

Disassembly and Reassembly of Front Axle Half

Job-No.

33 — 4

Disassembly:

1. Place the front axle half on a work bench and take off the brake drum.
2. Pull the cotter pin out of the castle nut of the tie-rod. Then unscrew the castle nut and press off the tie-rod end, using Bell-shaped Puller 186 589 10 33.

Control Arm:

3. Pull the cotter pin out of the threaded pin (2) at the lower control arm and remove the castle nut (3). Remove the threaded pin (1) and take off the two rubber sealing rings (2) (Fig. 33 — 4/1).

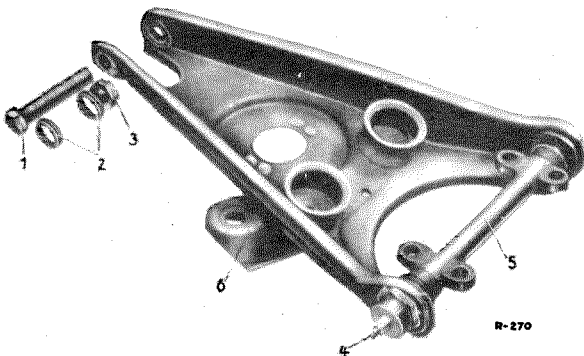


Fig. 33 — 4/1

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|----------------|--------------------------------|
| 1 Threaded pin | 4 Threaded bushing |
| 2 Sealing ring | 5 Pivot pin |
| 3 Castle nut | 6 Eye for torsion bar mounting |

4. Remove the hexagon screw (13) for the locking plate (11) of the camber adjustment, at the upper control arm. Take off the lock washer (12) and the locking plate (11) (Fig. 33 — 4/2).
5. Remove the hexagon nut (10) of the eccentric bolt (7) at the upper control arm. Take off the lock washer (9) and the eccentric bushing (8). Then pull out the eccentric bolt

(7) and take off the adjusting washer (5) for the caster adjustment and the washer (6). Take the two rubber sealing rings (4) off the threaded bushing (2) in the upper steering knuckle assembly and unscrew the threaded bushing (Fig. 33 — 4/2).

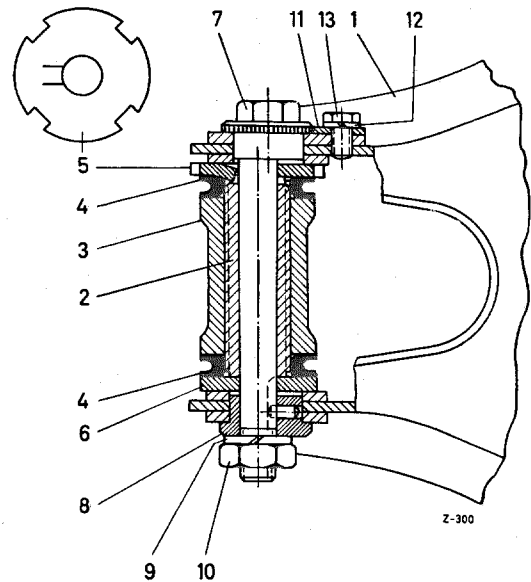


Fig. 33 — 4/2

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|------------------------------------------|
| 1 Upper left control arm |
| 2 Threaded bushing |
| 3 King pin |
| 4 Sealing ring |
| 5 Adjusting washer for caster adjustment |
| 6 Washer |
| 7 Eccentric bolt for camber adjustment |
| 8 Eccentric bushing |
| 9 Lock washer |
| 10 Hexagon nut |
| 11 Locking plate |
| 12 Lock washer |
| 13 Hexagon screw |

6. Unscrew the threaded bushings at the inside of the control arms and take off the pivot pins with the rubber rings.

Wheel Hub:

7. Set up the steering knuckle in Holding Device BE 10 515, if available, or otherwise in a vise.

8. Pull off the hub cap, using Remover 180 589 00 33.

Slacken the hexagon socket screw of the clamping nut (9) on the wheel spindle. Take off the clamping nut (9) and remove the ground steel washer (8) (see Fig. 33 — 4/3).

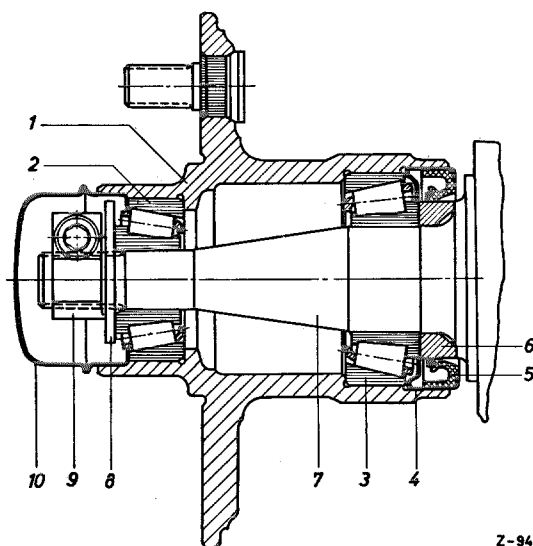


Fig. 33 — 4/3

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|------------------------|-----------------------|
| 1 Wheel hub | 6 Spacer ring |
| 2 Taper roller bearing | 7 Wheel spindle |
| 3 Taper roller bearing | 8 Ground steel washer |
| 4 Puller ring | 9 Clamping nut M 16×1 |
| 5 Seal | 10 Hub cap |

9. Pull off the hub by hand, or if necessary with Bell-shaped Puller 136 589 15 33. Then take the inner race (6) of the small bearing together with the roller cage out of the hub (Fig. 33 — 4/4).

10. Use a brass or aluminum drift to tap the large outer race (4) evenly all the way round the circumference and in this way press it, together with the roller cage (3) with inner race, puller ring (2) and seal (1), out of the wheel hub (Fig. 33 — 4/4).

11. If the inner race with roller cage (3), puller ring (2) and seal (1) remain on the wheel spindle, the seal must be pushed back 4—5 mm and a suitable puller used to pull off the puller ring (2) and the inner race with roller cage. Then take off the seal (1).

Note: In this case, the puller ring must be replaced.

12. Use a brass or aluminum drift in the same way to tap the outer race (5) of the small bearing carefully out of the wheel hub.

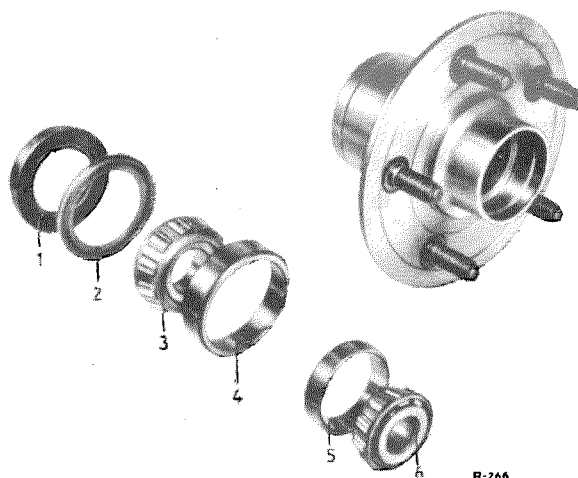


Fig. 33 — 4/4

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|-------------------------------|-------------------------------|
| 1 Seal | 4 Outer race of large bearing |
| 2 Puller ring | 5 Outer race of small bearing |
| 3 Roller cage with inner race | 6 Inner race with roller cage |

13. Remove the brake shoes (see Job No. 42 — 8).

Note: If necessary, remove the brake wheel cylinders (see Job No. 42 — 5).

14. Remove the two hexagon nuts from the brake line fixing screws, together with the short connecting pipe, and pull out the two fixing screws.

Take the hollow screw out of the lower brake wheel cylinder and take off the brake line.

Then remove the two hollow screws of the connecting line between the lower and upper brake wheel cylinders and take off the brake line.

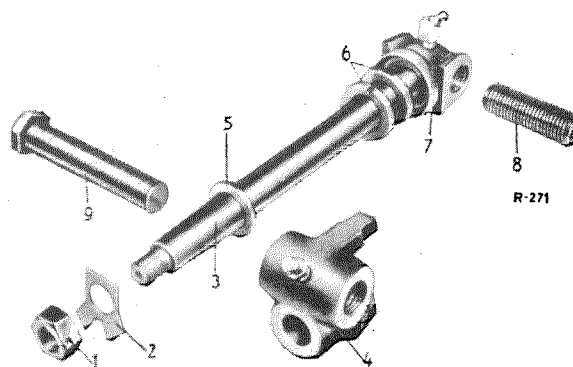


Fig. 33 — 4/5

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|----------------------------|--------------------|
| 1 Hexagon nut | 6 Thrust washer |
| 2 Locking plate | 7 Dust cover |
| 3 King pin | 8 Threaded bushing |
| 4 Steering knuckle support | 9 Threaded pin |
| 5 Compensating washer | |

Steering Knuckle:

15. Tap up the lower locking plate (2) and take the nut (1) off the king pin (3) (Fig. 33 — 4/5). Release the steering knuckle assembly (4) from the cone of the king pin (3) by giving it a sharp hammer blow (use a brass drift) and pull out the king pin (3) downward. Take off the compensating washer (5) and the thrust washers (6).
16. If necessary, press off the dust cover (7) (see Fig. 33 — 4/5).

Reassembly:

Steering Knuckle:

17. Place the lower thrust washer (6) on the steering knuckle in such a way that it is held by the dowel pin (17) (see Fig. 33 — 4/6). The oil grooves must point upward.
18. Press the dust cover (4) onto the king pin (9) (see Fig. 33 — 4/6).
19. Slide the upper thrust washer (5) on the steering knuckle (10) (see Fig. 33 — 4/6).
20. Push the king pin (9) into the steering knuckle (10) (see Fig. 33 — 4/6).
21. Push the compensating washer (11) and the lower steering knuckle support (12) onto the king pin (9). Put on the locking plate (13) and tighten the hexagon nut (14) finger-tight (see Fig. 33 — 4/6).
22. Use Fixture 120 589 01 61 to line up the two steering knuckle supports in position (Fig. 33 — 4/7).
23. Tighten up the hexagon nut (14) (see Fig. 33 — 4/6). The end play of the king pin should be approx. 0.05—0.1 mm. The end play should be corrected by choosing appropriate compensating washers (11). The compensating washers are available in a range of
1.7 to 2.7 mm thickness,
in stages of 0.2 mm.
24. Lock the hexagon nut (14) by tapping over the locking plate (13) (see Fig. 33 — 4/6).

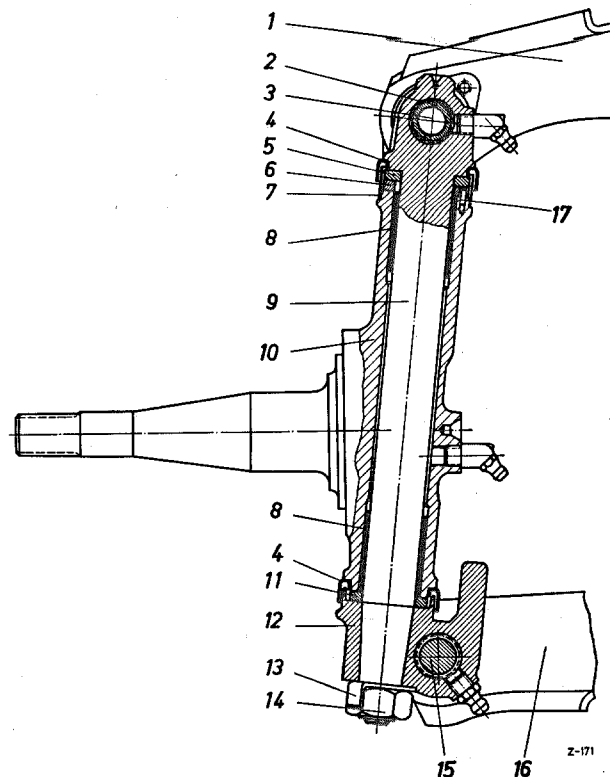


Fig. 33 — 4/6

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|----------------------------|------------------------------|
| 1 Upper control arm | 10 Steering knuckle |
| 2 Threaded bushing | 11 Compensating washer |
| 3 Eccentric bolt | 12 Steering knuckle support |
| 4 Dust cover | 13 Locking plate |
| 5 Upper thrust washer | 14 Hexagon nut |
| 6 Lower thrust washer | 15 Threaded pin |
| 7 Dust sleeve | 16 Lower control arm |
| 8 Upper and lower bushings | 17 Dowel pin 2.5 h 8×6 DIN 7 |
| 9 King pin | |

25. Attach the brake line with the short connecting pipe to the lower brake wheel cylinder by means of the hollow screw and using 2 new copper sealing rings A 10×14

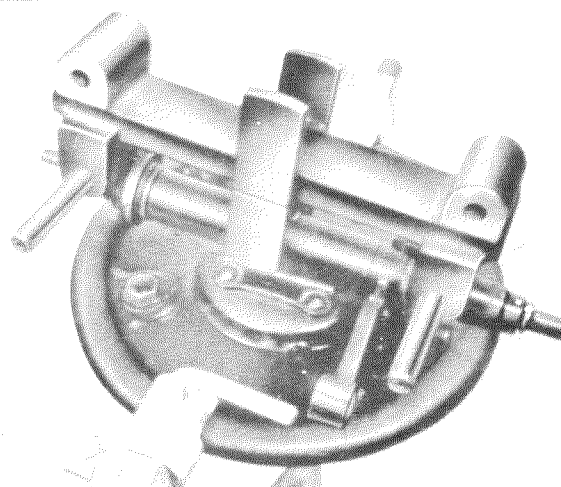


Fig. 33 — 4/7

DIN 7603, and at the top, to the brake anchor plate by means of 2 hexagon screws with nuts and lock washers.

Fit the connecting pipe between the upper and lower brake wheel cylinders, using new copper sealing rings.

Do not forget the rubber pad (1) between the brake lines and the brake anchor plate (Fig. 33 — 4/8).

Be careful not to twist the brake lines when tightening up the hollow screws.

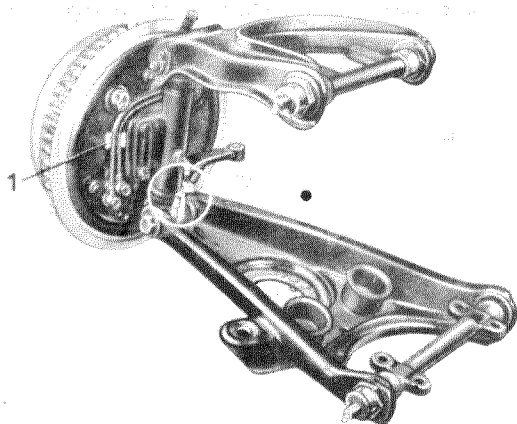


Fig. 33 — 4/8

1 Rubber pad

26. Fit the brake shoes (see Job No. 42 — 8).

Note: If the brake wheel cylinders were removed, re-install them (see Job No. 42 — 5).

Wheel Hub:

27. Press the outer races of the two taper roller bearings (2) and (3) (Fig. 33 — 4/9) into the wheel hub (1) by means of Assembly Fixture (4 parts) 120 589 03 61 (Fig. 33 — 4/10). The races must lie snugly against the shoulder of the wheel hub.

28. Place the roller cage (3) with the inner race in the outer race of the large bearing (see Fig. 33 — 4/9).

29. Then put on the puller ring (4) (see Fig. 33 — 4/9) and use Assembly Fixture 120 589 03 61 to press in the seal (5) (see Fig. 33 — 4/10).

30. Put 65 grams of anti-friction bearing grease into the wheel hub. See Operating Instructions for approved greases.

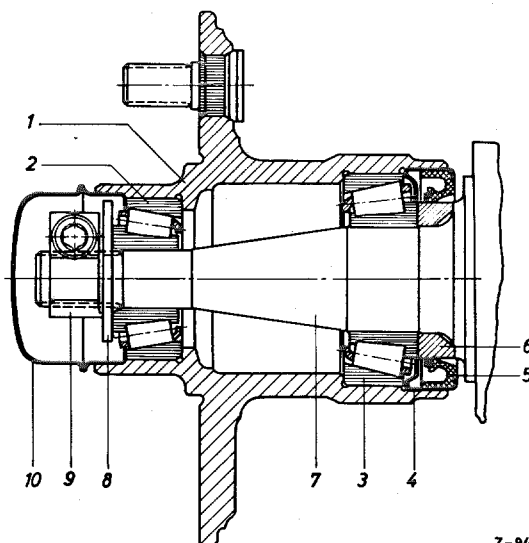


Fig. 33 — 4/9

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|------------------------|-----------------------|
| 1 Wheel hub | 6 Spacer ring |
| 2 Taper roller bearing | 7 Wheel spindle |
| 3 Taper roller bearing | 8 Ground steel washer |
| 4 Puller ring | 9 Clamping nut M16x1 |
| 5 Seal | 10 Hub cap |

Note: Always put in the exact specified amount of grease. If too much grease is put in the hub, the kneading action causes overheating of the grease and it thus loses its lubricating qualities.

In order to form a better seal, the spacer rings (6) (Fig. 33 — 4/9) have a right-hand or left-hand thread pattern marked on the outer edges (see Job No. 33 — 5, Paras. 2 and 3).

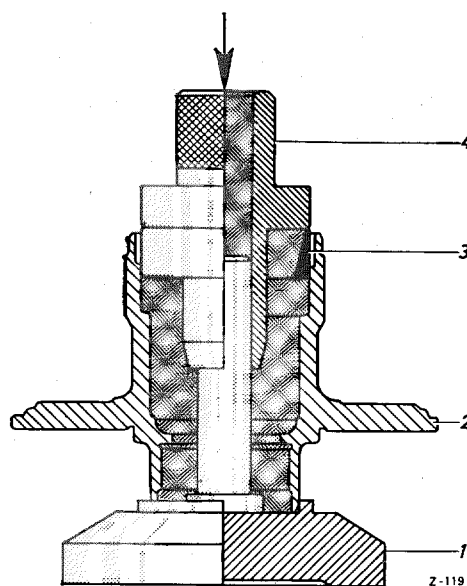


Fig. 33 — 4/10

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|----------------------------------------|
| 1 and 4 Assembly Fixture 120 589 03 61 |
| 2 Wheel hub |
| 3 Outer race of taper roller bearing |
| 4 Installing arbor of assembly fixture |

31. Push the wheel hub onto the steering knuckle.

Then put on the roller cage and the inner race of the small bearing and also the ground steel washer (8) (see Fig. 33—4/9).

32. Tighten up the clamping nut (2). After tightening, slacken the clamping nut again and neutralize the stresses by giving the wheel spindle a light hammer blow (plastic hammer) (see Fig. 33—4/11).

Note: Both steering knuckles have right-hand M 16×1 threads on the ends of the spindles.

33. Push Tester (4) 136 589 04 21 onto the wheel hub (1) and screw it in position with two wheel nuts (see Fig. 33—4/11).

34. Clamp the dial gage in the jaws of the tester in such a way that the dial gage feeler rests against the wheel spindle (3) with an initial tension of 1—2 mm.

35. By slowly tightening the clamping nut, adjust the wheel hub so that there is an end play of 0.000 to 0.005 mm (Fig. 33—4/11).

Note: The end play is checked by vigorously pulling and pushing the hub with both hands in the axial direction. The taper roller bearings should be so adjusted that they are not compressed but that at the same time no

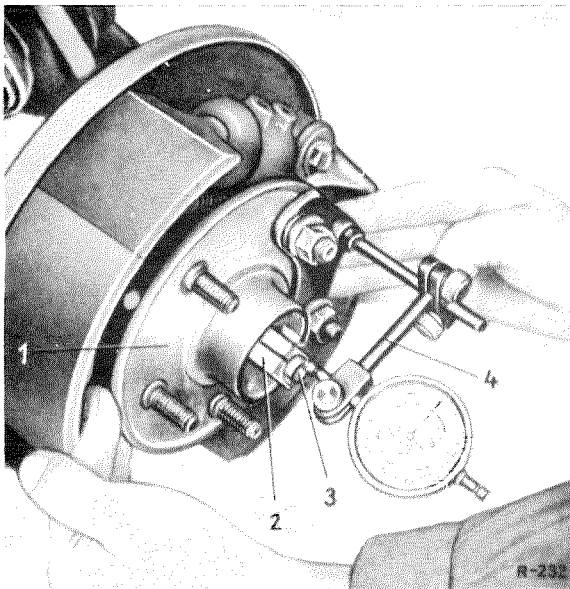


Fig. 33—4/11

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|----------------|------------------------|
| 1 Wheel hub | 3 Wheel spindle |
| 2 Clamping nut | 4 Tester 136 589 04 21 |

The specified small amount of end play is intended to indicate that it is better to have a slight end play than a trace of end thrust (binding).

After the adjustment of the taper roller bearings, the ground steel washer (8) (see Fig. 33—4/9) must just be able to be turned. Check this with a screwdriver.

36. Lock the clamping nut by tightening up the hexagon socket screw.

37. Tap in the suppressor contact dowel at the center of the wheel spindle and knock the wheel hub cap on, using Installer 180 589 00 33.

Control Arm:

38. Push a rubber sealing ring (10) onto the upper pivot pin (11) at the right and at the left (Fig. 33—4/12).

39. Insert the pivot pin in the control arm and screw in the two threaded bushings.

The pivot pin must now be able to turn without binding. If there is any damage to the thread, or if the alignment of the thread is not perfect, this shows when the pivot pin is turned.

Note: For reasons of manufacture, both the upper and the lower control arm have been

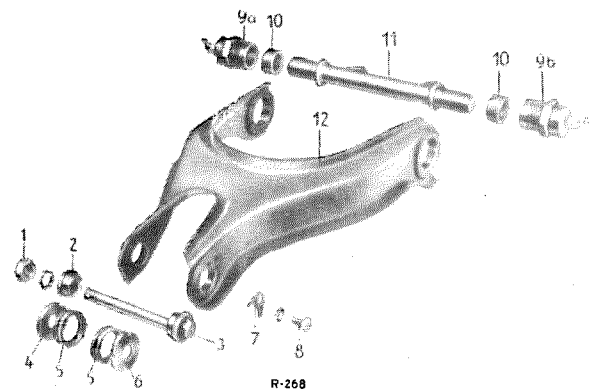


Fig. 33—4/12

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|------------------------------------------|----------------------------------|
| 1 Hexagon nut and lock washer | 7 Locking plate |
| 2 Eccentric bushing | 8 Hexagon screw with lock washer |
| 3 Eccentric bolt | 9a Threaded bushing, rear |
| 4 Washer | 9b Threaded bushing, front |
| 5 Rubber sealing ring | 10 Rubber sealing ring |
| 6 Adjustment screw for caster adjustment | 11 Upper pivot pin |
| | 12 Upper control arm, right |

given 2 different threads, the one M 30 × 2 and the other, M 31 × 2. In order to

distinguish between these two, the figure "31" has been stamped at the side of the eye of the control arm which has the M 31-thread and a groove has been machined in front of the thread in the threaded bushing which has the M 31-thread. The pivot pin should be screwed in in such a way that the threads are distributed evenly between the front and rear threaded bushings.

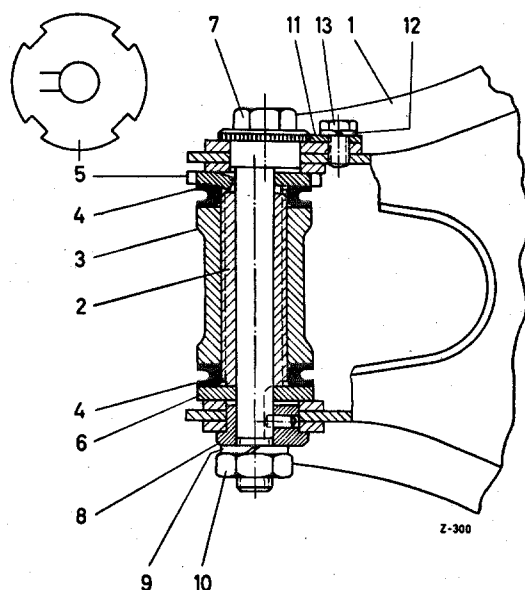


Fig. 33 — 4/13

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|------------------------------------------|----------------------------------------|
| 1 Upper control arm, left | 6 Washer |
| 2 Threaded bushing | 8 Eccentric bolt for camber adjustment |
| 3 King pin | 9 Eccentric bushing |
| 4 Sealing ring | 10 Hexagon nut |
| 5 Adjusting washer for caster adjustment | 11 Locking plate |
| | 12 Lock washer |
| | 13 Hexagon screw |

40. Screw the threaded bushing (2) into the upper steering knuckle support (distribute thread evenly left and right). Push a rubber sealing ring (4) onto each of the projecting ends of the threaded bushing (2) (see Fig. 33 — 4/13).

41. Push the eccentric bolt (7) from the front into the control arm and the threaded bushing (2). When doing this, push the adjusting washer (5) for the caster adjustment at the front in between in such a way that the nose of the washer engages in the groove of the threaded bushing. Push in the washer (6) at the rear between the threaded bushing and the control arm (Fig. 33 — 4/13).

42. Push the eccentric bushing (8) with the lock washer (9) onto the free end of the eccentric bolt (7) and tighten up the hexagon nut (10) (Fig. 33 — 4/13).

Note: The dowel pin in the eccentric bushing must be slid into the groove of the eccentric bolt.

43. Screw the locking plate (11) for the camber adjustment, together with the lock washer (12) and the hexagon screw (13), onto the side face of the control arm (1) and tighten up.

44. Push a rubber sealing ring onto the lower control arm pivot pin (5) at the right and at the left.

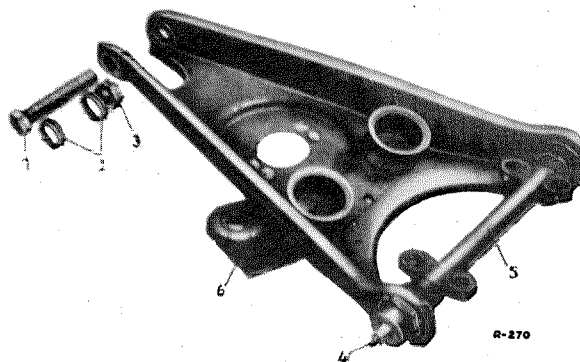


Fig. 33 — 4/14

- | | |
|------------------------|-----------------------------------------|
| 1 Threaded pin | 4 Pinion rim grease fitting |
| 2 Rubber sealing rings | 5 Pivot pin |
| 3 Castle nut | 6 Lug with eye for torsion bar mounting |

45. Slide the pivot pin (5) into the lower control arm and screw in the two threaded bushings (Fig. 33 — 4/14). The pivot pin must be capable of being turned without binding. If there is any damage to the threads or if there is any misalignment of the two threads, this shows when the pivot pin is turned.

Note: The pivot pin must be screwed in in such a way that the thread are evenly distributed at the front and the rear threaded bushing.

If the car is driven mainly over bad roads and in consequence, harder springs and shock-absorbers of larger diameter are used, a control arm with a larger through-way hole (58 mm diameter) for the shock-

absorber should be installed. These control arms should be subsequently installed if they were not installed at the works. They can be ordered under Part No. 180 330 00 08 for the left side and Part No. 180 330 01 08 for the right side.

46. Screw the threaded pin (1) from the front into the lower control arm and the steering knuckle support. When doing this, put a rubber sealing ring (2) on each side between the steering knuckle support and the control arm (Fig. 33 — 4/14).

47. Screw the castle nut (3) onto the threaded pin (1), tighten and cotter (Fig. 33 — 4/14).

Note: The lug with eye (6) for the torsion bar mounting must always be at the front.

48. Put on the brake drum and screw on one wheel-nut, finger-tight.

49. Put the seal cover and the rubber cuff on the ball stud of the tie-rod. Then press the ball stud into the steering arm, screw up the castle nut, tighten and cotter (see Fig. 33 — 6/3).