

Starter for Forklifts

Forklift Starter - A starter motors today is usually a permanent-magnet composition or a series-parallel wound direct current electrical motor along 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 using the starter ring gear that is found on the flywheel of the engine.

The solenoid closes the high-current contacts for the starter motor, that begins to turn. When 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 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 just one direction. Drive is transmitted in this manner via the pinion to the flywheel ring gear. The pinion remains engaged, for instance because the driver did not release the key as soon as the engine starts or if the solenoid remains engaged in view of the fact that there is a short. This actually causes the pinion to spin independently of its driveshaft.

This above mentioned action stops the engine from driving the starter. This is actually an important step since this kind of back drive will allow the starter to spin so fast that it would fly apart. Unless modifications were done, the sprag clutch arrangement would prevent utilizing the starter as a generator if it was made use of 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.

Hence, the electrical components are designed to be able to function for approximately under 30 seconds to avoid overheating. The overheating results from very slow dissipation of heat due to ohmic losses. The electrical parts are meant to save cost and weight. This is really the reason nearly all owner's manuals for vehicles suggest the operator to stop for at least 10 seconds right after every ten or fifteen seconds of cranking the engine, whenever trying to start an engine that does not turn over right away.

In the early part of the 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Prior to that time, a Bendix drive was utilized. The Bendix system operates by placing the starter drive pinion on a helically cut driveshaft. As soon as 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. When 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 therefore 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 launched 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 much better since the average Bendix drive used in order to disengage from the ring once the engine fired, even if it did not stay running.

The drive unit is force forward by inertia on the helical shaft as soon as the starter motor is engaged and starts turning. Then the starter motor becomes latched into the engaged position. As soon as the drive unit is spun at a speed higher than what is achieved by the starter motor itself, like for example it is backdriven by the running engine, and after that the flyweights pull outward in a radial manner. This releases the latch and permits the overdriven drive unit to become spun out of engagement, hence unwanted starter disengagement could be avoided before a successful engine start.