

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 with a starter solenoid installed on it. Once 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 located on the driveshaft and meshes the pinion with the starter ring gear that is seen on the engine flywheel.

When 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 to pull 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 means of an overrunning clutch. This permits the pinion to transmit drive in just one direction. Drive is transmitted in this particular way through the pinion to the flywheel ring gear. The pinion remains engaged, like for example since the driver fails to release the key once 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 above mentioned action prevents the engine from driving the starter. This is actually an essential step in view of the fact that this particular kind of back drive will enable the starter to spin really fast that it can fly apart. Unless adjustments were made, the sprag clutch arrangement will prevent the use of the starter as a generator if it was utilized in the hybrid scheme mentioned earlier. Normally a standard starter motor is intended for intermittent use that would prevent it being utilized as a generator.

The electrical parts are made to be able to operate for about thirty seconds in order to avoid overheating. Overheating is caused by a slow dissipation of heat is due to ohmic losses. The electrical parts are meant to save cost and weight. This is the reason the majority of owner's handbooks intended for vehicles recommend the operator to stop for a minimum of ten seconds right after every ten or fifteen seconds of cranking the engine, when trying to start an engine that does not turn over right away.

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 utilized. 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 enables it to ride forward on the helix, thus engaging with the ring gear. As soon as 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 thus out of mesh with the ring gear.

The development of Bendix drive was made during the 1930's with the overrunning-clutch design called the Bendix Folo-Thru drive, developed and introduced during the 1960s. The Folo-Thru drive has a latching mechanism along with a set of flyweights in the body of the drive unit. This was much better since the average Bendix drive used to be able to disengage from the ring once the engine fired, though it did not stay functioning.

When 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. As soon as the drive unit is spun at a speed higher than what is attained by the starter motor itself, 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 allows the overdriven drive unit to become spun out of engagement, hence unwanted starter disengagement can be avoided before a successful engine start.