

Forklift Starter and Alternator

Forklift Alternators and Starters - 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 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 utilizing the starter ring gear which is found on the flywheel of the engine.

The solenoid closes the high-current contacts for the starter motor, that starts to turn. Once the engine starts, the key operated switch is opened and a spring inside 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 particular way through the pinion to the flywheel ring gear. The pinion remains engaged, like for example because the operator fails to release the key once the engine starts or if the solenoid remains engaged as there is a short. This actually causes the pinion to spin separately of its driveshaft.

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

The electrical parts are made to operate for more or less thirty seconds in order to prevent overheating. Overheating is caused by a slow dissipation of heat due to ohmic losses. The electrical parts are intended to save weight and cost. This is the reason nearly all owner's manuals for vehicles recommend the driver to stop for a minimum of 10 seconds right after each 10 or 15 seconds of cranking the engine, whenever trying to start an engine that does not turn over right away.

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 works 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, therefore engaging with the ring gear. Once the engine starts, the backdrive caused from the ring gear allows the pinion to exceed the rotating speed of the starter. At this point, the drive pinion is forced back down the helical shaft and hence out of mesh with the ring gear.

In the 1930s, an intermediate development between the Bendix drive was developed. The overrunning-clutch design that was developed and introduced during the 1960s was the Bendix Folo-Thru drive. The Folo-Thru drive has a latching mechanism along with a set of flyweights in the body of the drive unit. This was better for the reason that the typical Bendix drive used in order to disengage from the ring when the engine fired, although 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. As soon as 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 could be prevented before a successful engine start.