Starters for Forklifts

Forklift Starters - The starter motor these days is typically 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. When 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 that is located on the driveshaft and meshes the pinion using the starter ring gear that is found on the engine flywheel.

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 which 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 an overrunning clutch. This allows the pinion to transmit drive in just a single direction. Drive is transmitted in this method through the pinion to the flywheel ring gear. The pinion remains engaged, for instance because the driver fails to release the key once the engine starts or if there is a short and the solenoid remains engaged. This causes the pinion to spin separately of its driveshaft.

The actions mentioned above would prevent the engine from driving the starter. This important step prevents the starter from spinning so fast that it can fly apart. Unless adjustments were made, the sprag clutch arrangement will stop the use of the starter as a generator if it was made use of in the hybrid scheme mentioned earlier. Normally an average starter motor is meant for intermittent utilization that will prevent it being utilized as a generator.

Thus, the electrical components are intended to be able to operate for roughly under 30 seconds to prevent overheating. The overheating results from too slow dissipation of heat because of ohmic losses. The electrical components are meant to save weight and cost. This is really the reason most owner's guidebooks used for automobiles suggest the driver to pause for at least ten seconds right after every ten or fifteen seconds of cranking the engine, when trying to start an engine that does not turn over instantly.

The overrunning-clutch pinion was launched onto the marked in the early part of the 1960's. Prior to the 1960's, a Bendix drive was utilized. This drive system operates on a helically cut driveshaft that has a starter drive pinion placed on it. Once the starter motor begins turning, the inertia of the drive pinion assembly enables it to ride forward on the helix, thus engaging with the ring gear. As soon as the engine starts, the backdrive caused from the ring gear allows the pinion to go beyond 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.

In the 1930s, an intermediate development between the Bendix drive was made. The overrunning-clutch design that was developed 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 inside the body of the drive unit. This was a lot better because the standard Bendix drive utilized to disengage from the ring when the engine fired, although it did not stay running.

When 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, 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, hence unwanted starter disengagement could be prevented before a successful engine start.