Starters for Forklifts

Forklift Starters - Today's starter motor is usually a permanent-magnet composition or a series-parallel wound direct current electrical motor with a starter solenoid installed on it. Once current from the starting battery is applied to the solenoid, basically through 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 utilizing the starter ring gear which is seen 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 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 an overrunning clutch. This permits the pinion to transmit drive in just a single direction. Drive is transmitted in this manner through the pinion to the flywheel ring gear. The pinion remains engaged, for instance as the driver fails to 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 separately of its driveshaft.

The actions mentioned above will prevent the engine from driving the starter. This significant step prevents the starter from spinning really fast that it will fly apart. Unless modifications were made, the sprag clutch arrangement will prevent the use of the starter as a generator if it was used in the hybrid scheme mentioned prior. Usually a regular starter motor is designed for intermittent use that will stop it being used as a generator.

Therefore, the electrical parts are designed to be able to function for more or less under 30 seconds in order to prevent overheating. The overheating results from very slow dissipation of heat due to ohmic losses. The electrical components are intended to save cost and weight. This is the reason the majority of owner's handbooks for automobiles recommend the driver to pause for at least 10 seconds after each ten or fifteen seconds of cranking the engine, whenever trying to start an engine that does not turn over at once.

During the early 1960s, this overrunning-clutch pinion arrangement was phased onto the market. Prior 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 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 allows the pinion to exceed the rotating speed of the starter. At this moment, the drive pinion is forced back down the helical shaft and hence 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 has a latching mechanism together with a set of flyweights in the body of the drive unit. This was a lot better as the standard Bendix drive used in order to disengage from the ring once the engine fired, even though it did not stay functioning.

The drive unit if force forward by inertia on the helical shaft as soon as the starter motor is engaged and begins turning. Afterward the starter motor becomes latched into the engaged position. Once the drive unit is spun at a speed higher than what is achieved 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 enables the overdriven drive unit to become spun out of engagement, thus unwanted starter disengagement can be avoided before a successful engine start.