

Forklift Starters and Alternators

Forklift Alternators and Starters - The starter motor of today is usually either a series-parallel wound direct current electric motor that has 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 that pushes out the drive pinion which is positioned on the driveshaft and meshes the pinion with the starter ring gear which is found on the flywheel of the engine.

The solenoid closes the high-current contacts for the starter motor, which begins to turn. When 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 particular action causes the starter motor to stop. The starter's pinion is clutched to its driveshaft by an overrunning clutch. This allows the pinion to transmit drive in just a single direction. Drive is transmitted in this particular method through the pinion to the flywheel ring gear. The pinion continuous to be engaged, like for instance for the reason that the operator did not 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 independently of its driveshaft.

This aforesaid action stops the engine from driving the starter. This is actually an essential step since this particular kind of back drive will enable the starter to spin so fast that it will fly apart. Unless modifications were made, the sprag clutch arrangement will stop using the starter as a generator if it was used in the hybrid scheme discussed prior. Normally a regular starter motor is intended for intermittent use which would preclude it being used as a generator.

Thus, the electrical parts are intended to be able to work for more or less under 30 seconds in order to avoid overheating. The overheating results from very slow dissipation of heat due to ohmic losses. The electrical parts are designed to save cost and weight. This is truly the reason most owner's guidebooks intended for vehicles recommend the driver to stop for at least 10 seconds right after each 10 or 15 seconds of cranking the engine, whenever trying to start an engine that does not turn over immediately.

In 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 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. When the engine starts, the backdrive caused from the ring gear allows the pinion to surpass 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.

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 consists of a latching mechanism along with a set of flyweights within the body of the drive unit. This was better since the typical Bendix drive utilized to disengage from the ring when the engine fired, even if it did not stay functioning.

The drive unit if force forward by inertia on the helical shaft once the starter motor is engaged and begins turning. After that the starter motor 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, 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 permits the overdriven drive unit to become spun out of engagement, thus unwanted starter disengagement can be prevented prior to a successful engine start.