

# Disassembly and Reassembly of Generator

Job No.

15-13

## I. Models 180, 180 a, 180 b, 180 D, 180 Db, 190 D, 190 Db, 190 SL, 220 a, 219, and 220 S

Disassembly and reassembly of the generator are essentially the same as in the case of Model 190.

## II. Model 220 SE

### Disassembly:

1. Unscrew the nut  $M 16 \times 1$  on the armature shaft. Remove the lock washer together with the pulley, paying attention to the Woodruff key.
2. Insert a suitable screw driver under the carbon brush below the connecting wire and carefully push the brush upward until it engages in the gap between the brush holder (Fig. 15-13/1) and the armature housing. In this position the brush spring presses the carbon brush into an oblique position.

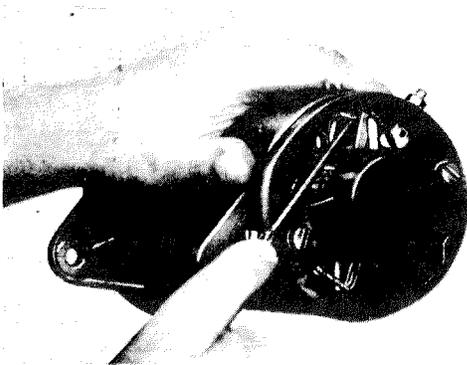


Fig. 15-13/1

3. Unscrew the through screws (armature housing screws) for the bearing caps.
4. Take the drive bearing with the armature out of the armature housing. The ball bearing on the collector side is taken out of the housing at the same time.

**Note:** The cap on the drive side is held in position in the housing by means of a nose, a groove, and a bore.

5. Remove the collector bearing cap from the armature housing, paying attention to the corrugated washer in the ball bearing seat of the collector bearing.
6. Fix the armature in a vise or in a clamping support, using special jaws.
7. Unscrew the three countersunk screws in the drive bearing after having removed the lacquer by means of a scriber.
8. Remove the drive bearing cap.
9. If the ball bearings have to be replaced, use a suitable puller to pull the ball bearings off the armature shaft, paying attention to the splash disk, the cover disk, and the spacer ring (Fig. 15-13/2).

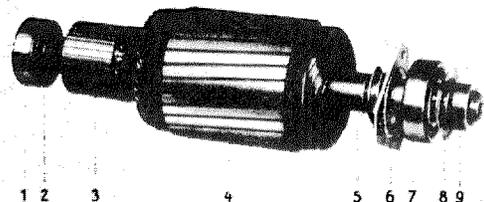


Fig. 15-13/2

- |                           |                           |
|---------------------------|---------------------------|
| 1 Annular grooved bearing | 6 Cover disk              |
| 2 Splash disk             | 7 Annular grooved bearing |
| 3 Collector               | 8 Splash disk             |
| 4 Armature                | 9 Spacer ring             |
| 5 Splash disk             |                           |

### Checking:

10. Check the collector. The surface must be uniformly smooth, grey-black in color, and free from dust, oil, and grease. Dirty segments must be cleaned with a clean, gasoline-soaked rag and well dried.

**Note:** There must be no charred spots on the collector.

11. Check the collector for signs of eccentricity. Eccentric or scored collectors should be lightly turned-off. Under no circumstances must emery cloth or a file be used. When turning, do not remove more material from the collector than is absolutely necessary to obtain a perfectly smooth surface.

The minimum permissible diameter of the collector is 35.5 mm. After turning-off, the segments must be sawn out with a collector saw (e. g. Bosch EFAW 10) appr. 0.5–0.8 mm. After this, the collector must once more be turned-off with a stock removal of 0.1 mm. Do not use the same turning tool for rough-turning and finish-turning and only use carbide-tipped tools (Widia). The maximum permissible run-out of the

collector is 0.03 mm and of the armature core laminations 0.05 mm.

Check the bindings of the armature winding. The winding head diameters must not be greater than the diameter of the armature; the bindings must be in perfect condition.

12. Check the armature and the field coil for short-circuit in windings and short-circuit to ground (see Job No. 15–5).

**Note:** This check is made in the same way as in the case of the starter.

13. Remove any dirt and oil from the carbon brushes with a clean rag. Badly worn carbon brushes must be replaced.
14. Check the pressure springs for the carbon brushes and if necessary replace them. The brush pressure should be  $900 \pm 50$  g.

**Note:** Because of the new brush holder arrangement in this generator, the brush pressure cannot be checked in the usual way.

The check should be carried out as follows:

#### Measurement by means of Contact Pressure Gage

- a) Slightly lift the pressure spring with a screwdriver and insert the tongue of the contact pressure gage between carbon brush and spring (Fig. 15–13/3).
- b) Move the contact pressure gage upward against the pressure spring until the spring begins to lift from the brush.
- c) Read off the contact pressure.

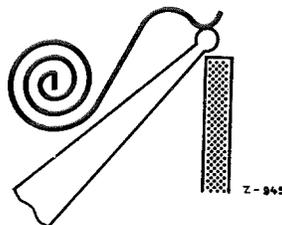
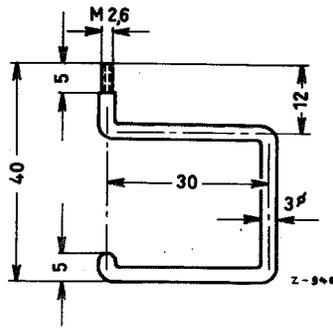


Fig. 15-13/3

Measuring brush pressure with contact pressure gage

#### Measurement by means of Spring Scale EF 12 44 B

To do this, make a new frame for the spring scale as shown in Fig. 15-13/4.



Free length appr. 103 mm

Fig. 15-13/4

Frame for Spring Scale EF 12 44 B

The frame of the spring scale is applied to the center of the spring (see arrow in Fig. 15-13/5) and the spring scale is operated until the spring begins to lift from the carbon brush. For the correct brush pressure of  $900 \pm 50$  g the indicated value should be 1400–1600 g.



Fig. 15-13/5

Point of attack of spring scale on brush spring

**Reassembly:**

15. Reassembly is the reverse of the disassembly procedure. When reassembling, grease the ball bearings with Bosch Grease Ft v 22 (blue).

**Note:** The drive-side ball bearing is fitted to the shaft with a sliding fit and can be moved on the shaft by hand.

16. After reassembly, the generator must be checked with its appropriate regulator on the test stand (see Job No. 15-16).