

## Forklift Starters and Alternators

Forklift Starters and Alternators - The starter motor of today is normally either a series-parallel wound direct current electric motor that consists of a starter solenoid, that is similar to a relay mounted on it, or it can be a permanent-magnet composition. Once current from the starting battery is applied to the solenoid, basically through a key-operated switch, the solenoid engages a lever which pushes out the drive pinion which is positioned on the driveshaft and meshes the pinion with the starter ring gear that is found on the flywheel of the engine.

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 within the solenoid assembly pulls the pinion gear away from the ring gear. This action causes the starter motor to stop. The starter's pinion is clutched to its driveshaft by an overrunning clutch. This allows the pinion to transmit drive in just a single direction. Drive is transmitted in this particular method through the pinion to the flywheel ring gear. The pinion continuous to be engaged, like for example in view of the fact that the driver did not release the key as soon as the engine starts or if there is a short and the solenoid remains engaged. This actually causes the pinion to spin separately of its driveshaft.

This aforesaid action stops the engine from driving the starter. This is actually an important step for the reason that this kind of back drive would allow the starter to spin so fast that it would fly apart. Unless modifications were made, the sprag clutch arrangement will preclude the use of the starter as a generator if it was used in the hybrid scheme discussed earlier. Usually an average starter motor is meant for intermittent utilization that would preclude it being used as a generator.

Therefore, the electrical components are intended to be able to function for approximately under thirty seconds to avoid overheating. The overheating results from too slow dissipation of heat due to ohmic losses. The electrical parts are meant to save cost and weight. This is truly the reason nearly all owner's manuals meant for automobiles recommend the operator to pause for a minimum of ten seconds right after each 10 or 15 seconds of cranking the engine, whenever trying to start an engine which does not turn over instantly.

In the early part of the 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Previous to that time, a Bendix drive was used. The Bendix system operates by placing the starter drive pinion on a helically cut driveshaft. When the starter motor starts spinning, 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 thus out of mesh with the ring gear.

In the 1930s, an intermediate development between the Bendix drive was made. The overrunning-clutch design that was developed and introduced during the 1960s was the Bendix Folo-Thru drive. The Folo-Thru drive has a latching mechanism along with a set of flyweights inside the body of the drive unit. This was an enhancement because the standard Bendix drive utilized to disengage from the ring once the engine fired, even though it did not stay functioning.

The drive unit is force forward by inertia on the helical shaft when the starter motor is engaged and begins turning. Then the starter motor becomes latched into the engaged position. Once 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 afterward the flyweights pull outward in a radial manner. This releases the latch and permits the overdriven drive unit to become spun out of engagement, thus unwanted starter disengagement can be avoided before a successful engine start.