

## Forklift Starters and Alternators

Forklift Starter and Alternator - A starter motor today is usually a permanent-magnet composition or a series-parallel wound direct current electrical motor with a starter solenoid installed on it. Once current from the starting battery is applied to the solenoid, basically via 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 using the starter ring gear that is found on the engine flywheel.

As soon as the starter motor begins to turn, the solenoid closes the high-current contacts. As soon as the engine has started, the solenoid has a key operated switch that opens the spring assembly in order to pull 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 means of an overrunning clutch. This permits the pinion to transmit drive in only one direction. Drive is transmitted in this manner via the pinion to the flywheel ring gear. The pinion continues to be engaged, for example as the driver did not release the key once the engine starts or if the solenoid remains engaged since there is a short. This actually causes the pinion to spin separately of its driveshaft.

This aforementioned action stops the engine from driving the starter. This is an essential step in view of the fact that this particular kind of back drive would allow the starter to spin so fast that it would fly apart. Unless adjustments were done, the sprag clutch arrangement would prevent making use of the starter as a generator if it was used in the hybrid scheme mentioned earlier. Normally a regular starter motor is meant for intermittent use which would prevent it being utilized as a generator.

Therefore, the electrical components are meant to work for more or less under 30 seconds so as to avoid overheating. The overheating results from too slow dissipation of heat due to ohmic losses. The electrical components are intended to save cost and weight. This is truly the reason most owner's manuals for vehicles recommend the driver to pause for at least 10 seconds right after every 10 or 15 seconds of cranking the engine, when trying to start an engine which does not turn over instantly.

The overrunning-clutch pinion was launched onto the market in the early 1960's. Prior to the 1960's, a Bendix drive was used. This drive system works on a helically cut driveshaft which consists of a starter drive pinion placed on it. When the starter motor starts turning, the inertia of the drive pinion assembly enables it to ride forward on the helix, thus engaging with the ring gear. When the engine starts, the backdrive caused from the ring gear allows the pinion to surpass the rotating speed of the starter. At this point, the drive pinion is forced back down the helical shaft and thus 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 during the 1960s was the Bendix Folo-Thru drive. The Folo-Thru drive has a latching mechanism together with a set of flyweights inside the body of the drive unit. This was better for the reason that the average Bendix drive used in order to disengage from the ring when the engine fired, even if it did not stay running.

Once 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. Once the drive unit is spun at a speed higher than what is attained by the starter motor itself, for instance it is backdriven by the running engine, and then the flyweights pull outward in a radial manner. This releases the latch and permits the overdriven drive unit to become spun out of engagement, hence unwanted starter disengagement can be avoided previous to a successful engine start.