

# DYNASTART PROBLEMS

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My Isetta 300 SW and Messerschmitt KR200 both had unusual problems with their Dynastarts that were really tough to find. My Electrical Engineer friend that used to own a motorcycle shop was completely stumped by the Messerschmitt situation and spent many hours trying to find the cause, to no avail. In the end the repairs turned out to be exactly the same for both units and they now work great. Lets start with the Isetta repair and then talk about the weird Messerschmitt problem.

### ISETTA

When I rebuilt my Isetta Dynastart I used John Jensen's excellent book "Isetta Restoration" as a guide. I had a generator shop turn the commutator slightly. I then removed the brush holders, cleaned everything meticulously, replaced the brushes and checked the insulation on all the wiring. I did everything short of removing the field magnets since their insulation and the wires connecting the magnets seemed to be in good shape, and I was afraid that my attempts to fix something that wasn't broken would be a big mistake. After the rebuild I checked for shorts with my voltmeter (an inexpensive model) and everything looked fine.

The problems started occurring after I had driven the car a few hundred miles on the rebuilt engine, but they were so intermittent that I had difficulty replicating the malfunctions in my shop. Sometimes when I tried to start the engine it would not turn over until I put the car in gear and pushed it slightly to turn the crankshaft a bit. Then the engine would turn over fine and start right up. At other times the generator warning light would illuminate to indicate that the battery was not being charged, but this happened rarely and seemed to correct itself after a while.

I disassembled the Dynastart a few times again and did all the checks and cleaning, but the same malfunctions would later happen again. Out of frustration I finally decided to disassemble the only parts that had not been touched – the field magnets.

The screws securing the field magnets did not budge, even when I used an impact driver. I had to take the assembly to a machine shop and they were able to remove the screws without damaging the screw heads too much. When I got home I looked at the disassembled magnet assembly under a magnifying glass and lots of light. I saw that there were a couple of areas where the insulating tape around the coils was discolored where the magnets sat against the Dynastart housing. It also appeared that on some of the coils the insulating tape was extremely brittle when a couple of small pieces broke off as I was handling the assembly.

I went back to the generator shop that had turned the armature and purchased a roll of electrical fiberglass tape to rewrap the magnets. I also purchased a can of insulator spray that is used in electric motor renewal applications.

I then removed the electrical tape that was obviously bad around 4 of the coils. This old tape was tedious to remove since it had been in the high-temperature engine environment for over 40 years. I could not just put new tape over the old since there would have been insufficient clearance between the magnets and the armature. I tried to replicate the way the tape had originally been put on so I would not put the tape on too thick. I then sprayed the remaining coils with the insulating spray and reaffixed the magnets to the Dynastart case.

It was important when reassembling the unit to be certain that the magnets would not rub against the armature. I used a magic marker (real mechanics would cringe!) to color the metal part of the magnets. I then reattached the Dynastart assembly, turned the engine over a few times by hand and removed the assembly to see if any of the magic marker coloring on the magnets had been rubbed off by the armature. There were a couple of magnets that exhibited some rubbing so I tightened those more, went through the entire procedure again and everything was fine.

My Dynastart now works fine with no further problems. I wish that I hadn't been so intimidated about removing the magnets when I first rebuilt the engine, but I am very relieved that everything now works perfectly.

Lets now look at the weird Dynastart problem with the Messerschmitt that drove my Electrical Engineering friend crazy.

### **MESSERSCHMITT**

One of the most unique things about a Messerschmitt is the ability to have its 2-stroke engine run backwards to give it four speeds in reverse. This is something I love telling people about and is of endless fascination for them.

I knew when I purchased the Messerschmitt that it needed a total engine rebuild and body restoration, and it was clear when I tried to turn the engine over in reverse that something was shorting out. During the rebuild I found a brush wire that was shorting, so I thought that would solve the problem.

Unfortunately my freshly rebuilt engine had the same shorting problem when I tried to turn the engine over in reverse, yet it turned over fine in the forward direction. This did not make any sense at all, since if there were no shorts with the engine spinning forward then simply reversing the polarity to make it spin backwards should work fine.

It turned out that one of the magnets had a similar shorting problem as the Isetta in which the coil insulation was worn where the coil rested against the Dynastart housing. But since the short was in the last coil in the assembly it did not short out enough to cause

problems when turning over the engine in forward. However, when reversing the polarity this problem coil was then the first to be energized and so the short was much more catastrophic. I may not be explaining this exactly right, but I hope you get the gist of what was happening.

The repairs were the same as for the Isetta, and there have been no problems at all with either Dynastart since then.