

**Disassembly**

1. Detach connector strap from solenoid switch. Remove end cap and lift up brushes
2. Clamp armature shaft at the drive pinion in a vise (use soft jaws) and remove nut at the commutator end of the starter



Fig. 29

3. Remove nuts of intermediate bracket hook studs and pull out intermediate bracket with armature. Note arrangement of plates, washers and shims

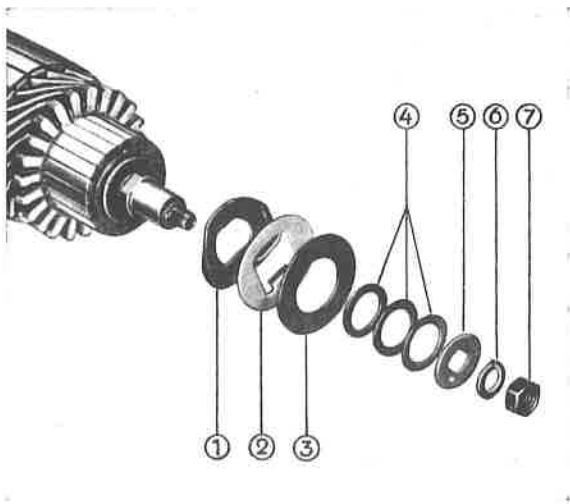


Fig. 30

- |                           |           |
|---------------------------|-----------|
| ① Spring washer           | } inside  |
| ② Drive washer            |           |
| ③ Thrust washer           |           |
| ④ Thrust washer and shims | } outside |
| ⑤ Drive washer            |           |
| ⑥ Lock washer             |           |
| ⑦ Nut                     |           |

4. Place armature in a vise with the commutator end pointing downwards and drive back pinion stop ring by means of a hollow punch



Fig. 31

5. Remove circlip by opening fully so as not to damage shaft surface and pull off stop ring. Remove burr which might have developed at circlip groove

6. Withdraw armature from intermediate bracket and remove drive pinion

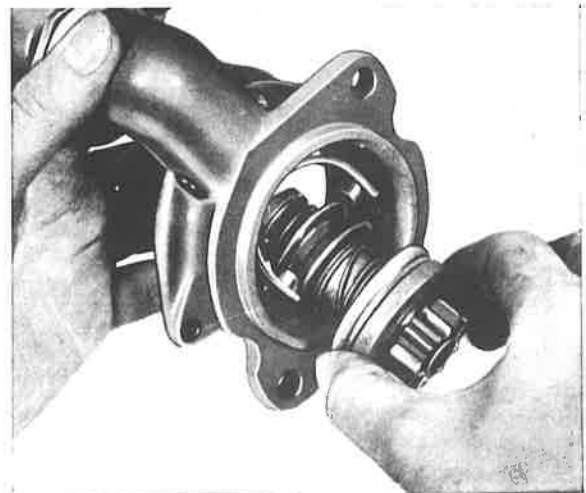


Fig. 32

**Assembly**

The components are cleaned with lint-free rag and compressed air. Never use solvent or fuel to clean the overrunning clutch. The bushing of the commutator bearing is only cleaned as far as it is accessible.

When assembling the starter proceed in reverse order, observing the following points:—

1. When replacing bushing in collector bearing, the new bushing (oilite) must be placed in a hot oil bath for a half hour prior to assembly
2. Bearing points, armature brake, helical spline, actuating lever and pinion should be greased with special purpose grease (high tenacity)
3. The stop ring must be secured in position after installation of circlip by means of a punch. Always use new circlip

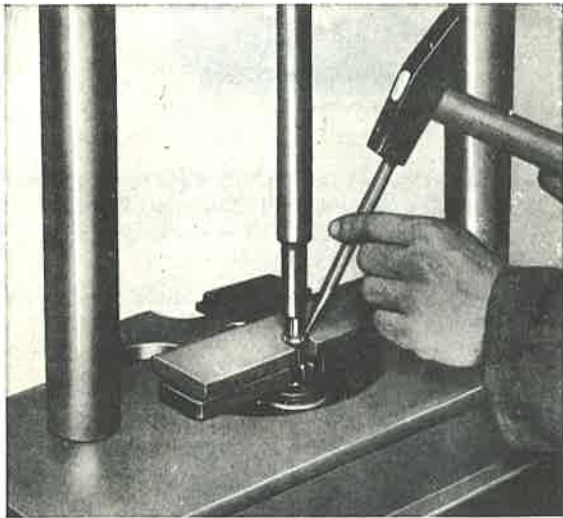


Fig. 33

4. Braking torque is tested with torque scale attached to the pinion, turning in direction of normal rotation. The torque should be .04—.08 Lb/in. (2,5—5cmkg) and is adjustable by fitting shims as shown on page 35 ④. The free running torque should be .01—.017 Lb/in. (0,6—1,0 cmkg) and the elastic end play of armature .004"—.012" (0,1—0,3 mm)
5. Do not forget to fit end cap rubber gasket
6. To avoid starting trouble caused by water entering the starter, the following points should be sealed with sealing compound:—

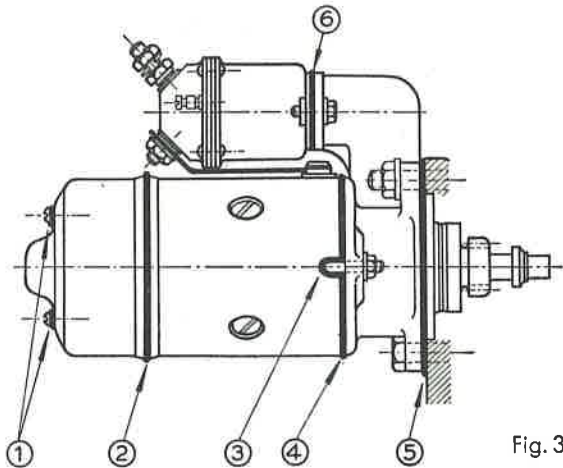


Fig. 34

- ① Holes for slotted screws in end cap
- ② Rubber seal between housing and end cap
- ③ Holes in housing for hook studs of intermediate bracket
- ④ Joint faces between housing and intermediate bracket
- ⑤ Joint faces between transmission housing and intermediate bracket
- ⑥ Joint faces between solenoid switch and intermediate bracket

## Testing Armature

16 Li

In many cases the armature does not give visible evidence of damage. The armature is tested for open circuits, short circuits and internal ground.

### Test

1. Open circuits in the armature are usually readily apparent, since this condition causes burned spots between adjacent commutator segments due to

brush deposits bridging the segments across the insulation. Check soldered commutator riserbar connections

2. The armature is tested for short circuits on the growler: Place the armature on the growler and slowly revolve it while holding a thin steel strip or hacksaw blade on the armature core. Short circuits in the armature cause the steel strip or hacksaw blade to vibrate against the core when it is held above the slot containing the shorted winding