It's Going the Wrong Way! (Engine starting in reverse)

Over the years, there have been reports of Kettle engines starting in reverse. Although a rare phenomenon, I believe that this can only be attributed to a timing related issue.

To begin with - there are 3 things that indicate that you may have fallen victim to this. The first (and most obvious) is that your rpm gauge doesn't work on starting. The second is that the engine won't sound quite right and the third... you'll go backwards if you if you put the bike into gear! The important thing is that if you suspect that your engine has started in reverse, you should turn off your ignition immediately.

Having given some thought to the detrimental effects of this, I can say that there are a couple. For one thing, your oil pump is turning backwards, but that's small fry when you consider the other thing that can have potentially catastrophic consequences for your the starter motor, depending on what the 3 starter clutch rollers decide to do.

The Kettle starter uses a roller clutch system not a sprag clutch, although it operates by similar principles. The clutch rollers are designed to grab the crank and turn it when the starter spins up. As soon as the engine fires and assumes control of the crank, the rollers are released. If however, the clutch rollers should not be released, the engine would then be driving the starter motor. As the reduction gearing from the starter to the crank shaft is about 12:1 (11.925 actually) the motor would be driven at 12 times the crankshaft speed. At idle, the engine is ticking-over at about 1,200RPM and therefore in this scenario, the starter motor would be doing about 14,400 RPM! If the engines speed is increased, so will the starter's. The centrifugal force exerted on the armature segments may well cause them to separate from the armature and lock the motor up. It is also possible that the windings themselves may be thrown off the armature. Look at the image to see what I mean!

If you're lucky and the rollers do release, then no damage to the starter motor should result. However, if the engine fires and turns in reverse (clockwise, viewed from the LH side), it is more than likely that the rollers will NOT be released, as the springs behind the rollers will force them into position against the reverse rotating crank.

The latest Accent ignition systems (from about a year ago) have been modified to take this reverse starting into consideration and have a delay built in, to allow the crank to gain momentum in the right direction before triggering the spark.

As I said above; spark timing must be linked to this phenomenon and yet having racked my brain (small, but useful at times) I have not found the real answer/cause because it can still occur in engines with seemingly perfectly set timing, I will however, continue to get to the bottom of it. In the meantime, you are now alive to its existence – "forewarned is forearmed' as they say.

Nick Lowe