

Forklift Alternators and Starters

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

The solenoid closes the high-current contacts for the starter motor, which starts 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 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 manner through the pinion to the flywheel ring gear. The pinion continuous to be engaged, like for example because the driver fails to release the key as soon as the engine starts or if there is a short and the solenoid remains engaged. This causes the pinion to spin independently of its driveshaft.

The actions mentioned above would stop the engine from driving the starter. This significant step prevents the starter from spinning so fast that it will fly apart. Unless modifications were done, the sprag clutch arrangement would stop using the starter as a generator if it was employed in the hybrid scheme discussed earlier. Typically a standard starter motor is meant for intermittent utilization which will preclude it being used as a generator.

Thus, the electrical parts are meant to be able to operate for around less than thirty seconds so as to avoid overheating. The overheating results from too 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 guidebooks for vehicles suggest the driver to stop for at least ten seconds after every 10 or 15 seconds of cranking the engine, whenever 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 operates by placing the starter drive pinion on a helically cut driveshaft. When the starter motor begins turning, the inertia of the drive pinion assembly enables 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 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.

During the 1930s, an intermediate development between the Bendix drive was made. The overrunning-clutch design which was developed and introduced in the 1960s was the Bendix Folo-Thru drive. The Folo-Thru drive consists of a latching mechanism together with a set of flyweights inside the body of the drive unit. This was an enhancement for the reason that the average Bendix drive used in order to disengage from the ring as soon as the engine fired, though it did not stay functioning.

The drive unit if force forward by inertia on the helical shaft once the starter motor is engaged and starts turning. After that the starter motor 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 example 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, therefore unwanted starter disengagement can be avoided prior to a successful engine start.