

## Forklift Starter and Alternator

Forklift Starters and Alternators - The starter motor of today is usually either a series-parallel wound direct current electric motor that has 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 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 using the starter ring gear that is found on the flywheel of the engine.

The solenoid closes the high-current contacts for the starter motor, that begins to turn. Once the engine starts, the key operated switch is opened and a spring in 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 an overrunning clutch. This allows the pinion to transmit drive in just one direction. Drive is transmitted in this particular method through the pinion to the flywheel ring gear. The pinion remains engaged, for example as the operator fails to release the key once the engine starts or if the solenoid remains engaged as there is a short. This actually causes the pinion to spin independently of its driveshaft.

This above mentioned action prevents the engine from driving the starter. This is an important step because this particular kind of back drive would enable the starter to spin so fast that it can fly apart. Unless modifications were done, the sprag clutch arrangement will prevent the use of the starter as a generator if it was made use of in the hybrid scheme discussed earlier. Usually an average starter motor is meant for intermittent use which would stop it being utilized as a generator.

The electrical parts are made so as to work for around thirty seconds to stop overheating. Overheating is caused by a slow dissipation of heat is due to ohmic losses. The electrical parts are intended to save cost and weight. This is the reason most owner's guidebooks for vehicles suggest the operator to pause for a minimum of ten seconds right after each ten or fifteen seconds of cranking the engine, whenever trying to start an engine which does not turn over immediately.

The overrunning-clutch pinion was launched onto the market in the early 1960's. Previous to the 1960's, a Bendix drive was utilized. This particular drive system works on a helically cut driveshaft that has a starter drive pinion placed on it. 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 exceed the rotating speed of the starter. At this instant, the drive pinion is forced back down the helical shaft and thus 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 has a latching mechanism together with a set of flyweights within the body of the drive unit. This was an improvement as the standard Bendix drive utilized in order to disengage from the ring when the engine fired, even though it did not stay running.

Once the starter motor is engaged and begins 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, for example it is backdriven by the running engine, and after that the flyweights pull outward in a radial manner. This releases the latch and allows the overdriven drive unit to become spun out of engagement, thus unwanted starter disengagement can be prevented prior to a successful engine start.