

Starters for Forklifts

Forklift Starters - Today's starter motor is normally a permanent-magnet composition or a series-parallel wound direct current electrical motor together with a starter solenoid mounted on it. As soon as 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 that is located on the driveshaft and meshes the pinion with the starter ring gear that is seen on the engine flywheel.

The solenoid closes the high-current contacts for the starter motor, which starts to turn. Once 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 an overrunning clutch. This allows the pinion to transmit drive in only one direction. Drive is transmitted in this method via the pinion to the flywheel ring gear. The pinion remains engaged, like for example in view of the fact that the driver fails to release the key once the engine starts or if there is a short and the solenoid remains engaged. This causes the pinion to spin separately of its driveshaft.

The actions mentioned above would prevent the engine from driving the starter. This significant step prevents the starter from spinning so fast that it could fly apart. Unless adjustments were made, the sprag clutch arrangement would preclude making use of the starter as a generator if it was utilized in the hybrid scheme discussed prior. Typically an average starter motor is intended for intermittent use which will prevent it being utilized as a generator.

Thus, the electrical parts are meant to be able to operate for around less than 30 seconds in order to prevent overheating. The overheating results from too slow dissipation of heat due to ohmic losses. The electrical components are meant to save cost and weight. This is the reason nearly all owner's manuals used for automobiles suggest the operator to stop for at least 10 seconds after every ten or fifteen seconds of cranking the engine, if trying to start an engine which does not turn over instantly.

The overrunning-clutch pinion was launched onto the market during the early 1960's. Before the 1960's, a Bendix drive was used. This particular drive system works on a helically cut driveshaft which has a starter drive pinion placed on it. When the starter motor starts turning, the inertia of the drive pinion assembly allows it to ride forward on the helix, therefore engaging with the ring gear. When the engine starts, the backdrive caused from the ring gear enables the pinion to go beyond 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 made in the 1930's with the overrunning-clutch design referred to as the Bendix Folo-Thru drive, developed and launched in 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 because the average Bendix drive utilized so as to disengage from the ring as soon as the engine fired, even if it did not stay running.

The drive unit is forced forward by inertia on the helical shaft once 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 attained by the starter motor itself, 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 enables the overdriven drive unit to become spun out of engagement, therefore unwanted starter disengagement can be avoided prior to a successful engine start.