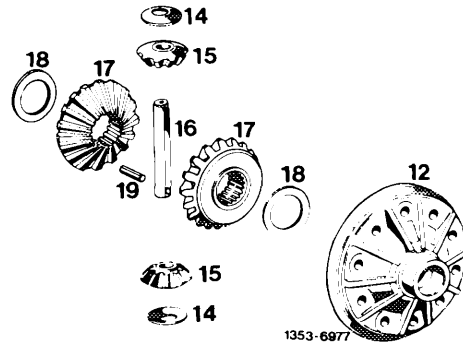


A. Standard differential



| | | |
|----|-------------------------------------|---|
| 12 | Differential housing | Check vertical and axial runout on fitted dia. for ring gear, max. 0.02 |
| 14 | Spherical washer | Renew |
| 15 | Differential | Check for damage |
| 16 | Differential pinion shaft | Check for wear |
| 17 | Differential side gear | Check for damage |
| 18 | Thrust washer | Renew, selecting thickness to obtain a friction torque of 30–90 Nm |
| 19 | Clamping sleeve | Renew |

Adjustment of differential gears

| | |
|---|----------|
| Friction torque when rotating complete differential | 30–90 Nm |
|---|----------|

Differential

| | |
|--|------|
| Permissible vertical runout of differential housing on fit for ring gear | 0.02 |
|--|------|

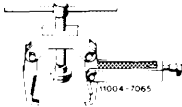
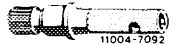

| | |
|--|------|
| Permissible lateral runout of differential housing on flange surface for ring gear | 0.02 |
|--|------|

| | | | |
|----------------------------|-----------|----------------------------------|-------------|
| Thrust washer on side gear | Thickness | large center piece ¹⁾ | 1.3 to 1.7 |
| | | small center piece ¹⁾ | 1.0 to 1.7 |
| | Steps | | 0.1 mm each |

| | | |
|-----------------|----------------------------------|--------|
| Clamping sleeve | large center piece ¹⁾ | 6 x 45 |
| | small center piece ¹⁾ | 6 x 40 |

¹⁾ Refer to installation survey rear axle center piece 35–500

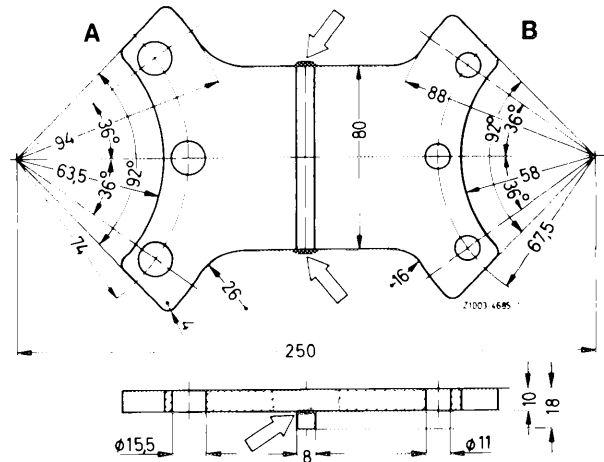
Special tools

| | | |
|---|---|------------------|
| Puller for tapered roller bearing |  | 123 589 08 33 00 |
| Assembly mandrel (2 each) for side gears |  | 116 589 18 61 00 |
| Assembly mandrel for differential gears | large center piece | 126 589 02 15 00 |
| | small center piece | 123 589 06 15 00 |
| Assembly mandrel for inner race of tapered roller bearing | large center piece | 116 589 08 61 00 |
| | small center piece | 115 589 04 61 00 |
| Support for differential housing |  | 126 589 06 31 00 |

Self-made tool

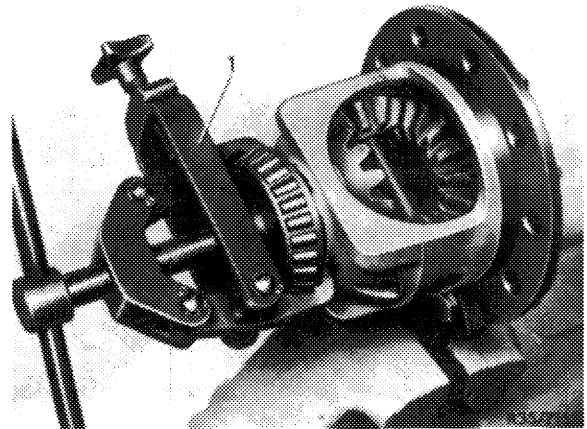
Clamping device for differential

A = large rear axle center piece
 B = small rear axle center piece
 Arrow = intermediate web welded

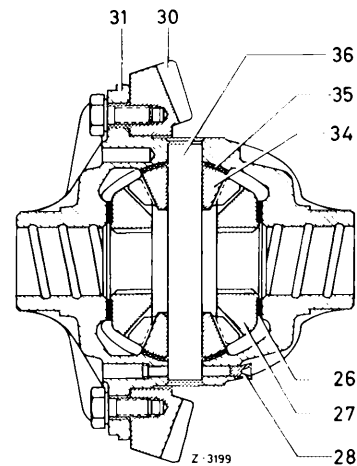


Disassembly

- 1 Clamp differential with self-made clamping device into vise.
- 2 Pull both tapered roller bearing inner races from differential housing with puller (1).



- 3 Knock clamping sleeve (28) for differential pinion shaft (36) out of differential housing (31) by means of a matching mandrel.



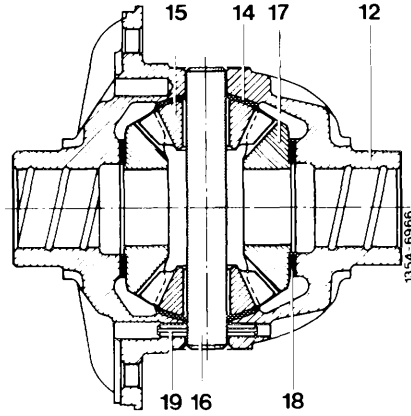
Complete differential of 1st version

- | | |
|--------------------|------------------------------|
| 26 Thrust washer | 31 Differential housing |
| 27 Side gear | 34 Differential pinion |
| 28 Clamping sleeve | 35 Ball washer |
| 30 Ring gear | 36 Differential pinion shaft |

4 Force out differential pinion shaft and remove differential pinions, side gears, thrust washers and ball washers.

Complete differential of 2nd version

- | | |
|------------------------------|--------------------|
| 12 Differential housing | 17 Side gear |
| 14 Ball washer | 18 Thrust washer |
| 15 Differential pinion | 19 Clamping sleeve |
| 16 Differential pinion shaft | |



5 Check individual parts for re-use. Renew all overheated or seized differential pinions, thrust washers and ball washers on principle.

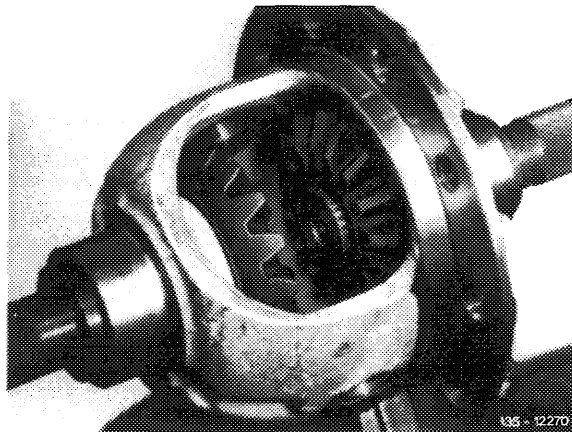
6 Check bores in differential housing. Check fit and supporting surface for ring gear for radial and axial runout.

Assembly

7 Insert both assembly mandrels into bores of differential housing.

8 Place thrust washer on side gears.

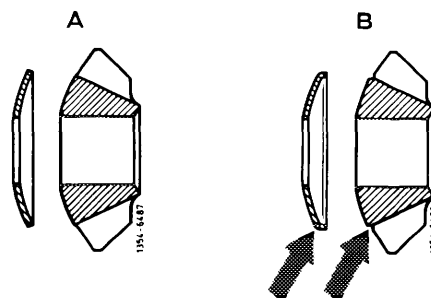
9 Place both side gears with thrust washers on assembly mandrels in differential housing.



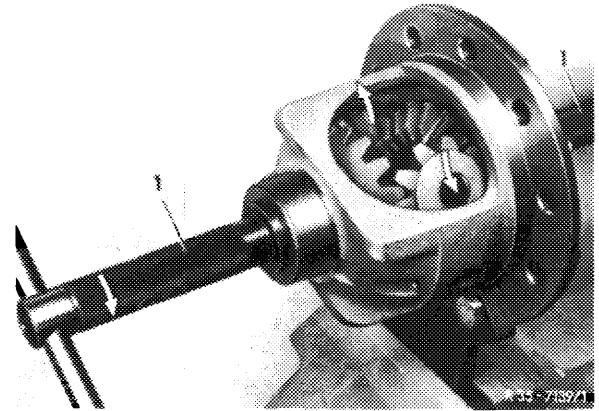
Attention!

To facilitate assembly, the ball washers of the present version (B) of the differential are provided with a collar at OD and the differential pinions with a shoulder (arrow).

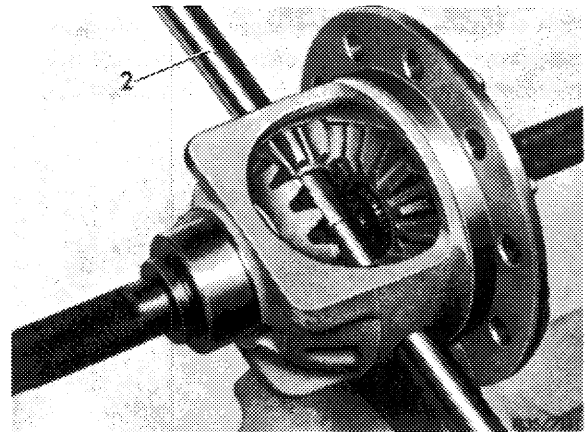
Mount differential pinions and ball washers only in the combination shown in illustration.



10 Turn both differential pinions and ball washers together into differential housing by means of assembly mandrel (1).

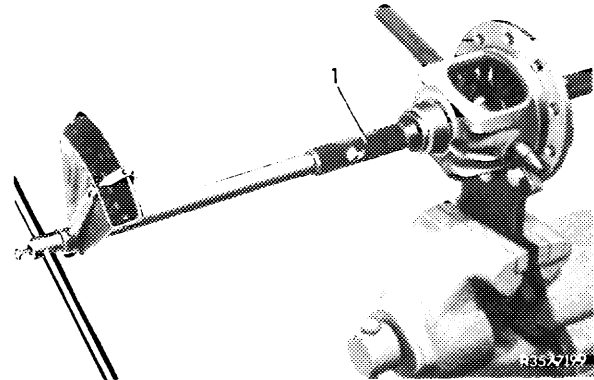


11 Slip assembly mandrel (2) instead of differential bolt into differential housing to locate differential pinions and ball washers.

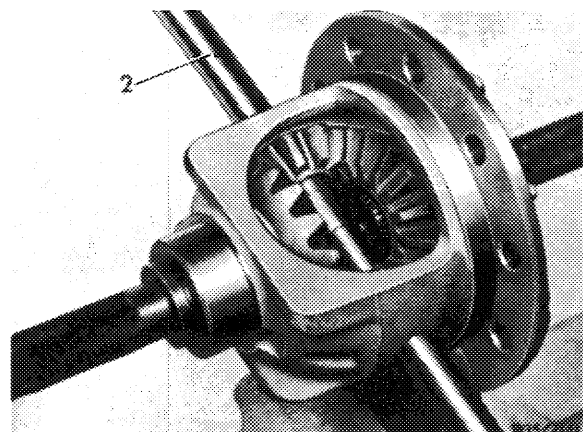


12 Check friction torque. Friction torque should amount to 30–90 Nm, at restraining points up to 100 Nm.

Note: Select thrust washers for side gears in such a manner that a given friction torque is available during assembly.



13 Knock in differential bolt while paying attention to bore for clamping sleeve.

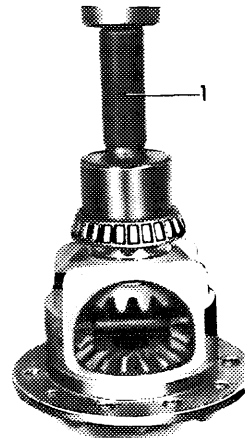


14 Knock in new clamping sleeve.

15 Press inner races of tapered roller bearings on differential housing by means of assembly mandrel (1).

Assembly mandrel for:

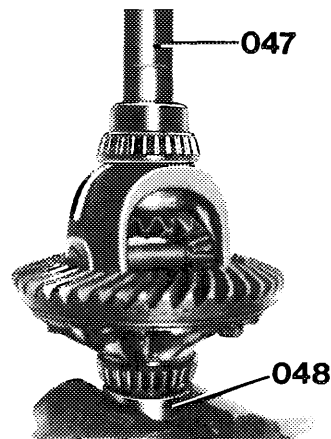
| | | |
|-------|-------------------------|------------------|
| small | rear axle center piece: | 115 589 04 61 00 |
| large | rear axle center piece: | 116 589 08 61 00 |



R35/7156

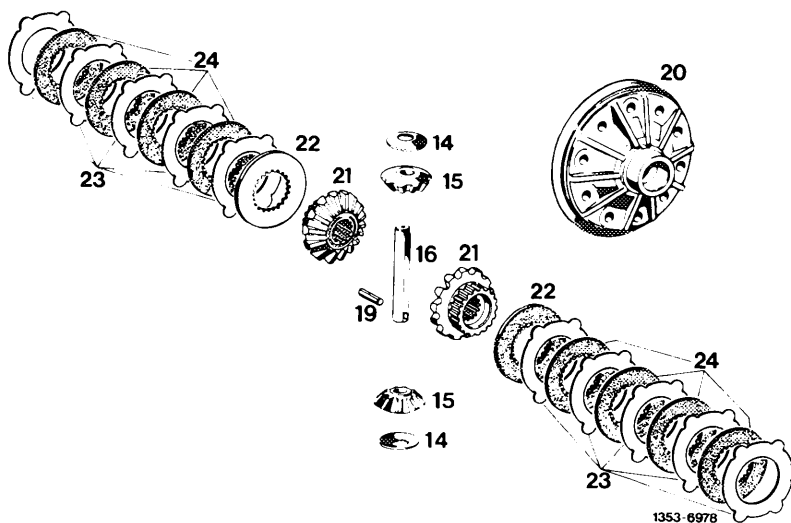
Attention!

To prevent damage to roller cage when pressing-on second inner race, use support (048) (for small rear axle center piece without lateral bearing caps only).



135-19649

B. Differential with limited slip



| | | |
|----|---|--|
| 14 | Spherical washer | Renew |
| 15 | Differential pinion | Check for damage |
| 16 | Differential pinion shaft | Check for wear |
| 19 | Clamping sleeve | Renew |
| 20 | Differential housing | Check vertical and axial runout on fitted dia. for ring gear, max. 0.02 mm |
| 21 | Differential side gear | Check for damage |
| 22 | Friction disc with lining on one side | Renew, selecting thickness to obtain a friction torque of 80–140 Nm |
| 23 | Friction disc without lining | Check for wear |
| 24 | Friction disc with lining on both sides | Check for wear |

Adjustment of differential gears

| | |
|---|-----------|
| Friction torque when rotating complete differential | 80–140 Nm |
|---|-----------|

Differential

| | |
|--|------|
| Permissible vertical runout of differential housing at fit for ring gear | 0.02 |
|--|------|

| | |
|--|------|
| Permissible lateral runout of differential housing at flange surface for ring gear | 0.02 |
|--|------|

Thickness of friction discs

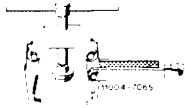
| | |
|----------------|-----|
| Without lining | 1.1 |
|----------------|-----|


| | |
|---------------------------|-----|
| With lining on both sides | 1.8 |
|---------------------------|-----|

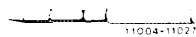
| | | |
|-------------------------|-----------|-------------------------|
| With lining on one side | Thickness | 3.0–3.6 and 4.0 |
| | Steps | from 0.1 to 0.1 and 0.4 |


| | |
|-----------------|--------|
| Clamping sleeve | 6 x 45 |
|-----------------|--------|

Special tools

| | | |
|-----------------------------------|---|------------------|
| Puller for tapered roller bearing |  | 123 589 08 33 00 |
|-----------------------------------|---|------------------|

| | | |
|--|---|------------------|
| Assembly mandrel (2 each) for side gears |  | 116 589 18 61 00 |
|--|---|------------------|

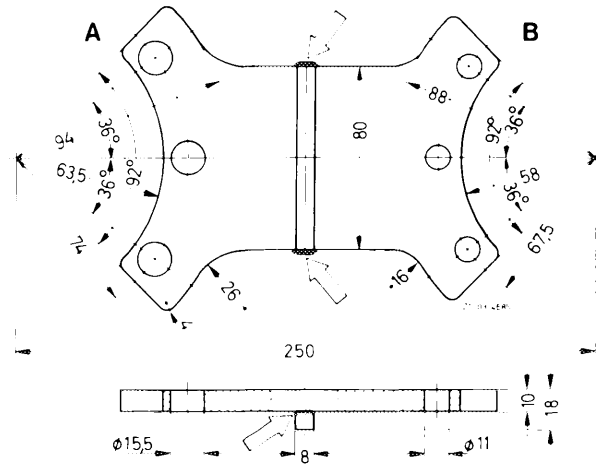
| | | |
|---|---|------------------|
| Assembly mandrel for differential gears |  | 126 589 02 15 00 |
|---|---|------------------|

| | | |
|---|---|------------------|
| Assembly mandrel for inner race of tapered roller bearing |  | 116 589 08 61 00 |
|---|---|------------------|

Self-made tool

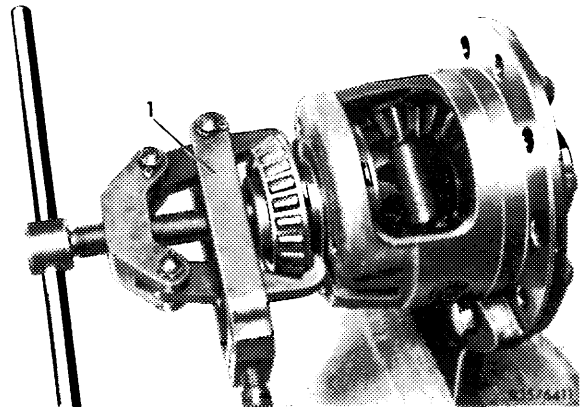
Clamping device for differential

A = large rear axle center piece
 B = small rear axle center piece
 Arrow = intermediate web welded



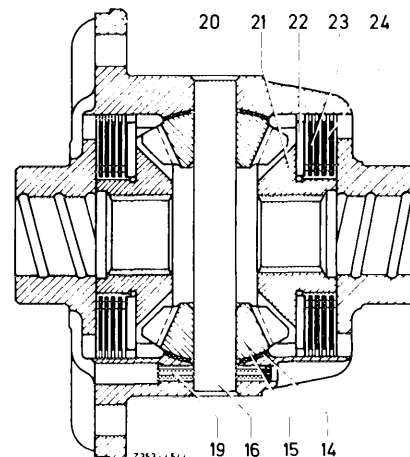
Disassembly

- 1 Clamp differential with clamping device (self-made) into vise.
- 2 Pull both tapered roller bearings from differential housing by means of puller (1).

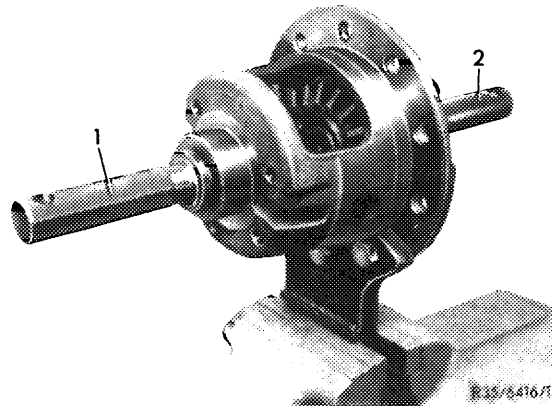


- 3 Knock clamping sleeve (19) for differential pinion shaft (16) out of differential housing (20) by means of a matching mandrel.
- 4 Knock out differential bolt (16).

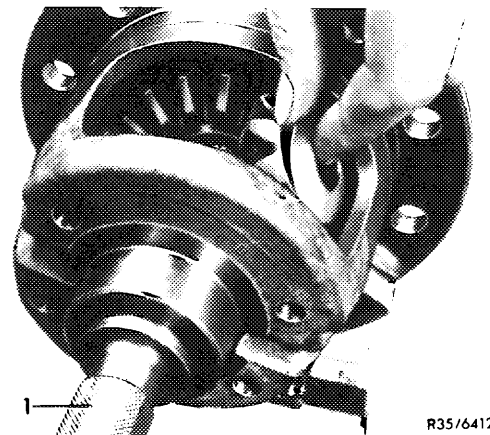
- | | |
|---------------------------------------|--|
| 14 Ball washer (spherical washer) | 22 Friction disc with lining on one side |
| 15 Differential pinion | 23 Friction disc with lining on both sides |
| 16 Differential pinion shaft | 24 Friction disc without lining |
| 19 Clamping sleeve (hollow dowel pin) | |
| 20 Differential housing | |
| 21 Side gear | |



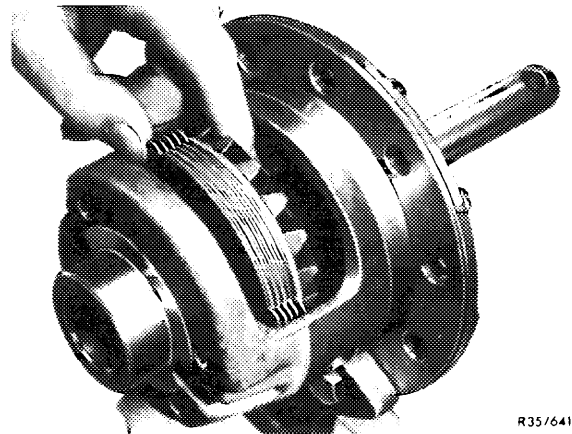
5 Insert assembly mandrels (1 and 2) for guiding side gears.



6 Turn out differential pinions with ball washers and remove.



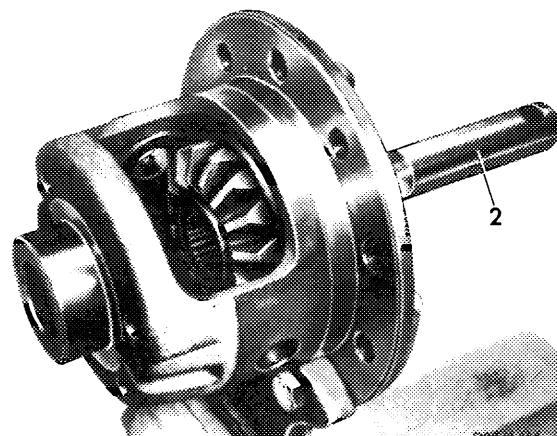
7 Remove righthand side gear with friction discs.



8 Remove lefthand side gear with friction discs.

9 Check individual parts for re-use and renew, if required.

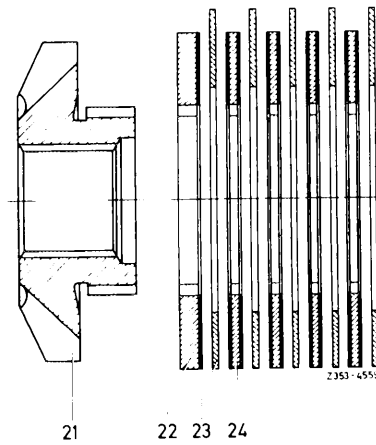
10 Check bores in differential housing. Check fit for ring gear for vertical runout and contact surface for lateral runout.



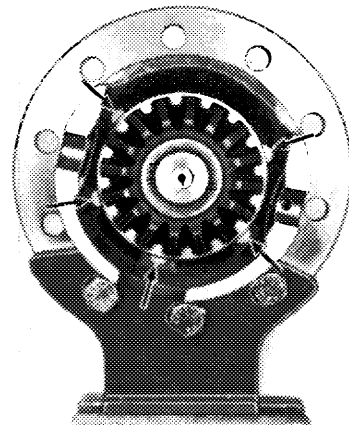
Assembly

Note: When new friction discs are installed, it will be of advantage to measure the removed friction discs with lining on one side (22) and to reinstall new friction discs of the same thickness.

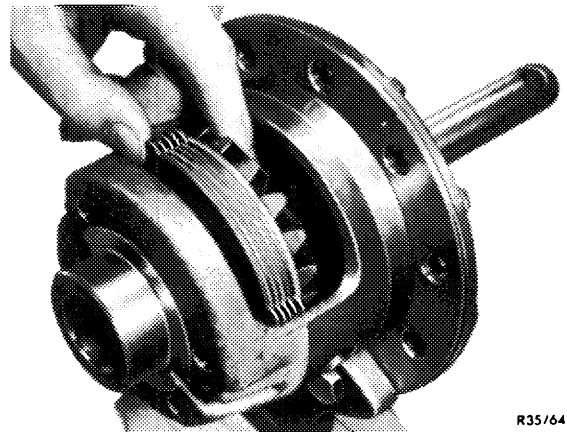
11 Place friction discs in correct sequence on both side gears and coat friction discs with lining (22 and 24) with Hypoid gear oil (refer to specifications for service products page 235.3).



12 Install lefthand side gear (ring gear end) together with friction discs and insert assembly mandrel, while paying attention to lugs of friction discs without lining (arrows).

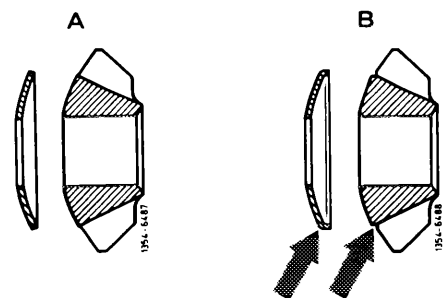


13 Install righthand side gear with friction discs and assembly mandrel.



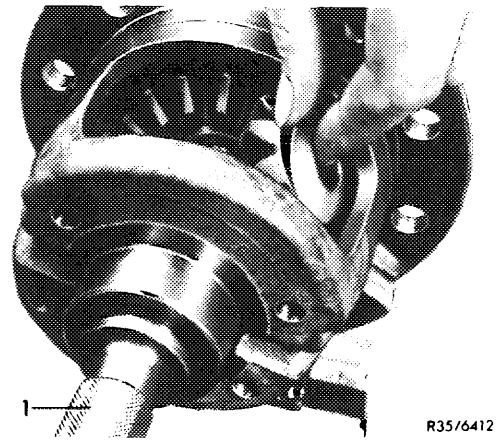
Attention!

To facilitate assembly, the ball washers of the present version (B) of the differential are provided with a collar at OD and the differential pinions with a shoulder (arrows). Mount differential pinions and ball washers only in the combination shown in illustration.

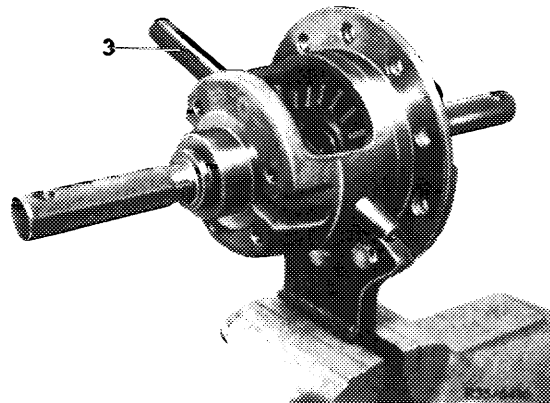


14 Insert one differential pinion with ball washer into differential and turn downward.

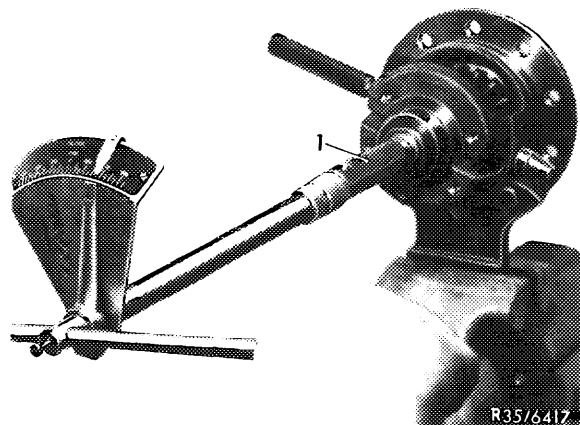
15 Insert second differential pinion with ball washer exactly opposite and turn down together until bores of differential pinion and differential housing are in alignment.



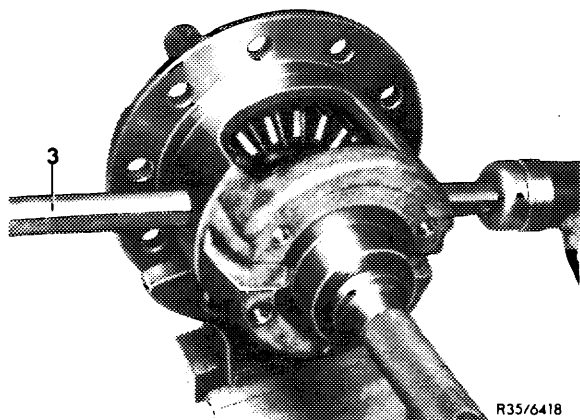
16 Insert assembly mandrel (3) instead of differential pinion shaft to locate differential pinions and ball washers.



17 Check friction torque. Friction torque should amount to approx 80–140 Nm.

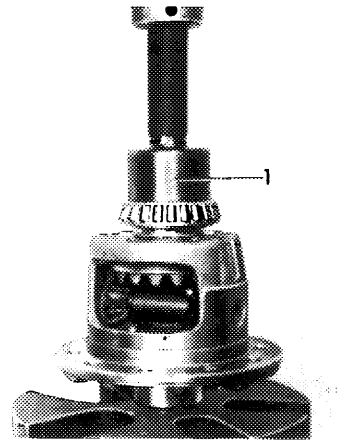


18 Knock in differential pinion shaft and remove assembly mandrel (3).



19 Knock in new clamping sleeve.

20 Press on inner races of tapered roller bearings by means of assembly mandrel (1).



R35/6419