Forklift Starter and Alternator

Forklift Starters and Alternators - A starter motors today is typically a permanent-magnet composition or a series-parallel wound direct current electrical motor along with a starter solenoid installed on it. Once current from the starting battery is applied to the solenoid, mainly via a key-operated switch, the solenoid engages a lever which pushes out the drive pinion which is located on the driveshaft and meshes the pinion with 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. As soon as the engine has started, the solenoid has a key operated switch which opens the spring assembly to be able to pull 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 one direction. Drive is transmitted in this manner via the pinion to the flywheel ring gear. The pinion remains engaged, like for instance since the operator fails to release the key once the engine starts or if the solenoid remains engaged as there is a short. This causes the pinion to spin independently of its driveshaft.

This above mentioned action prevents the engine from driving the starter. This is actually an essential step as this type of back drive will enable the starter to spin very fast that it would fly apart. Unless modifications were done, the sprag clutch arrangement will prevent making use of the starter as a generator if it was utilized in the hybrid scheme mentioned prior. Usually a regular starter motor is designed for intermittent utilization which will preclude it being utilized as a generator.

Hence, the electrical components are meant to function for just about less than 30 seconds to prevent overheating. The overheating results from very slow dissipation of heat due to ohmic losses. The electrical components are designed to save cost and weight. This is the reason the majority of owner's instruction manuals intended for vehicles suggest the operator to stop for at least ten seconds right after every 10 or 15 seconds of cranking the engine, whenever trying to start an engine which does not turn over instantly.

During the early part of the 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Before that time, a Bendix drive was used. The Bendix system works by placing the starter drive pinion on a helically cut driveshaft. When the starter motor starts turning, the inertia of the drive pinion assembly enables it to ride forward on the helix, hence engaging with the ring gear. When the engine starts, the backdrive caused from the ring gear allows the pinion to go beyond 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.

The development of Bendix drive was made in the 1930's with the overrunning-clutch design known as the Bendix Folo-Thru drive, developed and launched in the 1960s. 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 utilized so as to disengage from the ring once the engine fired, even if it did not stay functioning.

As soon as 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. When the drive unit is spun at a speed higher than what is achieved by the starter motor itself, for instance 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, hence unwanted starter disengagement could be avoided previous to a successful engine start.