

Forklift Starters and Alternators

Forklift Starters and Alternators - The starter motor these days is normally either a series-parallel wound direct current electric motor that includes a starter solenoid, which is similar to a relay mounted on it, or it could be a permanent-magnet composition. When current from the starting battery is applied to the solenoid, basically via a key-operated switch, the solenoid engages a lever that pushes out the drive pinion that is positioned on the driveshaft and meshes the pinion with the starter ring gear which is seen on the flywheel of the engine.

Once the starter motor begins to turn, the solenoid closes the high-current contacts. When the engine has started, the solenoid has a key operated switch that 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 an overrunning clutch. This permits the pinion to transmit drive in only one direction. Drive is transmitted in this particular method through the pinion to the flywheel ring gear. The pinion remains engaged, like for instance as the driver fails to release the key when the engine starts or if there is a short and the solenoid remains engaged. 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 really fast that it could fly apart. Unless adjustments were done, the sprag clutch arrangement would prevent utilizing the starter as a generator if it was employed in the hybrid scheme mentioned earlier. Usually a regular starter motor is intended for intermittent use which would preclude it being used as a generator.

Therefore, the electrical parts are designed to function for around less than 30 seconds in order to avoid overheating. The overheating results from too slow dissipation of heat due to ohmic losses. The electrical parts are meant to save cost and weight. This is actually the reason nearly all owner's handbooks utilized for automobiles suggest the driver to pause for a minimum of ten seconds after each and every 10 or 15 seconds of cranking the engine, if trying to start an engine which does not turn over immediately.

In the early 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Previous to 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 begins turning, the inertia of the drive pinion assembly allows it to ride forward on the helix, therefore engaging with the ring gear. As soon as the engine starts, the backdrive caused from the ring gear enables 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 hence out of mesh with the ring gear.

The development of Bendix drive was made during the 1930's with the overrunning-clutch design referred to as the Bendix Folo-Thru drive, made and introduced during the 1960s. The Folo-Thru drive consists of a latching mechanism together with a set of flyweights inside the body of the drive unit. This was much better in view of the fact that the typical Bendix drive used to disengage from the ring once the engine fired, even if it did not stay functioning.

Once 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 instance it is backdriven by the running engine, and after that the flyweights pull outward in a radial manner. This releases the latch and enables the overdriven drive unit to become spun out of engagement, thus unwanted starter disengagement can be prevented before a successful engine start.