



Fig. 8-17. *Aircraft starter motor.*

windings around the magnet and the brushes to the armature windings. In both cases, it then goes to ground. The simultaneous current flow through armature and field windings results in a strong magnetic field, which makes the armature turn.

The armature is connected to a drive system, which engages and disengages the motor to the engine flywheel. If you think about how a bicycle works, you will understand why a gear reduction is placed between the starter motor and the flywheel. Without gear reduction, the little motor would have difficulty turning the large, high-compression engine fast enough to get it started.

Starter Drive Mechanisms

The two principle types of drive units are the Bendix drive and the overrunning clutch. The Bendix unit operates by a combination of screw action and inertia. While there is some variation between systems, essentially what happens is the starting motor is engaged, which causes the armature and its pinion gear to rotate. The screw action forces the pinion gear forward and it meshes with the engine's flywheel ring gear. After the engine starts, the flywheel begins to turn faster than the armature, so the pinion gear accelerates and is threaded back along a specially designed shaft, out of mesh with the flywheel.

The pinion gear of the overrunning clutch usually is shifted manually, such as with the old Cessna 150 T-handle; however, on some models it is controlled by a solenoid. As