



Installing a two brush generator on a 1957 and earlier Harley Davidson

Pre 1957 Panheads, Knuckleheads, 45, and K models came with a three brush generator. 1958 and later generator models came with a two-brush generator. There are several reasons some one may want the change from a three-brush generator to a two-brush generator. The biggest reason is to get the upgraded technology. The three brush dose not use a voltage regulator. It is set up to put out a set amount of amperage. This system dose not handle switching electrical components on or off very well. It also requires an extremely robust battery to be able to handle the resulting periods of overcharging and under charging. These days it is hard to find a good 6-volt battery that can handle it. This leads to another reason. You can switch to a 12-volt system. There are those who want to keep the bike stock. This is a very noble and worthy effort for a show bike or collector. Unfortunately it is getting hard to find parts for the old 32E generators. If you do find parts it is getting even harder to find someone that understands how to make it work. Most of the craftsmen of that era have retired or past away. If you have a collectable or show bike leave it stock. If you want to ride it upgrading is a good choice. When putting a two-brush generator on a 1957 and earlier Harley Davidson there are some things to consider.

Oil Deflectors

The two brush and three brush generators use different oil deflectors. The oil deflector prevents too much oil from getting on the ball bearing. On two brush models it also sets the location of the gear.

Since the gear is pined in place on the three brushes, the oil deflector has a spring between it and the bearing to hold it up against the gear.

The oil deflector used on two brush generators has a built in collar. The gear is drawn onto the shaft with a nut until it pinches the oil deflector tight against the inner race of the ball bearing. This sets the location of the gear and locks the armature in place.

When changing from a three brush to a two-brush generator do not use the old oil deflector and spring. Use Harley Davidson part # 31035-58.

Gears

On three brush generators the gear is held on with a roll pin. These gears have a hole for the roll pin. On a two brush generator the gear is held on with a nut. The gears are the same except for the roll pinhole. Ether gear can be used on the two-brush generator. The three-brush generator needs gears with the pinhole.

Generator gears have ether 13 or 14 teeth. All models used 14 tooth gears through 1957. 1958 to 1969 Panheads and Shovelheads used a 13-tooth gear. The gear mesh on 1957 and earlier models is adjustable. It may be possible to use a 13-tooth gear if the proper gear mesh can be achieved. This will increase the

low speed generator output by 66%. See shimming and strapping.

All of the 45's, K models and Sportster use a 14-tooth gear. 45's require a built in slinger. The timing covers on the 45's have a spring-loaded brass breather that rides on the end of this special gear.

Police models came with fan-cooled generators. These generators have a large squeal cage fan attached to the commutator end of the generator. Fan cooled generators use a special ratchet gear. The ratchet is built in to take excessive stress off the timing gears during over revving situations. When replacing a fan cooled unit with a generator that is not fan cooled use a standard gear.

It is best to reuse the original gear when ever possible. Finding a good aftermarket gear can be difficult. The gear must be a press fit on the shaft. A loose fitting gear will ware the shaft out.

Bolts

The three-brush generator mounts with ¼ 24 bolts. The two brush generator mounts with 5/16 24 bolts. There are two methods to mount a two-brush generator on 1957 and earlier motors. One is to enlarge the mounting holes in the engine case to fit the larger 5/16" bolts. The second method is to use helicoids to reduce the 5/16-24 threads in the mounting holes down to ¼-24 and use the stock bolts. I recommend using the ¼-24 bolts then shimming and strapping.

H Option

When ordering a Cycle Electric Inc generator add the letter H to the end of the part # to get ¼-24 helicoids pre installed.

Shimming and strapping

On 1957 and earlier motors the mesh between the generator gear and the idler gear inside the motor needs to be set. This is accomplished by shimming between the generator and a cradle on the engine case. The object is to achieve .002" lash between the generator gear and the idler gear. You can check this by taking the timing cover off or by removing the front lifter block. Rotate the motor several times to find the tightest spot between the gears. Change the amount of lash by install different thickness paper shims between the generator housing and cradle on the engine case below the generator gasket surface. Tighten the strap and snug the mounting bolts, then check for proper lash.

On 1958 and later models the generator is doweled in place buy the snug fit between front bearing boss on the generator and the hole in the engine case. The gear mesh is a manufactured tolerance and is not adjustable.

Note: S&S generator motor cases are set up like the 1958 and later. No shimming is requierd.

M Option

Since there is no cradle on 1958 and later motors, the out side dimension on the two brush generator is not a critical dimension. When installing a two-brush generator on a 1957 and earlier motor there may not be clearance between the generator and cradle. If this is the case you will not be able to achieve proper gear mesh. Sometimes the second mounting bole will not line up. When ordering a Cycle Electric Inc models 65A (part # DGV-2569) or DGV-5000 add the letter M to the end of the part #. With the M option we set the outside dimensions to allow room for shimming. The Cycle Electric Inc models 61 6 volt, (part # DGV-2578) DGV-5006 6 volt and DGV-5000L 12 volt generators are intended to go on the older motor and get the M option automatically.

Wiring

The two-brush generator uses a regulator instead of a cut out relay. You will need to find a place to mount the regulator. Connect the “A” wire or terminal on the regulator to the “A” terminal on the generator. Then connect the “F” wire or terminal on the regulator to the “F” terminal on the generator. Connect the B+ wire or terminal on the regulator to the battery.

If you are using the Cycle Electric Inc DGV-5000 generator with built in regulator simply connect the battery wire from the old cut out relay to the “B” terminal on the generator. If you have a generator light connect the wire from the light terminal on the old cut out relay to the “L” terminal on the DGV-5000. Do not use the wire from the “S” or switch terminal on the 32E generator. This wire comes from the ignition switch. Remove this wire or tape it off. You can then remove the cut out relay.

Let the road you choose to ride bring you happiness.

Karl S Fahringer

President

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