

Forklift Starters and Alternators

Forklift Starter and Alternator - The starter motor nowadays is normally either a series-parallel wound direct current electric motor that includes a starter solenoid, that is similar to a relay mounted on it, or it can be a permanent-magnet composition. As soon as current from the starting battery is applied to the solenoid, mainly via a key-operated switch, the solenoid engages a lever that pushes out the drive pinion that is located on the driveshaft and meshes the pinion utilizing the starter ring gear that is seen on the engine flywheel.

The solenoid closes the high-current contacts for the starter motor, which begins to turn. After the engine starts, the key operated switch is opened and a spring within 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 means of an overrunning clutch. This allows the pinion to transmit drive in only one direction. Drive is transmitted in this way through the pinion to the flywheel ring gear. The pinion remains engaged, like for instance as the operator did not release the key as soon as the engine starts or if there is a short and the solenoid remains engaged. This causes the pinion to spin independently of its driveshaft.

The actions discussed above will stop the engine from driving the starter. This vital step prevents the starter from spinning so fast that it can fly apart. Unless modifications were made, the sprag clutch arrangement would preclude making use of the starter as a generator if it was employed in the hybrid scheme discussed earlier. Usually an average starter motor is meant for intermittent utilization that will stop it being utilized as a generator.

Thus, the electrical parts are intended to be able to work for about less than 30 seconds in order to prevent overheating. The overheating results from very slow dissipation of heat due to ohmic losses. The electrical components are designed to save cost and weight. This is actually the reason the majority of owner's guidebooks meant for automobiles suggest the operator to stop for at least ten seconds right after each and every ten or fifteen seconds of cranking the engine, when trying to start an engine which 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 used. The Bendix system works by placing the starter drive pinion on a helically cut driveshaft. When 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 allows the pinion to exceed the rotating speed of the starter. At this point, the drive pinion is forced back down the helical shaft and thus out of mesh with the ring gear.

During the 1930s, an intermediate development between the Bendix drive was developed. The overrunning-clutch design that was developed and introduced during the 1960s was the Bendix Folo-Thru drive. The Folo-Thru drive consists of a latching mechanism together with a set of flyweights within the body of the drive unit. This was better for the reason that the typical Bendix drive used to be able to disengage from the ring when the engine fired, though it did not stay running.

The drive unit is forced forward by inertia on the helical shaft as soon as the starter motor is engaged and starts turning. After that the starter motor becomes latched into the engaged position. When the drive unit is spun at a speed higher than what is achieved by the starter motor itself, like for instance it is backdriven by the running engine, and afterward the flyweights pull outward in a radial manner. This releases the latch and permits the overdriven drive unit to become spun out of engagement, thus unwanted starter disengagement can be prevented before a successful engine start.