

Special Tools

Hinged pin spanner for bearing insert	000 589 00 05 00
Assembly device for steering case	116 589 01 59 00
Slot nut wrench for slot nut on bearing cap	116 589 01 07 00
Assembly device for bearing cap	116 589 03 59 00
Slot nut wrench for slot nut on working piston	116 589 00 07 00
Hexagon socket wrench for screw cover	116 589 00 09 00
Assembly device for working piston	116 589 04 59 00

Conventional Tools

Pliers for inside lock (J 1)	e.g. made by Hazet/Remscheid Order No. 1846 a-1
Pliers for outside lock (A 1)	e.g. made by Hazet/Remscheid Order No. 1846 c-1
Hook wrench	e.g. made by Walter/Wuppertal Order No. 260-68/75

46.1 Disassembly of Power Steering

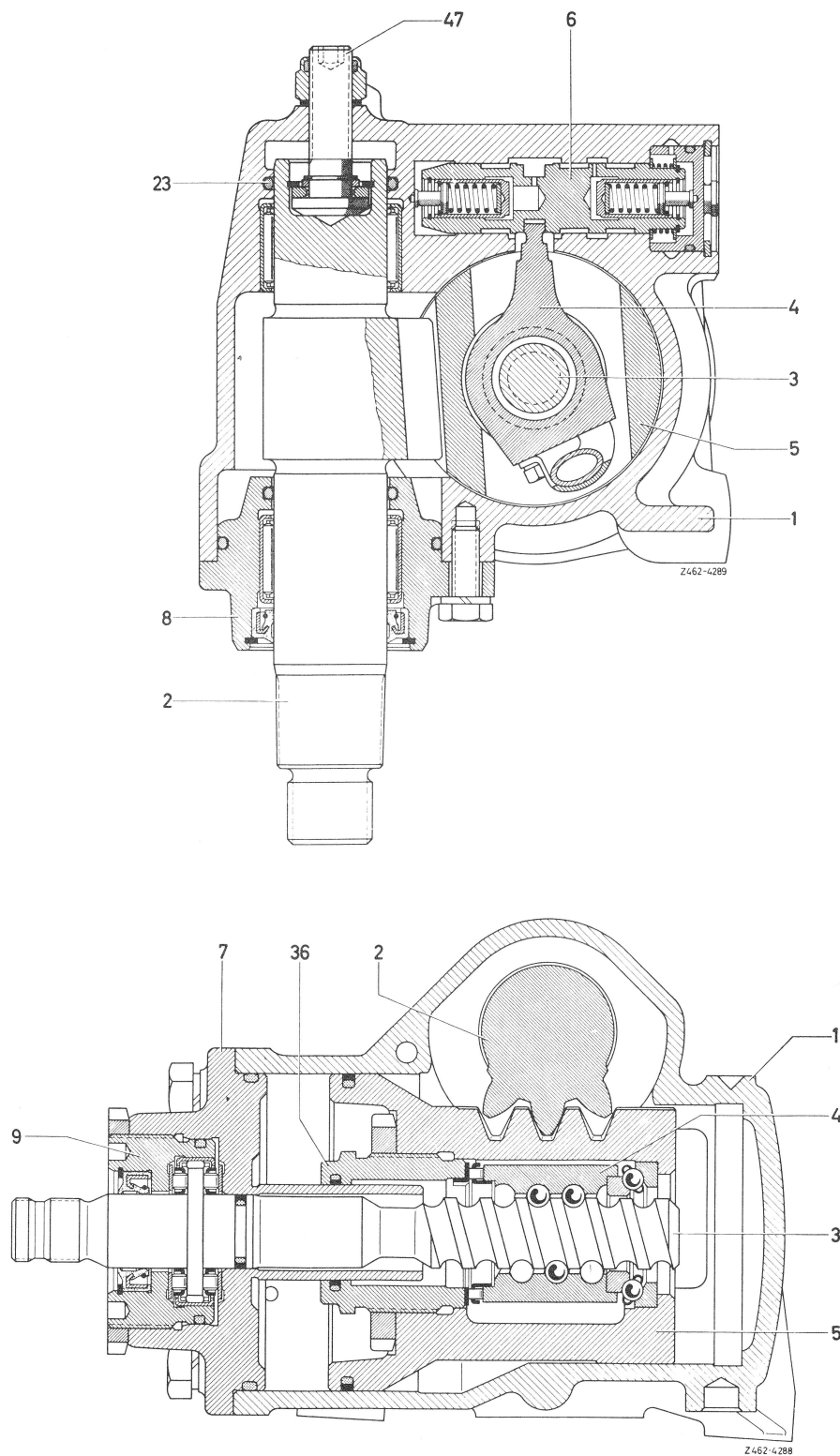


Fig. 1

- | | | | |
|-----------------|------------------|------------------|--------------------|
| 1 Steering case | 4 Steering nut | 7 Bearing cap | 23 O-ring |
| 2 Pitman shaft | 5 Working piston | 8 Housing cover | 36 Screw cover |
| 3 Steering worm | 6 Control valve | 9 Bearing insert | 47 Adjusting screw |

Disassembly

- 1 Attach steering (1) to assembly device (Fig. 2).

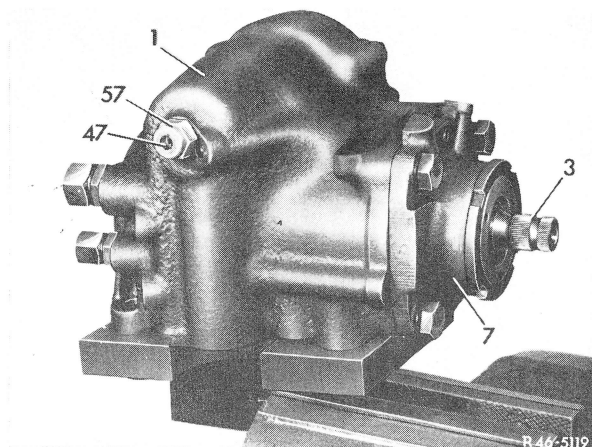


Fig. 2

- | | |
|-----------------|--------------------------|
| 1 Steering case | 47 Adjusting screw |
| 3 Steering worm | 57 Self-locking hex. nut |
| 7 Bearing cap | |

- 2 Unscrew self-locking hex. nut (57) from adjusting screw (47) while applying counterhold to adjusting screw (Fig. 2).

- 3 Unscrew hex. screws for attaching housing cover (8) to steering case (1) (Fig. 3).

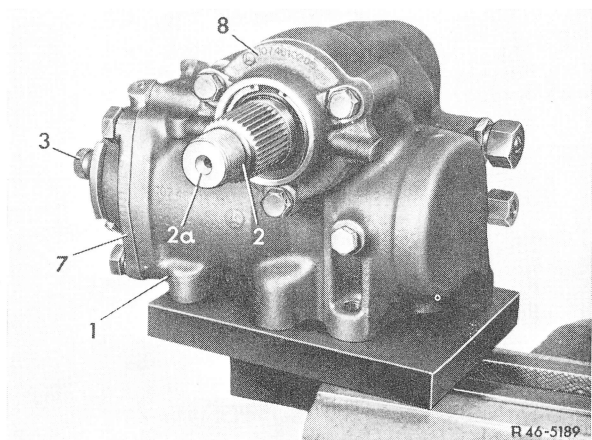


Fig. 3

- | | |
|---------------------------------|-----------------|
| 1 Steering case | 3 Steering worm |
| 2 Pitman shaft | 7 Bearing cap |
| 2a Marking line on pitman shaft | 8 Housing cover |

Note: Housing cover is now attached to steering case by means of **four** hex. screws.

- 4 In center position of steering, turn adjusting screw (47) to the left, which will force pitman shaft including housing cover out of steering case (Fig. 4).

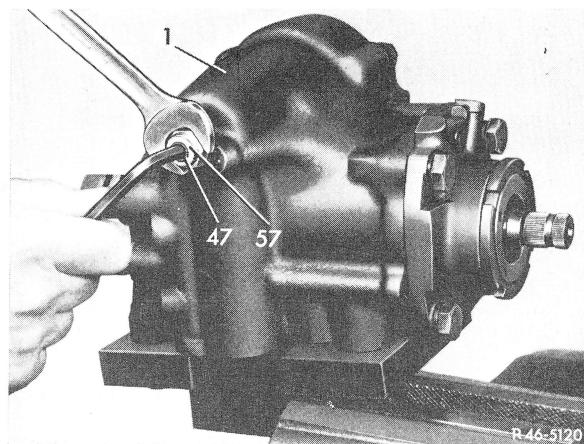


Fig. 4

- | | |
|--------------------|--------------------------|
| 1 Steering case | 57 Self-locking hex. nut |
| 47 Adjusting screw | |

- 5 Remove housing cover (8) from pitman shaft (2) (Fig. 5 and 7).

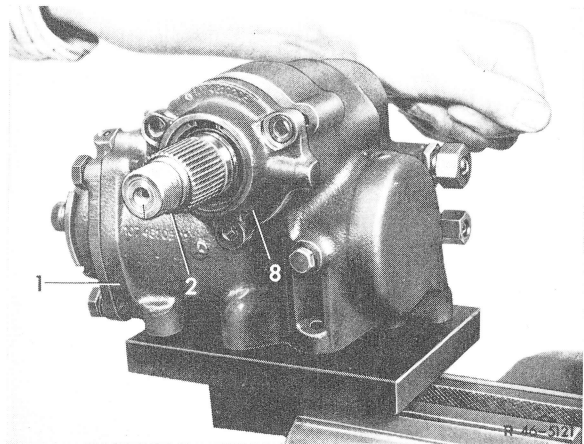


Fig. 5

- | | |
|-----------------|-----------------|
| 1 Steering case | 8 Housing cover |
| 2 Pitman shaft | |

- 6 Remove O-ring (54, 55 and 63) from housing cover (Fig. 6).

46.1 Disassembly of Power Steering

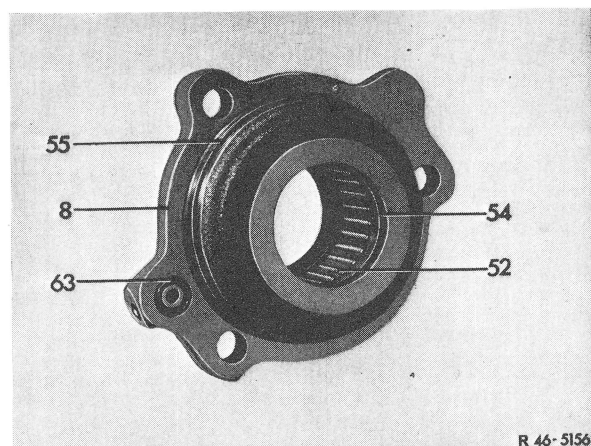


Fig. 6

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

7 Remove locking ring (53) and radial sealing ring (56) from housing cover (8) (Fig. 7).

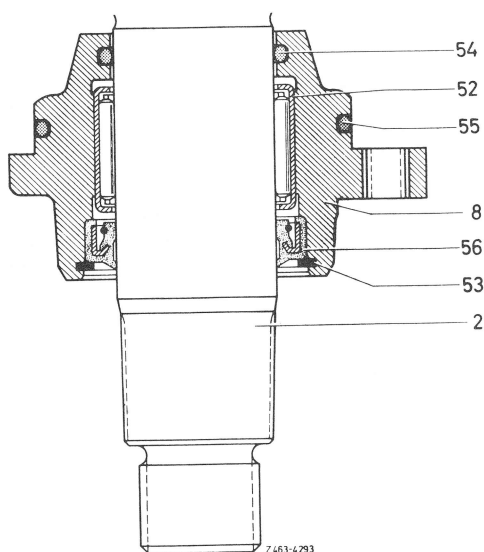


Fig. 7

- | | |
|-------------------|------------------------|
| 2 Pitman shaft | 54 O-ring |
| 8 Housing cover | 55 O-ring |
| 52 Needle bushing | 56 Radial sealing ring |
| 53 Locking ring | |

8 Remove locking ring (51) from adjusting screw (47), then take-off thrust ring (50) (Fig. 8 to 10).

9 Remove locking ring (49) from pitman shaft (2). Remove adjusting screw (47) including thrust washer (48) (Fig. 9 and 10).

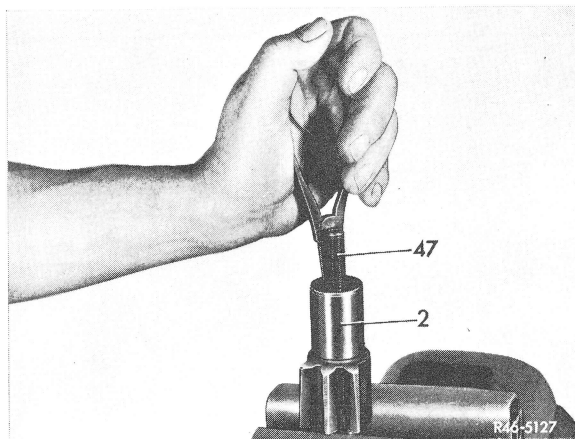


Fig. 8

- | | |
|----------------|--------------------|
| 2 Pitman shaft | 47 Adjusting screw |
|----------------|--------------------|

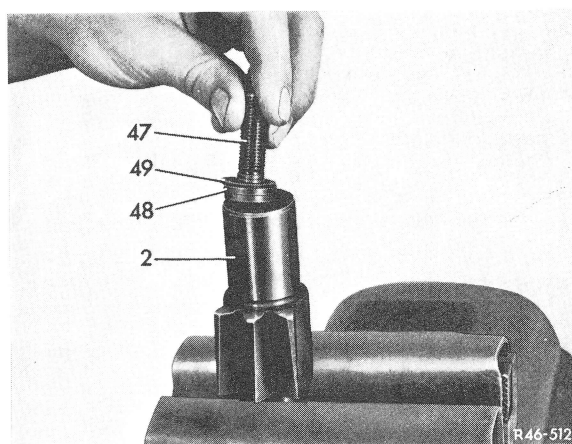


Fig. 9

- | | |
|--------------------|------------------|
| 2 Pitman shaft | 48 Thrust washer |
| 47 Adjusting screw | 49 Locking ring |

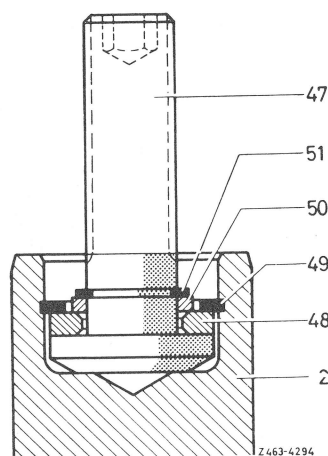


Fig. 10

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

10 Unscrew hex. bolts attaching bearing cap (7) to steering case (1) (Fig. 11).

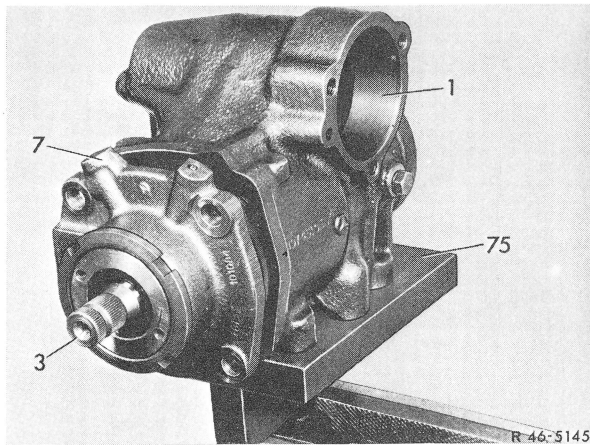


Fig. 11

1 Steering case 75 Assembly device for steering case
3 Steering worm
7 Bearing cap

11 Slide steering coupling on steering worm, turn steering worm to the left until bearing cap is forced out of steering case.

Note: Do not turn too far, since this would cause balls to drop out of circulating line-up.

12 Remove bearing cap together with steering worm and working piston from steering case.

13 Unscrew steering worm (3) from steering nut (4) making sure that no balls (42) are lost (Fig. 12).

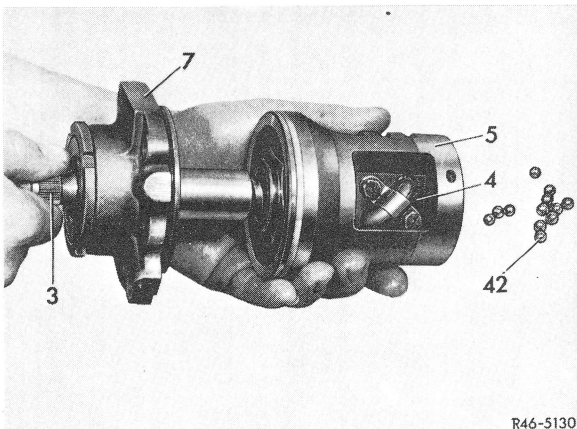


Fig. 12

3 Steering worm 7 Bearing cap
4 Steering nut 42 Steel ball (24 each)
5 Working piston

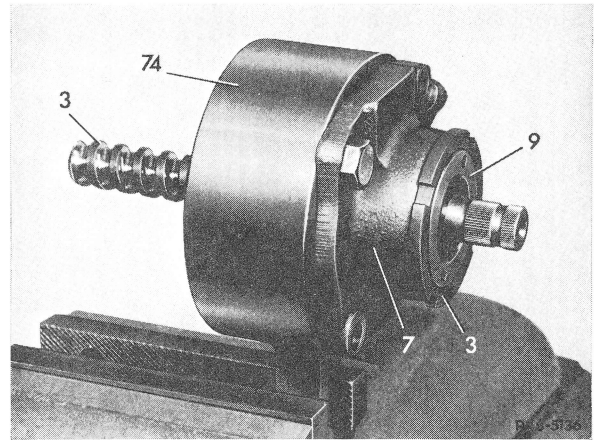


Fig. 13

3 Steering worm 31 Slot nut
7 Bearing cap 74 Assembly device for bearing cap
9 Bearing insert

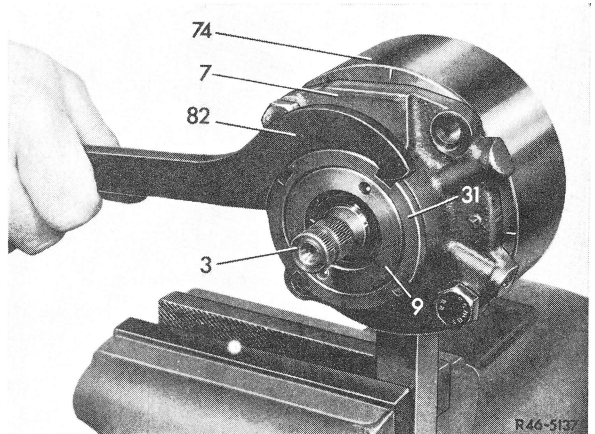


Fig. 14

3 Steering worm 31 Slot nut
7 Bearing cap 74 Assembly device
9 Bearing insert 82 Hook wrench (slot nut wrench)

14 Remove O-ring (46) from bearing cap (7) and attach bearing cap in device (74) (Fig. 14 and 18).

15 Unscrew slot nut (31) with hook wrench (82) or slot nut wrench (90) from bearing insert (9) (Fig. 14 and 15).

16 Unscrew bearing insert (9) from bearing cap (7) by means of hinged pin spanner (81) (Fig. 16).

17 Remove steering worm (3) from bearing cap (7), take axial cyl. roller cage (32) from steering worm (Fig. 17).

18 Remove sealing ring (30) and O-ring (29) from steering worm (3) (Fig. 18).

46.1 Disassembly of Power Steering

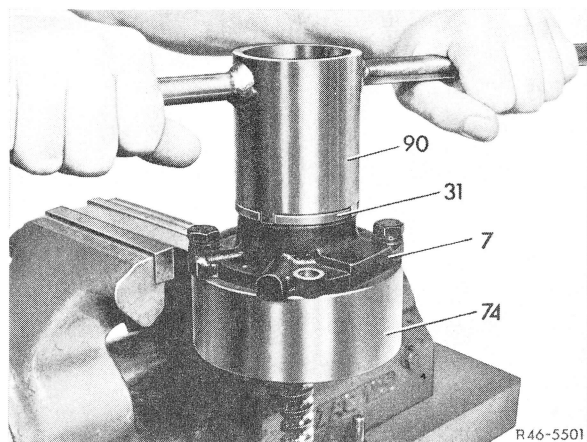


Fig. 15

- | | |
|---------------|--------------------|
| 7 Bearing cap | 74 Assembly device |
| 31 Slot nut | 90 Slot nut wrench |

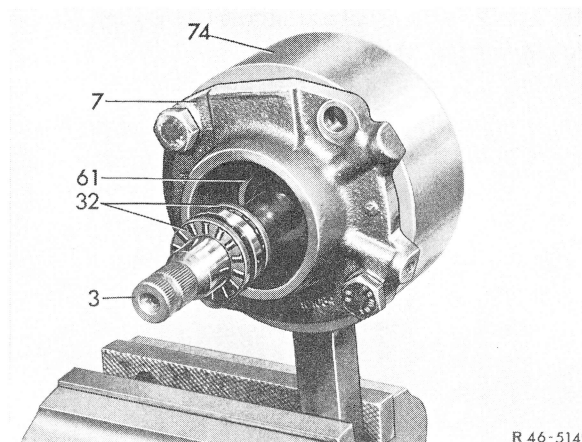


Fig. 17

- | | |
|---------------------------|--------------------|
| 3 Steering worm | 61 Axial disc |
| 7 Bearing cap | 74 Assembly device |
| 32 Axial cyl. roller cage | |

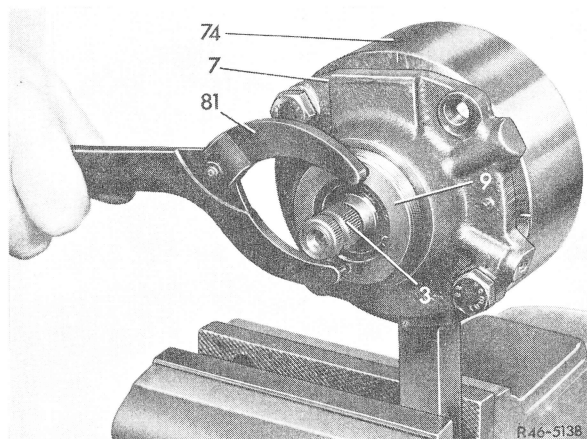


Fig. 16

- | | |
|------------------|------------------------------------------|
| 3 Steering worm | 74 Assembly device |
| 7 Bearing cap | 81 Hinged pin spanner for bearing insert |
| 9 Bearing insert | |

19 Remove axial cyl. roller cage (32) and axial disc (61) from bearing cap (7) (Fig. 18).

20 Unscrew hex. screws (45), remove fastening clip (44) and both ball guide halves (43) (Fig. 19).

21 Clamp working piston (5) into device (78), unscrew slot nut (39) with slot nut wrench (80), then unscrew screw cover (36) with hex. wrench (75) (Fig. 20 and 21).

22 Remove sealing ring (teflon) (38) and O-ring (37) from screw cover (36) (Fig. 21).

23 Remove axial disc (35) from screw cover (36) (Fig. 21).

Note: Axial disc is installed only on version 1 of power steering, but no longer on version 2, since the screw cover is hardened.

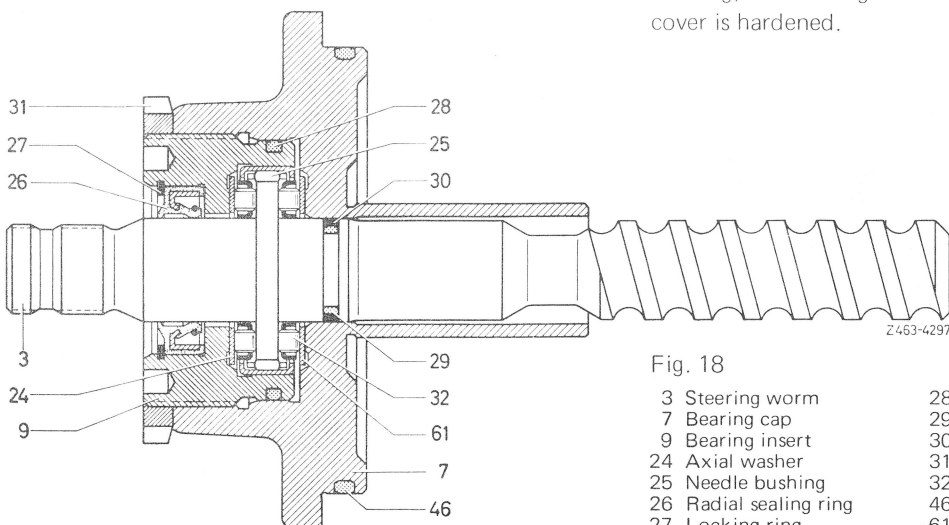


Fig. 18

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

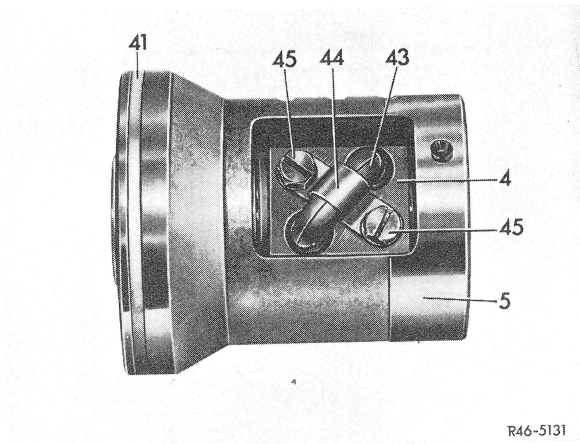


Fig. 19

- | | |
|--------------------------|-----------------------------------|
| 4 Steering nut | 43 Ball guide halves |
| 5 Working piston | 44 Fastening clip |
| 41 Sealing ring (teflon) | 45 Hex. screw and serrated washer |

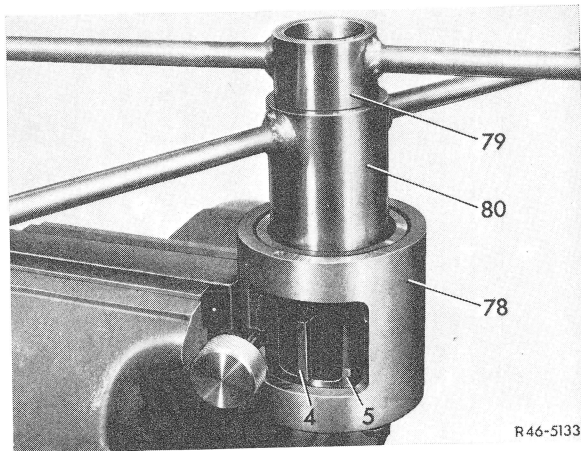


Fig. 20

- | | |
|--------------------|--------------------|
| 4 Steering nut | 79 Hex. wrench |
| 5 Working piston | 80 Slot nut wrench |
| 78 Assembly device | |

24 Remove axial cyl. roller cage (34) from steering nut (4) and take steering nut from working piston (5).

25 Remove axial tapered ball bearing (33) from working piston.

26 Remove locking ring (22) from steering case (1) (Fig. 22).

27 Remove closing cover (10) from steering case.

28 Remove control valve (6) from steering housing (1), making sure that in version 2 the spring bolts and in version 3 the springs will not drop out of control valve (Fig. 23, 24 and 25).

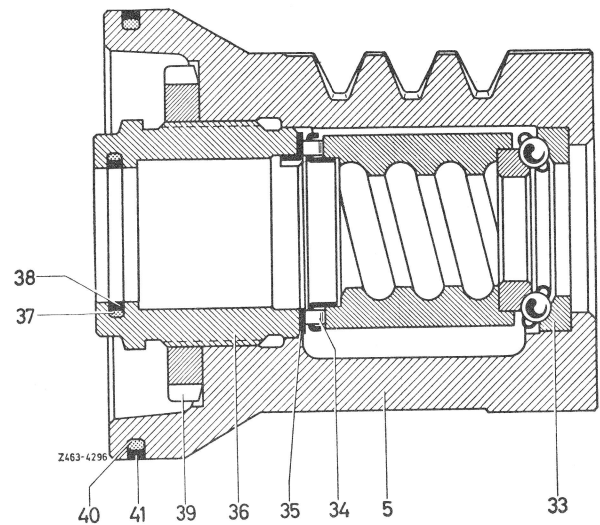


Fig. 21

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

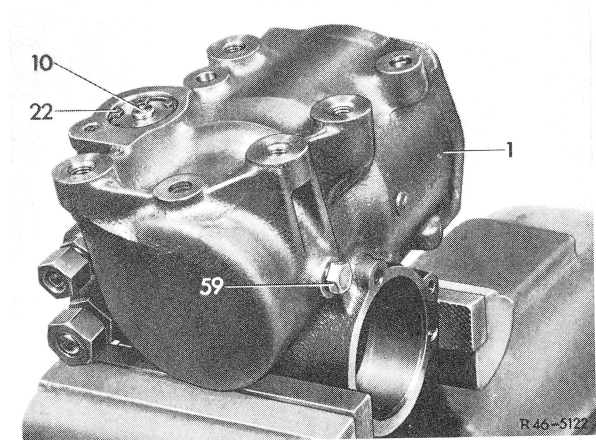


Fig. 22

- | | |
|------------------|-----------------|
| 1 Steering case | 22 Locking ring |
| 10 closing cover | 58 Closing plug |

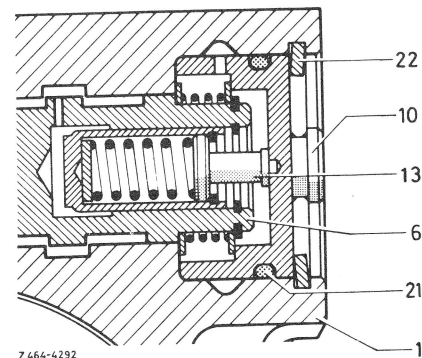


Fig. 23

Control valve version 1

- | | |
|------------------|--------------------|
| 1 Steering case | 13 Supporting bolt |
| 6 Control valve | 21 O-ring |
| 10 Closing cover | 22 Locking ring |

46.1 Disassembly of Power Steering

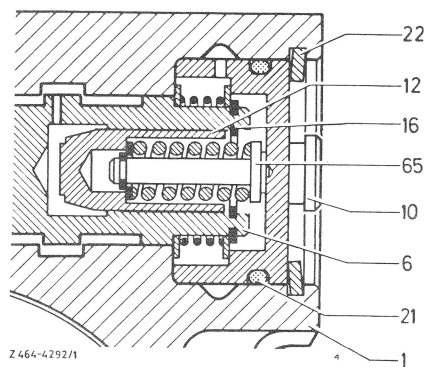


Fig. 24

Control valve version 2

- | | |
|------------------------------------|-----------------|
| 1 Steering case | 16 Locking ring |
| 6 Control valve | 21 O-ring |
| 10 Closing cover | 22 Locking ring |
| 12 Reaction piston
(10 mm dia.) | 65 Spring bolt |

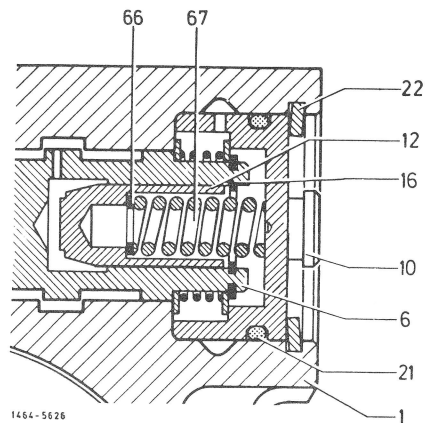


Fig. 25

Control valve version 3

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