

Forklift Starter and Alternator

Forklift Starter and Alternator - A starter motor today is typically a permanent-magnet composition or a series-parallel wound direct current electrical motor together with a starter solenoid installed on it. When 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 using the starter ring gear that is seen on the engine flywheel.

When the starter motor starts to turn, the solenoid closes the high-current contacts. As soon as the engine has started, the solenoid has a key operated switch which opens the spring assembly in order to pull 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 a single direction. Drive is transmitted in this particular way through the pinion to the flywheel ring gear. The pinion remains engaged, like for example because the operator did not release the key as soon as the engine starts or if there is a short and the solenoid remains engaged. This actually causes the pinion to spin independently of its driveshaft.

The actions discussed above will stop the engine from driving the starter. This important step stops the starter from spinning really fast that it can fly apart. Unless modifications were made, the sprag clutch arrangement would prevent making use of the starter as a generator if it was utilized in the hybrid scheme mentioned earlier. Normally a regular starter motor is designed for intermittent utilization which will prevent it being utilized as a generator.

The electrical components are made to be able to function for approximately 30 seconds in order to avoid overheating. Overheating is caused by a slow dissipation of heat is due to ohmic losses. The electrical components are designed to save weight and cost. This is actually the reason most owner's handbooks used for vehicles suggest the operator to pause for a minimum of 10 seconds right after each ten or fifteen seconds of cranking the engine, when trying to start an engine which does not turn over at once.

The overrunning-clutch pinion was launched onto the market in the early 1960's. Previous to the 1960's, a Bendix drive was used. This particular drive system operates on a helically cut driveshaft which has a starter drive pinion placed on it. When the starter motor begins 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 exceed the rotating speed of the starter. At this instant, 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 developed during the 1930's with the overrunning-clutch design known as the Bendix Folo-Thru drive, made and introduced during the 1960s. The Folo-Thru drive consists of a latching mechanism along with a set of flyweights inside the body of the drive unit. This was much better because the standard Bendix drive used to disengage from the ring as soon as the engine fired, even though it did not stay functioning.

Once the starter motor is engaged and starts turning, the drive unit is forced forward on the helical shaft by inertia. It then becomes latched into the engaged position. When 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 permits the overdriven drive unit to become spun out of engagement, thus unwanted starter disengagement could be avoided prior to a successful engine start.