Forklift Alternators and Starters

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, that is similar to a relay mounted on it, or it could 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 that 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 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 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 only one direction. Drive is transmitted in this particular manner via the pinion to the flywheel ring gear. The pinion remains engaged, for instance in view of the fact that the driver did not release the key once the engine starts or if the solenoid remains engaged for the reason that there is a short. This actually causes the pinion to spin separately of its driveshaft.

This aforementioned action prevents the engine from driving the starter. This is actually an essential step in view of the fact that this particular type of back drive will allow the starter to spin really fast that it will fly apart. Unless modifications were done, the sprag clutch arrangement would preclude the use of the starter as a generator if it was utilized in the hybrid scheme discussed earlier. Typically a standard starter motor is meant for intermittent utilization that would preclude it being used as a generator.

The electrical components are made so as to function for around 30 seconds to avoid overheating. Overheating is caused by a slow dissipation of heat is due to ohmic losses. The electrical components are intended to save cost and weight. This is the reason most owner's guidebooks used for automobiles suggest the driver to stop for at least ten seconds right after each ten or fifteen seconds of cranking the engine, whenever trying to start an engine which does not turn over instantly.

During the early 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Prior to that time, a Bendix drive was utilized. The Bendix system works by placing the starter drive pinion on a helically cut driveshaft. When the starter motor begins spinning, the inertia of the drive pinion assembly allows it to ride forward on the helix, hence engaging with the ring gear. When the engine starts, the backdrive caused from the ring gear enables 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 referred to as the Bendix Folo-Thru drive, made and introduced during the 1960s. The Folo-Thru drive consists of a latching mechanism along with a set of flyweights within the body of the drive unit. This was an enhancement for the reason that the average Bendix drive utilized to disengage from the ring when the engine fired, even though it did not stay functioning.

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 attained by the starter motor itself, like 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.