Installation Instructions
6-volt to 12-volt Alternator Conversion Kit

Instructions courtesy of Craig Vechorik.

This alternator does not require wiring modifications to the original harness. This unit carries a one year warranty. Please read the entire instructions once before proceeding with work!

1. The following cautions are very important. I can't stress how important they are, other than to say you can void your warranty and damage the electrical system if you don't follow the caution guidelines.

CAUTION ONE! This is an alternator system, not a generator system! This means you cannot run the motorcycle without a battery. If you do so, you will destroy the voltage regulator and diode board. A dead or weak battery in the system will also cause this charging system to over-charge (create excess heat) which can destroy the diode board. I highly recommend the installation and the use of a "smart battery trickle-charge system" to insure that the battery stays fully charged, even during storage. Bench Mark Works LLC sells such a battery charger: accessory 27D--battery tender 12-volt. Trickle charger with a brain! Switches automatically from charge to float. Running the motorcycle without a fully-charged battery voids the alternator conversion warranty.

CAUTION TWO! Please understand that while this is a powerful alternator, the total wattage demand must not exceed 200 watts. Your normal lighting configuration of a 55/65 watt H4 halogen headlight and the related normal 12-volt dual filament brake/tail light bulb, and related illumination bulbs will not come close to this limit. However, if you install high wattage auxiliary lighting, or use high wattage demand electrically heated clothes, you must determine that total wattage demand of your accessories. Exceeding the 200 watt limit will ultimately cause failure of the alternator conversion unit. If in doubt about the wattage of an accessory check with the manufacturer. Exceeding the 200 watt limit voids the alternator conversion warranty.

CAUTION THREE! Be sure to note (physically mark) what lead is the positive (+) lead

and what lead is the negative, ground (-) lead on your old battery. Disconnect and remove the 6-volt battery from the machine. You must mark the leads so that later, when you install the 12-volt battery, you do not reverse the battery leads. If you reverse the battery leads, it will damage the new alternator. Solid state electronics do not tolerate reversed polarity. If you reverse the leads, it voids the alternator conversion warranty.

2. Once your old 6-volt battery is disconnected, remove it. Then remove the front generator cover from the engine.
<------- Note that there are 4 wires attached to the 6-volt generator. The wires and corresponding terminals are:

A) One blue wire (which runs to the charge light) is attached to terminal # 61 on the generator.

B) Two red, (or sometimes one red, one black wire) heavy wires attached to terminals # 30/51 on the generator. (One of these wires runs to the headlight main switch, the other to the (+) terminal of the battery)

C) One brown wire (ground) which is attached to the unmarked terminal next to the negative (-) brush on the lower left face of the generator. Remove All of these wires from their respective terminals and move them aside temporarily.

3. Use the 5mm allen wrench (supplied in the kit) and remove the two socket head cap screws which retain the field of the generator to the front timing gear cover of the engine. Gently remove the field from the gear cover and set it aside. It is sometimes necessary to gently bump the side of the generator field with a mallet to dislodge it from the cover.

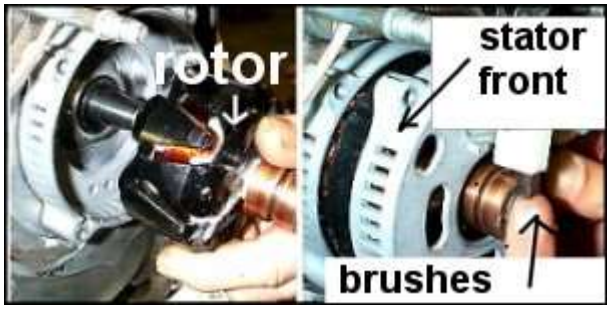
4. Use the 6mm allen wrench (supplied in the kit) and remove the socket head cap screw that retains the armature of the generator on the nose of the crankshaft. In place of the socket head cap screw, install the special puller bolt (supplied in the kit) and screw the puller bolt in, until it bottoms in the hole. Place one hand on the body of the armature, and use a 13mm wrench (not supplied) to tighten the puller bolt. The puller bolt will pop the armature off of the nose of the crankshaft, and your spare hand will keep the armature from falling on the floor. Occasionally, the puller bolt will require quite a bit of force, and may require you to "rap" the end of the puller bolt with a hammer, to shock the assembly, and to

make the armature pop off the shaft.

5. Remove the four 5mm socket head cap screws from the face of the stator with a 4mm allen wrench supplied in the kit. Disassemble the stator housing of the alternator and separate the back housing from the windings. Remove the back cover of the stator. Remove and discard the paper wrapping from the rotor.

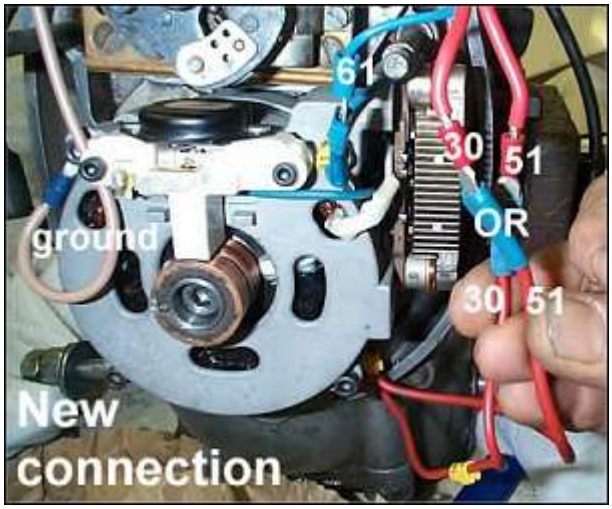
Note! There are two different angle tapers of crankshaft noses. Early shafts, (such as the R51/3 or the 1955-1960 twins) have a 17mm shaft diameter. Later crankshafts have a 20mm shaft diameter. The alternator rotors supplied in the kits are available in two versions: one kit for the 20mm shaft and one kit for the 17mm shaft. Compare the diameter of the hole in the back of the generator armature that you removed with the hole in the alternator rotor. It will be readily apparent if the hole in your old generator armature is the same or smaller. If they are the same, you are in business. If the hole is different, STOP immediately and call the vendor you purchased this kit from to trade-in the kit for the proper-sized kit.

6. On the inside of the back cover the word “TOP” is stamped. The back cover must be oriented and installed on the face of the timing gear cover with the “top” up on the engine. Use the two countersunk socket head screws and the 4mm allen wrench supplied in the kit to mount the back cover to the face of the timing gear cover. Tighten the countersunk screws. Clean and de-grease the nose of the crankshaft and the side tapered hole of the rotor. Place the rotor on the nose of the crankshaft, install the new socket head cap screw (supplied in the kit) and tighten the cap screw to seat the rotor on the shaft.



7. Position the face of the stator (with the windings in it) so that the brush assembly is at the top of the alternator. As you install the stator into the back cover, you must push the brushes upward, into their holders, in order to clear the two copper slip rings of the rotor. Be sure the external black case of the windings is squarely seated into the back cover, and that the four holes are lined up, before installing, and tightening, the four socket head cap screws that secure the front half of the stator to the rear cover. Tighten the four socket head cap screws with the 4mm allen wrench.

8. The attachment of the original wires is quite straightforward.
A) The blue wire on the alternator is marked with #61. The blue wire from the original harness is connected via the male crimp on connector provided to this wire.



B) The two red wires (or sometimes one red, one black wire) on the alternator are marked #30 and # 51. Both of these wires have a common connection to the alternator. Both the original heavy wires of the original harness attach to these red wires of the alternator. It does not matter which of the wires of the original harness is attached to which of the red wires of the alternator. Use the male crimp on the connectors provided in the kit to attach the original wires.

C) One wire remains, the brown, ground wire. Install the crimp on ring terminal on the end of this brown wire. Temporarily remove one of the socket head cap screws, on the face of the alternator and install the ring terminal of the brown wire under the head of the socket head cap screw. Re-tighten the cap screw.

9. Make sure all of the wires are routed in such a fashion and tied out of the way with the cable ties provided in the kit. You must make sure that the wires are not in a position to be pinched when you replace the generator cover. Make sure that the wires do not interfere with the advance of the magneto. Replace the front engine cover and tighten the bolts.

10. Replace all the 6-volt electrical components with 12-volt components: bulbs, H4 Halogen conversion headlight assembly, bulb holder, and battery. Have the

replacement 12-volt battery filled with battery acid, charged and then install the battery. Note: Depending on which 12-volt battery is used, it maybe necessary to flatten the two side tabs on the battery box to prevent interference between the box and the battery. This will be the case if you use a 12N7-4B battery. Be sure the (+) lead of the wiring harness goes to the (+) post of the battery. Failure to correctly attach the battery leads in their proper orientation will damage the electronics of this alternator and void the warranty.