



Workshop Manual

Jetta 2006 ➤

Golf Variant 2008 ➤

5-speed manual gearbox 0AF

Edition 08.2007





List of Workshop Manual Repair Groups

Repair Group

- 00 - Technical data
- 30 - Clutch
- 34 - Controls, housing
- 35 - Gears, shafts
- 39 - Final drive - differential

Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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00 – Technical data

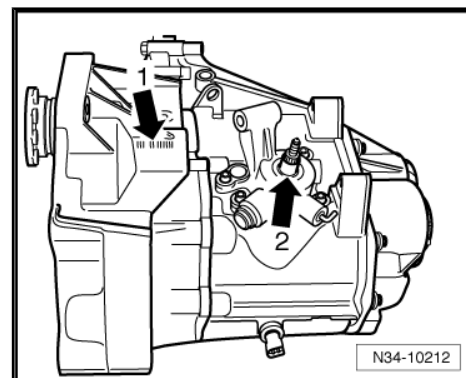
1 Gearbox identification

The 5-speed manual gearbox 0AF is installed in the Jetta 2006 ▶ and Golf Variant 2008 ▶ in conjunction with a 4-cylinder engine.

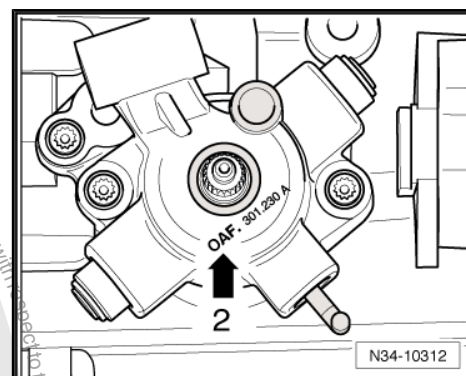
Allocation ⇒ [page 1](#)

1.1 Location on gearbox

Code letters and date of manufacture -arrow 1- Manual gearbox 0AF -arrow 2-



Manual gearbox 0AF -arrow 2-



Identification code and date of gearbox manufacture -arrow-

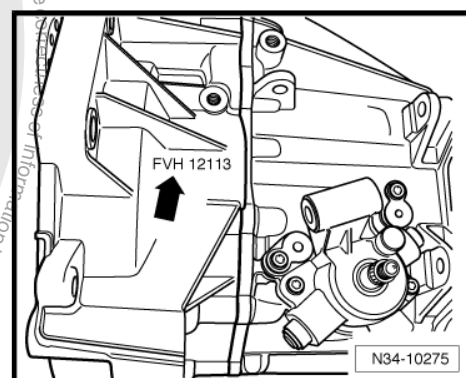
Example:	FVH	12	11	3
	Identification code	Day	Month	Year (2003) of manufacture

Additional data provide information about the production facility.



Note

The gearbox code also appears on the vehicle identification plates.



1.2 Identification codes, assembly allocation, capacities

Manual gearbox		5-speed 0AF		
Identification code		FVH	JHT	
Manufactured from	to	05.05	11.06	
Allocation	Model	Jetta 2006 ▶ Golf Variant 2008 ▶	Jetta 2006 ▶ Golf Variant 2008 ▶	



Manual gearbox	5-speed 0AF		
Identification code	FVH	JHT	
Engine	1.6 l - 75 kW	1.6 l - 75 kW	
Ratio Final drive Z1 : Z2	68 : 15 = 4.533	68 : 15 = 4.533	
Capacity of manual gear- box	2.0 l	2.0 l	
Drive shaft flange Ø	100 mm	100 mm	

The following data can be found in the ⇒ Electronic parts catalogue "ETKA" .

- ◆ Individual gear ratios
- ◆ Gear oil
- ◆ Clutch allocation



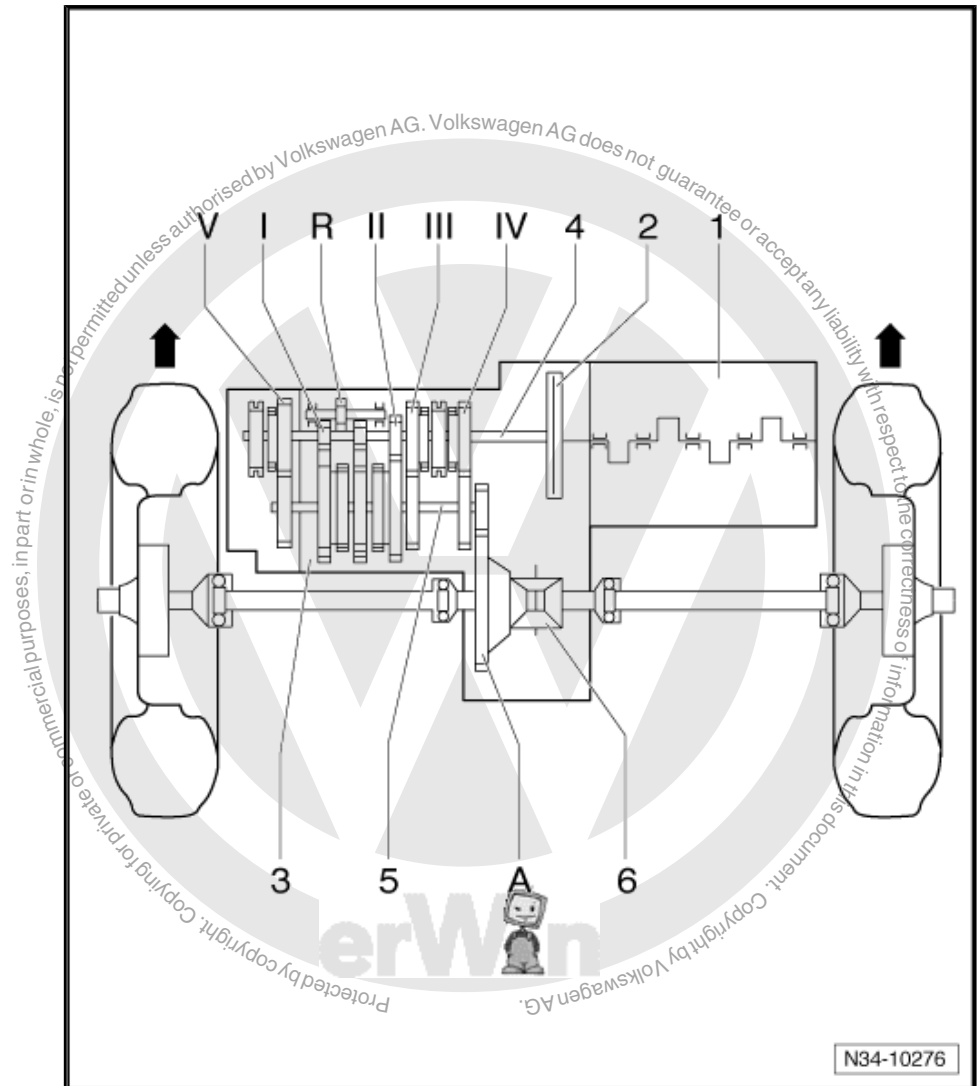


2 Overview - power transmission

Designation

-Arrows- indicate direction of travel.

- 1 - Engine
- 2 - Clutch
- 3 - Manual gearbox
- 4 - Input shaft
- 5 - Output shaft
- 6 - Differential

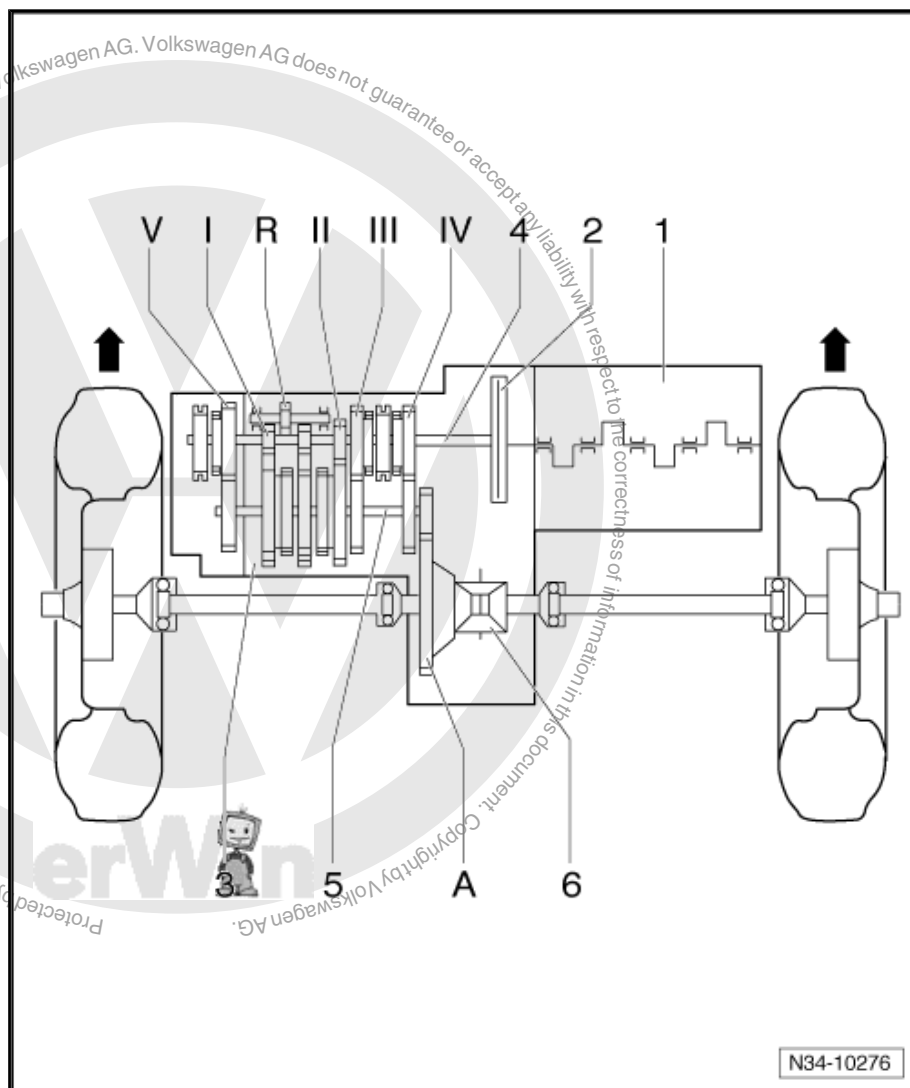


Gears

-Arrows- indicate direction of travel.



- I - 1st gear
- II - 2nd gear
- III - 3rd gear
- IV - 4th gear
- V - 5th gear
- R - Reverse gear
- A - Final drive





3 Calculating overall gear ratio "i"

Example:

	5th gear	Final drive
Drive gear	$ZG_1 = 49$	$ZA_1 = 16$
Driven gear	$ZG_2 = 38$	$ZA_2 = 67$

$$i = Z_2 : Z_1 \text{ } ^{1)}$$

$$i_G = \text{Gear ratio} = ZG_2 : ZG_1 = 38 : 49 = 0.776$$

$$i_A = \text{Final drive ratio} = ZA_2 : ZA_1 = 67 : 16 = 4.188$$

$$i_{\text{total}} = \text{Overall ratio} = i_G \times i_A = 0.776 \times 4.188 = 3.250$$

1) Z_1 = No. of teeth on driving gear, Z_2 = No. of teeth on driven gear



4 General repair notes

To ensure perfect and successful gearbox repairs, the greatest care and cleanliness as well as the use of good and proper tools is essential. Of course, the basic rules for safety also apply during repair work.

A number of instructions generally applicable to the various repair procedures - which were previously repeated a number of times at various places in the workshop manual are summarised under the topic "components" ➔ [page 6](#) . They apply to this workshop manual.

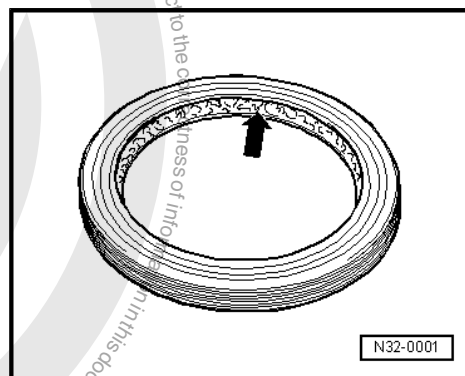
4.1 Components

4.1.1 Gearbox

- ◆ When installing the manual gearbox, ensure that the dowel sleeves between the engine and gearbox are correctly seated.
- ◆ When installing mounting brackets or waxed components, clean the contact surfaces. Contact surfaces must be free of wax and grease.
- ◆ Allocate bolts and other components using ➔ Electronic parts catalogue "ETKA" .
- ◆ When changing a gearbox, fill with gear oil to lower edge of filler hole.
- ◆ Capacities ➔ [page 1](#)

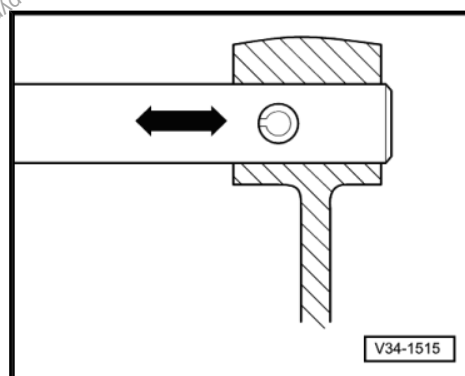
4.1.2 Seals and sealing rings

- ◆ Before installing oil seal, half-fill space between sealing lips with sealing grease -G 052 128 A1- -arrow-.
- ◆ After installing, check oil level ➔ [page 72](#) .
- ◆ Thoroughly clean parting surfaces and apply sealant -AMV 188 200 03- .
- ◆ Apply sealant uniformly but not too thick.



4.1.3 Locking devices

- ◆ Renew retaining rings.
- ◆ Do not overstretch retaining rings.
- ◆ Retaining rings must locate properly in grooves.
- ◆ Renew spring pins. Installation position: slot longitudinal to line of force.





4.1.4 Nuts and bolts

- ◆ Loosen and tighten securing bolts and nuts for covers and housings diagonally.
- ◆ Do not cant especially delicate parts, such as clutch pressure plates. Loosen and tighten bolts and nuts in stages in a diagonal sequence.
- ◆ Torque settings are specified for uncoiled bolts and nuts.
- ◆ Always renew self-locking bolts and nuts.
- ◆ Ensure with threaded connections that contact surfaces as well as nuts and bolts are rewaxed only after assembly, if necessary.
- ◆ Use a thread chaser to clear residual locking fluid from all threaded holes into which self-locking bolts are to be screwed. Otherwise there is a danger of bolts shearing when subsequently being removed.

4.1.5 Bearings

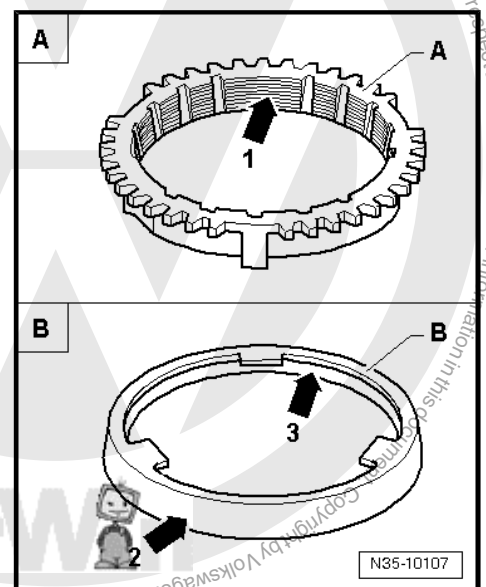
- ◆ Install new tapered roller bearings as supplied and do not lubricate additionally.
- ◆ Install needle bearings with lettered side (thicker metal) towards fitting tool.
- ◆ Tapered roller bearings fitted to one shaft must be renewed as a set. Use same make of bearings.
- ◆ Heat inner races to about 100° C with the inductive heater - VAS 6414- before installing.
- ◆ Do not interchange outer or inner races of bearings of the same size. The bearings are matched in pairs.

4.1.6 Shims

- ◆ Measure shims at several points with a micrometer. The various thicknesses make it possible to achieve the exact shim thickness required.
- ◆ Check for burrs and damage.
- ◆ Install only flawless shims.

4.1.7 Synchro-rings

- ◆ Do not interchange. When reusing synchro-rings, always fit to the same gear.
- ◆ Check for wear and renew if necessary.
- ◆ Check grooves -arrow 1- of synchro-ring -A- and inner ring for flat spots (worn grooves).
- ◆ If synchro-rings are coated, coating must not be damaged.
- ◆ If an intermediate ring -B- is installed, check the outer friction surface -arrow 2- and inner friction surface -arrow 3- of this intermediate ring for "scoring", "signs of abnormal wear" and "blue discolouration (due to overheating)".
- ◆ Check cone of synchromeshed gear for "scoring" and "signs of abnormal wear".
- ◆ Moisten synchromesh mechanism with gear oil before installing.





4.1.8 Gear wheels

- ◆ Before installing, clean and heat with the inductive heater - VAS 6414- to maximum 100° C.

4.1.9 Synchromeshed gears

- ◆ After assembly, check synchromeshed gears for slight play, or for freedom of movement.

4.1.10 Clutch

- ◆ Ensure that the pressure plate does not cant: loosen and tighten bolts diagonally and in several gradual stages.
- ◆ If the clutch has burnt out, thoroughly clean the bell housing as well as the friction surface of flywheel with a cloth to reduce the smell of burnt linings.

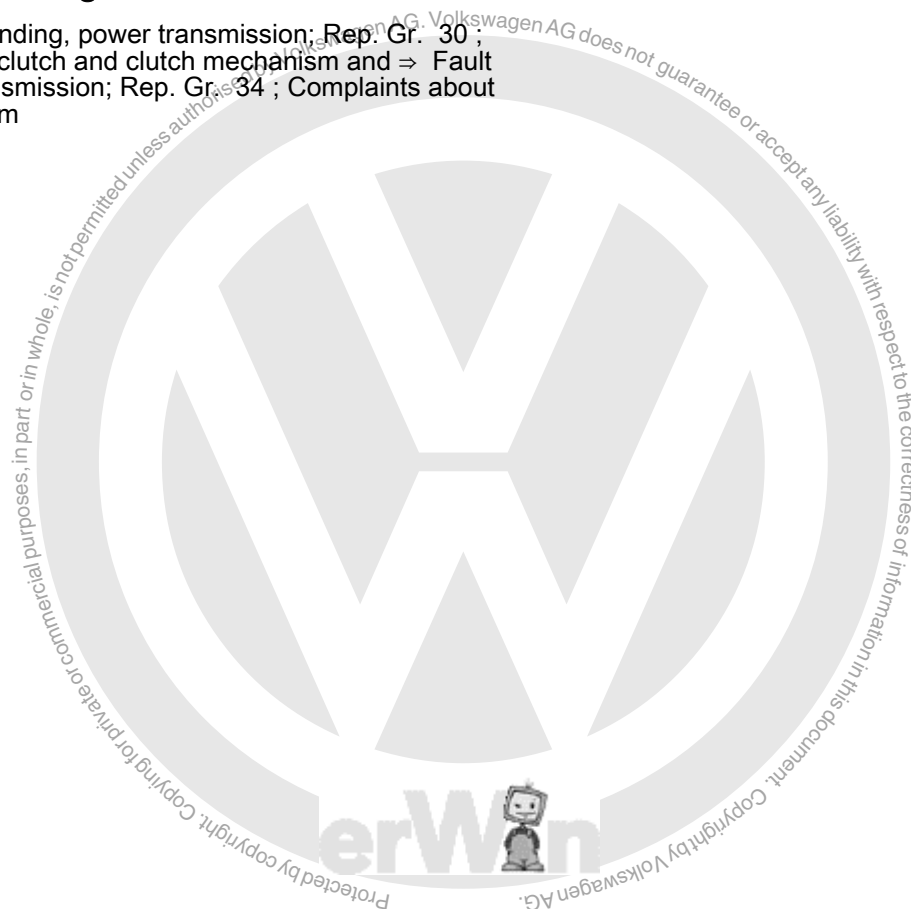




30 – Clutch

1 Fault finding, Power transmission

- Refer to ⇒ Fault finding, power transmission; Rep. Gr. 30 ;
Complaints about clutch and clutch mechanism and ⇒ Fault
finding, power transmission; Rep. Gr. 34 ; Complaints about
selector mechanism





2 Repairing clutch mechanism

2.1 Overview

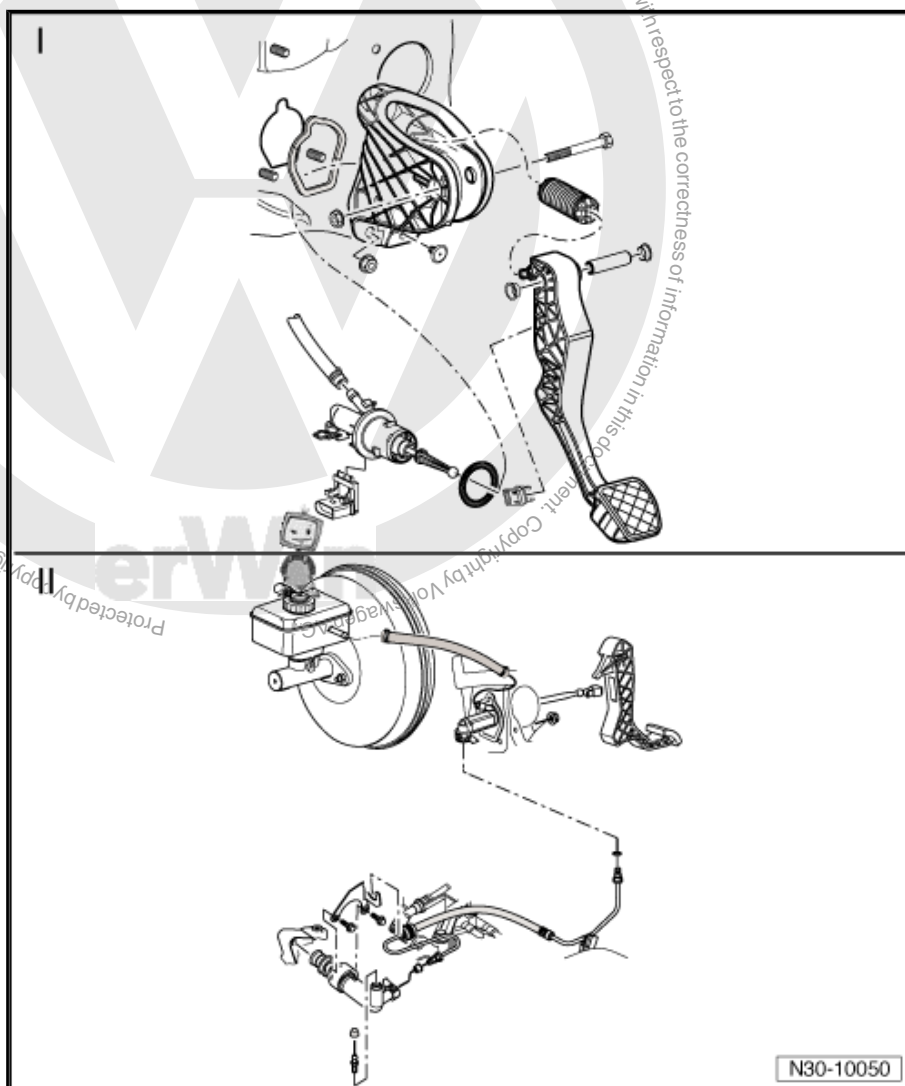


Note

- ◆ Before disconnecting battery, obtain code for radio units having anti-theft coding.
- ◆ With ignition switched off, disconnect battery earth strap.
- ◆ ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and connecting battery
- ◆ When reconnecting battery, refer to ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and connecting battery .
- ◆ Lubricate all bearings and contact surfaces with grease -G 000 450 02- .

I - Assembly overview - pedal cluster ⇒ [page 11](#)

II - Assembly overview - hydraulics ⇒ [page 24](#)





2.2 Assembly overview - pedal cluster

1 - Bulkhead

- ☐ With support for mounting bracket

2 - Seal

- ☐ Always renew
- ☐ Between mounting bracket and bulkhead
- ☐ Self-adhesive
- ☐ Bond to mounting bracket

3 - Mounting bracket

- ☐ For mounting clutch pedal
- ☐ Removing and installing
⇒ [page 16](#)

4 - Bolt

5 - Over-centre spring

- ☐ Removing and installing
⇒ [page 12](#)

6 - Bearing bush

7 - Pivot pin

8 - Clutch pedal

- ☐ Removing and installing
⇒ [page 14](#)

9 - Retainer

- ☐ To remove and install, separate master cylinder from clutch pedal.
⇒ [page 14](#)

10 - Seal

- ☐ Always renew
- ☐ Between master cylinder and mounting bracket

11 - Master cylinder

- ☐ Removing and installing after removal of mounting bracket ⇒ [page 19](#)

12 - Clutch position sender -G476-

- ☐ Removing and installing ⇒ [page 21](#)
- ☐ Can be checked in "guided fault finding" of vehicle diagnosis, testing and information system -VAS 5051-
- ☐ The clutch position sender -G476- is identified as clutch pedal switch -F36- in "guided fault finding".

13 - Clip

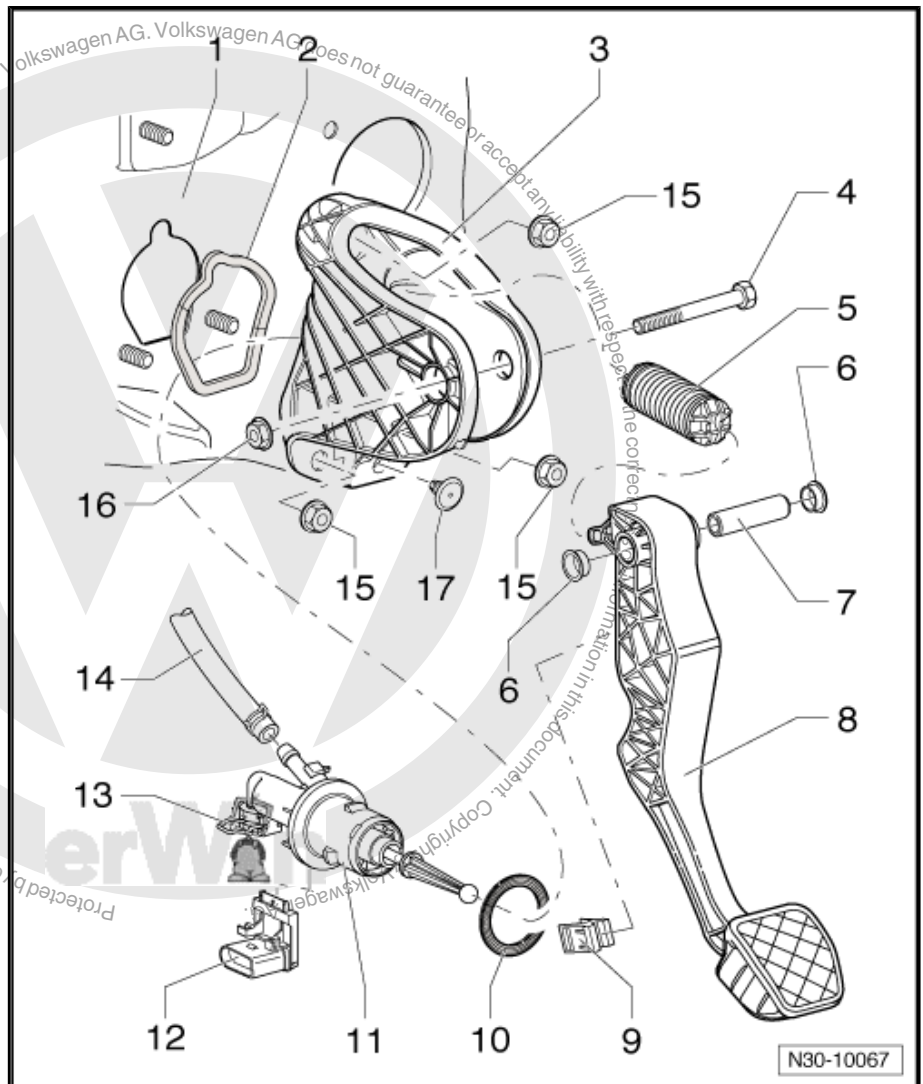
- ☐ Pull out clip to stop to remove and install pipe/hose line or plastic line

14 - Supply hose

- ☐ Rubber
- ☐ From 12.05, plastic in some vehicles ⇒ [page 25](#)

15 - Self-locking hexagon nut, 25 Nm

- ☐ Qty. 3
- ☐ For mounting bracket on bulkhead
- ☐ Always renew





16 - Hexagon nut, 25 Nm

- ☐ Always renew

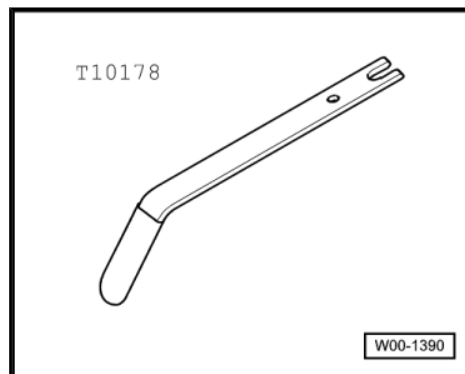
17 - Stop

- ☐ For clutch pedal

2.3 Removing and installing over-centre spring

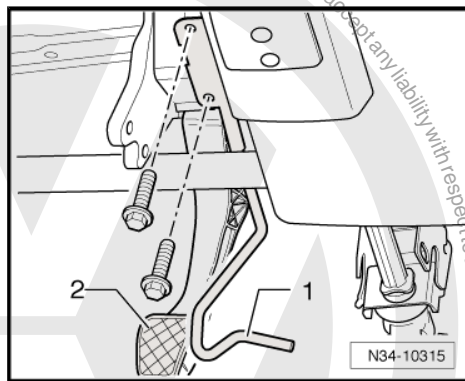
Special tools and workshop equipment required

- ◆ Release tool -T10178-



2.3.1 Removing

- Push driver seat as far back as possible and put steering wheel in highest position.
- Remove trim and cover below trim on drive side ➤ General body repairs, interior; Rep. Gr. 68 .
- Now unbolt crash bar -1- from in front of clutch pedal -2-.



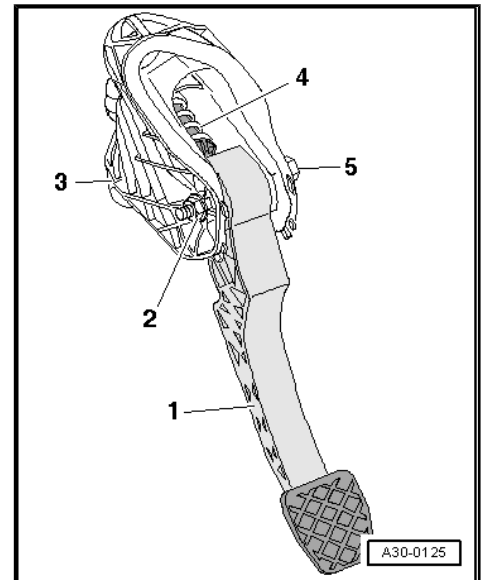


- Unbolt clutch pedal -1- from mounting bracket -3- by removing nut -2- and pulling out bolt -5-.

i Note

The clutch pedal remains hooked to operating rod of master cylinder.

- Swing clutch pedal down slightly and remove over-centre spring -4- from mounting bracket.



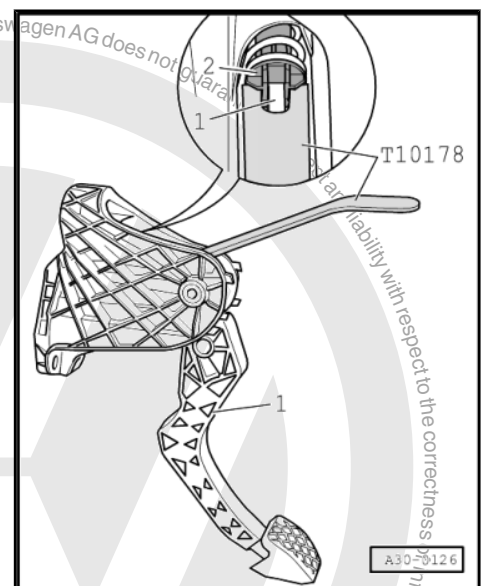
2.3.2 Installing

Install in the reverse order of removal, observing the following:

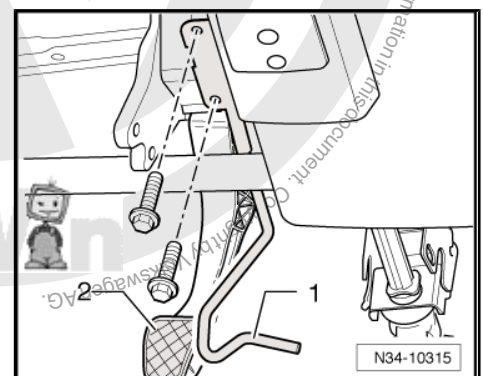
i Note

Renew self-locking nuts.

- Insert over-centre spring in mounting bracket from above while holding end of spring with release tool -T10178- in installation position.
- Insert tip of clutch pedal in bearing recess of over-centre spring.
- Depress clutch pedal slightly, push bolt through and tighten self-locking nut.



- Now bolt on crash bar -1- in front of clutch pedal -2-.
- Install trim and cover below trim on drive side ➔ General body repairs, interior; Rep. Gr. 68 .





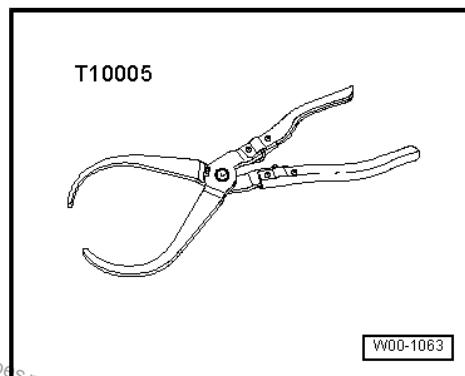
2.3.3 Torque settings

Component	Nm
Clutch pedal to mounting bracket ♦ Renew self-locking nuts	25
Crash bar to steering column mounting bracket	10

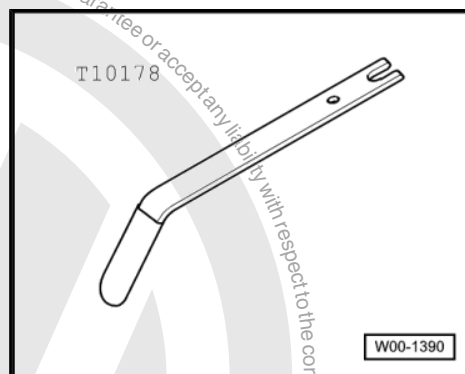
2.4 Removing and installing clutch pedal

Special tools and workshop equipment required

- ♦ Pliers -T10005-

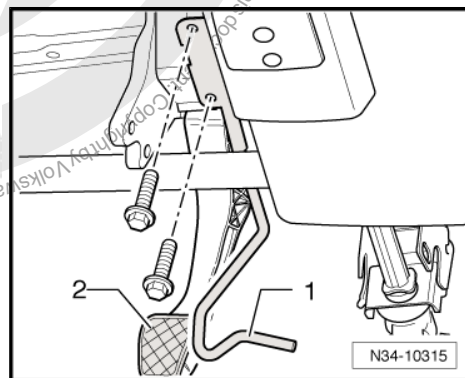


- ♦ Release tool -T10178-



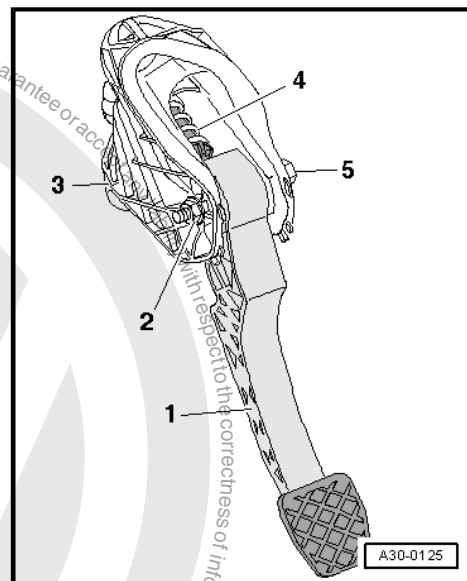
2.4.1 Removing

- Push driver seat as far back as possible and put steering wheel in highest position.
- Remove trim and cover below trim on drive side ⇒ General body repairs, interior, Rep. Gr. 68 .
- Now unbolt crash bar -1- from in front of clutch pedal -2-.

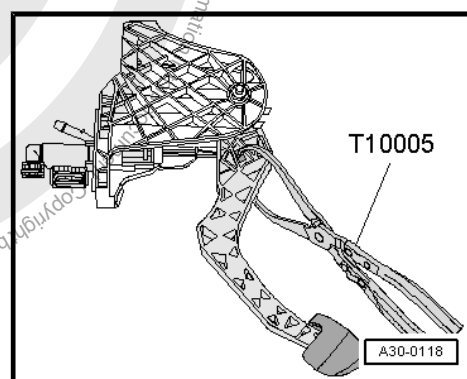




- Unbolt clutch pedal -1- from mounting bracket -3- by removing nut -2- and pulling out bolt -5-.
- Swing clutch pedal forward slightly and remove over-centre spring -4- from mounting bracket.



- Release clutch pedal from master cylinder with pliers - T10005- .
- Remove clutch pedal.



2.4.2 Installing

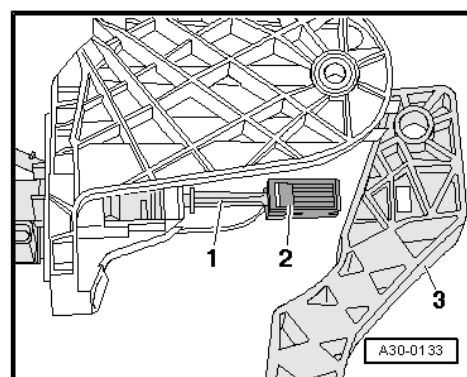
Install in the reverse order of removal, observing the following:



Note

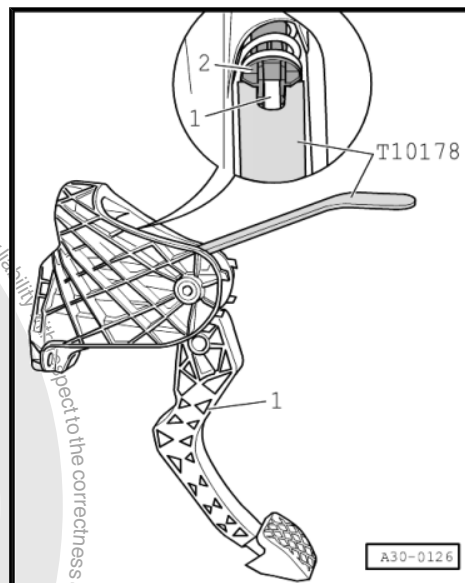
Renew self-locking nuts.

- Attach retainer -2- to master cylinder operating rod -1-.
- Press retainer into notch in clutch pedal until it can be heard to engage.

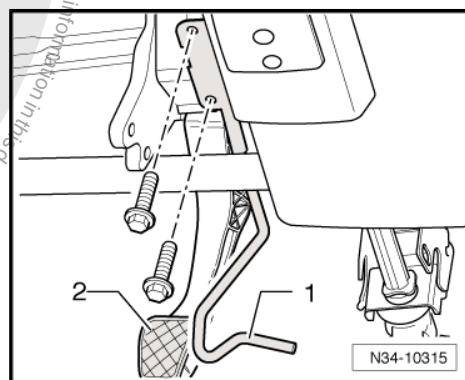




- Insert over-centre spring in mounting bracket from above while holding end of spring with release tool -T10178- in installation position.
- Insert tip of clutch pedal in bearing recess of over-centre spring.
- Depress clutch pedal slightly, push bolt through and tighten self-locking nut.



- Now bolt on crash bar -1- in front of clutch pedal -2-.
- Install trim and cover below trim on drive side ⇒ General body repairs, interior; Rep. Gr. 68 .



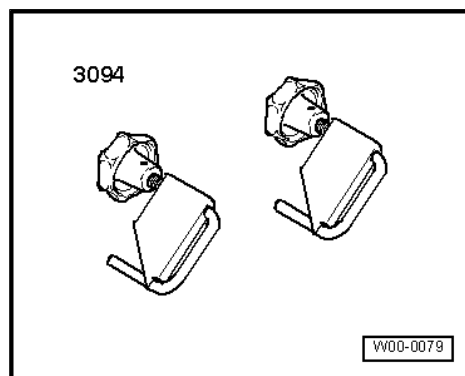
2.4.3 Torque settings

Component	Nm
Clutch pedal to mounting bracket ♦ Renew self-locking nuts	25
Crash bar to steering column mounting bracket	10

2.5 Removing and installing mounting bracket

Special tools and workshop equipment required

- ♦ Hose clamps to 25 mm Ø -3094-





Torque wrench -V.A.G 1331-

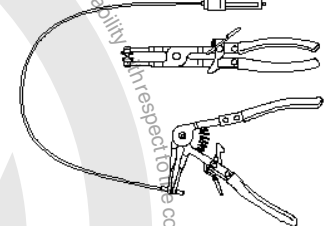
V.A.G 1331



W00-0427

Spring-type clip pliers -VAS 5024 A-

VAS 5024 A



W00-1179

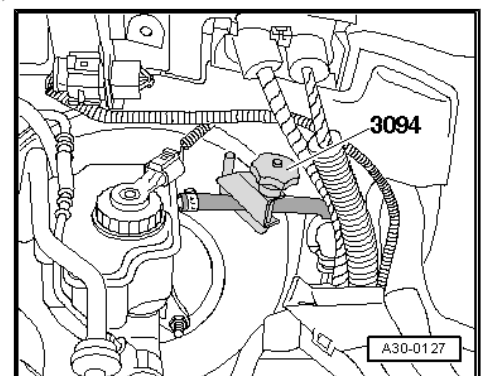
2.5.1 Removing

- First check whether a coded radio is fitted. If so, obtain anti-theft code.
- With ignition switched off, disconnect battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and connecting battery .
- Remove complete air filter housing if it is near battery ⇒ Rep. Gr. 24 ; Repairing injection system .
- Remove battery and battery tray ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .



Note

- ◆ *During the following work, ensure that no brake fluid lands on longitudinal member or gearbox. If this does happen, clean the affected areas thoroughly.*
- ◆ *Place a lint-free cloth under the master cylinder.*
- Clamp off supply hose to master cylinder using hose clamp -3094- .



A30-0127



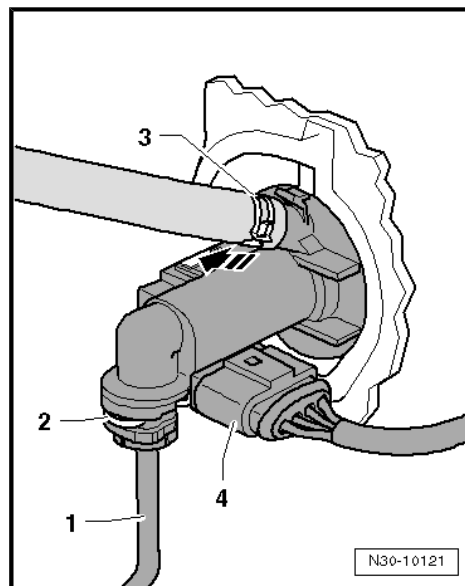
- Loosen spring-type clip -3- with spring-type clip pliers -VAS 5024- and pull supply hose off master cylinder.
- Release securing clip -2- using screwdriver and pull pipe/hose line or plastic line -1- off master cylinder.
- Unclip clutch position sender -G476- from master cylinder -arrow- and remove with electrical connector attached -4-.



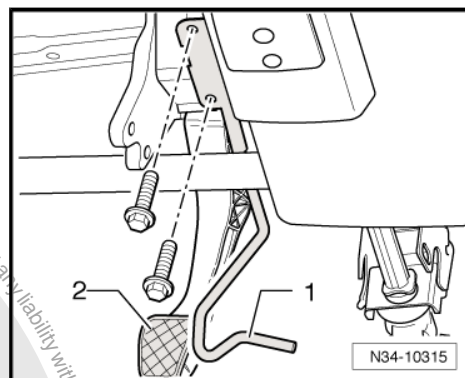
Note

When performing work in the footwell, put cloths on the carpet to protect it from possible brake fluid spills.

- Remove trim and cover below trim on drive side ➔ General body repairs, interior; Rep. Gr. 68 .



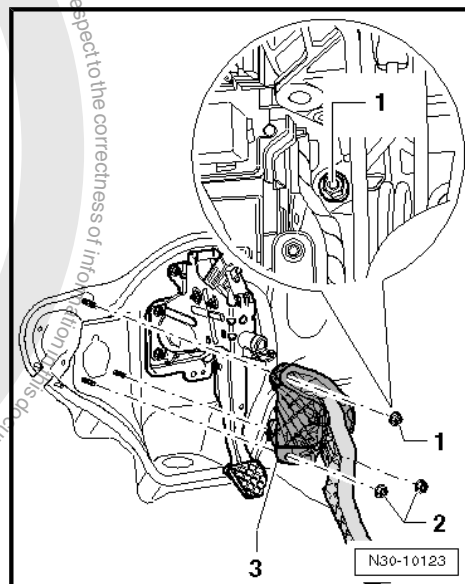
- Now unbolt crash bar -1- from in front of clutch pedal -2-.



- Remove securing nuts -1- and -2-.

The upper securing nut -1- is accessible between the relay carrier and the steering column trim.

- Remove mounting bracket -3-.



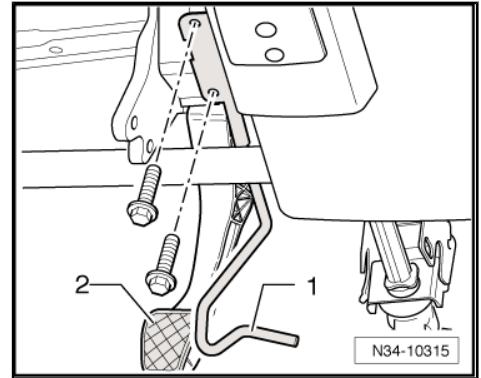
2.5.2 Installing

Install in the reverse order of removal, observing the following:

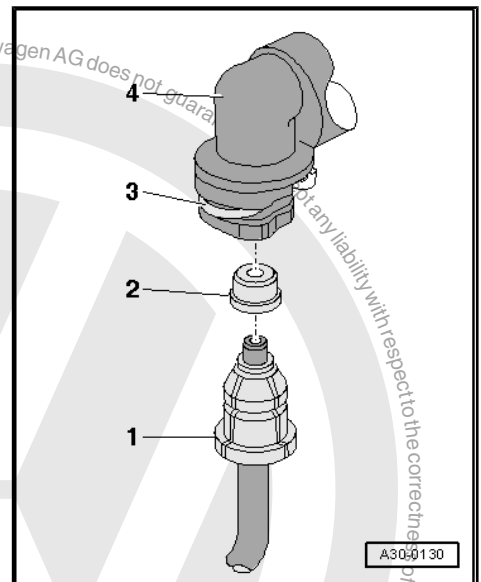


Note

- ◆ *Renew self-locking nuts.*
- ◆ *Renew hose clips.*
- ◆ *Allocate all components according to ⇒ Electronic parts catalogue "ETKA".*
- Now bolt on crash bar -1- in front of clutch pedal -2-.
- Install trim and cover below trim on drive side ⇒ General body repairs, interior; Rep. Gr. 68 .



- Push pipe/hose line or plastic line -1- with seal -2- onto connection of master cylinder -4- until securing clip -3- engages audibly.
- Test line by tugging on it.
- Bleed clutch system ⇒ [page 27](#) .
- Install battery ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .
- If removed, install complete air filter housing ⇒ Rep. Gr. 24 ; Repairing injection system .



2.5.3 Torque settings

Component	Nm
Mounting bracket to body ◆ Renew self-locking nuts	25
Crash bar to steering column mounting bracket	10

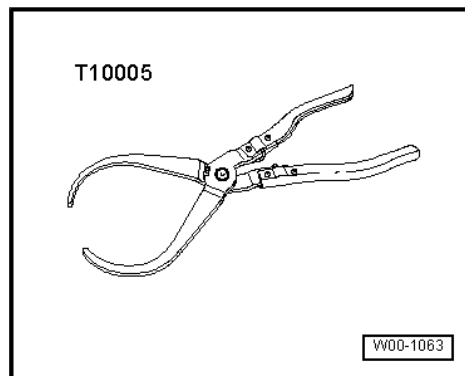
2.6 Removing and installing master cylinder

Special tools and workshop equipment required



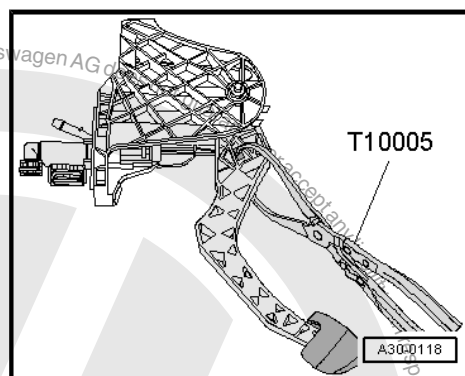


- ◆ Pliers -T10005-

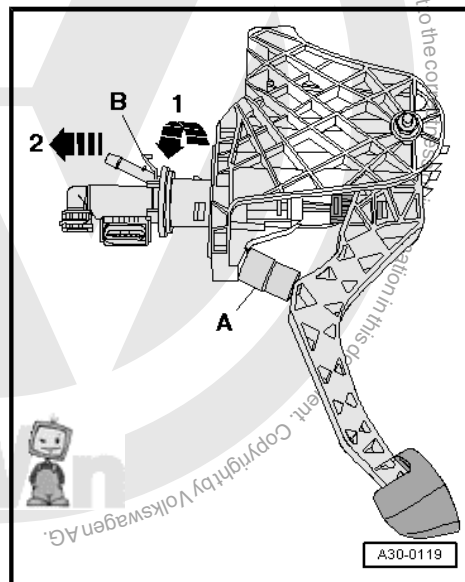


2.6.1 Removing

- Remove mounting bracket ➔ [page 16](#) .
- Release retainer for master cylinder operating rod using pliers -T10005- .



- Insert spacer -A- between clutch pedal and stop and press clutch pedal to spacer.
- ◆ Length of spacer = about 40 mm (e.g. 1/2" socket).
- Release securing bar -B- and pull master cylinder out of mounting bracket -arrow 1- and -arrow 2-.

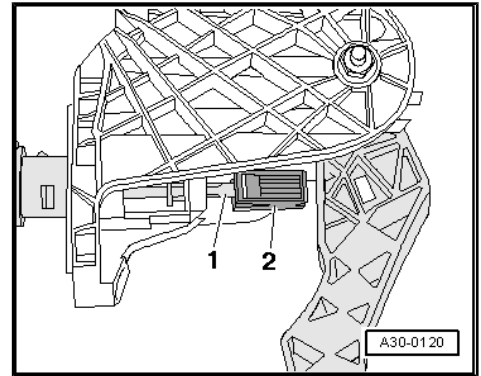


2.6.2 Installing

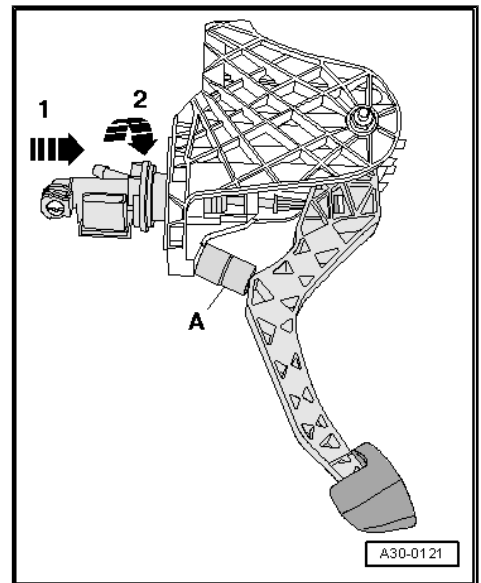
- Move clutch pedal to rest position at stop.



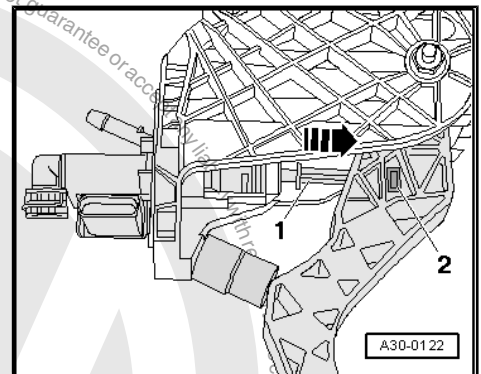
- Attach retainer -2- to master cylinder operating rod -1-.



- Insert spacer -A- between clutch pedal and stop and press clutch pedal to spacer.
- ◆ Length of spacer = about 40 mm (e.g. 1/2" socket).
- Engage master cylinder in mounting bracket -arrow 1- and -arrow 2-.



- Press master cylinder operating rod -1- in direction of arrow until retainer -2- engages audibly in clutch pedal.
- Install mounting bracket ➔ [page 16](#) .

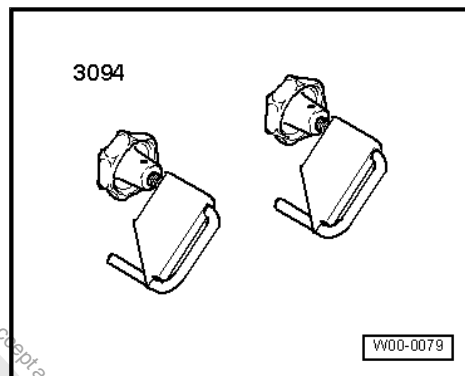


2.7 Removing and installing clutch position sender -G476-

Special tools and workshop equipment required



◆ Hose clamps -3094-



2.7.1 Removing

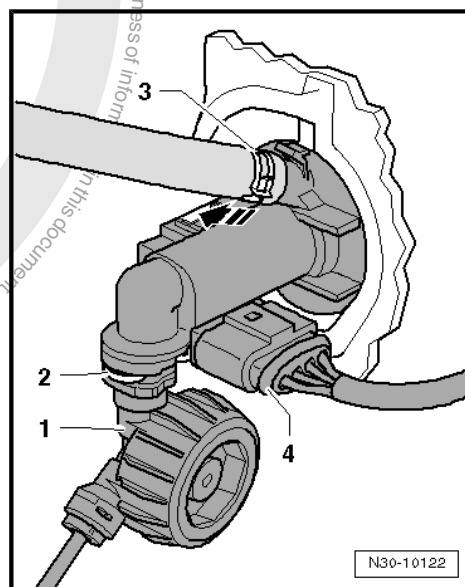
- First check whether a coded radio is fitted. If so, obtain anti-theft code.
- Remove complete air filter housing if it is near battery ⇒ Rep. Gr. 24 ; Repairing injection system .
- Remove battery, battery cover and battery tray ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .

If a pipe/hose line or plastic line -1- with a round component is installed directly beneath the master cylinder, the pipe/hose line or plastic line must be removed.

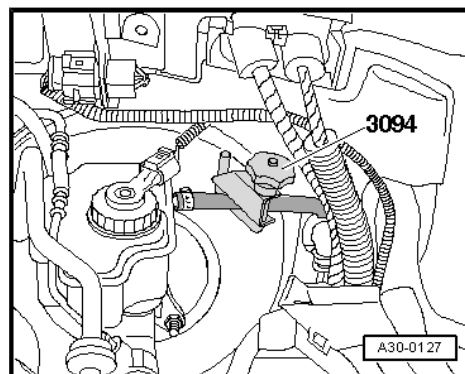


Note

- ◆ During the following work, ensure that no brake fluid lands on longitudinal member or gearbox. If this does happen, clean the affected areas thoroughly.
- ◆ Place a lint-free cloth under the master cylinder.



- Clamp off supply hose to master cylinder using hose clamp -3094- .

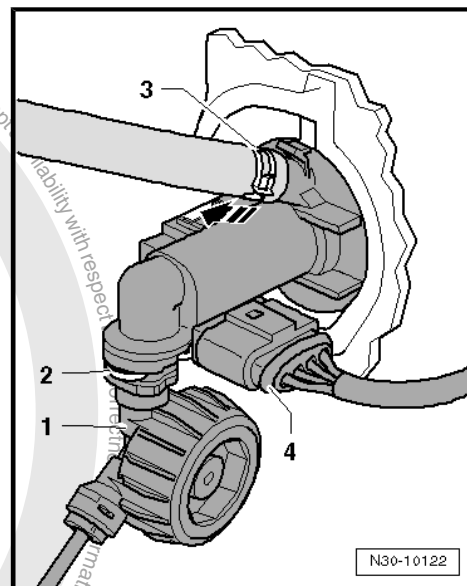




- Release securing clip -2- with a screwdriver and pull out of master cylinder to stop.
- Pull pipe/hose line or plastic line -1- out from master cylinder and seal hose.

All vehicles

- Disconnect electrical connector -4-.
- Unclip clutch position sender -G476- from master cylinder -arrow- and remove.



2.7.2 Installing

Install in reverse order of removal. During this step, observe the following:



Note

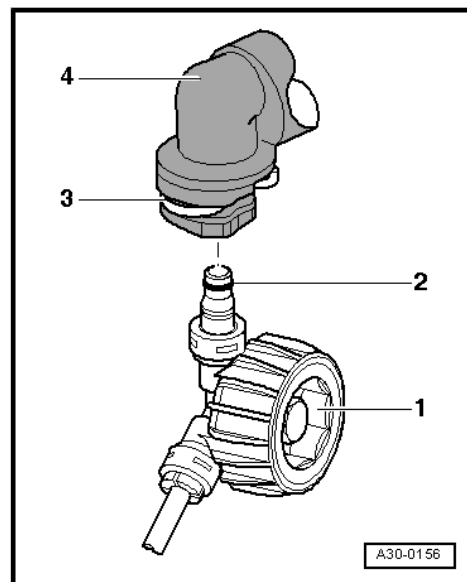
- ◆ *Renew hose clips.*
- ◆ *Allocate all components according to ⇒ Electronic parts catalogue "ETKA".*

If the pipe/hose line or plastic line was removed:

- Push pipe/hose line or plastic line -1- with seal -2- onto connection of master cylinder -4- until securing clip -3- engages audibly.
- Test line by tugging on it.
- Bleed clutch system ⇒ [page 27](#) .

All vehicles

- Install battery tray and battery ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .
- If removed, install complete air filter housing ⇒ Rep. Gr. 24 ; Repairing injection system .
- Reconnect battery and perform work required after connecting battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and connecting battery .





2.8 Assembly overview - hydraulic system

1 - Brake fluid reservoir

2 - Spring-type clip

3 - Supply hose

- ☐ Rubber
- ☐ From 12.05, plastic in some vehicles
⇒ [page 25](#)

4 - Master cylinder

- ☐ Removing and installing
⇒ [page 19](#)

5 - Clip

- ☐ Pull clip out to stop to remove or install line between master and slave cylinders

6 - Retainer

- ☐ To remove and install, separate master cylinder from clutch pedal.
⇒ [page 14](#)

7 - Clutch pedal

- ☐ Removing and installing
⇒ [page 14](#)

8 - Self-locking hexagon nut, 25 Nm

- ☐ Mounting bracket to body
- ☐ Always renew

9 - O-ring

- ☐ Pull onto line connection
- ☐ Insert with brake fluid
- ☐ Seals, O-rings depending on configuration of line connections ⇒ [page 25](#)
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

10 - Seal

- ☐ Pull onto line connection
- ☐ Insert with brake fluid
- ☐ Seals, O-rings depending on configuration of line connections ⇒ [page 25](#)
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"

11 - Pipe/hose line

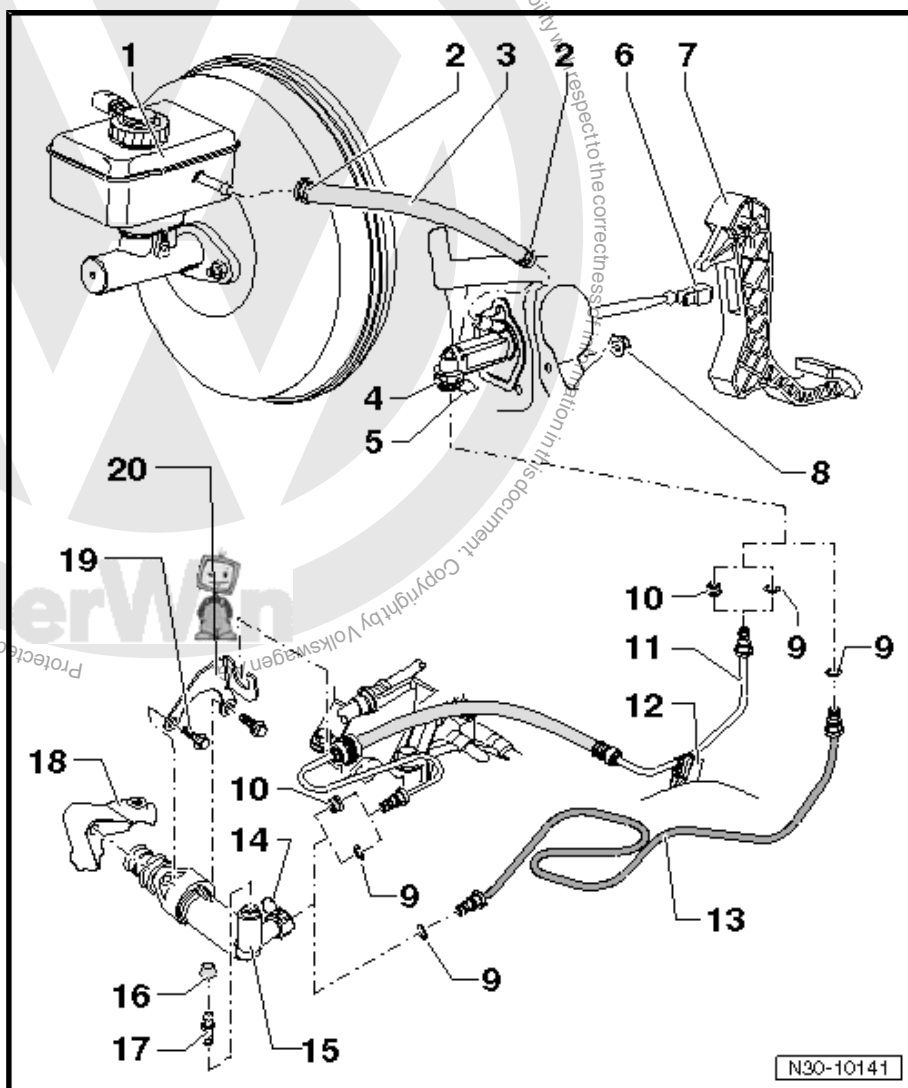
- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"
- ☐ To remove, remove battery and battery tray ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .

12 - Retainer

- ☐ For pipe/hose line ⇒ [Item 11 \(page 24\)](#)
- ☐ Secured to body.

13 - Plastic line

- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"
- ☐ To remove, remove battery and battery tray ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .





14 - Clip

- ❑ Pull clip out to stop to remove or install line between master and slave cylinders

15 - Slave cylinder

- ❑ Removing and installing ⇒ [page 25](#)

16 - Dust cap

17 - Bleeder valve

- ❑ Bleeding clutch system ⇒ [page 27](#)

18 - Gearbox

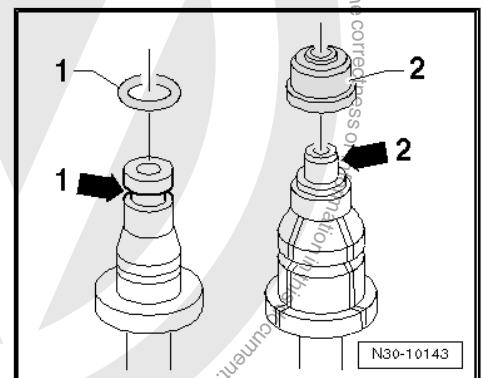
19 - Hexagon bolt, 20 Nm

20 - Retainer

- ❑ For pipe/hose line ⇒ [Item 11 \(page 24\)](#)

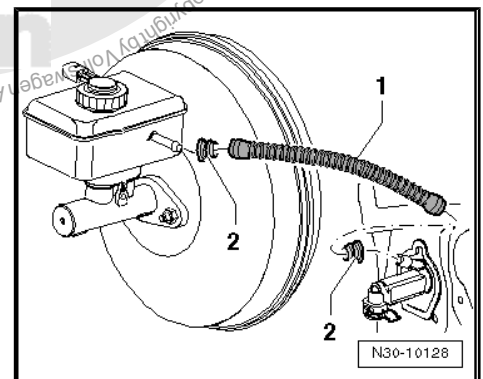
Seals and O-rings for pipe/hose line or plastic line

Item	Version of line connection
-1-	Line connection with circumferential groove -arrow 1-
-2-	Line connection with shoulder -arrow 2-



From 12.05, plastic supply hose -1- in some vehicles.

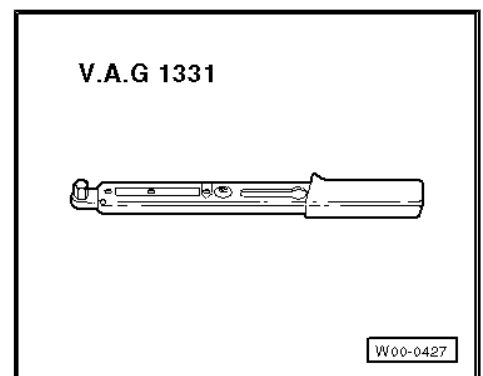
- The seals -2- must be located in supply hose



2.9 Removing and installing slave cylinder

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-





2.9.1 Removing

- First check whether a coded radio is fitted. If so, obtain anti-theft code.
- With ignition switched off, disconnect battery ➔ Electrical system; Rep. Gr. 27 ; Disconnecting and connecting battery .
- Remove complete air filter housing if it is near slave cylinder ➔ Rep. Gr. 24 ; Repairing injection system .
- Remove securing clip for gear selector cable -arrow 1- from gearbox selector lever -A-.
- Pull gear selector cable from pin.

Metal relay lever

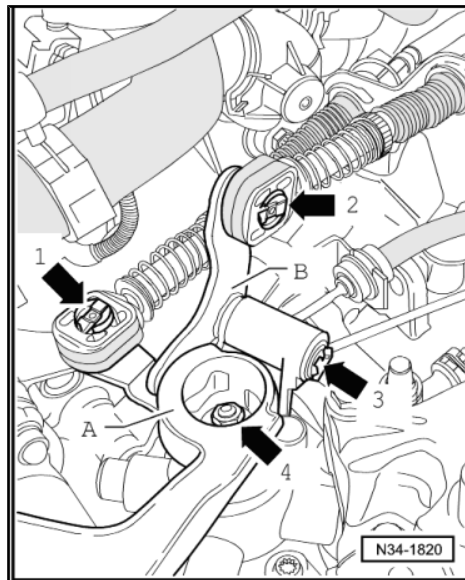
- Remove securing clip -arrow 2- for gate selector cable from relay lever -B-.
- Pull gate selector cable from pin.
- Pull securing clip -arrow 3- off relay lever -B- and remove relay lever.

Plastic relay lever

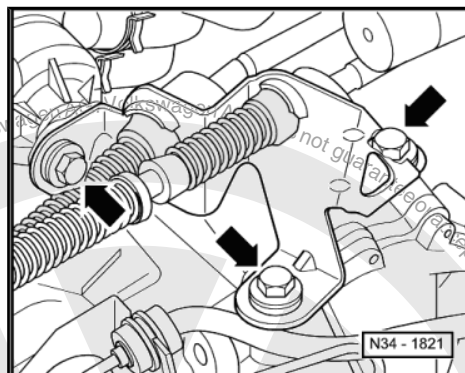
- Remove relay lever together with cable end-piece from gearbox ➔ [page 50](#) .

Continuation for all

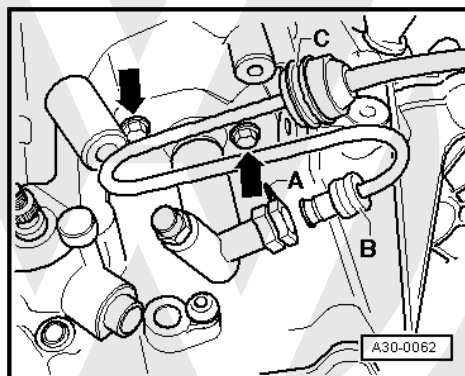
- Remove gearbox selector lever -A- by removing nut -arrow 4-.



- Remove cable support bracket from gearbox -arrows-.
- Then tie up selector cable and gate cable.
- Place a lint-free cloth under slave cylinder.



- Pull clip -A- for line between master and slave cylinders out of slave cylinder to stop.
- Pull line between master and slave cylinders out of support -C-.
- Pull line between master and slave cylinders -B- out of slave cylinder and seal opening.
- Unbolt slave cylinder -arrows- and remove.



Note

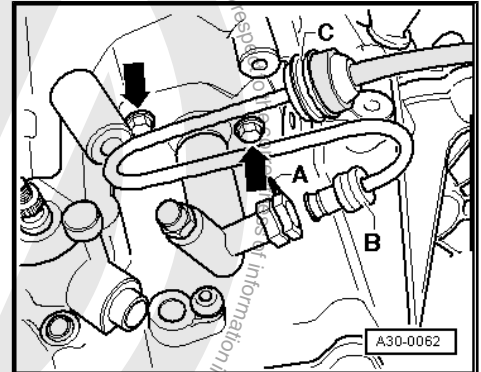
Do not depress clutch pedal.



2.9.2 Installing

Carry out installation in the reverse sequence, noting the following:

- Install slave cylinder and tighten bolts -arrows- to specified torque ➔ [Item 19 \(page 25\)](#) .
- Insert line between master and slave cylinders -B- into slave cylinder to stop.
- Push securing clip -A- into line between master and slave cylinders to stop.
- Test pipe/hose line by tugging on it.
- Press line between master and slave cylinders into mounting -C- to stop on gearbox.
- Bleed clutch system after installing slave cylinder ➔ [page 27](#) .



Assembling selector mechanism ➔ [page 47](#) .

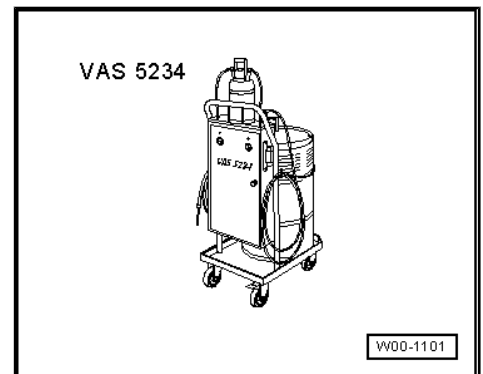
Adjusting selector mechanism ➔ [page 54](#) .

- If removed, install complete air filter housing ➔ Rep. Gr. 24 ; Repairing injection system .
- Connect battery earth ➔ Electrical system; Rep. Gr. 27 ; Battery; Disconnecting and connecting battery .

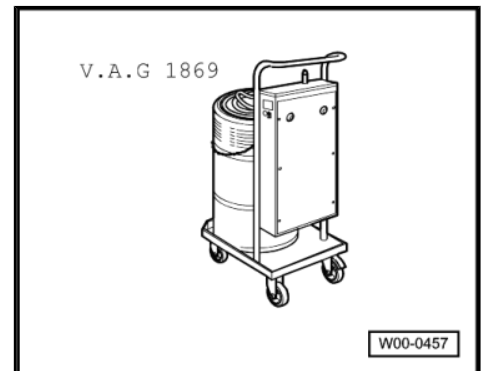
2.10 Bleeding clutch system

Special tools and workshop equipment required

- ◆ Brake filling and bleeding equipment -VAS 5234- or



- ◆ Brake filling and bleeding equipment -V.A.G 1869-





Note

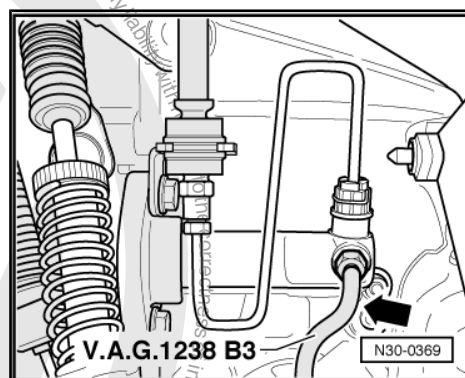
Prefilling system is not necessary!

Specifications for brake fluid ⇒ Brake systems; Rep. Gr. 47 ;
Bleeding brake system .

- Remove complete air filter housing if it hinders access to slave cylinder ⇒ Rep. Gr. 24 ; Repairing injection system .
- Connect brake filling and bleeding equipment -VAS 5234- or -V.A.G 1869- .

To bleed system, use 670 mm bleeder hose -V.A.G 1238/B3- if necessary.

- Connect bleeder hose to collector bottle of brake bleeding equipment.
- Connect bleed hose to bleeder -arrow-.
- Pressurise system to 2 bar.
- Open bleeder valve.
- Bleed off about 100 cm³ brake fluid.
- Close bleeder valve.
- Rapidly operate pedal from stop to stop 10 to 15 times.
- Open bleeder valve.
- Bleed off an additional 50 cm³ brake fluid.
- Close bleeder valve.
- Depress clutch pedal several times after completion of bleeding process.
- Install, if necessary, complete air filter housing ⇒ Rep. Gr. 24 ; Repairing injection system .





3 Repairing clutch release mechanism

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

V.A.G 1331



W00-0427

1 - Release bearing

- ☐ Remove and install together with clutch release lever
⇒ [Item 3 \(page 29\)](#)
and guide sleeve
⇒ [Item 5 \(page 29\)](#)
⇒ [page 30](#) to
⇒ [page 30](#)
- ☐ Do not wash out bearing; wipe only
- ☐ Renew noisy bearings

2 - Bolt, 5 Nm then turn 90° further

- ☐ Always renew

3 - Clutch release lever

- ☐ Remove and install together with release bearing
⇒ [Item 1 \(page 29\)](#) and
guide sleeve
⇒ [Item 5 \(page 29\)](#)
⇒ [page 30](#) to
⇒ [page 30](#)
- ☐ Remove old grease

4 - Retaining spring

- ☐ Secure to clutch release lever

5 - Guide sleeve

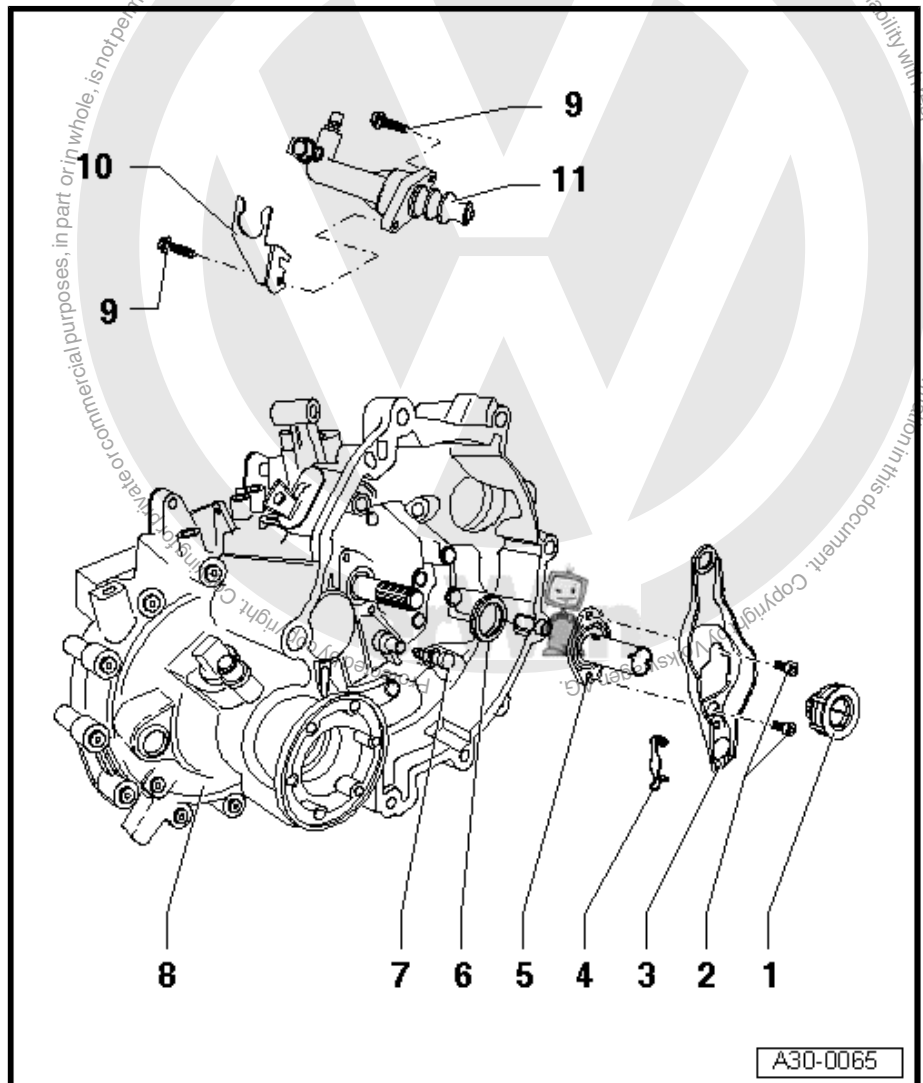
- ☐ Remove and install together with release bearing
⇒ [Item 1 \(page 29\)](#) and
guide sleeve
⇒ [Item 5 \(page 29\)](#)
⇒ [page 30](#) to ⇒ [page 30](#)

6 - Input shaft seal

- ☐ Removing and installing ⇒ [page 89](#)

7 - Ball stud, 20 Nm

- ☐ Remove old grease





- ❑ Lubricate with grease -G 000 100-

8 - Gearbox

9 - Hexagon bolt, 20 Nm

10 - Retainer

- ❑ For pipe/hose line ➔ [Item 11 \(page 24\)](#)

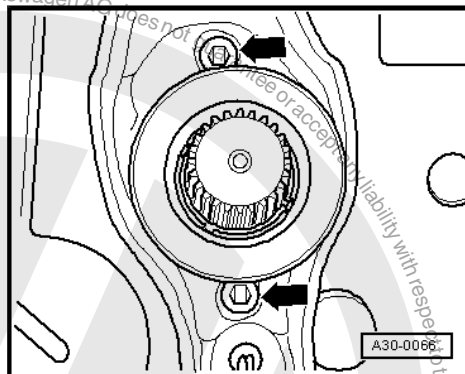
11 - Slave cylinder

- ❑ Removing and installing ➔ [page 25](#)

Removing and installing clutch release lever with release bearing and guide sleeve

- Remove bolts -arrows-.
- Pull clutch release lever with release bearing and guide sleeve off input shaft and ball stud.

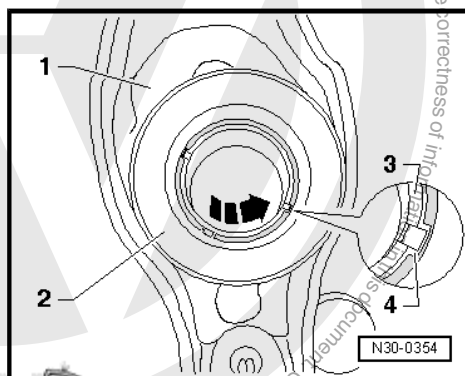
Install in reverse order of removal.



Removing and installing guide sleeve

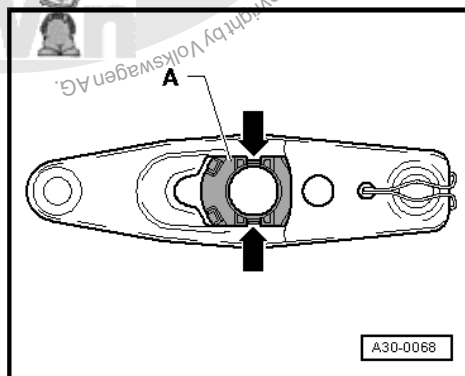
- Push guide sleeve -3- upwards out of release bearing -2-.
- Turn guide sleeve -3- about 90° in direction of arrow relative to release bearing -2- until locking lugs of guide sleeve align with grooves -4- of release bearing.
- Pull guide sleeve out of release bearing in this position.

Install in reverse order of removal.



Removing and installing release bearing

- Press together locking lugs -arrows- on back of clutch release lever and remove release bearing -A- from clutch release lever.
- To install, press release bearing -A- into clutch release lever until locking lugs -arrows- engage.

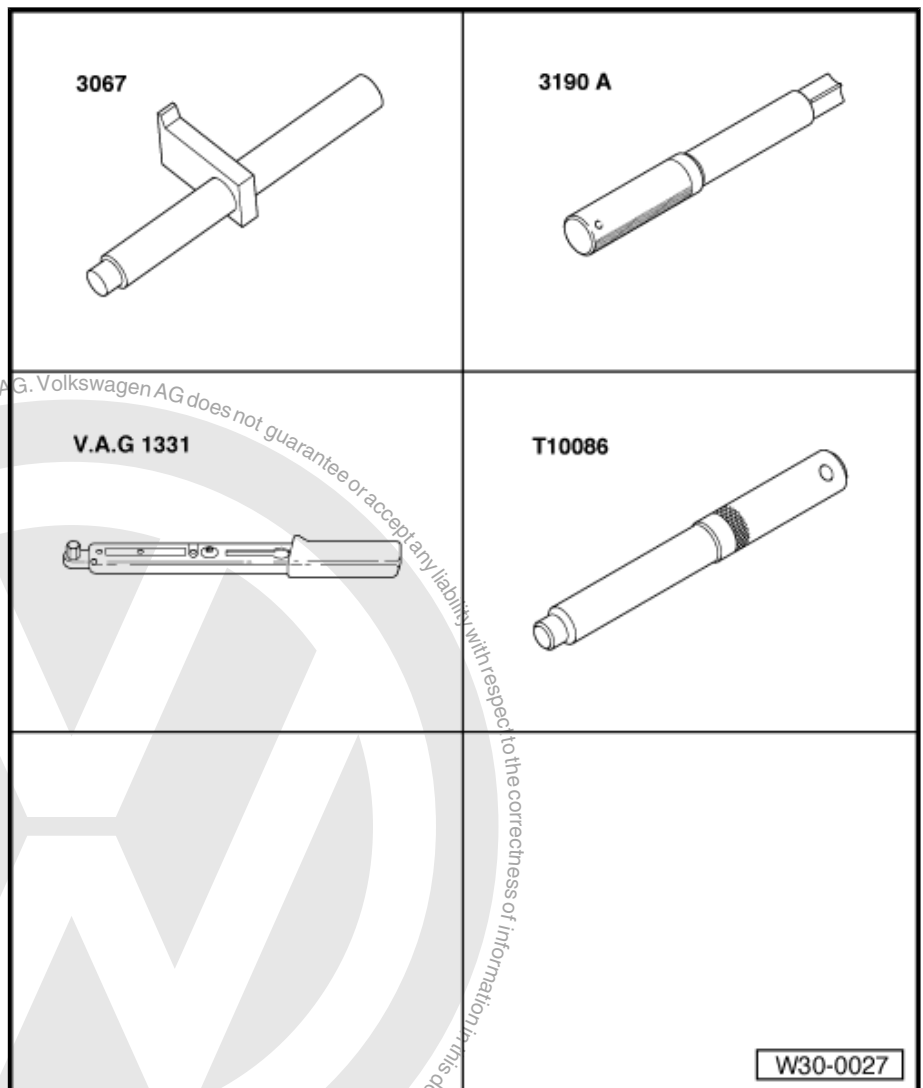




4 Repairing clutch

Special tools and workshop equipment required

- ◆ Counterhold -3067-
- ◆ Torque wrench -V.A.G 1331-
- ◆ Centring mandrel -3190 A-
- ◆ Grease for clutch plate splines -G 000 100-



(Gearbox removed)



Note

- ◆ Check whether dowel sleeves for aligning engine and gearbox are fitted in cylinder block and install if necessary.
- ◆ If dowel sleeves are not fitted, difficulties shifting gears, clutch problems and possible noises from the gearbox (rattling of gears which are not engaged) could occur.
- ◆ Replace clutch plates and pressure plates with damaged or loose rivets.
- ◆ Allocation ⇒ Electronic parts catalogue "ETKA".



1 - Flywheel

- ☐ Ensure that centring pins fit tightly
- ☐ Contact surface for clutch lining must be free of grooves, oil and grease
- ☐ Removing and installing
⇒ Rep. Gr. 13

2 - Clutch plate

- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"
- ☐ Installation position with two-part flywheel: shorter end of hub faces pressure plate
- ☐ Text
"Getriebeseite" (gear box side) always faces pressure plate and gearbox
- ☐ Installation position with single piece flywheel: spring cage faces pressure plate
- ☐ Centring ⇒ [page 32](#) .
- ☐ Lightly grease splines



Note

3 - Pressure plate

- ☐ Removing and installing
⇒ [page 32](#) .
- ☐ Check ends of diaphragm spring
⇒ [page 33](#)



Note

4 - Bolt, 20 Nm

- ☐ Allocation ⇒ Electronic parts catalogue "ETKA"
- ☐ Loosen or tighten diagonally and in steps

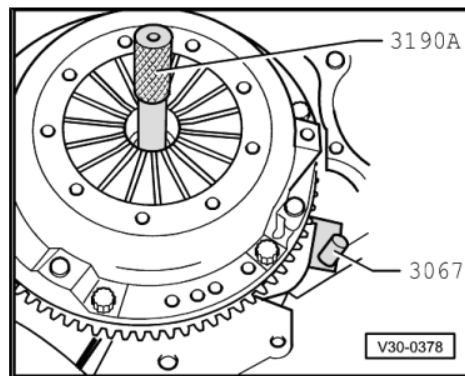
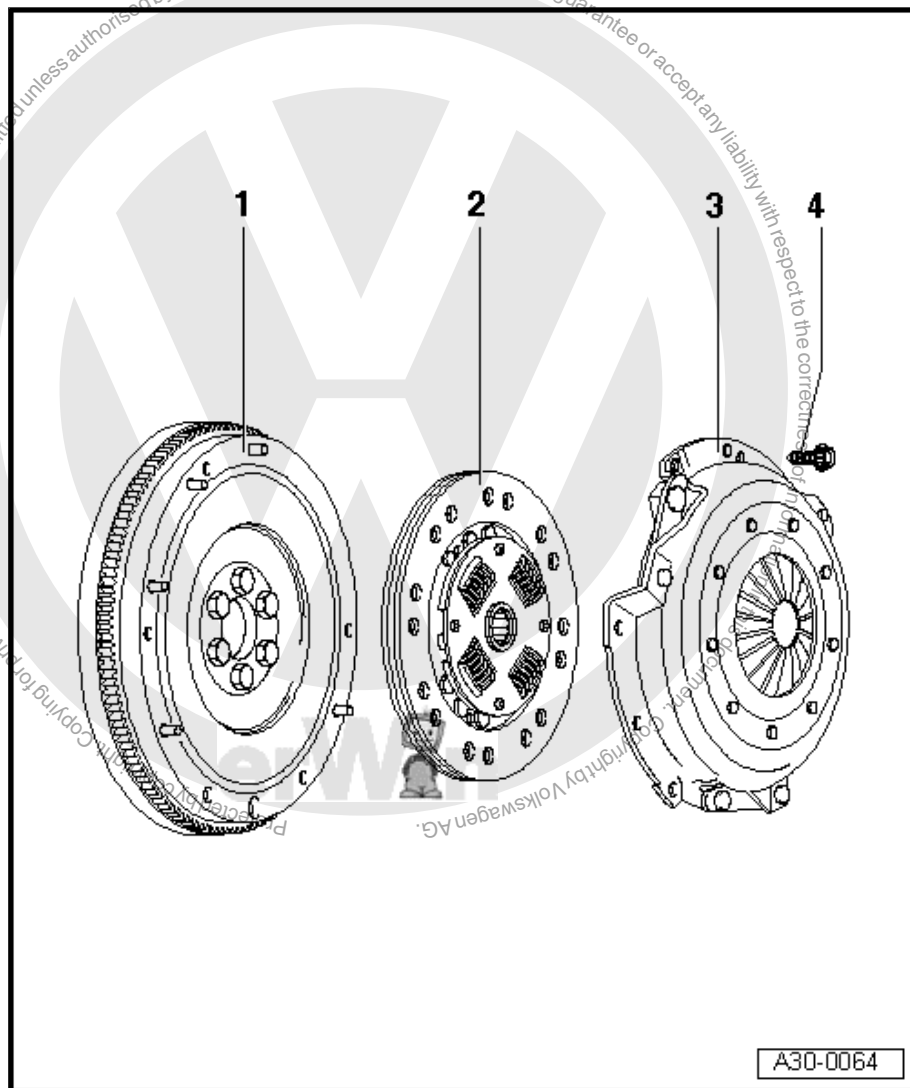
Centring clutch plate and removing and installing pressure plate

- Loosen or tighten bolts diagonally in stages.
- Reverse position of counterhold -3067- when removing.



Note

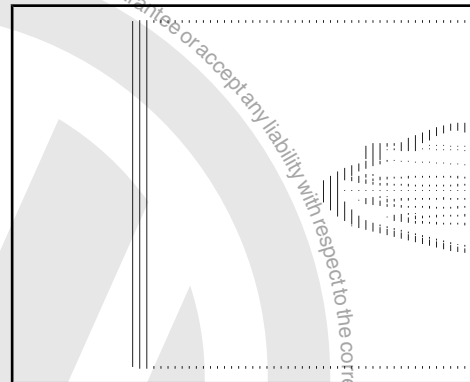
Pressure plate contact surface and clutch plate lining must make full contact with flywheel. Tighten securing bolts diagonally and evenly to prevent damage to the pressure plate centring hole and the flywheel centring pins.





Checking ends of diaphragm spring -arrows-

- Wear up to half the thickness of the diaphragm spring is permitted.





34 – Controls, housing

1 Fault finding, Power transmission

- Refer to ⇒ Fault finding, power transmission; Rep. Gr. 30 ;
Complaints about clutch and clutch mechanism and ⇒ Fault
finding, power transmission; Rep. Gr. 34 ; Complaints about
selector mechanism





2 Repairing selector mechanism

2.1 Installation position of selector mechanism

Arrow -A- Gear selection movement

Arrow -B- Gate selection movement

A - Gear selector cable

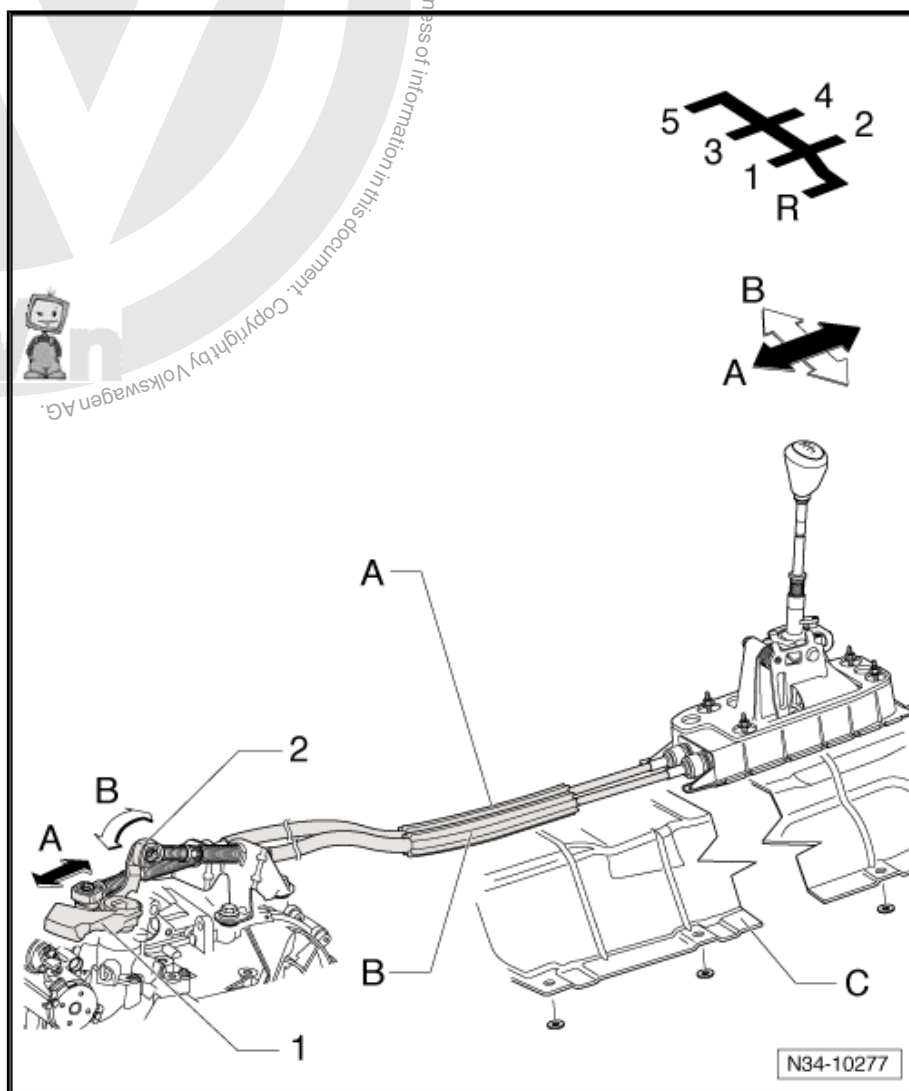
B - Gate selector cable

C - Heat shield

- ☐ Remove before removing gear selector mechanism

1 - Gearbox selector lever

2 - Relay lever



N34-10277



Note

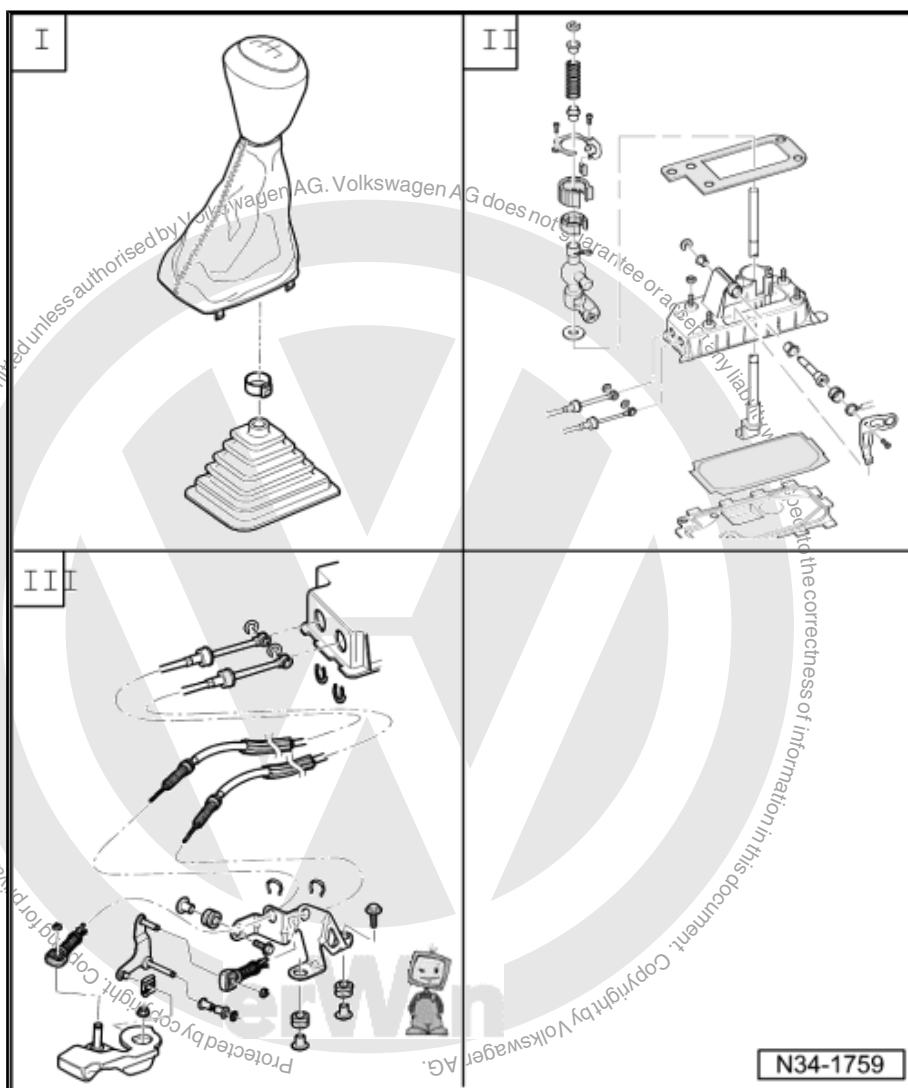
- ◆ Note radio code for vehicles with coded radio.
- ◆ Before working on the selector mechanism, disconnect earth strap from the battery in the engine compartment.
- ◆ ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and connecting battery
- ◆ When reconnecting battery, perform work required after connecting battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and connecting battery .
- ◆ For work on selector mechanism in engine compartment, remove complete air filter housing if it is located over selector mechanism ⇒ Rep. Gr. 24 .
- ◆ Remove selector mechanism to renew selector cables ⇒ [page 51](#) .
- ◆ Do not kink selector cables.

I - Removing and installing selector lever knob and cover
⇒ [page 38](#)

II - Repairing selector lever and selector lever housing (through 10.06) ⇒ [page 40](#)

II - Repairing selector lever and selector lever housing (from 11.06) ⇒ [page 42](#)

III - Assembly overview - removing and installing selector cables ⇒ [page 47](#)



Removing and installing selector mechanism ⇒ [page 51](#)

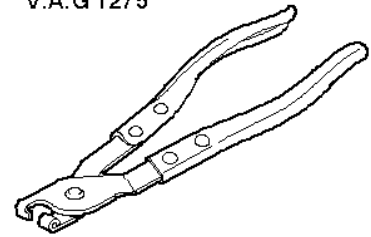
Adjusting selector mechanism ⇒ [page 54](#) .

Special tools and workshop equipment required



◆ Hose clip pliers -V.A.G 1275-

V.A.G 1275



W00-0451

◆ Torque wrench -V.A.G 1331-

V.A.G 1331



W00-0427



2.2 Removing and installing selector lever knob and cover

1 - Emblem

- ❑ Can be carefully levered off selector lever knob of plastic or leather

2 - Selector lever knob

- ❑ With gaiter
- ❑ Selector lever knob and gaiter cannot be separated from one another
- ❑ Always renew together
- ❑ Removing and installing
⇒ [page 38](#)

3 - Clamp

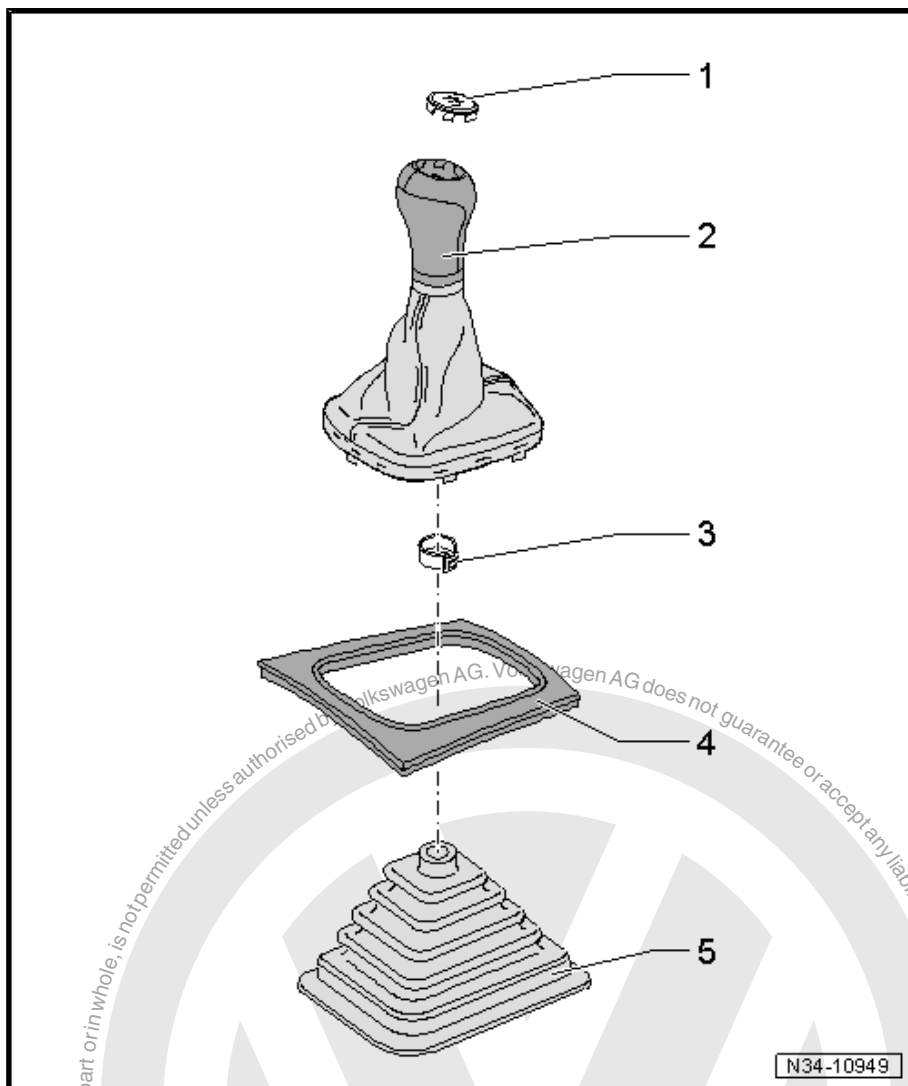
- ❑ For securing selector lever knob to selector lever
- ❑ Always renew

4 - Centre console cover

- ❑ In some equipment versions, forms one part together with centre console

5 - Noise insulation

- ❑ Not fitted in all vehicles
- ❑ Arrow on noise insulation points in direction of travel
- ❑ Locking lugs are arranged at varying intervals
- ❑ Therefore it can be installed in only one position



2.3 Removing and installing gaiter with selector lever knob and noise insulation

- Pull or carefully lever gaiter upwards out of centre console frame -arrows-.

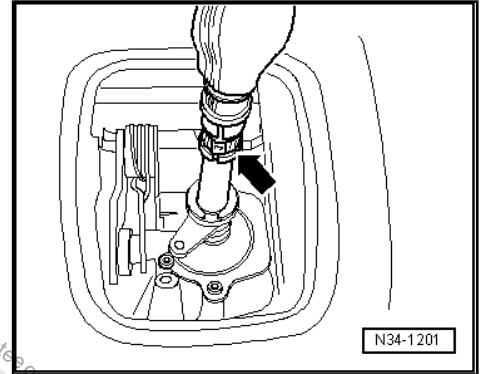
With some equipment variations, the gaiter must be levered off along the front section.



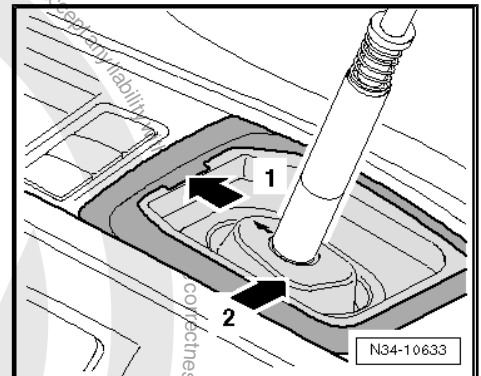


- Pull gaiter upwards, inside out over selector lever knob.
- Open clamp -arrow- and pull off selector lever knob together with gaiter.

In some versions, the centre console frame remains in the centre console.



- Then pull off, or carefully lever off, centre console frame -arrow 1-.
- Pull off noise insulation -arrow 2-.



2.3.1 Installing

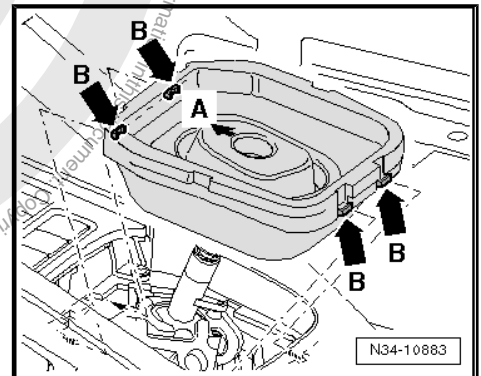
- First set noise insulation in place.

Installation position of noise insulation

-Arrow A- points in direction of travel.

Catches -arrows B- must engage in centre console.

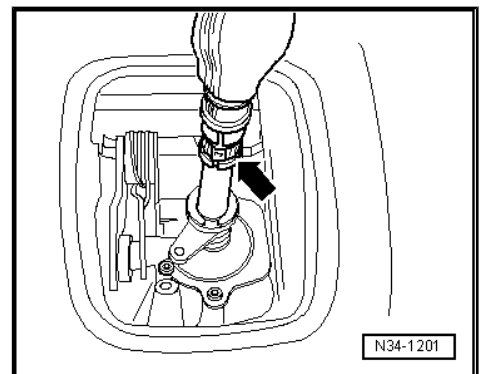
- Then press frame into centre console.
- Then turn gaiter inside out.



- Install selector lever knob and gaiter and squeeze new clamp -arrow- together.

When selector lever knob is pushed on, it must engage in circumferential groove in selector lever.

- Then press gaiter into frame of centre console.





2.4 Repairing selector lever and selector lever housing (through 10.06)



Note

Lubricate bearing positions and sliding surfaces with grease -G 000 450 02- .

1 - Securing clip

- ☐ Removing and installing
⇒ [page 41](#)

2 - Bush

3 - Compression spring

4 - Bush

5 - Torx screw, 5 Nm

6 - Cover

7 - Damping

8 - Damping

9 - Ball socket

10 - Selector lever guide

11 - Damping washer

12 - Seal

- ☐ Between selector lever housing and underbody
- ☐ Self-adhesive
- ☐ Bond to selector lever housing

13 - Selector lever

14 - Selector lever housing

15 - Bearing bush

16 - Pivot pin

17 - Guide bush

18 - Compression spring

- ☐ Installing ⇒ [page 41](#)

19 - Gate selector lever

20 - Torx screw, 5 Nm

21 - Seal

- ☐ Always renew

22 - Base plate

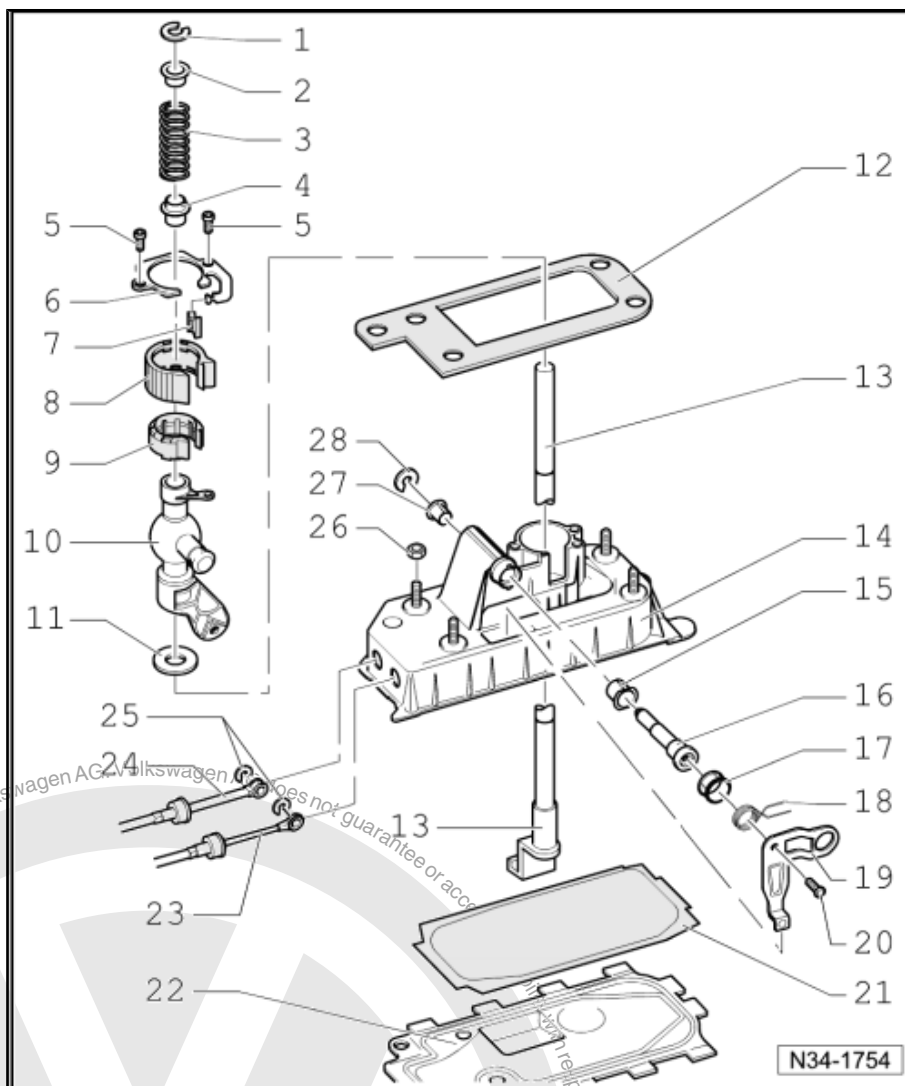
- ☐ Bend open tabs to remove
- ☐ Always renew

23 - Gate selector cable

- ☐ On gate selector lever
- ☐ Removing and installing ⇒ [page 41](#)

24 - Gear selector cable

- ☐ Removing from and attaching to selector lever guide ⇒ [page 41](#)





25 - Securing clip

- ☐ Always renew

26 - Hexagon nut M8, 25 Nm, hexagon nut M6, 8 Nm

- ☐ Qty. 4

27 - Bearing bush

- ☐ Fits in one position only

28 - Securing clip

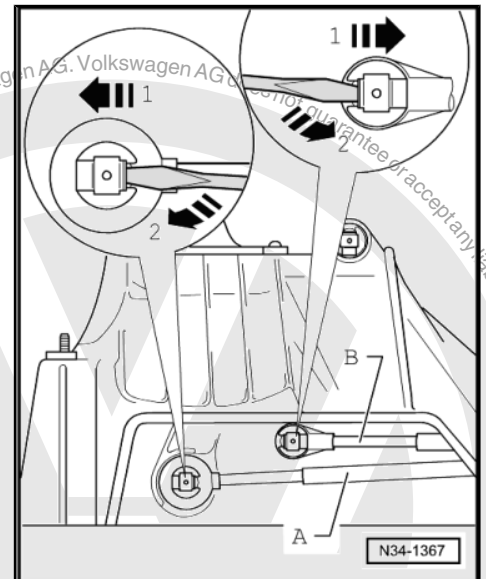
- ☐ Always renew

Removing and installing gate and gear selector cables

- Remove securing clip from gear selector cable -A- and gate selector cable -B-.

To do this, raise tab using screwdriver -arrow 1- and press off securing clip -arrow 2-.

- Remove gear selector cable -A- from selector lever retainer.
- Remove gate selector cable -B- from retainer of gate selector lever.



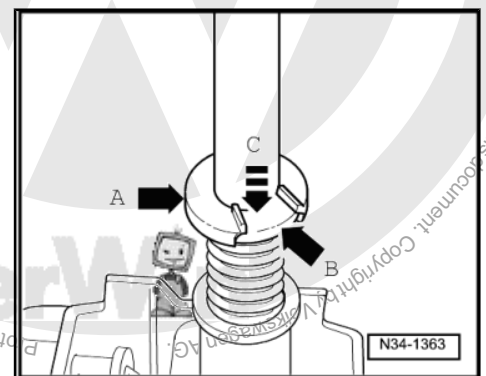
Removing and installing securing clip

- To remove or install securing clip -arrow A-, press spacer bush -arrow B- to stop in direction of arrow -arrow C- using screwdriver and pull off securing clip.



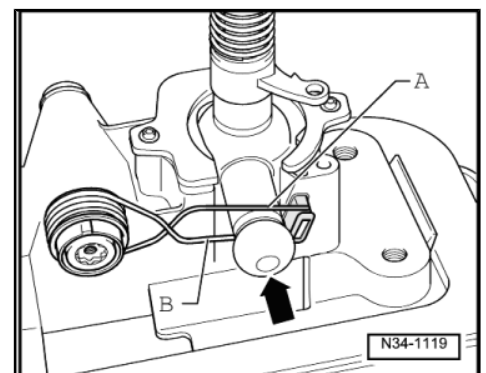
Note

- ◆ Do not cant spacer bush when pushing down.
- ◆ Slot in selector lever for securing clip must be visible.
- ◆ Carefully release tension from spring.



Installing compression spring

- Insert compression spring so that extension -A- lies on top of pin -arrow-.
- Then pull extension -B- down so that it sits below pin -arrow-.





2.5 Repairing selector lever and selector lever housing (from 11.06)



Note

- ◆ Lubricate bearing points and sliding surfaces with grease -G 000 450 02- .
- ◆ Dismantling and assembling selector mechanism ⇒ [page 43](#)

1 - Base plate

- ☐ Bend open tabs to remove
- ☐ Always renew

2 - Seal

- ☐ Always renew

3 - Selector lever

- ☐ Can be removed and installed with selector lever guide
⇒ [Item 15 \(page 43\)](#) installed

4 - Damping washer

- ☐ Push onto selector lever up to stop -arrow-

5 - Securing clip

- ☐ Do not damage cables when removing
- ☐ Always renew

6 - Gate selector cable

- ☐ Lever off gate selector lever
- ☐ Press onto gate selector lever inside selector mechanism
- ☐ Installation position
⇒ [page 35](#)

7 - Bush

8 - Gear selector cable

- ☐ Lever off selector lever guide
- ☐ Press onto selector lever inside selector mechanism
- ☐ Installation position ⇒ [page 35](#)

9 - Damping

10 - Ball socket

- ☐ Will be damaged when removed.
- ☐ Always renew

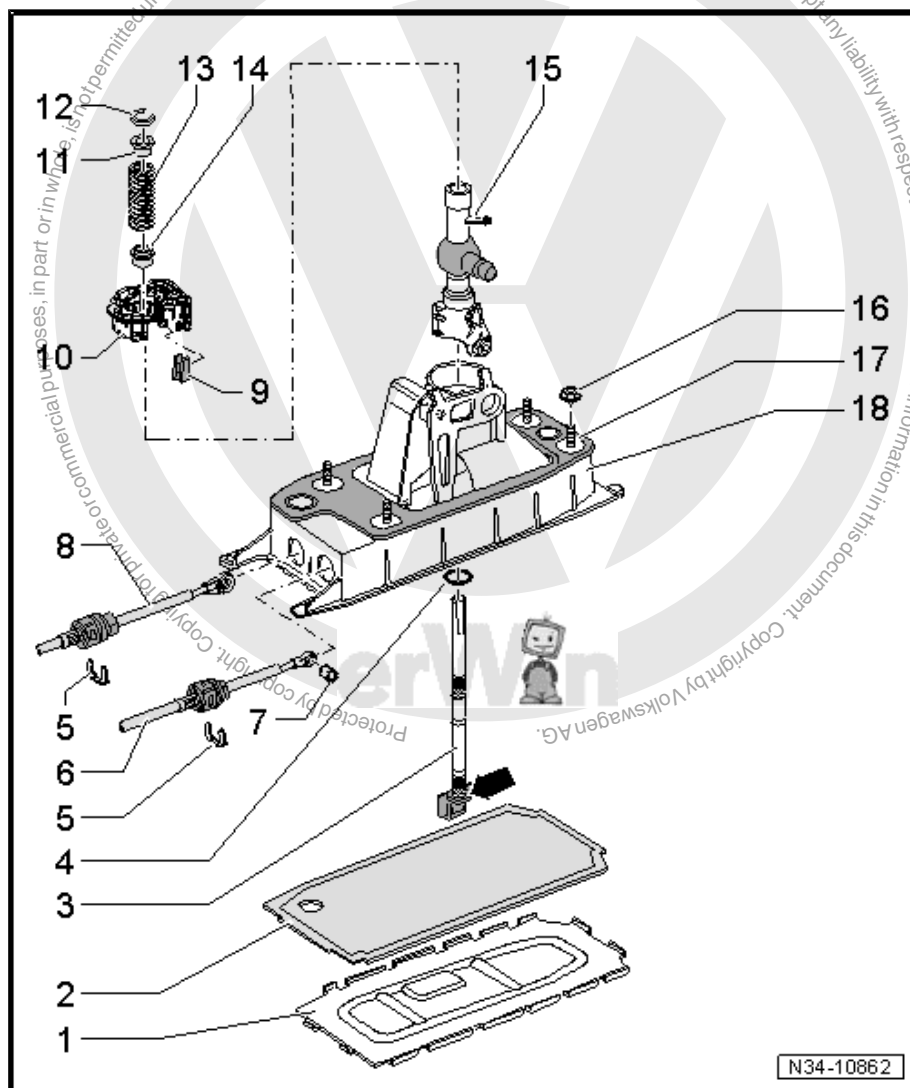
11 - Bush

12 - Securing clip

- ☐ Removing and installing ⇒ [page 41](#)

13 - Compression spring

- ☐ Removing and installing ⇒ [page 41](#)





14 - Bush

15 - Selector lever guide

16 - Hexagon nut M8 25 Nm; hexagon nut M6 8 Nm

- ☐ Qty. 4

17 - Seal

- ☐ Between selector lever housing and underbody
- ☐ Self-adhesive
- ☐ Bond to selector lever housing

18 - Selector lever housing

- ☐ With compression spring and gate selector lever
- ☐ Compression spring and gate selector lever cannot be removed

2.5.1 Dismantling and assembling selector mechanism

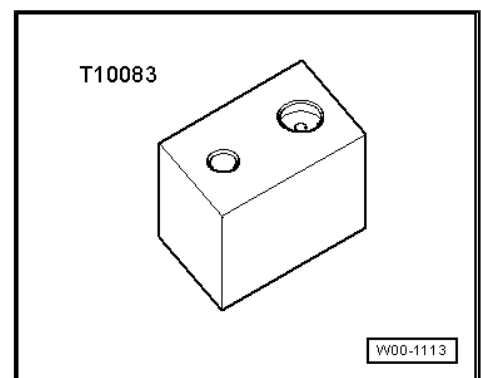
Special tools and workshop equipment required



Thrust piece -T10083-

Dismantling

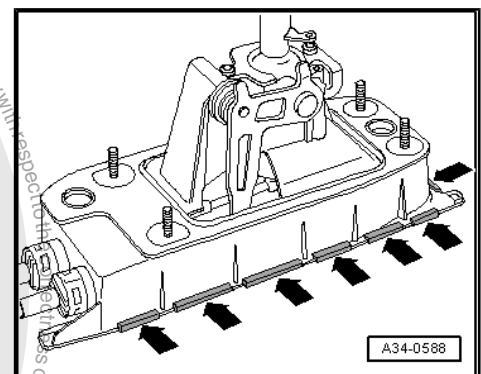
- Remove selector mechanism ➔ [page 51](#) .



- Bend open tabs -arrows- of base plate for selector mechanism using screwdriver and remove base plate; (tabs in front area of base plate are not illustrated).

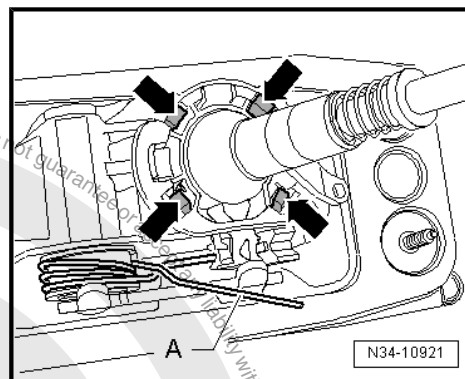
Remove seal from selector lever housing.

- Remove gear and gate selector cables from selector lever housing ➔ [page 42](#) .
- Lift upper end -A- of compression spring over tab of gate selector lever

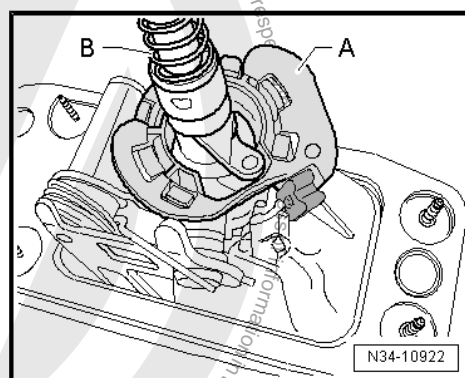




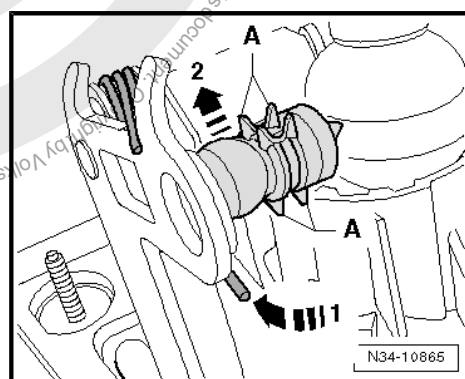
- Use screwdriver to press catches -arrows- of ball socket towards bearing ball of selector lever guide; break off catches if necessary.
- Lever ball socket -A- with selector lever guide -B- out of selector lever housing.



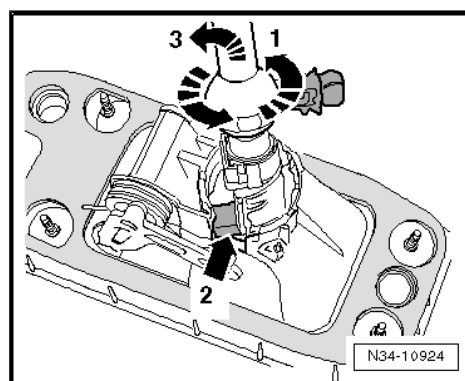
- Then press ball socket off bearing ball of selector lever guide and remove it.
- Please pay attention to guides -A- during the further procedure.
- They are not allowed to break off.
- Lever lower end -arrow 1- of compression spring onto shoulder on gate selector lever as far as stop



- Now pull selector lever guide up to stop and pull ball stud out of gate selector lever -arrow 2-.



- Then turn selector lever guide in -direction of arrow 1-
- Pin -arrow 2- must be in notch in selector housing
- Then swing out selector lever guide with selector lever in -direction of arrow 3-.



Assembling



Caution

The lower end of the compression spring (-arrow 1- ➔ figure above) can snap off the shoulder of the gate selector lever out of control during the further procedure.

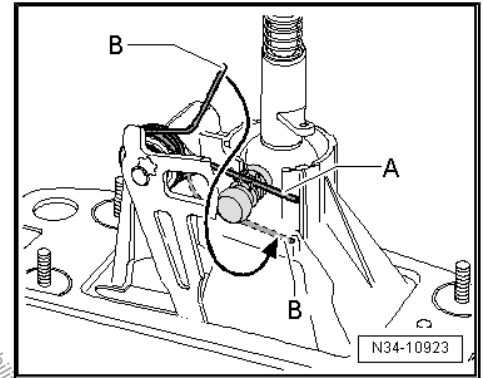
- Therefore, carefully press it down off shoulder of gate selector lever.

The ends of the compression spring then become tensioned “diagonally across” with a loud noise.

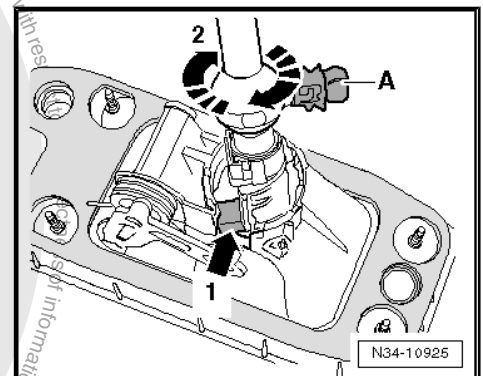
- Slacken ends -A- and -B- by turning both round to right.



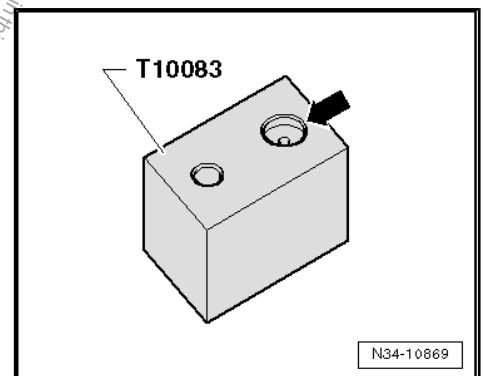
- Ends -A- and -B- must point in opposite directions.



- Fit selector lever guide in selector lever housing.
- Pin -arrow 1- is still located in notch in selector housing.
- Turn selector lever guide in -direction of arrow 2- until ball stud -A- is located in notch in selector lever housing.



- Place selector lever housing with selector lever guide into larger recess -arrow- in thrust piece -T10083- .



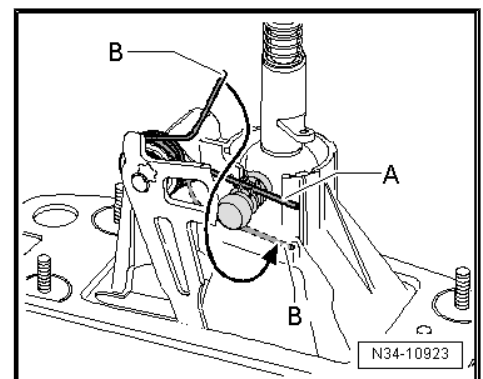
- The selector lever guide must project from the selector lever housing up to the stop.
- Insert end -A- of compression spring into guide from above.
- Pull end -B- of compression spring downwards and insert it next to guide (in direction of ball joint).
- Please pay attention to guides (⇒ figure above) during the further procedure.
- They are not allowed to break off.



Note

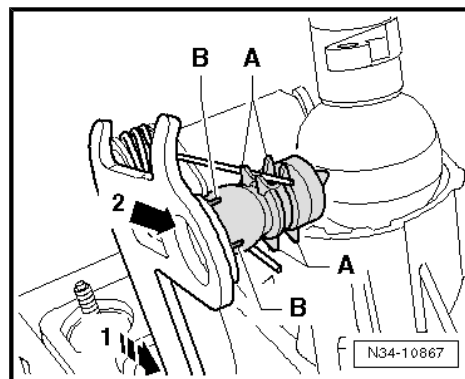
For clarity of illustration, only part of the gate selector lever is shown.

- Carefully remove selector housing with selector lever guide from thrust piece -T10083- .

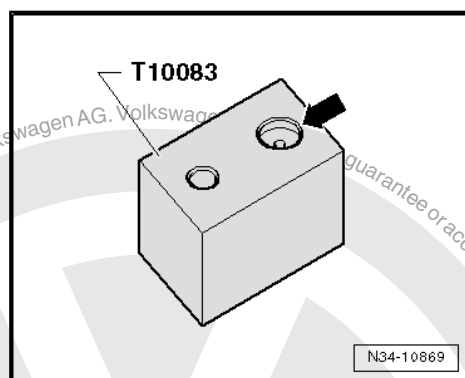




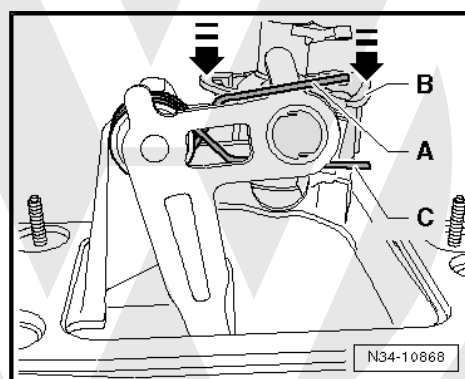
- Move gate selector lever back to stop (opposite from mounting holes for gear and gate selector cable) -arrow 1-.
- Grease ball stud.
- Press ball stud into gate selector lever -arrow 2-.
- Guides -A- and tabs -B- are not allowed to be damaged.



- Place selector lever housing with selector lever guide into larger recess -arrow- in thrust piece -T10083- .



- The selector lever guide must project from the selector lever housing up to the stop.
- Lift upper end -A- of compression spring over pin of gate selector lever
- Use a new ball socket -B-.
- Grease ball socket and bearing ball of selector lever guide.
- Press ball socket onto bearing ball of selector lever guide up to stop.
- Remove selector lever housing from thrust piece -T10083- .
- Insert lower end -C- of compression spring into guide.
- Lift upper end -A- of compression spring over pin of gate selector lever into guide.
- Press ball socket into selector lever housing -arrows-.
- All locking lugs must clip in.
- Mount selector lever, gear selector cable, gate selector cable and base plate ➔ [page 42](#)
- Install selector mechanism ➔ [page 51](#) .





2.6 Assembly overview - removing and installing selector cables



Note

Lubricate bearing positions and sliding surfaces with grease -G 000 450 02- .

1 - Gear selector cable

- ☐ Connect to cable end-piece
⇒ [Item 11 \(page 48\)](#)
- ☐ Installation position
⇒ [page 35](#)
- ☐ From 11.06, modified attachment to selector lever inside selector mechanism
⇒ [Item 8 \(page 42\)](#)

2 - Gate selector cable

- ☐ Connect to cable end-piece
⇒ [Item 10 \(page 47\)](#)
- ☐ Installation position
⇒ [page 35](#)
- ☐ From 11.06, modified attachment to gate selector lever inside selector mechanism
⇒ [Item 6 \(page 42\)](#)

3 - Securing clip

- ☐ Always renew

4 - Selector lever housing

5 - Securing clip

- ☐ Always renew
- ☐ Do not damage cables when removing

6 - Hexagon bolt, 20 Nm

- ☐ Qty. 3
- ☐ For support bracket

7 - Support bracket

- ☐ May be made from plastic or metal

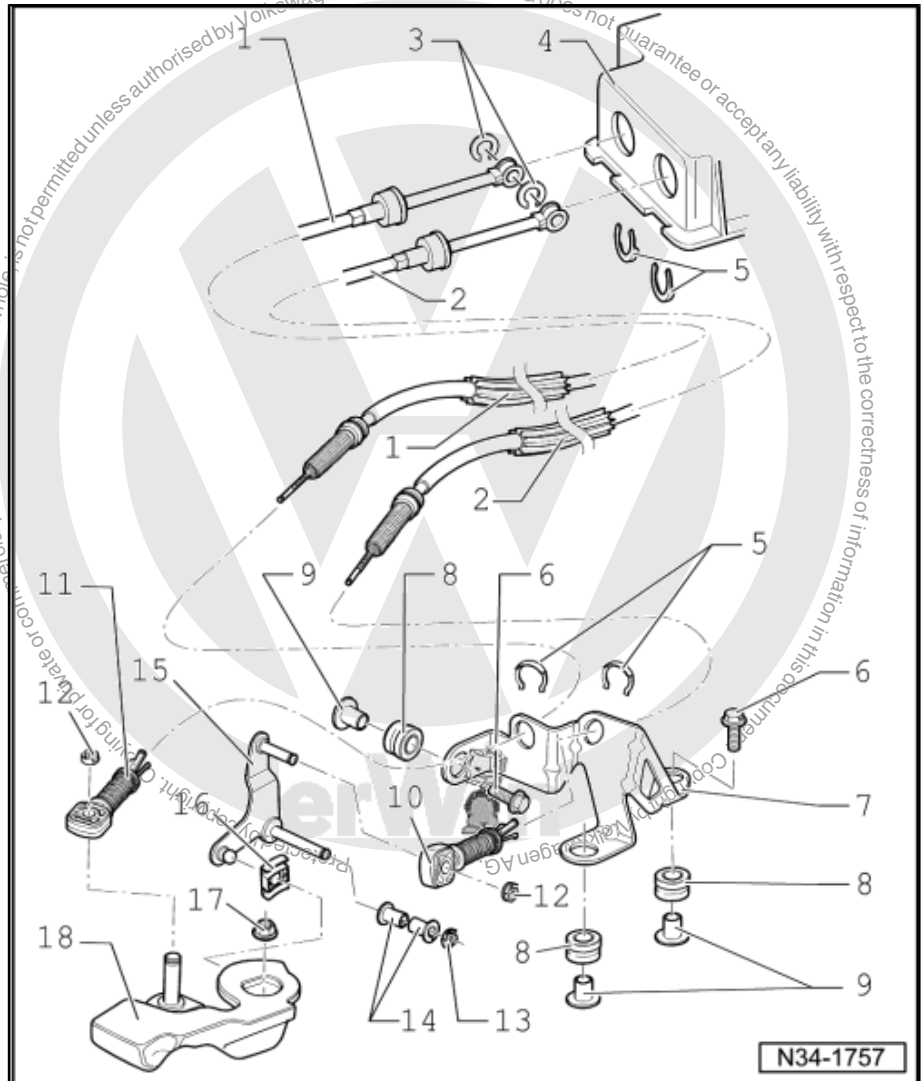
8 - Grommet

- ☐ Support bracket mounting on gearbox

9 - Spacer

10 - Cable end-piece

- ☐ After installing, adjust selector mechanism ⇒ [page 54](#)
- ☐ For gate selector cable to relay lever
- ☐ Do not interchange; cable end-pieces for gate selector cable to relay lever and gear selector cable to gearbox selector lever are different
- ☐ For metal relay lever, secured with securing clip ⇒ [Item 13 \(page 48\)](#)
- ☐ From 05.07, fitted in conjunction with plastic relay lever ⇒ [page 50](#)
- ☐ Removing from plastic relay lever ⇒ [page 50](#)
- ☐ Pressing onto plastic relay lever ⇒ [page 50](#)





- ☐ Allocation ➔ [page 49](#)

11 - Cable end-piece

- ☐ After installing, adjust selector mechanism ➔ [page 54](#)
- ☐ For gear selector cable to gearbox selector lever
- ☐ Do not interchange; cable end-pieces for gate selector cable to relay lever and gear selector cable to gearbox selector lever are different
- ☐ Allocation ➔ [page 49](#)

12 - Securing clip

- ☐ Always renew
- ☐ Not required for plastic relay lever

13 - Securing clip

- ☐ Always renew
- ☐ Not required for plastic relay lever

14 - Bearing bush

- ☐ Not required for plastic relay lever

15 - Relay lever

- ☐ Installation position ➔ [page 49](#)
- ☐ After installing, adjust selector mechanism ➔ [page 54](#)
- ☐ May be made from plastic or metal
- ☐ Metal relay lever is mounted in bearing bush ➔ [Item 14 \(page 48\)](#) and secured with securing clip ➔ [Item 13 \(page 48\)](#)
- ☐ From 05.07, plastic relay lever
- ☐ Remove and install plastic relay lever together with cable end-piece ➔ [page 50](#)
- ☐ Bearing bush and securing clip not required for plastic relay lever

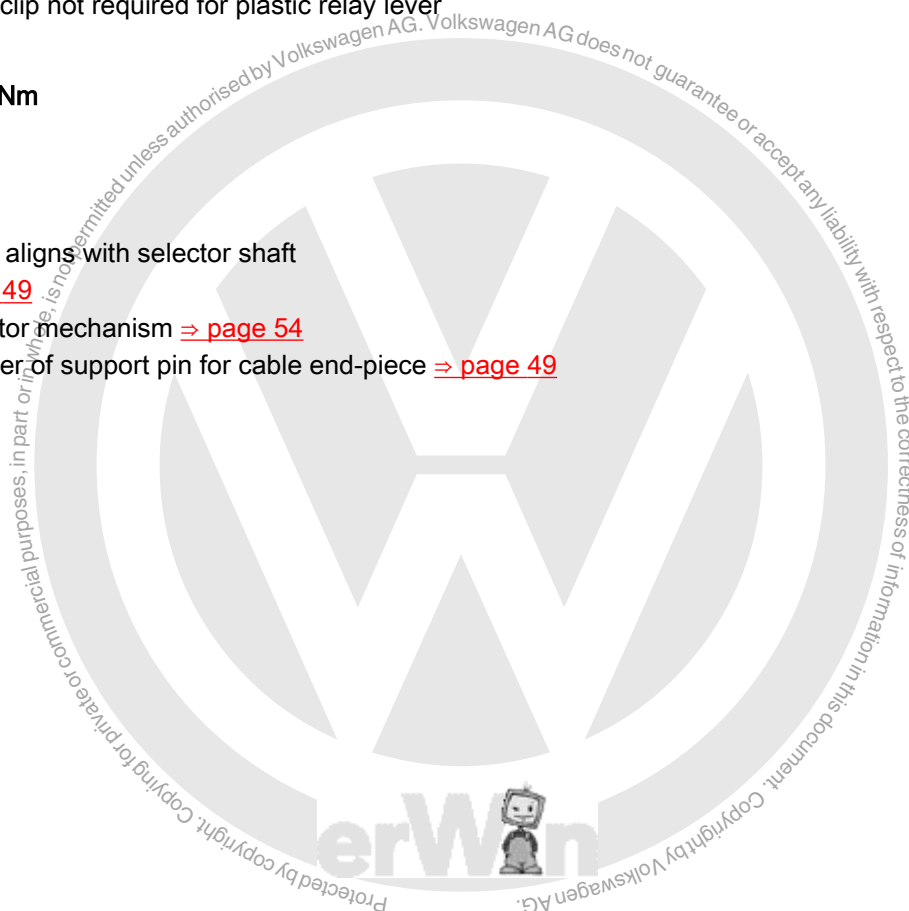
16 - Shoe

17 - Self-locking hexagon nut, 23 Nm

- ☐ Always renew

18 - Gearbox selector lever

- ☐ With damper weight
- ☐ Install so that master spline aligns with selector shaft
- ☐ Installation position ➔ [page 49](#)
- ☐ After installing, adjust selector mechanism ➔ [page 54](#)
- ☐ From 06.06, smaller diameter of support pin for cable end-piece ➔ [page 49](#)



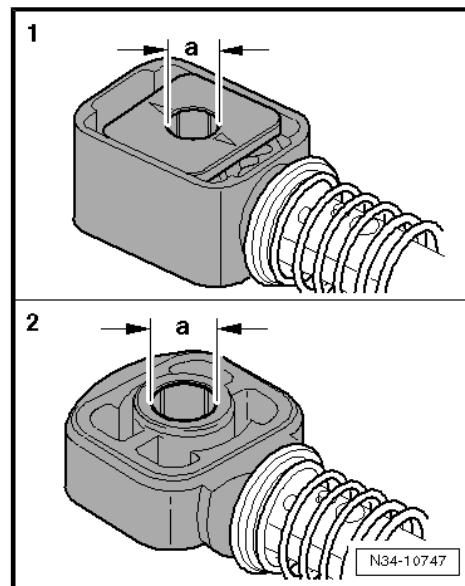


Allocation of cable end-pieces

The holes in the cable end-pieces have different diameters.

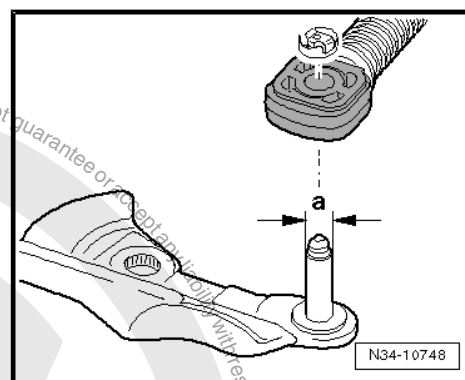
Cable end-piece for	Dimension "a"
1 - Gear selector cable to gearbox selector lever from 06.06	8.5 mm
2 - Gear selector cable to gearbox selector lever through 05.06	10 mm
2 - Gate selector cable to metal relay lever	8 mm
2 - Gate selector cable to plastic relay lever	10 mm

⇒ [page 50](#)



From 06.06, smaller diameter of support pin for gear selector cable end-piece

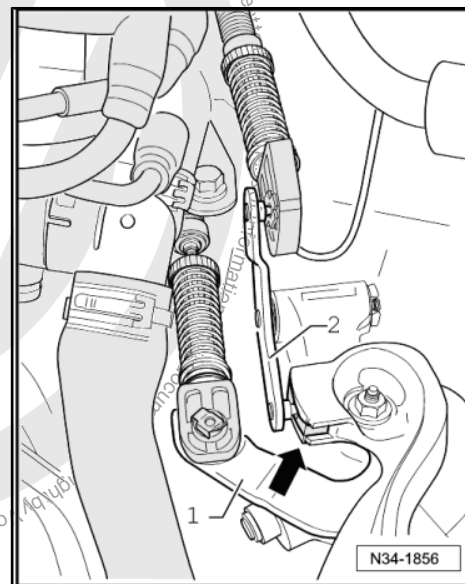
Support pin for gear selector cable end-piece	Dimension "a"
Through 05.06	10 mm
From 06.06	8.5 mm



Installation position of gearbox selector lever and relay lever

1 - Gearbox selector lever with damper weight

2 - Relay lever engages in guide rail of gearbox selector lever via shoe -arrow-.

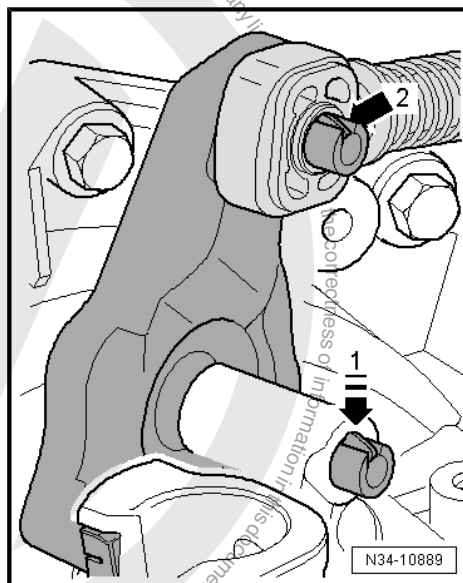




2.7 Plastic relay lever

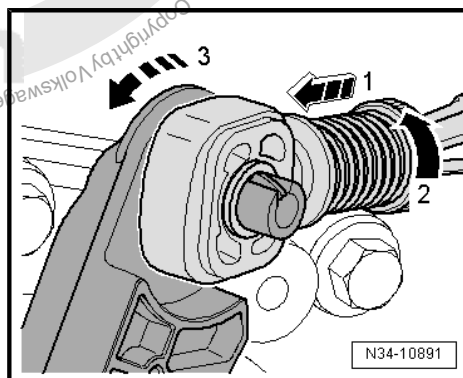
From 05.07, plastic relay lever

- To remove relay lever, first separate cable end-piece from gate selector lever:



This will avoid damage to the gate selector cable

- Pull locking mechanism forward to stop in -direction of arrow 1- and then lock by turning to left in -direction of arrow 2-.
- Then push relay lever forwards (-in direction of arrow 3-).
- Press latch -arrow 1- (⇒ previous figure) down to stop and remove relay lever together with cable end-piece.
- The cable end-piece can be removed only with the relay lever removed ⇒ [page 51](#) .



Note

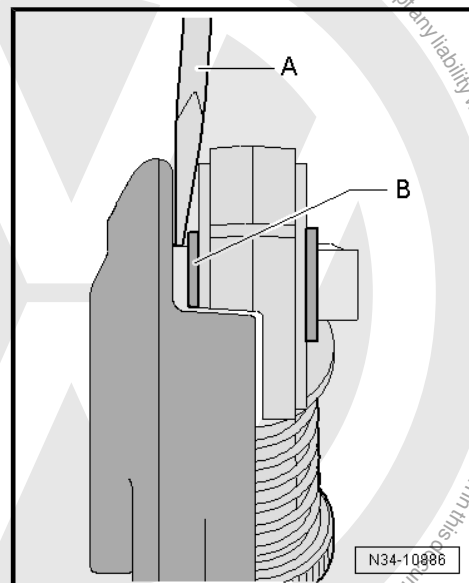
To fit, lubricate bearing points and sliding surfaces with grease - G 000 450 02- .

- Press cable end-piece onto relay lever ⇒ [page 51](#) .
- Insert relay lever together with cable end-piece.
- Fastener -arrow 1- secures relay lever (⇒ previous figure).
- Cable end-piece must be located behind fastener -arrow 2- (⇒ previous figure).



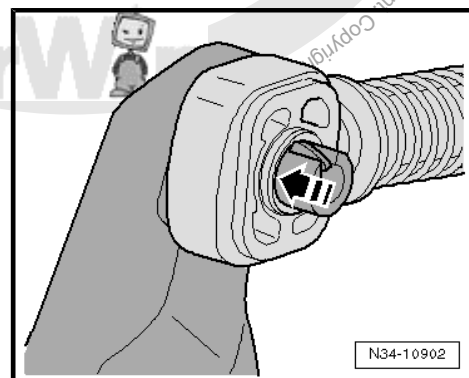
Levering gate selector cable end-piece off plastic relay lever

- Relay lever has been removed
- Insert a flat-blade screwdriver -A- between bush -B- and relay lever.



Pressing on cable end-piece

- Relay lever has been removed
- Cable end-piece may be pressed only onto bush -arrow-.
- Cable end-piece must move freely on relay lever.
- It must be located behind fastener -arrow 2- ⇒ [page 50](#) .

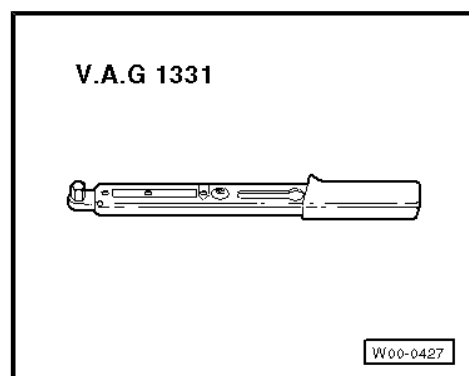


2.8 Removing and installing selector mechanism

2.8.1 Removing

Special tools and workshop equipment required

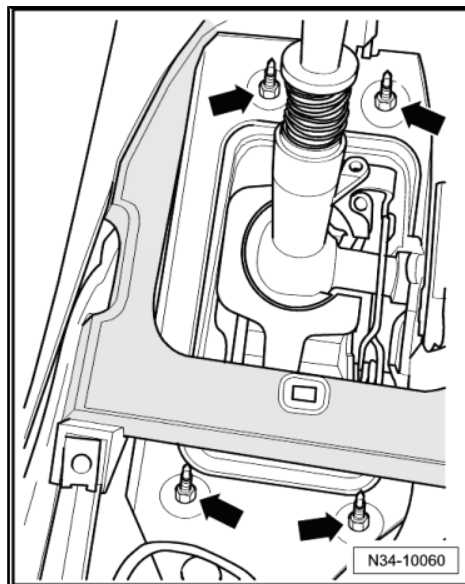
- ◆ Torque wrench -V.A.G 1331-



- ◆ Grease -G 000 450 02-
- First check whether a coded radio is fitted. If so, obtain anti-theft code.
- With ignition switched off, disconnect battery earth strap ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .



- Remove gaiter with selector lever knob and noise insulation.
⇒ [page 38](#)
- Remove centre console and securing bracket for centre console ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims .
- Remove selector lever housing nuts -arrows-.
- Remove complete air filter housing if it is over selector mechanism ⇒ Rep. Gr. 24 ; Repairing injection system .
- Remove securing clip -3- for gear selector cable from gearbox selector lever -1-.

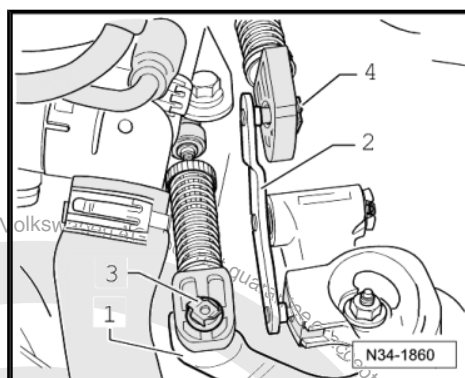


- Pull gear selector cable from pin.

Metal relay lever

- Remove securing clip -4- for gate selector cable from relay lever -2-.
- Pull gate selector cable from pin.

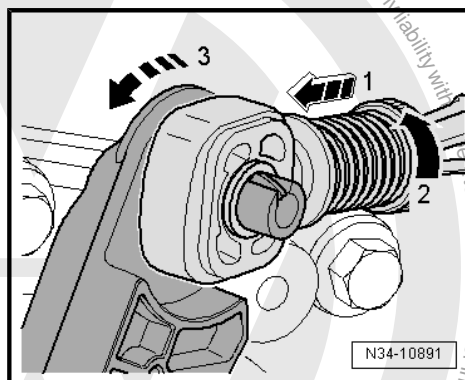
Plastic relay lever



Releasing cable end-piece from gate selector cable

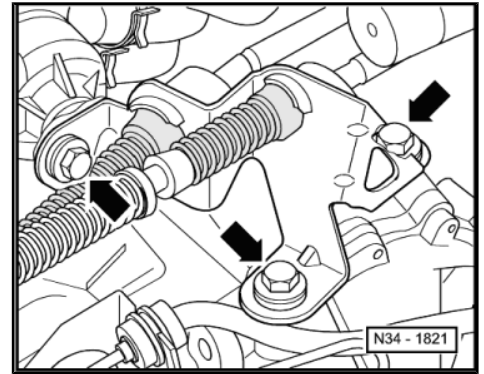
- Pull locking mechanism forward to stop in -direction of arrow 1- and then lock by turning to left in -direction of arrow 2-.
- Then push relay lever forwards (-in direction of arrow 3-).
- Remove relay lever and cable end-piece together
⇒ [page 50](#) .

Continued for all selector mechanisms





- Remove cable support bracket from gearbox -arrows-; if necessary unclip lines first.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Noise insulation .
- Remove tunnel cross member ⇒ Rep. Gr. 26 ; Removing and installing parts of exhaust system .
- Separate exhaust system and remove from subframe ⇒ Rep. Gr. 26 ; Removing and installing parts of exhaust system .
- Remove rear exhaust system and heat shield ⇒ Rep. Gr. 26 ; Removing and installing parts of exhaust system .
- Swing selector lever housing down and remove with selector cables.



2.8.2 Installing

Carry out installation in the reverse sequence, noting the following:

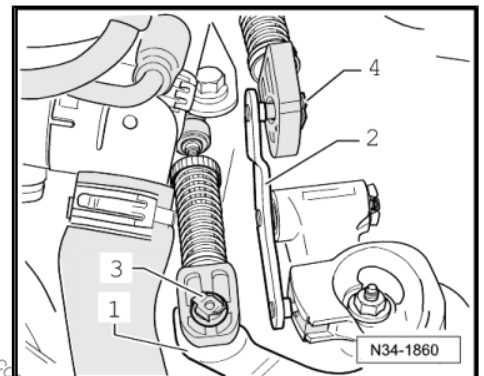
The holes in the cable end-pieces have different diameters.

Allocation of cable end-pieces ⇒ page 49

- Spread a small quantity of grease -G 000 450 02- on pins of gearbox selector lever -1- and relay lever -2-.
- Renew securing clips -3- and -4- each time they are removed.
- Secure gear selector cable with securing clip -3- and gate selector cable with securing clip -4-.

Cable end-piece to plastic relay lever

- Fit relay lever and cable end-piece together ⇒ **page 50** .
- Insert gate selector cable in cable end-piece.



Continued for all selector mechanisms

- Align selector lever housing parallel to body.
- Distance to body must be same on both sides.
- Install centre console ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims .
- Install gaiter with selector lever knob and noise insulation. ⇒ **page 38**
- Install heat shield.
- Assemble exhaust system free of tension and attach tunnel cross member ⇒ Rep. Gr. 26 ; Removing and installing parts of exhaust system .

Adjusting selector mechanism ⇒ page 54 .

- If removed, install complete air filter housing ⇒ Rep. Gr. 24 ; Repairing injection system .
- Follow procedure after connecting battery ⇒ Electrical system; Rep. Gr. 27 ; Battery; Disconnecting and connecting battery .

2.8.3 Torque settings

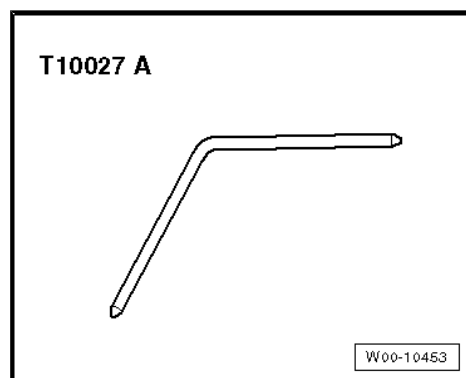
Component	Nm
Selector lever housing to body	Nuts M6 = 8 Nuts M8 = 25
Selector cables support bracket to gearbox	20 Nm



2.9 Adjusting selector mechanism

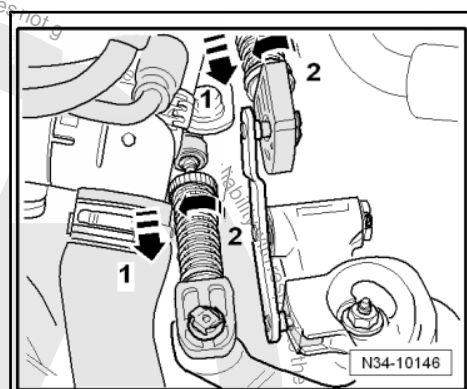
Special tools and workshop equipment required

- ♦ Locking pin -T10027 A-



Note

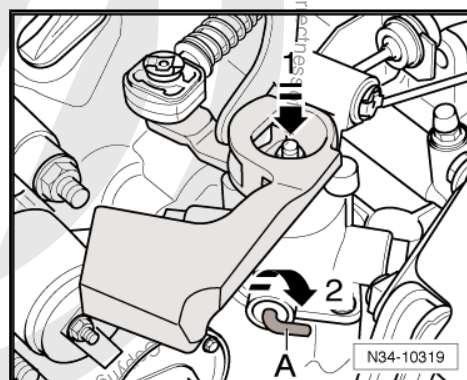
- ♦ *The following points are essential to ensure correct adjustment of selector mechanism:*
 - ♦ *Moving parts of selector mechanism and elements transferring force must be in proper condition.*
 - ♦ *Selector mechanism must move freely.*
 - ♦ *Gearbox, clutch and clutch mechanism must also be in proper condition.*
- Gearbox must be in neutral.
 - Remove entire air filter housing if bracket for securing selector shaft and securing mechanism for gear selector cable and gate selector cable are not accessible ⇒ Rep. Gr. 24 ; Repairing injection system .
 - Pull locking mechanisms on gate selector cable and gear selector cable forward to stop -direction of arrow 1- and then turn to left to lock -direction of arrow 2-.



Set selector shaft as follows:

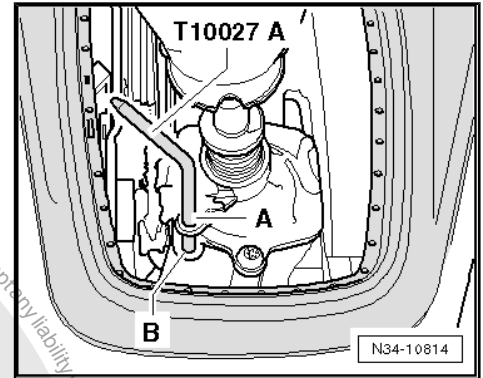
- Press selector shaft down -direction of arrow 1-.
- While pressing down selector shaft, turn locking pin -A- in -direction of arrow 2- press it carefully in until it engages in selector shaft.
- Remove gaiter with selector lever knob and noise insulation.
⇒ [page 38](#)

Now set selector lever as follows:



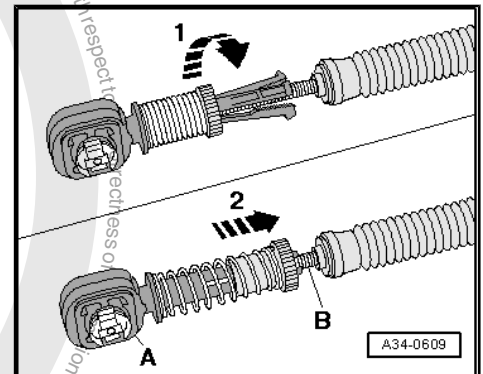


- Move selector lever to neutral.
- Guide locking pin -T10027 A- through hole -A- into hole -B-.

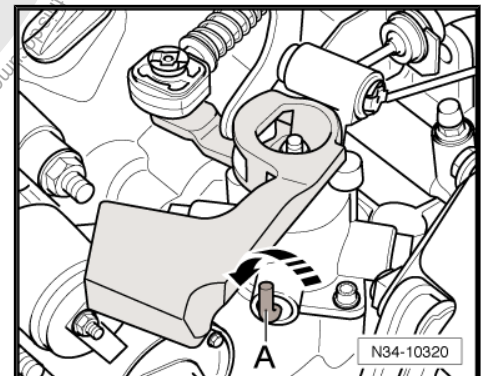


- Check that gate and selector cables -B- are inserted, free of stress, into locking device -A-.
- Now turn locking mechanisms on gear selector cable and gate selector cable clockwise to stop -direction of arrow 1-.

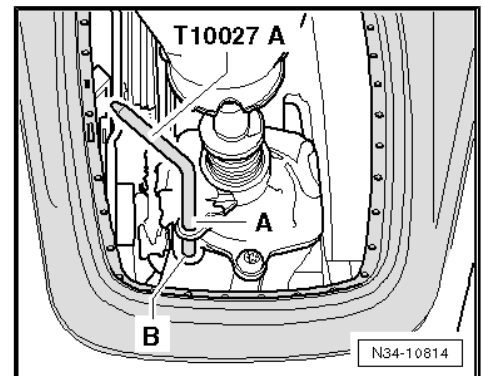
The spring presses the locking mechanism into original position -direction of arrow 2-.



- Now turn angled rod -A- back to original position -direction of arrow-.
- The angled rod must point straight up.



- Pull locking pin out of holes -A- and -B-.
- Install gaiter with selector knob and noise insulation.
⇒ [page 38](#)
- If removed, install complete air filter housing ⇒ Rep. Gr. 24 ;
Repairing injection system .



2.9.1 Functional check

- With gearbox in neutral, selector lever must rest in gate for 3rd and 4th gear.
- Operate clutch.
- Select all gears several times. Pay particular attention to operation of reverse gear lock.



- If it continues to be difficult to engage a gear after repeated attempts, repeat adjustment procedure of selector mechanism
⇒ [page 54](#) .

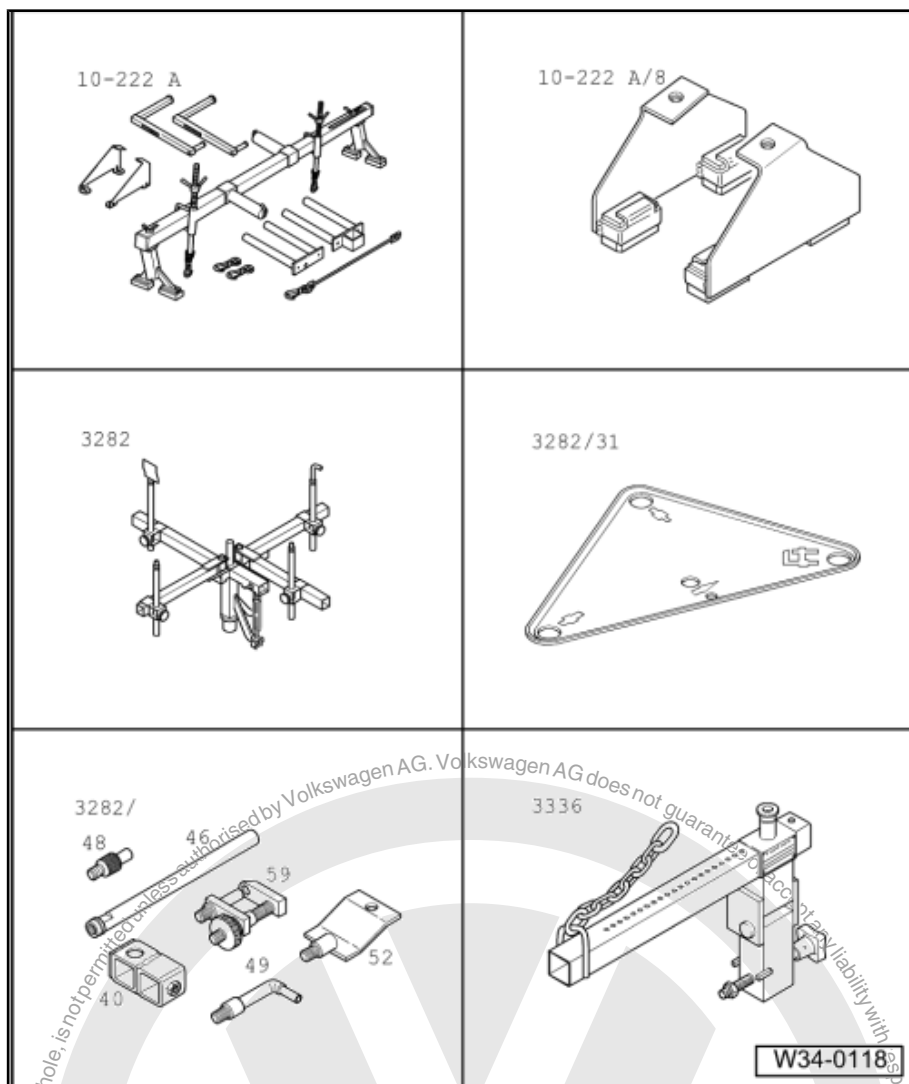


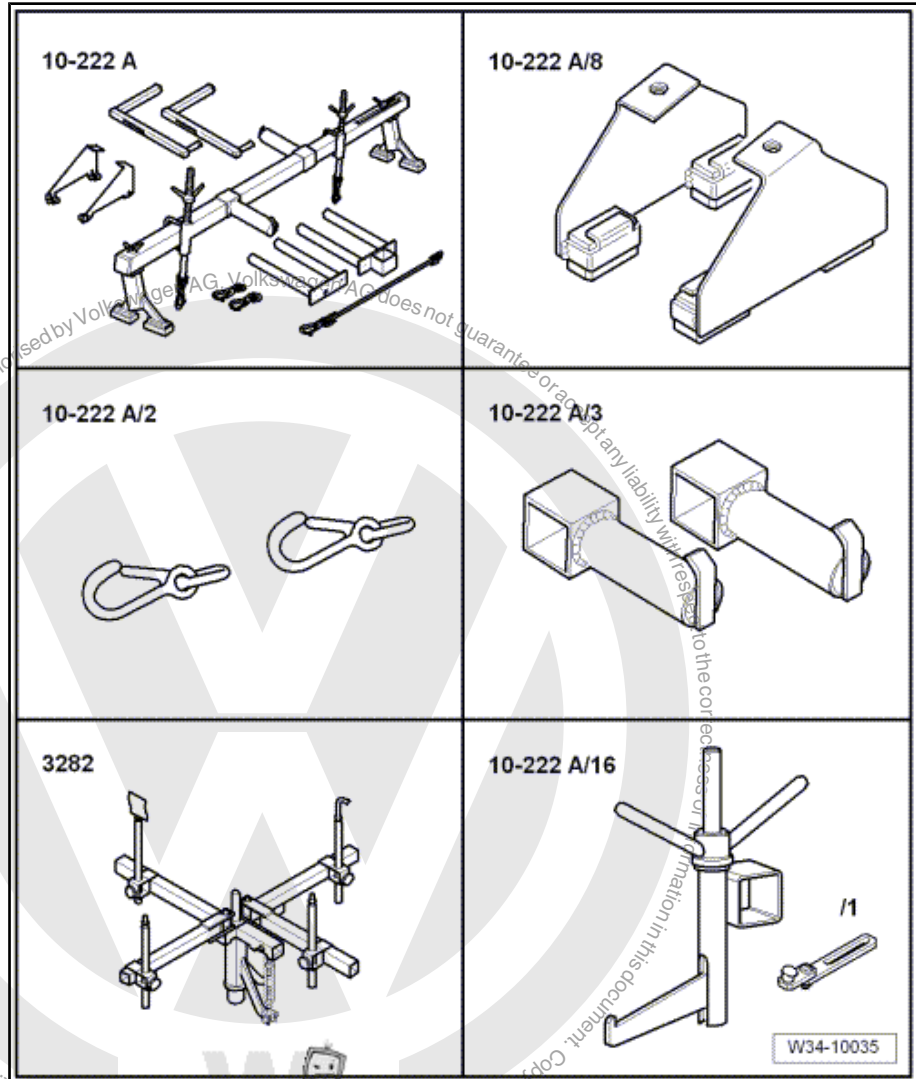


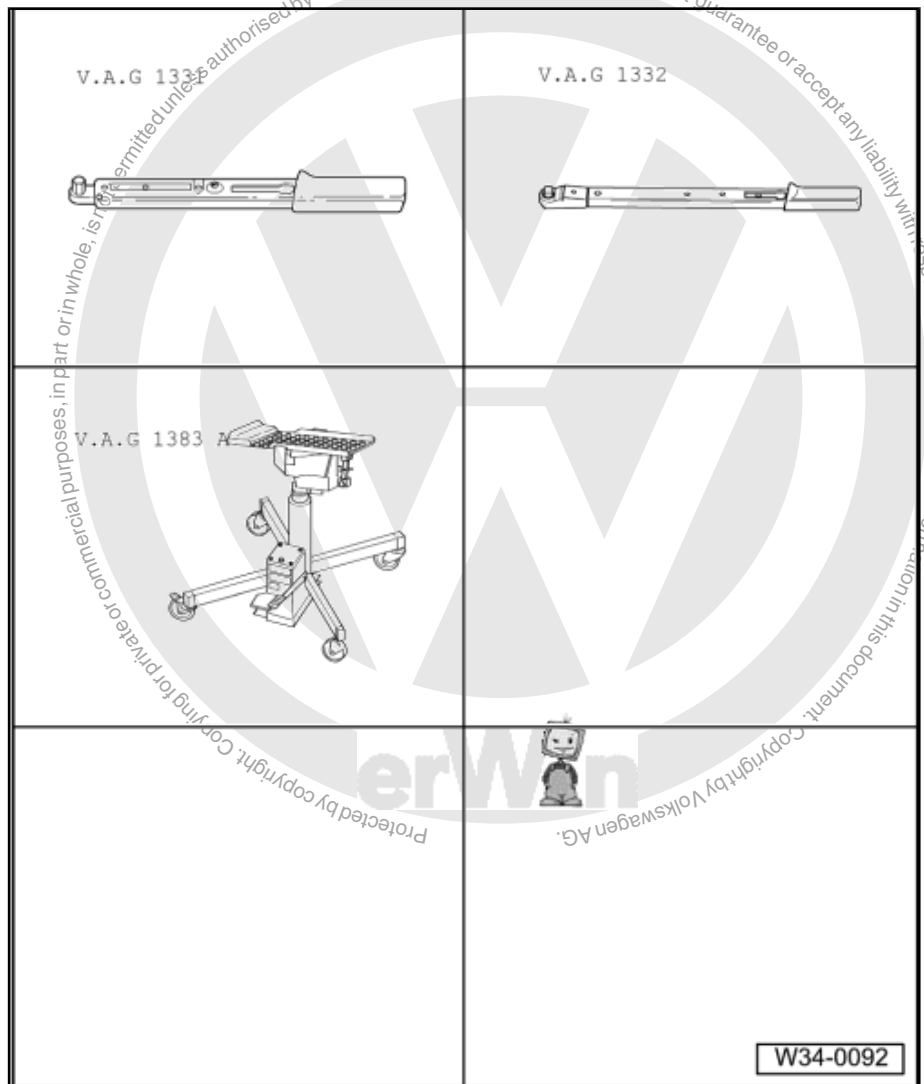
3 Removing and installing gearbox

Special tools and workshop equipment required

- ◆ Support bracket -10 - 222 A-
- ◆ Adapter -10 - 222 A /8-
- ◆ Gearbox support -3282-
- ◆ Adjustment plate -3282/31-
- ◆ Gearbox mounting support -3336-







- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Engine and gearbox jack -V.A.G 1383 A-
- ◆ Grease for clutch plate splines -G 000 100-
- ◆ Grease -G 000 450 02-

3.1 Removing gearbox

- First check whether a coded radio is fitted. If so, obtain anti-theft code.
- With ignition switched off, disconnect battery ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and connecting battery .
- If the lifting eyes of the engine for support bracket -10 - 222 A- are covered by a component, for example the air filter, it must be removed now. ⇒ Rep. Gr. 24 ; Repairing injection system
- Remove complete air filter housing if it is over the gearbox ⇒ Rep. Gr. 24 ; Repairing injection system .
- Remove battery and battery tray ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .

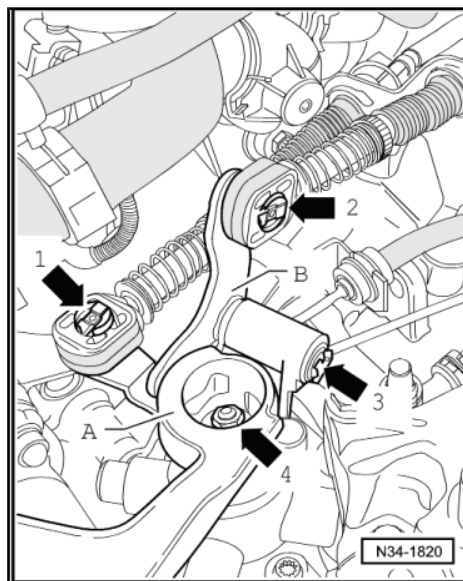


- Remove securing clip for gear selector cable -arrow 1- from gearbox selector lever -A-.
- Pull gear selector cable from pin.

Metal relay lever

- Remove securing clip -arrow 2- for gate selector cable from relay lever -B-.
- Pull gate selector cable from pin.
- Pull securing clip -arrow 3- off relay lever -B- and remove relay lever.

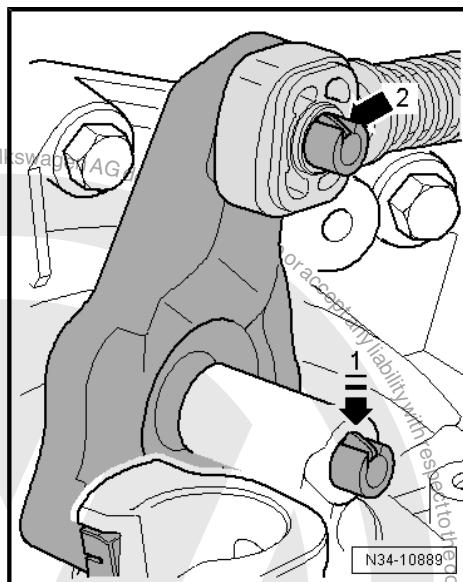
Plastic relay lever



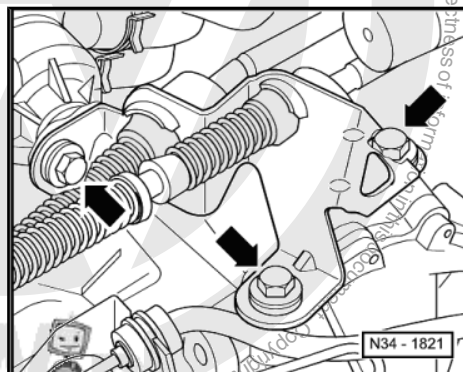
- Release end-piece from gate selector cable ⇒ [page 52](#) .
- Press latch -arrow 1- down to stop and remove relay lever together with cable end-piece.

Continuation for all

- Remove gearbox selector lever -A- by removing nut -arrow 4- (⇒ previous figure).



- Remove cable support bracket from gearbox -arrows-.
- Then tie up selector cable and gate cable.





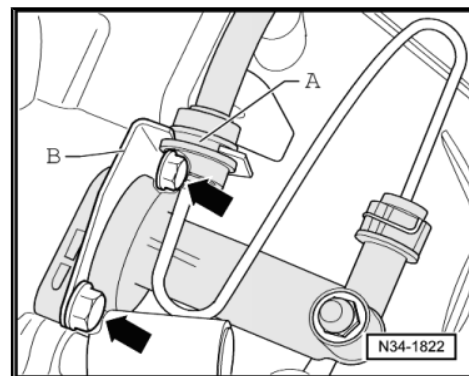
- Pull line between master and slave cylinders -A- out of support -B-, if present, on gearbox.
- Remove slave cylinder -arrows-, lay to side and secure with wire. Do not disconnect pipes.



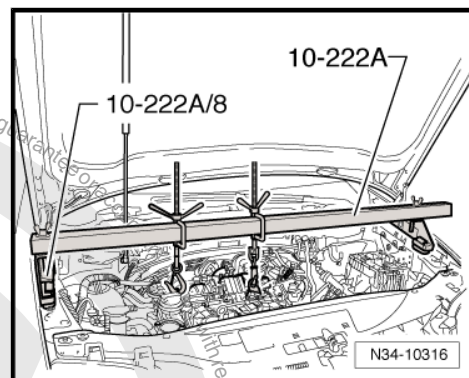
Note

Do not depress clutch pedal.

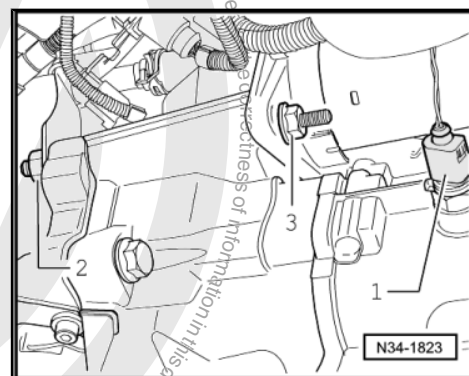
- Remove earth strap at engine/gearbox upper connecting bolt or at subframe.
- Remove upper engine/gearbox connecting bolts.
- Then remove upper securing bolt on starter.
- If there are hose and cable connections in area of engine support eye for support bracket -10 - 222 A- , remove these now.



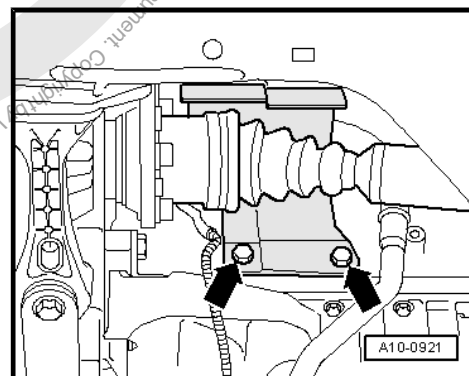
- Set up support bracket -10 - 222 A- together with adapters -10 - 222 A /8- in front of gas struts for bonnet.
- Take up weight of engine/gearbox assembly on spindles.
- Raise vehicle.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Noise insulation .
- Remove lower part of front left wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 ; Wheel housing liner .



- Pull off connector -1- for reversing light switch -F4- .
- If a nut -2- is installed, remove it now.
- Remove starter (bolt -3-) ⇒ Electrical system; Rep. Gr. 27 ; Starter .



- Remove drive shaft protective cover from engine -arrows-, if fitted.
- Separate exhaust system at double clamp and remove exhaust pipe bracket from subframe ⇒ Rep. Gr. 26 ; Removing and installing parts of exhaust system
- Disconnect drive shafts from flange shafts and tie up as high as possible, being careful not to damage surface protection.



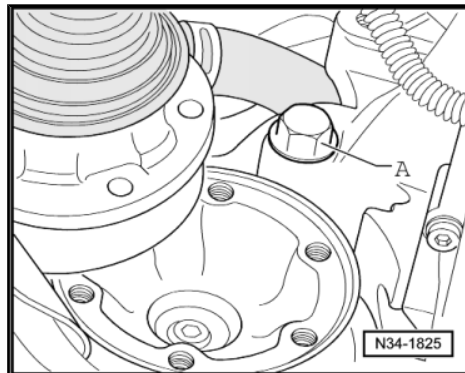


- Remove engine/gearbox connecting bolt -A- in area of right flange shaft.

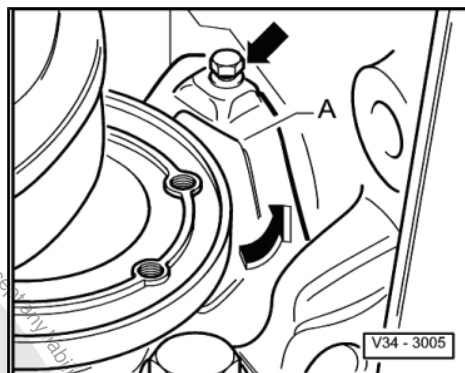


Note

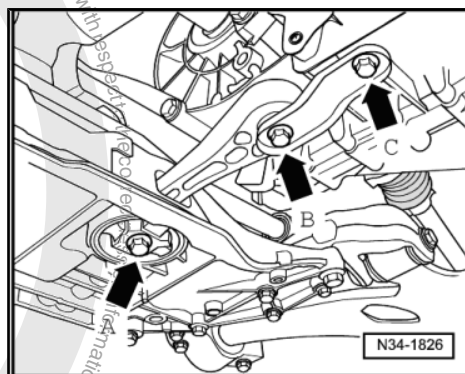
On some engines, the engine/gearbox connecting bolt is below the right flange shaft.



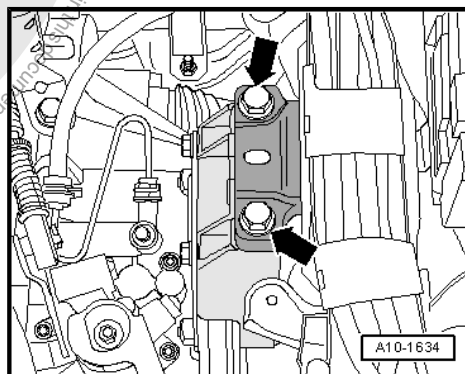
- Check to see if a cover plate -A- is installed above the right flange shaft.
- This cover plate must be removed now -arrows-.



- Remove pendulum support -arrows A-, -B- and -C-.



- Remove hexagon bolts -arrows- for left assembly mounting from gearbox mounting.
- Tilt engine/gearbox assembly by lowering the left spindle of support bracket -10 - 222 A- .

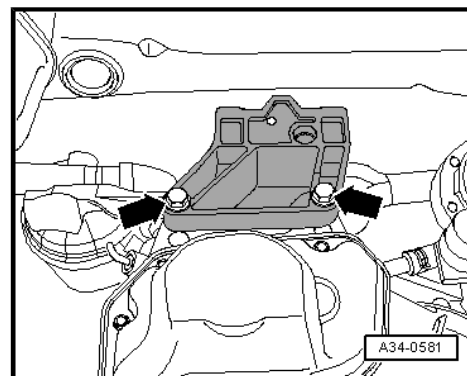




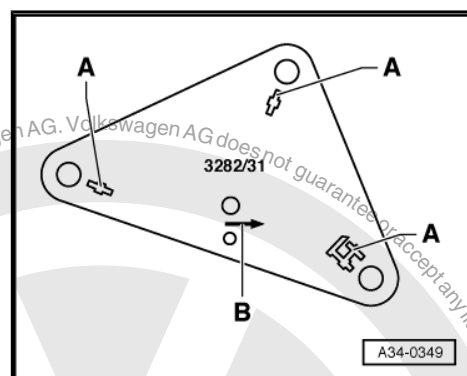
- Unbolt gearbox support from gearbox -arrows-.

To remove gearbox "0AF", set up gearbox support -3282- with adjustment plate -3282/31- .

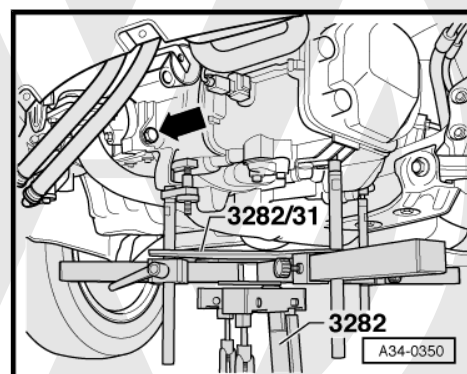
- Insert gearbox support -3282- in engine and gearbox jack - V.A.G 1383A- .
- Align arms of gearbox support according to holes in adjustment plate .



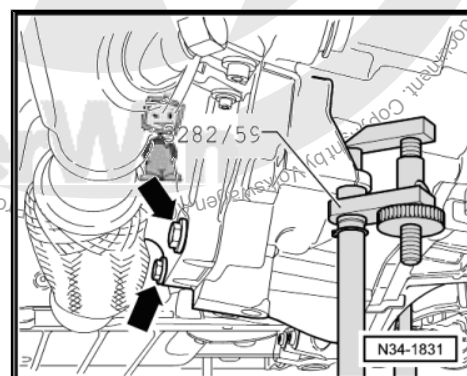
- Attach support elements -A- to adjustment plate as illustrated.
- Position engine and gearbox jack under vehicle. Arrow -B- on adjustment plate points in direction of vehicle travel.



- Align adjustment plate parallel to gearbox.
- Remove engine/gearbox connecting bolt (-arrow- in figure above).

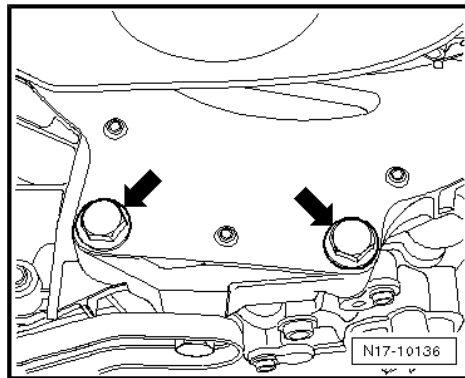


- Remove engine/gearbox connecting bolts -arrows- in vicinity of sump (bolts remain on engine when exhaust system is in front of bolts).

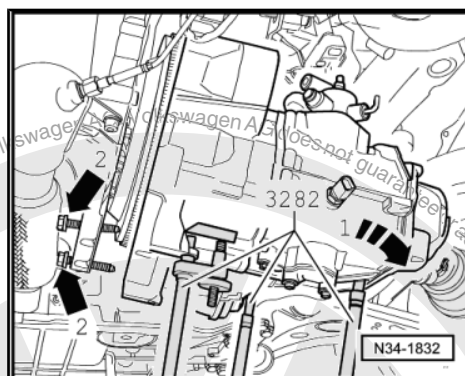




- For vehicles with a sheet metal sump, remove cover plate near sump -arrows-.
- Press gearbox off dowel sleeves.
- Observe intermediate plate on engine.
- Have a second mechanic press engine forwards.



- Turn gearbox downwards, in area of differential, and turn rear of gearbox slightly towards front end -arrow 1-.
- If engine/gearbox connecting bolts -arrow 2- cannot be removed, ensure that they are backed out until they contact exhaust system.



- Then carefully guide gearbox with right flange shaft past fly-wheel and intermediate plate -arrow 2- as shown.
- Lower gearbox, being careful of subframe -arrow 1-.
- When lowering gearbox, change position of gearbox using spindles of gearbox support -3282- .

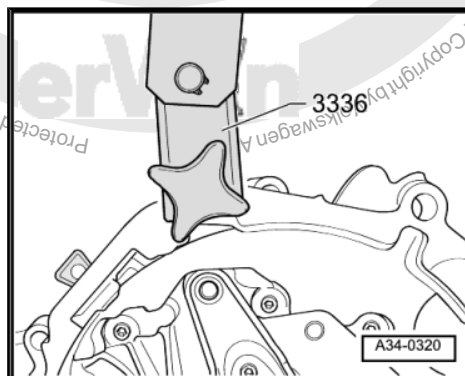


Note

Be careful of all lines when lowering gearbox.

3.2 Transporting gearbox

- Bolt gearbox lifting tackle -3336- to clutch housing.

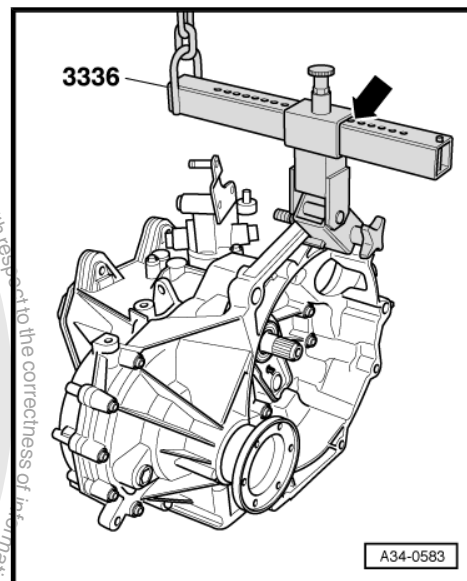




- Adjust support beam on sliding piece using locking pin -arrows-

No. of holes visible = 6

- Lift gearbox using workshop crane and gearbox lifting tackle -3336- .
- Set gearbox aside, for example in a transport container.



3.3 Installing gearbox



Note

Refer to procedure "Removing gearbox" for required special tools
⇒ [page 59](#) .

- All threaded holes into which self-locking bolts are to be screwed must be cleaned of residual locking fluid using a thread chaser.
- Always renew self-locking bolts and nuts.
- Check whether dowel sleeves for aligning engine and gearbox are fitted in cylinder block and install if necessary.

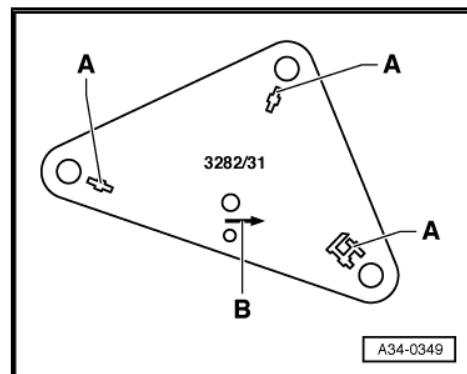
If dowel sleeves are not fitted, difficulties shifting gears, clutch problems and possible noises from the gearbox (rattling of gears which are not engaged) could occur.

- Ensure that intermediate plate is correctly seated on engine.
- Clean input shaft splines and apply thin coat of grease for clutch plate splines -G 000 100- .

The clutch plate must slide easily to and fro on the input shaft.

To install gearbox "0AF", set up gearbox support -3282- with adjustment plate -3282/31- .

- Align arms of gearbox support according to holes in adjustment plate .
- Attach support elements -A- to adjustment plate as illustrated.
- Place gearbox on gearbox jack .





- Align adjustment plate and gearbox parallel to one another.
- Position gearbox jack under vehicle. Arrow -B- on adjustment plate points in direction of vehicle travel.
- Using spindles of gearbox support -3282-, position gearbox so that differential is facing downwards.
- The area of the cover for 5th gear should also be facing slightly downwards.
- Then raise gearbox carefully and guide past subframe.



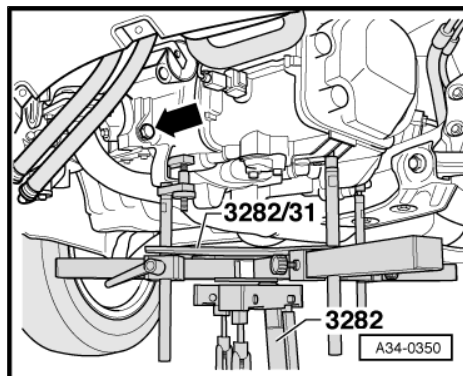
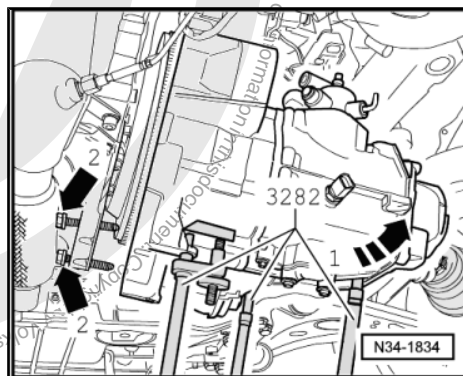
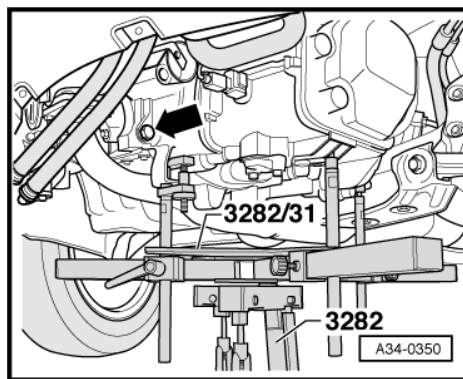
Note

Be careful of all lines when installing gearbox.

- Have a second mechanic press engine forwards.
- When doing this, guide gearbox carefully, as shown, past fly-wheel -arrow 2- and subframe -arrow 1-.

- Turn gearbox upwards in vicinity of 5th gear cover as shown -arrow 1- and towards subframe.
- At the same time, ensure that engine/gearbox connecting bolts -arrow 2- contact exhaust system, if installed.
- Set gearbox in position while screwing in bolts -arrow 2- and tighten to specified torque ➤ [page 70](#) .

- Screw in connecting bolt for engine and gearbox -arrow- and tighten to specified torque ➤ [page 70](#) .





- Then install connecting bolt for engine and gearbox -A- in area of right flange shaft and tighten to specified torque
⇒ [page 70](#) .



Note

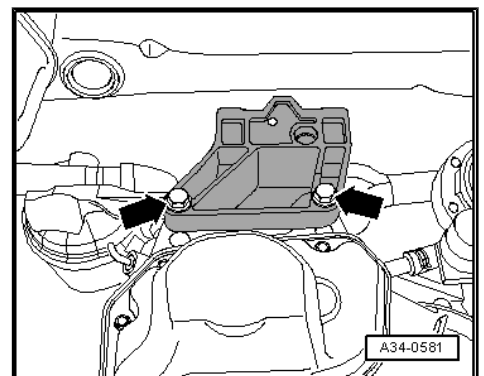
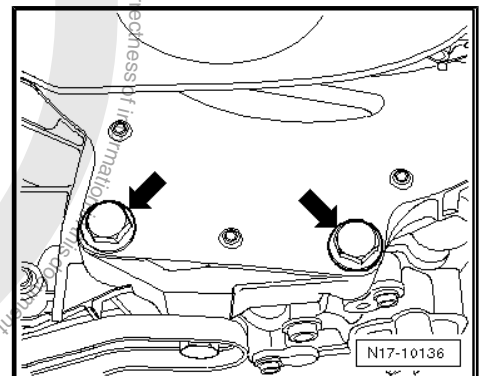
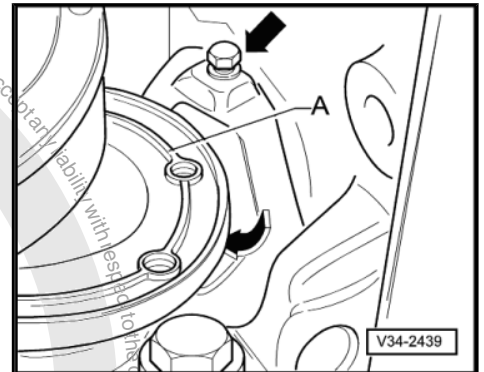
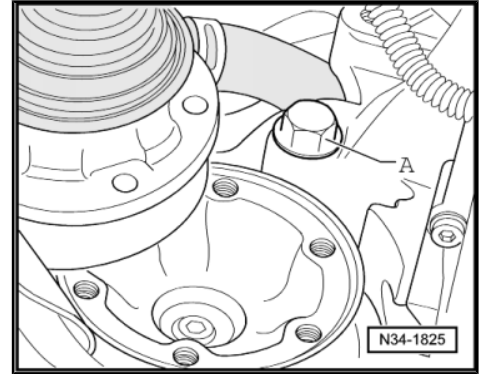
On some engines, the engine/gearbox connecting bolt is below the right flange shaft. ⇒ [page 70](#) .

- After gearbox has been bolted to engine, remove gearbox jack from gearbox.

- Check to see if a cover plate -A- is installed above the right flange shaft.

- If necessary, slide in cover plate so that the lower lug engages in the cylinder block and secure top with bolt -arrows-.
- For vehicles with a sheet metal sump, install cover plate near sump -arrows-.

- Bolt gearbox support to gearbox -arrows- using new bolts
⇒ [page 70](#) .
- Align engine and gearbox in installation position using spindles of support bracket -10 - 222 A- .





- Screw in new hexagon bolts -arrows- for left engine/gearbox mounting and tighten to specified torque ➤ [page 70](#) .



WARNING

Do not remove support bracket -10 - 222 A- until the bolts securing the left and right assembly mountings have been tightened to specified torque.

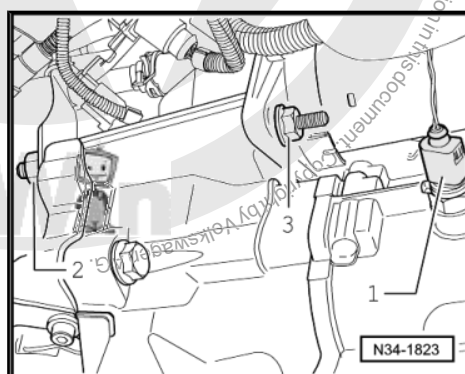
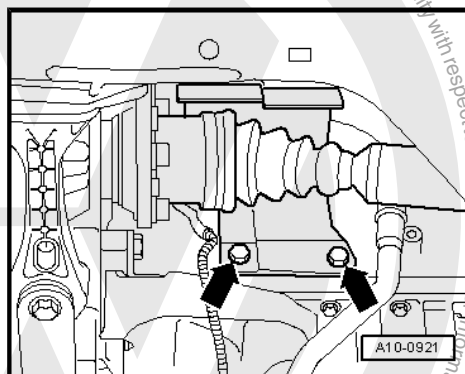
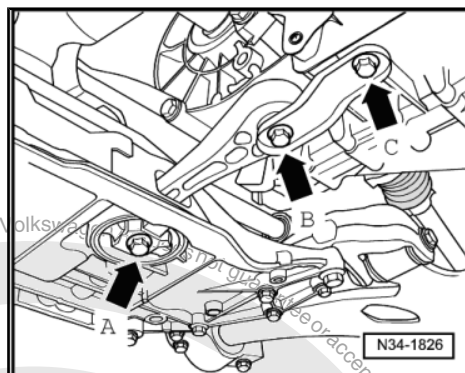
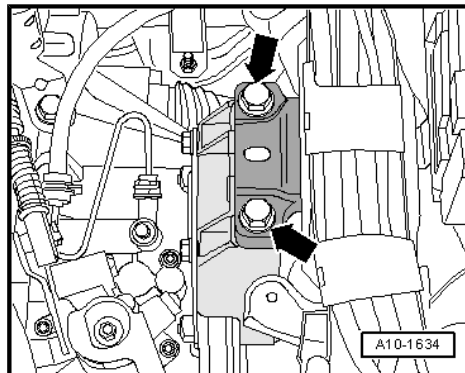
- Insert upper engine/gearbox securing bolts and tighten to torque specification ➤ [page 70](#) .
- Install pendulum support -arrows A-, -B- and -C- ➤ Rep. Gr. 40 ; Assembly overview - subframe, anti-roll bar, suspension links .
- Use new bolts for securing.



Note

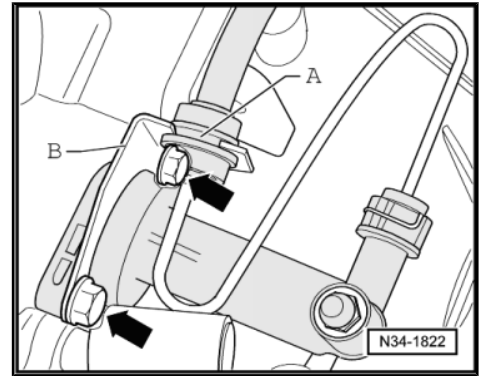
Install engine and gearbox mounting free of tension ➤ Rep. Gr. 10 ; Removing and installing engine .

- Attach drive shafts to gearbox ➤ Running gear, axles, steering; Rep. Gr. 40 ; Repairing drive shaft; Removing and installing drive shafts .
- Install drive shaft protective cover, if present, on engine -arrows- ➤ Running gear, axles, steering; Rep. Gr. 40 ; Suspension .
- Assemble exhaust system ➤ Rep. Gr. 26 ; Removing and installing parts of exhaust system .
- Install starter with bolt -3- and, if present, nut -2- ➤ Electrical system; Rep. Gr. 27 ; Starter .

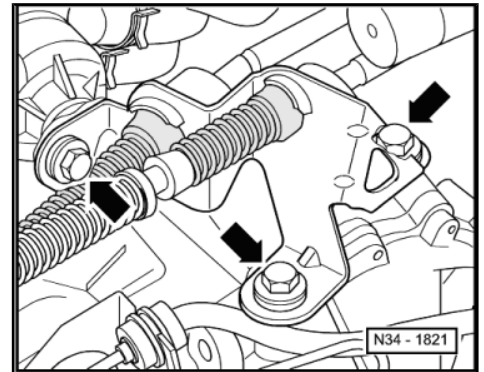




- Push connector -1- onto reversing light switch -F4- .
- Install slave cylinder and tighten bolts to specified torque
⇒ [page 25](#) .
- Push line between master and slave cylinders -A- into support
-B-, if present, on gearbox.



- Install cable support bracket on gearbox and tighten bolts
-arrows- to specified torque ⇒ [Item 6 \(page 47\)](#) .



- Install gearbox selector lever -A- and tighten nut -arrow 4- to
specified torque ⇒ [Item 17 \(page 48\)](#) .

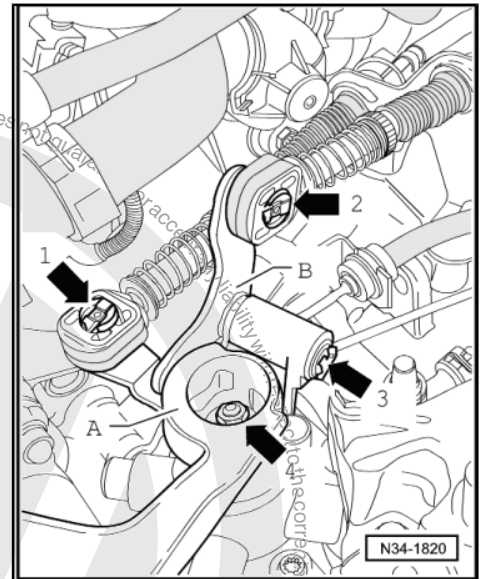
Metal relay lever



Note

*To fit, lubricate bearing points and sliding surfaces with grease -
G 000 450 02- .*

- Insert relay lever -B- into mounting of selector cover.
- At the same time, swing relay lever so that shoe engages in
guide of gearbox selector lever.
- Secure relay lever with new securing clip -arrow 3-.





Plastic relay lever



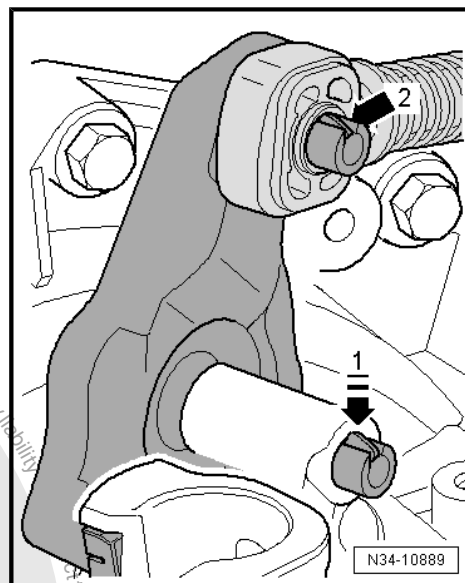
Note

To fit, lubricate bearing points and sliding surfaces with grease - G 000 450 02- .

- Insert relay lever together with cable end-piece.
- Fastener -arrow 1- secures relay lever.
- Cable end-piece must be located behind fastener -arrow 2-.
- Connect gate selector cable to cable end-piece.

Continuation for all

- Spread a small amount of grease -G 000 450 02- on pin of gearbox selector lever -A- (⇒ previous figure).
- Connect gear selector cable to gearbox selector lever -arrow 1- (⇒ previous figure).
- Adjust selector mechanism ⇒ [page 54](#) .
- Check gear oil ⇒ [page 72](#) .
- Install lower part of front left wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 ; Wheel housing liner .
- Install noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Noise insulation .
- Install engine cover and, if present, complete air filter housing ⇒ Rep. Gr. 24 ; Repairing injection system .
- Install battery tray, battery cover and battery ⇒ Electrical system; Rep. Gr. 27 ; Removing and installing battery .
- Follow procedure after connecting battery. ⇒ Electrical system; Rep. Gr. 27 ; Battery; Disconnecting and connecting battery .

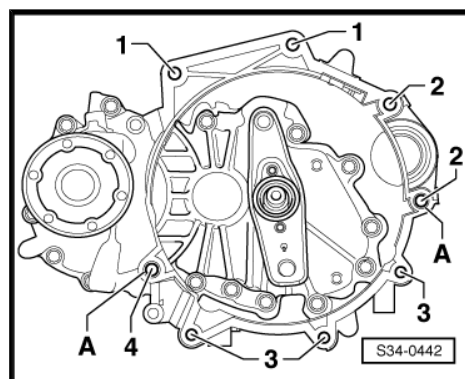


3.4 Torque settings

Gearbox to engine

Item	Bolt	Quantity	Nm
1	M 12 x 65	2	80
2	M 12 x 135 ♦ Additionally, starter to gearbox	2	80
3	M 10 x 60	3	40
4	M 12 x 90	1	80

Item -A- dowel sleeves for centring



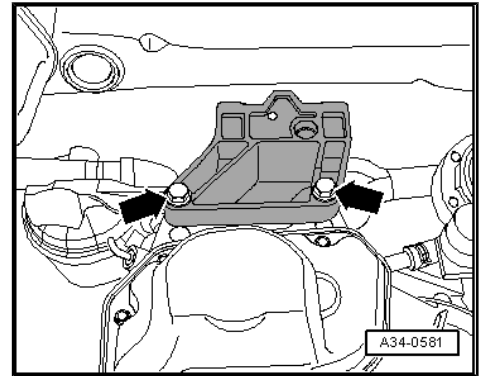


Gearbox support to gearbox

- Renew bolts.

Bolts -arrows-

40 Nm + 90°

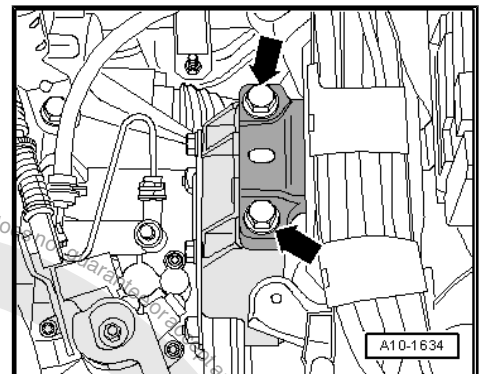


Gearbox bracket to gearbox

- Renew bolts.

Bolts -arrows-

60 Nm + 90°



Note

Install engine and gearbox mounting free of tension ⇒ Rep. Gr. 10 ; Removing and installing engine .

Slave cylinder to gearbox ⇒ [Item 9 \(page 30\)](#)

Gearbox selector lever to selector shaft ⇒ [Item 17 \(page 48\)](#) .

Selector cable support bracket to gearbox ⇒ [Item 6 \(page 47\)](#) .

Pendulum support to subframe and gearbox ⇒ Rep. Gr. 40 ;
Assembly overview - subframe, anti-roll bar, suspension links .

Drive shaft to flange shaft ⇒ Running gear, axles, steering; Rep.
Gr. 40 ; Repairing drive shafts; Removing and installing drive
shafts .

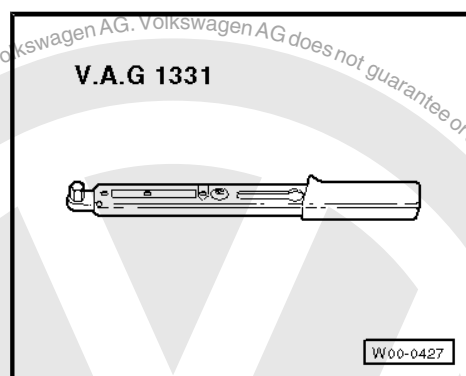
Double clamp to exhaust pipe ⇒ Rep. Gr. 26 ; Removing and
installing parts of exhaust system .



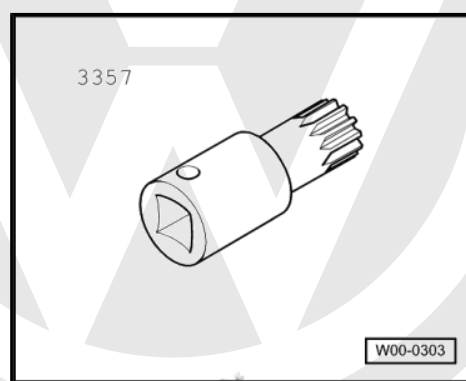
4 Checking gear oil

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



- ◆ Multi-point bit -3357-



or

- ◆ Allen key bit, 17 mm

Gear oil ⇒ Electronic parts catalogue "ETKA".

- Remove noise insulation ⇒ General body repairs, exterior;
Rep. Gr. 50 ; Noise insulation .

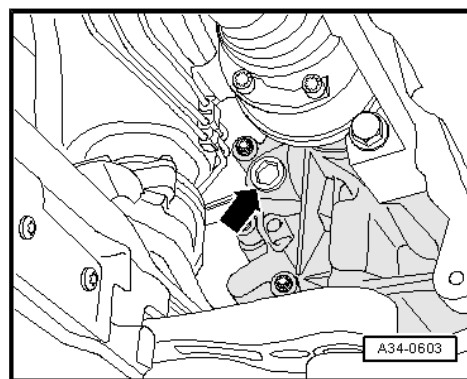
- To check gear oil, remove oil plug -arrow-.

Oil level is correct when gearbox is filled to lower edge of filler hole.

- Tighten oil plug -arrow- to specified torque ⇒ [page 73](#) .

When filling with oil, note the following:

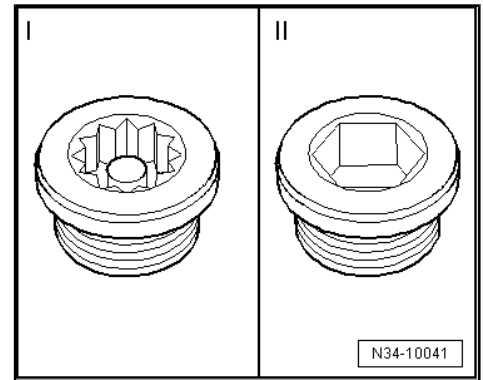
- Remove oil plug -arrow-.
- Fill with gear oil to lower edge of filler hole.
- Screw in plug -arrow-.
- Start engine, engage gear and allow gearbox to turn for approx. 2 minutes.
- Stop engine and remove plug -arrow-.
- Top up with gear oil to lower edge of filler hole.
- Tighten oil plug -arrow- to specified torque ⇒ [page 73](#) .





Various versions of oil filler and drain plugs

- I - Oil filler or oil drain plug with multi-point socket head 25 Nm
- II - Oil filler or oil drain plug with hexagon socket head 30 Nm
- Install noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Noise insulation .

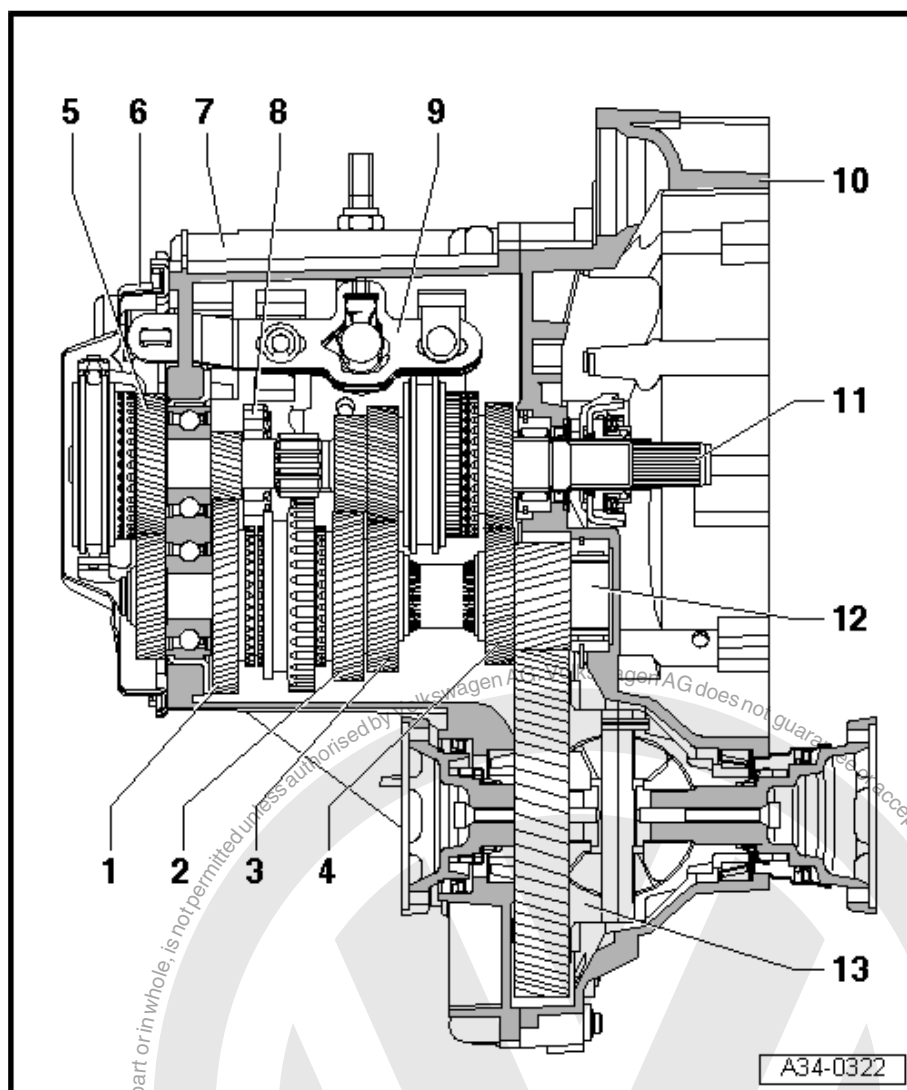




5 Dismantling and assembling gearbox

5.1 Overview - gearbox

- 1 - 1st gear
- 2 - 2nd gear
- 3 - 3rd gear
- 4 - 4th gear
- 5 - 5th gear
- 6 - Gearbox housing cover
- 7 - Gearbox housing
- 8 - Reverse gear
- 9 - Selector mechanism
 - (Selector forks)
- 10 - Clutch housing
- 11 - Input shaft
- 12 - Output shaft
- 13 - Differential





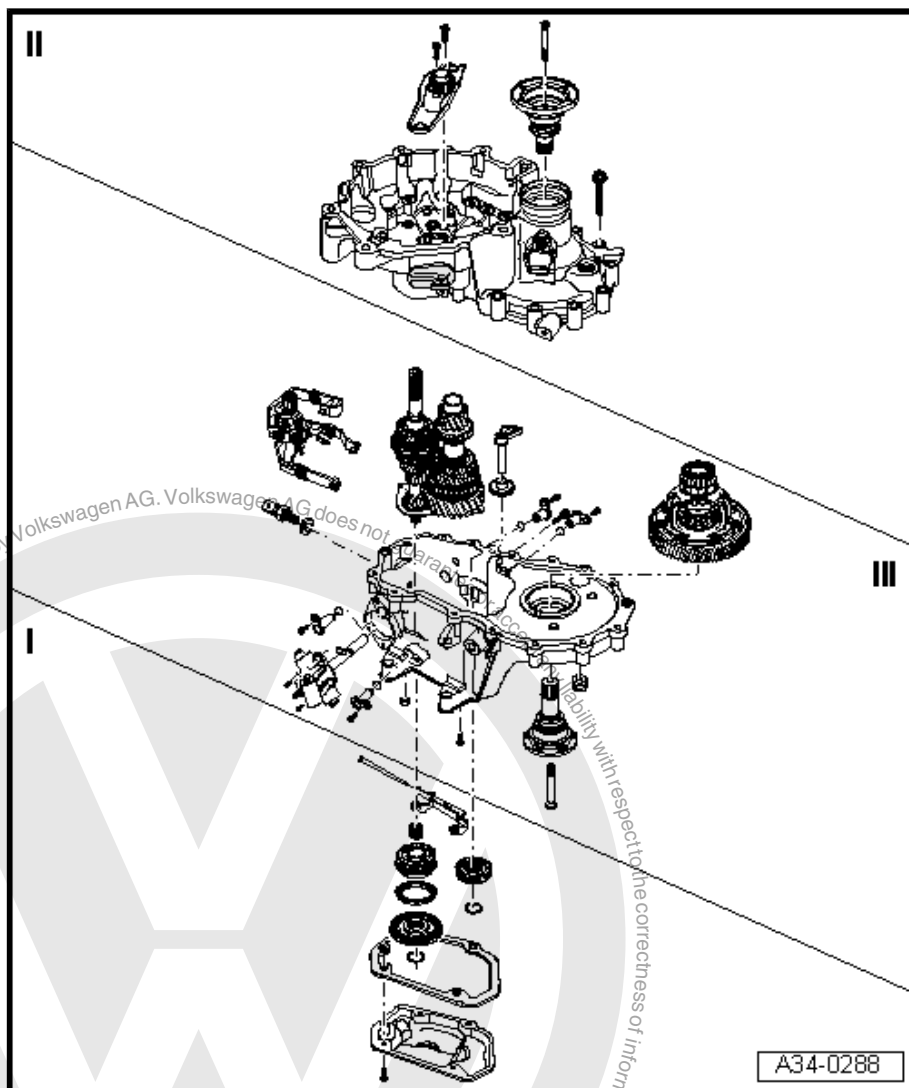
5.2 Assembly overview

Dismantling and assembling procedure ➔ [page 79](#)

I - Assembly overview - removing and installing cover for gearbox housing and 5th gear ➔ [page 76](#) .

II - Assembly overview - removing and installing clutch housing ➔ [page 77](#) .

III - Assembly overview - removing and installing input shaft, output shaft, differential, selector mechanism and selector forks ➔ [page 78](#) .





5.3 Assembly overview - removing and installing cover for gearbox housing and 5th gear

1 - Gearbox housing

- ☐ Repairing ➤ [page 89](#)

2 - Gear wheel for 5th gear

- ☐ Removing and installing
➤ [page 79](#)

3 - Retaining ring

- ☐ Renew
- ☐ Determining thickness
➤ [page 88](#)

4 - Seal

5 - Gearbox housing cover



Note

6 - Bolt, 5 Nm then turn 90° further

- ☐ Always renew

7 - Retaining ring

- ☐ Renew
- ☐ Determining thickness
➤ [page 88](#)

8 - Synchro-hub with locking collar and stop ring for 5-speed gearbox

- ☐ Dismantling and assembling ➤ [page 102](#)

9 - Synchro-ring for 5th gear

10 - Synchromeshed gear for 5th gear

11 - Needle bearing

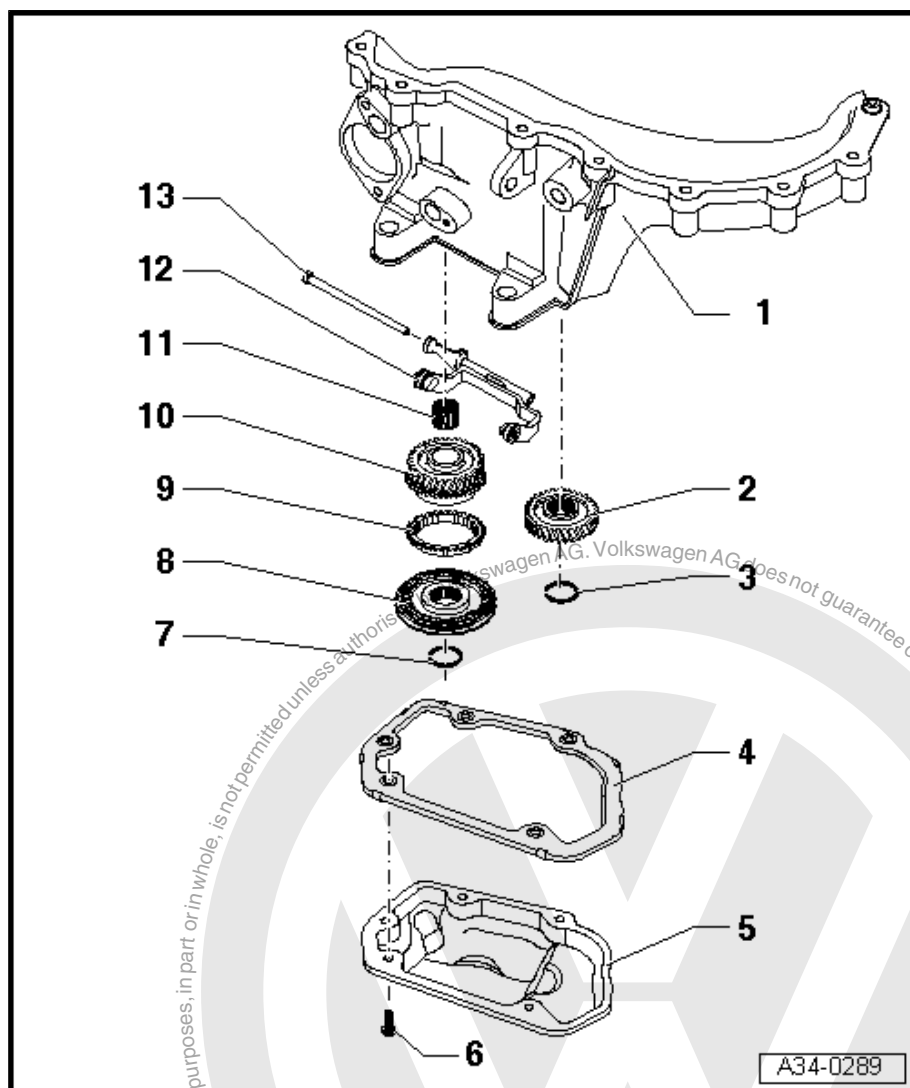
- ☐ For 5th gear

12 - 5th gear selector fork

- ☐ Dismantling and assembling ➤ [page 97](#)

13 - Pivot pin

- ☐ For 5th gear selector fork.





5.4 Assembly overview - removing and installing clutch housing

1 - Countersunk bolt, 25 Nm

2 - Flange shaft with compression spring

☐ Removing and installing

⇒ [page 79](#)

☐ Assembling

⇒ [page 124](#)

3 - Bolt, 5 Nm then turn 90° further

☐ Always renew

4 - Clutch housing

☐ Repairing ⇒ [page 89](#)

5 - Gearbox housing

☐ Repairing ⇒ [page 89](#)

6 - Clutch release lever

☐ With guide sleeve and release bearing

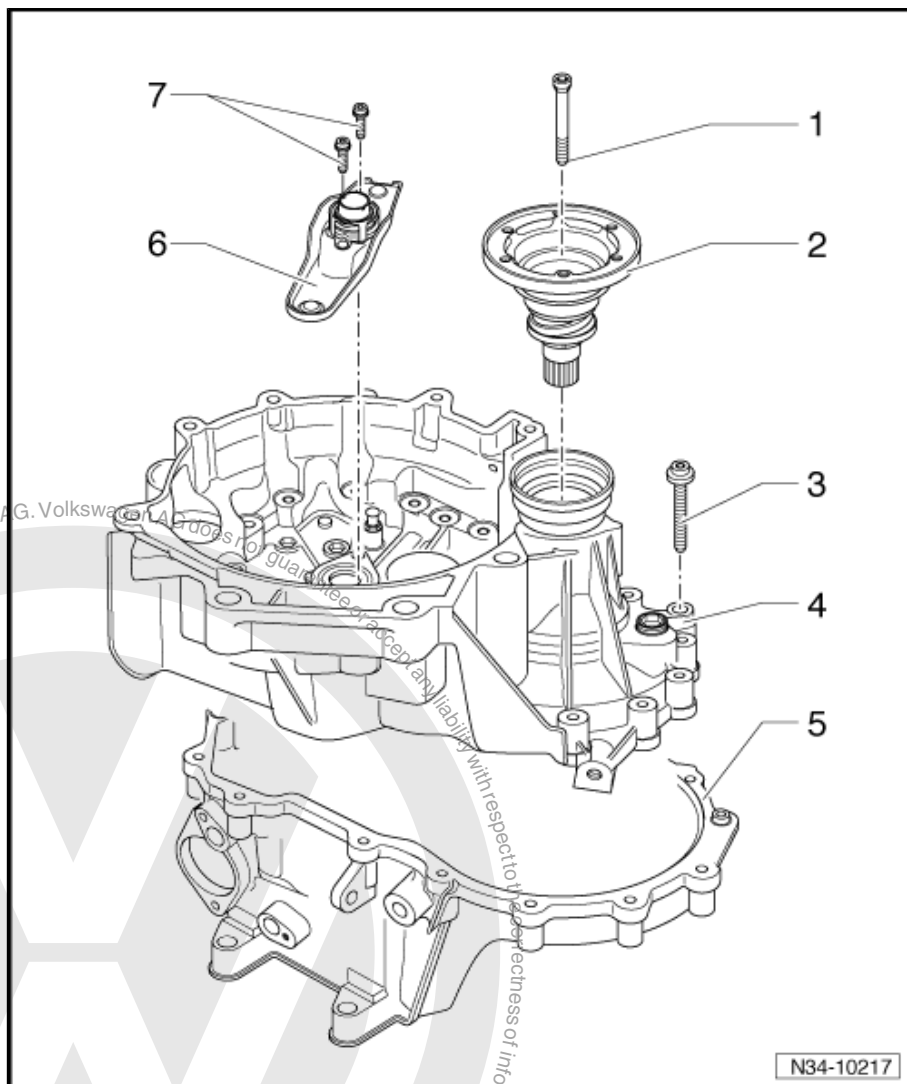
☐ Removing and installing

⇒ [page 79](#)

7 - Bolt

☐ Removing and installing

⇒ [page 29](#)





5.5 Assembly overview - removing and installing input shaft, output shaft (drive pinion), differential, selector mechanism and selector forks

1 - Differential

- ☐ Dismantling and assembling ➔ [page 124](#)

2 - Gearbox housing

- ☐ Repairing ➔ [page 89](#)
- ☐ Shim S1 for outer race of tapered roller bearing for differential from gearbox build date 04 12 6 is discontinued ➔ [page 134](#)
- ☐ Bearing seat for tapered roller bearing outer race adapted in gearbox housing

3 - Oil drain plug, tightening torque ➔ [page 73](#)

4 - Flange shaft with compression spring

- ☐ Removing and installing ➔ [page 79](#)
- ☐ Assembling from ➔ [page 124](#)

5 - Countersunk bolt, 25 Nm

6 - Bolt, 5 Nm then turn 90° further

- ☐ Self-locking
- ☐ Always renew
- ☐ To secure bearing mounting with deep groove ball bearing for input and output shafts ➔ [Item 16 \(page 79\)](#)

7 - Hexagon collared nut, 23 Nm

- ☐ For selector mechanism ➔ [Item 15 \(page 79\)](#)
- ☐ Self-locking
- ☐ Always renew

8 - O-ring

9 - Pivot pin

10 - Bolt, 5 Nm then turn 90° further

- ☐ Always renew

11 - Selector shaft with selector shaft cover

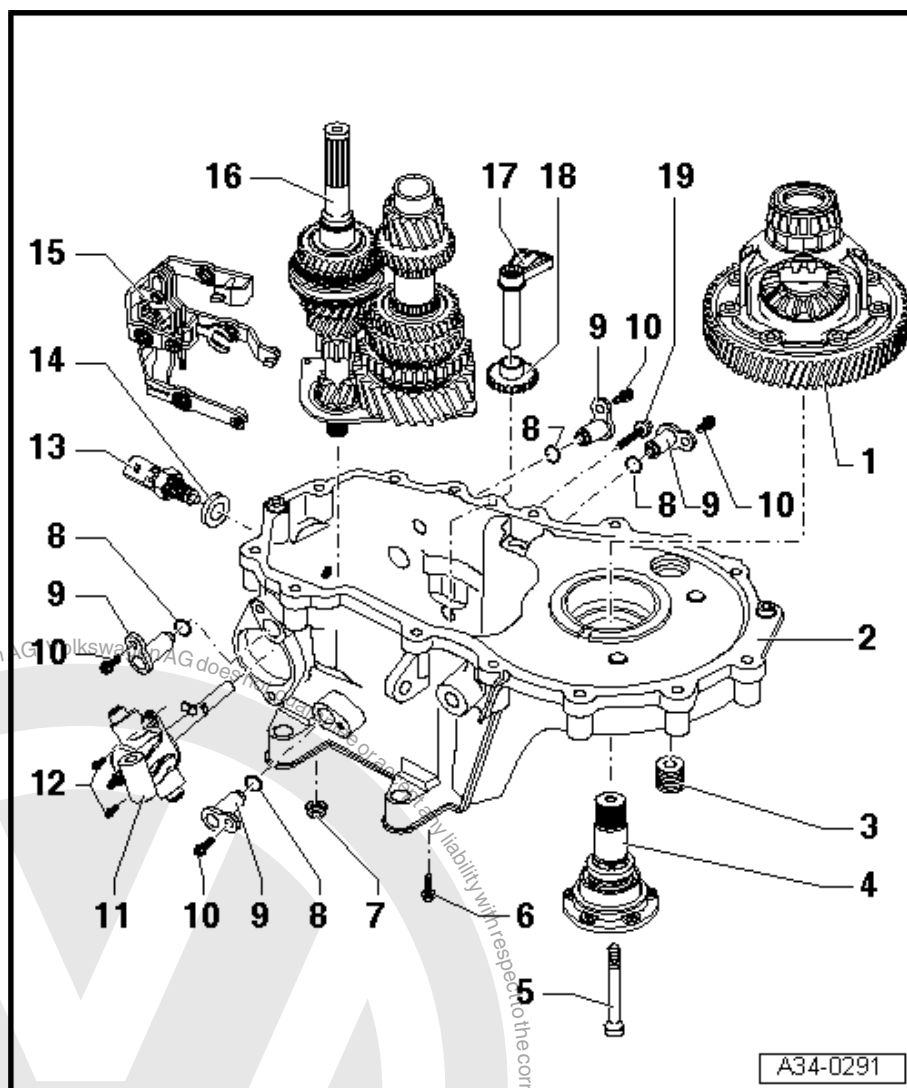
- ☐ (Selector unit):
- ☐ Repairing ➔ [page 94](#)

12 - Bolt, 5 Nm then turn 90° further

- ☐ Always renew

13 - Reversing light switch -F4- , 20 Nm

- ☐ Changed to captive seal shortly after introduction of gearbox.





14 - Seal

- ☐ Always renew, if part of original equipment

15 - Selector mechanism

- ☐ (Selector forks)
- ☐ Repairing ⇒ [page 97](#)

16 - Input shaft and output shaft with bearing mounting and deep groove ball bearing

- ☐ If bearing mounting is separated from gearbox housing, then mounting must always be renewed.
- ☐ Pressing bearing support off and on: Dismantling and assembling input shaft ⇒ [Item 8 \(page 105\)](#) .
- ☐ Dismantling and assembling input shaft ⇒ [page 102](#) .
- ☐ Dismantling and assembling output shaft ⇒ [page 113](#) .

17 - Reverse gear shaft

18 - Reverse gear

19 - Bolt, 25 Nm then turn 90° further

- ☐ Always renew
- ☐ For securing shaft for reverse gear.

5.6 Dismantling and assembling procedure

Removing and installing gearbox housing cover, clutch housing, selector shaft with selector mechanism cover, input shaft, output shaft, differential and selector mechanism



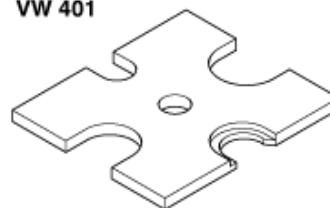
Special tools and workshop equipment required

- ◆ Support clamp -VW 313-
- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-
- ◆ Press tool -VW 412-
- ◆ Guide pin -T10079-
- ◆ Gearbox support -3221-
(modifying ⇒ [page 82](#))

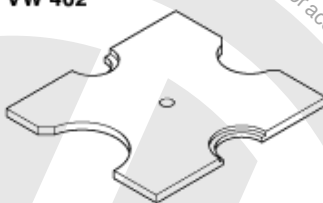
VW 313



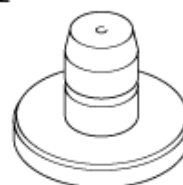
VW 401



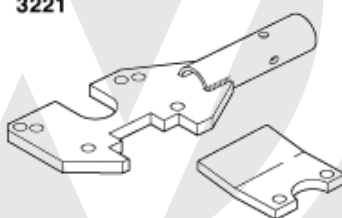
VW 402



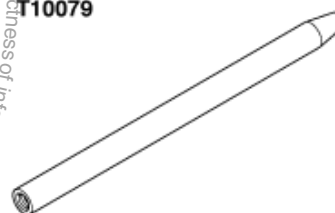
VW 412



3221



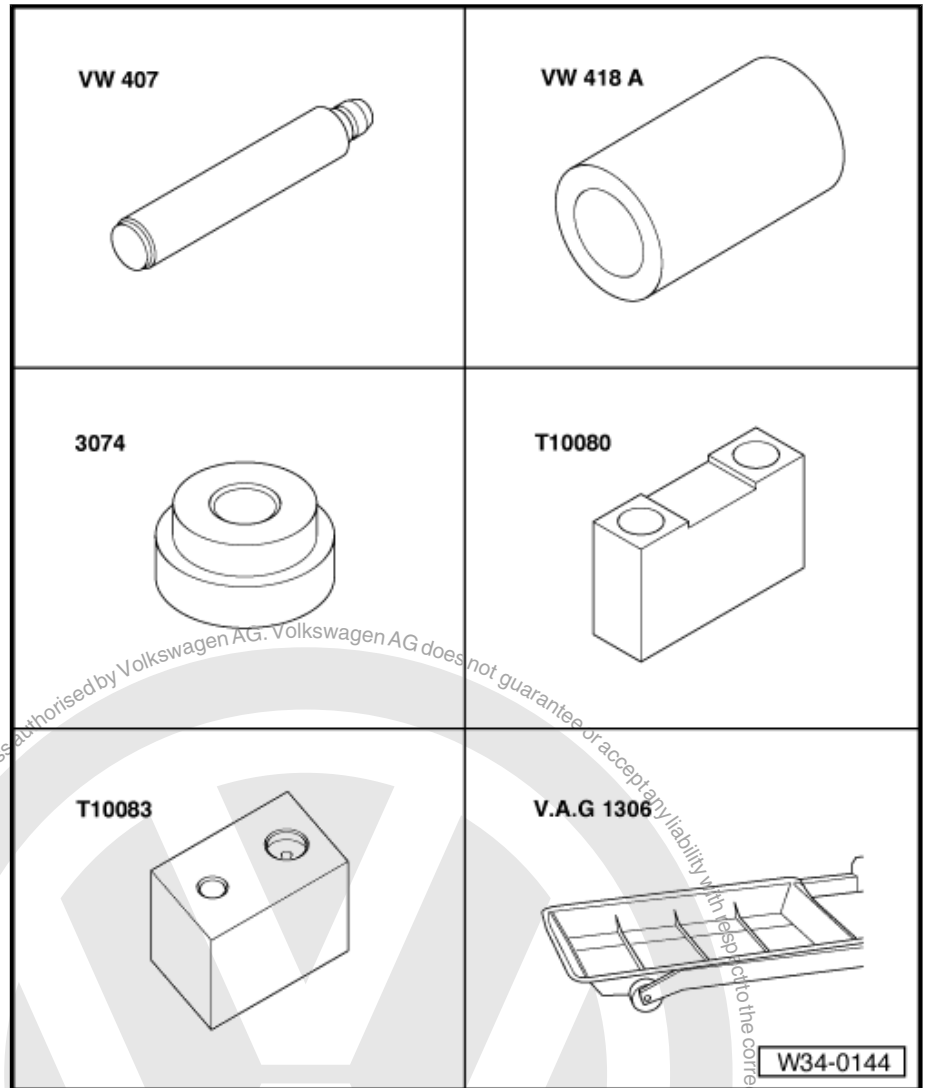
T10079



G34-0007

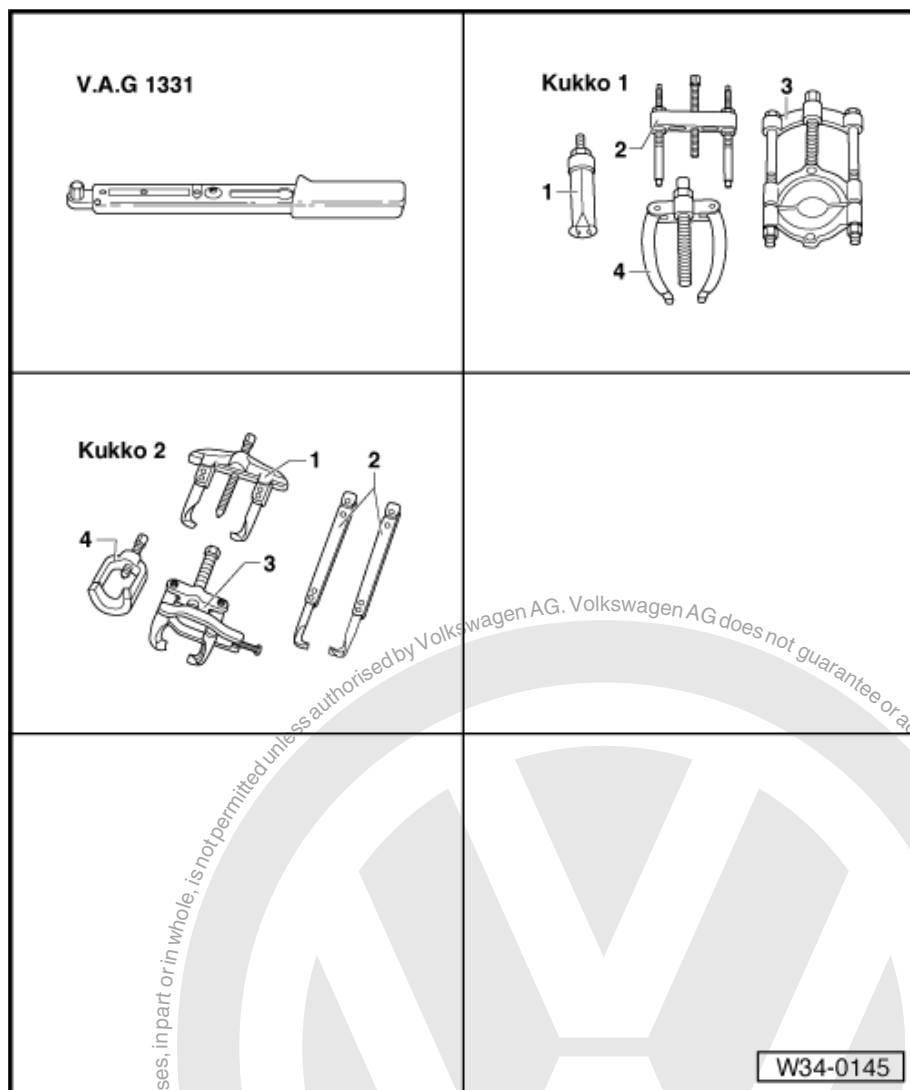


- ◆ Press tool -VW 407-
- ◆ Tube -VW 418 A-
- ◆ Thrust pad -3074-
- ◆ Thrust piece -T10080-
- ◆ Thrust piece -T10083-
- ◆ Drip tray -V.A.G 1306-



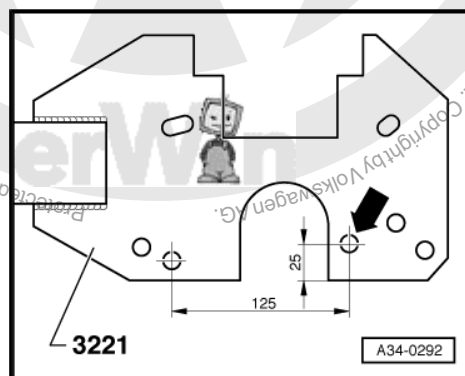


- ◆ Torque wrench -V.A.G 1331-
- ◆ Two arm puller -1 Kukko 20/10-
- ◆ Puller -2 Kukko 18/1 -
- ◆ Splitter -3 Kukko 17/1 -
- ◆ Sealant -AMV 188 200 03-
- ◆ Hexagon socket head bolt - M 8 X 15-



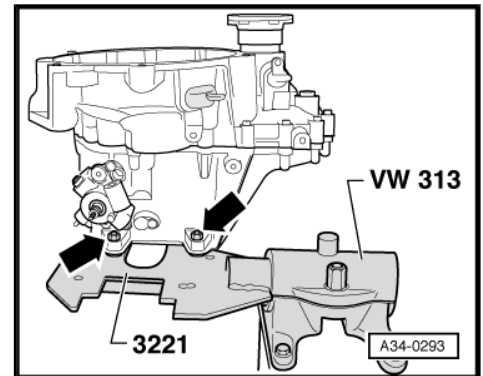
5.6.1 Removing

- First modify gearbox support -3221-
- Drill a 11.0 mm Ø hole -arrow-.

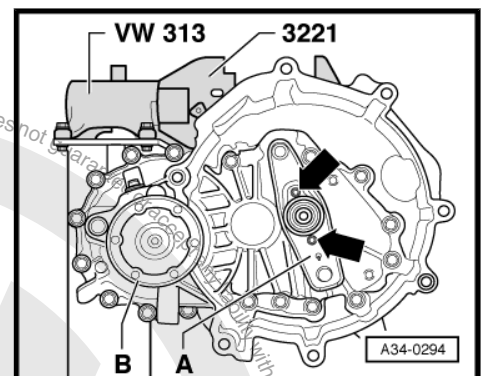




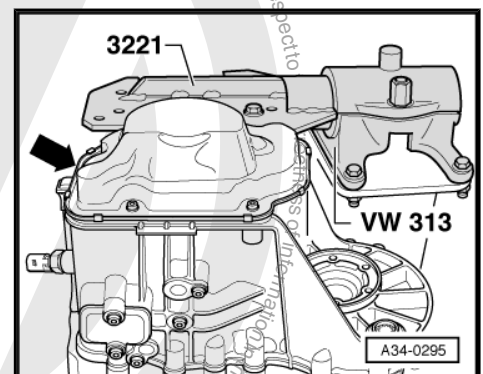
- Secure gearbox to Gearbox support -3221- -arrows-.
- Place drip tray -V.A.G 1306- underneath.
- Drain gear oil.



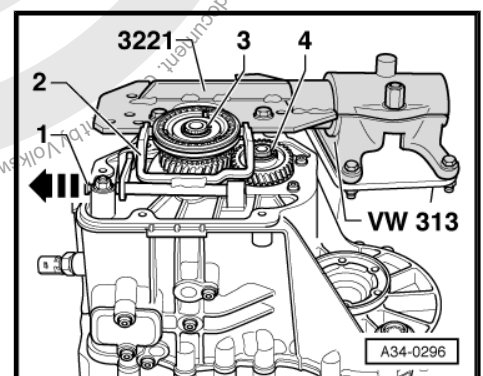
- Remove clutch release lever -A- together with release bearing and guide sleeve -arrows-.
- Remove right flange shaft securing bolt -B-.
- Screw two bolts into flange and counterhold flange shaft using a lever.
- Remove flange shaft along with spring, thrust washer and tapered ring.



- Remove gearbox housing cover -arrow-.

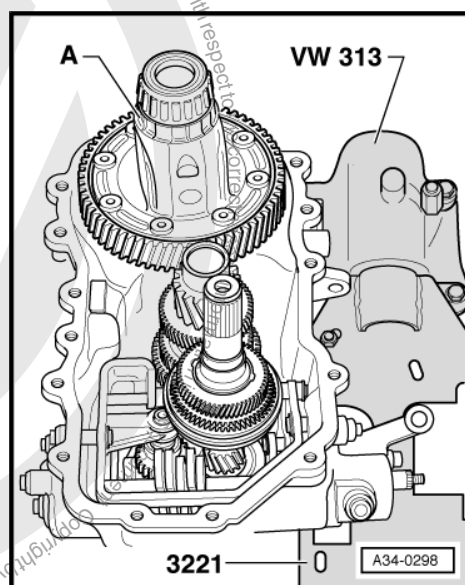
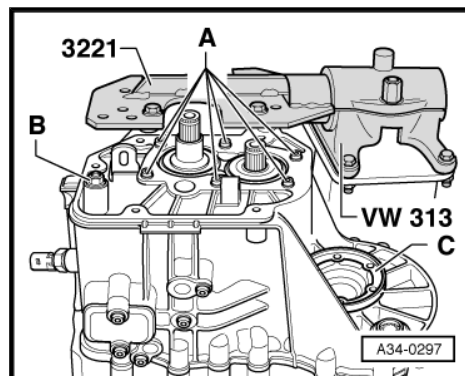


- Pull out pivot pin -1- for 5th gear -2- and remove selector fork.
- Remove retaining ring -3- for 5th gear synchro-hub.
- Remove retaining ring -4- for 5th gear wheel.
- Remove bearing mounting securing bolts -A- from input and output shafts.

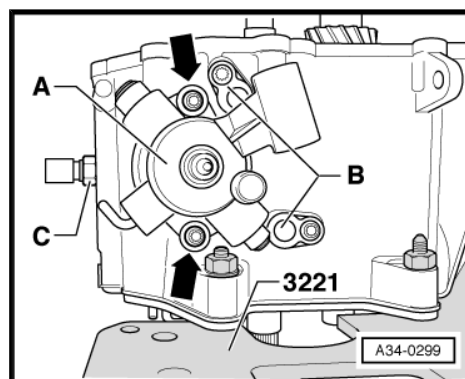




- Remove 5th gear synchro-hub and 5th gear wheel.
- Unscrew hexagon collared nut -B- for securing reverse gear selector mechanism.
- Remove flange shaft securing bolts by screwing two bolts into flange and counterholding flange shaft with a lever.
- Pull out flange shaft -C- with spring.
- Turn gearbox in support bracket so that clutch housing is upwards.
- Remove securing bolts from clutch housing side for securing clutch housing to gearbox housing.
- Remove clutch housing, if necessary carefully levering up all around along protruding housing flange and alternating between sides, being careful not to damage sealing surfaces.
- Do not cant the clutch housing. This prevents damage to roller bearings and their bearing seats on the input and output shafts.
- Remove differential -A- from gearbox housing.



- Remove selector shaft with selector cover -A-. Place selector shaft in neutral. Then remove bolts -arrows- and pull selector shaft out of gearbox housing.
- Remove pivot pins -B- located on underside of gearbox.
- Screw out reversing light switch -F4- -C-.



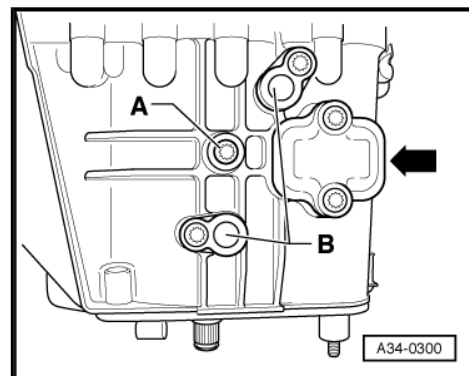


- Remove bolt -A- for securing reverse gear wheel shaft.
- Remove pivot pins -B- located on top of gearbox.



Note

Do not remove sealing cover -arrow- when dismantling gearbox.



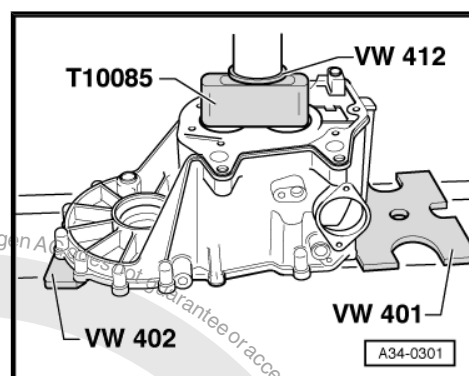
- Press out input shaft, output shaft with bearing mounting, selector mechanism (selector forks) and reverse gear together.



Note

- ◆ *Position gearbox so that dowel sleeves in the gearbox will not be damaged.*
- ◆ *When pressing out, get help from second mechanic to ensure components do not fall out.*

- Press input shaft and output shaft off bearing mounting with deep groove ball bearing ➔ [page 107](#).

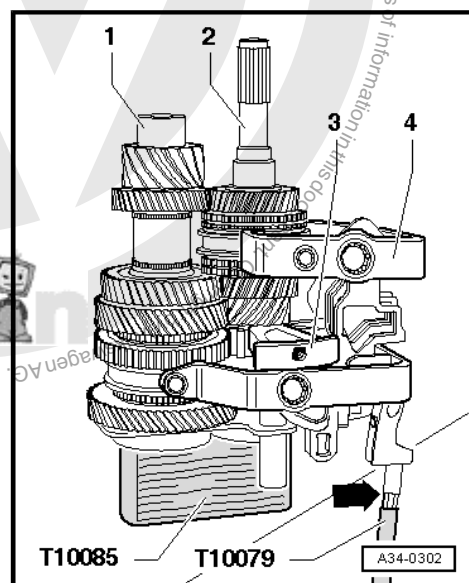


5.6.2 Installing



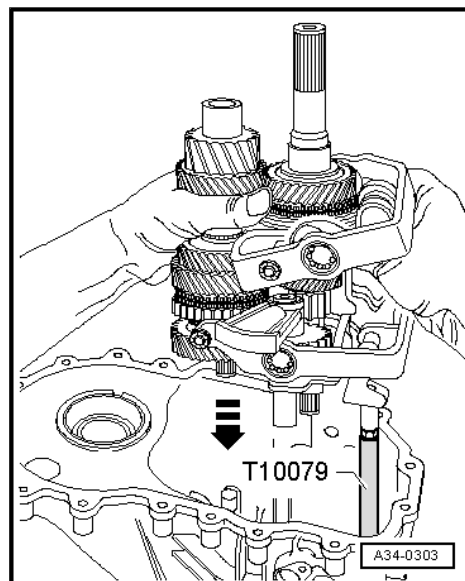
Note

- ◆ *Press bearing mounting with deep groove ball bearing onto input shaft and output shaft ➔ [page 110](#).*
- ◆ *Press needle roller bearing inner race for 5th gear synchromeshed onto input shaft ➔ [page 110](#).*
- Position assembled components, input shaft -2- and output shaft -1- with bearing mounting for deep groove ball bearing, in thrust piece -T10085-.
- Insert selector mechanism (selector forks) -4- in the shaft locking collars.
- Install reverse gear shaft -3- with reverse gear.
- Screw guide pin -T10079- onto stud (secures reverse gear) -arrow-.

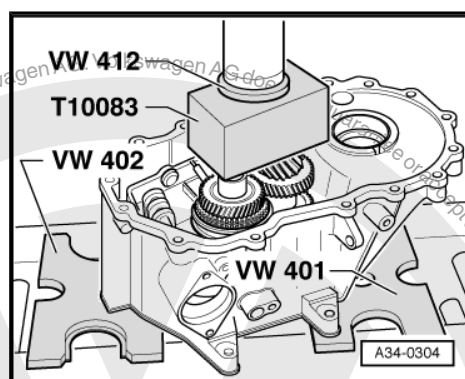




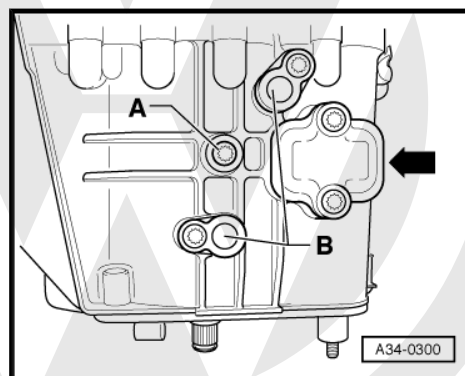
- Install components together into gearbox, when doing this guide pin -T10079- through hole to secure selector mechanism in gearbox housing.
- Remove guide pin -T10079- .
- Before pressing bearing mounting check selector forks are engaged correctly in locking collar.



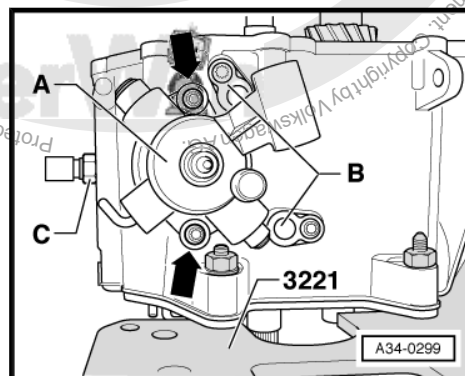
- Press bearing mounting together with input shaft and output shaft in to stop.



- Install bolt -A- for securing reverse gear wheel shaft.
- Install pivot pin -B- in bottom of gearbox.



- Screw in reversing light switch -F4- -C-.
- Install pivot pin -B- in top of gearbox.
- Place selector plates in neutral.
- Apply sealant -AMV 188 200- evenly to sealing surface of selector mechanism cover.
- Install selector shaft with selector cover -A-. Then tighten bolts -arrows-.





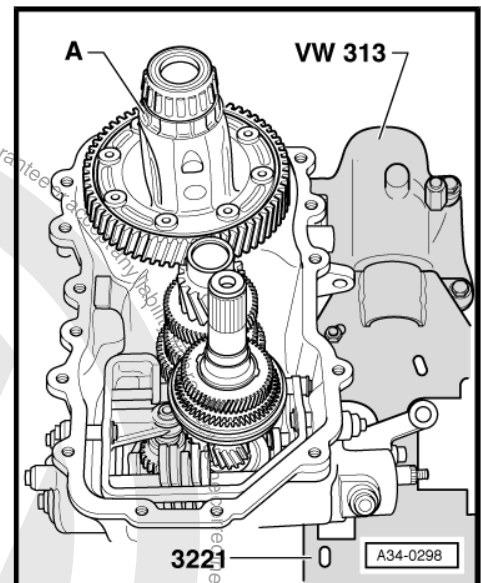
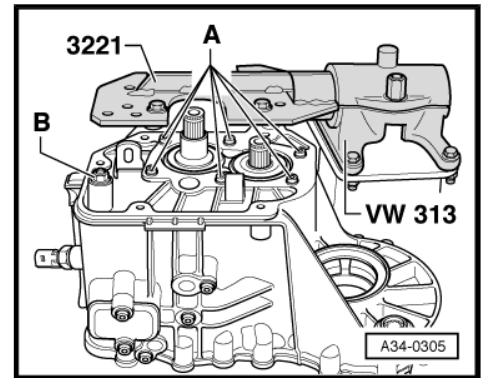
- Using new bolts -A- tighten bearing mounting for input and output shafts.



Note

Tighten bolts to specified torque, working from centre outwards alternately and diagonally.

- Tighten hexagon collared nut -B- for securing selector mechanism (selector forks).
- Install differential -A-.
- Apply sealant -AMV 188 200- evenly to sealing surface.
- Secure clutch housing to gearbox housing.
- Turn gearbox in support bracket so that gearbox housing is upwards.

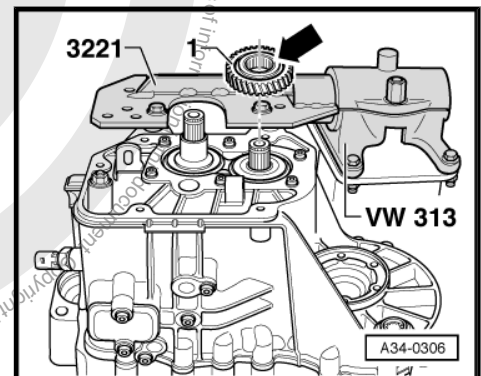


- Install 5th gear wheel -1-.

Installation position of 5th gear wheel:

The high shoulder -arrow- faces gearbox housing cover.

- Install 5th gear synchromeshed gear with needle bearing
- Place 5th gear synchro-ring on synchromeshed gear.
- Install 5th gear synchro-hub complete with locking collar and stop ring.



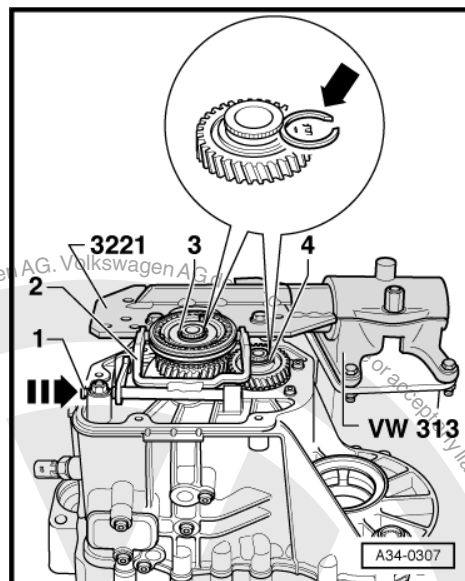


- Slide 5th gear selector fork -2- and pivot pin -1- in to stop -direction of arrow-.
- Determine new retaining ring -arrow-.
- Determine thickest retaining rings for input shaft -3- and output shaft -4- which will still fit and install them.

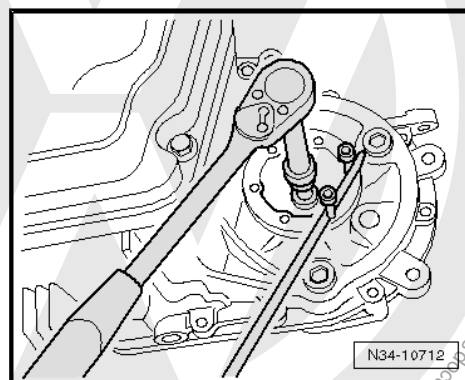
Available retaining rings ⇒ Electronic parts catalogue (ETKA)

Thickness (mm)	
2.00	2.10
2.20	

- Install gearbox housing cover.



- Install both flange shafts with springs, thrust washers and tapered rings.
- Install clutch release lever together with release bearing and guide sleeve.

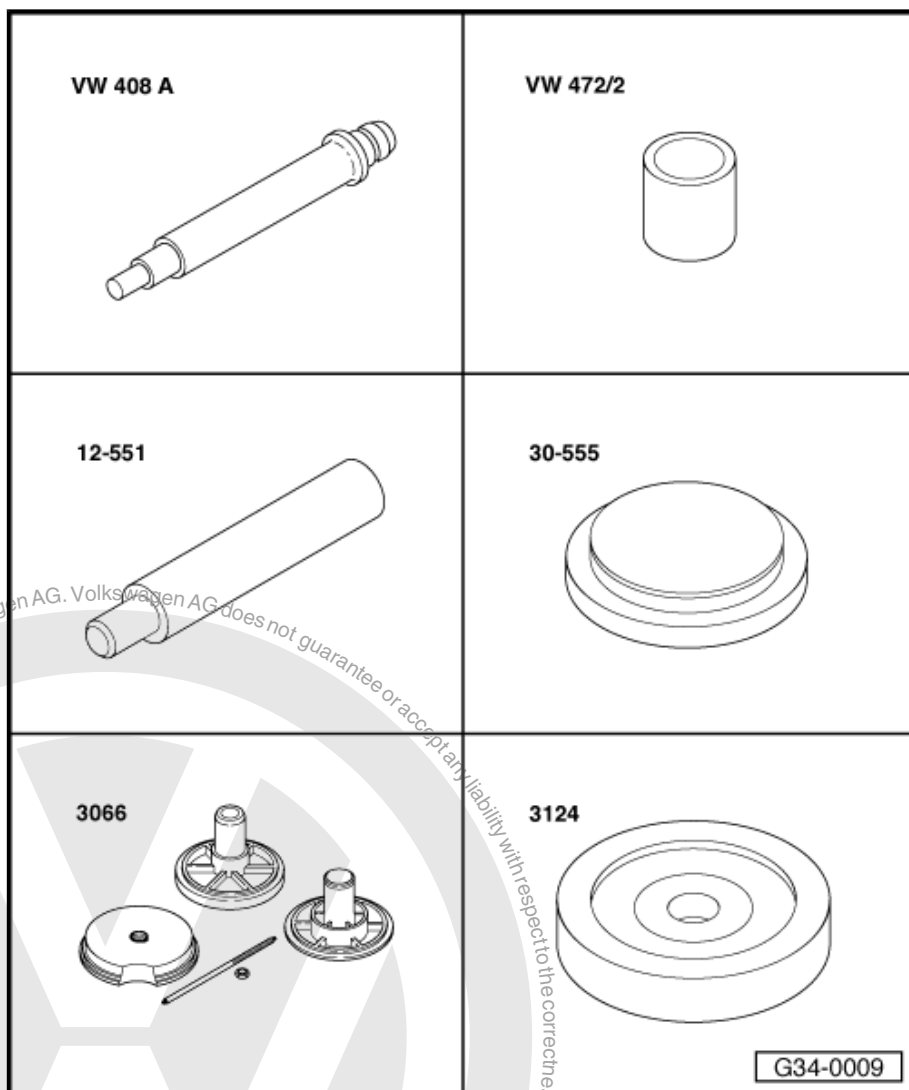




6 Repairing gearbox housing and clutch housing

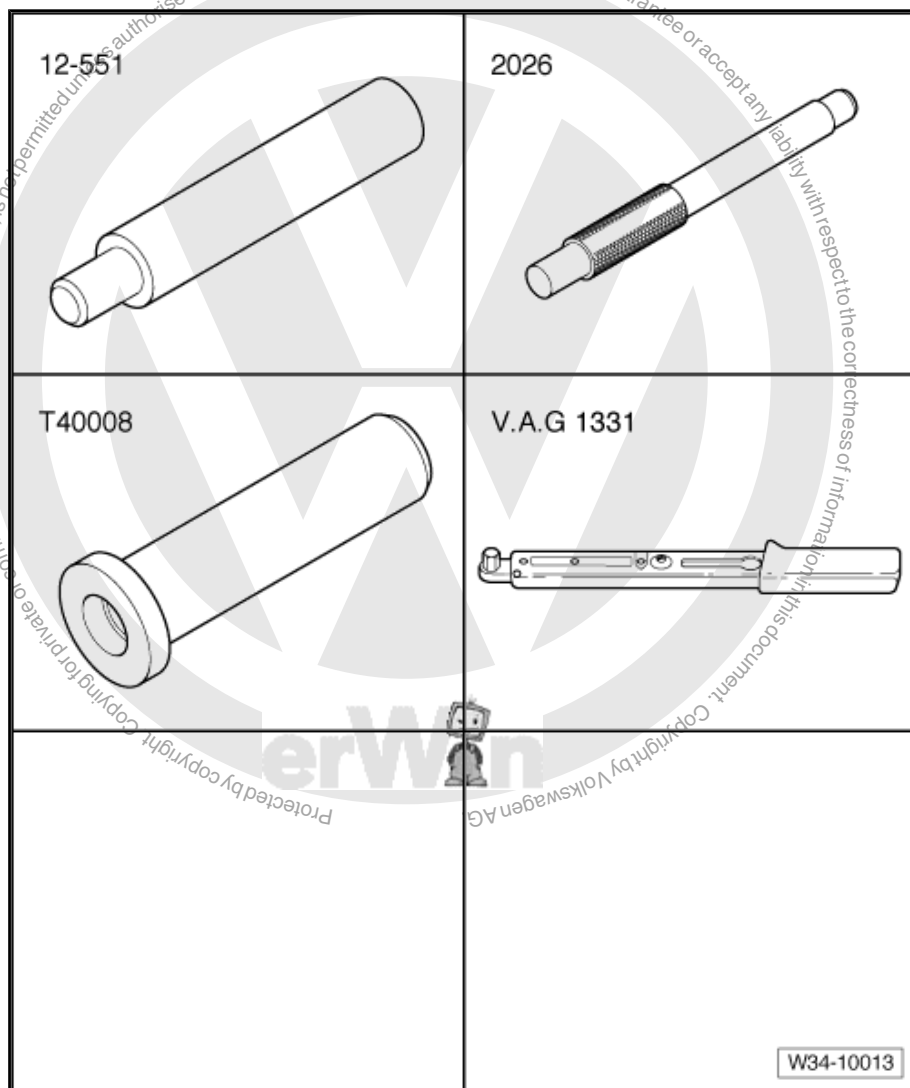
Special tools and workshop equipment required

- ◆ Press tool -VW 408 A-
- ◆ Spacer sleeve -VW 472/2-
- ◆ Centring mandrel -12 - 551-
- ◆ Thrust piece -30 - 555-
- ◆ Threaded rod from assembly device -3066-
- ◆ Thrust piece -3124-

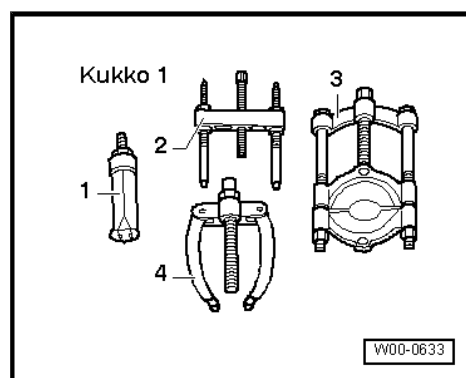




- ◆ Centring mandrel -12 - 551-
- ◆ Drift -2026-
- ◆ Thrust piece -T40008-
- ◆ Torque wrench -V.A.G 1331-



- ◆ Puller - Kukko 18/1-



- ◆ Splitter - Kukko 17/1-



1 - Sleeve

- ☐ For selector shaft
- ☐ Driving out ➔ [page 93](#)
- ☐ Driving in ➔ [page 93](#)

2 - Dowel sleeve

3 - Magnet

- ☐ Held in place by housing joint surface

4 - Sealing cover

- ☐ Apply sealant -AMV 188 200 03- before bolting on.

5 - Retaining ring

- ☐ Insert in groove of cylindrical roller bearing

6 - Retaining ring

- ☐ Insert in groove of cylindrical roller bearing

7 - Cylindrical roller bearing

- ☐ For input shaft
- ☐ Pulling out and pressing in ➔ [page 102](#)

8 - Cylindrical roller bearing

- ☐ For output shaft
- ☐ Pulling out and pressing in ➔ [page 113](#)

9 - Clutch housing

- ☐ If renewed, adjust differential ➔ [page 132](#)

10 - Input shaft seal

- ☐ Lever out with a screwdriver
- ☐ Driving in ➔ [page 92](#)

11 - Ball stud, 20 Nm

- ☐ Lubricate with grease -G 000 100-

12 - Oil seal for right flange shaft

- ☐ Renewing with gearbox installed ➔ [page 122](#)

13 - Sleeve

- ☐ For oil seal.
- ☐ Removing ➔ [page 92](#)
- ☐ Installing ➔ [page 93](#)

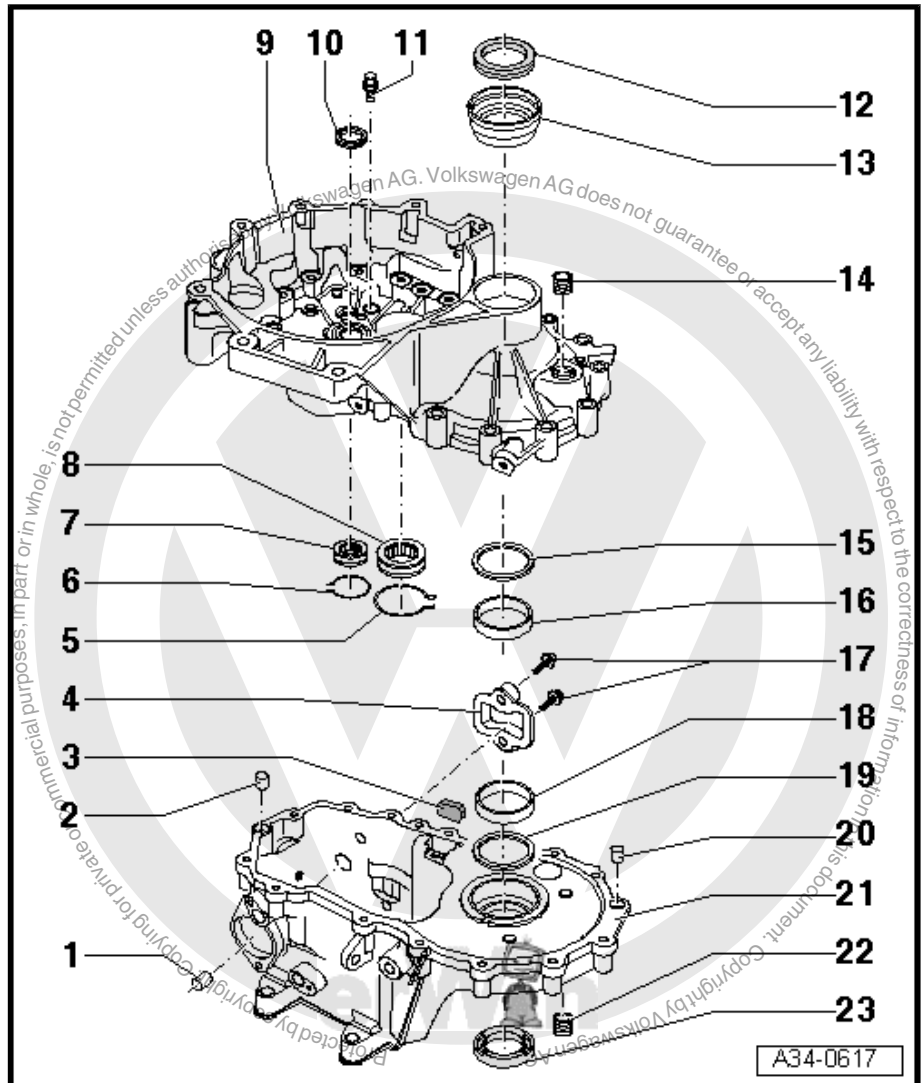
14 - Oil filler plug, tightening torque ➔ [page 73](#)

15 - Shim S₂

- ☐ For differential
- ☐ Calculating thickness.

16 - Outer race for tapered roller bearing

- ☐ For differential
- ☐ Pressing out of clutch housing and into clutch housing ➔ [page 124](#) .
- ☐ If renewed, adjust differential ➔ [page 132](#)





17 - Bolt, 5 Nm then turn 90° further

- ☐ Always renew

18 - Outer race for tapered roller bearing

- ☐ For differential
- ☐ Pulling out of clutch housing and pressing into clutch housing ⇒ [page 124](#)
- ☐ If renewed, adjust differential ⇒ [page 132](#) .

19 - Shim S₁

- ☐ For differential
- ☐ Always 1 mm thick
- ☐ Shim S₁ discontinued as of gearbox date 04 12 6

⇒ [page 134](#)

- ☐ Bearing seat for tapered roller bearing outer race adapted in gearbox housing

20 - Dowel sleeve

21 - Gearbox housing

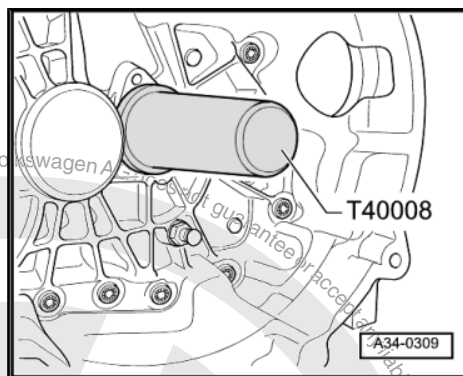
- ☐ Shim S₁ discontinued as of gearbox date 04 12 6 ⇒ [page 134](#)
- ☐ Bearing seat for tapered roller bearing outer race adapted in gearbox housing
- ☐ If renewed, adjust differential ⇒ [page 132](#) .

22 - Oil drain plug, tightening torque ⇒ [page 73](#)

23 - Oil seal for left flange shaft

- ☐ Renewing with gearbox installed ⇒ [page 120](#)

Driving in input shaft oil seal flush

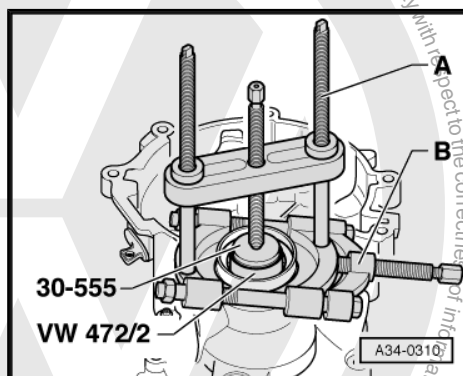


Pulling out sleeve for seal

- Fit spacer sleeve -VW 472/2- and press tool -30 - 555- onto differential.

A- Puller - Kukko 18/1-

B- Splitter - Kukko 17/1-





Pulling in sleeve for seal

A - Screw threaded rod from assembly device -3066- into threaded piece of differential.

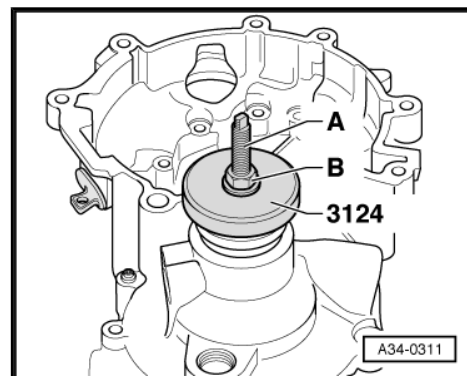
B - Nut M12 with washer.

- Pull sleeve in to stop using thrust piece -3124- by turning nut -B-.

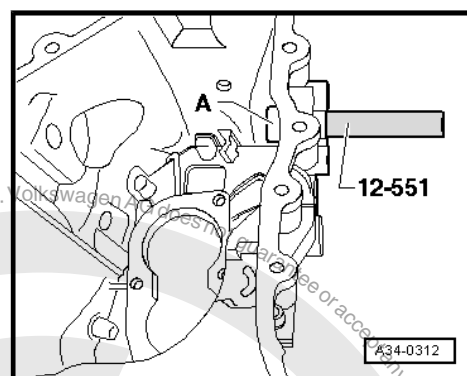


Note

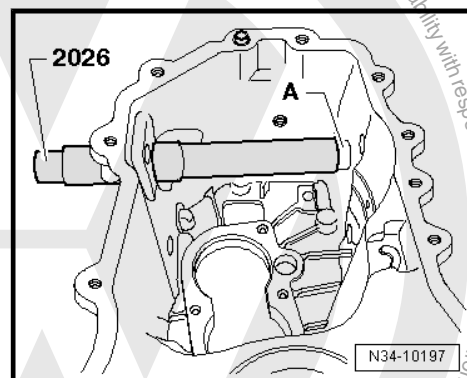
With gearbox dismantled, press sleeve in to stop using thrust piece -3124-.



Driving out selector shaft sleeve -A-



Driving in selector shaft sleeve -A- to stop

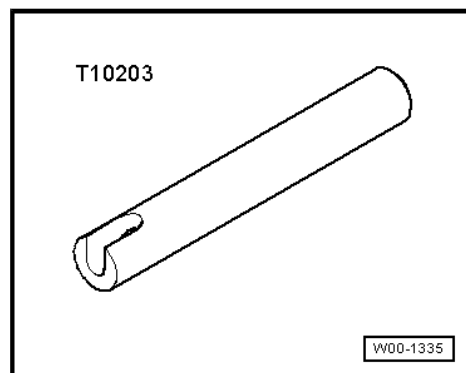




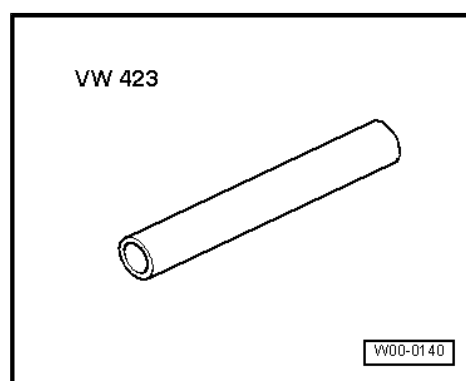
7 Repairing selector unit

Special tools and workshop equipment required

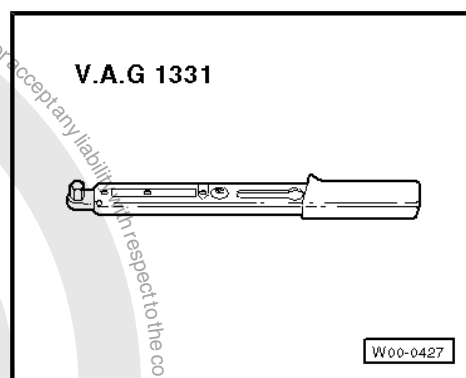
◆ Tube -T10203-



◆ Tube -VW 423-



◆ Torque wrench -V.A.G 1331-





1 - Sleeve

- ☐ For selector shaft
- ☐ Driving out ⇒ [page 93](#)
- ☐ Driving in ⇒ [page 93](#)

2 - Selector shaft with selector shaft cover

- ☐ Renew together

3 - Retaining pin

- ☐ For adjusting shift mechanism
- ☐ Removing ⇒ [page 95](#)
- ☐ Driving in ⇒ [page 96](#)

4 - Relay lever

- ☐ Installation position ⇒ [page 49](#)
- ☐ From 05.07, plastic relay lever ⇒ [page 50](#)

5 - Bearing bush

- ☐ Not required for plastic relay lever

6 - Seal

- ☐ Lever out with a screwdriver
- ☐ Installing ⇒ [page 96](#)

7 - Cap

- ☐ For gearbox breather

8 - Gearbox selector lever

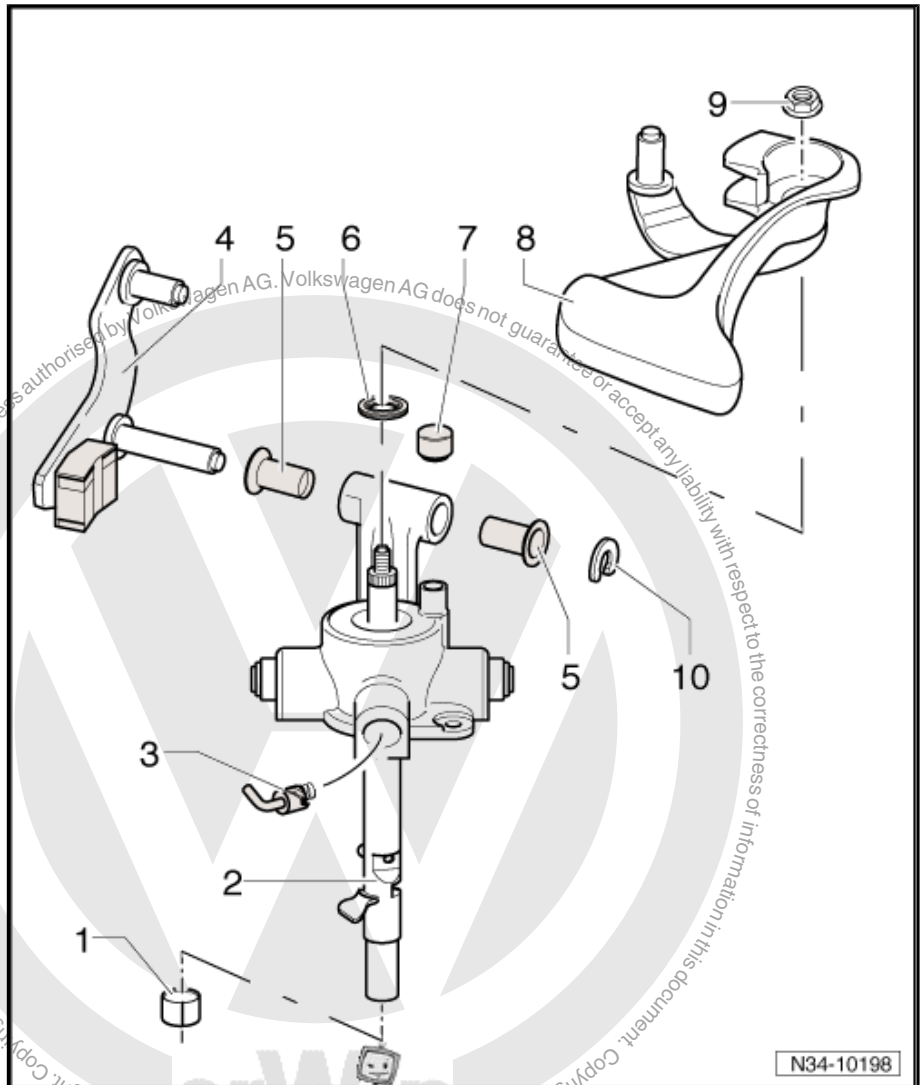
- ☐ Install so that master spline aligns with selector shaft
- ☐ Can be renewed with the selector mechanism installed
- ☐ Installation position ⇒ [page 49](#)

9 - Hexagon nut, 23 Nm

- ☐ Always renew

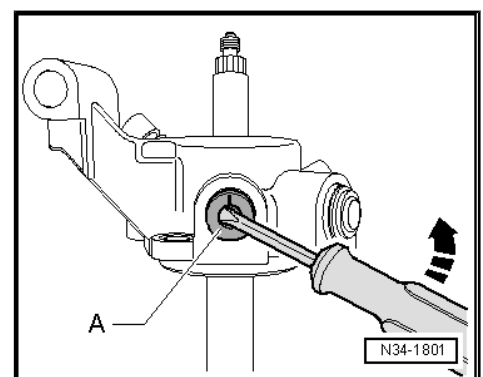
10 - Securing clip

- ☐ Always renew
- ☐ Not required for plastic relay lever



Removing retaining pin -A- from selector shaft cover

- Remove outer part of retaining pin.
- Then carefully lever out retaining pin using a screwdriver.

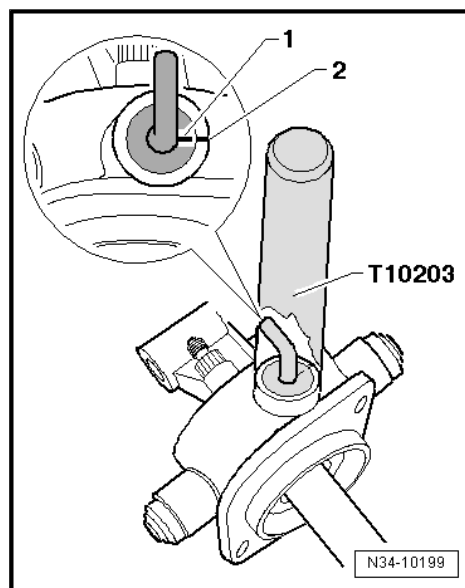




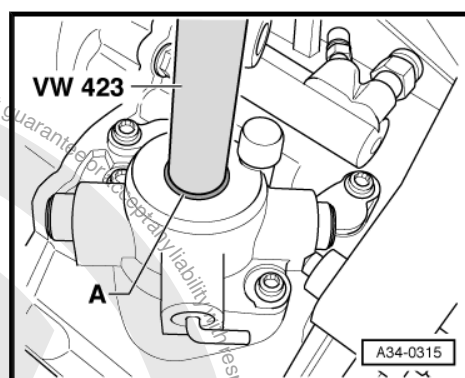
Drive retaining pin -A- into selector shaft cover.

Installation position:

Marking -1- points to marking -2- on selector cover.



Inserting oil seal -A- onto stop

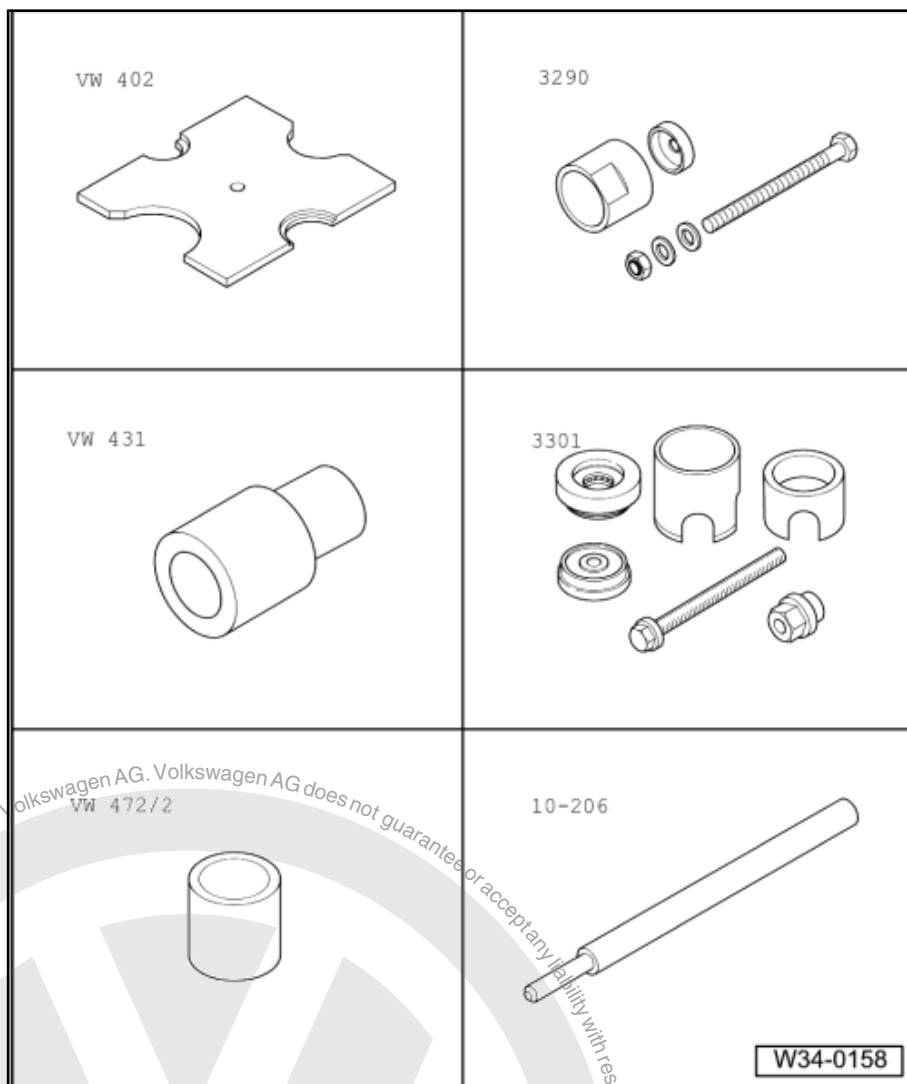




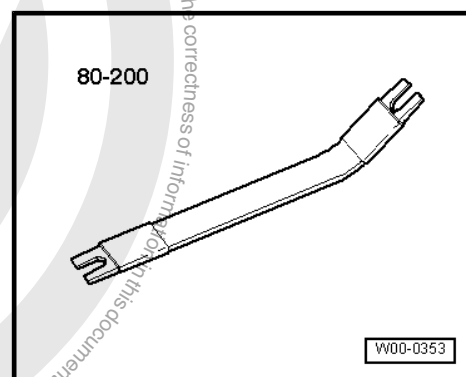
8 Dismantling and assembling selector forks

Special tools and workshop equipment required

- ◆ Thrust plate -VW 402-
- ◆ Thrust piece -3290/1-
- ◆ Assembly tool -3301-
- ◆ Thrust piece -VW 431-
- ◆ Spacer sleeve -VW 472/2-
- ◆ Drift -10 - 206-

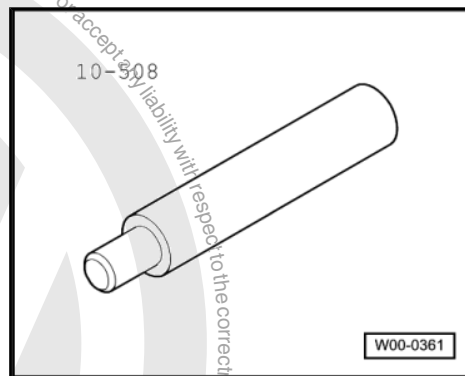


- ◆ Removal lever -80-200-

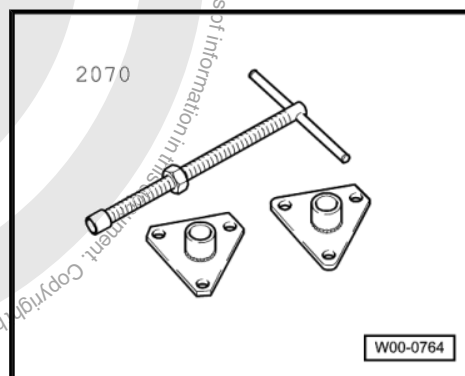




◆ Drift -10 - 508-



◆ Tensioning device -2070-



Note

It is not necessary to dismantle the selector fork group ⇒ [Item 1 \(page 99\)](#) in order to dismantle and assemble selector segments, lock washers and angular contact ball bearings.



1 - Selector fork group with selector plate

2 - Selector segment for 3rd and 4th gear

- ☐ Identification ➔ [page 100](#)
- ☐ After installation, selector segment must still rotate freely

3 - Angular contact ball bearing

- ☐ Qty. 4
- ☐ Removing ➔ [page 101](#)
- ☐ Press inner race into outer race ➔ [page 101](#)
- ☐ Installing ➔ [page 101](#)

4 - Lock washer

- ☐ Always renew
- ☐ Removing ➔ [page 100](#)
- ☐ Installing ➔ [page 100](#)

5 - 1st/2nd gear selector segment

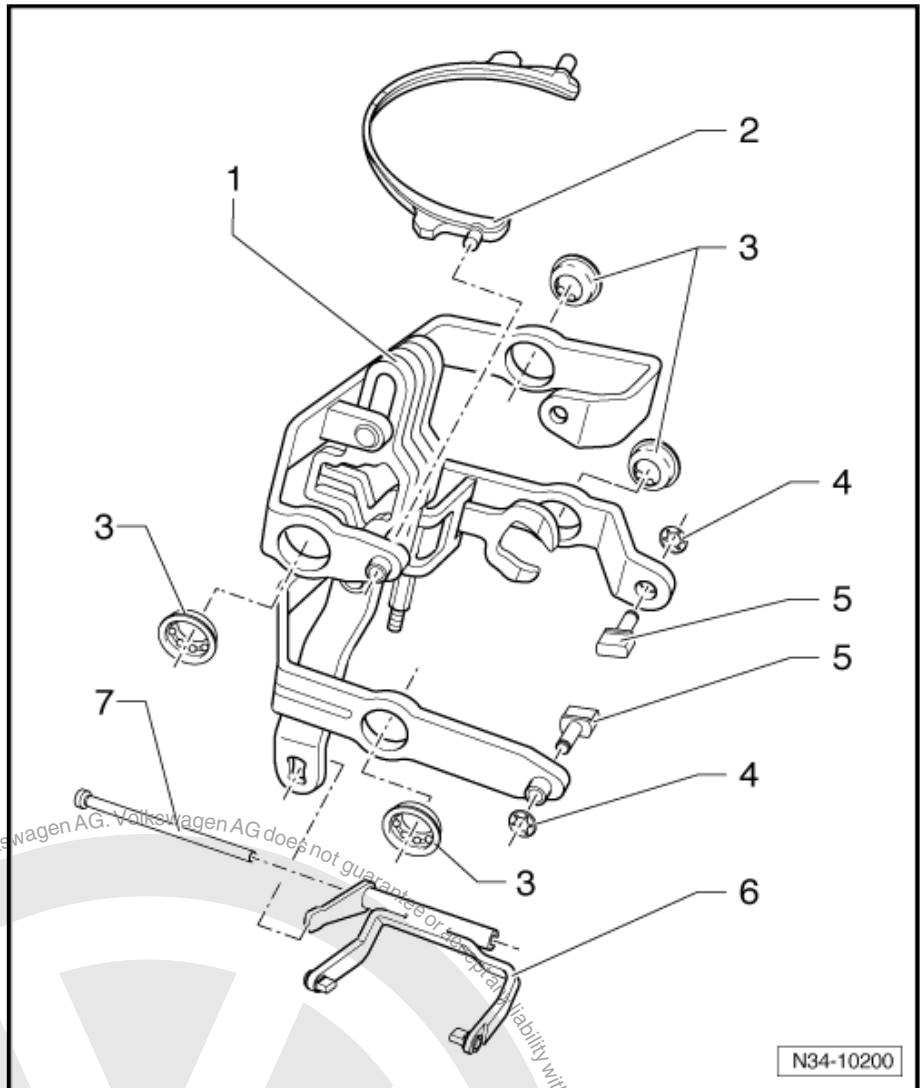
- ☐ Identification ➔ [page 100](#)
- ☐ After lock washer is installed, segment must still rotate freely
- ☐ Selector fork with selector segment ➔ [page 100](#)

6 - 5th gear selector fork with selector segment

- ☐ Selector segment is permanently connected to selector fork.
- ☐ Identification ➔ [page 100](#)

7 - Pivot pin

- ☐ For 5th gear selector fork.

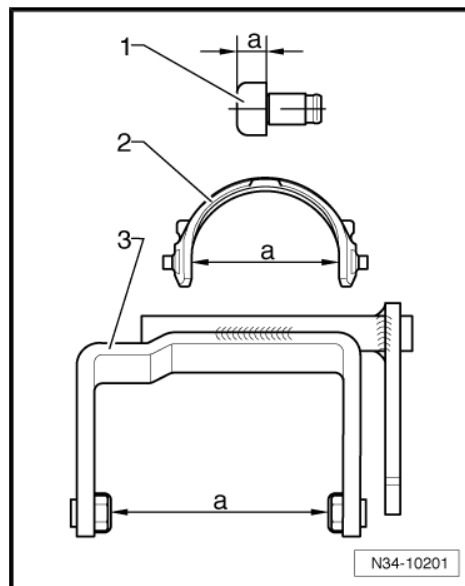




Identification of selector segments and selector fork for 5th gear with selector segments.

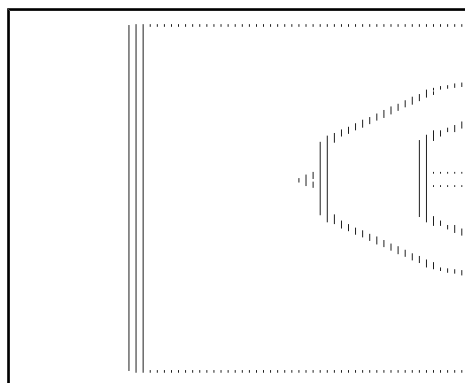
Dimension -a-

- 1 - 1st and 2nd gear selector segment = 10.2 mm.
- 2 - Selector segment for 3rd and 4th gear = 78.6 mm.
- 3 - 5th gear selector fork with selector segments = 79.5 mm



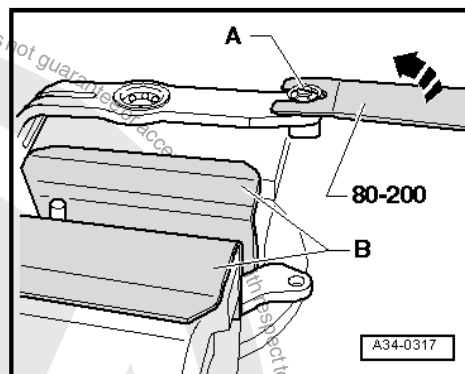
1st and 2nd gear selector fork with selector segments

Dimension -a- = 75 mm



Removing lock washer

- Clamp selector fork in vice with protective jaws -B-.
- Lever off lock washer -A- in direction of arrow.



Installing lock washer

- Press lock washer into groove of selector segment using socket and spinner handle.

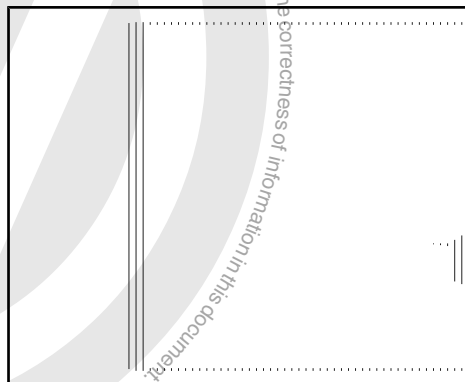


Note

After lock washer is installed, selector segment must still rotate freely.

A - Spinner handle with 10 mm socket

B - Protective jaw covers





Removing angular contact ball bearing



Note

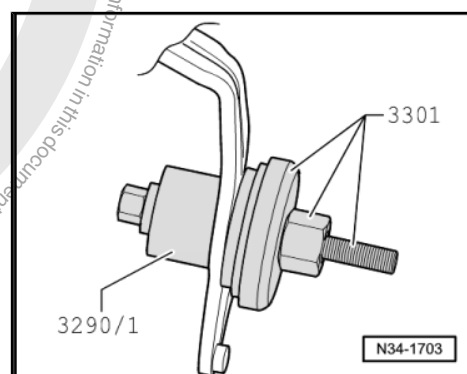
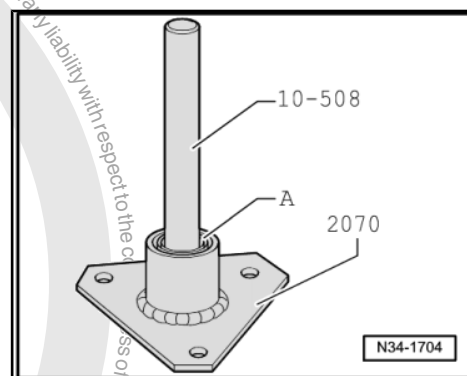
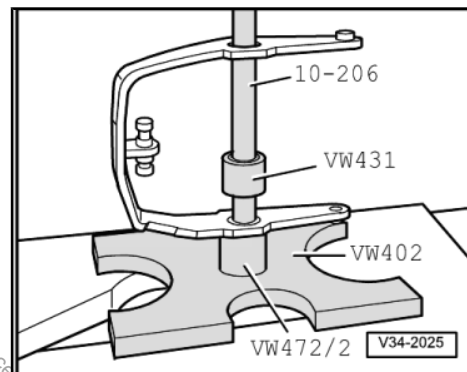
When removing and installing angular contact ball bearing, do not bend selector forks.

Pressing inner race -A- of angular contact ball bearing into outer race

Inner race must engage in outer race.

Pulling angular contact ball bearing into selector fork to stop

Depression in thrust piece -3290/1- faces ball bearing.





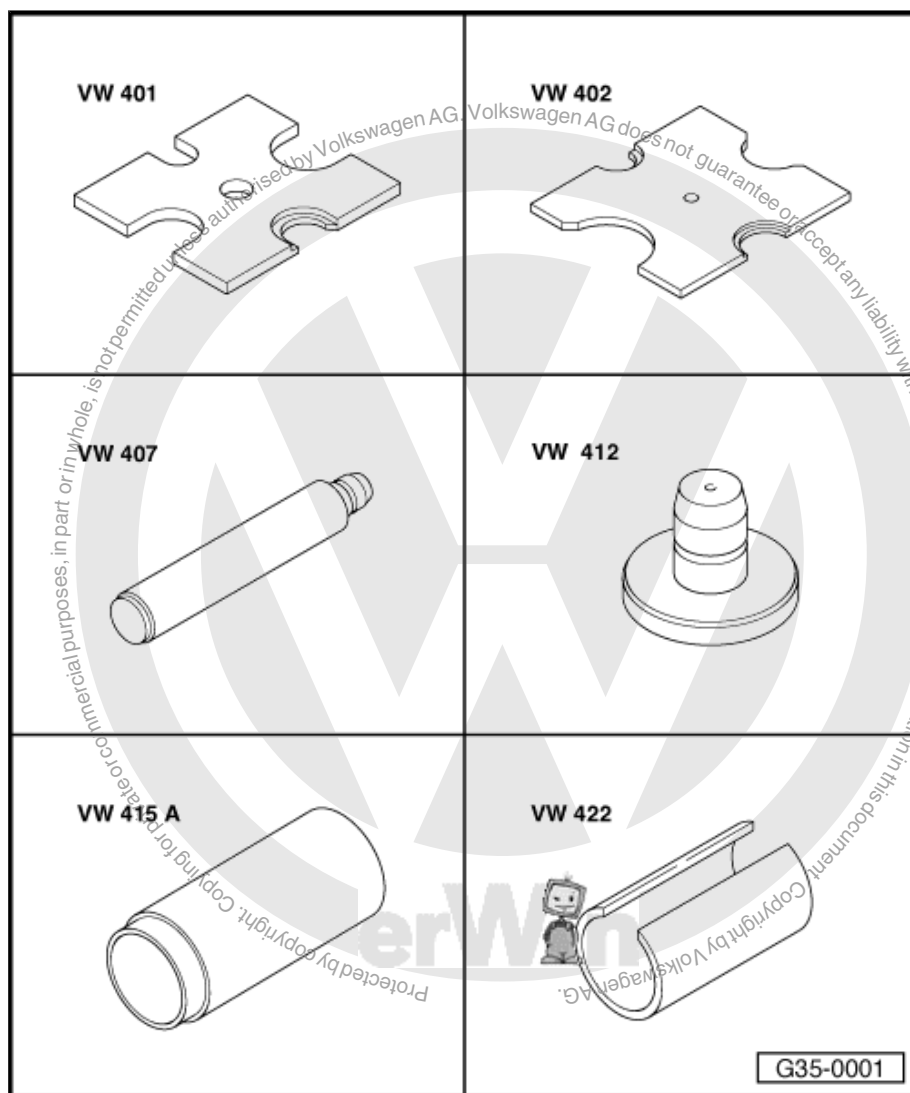
35 – Gears, shafts

1 Input shaft

1.1 Dismantling and assembling input shaft

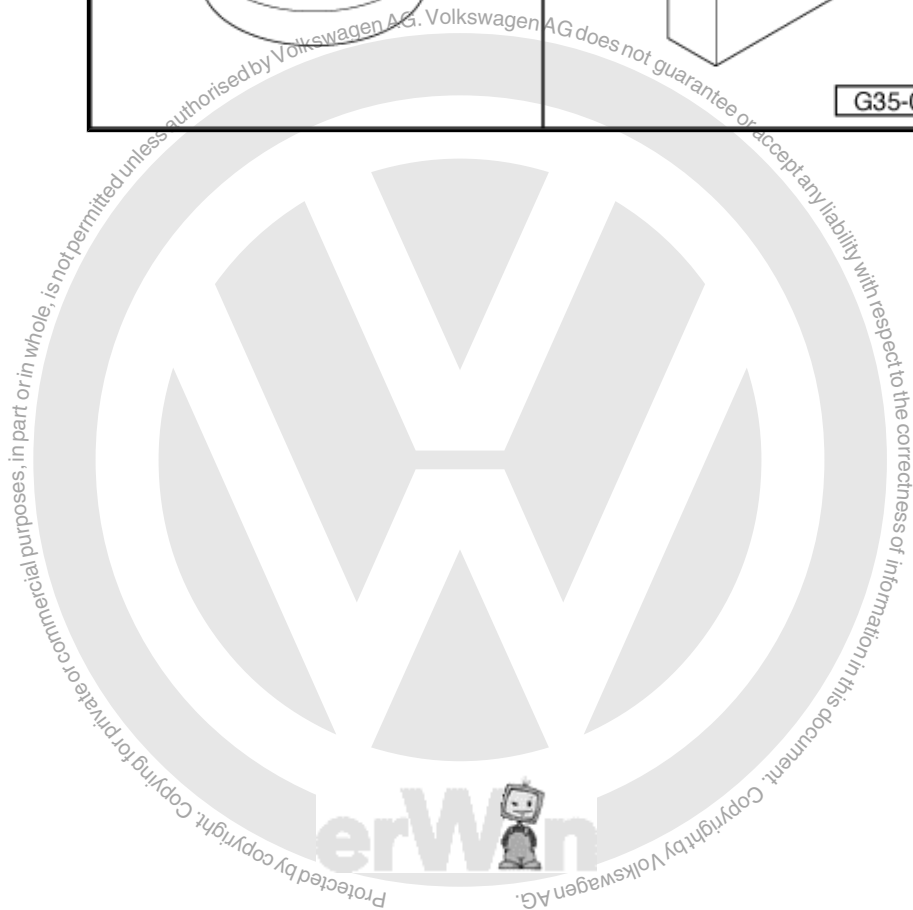
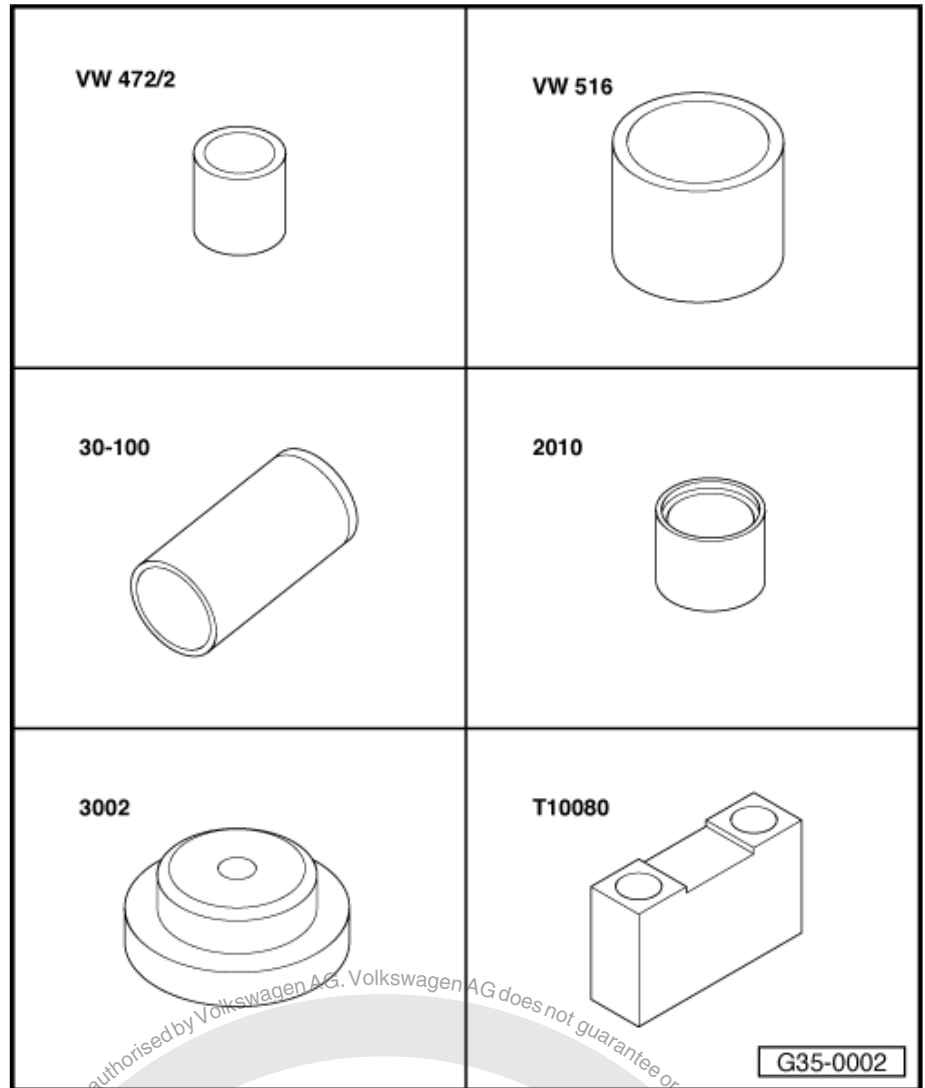
Special tools and workshop equipment required

- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-
- ◆ Press tool -VW 407-
- ◆ Press tool -VW 412-
- ◆ Tube -VW 415 A-
- ◆ Tube -VW 422-



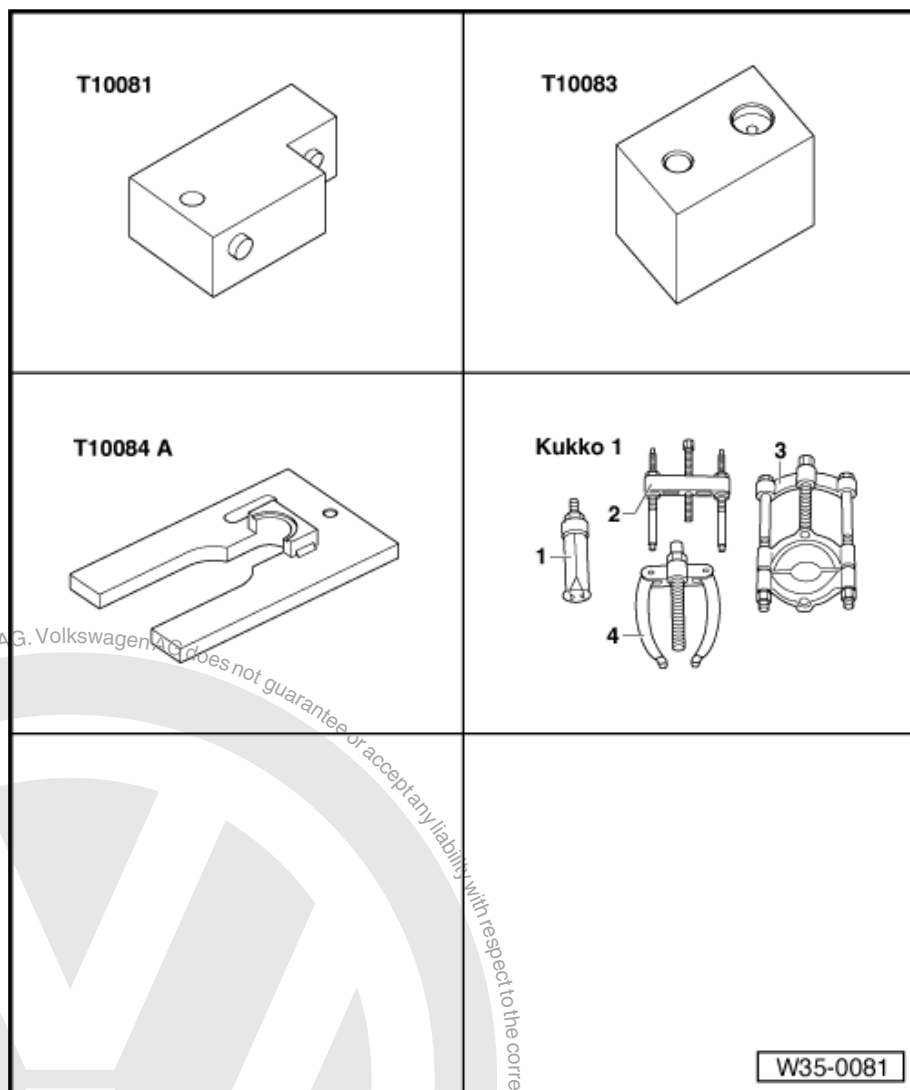


- ◆ Spacer sleeve -VW 472/2-
- ◆ Tube -VW 516-
- ◆ Drift sleeve -30-100-
- ◆ Tube -2010-
- ◆ Thrust piece -3002-
- ◆ Thrust piece -T10080-





- ◆ Thrust piece -T10081-
- ◆ Thrust piece -T10083-
- ◆ Thrust plate -T10084A-
- ◆ -1- Internal puller -Kukko 21/5-
- ◆ -2- Puller -Kukko 18/1-
- ◆ -3- Splitter -Kukko 17/1-
- ◆ -4- Counterhold -Kukko 22/1-



Note

- ◆ When installing new gear wheels, consult technical data ➔ [page 1](#) and ➔ Electronic parts catalogue "ETKA".
- ◆ Install all bearings, synchromeshed gears and synchro-rings on input shaft with gear oil.
- ◆ Do not interchange synchro-rings. When reusing always fit to the original gear.



1 - Retaining ring

- ☐ Always renew
- ☐ Determining thickness
⇒ [page 88](#)

2 - 5th gear locking collar with synchro-hub

- ☐ Removing and installing
⇒ [page 79](#)
- ☐ Dismantling
⇒ [page 111](#)
- ☐ Assembling 5th gear locking collar/synchro-hub
- ☐ Installation position
⇒ [page 111](#)

3 - Synchro-ring for 5th gear

- ☐ Check for wear
⇒ [page 109](#)

4 - Synchromeshed gear for 5th gear

5 - Needle bearing

- ☐ For 5th gear
- ☐ Renew together with
⇒ [Item 6 \(page 105\)](#)

6 - Sleeve

- ☐ For 5th gear needle bearing
- ☐ Renew together with
⇒ [Item 5 \(page 105\)](#)
- ☐ Press off with bearing mounting with deep groove ball bearing
⇒ [page 107](#)

- ☐ Pressing on.

7 - Gearbox housing

- ☐ Repairing ⇒ [page 89](#)

8 - Bearing mounting with deep groove ball bearing

- ☐ Renew deep groove ball bearing only together with bearing mounting
- ☐ If bearing mounting is separated from gearbox housing, then mounting must always be renewed.
- ☐ Pressing off ⇒ [page 107](#)
- ☐ Pressing on ⇒ [page 110](#)

9 - Input shaft

10 - Needle bearing

- ☐ For 3rd gear

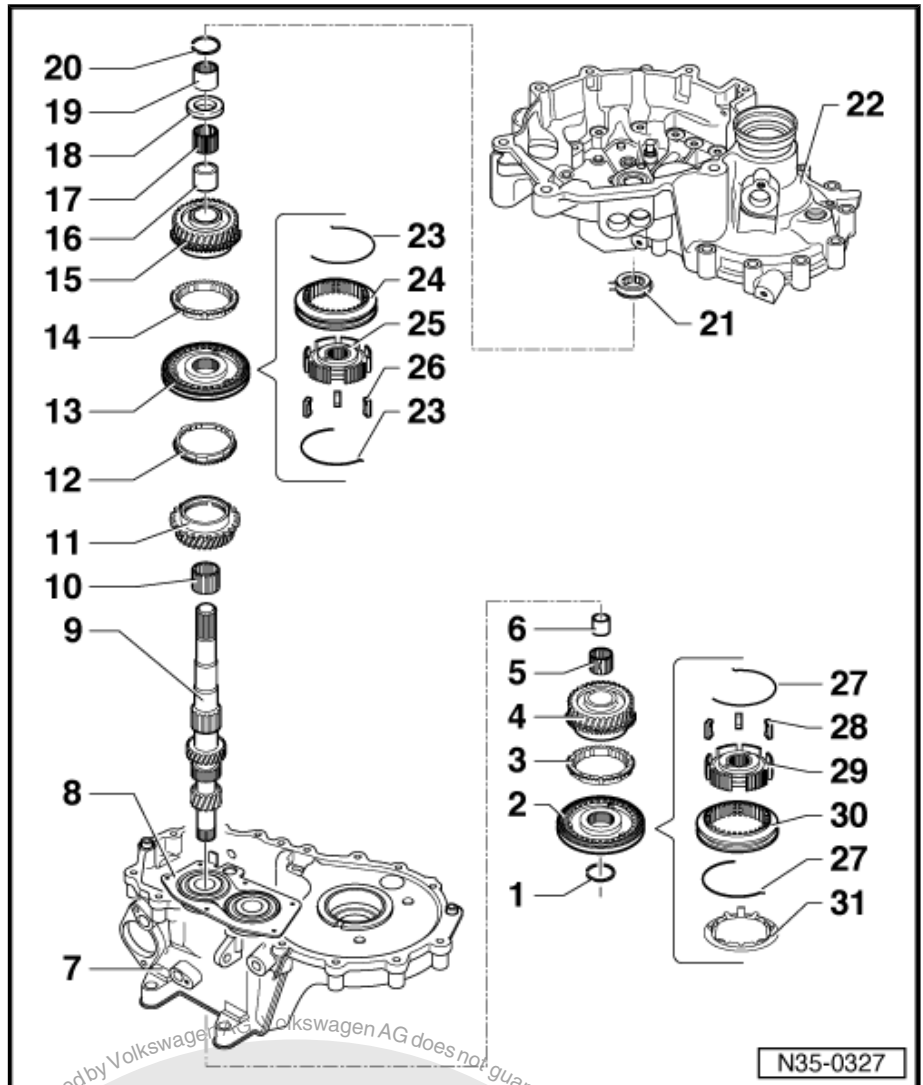
11 - Synchromeshed gear for 3rd gear

12 - Synchro-ring for 3rd gear

- ☐ Check for wear ⇒ [page 109](#)

13 - Locking collar with synchro-hub for 3rd and 4th gear

- ☐ Press off with 3rd gear synchromeshed gear ⇒ [page 108](#)
- ☐ Dismantling ⇒ [page 108](#)
- ☐ Installation position, locking collar and synchro-hub ⇒ [page 108](#)





- ☐ Assembling ⇒ [page 108](#)
- ☐ Pressing on ⇒ [page 109](#)

14 - Synchro-ring for 4th gear

- ☐ Check for wear ⇒ [page 109](#)

15 - Synchromeshed gear for 4th gear

16 - Sleeve

- ☐ For 4th gear needle bearing
- ☐ Renew together with ⇒ [Item 17 \(page 106\)](#)
- ☐ Removing ⇒ [page 107](#)

17 - Needle bearing

- ☐ For 4th gear
- ☐ Renew together with ⇒ [Item 16 \(page 106\)](#)

18 - Thrust washer

19 - Inner race for cylindrical roller bearing

- ☐ Removing ⇒ [page 107](#)
- ☐ Pressing on ⇒ [page 109](#)

20 - Retaining ring

- ☐ Renew
- ☐ Determining thickness ⇒ [page 110](#)

21 - Cylindrical roller bearing

- ☐ With retaining ring
- ☐ Pulling out ⇒ [page 107](#)
- ☐ Pressing in ⇒ [page 107](#)
- ☐ Installation position: retaining ring in bearing faces input shaft

22 - Clutch housing

- ☐ Repairing ⇒ [page 89](#)

23 - Spring

- ☐ Installation position ⇒ [page 108](#)

24 - 3rd and 4th gear locking collar

25 - 3rd and 4th gear synchro-hub

26 - Locking pieces (Qty. 3)

27 - Spring

- ☐ Installation position ⇒ [page 108](#)

28 - Locking pieces (Qty. 3)

29 - Synchro-hub for 5th gear

30 - Locking collar for 5th gear

31 - Stop ring

- ☐ Prevents the locking pieces from drifting out.
- ☐ Removing ⇒ [page 111](#)
- ☐ Installing ⇒ [page 112](#)

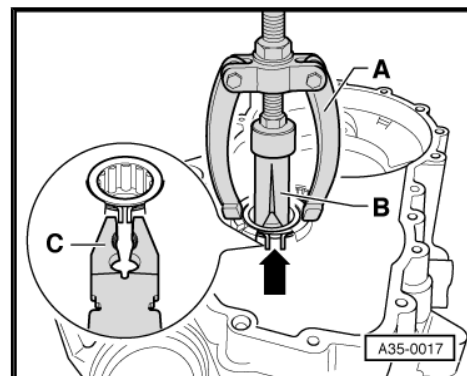


Pulling cylindrical roller bearing out of clutch housing

- When pulling out, squeeze together retaining ring -arrow- of cylindrical roller bearing, using pliers -C-.

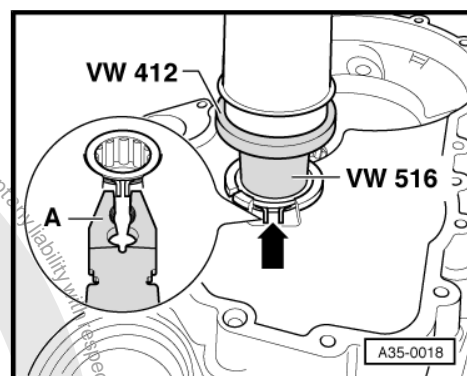
A - Counter support , e.g. -Kukko 22/1-

B - Internal puller, 30...37 mm , e.g. -Kukko 21/5-



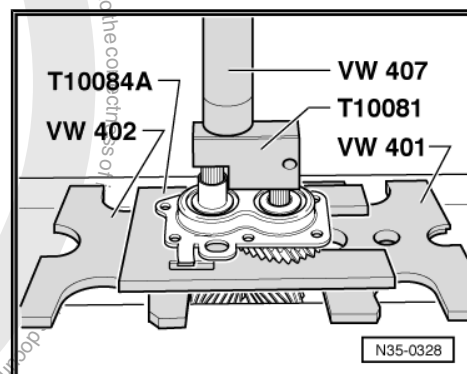
Pressing cylindrical roller bearing into clutch housing

- Support gearbox housing with tube -VW 415 A- (not visible in figure) directly below bearing support.
- When pressing in, squeeze cylindrical roller bearing retaining ring -arrow- together using pliers -A-.
- Remove pliers before cylindrical roller bearing is in installation position. Retaining ring must engage in groove of clutch housing.



Pressing off bearing mounting with deep groove ball bearing

- Slide locking collar for 1st and 2nd gear towards 2nd gear.
- Then slide pressure plate -T10084 A- onto input shaft to stop from side.
- Insert thrust piece -T10081- centralizing pins into holes in input and output shafts.



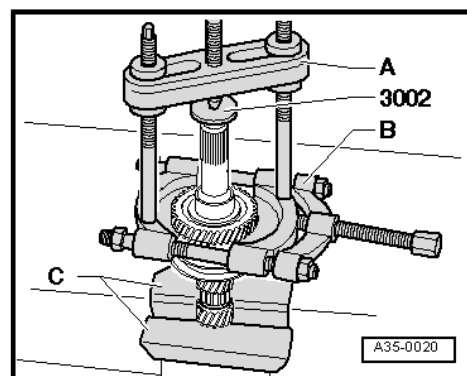
Pulling off sleeve for cylindrical roller bearing with 4th gear synchromeshed gear

- First remove retaining ring.
- Position splitter -B- behind teeth of synchromeshed gear for 4th gear which engage in the other gear wheel (not dog teeth) and tension.

A - Puller , e.g. -Kukko 18/1-

B - Splitter, 12...75 mm , e.g. -Kukko 17/1-

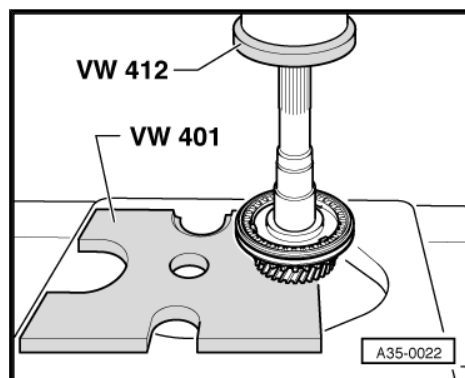
C - Protective jaw covers





Pressing off locking collar with synchro-hub for 3rd and 4th gear

- After removing retaining ring, press off 3rd gear synchromeshed gear together with locking collar and synchro-hub.

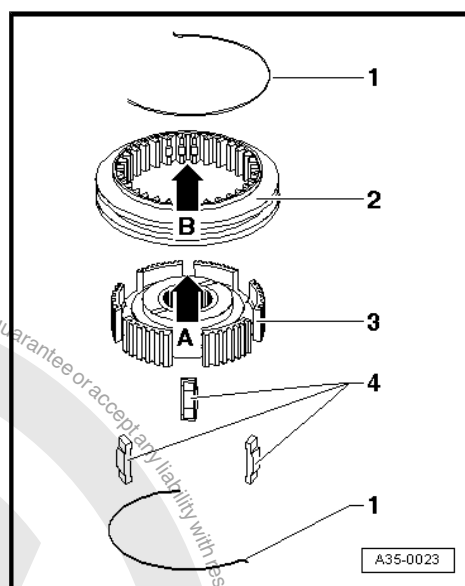


Dismantling and assembling 3rd and 4th gear locking collar and synchro-hub

- 1 - Spring
- 2 - Locking collar
- 3 - Synchro-hub
- 4 - Locking piece

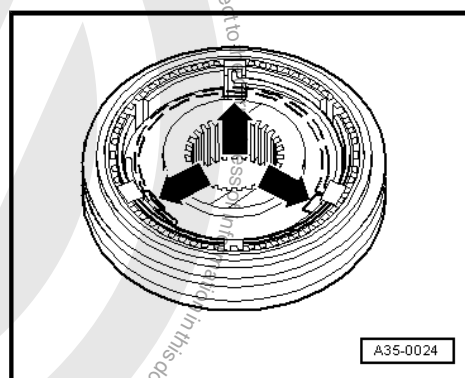
- Slide locking collar over synchro-hub.

Deeper notches -arrow A- for locking pieces in synchro-hub and notches -arrow B- in locking collar must align.



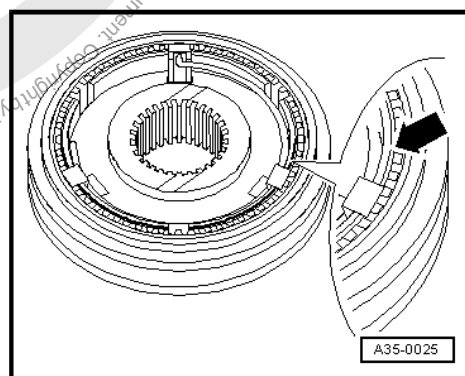
Assembling locking collar and synchro-hub for 3rd and 4th gears

- Locking collar has been pushed over synchro-hub.
- Insert locking pieces in deeper notches -arrows- and install springs offset 120°. Angled end of spring must locate in hollow locking piece.



Installation position of locking collar and synchro-hub for 3rd and 4th gears

Groove on top -arrow- faces 4th gear.

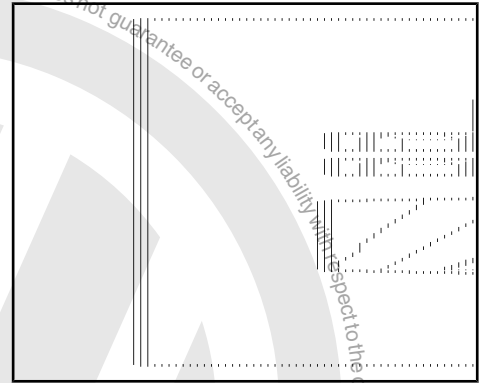




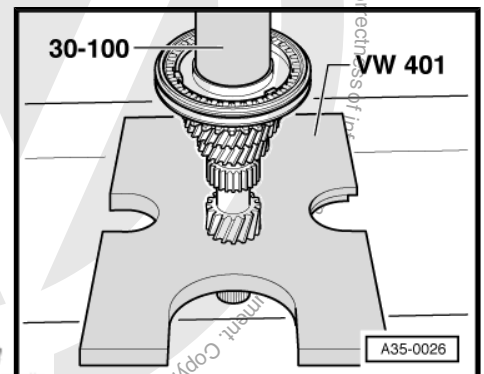
Checking synchro-ring for wear

- Press synchro-ring onto cone of synchromeshed gear and measure gap -a- using feeler gauge.

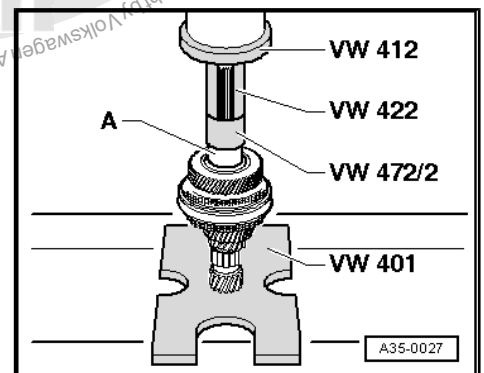
Gap -a-	Installation (new) dimension	Wear limit
3rd, 4th and 5th gear	1.1-1.7 mm	0.5 mm



Pressing on synchro-hub with locking collar for 3rd and 4th gears



Pressing on inner race -A- for cylindrical roller bearing.





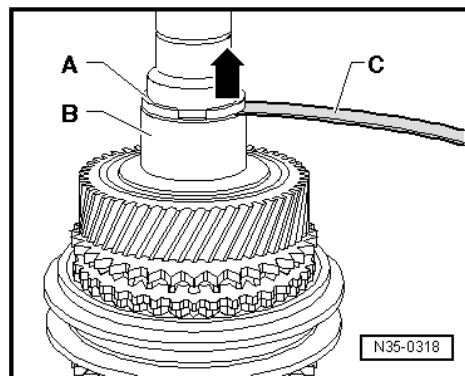
Determining thickness of retaining ring

- Insert a 2.0 mm thick retaining ring -A- in groove of input shaft and press upwards -arrow-.
- Measure distance between inner race -B- and installed retaining ring -A- using feeler gauge -C-.
- Remove retaining ring used for measuring purposes.
- Determine retaining ring from table.



Note

Allocate retaining rings according to ⇒ *Electronic parts catalogue "ETKA"*.

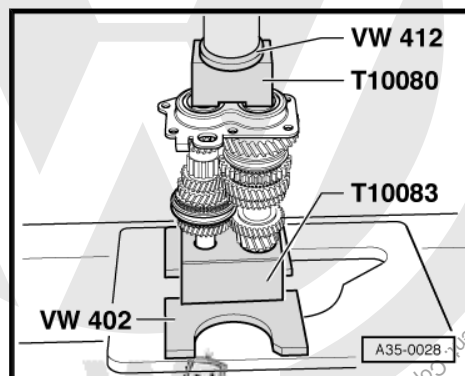


The following retaining rings are available:

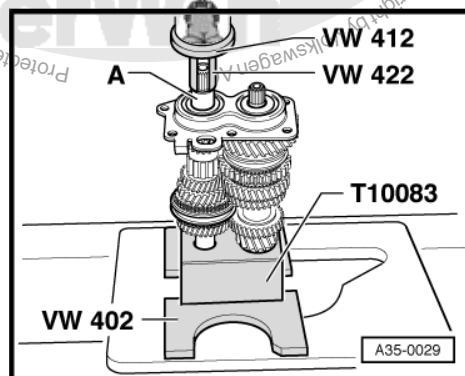
Measured value (mm)	Retaining ring thickness (mm)	Axial play (mm)
0.05...0.10	2.0	0.05...0.15
0.15...0.20	2.1	0.05...0.15
0.25...0.30	2.2	0.05...0.15
0.35...0.40	2.3	0.05...0.15
0.45...0.50	2.4	0.05...0.10

Pressing on bearing mounting with deep groove ball bearing.

- Heat inner bearing mounting to approx. 100 °C before pressing on.



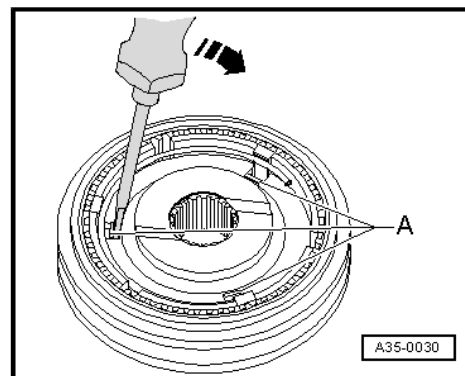
Pressing on sleeve -A- for 5th gear needle bearing





Removing stop ring

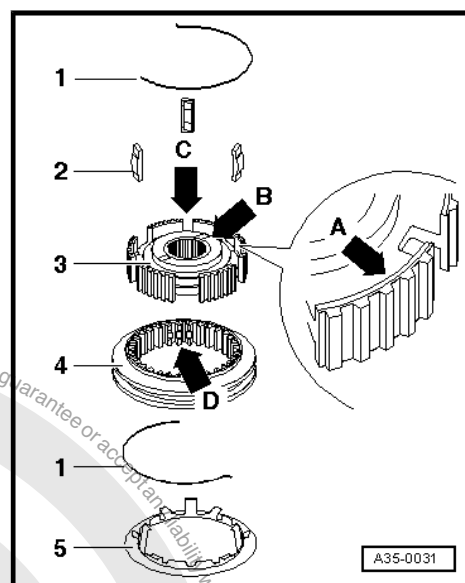
- Unclip stop ring hooks -A- from synchro-hub using a screw-driver



Dismantling and assembling 5th gear locking collar and synchro-hub

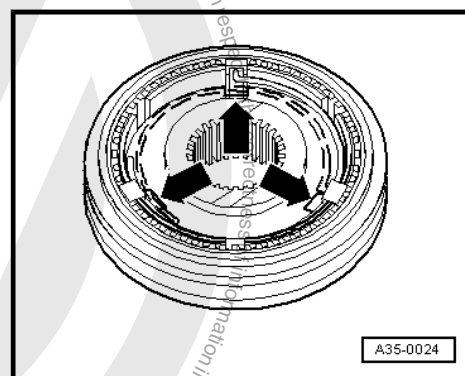
- 1 - Spring
 - 2 - Locking piece
 - 3 - Synchro-hub installation position: groove on face -arrow A- and wider shoulder -arrow B- must face 5th gear.
 - 4 - Locking collar
 - 5 - Stop ring
- Slide locking collar over synchro-hub.

Deeper notches -arrow C- for locking pieces in synchro-hub and notches -arrow D- in locking collar must align.



Assembling 5th gear locking collar/synchro-hub

- Locking collar has been pushed over synchro-hub.
- Insert locking pieces in deeper notches -arrows- and install springs offset 120°. Angled end of spring must locate in hollow locking piece.



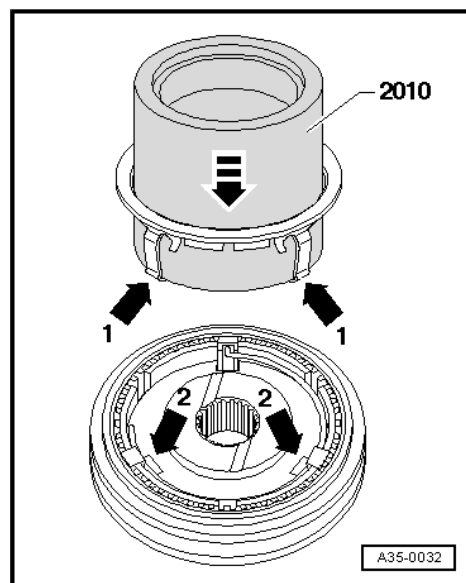


Installing stop ring

- Press stop ring on using tube -2010- .
- Insert stop ring together with tube -2010- into 5th gear synchro-hub/locking collar (observe installation position ➔ [page 111](#)).

The hooks -arrow 1- lock in the recess -arrow 2- of the synchro-hub locking pieces.

- Press stop ring downwards until hooks engage.



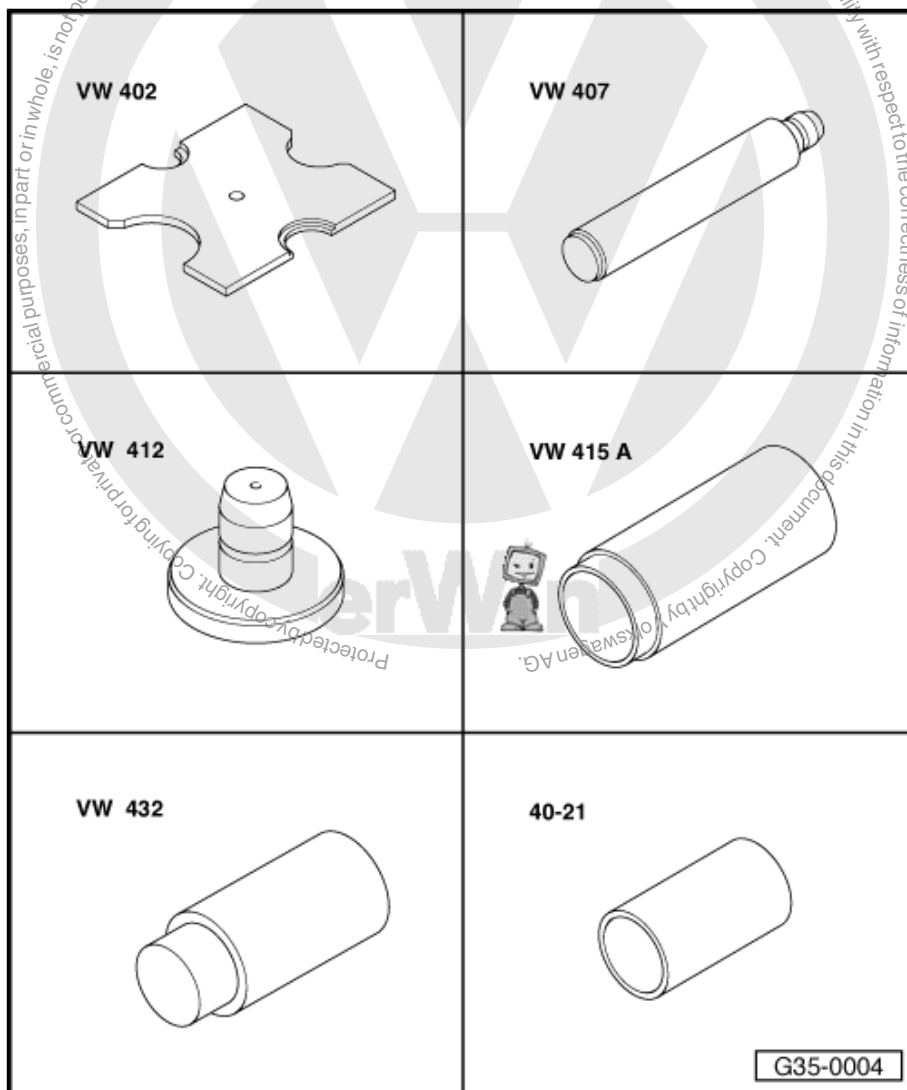


2 Output shaft

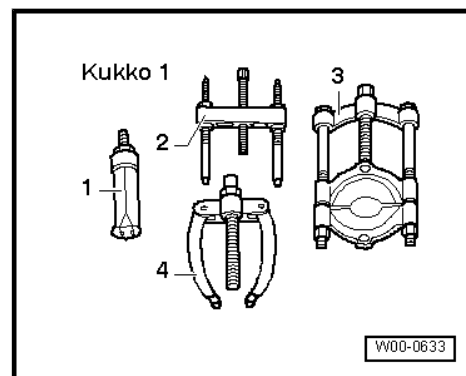
2.1 Dismantling and assembling output shaft

Special tools and workshop equipment required

- ◆ Thrust plate -VW 402-
- ◆ Press tool -VW 407-
- ◆ Tube -VW 415 A-
- ◆ Thrust piece -VW 432-
- ◆ Drift sleeve -30 - 100-



- ◆ Internal puller -1- Kukko 21/5-



- ◆ Counter support -4- Kukko 22/1-



Note

- ◆ When installing new gear wheels or final drive gear set, consult technical data ➔ [page 1](#) and ➔ *Electronic parts catalogue "ETKA"*.
- ◆ Install all bearings, synchromeshed gears and synchro-rings on output shaft with gear oil.
- ◆ Do not interchange synchro-rings. When reusing always fit to the original gear.

1 - Clutch housing

- ☐ Repairing ➔ [page 89](#)

2 - Cylindrical roller bearing

- ☐ With retaining ring
- ☐ Pulling out ➔ [page 116](#)
- ☐ Pressing in ➔ [page 116](#)
- ☐ Installation position: retaining ring in bearing faces output shaft

3 - Output shaft

- ☐ If an inner race as bearing seat for cylindrical roller bearing ➔ [Item 2 \(page 114\)](#) is present, it cannot be removed from output shaft
- ☐ Check bearing seat or inner race for cylindrical roller bearing for scoring and damage.
- ☐ If cylindrical roller bearing inner race or bearing seat is damaged or scored, renew output shaft and cylindrical roller bearing together

4 - Gear wheel for 4th gear

- ☐ Installation position: shoulder faces 3rd gear ➔ [page 117](#)

5 - Retaining ring

- ☐ Renew

6 - Retaining ring

- ☐ Renew

7 - Gear wheel for 3rd gear

- ☐ Installation position: shoulder faces 4th gear ➔ [page 117](#)

8 - Retaining ring

- ☐ Renew

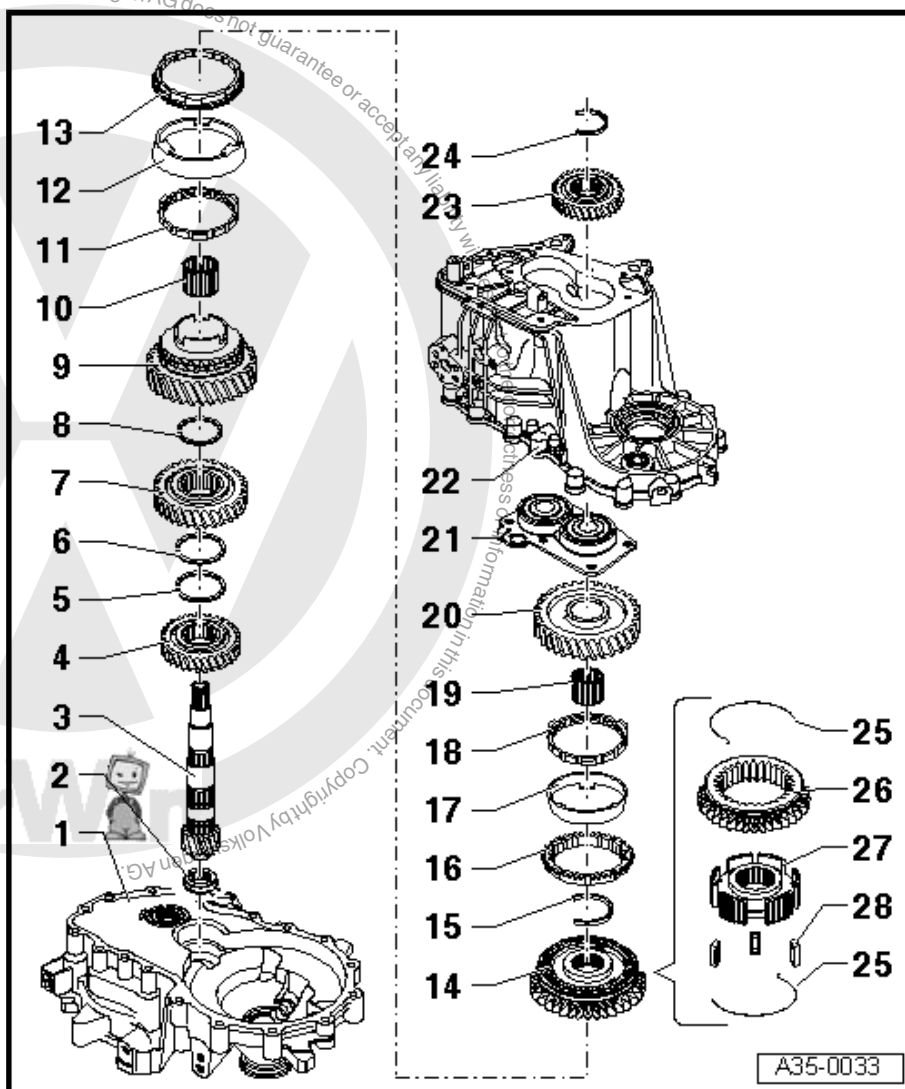
9 - Synchromeshed gear for 2nd gear

10 - Needle bearing

- ☐ For 2nd gear

11 - Inner ring for 2nd gear

- ☐ Check for wear ➔ [page 117](#)





- ☐ Installation position ➤ [page 117](#)
- 12 - Outer ring for 2nd gear**
 - ☐ Place on inner ring ➤ [Item 11 \(page 114\)](#)
 - ☐ Renew if scored
 - ☐ Installation position ➤ [page 117](#)
- 13 - Synchro-ring for 2nd gear**
 - ☐ Check for wear ➤ [page 117](#)
 - ☐ Installation position ➤ [page 117](#)
- 14 - Locking collar with synchro-hub for 1st and 2nd gears**
 - ☐ After removing retaining ring ➤ [Item 15 \(page 115\)](#) , press off with 2nd gear synchromeshed gear ➤ [page 116](#)
 - ☐ Dismantling ➤ [page 118](#)
 - ☐ Assembling locking collar and synchro-hub ➤ [page 118](#) and ➤ [page 118](#)
 - ☐ Installation position ➤ [page 118](#)
 - ☐ Pressing on ➤ [page 118](#)
- 15 - Retaining ring**
 - ☐ Pressing out ➤ [page 116](#)
 - ☐ Installing ➤ [page 119](#)
- 16 - Synchro-ring for 1st gear**
 - ☐ Check for wear ➤ [page 117](#)
 - ☐ Assemble so that notches engage in locking pieces of locking collar ➤ [Item 14 \(page 115\)](#)
- 17 - Outer ring for 1st gear**
 - ☐ Insert in synchro-ring ➤ [Item 16 \(page 115\)](#)
 - ☐ Installation position ➤ [page 119](#)
 - ☐ Renew if scored
- 18 - Inner ring for 1st gear**
 - ☐ Check for wear ➤ [page 117](#)
 - ☐ Check lugs for scoring
 - ☐ Installation position ➤ [page 119](#)
- 19 - Needle bearing**
 - ☐ For 1st gear
- 20 - Synchromeshed gear for 1st gear**
 - ☐ Installation position ➤ [page 119](#)
- 21 - Bearing mounting with deep groove ball bearing**
 - ☐ Renew deep groove ball bearing only together with bearing mounting
 - ☐ If bearing mounting is separated from gearbox housing, then mounting must always be renewed.
 - ☐ Pressing off ➤ [page 107](#)
 - ☐ Pressing on ➤ [page 110](#)
- 22 - Gearbox housing**
 - ☐ Repairing ➤ [page 89](#)
- 23 - Gear wheel for 5th gear**
 - ☐ Installation position: shoulder faces gearbox housing cover ➤ [page 87](#)
 - ☐ Removing and installing ➤ [page 79](#)
- 24 - Retaining ring**
 - ☐ Always renew
 - ☐ Determining thickness ➤ [page 88](#)



25 - Spring

- ❑ Installation position ➔ [page 118](#)

26 - Locking collar

27 - Synchro-hub

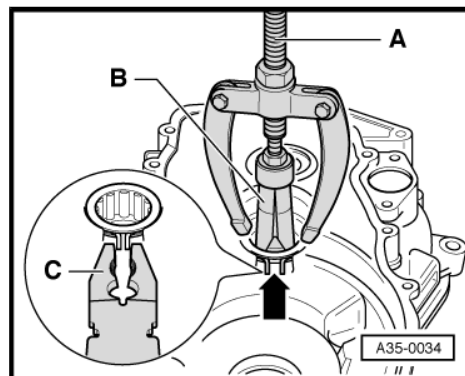
28 - Locking pieces (Qty. 3)

Pulling cylindrical roller bearing out of clutch housing

- When pulling out, squeeze together retaining ring -arrow- of cylindrical roller bearing, using pliers -C-.

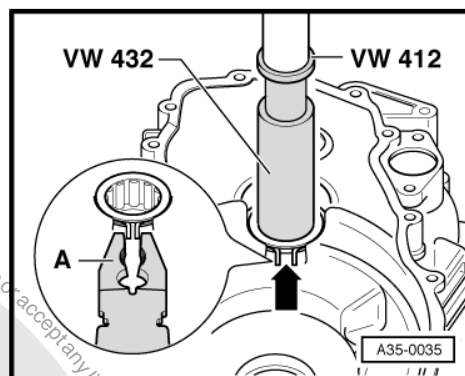
A - Counter support , e.g. -Kukko 22/1-

B - Internal puller, 30...37 mm , e.g. -Kukko 21/5-



Pressing cylindrical roller bearing into clutch housing

- Support gearbox housing with tube -VW 415 A- (not visible in figure) directly below bearing support.
- When pressing in, squeeze cylindrical roller bearing retaining ring -arrow- together using pliers -A-.
- Remove pliers before cylindrical roller bearing is in installation position. Retaining ring must engage in groove of clutch housing.



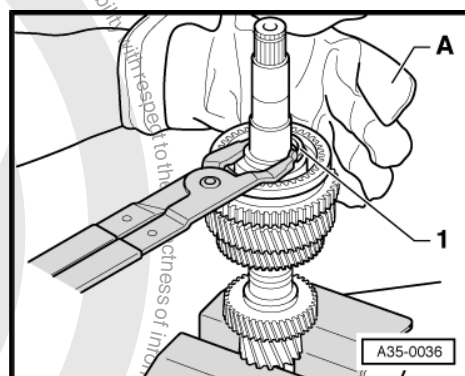
Pressing retaining ring -1- out of groove

A - Protective gloves



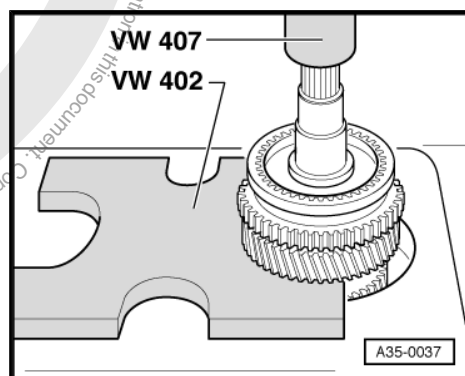
WARNING

Ensure retaining ring does not spring out uncontrolled.



Pressing off 1st and 2nd gear locking collar and synchro-hub

- After removing retaining ring, press off synchromeshed gear for 2nd gear together with locking collar and synchro-hub.





Installation position of 3rd gear and 4th gear

- Install 4th gear wheel -A- on output shaft.

Installation position:

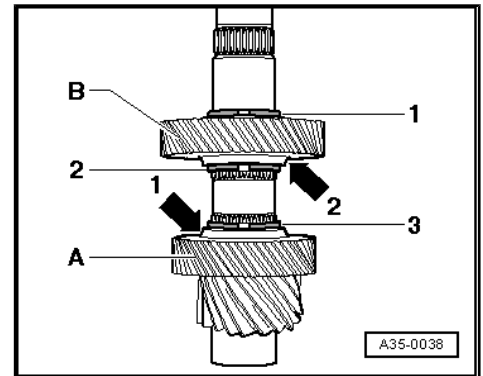
Collar -arrow 1- faces 3rd gear wheel -B-.

- Install retaining rings -2- and -3-.
- Install 3rd gear wheel -B- on output shaft.

Installation position:

Collar -arrow 2- faces 4th gear wheel -A-.

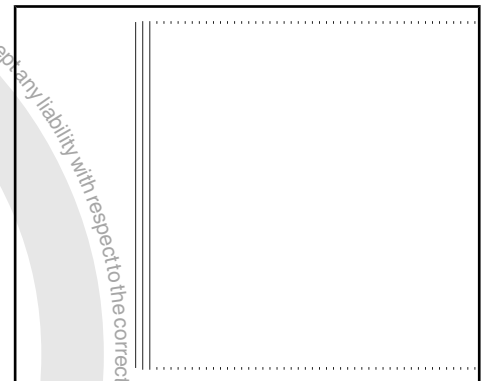
- Install retaining ring -1-.



Checking 1st and 2nd gear inner ring for wear

- Press inner ring onto cone of synchromeshed gear and measure gap -a- using a feeler gauge.

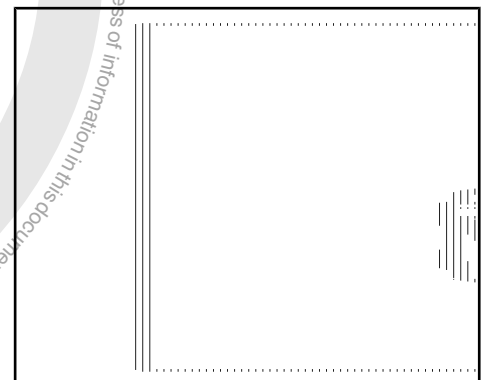
Gap -a-	Installation (new) dimension	Wear limit
1st and 2nd gears	0.75...1.25 mm	0.3 mm



Checking 1st and 2nd gear synchro-rings for wear

- Press synchro-ring, outer ring and inner ring onto cone of synchromeshed gear and measure gap -a- using a feeler gauge.

Gap -a-	Installation (new) dimension	Wear limit
1st and 2nd gears	1.2...1.8 mm	0.5 mm



Installation position of outer ring, inner ring and synchro-ring for 2nd gear

- Place inner ring -A- on synchromeshed gear for 2nd gear.

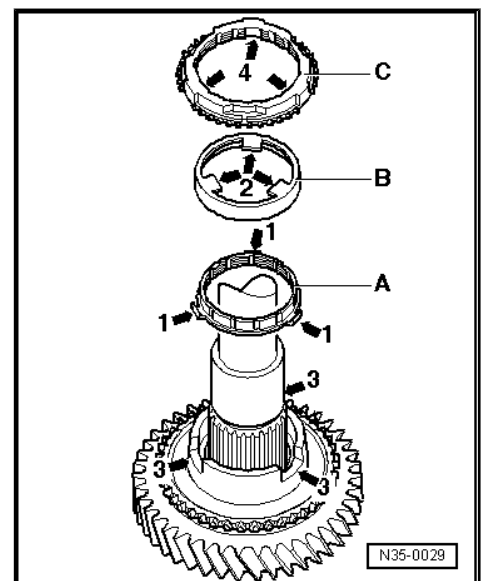
Angled lugs -arrow 1- face outer ring -B-.

- Fit outer ring -B-.

Lugs -arrow 2- engage in notches -arrow 3- of synchromeshed gear.

- Fit synchro-ring -C-.

Notches -arrow 4- engage in lugs -arrow 1- of inner ring -A-.





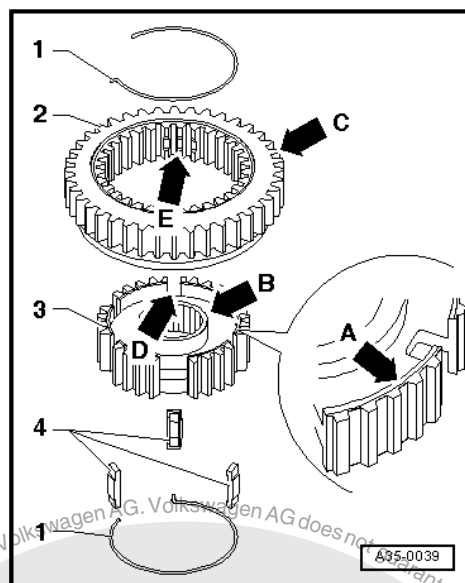
Dismantling and assembling locking collar and synchro-hub for 1st and 2nd gears

- 1 - Spring
- 2 - Locking collar
- 3 - Synchro-hub
- 4 - Locking piece
- Slide locking collar over synchro-hub.

Installation position:

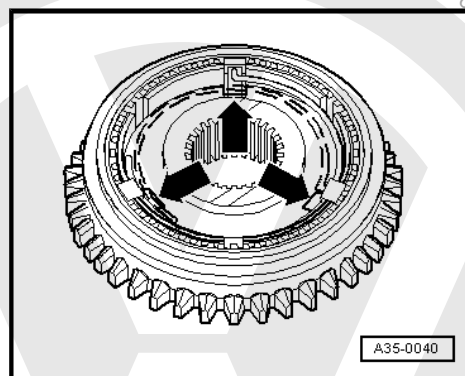
After installation, the groove on the face -arrow A- and the higher shoulder -arrow B- face towards outer splines of the locking collar -arrow C-.

Deeper cut-outs -arrow D- for locking pieces in synchro-hub and notches -arrow E- in locking collar must align.



Assembling locking collar with synchro-hub for 1st and 2nd gears

- Locking collar has been pushed over synchro-hub.
- Insert locking pieces in deeper cut-outs -arrows- and install springs offset 120°. Angled end of spring must locate in hollow locking piece.

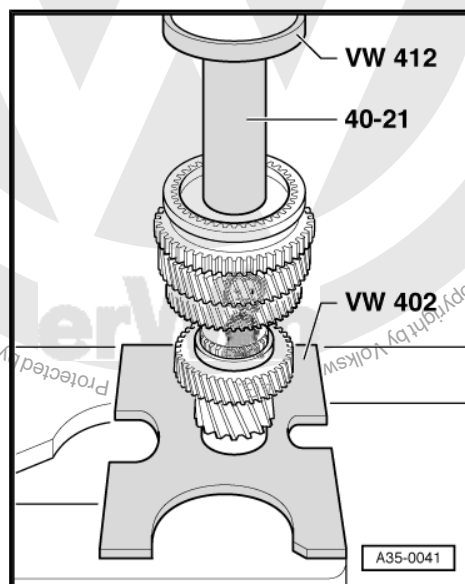


Pressing on locking collar and synchro-hub for 1st and 2nd gears

Installation position:

Groove in locking collar for selector fork faces 1st gear and teeth for reverse gear face 2nd gear.

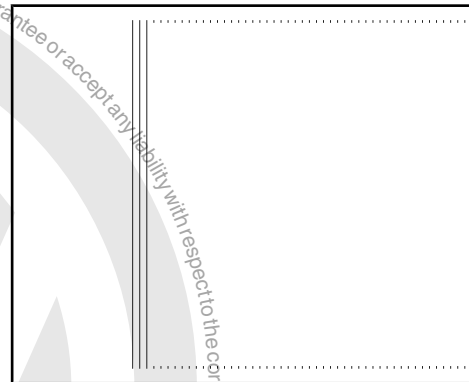
- Turn synchro-ring so that grooves align with locking pieces.





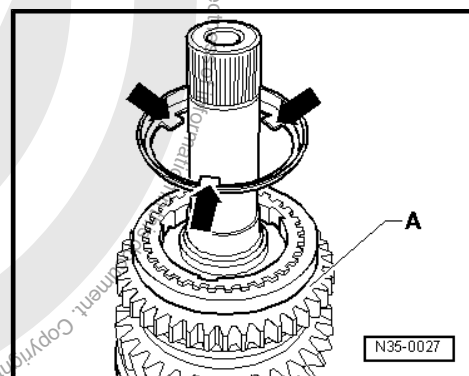
Fitting retaining ring

- Place 1st gear synchro-ring in locking collar/synchro-hub.



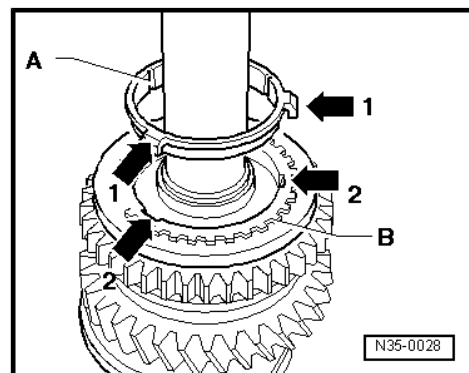
Installation position of 1st gear outer ring

Lugs -arrows- face reverse gear teeth.



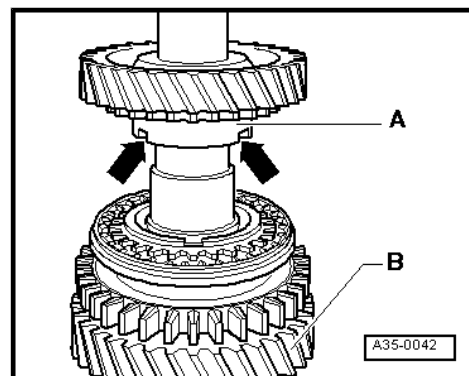
Installation position of 1st gear -A-

Lugs -arrow 1- engage in notches -arrow 2- in synchro-ring -B-.



Installation position of 1st gear synchromeshed gear

Higher shoulder -A- faces 2nd gear -B-. Notches in shoulder -arrows- engage in lugs of outer ring ➤ [page 119](#) .





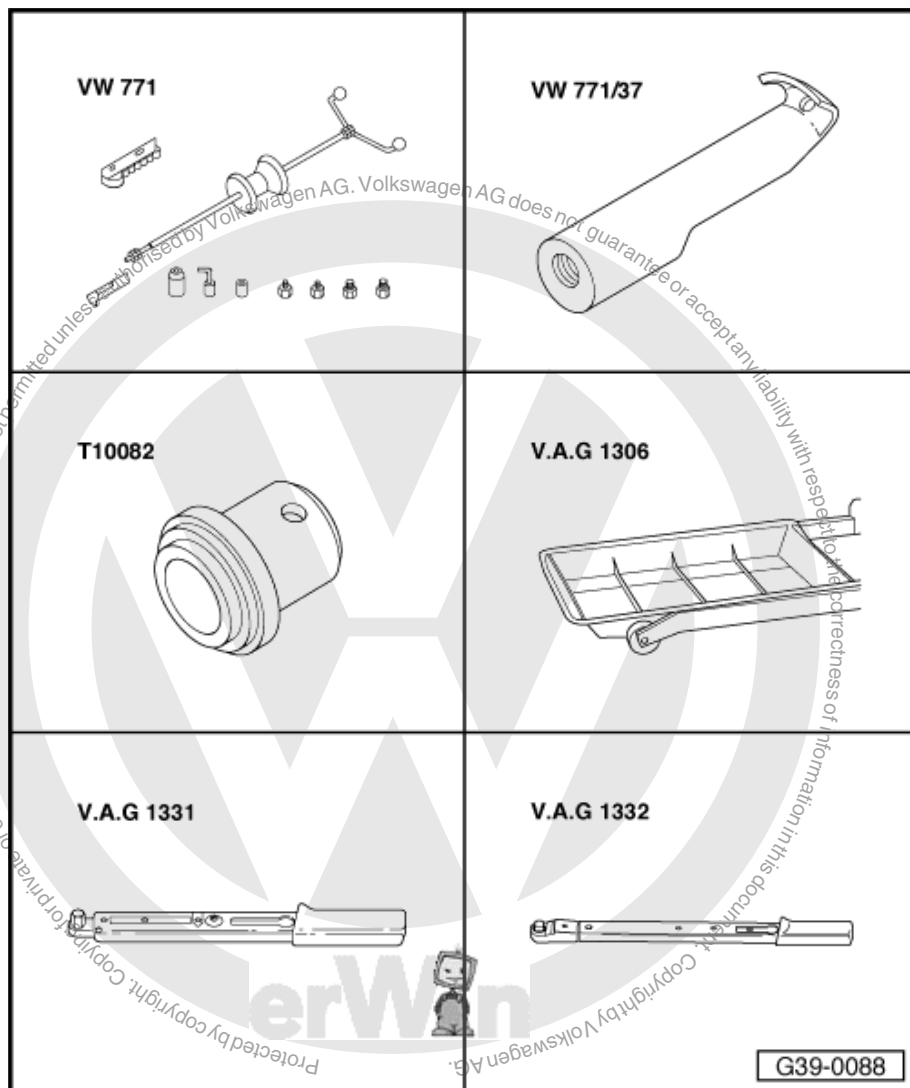
39 – Final drive - differential

1 Renewing flange shaft oil seals with gearbox installed

1.1 Renewing oil seal for left flange shaft

Special tools and workshop equipment required

- ◆ Multipurpose tool -VW 771-
- ◆ Puller hooks -VW 771/37-
- ◆ Thrust piece -T10082-
- ◆ Torque wrench - V.A.G 1331-

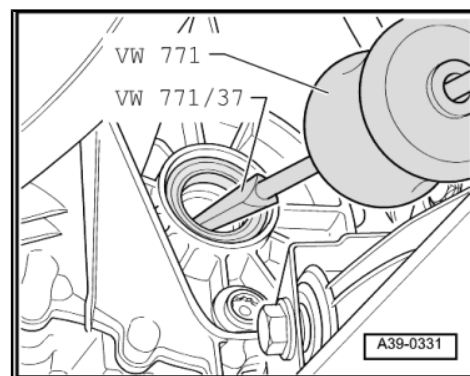
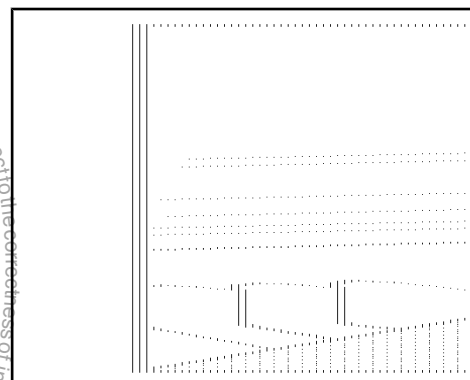


1.1.1 Removing

- Remove left wheel.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Noise insulation .
- Remove lower part of front left wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 ; Wheel housing liner .
- Turn steering to left lock.
- Disconnect drive shaft from flange shaft ⇒ Running gear, axles, steering; Rep. Gr. 40 ; Repairing drive shaft; Removing and installing drive shafts .

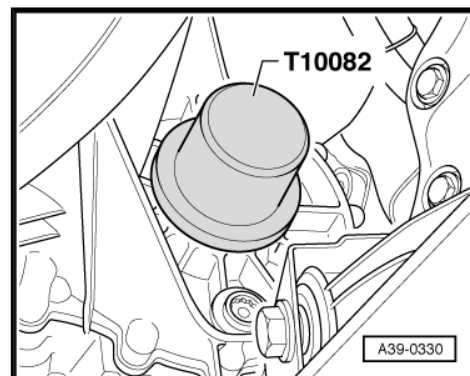


- Tie up drive shaft as high as is possible. Take care not to damage paint on drive shaft in the process.
- Place drip tray under gearbox.
- Remove flange shaft securing bolts by screwing two bolts into flange and counterholding flange shaft with a lever.
- Pull out flange shaft with compression spring.
- Pull out flange shaft oil seal using multi-purpose tool -VW 771- and puller hooks -VW 771/37- .



1.1.2 Installing

- Drive in new seal to stop, being careful not to cant seal.
- Half-fill space between sealing lip and dust lip with sealing grease -G 052 128 A1- .
- Insert flange shaft.
- Secure flange shaft using countersunk bolt and tighten to 25 Nm torque.
- Attach drive shaft to gearbox ⇒ Running gear, axles, steering; Rep. Gr. 40 ; Repairing drive shaft; Removing and installing drive shafts .
- Install wheel ⇒ Running gear, axles, steering; Rep. Gr. 44 ; Torque settings for mounting wheels .
- Check gear oil ⇒ [page 72](#) .
- Install lower part of front left wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 ; Wheel housing liner .
- Install noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Noise insulation .

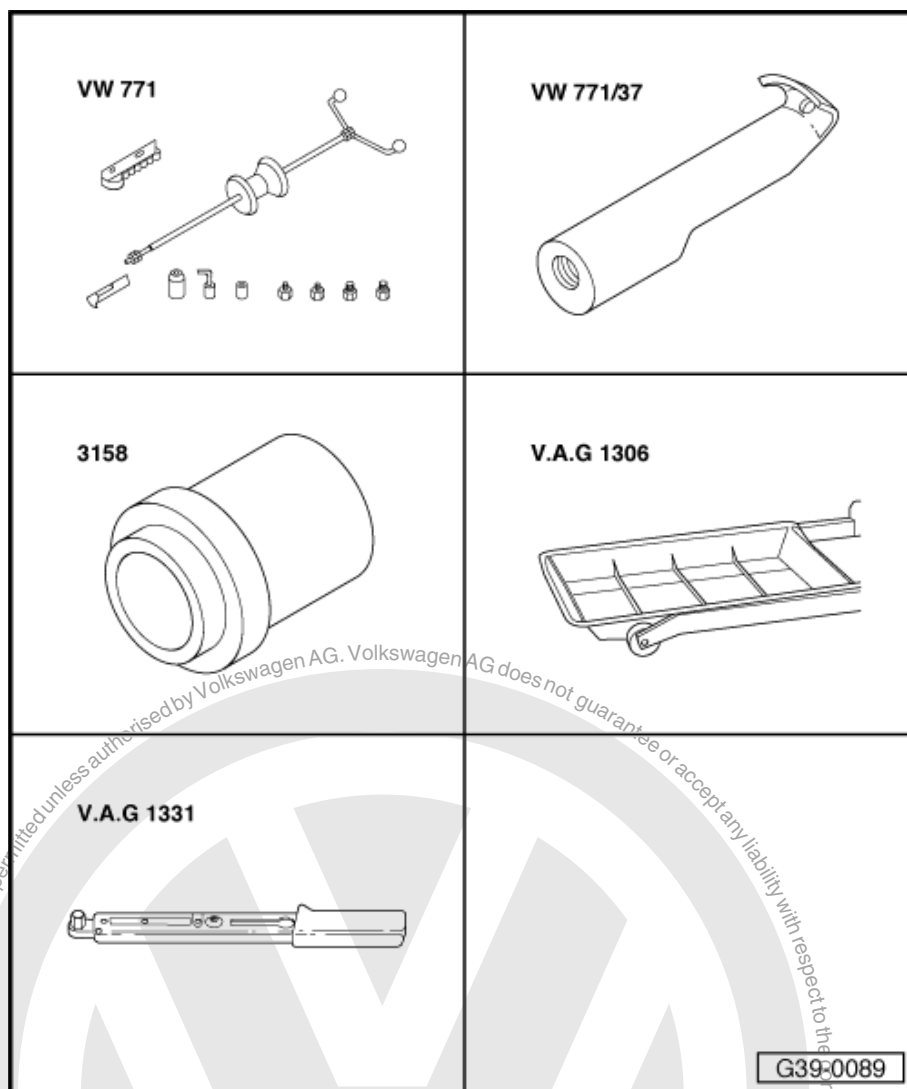




1.1.3 Torque settings:

Flange shaft to gearbox (countersunk bolt) 25 Nm

1.2 Renewing seal for right flange shaft



Special tools and workshop equipment required

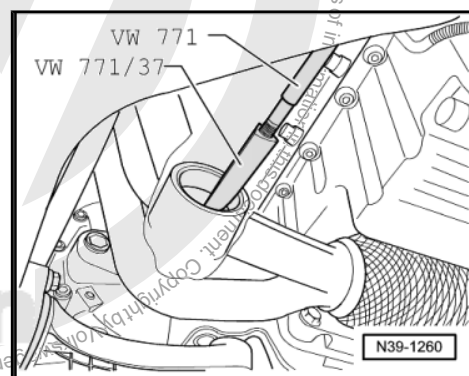
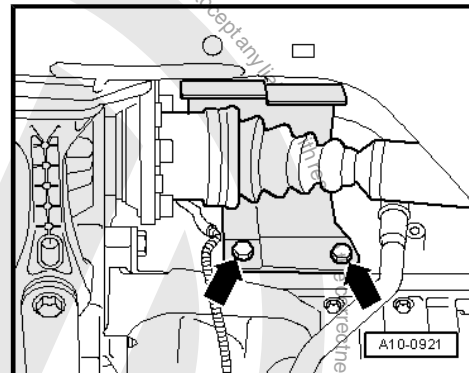
- ◆ Multipurpose tool -VW 771-
- ◆ Puller hooks -VW 771/37-
- ◆ Drift sleeve -3158-
- ◆ Torque wrench -V.A.G 1331-

1.2.1 Removing

- Remove noise insulation ⇒ General body repairs, exterior;
Rep. Gr. 50 ; Noise insulation .
- Turn steering to right to full lock.

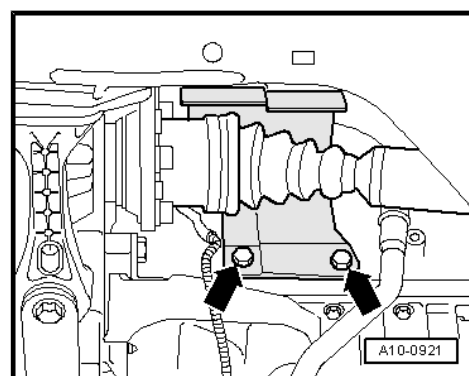
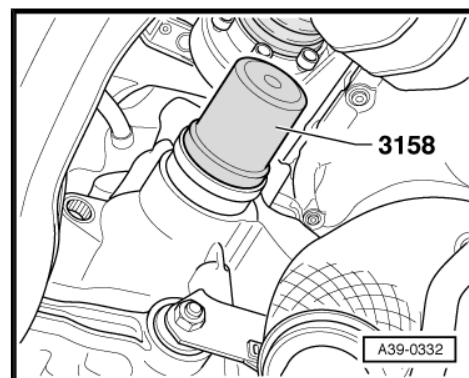


- Remove drive shaft protective cover from engine -arrows-, if fitted.
- Unbolt drive shaft from flange shaft.
- Tie up drive shaft as high as is possible. Take care not to damage paint on drive shaft in the process.
- Place drip tray under gearbox.
- Remove flange shaft securing bolts by screwing two bolts into flange and counterholding flange shaft with a lever.
- Pull out flange shaft with compression spring.
- Pull out flange shaft oil seal using multi-purpose tool -VW 771- and puller hooks -VW 771/37- .



1.2.2 Installing

- Drive in new seal to stop, being careful not to cant seal.
- Half-fill space between sealing lip and dust lip with sealing grease -G 052 128 A1- .
- Insert flange shaft.
- Secure flange shaft with countersunk bolt.
- Reconnect drive shaft to flange shaft ⇒ Running gear, axles, steering; Rep. Gr. 40 ; Repairing drive shaft; Removing and installing drive shafts .
- Install drive shaft protective cover, if present, on engine -arrows- ⇒ Running gear, axles, steering; Rep. Gr. 40 ; Suspension .
- Check gear oil ⇒ [page 72](#) .
- Install noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Noise insulation .



1.2.3 Torque settings:

Flange shaft to gearbox (countersunk bolt) 25 Nm

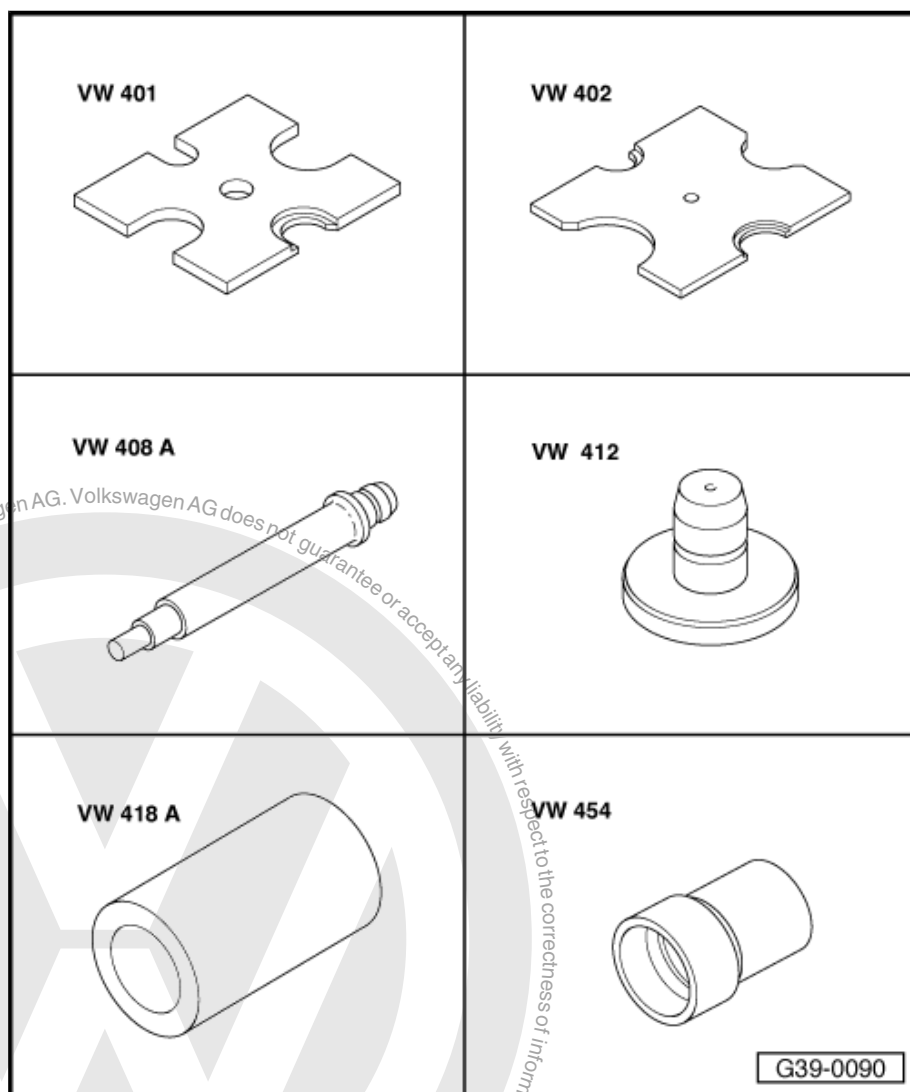


2 Differential

2.1 Dismantling and assembling differential

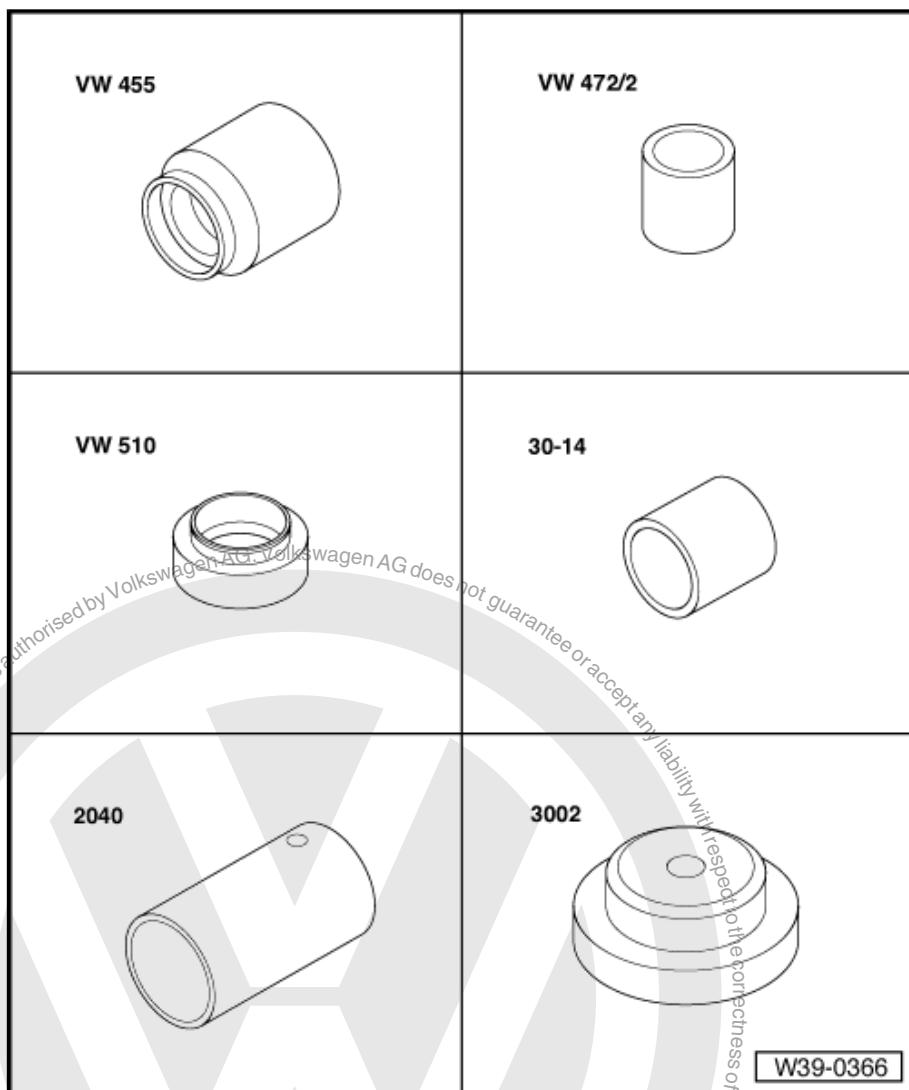
Special tools and workshop equipment required

- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-
- ◆ Press tool -VW 408 A-
- ◆ Press tool -VW 412-
- ◆ Tube -VW 418 A-
- ◆ Thrust piece -VW 454-



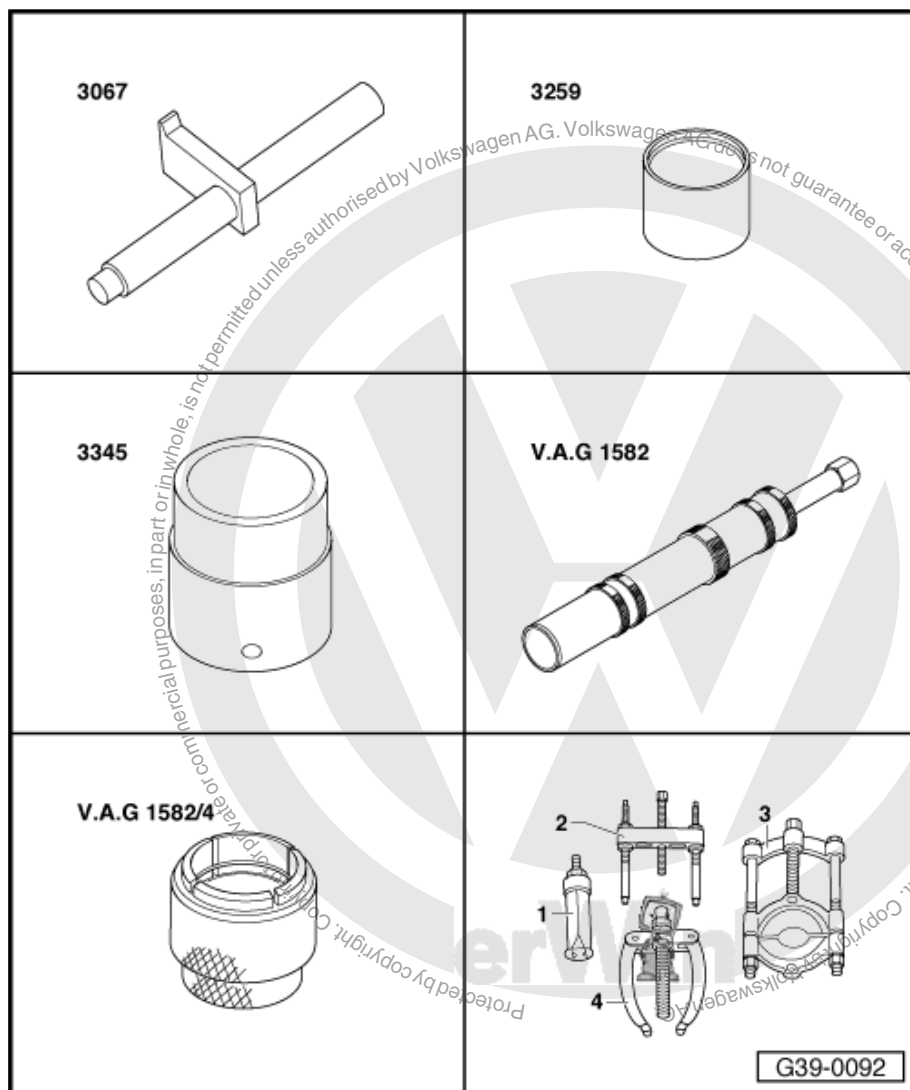


- ◆ Installing sleeve -VW 455-
- ◆ Spacer sleeve -VW 472/2-
- ◆ Thrust pad -VW 510-
- ◆ Tube -30 - 14-
- ◆ Tube -2040-
- ◆ Thrust piece -3002-



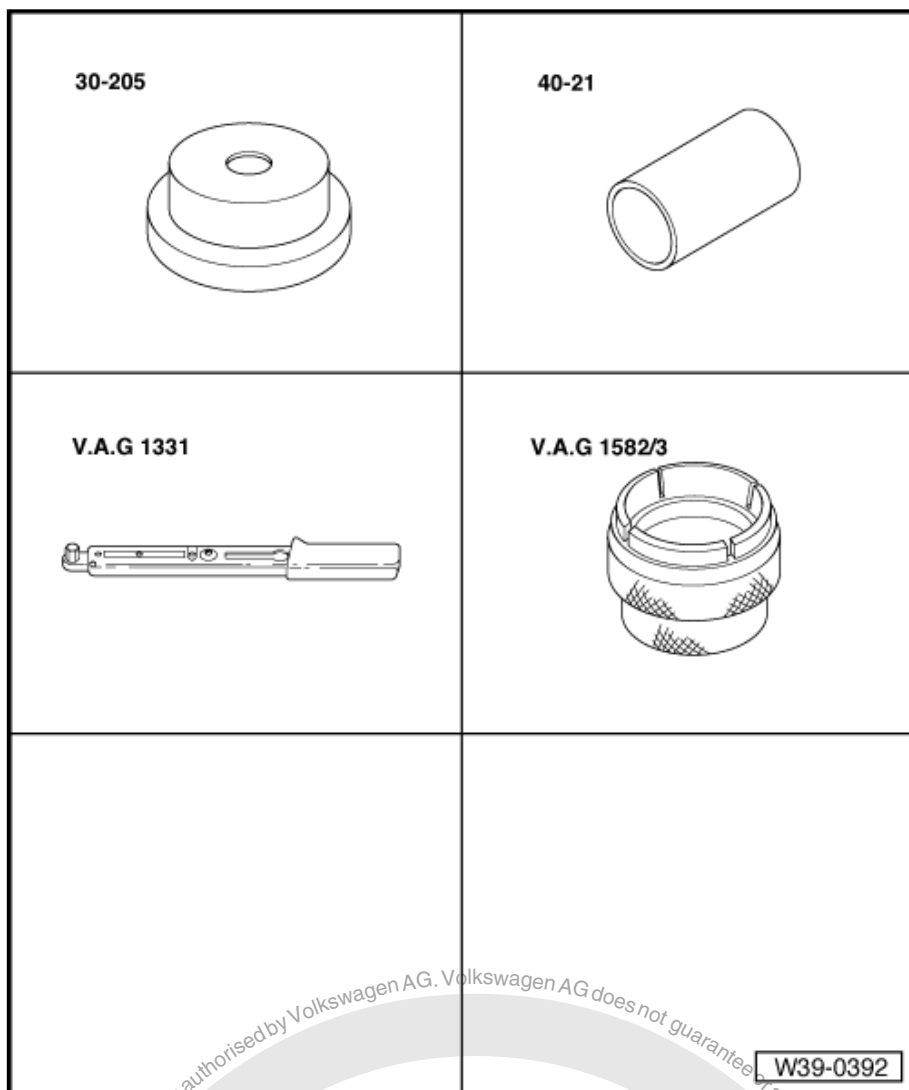


- ◆ Counterhold -3067-
- ◆ Tube -3259-
- ◆ Wheel bearing tube -3345-
- ◆ Tapered roller bearing puller -V.A.G 1582-
- ◆ Grip -V.A.G 1582/4-
- ◆ Internal puller -1- Kukko 21/7-
- ◆ Counter support -4- Kukko 22/2-





- ◆ Thrust plate -30 - 205-
- ◆ Drift sleeve -40 - 21-
- ◆ Torque wrench -
V.A.G 1331- (5 ... 50 Nm)
- ◆ Grip -V.A.G 1582/3-



Note

- ◆ Heat tapered roller bearing inner race to 100° C before installing.
- ◆ Always renew both tapered roller bearings together as a set.
- ◆ If tapered roller bearings, differential cage, gearbox housing or clutch housing is renewed, adjust differential
⇒ [page 132](#).



1 - Countersunk bolt, 25 Nm

- ☐ Screw into threaded piece
⇒ [Item 8 \(page 128\)](#)

2 - Right flange shaft

3 - Compression spring for flange shaft

- ☐ Installed behind flange shafts

4 - Thrust washer

- ☐ Installation position:
shoulder towards spring

5 - Tapered ring

- ☐ Installation position:
taper towards differential cage

6 - Retaining ring

- ☐ Holds tapered ring, thrust washer and spring in position when flange shaft is removed

7 - Sun wheel

- ☐ Installing ⇒ [page 131](#)

8 - Threaded piece

- ☐ Installing ⇒ [page 131](#)

9 - Differential pinion pin

- ☐ To remove, shear off spring pin
⇒ [Item 18 \(page 129\)](#)
⇒ [page 131](#)
- ☐ Installing ⇒ [page 131](#)

10 - Planet pinion

- ☐ Installing ⇒ [page 131](#)

11 - One-piece thrust washer

- ☐ Coat with gear oil when installing

12 - Left flange shaft

13 - Oil seal for left flange shaft

- ☐ Renewing with manual gearbox installed ⇒ [page 120](#)

14 - Shim S₁

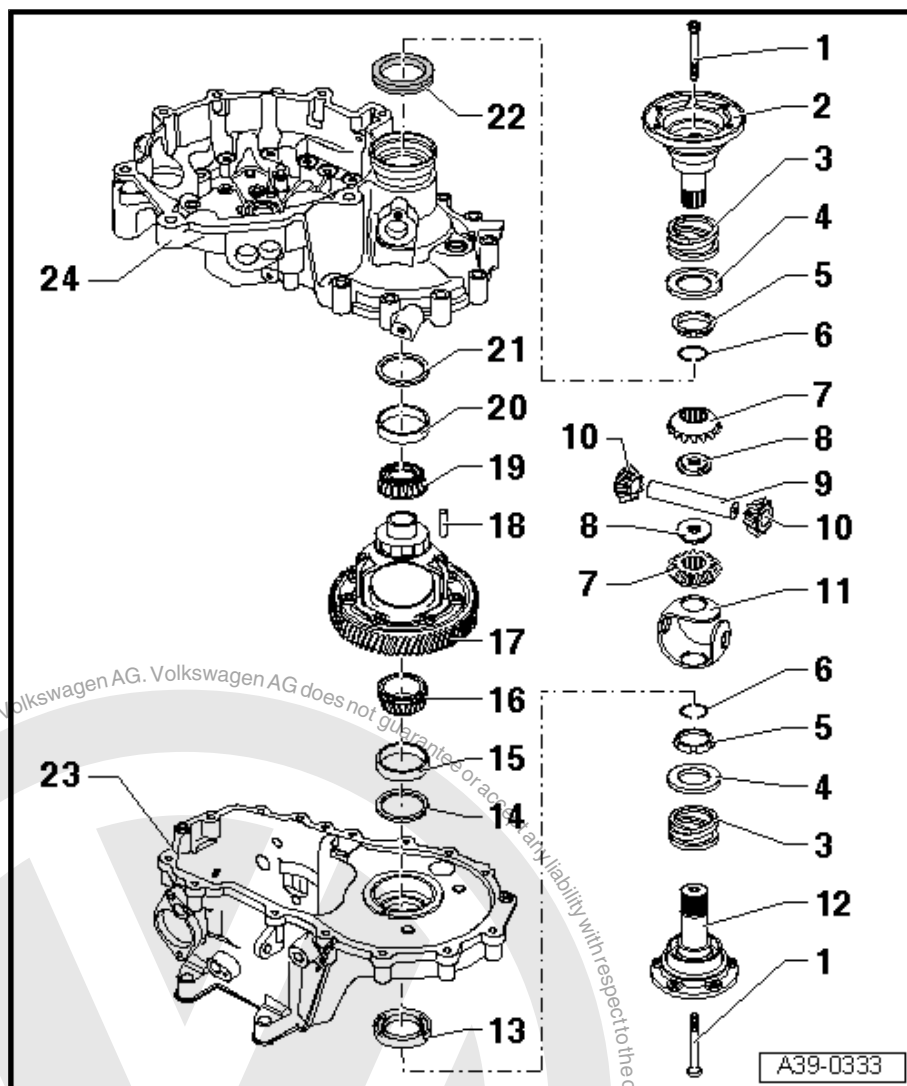
- ☐ For differential
- ☐ Always 1 mm thick
- ☐ Shim S₁ discontinued as of gearbox date 04 12 6 ⇒ [page 134](#)
- ☐ Bearing seat for tapered roller bearing outer race adapted in gearbox housing
- ☐ Allocation ⇒ Electronic parts catalogue (ETKA)

15 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 129](#)
- ☐ Pressing in ⇒ [page 129](#)

16 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 130](#)
- ☐ Pressing on ⇒ [page 130](#)





17 - Differential cage

- ☐ With final drive gear

18 - Spring pin

- ☐ For securing planet pinion pin
- ☐ Is sheared off when removed ⇒ [page 131](#)

19 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 131](#)
- ☐ Pressing on ⇒ [page 131](#)

20 - Tapered roller bearing outer race

- ☐ Pressing out ⇒ [page 130](#)
- ☐ Pressing in ⇒ [page 130](#)

21 - Shim S₂

- ☐ For differential
- ☐ Determining thickness ⇒ [page 132](#)

22 - Oil seal for right flange shaft

- ☐ Renewing with manual gearbox installed ⇒ [page 122](#) .

23 - Gearbox housing

- ☐ Repairing ⇒ [page 89](#)
- ☐ Shim S₁ discontinued as of gearbox date 04 12 6 ⇒ [page 134](#)
- ☐ Bearing seat for tapered roller bearing outer race adapted
- ☐ Allocation ⇒ Electronic parts catalogue (ETKA)

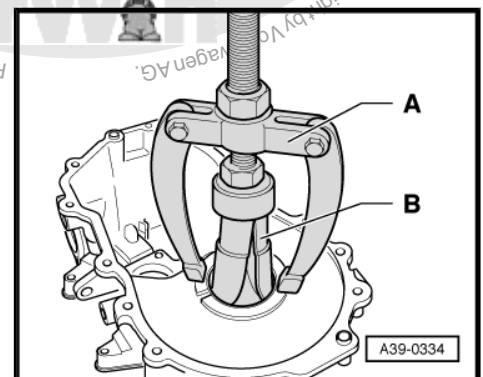
24 - Clutch housing

- ☐ Repairing ⇒ [page 89](#)

Pulling tapered roller bearing outer race out of gearbox housing

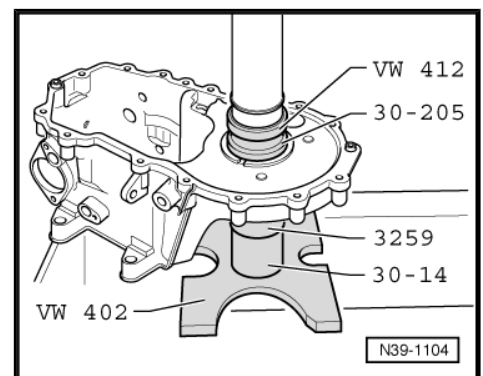
A - Counter support , e.g. -Kukko 22/2-

B - Internal puller, 46...58 mm , e.g. -Kukko 21/7-



Pressing tapered roller bearing outer race into gearbox housing

- Check whether a shim S₁ has to be placed under the outer race ⇒ [page 134](#)
- Fit a 1 mm thick shim S₁ under outer race as necessary.
- Support gearbox housing with tube -3259- directly below bearing support.



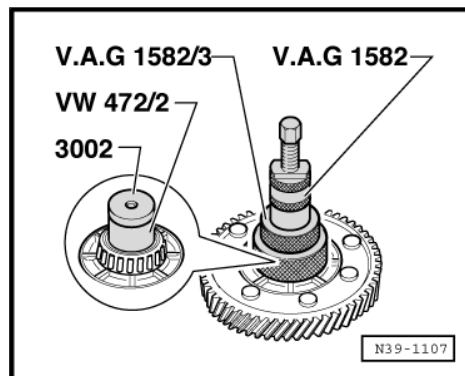


Pulling off tapered roller bearing inner races



Note

Both tapered roller bearing inner races are pulled off the differential cage in the same way.



Pressing on tapered roller bearing inner race

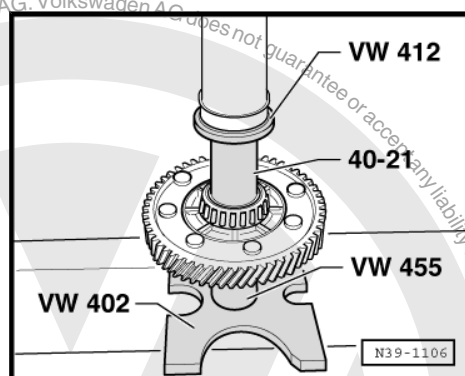


WARNING

Wear protective gloves!

- Heat inner tapered roller bearing race to approx. 100 °C before pressing on.
- Support inner race on opposite side using installing sleeve - VW 455- .

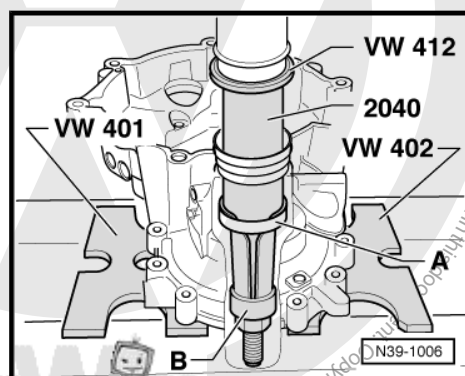
Shoulder of sleeve -VW 455- faces towards differential cage.



Pressing tapered roller bearing outer race -A- out of clutch housing

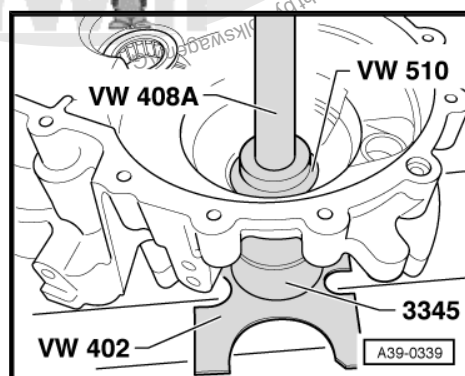
B - Internal puller, 46...58 mm , e.g. -Kukko 21/7-

- Clamp internal puller securely behind tapered roller bearing outer race.



Pressing tapered roller bearing outer race into clutch housing

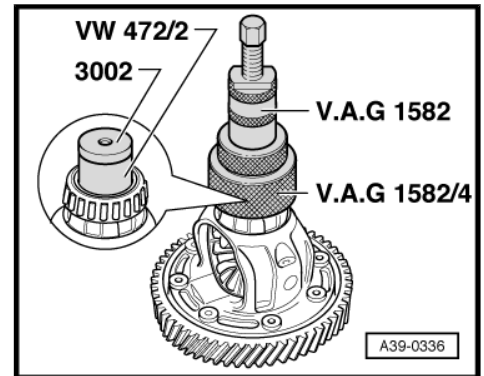
- Support clutch housing with wheel bearing tube -3345- directly below bearing mounting.





Pulling off tapered roller bearing inner race

- Before fitting extractor, position spacer sleeve -VW 472/2- and thrust piece -3002- on differential housing.



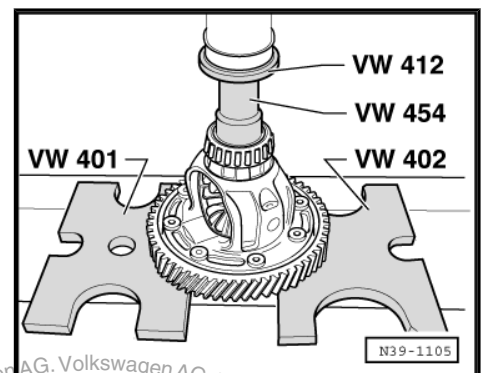
Pressing on tapered roller bearing inner race



WARNING

Wear protective gloves!

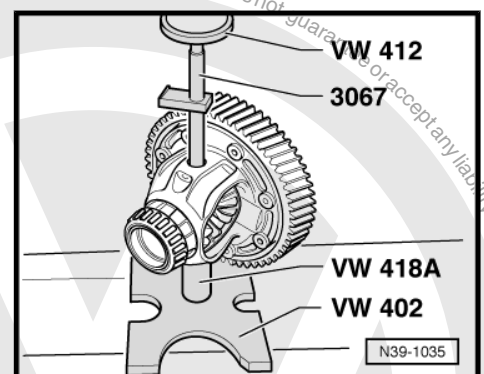
- Heat inner tapered roller bearing race to approx. 100 °C before pressing on.



Pressing out differential pinion pin

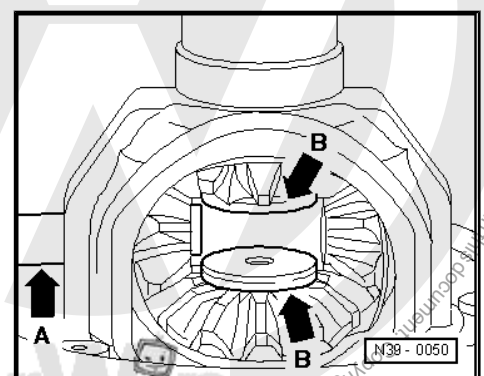
When pressed out, spring pin will be sheared off.

- Drive remainder of spring pin out of differential housing.



Installing differential bevel gears

- Lubricate one-piece thrust washer with gear oil and install.
- Install both sun wheels and secure (e.g. with flange shaft).
- Insert planet pinions offset 180° and pivot into position.
- Press in differential pinion pin (-arrow A-) to first planet pinion.
- Place threaded pieces -arrows B- in sun gears.
- Drive differential pinion pin into final position and secure with spring pin.

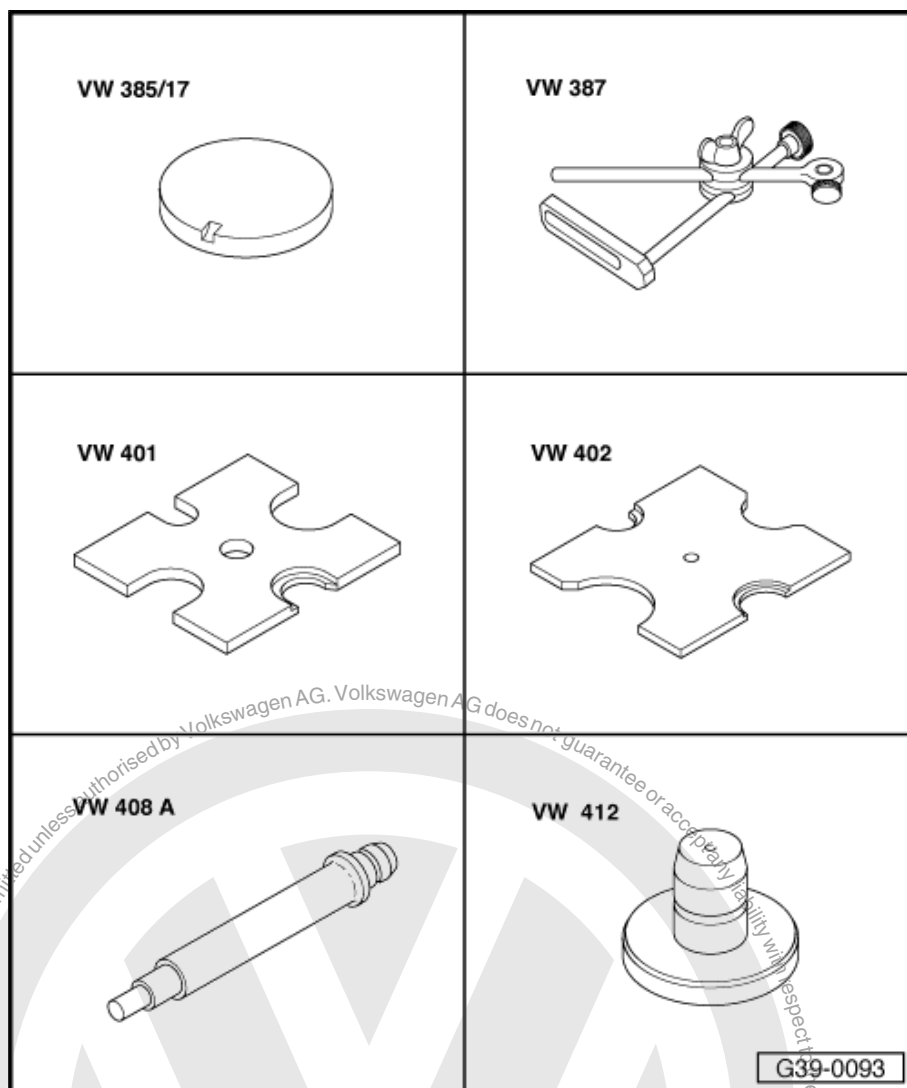




2.2 Adjusting differential

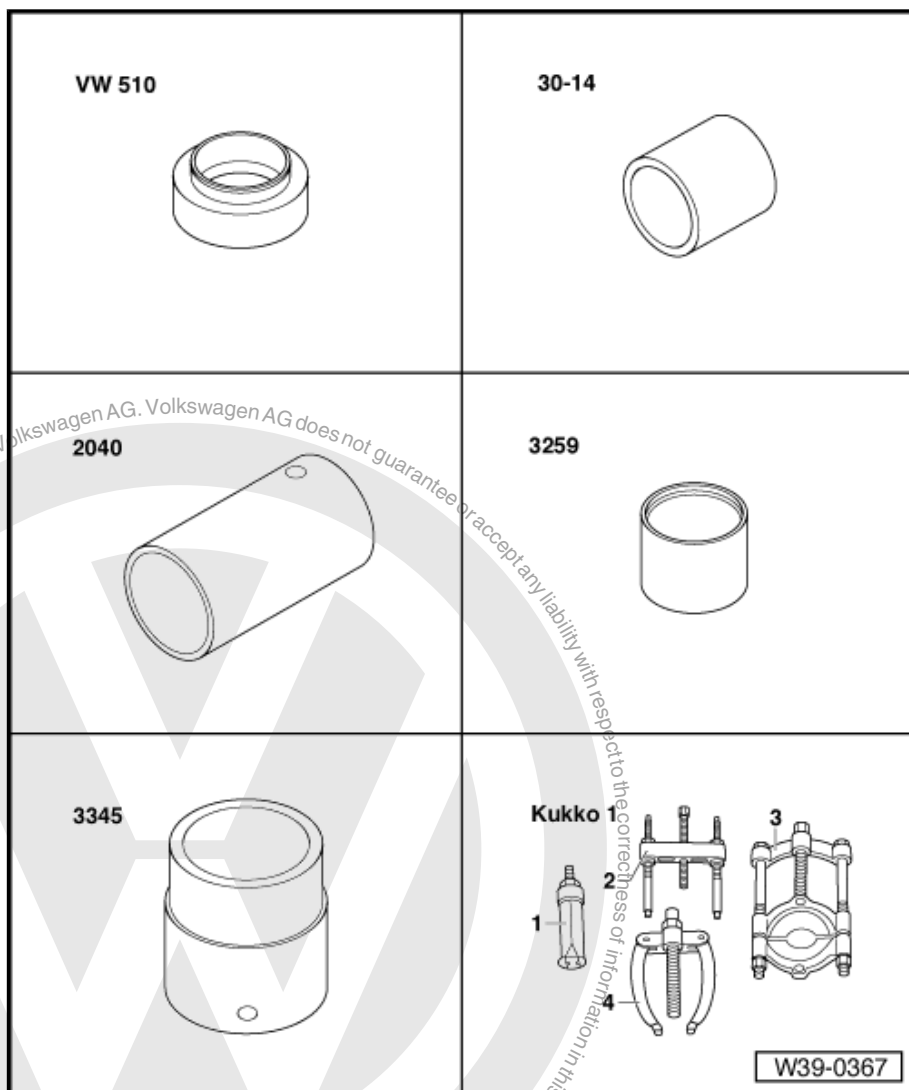
Special tools and workshop equipment required

- ◆ End dimension plate - VW 385/17-
- ◆ Universal dial gauge bracket -VW 387-
- ◆ Thrust plate -VW 402-
- ◆ Thrust plate -VW 401-
- ◆ Press tool -VW 408-
- ◆ Press tool -VW 412-

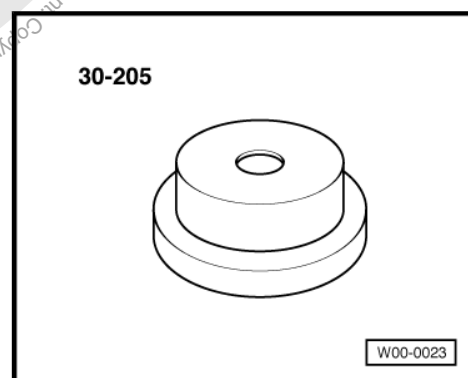




- ◆ Thrust pad -VW 510-
- ◆ Tube -30 - 14-
- ◆ Tube -2040-
- ◆ Tube -3259-
- ◆ Wheel bearing tube -3345-
- ◆ Torque wrench -
V.A.G 1331-
- ◆ Dial gauge



- ◆ Thrust plate -30 - 205-



It is necessary to readjust the differential when the following components are renewed:

- ◆ Gearbox housing
- ◆ Clutch housing
- ◆ Differential cage

or the



♦ Tapered roller bearings of differential

Shim S₁ for the tapered roller bearing outer race has been discontinued as of gearbox date 04 12 6.

Bearing seat for tapered roller bearing outer race adapted

- Measure the depth of the bearing seat for tapered roller bearing outer race in gearbox housing

Dimension "a"	Shim S ₁
15.2 mm	no
16.2 mm	yes

Continuation for all

- Press tapered roller bearing outer race (gear wheel side) with shim S₁ (always 1 mm thick) into the gearbox housing.



Note

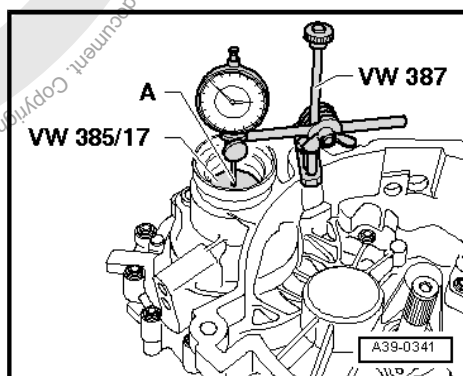
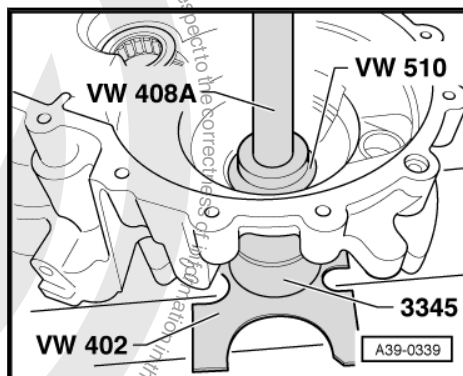
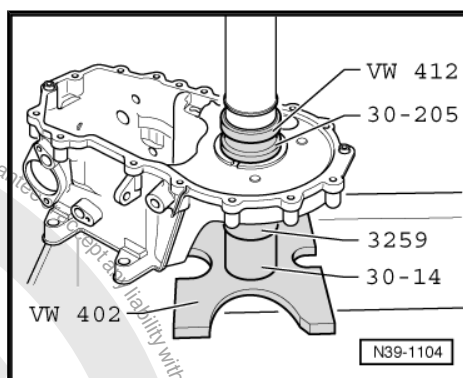
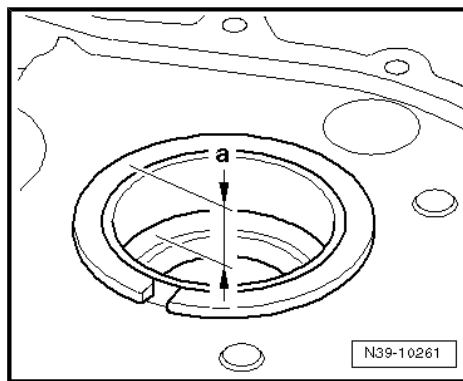
Inner and outer tapered roller bearing races are paired. Do not interchange!

- Press tapered roller bearing outer race (opposite gear wheel) with no shim into gearbox housing.
- Insert differential in gearbox housing.
- Fit clutch housing and tighten 5 bolts to specified torque
⇒ [page 77](#) .

- Attach dial gauge and set to "0" with 1 mm preload.

A - 30 mm dial gauge extension

- Set dial gauge to "0" with 1 mm preload.
- Move differential up and down. Read and note play indicated on dial gauge. (Example: 1.50 mm)



2.2.1 Determining shim S₂

The specified bearing preload is obtained for S₂ by adding a constant value for preload (0.35 mm) to the measured value.

Example:

Measured value 1.50 mm



+ Preload (constant)	0.35 mm
Thickness of shim S ₂ =	1.85 mm

- Remove clutch housing and press out tapered roller bearing outer race -A-.

B - Internal puller, 46...58 mm , e.g. -Kukko 21/7-

- Allocate shim(s) using ⇒ Electronic parts catalogue “ETKA” .

The various thicknesses make it possible to achieve the exact shim thickness required.

If the size of shim required is larger than those listed in the ⇒ Electronic parts catalogue “ETKA” , insert two shims totalling the correct figure.

- Insert correct S₂ shim (in example 1.85 mm) and press tapered roller bearing outer race into clutch housing again.
- Fit clutch housing and tighten bolts to specified torque setting
⇒ [page 77](#) .

