Forklift Starters and Alternators

Forklift Starters and Alternators - The starter motor these days is normally either a series-parallel wound direct current electric motor which consists of a starter solenoid, which is similar to a relay mounted on it, or it could be a permanent-magnet composition. As soon as 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 positioned on the driveshaft and meshes the pinion with the starter ring gear which is found on the flywheel of the engine.

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 inside 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 means of an overrunning clutch. This permits the pinion to transmit drive in only a single direction. Drive is transmitted in this way through the pinion to the flywheel ring gear. The pinion continuous to be engaged, like for example because the driver did not release the key as soon as the engine starts or if the solenoid remains engaged as there is a short. 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 really fast that it could fly apart. Unless adjustments were made, the sprag clutch arrangement will stop utilizing the starter as a generator if it was used in the hybrid scheme mentioned earlier. Usually an average starter motor is designed for intermittent use which would stop it being utilized as a generator.

Thus, the electrical components are designed to operate for around under 30 seconds to be able to prevent overheating. The overheating results from very slow dissipation of heat because of ohmic losses. The electrical parts are designed to save cost and weight. This is really the reason the majority of owner's instruction manuals utilized for vehicles suggest the driver to pause for at least 10 seconds after each and every ten or fifteen seconds of cranking the engine, if trying to start an engine that 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 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, thus engaging with the ring gear. Once the engine starts, the backdrive caused from the ring gear allows the pinion to surpass the rotating speed of the starter. At this instant, 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 in the 1930's with the overrunning-clutch design called the Bendix Folo-Thru drive, developed and introduced in the 1960s. The Folo-Thru drive has a latching mechanism together with a set of flyweights in the body of the drive unit. This was a lot better because the typical Bendix drive used to be able to disengage from the ring when the engine fired, though 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. As soon as 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 afterward the flyweights pull outward in a radial manner. This releases the latch and allows the overdriven drive unit to become spun out of engagement, hence unwanted starter disengagement could be prevented before a successful engine start.