Check steering components very carefully. When in doubt, the pertinent part should be replaced.

Notes

The ball circulation assembly, that is, the steering worm and the steering nut, are assembled free of play at the factory.

To maintain the specified play of 0.006–0.01 mm between the straightedge of the steering nut and the control valve, both parts are assembled by the selection system.

The same applies to the steering case and its control valve. For these reasons, available spare parts in addition to the sealing and bearing assembly include the pitman shaft, the bearing cap and the bearing insert, as well as the housing cover only.

Steering Worm and Steering Nut

1 Check ball paths on steering worm (3). If traces of wear are shown, replace steering (Fig. 1).

2 Remove sealing ring (30) and O-ring (29) from steering worm (Fig. 1).

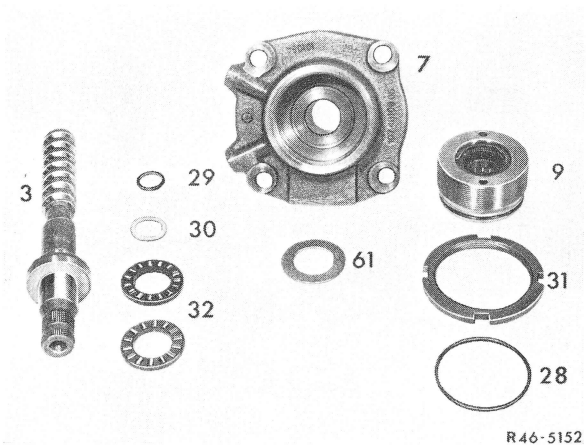

Fig. 1

3 Steering worm
7 Bearing cap
9 Bearing insert
28 O-ring
29 O-ring
30 Sealing ring (teflon)
31 Slotted nut
32 Axial cyl. roller cage
61 Axial disc

Working Piston and Steering Nut

3 Remove sealing ring (41) and O-ring (40) from working piston (5). Press outer race of axial tapered ball bearing (33) from working piston (Fig. 2 and 3).

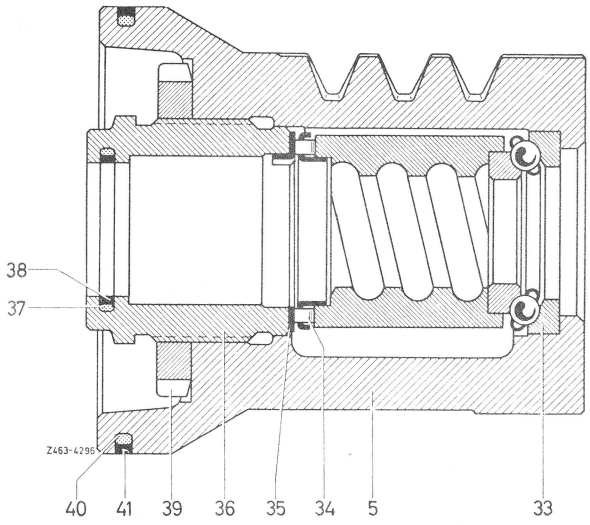

Fig. 2

5 Working piston
33 Axial tapered ball bearing
34 Axial cyl. roller cage
35 Axial disc
36 Screw cover
37 O-ring
38 Sealing ring (teflon)
39 Slotted nut
40 O-ring
41 Sealing ring (teflon)

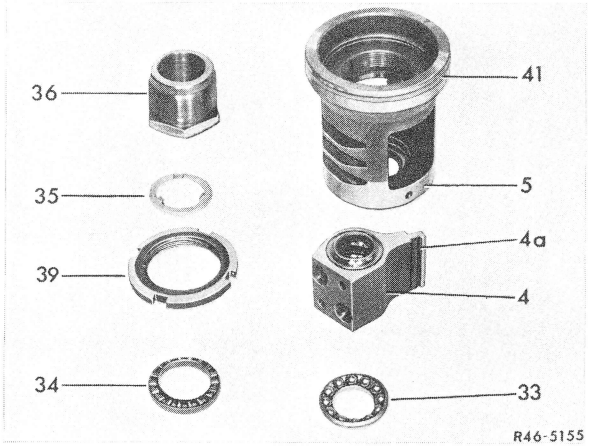

Fig. 3

4 Steering nut
4a Straightedge on steering nut
5 Working piston
33 Axial tapered ball bearing
34 Axial cyl. roller cage
35 Axial disc
36 Screw cover
39 Slot nut
41 Sealing ring (teflon)

Pitman Shaft

4 Check pitman shaft (2) for wear at bearing points and for distortion or other damage. Replace pitman shaft, if required (Fig. 4).

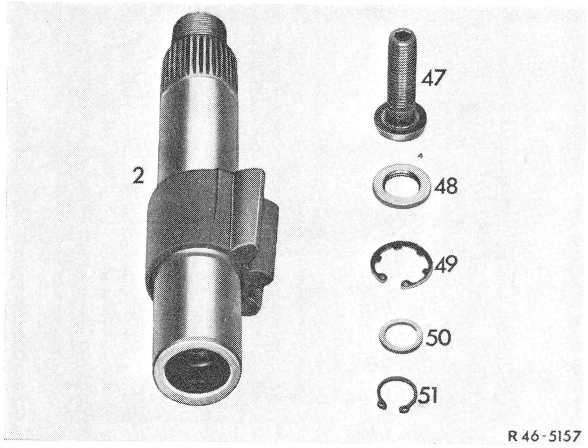

Fig. 4

2 Pitman shaft
47 Adjusting screw
48 Thrust washer
49 Locking ring
50 Thrust ring
51 Locking ring

Housing Cover

6 Check needle bushing (25) for wear. Completely replace housing cover, if the needle bushing is damaged. (Fig. 5).

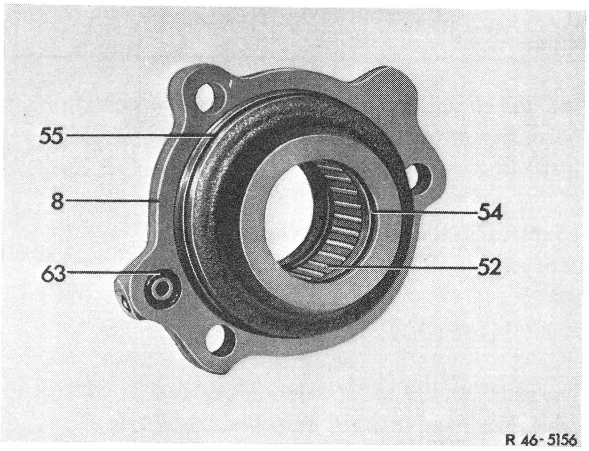

Fig. 5

8 Housing cover
52 Needle bushing
54 O-ring
55 O-ring
63 O-ring

Steering Case

5 Check needle bushing in steering case for wear. If required, pull out needle bushing with conventional puller.

Bearing Insert

6 Check needle bushing (25) for wear. Completely replace bearing insert (9), if the needle bushing is damaged. (Fig. 6).

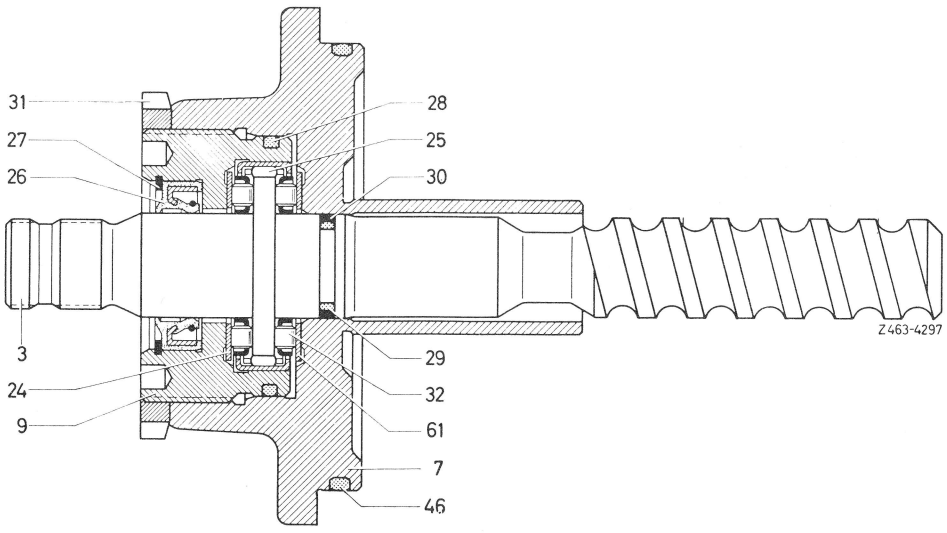

Fig. 6

3 Steering worm
7 Bearing cap
9 Bearing insert
24 Axial disc
25 Needle bushing
26 Radial sealing ring
27 Locking ring
28 O-ring
29 O-ring
30 Sealing ring (teflon)
31 Slotted nut
32 Axial cyl. roller cage
46 O-ring
61 Axial disc

Control Valve

Note: On version 1 of control valve the diameter of the reaction pistons is 11 mm and the supporting pistons (13) are secured in reaction pistons with locking rings (14) (Fig. 8 and 9). On version 2 (production as from the middle of 1972) the diameter of the reaction pistons (12) is 10 mm. Two spring bolts (65) are inserted in reaction pistons (Fig. 10 and 11). On control valve version 3 (production starting end of 1973) diameter of reaction pistons (12) is 11 mm. Compensating disc (66) and spring (67) are inside reaction piston (Fig. 12).

Version 1

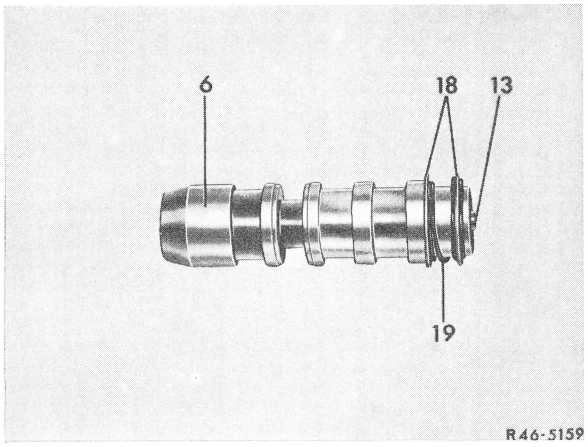

Fig. 7

6 Control valve
13 Supporting bolt
18 Thrust washer
19 Compression spring

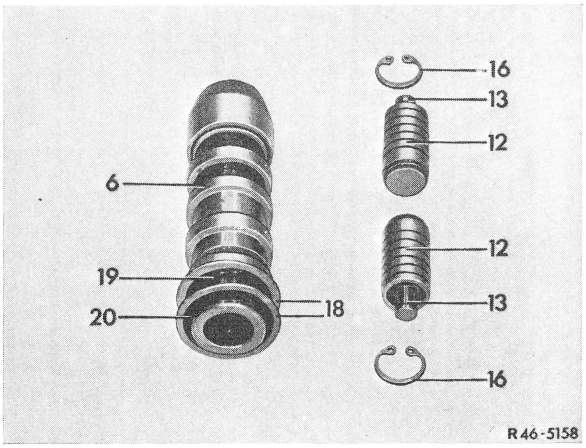

Fig. 8 Control valve version 1

6 Control valve
12 Reaction piston (11 mm dia.)
13 Supporting bolt
16 Locking ring
18 Thrust washer
19 Compression spring
20 Locking ring

7 Check reaction piston (12) and supporting bolt (13) in control valve (6) for easy running. If required, remove reaction piston after removing locking ring (16) and clean (Fig. 7, 8 and 9).

Note: Do not remove supporting bolts (13) from reaction pistons (12), since spring preload of compression spring (15) has been set by means of compensating washers (17) (Fig. 9).

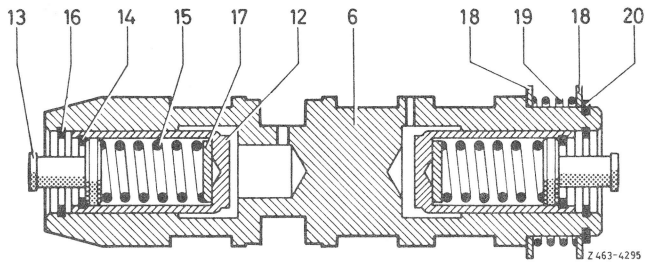

Fig. 9 Control valve version 1

6 Control valve
12 Reaction piston (11 mm dia.)
13 Supporting bolt
14 Locking ring
15 Compression spring
16 Locking ring
17 Compensating washer
18 Thrust washer
19 Compression spring
20 Locking ring

Version 2

8 Check reaction piston (12) in control valve (6) for easy running. If required, remove reaction piston after removing locking ring (16) and clean. (Fig. 10 and 11).

Note: Do not disassemble spring bolts (65), since spring preload has been set by means of compensating washers (17) (Fig. 10 and 11).

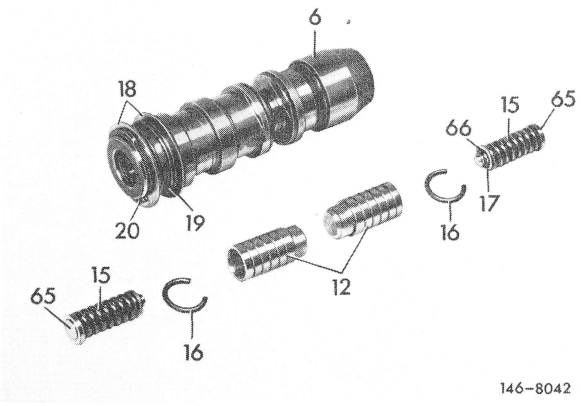

Fig. 10 Control valve version 2

6 Control valve
12 Reaction piston (10 mm dia.)
15 Compression spring
16 Locking ring
17 Compensating washer
18 Thrust washer
19 Compression spring
20 Locking ring
65 Spring bolt
66 Locking ring

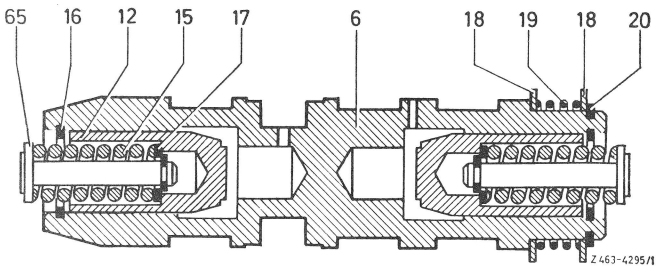

Fig. 11

Control valve version 2

6 Control valve
12 Reaction piston (10 mm dia.)
15 Compression spring
16 Locking ring
17 Compensating washer
18 Thrust washer
19 Compression spring
20 Locking ring
65 Spring bolt

Version 3

9 Check reaction piston (12) in control valve (6) for easy running. If required, remove reaction piston after removing locking ring (16) and clean (Fig. 12).

Note: Do not confuse springs (67) and compensating washers (66) of both reaction pistons.

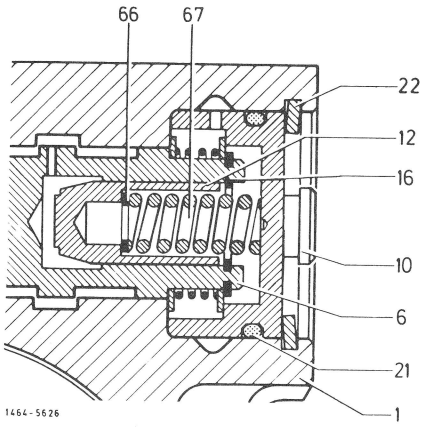

Fig. 12

Control valve version 3

1 Steering case
6 Control valve
10 Closing cover
12 Reaction piston (11 mm dia.)
16 Locking ring
21 O-ring
22 Locking ring
66 Compensating washer
67 Spring