

Forklift Alternators and Starters

Forklift Alternators and Starters - The starter motor these days is usually either a series-parallel wound direct current electric motor which includes a starter solenoid, which is similar to a relay mounted on it, or it can be a permanent-magnet composition. When 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 using the starter ring gear which is seen on the engine flywheel.

The solenoid closes the high-current contacts for the starter motor, which starts to turn. After 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 a single direction. Drive is transmitted in this method through the pinion to the flywheel ring gear. The pinion remains engaged, like for instance as the driver fails to release the key when the engine starts or if there is a short and the solenoid remains engaged. This causes the pinion to spin separately of its driveshaft.

The actions discussed above would prevent the engine from driving the starter. This vital step prevents the starter from spinning really fast that it will fly apart. Unless modifications were done, the sprag clutch arrangement would stop the use of the starter as a generator if it was employed in the hybrid scheme discussed prior. Typically a regular starter motor is meant for intermittent use which would stop it being used as a generator.

Therefore, the electrical parts are designed to be able to work for approximately under thirty seconds to be able to avoid overheating. The overheating results from too slow dissipation of heat because of ohmic losses. The electrical components are designed to save cost and weight. This is truly the reason nearly all owner's manuals for vehicles recommend the driver 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 instantly.

During 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 functions by placing the starter drive pinion on a helically cut driveshaft. Once 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. As soon as the engine starts, the backdrive caused from the ring gear enables the pinion to surpass the rotating speed of the starter. At this point, the drive pinion is forced back down the helical shaft and hence out of mesh with the ring gear.

The development of Bendix drive was made in the 1930's with the overrunning-clutch design referred to as the Bendix Folo-Thru drive, developed and launched during the 1960s. The Folo-Thru drive has a latching mechanism along with a set of flyweights inside the body of the drive unit. This was much 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.

When the starter motor is engaged and begins 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 attained by the starter motor itself, for instance it is backdriven by the running engine, and next the flyweights pull outward in a radial manner. This releases the latch and permits the overdriven drive unit to become spun out of engagement, therefore unwanted starter disengagement could be prevented prior to a successful engine start.