DELCO THREE-BRUSH GENERATOR MYSTERY

Article by Don Reddaway

Last summer, the generator on our 1930 Franklin automobile failed. The five-amp field fuse was blown. A visual inspection revealed nothing was amiss. The fuse was replaced and the engine started, but still no output current. The fuse was again blown.

As a result, the generator together with a second unit, was taken to a generator shop for rebuilding. We were informed that the armature was worn out-of-round. To correct the problem, the armature of both generators needed to be turned and new brushes installed. The shop was told that the Franklin generator is a positive-grounded system.

A few days later I received a call that both generators were rebuilt and ready for pickup. The newly rebuilt generator was installed. The engine was started, and again, there was no output and the fuse was blown. The second generator installed had the same result. The generator was removed and this time a voltmeter was connected across to the output terminals and the generator spun by hand. The meter showed a positive voltage output - not the negative output which the Franklin auto requires. Having returned both generators to the rebuild shop, I was informed that they knew nothing about how to re-establish a negative output, but would call someone who might know.

By this time, my patience was running very thin. The company finally did call back and said, "Yes, indeed, three-brush generators need to be re-polarized after the armatures are turned." They claimed that nothing was wrong with their work and that something must be wrong with the car's wiring. I removed the floorboards along with the upholstery to get to the wiring of the generator. The shop also said they knew nothing about polarizing three-brush systems, and did not have the hardware to do the operation.

At this point, a second opinion was needed. I contacted a shop in North Lynnwood. I was lucky to find an older person who was an expert with these generators. I was told that the generator first needed to be polarized and reinstalled in the car so that it could not be rotated. (**Note:** If this is not done, the generator will run as a dc motor.) Next, the output wire (negative) from the battery should be momentarily connected to output terminal of the generator (just a quick touch), with the cutout relay removed. Finally, all generator system parts should be reconnected as factory original.

This time when the car was started, the generator operated correctly, but the current was at plus-25 amps. The generator output needed to be lowered. The correct output, when cold, should not be more than 20 amps. To reduce the output, the third-brush has a moveable mounting which has to be loosened and the brush moved counter-clockwise until the output is between 15 and 18 amps, cold, at about 1,000 rpm.

Removing the generator from a Franklin is no small task, because it is part of the timing chain system and is connected to the front of the engine through the timing cover.

The moral of the story is:

Find an old-time mechanic!

INTERESTING INFORMATION

- The small-size fuses (field fuses) can be purchased at the Interstate Battery Store in North Lynnwood.
- The field-fuse is a #AGA Bussman, rated at 5 amps. (cost - 85 cents per box of five units).
- NAPA no longer stocks this type of fuse, so they charge $5.00 per box plus $10 ordering charge.
- Interstate Battery Store stocks a large selection of battery terminals (same type as used in the 1930s).
- Interstate Battery Store stocks a large selection of six-volt batteries.
- When installing the fuse in the back of the generator, make sure the spring inside the fuse holder is holding the fuse securely and that there are no oil contaminates in the fuse holder. The spring that holds the fuse is a bronze coil which loses its tension over time or can become corroded due to oil or dirt inside the generator.