

Forklift Alternators and Starters

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. Once current from the starting battery is applied to the solenoid, basically via a key-operated switch, the solenoid engages a lever which pushes out the drive pinion that is positioned on the driveshaft and meshes the pinion using the starter ring gear which is found on the flywheel of the engine.

Once the starter motor starts to turn, the solenoid closes the high-current contacts. Once the engine has started, the solenoid has a key operated switch that opens the spring assembly so as 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 just a single direction. Drive is transmitted in this way through the pinion to the flywheel ring gear. The pinion continues to be engaged, for instance for the reason that the operator did not release the key once the engine starts or if the solenoid remains engaged because there is a short. This actually causes the pinion to spin separately of its driveshaft.

This aforementioned action prevents the engine from driving the starter. This is actually an important step since this particular type of back drive will allow the starter to spin very fast that it can fly apart. Unless modifications were done, the sprag clutch arrangement will prevent the use of the starter as a generator if it was utilized in the hybrid scheme discussed earlier. Normally an average starter motor is designed for intermittent utilization which would preclude it being used as a generator.

Hence, the electrical parts are designed to be able to work for more or less less than thirty seconds to be able to prevent overheating. The overheating results from very slow dissipation of heat because of ohmic losses. The electrical components are designed to save cost and weight. This is the reason the majority of owner's instruction manuals meant for automobiles suggest the operator to stop for at least 10 seconds after each 10 or 15 seconds of cranking the engine, when trying to start an engine that 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 operates by placing the starter drive pinion on a helically cut driveshaft. As soon as the starter motor starts spinning, the inertia of the drive pinion assembly allows it to ride forward on the helix, thus engaging with the ring gear. Once 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 thus out of mesh with the ring gear.

The development of Bendix drive was developed during the 1930's with the overrunning-clutch design referred to as the Bendix Folo-Thru drive, made and launched in the 1960s. The Folo-Thru drive consists of a latching mechanism along with a set of flyweights within the body of the drive unit. This was better as the average Bendix drive utilized so as to disengage from the ring when the engine fired, even if it did not stay functioning.

The drive unit is forced forward by inertia on the helical shaft once the starter motor is engaged and starts turning. Next 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 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, hence unwanted starter disengagement can be prevented previous to a successful engine start.