Starter for Forklifts

Forklift Starter - A starter motors today is normally a permanent-magnet composition or a series-parallel wound direct current electrical motor together with a starter solenoid installed on it. 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 which is situated on the driveshaft and meshes the pinion with the starter ring gear that 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 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 just a single direction. Drive is transmitted in this way through the pinion to the flywheel ring gear. The pinion remains engaged, like for example since the driver fails to release the key when the engine starts or if the solenoid remains engaged as there is a short. This actually causes the pinion to spin independently of its driveshaft.

This aforesaid action stops the engine from driving the starter. This is an essential step in view of the fact that this particular type of back drive would enable the starter to spin very fast that it will fly apart. Unless modifications were done, the sprag clutch arrangement will prevent using the starter as a generator if it was used in the hybrid scheme discussed prior. Normally a regular starter motor is designed for intermittent utilization that will stop it being used as a generator.

Therefore, the electrical components are intended to operate for about under thirty seconds to be able to avoid overheating. The overheating results from too slow dissipation of heat due to ohmic losses. The electrical components are intended to save weight and cost. This is the reason the majority of owner's instruction manuals for vehicles suggest the operator to stop for a minimum of 10 seconds after every 10 or 15 seconds of cranking the engine, if trying to start an engine which does not turn over instantly.

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 operates by placing the starter drive pinion on a helically cut driveshaft. Once the starter motor starts turning, the inertia of the drive pinion assembly allows it to ride forward on the helix, hence engaging with the ring gear. When the engine starts, the backdrive caused from the ring gear allows the pinion to exceed the rotating speed of the starter. At this instant, the drive pinion is forced back down the helical shaft and therefore out of mesh with the ring gear.

In the 1930s, an intermediate development between the Bendix drive was developed. The overrunning-clutch design which was made and introduced during the 1960s was the Bendix Folo-Thru drive. The Folo-Thru drive has a latching mechanism together with a set of flyweights inside the body of the drive unit. This was an enhancement because the standard Bendix drive utilized in order to disengage from the ring when the engine fired, even though it did not stay running.

Once the starter motor is engaged and begins turning, the drive unit is forced forward on the helical shaft by inertia. It then 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 after that the flyweights pull outward in a radial manner. This releases the latch and allows the overdriven drive unit to become spun out of engagement, thus unwanted starter disengagement can be prevented previous to a successful engine start.