

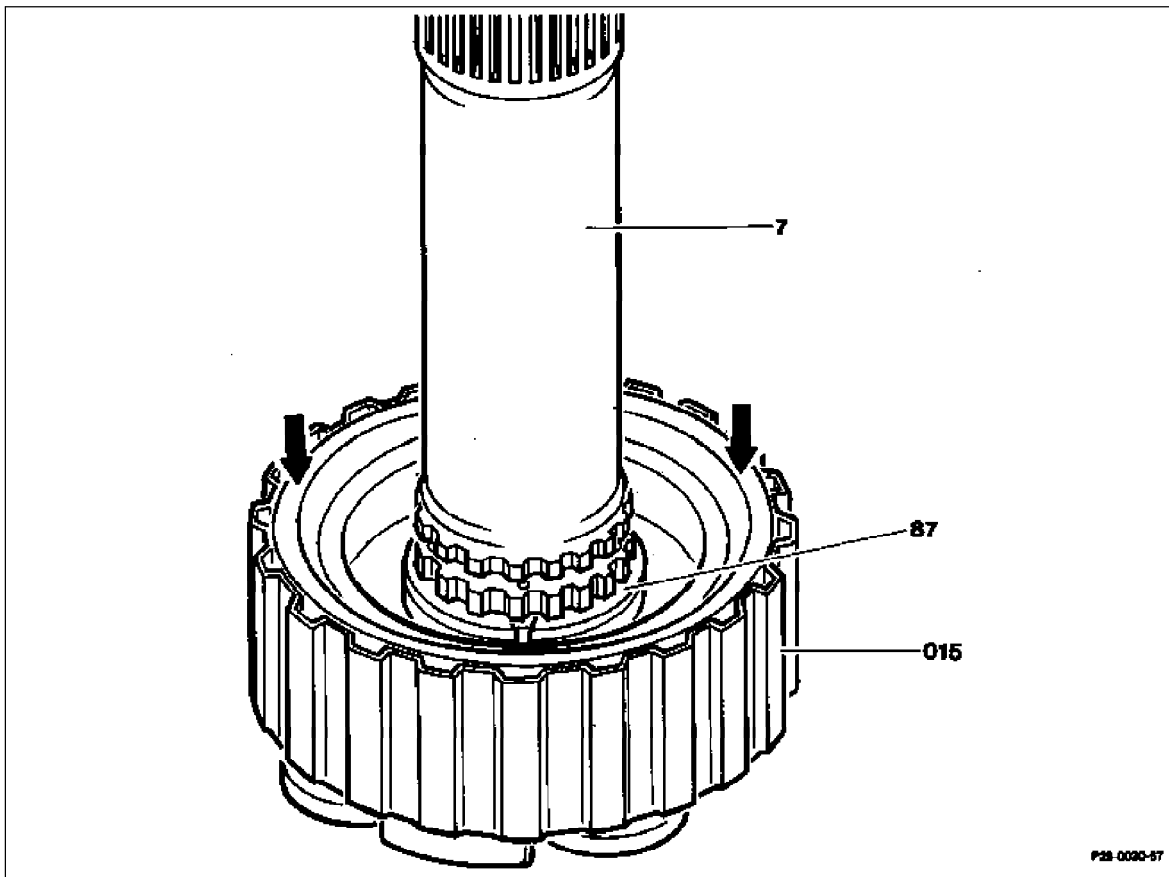
## 28-301 Repairing multi-disk stack of center differential lock (ZS)

Preceding work:

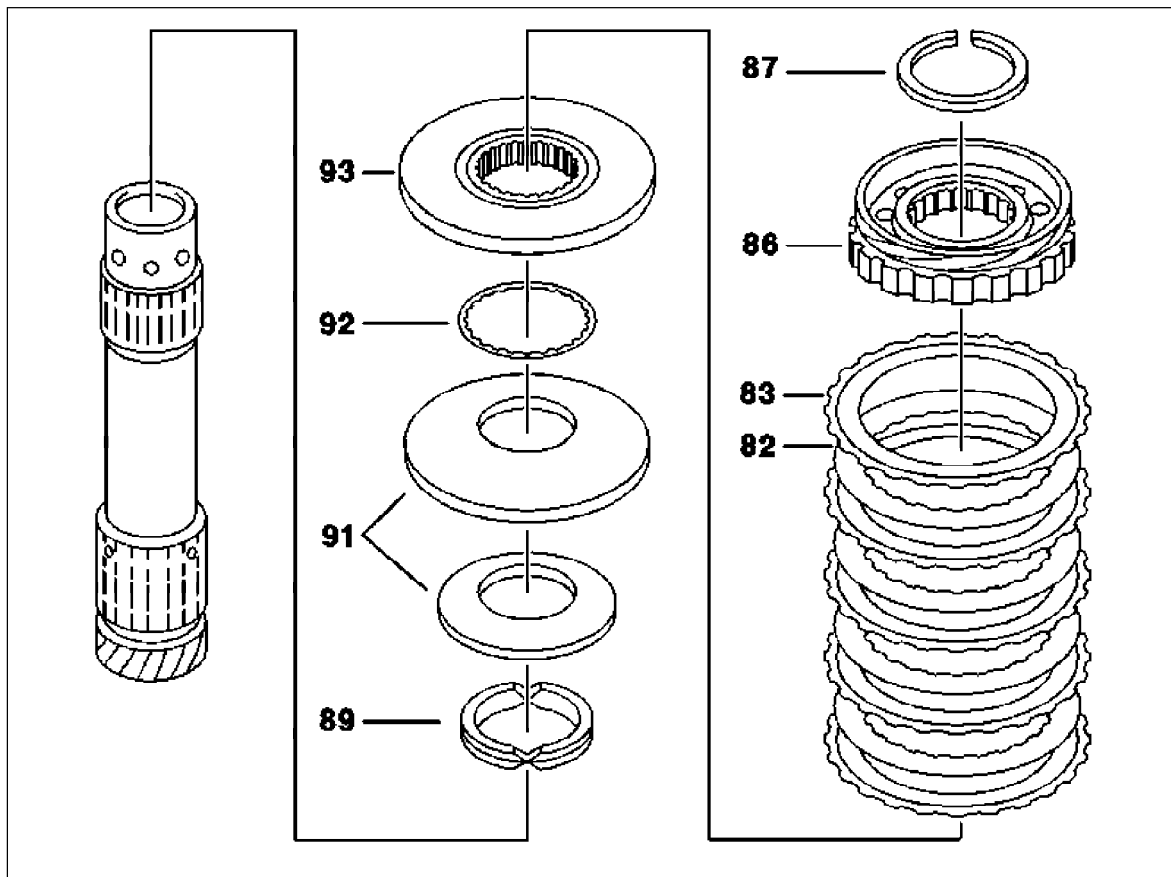
Sun gear shaft removed (28-300, section A).

### A. Dismantling and assembling (up to transfer case no. 26 616)

Dismantling and assembling (production up to 05/91)



Snap ring (87) \_\_\_\_\_ Remove, install. Mount locator (015) on sun gear shaft (7). Press down multi-disk stack using suitable press at the marked position (arrows).  
Pliers 000 589 52 37 00,  
Locator 124 589 04 31 00.



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Inner multi-disk carrier (86)	Remove, install.
Multi-disk stack	Remove, check for burnt spots and evidence of settling. When installing, place new multi-disks in ATF oil for approx. 1 hour.
Pressure plate (93)	Remove spacer ring (92) and diaphragm spring (91).

**Note**

The diaphragm spring (91) always consists of two parts, either diaphragm spring with narrow shim or diaphragm spring with support spring.

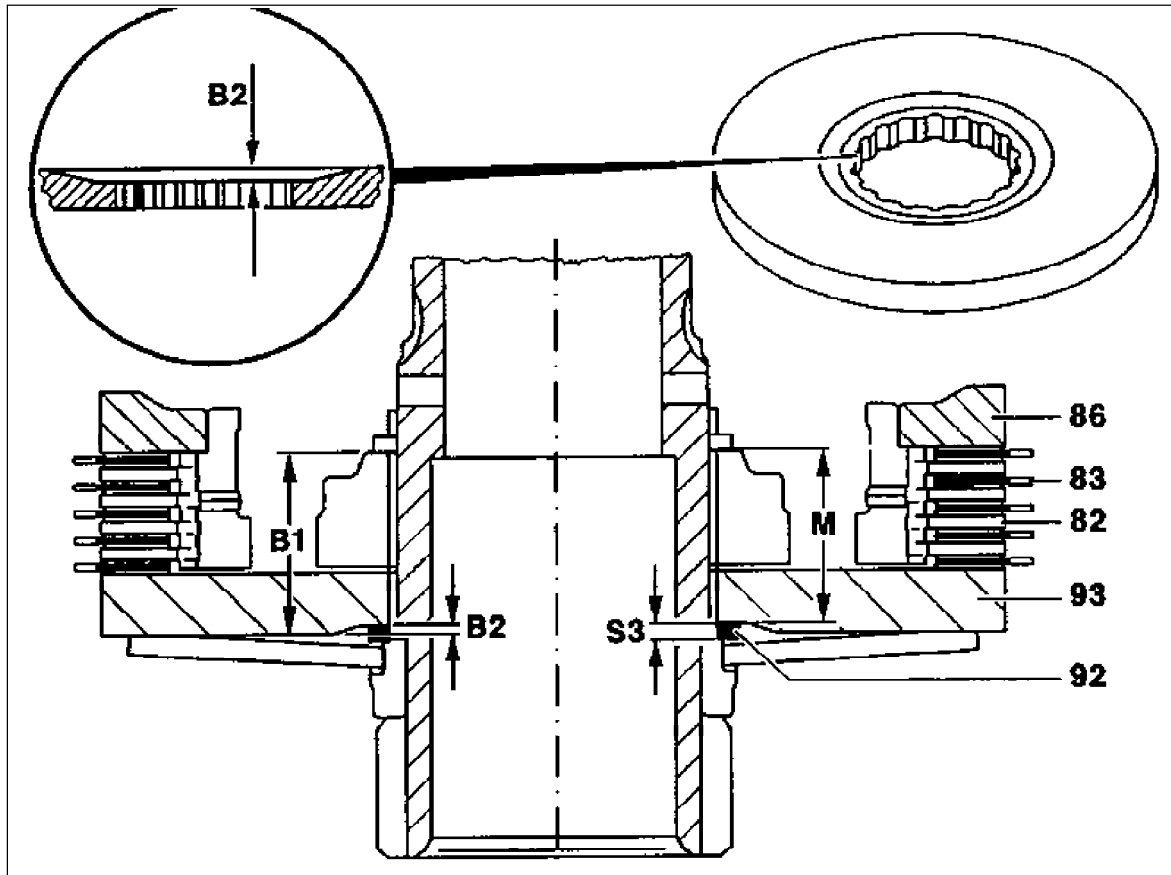
Locking halves (89)	Remove, install.
Multi-disk stack	Measure.

**Special tools**



**B. Measuring (up to transfer case no. 26 616)**

Multi-disk stack of center differential lock (ZS) without automatic adjustment



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82 Inner multi-disk  
83 Outer multi-disk  
86 Inner multi-disk carrier

92 Spacer ring  
93 Pressure plate

Dimension "B1" \_\_\_\_\_ Measure. During the measurement, compress multi-disk stack (82 and 83) in the inner multi-disk carrier (86) by hand (numbers 1 and 2).

Dimension "B2" \_\_\_\_\_ Measure at pressure plate (93) using a depth gauge (number 3)

Dimension "M" \_\_\_\_\_ Specified value 25.25 mm up to 25.85 mm (number 4).  
Dimension "M" = (B1 - B2).

Thickness "S3" of spacer ring (92) \_\_\_\_\_ Calculate (number 5).  
 $S3 = 27.9 - (M + 0.35)$ .

**Note**

The dimensions 27.9 mm and 0.35 mm are specified by design.

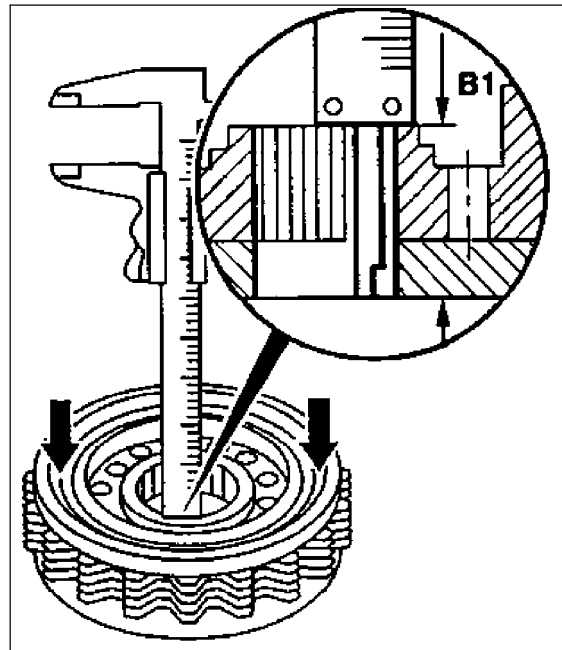
Spacer rings (92) are available in thicknesses of 1.5 mm to 2.3 mm in increments of 0.1 mm.

### Measuring

1 Measure dimension "B1".

Place pressure plate and inner multi-disk carrier with multi-disk stack on a measuring plate.

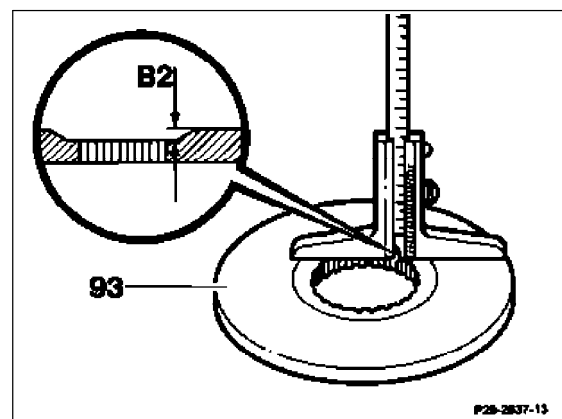
2 Using a caliper gauge measure from the hub of the inner multi-disk carrier to the measuring plate. During the measurement the multi-disk stack must be compressed by hand (arrows).



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3 Measure dimension "B2".

Measure turned groove of pressure plate (93) with a depth gauge.



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4 Calculate dimension "M".

**Specified value** 25.25 mm - 25.85 mm

**Calculation formula:**  $B1 - B2 = M$

Example:

$B1 = 26.7 \text{ mm}$

$B2 = 1.2 \text{ mm}$

$M = 26.7 \text{ mm} - 1.2 \text{ mm} = 25.5 \text{ mm}$

If the dimension "M" does not correspond to the specified value, it must be corrected by inserting suitable steel multi-disks.

Steel multi-disks are available in thicknesses of 1.8 mm and 2.0 mm.

5 Calculate thickness S3 of spacer ring.

**Calculation formula:**  $S3 = 27.9 - (M + 0.35)$

### Note

The dimensions 27.9 mm and 0.35 mm are specified by design.

Example:

$27.9 - (M 25.5 + 0.35) = 25.85$

$27.9 - 25.85 = 2.05$

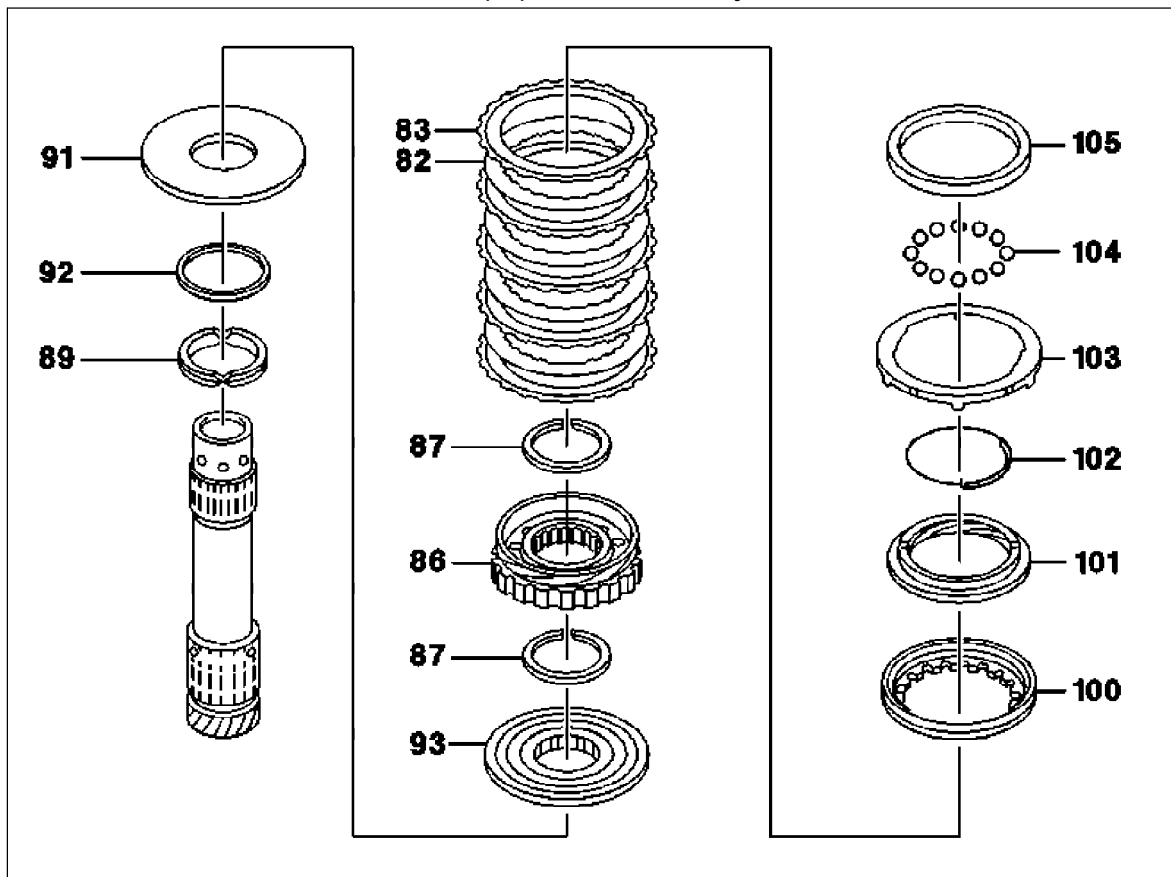
$S3 = 2.05$

A spacer ring of 2.1 mm thickness is to be installed.

Spacer rings are available in thicknesses of 1.7 mm to 2.3 mm in increments of 0.1 mm.

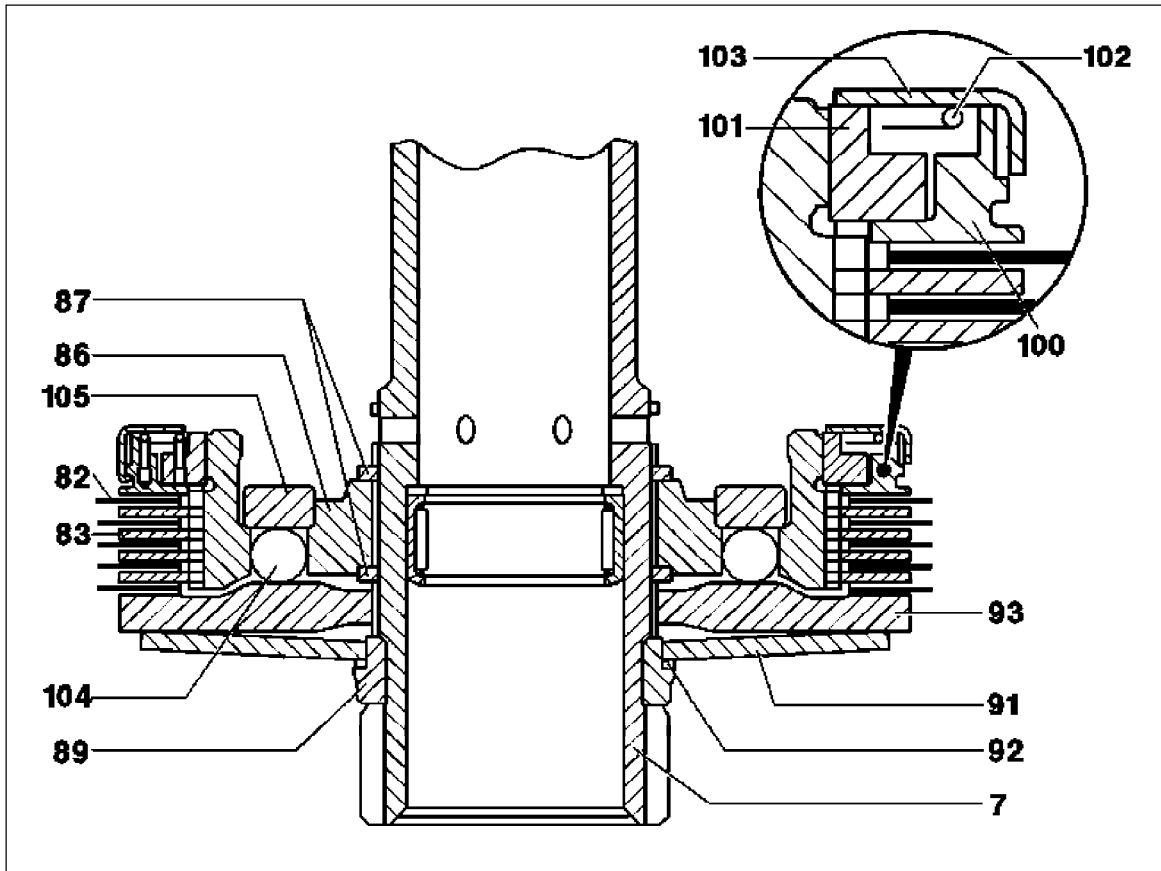
C. Dismantling and assembling (as of transfer case no. 26 617)

Multi-disk stack of center differential lock (ZS) with automatic adjustment



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82	Inner multi-disk	93	Pressure plate
83	Outer multi-disk	100	Final disk
86	Inner multi-disk carrier	101	Adjusting nut (left-hand thread)
87	Circlip	102	Wire circlip
89	Circlip (2-piece)	103	Closing plate
91	Disk spring	104	Balls
92	Spacer ring	105	Thrust washer

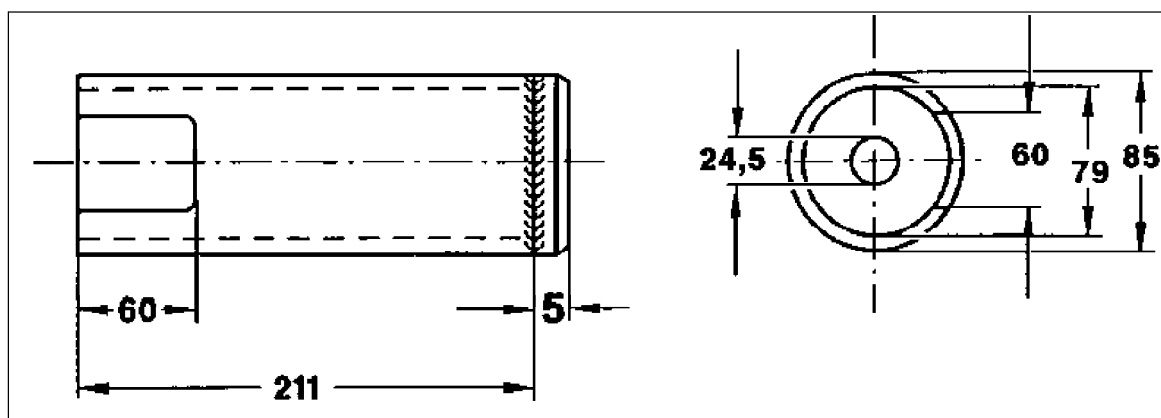


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7	Sun gear shaft	93	Pressure plate
82	Inner multi-disk	100	Final disk
83	Outer multi-disk	101	Adjusting nut (left-hand thread)
86	Inner multi-disk carrier	102	Wire circlip
87	Circlip	103	Closing plate
89	Circlip (2-piece)	104	Balls
91	Disk spring	105	Thrust washer
92	Spacer ring		

### Shop-made tool

**Assembly sleeve** (Material - structural steel ST37)



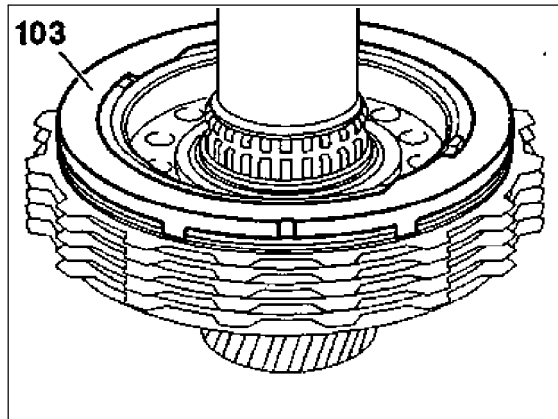
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### Special tools



### Dismantling

1 Bend up all securing clips and carefully remove closing plate (103).

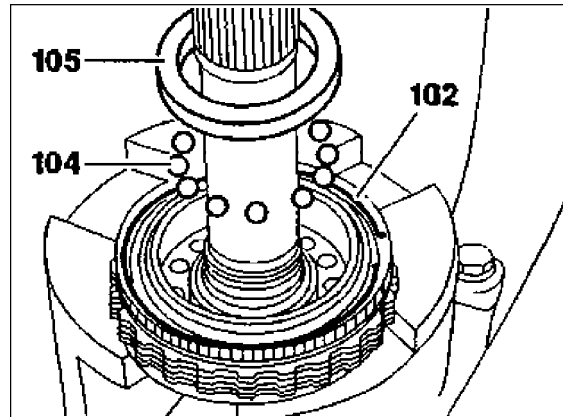


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2 Remove wire circlip (102). Insert balls (104) and thrust washer (105).

#### Note

Observe installed position of thrust washer (105). One-piece contact surface points towards the axial bearing.



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3 Mount assembly sleeve (016) and preload disk spring using the clamping device 201 589 00 63 00 or a hydraulic press.

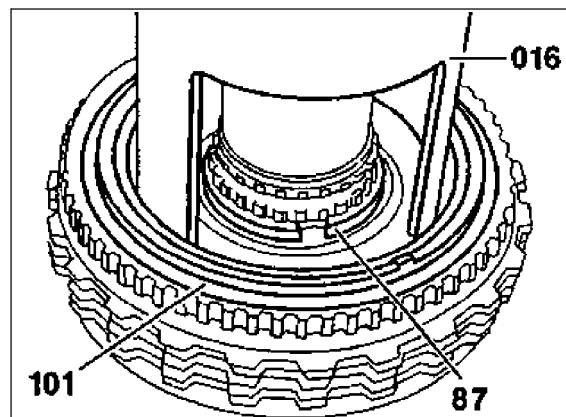
#### Note

To preload the disk springs, clamp the shaft in a vise, push on sun gear shaft with center differential lock clutch and tighten tensioning nut using a box wrench WAF 32.

4 Unscrew adjusting nut (101). Remove circlip (87) from the groove using pliers 000 580 53 37 00 and push upwards.

#### Note

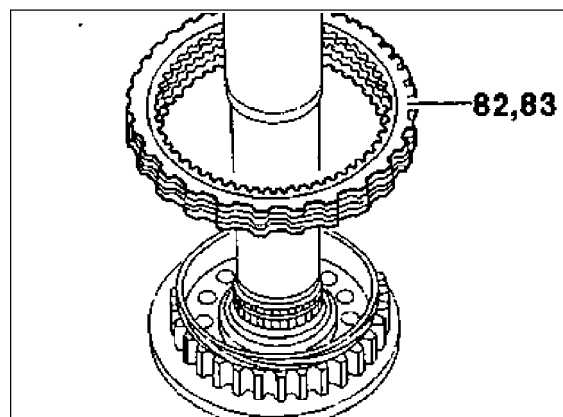
Adjusting nut with left-hand thread



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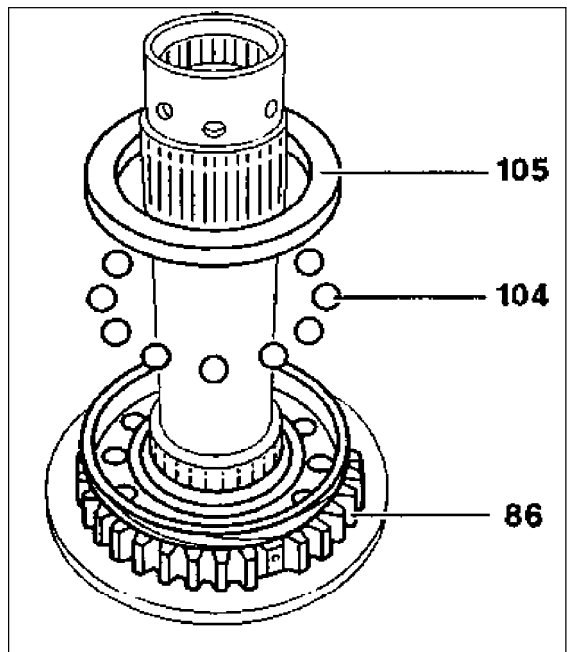
5 Remove assembly sleeve (016).

6 Remove multi-disk stack (82, 83).



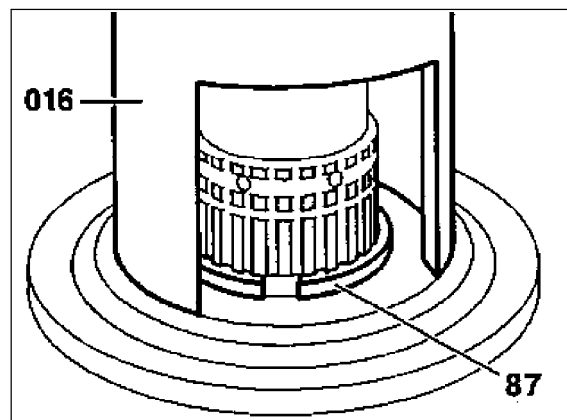
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7 Remove inner multi-disk carrier (86) with balls (104) and thrust washer (105).



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- 8 Mount assembly sleeve (016) and preload disk spring.
- 9 Remove circlip (87) from the groove using pliers and push upwards.
- 10 Remove assembly sleeve (016).

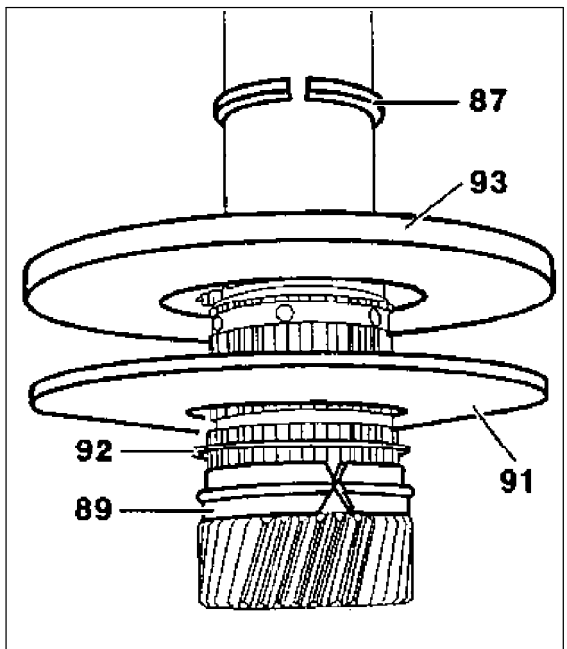


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- 11 Remove pressure plate (93), disk spring (91) with spacer ring (92) and 2-piece circlip (89).

### Assembly

- 12 Push on 2-piece circlip (89), spacer ring (92), disk spring (91), thrust plate (93) and circlip (87).



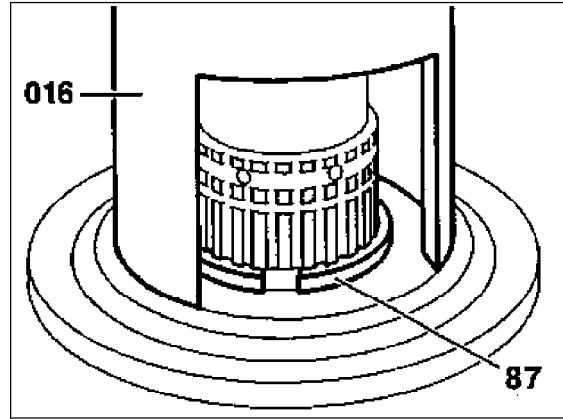
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13 Mount assembly sleeve (016) and preload disk spring.

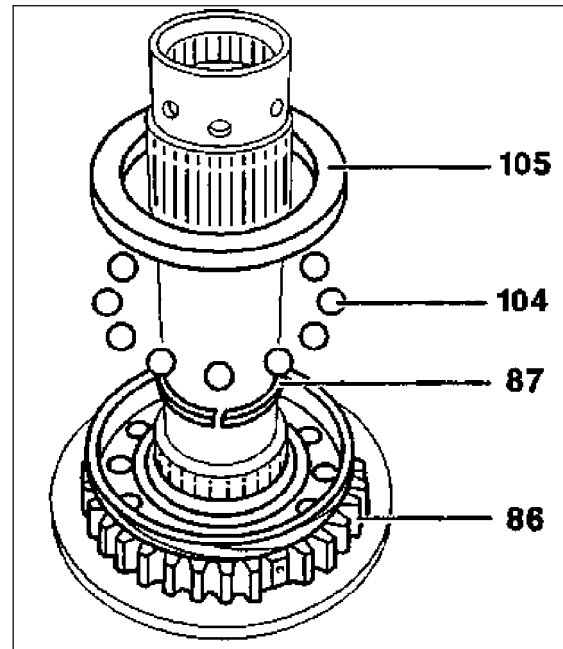
14 Insert circlip (87) in the groove of the sun gear shaft using pliers.

15 Remove assembly sleeve (016).



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16 Push on inner multi-disk carrier (86) and circlip (87) and insert balls (104) and thrust washer (105).

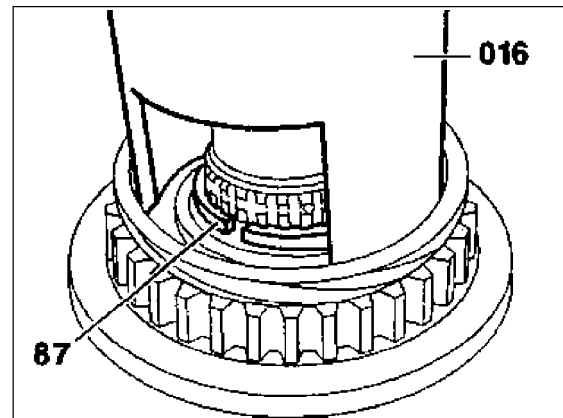


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17 Mount assembly sleeve (016) and preload disk spring.

18 Mount circlip (87) in the groove of the sun gear shaft using pliers.

19 Remove assembly sleeve (016).

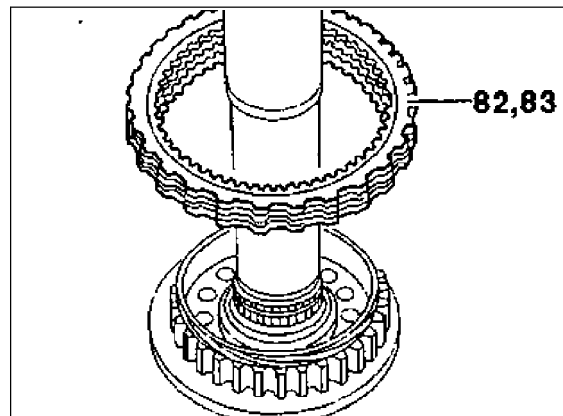


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20 Mount outer multi-disks (83) and inner multi-disks (82) on the inner multi-disk carrier.

**Note**

Place new multi-disks in ATF oil for approx. 1 hour.

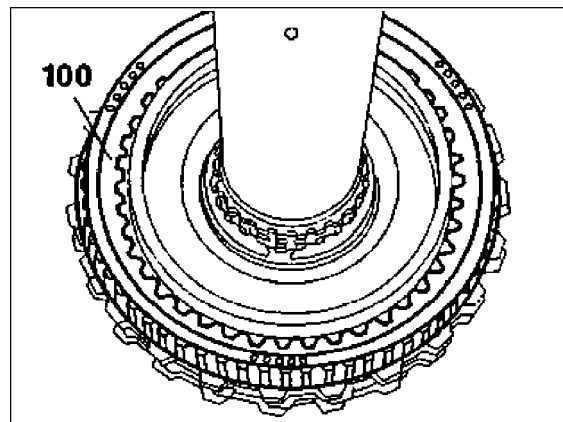


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21 Insert final disk (100).

**Note**

Center multi-disk **exactly** on the splines of the inner multi-disk carrier.



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22 Insert sun gear shaft complete in the locator 124 589 04 31 00, centering the multi-disk stack at the same time.

23 Place adjusting nut (101) on the inner multi-disk carrier (86).

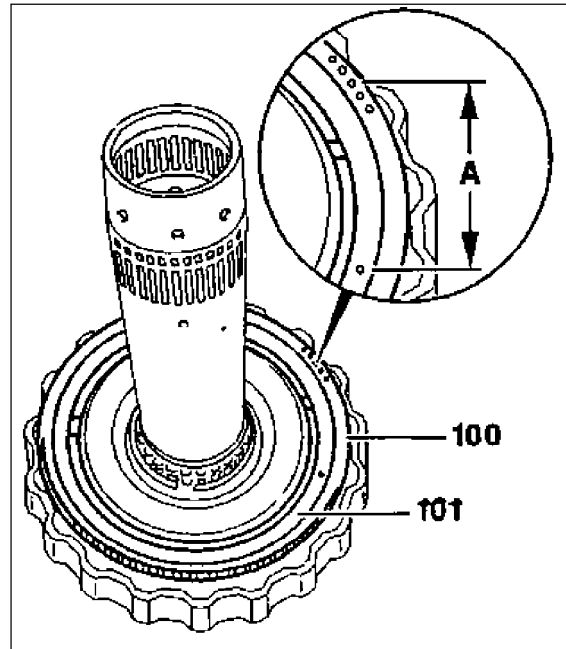
24 Mount assembly sleeve and preload disk spring.

25 Screw on adjusting nut (101) until there is a distance of approx. 3 cm (A) between the center bore of the adjusting nut (101) and the center bore of the final disk (100).

**Note**

Only assemble adjusting nut (101) **loosely**. The dimension (A) can be corrected by relocating the final disk (100).

26 Remove assembly sleeve.

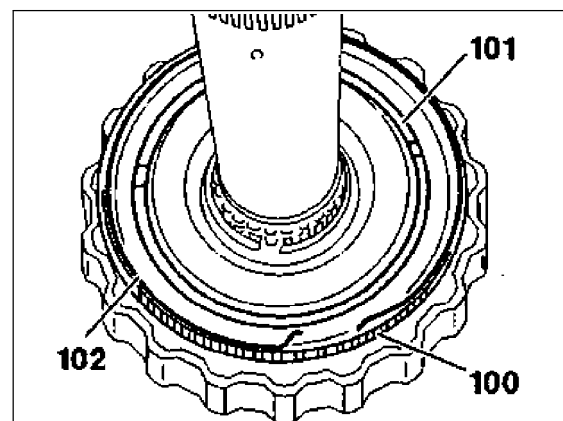


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27 Insert the wire circlip (102) so that this contacts the outer circumference of the final disk (100) for at **least 90°**, but a **maximum of 270°**.

**Checking automatic adjustment**

Mount assembly sleeve (16) and preload disk spring, observing whether the wire circlip (102) adjusts the adjusting nut (101) **automatically** due to its spring force.



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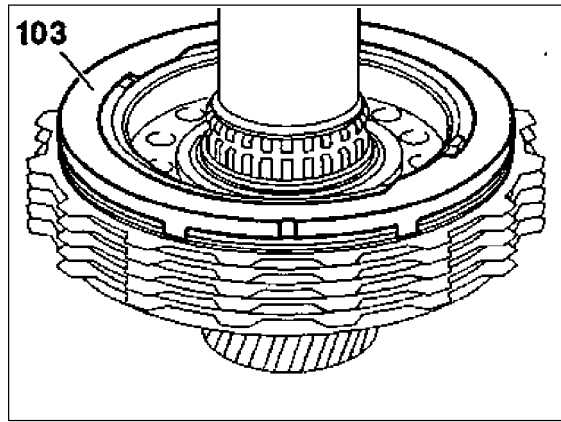
**Note**

If the adjusting nut (101) has **not adjusted** itself when the load on the disk spring (91) is relieved, the center differential lock is excessively preloaded or a mistake was made during assembly. Dismantle the sun gear again and rebuild from item 12.

28 Mount closing plate (103) and carefully bend over all securing clips.

**Note**

When bending over the securing clips, ensure that no outer multi-disk is damaged.



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