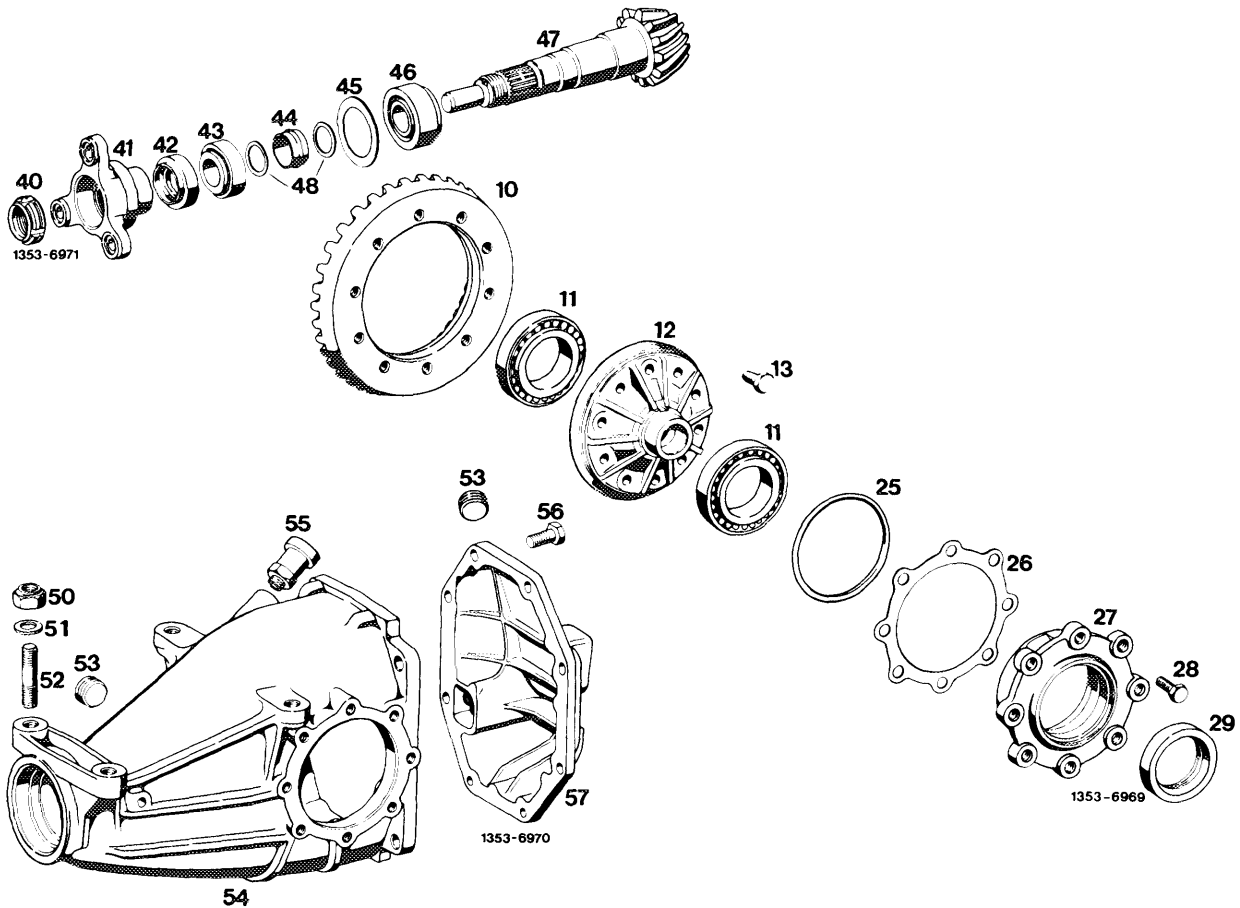


A. Rear axle center piece with lateral bearing caps



|    |   |   |
|----|---|---|
| 10 | Ring gear . . . . .                                   | Check for damage and wear<br>For assembly, heat to 60–70 °C                       |
| 11 | Tapered roller bearing (differential) . . . . .       | Check for damage and wear   |
| 12 | Differential housing . . . . .                        | Check for damage  |
| 13 | Hex. head screw normal or self-locking. . . . .       | Renew, pay attention to tightening torque and lenght,<br>refer to table           |
| 25 | Sealing ring . . . . .                                | Renew   |
| 26 | Compensating washer                                   |   |
| 27 | Bearing cap . . . . .                                 | Check for damage  |
| 28 | Hex. head screw . . . . .                             | Tightening torque 20 Nm   |
| 29 | Radial sealing ring . . . . .                         | Renew   |
| 40 | Slot nut or double hex. collar nut . . . . .          | Renew, secure by peening collar   |
| 41 | Universal flange . . . . .                            | Check, renew, if vertical runout exceeds<br>0.06 mm after resetting several times |
| 42 | Radial sealing ring . . . . .                         | Renew   |
| 43 | Small tapered roller bearing (drive pinion) . . . . . | Check for damage and wear   |
| 44 | Spacing sleeve . . . . .                              | Renew   |

|    |   |  |
|----|---|--|
| 45 | Compensating washer                                   |  |
| 46 | Large tapered roller bearing (drive pinion) . . . . . | Check for damage and wear  |
| 47 | Drive pinion . . . . .                                | Pay attention to mating no., check for damage and wear. Refer to note: A item 28 |
| 48 | Washer . . . . .                                      | Renew  |
| 50 | Self-locking nut . . . . .                            | Renew, tightening torque 100 Nm  |
| 51 | Washer  |  |
| 52 | Stud . . . . .  | Check for damage, tightening torque 50 Nm  |
| 53 | Closing plug  |  |
| 54 | Rear axle housing . . . . .                           | Check for damage   |
| 55 | Breather . . . . .                                    | Renew  |
| 56 | Hex. screw . . . . .                                  | Tightening torque 45 Nm  |
| 57 | End cover . . . . .                                   | Check for damage, clean parting surface and coat with sealing compound           |

## Oil types and capacities

|  |  |                         |
|--|--|-------------------------|
| Standard differential  | Hypoid gear oil SAE 90<br>refer to specifications for service products page 235    |                         |
| Differential with restricted slip (positive traction)<br>(name plate on rear axle housing) | Special Hypoid gear oil<br>refer to specifications for service products page 235.3 |                         |
| Capacity   | large center piece <sup>1)</sup>   | 1.3 litres              |
|  | small center piece <sup>1)</sup>   | 1.0 litre <sup>2)</sup> |

<sup>1)</sup> Refer to installation survey rear axle center piece 35–500

<sup>2)</sup> On models 114 and 115 with rear rubber bearing of rear axle 1st version (cast iron end cover)  
the oil capacity amounts to 1.15 liter.

## Gear wheel (rotor) for rpm sensor on vehicles with ABS

| Part number   | Ratio     | Number of teeth |
|---------------|-----------|-----------------|
| 123 353 01 85 | 4.08      | 23              |
| 123 353 02 85 | 3.92      | 24              |
| 123 353 03 85 | 3.69      | 26              |
| 123 353 04 85 | 3.58/3.54 | 27              |
| 123 353 05 85 | 3.46      | 28              |
| 126 353 00 85 | 3.27      | 29              |
| 126 353 01 85 | 3.06/3.07 | 31              |
| 126 353 03 85 | 2.82      | 34              |
| 126 353 04 85 | 2.72      | 35              |
| 126 353 06 85 | 2.47      | 39              |
| 126 353 05 85 | 2.24      | 43              |

## Compensating washers for adjusting backlash and spread

|           |                                  |              |
|-----------|----------------------------------|--------------|
| Thickness | large center piece <sup>1)</sup> | 0,9 to 1.4   |
|           | small center piece <sup>1)</sup> | 0.6 to 1.9   |
| Steps     |                                  | 0.05 to 0.05 |

**Note:** If required, grind one compensating washer to required thickness.

### Adjusting values of gear assembly

|   |                                  |                 |
|---|----------------------------------|-----------------|
| Backlash of gear assembly   |                                  | 0.08–0.14 mm    |
| Adjustment of tapered roller bearings for differential:<br>Tapered roller bearings are provided with the required<br>preload by widening (spreading) rear axle housing by | large center piece <sup>1)</sup> | 0.15–0.20 mm    |
|   | small center piece <sup>1)</sup> | 0.10–0.15 mm    |
| Permissible tolerance of adjusting dimension "A"<br>of drive pinion   |                                  | + 0.01<br>–0.02 |
| Adjustment of tapered roller bearing<br>of drive pinion by measuring friction<br>torque when rotating drive pinion<br>with friction torque wrench <sup>2)</sup>           | new tapered<br>roller bearing    | 120–140 Ncm     |
|   | used tapered<br>roller bearing   | 50–100 Ncm      |

<sup>1)</sup> Refer to installation survey rear axle center piece 35–500.

<sup>2)</sup> For correct adjustment of tapered roller bearings tighten slot nut or double hex. collar nut on universal flange until the specified friction torque is attained when rotating drive pinion. For checking friction torque when rotating drive pinion, the differential with ring gear should not be installed.

### Compensating washers for adjusting drive pinion

|           |                    |              |
|-----------|--------------------|--------------|
| Thickness | large center piece | 1.5 to 2.4   |
|           | small center piece | 1.5 to 1.8   |
| Steps     |                    | 0.05 to 0.05 |

**Note:** If required, grind one compensating washer to required thickness.

### Fastening screws for ring gear

| Center piece<br>version | Flange thickness of<br>differential housing | Length of<br>hex. screws | Part number                          |
|-------------------------|---|--------------------------|--------------------------------------|
| Large                   | 10  | 22                       | 116 990 02 01                        |
|                         | 8   | 20                       | 126 990 01 01                        |
|                         | 10  | 20                       | 128 990 00 01                        |
| Small                   | 8   | 18                       | standard<br>123 990 16 01 (replaced) |
|                         |   |                          | self-locking<br>123 990 30 01        |

### Universal flange on drive pinion

|  |  |                |
|--|--|----------------|
| Dia. of running surface for radial<br>sealing ring on universal flange | when new                               | 40.00<br>39.84 |
|  | minimum dia. for repairs <sup>1)</sup> |                |
| Running surface of universal flange                                    |  | without thread |
| Permissible vertical runout of sealing surface of universal flange     |  | 0.06           |

<sup>1)</sup> Refinish running surface for seal in an emergency only.

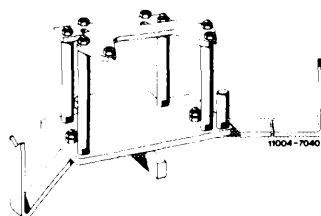
### Compensating washer between inner synchromesh joint and differential housing

|              |           |                 |
|--------------|-----------|-----------------|
| Spacing ring | Thickness | from 2.6 to 3.4 |
|              | Steps     | from 0.1 to 0.1 |

| <b>Tightening torques</b>  |                    | Nm                  |
|--|--------------------|---------------------|
| Hex. screws for fastening rear axle end cover to rear axle housing |                    | 45                  |
| Fastening screws for ring gear                                     | Small center piece | standard<br>80      |
|  |                    | self-locking<br>100 |
| Large center piece   |                    | 120                 |
| Studs in rear axle housing   |                    | 50                  |
| Hex. screws for bearing caps on rear axle housing                  |                    | 20                  |

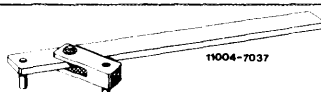
### Special tool

Assembly stand for rear axle center piece



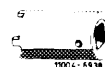
116 589 00 59 00

Holding wrench for universal flange



116 589 10 07 00

Slot nut socket 3/4" square for slot nut on universal flange



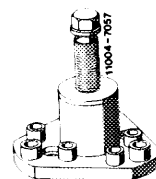
115 589 01 07 00

Socket 30 mm double hex. 3/4" square for double hex. collar nut on universal flange



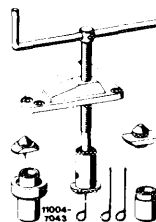
126 589 02 09 00

Puller for universal flange on drive pinion



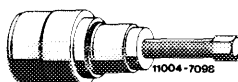
116 589 19 33 00

Installer and remover for pinion



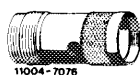
116 589 12 61 00

Puller for tapered roller bearing inner races (basic tool)

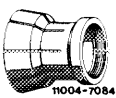
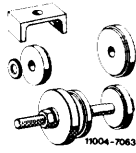

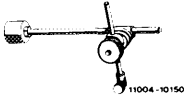
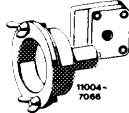
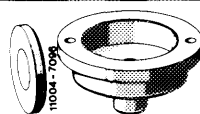
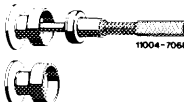

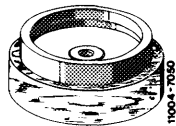

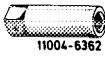
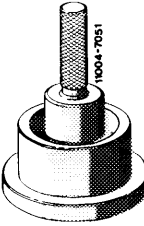



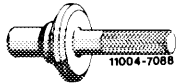
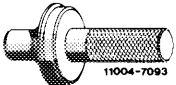
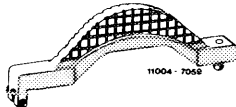
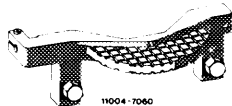
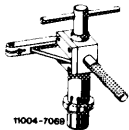
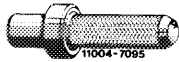
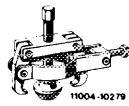
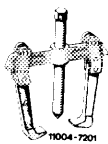
001 589 36 33 00

Extension for puller 001 589 36 33 00



000 589 35 34 00

|   |  |   |  |
|---|--|---|--|
| Collet for puller<br>001 589 36 33 00<br>for tapered roller bearing inner race                        | small center piece<br><hr/> large center piece | <br>11004-7084   | 000 589 33 34 00<br><hr/> 000 589 34 34 00 |
| Installer for tapered roller bearing outer races  |  | <br>11004-7083   | 116 589 11 61 00                           |
| Measuring plate for pinion height with bearing  |  | <br>11004-11138   | 601 589 00 23 00                           |
| Dial gauge holder for measuring plate<br>601 589 00 23 00   |  | <br>11004-10150   | 363 589 02 21 00                           |
| Measuring device for pinion bearing height in rear axle housing                                       | small center piece                             | <br>11004-7096   | 115 589 00 21 00                           |
|   | large center piece                             | <br>11004-7098  | 116 589 01 21 00                           |
| Measuring device for pinion bearing   |  | <br>11004-7066  | 116 589 07 21 00                           |
| Dial gauge holder   |  | <br>11004-7073   | 111 589 08 23 00                           |
| Adjusting gauge for adjusting pinion  |  | <br>11004-7050  | 115 589 05 21 00                           |
| Torque measuring tool<br>30–600 Ncm 1/2" square   |  | <br>11004-7074   | 001 589 49 21 00                           |
| Connection 3/4" square head to 1/2" square socket   |  | <br>11004-6362 | 100 589 02 59 00                           |
| Removing tool for removing tapered roller bearing outer race and radial sealing ring from bearing cap | small center piece                             | <br>11004-7051   | 115 589 00 35 00                           |

|   |                    |  |                  |
|---|--------------------|--|------------------|
| Removing tool for removing tapered roller bearing outer race from bearing cap | large center piece |     | 116 589 00 35 00 |
| Installing mandrel for radial sealing ring with 65 mm OD                      |                    |    | 116 589 05 43 00 |
| Installing mandrel for radial sealing ring with 81 mm OD                      |                    |    | 116 589 10 15 00 |
| Gauge for measuring spread by means of 2 mounting blocks                      | large center piece |    | 116 589 04 21 00 |
|   | small center piece |    | 115 589 04 21 00 |
| Backlash gauge  |                    |     | 115 589 03 23 00 |
| Assembly mandrel for inner race of tapered roller bearing                     |                    |  | 115 589 04 61 00 |
| Puller for tapered roller bearing   |                    |   | 123 589 08 33 00 |
| Puller for pulling gear wheel on drive pinion of vehicles with ABS            |                    |   | 000 589 88 33 00 |

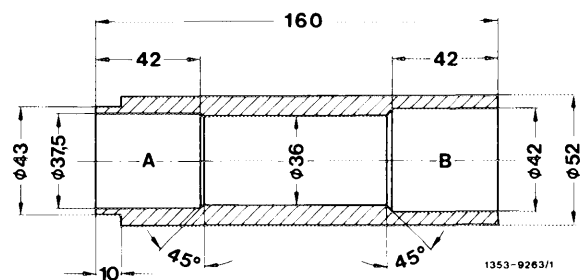
**Conventional tools**

Two-arm puller e.g. made by Nexus, D-5630 Remscheid  
order no. 100 size 2

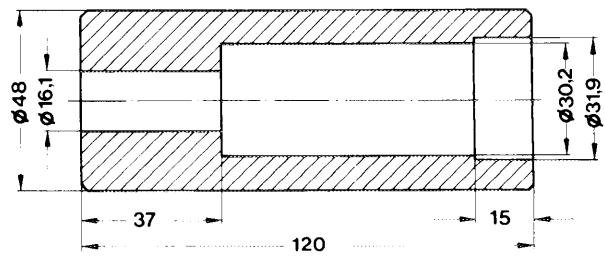
**Self-made tools**

Installing sleeve for tapered roller bearing on drive pinion

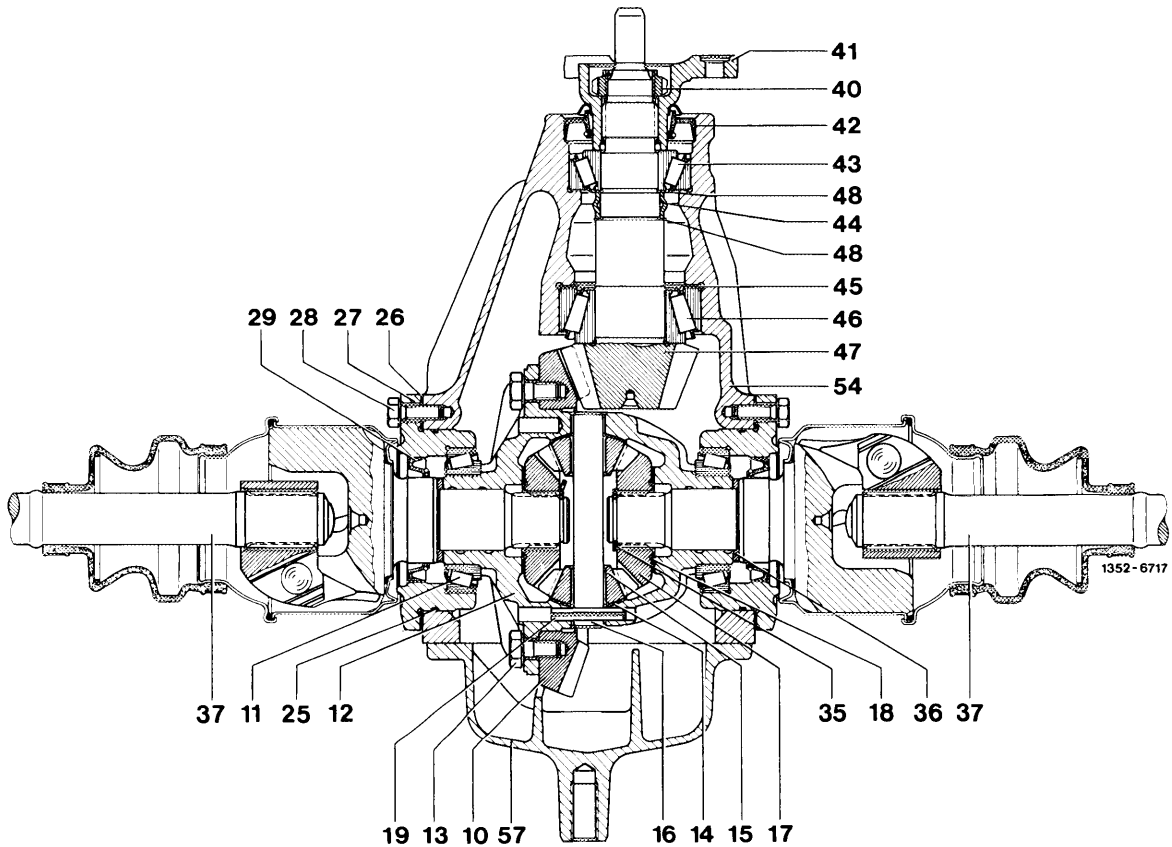
A = Small drive pinion  
B = Large drive pinion



Installing sleeve for gear wheel on drive pinion of vehicles with ABS



1354-9282



- 10 Ring gear
- 11 Tapered roller bearing
- 12 Differential housing
- 13 Hex bolt
- 14 Ball washer
- 15 Differential pinion
- 16 Differential pinion shaft

- 17 Side gear
- 18 Thrust washer
- 19 Clamping sleeve
- 25 Sealing ring
- 26 Compensating washer
- 27 Bearing cap
- 28 Hex bolt

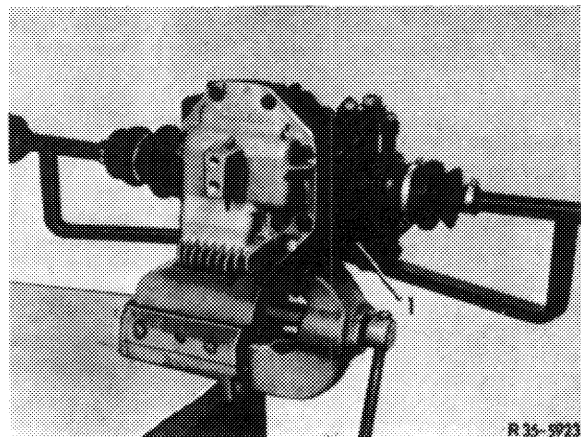
- 29 Radial sealing ring
- 35 Locking ring
- 36 Compensating washer
- 37 Rear axle shaft complete
- 40 Crush collar nut or double hex. collar nut
- 41 Universal flange
- 42 Radial sealing ring

- 43 Small tapered roller bearing
- 44 Spacing sleeve
- 45 Compensating washer
- 46 Large tapered roller bearing
- 47 Drive pinion
- 48 Thrust washer
- 54 Rear axle housing
- 57 Rear axle end cover

## Disassembly

### Removing differential together with ring gear

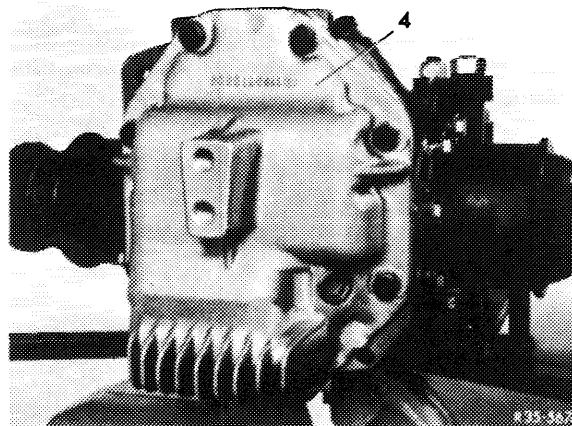
- 1 Remove rear axle center piece with rear axle shafts (35-520).
- 2 Clamp rear axle center piece with rear axle shafts on assembly stand (1) and support rear axle shafts. Drain oil from rear axle housing.



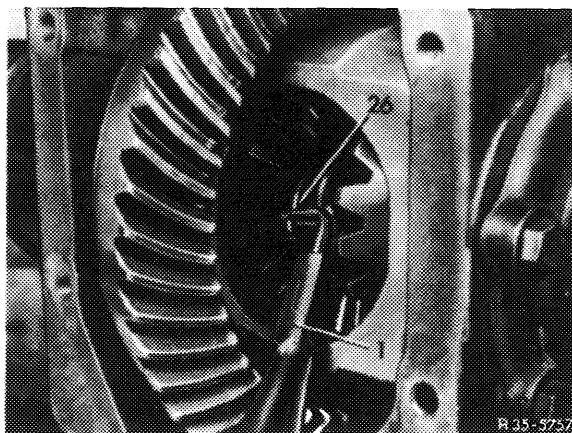
R 35-5923



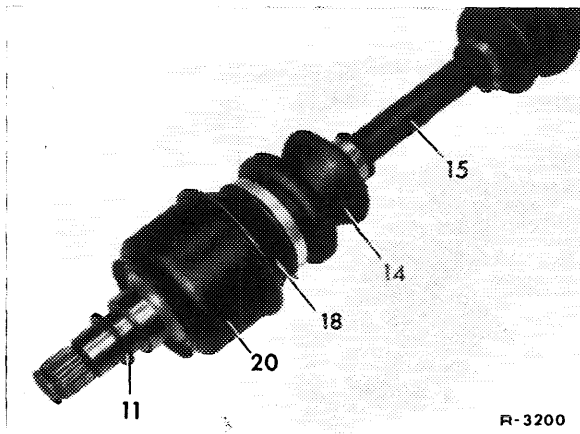
3 Unscrew end cover (4) from rear axle housing.



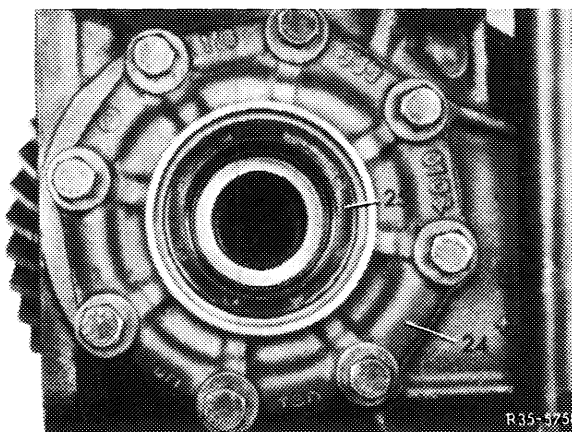
4 Pull off locking rings (26) between inner synchromesh joints and side gears by means of pliers (1) or a hook and remove from housing.



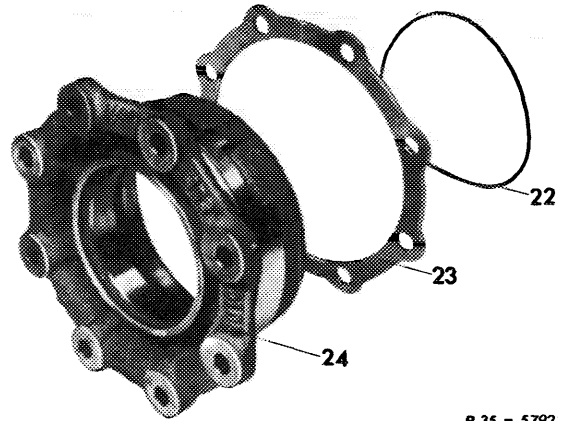
5 Pull rear axle shafts out of side gears and remove together with spacing rings (11).



6 Remove lateral bearing caps (24).



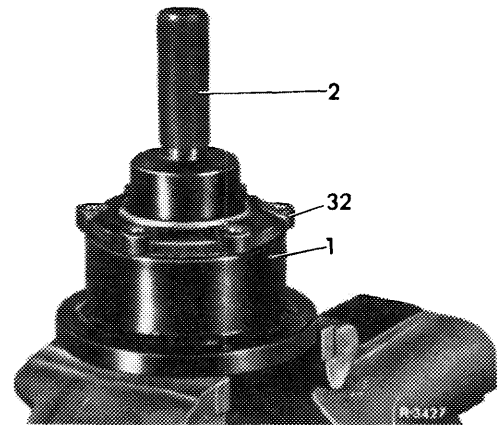
7 Pull off sealing rings (22). Remove compensating washers (23) for adjusting backlash or spread dimension (widening) and mark together with bearing caps (for lefthand and righthand side).



R 35 - 5792

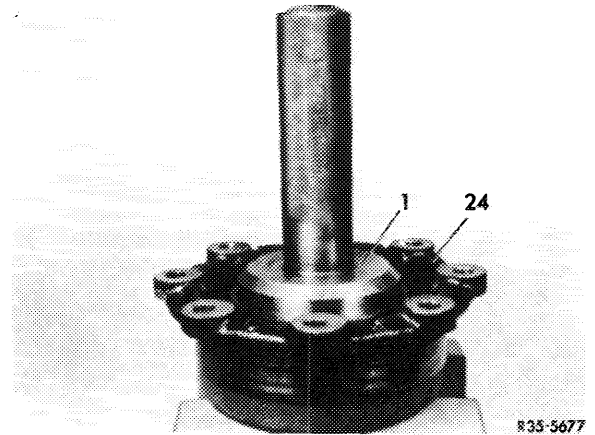
**With small rear axle center piece**

8 Press radial sealing ring and tapered roller bearing outer race together out of bearing cap by means of removing tool (1 and 2).

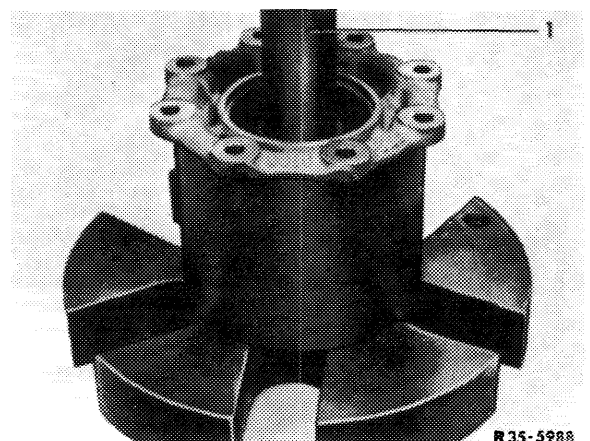


**With large rear axle center piece**

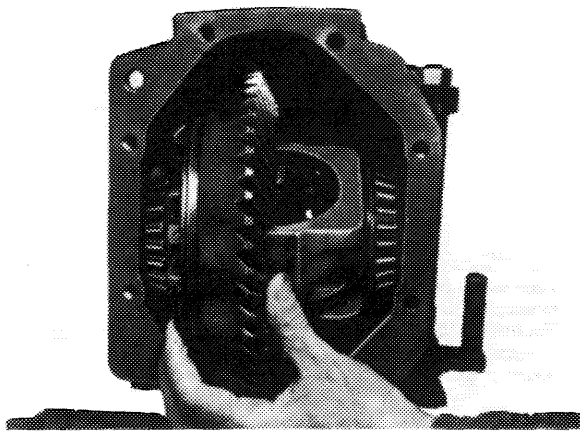
9 Force radial sealing ring out of bearing cap by means of removing tool (1).



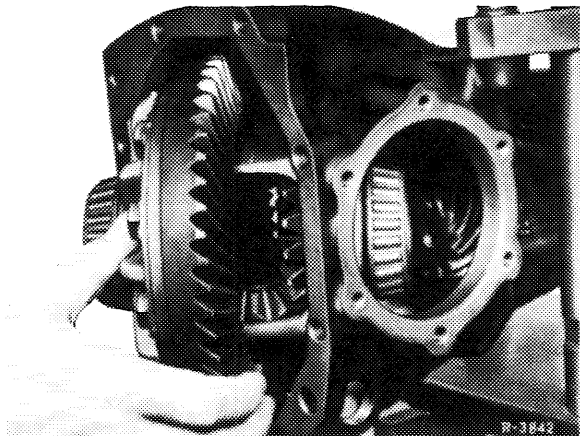
10 Force out bearing outer race by means of removing tool (1).



11 Take differential out of rear axle housing (large center piece).

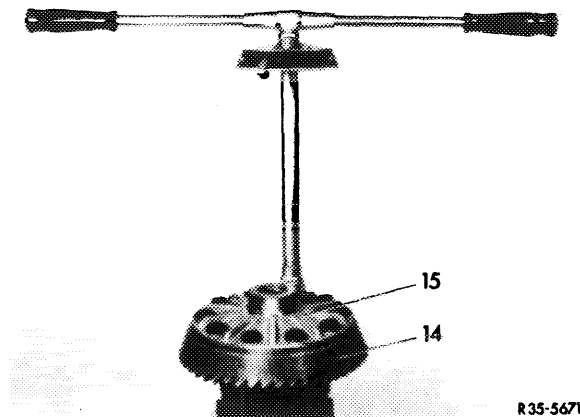


12 Move differential into position shown and take out of rear axle housing (small center piece).



**Note:** If the wheel assembly is used again, mark position of ring gear in relation to differential housing, so that the ring gear is reinstalled in the same position as before.

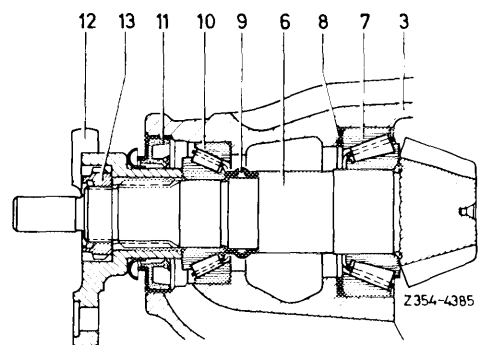
13 Unscrew ring gear from differential housing and carefully push from housing.



### Removing and checking drive pinion

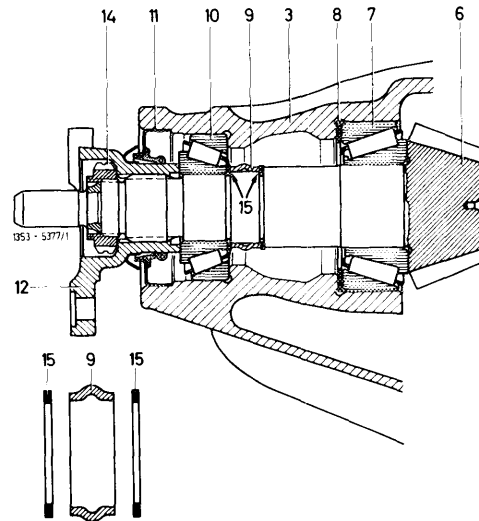
1st version

- |                           |  |
|---------------------------|--|
| 3 Rear axle housing       | 11 Radial sealing ring                 |
| 6 Drive pinion            | 12 Universal flange                    |
| 7 Tapered roller bearing  | 13 Self-locking slot nut (1st version) |
| 8 Compensating washer     |  |
| 9 Spacing sleeve          |  |
| 10 Tapered roller bearing |  |



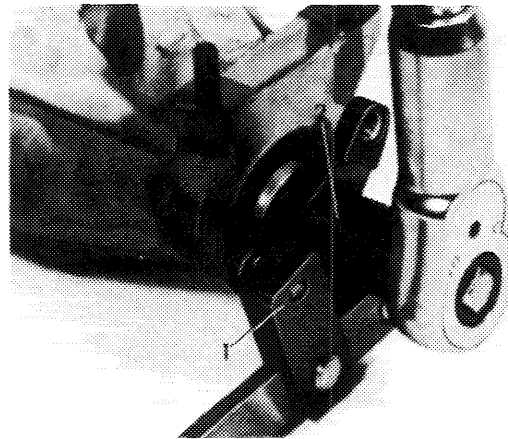
2nd version

- |                           |                                 |
|---------------------------|---------------------------------|
| 3 Rear axle housing       | 11 Radial sealing ring          |
| 6 Drive pinion            | 12 Universal flange             |
| 7 Tapered roller bearing  | 14 Crush slot nut (2nd version) |
| 8 Compensating washer     | or double hex. collar nut       |
| 9 Spacing sleeve          | (3rd version)                   |
| 10 Tapered roller bearing | 15 Washer                       |

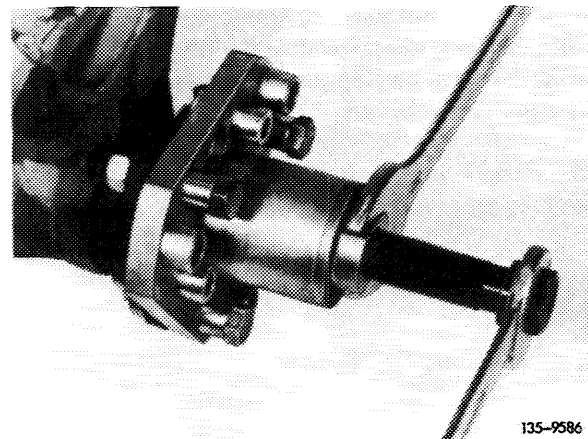


14 Plug holding wrench (1) on universal flange and loosen self-locking or crush slot nut with slot nut wrench (2) or double hex. collar nut with double hex. socket.

15 Mark universal flange in relation to drive pinion.



16 Pull universal flange from drive pinion with puller, if required.



17 Force drive pinion out of rear axle housing by means of a conventional puller.

