

Forklift Starters and Alternators

Forklift Starters and Alternators - A starter motor today is normally a permanent-magnet composition or a series-parallel wound direct current electrical motor with a starter solenoid installed on it. When current from the starting battery is applied to the solenoid, mainly through a key-operated switch, the solenoid engages a lever which pushes out the drive pinion that is situated on the driveshaft and meshes the pinion utilizing the starter ring gear which is found on the flywheel of the engine.

The solenoid closes the high-current contacts for the starter motor, that 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 particular 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 particular method through the pinion to the flywheel ring gear. The pinion continues to be engaged, like for example since the driver did not release the key once the engine starts or if the solenoid remains engaged because there is a short. This actually causes the pinion to spin independently of its driveshaft.

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

The electrical components are made to function for around 30 seconds to stop overheating. Overheating is caused by a slow dissipation of heat is due to ohmic losses. The electrical parts are meant to save weight and cost. This is really the reason most owner's instruction manuals for vehicles suggest the driver 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 at once.

During the early part of the 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. Once the starter motor starts turning, the inertia of the drive pinion assembly enables it to ride forward on the helix, therefore engaging with the ring gear. Once the engine starts, the backdrive caused from the ring gear enables the pinion to exceed the rotating speed of the starter. At this moment, the drive pinion is forced back down the helical shaft and therefore out of mesh with the ring gear.

During the 1930s, an intermediate development between the Bendix drive was developed. The overrunning-clutch design which was developed and introduced in the 1960s was the Bendix Folo-Thru drive. The Folo-Thru drive has a latching mechanism along with a set of flyweights in the body of the drive unit. This was an improvement because the typical Bendix drive used in order to disengage from the ring once the engine fired, although 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. Next 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, for example it is backdriven by the running engine, and then the flyweights pull outward in a radial manner. This releases the latch and allows the overdriven drive unit to become spun out of engagement, hence unwanted starter disengagement can be avoided prior to a successful engine start.