Removal:

1. Remove starter (see Job No. 15–1).

Disassembly:

2. Remove end cap (2) after unscrewing the two fixing screws (Figure 15–4/1).

3. Lift the carbon brushes off the commutator and support them with the brush springs.

4. Disconnect at solenoid switch the copper lead between field coil and solenoid switch (1) (Figure 15–4/1).

5. Remove the solenoid switch (1) from the drive bearing (5) after unscrewing the three slotted screws M 5 (Figure 15–4/1).

6. Remove the hex nut and lock washer from the pivot pin of the engaging lever (11) and drive out the pivot pin with a suitable drift.

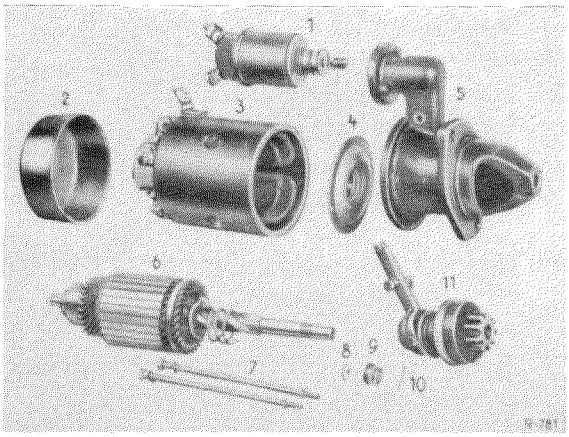

Figure 15–4/1

1 Solenoid switch
2 End cap
3 Armature housing
4 Intermediate bearing
5 Drive bearing
6 Armature
7 Armature housing bolts
8 Retaining ring
9 Castle nut
10 Split pin
11 Pinion assembly

7. Remove the two hex nuts and lock washers from the threaded bolts at the commutator bearing and take the drive bearing (5) with intermediate bearing (4) and armature (6) off the armature housing (3) (Figure 15–4/1).

8. Unscrew the two threaded bolts (7) from the drive bearing (5) and remove the drive bearing from the armature.

9. Clamp the armature in two suitable wooden jaws and pull the split pin (10) out of the castle nut (9) located on the front end of the armature shaft.

10. Unscrew the castle nut from the armature shaft.

    Caution, left-hand thread. Then press out the retaining ring (8) with a screwdriver and take off pinion assembly with intermediate bearing (4) and the parts of the armature brake (Figure 15–4/1).

Note: During the removal of the retaining ring make sure that the thread is not damaged.

11. Check the pinion for burrs on the front edge of the teeth and carefully file away the burrs if necessary.

    If more serious damages are discovered or if the free-wheel assembly does not function properly, the complete pinion assembly must be replaced.

12. Check the bearing bushes in the drive bearing and in the commutator bearing for wear. If necessary, remove the old bushes and press in new bearing bushes.

13. Remove dirt and oil from the carbon brushes with a clean rag. Badly worn carbon brushes must be replaced. Install the carbon brushes in the brush holders and check operating ease.

14. Test the pressure springs of the carbon brushes and replace if necessary. This test should be made with a suitable spring tester, e.g. Bosch Spring Tester EF 1244. Brush Pressure see Job No. 15–0.

15. Check the commutator for eccentricity. Out-of-round or charred commutators must be lightly machined on a lathe. Under no circumstances use emery cloth or file. During the machining of the commutator do not remove more material than absolutely necessary to obtain a perfectly smooth surface.
    After the machining the segments must be cut out 0.6 to 0.7 mm deep with a commutator saw. After that machine the commutator again with a finishing cut (0.1 mm). Use only carbide-tipped cutters! For smallest permissible diameter and maximum permissible run-out of the commutator (see Job No. 15–0).

16. Check armature and exciter coil for short-circuit in coil or to ground (see Job No. 15–5).

    Check the adjusting dimension "a" at the solenoid switch and correct if necessary (see Job No. 15–0).

Assembly:

Note: Before assembly of the starter grease well the quick thread on the armature shaft, the parts of the armature brake and the guide rings of the pinion assembly with Bosch Grease Ft 1 V 8 (red).

17. Slip on the armature shaft, the insulating washer, the spring retainer and the tension spring of the armature brake, the intermediate bearing and the pinion assembly. Install the retaining ring in the groove and screw on the castle nut.

    Caution. Left-hand thread!

Note. At the starter EJD 1,8/12 R 82 a rubber sealing ring is installed between the drive bearing and the armature housing.

18. Secure castle nut with split pin.

19. Slip the spacer washers on the commutator end of the shaft in the following order: steel – insulator – steel and stick them lightly together with Bosch Grease Ft 1 V 8 (red).

20. Push the pinion assembly fully against the castle nut and fit the engaging lever in the guide rings.

21. Now press the engaging lever upwards towards the armature shaft and slip the drive bearing over the engaging lever and the armature shaft simultaneously. During this operation take care that the engaging lever does not slip out of the guide rings.

22. Screw the intermediate bearing to the drive bearing with the threaded bolts; make sure of proper seating.

23. Slip armature housing with commutator bearing over the armature and the threaded bolts and secure with the two hex nuts.

Note: After tightening check the end play of the armature. The end play must be 0.1 to 0.3 mm.

24. Push the pivot pin of the engaging lever into the drive bearing and the engaging lever, mount lock washer and screw on the hex nut.

25. Screw the solenoid switch to the drive bearing. When doing this, insert the bolt of the solenoid switch yoke in the cutout of the engaging lever.

26. Connect the copper lead from the field coil to the solenoid switch.

27. Bring the carbon brushes in operating position by setting the brush springs properly.

28. Mount the end cap and screw it on.

Installation:

29. Install the starter (see Job No. 15–1).