

Forklift Starters and Alternators

Forklift Alternators and Starters - A starter motor today is usually a permanent-magnet composition or a series-parallel wound direct current electrical motor along with a starter solenoid mounted on it. When current from the starting battery is applied to the solenoid, mainly via 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 found on the flywheel of the engine.

As soon as the starter motor begins to turn, the solenoid closes the high-current contacts. Once the engine has started, the solenoid consists of a key operated switch that opens the spring assembly in order 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 a single direction. Drive is transmitted in this particular manner through the pinion to the flywheel ring gear. The pinion remains engaged, for instance because the operator fails to release the key as soon as the engine starts or if there is a short and the solenoid remains engaged. This actually causes the pinion to spin separately of its driveshaft.

This aforementioned action stops the engine from driving the starter. This is an important step because this particular kind of back drive will allow the starter to spin really fast that it will fly apart. Unless adjustments were done, the sprag clutch arrangement would prevent utilizing the starter as a generator if it was used in the hybrid scheme discussed earlier. Typically a standard starter motor is designed for intermittent utilization that would stop it being used as a generator.

Therefore, the electrical parts are intended to function for more or less less than thirty seconds in order to avoid overheating. The overheating results from very slow dissipation of heat due to ohmic losses. The electrical components are meant to save weight and cost. This is truly the reason the majority of owner's instruction manuals for automobiles suggest the driver to pause for a minimum of 10 seconds after each ten or fifteen seconds of cranking the engine, if trying to start an engine which does not turn over immediately.

In the early part of the 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Prior 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, thus engaging with the ring gear. When 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 thus 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 made and launched in 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 an improvement for the reason that the typical Bendix drive used in order to disengage from the ring when the engine fired, even if it did not stay running.

The drive unit is forced forward by inertia on the helical shaft when the starter motor is engaged and starts turning. Afterward the starter motor 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, like for instance 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 avoided prior to a successful engine start.