Forklift Starters and Alternators

Forklift Starters and Alternators - Today's starter motor is normally a permanent-magnet composition or a series-parallel wound direct current electrical motor along with a starter solenoid mounted on it. When current from the starting battery is applied to the solenoid, basically through a key-operated switch, the solenoid engages a lever which pushes out the drive pinion that is positioned on the driveshaft and meshes the pinion with the starter ring gear which is found on the flywheel of the engine.

When the starter motor begins to turn, the solenoid closes the high-current contacts. Once the engine has started, the solenoid has a key operated switch which opens the spring assembly so as 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 particular way via the pinion to the flywheel ring gear. The pinion remains engaged, for instance in view of the fact that the operator fails to release the key once the engine starts or if the solenoid remains engaged because there is a short. This actually causes the pinion to spin independently of its driveshaft.

This aforementioned action prevents the engine from driving the starter. This is actually an essential step since this particular kind of back drive would allow the starter to spin very fast that it will fly apart. Unless adjustments were made, the sprag clutch arrangement would stop the use of the starter as a generator if it was utilized in the hybrid scheme mentioned earlier. Typically an average starter motor is designed for intermittent use which will preclude it being utilized as a generator.

The electrical parts are made so as to function for approximately 30 seconds in order to avoid overheating. Overheating is caused by a slow dissipation of heat is because of ohmic losses. The electrical components are intended to save weight and cost. This is the reason the majority of owner's guidebooks meant for vehicles recommend the driver to pause for a minimum of ten seconds right after every 10 or 15 seconds of cranking the engine, if trying to start an engine which does not turn over right away.

In the early 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Before that time, a Bendix drive was used. The Bendix system functions by placing the starter drive pinion on a helically cut driveshaft. 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.

During the 1930s, an intermediate development between the Bendix drive was made. The overrunning-clutch design that was developed and introduced during the 1960s was the Bendix Folo-Thru drive. The Folo-Thru drive consists of a latching mechanism together with a set of flyweights in the body of the drive unit. This was much better in view of the fact that the average Bendix drive used so as to disengage from the ring as soon as the engine fired, though it did not stay running.

The drive unit if force forward by inertia on the helical shaft once the starter motor is engaged and starts turning. Next the starter motor becomes latched into the engaged position. Once 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 permits the overdriven drive unit to become spun out of engagement, therefore unwanted starter disengagement can be avoided prior to a successful engine start.