Forklift Starter and Alternator

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

The solenoid closes the high-current contacts for the starter motor, that starts to turn. When 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 particular action causes the starter motor to stop. The starter's pinion is clutched to its driveshaft by means of an overrunning clutch. This allows the pinion to transmit drive in only one direction. Drive is transmitted in this method via the pinion to the flywheel ring gear. The pinion remains engaged, like for instance since the driver did not release the key as soon as 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 stops the engine from driving the starter. This is actually an essential step because this kind of back drive will enable the starter to spin very fast that it would fly apart. Unless adjustments were done, the sprag clutch arrangement would prevent using the starter as a generator if it was used in the hybrid scheme discussed earlier. Usually a standard starter motor is intended for intermittent use that will stop it being used as a generator.

Hence, the electrical parts are meant to be able to operate for approximately under 30 seconds in order to prevent overheating. The overheating results from very slow dissipation of heat due to ohmic losses. The electrical components are intended to save cost and weight. This is the reason nearly all owner's handbooks utilized for vehicles suggest the driver to pause for a minimum of 10 seconds after every ten or fifteen seconds of cranking the engine, if trying to start an engine that does not turn over immediately.

The overrunning-clutch pinion was introduced onto the marked in the early 1960's. Previous to the 1960's, a Bendix drive was used. This particular drive system operates on a helically cut driveshaft that consists of a starter drive pinion placed on it. Once the starter motor begins turning, the inertia of the drive pinion assembly allows it to ride forward on the helix, thus engaging with the ring gear. When the engine starts, the backdrive caused from the ring gear allows the pinion to exceed the rotating speed of the starter. At this instant, 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 launched in the 1960s was the Bendix Folo-Thru drive. 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 for the reason that the typical Bendix drive utilized to be able to disengage from the ring as soon as the engine fired, though it did not stay running.

Once the starter motor is engaged and starts turning, the drive unit is forced forward on the helical shaft by inertia. It then becomes latched into the engaged position. Once the drive unit is spun at a speed higher than what is attained 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 permits the overdriven drive unit to become spun out of engagement, therefore unwanted starter disengagement could be prevented previous to a successful engine start.