

Forklift Starters and Alternators

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

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 within 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 an overrunning clutch. This permits the pinion to transmit drive in only a single direction. Drive is transmitted in this way via the pinion to the flywheel ring gear. The pinion continuous to be engaged, like for example because the operator fails to release the key once the engine starts or if the solenoid remains engaged in view of the fact that there is a short. This actually causes the pinion to spin separately of its driveshaft.

This above mentioned action prevents the engine from driving the starter. This is actually an important step because this particular kind of back drive will allow the starter to spin so fast that it will fly apart. Unless modifications were made, the sprag clutch arrangement will prevent the use of the starter as a generator if it was employed in the hybrid scheme discussed prior. Normally an average starter motor is intended for intermittent use that would prevent it being used as a generator.

Therefore, the electrical parts are designed to operate for about under 30 seconds so as to prevent overheating. The overheating results from too slow dissipation of heat because of ohmic losses. The electrical parts are designed to save cost and weight. This is the reason most owner's manuals meant for vehicles suggest the driver to pause for at least ten seconds after each ten or fifteen seconds of cranking the engine, whenever trying to start an engine that does not turn over at once.

During the early part of the 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Previous to that time, a Bendix drive was used. The Bendix system operates by placing the starter drive pinion on a helically cut driveshaft. Once the starter motor starts spinning, the inertia of the drive pinion assembly enables it to ride forward on the helix, therefore engaging with the ring gear. When the engine starts, the backdrive caused from the ring gear enables the pinion to exceed 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 developed during the 1930's with the overrunning-clutch design called 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 within the body of the drive unit. This was better for the reason that the typical Bendix drive used so as to disengage from the ring once the engine fired, though it did not stay running.

The drive unit if force 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 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, therefore unwanted starter disengagement can be prevented previous to a successful engine start.