Forklift Starters

The starter motor these days is usually either a series-parallel wound direct current electric motor that includes a starter solenoid, which is similar to a relay mounted on it, or it can be a permanent-magnet composition. As soon as current from the starting battery is applied to the solenoid, basically via a key-operated switch, the solenoid engages a lever that pushes out the drive pinion which is situated on the driveshaft and meshes the pinion with the starter ring gear which is seen on the engine flywheel.

The solenoid closes the high-current contacts for the starter motor, which starts to turn. When the engine starts, the key operated switch is opened and a spring inside the solenoid assembly pulls the pinion gear away from the ring gear. This particular action causes the starter motor to stop. The starter's pinion is clutched to its driveshaft by means of an overrunning clutch. This allows the pinion to transmit drive in only one direction. Drive is transmitted in this method through the pinion to the flywheel ring gear. The pinion remains engaged, like for instance in view of the fact that the operator fails to release the key when the engine starts or if there is a short and the solenoid remains engaged. This actually causes the pinion to spin independently of its driveshaft.

This above mentioned action prevents the engine from driving the starter. This is actually an important step in view of the fact that this kind of back drive would allow the starter to spin very fast that it will fly apart. Unless adjustments were made, the sprag clutch arrangement would preclude using the starter as a generator if it was employed in the hybrid scheme mentioned earlier. Normally a standard starter motor is intended for intermittent utilization that will prevent it being utilized as a generator.

Thus, the electrical parts are designed to be able to work for just about under thirty seconds so as to avoid overheating. The overheating results from too slow dissipation of heat because of ohmic losses. The electrical parts are meant to save weight and cost. This is the reason most owner's instruction manuals intended for automobiles recommend the driver to stop for at least 10 seconds right after each and every 10 or 15 seconds of cranking the engine, if trying to start an engine that does not turn over right away.

In the early part of the 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Before that time, a Bendix drive was utilized. The Bendix system operates by placing the starter drive pinion on a helically cut driveshaft. Once the starter motor begins turning, the inertia of the drive pinion assembly allows it to ride forward on the helix, hence engaging with the ring gear. As soon as the engine starts, the backdrive caused from the ring gear allows the pinion to surpass the rotating speed of the starter. At this moment, the drive pinion is forced back down the helical shaft and therefore out of mesh with the ring gear.

The development of Bendix drive was developed in the 1930's with the overrunning-clutch design called the Bendix Folo-Thru drive, made and introduced during the 1960s. The Folo-Thru drive consists of a latching mechanism together with a set of flyweights in the body of the drive unit. This was better as the standard Bendix drive utilized in order to disengage from the ring as soon as the engine fired, even though it did not stay running.

The drive unit if force forward by inertia on the helical shaft when the starter motor is engaged and begins turning. After that the starter motor becomes latched into the engaged position. As soon as the drive unit is spun at a speed higher than what is achieved by the starter motor itself, for instance it is backdriven by the running engine, and next the flyweights pull outward in a radial manner. This releases the latch and permits the overdriven drive unit to become spun out of engagement, therefore unwanted starter disengagement could be prevented prior to a successful engine start.