

Forklift Starters and Alternators

Forklift Starters and Alternators - Today's starter motor is normally a permanent-magnet composition or a series-parallel wound direct current electrical motor together with a starter solenoid installed on it. Once current from the starting battery is applied to the solenoid, mainly 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 with the starter ring gear which is seen on the engine flywheel.

The solenoid closes the high-current contacts for the starter motor, that starts to turn. When the engine starts, the key operated switch is opened and a spring in 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 just one direction. Drive is transmitted in this manner via the pinion to the flywheel ring gear. The pinion continuous to be engaged, like for instance because 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.

The actions mentioned above would stop the engine from driving the starter. This significant step stops the starter from spinning really fast that it would fly apart. Unless adjustments were made, the sprag clutch arrangement will preclude using the starter as a generator if it was used in the hybrid scheme discussed prior. Typically a regular starter motor is designed for intermittent use which would prevent it being utilized as a generator.

The electrical parts are made in order to work for about thirty seconds to stop overheating. Overheating is caused by a slow dissipation of heat is because of ohmic losses. The electrical parts are meant to save weight and cost. This is really the reason most owner's manuals meant for vehicles recommend the operator to stop for at least ten seconds after every ten or fifteen seconds of cranking the engine, when trying to start an engine which does not turn over immediately.

The overrunning-clutch pinion was introduced onto the market in the early 1960's. Previous to the 1960's, a Bendix drive was used. This drive system functions on a helically cut driveshaft which consists of a starter drive pinion placed on it. As soon as the starter motor begins 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 allows the pinion to exceed the rotating speed of the starter. At this instant, 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, developed and launched in the 1960s. The Folo-Thru drive has a latching mechanism together with a set of flyweights in the body of the drive unit. This was an improvement since the standard Bendix drive used so as to disengage from the ring as soon as the engine fired, even if it did not stay functioning.

Once the starter motor is engaged and starts turning, the drive unit is forced forward on the helical shaft by inertia. It then becomes latched into the engaged position. Once the drive unit is spun at a speed higher than what is achieved by the starter motor itself, for example it is backdriven by the running engine, and next the flyweights pull outward in a radial manner. This releases the latch and allows the overdriven drive unit to become spun out of engagement, thus unwanted starter disengagement can be avoided prior to a successful engine start.