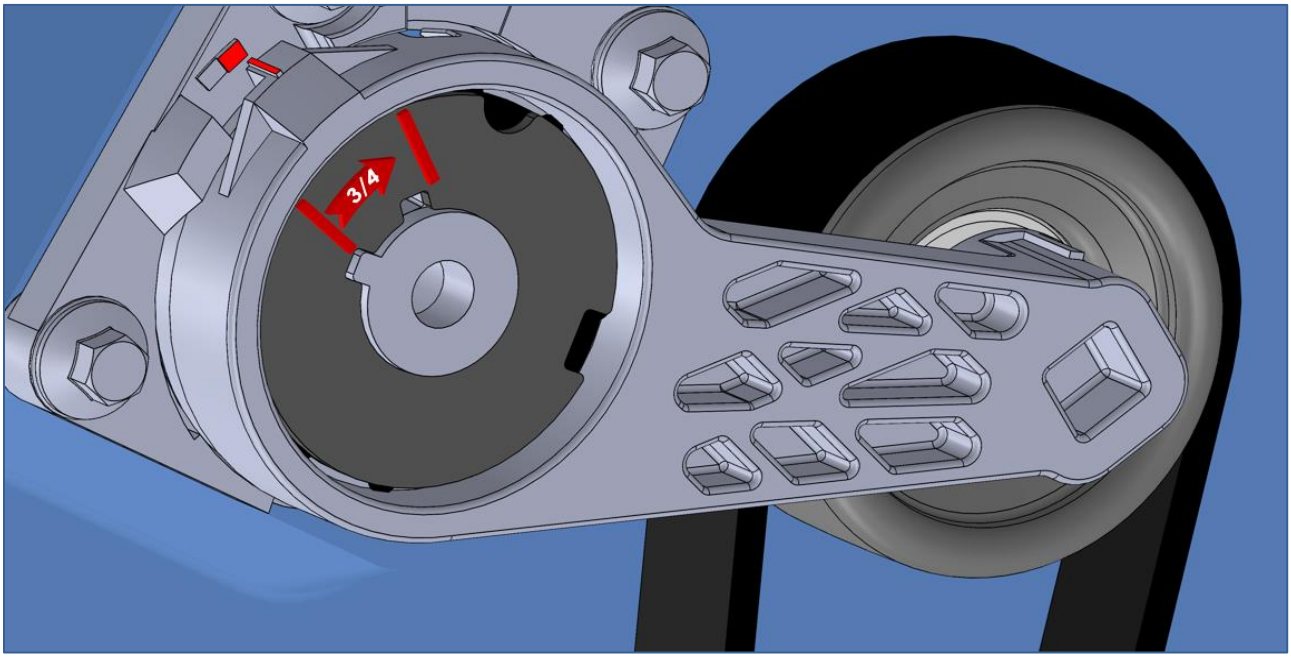
Shown below with optional passenger's side idler already relocated to the alternator.



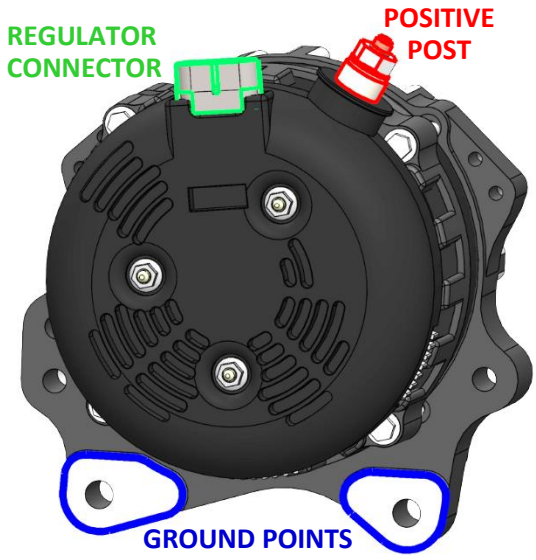
Torque M10 bolts to 36 ft./lbs.

15. **MEASURE FOR YOUR APPLICATION'S BELT:** Because of all the variables described previously and other variables related to your specific application, it is impossible to predict the belt required. After all components are installed, route masking tape or string around the belt path. Leave the tensioner in the un-sprung position for this measurement. Mark or cut the tape/string to length and remove from the pulleys. Subtract 2" (52 mm) from the measured length to compensate for the un-sprung tensioner position. You will need to convert belt length to millimeters if measured in inches (inches X 25.4 = mm). Go to any auto parts store and ask for a belt part number 6PK- - - - (8PK - - - - if eight groove) with the "- - - -" being the length in millimeters. For example, if you measured 2493 mm and then subtracted 52 mm, you would get 2441 mm, and the part number would be 6PK2441. Sometimes it is best to also purchase belts the next size longer and shorter than your measured length and return the unused belts later.

16. **INSTALL THE NEW BELT AND CONFIRM THE TENSIONER IS IN THE OPTIMAL POSITION:** The tension should have a pointer and a range marker. With a new belt, it is best to have the pointer at the top of the marked range. This should be about 3/4 of the rotation from its resting un-sprung position

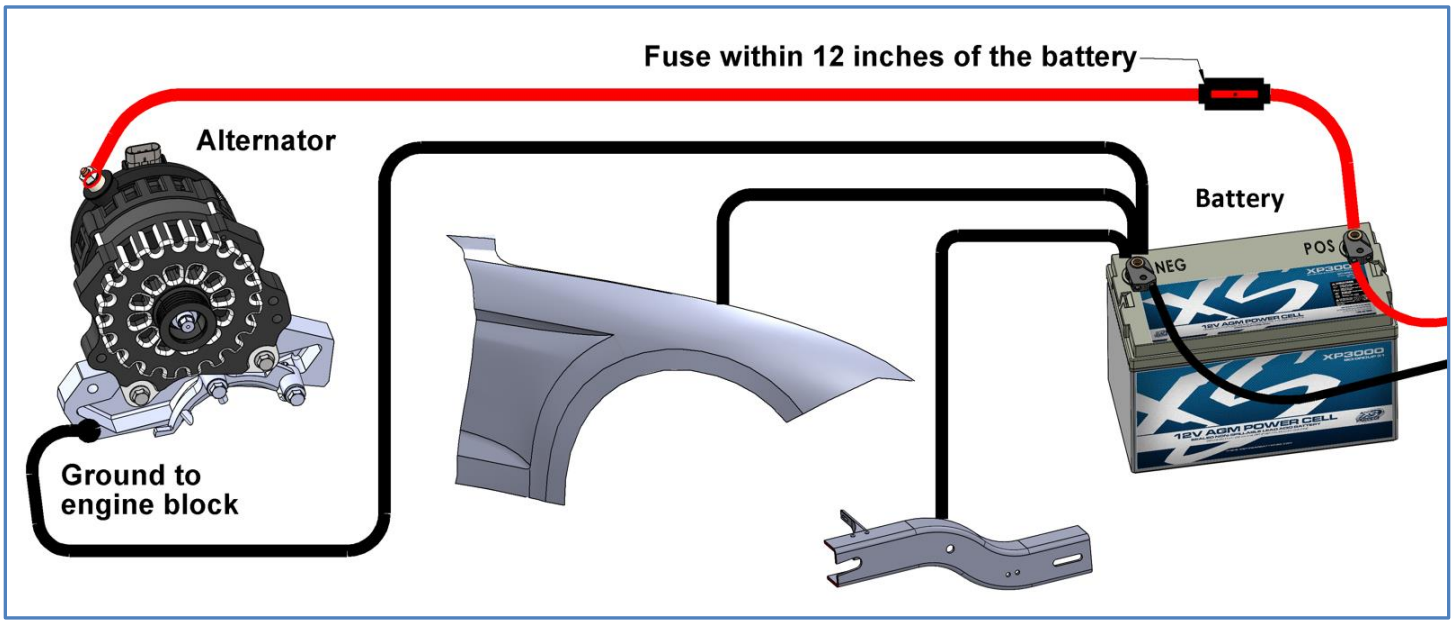


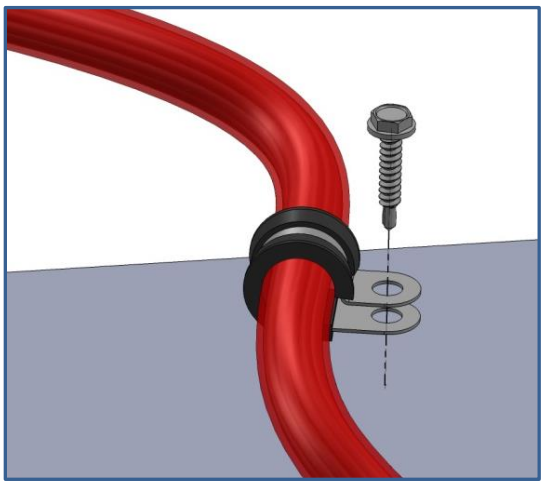
17. **INSTALL THE ALTERNATOR CHARGE WIRE:** **It is important you increase the size of the battery charge cable to accept the higher amperage of your new alternator. In most cases the original charge wire can either be removed and replaced or left on the vehicle with a 1/0 AWG (zero gauge) cable stacked on the alternator charge post for more amperage carrying capacity. The charge wire should be fused within 12" of the battery terminal for safety. The fuse installed in the 1/0-gauge cable needs to be of equal amperage capacity as the alternator being installed. To support this alternator's amperage, it's essential to use a 1/0 pure copper cable, connecting it directly from the alternator charge post directly to the battery positive post.**



18. **UPGRADE THE ALTERNATOR GROUNDS:** **An upgraded battery to engine block ground is an ABSOLUTE must. Painted, coated, and rusted surfaces are non-conductive. A 1/0-gauge ground cable MUST be run from a bare metal spot on the engine block, directly to the negative terminal of the battery. Failure to do so will cause damage to the alternator and cause potential harm to other components.**

19. **FRAME AND BODY CONNECTIONS:** Clean all metal surface of any paint or rust with a wire brush or die grinder. Use a conductive corrosion inhibitor available at any electrical parts supply house. Run 1/0 frame and body ground cables from the NEGATIVE TERMINAL OF THE BATTERY.





Use screws and insulated mounting clamps (not included) to secure larger cables to the vehicle.

Warning: It is critical that all electrical wiring be kept at least 12" away from heat sources such as exhaust manifolds and other exhaust components.

Also, avoid moving components such as cooling fans and suspension components. When wiring must be routed through metal panels, be sure to use a grommet to prevent chaffing and potential shorts.

20. **Your alternator *may* come with one or more adapter harnesses. If so, plug the corresponding adapter's connector into the vehicle's original alternator harness. Then, plug the adapter's other connector into the alternator's regulator connector. If no harness is included, the vehicles original harness should plug directly into the alternator's regulator connector.**

21. **Reconnect the battery ground and confirm all other electrical connections are complete.**

22. **Before starting the vehicle, check to confirm the battery is charged. Starting the vehicle with a discharged battery puts unnecessary strain and heat into the alternator and may damage it. Use a battery charger to fully charge the battery BEFORE starting the engine.**

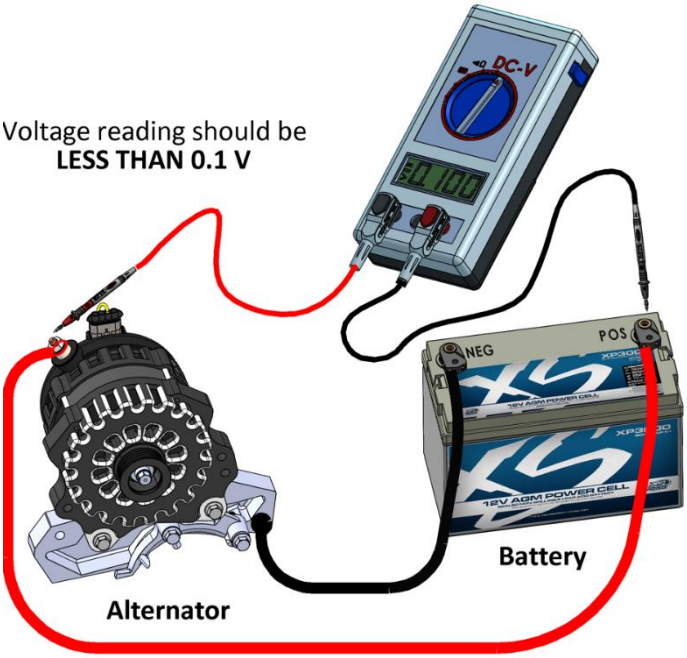
System Voltage	Charged battery
12 V Battery	12.5 V or higher

23. Start the vehicle and turn only the headlights ON. Keep audio system and other electrical loads OFF. Perform system testing below.

Ground path test

If greater than 0.1V is measured improve:

- Ground connection surfaces. Confirm all paint, anodizing, rust is removed and the connections are to bare metal.
- Make certain all terminals are tight to the wire.
- Make certain the ground wire is of adequate size.



Charge path test

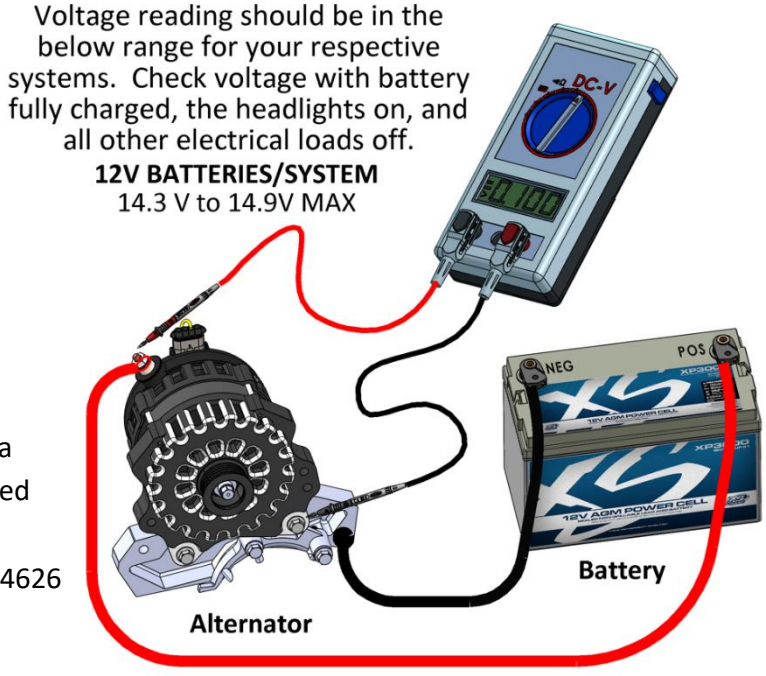
If greater than 0.1V is measured improve:

- Terminal is tight to alternator charge post.
- Make certain all terminals are tight to the wire.
- Make certain charge wire is of adequate size

Alternator test

If voltages aren't obtained:

- Recheck all connections.
- Remove the alternator and take it to a local auto parts store and have it tested for functionality.
- Call for technical support: 1-888-632-4626



Help and Troubleshooting

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 the engine block to the negative terminal of the battery.
2. Verify that the alternator regulator plug has been properly connected as per provided instructions.

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 a bare aluminum spot on one of the alternator's lower mounting feet. Using the multimeter take a voltage reading 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. Most commonly, this is caused by one or more compromised cable end connections.
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 powdery rubber residue on the front of the alternator, or if the alternator pulley's coating is wearing off, it is a good indication that you have a belt slippage problem. Make sure that the belt is of high quality and proper length. 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 a howling "supercharger" sound if it is charging a sulfated / damaged battery.