

Forklift Alternators and Starters

Forklift Starters and Alternators - The starter motor these days is typically either a series-parallel wound direct current electric motor that includes a starter solenoid, which is similar to a relay mounted on it, or it could be a permanent-magnet composition. 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, 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 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 a single direction. Drive is transmitted in this way through the pinion to the flywheel ring gear. The pinion remains engaged, for example as the operator did not release the key as soon as the engine starts or if the solenoid remains engaged because there is a short. This causes the pinion to spin independently of its driveshaft.

The actions mentioned above would prevent the engine from driving the starter. This vital step prevents the starter from spinning very fast that it could fly apart. Unless modifications were made, the sprag clutch arrangement would stop utilizing the starter as a generator if it was made use of in the hybrid scheme mentioned earlier. Typically an average starter motor is intended for intermittent use which will prevent it being utilized as a generator.

Hence, the electrical components are intended to be able to operate for approximately under 30 seconds in order to prevent overheating. The overheating results from too slow dissipation of heat because of ohmic losses. The electrical parts are designed to save cost and weight. This is the reason nearly all owner's instruction manuals intended for vehicles recommend the driver to pause for at least ten seconds right after every 10 or 15 seconds of cranking the engine, whenever trying to start an engine that does not turn over immediately.

In the early 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Previous to that time, a Bendix drive was utilized. The Bendix system operates 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.

During the 1930s, an intermediate development between the Bendix drive was made. The overrunning-clutch design that was made and introduced in the 1960s was the Bendix Folo-Thru drive. The Folo-Thru drive has a latching mechanism together with a set of flyweights inside the body of the drive unit. This was an enhancement in view of the fact that the typical Bendix drive utilized to disengage from the ring when the engine fired, even if it did not stay running.

Once 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. 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 then 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 prior to a successful engine start.