

## Forklift Starters and Alternators

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

When the starter motor starts to turn, the solenoid closes the high-current contacts. When the engine has started, the solenoid has a key operated switch that opens the spring assembly to pull 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 an overrunning clutch. This permits 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 remains engaged, like for instance because the operator fails to release the key when the engine starts or if there is a short and the solenoid remains engaged. This causes the pinion to spin separately of its driveshaft.

This aforementioned action prevents the engine from driving the starter. This is actually an important step since this particular type of back drive will enable the starter to spin really fast that it would fly apart. Unless modifications were done, the sprag clutch arrangement will prevent the use of the starter as a generator if it was employed in the hybrid scheme discussed earlier. Normally an average starter motor is intended for intermittent utilization that would preclude it being utilized as a generator.

The electrical parts are made so as to operate for more or less thirty seconds to stop overheating. Overheating is caused by a slow dissipation of heat is because of ohmic losses. The electrical components are intended to save cost and weight. This is truly the reason the majority of owner's manuals utilized for vehicles recommend the driver to pause for at least 10 seconds right after each 10 or 15 seconds of cranking the engine, when trying to start an engine which does not turn over immediately.

In the early part of the 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Prior to 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 starts turning, the inertia of the drive pinion assembly enables it to ride forward on the helix, therefore engaging with the ring gear. Once the engine starts, the backdrive caused from the ring gear allows the pinion to go beyond the rotating speed of the starter. At this point, the drive pinion is forced back down the helical shaft and hence out of mesh with the ring gear.

During the 1930s, an intermediate development between the Bendix drive was made. The overrunning-clutch design that was made and introduced in the 1960s was the Bendix Folo-Thru drive. 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 because the standard Bendix drive utilized to disengage from the ring when the engine fired, though it did not stay functioning.

When the starter motor is engaged and starts turning, the drive unit is forced forward on the helical shaft by inertia. It then becomes latched into the engaged position. When the drive unit is spun at a speed higher than what is achieved by the starter motor itself, like for instance it is backdriven by the running engine, and then the flyweights pull outward in a radial manner. This releases the latch and enables the overdriven drive unit to become spun out of engagement, thus unwanted starter disengagement can be avoided prior to a successful engine start.