

12. Remove the steel ball from the starter drive. If necessary, use a magnet to draw the steel ball out of the starter drive.



b330744 12

13. Remove the O-ring from the groove inside the starter drive housing.



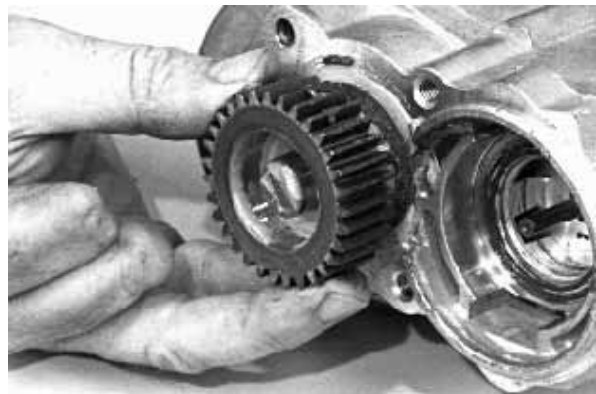
b330701 13

14. Remove the spring.



b330702 14

15. Remove the idler gear.



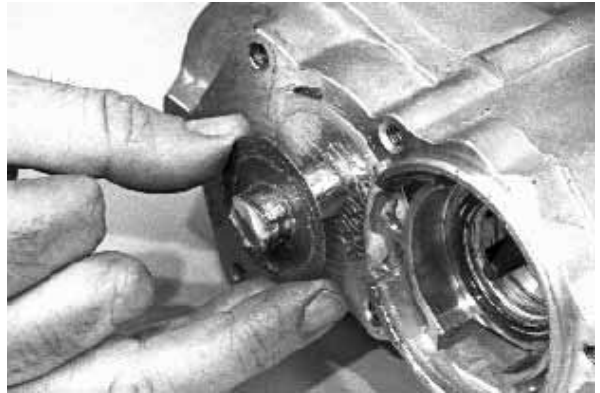
b330703 15

16. Remove the bearing cage.



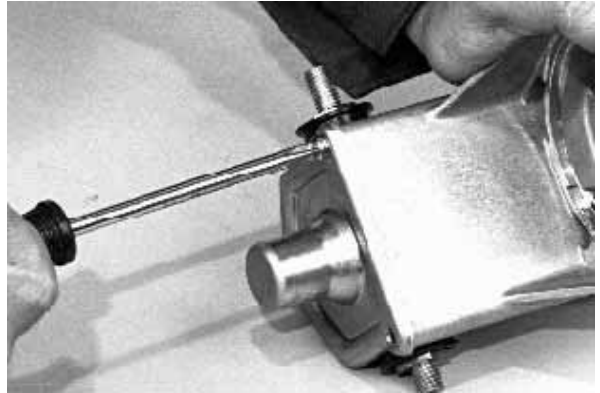
b330704 16

17. Remove the thrust washer.



b330705 17

18. Loosen and remove the screws that mount the cover.



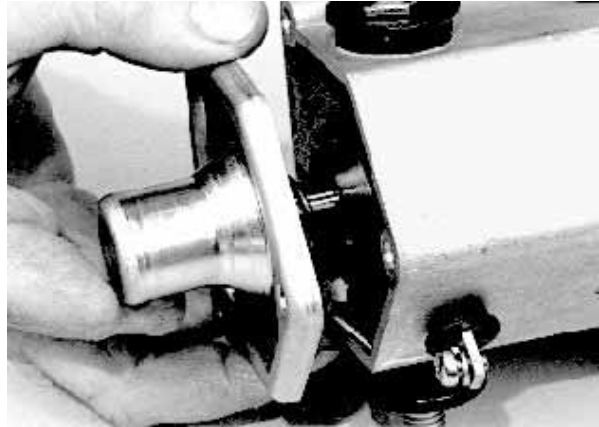
b330706 18

19. If necessary, loosen the cover with a hammer.



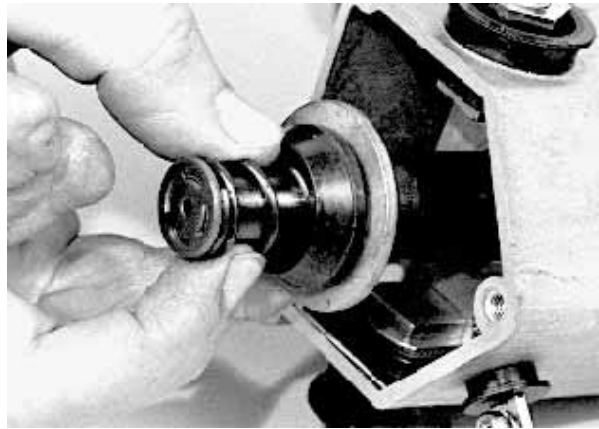
b330707 19

20. Remove the cover.



b330708 20

21. Remove the plunger.



b330709 21

22. Inspect the gasket. Remove and replace the gasket if the gasket is worn or needs repair.



b330710 22

**Next operation:**

**Engine starter - Visual inspection (B.80.A) or Engine starter - Electrical test (B.80.A)**

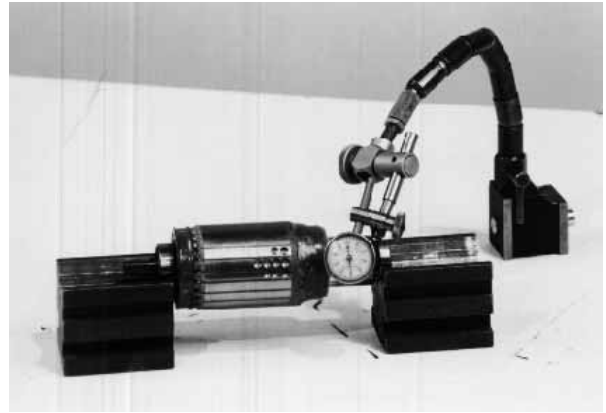
## Engine starter - Visual inspection

### Prior operation:

### Engine starter - Disassemble (B.80.A) or Engine starter - Electrical test (B.80.A)

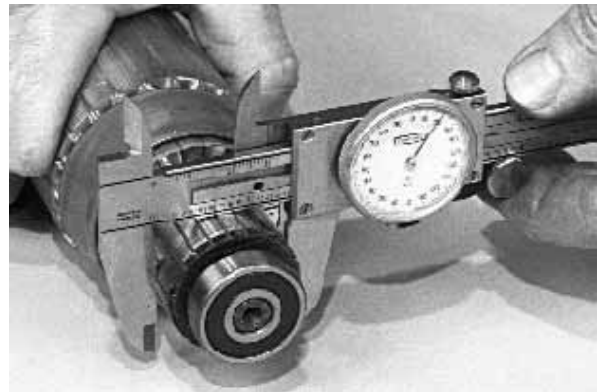
**NOTE:** All parts except the starter drive, must be cleaned using mineral spirits with a clean, dry cloth or brush.

1. If the length of a brush that is attached to the brush holder is less than **11 mm (7/16 in)**, replace with a new brush assembly.
2. If the length of a brush that is attached to the field coil is less than **11 mm (7/16 in)**, replace with a new field frame assembly.
3. Use a spring scale to check the tension of the brush springs. Pull the brush spring up until the brush spring is just above the brush holder. The scale indication must be between **1.8 - 4.1 kg (4 - 9 lb)**. If a brush spring tension is not as specified, replace with a new brush spring.
4. Test the armature on an armature tester. Follow the equipment manufacturer's instructions.
5. Place the armature on vee-blocks. Check the runout of the armature with a dial indicator. The runout must not be more than **0.05 mm (.002 in)**.



b834918 1

6. If the runout is more than **0.05 mm (.002 in)**, use a lathe to remove enough material for the runout to be less than specified.
7. Measure the diameter of the commutator. The diameter must not be less than **35 mm (1.377 in)**. If the diameter is less than specified, replace with a new armature.



b313141 2

8. If the depth of the groove between the commutator bars is less than **0.2 mm (.008 in)**, cut the insulation between the commutator bars to a depth of **0.4 - 0.8 mm (1/64 - 1/32 in)**. Use sandpaper to remove the rough edges from the commutator bars.

9. Check the bearings on the armature for free rotation, rough balls, and damage to the inner race or outer race. If a bearing is to be replaced, use a press and acceptable tools to remove and install the bearings.

**Next operation:**

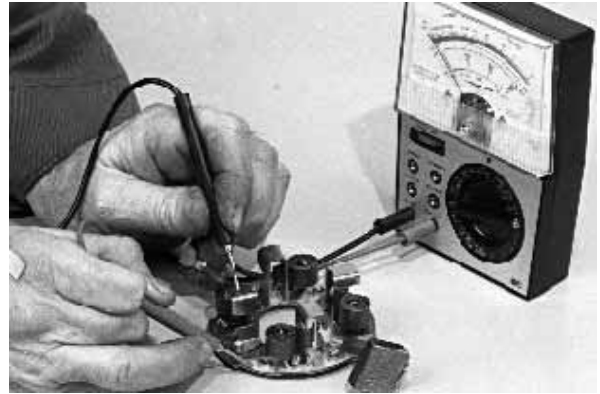
**Engine starter - Electrical test (B.80.A) or Engine starter - Assemble (B.80.A)**

## Engine starter - Electrical test

### Prior operation:

#### Engine starter - Disassemble (B.80.A)

1. To test the brush holders, hold the leads of an ohmmeter against the frame and the brush holders that have insulation between them and the frame.
2. The needle of the ohmmeter must not move when touching the brush holders and the frame. If the needle moves, replace with a new brush holder.



b313142 1

3. To test the field coil, hold one of the leads of an ohmmeter against the field frame. Hold the other lead of the ohmmeter against one of the brushes. Look at the ohmmeter, the needle must not move. Move the lead that is on the brush to the other brush. Look at the ohmmeter, the needle must not move. If the needle of the ohmmeter moves, replace with a new field frame assembly.



b610614 2

4. Hold one of the leads of an ohmmeter against the end of the cable. Hold the other lead of the ohmmeter against one of the brushes. Look at the ohmmeter, the needle must move. Move the lead that is on the brush to the other brush. Look at the ohmmeter, the needle must move. If the needle of the ohmmeter does not move, replace with a new field frame assembly.



b610616 3

### Next operation:

#### Engine starter - Assemble (B.80.A) or Engine starter - Visual inspection (B.80.A)