

Tackling 'Click No Start' Issues

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One series of problems I have been working on lately is the 'click no start' issue on starters in general. I wanted to be sure that the problem was not in the starter I had rebuilt.

Here are some things to do.

First, what is the *width* of penetration on the old drive, as evidenced by the wear pattern on the leading edge of the teeth? Don't confuse this with the *depth* of penetration which is corrected with shims on some starters. Use this measurement to cut a strip of metal which you will use to block the starter drive back during the following tests. Also, don't connect the battery to the main solenoid terminal (B+). We don't want the starter to spin during these tests.

Second, using a carbon pile between a battery and the 's' terminal, you will be able to increase the voltage gradually to the solenoid. Hold your blocking strip between the drive and the stop collar. This simulates the occasional condition where the drive teeth butt the ring gear teeth instead of meshing right away.

Then connect a test light between +12v and B+ to indicate when the contacts close.

Connect a voltmeter separately to the 's' terminal and ground (called a 'Kelvin' connection), tighten the carbon pile, and measure the 's' voltage at which the test light comes on with the drive held back by your blocking strip.

I generally find if that voltage is higher than 8.5v, I may experience the 'click no start' symptoms on a cold morning if the battery is a bit low, or if the ignition switch circuit cannot deliver enough voltage to the solenoid, or if there is a bad ground to the starter circuit. The contacts have to be able to close if the starter drive teeth ever butt with the ring gear teeth. I have also found that different manufacturers' solenoids have different magnetic strengths so you could use this test for quality control. This test should be done first, because once the coil gets warm from other tests, the voltage necessary to close the contacts will be much higher.

In some older 350 Chevy vehicles and some VW automatics, the solenoid would get so warm from the exhaust manifold, that it would require more than the available 10 or 11 volts to the 's' terminal in order to get the contacts to close at all, much less in the case of the drive teeth butting the ring gear teeth. This was dubbed 'hot soak.'

Here are some other drive linkage issues to look at:

- Check that the drive comes up to the stop collar with about 1 or 2 mm of slack when you apply full 's' voltage. It should not be tight, nor too loose. I have found that Nikko starters, including 28mt, will butt up tight to the stop collar, but this is not a problem, as long as the next test (following paragraph) is good. Speaking of Nikko starters (and others), on some of them the solenoid current is enough by itself to rotate the starter slowly. This is a form of soft engagement.
- Pry the starter drive up tight against the stop collar manually like it would be when it's cranking an engine, because of the spiral splines. Now apply full voltage to the 's' terminal and check the contacts with the test light connected as before. The test light should go first on and then *off* if the 's' voltage is applied and then removed while the gear is blocked *forward*. If not, you will encounter the infamous run-on condition in the application.
- Check that when the drive is at rest, it has at least the amount of clearance from the stop collar as the width of your metal strip in the first step. This makes sure that the rotating ring gear doesn't catch the starter drive.

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