35-1

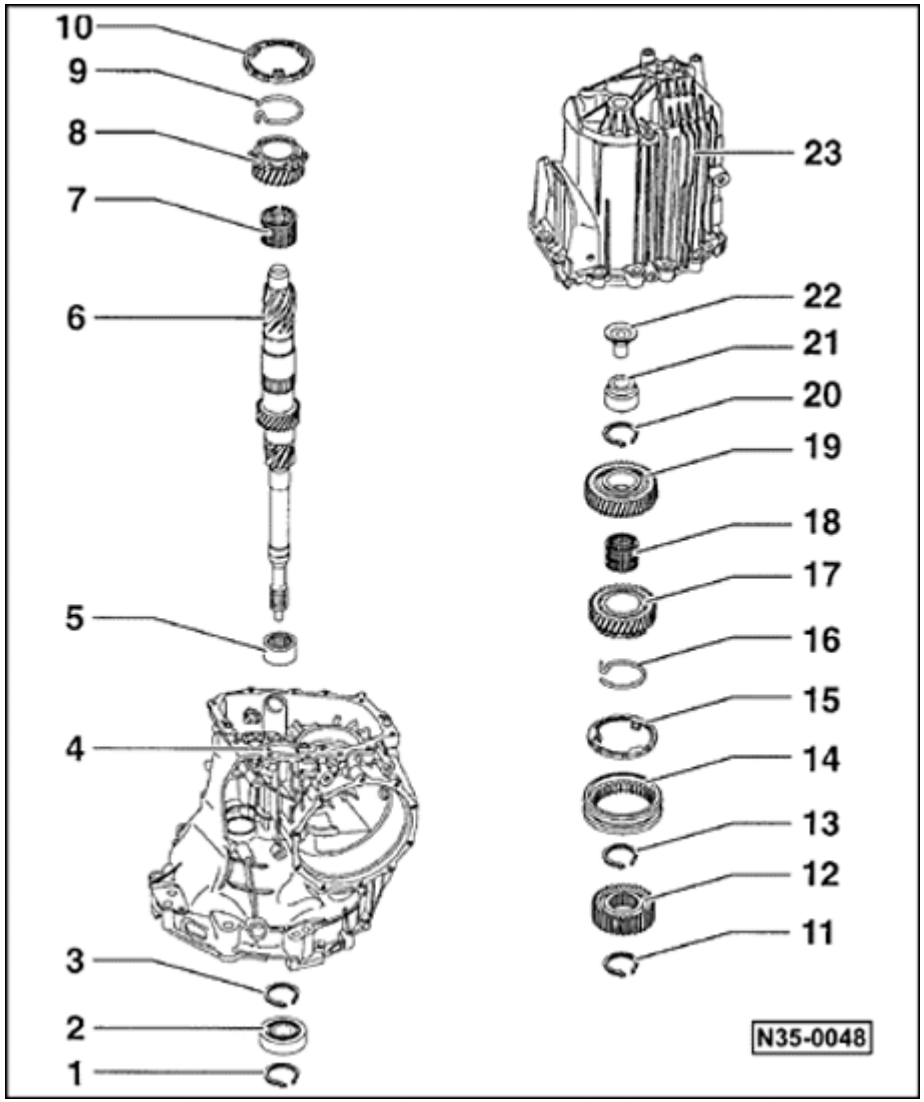
Input shaft, disassembling and assembling

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 VW416B 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
- 21/4 KUKKO extractor

35-2



Notes:

- *When installing the input shaft or new gears, consult technical data ⇒ Page 00-3 .*
- *By replacing items - 2 -, - 4 - and/or - 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
- Installed position ⇒ Fig. 15 , item -1-
- Determining thickness ⇒ Page 35-17

2 - Input shaft ball bearing

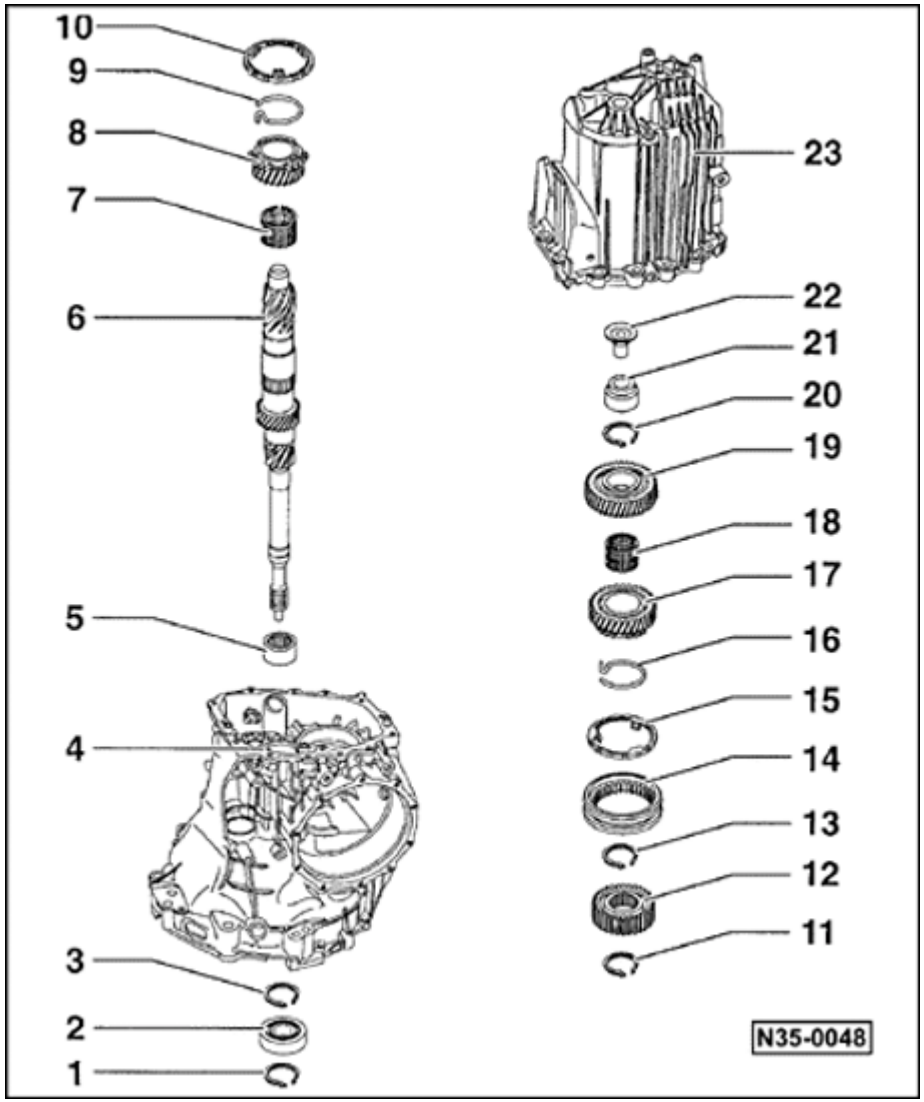
- Removing and installing ⇒ Page 34-49

3 - Circlip

- Identification
- Installed position ⇒ Fig. 15 , item -2-
- Determining thickness ⇒ Page 35-17

4 - Transmission housing

35-3



5 - Needle bearing

- Secured with bolt ⇒ Fig. 1
- Driving out ⇒ Fig. 2
- Allocation of input shaft/needle bearing ⇒ Fig. 3
- Installed position ⇒ Fig. 4
- Pressing in ⇒ Fig. 5
- Securing ⇒ Fig. 6

6 - Input shaft

- With oiling sleeve
- Driving in oiling sleeve ⇒ Fig. 7
- Adjusting ⇒ Page 35-17
- Allocation of input shaft/needle bearing ⇒ Fig. 3

7 - Needle bearing for for 3rd gear

- Identification

8 - 3rd gear

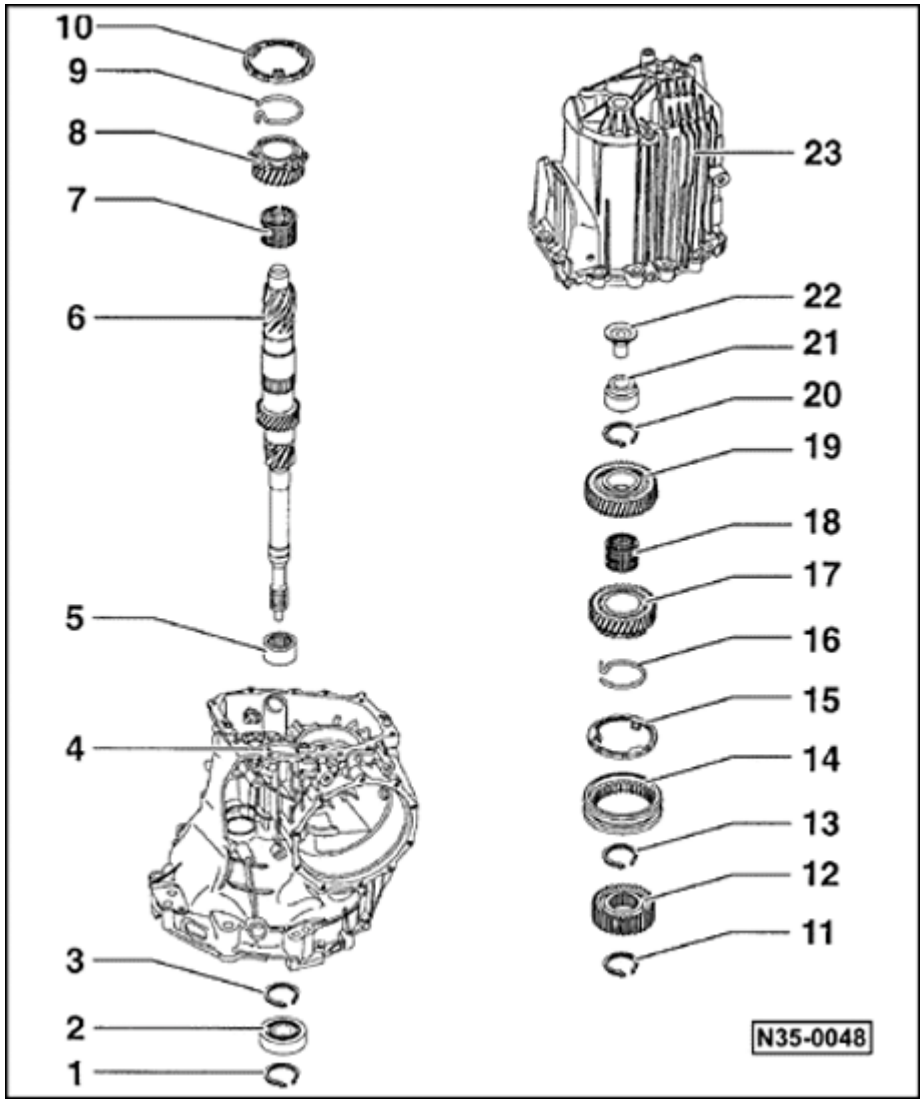
9 - Spring

- Inserting in 3rd gear ⇒ Fig. 13
- Allocation of spring to gear ⇒ parts catalog

10 - Synchronizer ring for 3rd gear

- Checking for wear ⇒ Fig. 14

35-4



11 - Circlip

- Identification
- Installed position ⇒ Fig. 15 , item -3-

12 - Synchronizer hub for 3rd and 4th gears

- Shoulder faces third gear
- Pressing off ⇒ Fig. 12
- Pressing on ⇒ Fig. 17

13 - Circlip

- Identification
- Installed position ⇒ Fig. 15 , item 4
- Re-determining thickness when replacing synchronizer body ⇒ Fig. 16

14 - Operating sleeve for 3rd and 4th gears

- Installed position ⇒ Fig. 18

15 - Synchronizer ring for 4th gear

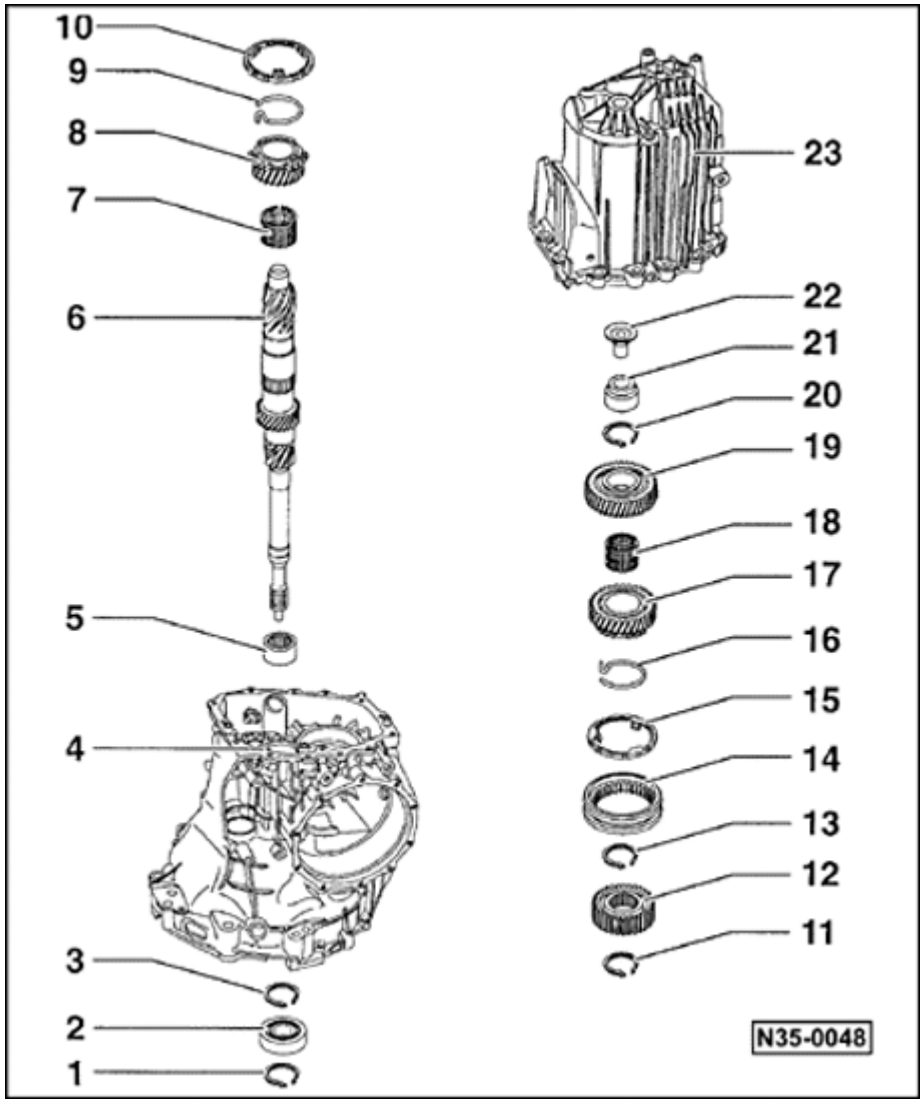
- Checking for wear ⇒ Fig. 14

16 - Spring

- Inserting in 4th gear ⇒ Fig. 13
- Allocation of spring to gear ⇒ parts catalog

17 - 4th gear

35-5



18 - Needle bearing for 4th gear

- Identification

19 - 5th gear

- Pressing off ⇒ Fig. 11
- Pressing on ⇒ Fig. 19

20 - Circlip

- Identification
- Installed position ⇒ Fig. 15 , item -5-
- If 5th gear is replaced, re-determine thickness of circlip ⇒ Fig. 16

21 - Roller sleeve

- Always replace
- Damaged when removed
- Pulling out ⇒ Fig. 8
- Installed position ⇒ Fig. 9
- Driving in ⇒ Fig. 10

22 - Plastic sleeve

- Made of plastic

23 - Transmission cover

- With reverse idler gear ⇒ Page 35-44

- Coat sealing surfaces with a thin layer of sealant AMV 188 001 02

35-6

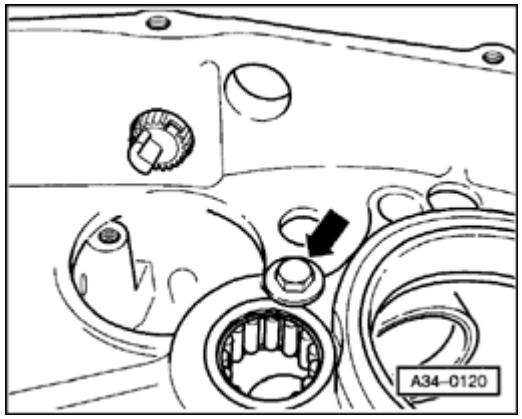


Fig. 1 Securing bolt for needle bearing

- Remove securing bolt (arrow).

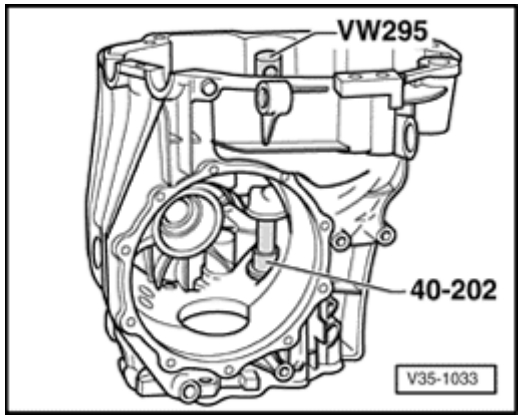


Fig. 2 Driving out needle bearing

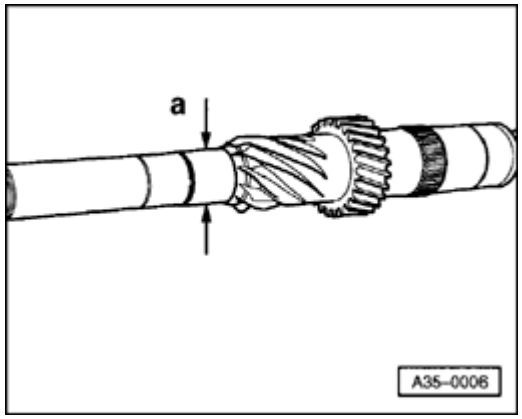


Fig. 3 Allocation of input shaft/needle bearing

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

Notes:

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

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

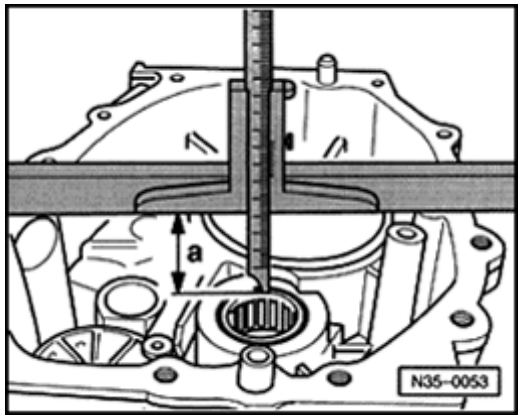


Fig. 4 Allocation of needle bearing

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.

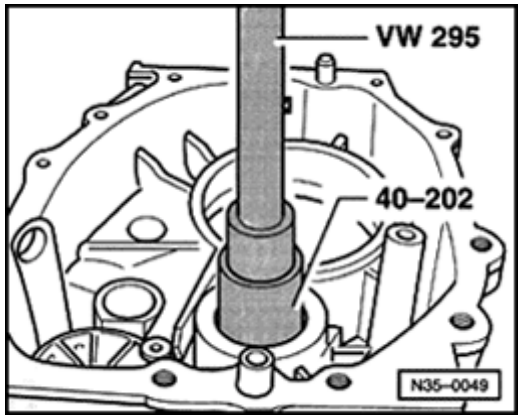


Fig. 5 Pressing in needle bearing

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

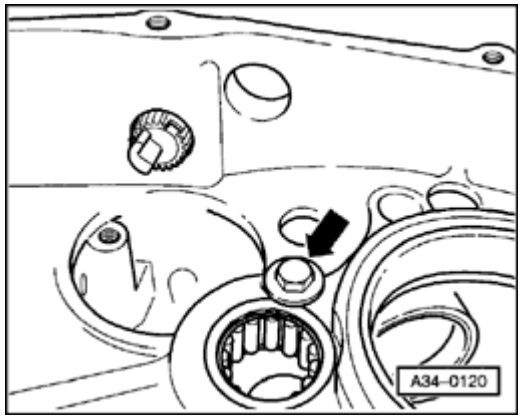


Fig. 6 Installing securing bolt (arrow)

Tightening torque: 25 Nm (18 ft lb).

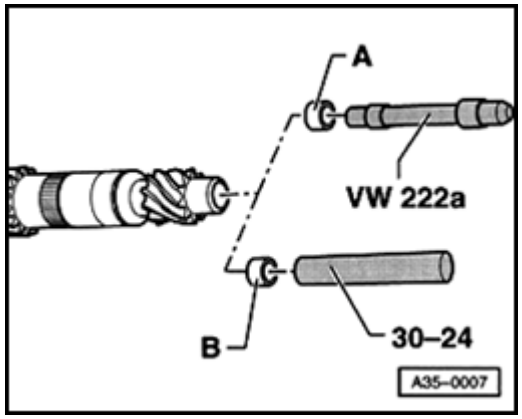


Fig. 7 Driving in oiling sleeve into input shaft

Item	Diameter 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 tool

Installation depth: 3.5 mm (0.138 in.) below upper edge

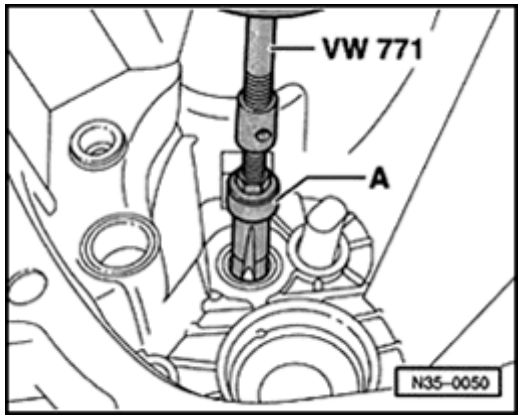


Fig. 8 Pulling out roller sleeve

A - Internal puller 22-28 mm, e.g. Kukko 21/4

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

35-10

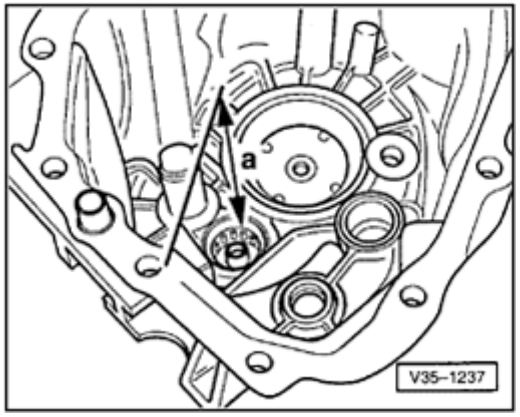


Fig. 9 Installed position of roller sleeve

Dimension -a- = 216 mm (8.5 in.)

Note:

Measure from upper edge of cover to upper edge of bearing.

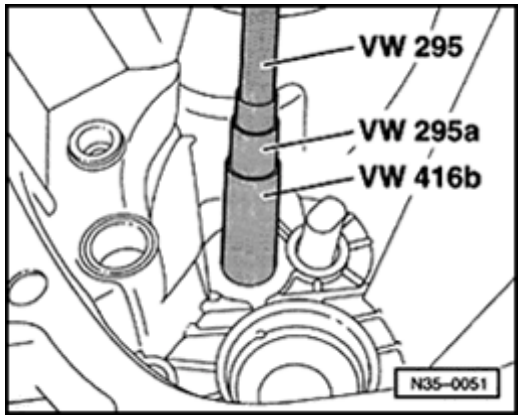


Fig. 10 Driving in roller sleeve

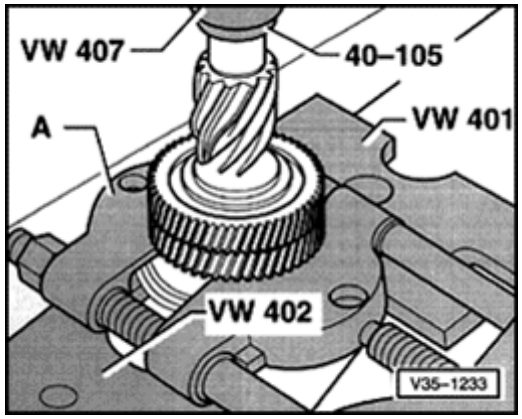


Fig. 11 Pressing off 5th gear

- Remove circlip before pressing off.

A - Separating device 22-115 mm, e.g. Kukko 17/2 separating tool

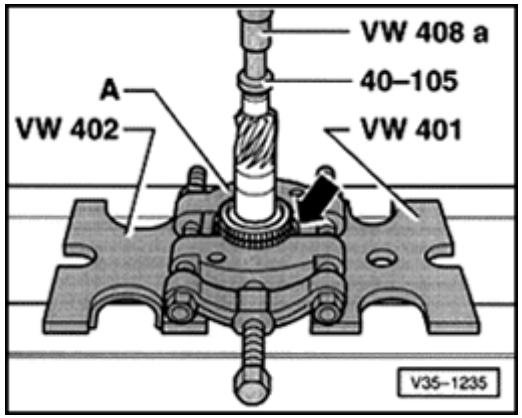


Fig. 12 Pressing off synchronizer hub for 3rd and 4th gears

- 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, e.g. Kukko 17/2 separating tool

35-12

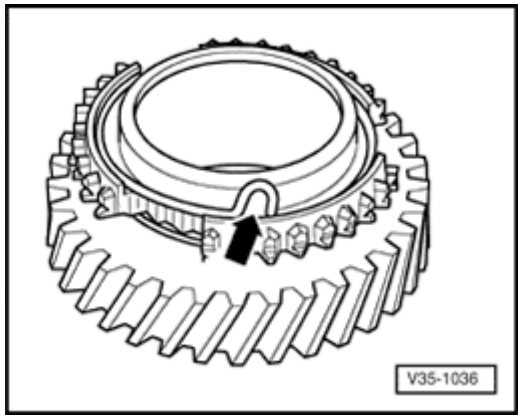


Fig. 13 Inserting spring into gear

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

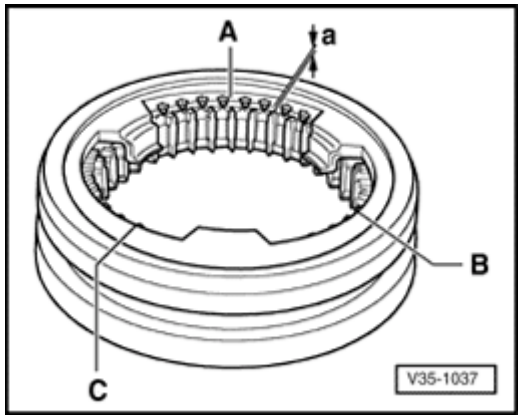


Fig. 14 Checking synchronizer ring for wear

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

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

35-13

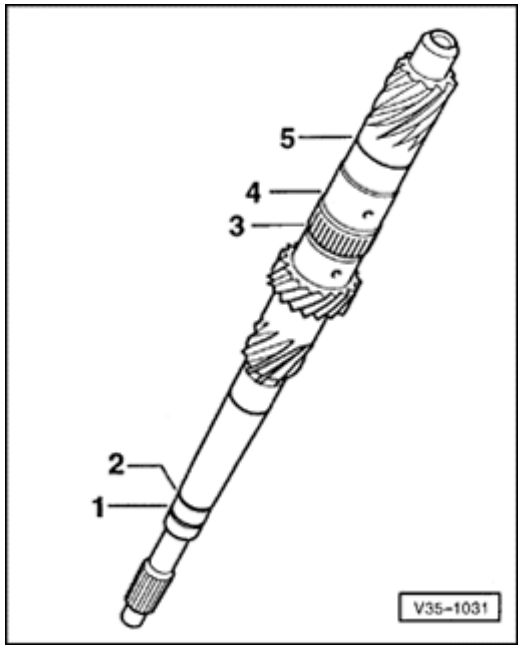


Fig. 15 Allocation of circlips

- Circlips -1- and -2- secure the input shaft ball bearing.

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

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

  Thickness: 2.00 mm (0.078 in.).

  Identification: brown in color.

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

  Determining thickness ⇒ Page 35-14 , table

  Identification: blue in color.

- Circlip -5- secures the 5th gear.

  Determining thickness ⇒ Page 35-14 , table

35-14

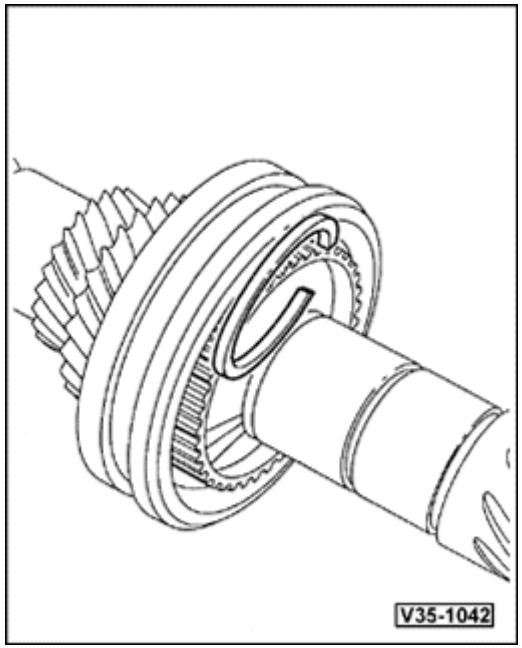


Fig. 16 Determining thickness of circlip

- 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	

35-15

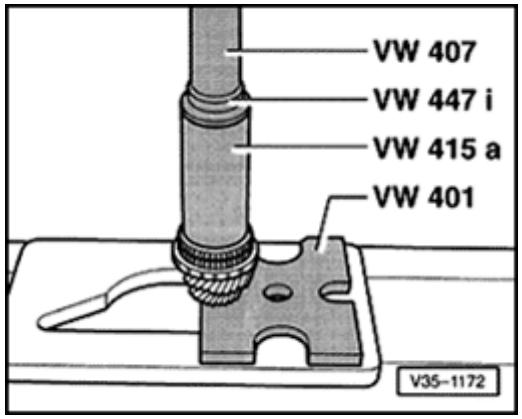


Fig. 17 Pressing on synchronizer hub for 3rd and 4th gears

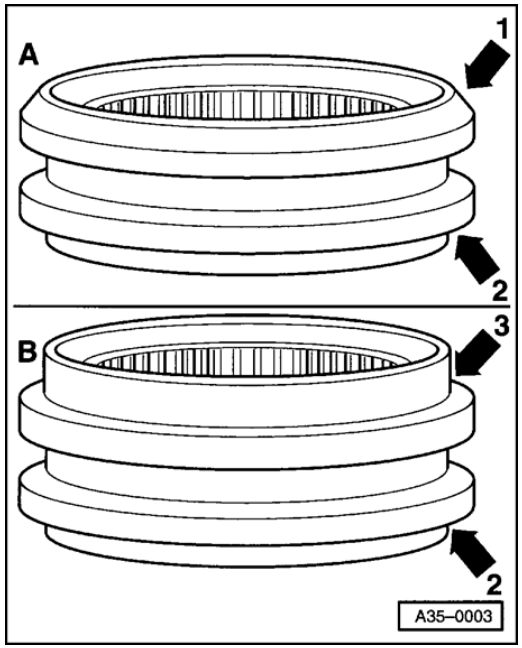


Fig. 18 Installation position of operating sleeve

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

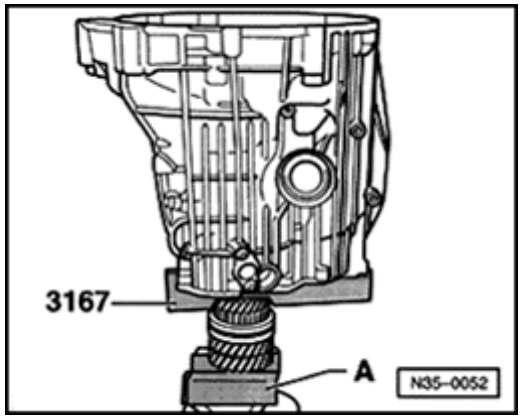


Fig. 19 Pressing on 5th gear

WARNING!

Wear protective gloves!

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

Installation position: shoulder faces reverse gear.