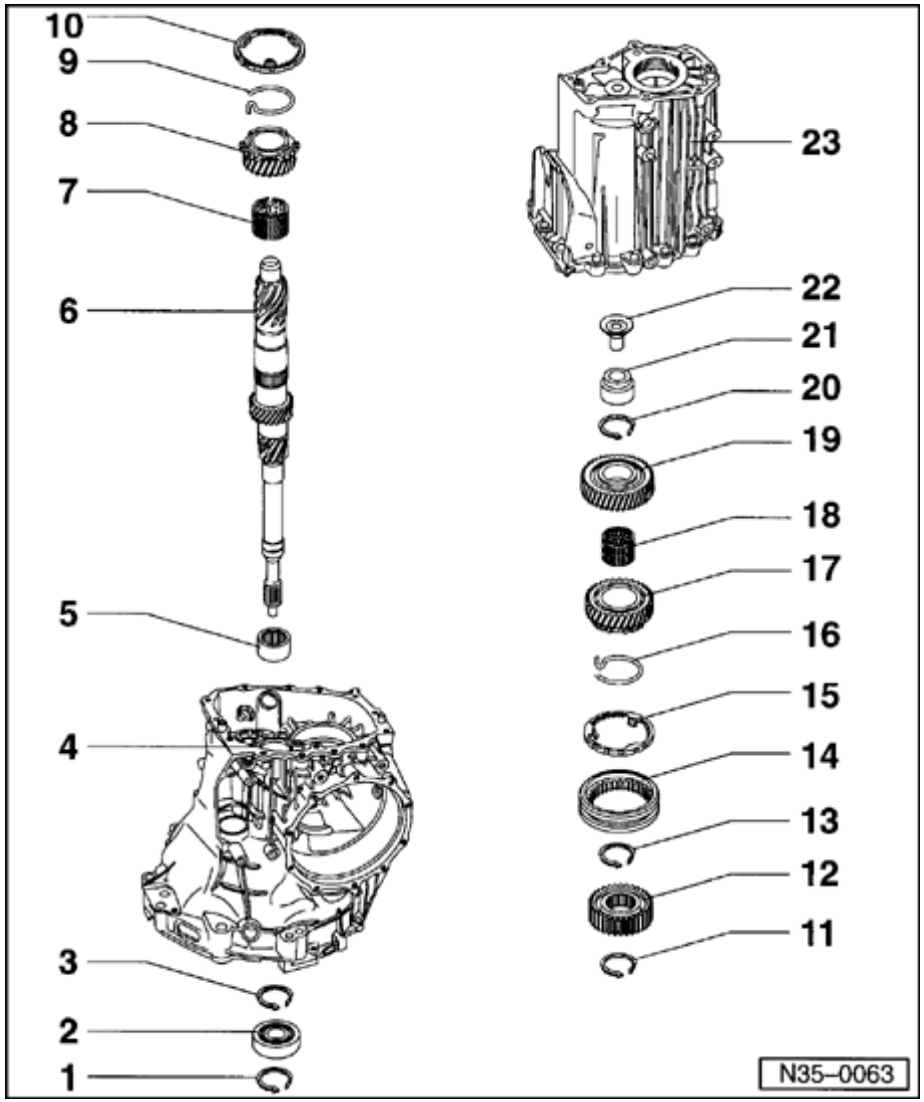
Input shaft, disassembling and assembling

Special tools and equipment

- VW222A pilot drift
- VW295 needle bearing drift
- VW295A needle bearing drift
- VW401 thrust plate and VW402 thrust plate
- VW407 punch and VW408A punch
- VW415A tube and 416B tube
- VW447I thrust pad
- VW771 slide hammer-complete set
- 30-24 drift
- 30-100 press tube

- 40-105 thrust piece
- 40-202 press-out piece
- Kukko 17/2 separating tool
- Kukko 21/4 extractor



Notes:

- *When installing the input shaft or new gears, consult technical data ⇒ Page 00-3 .*
- *By exchanging parts (Figs. 2, 4 and 6), the position of the ball bearing is influenced. In this case the input shaft must be re-adjusted ⇒ Page 35-17 .*

1 - Circlip

- Identification
- Allocation ⇒ Fig. 14 , item -1-
- Determining thickness ⇒ Page 35-17 , input shaft, adjusting

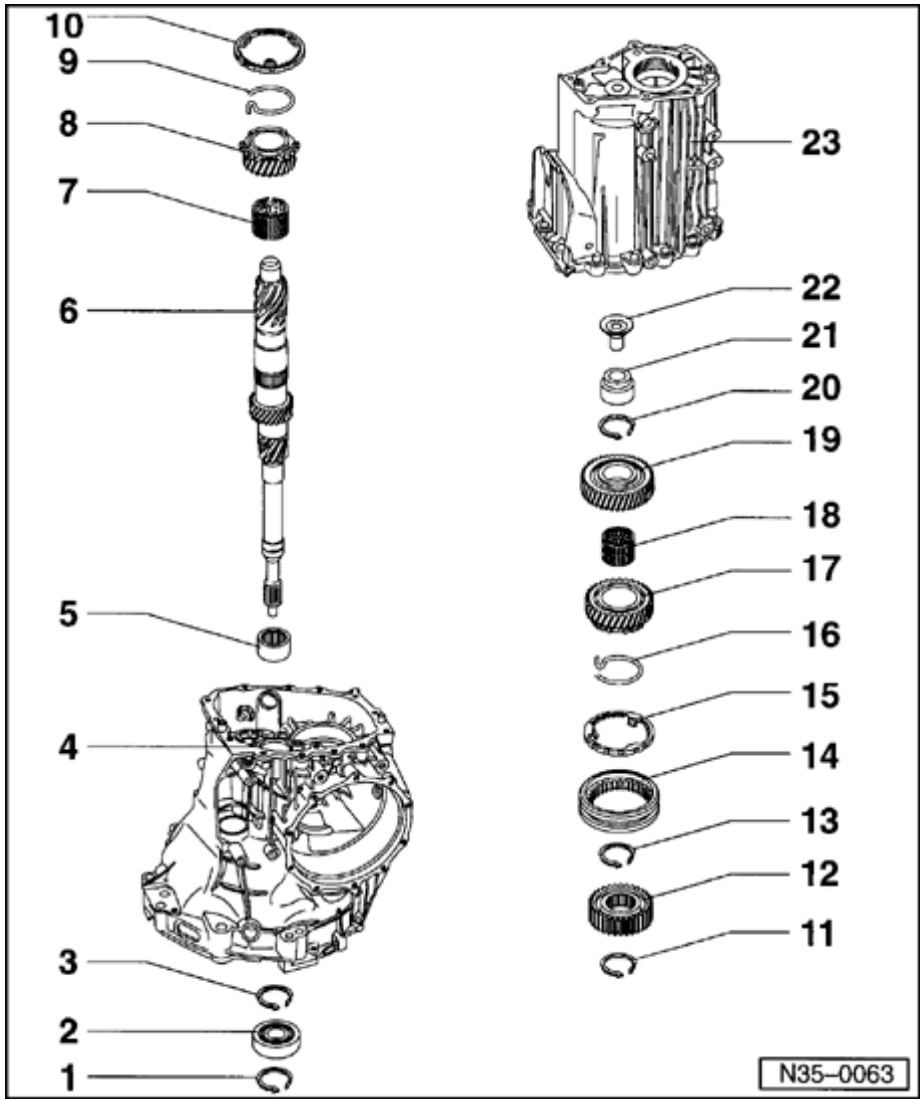
2 - Ball bearing for input shaft

- Removing and installing ⇒ Page 34-55

3 - Circlip

- Identification
- Allocation ⇒ Fig. 14 , item -2-
- Determining thickness ⇒ Page 35-17 , input shaft, adjusting

4 - Transmission housing



5 - Needle bearing for input shaft

- Secured with bolt ⇒ Fig. 1
- Driving out ⇒ Fig. 2
- Application of input shaft/needle bearing ⇒ Fig. 3
- Allocation ⇒ Fig. 4
- Pressing in ⇒ Fig. 5

6 - Input shaft

- With oiling sleeve
- Driving in oiling sleeve ⇒ Fig. 6
- Application of input shaft/needle bearing ⇒ Fig. 3
- Adjusting ⇒ Page 35-17

7 - Needle bearing for 3rd gear

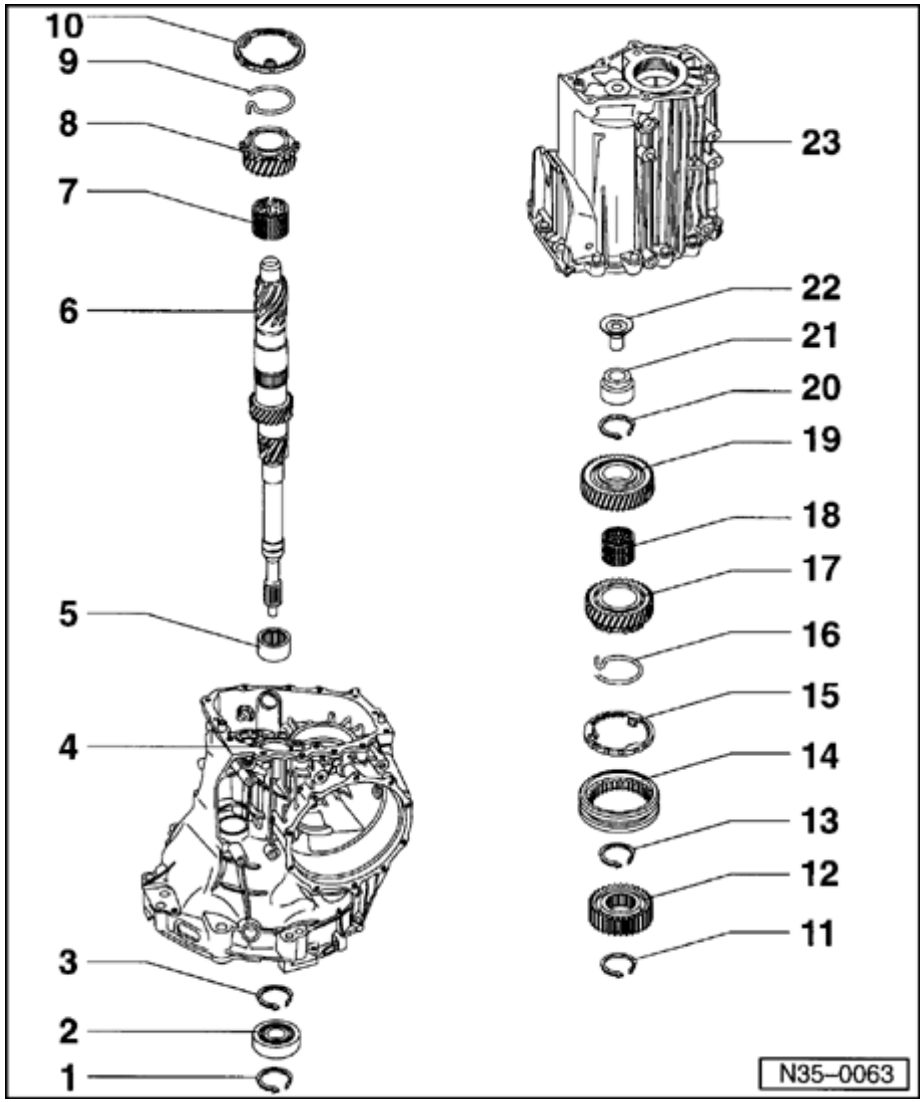
8 - 3rd gear

9 - Spring

- Inserting in 3rd gear ⇒ Fig. 12
- Application of spring to gear ⇒ Parts catalog

10 - Synchronizer ring for 3rd gear

- Checking for wear ⇒ Fig. 13



11 - Circlip

- Identification
- Allocation ⇒ Fig. 14 , item -3-

12 - Synchronizer hub for 3rd and 4th gears

- Shoulder faces 3rd gear
- Pressing off ⇒ Fig. 11
- Pressing on ⇒ Fig. 16

13 - Circlip

- Identification
- Allocation ⇒ Fig. 14 , item -4-
- Re-determining thickness when replacing synchronizer body ⇒ Fig. 13

14 - Operating sleeve for 3rd and 4th gears

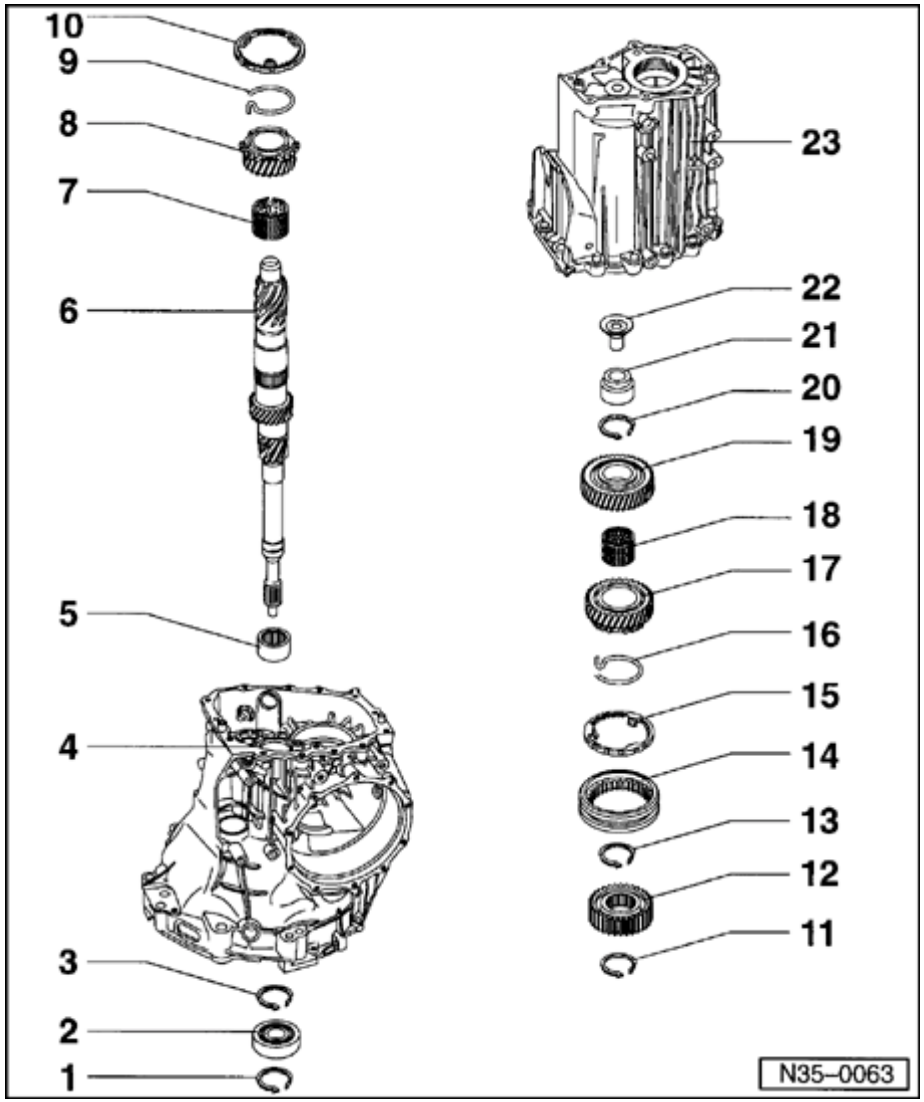
- Allocation ⇒ Fig. 17

15 - Synchronizer ring for 4th gear

- Checking for wear ⇒ Fig. 13

16 - Spring

- Inserting in 4th gear ⇒ Fig. 12
- Application of spring to gear ⇒ Parts catalog



17 - 4th gear

18 - Needle bearing for 4th gear

19 - 5th gear

- Pressing off ⇒ Fig. 10
- Pressing on ⇒ Fig. 18

20 - Circlip

- Identification
- Allocation ⇒ Fig. 14 item -5-
- If 5th gear is replaced, re-determine thickness of circlip ⇒ Fig. 15

21 - Needle bearing for input shaft

- Always replace
- Damaged when removed
- Pulling out ⇒ Fig. 7
- Allocation ⇒ Fig. 8
- Driving in ⇒ Fig. 9

22 - Plastic sleeve

- Made of plastic

23 - Transmission cover

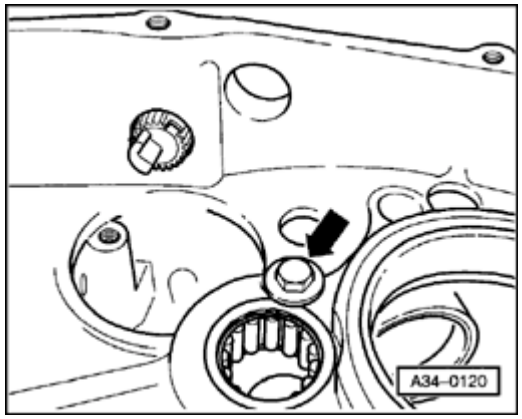


Fig. 1 Securing bolt for needle bearing

- Remove securing bolt (arrow).

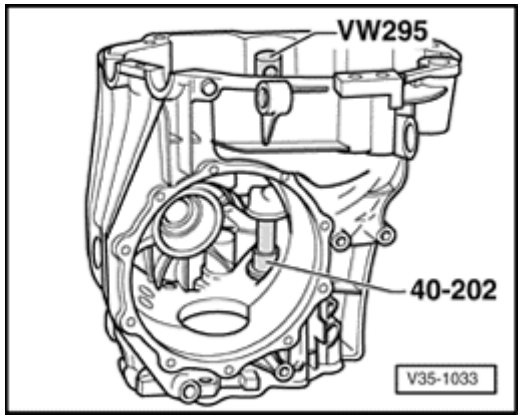


Fig. 2 Driving out needle bearing

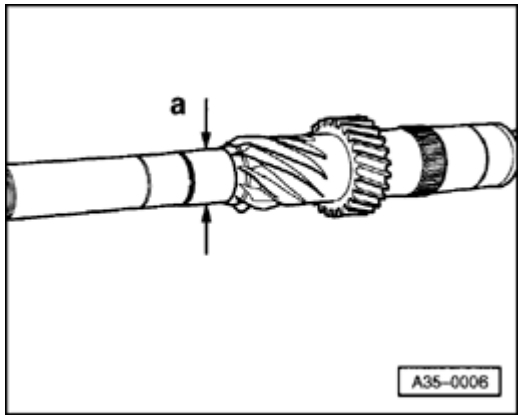


Fig. 3 Allocation of input shaft/needle bearing

Input shaft diameter	
a: 27 mm (1.062 in.)	012 311 123 D
a: 29 mm (1.141 in)	012 311 123

CAUTION!

Part numbers are listed here for reference only. Always check with your Parts department for the latest information.

In order to avoid damage due to improper assembly, check the following after replacing input shaft:

- ***Input shaft must be able to be guided in.***
- ***Input shaft must have no play.***

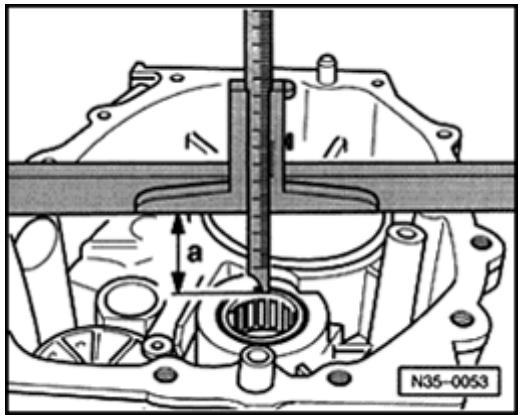


Fig. 4 Allocation of needle bearing

Dimension -a- from lower edge of straight-edge to upper edge of needle bearing: 39.5 mm (1.555 in.)

Note:

Measure the dimension from the top edge of the straight-edge and subtract the height of the straight-edge from the measured dimension.

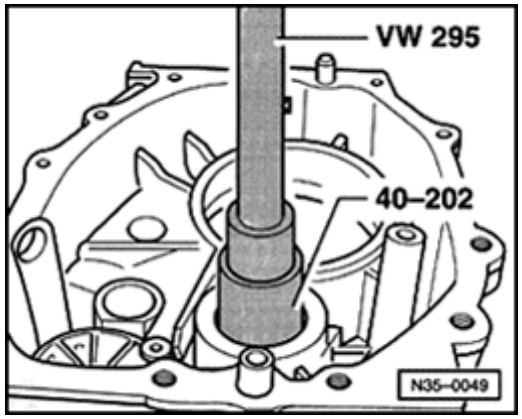


Fig. 5 Pressing in needle bearing

- Install securing bolt and tighten to 25 Nm (18 ft lb).

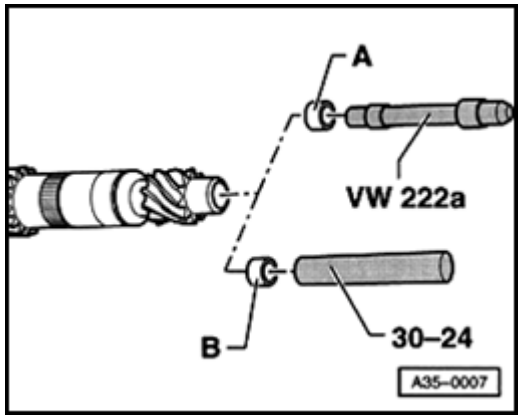


Fig. 6 Driving in oiling sleeve into input shaft

Item	Dia. of oiling sleeve	Tool
A	14 mm (0.551 in.)	VW222A pilot drift
B	16 mm (0.629 in.)	30-24 drift

Installed position

- Flared edge of oiling sleeve faces installation tool
- Allocation: 3.5 mm (0.138 in.) below upper edge

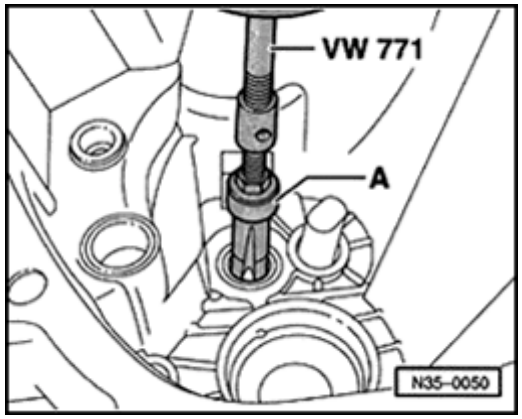


Fig. 7 Pulling out needle bearing

A - Internal puller 22-28 mm (0.866-1.102 in.), e.g. Kukko 21/4 extractor

- Plastic sleeve inside roller sleeve must be destroyed to install internal puller.

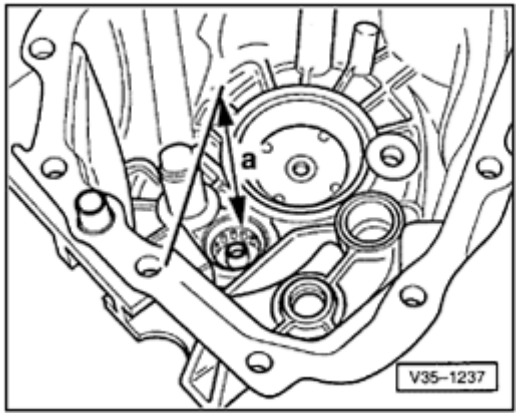


Fig. 8 Allocation of needle bearing

Dimension a: 216 mm (8.503 in.)

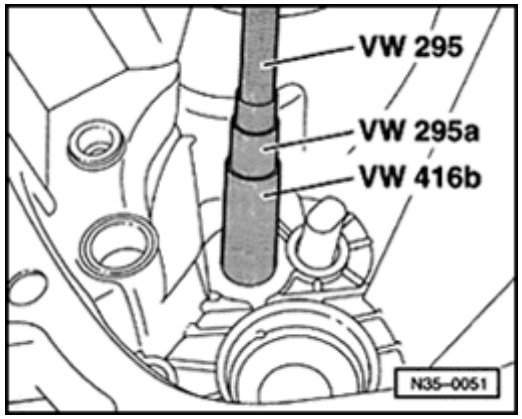


Fig. 9 Driving in roller sleeve

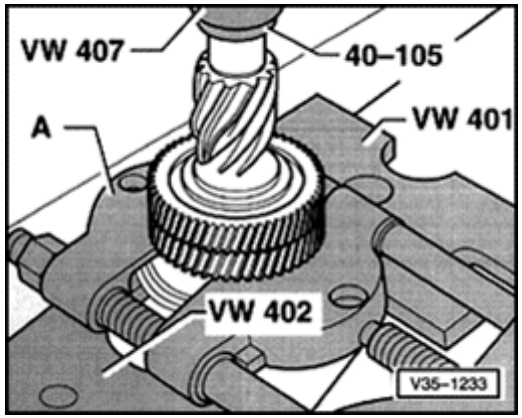


Fig. 10 Pressing off 5th gear

- Remove circlip before pressing off.

A- Separating device 22-115 mm (0.866-4.527 in.), e.g. Kukko 17/2 separating tool

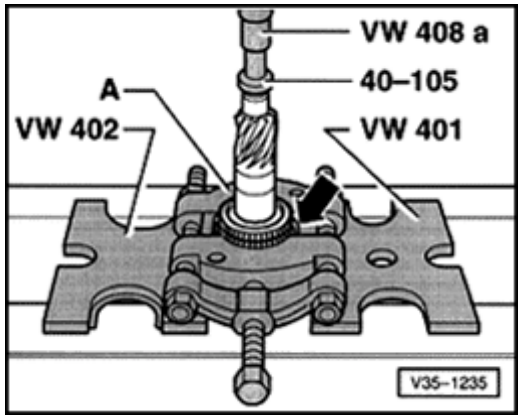


Fig. 11 Pressing off synchronizer hub for 3rd and 4th gears

- Remove circlip before pressing off.
- Press 3rd gear synchronizer ring (arrow) toward 3rd gear and install separating device -A-.

A- Separating device 22-115 mm (0.866-4.527 in.), e.g. Kukko 17/2 separating tool

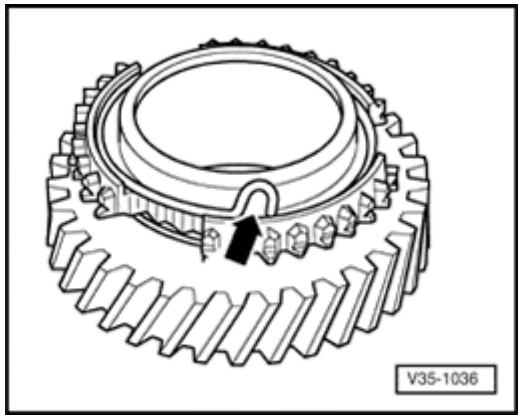


Fig. 12 Inserting spring in gear

The bent end of the spring (arrow) must be hooked into the hole of the gear.

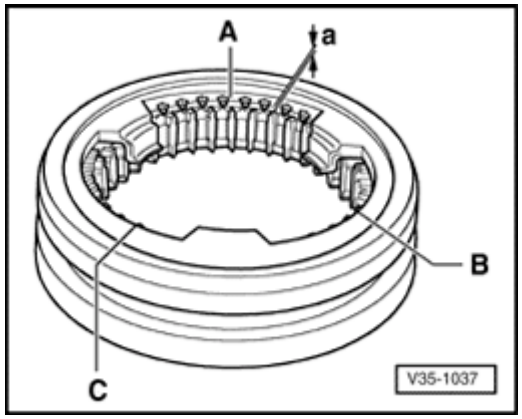


Fig. 13 Checking synchronizer-ring for wear

- Press synchronizer-ring into operating sleeve and measure gap -a- using feeler gauge at positions -A-, -B- and -C-.
- Add measured values and divide by 3 to calculate average.

The calculated gap must not be less than 0.5 mm (0.019 in.).

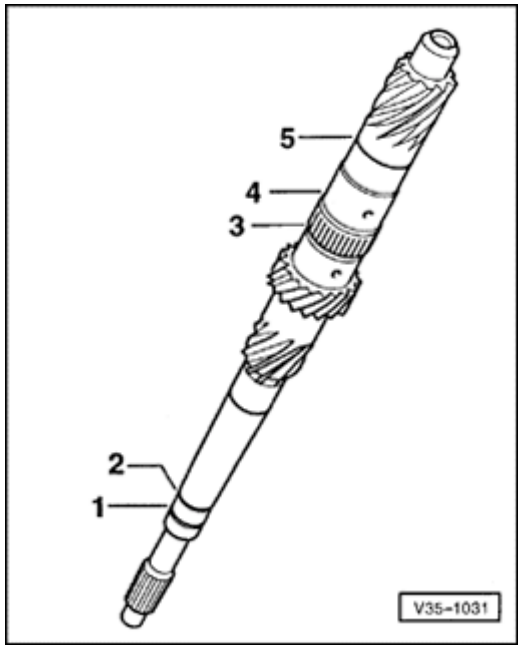


Fig. 14 Allocation of circlips

The circlips -1- and -2- secure the input shaft ball bearing.

Determining thickness ⇒ Page 35-17 , input shaft, adjusting

The circlip -3- secures the 3rd and 4th gear synchronizer hub.

Thickness: 2.00 mm (0.078 in.)

Identification: brown color

The circlip -4- secures the 3rd and 4th gear synchronizer hub.

Determining thickness ⇒ Page 35-14 , table

Identification: blue color

The circlip -5- secures the 5th gear.

Determining thickness ⇒ Page 35-14 , table

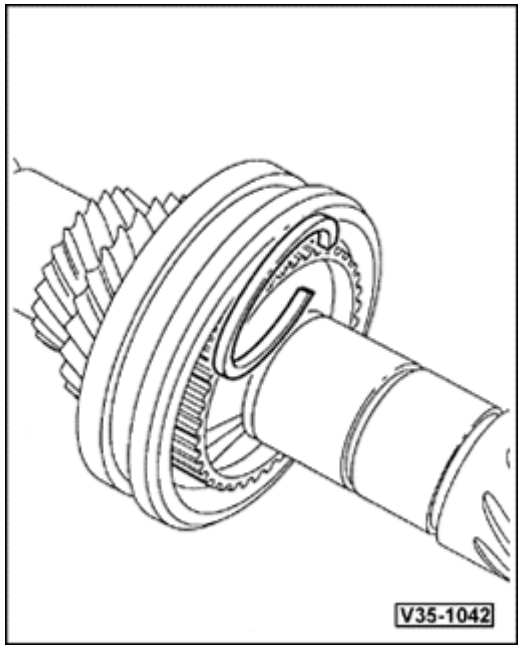


Fig. 15 Determining thickness of circlip

- Determine thickest circlip which can still just be installed and install it.
- Determine circlip according to table. Part number ⇒ parts catalog

The following circlips are available for synchronizer hub for 3rd and 4th gear

Circlip thickness (mm)		
1.90	1.96	2.02
1.93	1.99	2.05

The following circlips are available for 5th gear

Circlip thickness (mm)		
1.90	1.96	2.02
1.93	1.99	

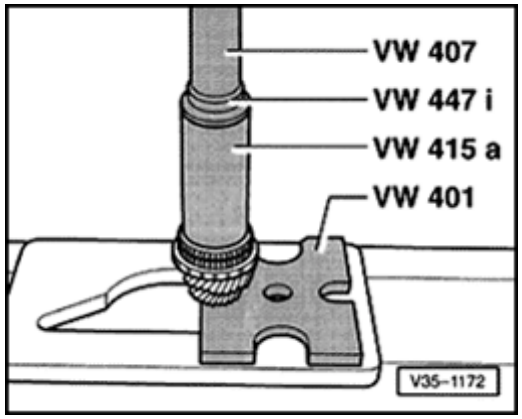


Fig. 16 Pressing on synchronizer hub for 3rd and 4th gears

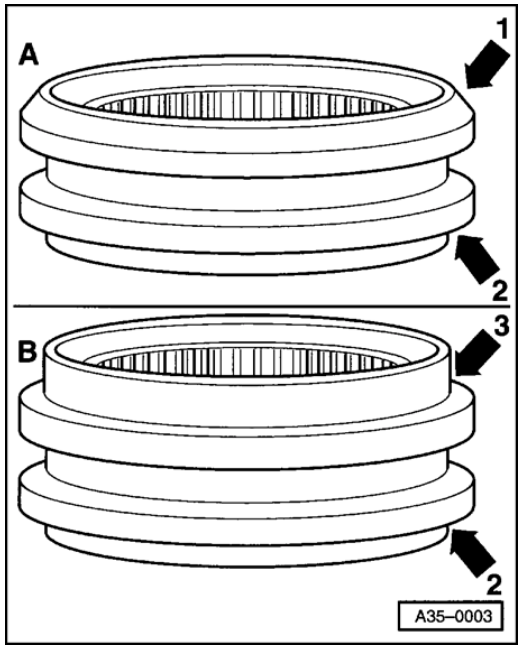


Fig. 17 Allocation of operating sleeve

Operating sleeves with chamfer -A- as well as operating sleeves with a large offset -B- are installed.

Installed position:

- The chamfer (arrow -1-) faces 4th gear
- The small stepped side (arrow -2-) faces 3rd gear
- The large stepped side (arrow -3-) faces 4th gear

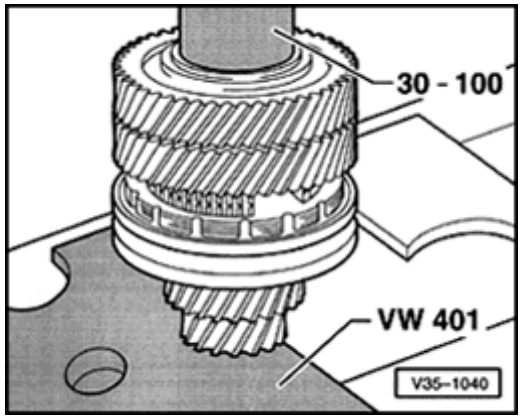


Fig. 18 Pressing on 5th gear

WARNING!

Wear protective gloves.

- Heat 5th gear to approx. 100 ° C (212 ° F) before pressing on.

Allocation: wider collar faces reverse gear.