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★ **NEW INFORMATION** since last filming

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Technical data, 5-speed transmission 01A

Note

For location of transmission codes, see Group 00.

Code		AKT	AKU	AXL
Production	*from*	06/87	06/87	09/90
	to		09/90	
Application	type	Audi 80 Quattro	Audi 80 Quattro/Audi 90 Quattro	
	engine	2.0 liter - 83 kW	2.3 liter - 101 kW	
Rear final drive		AEX	AEC/ARS	
Ratio	final drive	41:09 = 4.556	37:09 = 4.111	
	1st gear	39:11 = 3.545	39:11 = 3.545	
	2nd gear	40:19 = 2.105	40:19 = 2.105	
	3rd gear	39:30 = 1.300	39:30 = 1.300	
	4th gear	32:36 = 0.889	33:35 = 0.943	
	5th gear	29:40 = 0.725	30:39 = 0.769	
	reverse gear	35:10 = 3.500	35:10 = 3.500	
Speedometer		electric		
Lubricant capacity		2.85 liters (3.0 US qt)		
Lubricant type		Transmission oil G 50 (synthetic oil) SAE 75 W 90		
Clutch actuation		hydraulic		
Clutch disc diameter		228 mm	228 mm	
Drive flange diameter		100 mm	100 mm	
Speed in highest gear at 1000 RPM		33.63 km/h (20.9 mph)	34.17 km/h (21.2 mph)	

Technical data, 5-speed transmission 01A

Note

For location of transmission codes, see Group 00.

Code		ASZ	AXM	AKU	AXL
Production	from	11/88	10/90	07/86	10/90
	to	10/90		10/90	
Application	type	Coupe Quattro		Audi 90 Quattro 20V	
	engine	20 valve 2.3 liter - 125 kW		20 valve 2.3 liter - 125 kW	
Rear final drive		AEC, ARS		AEC, ARS	
Ratio	final drive	37:09 = 4.111		37:09 = 4.111	
	1st gear	39:11 = 3.545		39:11 = 3.545	
	2nd gear	40:19 = 2.105		40:19 = 2.105	
	3rd gear	40:28 = 1.429		39:30 = 1.300	
	4th gear	35:34 = 1.029		33:35 = 0.943	
	5th gear	31:37 = 0.0838		30:39 = 0.769	
	reverse gear	35:10 = 3.500		35:10 = 3.500	
Speedometer		electric			
Lubricant capacity		2.85 liters (3.0 US qt)			
Lubricant type		Transmission oil G 50 (synthetic oil) SAE 75 W 90			
Clutch actuation		hydraulic			
Clutch disc diameter		240 mm		228 mm	
Drive flange diameter		100 mm		100 mm	
Speed in highest gear at 1000 RPM		33 km/h (20.5 mph)		35 km/h (21.7 mph)	

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Transmission, removing/installing

Removing

- disconnect battery ground strap
- remove 3 upper engine/transmission bolts
- disconnect ground strap from transmission

- remove wiring connectors for speedometer sender and multi-function sender
- disconnect wiring for oxygen sensor and oxygen sensor heating element
- remove engine protection plate

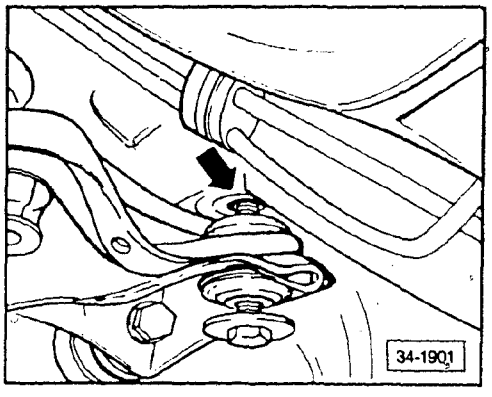
- disconnect exhaust pipe from manifold
- separate exhaust pipe behind catalyst and remove pipe and catalyst
- remove drive shaft

- remove rear cross member
- remove shift rod securing bolt at transmission and let shift rod hang
- remove transmission cover plate

- remove right axle shaft shield
- disconnect left and right axle shafts, turn steering to right lock and tie both drive shafts up
- remove clutch slave cylinder

- remove tie rod coupling from steering rack and turn wheels to the left
- support engine with **10-222A**
- support transmission with **VW 1383**

- remove transmission strut at left rear and front engine mount
- remove heat shield from bonded rubber bushing
- remove bonded rubber bushing support bracket from transmission



- remove bonded rubber bushing
- remove bolt for seat belt tensioning cable guide at left rear of transmission. Position cables and guide out of way
- lower right rear subframe by loosening mounting bolts (**arrow**)

- remove remaining engine/transmission bolts
- remove transmission

Installing

Proceed in reverse order of removal and note the following:

- press clutch master cylinder in with a lever until retaining bolt can be installed

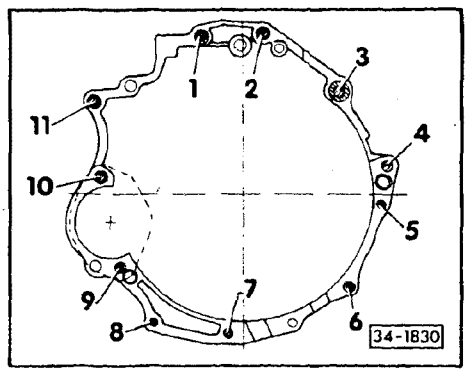
Note

Be sure that centering (dowel) sleeves are in cylinder block before reassembly.

Tightening torques

Transmission to engine	
M 8 bolts	25 Nm (18 ft lb)
M 10 bolts	45 Nm (33 ft lb)
M 12 bolts	65 Nm (48 ft lb)
Drive shaft to flange	
M 8 bolts	45 Nm (33 ft lb)
Subframe mounting bolts	
M 10 bolts	35 Nm (25 ft lb)
after tightening, turn 90° (1/4 turn) more	
Drive shaft to transmission and final drive	
M 8 bolts	55 Nm (40 ft lb)
Tie rod coupling bolts to steering rack	
45 Nm (33 ft lb)	

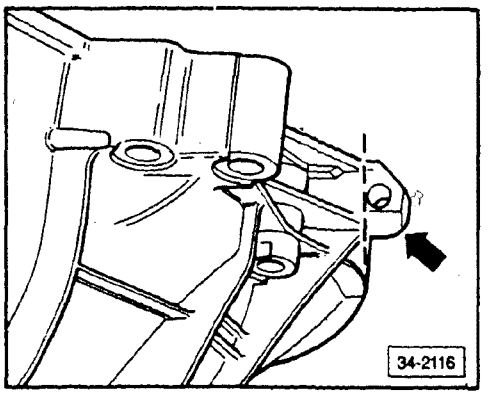
Mounting transmission to engine



1— Bolt M 12 x 70
2— Bolt M 12 x 70
3— Bolt M 12 x 90
4— Bolt M 12 x 80
5— Bolt M 8 x 40
6— Bolt M 10 x 50
7— Bolt M 10 x 40
8— Bolt M 8 x 40
9— Bolt M 10 x 120
10— Bolt M 12 x 100
11— Bolt M 12 x 70

Centering (dowel) sleeves:
positions **3** and **11**

Final drive housing, modification (vehicles with 20 valve engine)

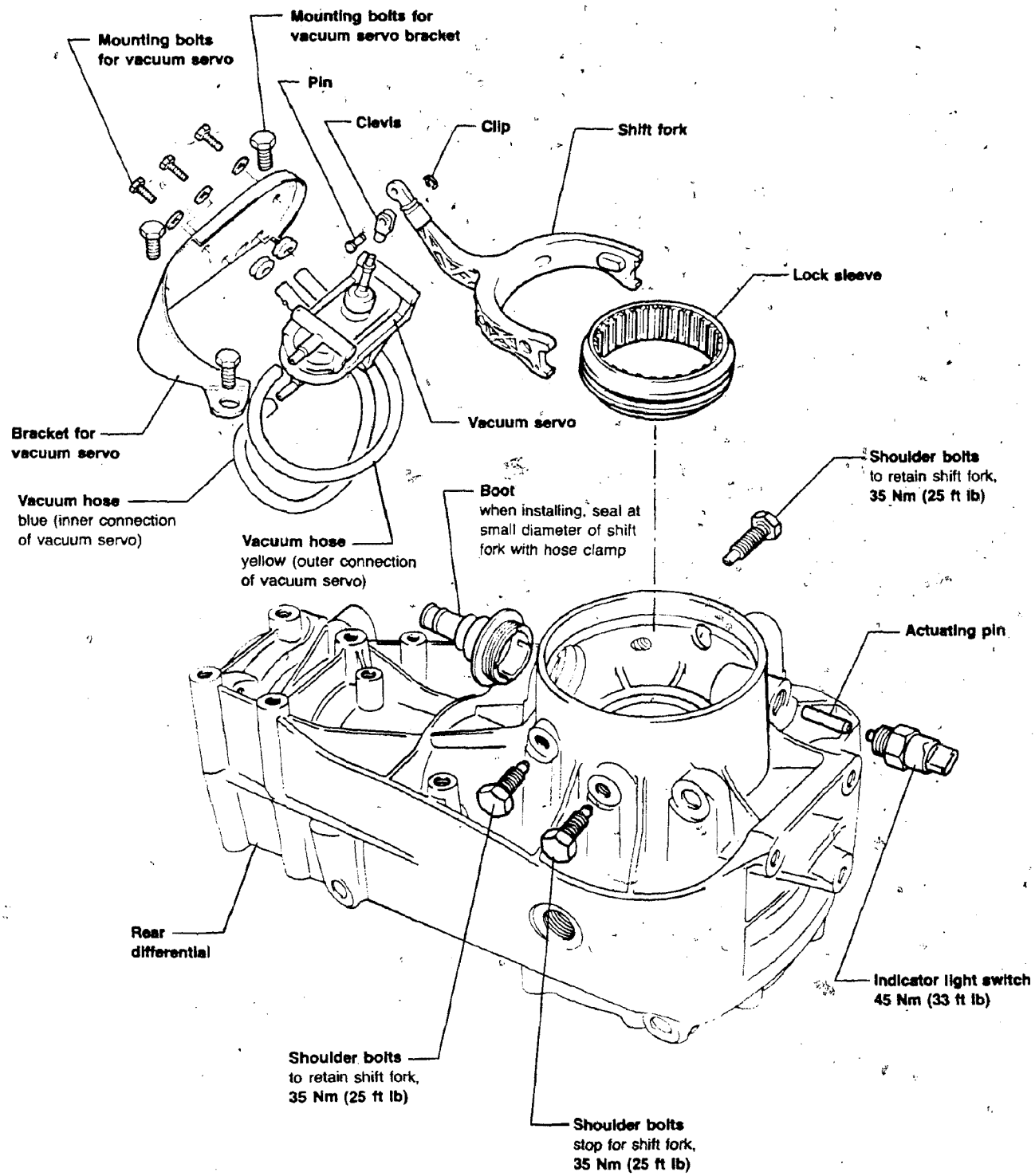


If during repairs the final drive housing is replaced, the right side mounting eye must be removed.

- saw off eye (**arrow**) as indicated by dotted line in illustration

CAUTION

Mounting eye will contact exhaust system unless removed before installing transmission.

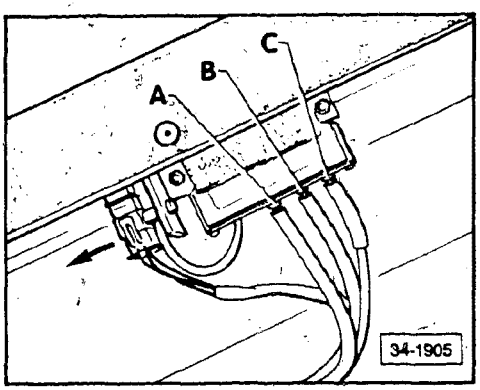

Mounting bolts for vacuum servo
Mounting bolts for vacuum servo bracket
Pin
Clevis
Clip
Shift fork
Lock sleeve
Bracket for vacuum servo
Vacuum servo
Vacuum hose blue (inner connection of vacuum servo)
Vacuum hose yellow (outer connection of vacuum servo)
Boot when installing, seal at small diameter of shift fork with hose clamp
Shoulder bolts to retain shift fork, 35 Nm (25 ft lb)
Actuating pin
Rear differential
Indicator light switch 45 Nm (33 ft lb)
Shoulder bolts to retain shift fork, 35 Nm (25 ft lb)
Shoulder bolts stop for shift fork, 35 Nm (25 ft lb)
34-1902

Differential lock control unit, removing/installing

Removing

Note

For repair of system electrical components, refer to wiring diagrams and troubleshooting information in Repair Group 97.

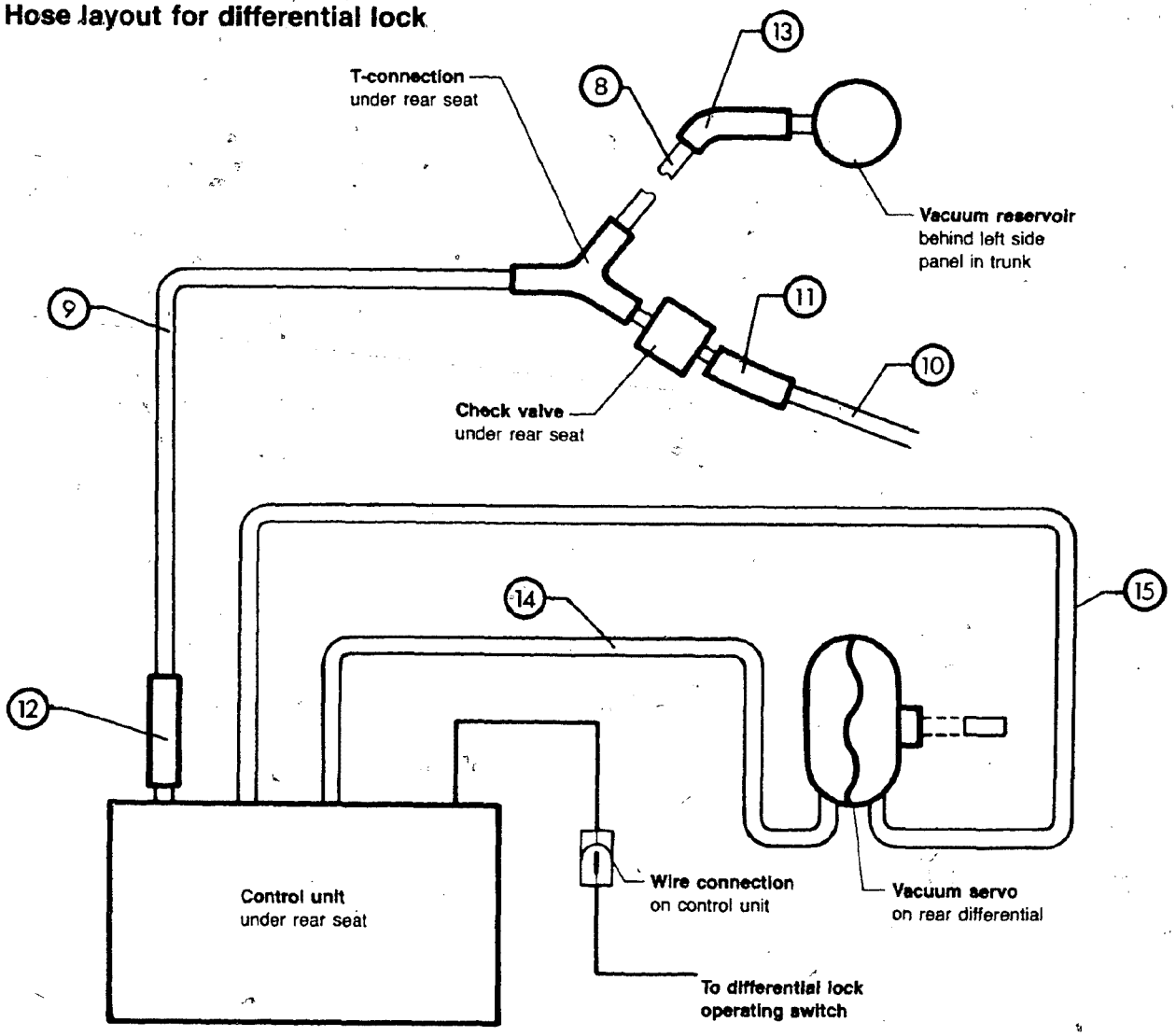


- remove vacuum hoses
  - **A** blue = to lock servo
  - **B** yellow = to lock servo vacuum element
  - **C** violet = from intake manifold
- remove wiring connector from control unit (**arrow**)
- remove control unit mounting screws

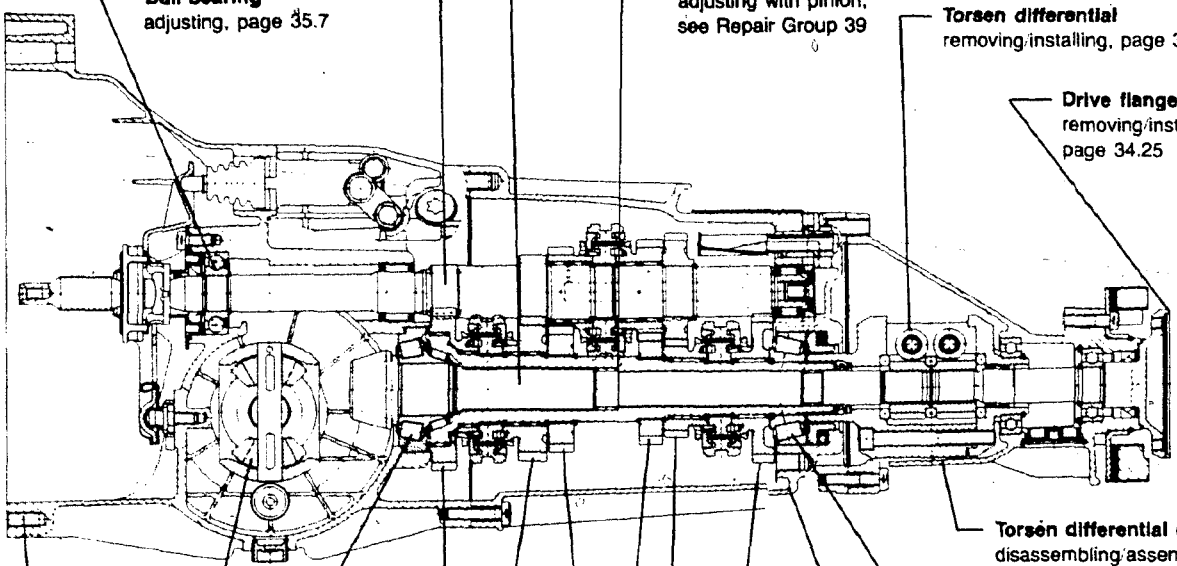
Installing

- to install the control unit, proceed in reverse order of removal

Hose layout for differential lock



	Length (mm)	Color	
8	1020	white	tubes 4 x 1 (to intake manifold)
9	815	violet	
10	2970	violet	
11	45	black	hoses 3.5 x 2
12	100	black	
13	390	black	
14	900	blue	hoses 3.5 x 2.25
15	900	yellow	



Main shaft
disassembling/assembling, page 35.2
adjusting, page 35.6

Ball bearing
adjusting, page 35.7

Pinion
disassembling/assembling, page 35.8
adjusting with hollow shaft,
see Repair Group 39

Hollow shaft
disassembling/assembling, page 35.8
adjusting with pinion,
see Repair Group 39

Torsen differential
removing/installing, page 34.23

Drive flange
removing/installing,
page 34.25

Torsen differential cover
disassembling/assembling
page 34.23

Tapered roller bearing
adjusting, see Repair Group 39

Transmission cover housing
disassembling/assembling,
page 34.20

Reverse gear

5th gear

4th gear

3rd gear

2nd gear

1st gear

Double tapered roller bearing
adjusting, see Repair Group 39

Differential
disassembling/assembling,
see Repair Group 39
adjusting, see Repair Group 39
Adjustment Overview

Transmission housing
disassembling/assembling, page 34.15

34-1745

Transmission, disassembling/ assembling

Disassembling

- clamp transmission in assembly stand, page 34.16
- drain transmission oil
- remove clutch return lever and clutch release bearing
- remove guide sleeve
- remove and measure thickness of circlip in front of ball bearing
- pull ball bearing out of transmission housing using puller, page 34.16
- remove and measure thickness of circlip behind ball bearing
- remove bolts between gear carrier housing/ cover (for Torsen differential) and remove cover with Torsen differential
- remove bolts between transmission housing/gear carrier housing and take off gear carrier housing
- remove multi-function sender
- remove relay shaft bolts, page 34.21
- remove locking segment bolt and take locking segment out
- remove main shaft, pinion, relay shaft, selector rods and shift forks together

Assembling

Assemble in reverse order of procedure shown above and note the following:

- main shaft, pinion with hollow shaft, relay shaft, selector rods and shift forks must be installed together, page 34.21
- circlips for main shaft at ball bearing must be replaced in the same position and be of the same thickness

Note

Before installing gear carrier housing, make sure that the centering sleeves are mounted in transmission housing.

Note

Handle speedometer sender carefully. Do not let it fall, otherwise speedometer data may not be exact.

Transmission housing
clamp transmission in assembly stand Fig. 1
remove sealing ring for drive flange with **VW 681**,
drive in 5 mm under transmission housing surface with **VW 195**
note breather insertion depth Fig. 5
tapered roller bearing outer race, removing Fig. 12
drive in with **30-205** selector rod bushing, removing Fig. 6 seal with **AMV 188 200 03**

Circlip
mark after removing
measuring, page 35.5

Guide sleeve with sealing ring
sealing ring, removing/installing, see Repair Group 30

35 Nm (26 ft lb)

Concave washer
small diameter faces guide sleeve (convex side)

Main shaft ball bearing
pullout out of transmission housing Fig. 2
installing Fig. 3, also see page 34.27

10 Nm (7 ft lb)

Speedometer sender

Differential
can be removed with gear carrier housing installed
disassembling/assembling, see Repair Group 39

Sealing ring

Drive flange
removing Fig. 7
drive in with **VW 295**

Circlip
always replace

25 Nm (18 ft lb)

Final drive cover
tapered roller bearing outer race, removing/installing Figs. 9 and 10
pull sealing ring out with **VW 681**
installing Fig. 11
seal with **AMV 188 200 03**

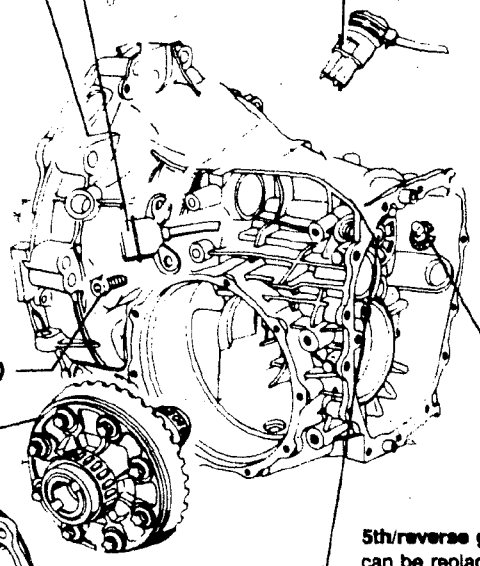
Multi-function sender
installing Fig. 4

Multi-function sender connector

Locking plate
for multi-function sender

25 Nm (18 ft lb)

Right drive flange
removing Fig. 7
drive in with **VW 295**



Circlip
always replace
removing/installing Fig. 8

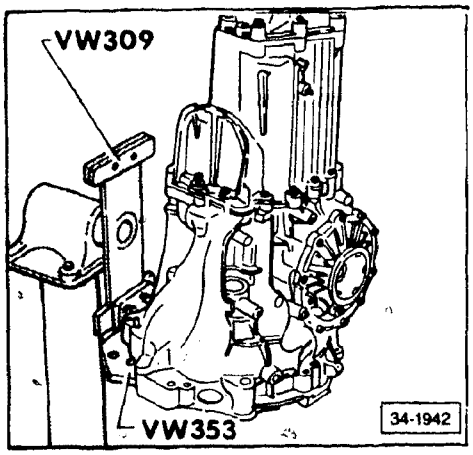
5th/reverse gear lock
can be replaced with transmission installed
install beveled side of plastic bushing towards relay shaft bore
disassembling/assembling Fig. 13
installation position Fig. 14

Gear shift lever shaft cover

CAUTION

If transmission housing or tapered roller bearing for pinion or hollow shaft is to be replaced and the deviation *r* is not specified on the bevel gear, the position of the pinion must be determined before removal of the gear carrier housing (actual measurement), see Repair Group 39.

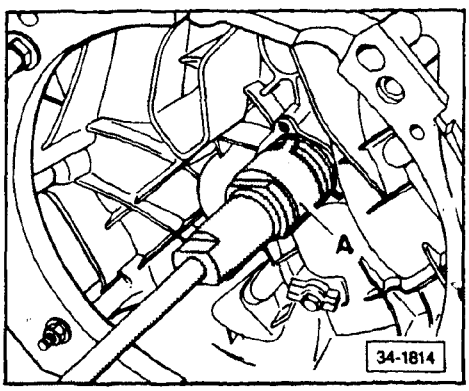
34-1818



▶ **Fig. 1 Transmission, mounting in assembly stand**

Note

Mount transmission so that top of transmission faces **VW 309**. If holes do not align modify **VW 353**. This method of mounting makes measuring for **S1** and **S2** possible.

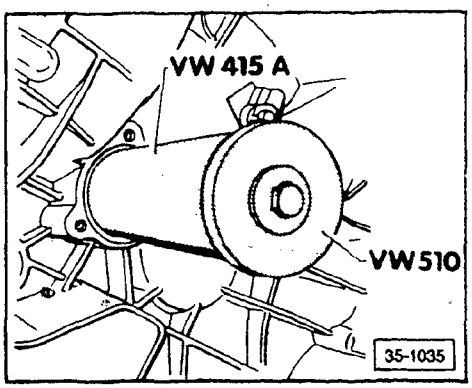


▶ **Fig. 2 Ball bearing, removing from housing**

- **A** — puller **VW 1528** and gripper **VW 1582/2**

Note

When installing puller do not damage the ball bearing cage.



▶ **Fig. 3 Ball bearing, installing in housing**

- install circlip on main shaft
- pull main shaft into transmission housing and ball bearing with bolt
  - installation position: open side of plastic cage points towards guide sleeve

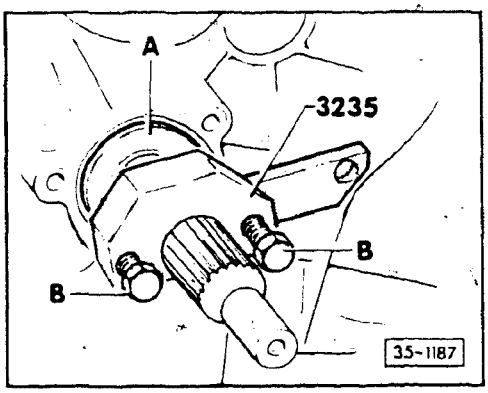
Beginning with transmission 21 07 9, the threaded hole in the main shaft, which is used for installing the ball bearing, is discontinued.

When installing the bearing in transmissions without the threaded hole, use tool **3235**. The procedure for removing the bearing is unchanged.

- install thrust pad A (part of tool **3235**) on bearing
- press bearing in by turning two bolts B alternately in stages

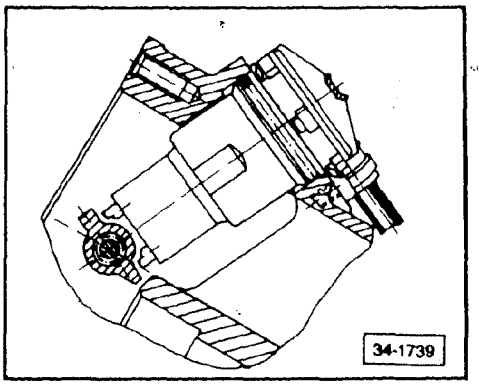
Note

The ends of bolts B must align with the two depressions in the thrust pad when pressing.



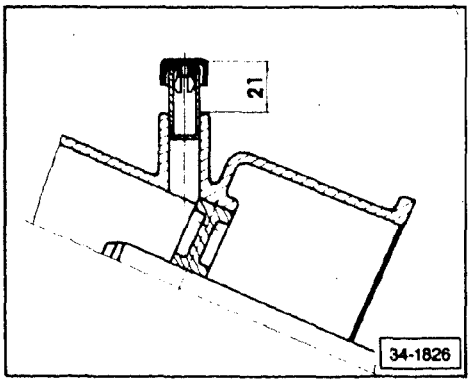
CAUTION

Turn each bolt ONLY a half turn at a time to prevent damage to the bearing.

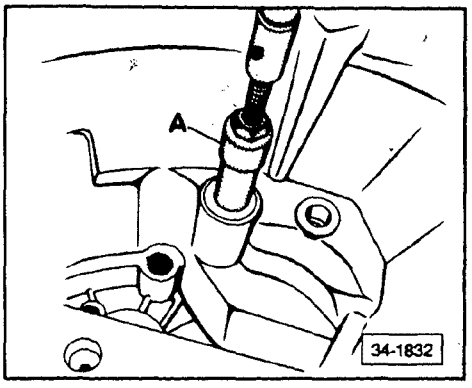


▶ **Fig. 4 Multi-function sender, installing**

- install lock ring to seal multi-function sender

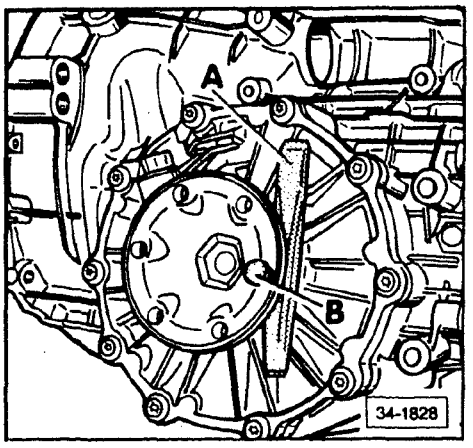


▶ **Fig. 5 Transmission breather sleeve, installing**



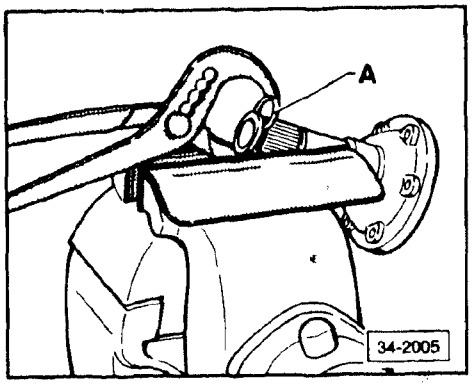
▶ **Fig. 6 Shift rod bushing, removing**

- with puller **A**, i.e. **Kukko 21/3** 18.5 mm - 23.5 mm



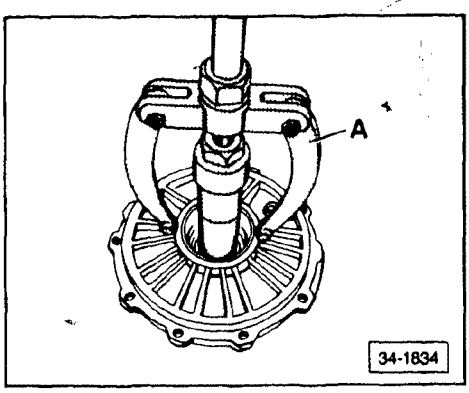
▶ **Fig. 7 Drive flange, removing**

- put chisel or spacer **A** under drive flange and pull drive flange out of differential gear by turning bolt **B**



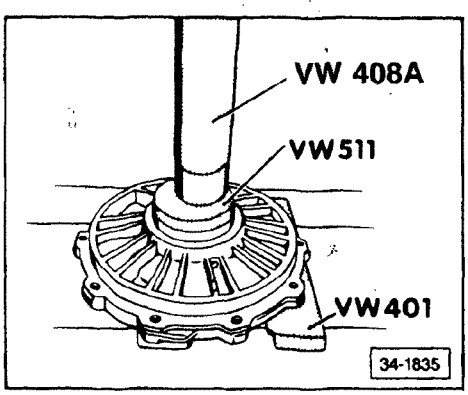
▶ **Fig. 8 Drive flange circlip, removing/installing**

- clamp drive flange in vise with protective jaw covers. Press circlip out of drive flange groove with new circlip **A**

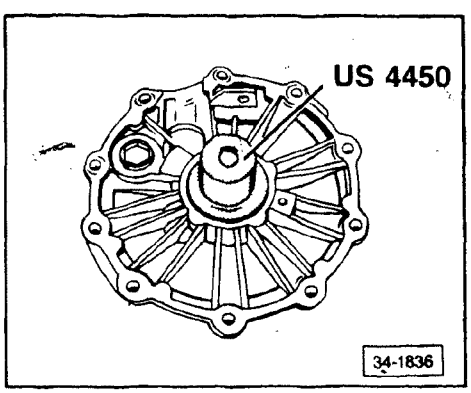


▶ **Fig. 9 Tapered roller bearing outer race in final drive cover, removing**

- with puller and holder **A**, i.e. **Kukko 21/7** = 46 mm - 56 mm and **Kukko 22/2**
- outer race can also be removed with **3138**

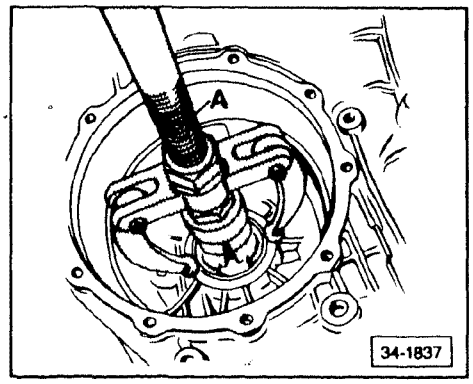


▶ **Fig. 10 Tapered roller bearing outer race for final drive cover, installing**



▶ **Fig. 11 Drive flange sealing ring, installing**

- drive sealing ring in 5 mm under cover upper edge

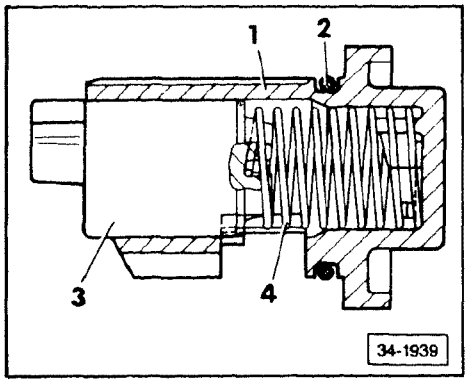


▶ **Fig. 12 Tapered roller bearing outer race in transmission housing, removing/installing**

- remove with puller and holder **A**, i.e. **Kukko 21/7** = 46 mm - 56 mm and **Kukko 22/2**

Note

Install, using **30-205**

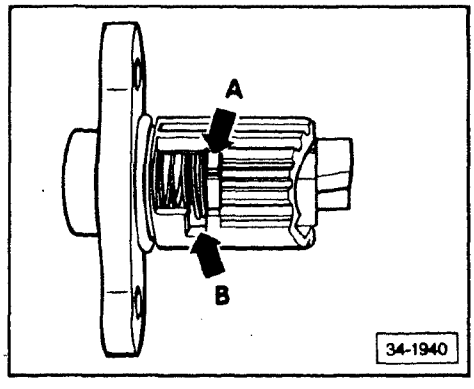


▶ **Fig. 13 5th and reverse gear lock, assembling**

- **1** - plastic bushing
- **2** - lock ring
- **3** - bushing with lock for 5th and R gear
- **4** - spring

Assembly instructions

- place spring **4** in plastic bushing **1**
- turn spring counterclockwise under light pressure until spring snaps in place in base of plastic part
- place bushing **3** on spring so that bent end of spring lies in groove
- press spring together using bushing **3**
  - approximately one turn counterclockwise (turn to left), until bushing tab **3** lies over the groove in plastic bushing
- press bushing tab **3** into groove in plastic bushing **1** to stop surface
- turn bushing **3** in clockwise direction (to the right) and release
  - bushing **3** springs into assembly end position



▶ **Fig. 14 5th/reverse gear lock, installation position**

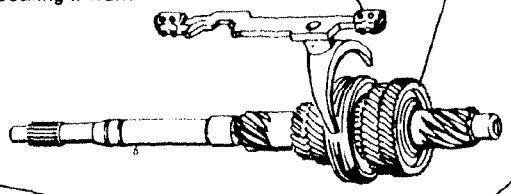
- 5th/reverse gear bushing tab (**arrow A**) must always come to stop opposite groove (**arrow B**) on plastic bushing

Note

If there is any catching or hanging up in 5th or reverse gear after adjusting the shifting control, the 5th and reverse gear lock must first be removed, checked, and if necessary replaced, before removal and disassembly of the transmission.

3rd/4th gear selector shaft and shift fork
position of selector shaft Fig. 2
selector shaft or shift fork can be replaced individually
selector shaft bushing, removing Fig. 4
driving in with **VW 295** and **VW 295 a**
replace selector shaft bearing if worn
installing Fig. 3

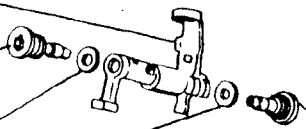
Main shaft
disassembling/assembling, page 35.2
adjusting, page 35.6
installing Fig. 3



Circlip

Thrust washer

Relay shaft



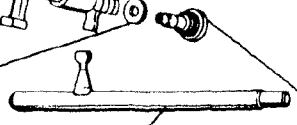
40 Nm (30 ft lb)
removing Fig. 1

Spacer

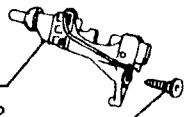
Spacer

Reverse gear needle bearing

Reverse gear

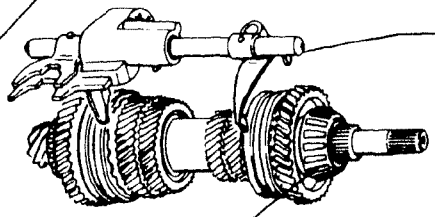


40 Nm (30 ft lb)
removing Fig. 1



Locking segment
installation position Fig. 2

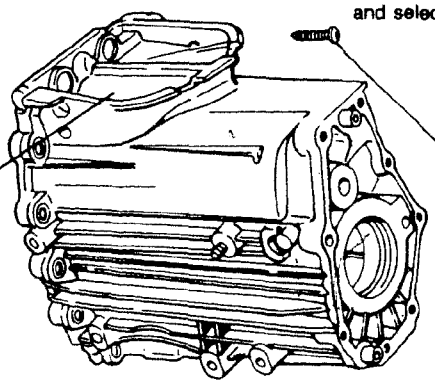
25 Nm (18 ft lb)
with flange facing spring/locking segment safety mechanism



1st, 2nd, 5th and reverse gear selector shaft with shift fork
to disassemble/assemble, remove/install spring pins
1st/2nd gear shift fork bearing, removing/installing Fig. 5
1st/2nd gear shift fork can be replaced individually
replace 5th/reverse gear shift fork only together with selector ring and selector shaft

Inner shift rod
installation position Fig. 2
installing Fig. 3
pull shift rod sealing ring out with **VW 681** and drive in flush with **VW 431**

Pinion with hollow shaft
disassembly/assembly, page 35.8



35 Nm (26 ft lb)
Torx screw for reverse gear selector shaft

Transmission cover housing
oil collector, removing installing Fig. 6

CAUTION

If transmission housing or tapered roller bearing for pinion or hollow shaft is to be replaced and the deviation r is not specified on the bevel gear, the position of the pinion must be determined before removal of the gear carrier housing (actual measurement), see Repair Group 39.

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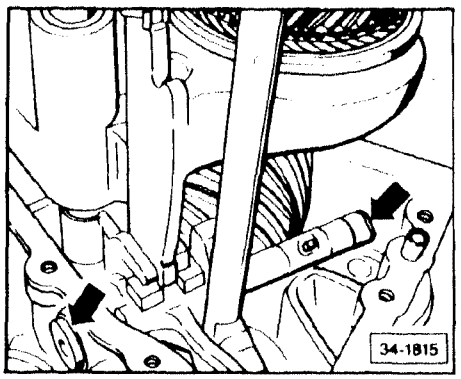
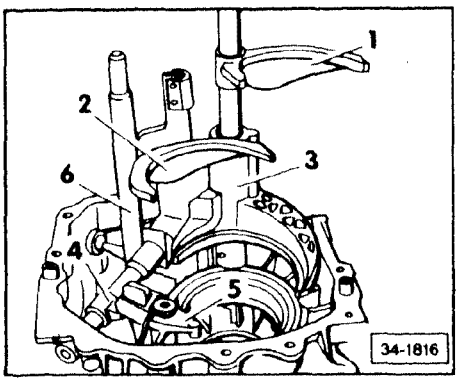
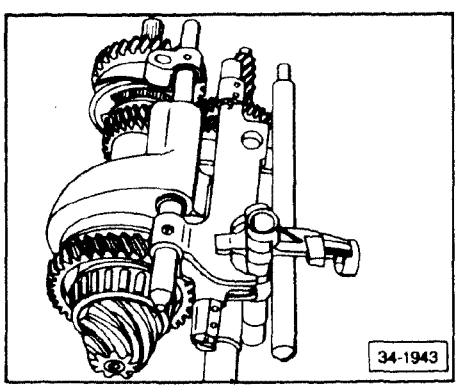


▶ **Fig. 1 Relay shaft bolts (arrows), removing**



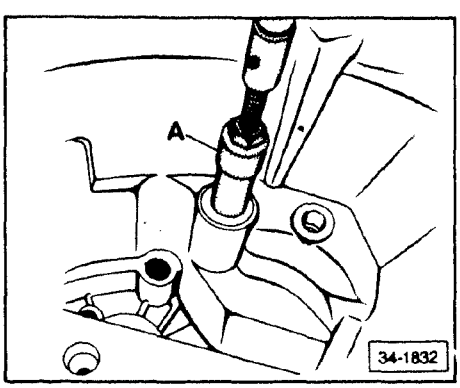
▶ **Fig. 2 Shift mechanism, installation position**

1 — 5th/reverse gear selector shaft with swinging fork
2 — 3rd/4th gear selector shaft
3 — 1st/2nd gear shift fork
4 — relay shaft
5 — locking segment
6 — shift rod



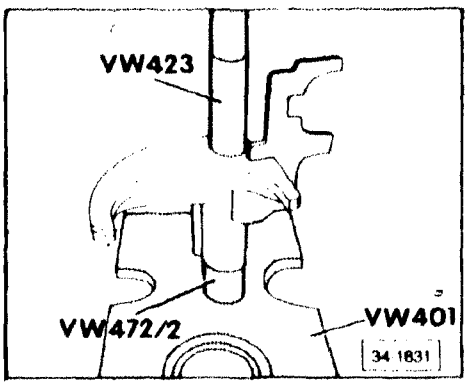
▶ **Fig. 3 Main shaft, pinion with hollow shaft, selector shafts and shift forks, installation position**

- these parts must be installed together

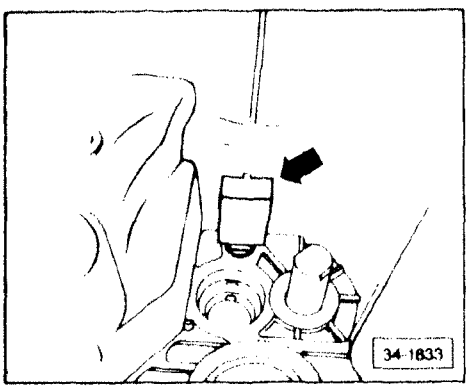


▶ **Fig. 4 Selector shaft bushing, removing**

- with puller **A**, i.e. **Kukko 21/3** 18.5 mm - 23.5 mm

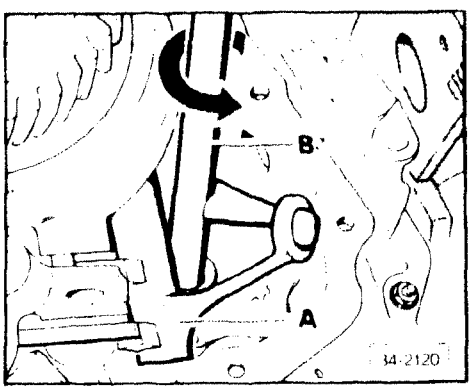


▶ **Fig. 5 Shift fork bearing, removing/installing**



▶ **Fig. 6 Oil collector, removing/installing**

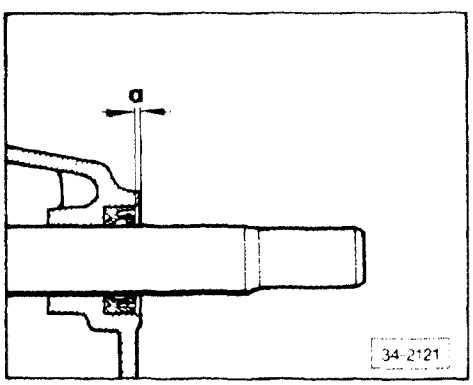
- pry out oil collector (**arrow**) with screwdriver
- push oil collector far enough into gear carrier housing that oil collector locking tab snaps into gear carrier housing
  - collector cup points upwards in gear carrier housing



▶ **Fig. 7 Inner shift rod/relay shaft, installing**

After installing the main shaft, pinion shaft and selector shafts, the inner shift rod and relay shaft can be installed as follows

- engage 3rd gear
- install relay shaft **A**
- install inner shift rod **B** sideways in housing and join to relay lever eye
- rotate inner shift rod in direction of arrow

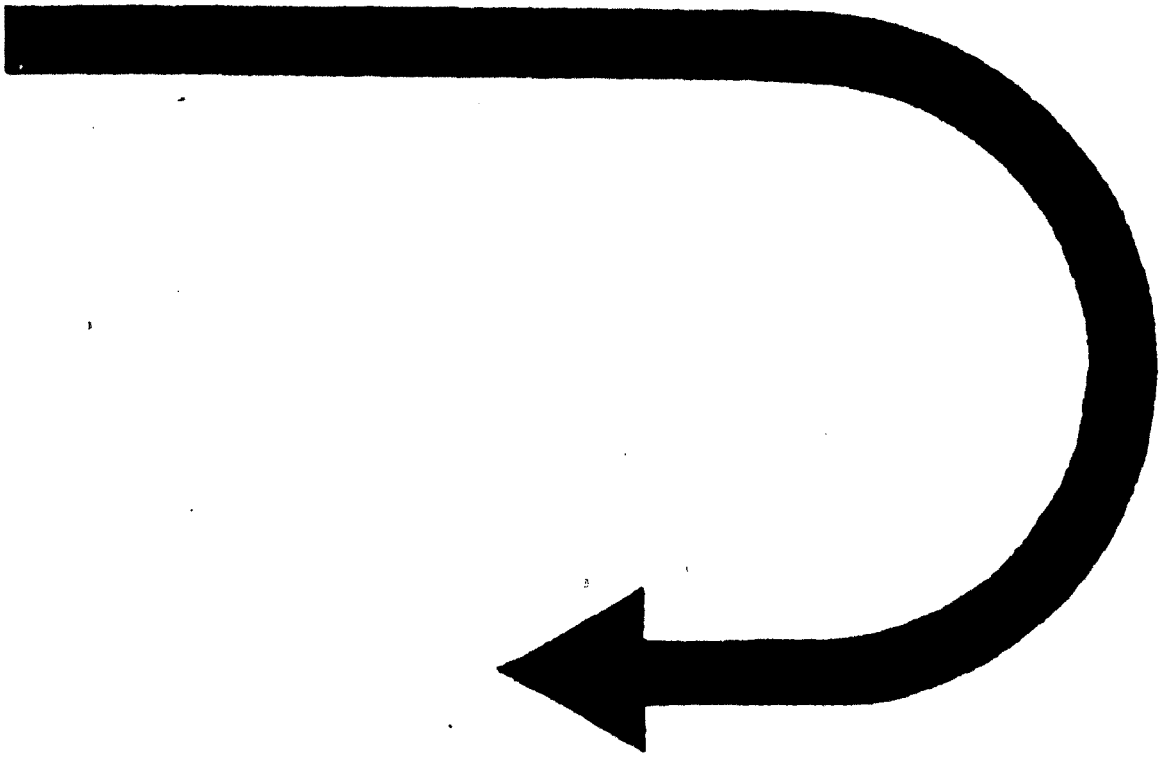


▶ **Fig. 8 Inner shift rod oil seal, replacing (transmission installed)**

- remove exhaust system as necessary
- remove shift rod
- pry out seal using small screwdriver
- install new seal with **VW 423**
  - installed position **a** 1.0 mm

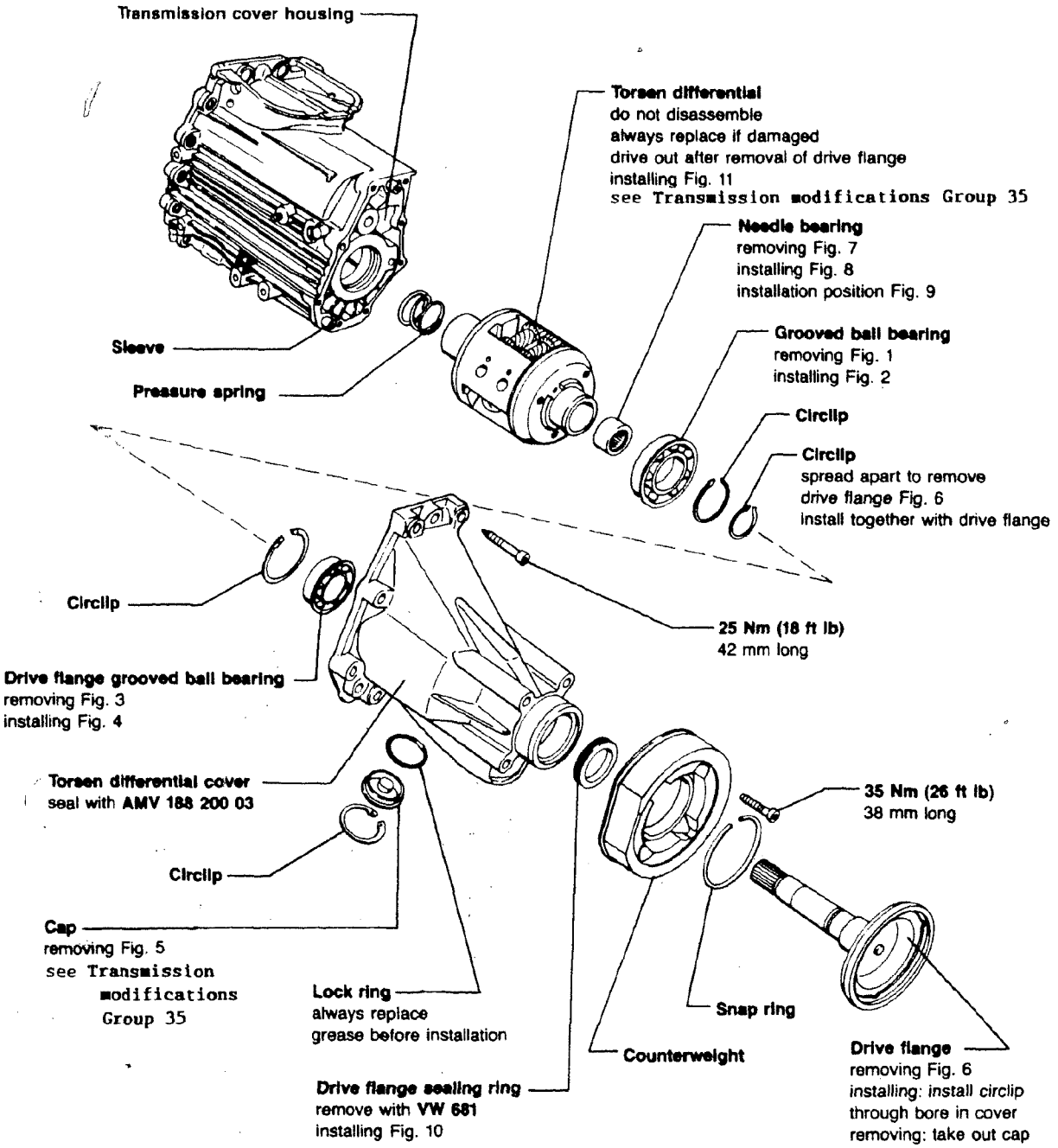
CONTINUED IN THE

BEGINNING OF NEXT ROW

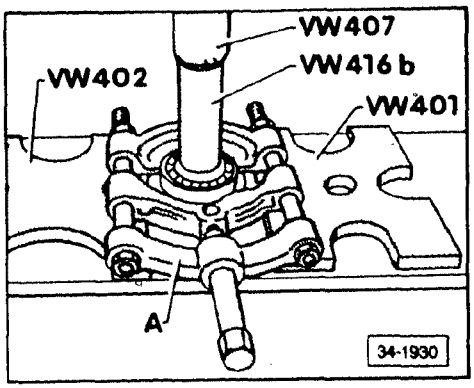


Note

Cover can also be removed/installed with Torsen differential.

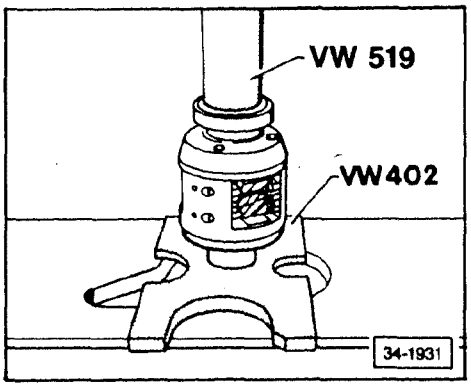


34-1929

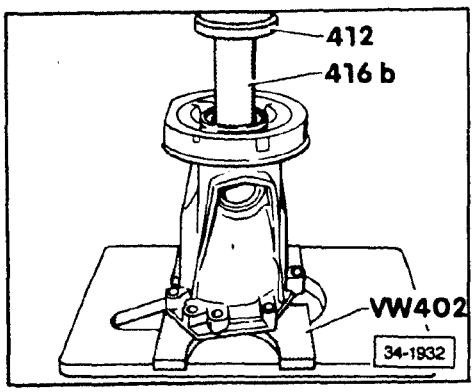


▶ **Fig. 1 Torsen differential grooved ball bearing, removing**

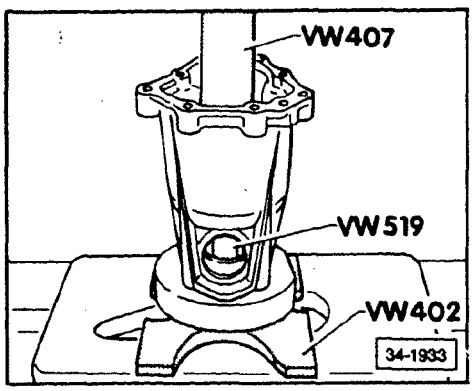
- **A** — separating device 12 - 75 mm, i.e. **Kukko 17/1**



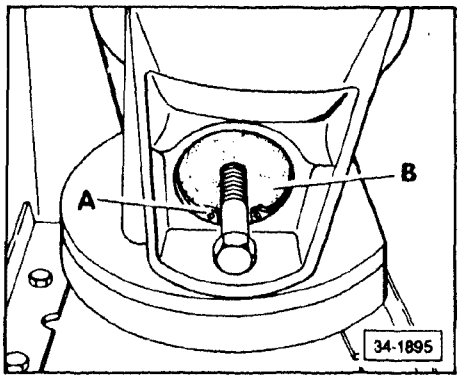
▶ **Fig. 2 Torsen differential grooved ball bearing, installing**



▶ **Fig. 3 Drive flange grooved ball bearing, removing**

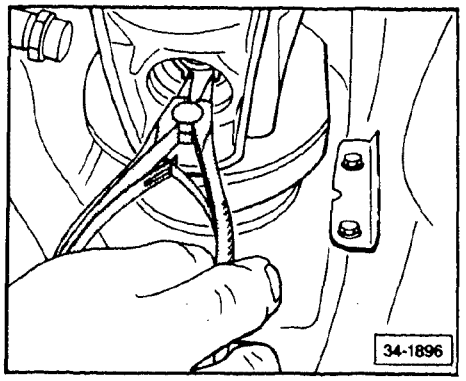


▶ **Fig. 4 Drive flange grooved ball bearing, installing**



▶ **Fig. 5 Cap, removing**

- insert M8 screw into threaded hole of cap **B** and pull cap out

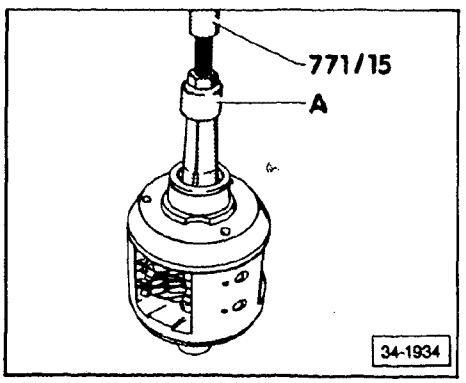


▶ **Fig. 6 Drive flange, removing**

- spread circlip to remove drive flange
  - when installing drive flange, also install circlip

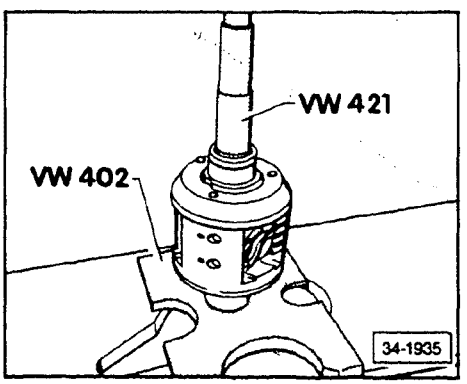
Note

Do not over stretch circlip, it must lie in the base of the groove.

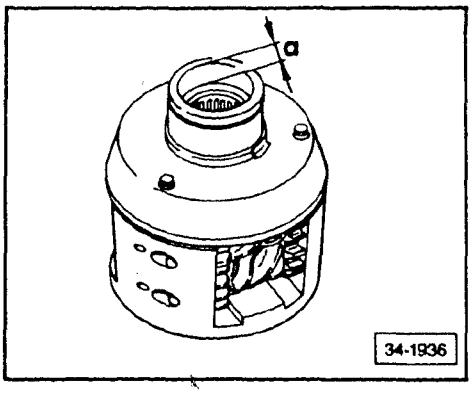


▶ **Fig. 7 Needle bearing, removing**

- drive out with puller **A**, i.e. **Kukko 21/4** 23.5 mm - 30 mm

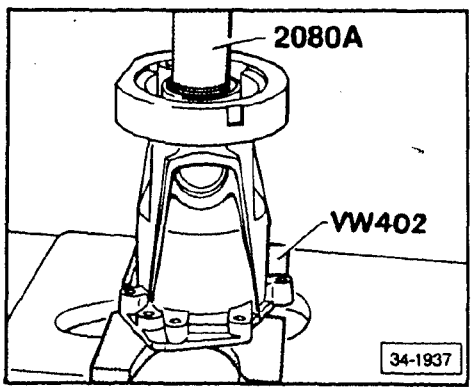


▶ **Fig. 8 Needle bearing, installing**



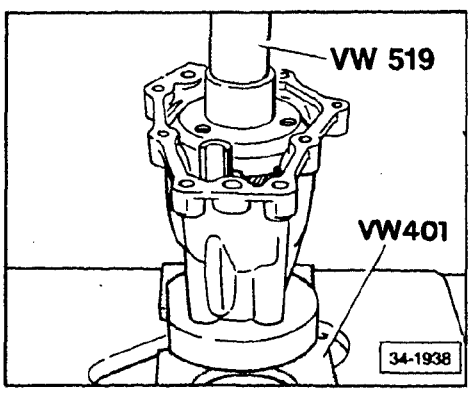
▶ **Fig. 9 Needle bearing, installation position**

- dimension **a** = 14 mm

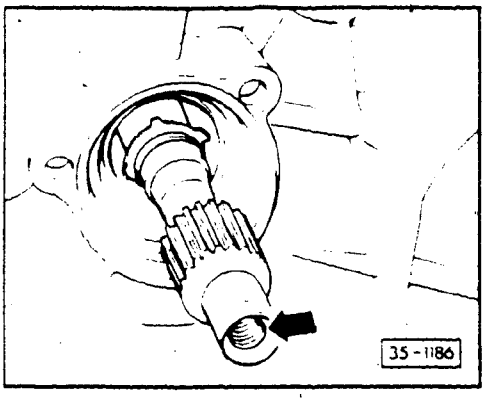


▶ **Fig. 10 Sealing ring, installing**

- drive sealing ring in to 2 mm below cover inner edge



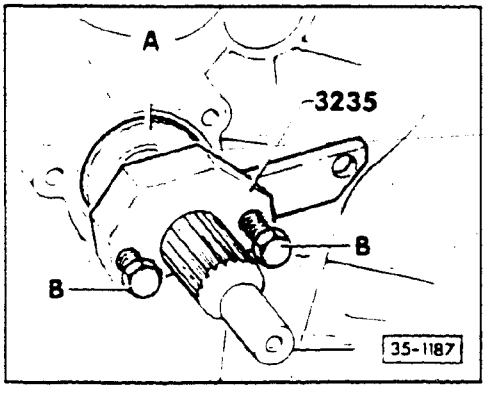
▶ **Fig. 11 Torsen differential, installing**



Beginning with transmission 21 07 9, the threaded hole (**arrow**) in the main shaft, which is used for installing the ball bearing, is discontinued.

When installing the bearing in transmissions without the threaded hole, use tool **3235**. The procedure for removing the bearing is unchanged.

Ball bearing, installing in housing



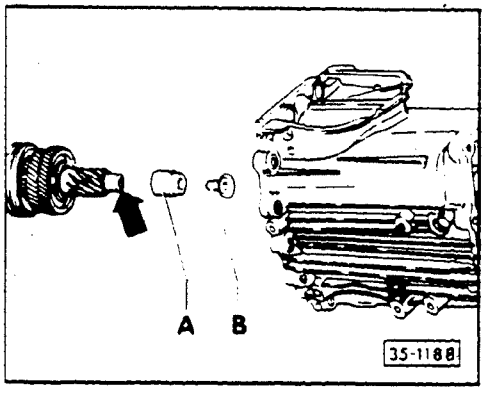
- push bearing as far as possible onto main shaft
- install thrust pad **A** (part of tool **3235**) on bearing
- install **3235** behind clutch plate splines on main shaft
- press bearing in by turning two bolts **B** alternately in stages

Note

The ends of bolts **B** must align with the two depressions in the thrust pad when depressing.

> **CAUTION**
>
> **Turn each bolt ONLY a half turn at a time to prevent damage to the bearing.**

Oil drilling in main shaft, deleted



Also beginning with transmission 21 07 9, the oil drilling (**arrow**) for 3rd/4th gear is no longer present in **some transmissions**.

The needle bearing **A** to support the main shaft in the transmission housing is then installed without the plastic sleeve **B**.

If, during repairs, the main shaft is replaced with a shaft that has the oil drilling, the plastic sleeve must be installed.