

Forklift Alternators and Starters

Forklift Starter and Alternator - A starter motors today is usually a permanent-magnet composition or a series-parallel wound direct current electrical motor along 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 which is situated on the driveshaft and meshes the pinion with the starter ring gear that is found on the engine flywheel.

When the starter motor starts to turn, the solenoid closes the high-current contacts. When the engine has started, the solenoid consists of 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 only one direction. Drive is transmitted in this particular method 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 as there is a short. This causes the pinion to spin independently of its driveshaft.

This aforesaid action stops the engine from driving the starter. This is an important step because this particular type of back drive would enable the starter to spin so fast that it could fly apart. Unless adjustments were done, the sprag clutch arrangement would stop the use of the starter as a generator if it was employed in the hybrid scheme mentioned earlier. Usually a standard starter motor is meant for intermittent utilization that would prevent it being used as a generator.

The electrical parts are made in order to work for about 30 seconds so as to avoid overheating. Overheating is caused by a slow dissipation of heat is due to ohmic losses. The electrical parts are designed to save cost and weight. This is the reason nearly all owner's manuals intended for vehicles recommend the operator to pause for a minimum of ten seconds after every 10 or 15 seconds of cranking the engine, when trying to start an engine which does not turn over right away.

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 functions by placing the starter drive pinion on a helically cut driveshaft. As soon as the starter motor starts turning, the inertia of the drive pinion assembly allows 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 exceed the rotating speed of the starter. At this instant, 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 in the 1930's with the overrunning-clutch design known as the Bendix Folo-Thru drive, developed and introduced in the 1960s. The Folo-Thru drive has a latching mechanism together with a set of flyweights inside the body of the drive unit. This was better as the standard Bendix drive utilized to be able to disengage from the ring as soon as the engine fired, although it did not stay running.

As soon as 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, 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, hence unwanted starter disengagement could be avoided before a successful engine start.