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01A All Wheel Drive

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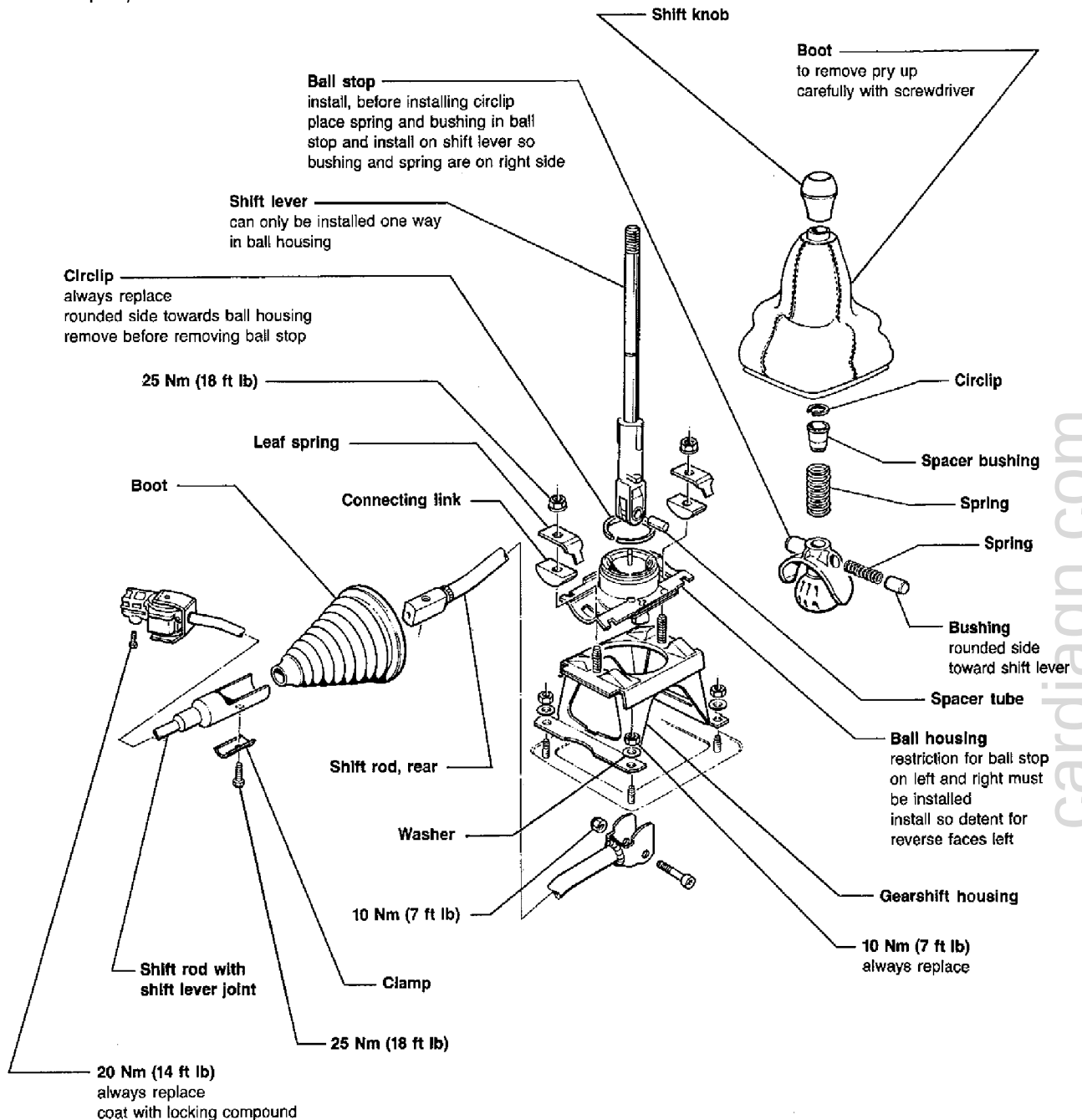
Technical data, 5-speed transmission O1A

Code		AML
Production	from	01/88
	to	
Application	type	Audi 100 Quattro
	engine	2.3 liter - 100 kW
Rear final drive		AAT
Ratio:	final drive	37.09 ± 4.111
	1st gear	39:11 ± 3.545
	2nd gear	40:19 ± 2.105
	3rd gear	40:28 ± 1.429
	4th gear	35:34 ± 1.029
	5th gear	31:37 ± 0.838
	reverse gear	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
Drive flange diameter		108 mm
Speed in highest gear at 1000 RPM		33.63 km/h (20.9 mph)

Manual Transmission – Controls, Assembly

Note

Before repairing, take out center console (see Repair Group 70).

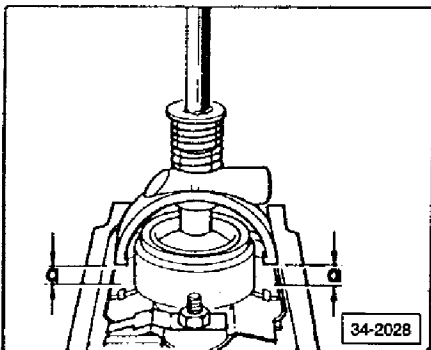
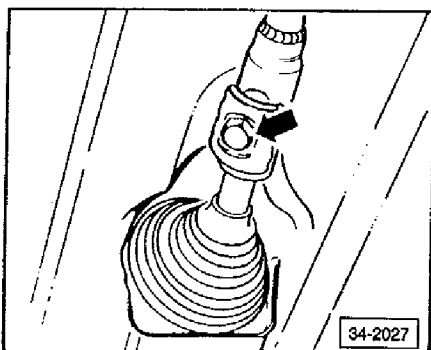


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Shift linkage, adjusting/checking

Adjusting

- place gearshift lever in neutral
- remove shift knob, screw for boot and boot
- loosen bolt (**arrow**)
- position gearshift lever as close to vertical as possible

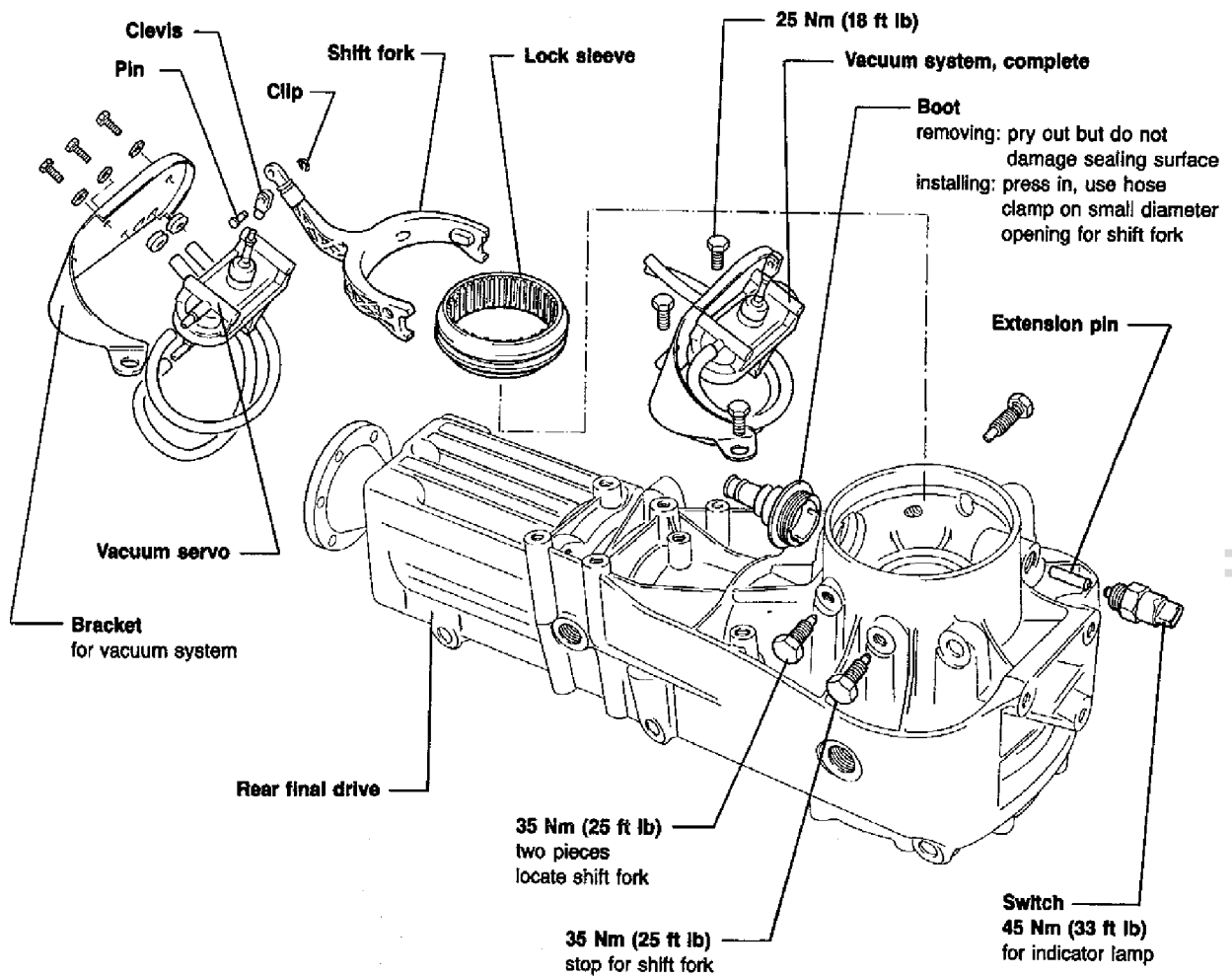


- align lever so that both lugs on ball stop are same distance **a** (**arrows**) from ball housing
- tighten bolt and ensure that lever does not move

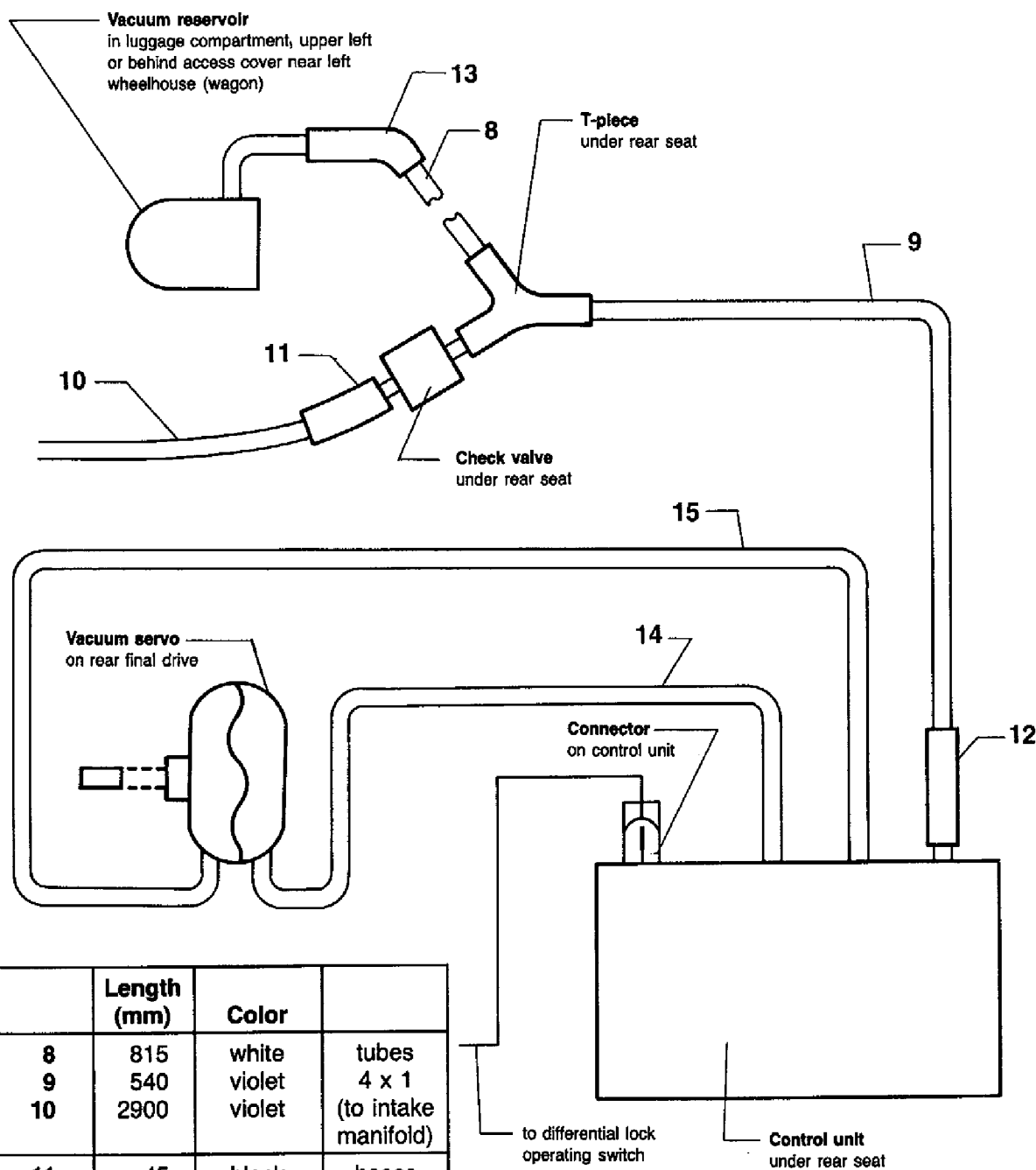
Checking

- check function of shifter; shift through all gears
 - lever must be in the 3rd/4th gear plane in neutral
 - ensure that reverse safety catch is effective. If not, loosen screws and turn ball housing slightly
- install boot and shift knob

Manual Transmission – Controls, Assembly

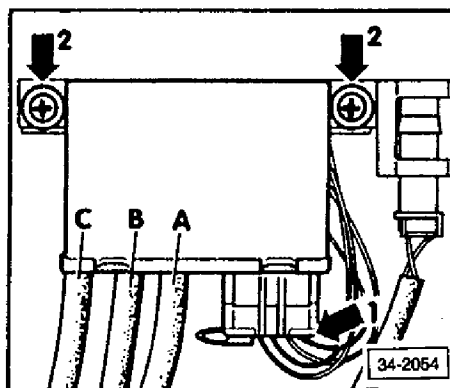


34-1628



*wagon

34-2057



Differential lock control unit, removing/installing

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

Removing

- remove vacuum hoses
 - **A** blue — to vacuum servo
 - **B** yellow — to vacuum servo
 - **C** violet — from engine intake manifold
- remove wiring connector from control unit (**arrow**)
- remove control unit by loosening two screws (**arrows 2**)

Installing

Proceed in reverse order of removal to install the control unit.

Differential lock operating switch, removing

The differential lock operating switch is mounted in the cover of the front center console.

- carefully pry switch out with screwdriver
- disconnect wiring connectors

Transmission, removing/installing**Removing**

- disconnect battery ground strap
- remove upper engine/transmission bolts
- remove wiring connectors for speedometer sender and multifunction switch
- remove engine protection plate
- remove oxygen sensor probe from exhaust
- disconnect exhaust pipe from manifold
- separate exhaust pipe behind catalyst and remove pipe and catalyst
- remove crossmember
- remove driveshaft from transmission and tie out of way
- remove shift rod to transmission mounting and take out shift rod
- remove right and left axle shafts at transmission, turn steering to right side and tie axle shafts out of way
- remove clutch slave cylinder

Note

Do not open hydraulic line.

- remove cables for seat belt tensioning system from transmission (see Repair Group 68)
- install engine support **10-222A**
- remove heat shield from right side bonded rubber bushing
- remove bolts for transmission supports, right and left
- support transmission with **VW 1383** or equivalent
- remove transmission supports from transmission

Manual Transmission – Controls, Assembly

- remove lower engine/transmission mounting bolts
- pry transmission out of sleeves and lower carefully

Installing

Proceed in reverse order of removal and note the following:

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

Note

Ensure that engine/transmission alignment bushings (sleeves) are installed in engine before installing transmission.

Tightening torques

Axle shaft to drive flange

M 8 bolts 45 Nm (33 ft lb)

M 10 bolts 80 Nm (59 ft lb)

Driveshaft to transmission and final drive flanges

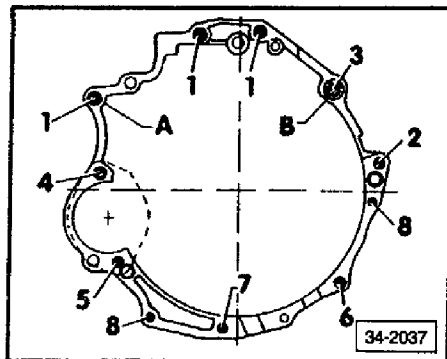
M 8 bolts 55 Nm (41 ft lb)

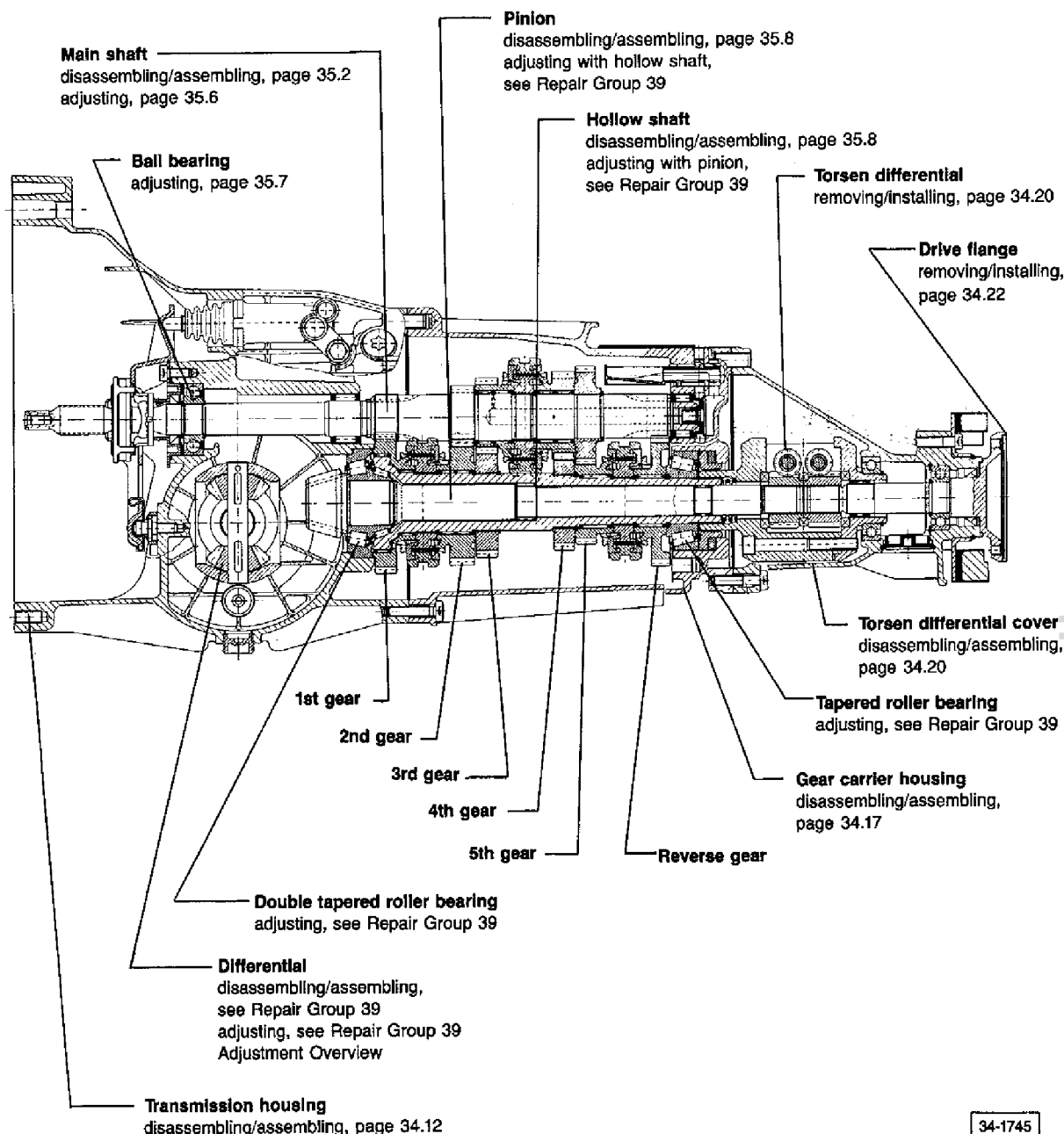
(always replace)

Engine/transmission mounting bolts

- 1 — Bolt M 12 x 70 65 Nm (48 ft lb)
- 2 — Bolt M 12 x 80 65 Nm (48 ft lb)
- 3 — Bolt M 12 x 90 65 Nm (48 ft lb)
- 4 — Bolt M 12 x 100 65 Nm (48 ft lb)
- 5 — Bolt M 10 x 120 65 Nm (48 ft lb)
- 6 — Bolt M 10 x 50 45 Nm (33 ft lb)
- 7 — Bolt M 10 x 40 45 Nm (33 ft lb)
- 8 — Bolt M 8 x 40 25 Nm (18 ft lb)

Alignment bushing located at positions A and B.





Transmission, disassembling/ assembling

Disassembling

- clamp transmission in assembly stand, page 34.13
- 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 34.13
- 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 34.18
- 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 34.18
- circlips for main shaft at ball bearing must be replaced in the same position and be of the same thickness

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 **VW 511** and **VW 295**
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 (25 ft lb)

Concave washer
small diameter faces guide sleeve (convex side)

Main shaft ball bearing
pulling out of transmission housing Fig. 2
installing Fig. 3
also see page 34.23A

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**

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.

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

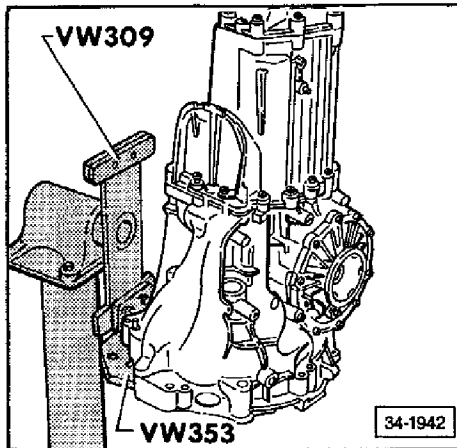
5th/reverse gear lock
can be replaced with transmission installed
install beveled side of plastic bushing towards relay shaft bore
disassembling/assembling Fig. 13
installation position Fig. 14

Gear shift lever shaft cover

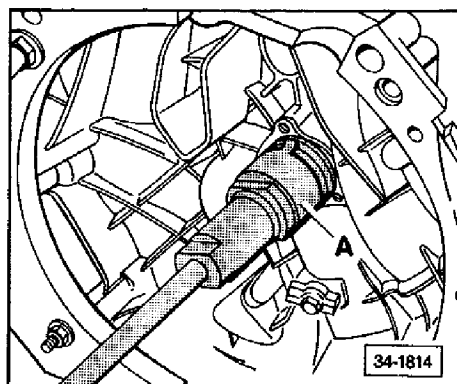
CAUTION

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

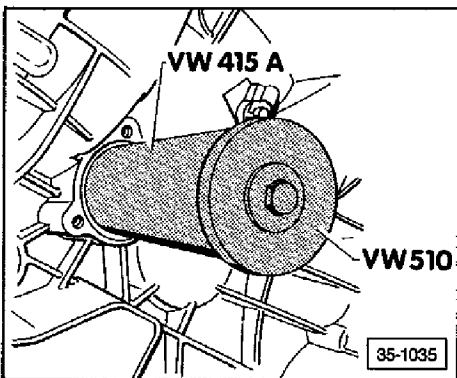


► Fig. 2 Ball bearing, removing from housing

- 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.

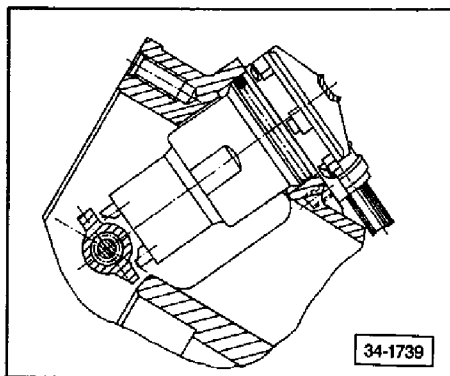
- install thrust pad A (part of tool 3235) on bearing
- press bearing in by turning two bolts B alternately in stages

Note

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

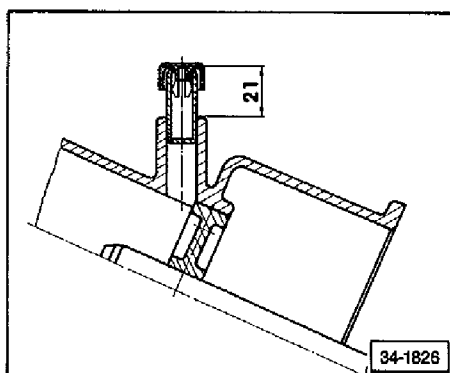
CAUTION

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

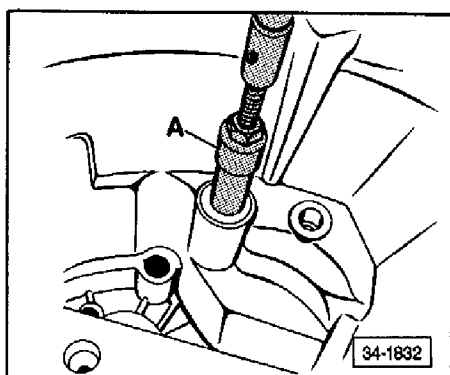


► Fig. 4 Multi-function sender, installing

- install lock ring to seal multi-function sender

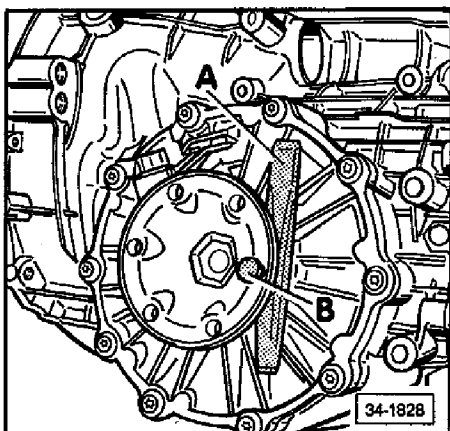


► Fig. 5 Transmission breather sleeve, installing



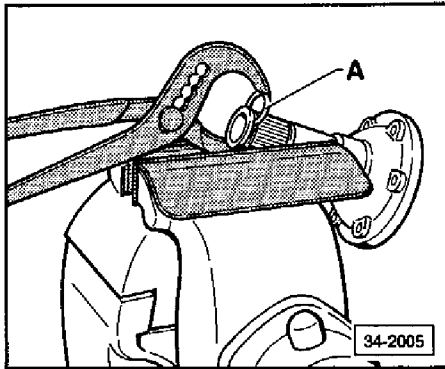
► Fig. 6 Shift rod bushing, removing

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



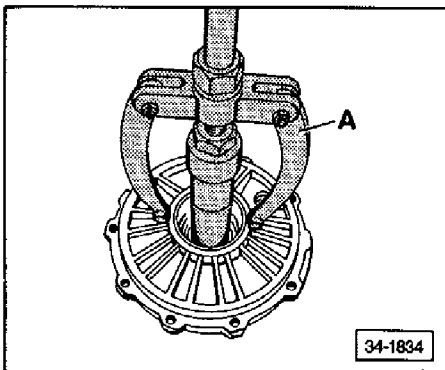
► Fig. 7 Drive flange, removing

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



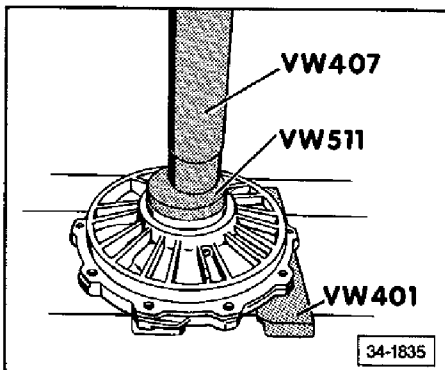
► Fig. 8 Drive flange circlip, removing/installing

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

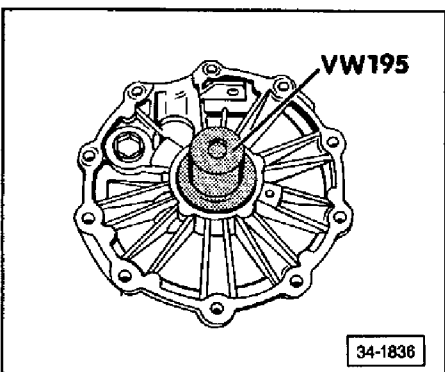


► Fig. 9 Tapered roller bearing outer race in final drive cover, removing

- 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

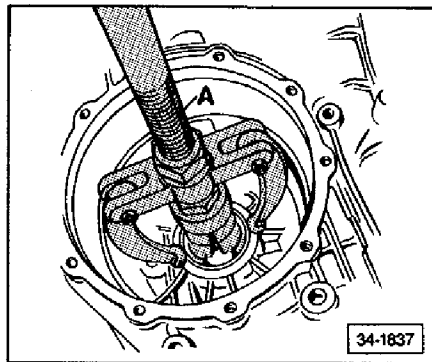


► Fig. 10 Tapered roller bearing outer race for final drive cover, installing



► Fig. 11 Drive flange sealing ring, installing

- drive sealing ring in 5 mm under cover upper edge with VW 195

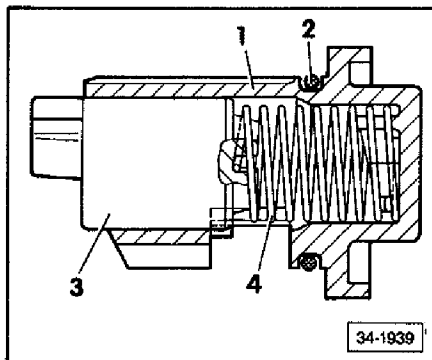


► Fig. 12 Tapered roller bearing outer race in transmission housing, removing/installing

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

Note

Install, using VW 511 and VW 295.

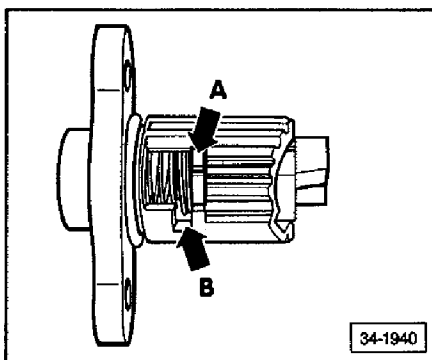


► Fig. 13 5th and reverse gear lock, assembling

- 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

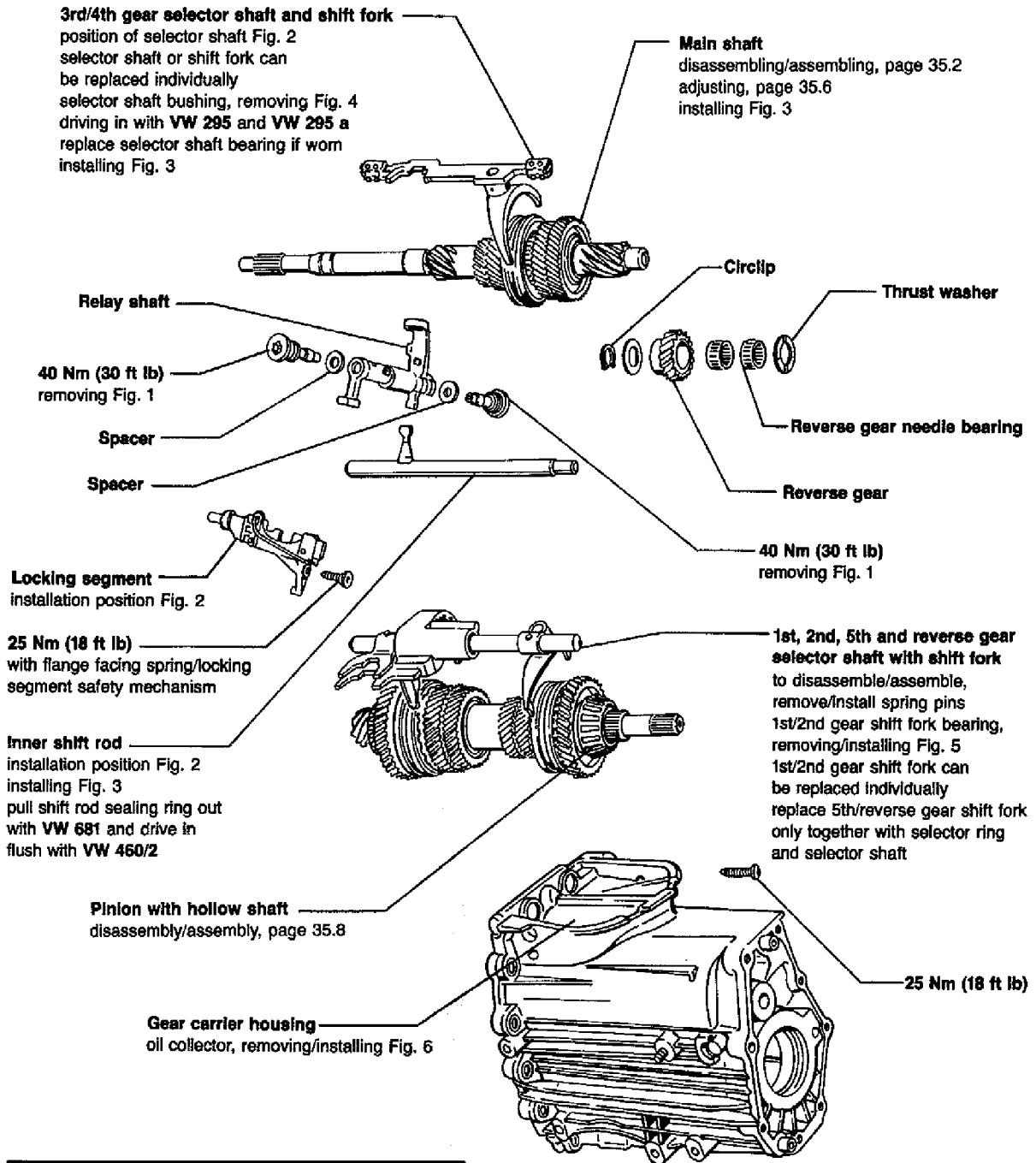
- 5th/reverse gear bushing tab (arrow A) must always come to stop opposite groove (arrow B) on plastic bushing

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.

Manual Transmission – Controls, Assembly

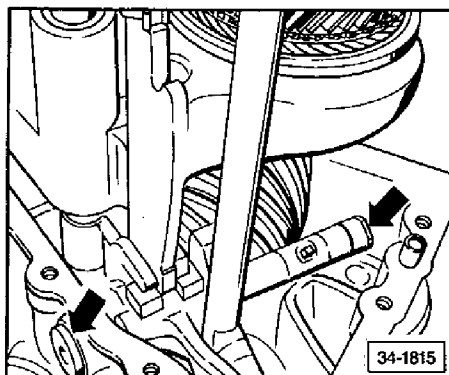
Gear carrier housing, assembling, page 34.11



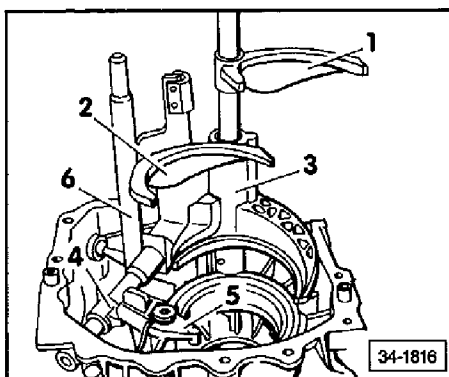
CAUTION

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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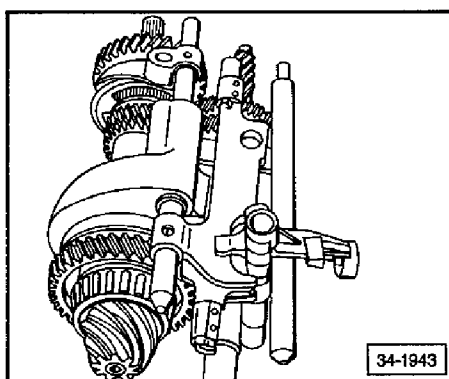


► Fig. 1 Relay shaft bolts (arrows), removing



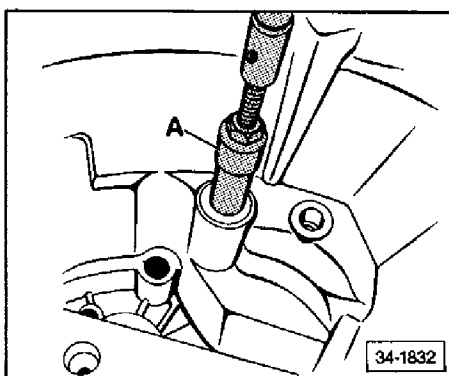
► Fig. 2 Shift mechanism, installation position

- 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



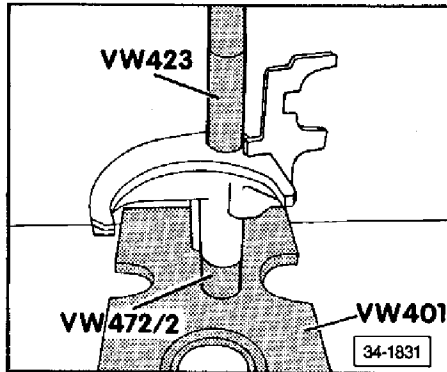
► Fig. 3 Main shaft, pinion with hollow shaft, selector shafts and shift forks, installation position

- these parts must be installed together

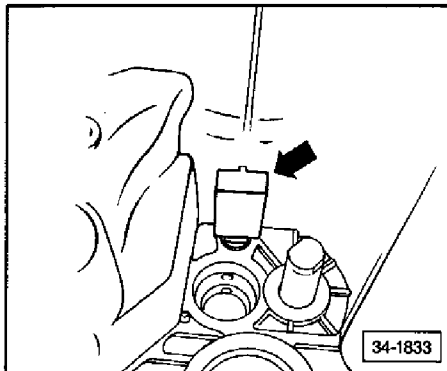


► Fig. 4 Selector shaft bushing, removing

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



► Fig. 5 Shift fork bearing, removing/installing



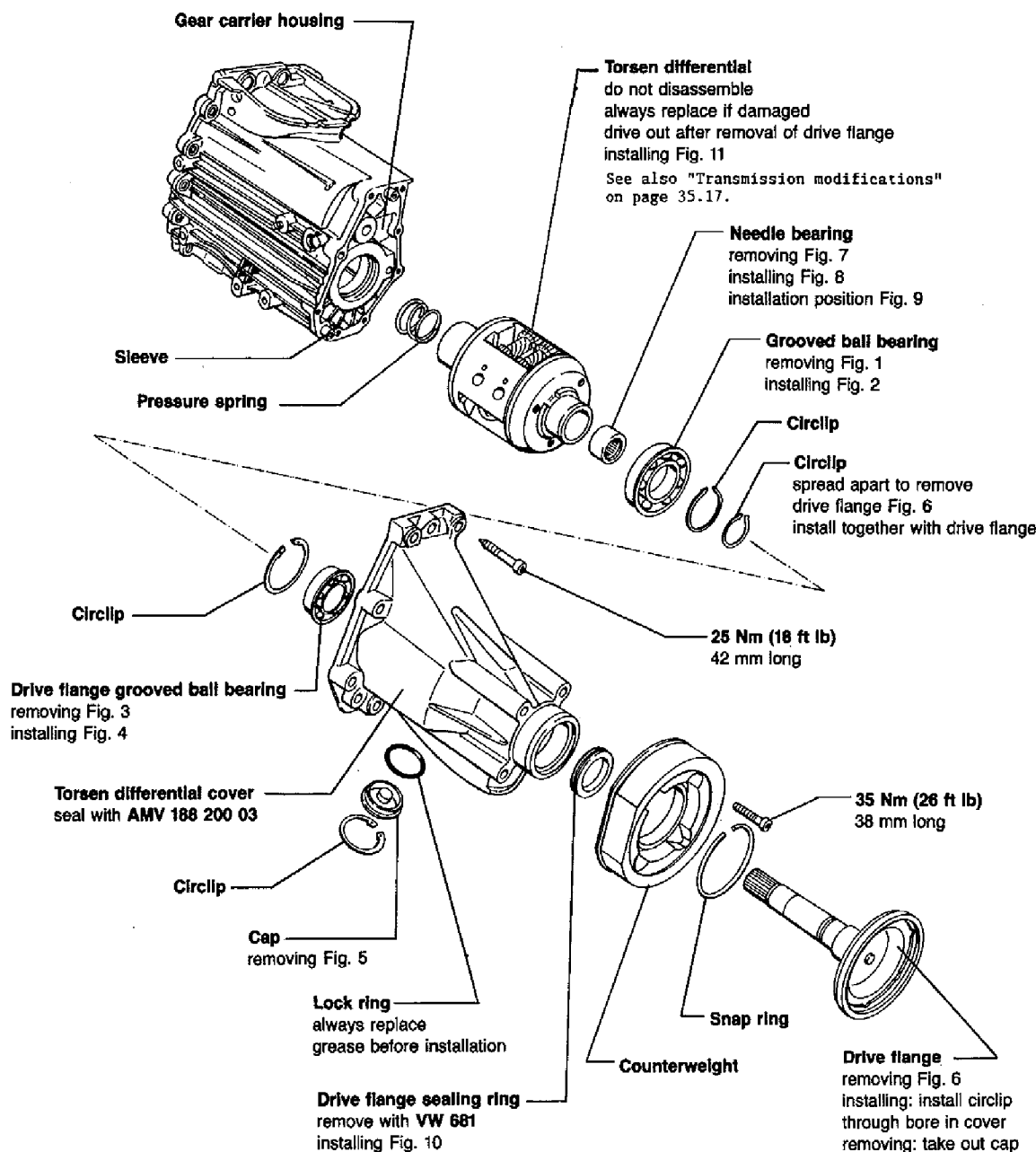
► Fig. 6 Oil collector, removing/installing

- 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

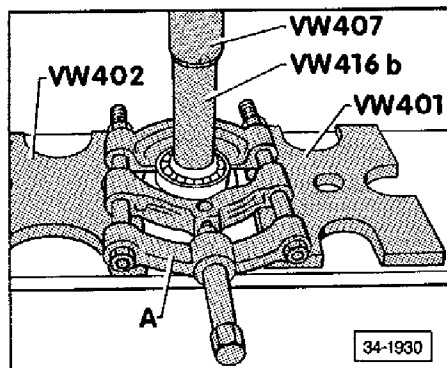
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Note

Cover can also be removed/installed with Torsen differential.

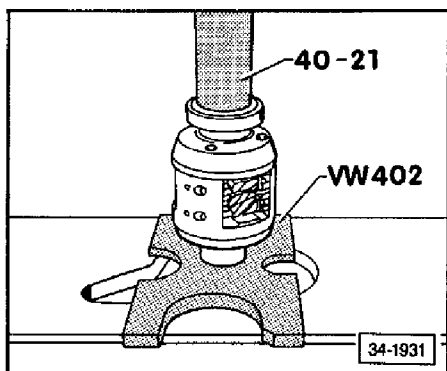


34-1929

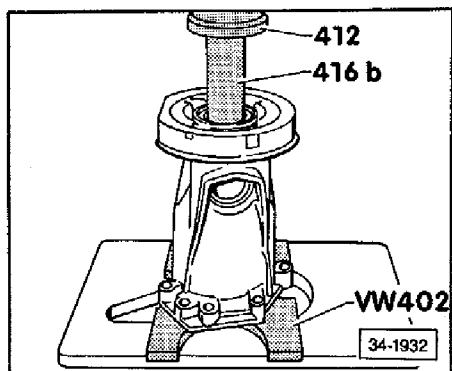


► Fig. 1 Torsen differential grooved ball bearing, removing

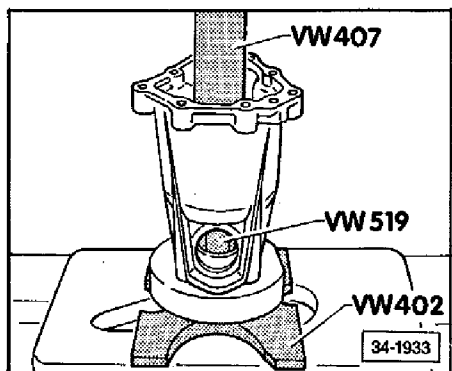
- A — separating device 12 - 75 mm, i.e. Kukko 17/1



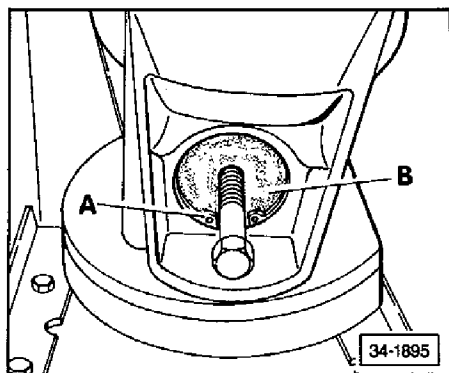
► Fig. 2 Torsen differential grooved ball bearing, installing



► Fig. 3 Drive flange grooved ball bearing, removing

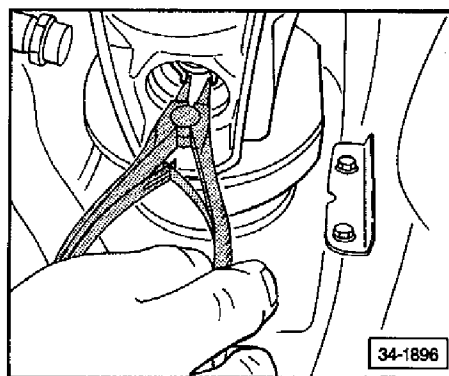


► Fig. 4 Drive flange grooved ball bearing, installing



► Fig. 5 Cap, removing

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

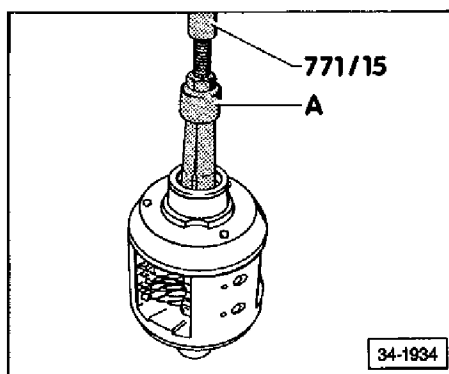


► Fig. 6 Drive flange, removing

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

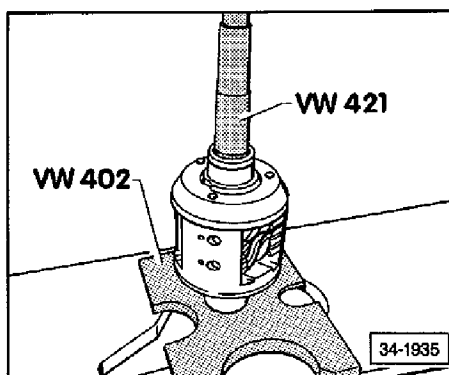
Note

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

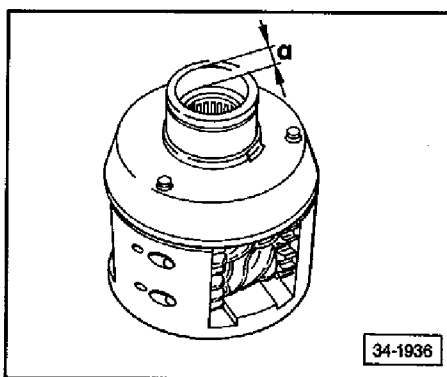


► Fig. 7 Needle bearing, removing

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

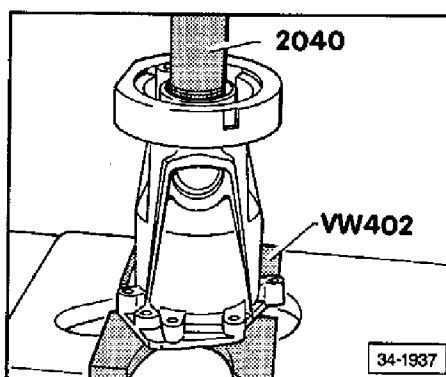


► Fig. 8 Needle bearing, installing



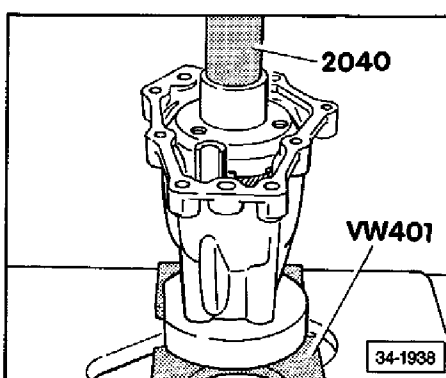
► Fig. 9 Needle bearing, installation position

- dimension $a = 14 \text{ mm}$

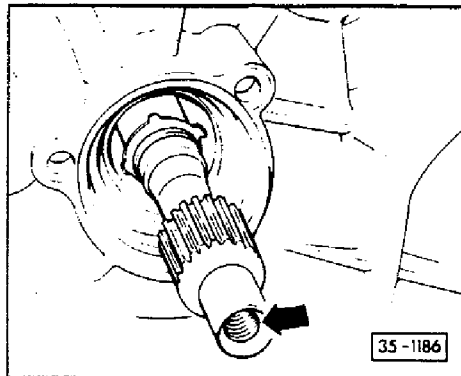


► Fig. 10 Sealing ring, installing

- 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

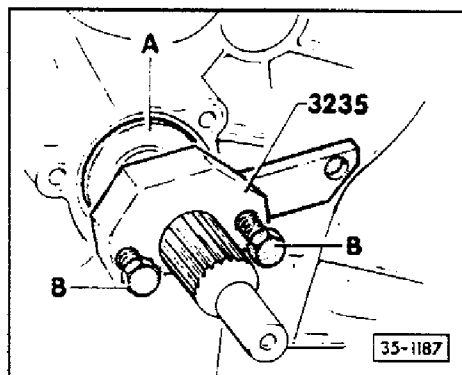
- push bearing as far as possible onto main shaft
- install thrust pad A (part of tool 3235) on bearing
- install 3235 behind clutch plate splines on main shaft
- press bearing in by turning two bolts B alternately in stages

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.

