Forklift Alternators and Starters

Forklift Starters and Alternators - A starter motors today is typically a permanent-magnet composition or a series-parallel wound direct current electrical motor with a starter solenoid mounted on it. 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 situated on the driveshaft and meshes the pinion utilizing the starter ring gear which is seen on the engine flywheel.

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 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 just one direction. Drive is transmitted in this manner through the pinion to the flywheel ring gear. The pinion remains engaged, like for instance because the operator fails to release the key when the engine starts or if there is a short and the solenoid remains engaged. This causes the pinion to spin separately of its driveshaft.

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

The electrical parts are made so as to function for more or less thirty seconds to avoid 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 nearly all owner's manuals utilized for vehicles suggest the driver to stop for at least 10 seconds right after every 10 or 15 seconds of cranking the engine, if trying to start an engine that does not turn over right away.

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 functions by placing the starter drive pinion on a helically cut driveshaft. As soon as 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 moment, the drive pinion is forced back down the helical shaft and therefore out of mesh with the ring gear.

In the 1930s, an intermediate development between the Bendix drive was developed. The overrunning-clutch design that was developed and introduced during the 1960s was the Bendix Folo-Thru drive. The Folo-Thru drive has a latching mechanism along with a set of flyweights inside the body of the drive unit. This was much better since the average Bendix drive used so as to disengage from the ring when the engine fired, though it did not stay functioning.

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, like for example it is backdriven by the running engine, and then the flyweights pull outward in a radial manner. This releases the latch and enables the overdriven drive unit to become spun out of engagement, therefore unwanted starter disengagement could be prevented previous to a successful engine start.