

Forklift Starters and Alternators

Forklift Starter and Alternator - The starter motor nowadays 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 could be a permanent-magnet composition. When 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 which is found on the engine flywheel.

The solenoid closes the high-current contacts for the starter motor, that starts to turn. When the engine starts, the key operated switch is opened and a spring inside 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 permits the pinion to transmit drive in only one direction. Drive is transmitted in this particular method through the pinion to the flywheel ring gear. The pinion continuous to be engaged, like for example as the operator fails to release the key once the engine starts or if the solenoid remains engaged because there is a short. This causes the pinion to spin independently of its driveshaft.

This aforementioned action stops the engine from driving the starter. This is an important step as this type of back drive will enable the starter to spin very 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 used in the hybrid scheme discussed earlier. Usually a standard starter motor is meant for intermittent use that will preclude it being used as a generator.

Hence, the electrical parts are meant to be able to operate for more or less less than thirty seconds to prevent overheating. The overheating results from too slow dissipation of heat due to ohmic losses. The electrical parts are intended to save weight and cost. This is the reason most owner's handbooks intended for vehicles recommend the driver to pause for at least ten seconds after each and every 10 or 15 seconds of cranking the engine, whenever trying to start an engine which does not turn over at once.

During the early 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Before that time, a Bendix drive was utilized. The Bendix system works by placing the starter drive pinion on a helically cut driveshaft. Once the starter motor begins 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 enables the pinion to surpass 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 developed during the 1930's with the overrunning-clutch design called the Bendix Folo-Thru drive, developed and introduced in the 1960s. The Folo-Thru drive consists of a latching mechanism along with a set of flyweights inside the body of the drive unit. This was a lot better since the standard Bendix drive utilized in order to disengage from the ring when the engine fired, even though it did not stay functioning.

When 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. When the drive unit is spun at a speed higher than what is attained by the starter motor itself, like for instance it is backdriven by the running engine, and after that the flyweights pull outward in a radial manner. This releases the latch and enables the overdriven drive unit to become spun out of engagement, thus unwanted starter disengagement could be avoided before a successful engine start.