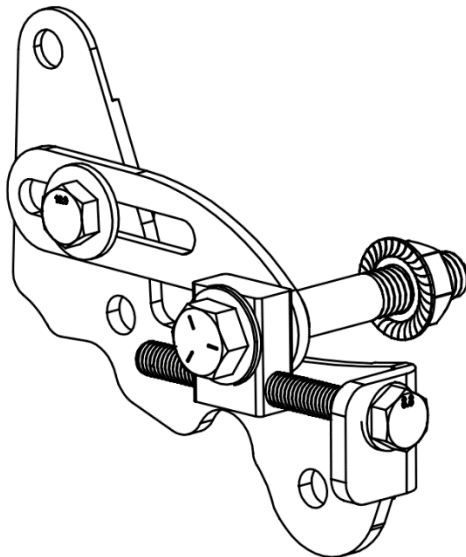
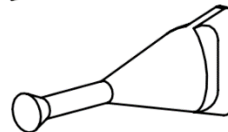
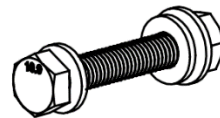
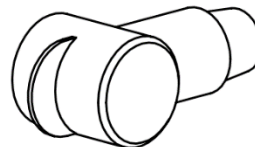
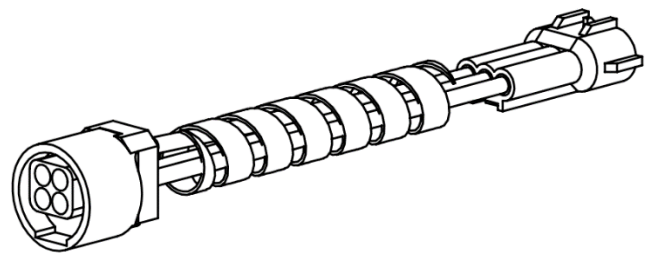
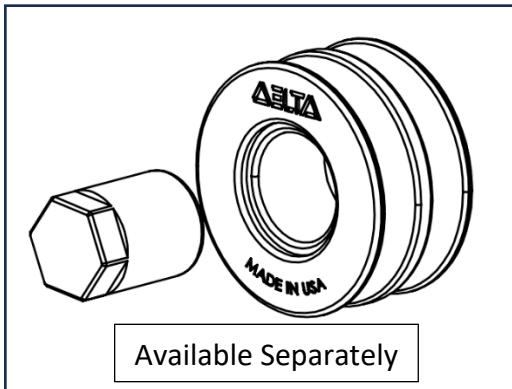




ALTERNATOR UPGRADE KIT FOR LC 93-97 1FZ-FE



Overview

Congratulations on your purchase of the DELTA Vehicle Systems alternator upgrade kit for the 80 series Land Cruiser. The adapter kit has been designed in CAD, CNC laser cut, formed, fabricated, machined, anodized, and zinc coated 100% in the U.S.A. This kit allows you to adapt a 150amp Toyota Sequoia alternator to the existing mounting locations for the stock 80 series. This alternator upgrade kit is here to support accessory power needs and boost power efficiency.

Product Compatibility

This product is compatible with 93-97 Land Cruiser equipped with the 1FZ-FE. The DeltaVS alternator kit comes with everything needed to mount and adapt a 150amp Toyota Sequoia alternator, with an over-drive pulley kit available separately. A **highly recommended**, but optional wiring kit is also sold separately to accommodate for the higher output alternator.

Packing List

Part Number	Description	Quantity	
<u>13227</u>	<u>Alternator-Photoman Kit Assy</u>		
(13214)	<i>Over-Drive Pulley</i> (Available Separately)	1	-
(13215)	<i>Over-Drive Pulley Nut</i> (Available Separately)	1	-
13233	Alternator-Photoman-Adapter Harness Assy	1	☐
13224	Cable Lug Boot	1	☐
13235	Loctite 242 0.5mL Pack	1	☐
11144	Hex Bolt M8x1.25 Steel-Zinc	1	☐
12395	Flange Nut M8 Steel-Zinc	1	☐
11043	Washer M8 Steel-Zinc	2	☐
13226	Alternator-Mounting Bracket Assy	1	☐

Packaged By _____

These instructions are for a professional installer.

Tools (tear down)

- 10mm socket and box wrench
- 12mm socket and box wrench (swivel ratchet wrench preferred)
- 14mm socket and box wrench
- 3/8 ratchet
- Impact driver (optional)

Tools (install)

- 10mm socket and box wrench
- 12mm socket and box wrench
- 13mm socket and box wrench (swivel ratchet wrench preferred)
- 14mm socket and box wrench
- 16mm socket and box wrench
- 22mm socket
- Impact driver
- Torque wrench

Other Items

- Grinder with flap disk
- Hammer/Mallet

Other Items

- Chassis tape
- Disposable rubber gloves

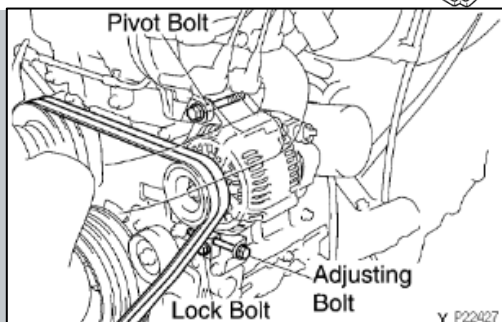
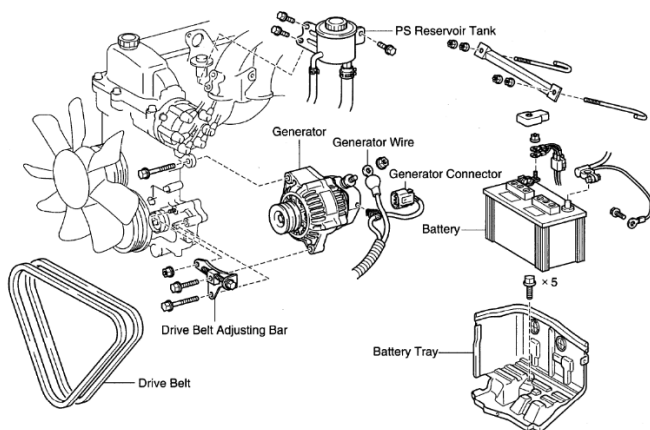
Tear down, Alternator prep, Install, and wiring sections:

Section 0-Tear Down. This section contains information about removing the stock 1FZ-FE alternator. Removal steps were taken from the Toyota Factory Service Manual. Other helpful tips are included for further support.

Section 1-Alternator Prep. This section will go over the assembly steps and vehicle preparation for the new 150amp alternator.

Section 2-Install. This section will cover the in-depth installation of the alternator upgrade kit, including helpful tips and tricks for a smooth process.

0a Tear Down



DISCONNECT BATTERY- It is important that the installer disconnects the vehicle's battery and all connected power sources to avoid compromising the vehicle's electrical system during tear down and installation.

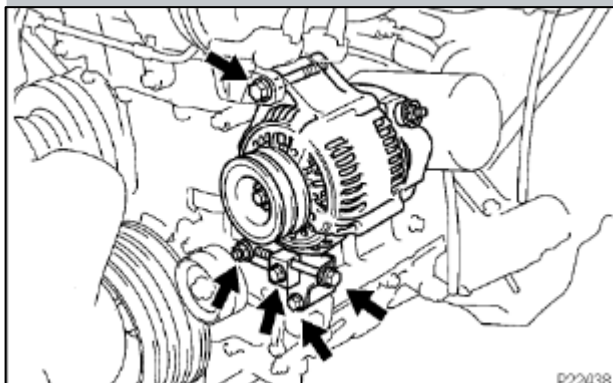
Disconnect your alternator's electrical connections- This includes the plastic generator connector, and the generator wire held on by a 10mm nut.

Using a 14mm socket, loosen the pivot bolt at the top of the alternator. Once loose, use a 12mm socket or box wrench to loosen the lock bolt on the alternator belt tensioner. Finally, the tensioner adjusting bolt can be loosened.

Note: A 12mm swivel ratchet wrench is very useful for loosening the tensioner adjusting bolt. This bolt also may be easier to access from underneath the vehicle.

Remove the 2 drive belts once there is enough clearance.

0b Removing Old Alternator



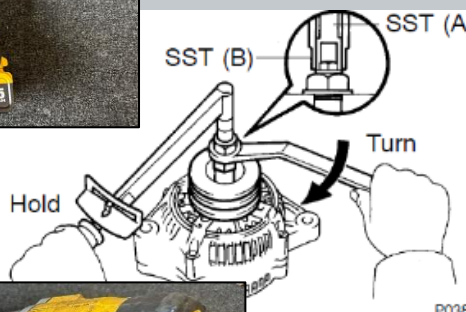
Now the lock bolt can be completely removed along with the lower bracket mounting bolt, bracket nut, and the upper pivot bolt. Be careful not to drop the hardware in your engine bay, you will be re-using them!

With all of the bolts and nuts removed, the bracket and tensioner can be removed as one.

Now it will be helpful to remove the 3 bolts holding your power steering reservoir in place. This will open up some space to slide the old alternator out of the engine bay.

Remove the old alternator, this may be difficult due to the little amount of space available. It helps to pull the alternator out with the pulley facing down.

1a Preparing your new alternator



Your new 150amp alternator will likely come with a pulley system that will not work with the 1FZ-FE belt design. Luckily, DeltaVS has a custom pulley designed to work with the 2 belt drive system, available for purchase separately.

The old pulley must be removed with a 22mm socket and impact driver.

Note: If stuck, a special service tool (SST – 09820-63010) can be used to break the pulley free as shown.

Install the new pulley and nut using a 22mm socket and impact driver as shown. The Toyota (FSM) recommends the generator pulley to be torqued to **81 ft*lb**.

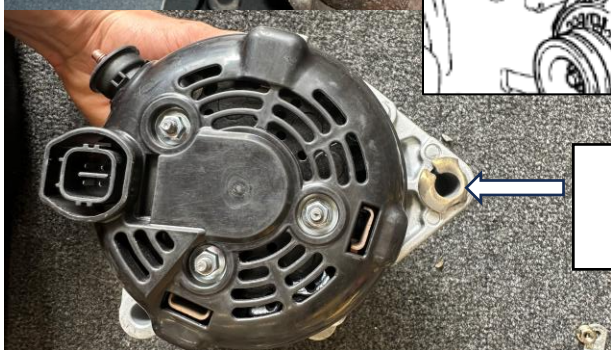
1b Adjusting alternator fitment



Upper Mounting Location (pivot Bolt).



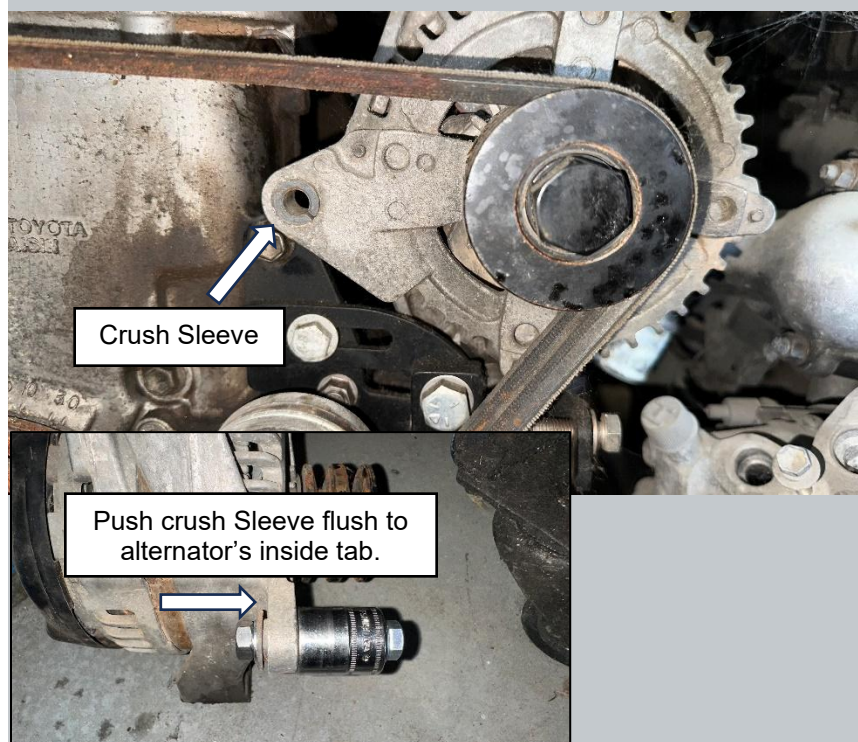
Gently sand down this surface.



The stock alternator upper mounting location is too narrow for the new 150amp alternator. The bushing on the outer most arm must be pressed out to provide enough clearance for the new alternator. This will be done using the provided M8 hex bolt, nut, washers, and your own 19mm socket. Tighten the shown assembly using a 13mm box wrench and ratchet/socket until the bushing is pushed flush with the arm.

Note: This procedure may not provide enough clearance for the alternator to fit. In this case, DeltaVS recommends sanding down the crush sleeve on the new alternator using an angle grinder and flap disk in the area shown. DO NOT GO CRAZY WITH THE GRINDER! Sanding should be done in increments until the alternator fits properly.

1c Final Preparation Step



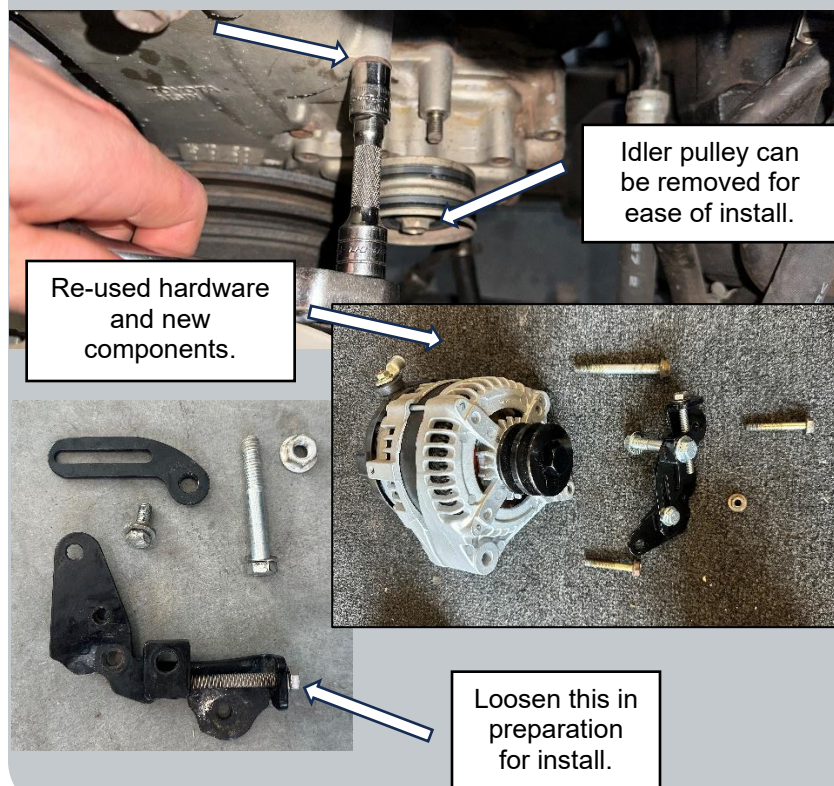
There is another crush sleeve located on the third arm of the alternator as shown.

To avoid clearance issues with the arm and timing cover, this crush sleeve can be pressed flush to the alternator's inside mounting tab using the same hardware and procedure outlined in step 1b.

It is unlikely that this crush sleeve will cause clearance issues but follow the outlined procedure if so.

This concludes the preparation work, and the new 150amp alternator is now ready to be mounted on your rig.

2a Installation

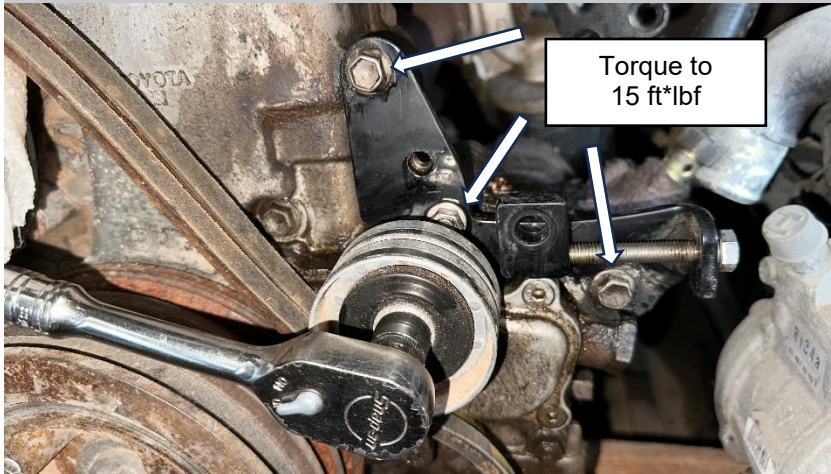


The alternator bracket requires a third mounting location on the timing cover. To prepare for this, remove the timing cover bolt with a 12mm socket and ratchet as shown by upper left arrow.

The re-used hardware and new components are shown. DeltaVS recommends laying out the pieces needed for the install to avoid confusion and later frustration.

For ease of assembly, disassemble the tensioning bracket and loosen the tensioning block as shown.

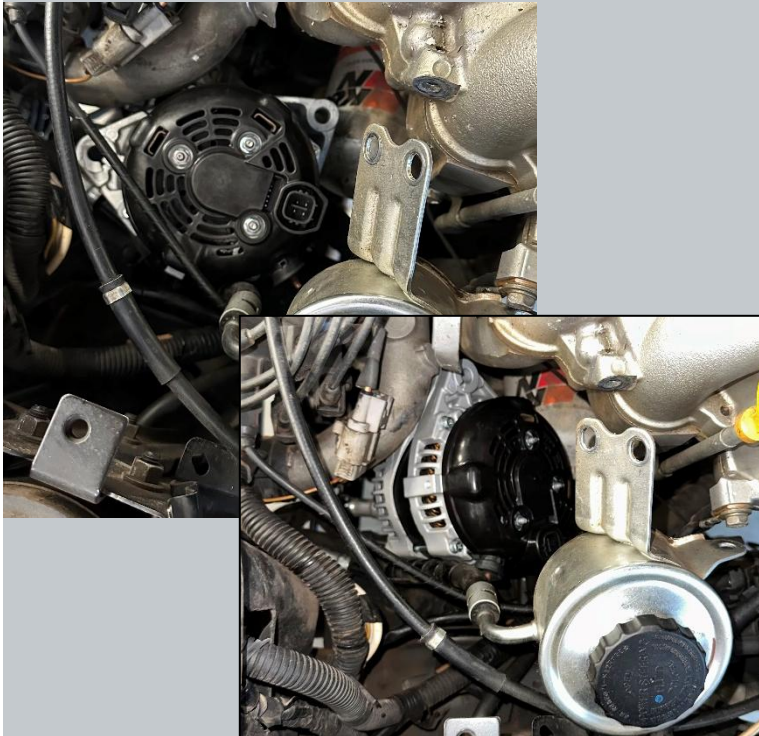
2b Alternator Bracket Install



Install the main bracket to the factory mounting locations using a 12mm socket and ratchet as shown. The Toyota FSM recommends torquing the timing cover bolts and nut to **15 ft*lb**.

Note: If you haven't already, remove the idler pulley with a 14mm socket and ratchet to properly torque the timing cover nut. Reinstall the idler pulley before the drive belts are installed in step 2d.

2c Alternator Install



This step can be frustrating so take your time... with the power steering reservoir and hoses pushed out of the way, slide the new alternator into the engine bay with the pulley side down.

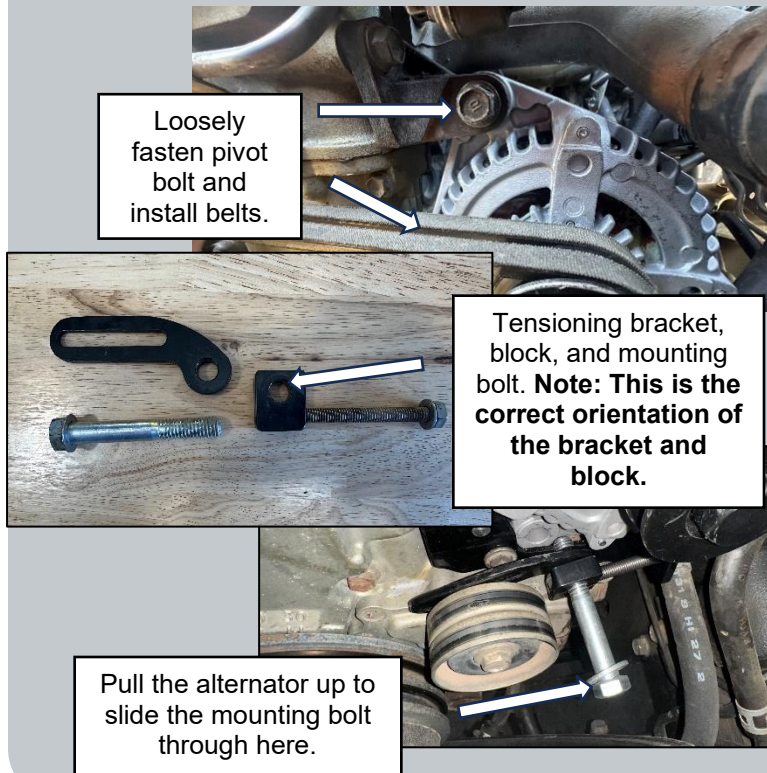
Once the alternator clears the power steering reservoir and wiring, begin to angle the pulley towards the front of the vehicle. Wiggle the alternator until it slides into its home.

Yes, this can be done without removing anything from your engine bay...Channel those Tetris memories.

Once in place, rotate the alternator and slide the upper mounting sleeve into the upper mounting bracket.

Note: Don't forget to reattach the power steering reservoir once the alternator is in place.

2d Securing the Alternator

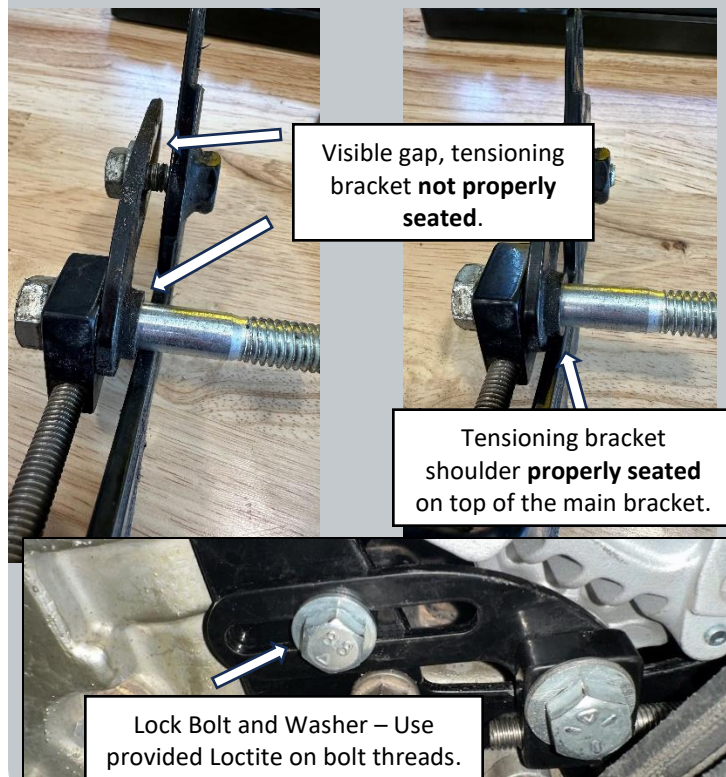


With the alternator in place, slide the upper pivot bolt through the upper mounting bracket and alternator sleeve. Loosely fasten this bolt.

Install the drive belts onto the alternator pulley. This must be done before the tensioning bracket is mounted.

The bottom mounting bolt and tensioner can now be installed. Loosely slide the 7/16-14 bolt and flat washer through the tensioning block and bracket. With a free hand pull the alternator up, rotating it towards the top of the engine bay. This will create enough room to slide the bolt end through the bottom mounting sleeve of the alternator. Refer to the pictures shown.

2e Final Installation Steps

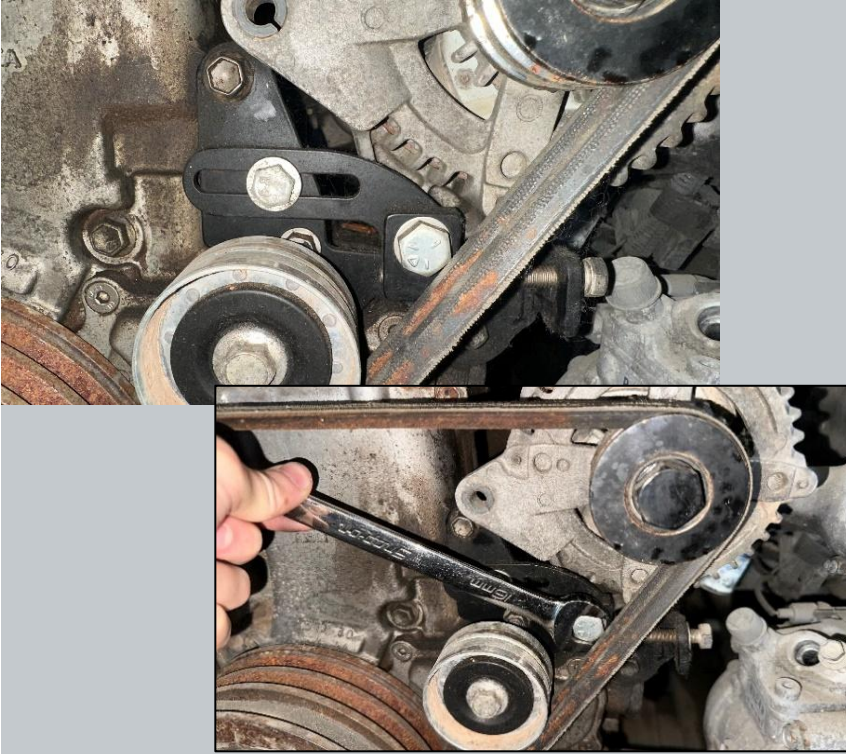


With the bottom mounting bolt properly pushed through the alternator sleeve, loosely fasten the provided flange nut onto the threads. **Note: It is easiest to thread the nut on through the top of the engine bay.**

This is very important: Make sure the flat portion of the tensioning bracket is making full flat contact with the main mounting bracket once installed. If there is a gap, then the tensioning bracket wasn't properly seated and is bound on the raised shoulder of the tensioner bracket. This can be fixed by lifting up on the alternator from underneath. The upward force will create enough room for the shoulder on the tensioning bracket to properly seat on top of the main bracket.

Finally, the lock bolt and washer can be loosely fastened onto the main mounting bracket. Apply the provided Loctite to the threads of the lock bolt before installation.

2f Tensioning and Torquing



1. Tension Belts: Using a 13mm box wrench (swivel ratchet wrench preferred), tighten the tensioning bolt until the belts are tight per Toyota specs.
2. Torque the top pivot bolt to **43 ft*lb** using a 14mm socket.
3. Torque the lock bolt to **15 ft*lb**.
4. Torque the lower mounting bolt to **43 ft*lb**. Start the tightening process by using a 16mm box wrench and holding the flange nut in place by hand.
5. Double check all of the nuts and bolts!

2g Factory Wiring

Attach the provided harness adapter to the new 4 pin alternator and factory harness 3 pin alternator plug.

DELTA recommends the "Alternator wiring upgrade kit for LC 93-97 1FZ-FE" **PN 13240** to replace the factory charge wire. These higher current alternators are pushing the limit of the factory wiring which was only designed for 80 amp charging current. If upgrading the wiring, skip to the DeltaVS 13240 instructions now.

If using the **not recommended** stock wiring setup, install the red isolator lug boot on the factory alternator charging cable and attach to the new alternator stud/nut using a 10mm socket or box wrench to tighten.

With all connections in place and hardware securely fastened, the battery and other power sources can be reconnected.

This concludes the install of the alternator upgrade kit with stock charge cable wiring for the 1FZ-FE 80 series Land Cruiser.

