Forklift Starters and Alternators

Forklift Starters and Alternators - The starter motor of today is typically either a series-parallel wound direct current electric motor which has a starter solenoid, that is similar to a relay mounted on it, or it can 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 which is situated on the driveshaft and meshes the pinion using the starter ring gear which is found on the engine flywheel.

Once the starter motor starts to turn, the solenoid closes the high-current contacts. When the engine has started, the solenoid consists of a key operated switch that opens the spring assembly to be able 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 allows the pinion to transmit drive in just one direction. Drive is transmitted in this way through the pinion to the flywheel ring gear. The pinion remains engaged, like for instance as the operator did not release the key when the engine starts or if there is a short and the solenoid remains engaged. This causes the pinion to spin independently of its driveshaft.

This above mentioned action stops the engine from driving the starter. This is actually an important step since this kind of back drive will enable the starter to spin so fast that it could fly apart. Unless modifications were done, the sprag clutch arrangement will preclude using the starter as a generator if it was used in the hybrid scheme mentioned prior. Normally an average starter motor is meant for intermittent utilization which would prevent it being used as a generator.

Hence, the electrical parts are intended to operate for just about under thirty seconds to be able to prevent overheating. The overheating results from too slow dissipation of heat due to ohmic losses. The electrical parts are designed to save weight and cost. This is actually the reason most owner's guidebooks meant for automobiles recommend the driver to pause for a minimum of 10 seconds right after each ten or fifteen seconds of cranking the engine, whenever trying to start an engine which does not turn over right away.

The overrunning-clutch pinion was introduced onto the marked during the early 1960's. Before the 1960's, a Bendix drive was utilized. This particular drive system functions on a helically cut driveshaft that has a starter drive pinion placed on it. As soon as 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. 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.

The development of Bendix drive was developed during the 1930's with the overrunning-clutch design referred to as the Bendix Folo-Thru drive, developed and introduced during the 1960s. The Folo-Thru drive consists of a latching mechanism together with a set of flyweights in the body of the drive unit. This was an enhancement because the average Bendix drive utilized to be able to disengage from the ring once the engine fired, although it did not stay functioning.

The drive unit if force forward by inertia on the helical shaft once the starter motor is engaged and starts turning. Afterward the starter motor 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 example it is backdriven by the running engine, and next 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 could be avoided previous to a successful engine start.