



## Workshop Manual up! 2017 ➤

### 6-speed manual gearbox 0DQ

Edition 11.2017





## 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 Safety information

(VRL011035; Edition 11.2017)

⇒ [“1.1 Safety measures when working on vehicles with a start/stop system”, page 1](#)

#### 1.1 Safety measures when working on vehicles with a start/stop system



##### WARNING

*Risk of injury due to automatic start of engine on vehicles with a start/stop system.*

- ◆ *Deactivate the start/stop system when working on vehicle. Switch off ignition.*
- ◆ *Switch on the ignition briefly only if required.*





## 2 Identification

⇒ "2.1 Gearbox identification", page 2

### 2.1 Gearbox identification

Configuration of identification codes and construction data on manual gearbox -arrow-

Example:

Manual gearbox 0DQ -arrow-

Example:

Codes and production date of gearbox

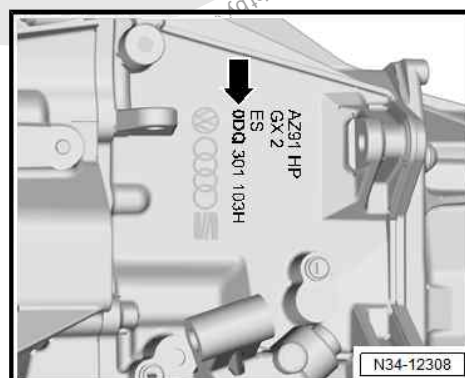
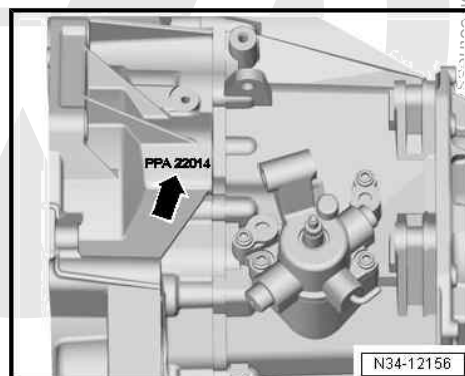
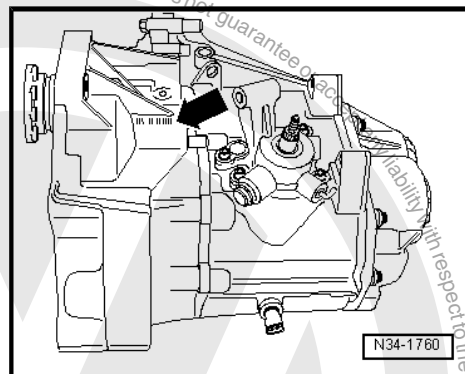
Example:	SJE	22	01	4
	Codes	Day	Month	Year (2014) of manufacture

Additional data provide information about the production facility.



Note

The gearbox code is also included on the vehicle data stickers.





### 3 Technical data

⇒ "3.1 Allocation gearbox - engine", page 3

⇒ "3.2 Capacities", page 3

⇒ "3.3 Calculation of gear ratios", page 3

#### 3.1 Allocation gearbox - engine

⇒ "3.1.1 Allocation gearbox - engine, manual gearbox 0DQ", page 3

##### 3.1.1 Allocation gearbox - engine, manual gearbox 0DQ

Manual gearbox	6-speed, 0DQ		
<b>Codes</b>	<b>SJE</b>		
Manufactured from to	05.01		
Allocation Engine	1.0 l - 85 kW petrol		
Ratio Z2 : Z1 Final drive	61 : 14 = 4.357		

Glean following data from ⇒ Electronic parts catalogue (ETKA) :

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

#### 3.2 Capacities

Capacity of manual gearbox	2.2 l
----------------------------	-------

#### 3.3 Calculation of gear ratios

Example:

	6th gear	Final drive
Drive gear	ZG <sub>1</sub> = 46	ZA <sub>1</sub> = 24
Driven gear	ZG <sub>2</sub> = 33	ZA <sub>2</sub> = 70

$$i = ZG_2 : ZG_1 \text{ } ^1)$$

$$i_G = \text{gear ratio} = ZG_2 : ZG_1 = 33 : 46 = 0.717$$

$$i_A = \text{final drive ratio} = ZA_2 : ZA_1 = 70 : 24 = 2.917$$

$$i_{\text{total}} = \text{Overall ratio} = i_G \times i_A = 0.717 \times 2.917 = 2.091$$

1) Z<sub>1</sub> = No. of teeth on driving gear, Z<sub>2</sub> = No. of teeth on driven gear

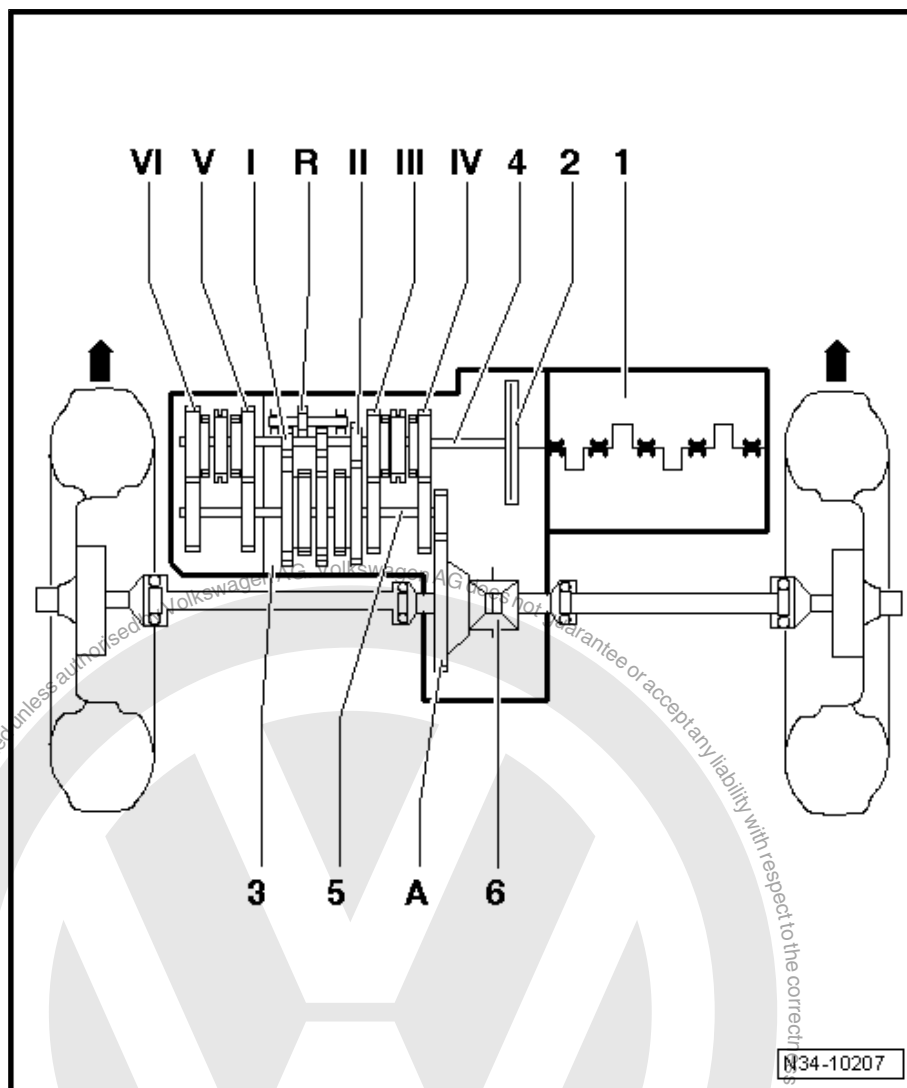


## 4 Overview - power transmission

Designation:

-Arrows- point in direction of travel.

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



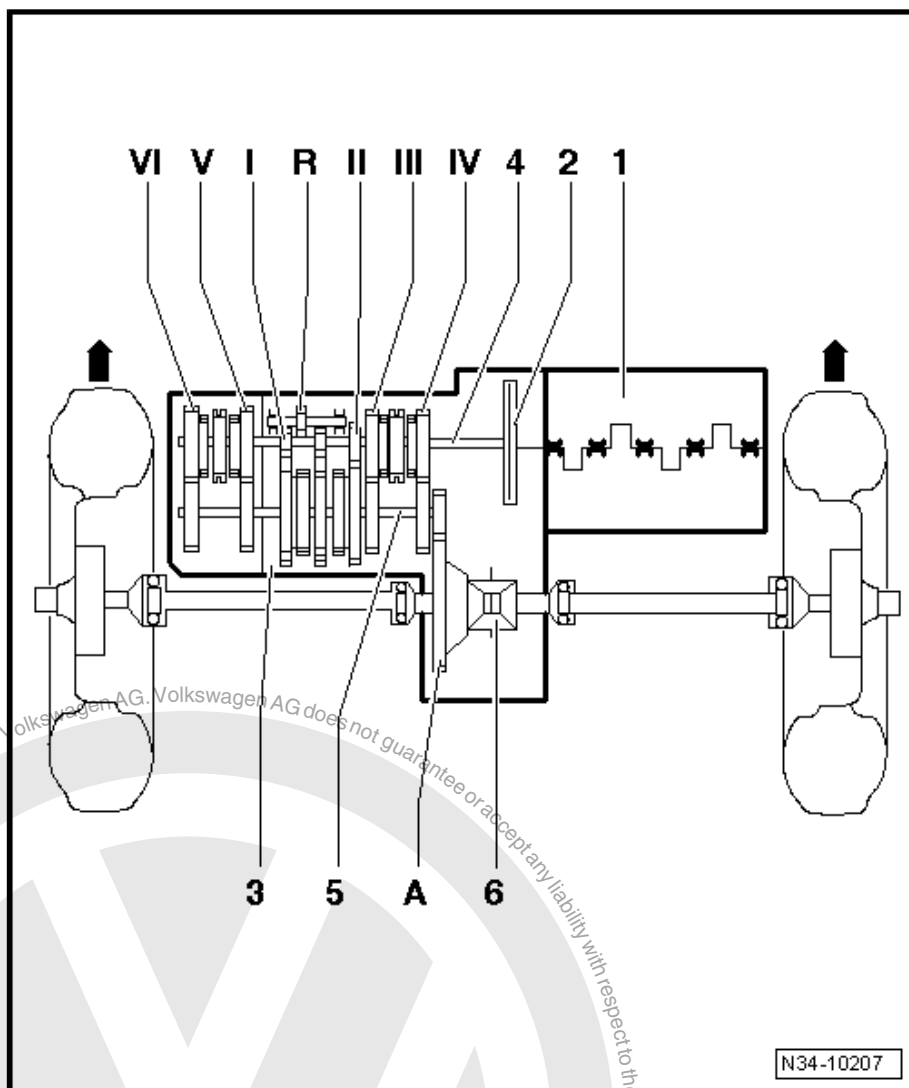
Ratio

-Arrows- point in direction of travel.





- I - 1st gear
- II - 2nd gear
- III - 3rd gear
- IV - 4th gear
- V - 5th gear
- VI - 6th gear
- R - Reverse gear
- A - Final drive



N34-10207

## 5 Electrical components

⇒ "5.1 Overview of fitting locations - electrical components", page 6

### 5.1 Overview of fitting locations - electrical components

⇒ "5.1.1 Overview of fitting locations – electrical components, manual gearbox", page 6

⇒ "5.1.2 Overview of fitting locations – electrical components, clutch mechanism", page 6

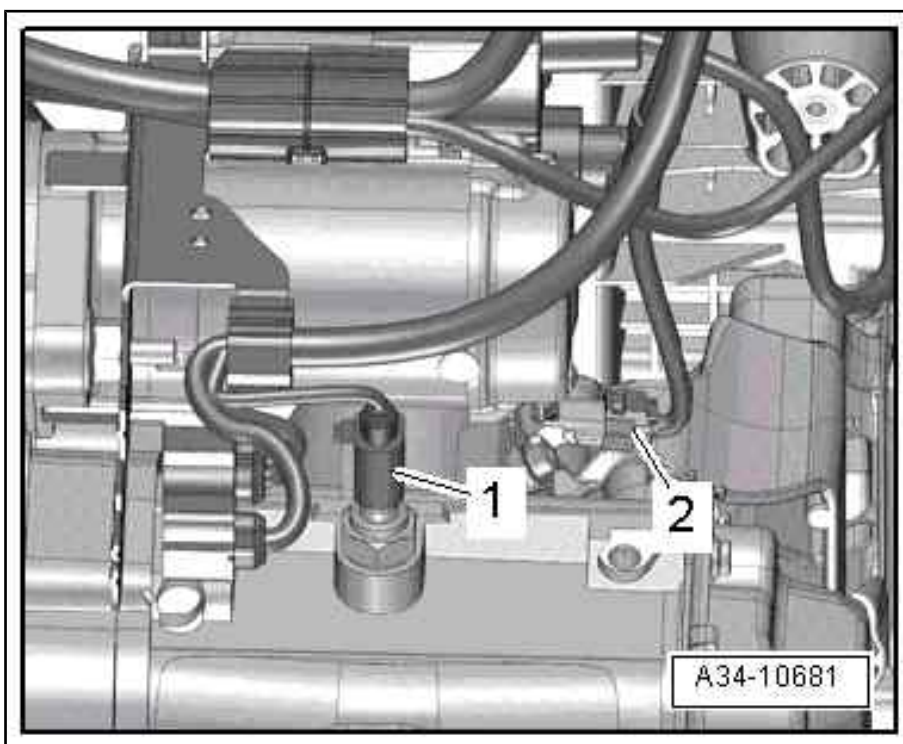
#### 5.1.1 Overview of fitting locations – electrical components, manual gearbox

##### 1 - Reversing light switch - F4-

- ❑ Installation location: below starter
- ❑ Removing and installing  
⇒ [page 80](#)

##### 2 - Gearbox neutral position sender - G701-

- ❑ Fitting location: in area of selector unit beneath angled rod for securing selector shaft
- ❑ Removing and installing  
⇒ [page 80](#)



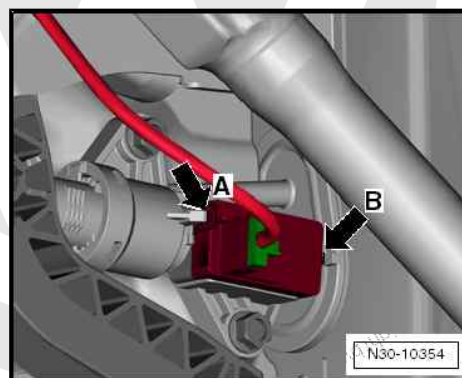
#### 5.1.2 Overview of fitting locations – electrical components, clutch mechanism

##### Clutch position sender - G476-

Location: in passenger compartment on clutch master cylinder.

Held in position by retainer -arrow A- and -arrow B-

Removing and installing clutch position sender - G476-  
⇒ [page 19](#).



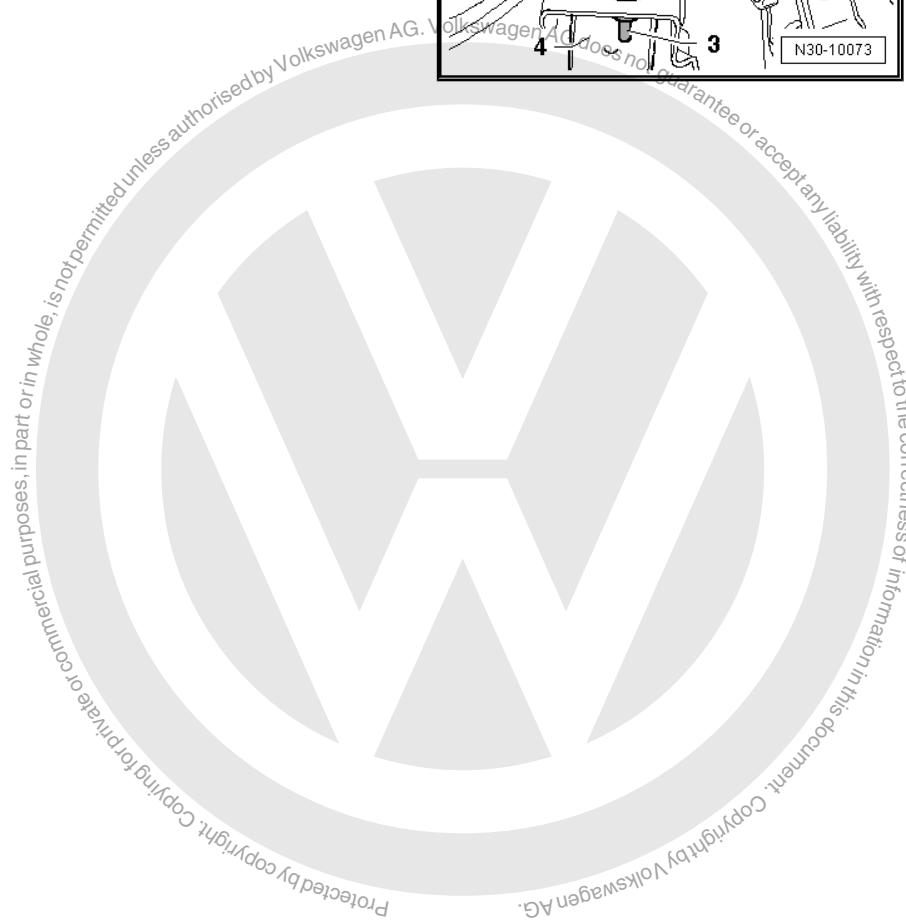
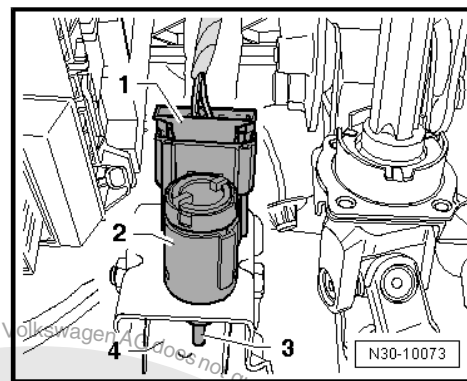


### Clutch pedal switch - F36- (item -2-)

Location: in passenger compartment on mounting bracket for clutch pedal

Connector -1- is connected; plunger -3- makes contact with clutch pedal -4-.

Removing and installing clutch pedal switch - F36- ⇒ [page 31](#)





## 6 Repair instructions

⇒ **"6.1 General repair instructions", page 8**

### 6.1 General repair instructions

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

A number of general notes on the individual repair procedures, which can otherwise be found in the relevant sections of the manual, are summarised here. They apply for this particular workshop manual.

#### Special tool

For a complete list of special tools used in this workshop manual, see ⇒ Electronic parts catalogue (ETKA) .

#### 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 the ⇒ Electronic parts catalogue (ETKA) .
- ◆ After repairing the gearbox, fill with gear oil.

#### Gaskets and seals

After removing gaskets and seals, always inspect contact surfaces of housing and shaft for burrs resulting from removal or for other signs of damage.

- ◆ Thoroughly clean joint surfaces and apply sealant .
- ◆ Allocation ⇒ Electronic parts catalogue (ETKA)
- ◆ Before installing radial oil seals, half-fill space between sealing lips with sealing grease -arrow-.
- ◆ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .
- ◆ The open side of the oil seals faces toward the side with fluid filling.
- ◆ Lightly oil O-rings before installing; this prevents the rings being crushed when inserted.

#### Sealant

- ◆ Thoroughly clean housing joint surfaces before applying sealant .
- ◆ Apply sealant uniformly and not too thickly.
- ◆ Allocation ⇒ Electronic parts catalogue (ETKA) .
- ◆ Breather holes must remain free of sealant .





## Locking devices

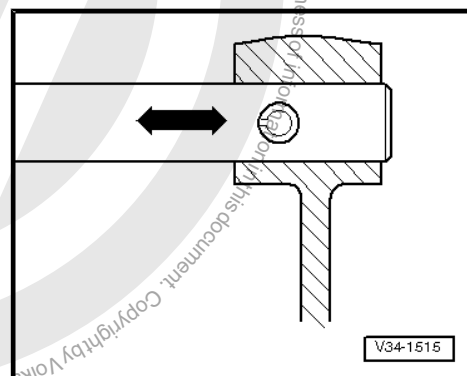
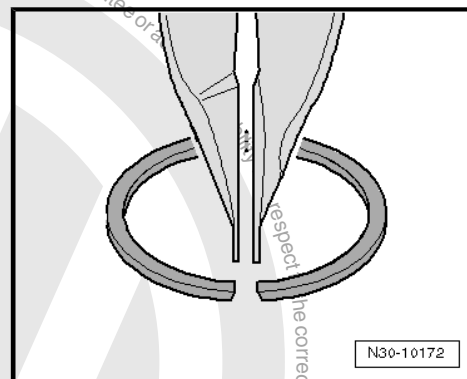
- ◆ Renew retaining rings.
- ◆ Do not overstretch retaining rings.
- ◆ Retaining rings must locate properly in grooves.
- ◆ Renew spring pins. Installation position: slot must be in line with direction of force.

## Nuts and bolts

- ◆ Loosen and tighten securing bolts and nuts for covers and housings alternately and diagonally.
- ◆ Do not cant especially delicate parts, such as clutch pressure plates. Loosen and tighten bolts and nuts alternately and in stages.
- ◆ Specified torques given are for unoled nuts, bolts and screws.
- ◆ Renew self-locking bolts and nuts after each removal.
- ◆ 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.
- ◆ Check pitch of thread, to ensure correct thread chaser is used to clean threads and to ensure the threads are not damaged.

## Mountings

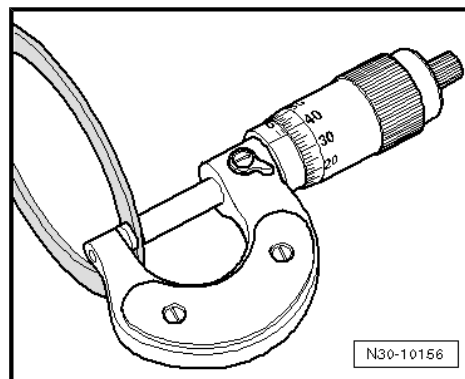
- ◆ Lubricate all bearings with gear oil before installing.
- ◆ Install new tapered roller bearings as supplied and do not lubricate additionally.
- ◆ Install needle bearings with lettered side (thicker metal) towards fitting tool.
- ◆ Tapered roller bearings fitted to one shaft must be renewed as a 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.





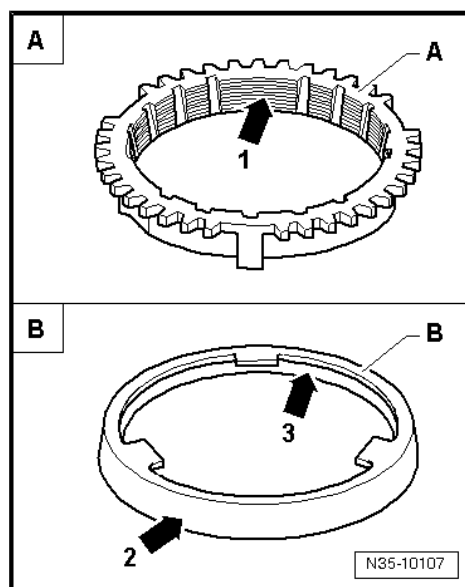
## Shims

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



## Synchro-rings

- ◆ Do not interchange them. When reusing synchro-rings, always fit to the same synchromeshed 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 the cone of the synchromeshed gear for »scoring« and »signs of abnormal wear«.
- ◆ Moisten synchromesh mechanism with gear oil before installing.



## Gears and synchro-hubs

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

## Synchromeshed gears

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

## Clutch operation

Disconnect battery earth strap ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

When reconnecting battery, refer to ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

## Clutch

- ◆ Make sure that the pressure plate does not cant: loosen and tighten bolts alternately and diagonally, and in several gradual stages (1 full turn).
- ◆ In order to reduce the smell of a burned clutch, the clutch housing as well as the stopping face of the flywheel must be thoroughly cleaned with a cloth.



## 30 – Clutch

### 1 Clutch operation

⇒ [“1.1 Overview of fitting locations – clutch mechanism”, page 11](#)

⇒ [“1.2 Assembly overview - pedal cluster”, page 13](#)

⇒ [“1.3 Assembly overview - clutch hydraulics”, page 14](#)

⇒ [“1.4 Assembly overview - clutch release mechanism”, page 17](#)

⇒ [“1.5 Removing and installing bearing bush”, page 18](#)

⇒ [“1.6 Checking clutch master cylinder and clutch slave cylinder”, page 18](#)

⇒ [“1.7 Removing and installing clutch position sender G476 ”, page 19](#)

⇒ [“1.8 Removing and installing extension spring”, page 19](#)

⇒ [“1.9 Removing and installing clutch pedal”, page 20](#)

⇒ [“1.10 Removing and installing mounting bracket”, page 20](#)

⇒ [“1.11 Removing and installing clutch master cylinder”, page 24](#)

⇒ [“1.12 Removing and installing clutch slave cylinder”, page 25](#)

⇒ [“1.13 Removing and installing lines for clutch mechanism”, page 27](#)

⇒ [“1.14 Bleeding clutch mechanism”, page 30](#)

⇒ [“1.15 Removing and installing clutch pedal switch F36 ”, page 31](#)

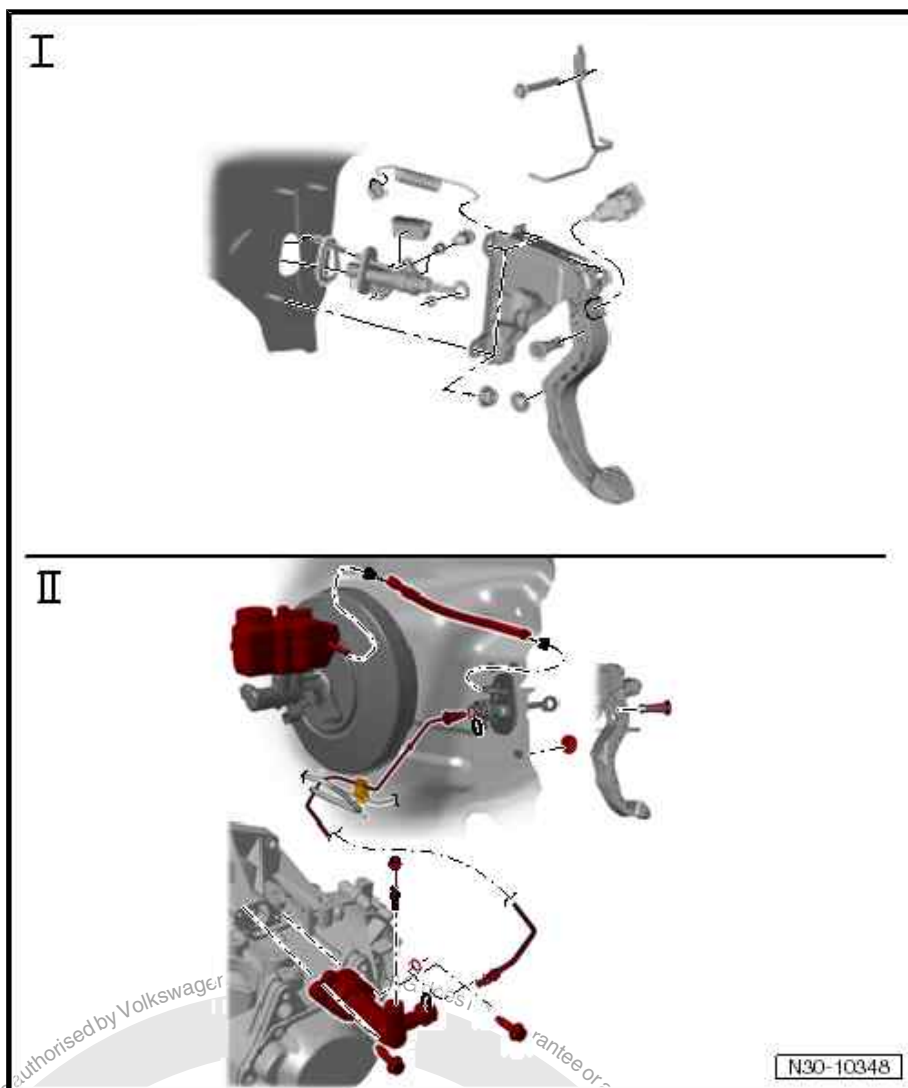
⇒ [“1.16 Repairing clutch release mechanism”, page 32](#)

#### 1.1 Overview of fitting locations – clutch mechanism



I -  
⇒ "1.2 Assembly overview -  
pedal cluster", page 13

II -  
⇒ "1.3.1 Assembly overview -  
clutch hydraulics", page 15







## 1.2 Assembly overview - pedal cluster

### 1 - Bulkhead

- ☐ With support for mounting bracket and clutch master cylinder.

### 2 - Seal

- ☐ Self-adhesive
- ☐ Renew after removing mounting bracket or clutch master cylinder
- ☐ Stick to clutch master cylinder.

### 3 - Supply hose

- ☐ ⇒ ["1.3.1 Assembly overview - clutch hydraulics", page 15](#)

### 4 - Support

- ☐ No specific installation position needs to be adhered to.

### 5 - Clutch position sender - G476-

- ☐ Installed depending on version.
- ☐ Can be checked using ⇒ Vehicle diagnostic tester in [Guided Fault Finding](#) mode
- ☐ Allocation ⇒ Electronic parts catalogue (ETKA)
- ☐ Removing and installing ⇒ [page 19](#)

### 6 - Spring

- ☐ Hooked into mounting bracket and into clutch pedal
- ☐ Removing and installing extension spring ⇒ [page 19](#)

### 7 - Bush

- ☐ Qty. 2
- ☐ Chamfer -arrow- faces clutch master cylinder.
- ☐ Press in flush.

### 8 - Bolt

- ☐ 13 Nm

### 9 - Mounting bracket with clutch pedal

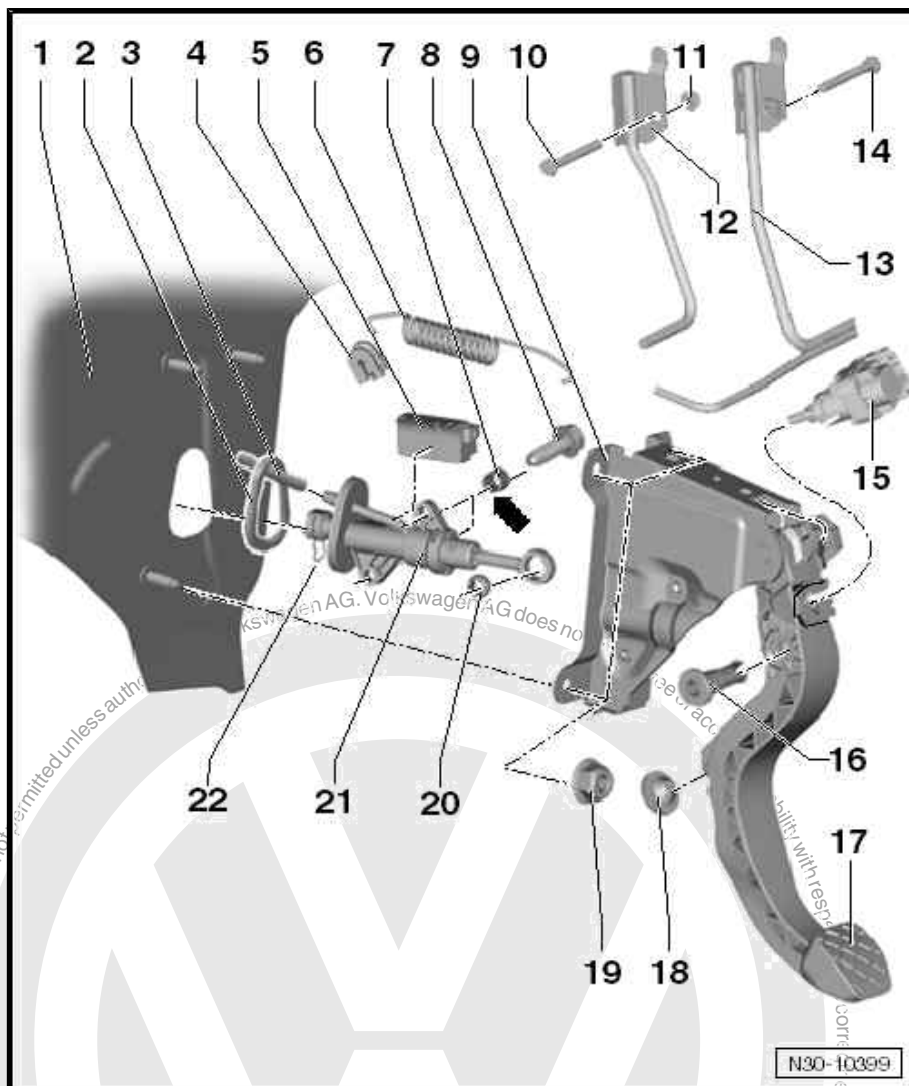
- ☐ Removing and installing ⇒ [page 20](#)

### 10 - Bolt

- ☐ LHD vehicles
- ☐ For crash bar on steering column
- ☐ 20 Nm

### 11 - Hexagon nut

- ☐ LHD vehicles
- ☐ For crash bar on steering column





## 12 - Crash bar

- ☐ LHD vehicles
- ☐ Attached to steering column
- ☐ Allocate components using ⇒ Electronic parts catalogue (ETKA)

## 13 - Crash bar

- ☐ RHD vehicles
- ☐ Attached to steering column
- ☐ Allocate components using ⇒ Electronic parts catalogue (ETKA)

## 14 - Bolt

- ☐ RHD vehicles
- ☐ For crash bar on steering column
- ☐ 20 Nm

## 15 - Clutch pedal switch - F36-

- ☐ Installed depending on version.
- ☐ Allocate components using ⇒ Electronic parts catalogue (ETKA)
- ☐ Removing and installing ⇒ [page 31](#)

## 16 - Pivot pin

- ☐ For plunger/clutch master cylinder
- ☐ Renew after removal

## 17 - Cap

## 18 - Buffer stop

- ☐ For clutch pedal

## 19 - Hexagon nut

- ☐ Qty. 3
- ☐ Self-locking
- ☐ Renew after removal
- ☐ 25 Nm

## 20 - Bearing bush

- ☐ Removing and installing ⇒ [page 18](#)

## 21 - Clutch master cylinder

- ☐ Removing and installing ⇒ [page 24](#)

## 22 - Clip

- ☐ To remove pipe/hose line, pull out clip to stop
- ☐ Can be pressed in as far as stop before fitting line

## 1.3 Assembly overview - clutch hydraulics

⇒ ["1.3.1 Assembly overview - clutch hydraulics", page 15](#)



### 1.3.1 Assembly overview - clutch hydraulics

#### 1 - Brake fluid reservoir

#### 2 - Supply hose

#### 3 - Seal

- ☐ If damaged, renew together with supply hose
- ☐ The seals must be located in supply hose

#### 4 - Clutch master cylinder

- ☐ Removing and installing  
⇒ [page 24](#)

#### 5 - Clip

- ☐ To remove pipe/hose line, pull out clip to stop
- ☐ Can be pressed in as far as stop before fitting line

#### 6 - Mounting bracket with clutch pedal

#### 7 - Pivot pin

- ☐ For plunger/clutch master cylinder

#### 8 - Hexagon nut

- ☐ ⇒ [page 13](#)

#### 9 - Seal / O-ring

- ☐ Renew if damaged
- ☐ Pull onto line connection
- ☐ Insert with brake fluid
- ☐ Seals/O-rings are adapted to material of line connection ⇒ [page 27](#)
- ☐ Allocation ⇒ Electronic parts catalogue (ETKA)

#### 10 - Pipe

- ☐ Installed on left-hand drive vehicles as an alternative to pipe/hose line.
- ☐ Different lengths for LHD and RHD vehicles.
- ☐ Allocation ⇒ Electronic parts catalogue (ETKA)

#### 11 - Pipe/hose line

#### 12 - Bracket

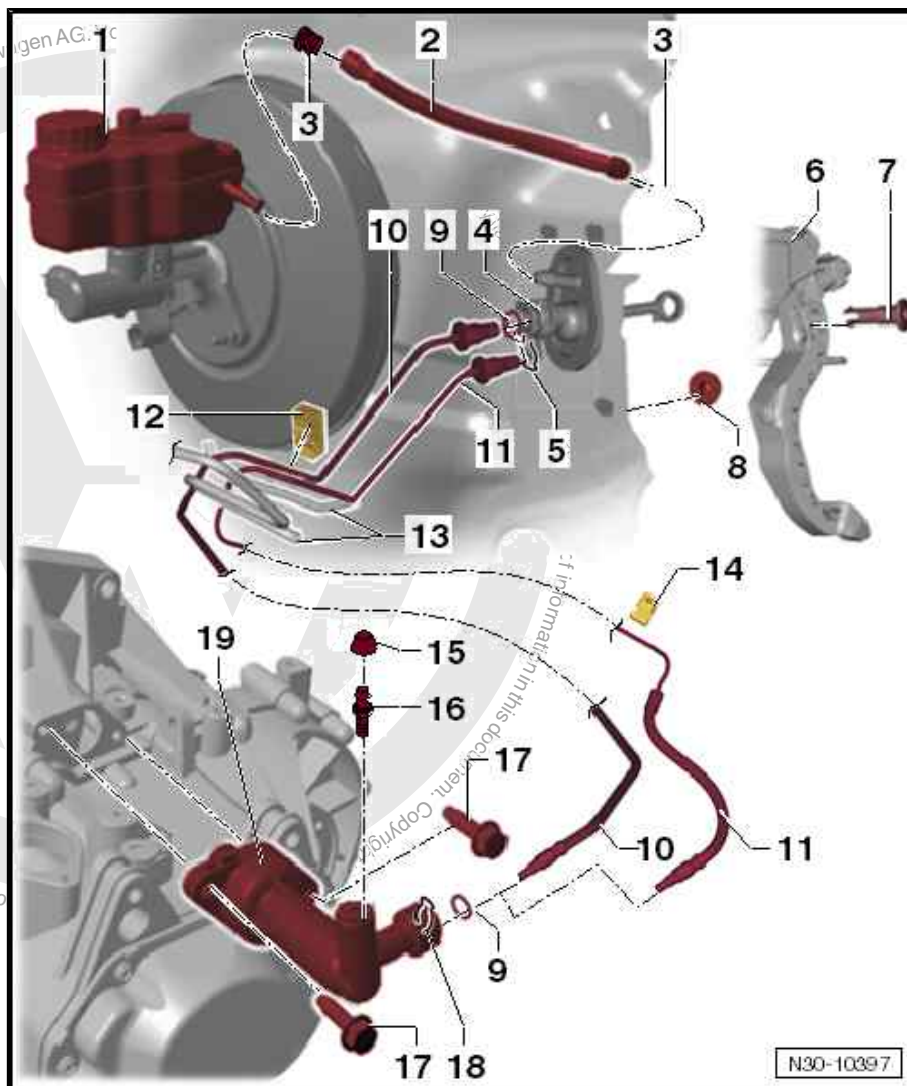
- ☐ Only LHD.
- ☐ Secured to body
- ☐ For brake lines, pipe line and pipe/hose line.
- ☐ Identifying differences between brackets for pipe line and pipe/hose line ⇒ [page 16](#).

#### 13 - Brake lines

- ☐ Various number
- ☐ Allocation ⇒ Electronic parts catalogue (ETKA)

#### 14 - Bracket

- ☐ Only RHD.
- ☐ Secured to body





#### 15 - Dust cap

#### 16 - Bleeder valve

- ☐ Bleeding clutch mechanism ⇒ [page 30](#)
- ☐ Specified torque ⇒ [page 30](#)

#### 17 - Hexagon bolt

- ☐ ⇒ [page 17](#)

#### 18 - Clip

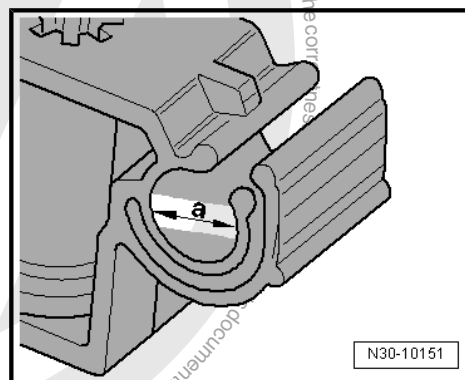
- ☐ To remove pipe/hose line, pull out clip to stop
- ☐ Can be pressed in as far as stop before fitting line

#### 19 - Clutch slave cylinder

- ☐ Allocation ⇒ Electronic parts catalogue (ETKA)
- ☐ Removing and installing ⇒ [page 25](#)

LHD, identifying differences between brackets for pipe line and pipe/hose line

Dimension "a" mm	Line configuration
approx. 6	Pipe
approx. 8	Pipe/hose line





## 1.4 Assembly overview - clutch release mechanism

### 1 - Release bearing

- ☐ Remove and install together with clutch release lever and guide sleeve ⇒ [page 32](#)
- ☐ Do not wash out bearing; wipe only
- ☐ Renew noisy bearings

### 2 - Bolt

- ☐ Renew after removal
- ☐ 5 Nm +90°

### 3 - Clutch release lever

- ☐ Remove and install together with clutch release bearing and guide sleeve ⇒ [page 32](#) .
- ☐ Remove old grease
- ☐ Grease contact surface of ball-head pin with grease for clutch plate splines .
- ☐ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .

### 4 - Retaining spring

- ☐ Secure to clutch release lever

### 5 - Guide bush

- ☐ Remove and install together with clutch release bearing and clutch release lever ⇒ [page 32](#)

### 6 - Ball-head pin

- ☐ Remove old grease
- ☐ Grease contact surface of ball-head pin with grease for clutch plate splines .
- ☐ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .
- ☐ 20 Nm

### 7 - Input shaft seal

- ☐ Renew after removal ⇒ [page 125](#)

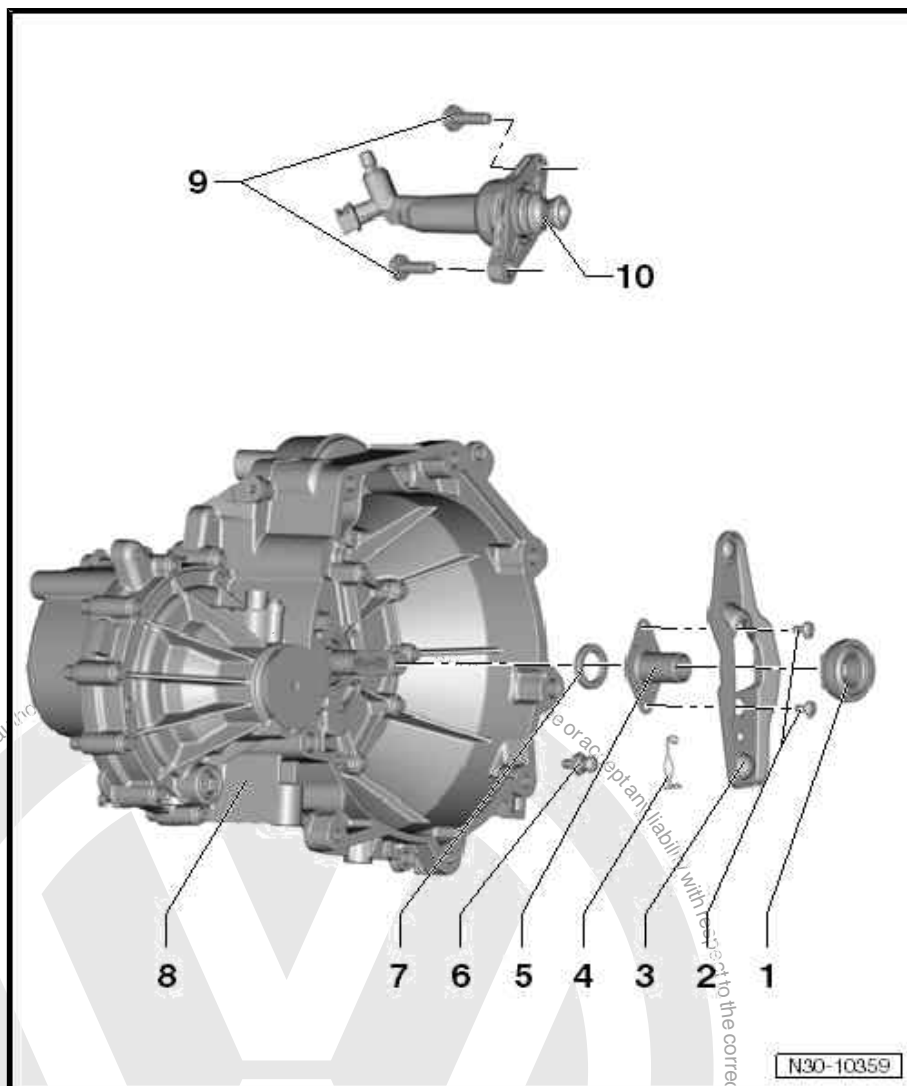
### 8 - Gearbox

### 9 - Hexagon bolt

- ☐ 20 Nm

### 10 - Clutch slave cylinder

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





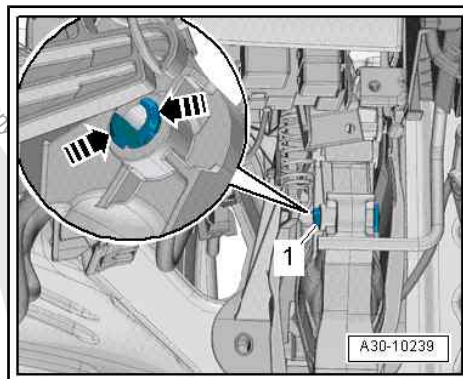


## 1.5 Removing and installing bearing bush

### Removing

Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery;  
Disconnecting and reconnecting battery .

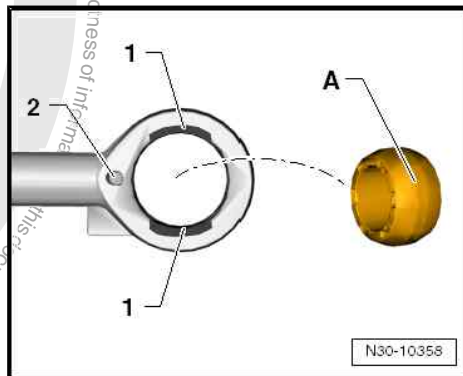
- Compress catches -arrows- and take out pin -1- towards right side.
- Pull clutch pedal into passenger compartment as far as stop.
- Remove over-centre spring/extension spring.



- Turn plunger of clutch master cylinder so that recesses -1- or marking -2- become visible.

Ensure that recesses -1- and marking -2- point in same direction.

- Remove bearing bush -A- from recesses -1-.

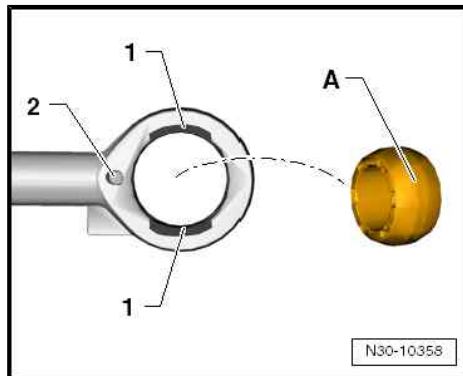


### Installing

- Turn plunger of clutch master cylinder so that recesses -1- or marking -2- become visible.

Ensure that recesses -1- and marking -2- point in same direction.

- Fit and swivel bearing bush -A- into recesses -1-.
- Install extension spring ⇒ [page 19](#) , and connect plunger/ clutch master cylinder to clutch pedal.
- Use new pivot pin.
- Connect battery ⇒ Electrical system; Rep. gr. 27 ; Battery;  
Disconnecting and connecting battery .



## 1.6 Checking clutch master cylinder and clutch slave cylinder

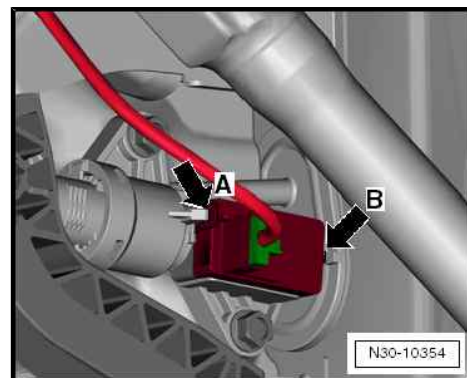
Carry out Guided Fault Finding using ⇒ Vehicle diagnostic tester before renewing clutch master cylinder due to suspected fault.



## 1.7 Removing and installing clutch position sender - G476-

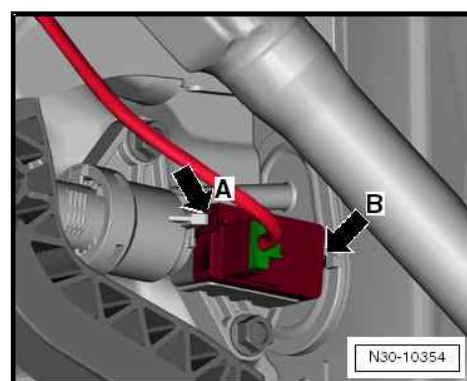
### Removing

- Unclip clutch position sender - G476- from clutch master cylinder -arrow A- and remove from fitting location -arrow B-.
- Remove clutch position sender - G476- from master cylinder, and disconnect connector.



### Installing

- Fit clutch position sender - G476- on clutch master cylinder into fitting location -arrow B- and clip it in -arrow A-.
- Test clutch position sender - G476- by tugging on it.
- Connect electrical connector.



## 1.8 Removing and installing extension spring

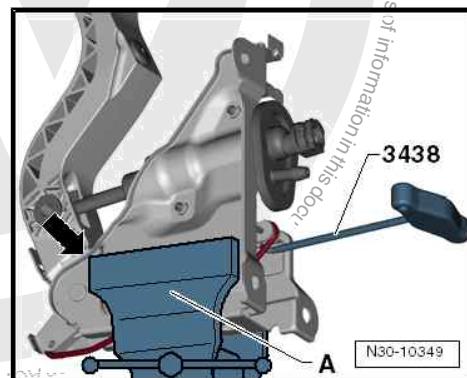
### Special tools and workshop equipment required

- ◆ Hook - 3438-



### Removing

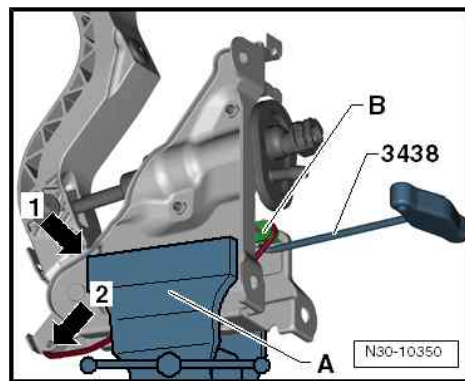
- Remove mounting bracket ⇒ [page 20](#).
- Carefully clamp mounting bracket in a vice -A-.
- The mounting bracket -arrow 1- is secured in the vice by the edge in the front area.
- The edge ensures that the mounting bracket is not pulled out of the vice when removing the extension spring.
- Pull extension spring firmly out of support and remove.





## Installing

- Carefully clamp mounting bracket in a vice -A-.
- The mounting bracket -arrow 1- is secured in the vice by the edge in the front area.
- The edge ensures that the mounting bracket is not pulled out of the vice when installing the extension spring.
- Install new support -B- for extension spring.
- Slightly grease following areas for extension spring:
  - Mounting -B-
  - Mounting on clutch pedal -arrow 2-
- Grease ⇒ Electronic parts catalogue (ETKA)
- Attach extension spring to support on clutch pedal. -Arrow 2-.
- Attach extension spring to support -B- on mounting bracket.



## 1.9 Removing and installing clutch pedal

The clutch pedal is removed and installed together with the mounting bracket ⇒ [page 20](#) .

The clutch pedal stays fitted to the mounting bracket.

## 1.10 Removing and installing mounting bracket







# Special tools and workshop equipment required

<b>3094</b> 	<b>V.A.G 1331</b> 
<b>VAS 5024 A</b> 	

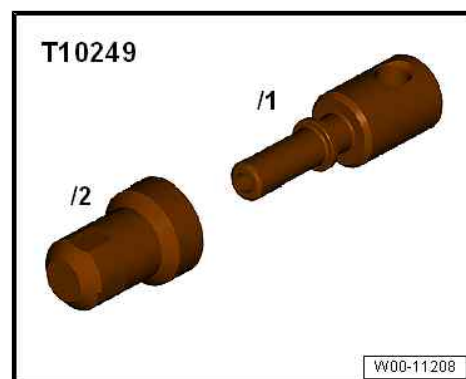
WV30-10004

- ◆ Hose clamp - 3094-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Not required, spring-type clip pliers - VAS 5024 A-

Sealing tool - T10249-

## Removing

- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .



W00-11208



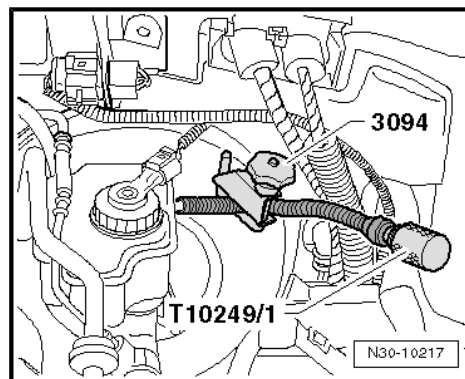
- Clamp off supply hose to clutch master cylinder using hose clamp - 3094- .



### Caution

#### *Risk of leaking brake fluid.*

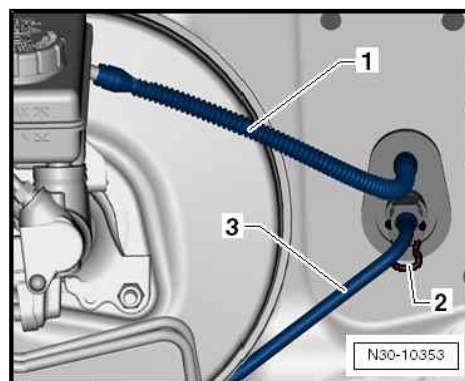
- ◆ *During the following work, ensure that no brake fluid lands on longitudinal member or gearbox. If this does happen, clean the affected areas thoroughly.*
- ◆ *Lay a lint-free cloth under clutch master cylinder.*
- ◆ *When performing work in the footwell, put cloths on the carpet to protect it from possible brake fluid spills.*



- Disconnect supply hose -1- from clutch master cylinder.
- In addition to clamping off, it can also be sealed with sealing tool - T10249/1- (⇒ illustration above).
- Pull out clip for pipe/hose assembly -1- as far as stop and remove pipe/hose assembly ⇒ [page 27](#) .
- Remove driver side footwell cover ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel end trim on driver side .

#### Vehicles with clutch pedal switch - F36- .

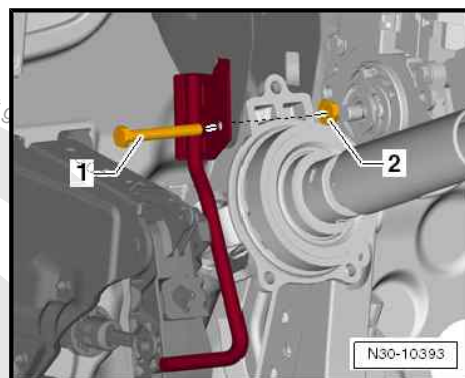
- Remove clutch pedal switch - F36- ⇒ [page 31](#) .



#### LHD vehicles

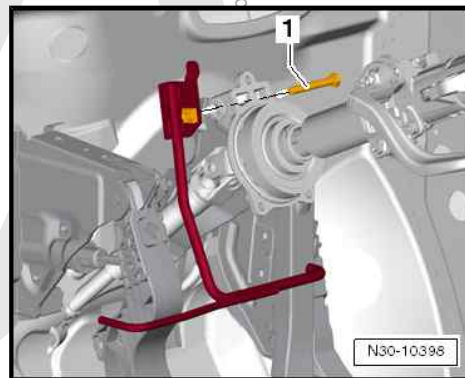
- Remove crash bar by unscrewing bolt -1-.

Note nut -2-.



#### RHD vehicles

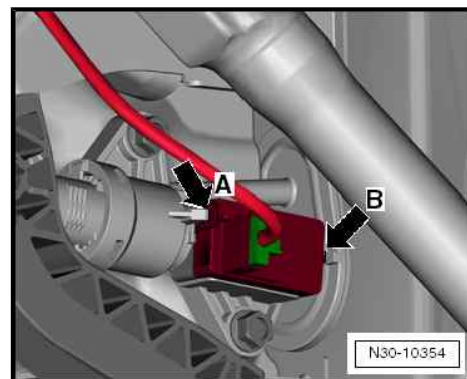
- Remove crash bar by unscrewing bolt -1-.





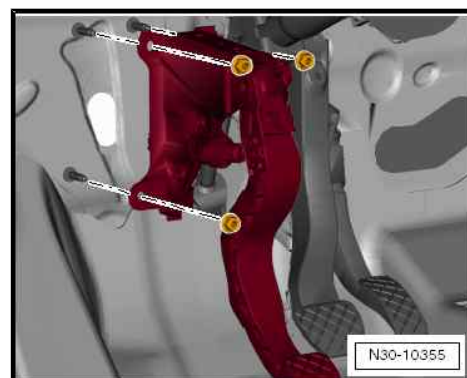
### Vehicles with clutch pedal sender - G476- :

- Unclip clutch position sender - G476- from clutch master cylinder -arrow A- and remove from fitting location -arrow B-.
- Remove clutch position sender - G476- with electrical connector connected.



### Continuation for all

- Unscrew securing nuts.
- Remove mounting bracket with clutch master cylinder.



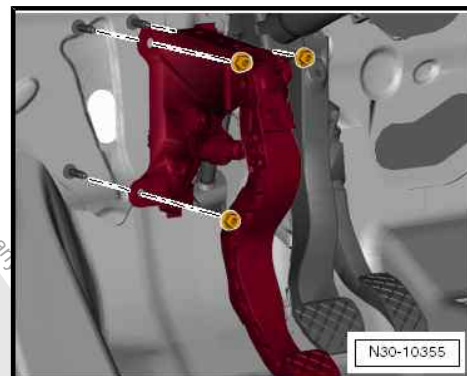
### Installing

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



#### Note

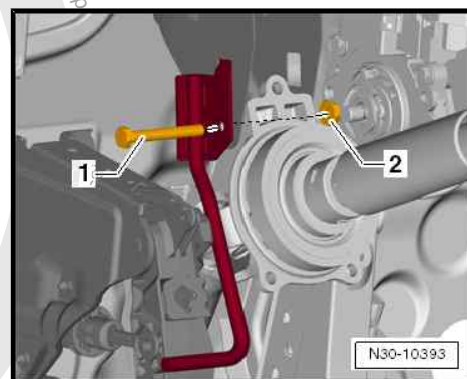
- ◆ *Renew self-locking nut.*
- ◆ *Renew seal for clutch master cylinder after removing mounting bracket or clutch master cylinder ⇒ [Item 2 \(page 13\)](#).*
- Tighten securing nuts for mounting bracket.



### LHD vehicles

- Install crash bar; tighten bolt -1-.

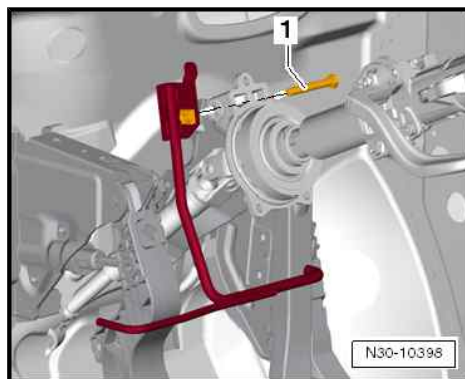
Note nut -2-.





## RHD vehicles

- Install crash bar; tighten bolt -1-.



## Vehicles with clutch pedal sender - G476- :

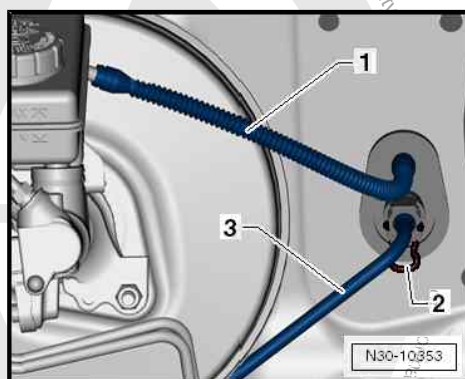
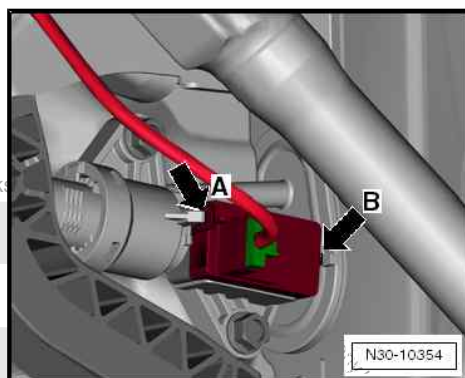
- Fit clutch position sender - G476- on clutch master cylinder into fitting location -arrow B- and clip it in -arrow A-.
- Test clutch position sender - G476- by tugging on it.

## Vehicles with clutch pedal switch - F36- .

- Install clutch pedal switch - F36- ⇒ [page 31](#) .

## Continuation for all

- Install driver side footwell cover ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel end trim on driver side .
- After removing hose clamp - 3094- , supply hose -1- must be returned to its original position and shape.
- Press pipe -3- all the way in at master cylinder connection, and press securing clip -2- in all the way.
- Test line by tugging on it.
- Bleed clutch mechanism ⇒ [page 30](#) .



## Specified torques

- ♦ For securing mounting bracket to plenum chamber bulkhead ⇒ [page 13](#)
- ♦ Crash bar to module carrier ⇒ [page 13](#)

## 1.11 Removing and installing clutch master cylinder

### Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



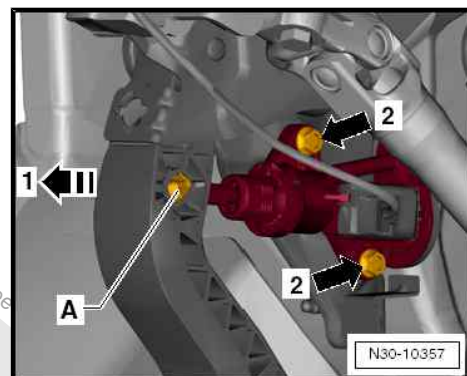


## Removing

Remove mounting bracket with clutch master cylinder  
⇒ [page 20](#) .

The figure shows installed mounting bracket with clutch master cylinder

- Pull pivot pin -A- for plunger/clutch master cylinder in direction of -arrow 1- out of clutch pedal.
- Unscrew securing bolts -arrows 2- and remove clutch master cylinder from mounting bracket.
- Remove clutch master cylinder from mounting bracket.



## Installing

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

- Renew seal for clutch master cylinder ⇒ [Item 2 \(page 13\)](#) .
- Renew pivot pin -A- after removing.
- Pivot pin -A- must audibly engage in clutch pedal.
- Ensure proper engagement by carefully pulling pivot pin.
- Install clutch master cylinder to mounting bracket using securing bolts -arrows 2-.

Specified torque ⇒ [page 13](#) .

Install mounting bracket with clutch master cylinder ⇒ [page 20](#) .

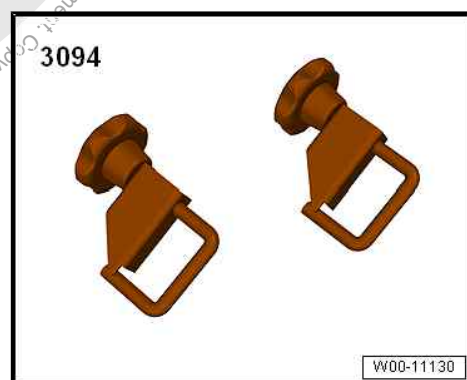
## Specified torques

- ◆ Clutch master cylinder to mounting bracket ⇒ [page 13](#)

## 1.12 Removing and installing clutch slave cylinder

### Special tools and workshop equipment required

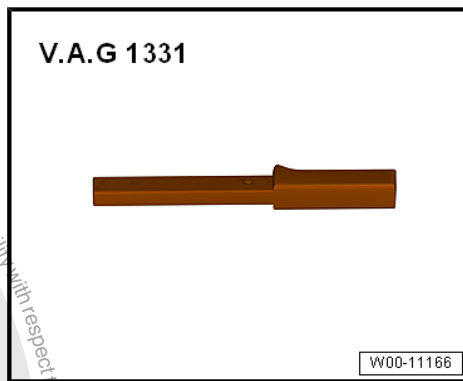
- ◆ Hose clamps to 25 mm - 3094-







◆ Torque wrench - V.A.G 1331-



Removing



Note

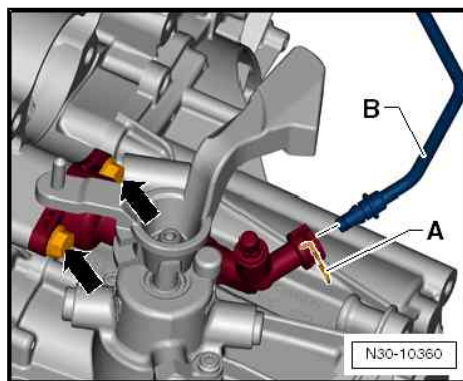
- ◆ *Before replacing the clutch slave cylinder due a suspected defect, you must first use Guided Fault Finding → Vehicle diagnostic tester.*
- ◆ *Make sure you do not depress the clutch pedal if the clutch slave cylinder is removed from the gearbox with the pipe/hose assembly still attached. Otherwise the piston will be pressed out of the clutch slave cylinder and thus destroyed.*
- If air filter prevents access to clutch slave cylinder, it must be removed ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting battery .
- Lay a lint-free cloth under clutch slave cylinder.
- Release clip -A- with a screwdriver and disconnect pipe/hose assembly -B- from connection.
- Pull pipe/hose assembly -B- out of clutch slave cylinder and seal openings.
- Remove bolts -arrows- and remove clutch slave cylinder.



Caution

***Risk of soiling due to escaping brake fluid***

- ◆ ***Do not operate clutch pedal after pipe/hose assembly has been disconnected.***

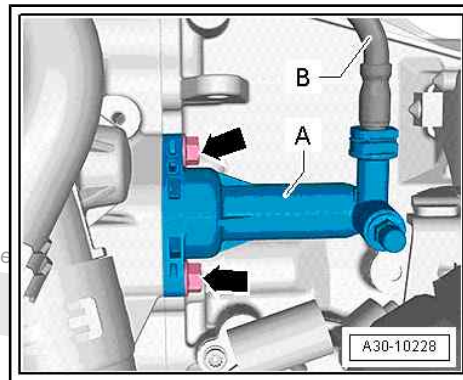


Installing

Install in reverse order of removal, observing the following:



- Fit clutch slave cylinder -A- and secure with bolts -arrows-.
- Connect pipe/hose assembly -B- ⇒ [page 27](#) .



## Disconnecting and connecting lines for clutch hydraulics

### Disconnecting

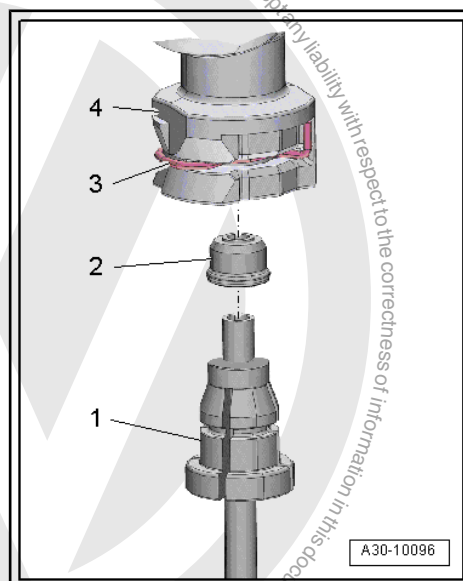
- Release clip -3- with a screwdriver and disconnect pipe/hose assembly -1- from connection -4-.

### Connecting



#### Note

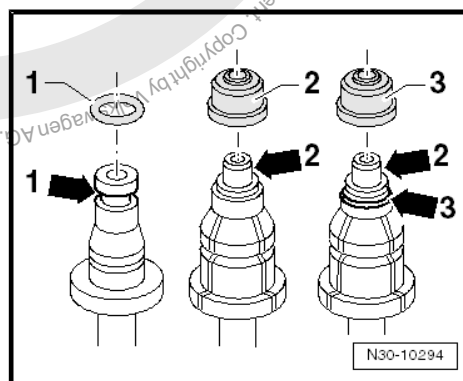
- ◆ It is also possible to install an O-ring instead of the seal -2- ⇒ [page 27](#) .
- ◆ Renew seal -2- if damaged.
- Press pipe/hose assembly -1- into connection -4- until clip -3- engages audibly.
- Test pipe/hose assembly by tugging on it.



## Seals and O-rings for pipe/hose assembly or pipe line

Item	Material of line connection
1	Line connection with circumferential groove -arrow 1-
2	Line connection with shoulder -arrow 2-
3	Line connection with shoulder -arrow 2- and circumferential groove -arrow 3-

- For line connection having circumferential groove -arrow 1- and -arrow 3-, a seal or O-ring must be set there.
- Bleed clutch mechanism ⇒ [page 30](#) .
- Connect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- If air filter has been removed, it must be reinstalled now ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .



### Specified torques

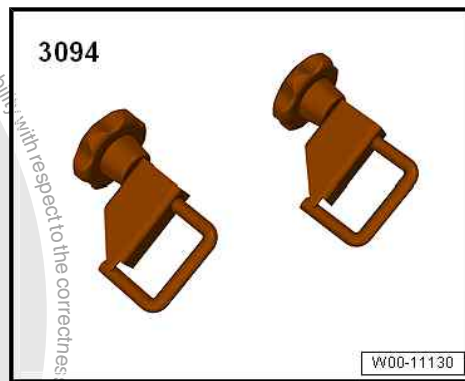
- ◆ Clutch slave cylinder to gearbox ⇒ [page 17](#)

## 1.13 Removing and installing lines for clutch mechanism

### Special tools and workshop equipment required



- ◆ Hose clamps to 25 mm - 3094-



### Removing

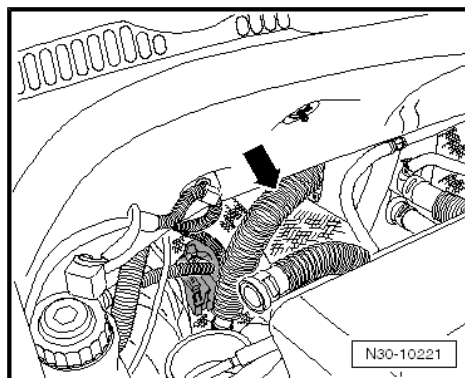
- Remove complete air filter housing if it prevents access to the lines for clutch mechanism ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .

### LHD vehicles

- Unclip engine control unit from bracket on plenum chamber bulkhead without disconnecting electrical connector, and lay it to one side ⇒ Rep. gr. 24 ; Engine control unit .

### RHD vehicles

In some vehicles, master cylinder is located behind a line for air conditioning system -arrow-.



An insulation mat is installed in conjunction with some engines. Appearance may be different from that illustrated.

- Remove insulation mat. Note item -1 to 4-.

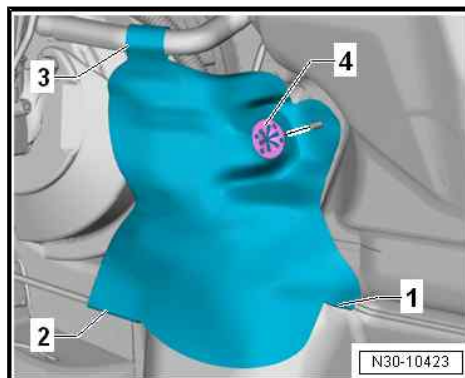
### Continuation for all



#### Caution

#### *Risk of leaking brake fluid.*

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



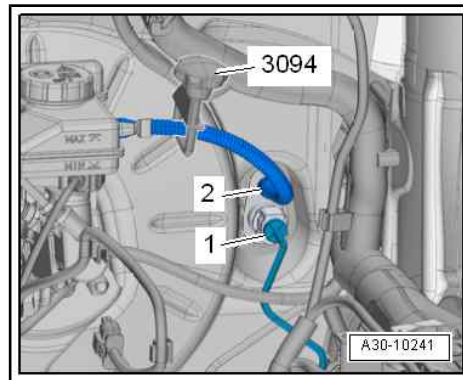




- Using hose clamp - 3094- , clamp off supply hose -2- to clutch master cylinder.

### Note

- ◆ *Clamping off the supply hose with the hose clamp - 3094- will cause a permanent deformation.*
- ◆ *However, this does not damage the supply hose.*
- ◆ *After removing the hose clamp - 3094- , the supply hose must be returned to its original shape.*

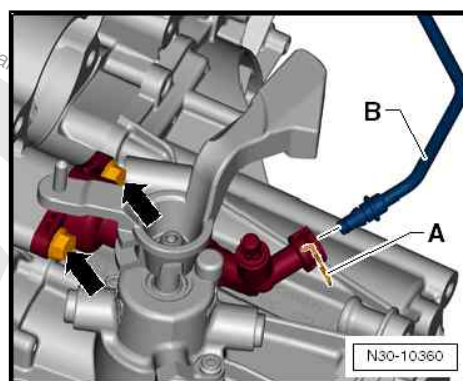


- Pull out clip for pipe/hose line -1- as far as stop, and detach pipe/hose line.
- Seal openings.
- Pull out clip -A- as far as stop and pull off pipe/hose assembly -B-.
- Seal openings.

### Note

*-Arrows- can be disregarded.*

- Seal off open lines and connections if necessary with clean plugs from engine bung set - VAS 6122- .
- Move pipe/hose assembly clear and remove it.



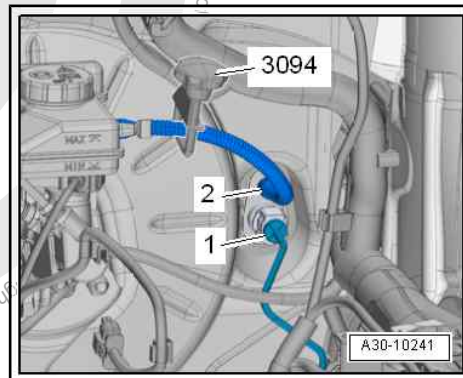
### Installing

Install in reverse order of removal, observing the following:

- Connect pipe/hose assembly -1- to clutch master cylinder and clutch slave cylinder.
- Test line by tugging on it.
- After removing the hose clamp - 3094- , the supply hose -2- must be returned to its original shape.

### LHD vehicles

- Clip engine control unit with connector connected into bracket on plenum chamber bulkhead ⇒ Rep. gr. 24 ; Engine control unit .

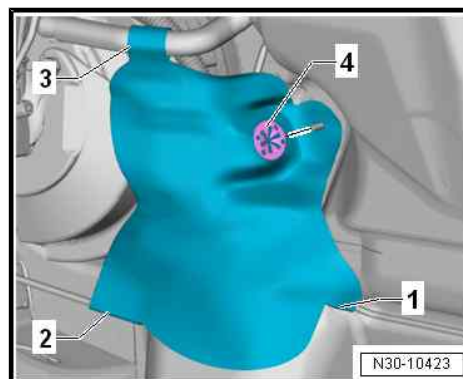


### RHD vehicles

- If fitted, fold insulation mat in the sequence -1, 2, 3- around lines.
- Secure insulation mat with lock washer -4-.

### Continuation for all

- Bleed clutch mechanism ⇒ [page 30](#) .
- Install battery and battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Install complete air filter housing ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .





## 1.14 Bleeding clutch mechanism

### Special tools and workshop equipment required

- ◆ Brake filling and bleeding unit - VAS 5234-



### Note

- ◆ *The clutch system must always be bled after performing work on the hydraulic clutch mechanism.*
- ◆ *When performing the following steps, make sure that no brake fluid escapes onto the gearbox.*
- ◆ *Refilling system is not necessary!*
- ◆ *Before bleeding, fill brake fluid reservoir with brake fluid up to "max" marking.*
- ◆ *Clutch pedal is at rest position, is not being depressed.*
- ◆ *Brake fluid: Allocation ⇒ Electronic parts catalogue (ETKA) .*
- Remove complete air filter housing if it prevents access to bleeder valve (-arrow- in illustration below) ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .



- Move clutch pedal back to its rest position.
- Remove protective cap from bleeder valve -arrow-.
- Connect brake filling and bleeding equipment .
- Fit bleeder hose, and connect it to pressure hose of fluid collector bottle.

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

- Switch on brake filling and bleeding equipment .
- Working pressure 2.0 bar.
- Open bleeder valve.
- Allow about 100 cm<sup>3</sup> of brake fluid to flow out.
- Close bleeder valve.
- Rapidly operate pedal from stop to stop 10 to 15 times.
- Open bleeder valve.
- Allow another 50 cm<sup>3</sup> of brake fluid to flow out.
- Close bleeder valve.
- Switch off brake filling and bleeding equipment and relieve pressure completely from equipment.
- Depress clutch pedal several times after completion of bleeding process.

#### Specified torque:

Component	Nm
Bleeder valve	4.5

### 1.15 Removing and installing clutch pedal switch - F36-

To ensure sufficiently secure seating in mounting bracket for clutch pedal, clutch pedal switch - F36- may be installed only once.

#### Removing

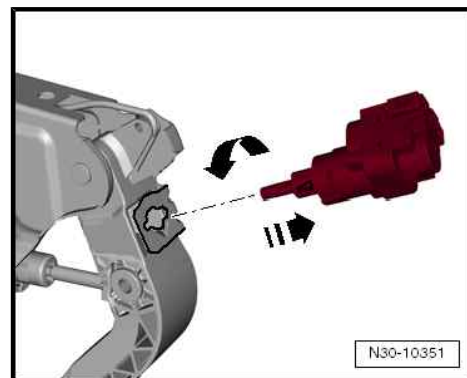
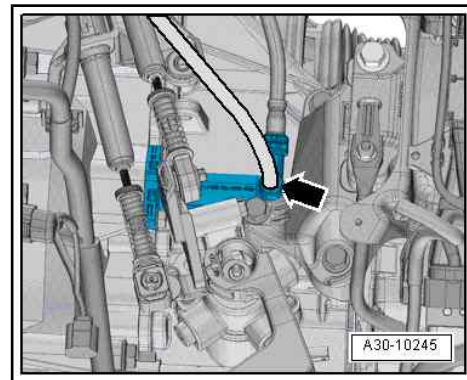
- Remove driver side footwell cover ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel end trim on driver side .
- Pull connector off clutch pedal switch - F36- .
- Turn clutch pedal switch - F36- on mounting bracket 45° in direction of -arrow- and pull out of support.

#### Installing

- Grease plunger.
- Allocate grease using ⇒ Electronic parts catalogue (ETKA) .

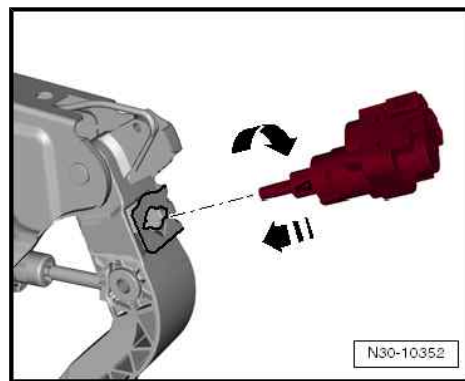
Clutch pedal switch - F36- is installed from passenger compartment.

- Clutch pedal must always remain in rest position when clutch pedal switch - F36- is being installed. During entire installation procedure, clutch pedal is only allowed to be touched with plunger head of clutch pedal switch - F36- .





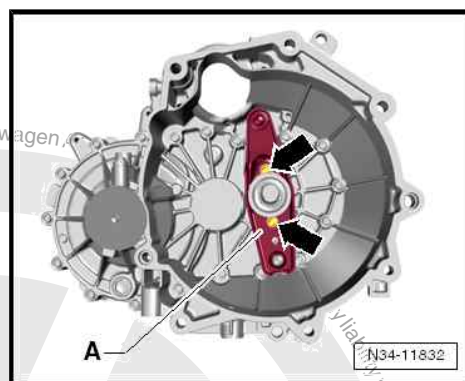
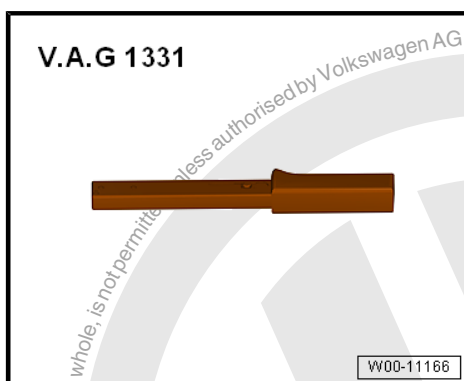
- Insert clutch pedal switch - F36- into mounting bracket support and turn 45° in direction of -arrow-.
- Push connector onto clutch pedal switch - F36- .
- Install driver side footwell cover ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel end trim on driver side .



## 1.16 Repairing clutch release mechanism

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Grease for splines
- ◆ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .

**Removing and installing clutch release lever -A- with release bearing and guide sleeve**

- Gearbox has been removed.
- Unscrew bolts -arrows-.
- Pull clutch release lever with release bearing and guide sleeve off input shaft and ball stud.

Install in reverse order of removal.

- Install gearbox ⇒ [page 64](#) .

**Specified torques**

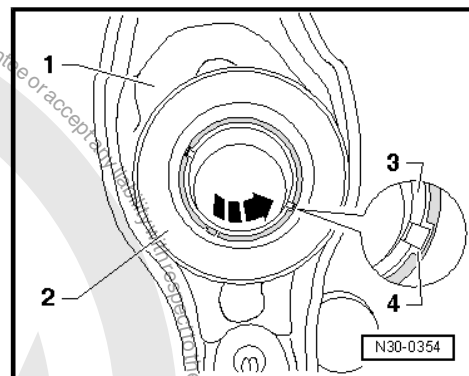
- Guide sleeve to gearbox ⇒ [page 17](#)

### Removing and installing guide sleeve from/to clutch release bearing

- Remove clutch release lever together with release bearing and guide sleeve ⇒ [page 32](#) .
- 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.

- Install clutch release lever together with release bearing and guide sleeve ⇒ [page 32](#) .

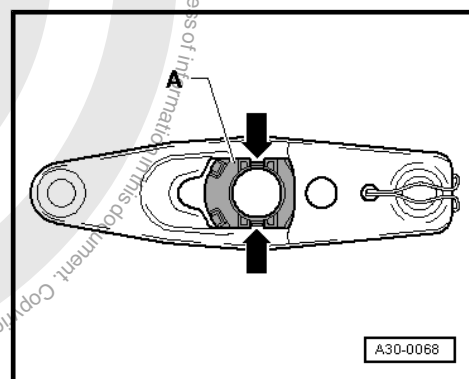


### Removing and installing release bearing

- Remove clutch release lever together with release bearing and guide sleeve ⇒ [page 32](#) .
- 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 retaining lugs -arrows- engage.
- Grease contact surface of ball-head pin with grease for clutch plate splines .

Allocate grease using ⇒ Electronic parts catalogue (ETKA) .

- Install clutch release lever together with release bearing and guide sleeve ⇒ [page 32](#) .







## 2 Clutch

⇒ "2.1 Assembly overview - clutch", page 34

⇒ "2.2 Removing and installing clutch", page 35

### 2.1 Assembly overview - clutch

#### 1 - Flywheel

- ☐ Removing and installing  
⇒ Rep. gr. 13 ; Cylinder  
block (gearbox end);  
Removing and installing  
flywheel .
- ☐ Ensure that centring  
pins fit tightly
- ☐ Keep contact surface for  
clutch lining free of  
grooves, oil and grease.

#### 2 - Clutch plate

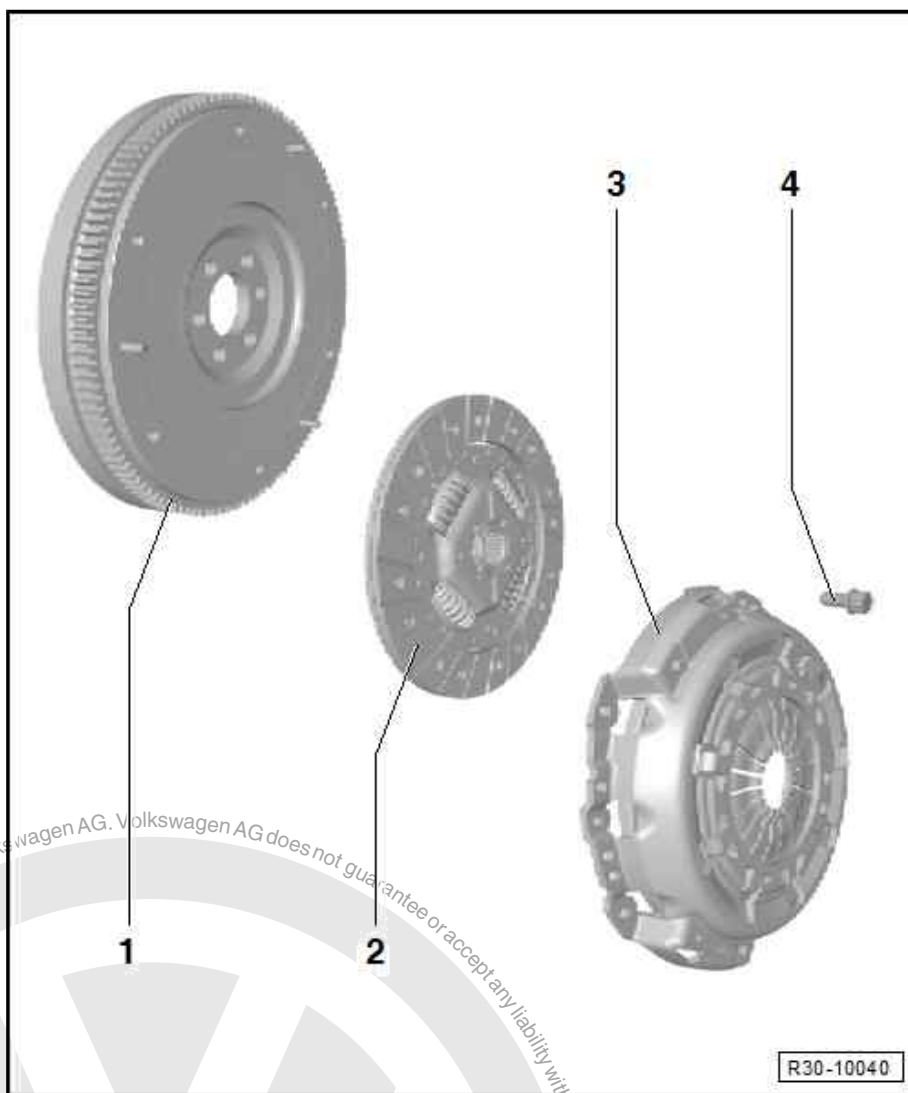
- ☐ Allocation ⇒ Electronic  
parts catalogue (ETKA)
- ☐ Centring ⇒ [page 35](#)

#### 3 - Thrust plate

- ☐ Removing and installing  
⇒ [page 35](#)
- ☐ Check ends of dia-  
phragm spring  
⇒ [page 37](#)
- ☐ Check spring connec-  
tions and riveted con-  
nections ⇒ [page 37](#) .

#### 4 - Bolt

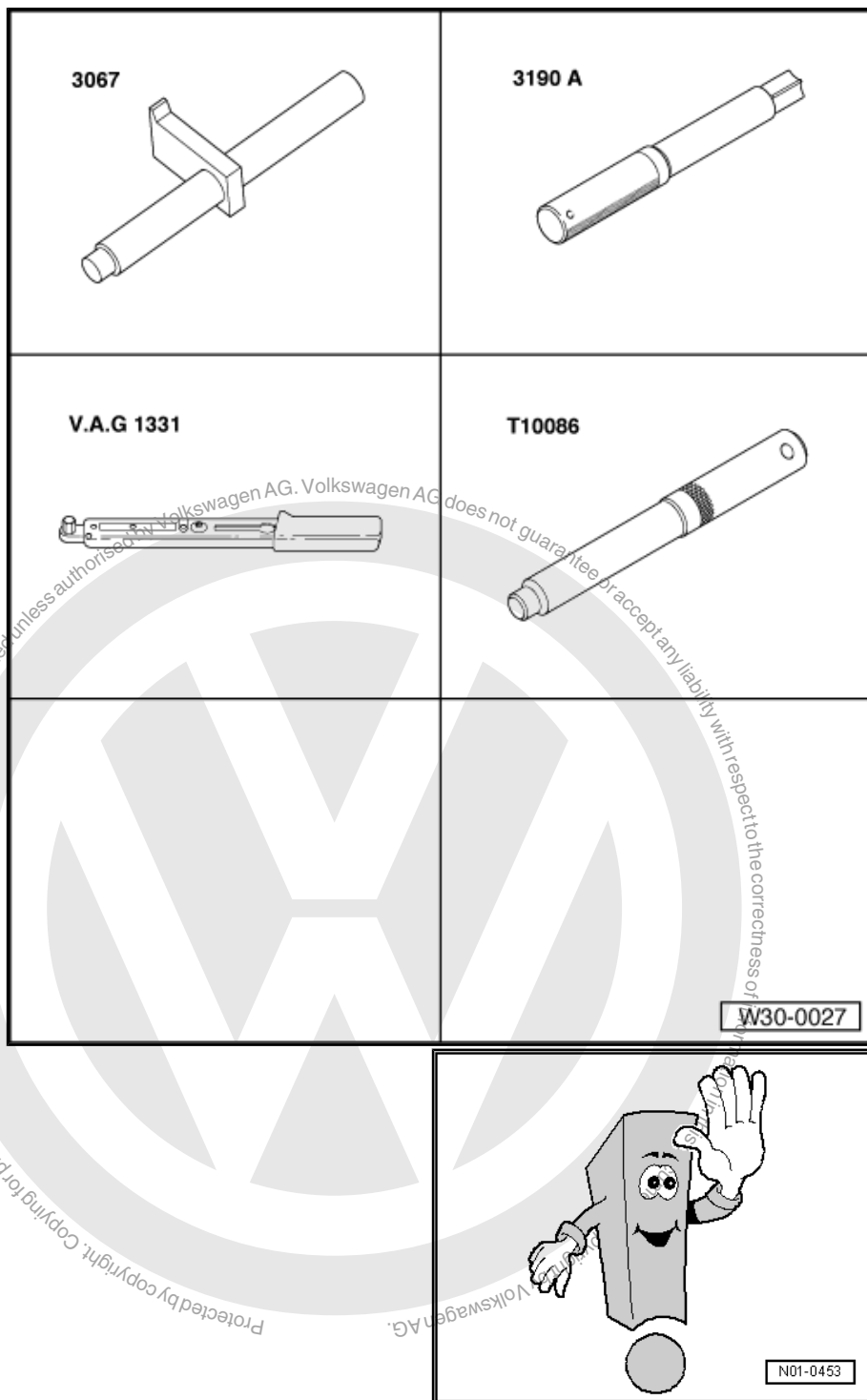
- ☐ Allocation ⇒ Electronic  
parts catalogue (ETKA)
- ☐ Loosen or tighten alter-  
nately and diagonally in  
small steps (1 full turn)
- ☐ M 6: 13 Nm
- ☐ M 7: 20 Nm





## 2.2 Removing and installing clutch

Special tools and workshop equipment required



- ◆ Counter-hold tool - 3067-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Centring mandrel - 3190 A-
- ◆ For engines having a crankshaft of smaller diameter or having needle bearings in the crankshaft - [⇒ page 39](#) centring mandrel - T10086-



- ◆ Grease for splines
- ◆ Allocate grease using ⇒ Electronic parts catalogue (ETKA)

### Removing

- Gearbox is removed.
- Use counter-hold tool - 3067- to loosen bolts.

**To prevent the pressure plate from becoming distorted during removal (causes clutch grab when driving off), always keep to the following procedure when unbolting the pressure plate:**

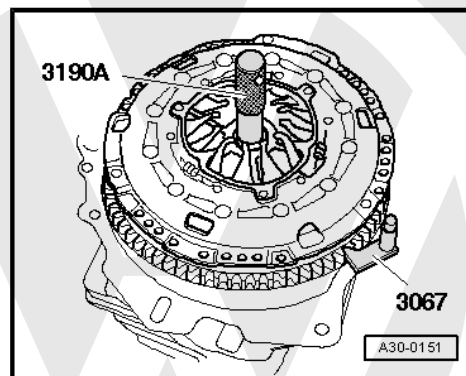
- Loosen all bolts alternately and diagonally in small steps (1 full turn).
- Remove pressure plate and clutch plate.

### Installing



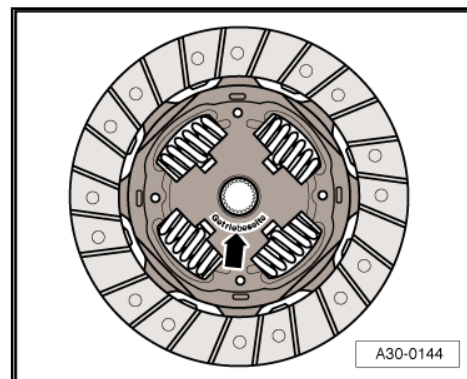
#### Note

- ◆ *Allocate clutch plate and clutch pressure plate according to engine code and ⇒ Electronic parts catalogue (ETKA) .*
- ◆ *Clean splines of drive shaft and, if the clutch plate has been used, clean the splines of the hub. Remove corrosion and apply a very thin coat of clutch plate spline grease to splines. Then, move the clutch plate back and forth on the drive shaft until the hub moves easily on the shaft. Remove excess grease.*
- ◆ *Clutch pressure plates are protected against corrosion and greased. With the exception of the friction surface for the clutch plate, the clutch pressure plate must not be cleaned. Service life of clutch will otherwise be shortened considerably.*
- ◆ *The friction surface of the clutch pressure plate and the flywheel must be cleaned (degreased) thoroughly.*
- ◆ *If the clutch has burnt out, thoroughly clean the gearbox in the area of the clutch as well as parts of the engine facing the gearbox in order to reduce the smell of burnt linings.*
- ◆ *Clutch plate linings must make full contact with flywheel and friction surface of clutch pressure plate. Only then insert securing bolts.*
- ◆ *Tighten or loosen securing bolts alternately and diagonally in small steps (1 full turn) in order not to damage centring holes of pressure plate and centring pins of flywheel.*
- ◆ *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.*



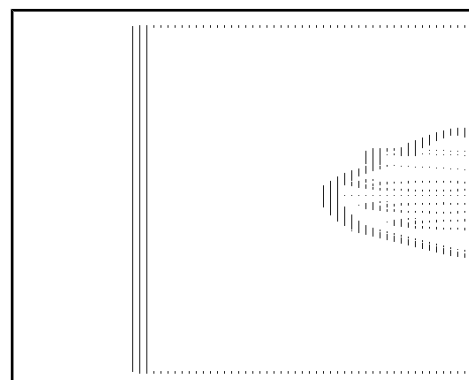


- Installation position of clutch plate: lettering "Getriebeseite" (gearbox end) or spring cage faces pressure plate.



### Check ends of diaphragm spring

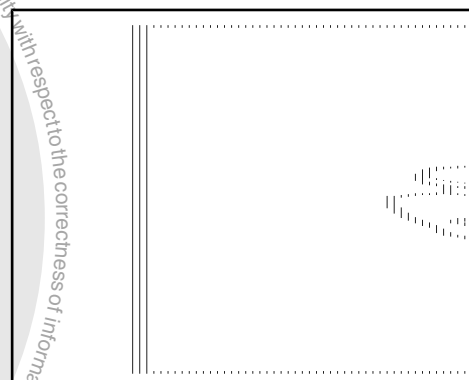
- Wear to half the thickness of the diaphragm spring -arrows- is permitted.



### Check spring connection and riveted fastenings.

Check spring connection between thrust plate and cover for cracks and make sure rivet fastenings are seated tightly.

- If pressure plate has damaged springs or loose rivet connections -arrows-, it must be renewed.



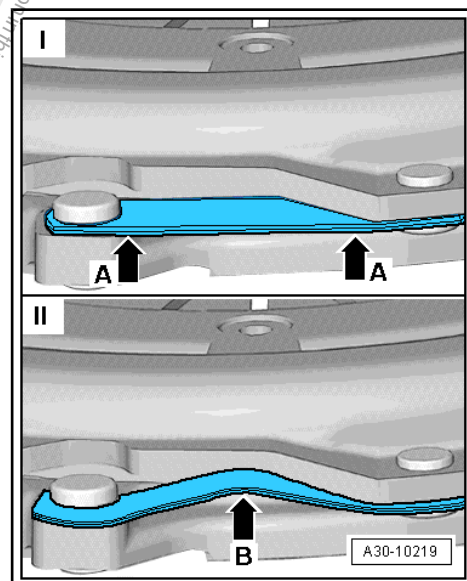
### Check extension springs and riveted connections

I - Extension springs OK.

- Minor kinks on the outside area -arrows A- have series production status.

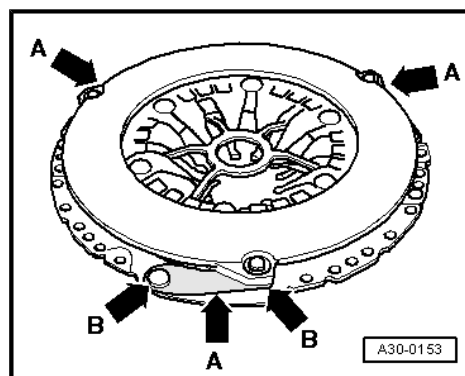
II - Extension springs damaged

- Renew clutch pressure plate if springs are broken or badly bent -arrow B-.
- Check spring connections -arrows A- for damage, and make sure that rivet joints -arrows B- are firmly seated.
- Renew clutch pressure plate if spring connections are broken or badly bent, or if riveting is loose.



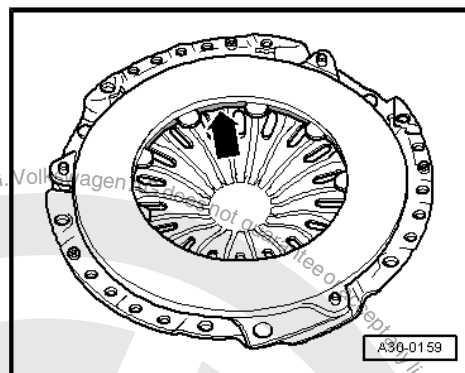


- Make sure rivet joints -arrows B- on all extension springs -arrows A- are firmly seated.
- Tighten all bolts one after another (clockwise) to final torque.
- Renew clutch pressure plate if riveting -arrow B- is loose.

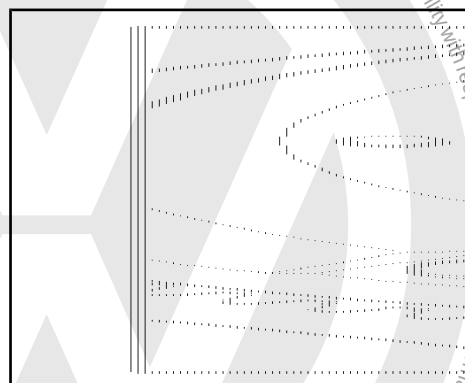


#### Check metal ring.

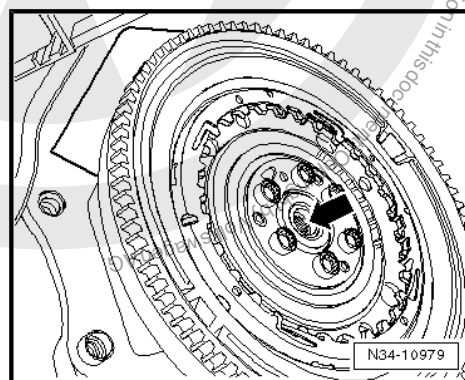
- Check that metal ring in clutch pressure plate -arrow- is not damaged.
- Renew clutch pressure plate if metal ring is broken.



- To centre clutch plate, use centring mandrel - 3190 A- .



For engines having a crankshaft of smaller diameter -arrow- or having an needle bearing -arrow- in the crankshaft





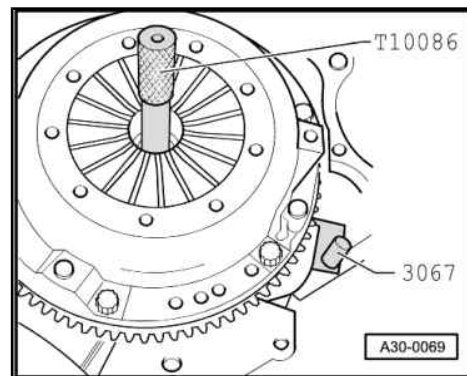
**Centring clutch disc and removing and installing pressure plate for engines having a crankshaft of smaller diameter or having a needle bearing -arrow- in the crankshaft**

**Continuation for all**

- Loosen or tighten alternately and diagonally in small steps (1 full turn).
- Install gearbox ⇒ [page 64](#) .

**Specified torques**

- ◆ Pressure plate to flywheel ⇒ [page 34](#) .





## 34 – Controls, housing

### 1 Selector mechanism

- ⇒ [“1.1 Installation position - selector mechanism”, page 40](#)
- ⇒ [“1.2 Assembly overview - gear knob and cover”, page 42](#)
- ⇒ [“1.3 Assembly overview - selector mechanism”, page 43](#)
- ⇒ [“1.4 Removing and installing gear knob”, page 44](#)
- ⇒ [“1.5 Removing and installing selector mechanism”, page 46](#)
- ⇒ [“1.6 Repairing selector mechanism”, page 50](#)
- ⇒ [“1.7 Adjusting selector mechanism”, page 52](#)
- ⇒ [“1.8 Checking selector mechanism”, page 55](#)

#### 1.1 Installation position - selector mechanism



##### Note

- ◆ *Disconnect battery before working on selector mechanism in engine compartment ⇒ [Electrical system; Rep. gr. 27](#) ; [Battery; Disconnecting and connecting battery](#) .*
- ◆ *Removing and installing selector mechanism ⇒ [page 46](#) .*

Gear selection movement is indicated by -arrow A-

Gate selection movement is indicated by -arrow B-



A - Gear selector cable

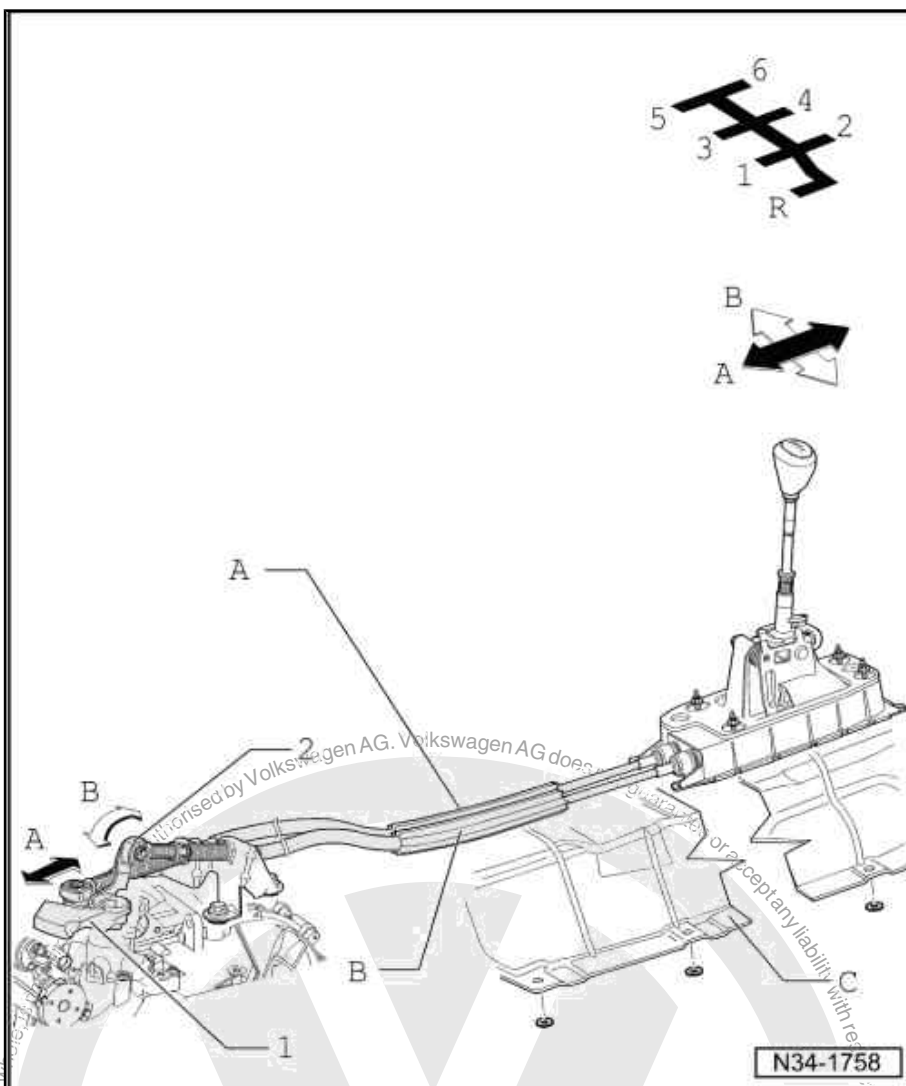
B - Gate selector cable

C - Heat shield

- ☐ Remove before removing selector mechanism.

1 - Gearbox selector lever

2 - Deflector lever





## 1.2 Assembly overview - gear knob and cover

### 1 - Emblem

- ☐ Except for GT versions
- ☐ Can be carefully levered off gear knob of plastic or leather

### 2 - Gear knob

- ☐ With gaiter
- ☐ Gear knob and gaiter cannot be separated from one another
- ☐ Always renew together
- ☐ Removing and installing  
⇒ [page 44](#)

### 3 - Clip

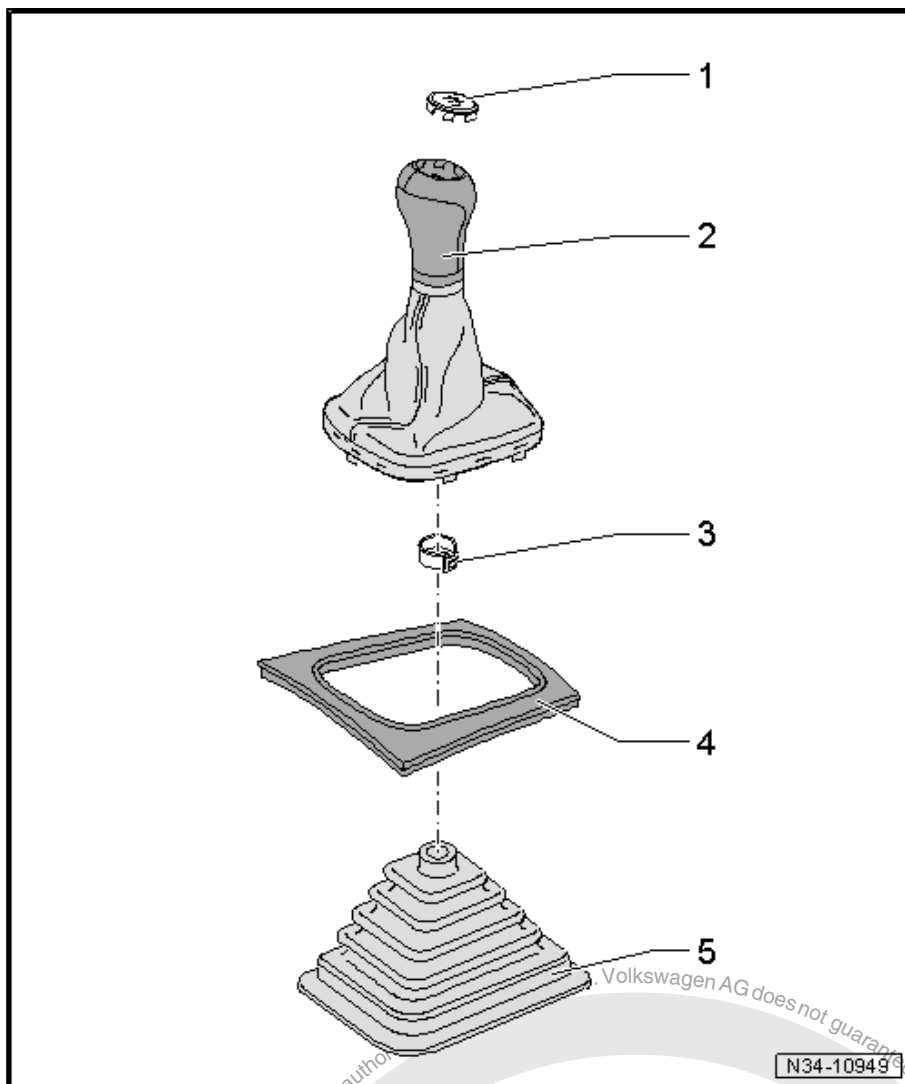
- ☐ For securing gear knob to gear lever
- ☐ Renew after removal
- ☐ Secure to gear knob using hose clip pliers - V.A.G 1275 A-

### 4 - Centre console cover

- ☐ Combined with upper part of centre console in one part
- ☐ Is an individual part in some equipment versions ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Assembly overview – 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





## 1.3 Assembly overview - selector mechanism



### Note

- ◆ Lubricate bearing positions and sliding surfaces.
- ◆ Allocate grease using ⇒ *Electronic parts catalogue (ETKA)*.

#### 1 - Selector shaft with selector shaft cover

#### 2 - Seal

- ☐ Renew after removal  
⇒ [page 90](#)

#### 3 - Slide block

#### 4 - Gate relay lever

- ☐ Greasing ⇒ [page 50](#).
- ☐ Fitting position  
⇒ [page 50](#)
- ☐ After installing, adjust selector mechanism  
⇒ [page 52](#)
- ☐ Remove and install gate relay lever together with cable end-piece  
⇒ [page 51](#)

#### 5 - Cable end-piece

- ☐ For gate selector cable to relay lever
- ☐ After installing, adjust selector mechanism  
⇒ [page 52](#)
- ☐ Do not interchange; cable end-pieces securing gate selector cable to gate relay lever and gear selector cable to gearbox selector lever are different
- ☐ Allocation ⇒ [page 50](#).
- ☐ Removing from gate relay lever ⇒ [page 52](#)
- ☐ Pressing onto gate relay lever ⇒ [page 52](#)

#### 6 - Gearbox selector lever

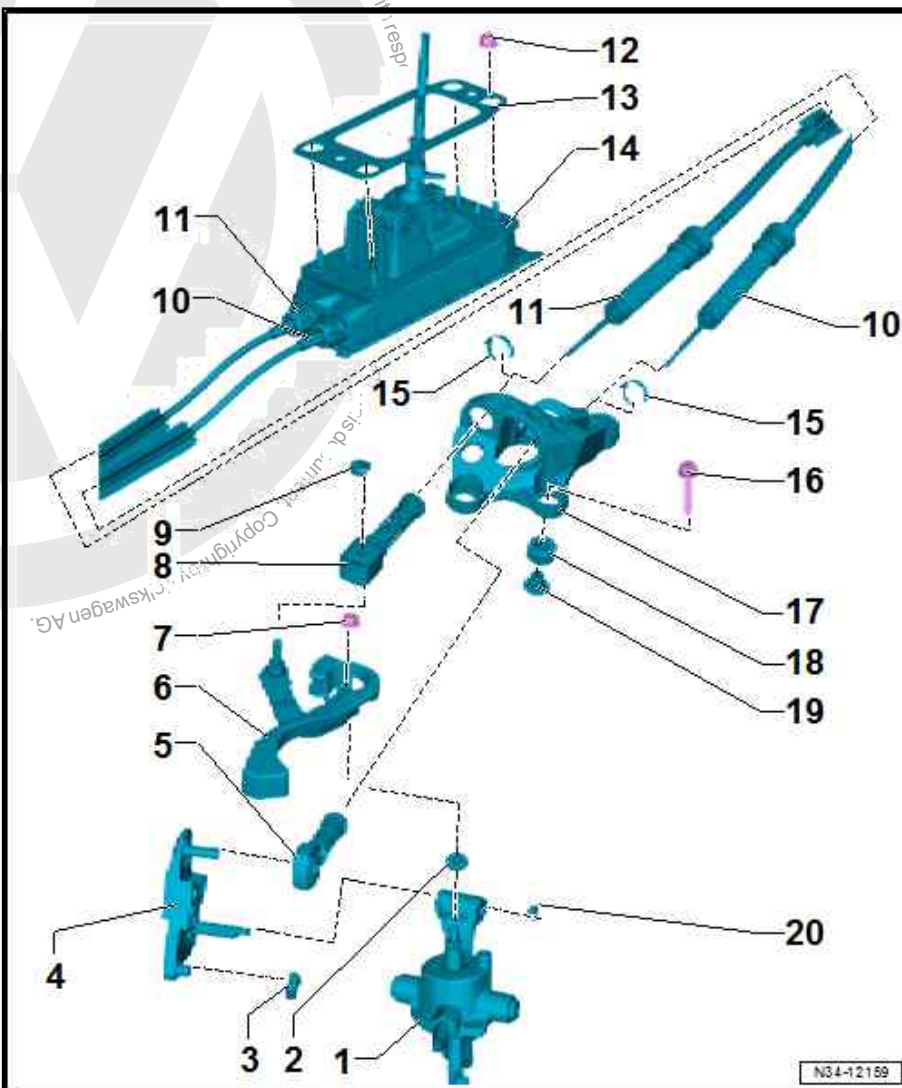
- ☐ Greasing ⇒ [page 50](#).
- ☐ Install so that master spline aligns with selector shaft ⇒ [page 51](#)
- ☐ Fitting position ⇒ [page 50](#)
- ☐ After installing, adjust selector mechanism ⇒ [page 52](#)

#### 7 - Hexagon nut

- ☐ Specified torque ⇒ [page 81](#)

#### 8 - Cable end-piece

- ☐ For gear selector cable to gearbox selector lever
- ☐ After installing, adjust selector mechanism ⇒ [page 52](#)







- ☐ Do not interchange; cable end-pieces securing gate selector cable to gate relay lever and gear selector cable to gearbox selector lever are different
- ☐ Allocation ⇒ [page 50](#) .

#### 9 - Securing clip

- ☐ Renew after removal

#### 10 - Gate change cable

- ☐ Connect to cable end-piece.
- ☐ Fitting position ⇒ [page 40](#)

#### 11 - Gear change cable

- ☐ Connect to cable end-piece.
- ☐ Fitting position ⇒ [page 40](#)

#### 12 - Hexagon nut

- ☐ Qty. 4
- ☐ M 6: 8 Nm
- ☐ M 8: 20 Nm

#### 13 - Seal

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

#### 14 - Selector housing

#### 15 - Securing clip

- ☐ Renew after removal
- ☐ Do not damage cables when removing
- ☐ Fitting position ⇒ [page 52](#)

#### 16 - Hexagon bolt

- ☐ Qty. 3
- ☐ For cable support bracket
- ☐ 20 Nm

#### 17 - Cable support bracket

- ☐ After installing, adjust selector mechanism ⇒ [page 52](#)

#### 18 - Grommet

- ☐ Qty. 3
- ☐ Cable support bracket mounting on gearbox

#### 19 - Spacer

- ☐ Qty. 3

#### 20 - Clip

## 1.4 Removing and installing gear knob

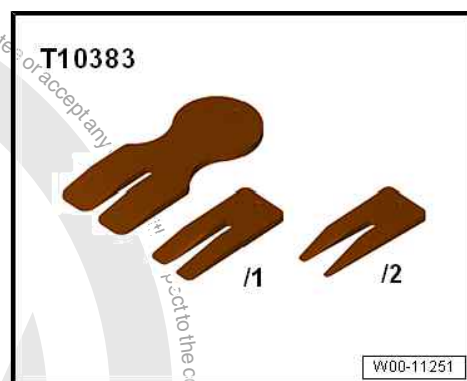
Special tools and workshop equipment required



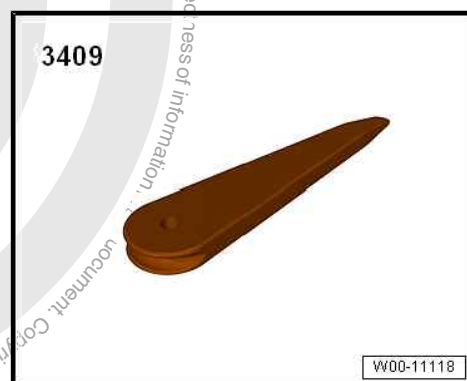
- ◆ Hose clip pliers - V.A.G 1275 A-



- ◆ Wedges - T10383-

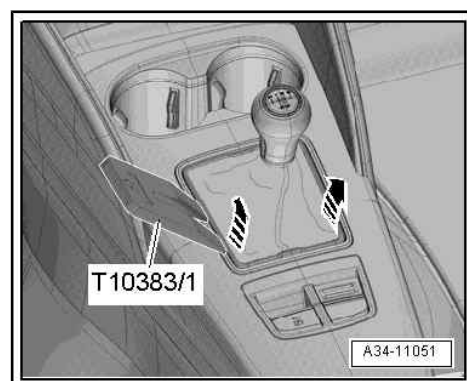


- ◆ Or removal wedge - 3409- , depending on equipment version



## Removing

- Using wedge - T10383- , carefully lever gear lever gaiter off centre console insert -arrows-.
- Alternatively, use removal wedge - 3409- to lever out gear lever gaiter.



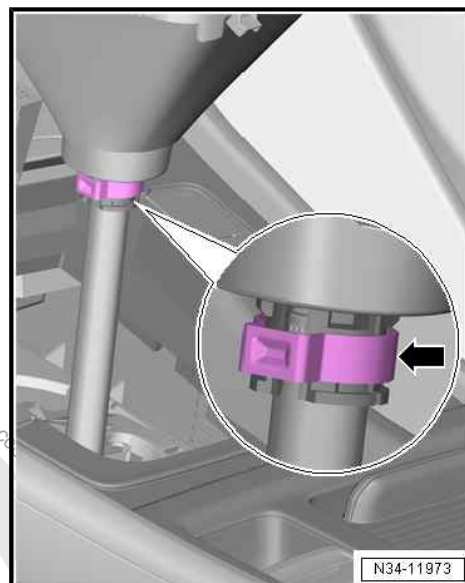


- Pull gear lever gaiter upwards off gear knob.
- Open clamp -arrow- and pull off gear knob together with gear lever gaiter.

### Installing

Install in reverse order of removal, observing the following:

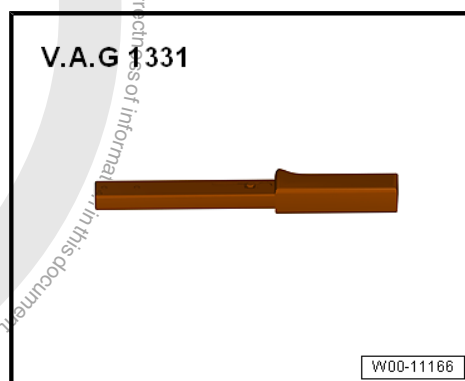
- Press gear knob together with gear lever gaiter onto gear lever as far as stop.
- Secure gear lever knob to gear lever using clamp -arrow-. Use hose clip pliers - V.A.G 1275 A - to do this.



## 1.5 Removing and installing selector mechanism

### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



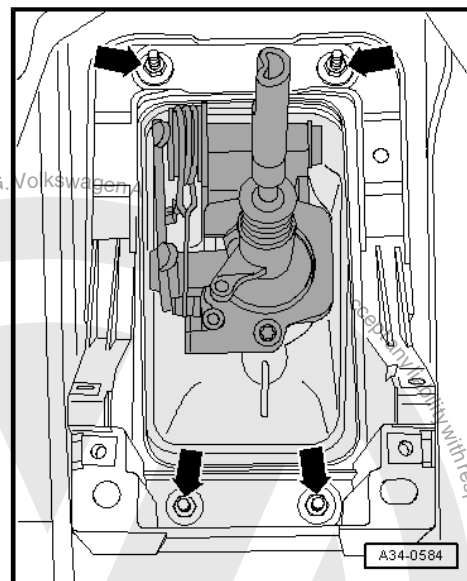
- ◆ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .

### Removing

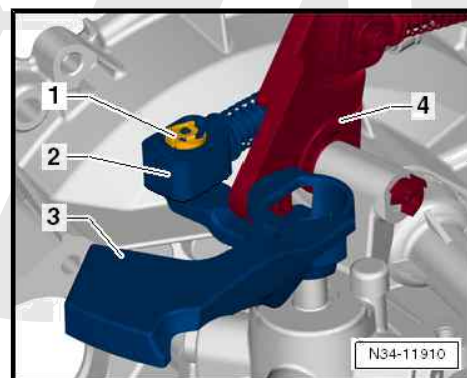
- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting battery .
- Remove gear lever gaiter with gear knob and any noise insulation from frame for centre console ⇒ [page 44](#) .
- Remove upper part of centre console together with securing bracket for centre console and cup holder ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Assembly overview – centre console .



- Remove nuts for selector housing -arrows-.
- Lower selector housing.
- If fitted, remove insulation from selector housing ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Assembly overview – centre console .
- Remove complete air filter housing if it is located over selector mechanism ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter .



- Remove circlip -1-.
- Remove gear selector cable -2- from pin of gearbox selector lever -3-.
- Proceed as follows to remove gate selector cable from gate relay lever -4-:
- Separate cable end-piece on gate relay lever from gate selector cable ⇒ [page 51](#) .
- Remove gate relay lever if necessary ⇒ [page 51](#) .



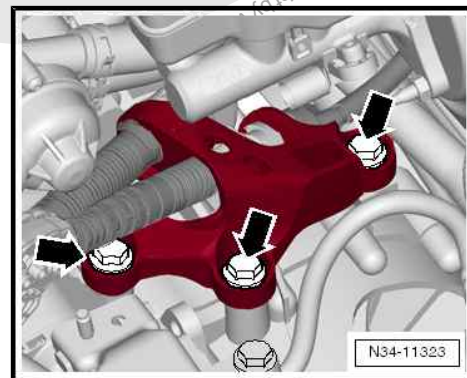
- Remove cable support bracket from gearbox -arrows-.



#### Caution

**Risk of damage to decoupling element on exhaust pipe.**

- ◆ **Observe ⇒ Rep. gr. 26 ; Emission control; Assembly overview - emission control .**



- Remove heat shield below selector mechanism ⇒ General body repairs, exterior; Rep. gr. 66 ; Mouldings/trims/extensions; Removing and installing floor heat shield .
- Swing down selector housing, and remove it together with cables.

#### Installing

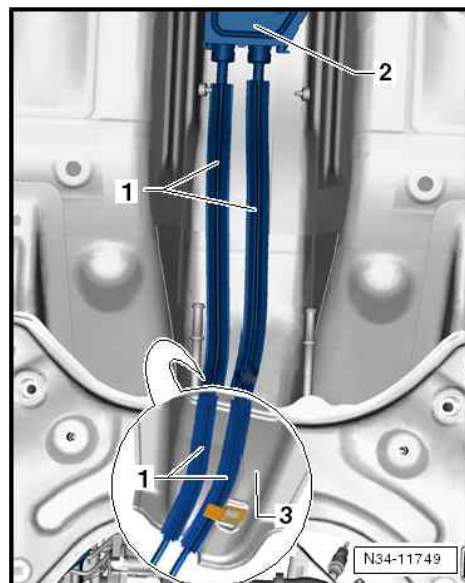
Install in the reverse order of removal, observing the following.

- Align selector housing parallel to body.
- Distance to body must be same on both sides.

Bolt on selector housing.

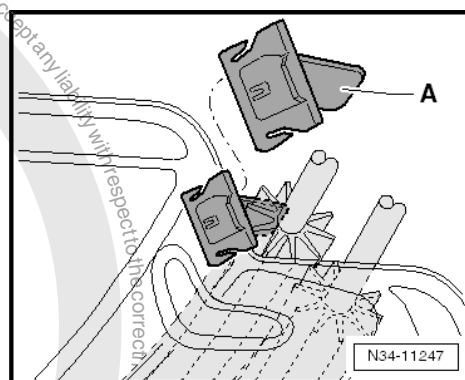


- Route Bowden cables -1- from selector mechanism -2- to gearbox as follows:
- Bowden cables must lie parallel to each other and must not cross.
- Bowden cables must be laid in the intended indentation in heat shield -3-.



On some equipment versions, cables and heat shield are held in position by clip -A-.

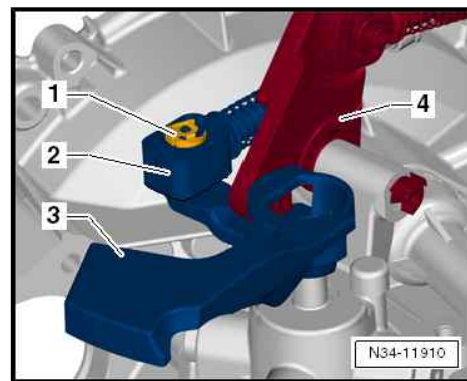
The holes in the cable end-pieces have different diameters.





### Note allocation of cable end-pieces ➔ [page 50](#)

- Grease following areas:
  - Guide rail for engagement of gate relay lever -4- in gearbox selector lever ➔ [page 50](#) ,
  - Pins of gearbox selector lever -3- and of gate relay lever -4- ➔ [page 50](#)
  - Allocate grease using ➔ Electronic parts catalogue (ETKA) .
- Renew securing clip -1- for cable end-piece -2- after each removal.
- Install gate relay lever -4- and cable end-piece together ➔ [page 51](#) .
- Insert gate selector cable in cable end-piece on gate relay lever.
- Adjust selector mechanism ➔ [page 52](#) .
- Install centre console and cup holder ➔ General body repairs, interior; Rep. gr. 68 ; Centre console; Assembly overview – centre console .
- Install gaiter with gear knob ➔ [page 44](#) .
- Install heat shield below selector mechanism ➔ General body repairs, exterior; Rep. gr. 66 ; Mouldings/trim/extensions; Removing and installing floor heat shield .
- Assemble exhaust system free of tension ➔ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .
- If removed, install complete air filter housing ➔ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- If removed, install battery tray ➔ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Connect battery ➔ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



### Specified torques

- ◆ Selector housing to body  
➔ [1.3 Assembly overview - selector mechanism", page 43](#)
- ◆ Selector cable support bracket to gearbox  
➔ [1.3 Assembly overview - selector mechanism", page 43](#)





## 1.6 Repairing selector mechanism

### Allocation of cable end-pieces

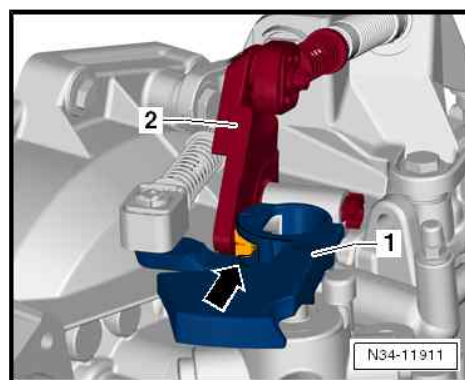
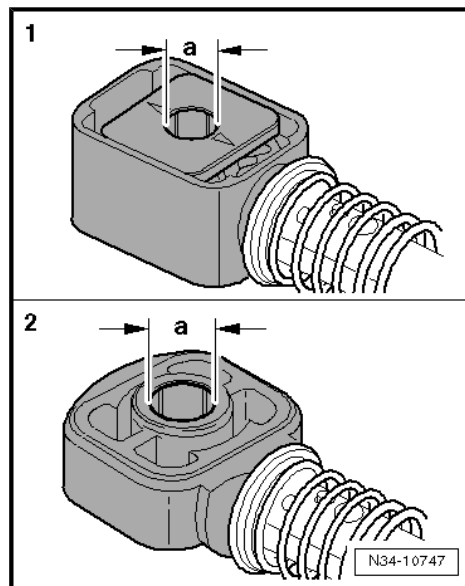
The holes in the cable end-pieces have different diameters.

Cable end-piece for	Dimension "a"
-1- Gear selector cable to gearbox selector lever	8.5 mm
-2- Gate selector cable to gate relay lever	10 mm

### Installation position of gearbox selector lever/gate relay lever

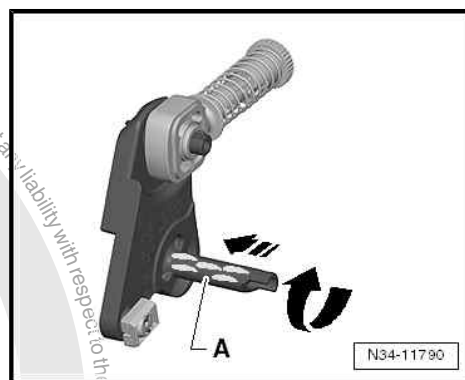
1 - Gearbox selector lever

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



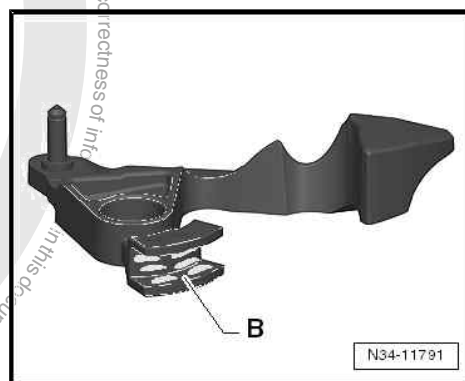
### Gate relay lever: thoroughly grease following areas in particular prior to installation

- Shaft -A- of gate relay lever -arrows-; amount of grease: 0.2 grams.
- Allocate grease using ⇒ Electronic parts catalogue (ETKA) .



### Gearbox selector lever: thoroughly grease following areas in particular prior to installation

- Guide rail -B- of gearbox selector lever into which gate relay lever engages.
- Support pin for cable end-piece.
- Allocate grease using ⇒ Electronic parts catalogue (ETKA) .
- Illustration of gate relay lever and gearbox selector lever may differ from actual components.

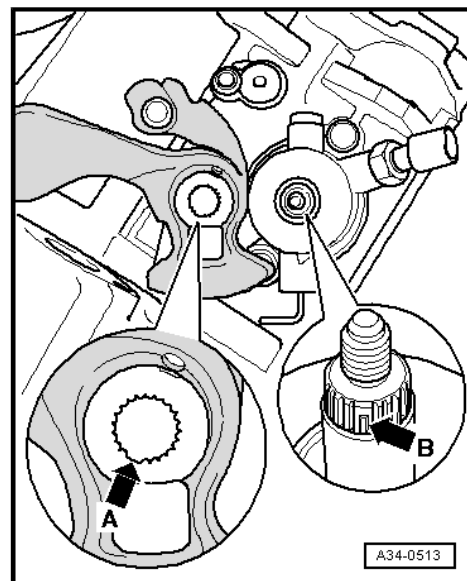






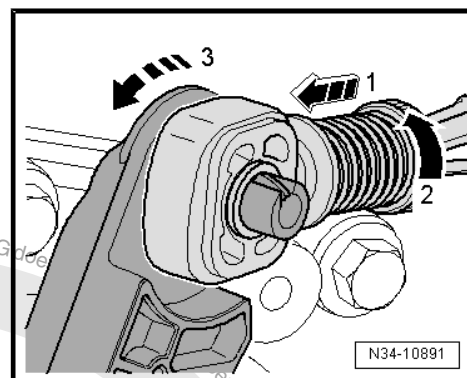
### Install gearbox selector lever

- When fitting the gearbox selector lever, ensure that the gap -arrow A- is aligned with the master spline -arrow B-.

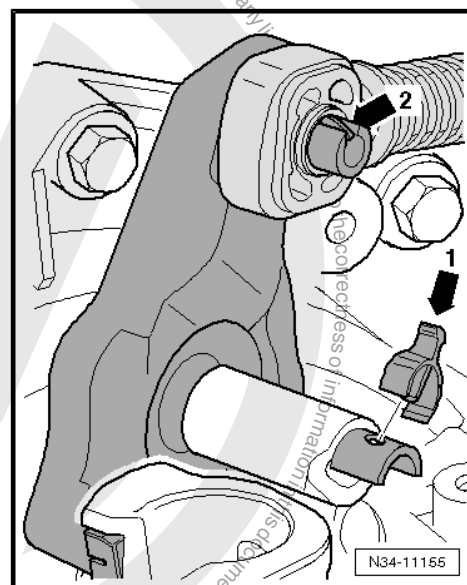


### Removing and installing gate relay lever

- Pull locking mechanism forward to stop in -direction of arrow 1-, and then lock it by turning to left in -direction of arrow 2-.
- Then push gate relay lever forwards (-direction of arrow 3-).



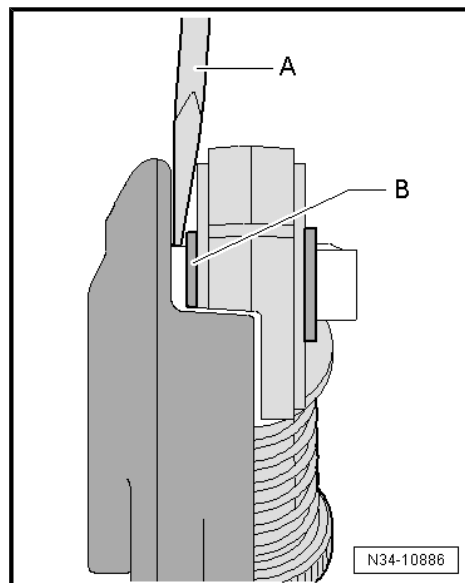
- Pull off clip -arrow 1- and remove gate relay lever together with cable end-piece.
- Cable end-piece must be located behind catch -arrow 2-.
- It is permissible to remove cable end-piece only after gate relay lever has been removed ⇒ [page 52](#) .
- Press cable end-piece onto gate relay lever ⇒ [page 52](#) .
- Insert gate relay lever together with cable end-piece as far as stop.
- The clip -arrow 1- secures gate relay lever.
- Ensure proper engagement of clip.
- Cable end-piece must be located behind catch -arrow 2-.





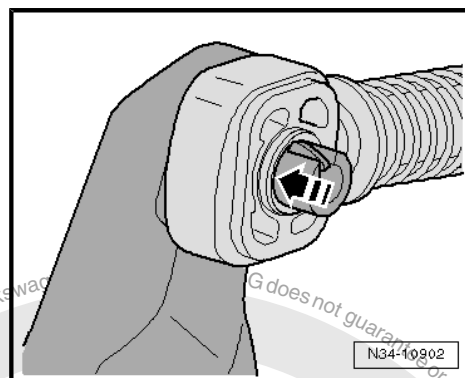
**With gate relay lever removed: levering cable end-piece for gate selector cable off gate relay lever**

- Fit a flat-bladed screwdriver between bush -B- and gate relay lever -A-.

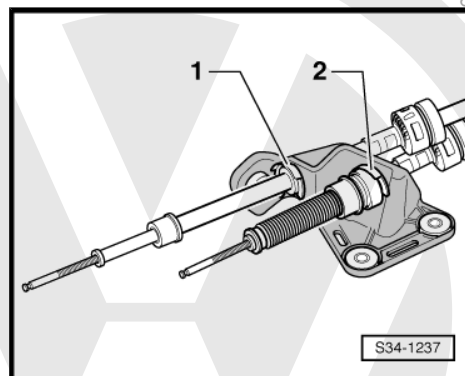


#### Pressing on cable end-piece

- Gate relay lever is removed.
- Grease support pins for cable end-piece.
- Allocate grease using ⇒ Electronic parts catalogue (ETKA) .
- Cable end-piece may be pressed only onto bush -arrow-.
- Cable end-piece must move freely on gate relay lever.
- The cable end-piece must be located behind catch.
- Ensure proper engagement.



#### Installation position of securing clips -1- and -2-.

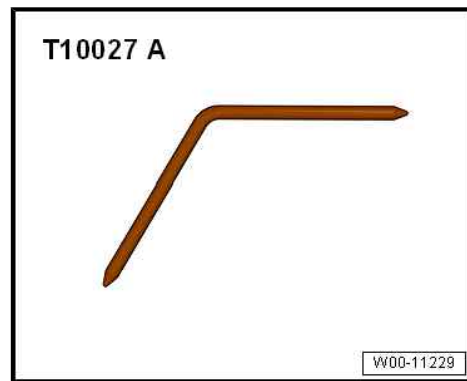


## 1.7 Adjusting selector mechanism

**Special tools and workshop equipment required**



◆ Pin - T10027A-

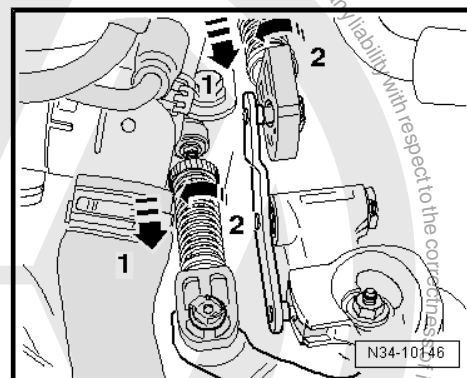


**Prerequisites for adjustment**

- 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 be in proper condition.
- Gearbox must be in neutral.
- Remove entire air filter housing if angled rod for securing selector shaft and securing mechanism for gear selector cable and gate selector cable are not accessible ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .

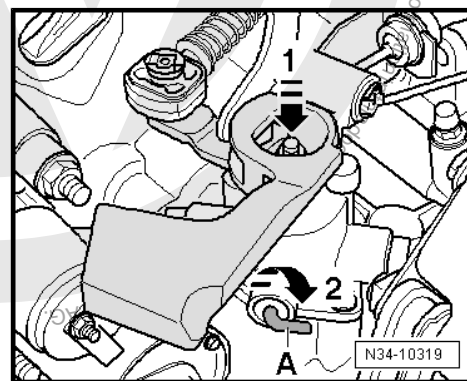
**Open cable end-pieces on gearbox:**

- Pull locking mechanisms on gate selector cable and gear selector cable end-pieces forward to stop -direction of arrow 1- and then turn to left to lock -direction of arrow 2-.
- It must be possible to push the cables into the cable end-piece.
- Gearbox must be in neutral.



**Move selector shaft in correct position for adjustment:**

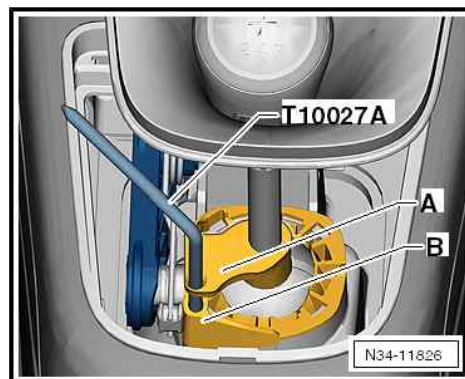
- Press selector shaft down in -direction of arrow 1-.
- While pressing down selector shaft, turn angled rod -A- in -direction of arrow 2- and at the same time press it in until it engages in selector shaft.





### Move gear lever in correct position for adjustment:

- Pull gaiter with gear knob upwards, inside out over gear knob.
- Remove noise insulation, if present ⇒ [page 44](#) .
- Move gear lever to neutral position, press it to left and hold in this position.
- Push locking pin - T10027 A- through hole -A- into hole -B-.

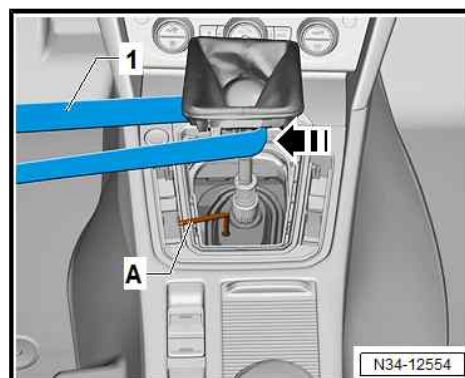


- Wrap left seat belt -1- around gear lever so that the belt holds the lever.

The gear lever is secured by the locking pin - T10027A- (-A-).

In addition, the seat belt presses the gear lever against the stop for 1st and 2nd gear -direction of arrow-.

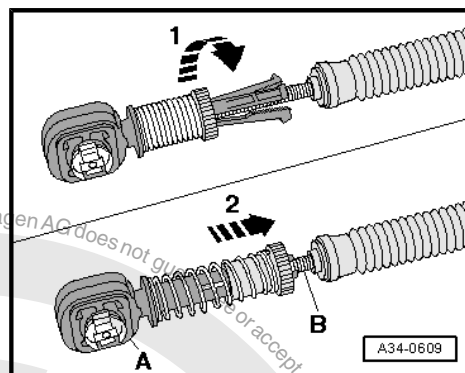
This takes all »play out of the selector mechanism«.



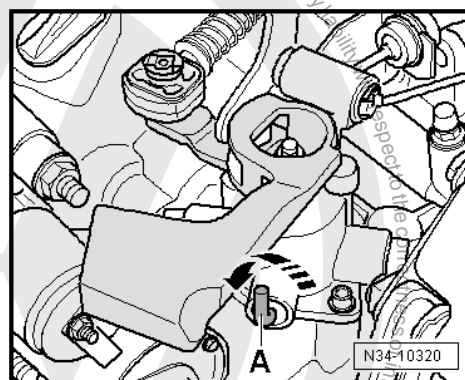
### Adjusting the selector mechanism:

- Now turn locking mechanisms on gear selector cable and gate selector cable end pieces 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 in direction of -arrow-.
- During this procedure, angled rod -A- must be pressed out of gearbox in -direction of arrow-.

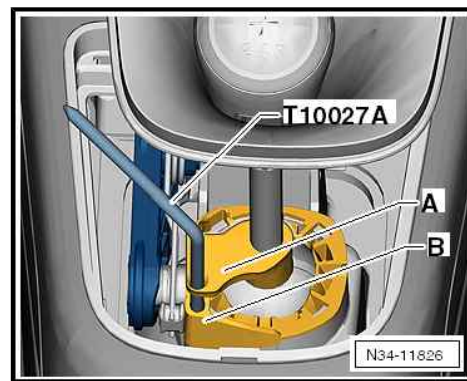




- Remove seat belt from selector lever.
- Pull locking pin out of holes -A- and -B-.
- If noise insulation was present, install it.
- Install gaiter with gear knob ➔ [page 44](#)
- Check selector shaft can move freely.

To do this, move selector shaft »back and forth« on gearbox at front by hand.

- Check selector mechanism ➔ [page 55](#) .
- If removed, install complete air filter housing ➔ Rep. gr. 24 ;  
Air filter; Removing and installing air filter housing .



## 1.8 Checking selector mechanism

- With gearbox in neutral, gear lever must be in gear lever 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 52](#) .



## 2 Removing and installing gearbox

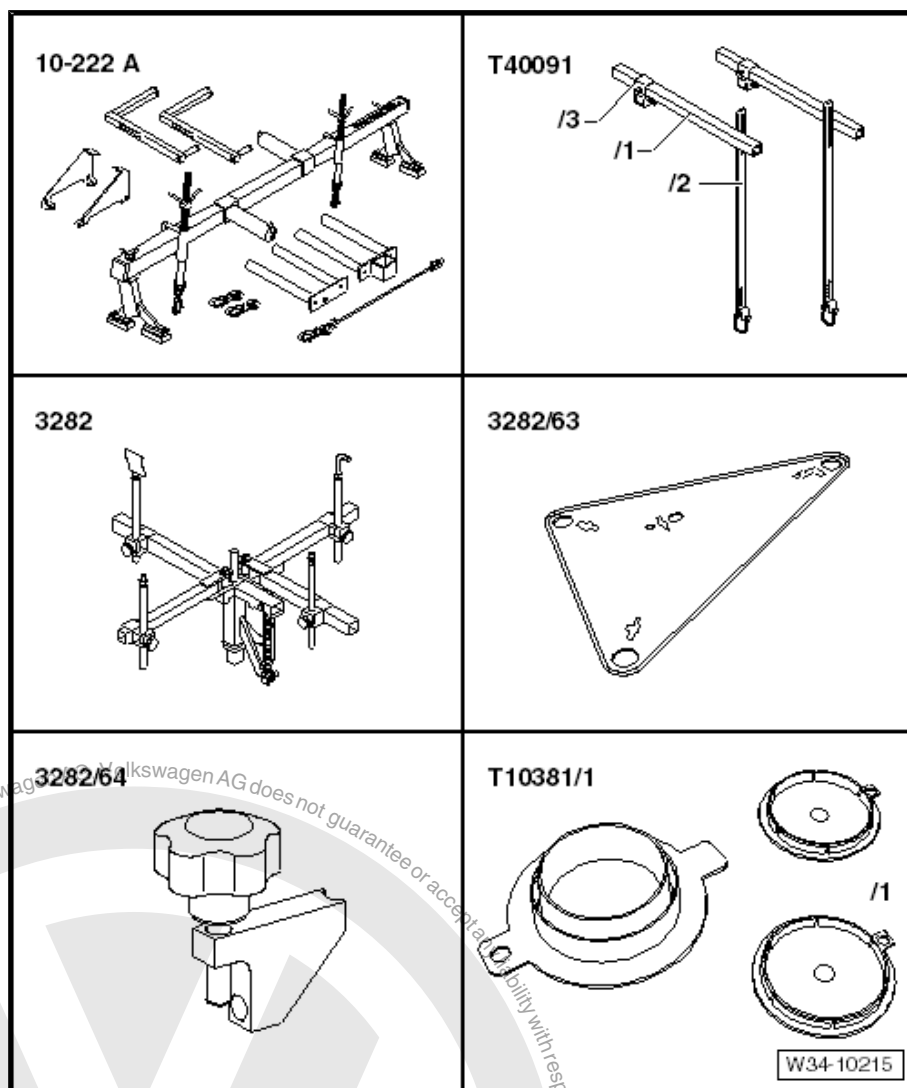
⇒ "2.1 Removing gearbox", page 56

⇒ "2.2 Install gearbox", page 64

⇒ "2.3 Specified torques for gearbox", page 66

### 2.1 Removing gearbox

Special tools and workshop  
equipment required



- ◆ Support - 10 - 222 A-
- ◆ Adapter - 10 - 222 A /31-1-
- ◆ Adapter - 10 - 222 A /31-2-
- ◆ Support - 10 - 222 A /31-3-
- ◆ Adapter - 10 - 222 A /31-5-
- ◆ Square tube - T40091/1-
- ◆ Joints - T40091/3-
- ◆ Gearbox support - 3282-
- ◆ Support elements for gearbox (determine when setting adjustment plate on gearbox support )



- ◆ Sealing cap - T10381/1-
- ◆ Not required adjustment plate - 3282/63-
- ◆ Not required: adapter - 3282/64-
- ◆ Adjustment plate - 3282/69-



- ◆ Torque wrench - V.A.G 1331-
- ◆ Torque wrench - V.A.G 1332-
- ◆ Engine and gearbox jack - V.A.G 1383 A-

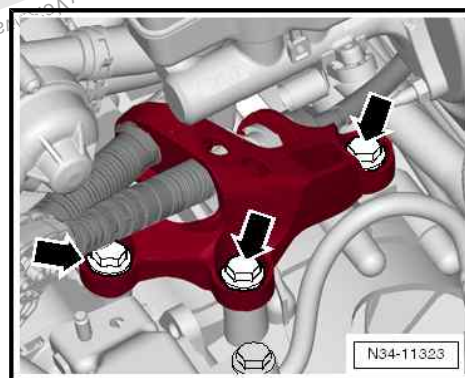
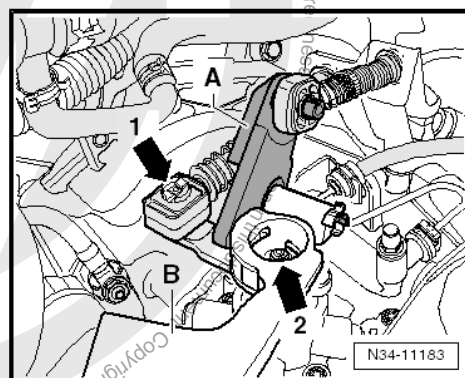
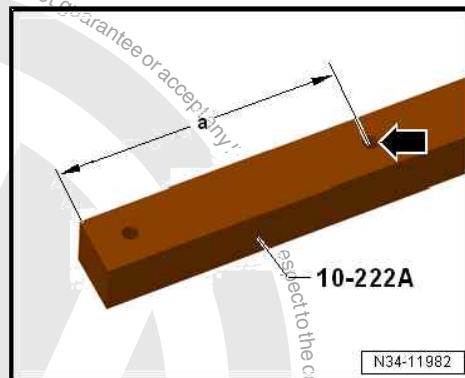




- ◆ Or engine and gearbox jack - VAS 6931-
- ◆ Grease for splines
- ◆ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .
- ◆ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .
- If support bracket - 10 - 222 A- does not yet have hole marked with -arrow-, then hole must subsequently be drilled into support bracket.
- Dimension -a- = 225 mm.
- Hole diam. = 12.5 mm.

### Removing manual gearbox 0DQ

- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .
- Remove complete air filter housing ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Remove securing clip -1- for gear selector cable from gearbox selector lever -B-.
- Remove gate relay lever -A- together with cable end-piece ⇒ [page 51](#) .
- Remove gearbox selector lever -B- by removing nut -arrow 2-.
- Unscrew bolts -arrows-, and tie up cable support bracket with cables.





- Unscrew bolts -arrows- and place clutch slave cylinder to one side. Do not disconnect lines.

**Caution**

**Do not operate clutch pedal any more.**

- Then remove upper securing bolt on starter.
- Then, disconnect lines from starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Assembly overview – starter .
- Remove upper engine/gearbox connecting bolts.
- If there are hose and cable connections in area of engine support eyes for support bracket - 10 - 222 A- , remove these now.
- Install support bracket as follows:

**Required material:**

- ◆ Adapter - 10 - 222 A /31-1-
- ◆ Adapter - 10 - 222 A /31-2-
- ◆ Connector - T40091/3-
- ◆ Square tube - T40091/1-
- ◆ Support - 10 - 222 A /31-3-
- ◆ Adapter - 10 - 222 A /31-5-

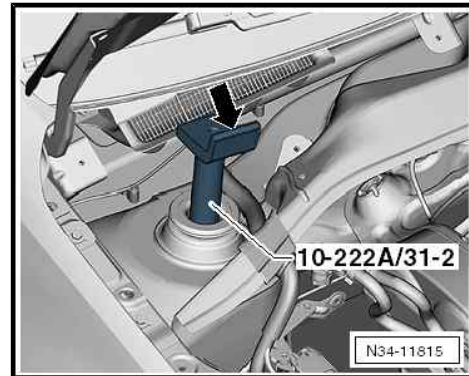
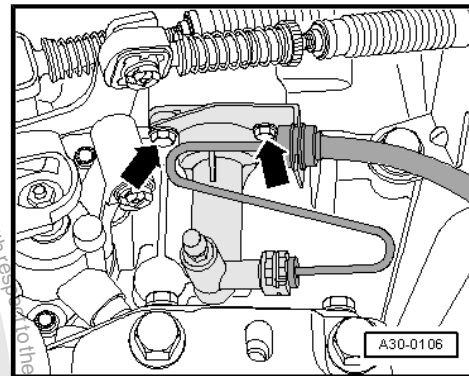
**Install support bracket as follows:**

Adapter - 10 - 222 A /31-1- and adapter - 10 - 222 A /31-2- are placed onto suspension strut supports underneath plenum chamber cover.

Therefore, remove following components:

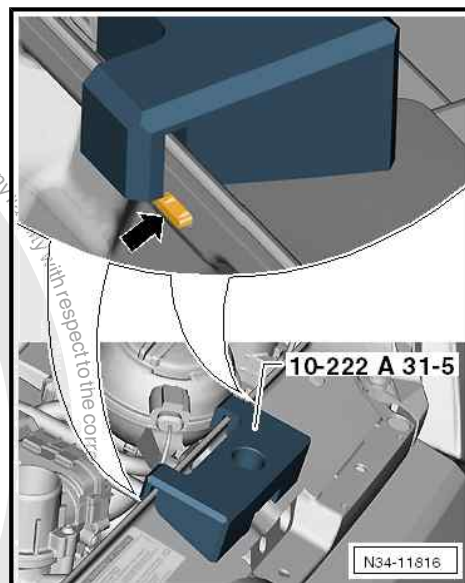
- ◆ Wiper arms ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Removing and installing wiper arms
- ◆ Plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover
- Fit adapter - 10 - 222 A /31-1- and adapter - 10 - 222 A /31-2- onto suspension strut supports.

Angled pieces of adapters -arrow- point towards engine compartment.

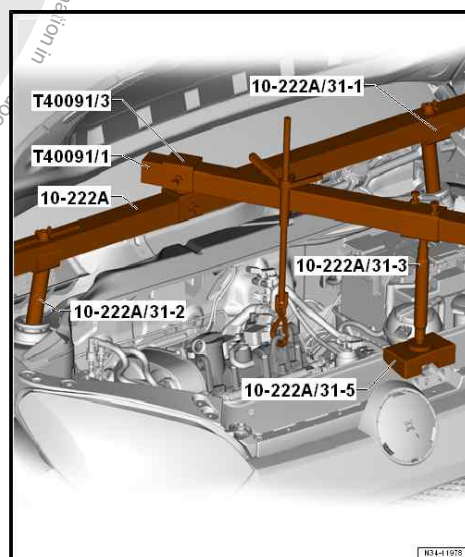




- If fitted, pull bonnet seal off lock carrier.
  - Position support - 10 - 222 A /31-5- above bonnet catch.
- Correct position is between 2 lugs -arrow-.



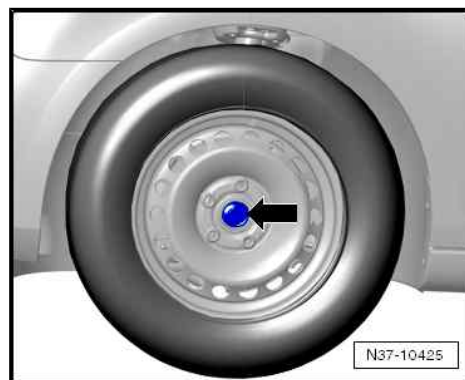
- Slide connector - T40091/3- onto support bracket - 10-222 A- .
- Bolt support bracket - 10-222 A- to adapter - 10 - 222 A /31-1- and to adapter - 10 - 222 A /31-2- .
- Attach square tube - T40091/1- to support bracket - 10-222 A- .
- Fit square tube on support - 10 - 222 A /31-3- and adapter - 10 - 222 A /31-5- .
- Then attach spindle to front engine support eye.
- Slightly take up weight of engine/gearbox assembly on spindle .
- Take up weight of engine/gearbox assembly on spindles.



The drive shafts are located directly in the gearbox

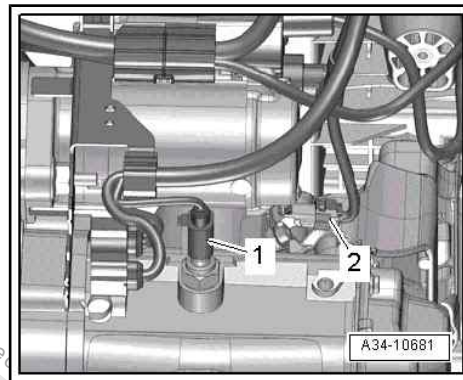
During subsequent work process, drive shafts with joint sections must be removed.

- With vehicle standing on its wheels, loosen front flange bolts -arrow- 90° at most, or wheel bearing will be damaged ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Remove front left wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview - front wheel housing liner .

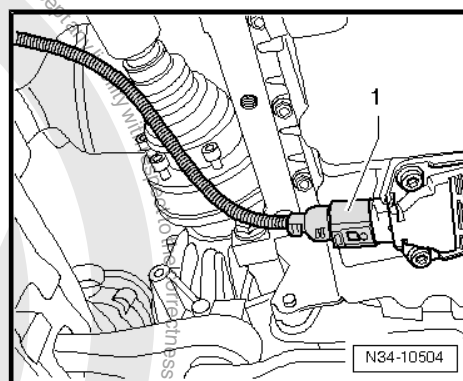




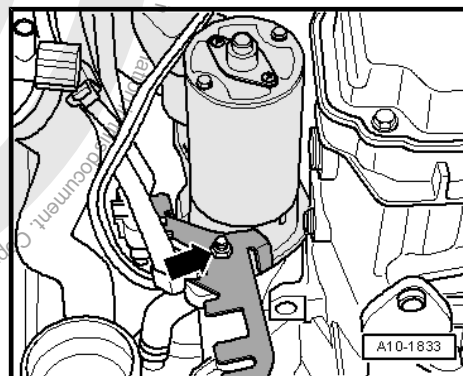
- Disconnect electrical connectors:
- 1 - Reversing light switch - F4-
- 2 - Gearbox neutral position sender - G701-



- Pull connector -1- off oil level and oil temperature sender - G266- .



- Remove nut -arrow- and remove retainer for electrical lines.
- Remove starter => Electrical system; Rep. gr. 27 ; Starter; Assembly overview - starter .
- Separate exhaust system from engine and tie it up => Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .

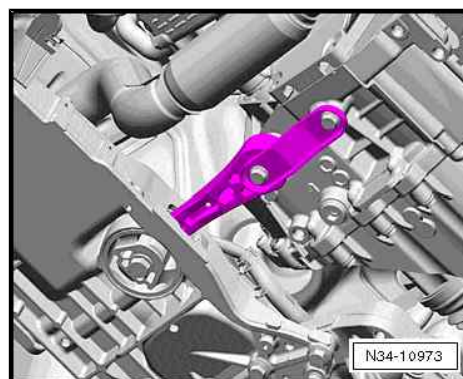


#### Caution

**Risk of damage to flexible joint.**

- ◆ **Observe => Rep. gr. 26 ; Emission control; Assembly overview - emission control .**

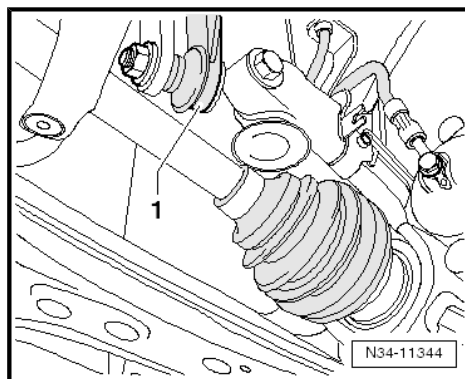
- Remove pendulum support.



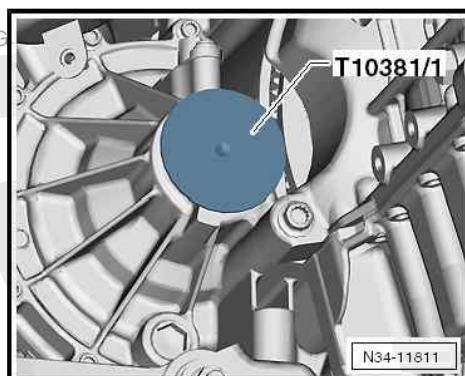




- Remove coupling rod -1- from anti-roll bar on both sides ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Assembly overview – subframe .
- Press anti-roll bar upwards.

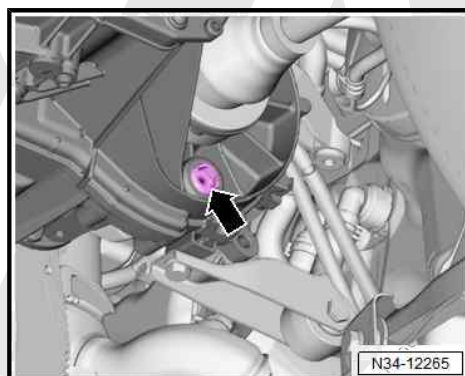


- Remove both drive shafts with joint sections ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Install sealing caps in gearbox.

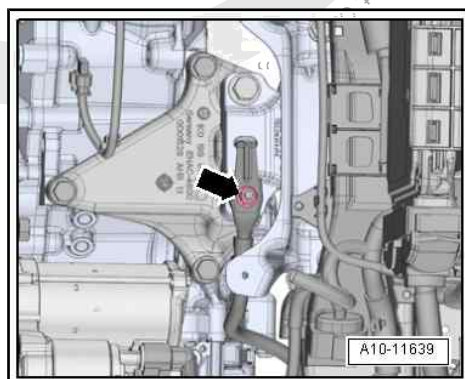


#### Manual gearbox 0DQ

- Drain gearbox oil -arrow- ⇒ [page 70](#) .



- If fitted, remove earth wire -arrow-.



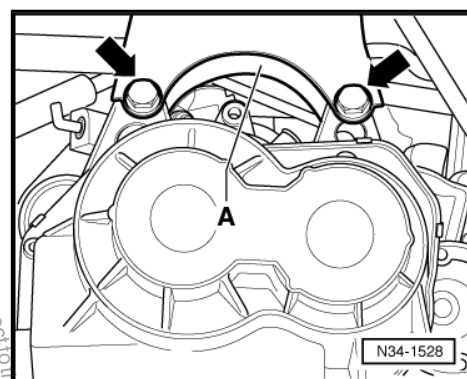
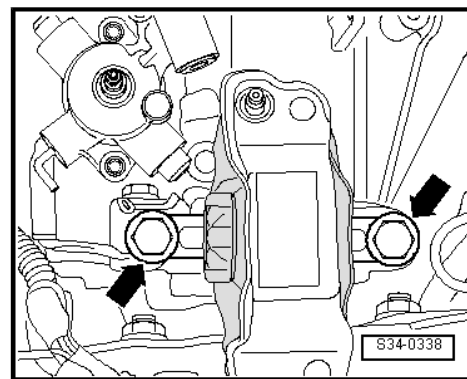


- Remove hexagon bolts -arrows- for left assembly mounting from gearbox mounting.
- Tilt engine and gearbox assembly by lowering spindles of support bracket - 10-222 A- .

**Note**

*Remove lines for lambda probe from plenum chamber bulkhead. Do not disconnect pipe/hose system.*

- Securing bolts -arrows- for gearbox bracket -A- must be accessible.
- Remove gearbox bracket -A- -arrows-.

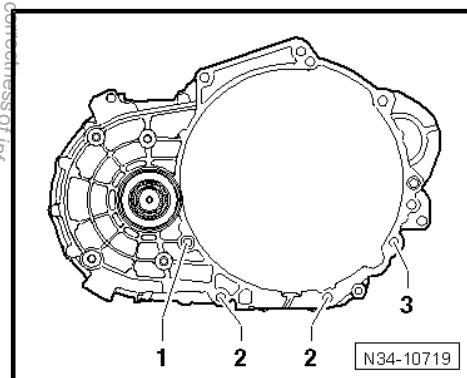


- Remove lower engine/gearbox connecting bolt -1-.

**Note**

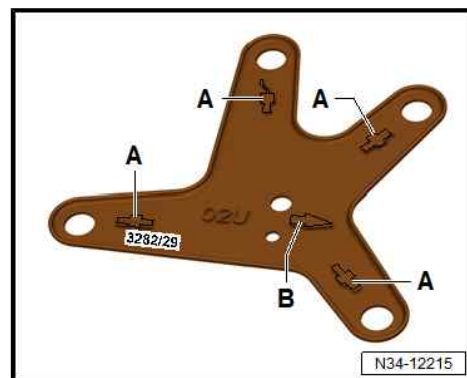
*Loosen engine/gearbox connecting bolts -2- and -3-, and leave them installed just hand-tight.*

- Insert gearbox support - 3282- into engine and gearbox jack



Gearbox support - 3282- is aligned with adjustment plate - 3282/69- for removal of gearbox.

- Fit adjustment plate - 3282/69- on gearbox support - 3282- (adjustment plate fits in only one position).
- Screw in support elements -A- as illustrated on adjustment plate.

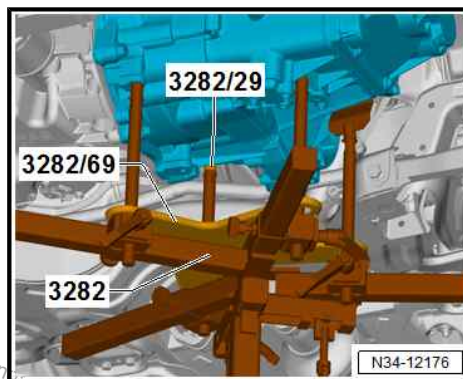




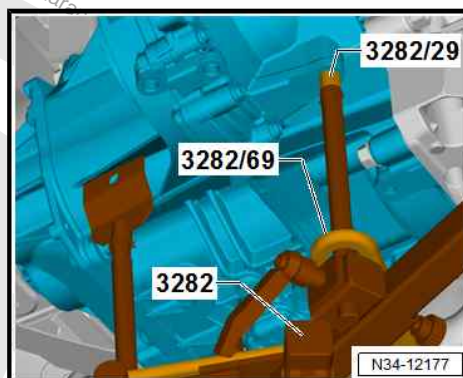
- Position engine and gearbox jack under vehicle. Arrow -B- on adjustment plate points in direction of vehicle travel (⇒ previous illustration).

Rods holding the support elements should be flush with gearbox support - 3282- at bottom.

- Align adjustment plate parallel to gearbox.



- Then screw pin - 3282/29- into rear hole on gearbox for securing bolt of pendulum support.
- Press gearbox off dowel sleeves.
- Swing gearbox upwards in area of differential.
- Slightly turn down gearbox in area of 6th gear (aluminium cover) using spindles of gearbox support - 3282- .
- Guide gearbox with differential -arrow- over subframe, and swing it out.
- Differential must face upwards.
- If necessary, turn gearbox further upwards near differential using spindles of gearbox support - 3282- .
- Carefully continue swinging gearbox out -arrow-, and lower it.
- When lowering gearbox, change position of gearbox using spindles of gearbox support - 3282- .



#### Note

*Please make sure that the coolant hose and electrical wiring retainer do not get caught on the gearbox.*

Install gearbox ⇒ [page 64](#) .

## 2.2 Install gearbox

Install in reverse order of removal, observing the following:

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

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

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

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

- After gearbox has been bolted to engine all around, detach engine and gearbox jack from gearbox.





⇒ "2.3 Specified torques for gearbox", page 66 .

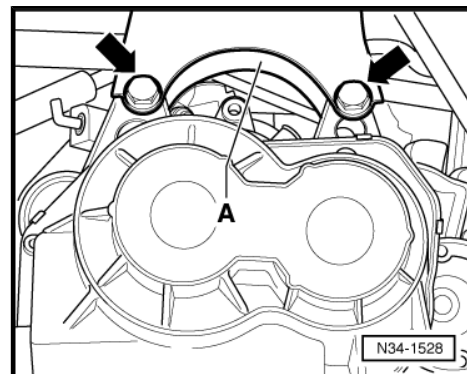
- Right afterwards, connect gearbox to assembly mountings.

### Assembly mountings

Gearbox bracket with bolts, »side view« -arrows-

#### Example

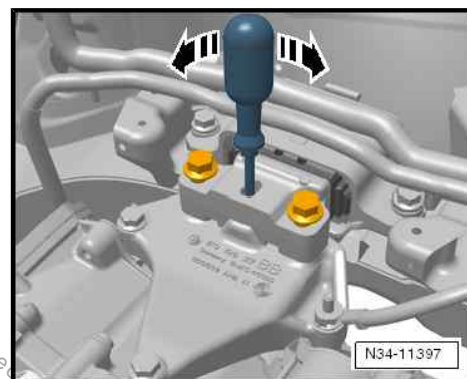
- Fit and tighten »new« bolts -arrows- ⇒ page 67 .



- Align engine/gearbox assembly in installation position; to do so, tighten spindles of support bracket - 10 - 222 A- until gearbox support makes contact with gearbox mounting.

#### Example

- Insert -new bolts- and »tighten by hand« until bolt head comes into contact.
- Adjust assembly mountings ⇒ Rep. gr. 10 ; Assembly mountings; Adjusting assembly mountings
- Do not remove engine support bracket - 10 - 222 A- until all bolts securing the assembly mounting have been tightened to specified torque.



- Attach pendulum support to gearbox using new bolts ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings.

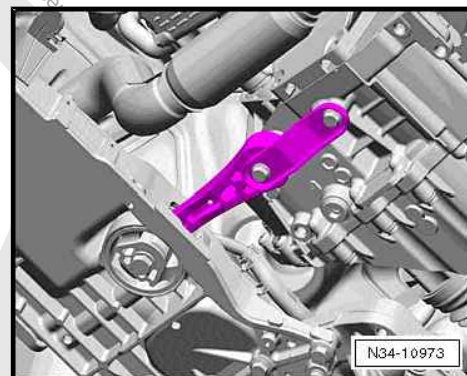
#### Example

### Exhaust system

- Assemble exhaust system ⇒ Rep. gr. 26 ; Emission control; Assembly overview – emission control .

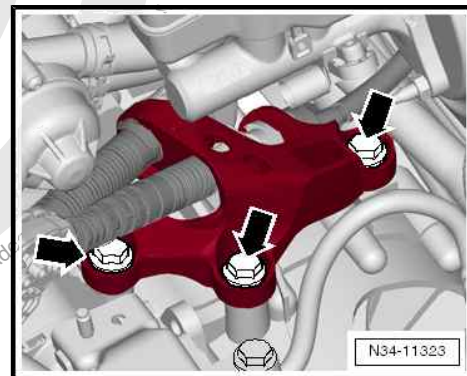
### Selector mechanism

- Install cable support bracket on gearbox, and tighten bolts -arrows- ⇒ page 43 .
- Install gearbox selector lever -B- ⇒ page 81 .
- Attach gear selector cable to gearbox selector lever.
- Adjust selector mechanism ⇒ page 52 .



### Other components

- Install starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Assembly overview - starter.
- Install clutch slave cylinder ⇒ page 25 .

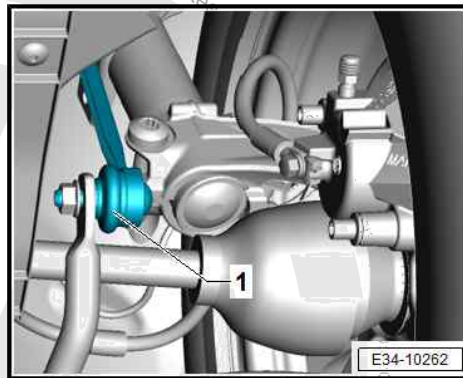




- Coupling rod -1- ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Assembly overview - subframe .

#### Example

- Install battery tray, battery and battery cover ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Install air filter ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Install engine cover panel ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Install front left wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview - front wheel housing liner .



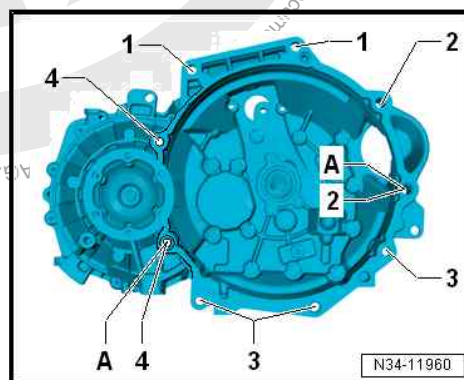
#### Specified torques

- ◆ Gearbox to engine: ⇒ [page 66](#)
  - ◆ Clutch slave cylinder to gearbox ⇒ [page 25](#)
- ⇒ "1.12 Removing and installing clutch slave cylinder", page 25

### 2.3 Specified torques for gearbox

Item	Bolt	Quantity	Nm
1	M12 x 60	2	80
2	M12 x 150 ◆ Additionally, start- er to gearbox	2	80
3	M10 x 55	3	40
4	M12 x 70	2	80

Item -A- dowel sleeves for centring





## 3 Assembly mountings

⇒ ["3.1 Assembly overview - assembly mountings", page 67](#)

### 3.1 Assembly overview - assembly mountings

#### 1 - Bolt

- ☐ Renew after removal
- ☐ Insert new bolts and »tighten by hand« until bolt head comes into contact.
- ☐ Tightening torque: adjust assembly mountings ⇒ Rep. gr. 10 ; Assembly mountings; Adjusting assembly mountings .

#### 2 - Bolt

- ☐ Gearbox mounting to body
- ☐ ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

#### 3 - Gearbox mounting

- ☐ ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

#### 4 - Gearbox bracket

#### 5 - Bolt

Qty. 2 (different from qty. shown in illustration)

⇒ [page 68](#)

- ☐ Renew after removal
- ☐ Gearbox bracket to gearbox
- ☐ 40 Nm +90°

#### 6 - Pendulum support

- ☐ ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

#### 7 - Bolt

- ☐ Pendulum support to subframe
- ☐ ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

#### 8 - Bolt

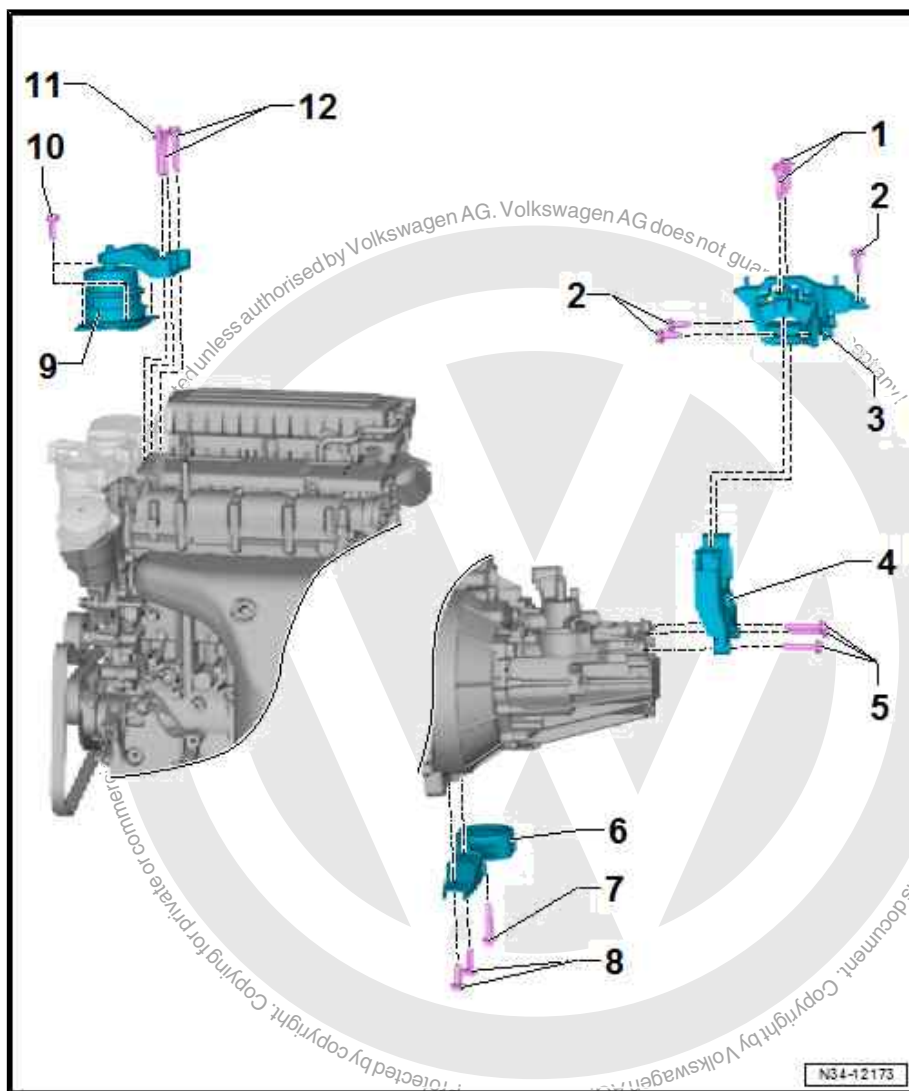
- ☐ Pendulum support to gearbox
- ☐ ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

#### 9 - Engine mounting

- ☐ ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

#### 10 - Bolt

- ☐ Qty. 4
- ☐ Engine mounting to body
- ☐ ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings





## 11 - Bolt

- Engine mounting to engine

⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

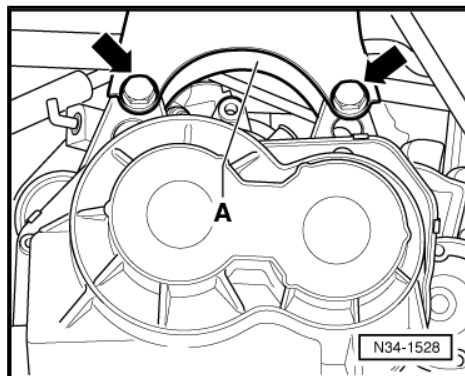
## 12 - Bolt

- Qty. 2
- Engine mounting to engine

⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

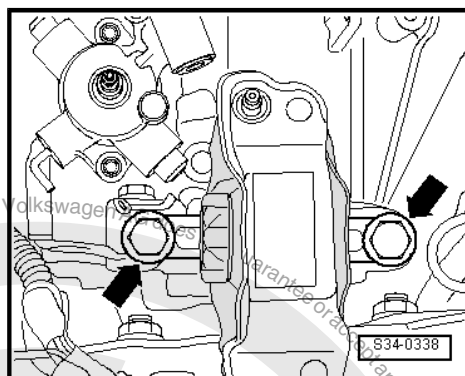
### Gearbox bracket -A- to gearbox

- Renew bolts.
- Tighten bolts by hand.
- Tighten bolt to specified torque ⇒ [Item 5 \(page 67\)](#) .



### Gearbox bracket to gearbox

- Renew bolts.
- Tighten bolts by hand.
- Tighten bolt to specified torque ⇒ [Item 1 \(page 67\)](#) .



### Note

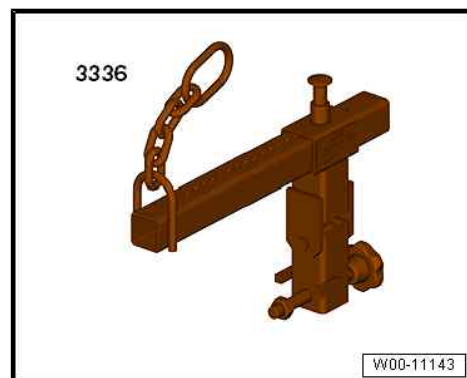
*Install engine and gearbox mounting free of tension ⇒ Rep. gr. 10 ; Removing and installing engine .*



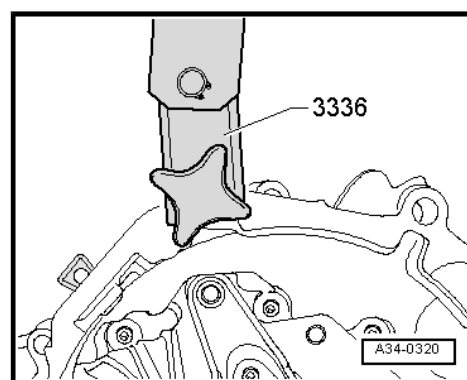
## 4 Transporting gearbox

### Special tools and workshop equipment required

- ◆ Gearbox mounting support - 3336-



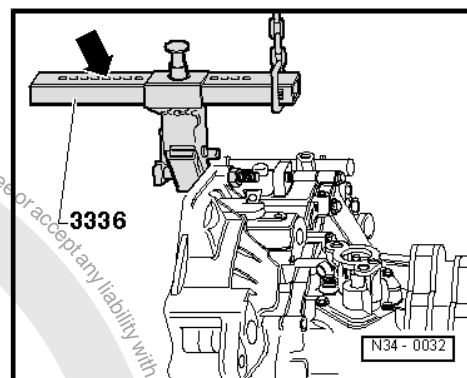
- Bolt gearbox lifting tackle - 3336- to clutch housing.



- Adjust support beam on sliding piece using locking pin -arrow-.

No. of holes visible = 5

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







## 5 Gear oil

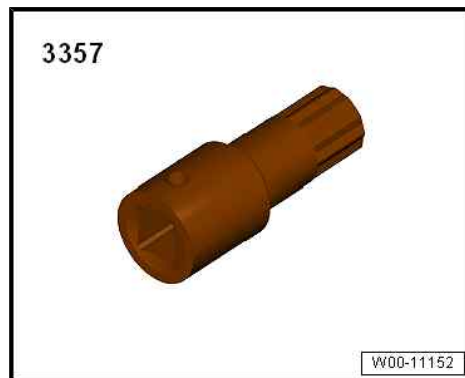
⇒ "5.1 Checking gear oil level", page 70

⇒ "5.2 Draining and filling gear oil", page 71

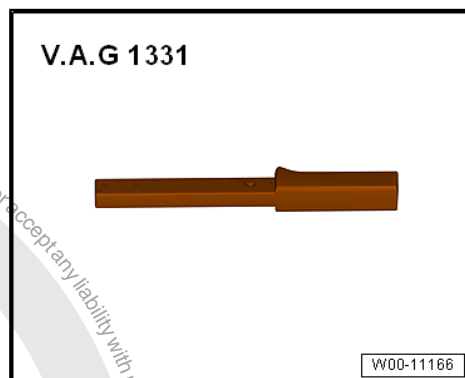
### 5.1 Checking gear oil level

Special tools and workshop equipment required

- ◆ Multi-point bit XZN - 3357- , only for oil filler plug with multi-point socket head



- ◆ Torque wrench - V.A.G 1331-

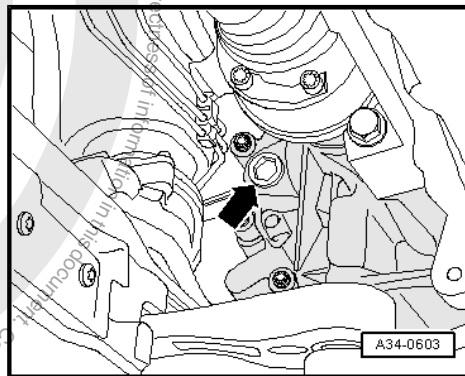


Gear oil ⇒ Electronic parts catalogue (ETKA)

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .
- To check gear oil, remove oil plug -arrow-.

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

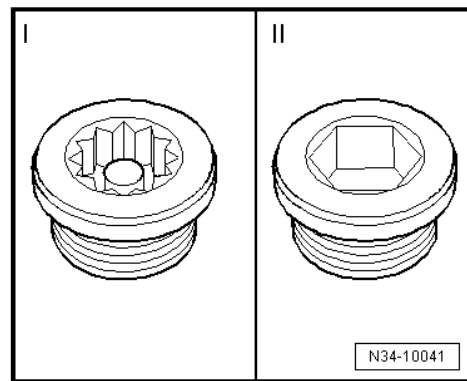
- If necessary, fill with gear oil to lower edge of filler hole.
- Tighten bolt -arrow-.





### Various versions of oil filler and drain plug

- I - Oil filler plug/oil drain plug with multi-point socket head, 25 Nm
- II - Oil filler plug/oil drain plug with hexagon socket head, 30 Nm
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .



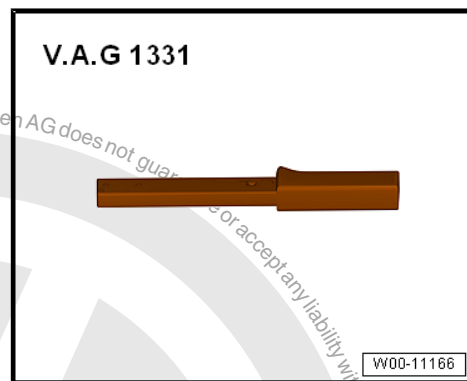
## 5.2 Draining and filling gear oil

### Special tools and workshop equipment required

- ◆ Multi-point bit XZN - 3357- , only for oil filler plug with multi-point socket head



- ◆ Torque wrench - V.A.G 1331-

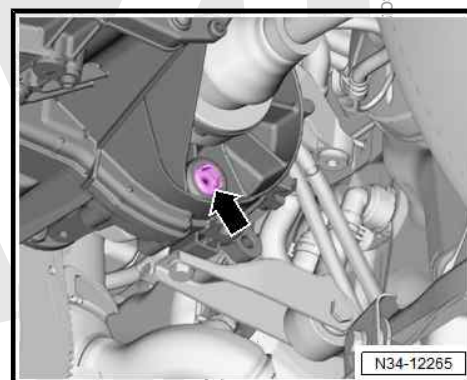


Gear oil ⇒ Electronic parts catalogue (ETKA) .

**Use a clean container with a scale and a capacity of approx. 3.0 l to catch the gear oil when draining.**

**Drain gear oil -arrow- - -**

- Tighten oil drain plug -arrow- to specified torque.







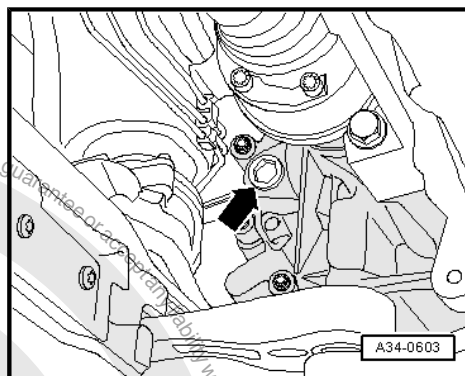
### Fill with gear oil

- Remove oil plug -arrow- to fill.
- If previous oil is clean, fill it into gearbox.

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

- If oil should get on gearbox and other components, remove it thoroughly.

**Specified torques ➔ [page 71](#)**

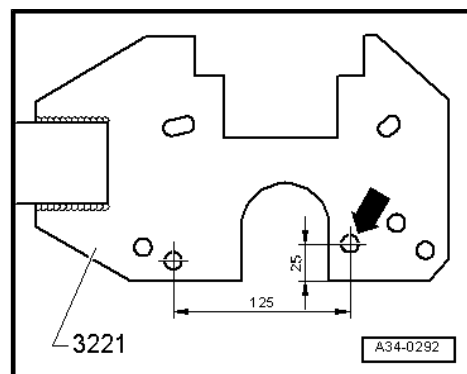
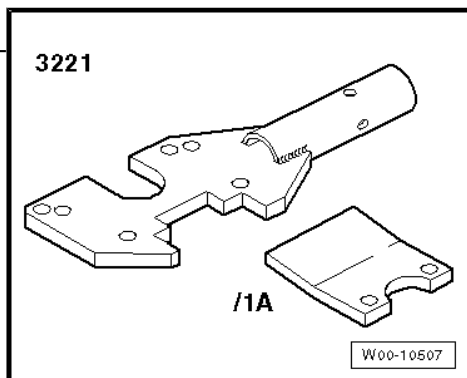




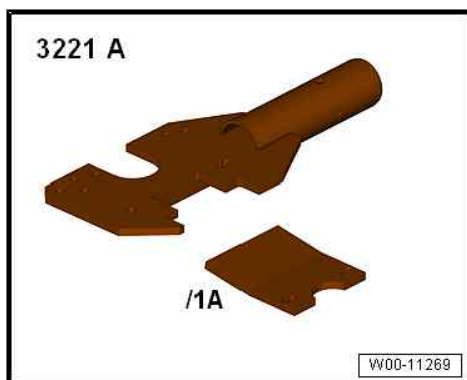
## 6 Installing to engine and gearbox support

### Special tools and workshop equipment required

- ◆ Gearbox support - 3221- (check and adjust as necessary ⇒ [page 73](#) )



- ◆ or gearbox support - 3221A-



- ◆ Support clamp - VW 313-

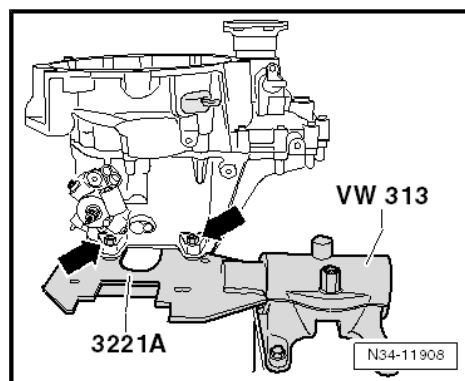


### Gearbox support - 3221- (check and adjust as necessary)

- If necessary, drill a hole with 11.0 mm in diameter -arrow-.
- Then, mark gearbox support - 3221- with -3221A- .



- Secure gearbox to gearbox support - 3221A- -arrows-.





## 7 Dismantling and assembling gearbox

⇒ [“7.1 Schematic overview - gearbox”, page 75](#)

⇒ [“7.2 Assembly overview - gearbox”, page 76](#)

⇒ [“7.3 Assembly overview - cover for gearbox housing and 5th/6th gear”, page 77](#)

⇒ [“7.4 Assembly overview - clutch housing”, page 79](#)

⇒ [“7.5 Assembly overview - shafts, differential, selector mechanism”, page 80](#)

⇒ [“7.6 Assembly overview - selector unit”, page 81](#)

⇒ [“7.7 Assembly overview - selector forks”, page 83](#)

⇒ [“7.8 Repairing selector forks”, page 84](#)

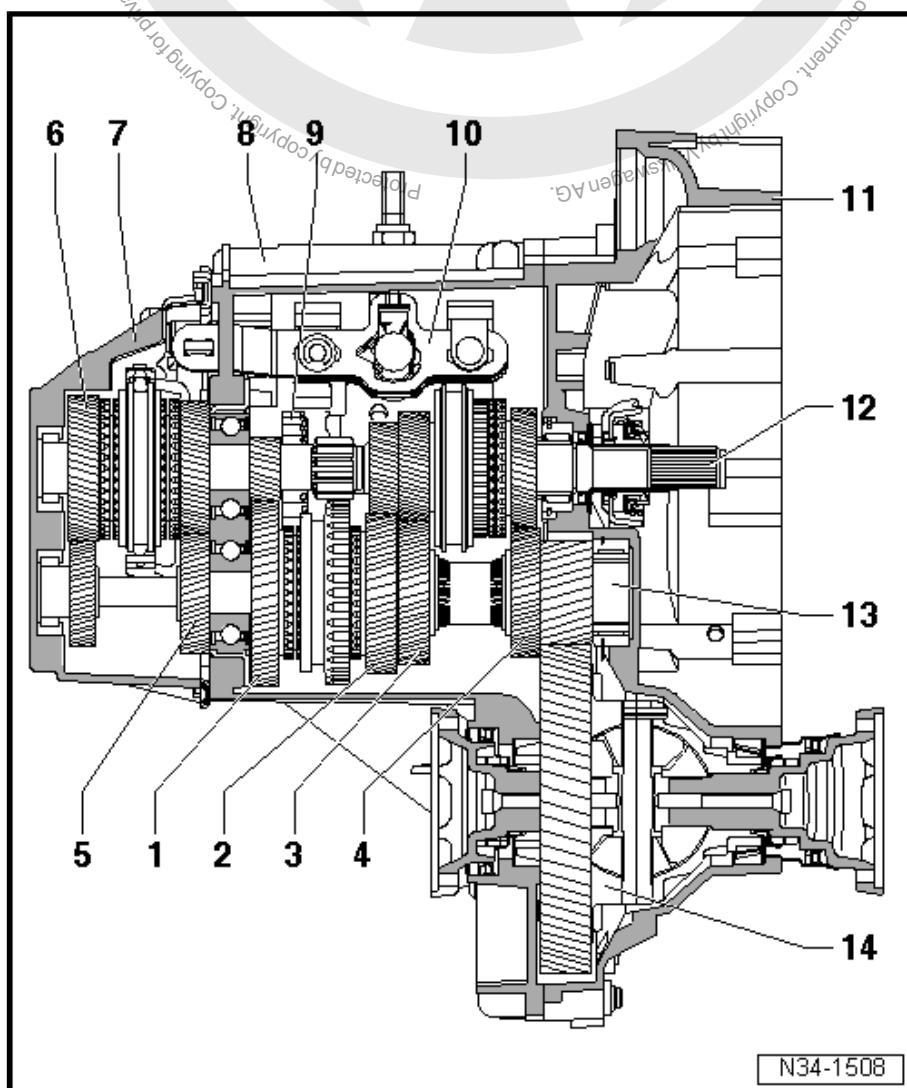
⇒ [“7.9 Repairing selector unit”, page 87](#)

⇒ [“7.10 Renewing oil seal for selector shaft”, page 90](#)

⇒ [“7.11 Dismantling and assembling gearbox”, page 90](#)

### 7.1 Schematic overview - gearbox

- 1 - 1st gear
- 2 - 2nd gear
- 3 - 3rd gear
- 4 - 4th gear
- 5 - 5th gear
- 6 - 6th gear
- 7 - Gearbox housing cover
- 8 - Gearbox housing
- 9 - Reverse gear wheel
- 10 - Selector mechanism
  - (Selector forks)
- 11 - Clutch housing
- 12 - Input shaft
- 13 - Output shaft
- 14 - Differential
  - Flange shafts shown in illustration are not fitted on 0DQ





## 7.2 Assembly overview - gearbox

I -  
⇒ [“7.3 Assembly overview - cover for gearbox housing and 5th/6th gear”, page 77](#)

II -  
⇒ [“7.4 Assembly overview - clutch housing”, page 79](#)

III -  
⇒ [“7.5 Assembly overview - shafts, differential, selector mechanism”, page 80](#)

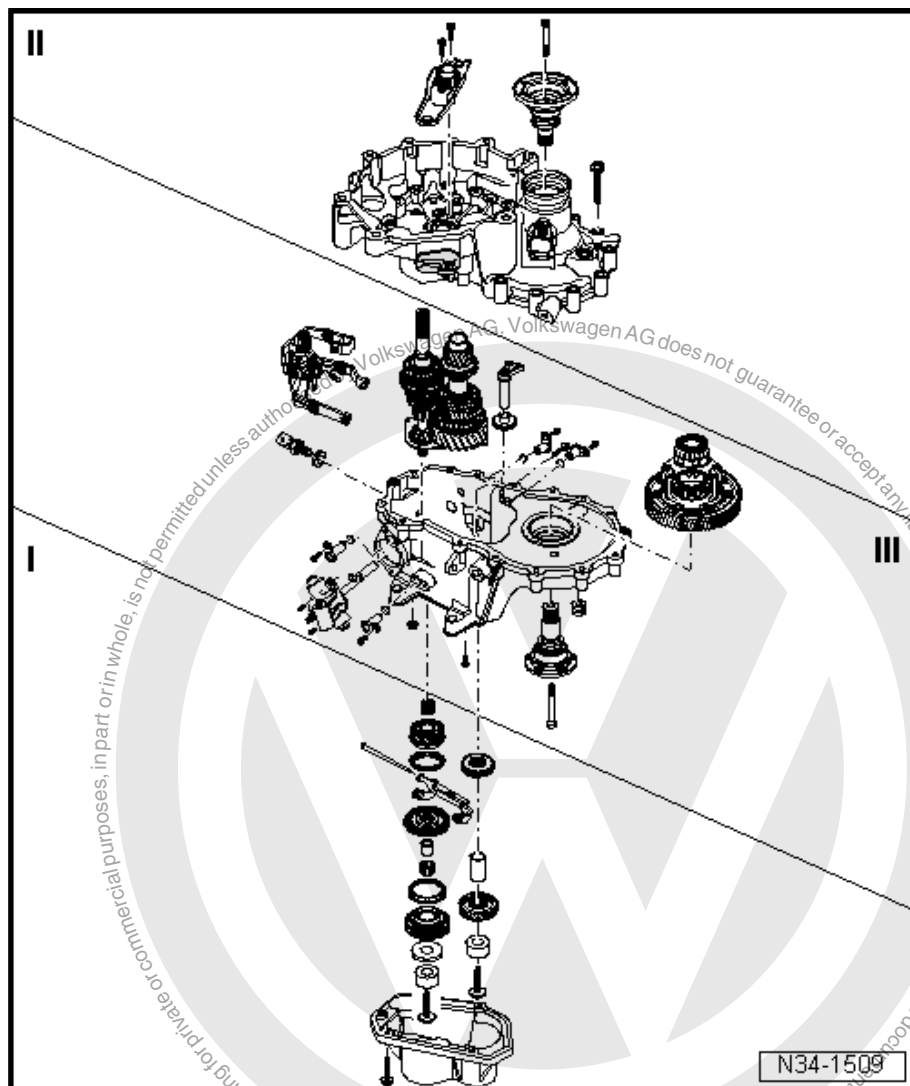
III -  
⇒ [“7.6 Assembly overview - selector unit”, page 81](#)

III -  
⇒ [“7.7 Assembly overview - selector forks”, page 83](#)

III -  
⇒ [“7.8 Repairing selector forks”, page 84](#)

III -  
⇒ [“7.9 Repairing selector unit”, page 87](#)

III -  
⇒ [“7.10 Renewing oil seal for selector shaft”, page 90](#)





### 7.3 Assembly overview - cover for gearbox housing and 5th/6th gear

#### 1 - Gearbox housing

- ☐ Repairing ⇒ [page 106](#)

#### 2 - Gear wheel for 5th gear

- ☐ Fitting position  
⇒ [page 102](#)
- ☐ Needs to be pressed off  
and on ⇒ [page 102](#) on  
some gearboxes

#### 3 - Sleeve

#### 4 - Gear wheel for 6th gear

- ☐ Fitting position  
⇒ [page 103](#)

#### 5 - Cylindrical roller bearing inner race

- ☐ For output shaft

#### 6 - Bolt

- ☐ For output shaft
- ☐ Self-locking
- ☐ Renew after removal
- ☐ M8: 30 Nm and turn 90° further
- ☐ M10: 75 Nm and turn 45° further

#### 7 - Gearbox housing cover

- ☐ With cylindrical roller bearings for input and output shafts
- ☐ Repairing ⇒ [page 109](#)

#### 8 - Bolt

- ☐ Renew after removal
- ☐ 5 Nm and turn 90° further

#### 9 - Bolt

- ☐ For input shaft
- ☐ Self-locking
- ☐ Renew after removal
- ☐ M8: 30 Nm and turn 90° further
- ☐ M10: 75 Nm and turn 45° further

#### 10 - Inner race for cylindrical roller bearing with thrust washer

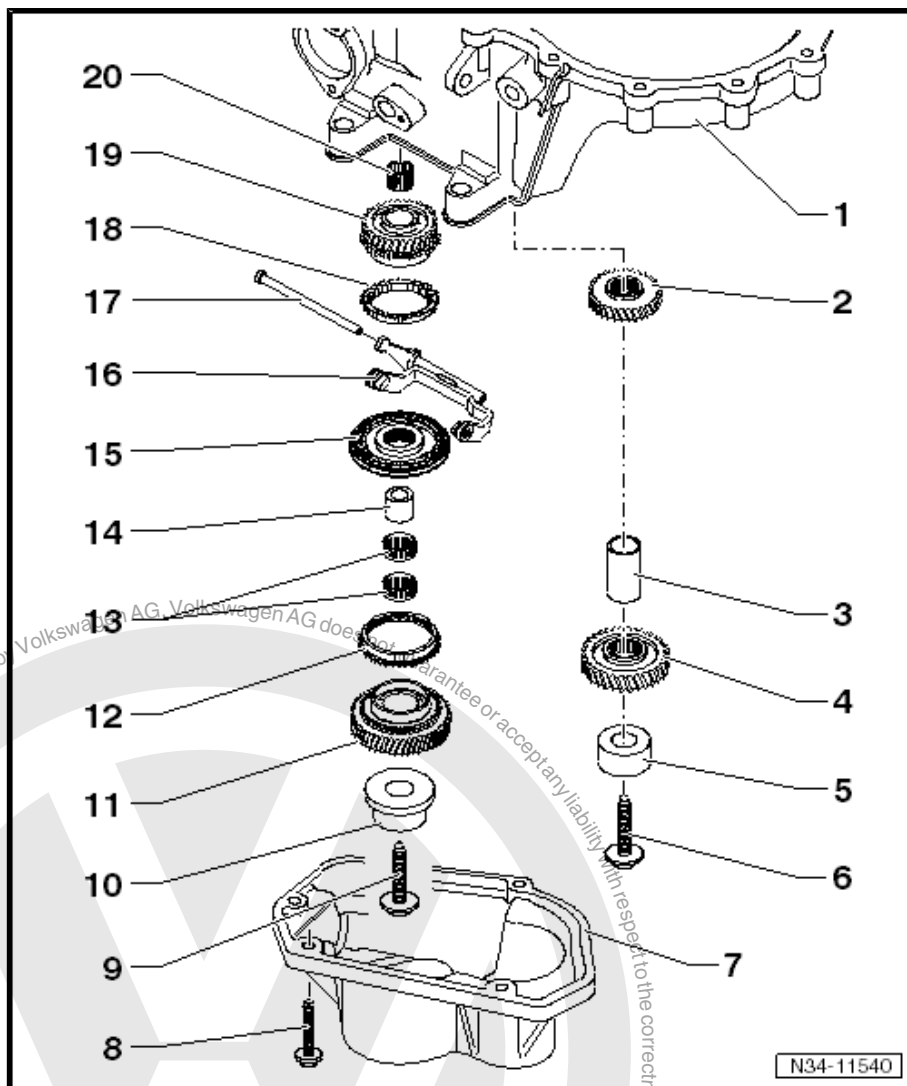
- ☐ For input shaft

#### 11 - Synchromeshed gear for 6th gear

#### 12 - Synchro-ring for 6th gear

#### 13 - Needle bearing

- ☐ For 6th gear
- ☐ Is a one-part item in some gearboxes
- ☐ Allocation ⇒ Electronic parts catalogue (ETKA)
- ☐ Replace together with bushing.





**14 - Sleeve**

- ☐ For 6th gear needle bearing
- ☐ Renew together with needle bearing.

**15 - Locking collar with synchro-hub for 5th and 6th gear**

- ☐ Dismantling and assembling ⇒ [page 114](#)

**16 - Selector fork for 5th and 6th gear**

**17 - Pivot pin**

- ☐ for 5th gear selector fork.

**18 - Synchro-ring for 5th gear**

- ☐ Will be damaged during removal of input shaft
- ☐ Renew after removal

**19 - Synchromeshed gear, 5th gear**

**20 - Needle bearing**

- ☐ For 5th gear





## 7.4 Assembly overview - clutch housing

⇒ "7.4.1 Assembly overview - clutch housing, manual gearbox 0DQ", page 79

### 7.4.1 Assembly overview - clutch housing, manual gearbox 0DQ

#### 1 - Bolt

- ☐ Renew after removal
- ☐ 5 Nm and turn 90° further

#### 2 - Clutch housing

- ☐ Repairing ⇒ [page 106](#)

#### 3 - Gearbox housing

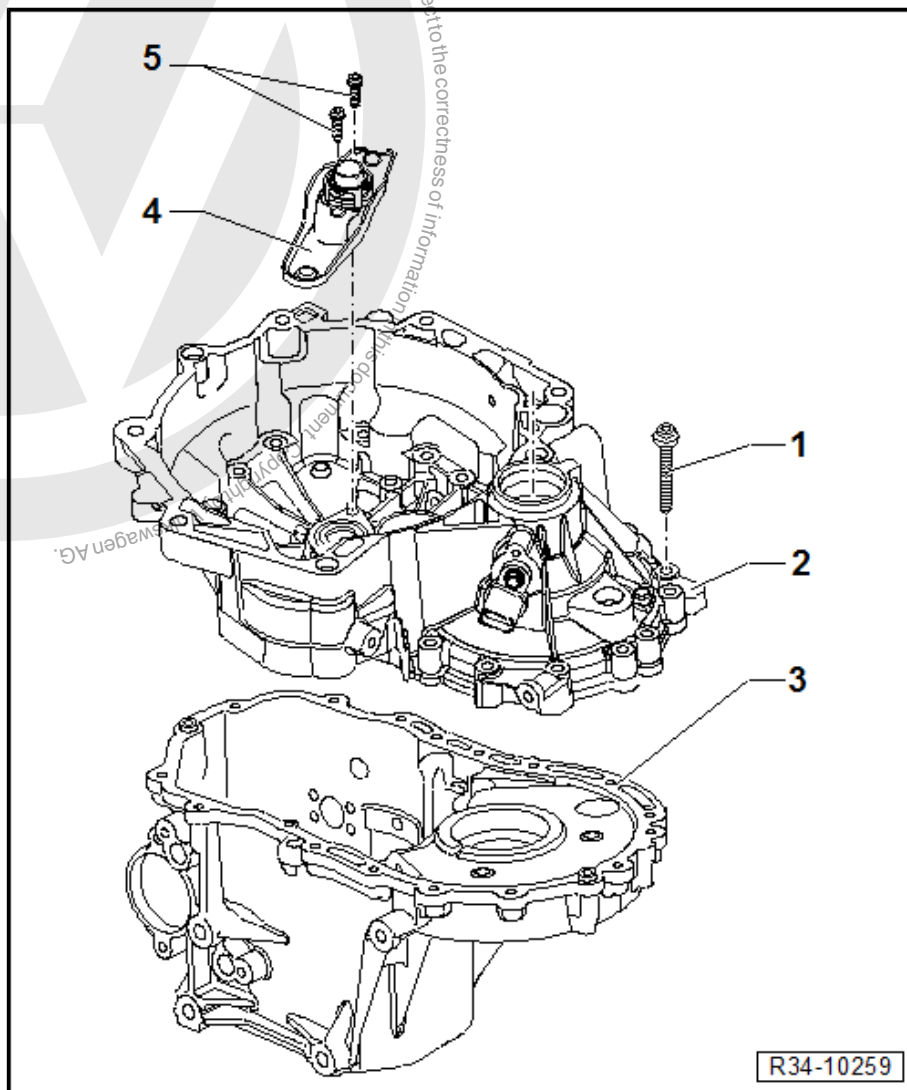
- ☐ Repairing ⇒ [page 106](#)

#### 4 - Clutch release lever

- ☐ With guide sleeve and release bearing
- ☐ Removing and installing ⇒ [page 17](#)

#### 5 - Bolt

- ☐ Removing and installing ⇒ [page 17](#)



## 7.5 Assembly overview - shafts, differential, selector mechanism

### 1 - Differential

- ☐ Dismantling and assembling ➔ [page 141](#)

### 2 - Gearbox housing

- ☐ Repairing ➔ [page 106](#)

### 3 - Oil drain plug

- ☐ Specified torque ➔ [page 71](#)

### 4 - Flange shaft with compression spring

- ☐ Only manual gearbox 02U
- ☐ Removing and installing ➔ [page 90](#)
- ☐ Assembling, from ➔ [page 141](#)

### 5 - Countersunk bolt

- ☐ Only manual gearbox 02U

### 6 - Bolt

- ☐ Self-locking
- ☐ Renew after removal
- ☐ For securing bearing support for input and output shafts ➔ [page 80](#)
- ☐ 5 Nm and turn 90° further

### 7 - Hexagon flange nut

- ☐ For selector mechanism ➔ [page 80](#)
- ☐ Self-locking
- ☐ Renew after removal
- ☐ 23 Nm

### 8 - O-ring

- ☐ Renew after removal

### 9 - Pivot pin

### 10 - Bolt

- ☐ Renew after removal
- ☐ 5 Nm and turn 90° further

### 11 - Selector shaft with selector shaft cover

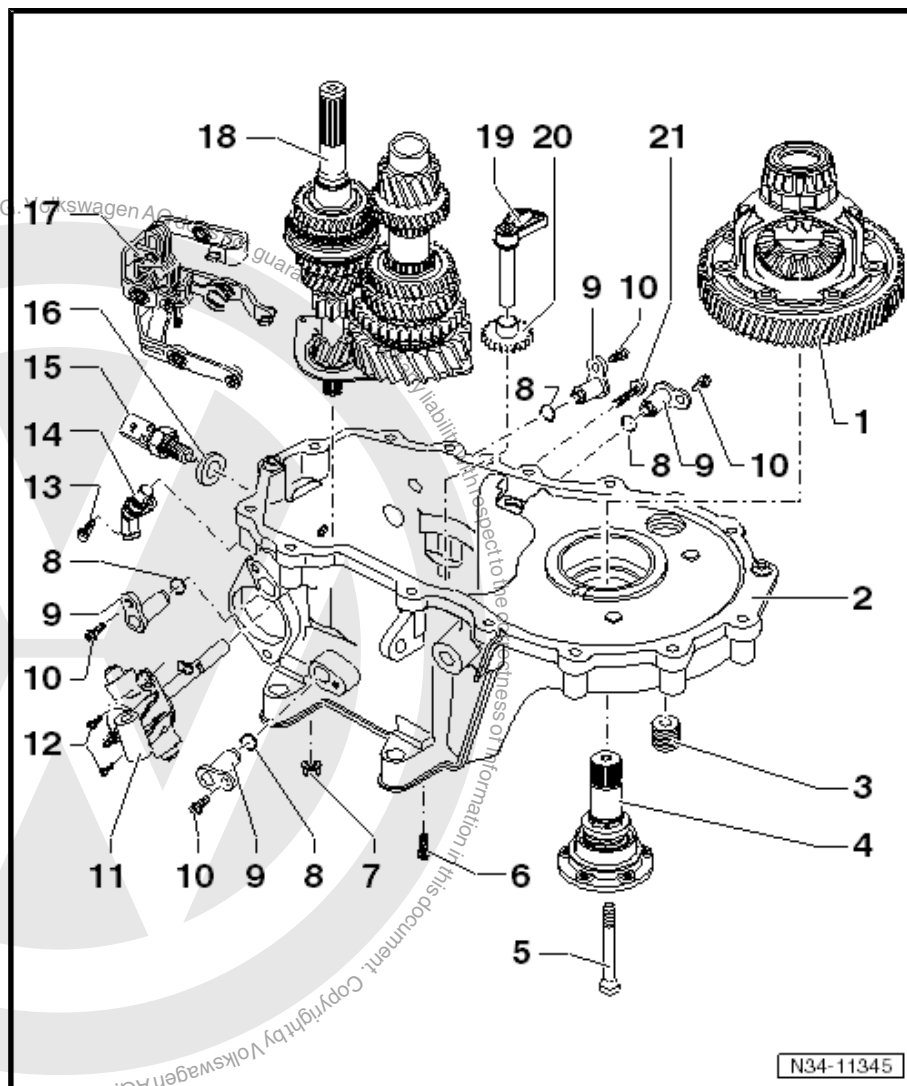
- ☐ (Selector unit)
- ☐ Repairing ➔ [page 87](#)

### 12 - Bolt

- ☐ Renew after removal
- ☐ 5 Nm and turn 90° further

### 13 - Bolt

- ☐ 6 Nm





#### 14 - Gearbox neutral position sender - G701-

- ☐ for vehicles with start/stop system

#### 15 - Reversing light switch - F4-

- ☐ Switch without seal: clean thread of switch if necessary
- ☐ Switch without seal: install switch with sealant if necessary
- ☐ For allocation of sealant, refer to ⇒ Electronic parts catalogue (ETKA) .
- ☐ Switch with encapsulated seal: renew switch
- ☐ Switch with separate seal: renew seal
- ☐ Lightly coat lug with MoS<sub>2</sub> grease
- ☐ Remove noise insulation with gearbox installed ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview – noise insulation .
- ☐ 20 Nm

#### 16 - Seal

- ☐ Not fitted in all gearboxes
- ☐ Renew after removal

#### 17 - Selector mechanism

- ☐ (Selector forks)
- ☐ Repairing ⇒ [page 84](#)

#### 18 - Input shaft and output shaft with bearing mounting and deep groove ball bearing

- ☐ If bearing support is separated from gearbox housing, the support must always be renewed
- ☐ Pressing bearing support off and on: Dismantling and assembling input shaft ⇒ [page 114](#)
- ☐ Dismantling and assembling input shaft ⇒ [page 114](#)
- ☐ Dismantling and assembling output shaft ⇒ [page 127](#)

#### 19 - Reverse gear shaft

#### 20 - Reverse gear wheel

- ☐ Reverse gear installation position ⇒ [page 99](#)

#### 21 - Bolt

- ☐ Renew after removal
- ☐ For securing shaft for reverse gear
- ☐ M 6: 5 Nm and turn 90° further
- ☐ M 8: 25 Nm and turn 45° further

## 7.6 Assembly overview - selector unit



#### Note

- ◆ Lubricate bearing positions and sliding surfaces.
- ◆ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .



#### 1 - Sleeve

- ☐ For selector shaft
- ☐ Driving out ⇒ Fig. ⇒ [page 89](#)
- ☐ Driving in ⇒ [page 89](#)

#### 2 - Selector shaft with selector shaft cover

- ☐ Renew together

#### 3 - Angled rod

- ☐ For adjusting selector mechanism
- ☐ Removing ⇒ [page 89](#)
- ☐ Driving in ⇒ [page 89](#)

#### 4 - Gate relay lever

- ☐ Fitting position ⇒ [page 50](#)

#### 5 - Clip

#### 6 - Seal

- ☐ Renew after removal ⇒ [page 90](#)

#### 7 - Cap

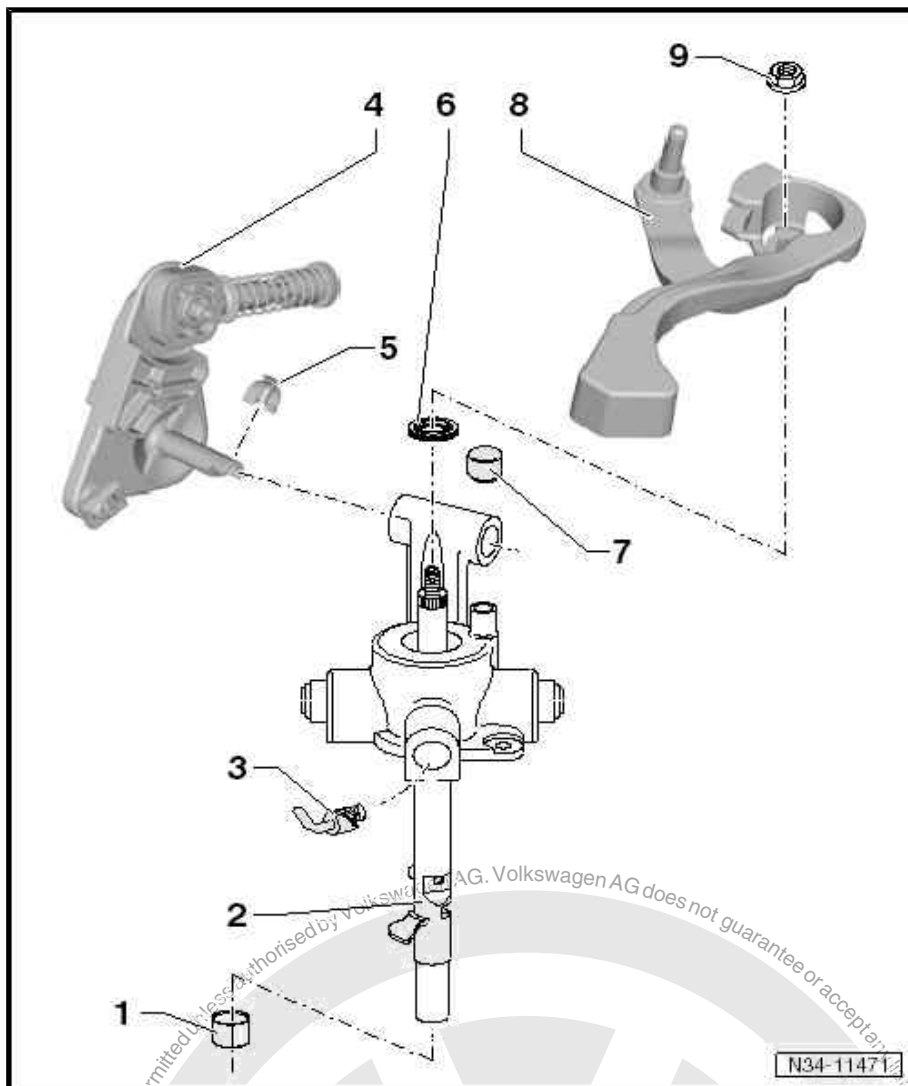
- ☐ For gearbox breather

#### 8 - Gearbox selector lever

- ☐ Illustration may differ from original component.
- ☐ Install so that master spline aligns with selector shaft
- ☐ Can be renewed with the selector mechanism installed
- ☐ Fitting position ⇒ [page 50](#)

#### 9 - Hexagon nut

- ☐ Self-locking
- ☐ Renew after removal
- ☐ 23 Nm





## 7.7 Assembly overview - selector forks



### Note

*It is not necessary to dismantle the selector fork group in order to dismantle and assemble detent 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 85](#)
- ☐ After installation, selector segment must still rotate freely

#### 3 - Angular contact ball bearing

- ☐ Qty. 4
- ☐ Removing ⇒ [page 86](#)
- ☐ Press inner race into outer race ⇒ [page 87](#)
- ☐ Installing ⇒ [page 87](#)

#### 4 - Clamping washer

- ☐ Renew after removal
- ☐ Removing ⇒ [page 86](#)
- ☐ Installing ⇒ [page 86](#)

#### 5 - 1st/2nd gear selector segment

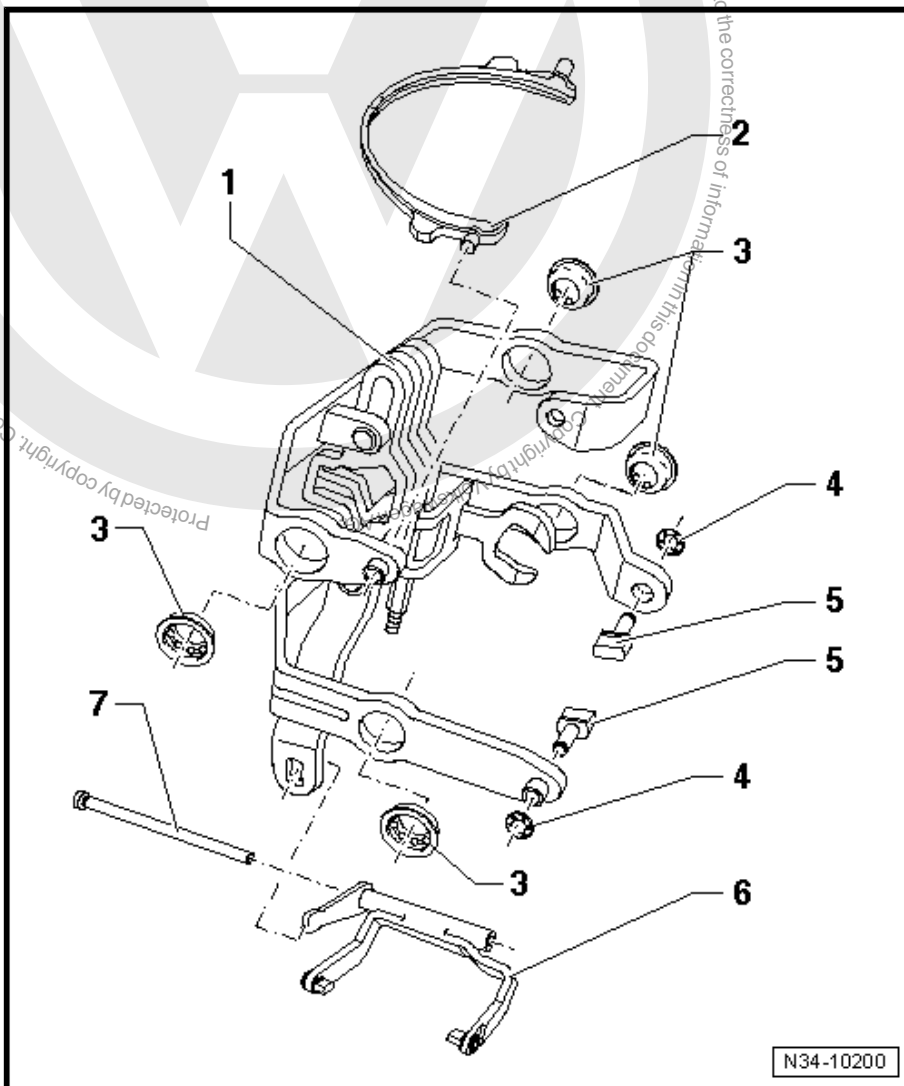
- ☐ Identification ⇒ [page 85](#)
- ☐ After lock washer is installed, segment must still rotate freely
- ☐ Selector fork with selector segment ⇒ [page 86](#)

#### 6 - Selector fork for 5th and 6th gears with selector segments

- ☐ Selector segment is permanently connected to selector fork.
- ☐ Identification ⇒ [page 85](#)

#### 7 - Pivot pin

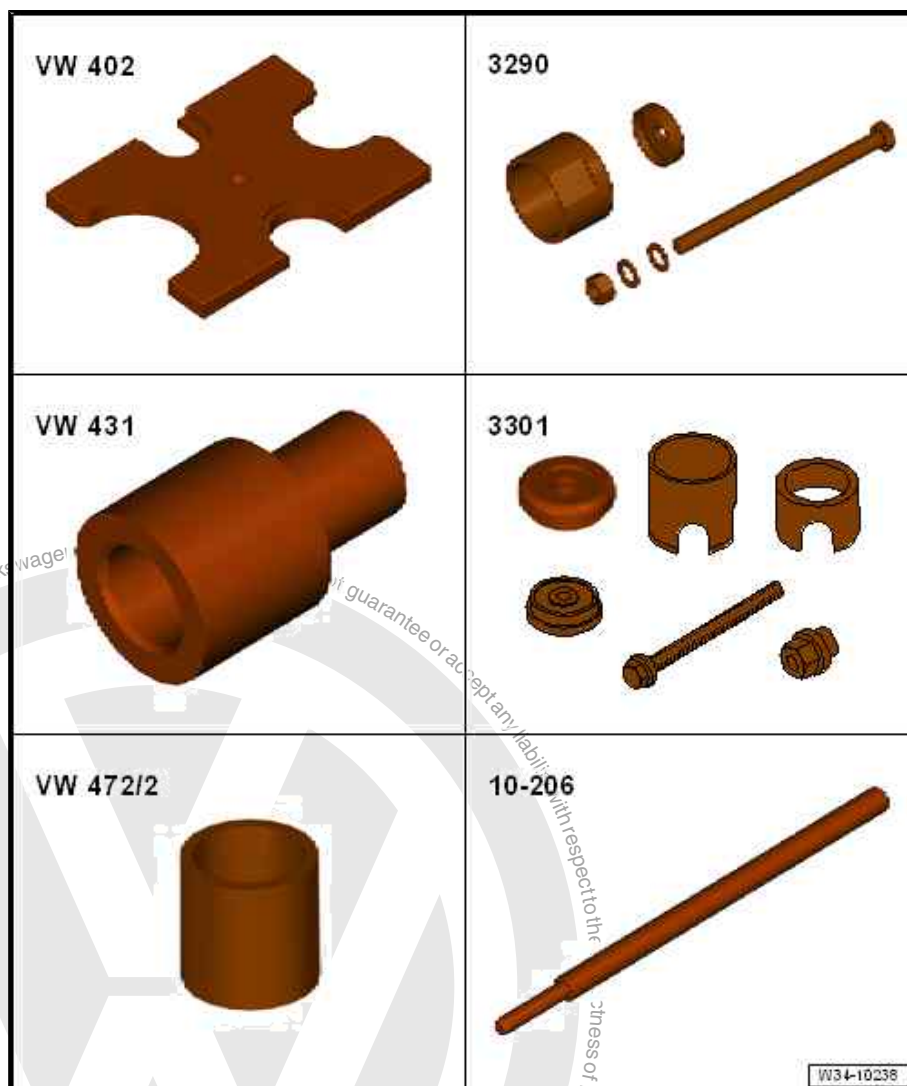
- ☐ For selector fork for 5th and 6th gears





## 7.8 Repairing selector forks

Special tools and workshop  
equipment required

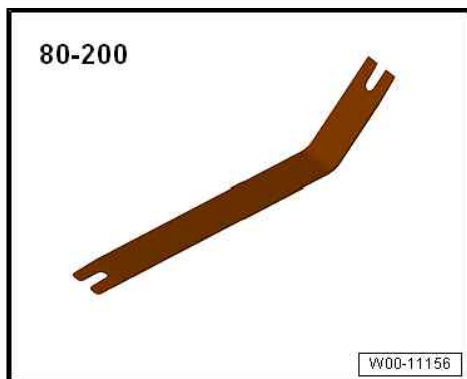


- ◆ Thrust plate - VW 402-
- ◆ Thrust piece - 3290/1-
- ◆ Assembly tool - 3301-
- ◆ Thrust piece - VW 431-
- ◆ Spacer sleeve - VW 472/2-
- ◆ Drift - 10-206-

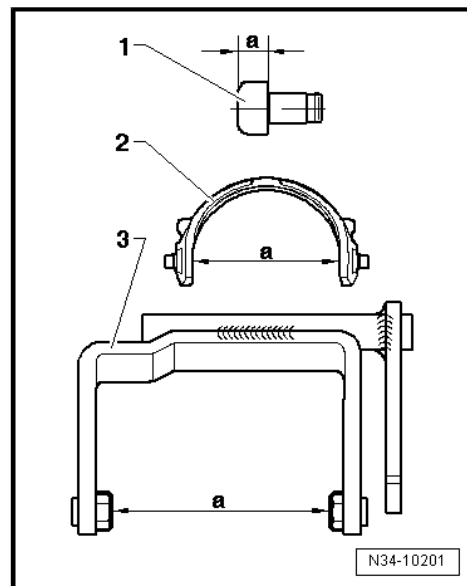
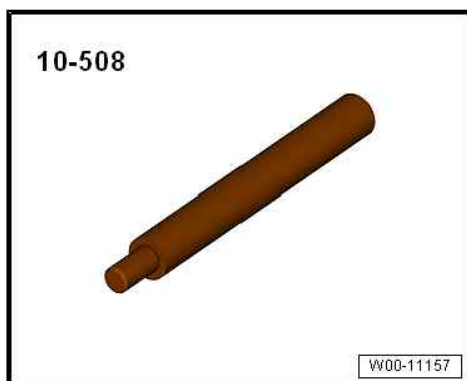




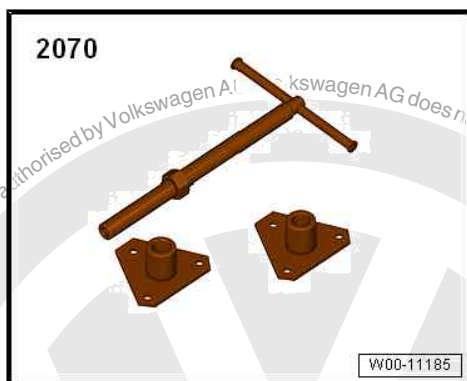
- ◆ Release lever - 80-200-



- ◆ Assembly mandrel - 10-508-



- ◆ Tensioning device - 2070-



### Identification of selector segments and selector fork for 5th and 6th gear with selector segments

#### Dimension a-

- 1 - Selector segment for 1st and 2nd gears = 10.0 mm
- 2 - Selector segment for 3rd and 4th gears = 78.6 mm
- 3 - Selector fork for 5th and 6th gears with selector segments = 79.5 mm



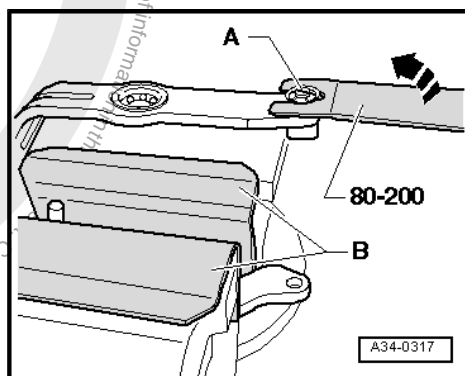
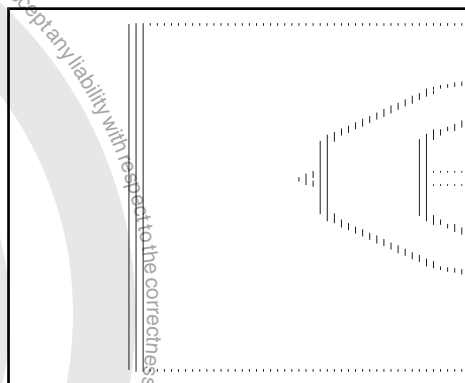


## Selector fork for 1st and 2nd gears with selector segments

Dimension -a- = 78 mm

### Removing lock washer

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



### Installing lock washer

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

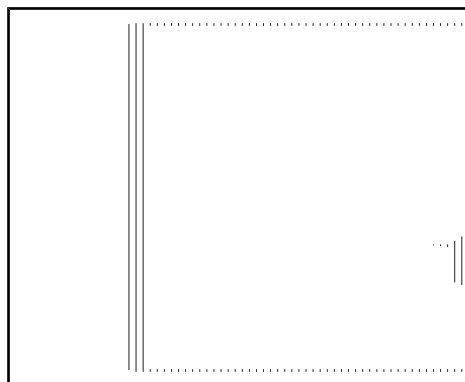


#### Note

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

A - Spinner handle with 10 mm socket

B - Protective jaw covers

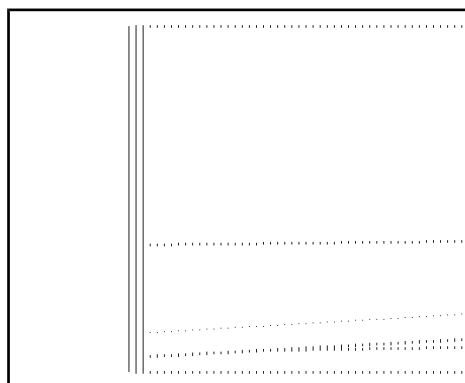


### Removing angular contact ball bearing



#### Note

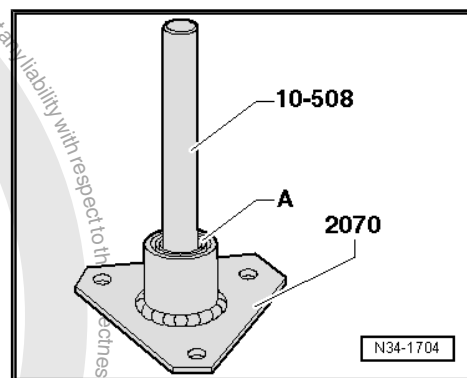
*When removing and installing angular contact ball bearing, do not bend selector forks.*





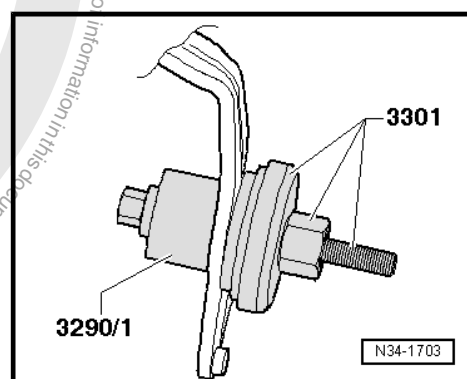
## Pressing inner race -A- of angular contact ball bearing into outer race

Inner race must engage in outer race.



## Pulling angular contact ball bearing into selector fork to stop

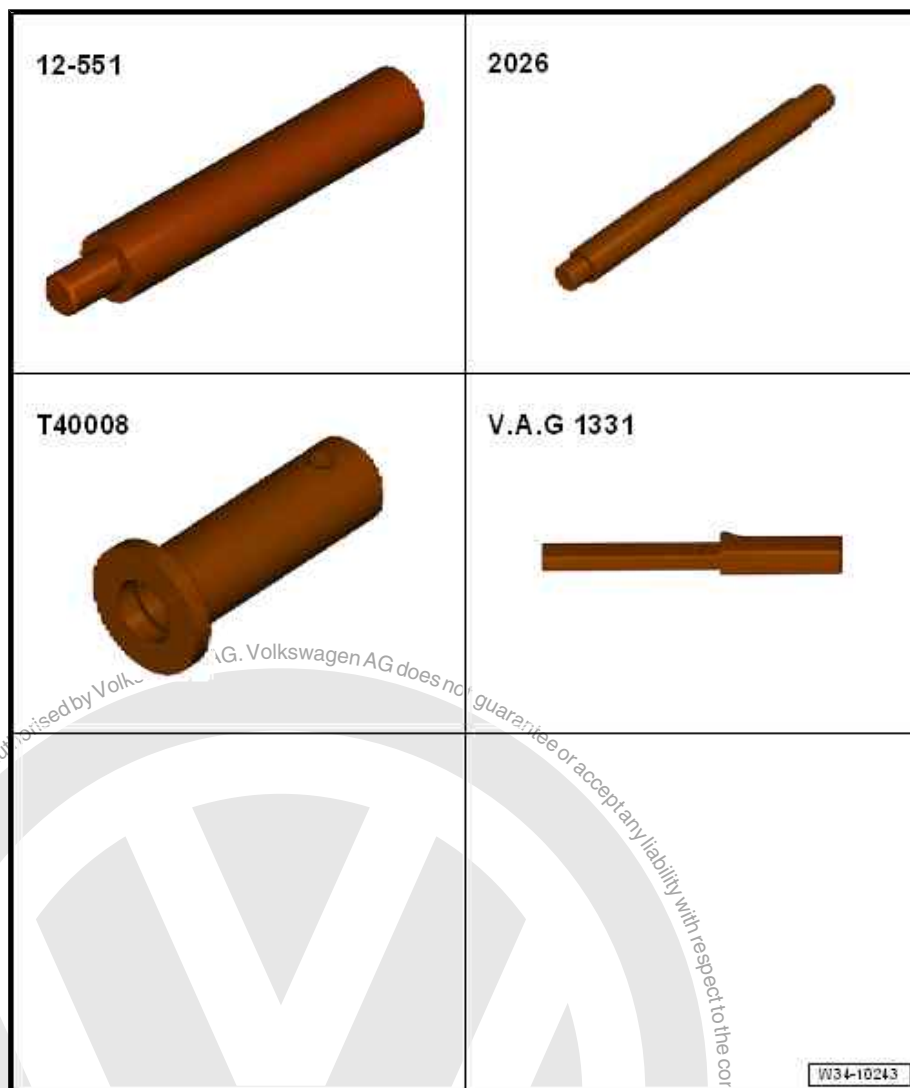
Depression in thrust piece - 3290/1- faces ball bearing.



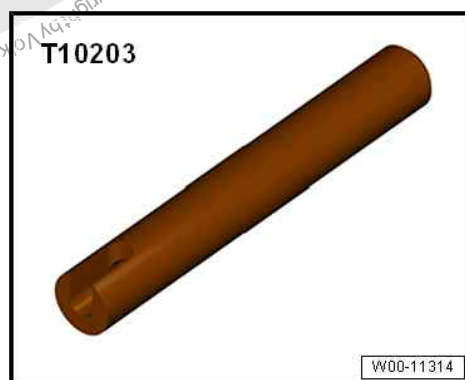
## 7.9 Repairing selector unit



**Special tools and workshop  
equipment required**



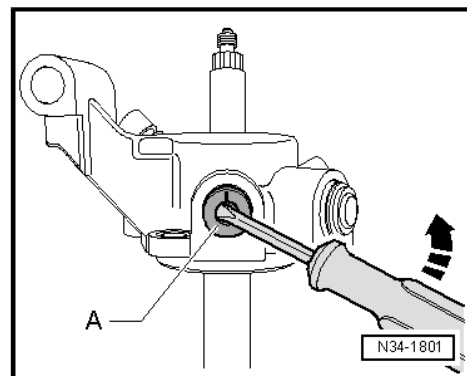
- ◆ Centring mandrel - 12-551-
  - ◆ Drift - 2026-
  - ◆ Or press tool - VW 408 A-
  - ◆ Thrust piece - T40008-
  - ◆ Torque wrench - V.A.G 1331-
  - ◆ Sealant
  - ◆ Allocation ⇒ Electronic parts catalogue (ETKA)
- Tube - T10203-
- Remove selector mechanism ⇒ [page 80](#).





### Removing angled rod -A- from selector shaft cover

- Remove outer part of angled rod.
- Then carefully pry out angled rod using a screwdriver.

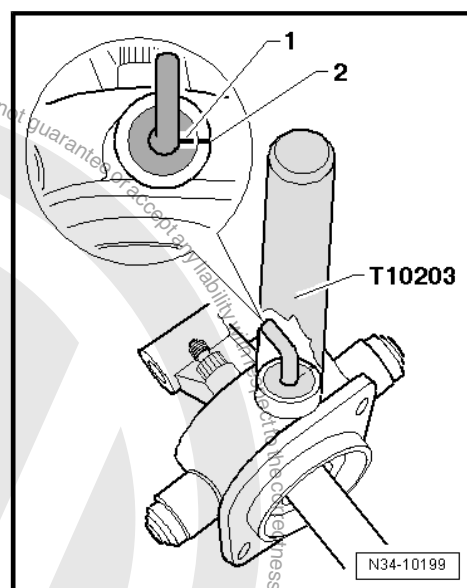


### Drive angled rod -A- into selector shaft cover

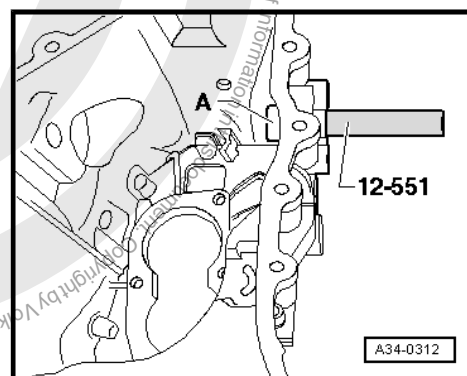
#### Installation position:

Marking -1- aligns with marking -2- on selector cover.

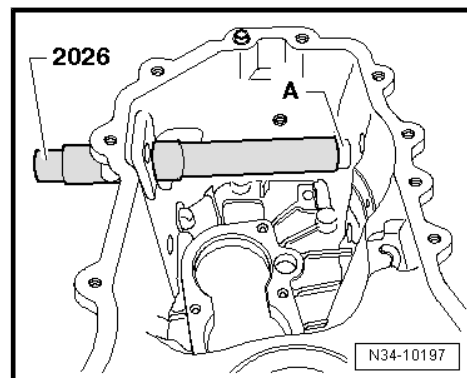
- Install selector mechanism [page 80](#).



### Driving out selector shaft sleeve -A-



### Driving in selector shaft sleeve -A- to stop

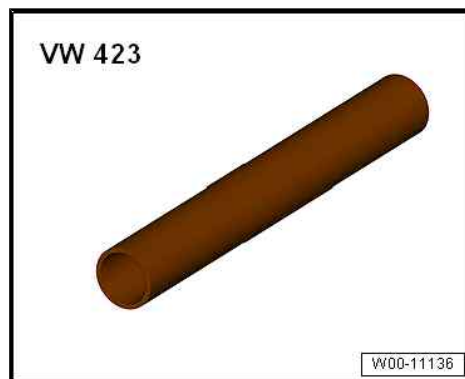




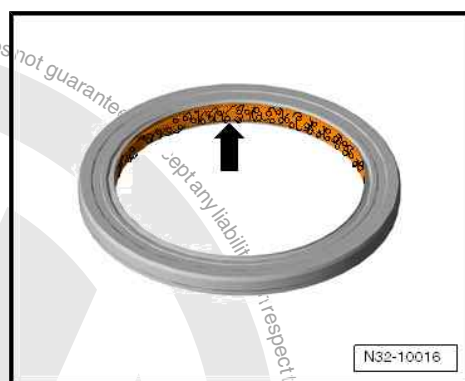
## 7.10 Renewing oil seal for selector shaft

### Special tools and workshop equipment required

- ◆ Tube - VW 423-

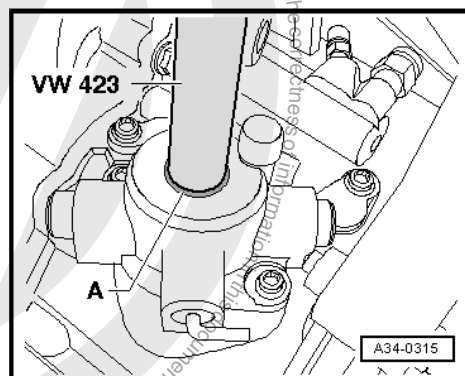


- ◆ Sealing grease
- ◆ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .
- Remove gearbox selector lever and gate relay lever  
⇒ [page 43](#) .
- Lever seal out using a screwdriver.
- Lightly oil outer circumference of new oil seal.
- Half-fill space between sealing lip and dust lip -arrow- with sealing grease .



### Inserting oil seal -A- onto stop

- Install gearbox selector lever and gate relay lever  
⇒ [page 43](#) .

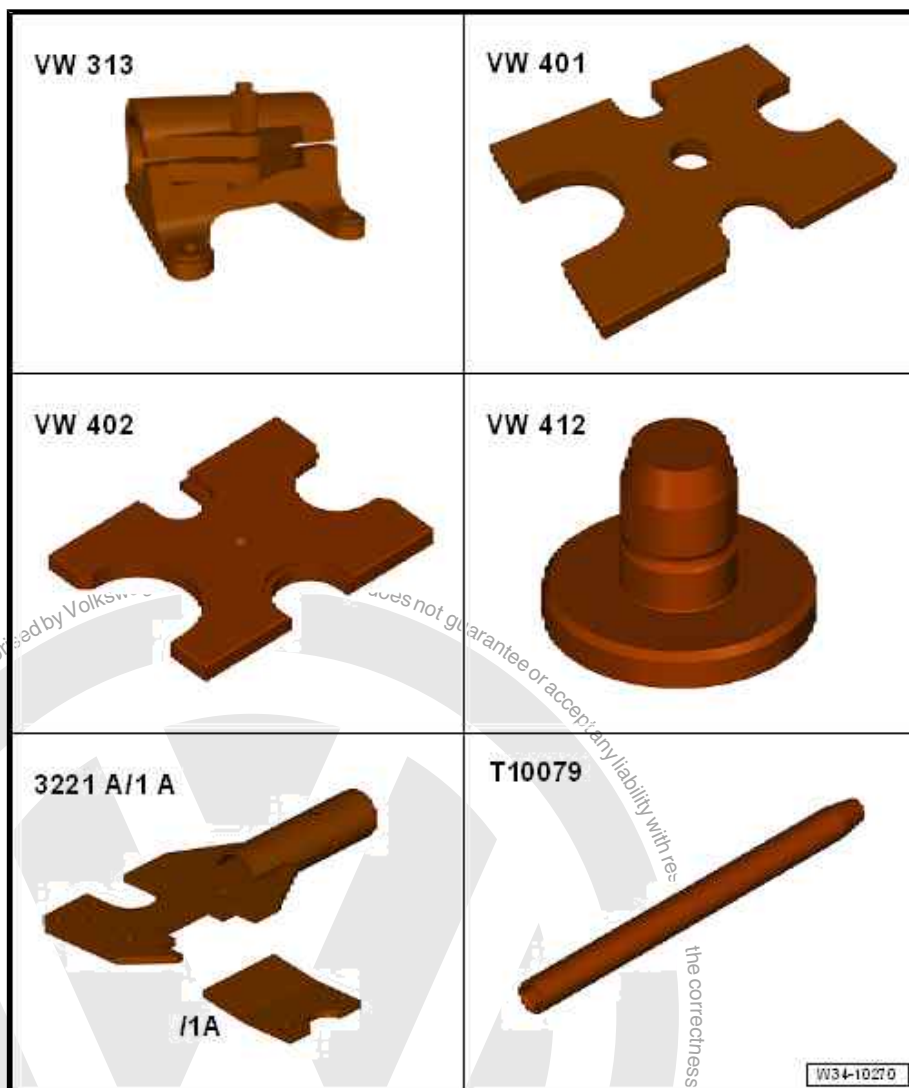


## 7.11 Dismantling and assembling gearbox

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

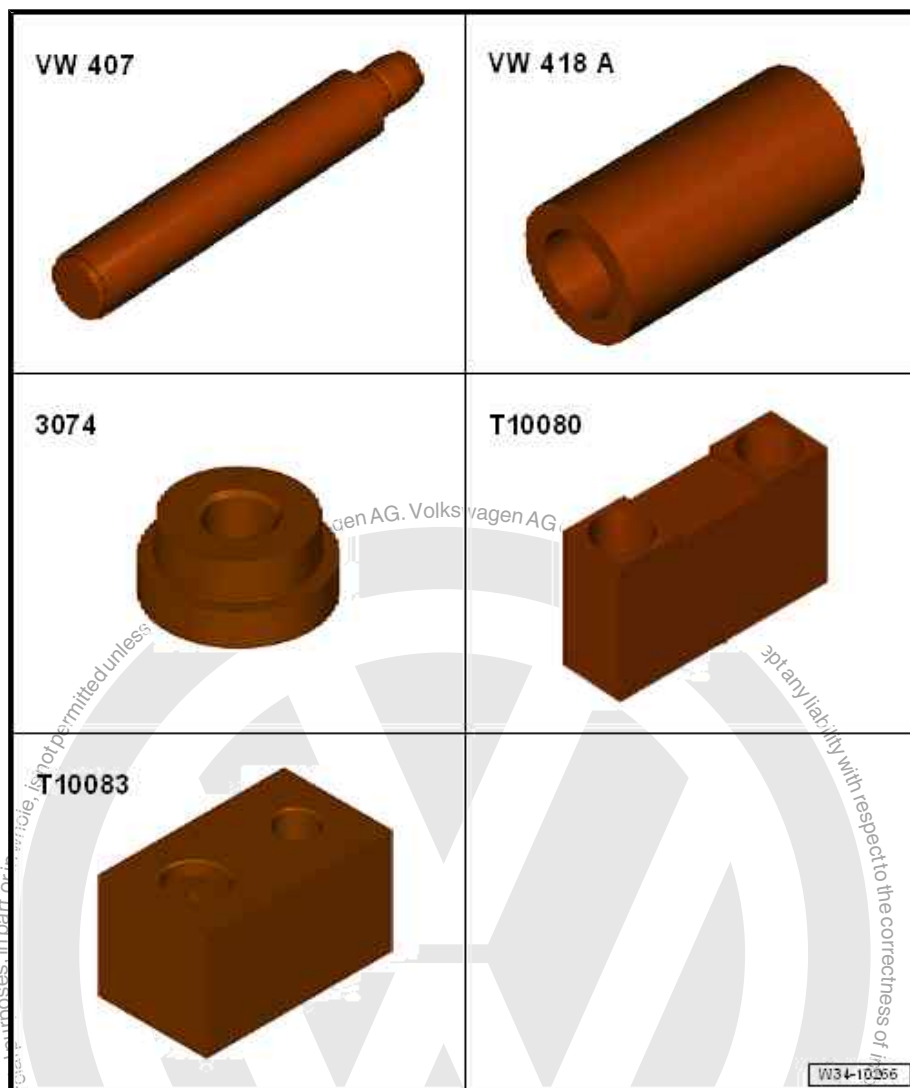


# Special tools and workshop equipment required



- ◆ Support clamp - VW 313-
- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 412-
- ◆ Gearbox support - 3221A-
- ◆ or gearbox support - 3221- (modifying ⇒ [page 73](#) )
- ◆ Guide pin - T10079-





- ◆ Press tool - VW 407-
- ◆ Tube - VW 418 A-
- ◆ Thrust piece - T10080-
- ◆ Thrust block - T10083-
- ◆ Washer - T10083/1-
- ◆ If gear wheel for 5th gear was pressed off
- ◆ Thrust plate - 3074-



- ◆ If gear wheel for 5th gear was not pressed off

**T10375**



W00-11240

- ◆ Thrust plate - T10375-

- ◆ Puller - T10309-

**T10309**



W00-11333

- ◆ Half-sleeve - T10309/4-

- ◆ If pulling off is not possible using half-sleeve mentioned above, use

- ◆ Half-sleeve - T10309/4A-

- ◆ Adapter - T10309/5-

- ◆ Torque wrench - V.A.G 1331-

**V.A.G 1331**



W00-11166

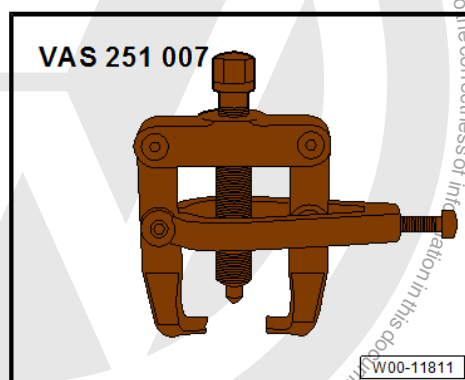
- ◆ Torque wrench - V.A.G 1332-



- ◆ Three-arm puller - VAS 251 203- or e.g. three-arm puller - Kukko 30/1-



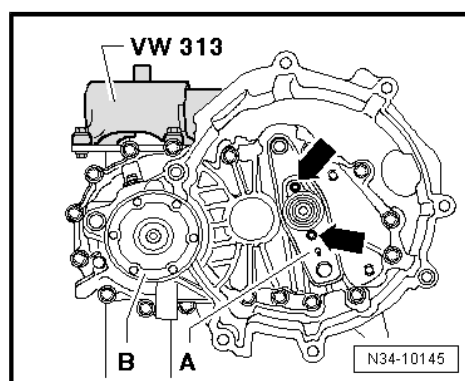
- ◆ or two-arm puller - VAS 251 007- or e.g. two-arm puller - Kukko 204/2-



- ◆ Hexagon socket head bolt - M8 x 15-
- ◆ Drip tray - V.A.G 1306-
- ◆ or drip tray for workshop hoist - VAS 6208-
- ◆ Sealant
- ◆ Allocation ⇒ Electronic parts catalogue (ETKA)

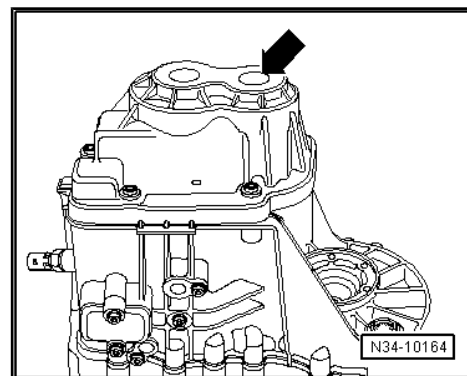
#### Dismantling gearbox

- Secure gearbox to engine and gearbox support ⇒ [page 73](#) .
- Place drip tray underneath.
- Drain gear oil.
- Remove clutch release lever -A- together with release bearing and guide sleeve -arrows-.

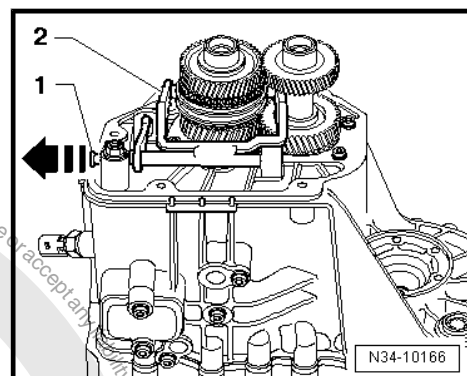




- Unbolt gearbox housing cover -arrow- and carefully pull it off.



- Pull out pivot pin -1- for 5th and 6th gear selector fork -2- and remove selector fork.

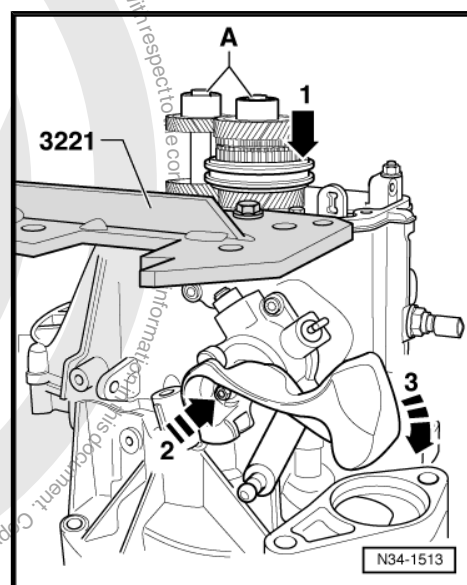


- Unscrew bolts -A- for inner bearing races on input and output shafts. To do so, engage 5th gear -arrow 1- and 1st gear -arrow 2- and -arrow 3-.
- Input shaft and output shaft are locked when both gears are engaged. Both bolts can now be loosened.



#### Note

- ◆ If the shafts are to be reused, clean residual locking material out of threaded holes using a thread chaser.
- ◆ Pull off gear wheel for 6th gear using three-arm puller - VAS 251 203- or e.g. three-arm puller - Kukko 30/1- .
- ◆ If necessary, pull off gear wheel for 6th gear to stop on spindle with two-arm puller - VAS 251 007- or e.g. two-arm puller - Kukko 204/2- .
- ◆ . Then continue to pull off with three-arm puller - VAS 251 203- or e.g. three-arm puller - Kukko 30/1- .



- Pull off gear wheel for 6th gear with inner race of cylindrical roller bearing for output shaft.

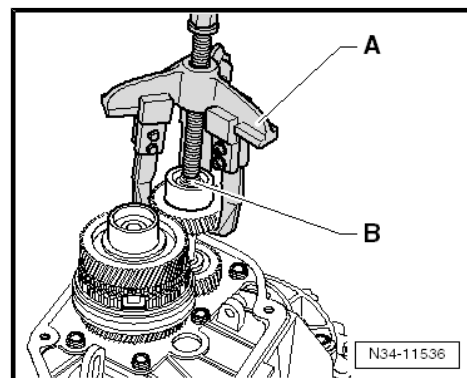
A - Three-arm puller - VAS 251 203- or e.g. three-arm puller - Kukko 30/1-

B - Hexagon socket-head bolt - M8 x 15-

#### Adhere to the sequence for pulling off the following components:

- Synchromeshed gear for 6th gear: pull off together with inner race of cylindrical roller bearing for input shaft.
- Synchro-hub for 5th and 6th gear: pull off together with inner race for 6th gear needle bearing.

Use puller - T10309A- .





**Synchromeshed gear for 6th gear: pull off together with inner race of cylindrical roller bearing for input shaft.**

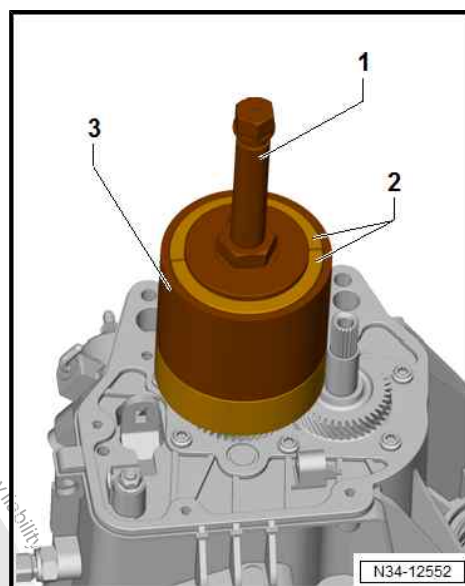
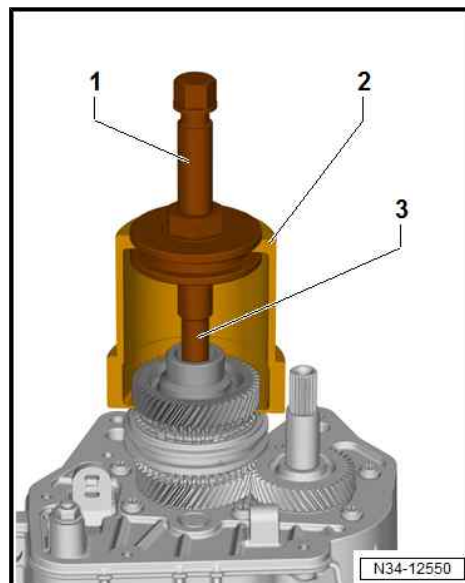
- First insert sleeve section - T10309/4A- -2-.
- The half-sleeve must be positioned beneath the synchromeshed gear for 6th gear.



**Note**

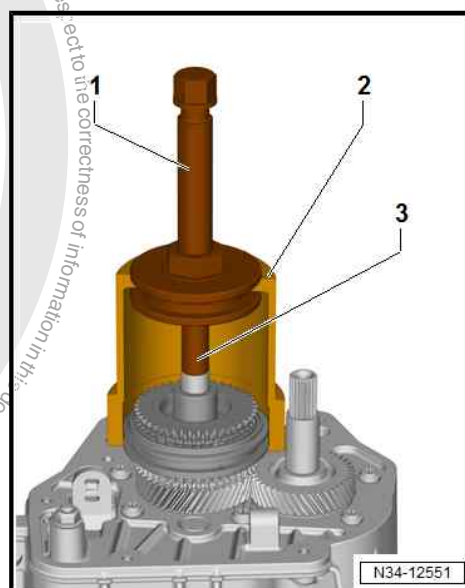
*The force necessary for tightening may be very high. Therefore, use grip - T10309/4A- .*

- If necessary, half sleeve must be pressed to end position.
- Then bring adapter - T10309/5- -3- into position.
- Insert thread insert - T10309/3- -1- in sleeve section and tension slightly.
- Now install second sleeve section - T10309/4A- and fit tube - T10309/2- -3- onto assembly.



**Then pull off synchro-hub for 5th and 6th gear together with inner race for needle bearing for 6th gear synchromeshed gear.**

- First insert sleeve section - T10309/4A- -2-.
- Half sleeve must be positioned beneath synchro-ring.
- If necessary, half sleeve must be pressed to end position.
- Then bring adapter - T10309/5- -3- into position.
- Insert thread insert - T10309/3- -1- in sleeve section and tension slightly.





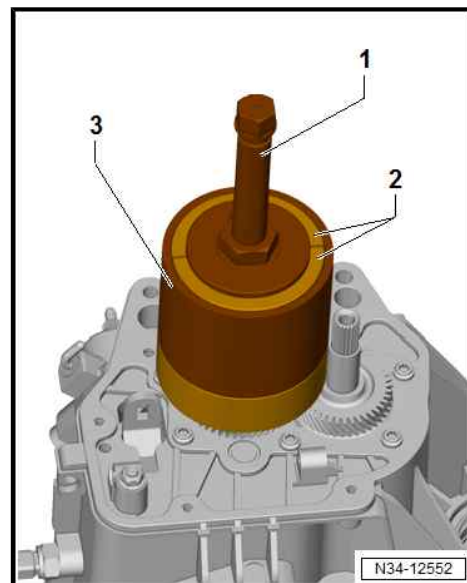
- Now install second sleeve section - T10309/4A- and fit tube - T10309/2- -3- onto assembly.



#### Note

*The synchro-ring for 5th gear must always be renewed after it is pulled off.*

- Remove synchromeshed gear for 5th gear.



**Manual gearbox 0DQ: flange shafts -1- are not fitted.**

- Detach sleeve -2- and needle bearing -4-.
- Remove bearing mounting securing bolts -6- from input and output shafts.

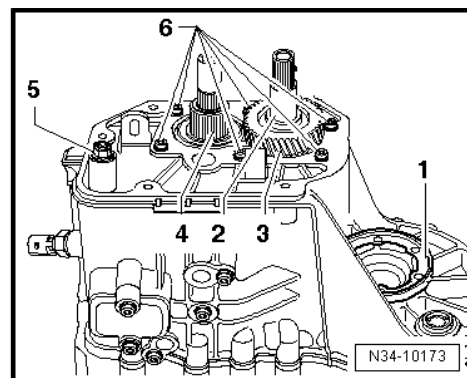
**5th gear wheel can be removed by hand**

- Remove gear wheel for 5th gear -3-.

**5th gear wheel cannot be removed by hand**

- The gear wheel for 5th gear -3- will be pressed off later when the bearing support for the deep groove ball bearing  
⇒ [page 120](#) .

- Turn gearbox in support bracket so that clutch housing is upwards.



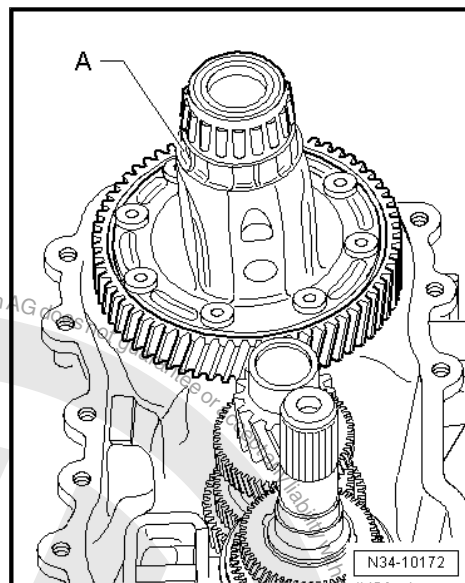
**Continuation for all**

- 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 clutch housing in order to prevent damage to roller bearings and their bearing seats on the input and output shafts.

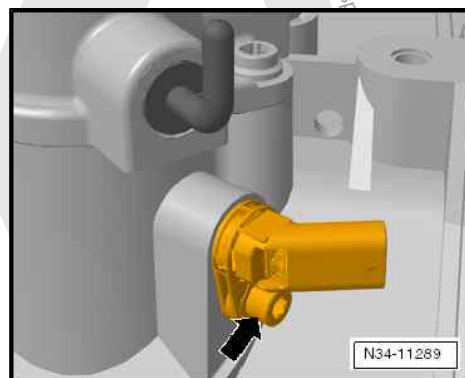




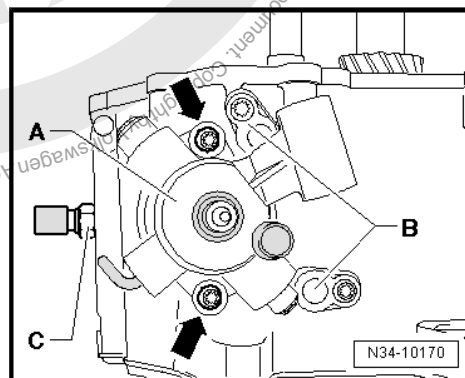
- Remove differential -A- from gearbox housing.



- Gearboxes for vehicles with start-stop system: remove gearbox neutral position sender - G701- -arrow-.



- 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-.

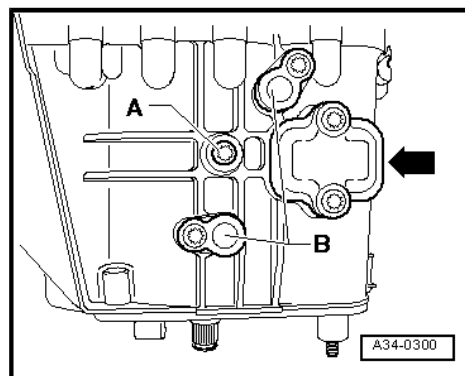


- Remove bolt -A- for securing reverse gear wheel shaft.
- Remove pivot pins -B- located on bottom of gearbox.



**Note**

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





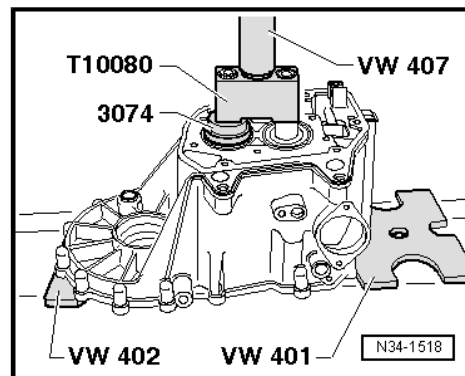
### 5th gear wheel could be removed by hand

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



#### Note

- ◆ Position gearbox housing 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.



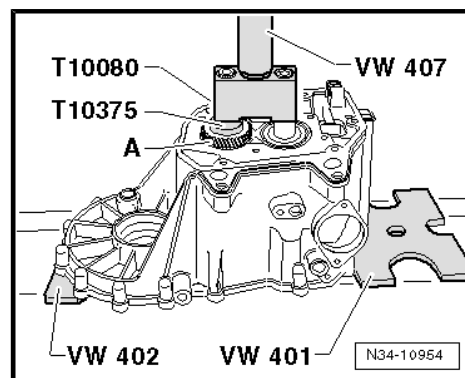
### 5th gear wheel could not be removed by hand

- Press out input shaft, output shaft with gear wheel for 5th gear -A-, bearing mounting, selector mechanism (selector forks) and reverse gear together.



#### Note

- ◆ Position gearbox housing 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 and output shafts with deep groove ball bearing and, as appropriate, gear wheel for 5th gear off bearing mounting ➔ [page 114](#).

### Assembling gearbox



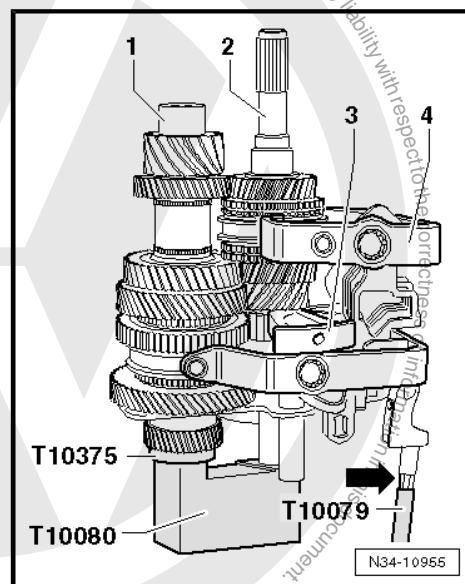
#### Note

- ◆ If bearing mounting with deep groove ball bearing was removed, press onto input shaft and output shaft ➔ [page 124](#).
- ◆ If needle roller bearing bushing for synchromeshed gear for 5th gear was removed, press onto input shaft ➔ [page 124](#).

### If gear wheel for 5th gear was not pressed off

- Position assembled components, input shaft -2- and output shaft -1- with bearing mounting for deep groove ball bearing, in thrust piece - T10080-.
- Insert selector mechanism (selector forks) -4- in the shaft locking collars.
- Install reverse gear shaft -3- with reverse gear.

Installation position of reverse gear wheel: smooth side points downwards, shoulder and »bevelled teeth« point to clutch end.





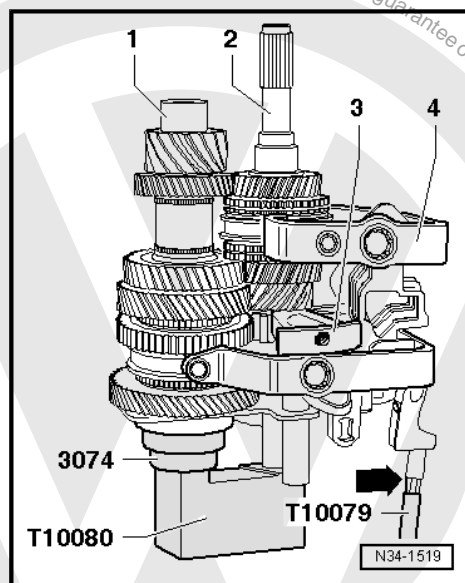
- Screw guide pin - T10079- onto stud (secures reverse gear) -arrow-.

#### If gear wheel for 5th gear was pressed off

- Position assembled components, input shaft -2- and output shaft -1- with bearing mounting for deep groove ball bearing, in thrust piece - T10080- .
- Insert selector mechanism (selector forks) -4- in the shaft locking collars.
- Install reverse gear shaft -3- with reverse gear.

**Installation position of reverse gear wheel: smooth side points downwards, shoulder and »bevelled teeth« point to clutch end.**

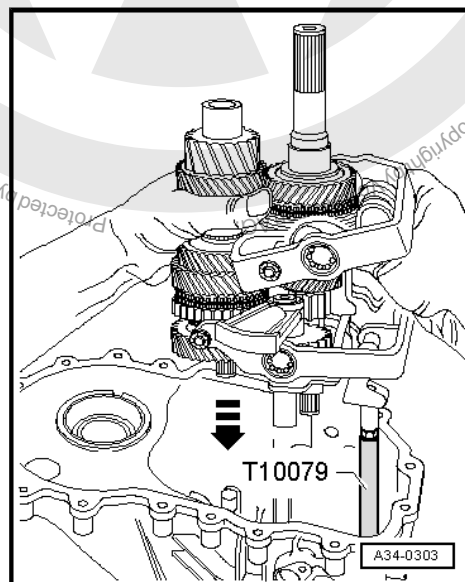
- Screw guide pin - T10079- onto stud (secures reverse gear) -arrow-.



#### Continuation for all

- Insert components together in gearbox housing. To do this, guide guide pin - T10079- through hole for attachment of selector mechanism in gearbox housing.
- Remove guide pin - T10079- .

**Note the following before pressing in:**

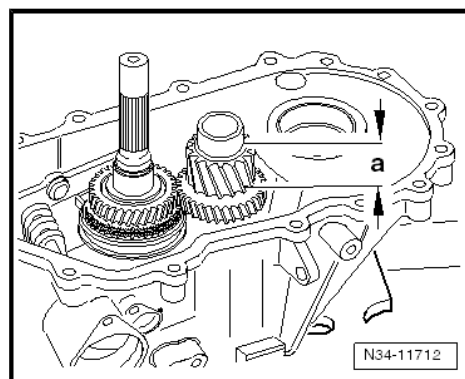


- ◆ Selector forks engage correctly in locking collars.
- ◆ Check dimension -a- for output shaft teeth.



#### Note

- ◆ Due to different spline heights, dimension -a-, output shafts of individual gearboxes have different lengths.
- ◆ A shim - T10083/1- (3 mm thick) may have to be fitted on the input shaft to ensure that the input shaft and the output shaft are always pressed in evenly.
- ◆ This is the reason why dimension -a- for output shaft teeth must be measured.

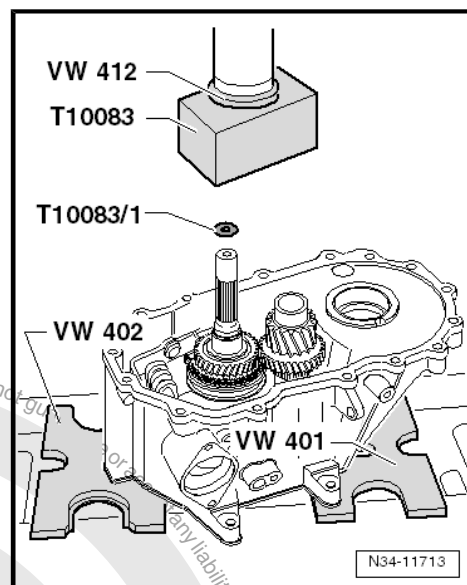


**Dimension -a- = 30.6 mm**

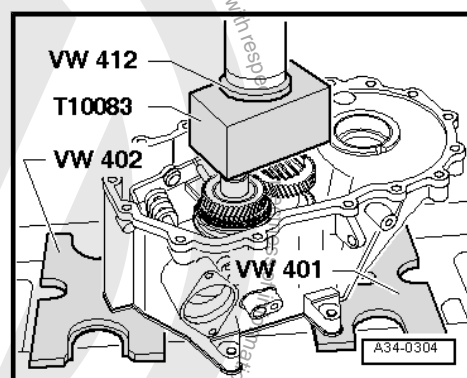
Fit washer - T10083/1- onto input shaft ⇒ next figure.



Place shim - T10083/1- onto input shaft and carefully press in bearing mounting together with input shaft and output shaft to stop



Carefully press in bearing mounting together with input shaft and output shaft to stop.

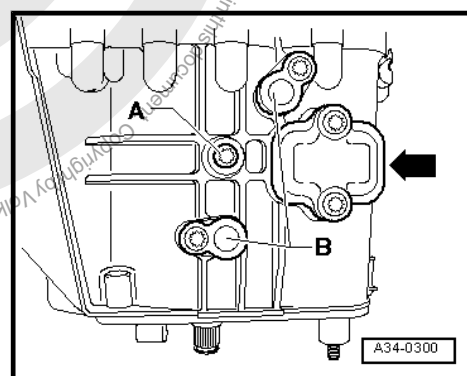


- Install bolt -A- for securing reverse gear wheel shaft.
- Install pivot pin -B- in bottom of gearbox.

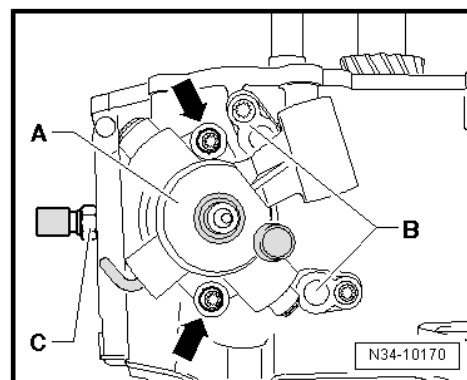


#### Note

Cap -arrow- is fitted.

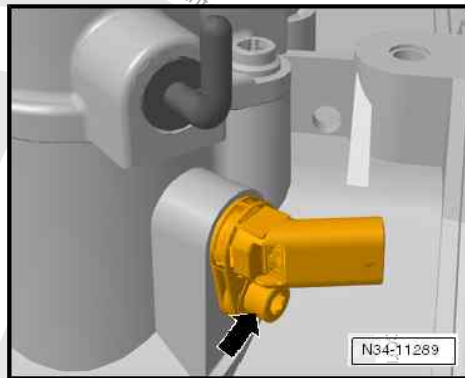


- Install pivot pin -B- in top of gearbox.
- To do this, move selector shaft to neutral position.
- Apply sealant evenly to sealing surface of selector mechanism cover.
- Install selector shaft with selector cover -A-. Then tighten bolts -arrows-.
- Screw in reversing light switch - F4- -C-.





- Gearbox for vehicles with start/stop system: Insert gearbox neutral position sender - G701- -arrow- and tighten securing bolt ➔ [page 80](#) .

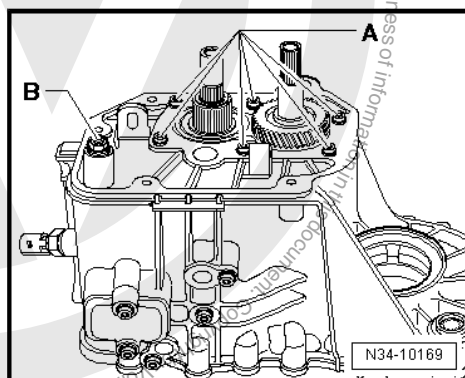


- Using new bolts -A-, tighten bearing mounting for input and output shafts.

**Note**

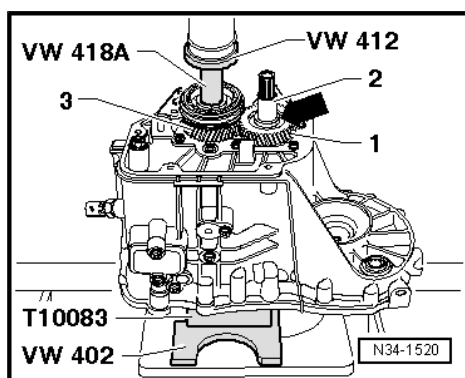
*Tighten bolts alternately and diagonally, working from centre outwards.*

- Tighten hexagon flange nut -B- for securing selector mechanism (selector forks).
- Insert input and output shafts together with gearbox housing into thrust block - T10083- .



### Fitting position for pressing on gear wheel for 5th gear and 5th gear synchro-hub and locking collar

The high shoulder -arrow- faces gearbox housing cover.

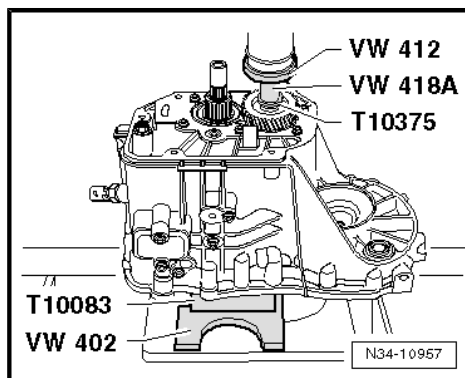


### If gear wheel for 5th gear was pressed off

- Press on gear wheel for 5th gear.
- Fit sleeve onto gear wheel for 5th gear (item -2-).

### Continuation for all

- Set 5th gear synchromeshed gear with needle bearing in place item -3-.
- Place 5th gear synchro-ring on synchromeshed gear.

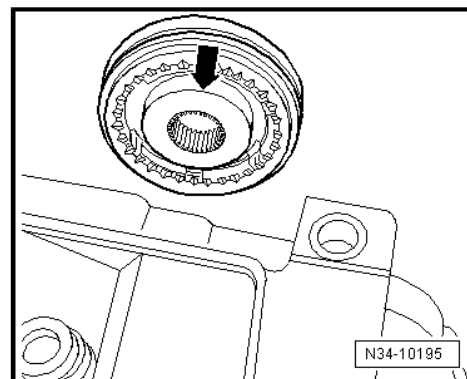





### Installation position of synchro-hub/locking collar for 5th and 6th gears

The high shoulder -arrow- faces 5th gear and gearbox housing.

- Press on synchro-hub and locking collar for 5th and 6th gear  
⇒ [page 102](#) .



- Heat inner race for needle bearing for 6th gear to maximum 100° C and press on.



**WARNING**  
*Wear protective gloves.*

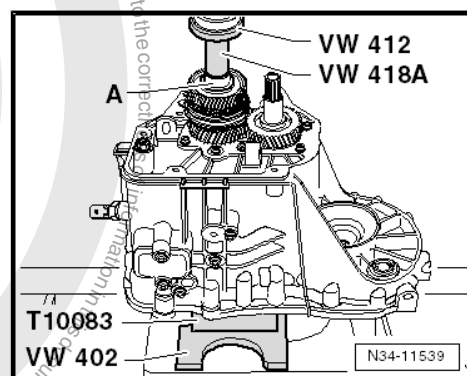
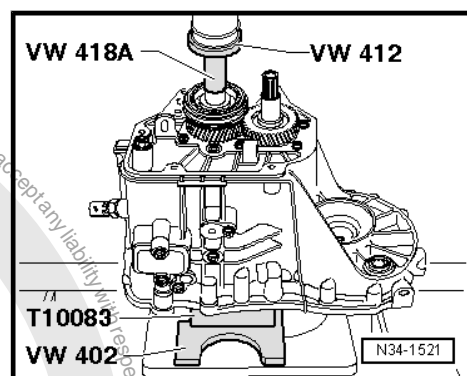
- Install synchromeshed gear for 6th gear with needle bearing and synchro-ring.

- Heat cylindrical roller bearing inner race -A- to maximum 100 ° C and drive onto input shaft.



**WARNING**  
*Wear protective gloves.*

- Heat cylindrical roller bearing inner race to maximum 100°C and press onto input shaft.



### Installation position of 6th gear wheel:

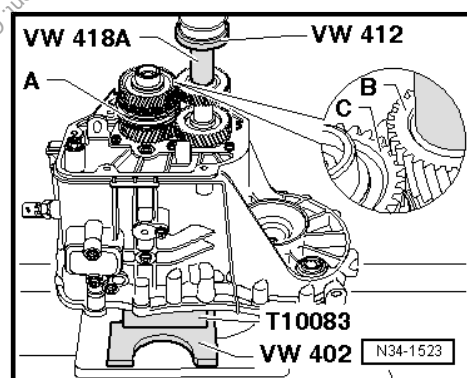
High collar faces bushing.

- Shift locking collar -A- for 5th and 6th gear to freewheel position to enable 6th gear synchromeshed gear to turn while gear wheel for 6th gear is being pressed on.



**WARNING**  
*Wear protective gloves.*

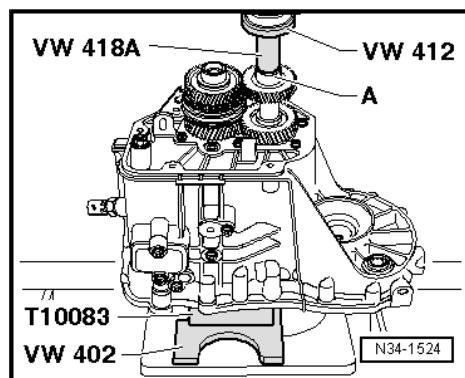
- Heat gear wheel for 6th gear to maximum 100°C.
- Pressing on 6th gear wheel. When doing this, ensure that teeth of gear wheel -B- for 6th gear and those of synchromeshed gear -C- for 6th gear mesh properly.



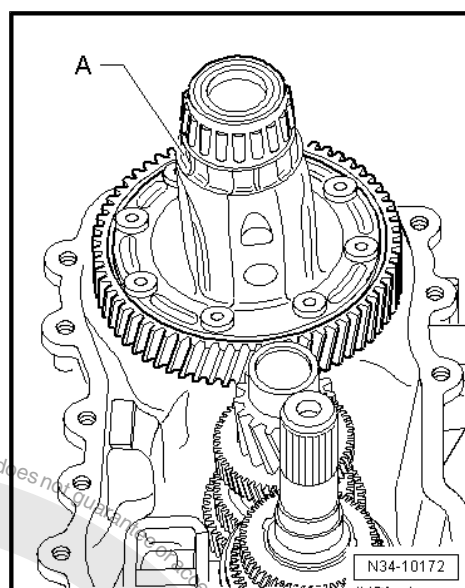




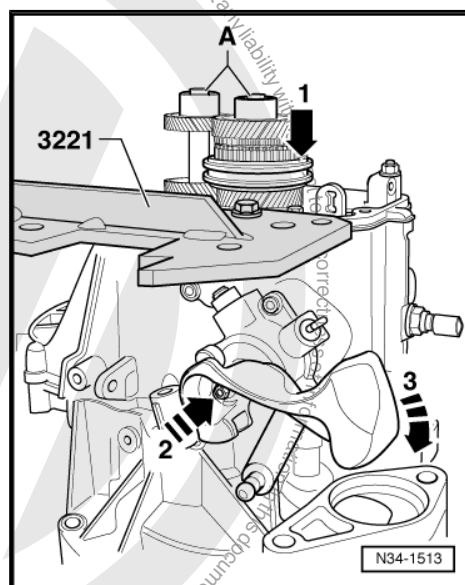
- Heat cylindrical roller bearing inner race -A- to maximum 100° C and press onto output shaft.
- Insert magnet in gearbox housing ⇒ [page 106](#) .



- Install differential -A-.
- Apply sealant evenly to sealing surface.
- Secure clutch housing to gearbox housing.
- Turn gearbox in support bracket so that gearbox housing is upwards.



- Before tightening securing bolts -A-, engage 2 gears  
-arrow 1- to -arrow 3-.

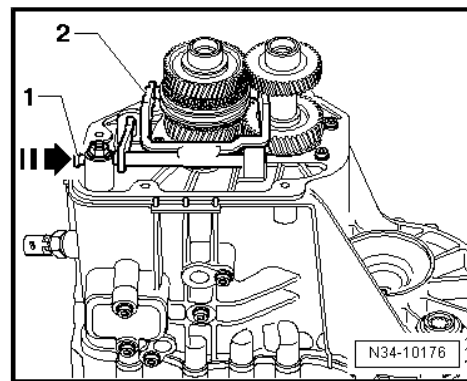




- Insert selector fork for 5th and 6th gears -2- and push pivot pin -1- in to stop -direction of arrow-.
- Apply sealant evenly to sealing surface.
- Tighten gearbox housing cover.
- Install clutch release lever together with release bearing and guide sleeve ⇒ [page 17](#) .

#### Specified torques

- ◆ ⇒ [“7.5 Assembly overview - shafts, differential, selector mechanism”, page 80](#)
- ◆ Gearbox housing to clutch housing  
⇒ [“7.4 Assembly overview - clutch housing”, page 79](#) .
- ◆ Gearbox housing cover  
⇒ [“7.3 Assembly overview - cover for gearbox housing and 5th/6th gear”, page 77](#) .



## 8 Gearbox housing, clutch housing

⇒ ["8.1 Assembly overview - gearbox housing and clutch housing", page 106](#)

⇒ ["8.2 Assembly overview - gearbox housing cover", page 108](#)

⇒ ["8.3 Repairing gearbox housing cover", page 109](#)

⇒ ["8.4 Repairing clutch housing", page 111](#)

### 8.1 Assembly overview - gearbox housing and clutch housing

⇒ ["8.1.1 Assembly overview - gearbox housing and clutch housing, manual gearbox 0DQ", page 106](#)

#### 8.1.1 Assembly overview - gearbox housing and clutch housing, manual gearbox 0DQ

##### 1 - Clutch housing

- ☐ If renewed, adjust differential ⇒ [page 149](#)

##### 2 - Input shaft seal

- ☐ Renew after removal ⇒ [page 125](#)

##### 3 - Ball-head pin

- ☐ Removing and installing ⇒ [page 17](#)

##### 4 - Seal for right drive shaft

- ☐ Renew after removal ⇒ [page 138](#)

##### 5 - Oil filler plug

- ☐ Specified torque ⇒ [page 71](#)

##### 6 - Ring

- ☐ Renew after removal

##### 7 - Plug

##### 8 - Bolt

- ☐ Renew after removal
- ☐ 5 Nm and turn 90° further

##### 9 - Baffle plate

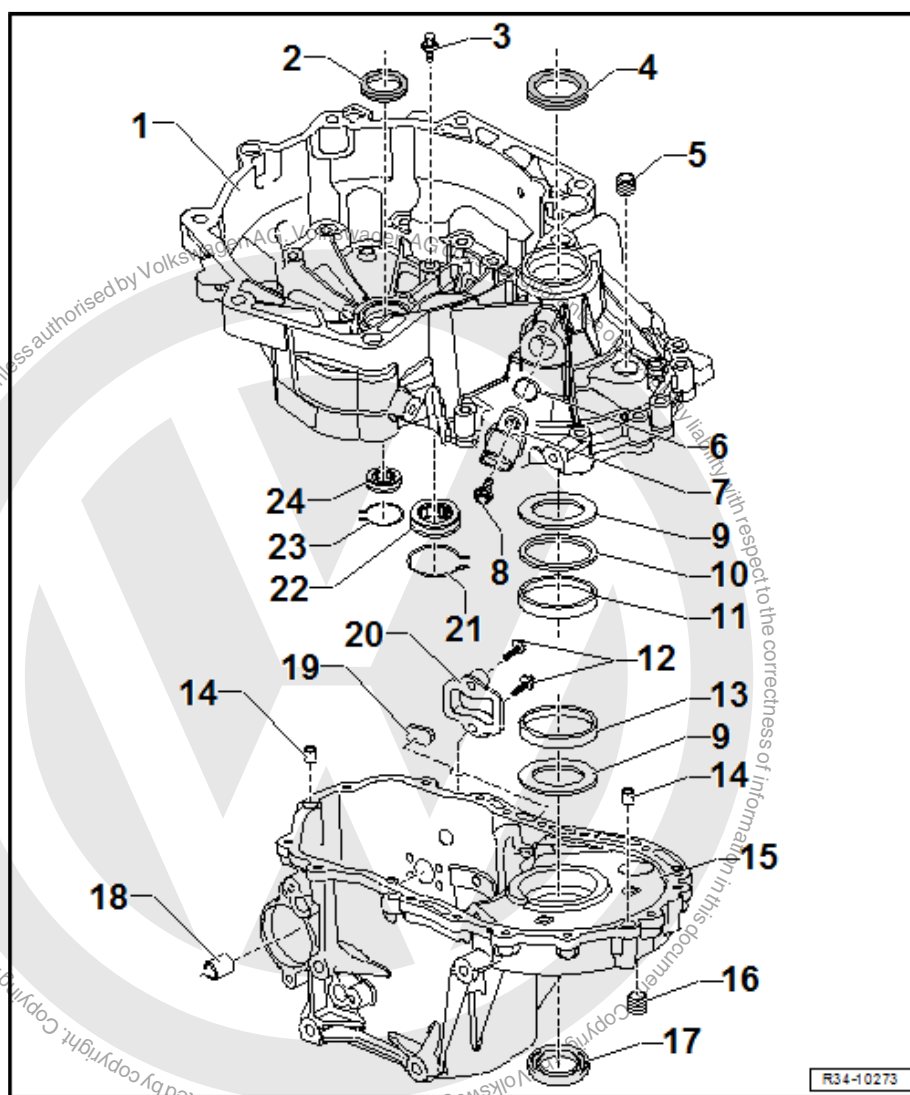
- ☐ Installation position: ⇒ [page 141](#)

##### 10 - Shim

- ☐ For differential
- ☐ Determining thickness ⇒ [page 149](#)

##### 11 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Pressing out of and into clutch housing ⇒ [page 141](#)
- ☐ If renewed, adjust differential ⇒ [page 149](#)





## 12 - Bolt

- ☐ Renew after removal
- ☐ 5 Nm and turn 90° further

## 13 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Pressing out of and into clutch housing ⇒ [page 141](#)
- ☐ If renewed, adjust differential ⇒ [page 149](#)

## 14 - Dowel sleeve

## 15 - Gearbox housing

- ☐ If renewed, adjust differential ⇒ [page 149](#)

## 16 - Oil drain plug

- ☐ Specified torque ⇒ [page 71](#)

## 17 - Left drive shaft seal

- ☐ Renew after removal ⇒ [page 137](#)

## 18 - Sleeve

- ☐ For selector shaft
- ☐ Driving out ⇒ Fig. ⇒ [page 89](#)
- ☐ Driving in ⇒ [page 89](#)

## 19 - Magnet

- ☐ Held in place by housing joint surface

## 20 - Cap

- ☐ Apply sealant before bolting on.
- ☐ Allocation ⇒ Electronic parts catalogue (ETKA)

## 21 - Retaining ring

- ☐ Insert in groove of cylindrical roller bearing

## 22 - Cylindrical roller bearing

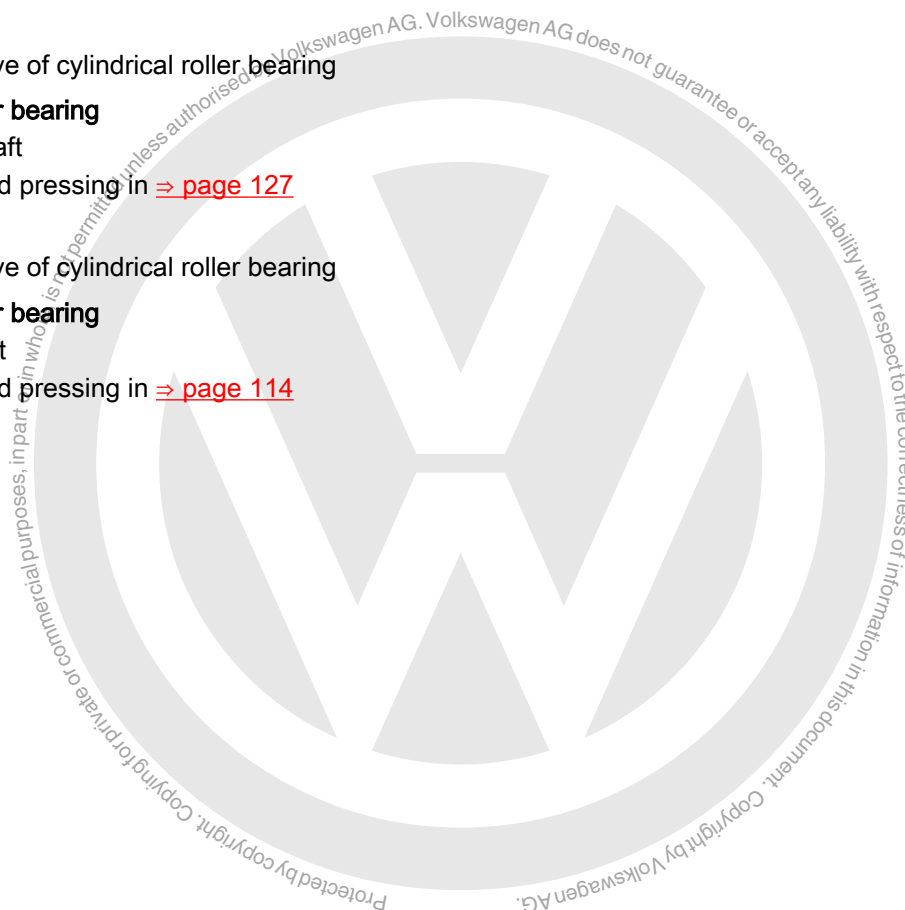
- ☐ For output shaft
- ☐ Pulling out and pressing in ⇒ [page 127](#)

## 23 - Retaining ring

- ☐ Insert in groove of cylindrical roller bearing

## 24 - Cylindrical roller bearing

- ☐ For input shaft
- ☐ Pulling out and pressing in ⇒ [page 114](#)





## 8.2 Assembly overview - gearbox housing cover

### 1 - Countersunk bolt

- ☐ Tighten diagonally and alternately.
- ☐ 2 Nm

### 2 - Mounting plate

- ☐ For securing cylindrical roller bearings
- ☐ Installation position: countersinks for countersunk head bolts face gearbox housing
- ☐ Not used with all gearboxes, in which case securing with bolts  
⇒ [page 111](#)

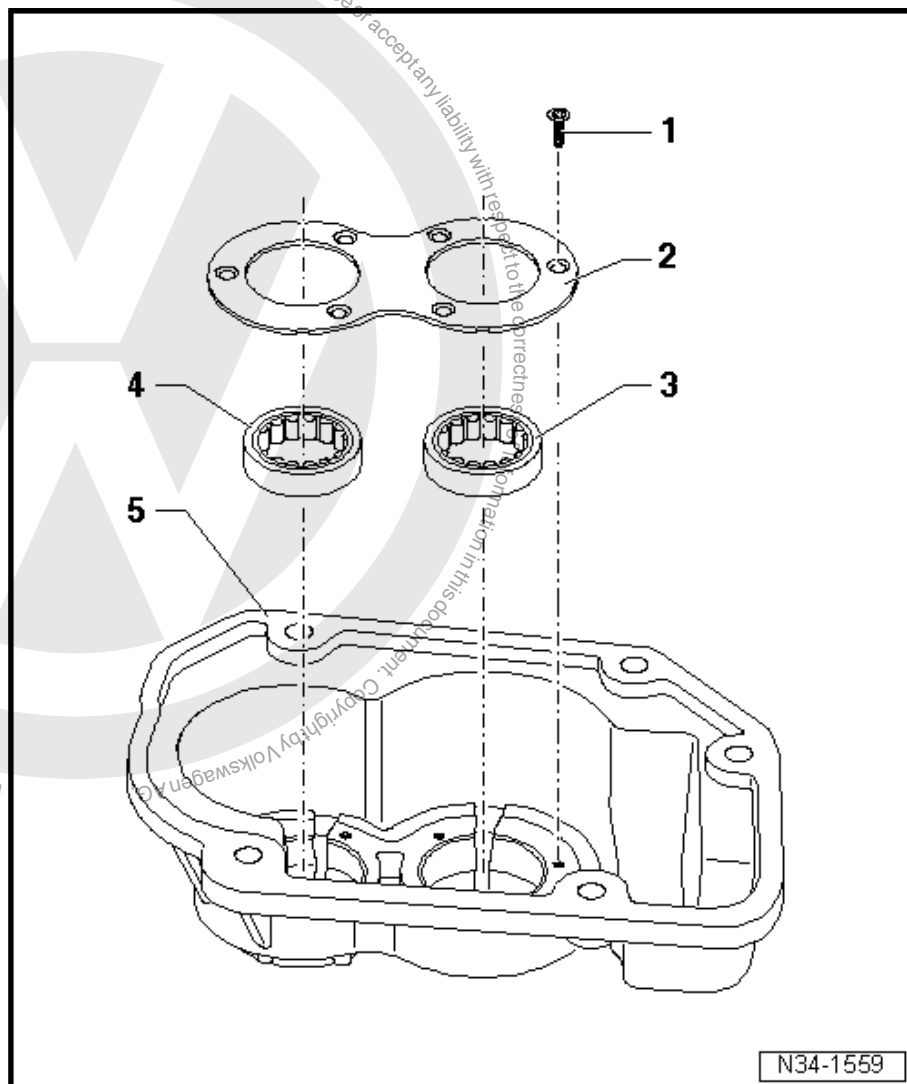
### 3 Cylindrical roller bearing

- ☐ For input shaft
- ☐ Do not interchange with cylindrical roller bearing for output shaft
- ☐ Removing ⇒ [page 110](#)
- ☐ Pressing in ⇒ [page 110](#)
- ☐ Different locking element ⇒ [page 111](#)

### 4 - Cylindrical roller bearing

- ☐ For output shaft
- ☐ Do not interchange with cylindrical roller bearing for input shaft
- ☐ Removing ⇒ [page 110](#)
- ☐ Pressing in ⇒ [page 110](#)
- ☐ Different locking element ⇒ [page 111](#)

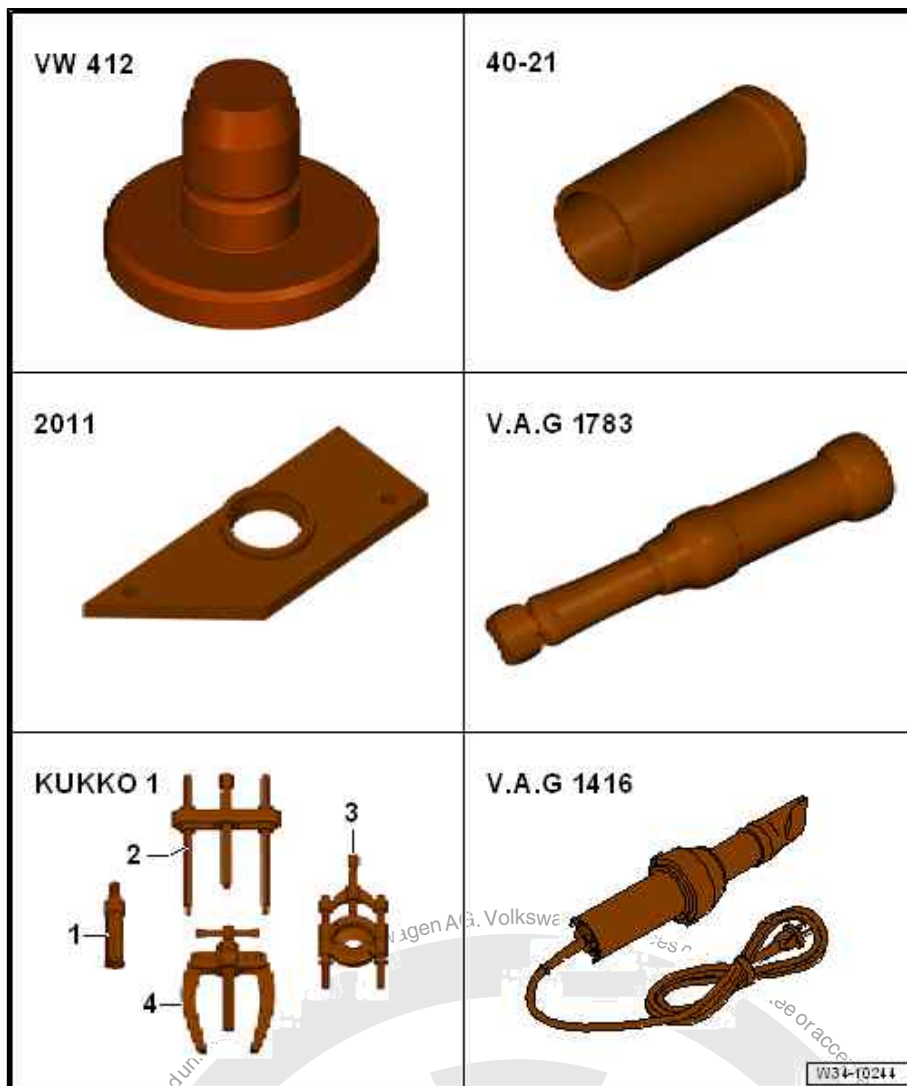
### 5 - Gearbox housing cover





### 8.3 Repairing gearbox housing cover

Special tools and workshop equipment required



- ◆ Press tool - VW 412-
- ◆ Drift sleeve - 40-21-
- ◆ Support bridge - 2011-
- ◆ Hot-air blower - V.A.G 1416-
- ◆ Do not apply: tools 1-4
- ◆ Not required: torque wrench - V.A.G 1783-

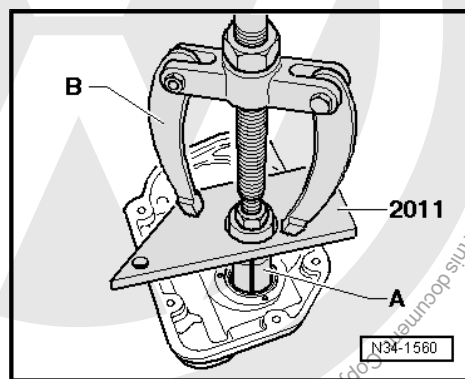
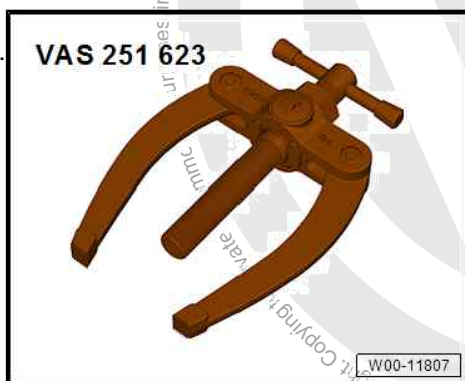




- ◆ Internal puller - VAS 251 611- , or e.g. internal puller - Kukko 21/5-



- ◆ Counter support - VAS 251 623- , or e.g. counter support - Kukko 22/2-



### Pulling cylindrical roller bearing out of gearbox housing cover

A - Internal puller - VAS 251 611- , or e.g. internal puller - Kukko 21/5-

B - Counter support - VAS 251 623- , or e.g. counter support - Kukko 22/2-

### Pressing cylindrical roller bearing into gearbox housing cover

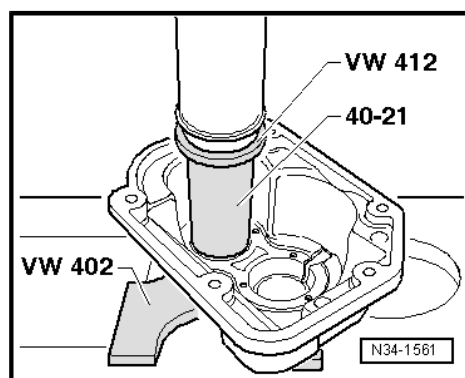
- Heat gearbox housing cover with, for example, hot air blower - V.A.G 1416- to about 100 °C in vicinity of bearing seat.
- Insert cylindrical roller bearing in heated housing and press in using workshop press until heat exchange has taken place.



#### Note

*Cylindrical roller bearings must be pressed into cover to stop. Do not use mounting plate to press bearings by tightening counter-sunk head bolts.*

- Securing cylindrical roller bearings.

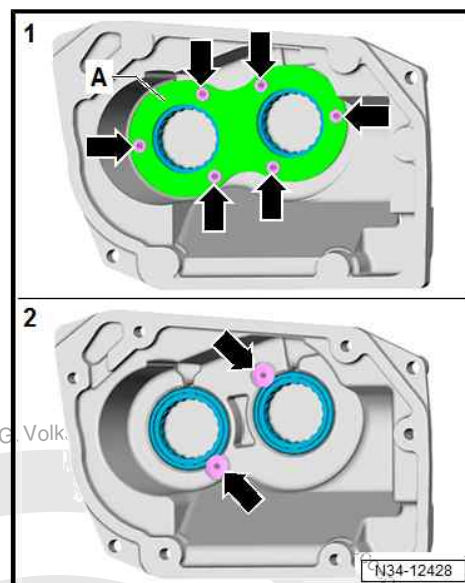




## Different locking elements for cylindrical roller bearings

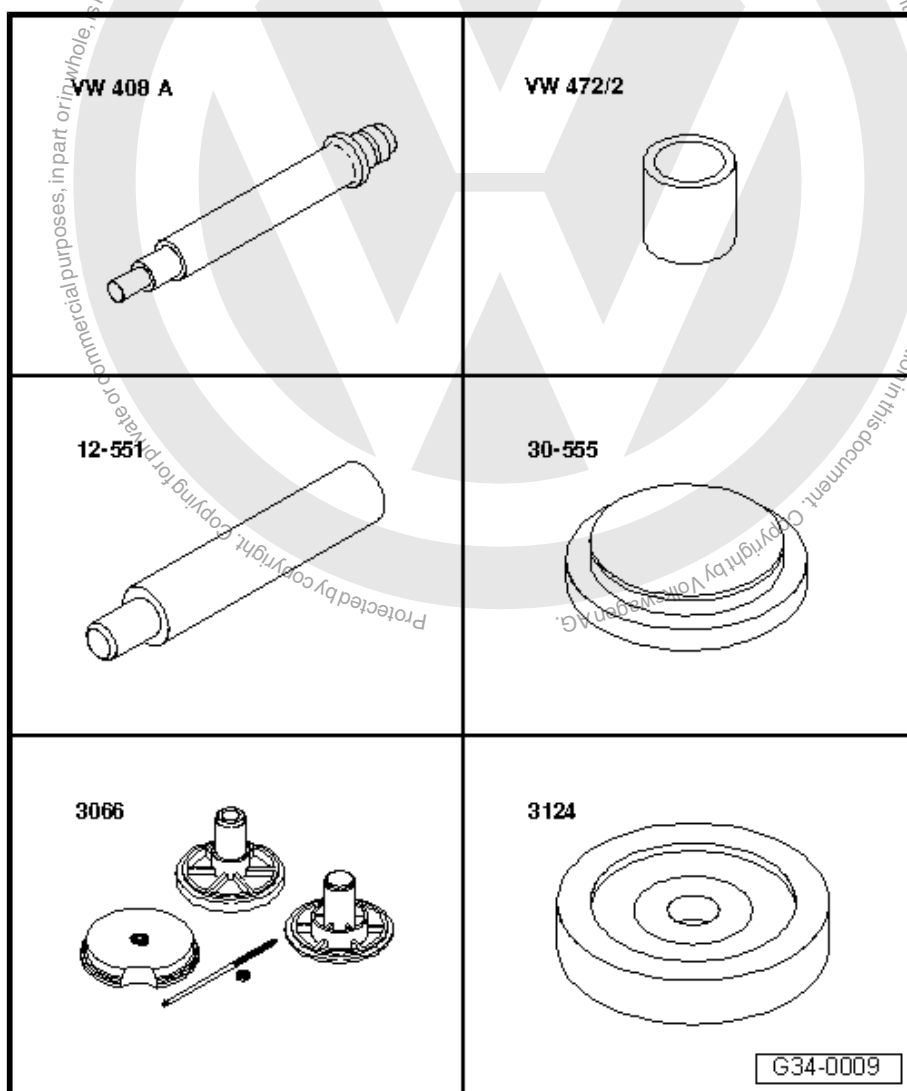
The cover was adapted.

Locking element	Threaded holes in cover
1. - Securing with mounting plate -A- and countersunk head bolt M 4 x 14 -arrows-	6
2. - Securing with countersunk head bolt M 4 x 12 -arrows-	2



## 8.4 Repairing clutch housing

Special tools and workshop  
equipment required



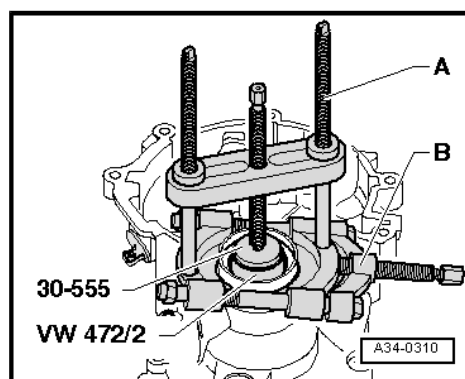
◆ Spacer sleeve - VW 472/2-



- ◆ Thrust piece - 30 - 555-
- ◆ Thrust piece - 3124-
- ◆ Spindle from assembly tool - 3066-
- ◆ Tools shown in illustration but not mentioned in text are not required.
- ◆ Puller - VAS 251 417- , or e.g. puller - Kukko 18/1-



- ◆ Splitter - VAS 251 409- or e.g. splitter - Kukko 17/1-



### Pulling out sleeve for seal

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

A - Puller - VAS 251 417- , or e.g. puller - Kukko 18/1-

B - Splitter - VAS 251 409- or e.g. splitter - Kukko 17/1-



### Pulling in sleeve for seal

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

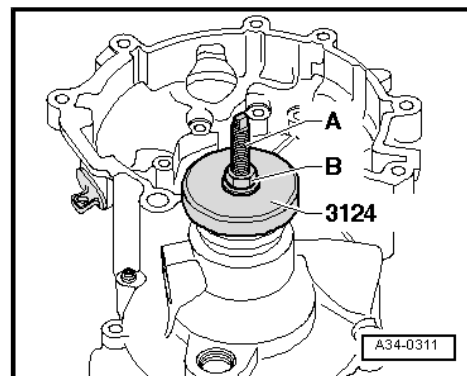
B - M12 nut with washer

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



#### Note

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



## 35 – Gears, shafts

### 1 Input shaft

⇒ "1.1 Assembly overview - input shaft", page 114

⇒ "1.2 Dismantling and assembling input shaft", page 117

⇒ "1.3 Renewing input shaft seal", page 125

#### 1.1 Assembly overview - input shaft



#### Note

- ◆ When installing new gears or new input shaft, refer to ⇒ *Electronic parts catalogue (ETKA) and technical data.*
- ◆ 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 - Bolt

- ❑ Removing and installing  
⇒ [page 77](#)

#### 2 - Cylindrical roller bearing inner race

- ❑ Removing and installing  
⇒ [page 90](#)

#### 3 - Synchromeshed gear for 6th gear

#### 4 - Synchro-ring for 6th gear

- ❑ Check for wear  
⇒ [page 122](#)

#### 5 - Needle bearing

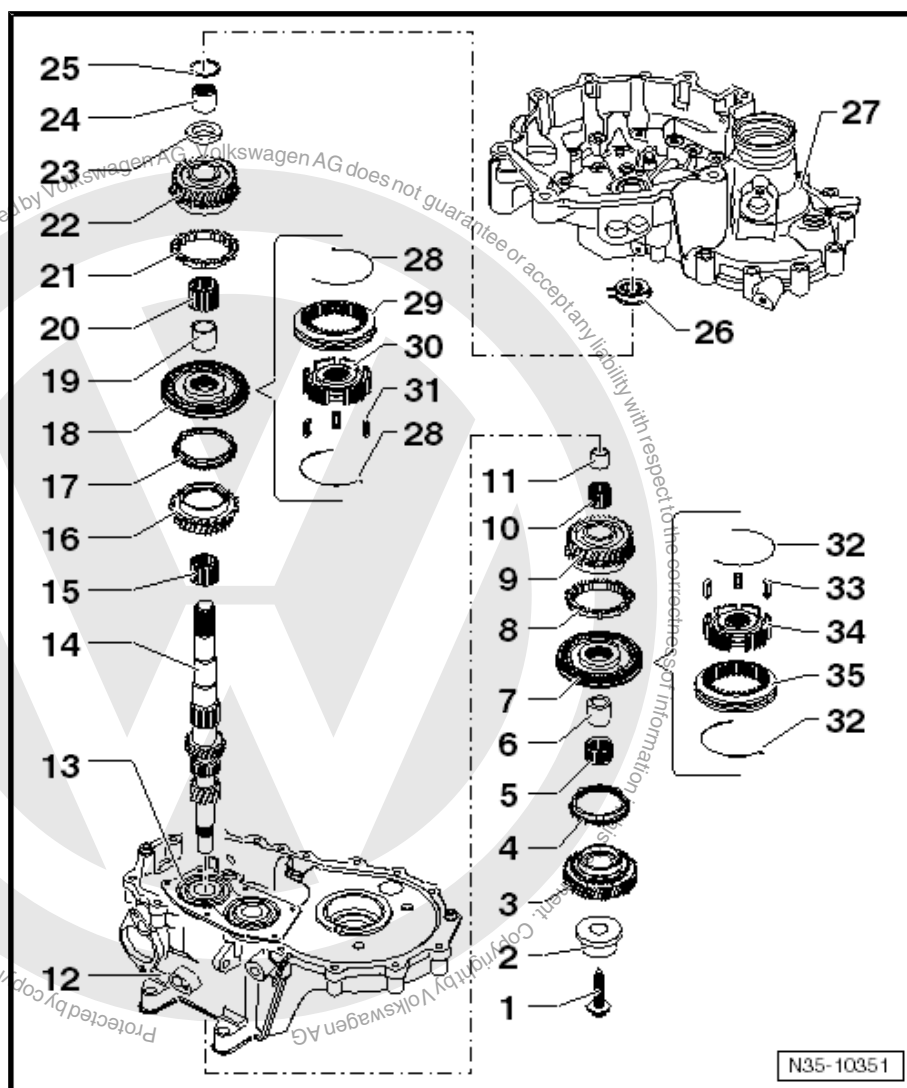
- ❑ For 6th gear
- ❑ Replace together with bushing.
- ❑ Two-part ⇒ [page 77](#)

#### 6 - Sleeve

- ❑ For 6th gear needle bearing.
- ❑ Renew together with needle bearing.
- ❑ Removing and installing  
⇒ [page 90](#)

#### 7 - Locking collar with synchro-hub for 5th and 6th gear

- ❑ Removing and installing  
⇒ [page 90](#)
- ❑ Dismantling  
⇒ [page 124](#)
- ❑ Assembling locking collar and synchro-hub for 5th and 6th gears ⇒ [page 124](#) and ⇒ [page 125](#)
- ❑ Fitting position ⇒ [page 125](#)





## 8 - Synchro-ring for 5th gear

- ☐ Will be damaged during removal of input shaft
- ☐ Renew after removal
- ☐ Check synchromeshed gear for wear ⇒ [page 122](#)

## 9 - Synchromeshed gear, 5th gear

### 10 - Needle bearing

- ☐ For 5th gear
- ☐ Renew together with sleeve

### 11 - Sleeve

- ☐ For 5th gear needle bearing
- ☐ Renew together with needle bearing
- ☐ Press off with bearing mounting with deep groove ball bearing
- ☐ Pressing on ⇒ [page 124](#)

### 12 - Gearbox housing

- ☐ Repairing ⇒ [page 106](#)

### 13 - Bearing mounting with deep groove ball bearing

- ☐ Renew deep groove ball bearing only together with bearing mounting
- ☐ If bearing support is separated from gearbox housing, the support must always be renewed
- ☐ Gear wheel for 5th gear could be removed by hand: Press off without gear wheel for 5th gear ⇒ [page 120](#) .
- ☐ Gear wheel for 5th gear could not be removed by hand: Press off with gear wheel for 5th gear ⇒ [page 120](#) .
- ☐ Pressing on ⇒ [page 124](#)

### 14 - Input shaft

- ☐ Clean residual locking fluid from threaded hole in input shaft using a thread chaser.

### 15 - Needle bearing

- ☐ For 3rd gear

### 16 - Synchromeshed gear for 3rd gear

### 17 - Synchro-ring for 3rd gear

- ☐ Check for wear ⇒ [page 122](#)

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

- ☐ Press off with 3rd gear synchromeshed gear ⇒ [page 121](#)
- ☐ Dismantling ⇒ [page 121](#)
- ☐ Installation position, locking collar and synchro-hub ⇒ [page 122](#)
- ☐ Assembling ⇒ [page 121](#) .
- ☐ Pressing on ⇒ [page 122](#)

### 19 - Sleeve

- ☐ For 4th gear needle bearing
- ☐ Renew together with needle bearing.
- ☐ Press off with 3rd gear synchromeshed gear ⇒ [page 121](#)
- ☐ Pressing on ⇒ [page 122](#)

### 20 - Needle bearing

- ☐ For 4th gear
- ☐ Renew together with bushing.

### 21 - Synchro-ring for 4th gear

- ☐ Check for wear ⇒ [page 122](#)





**22 - Synchromeshed gear for 4th gear**

**23 - Thrust washer**

**24 - Cylindrical roller bearing inner race**

- ☐ Pressing off ⇒ [page 121](#)
- ☐ Pulling off is also possible ⇒ [page 121](#)
- ☐ Pressing on ⇒ [page 123](#)

**25 - Retaining ring**

- ☐ Renew after removal
- ☐ Determining thickness ⇒ [page 123](#)

**26 - Cylindrical roller bearing**

- ☐ With retaining ring
- ☐ Removing ⇒ [page 120](#)
- ☐ Pressing in ⇒ [page 120](#) .
- ☐ Installation position: retaining ring in bearing faces input shaft

**27 - Clutch housing**

- ☐ Repairing ⇒ [page 106](#)

**28 - Spring**

- ☐ Fitting position ⇒ [page 125](#)

**29 - 3rd and 4th gear locking collar**

**30 - 3rd and 4th gear synchro-hub**

**31 - Locking pieces (qty. 3)**

**32 - Spring**

- ☐ Fitting position ⇒ [page 121](#)

**33 - Locking pieces (qty. 3)**

**34 - Synchro-hub for 5th and 6th gears**

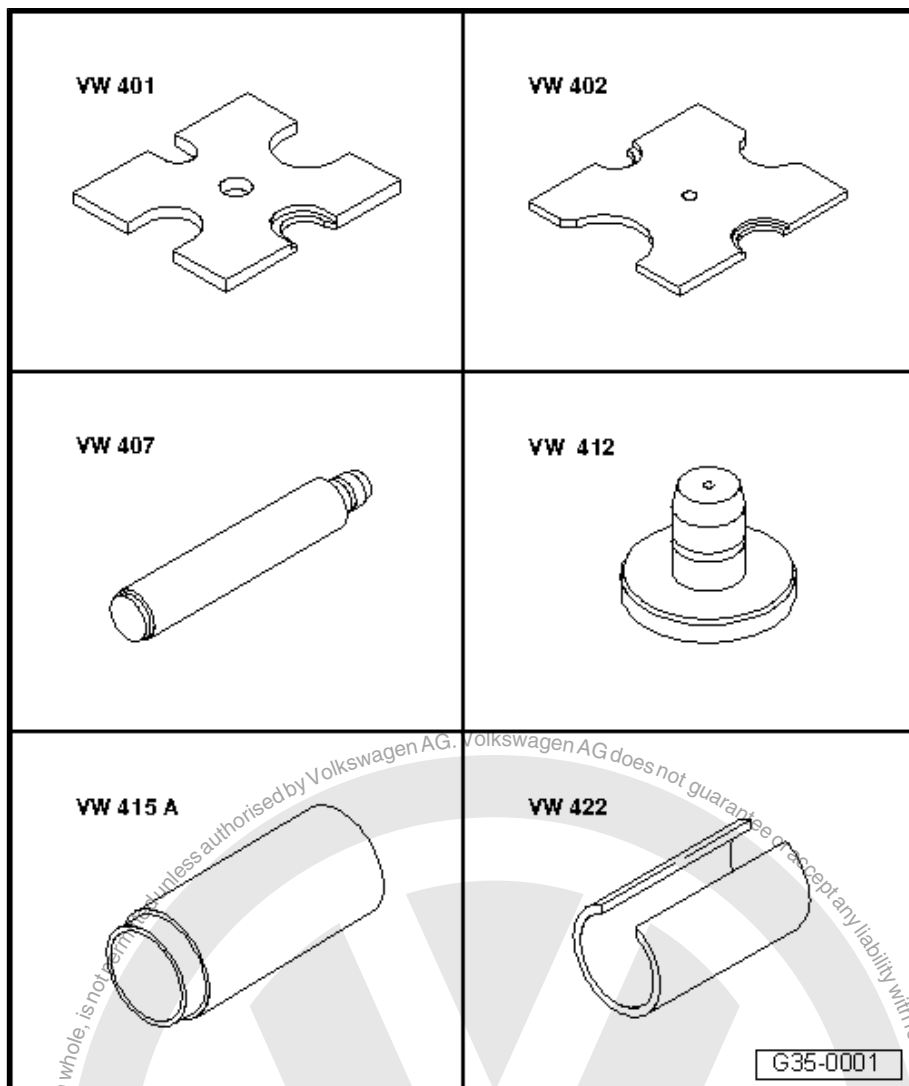
**35 - Locking collar for 5th and 6th gears**



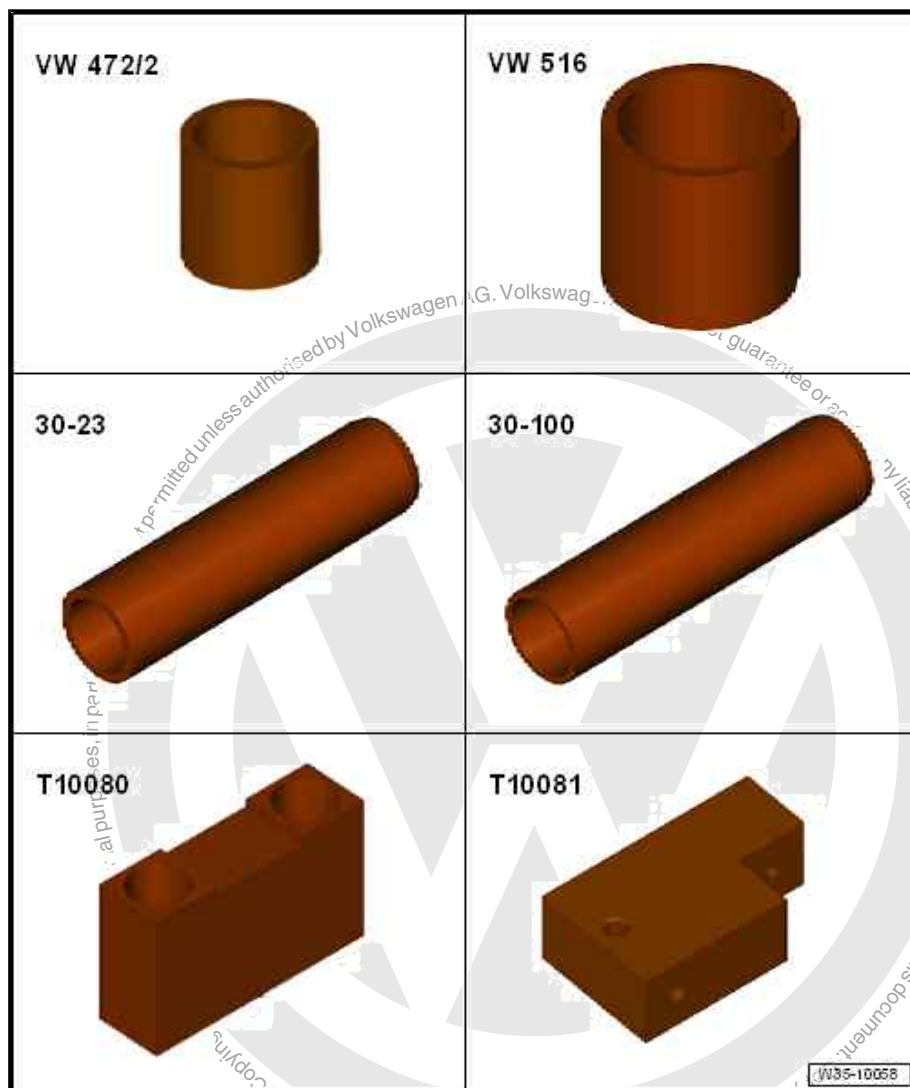


## 1.2 Dismantling and assembling input shaft

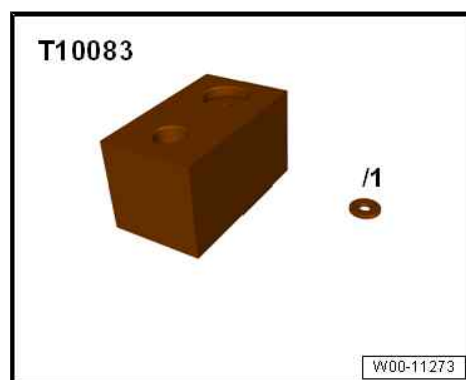
Special tools and workshop equipment required



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

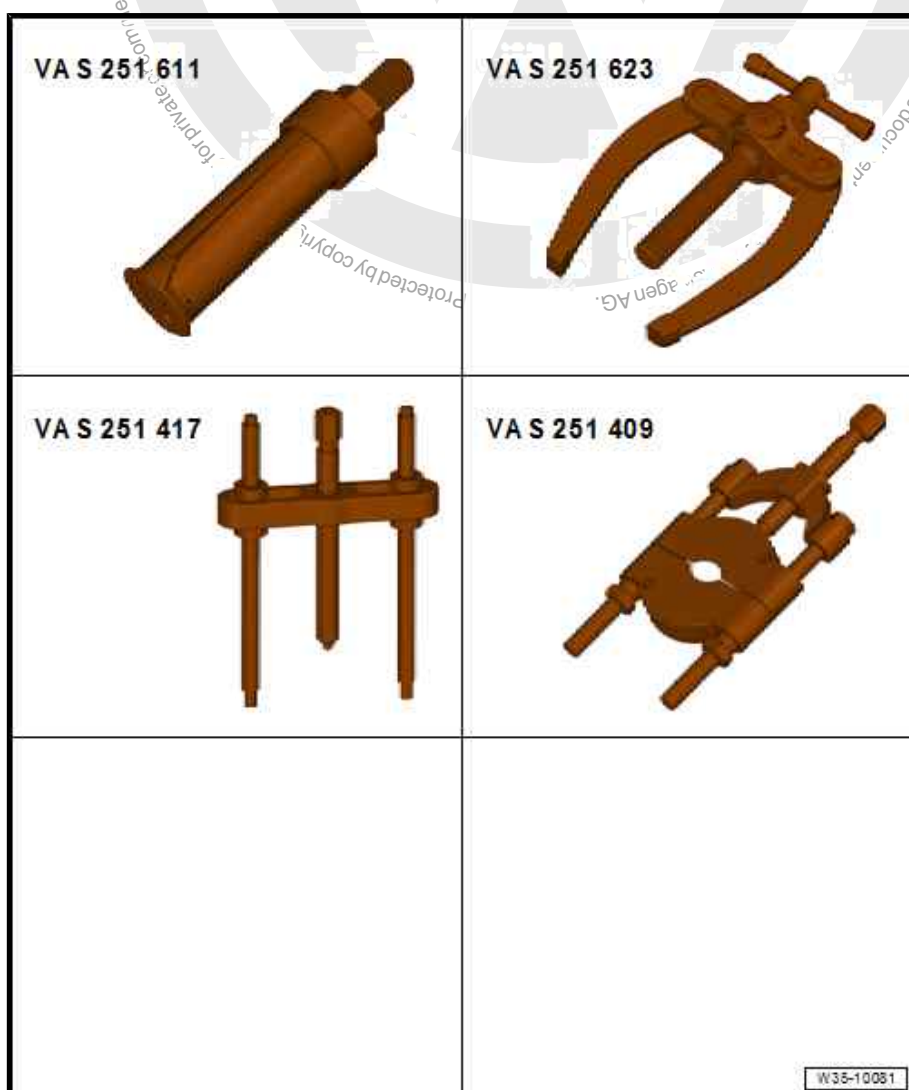
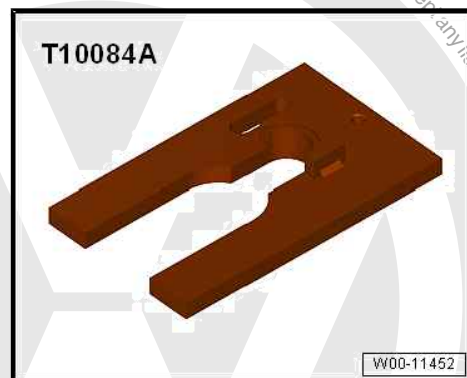


- ◆ Spacer sleeve - VW 472/2-
- ◆ Tube - VW 516-
- ◆ Extension - 30-23-
- ◆ Drift sleeve - 30-100-
- ◆ Thrust piece - T10080-
- ◆ Thrust piece - T10081-
- ◆ Thrust block - T10083-





- ◆ Washer - T10083/1-
- ◆ Thrust plate - T10084 A-



- ◆ Internal puller - VAS 251 611- , or e.g. internal puller - Kukko 21/5-
- ◆ Counter support - VAS 251 623- , or e.g. counter support - Kukko 22/2-
- ◆ Puller - VAS 251 417- , or e.g. puller - Kukko 18/1-



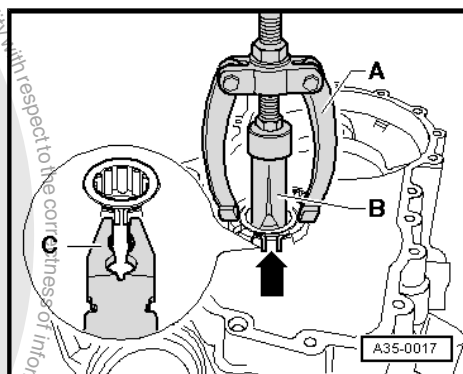
- ◆ Splitter - VAS 251 409- or e.g. splitter - Kukko 17/1-
- ◆ Circlip pliers - VW 161 A-
- ◆ Feeler gauge-

#### Pulling cylindrical roller bearing out of clutch housing

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

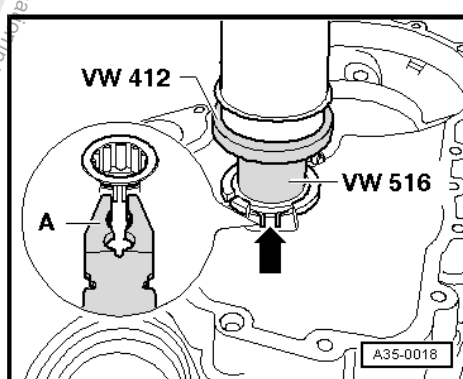
A - Counter support - VAS 251 623- , or e.g. counter support - Kukko 22/2-

B - Internal puller - VAS 251 611- , or e.g. internal puller - 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 together retaining ring -arrow- for cylindrical roller bearing using pliers -A-.
- Remove pliers before cylindrical roller bearing is in installation position. Retaining ring must engage in groove of clutch housing.

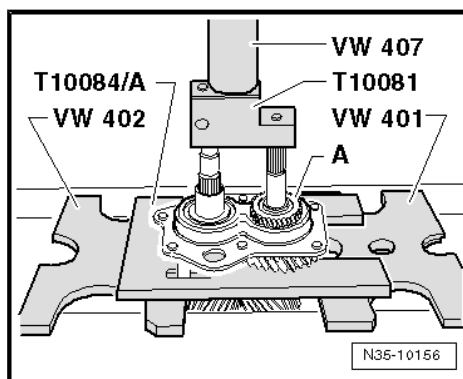


5th gear wheel could not be removed by hand

#### Pressing off bearing mounting with deep groove ball bearing and gear wheel for 5th gear -A-

- Slide locking collar for 1st and 2nd gear towards 2nd gear.
- Then slide thrust plate - T10084 A- sideways onto input shaft to stop.

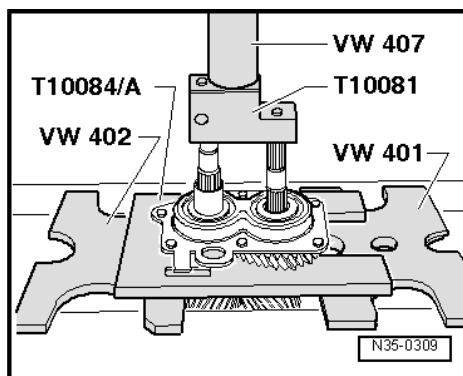
5th gear wheel could be removed by hand



#### Pressing off bearing mounting with deep groove ball bearing

- Slide locking collar for 1st and 2nd gear towards 2nd gear.
- Then slide thrust plate - T10084 A- sideways onto input shaft to stop.

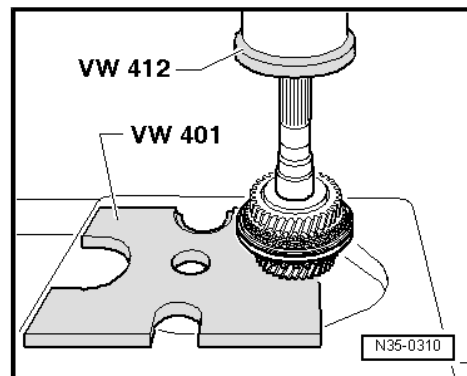
Continuation for all





**Press off cylindrical roller bearing inner race together with thrust washer, 4th gear synchromeshed gear with needle bearing, locking collar and synchro-hub for 3rd and 4th gear and 3rd gear synchromeshed gear.**

- Remove retaining ring.
- Press off cylindrical roller bearing inner race together with thrust washer, 4th gear synchromeshed gear with needle bearing, locking collar and synchro-hub for 3rd and 4th gear and 3rd gear synchromeshed gear.



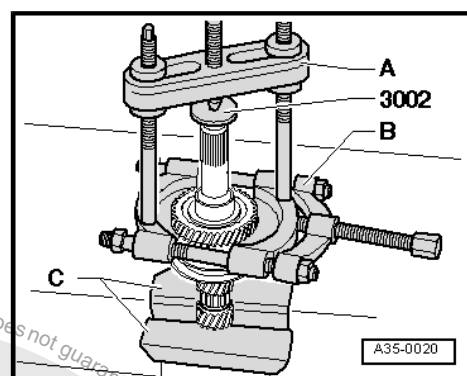
**Inner race for cylindrical roller bearing can also be pulled off together with synchromeshed gear for 4th gear only**

- First remove retaining ring with snap ring pliers - VW 161 A -.
- 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 - VAS 251 417- , or e.g. puller - Kukko 18/1-

B - Splitter - VAS 251 409- or e.g. splitter - Kukko 17/1-

C - Protective jaw covers

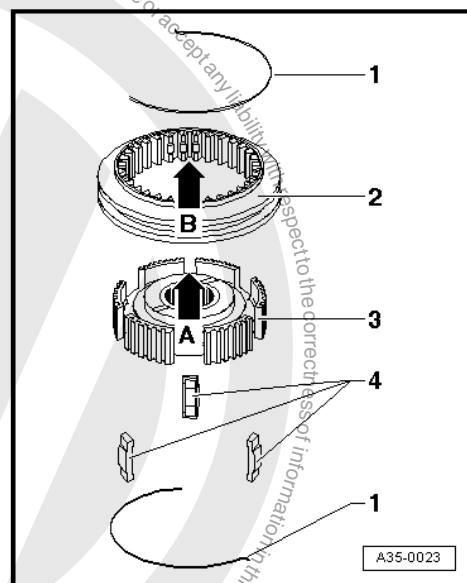


**Dismantling and assembling 3rd and 4th gear locking collar and synchro-hub**

- 1 - Spring
- 2 - Sliding sleeve
- 3 - Synchro-hub
- 4 - Locking piece

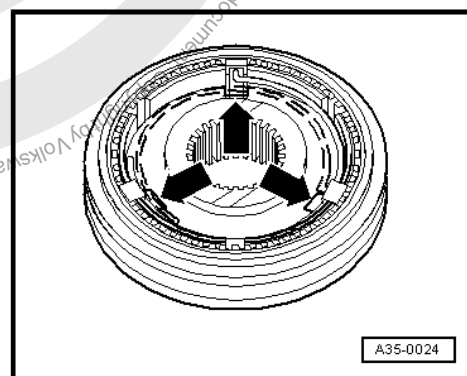
- Slide locking collar over synchro-hub.

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**

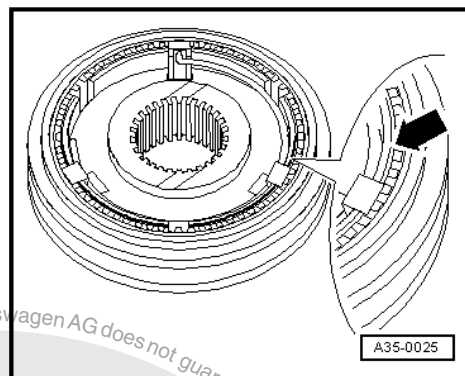
- Locking collar has been pushed over synchro-hub.
- Insert locking pieces in deeper notches -arrows- and install springs offset 120°. Angled end of spring must locate in hollow locking piece.





### Installation position of locking collar with synchro-hub for 3rd and 4th gear

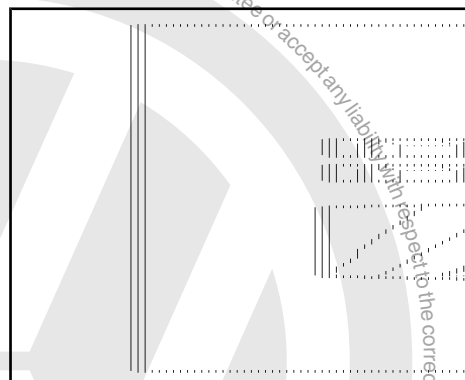
Groove on top -arrow- faces 4th gear.



### Checking synchro-ring for wear

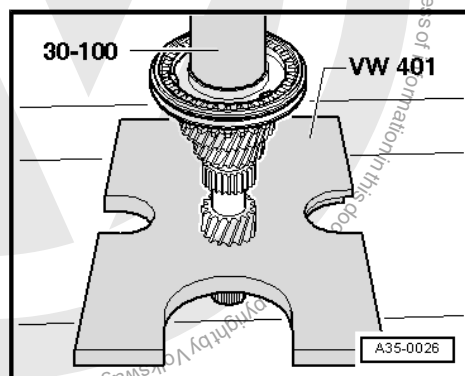
- Press synchro-ring onto cone of synchromeshed gear and measure gap -a- using feeler gauge.
- Measure gap size -a- at 3 points offset by 120° using feeler gauge.
- Make a note of average value.

Gap -a-	Installation dimension	Wear limit
3rd, 4th, 5th and 6th gear	1.1 ... 1.7 mm	0.5 mm



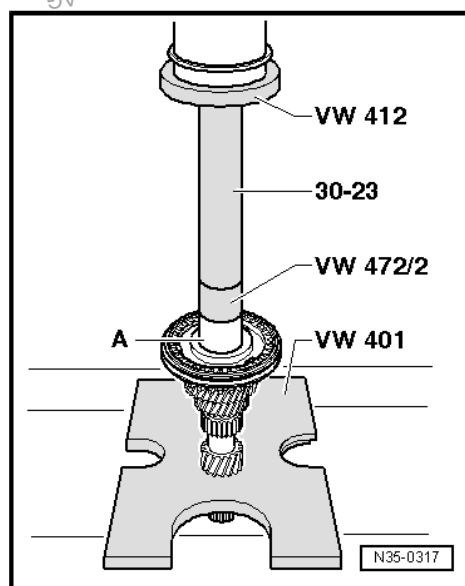
### Pressing on synchro-hub with locking collar for 3rd and 4th gears

Installation position: high inside collar faces 3rd gear synchromeshed gear.



### Pressing on sleeve -A- for 4th gear needle bearing

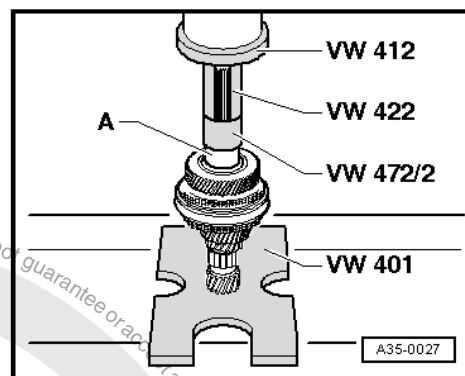
- After pressing on the sleeve -A-, fit 4th gear needle bearing, synchromeshed gear for 4th gear and thrust washer.







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



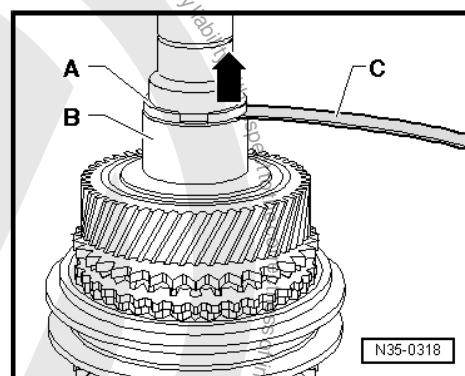
### Determining thickness of retaining ring

- 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 (only used for measuring purposes).
- Determine retaining ring from table.



#### Note

Allocate retaining rings using  $\Rightarrow$  Electronic parts catalogue (ET-KA).



The following securing clips are available:

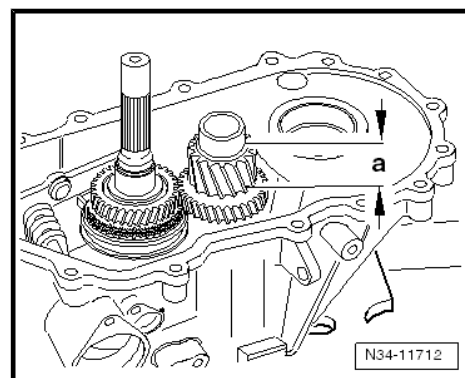
Measured value (mm)	Retaining ring thickness (mm)	Axial play (mm)
0.05 to 0.14	2.0	0.05 to 0.15
0.15 to 0.24	2.1	0.05 to 0.15
0.25 to 0.34	2.2	0.05 to 0.15
0.35 to 0.44	2.3	0.05 to 0.15
0.45 to 0.51	2.4	0.05 to 0.10

Press bearing mounting with deep groove ball bearing onto input shaft and output shaft.



#### Note

- ◆ Due to different spline heights, dimension -a-, output shafts of individual gearboxes have different lengths (shown here with shafts installed).
- ◆ To ensure that bearing support is always evenly pressed onto shafts, it is necessary for shafts always to be inserted evenly into thrust block - T10083-.
- ◆ If necessary, insert a shim - T10083/1- (3 mm thick) into mounting hole for input shaft  $\Rightarrow$  page 124.
- ◆ This is the reason why dimension -a- for output shaft teeth must be measured.



Dimension -a- = 30.6 mm

Insert shim - T10083/1-  $\Rightarrow$  next figure.



## Fit shim - T10083/1- .

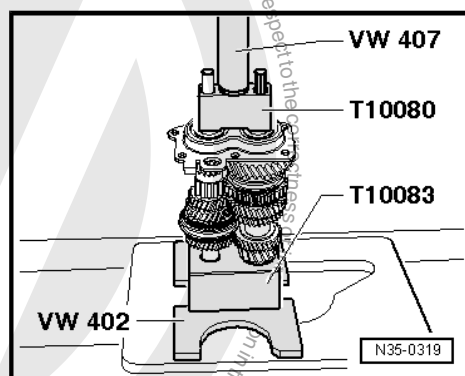
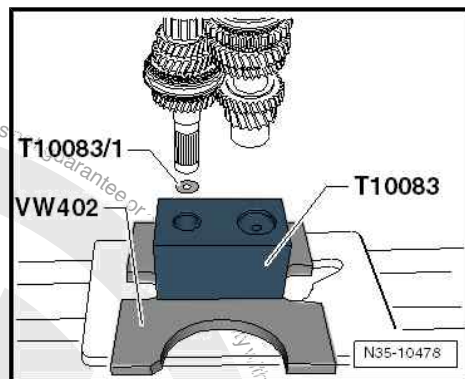
### Pressing on bearing support

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

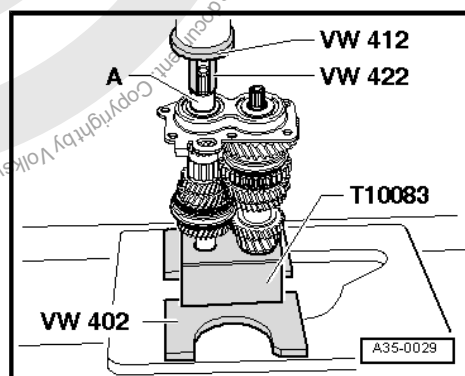


#### WARNING

*Wear protective gloves.*



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

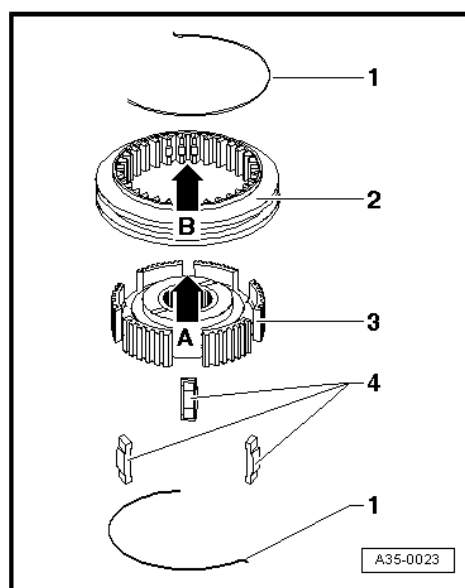


### Dismantling and assembling locking collar and synchro-hub for 5th and 6th gear

- 1 - Spring
- 2 - Sliding sleeve
- 3 - Synchro-hub
- 4 - Locking piece

- Slide locking collar over synchro-hub.

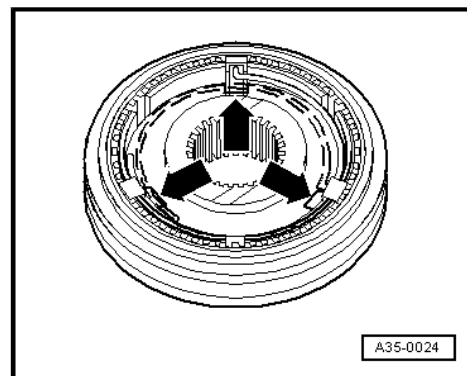
Deeper notches -arrow A- for locking pieces in synchro-hub and notches -arrow B- in locking collar must align.





### Assembling locking collar and synchro-hub for 5th and 6th gears

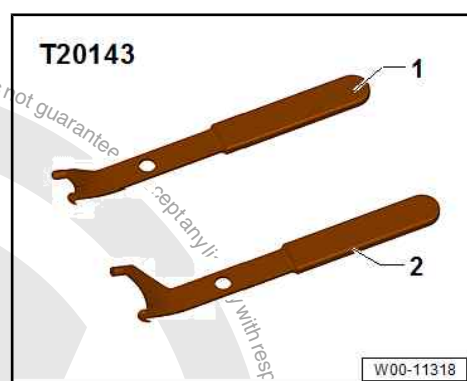
- Locking collar has been pushed over synchro-hub.
- Insert locking pieces in deeper notches -arrows- and install springs offset 120°.
- Angled end of spring must locate in hollow locking piece.



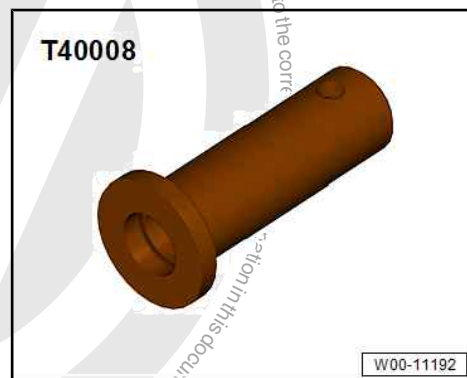
## 1.3 Renewing input shaft seal

### Special tools and workshop equipment required

- ◆ Removal tool - T20143/1-



- ◆ Thrust piece - T40008-



- ◆ Sealing grease
- ◆ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .
- Remove manual gearbox.
- Remove clutch release lever together with release bearing and guide sleeve ⇒ [page 17](#) .



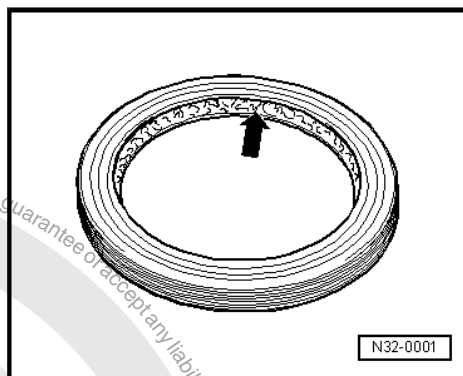
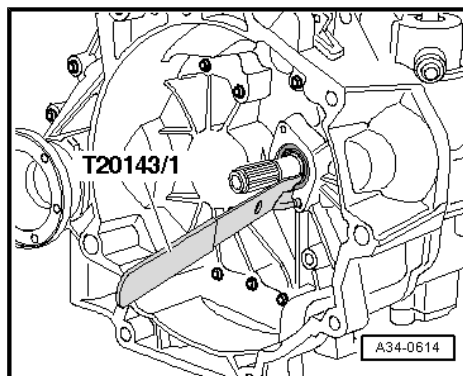
- Lever out input shaft seal.



#### Note

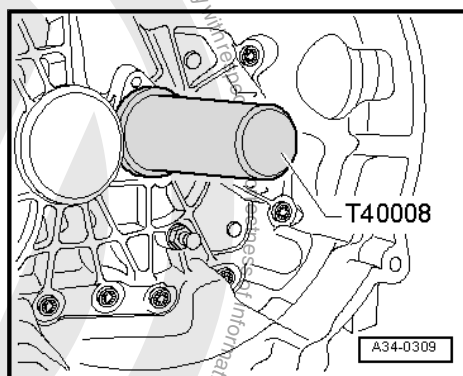
*Do not damage oil seal running surface on input shaft.*

- Half-fill space between sealing lip and dust lip -arrow- with sealing grease .
- Lightly moisten outer circumference of oil seal with gear oil.



#### Driving in input shaft oil seal flush

- Install clutch release lever together with release bearing and guide sleeve ➔ [page 17](#) .
- Install manual gearbox.





## 2 Output shaft

⇒ "2.1 Assembly overview - output shaft", page 127

⇒ "2.2 Dismantling and assembling output shaft", page 130

### 2.1 Assembly overview - output shaft



#### Note

- ◆ When installing new gears or new input shaft, refer to ⇒ *Electronic parts catalogue (ETKA) and technical data.*
- ◆ 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 106](#)

#### 2 - Cylindrical roller bearing

- With retaining ring
- Removing ⇒ [page 131](#)
- Pressing in  
⇒ [page 131](#).
- Installation position: retaining ring in bearing faces output shaft

#### 3 - Output shaft

- If an inner race as bearing seat for cylindrical roller bearing is present, it cannot be removed from output shaft
- Check bearing seat or inner race of 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 132](#)

#### 5 - Retaining ring

#### 6 - Retaining ring

#### 7 - Gear wheel for 3rd gear

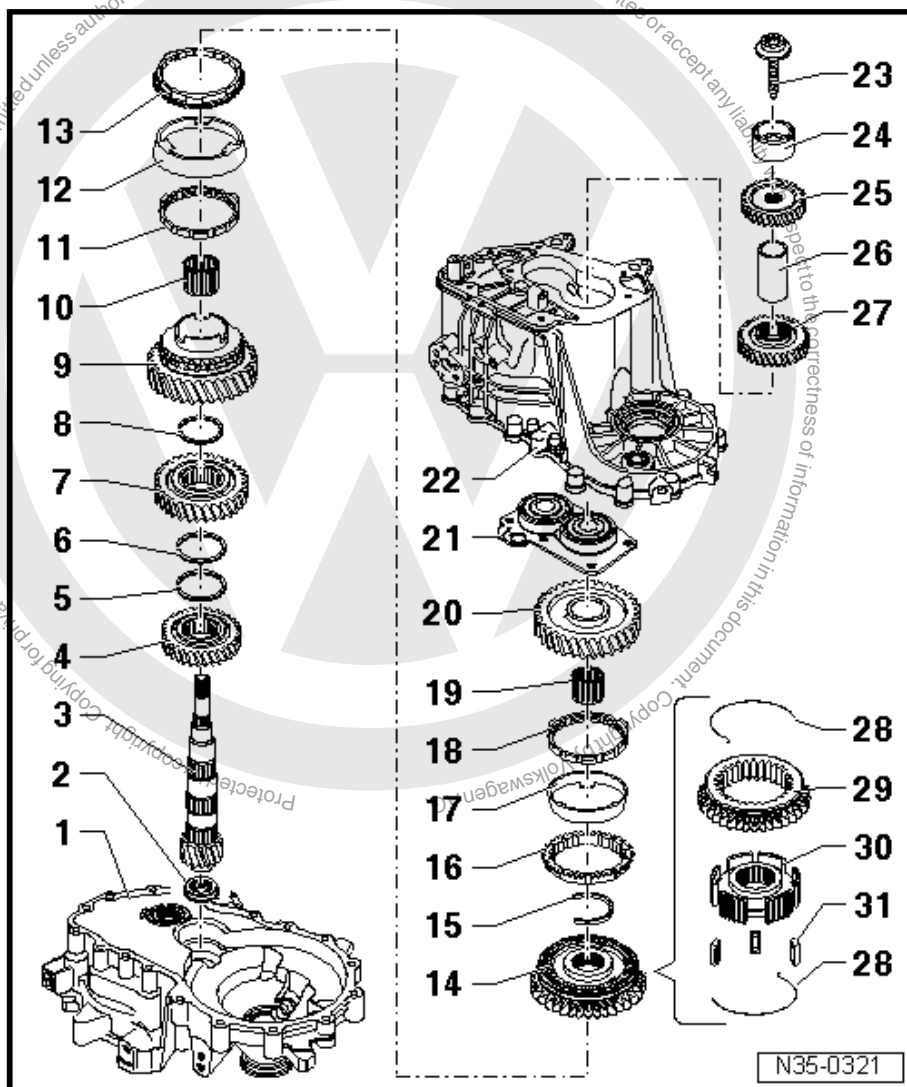
- Installation position: shoulder faces 4th gear ⇒ [page 132](#)

#### 8 - Retaining ring

#### 9 - Synchromeshed gear, 2nd gear

#### 10 - Needle bearing

- For 2nd gear





#### 11 - Inner ring for 2nd gear

- ☐ Check lugs for scoring
- ☐ Fitting position ⇒ [page 133](#)
- ☐ Checking synchro-ring, outer ring and inner ring together for wear ⇒ [page 132](#)

#### 12 - Outer bearing race for 2nd gear

- ☐ Renew if scored
- ☐ Fitting position ⇒ [page 133](#)
- ☐ Checking synchro-ring, outer ring and inner ring together for wear ⇒ [page 132](#)

#### 13 - Synchro-ring for 2nd gear

- ☐ Fitting position ⇒ [page 133](#)
- ☐ Checking synchro-ring, outer ring and inner ring together for wear ⇒ [page 132](#)

#### 14 - Locking collar with synchro-hub for 1st and 2nd gear

- ☐ After removing retaining ring, press off with 2nd gear synchromeshed gear ⇒ [page 132](#)
- ☐ Dismantling ⇒ [page 133](#)
- ☐ Assembling locking collar and synchro-hub ⇒ [page 133](#) and ⇒ [page 133](#)
- ☐ Fitting position ⇒ [page 133](#)
- ☐ Pressing on ⇒ [page 134](#)

#### 15 - Retaining ring

- ☐ Renew after removal
- ☐ Pressing out ⇒ [page 132](#)
- ☐ Installing ⇒ [page 134](#)

#### 16 - Synchro-ring for 1st gear

- ☐ Checking synchro-ring, outer ring and inner ring together for wear ⇒ [page 132](#)
- ☐ Assemble so that notches engage in locking pieces of locking collar.

#### 17 - Outer ring for 1st gear

- ☐ Check for scoring or signs of abnormal wear
- ☐ Checking synchro-ring, outer ring and inner ring together for wear ⇒ [page 132](#)
- ☐ Fitting position ⇒ [page 134](#)
- ☐ Insert in synchro-ring

#### 18 - Inner ring for 1st gear

- ☐ Check lugs for scoring
- ☐ Checking synchro-ring, outer ring and inner ring together for wear ⇒ [page 132](#)
- ☐ Fitting position ⇒ [page 134](#)

#### 19 - Needle bearing

- ☐ For 1st gear

#### 20 - Synchromeshed gear, 1st gear

- ☐ Fitting position ⇒ [page 135](#)

#### 21 - Bearing mounting with deep groove ball bearing

- ☐ Renew deep groove ball bearing only together with bearing mounting
- ☐ If bearing support is separated from gearbox housing, the support must always be renewed
- ☐ Press off without gear wheel for 5th gear ⇒ [page 120](#)
- ☐ Press off with gear wheel for 5th gear ⇒ [page 120](#)
- ☐ Pressing on ⇒ [page 124](#)

#### 22 - Gearbox housing

- ☐ Repairing ⇒ [page 106](#)

#### 23 - Bolt

- ☐ Removing and installing ⇒ [page 77](#)



#### 24 - Cylindrical roller bearing inner race

- ☐ Mark before removing
- ☐ Do not interchange with inner race for cylindrical roller bearing of input shaft
- ☐ Removing and installing ⇒ [page 90](#)

#### 25 - Gear wheel for 6th gear

- ☐ Installation position: ⇒ [page 103](#) .
- ☐ Removing and installing ⇒ [page 90](#)

#### 26 - Sleeve

- ☐ Removing and installing ⇒ [page 90](#)

#### 27 - Gear wheel for 5th gear

- ☐ Fitting position ⇒ [page 102](#)
- ☐ Must be pressed off and pressed on in gearboxes for the 1.4 l engine ⇒ [page 102](#)

#### 28 - Spring

- ☐ Fitting position ⇒ [page 133](#)

#### 29 - Sliding sleeve

#### 30 - Synchro-hub

#### 31 - Locking pieces (qty. 3)

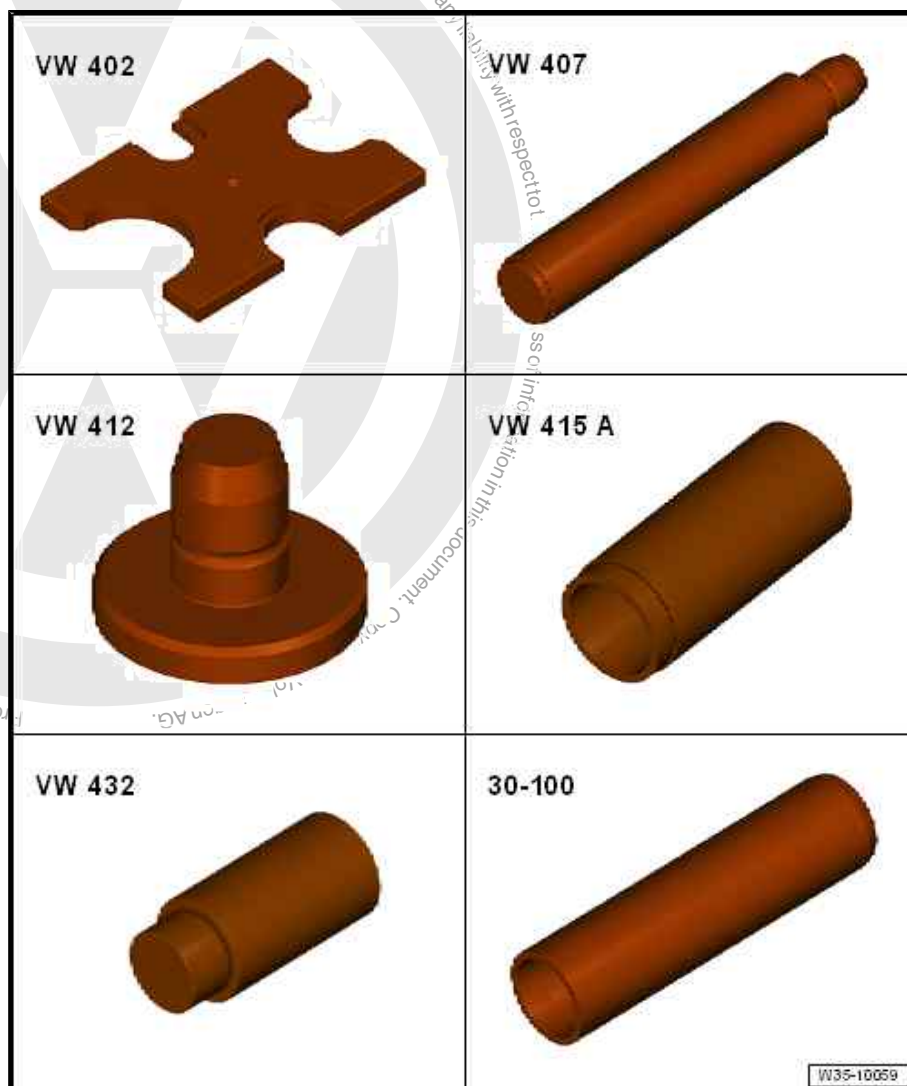






## 2.2 Dismantling and assembling output shaft

### Special tools and workshop equipment required



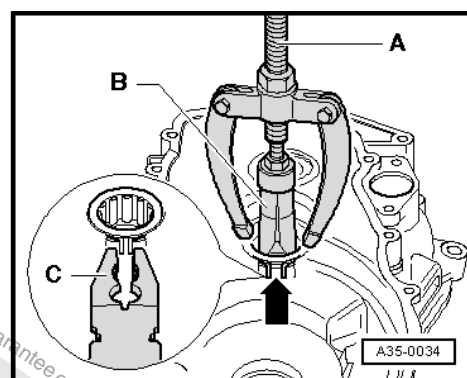
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 415 A-
- ◆ Thrust piece - VW 432-
- ◆ Drift sleeve - 30-100-



- ◆ Internal puller - VAS 251 611- , or e.g. internal puller - Kukko 21/5-



- ◆ Counter support - VAS 251 621- , or e.g. counter support - Kukko 22/1-



#### Pulling cylindrical roller bearing out of clutch housing

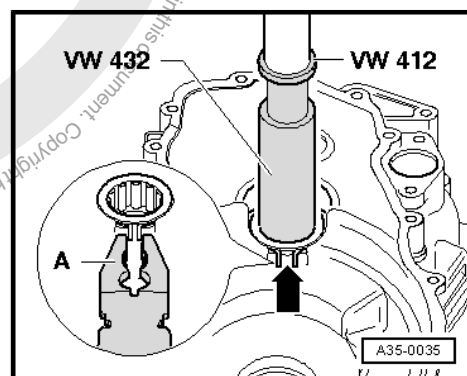
- When pulling out, squeeze together retaining ring -arrow- of cylindrical roller bearing, using pliers -C-.

A - Counter support - VAS 251 621- , or e.g. counter support - Kukko 22/1-

B - Internal puller - VAS 251 611- , or e.g. internal puller - 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 together retaining ring -arrow- for cylindrical roller bearing using pliers -A-.
- Remove pliers before cylindrical roller bearing is in installation position. Retaining ring must engage in groove of clutch housing.
- ➔ [page 120](#) Press bearing mounting with deep groove ball bearing onto input shaft and output shaft.





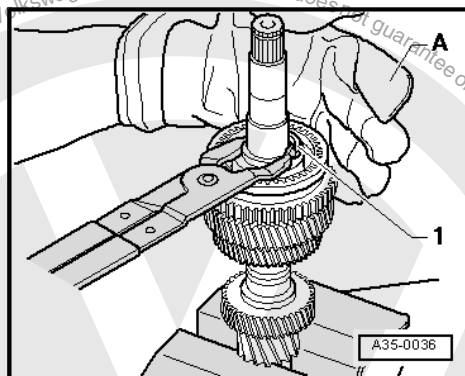
## Pressing retaining ring -1- out of groove

A - Protective gloves



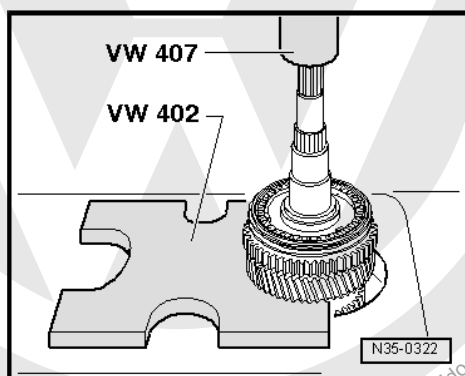
### WARNING

*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 gear wheel for 4th gear -A- on output shaft.

### Installation position:

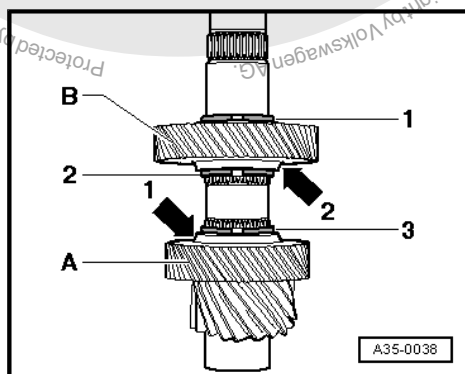
Collar -arrow 1- faces 3rd gear wheel -B-.

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

### Installation position:

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

- Install retaining ring -1-.



## Checking 1st and 2nd gear synchro-ring, outer ring and inner ring together for wear

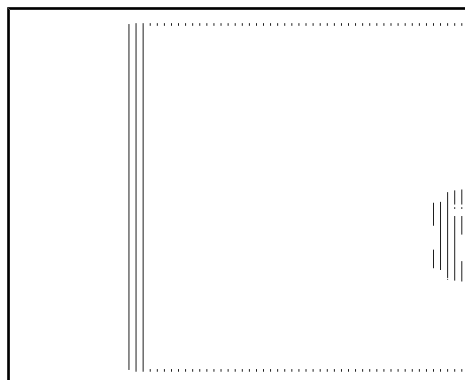
- Press synchro-ring, outer ring and inner ring onto cone of synchromeshed gear and measure gap -a- at 3 points offset by 120° using a feeler gauge.
- Make a note of average value.

Gap "a"	Installation dimension	Wear limit
1st and 2nd gears	1.1 - 1.8 mm	0.5 mm



### Note

*Always renew inner ring, outer ring and synchro-ring together.*





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

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

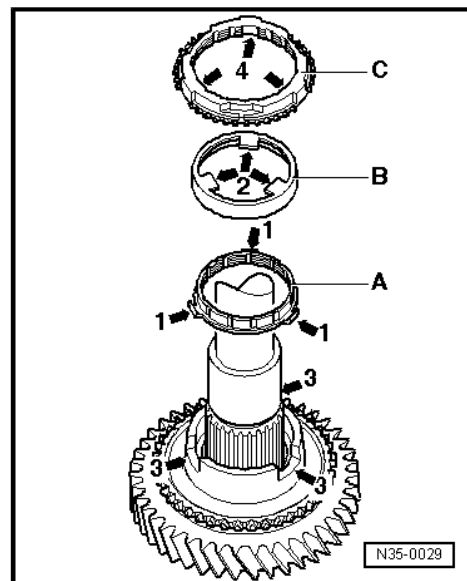
Angled lugs -arrow 1- face outer ring -B-.

- 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 race -A-.



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

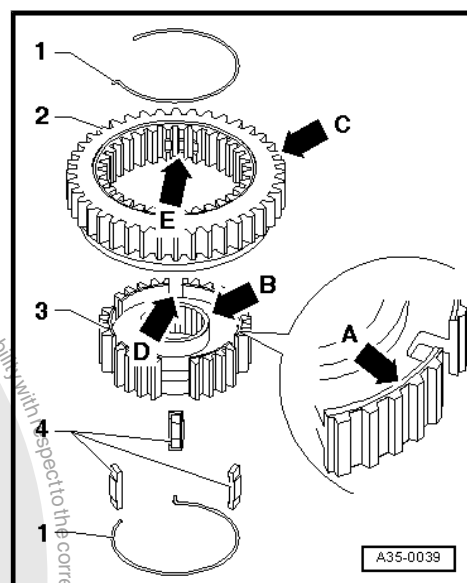
- 1 - Spring
- 2 - Sliding sleeve
- 3 - Synchro-hub
- 4 - Locking piece

- Slide locking collar over synchro-hub.

#### Installation position:

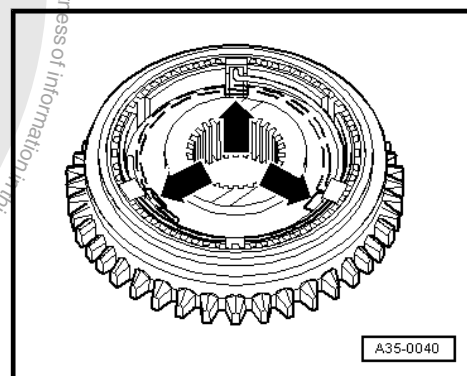
After assembly, the groove on the face -arrow A- and the higher shoulder -arrow B- of synchro-hub face outer splines of the locking collar -arrow C-.

Deeper notches -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.



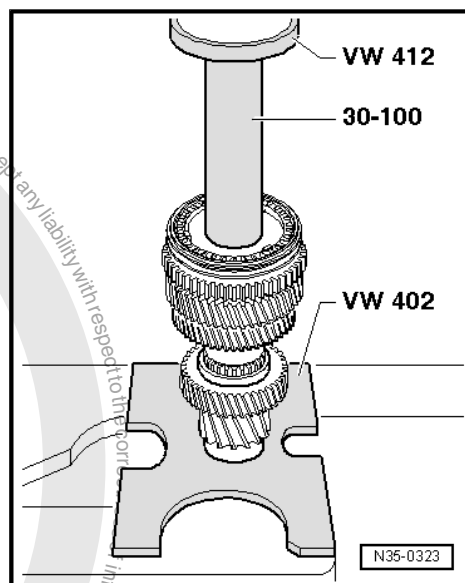


### Pressing on locking collar and synchro-hub for 1st and 2nd gears

#### Installation position:

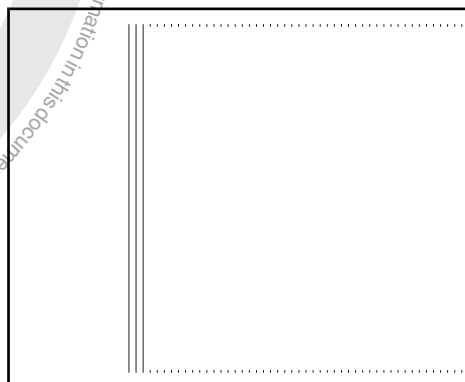
Groove in locking collar for selector fork faces 1st gear and teeth for reverse gear face 2nd gear.

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



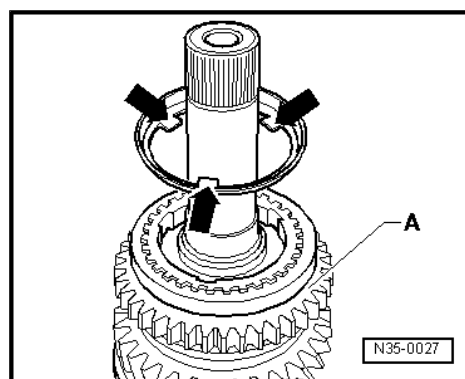
#### Fitting retaining ring

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



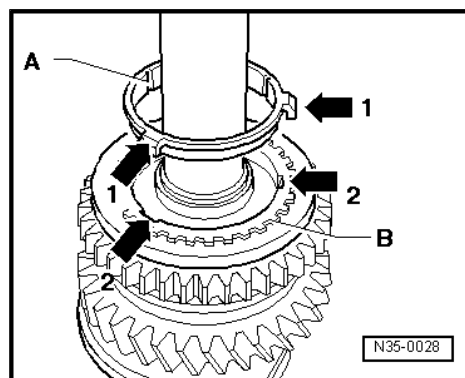
#### Installation position of 1st gear outer ring

Lugs -arrows- face towards reverse gear teeth.



#### Installation position of 1st gear inner ring -A-

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

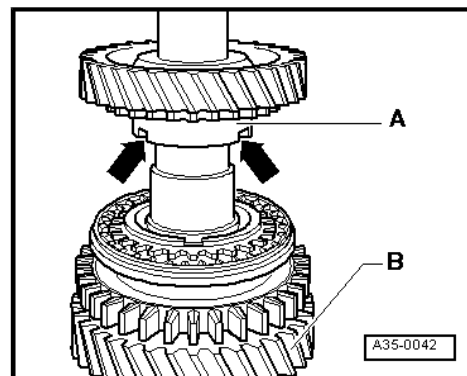




### Installation position of synchromeshed gear for 1st gear

Higher shoulder -A- faces 2nd gear -B-. Notches in shoulder -arrows- engage in lugs of outer ring [⇒ page 134](#).

- Press bearing mounting with deep groove ball bearing onto input shaft and output shaft, from [⇒ page 124](#)
- Heat inner bearing mounting to approx. 100 °C before pressing on.



## 39 – Final drive - differential

### 1 Oil seals

⇒ [“1.1 Overview of fitting locations - seals”, page 136](#)

⇒ [“1.2 Renewing left oil seal”, page 137](#)

⇒ [“1.3 Renewing right oil seal”, page 138](#)

#### 1.1 Overview of fitting locations - seals

##### 1 - Seal

- ☐ For input shaft
- ☐ Renew after removal  
⇒ [page 125](#)

##### 2 - Seal

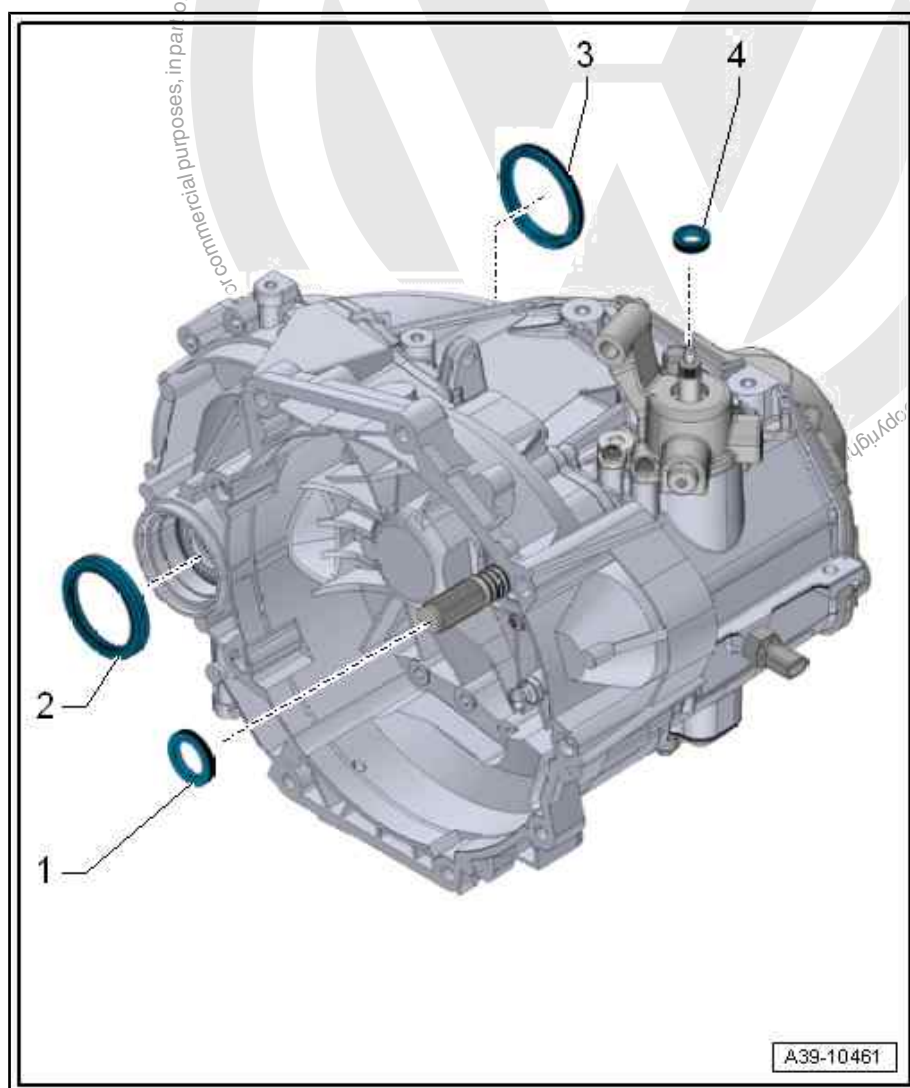
- ☐ Manual gearbox 0DQ:  
for right flange shaft
- ☐ Renew after removal  
⇒ [page 138](#)

##### 3 - Seal

- ☐ Manual gearbox 0DQ:  
for left flange shaft
- ☐ Renew after removal  
⇒ [page 137](#)

##### 4 - Seal

- ☐ For selector shaft
- ☐ Renew after removal  
⇒ [page 90](#)



A39-10461



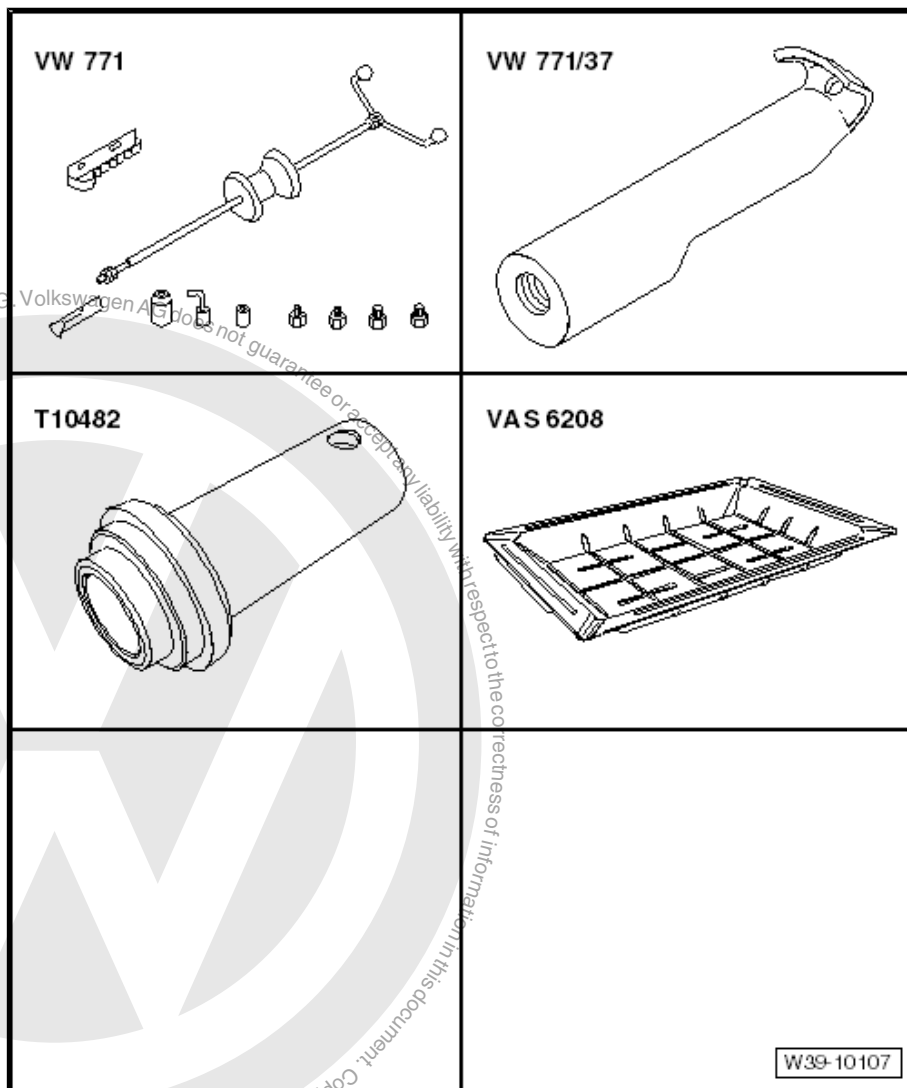


## 1.2 Renewing left oil seal

⇒ ["1.2.1 Renewing oil seal for left flange shaft, manual gearbox 0DQ", page 137](#)

### 1.2.1 Renewing oil seal for left flange shaft, manual gearbox 0DQ

Special tools and workshop equipment required



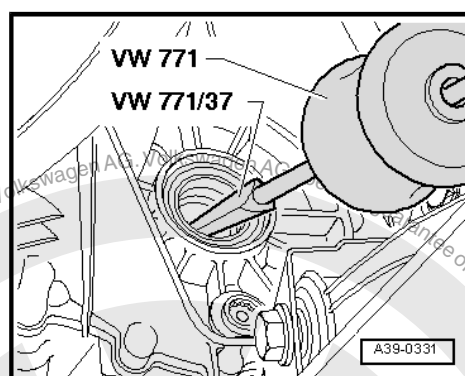
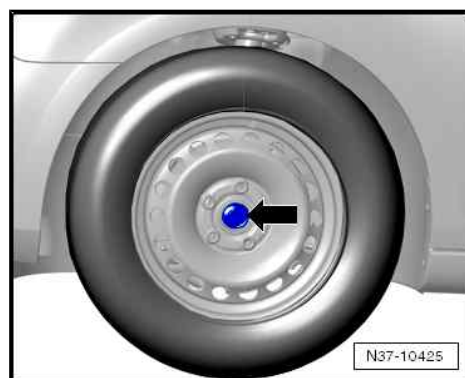
- ◆ Multi-purpose tool - VW 771-
- ◆ Extractor hook - VW 771/37-
- ◆ Thrust piece - T10482-
- ◆ Drip tray - V.A.G 1306-
- ◆ or drip tray for workshop hoist - VAS 6208-
- ◆ Sealing grease
- ◆ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .



## Removing

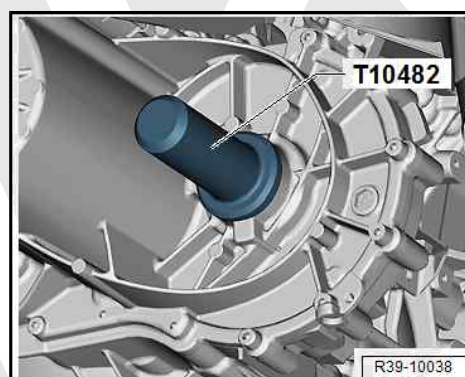
The drive shaft must be removed in a later step.

- With vehicle standing on its wheels, loosen front flange bolt -arrow- 90° at most, or wheel bearing will be damaged ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Remove wheel.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .
- Place drip tray under gearbox.
- Remove drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Pull out drive shaft seal.



## 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 .
- Install drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Check gear oil level and top up to lower edge of oil filler hole if necessary ⇒ [page 70](#) .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .
- Attach wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts .



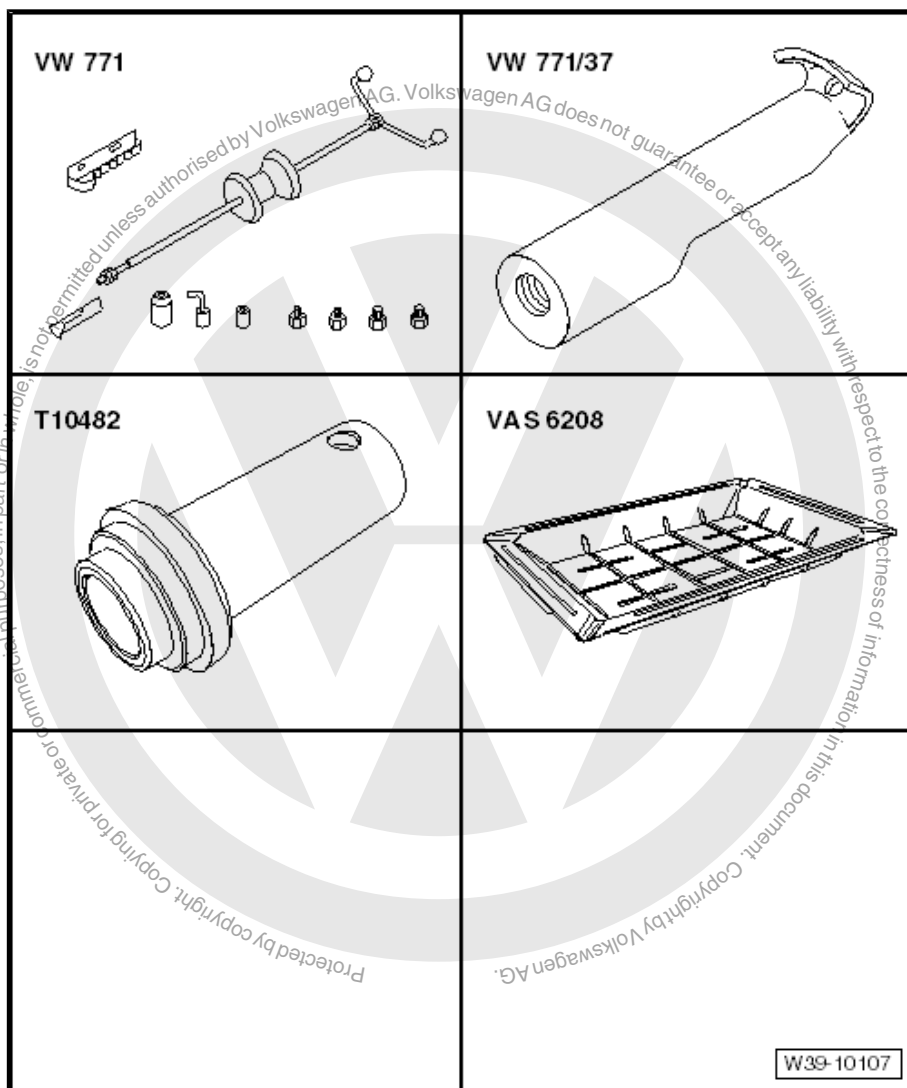
## 1.3 Renewing right oil seal

⇒ **"1.3.1 Renewing oil seal for right flange shaft, manual gearbox 0DQ", page 138**

### 1.3.1 Renewing oil seal for right flange shaft, manual gearbox 0DQ



# Special tools and workshop equipment required



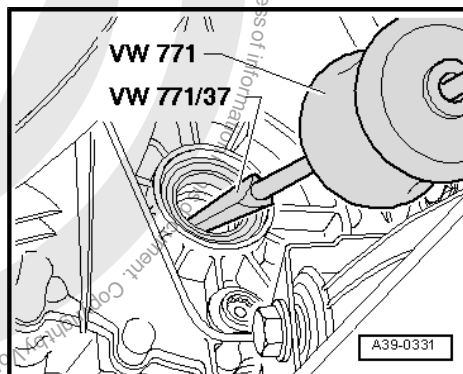
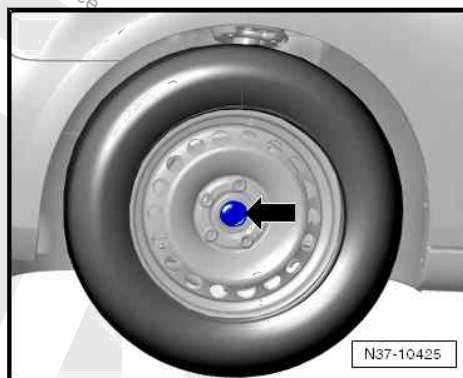
- ◆ Multi-purpose tool - VW 771-
- ◆ Extractor hook - VW 771/37-
- ◆ Thrust piece - T10482-
- ◆ Drip tray - V.A.G 1306-
- ◆ or drip tray for workshop hoist - VAS 6208-
- ◆ Sealing grease
- ◆ Allocate grease using ⇒ Electronic parts catalogue (ETKA) .



## Removing

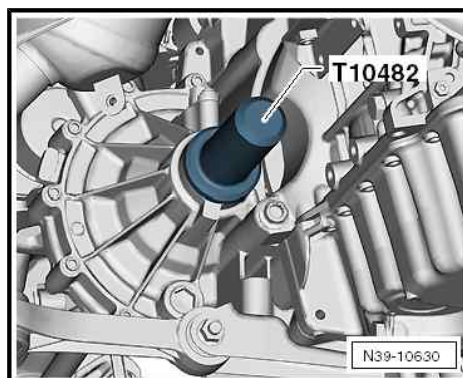
The drive shaft must be removed in a later step.

- With vehicle standing on its wheels, loosen front flange bolt -arrow- 90° at most, or wheel bearing will be damaged ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .
- Place drip tray under gearbox.
- Remove drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Pull out drive shaft seal.



## 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 .
- Install drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shafts .
- Check gear oil level and top up to lower edge of oil filler hole if necessary ⇒ [page 70](#) .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .





## 2 Differential

⇒ ["2.1 Assembly overview - differential", page 141](#)

⇒ ["2.2 Dismantling and assembling differential", page 142](#)

⇒ ["2.3 Adjusting differential", page 149](#)

### 2.1 Assembly overview - differential

⇒ ["2.1.1 Assembly overview - differential housing, manual gearbox 0DQ", page 141](#)

#### 2.1.1 Assembly overview - differential housing, manual gearbox 0DQ

##### 1 - Left drive shaft seal

- ☐ Renewing with manual gearbox installed  
⇒ [page 137](#) .

##### 2 - Gearbox housing

- ☐ ⇒ ["8 Gearbox housing, clutch housing", page 106](#)

##### 3 - Baffle plate

- ☐ Renew after removal
- ☐ Shoulder points away from housing

##### 4 - Tapered roller bearing outer race

- ☐ Removing ⇒ [page 146](#)
- ☐ Pressing in  
⇒ [page 146](#) .

##### 5 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 146](#)
- ☐ Pressing on  
⇒ [page 147](#)

##### 6 - Differential

- ☐ With final drive gear

##### 7 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 148](#)
- ☐ Pressing on  
⇒ [page 148](#)

##### 8 - Tapered roller bearing outer race

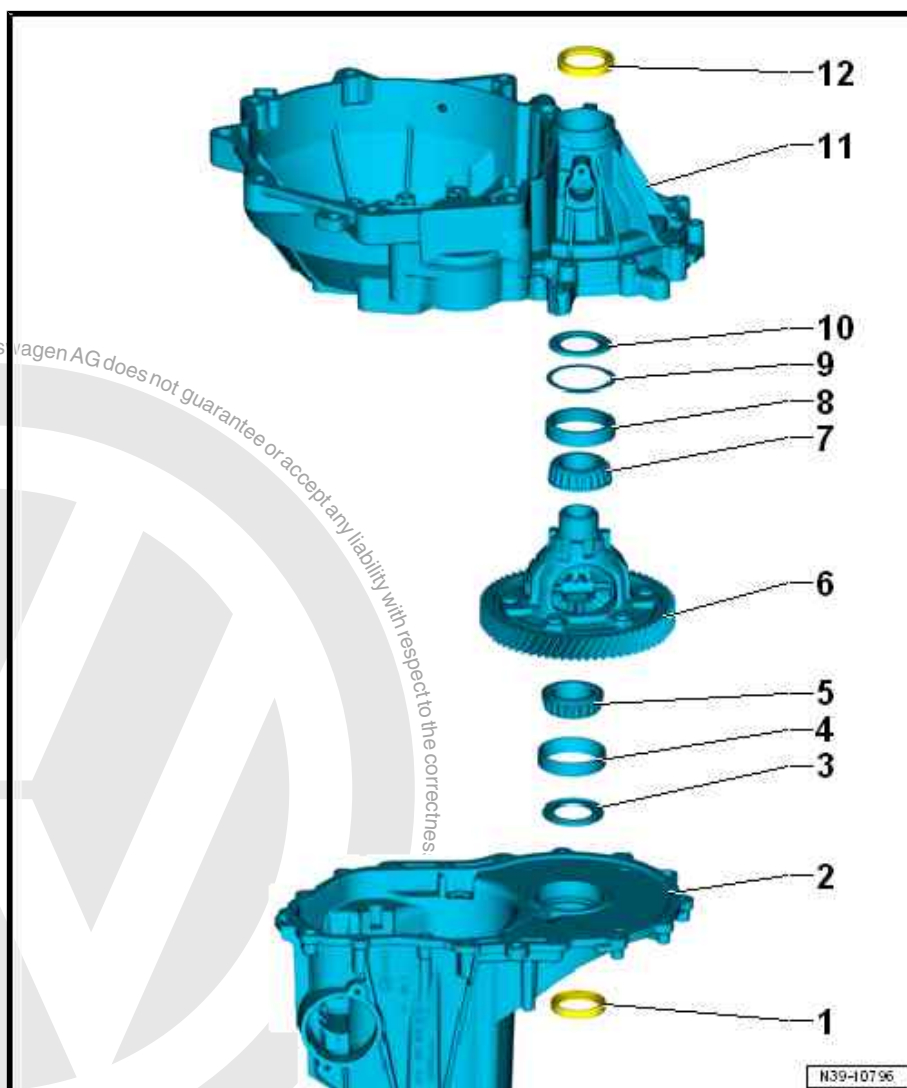
- ☒ Pressing out  
⇒ [page 147](#) .
- ☐ Pressing in ⇒ [page 147](#) .

##### 9 - Shim

- ☐ For differential
- ☐ Determining thickness ⇒ [page 149](#)

##### 10 - Baffle plate

- ☐ Renew after removal
- ☐ Shoulder points away from housing





## 11 - Clutch housing

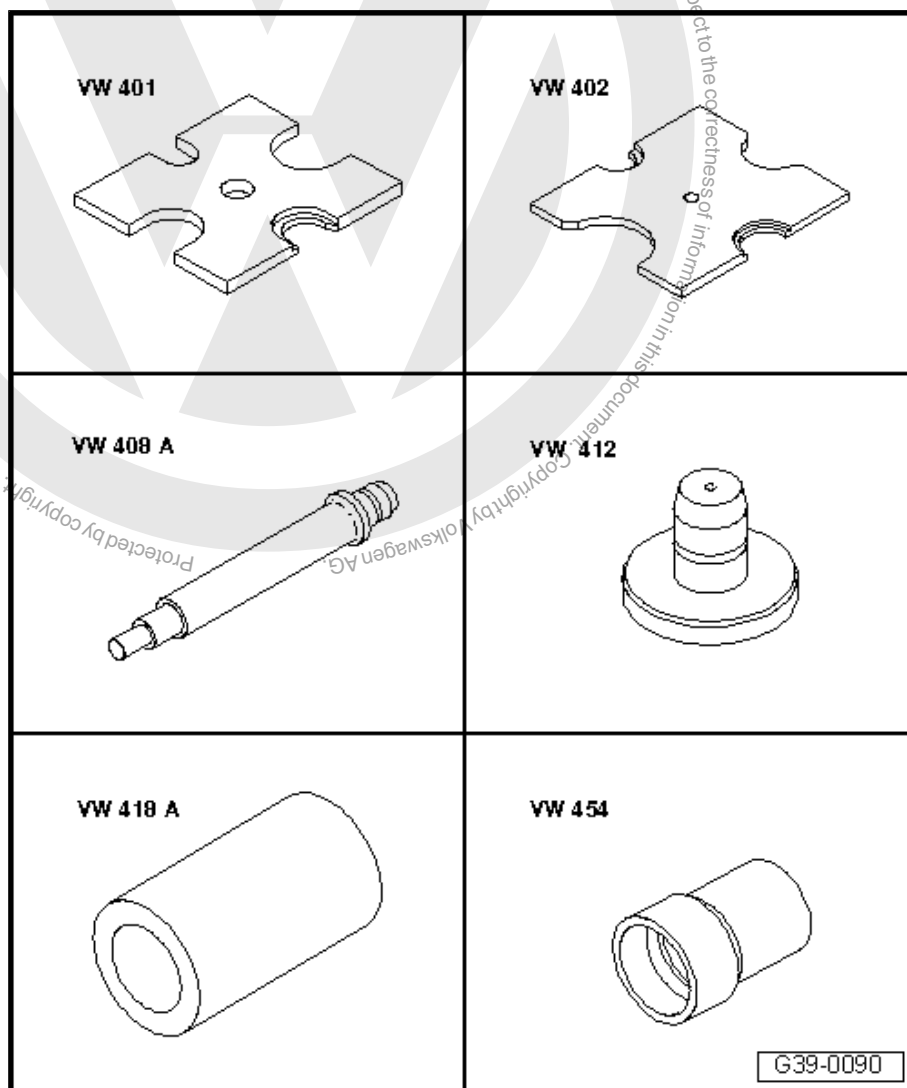
- ➔ ["8 Gearbox housing, clutch housing", page 106](#)

## 12 - Seal for right drive shaft

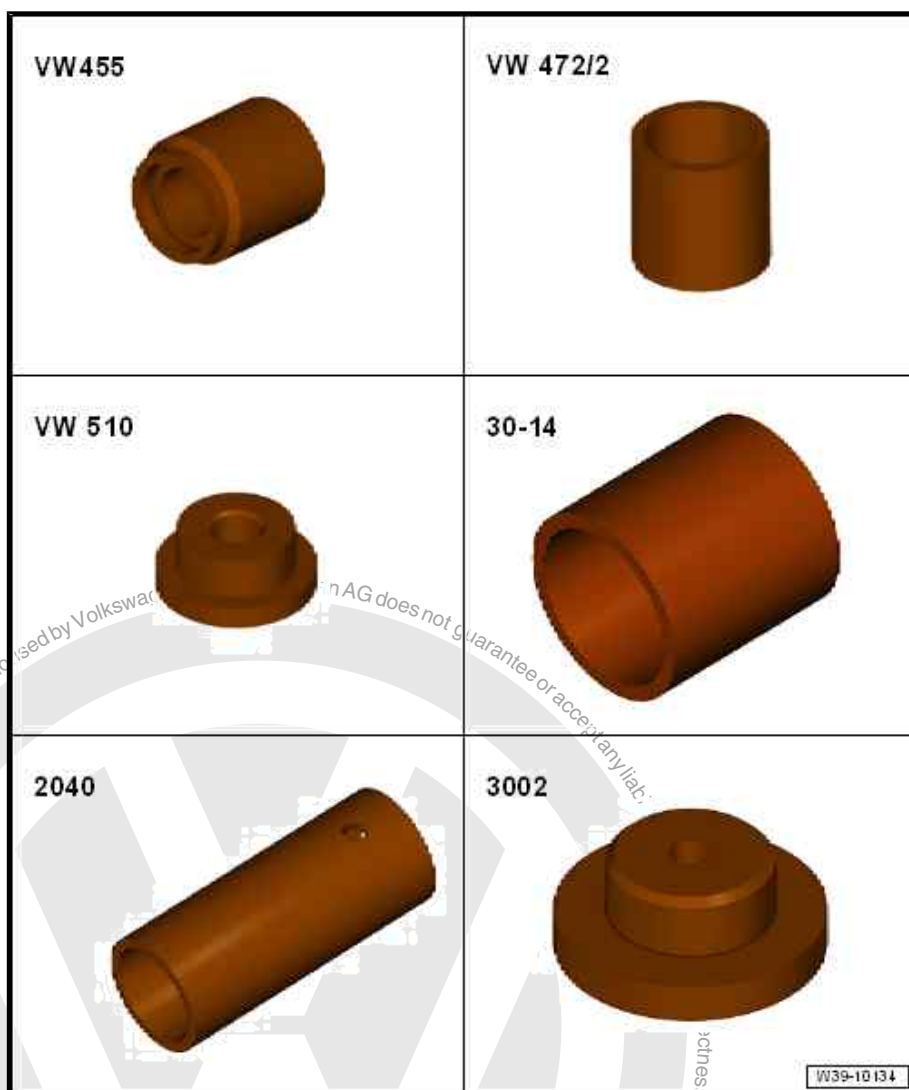
- Renewing with manual gearbox installed ➔ [page 138](#) .

## 2.2 Dismantling and assembling differential

### Special tools and workshop equipment required

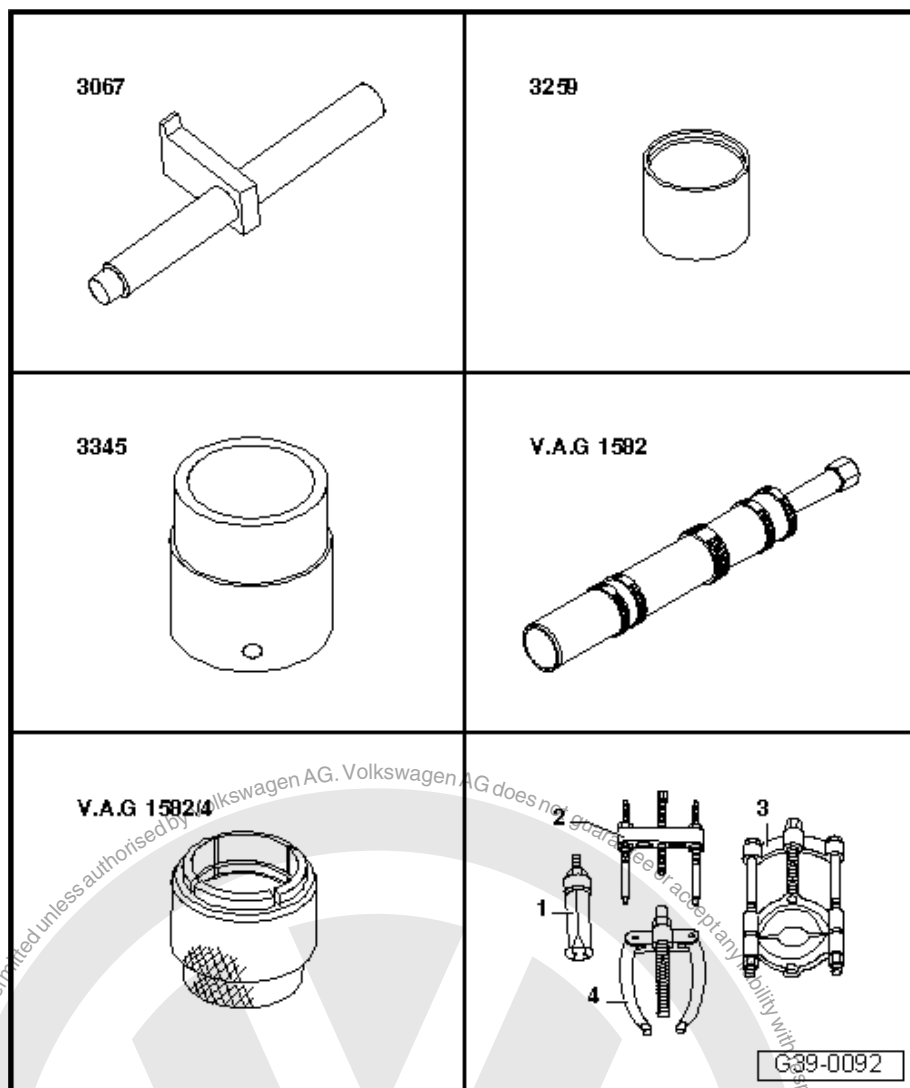


- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 418 A-
- ◆ Thrust piece - VW 454-



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



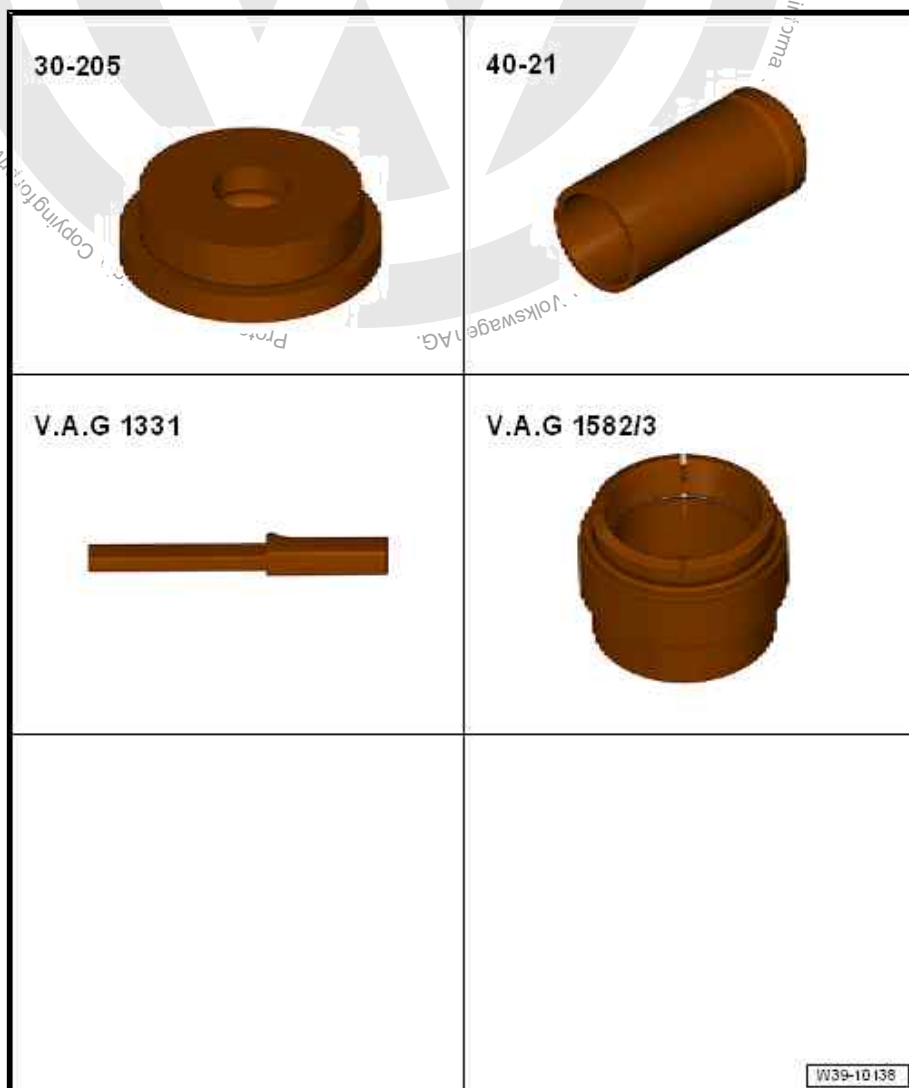


- ◆ Counter-hold tool - 3067-
- ◆ Tube - 3259-
- ◆ Wheel bearing tube - 3345-
- ◆ Tapered roller bearing puller - V.A.G 1582-
- ◆ Grip tool - V.A.G 1582/4-
- ◆ Do not apply: tools 1-4
- ◆ Internal puller - VAS 251 615-, or e.g. internal puller - Kukko 21/7-





- ◆ Counter support - VAS 251 623- or e.g. counter support - Kukko 22/2-



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



## Note

- ◆ Heat tapered roller bearing inner races 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 149](#).

### Pulling outer race for tapered roller bearing out of gearbox housing

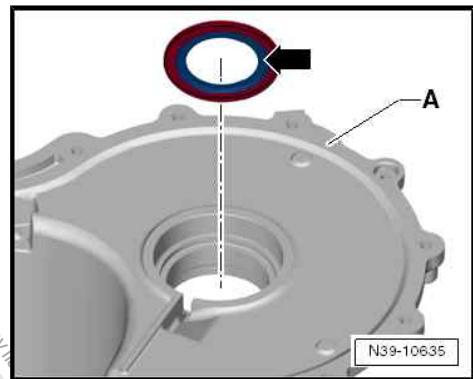
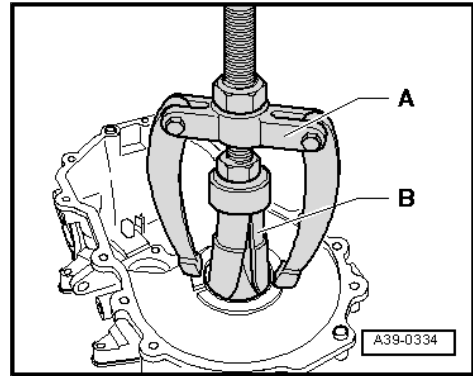
A - Counter support - VAS 251 623- , or e.g. counter support - Kukko 22/2-

B - Internal puller - VAS 251 615- , or e.g. internal puller - Kukko 21/7-

### Manual gearbox 0DQ

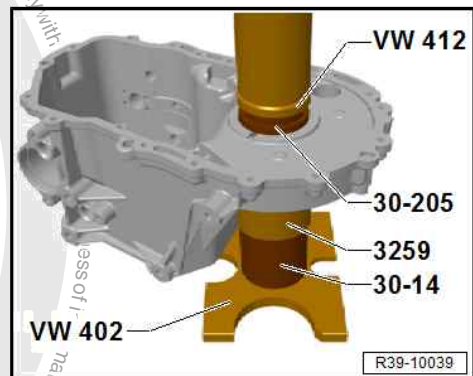
#### Insert new baffle plate

Installation position: shoulder -arrow- faces away from housing  
-A-

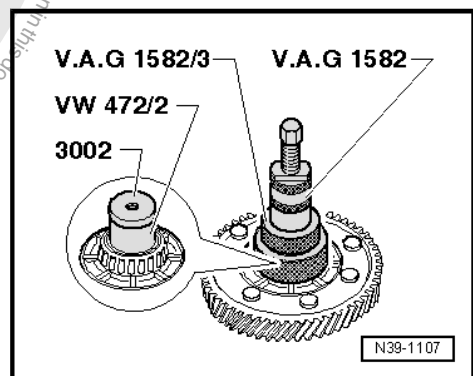


### Pressing tapered roller bearing outer race into gearbox housing

- Support gearbox housing with tube - 3259- directly below bearing support.



### Pulling off tapered roller bearing inner races





## Pressing on tapered roller bearing inner races

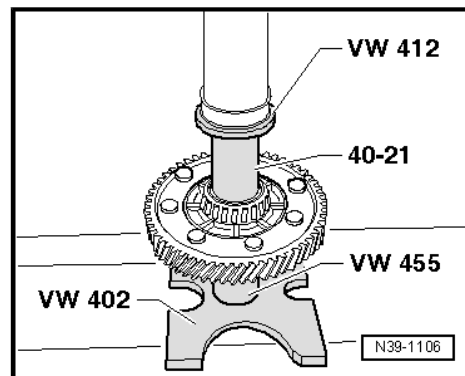


### WARNING

*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- .

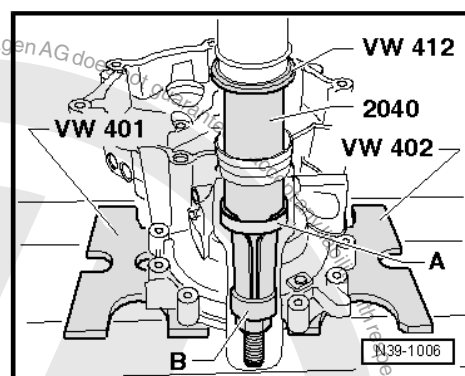
Shoulder of installing sleeve - VW 455- faces towards differential cage.



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

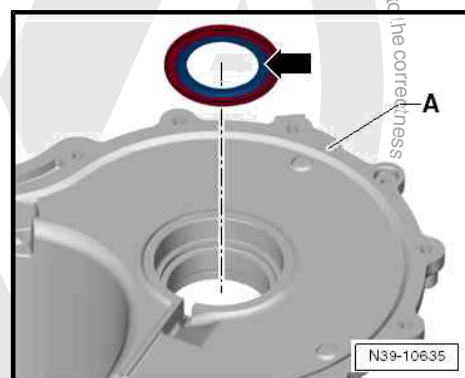
B - Internal puller - VAS 251 615- , or e.g. internal puller - Kukko 21/7-

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



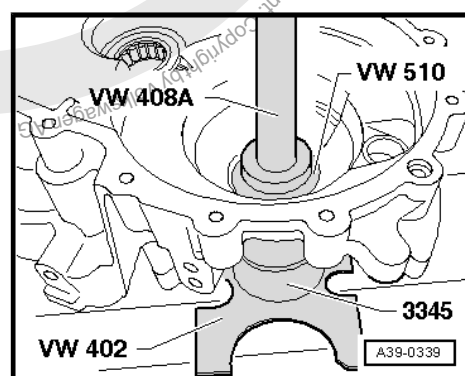
## Insert new baffle plate (shown here in conjunction with gearbox housing)

Installation position: shoulder -arrow- faces away from housing -A-



## Pressing tapered roller bearing outer race into clutch housing

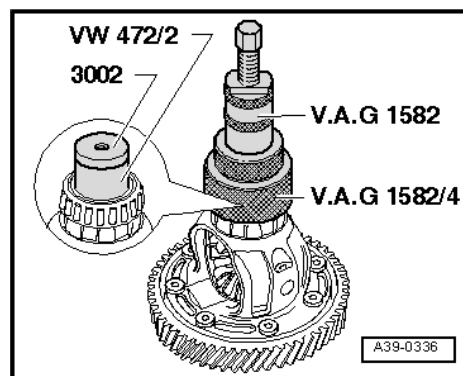
- Set clutch housing directly on pressure plate - VW 402-





### Pulling off tapered roller bearing inner race

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



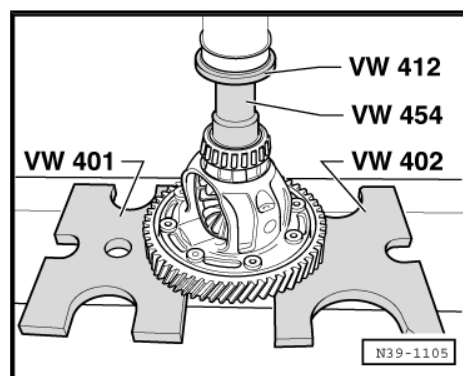
### Pressing on tapered roller bearing inner race



#### WARNING

*Wear protective gloves.*

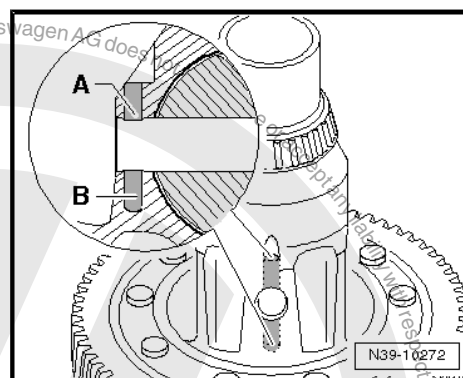
- Heat inner tapered roller bearing race to approx. 100 °C before pressing on.



### Allocation of differential cage for removing and installing spring pin

The hole in the differential cage was modified for the longer spring pin.

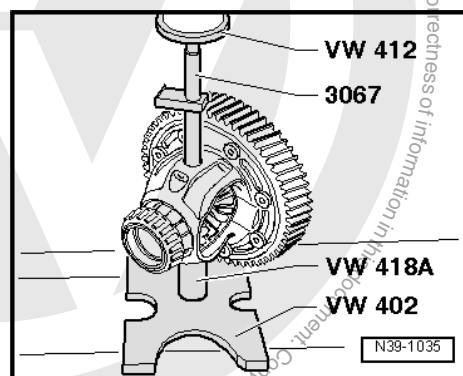
Bore	Length of spring pin (mm)	Clamping sleeve	
-A-	24.0 (short spring pin)	Removing ⇒ <a href="#">page 148</a>	Installing ⇒ <a href="#">page 149</a>
-A- and -B-	36.0 (long spring pin)	Removing ⇒ <a href="#">page 148</a>	Installing ⇒ <a href="#">page 149</a>
Through-hole	36.0 (long spring pin)	Removing ⇒ <a href="#">page 149</a>	Installing ⇒ <a href="#">page 149</a>



### Pressing off differential pinion pin, and shearing off spring pin

When pressed out, spring pin will be sheared off.

- Remove remainder of spring pin from differential cage.





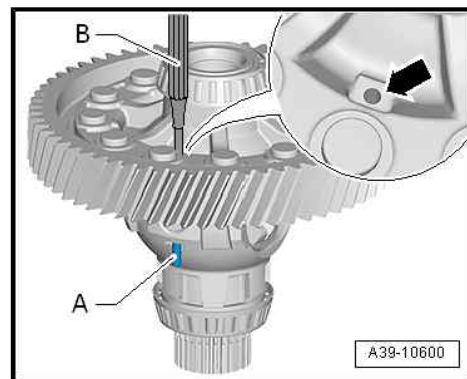
### Removing long spring pin to remove differential pinion pin

- Drive spring pin -A- out of hole -arrow- in differential housing using a 5 mm diameter drift -B-.



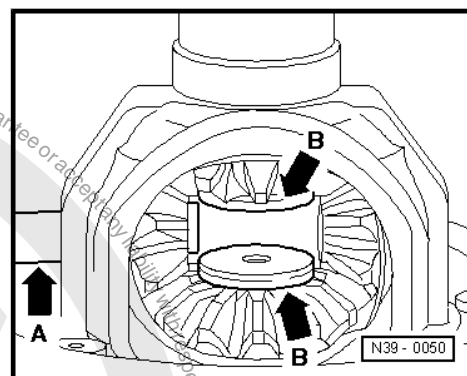
#### Note

If there is no hole -arrow- in the differential cage, shear off the spring pin ⇒ [page 148](#).



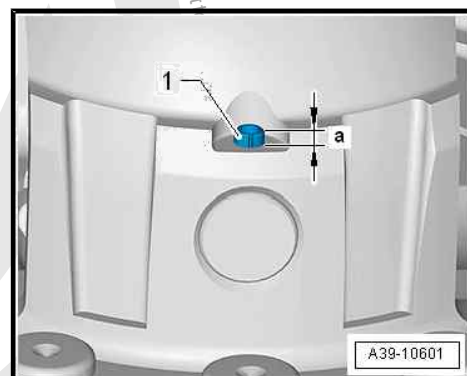
### Installing differential bevel gears

- Lubricate one-piece thrust washer with gear oil and install.
- Install both sun wheels and secure (e.g. with flange shaft).
- Insert both 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.



### Installing spring pin for differential pinion pin

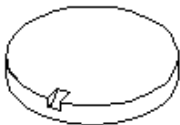
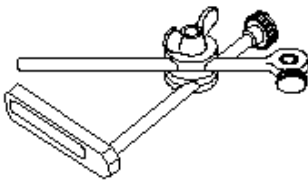
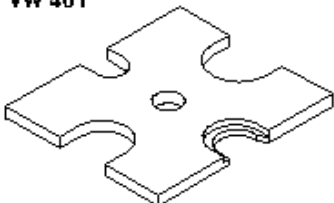
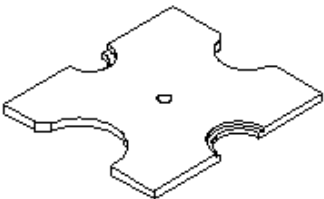
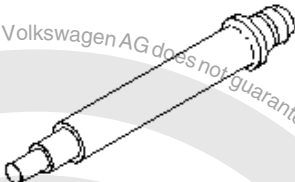
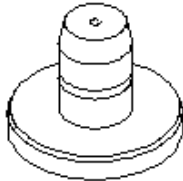
- Align hole in differential pinion pin with hole in differential cage.
- Using a drift, drive in spring pin -1- until a dimension -a- of 2.5 mm is attained.
- Spring pin -1- must not touch clutch housing.



## 2.3 Adjusting differential

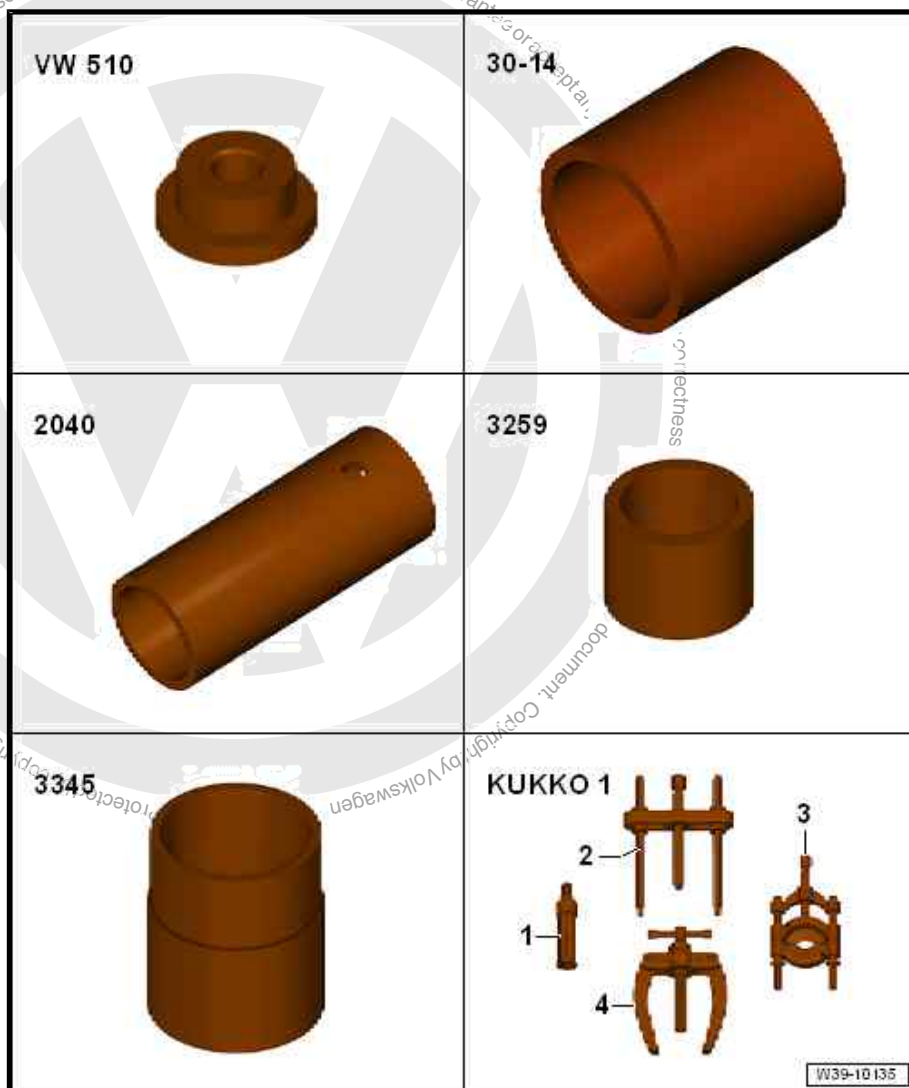


**Special tools and workshop  
equipment required**

<b>VW 385/17</b> 	<b>VW 387</b> 
<b>VW 401</b> 	<b>VW 402</b> 
<b>VW 408 A</b> 	<b>VW 412</b>  <div>G39-0093</div>

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



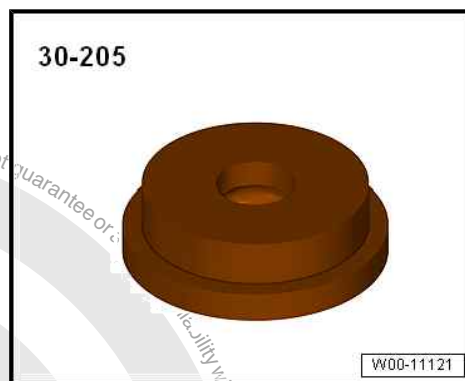


- ◆ Thrust plate - VW 510-
- ◆ Tube - 30 - 14-
- ◆ Tube - 2040-
- ◆ Tube - 3259-
- ◆ Wheel bearing tube - 3345-
- ◆ Do not apply: tools 1-4
- ◆ Internal puller - VAS 251 615- , or e.g. internal puller - Kukko 21/7-





◆ Thrust plate - 30 - 205-



◆ Torque wrench - V.A.G 1331-

◆ Dial gauge - VAS 6080A-

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

◆ Gearbox housing

◆ Clutch housing

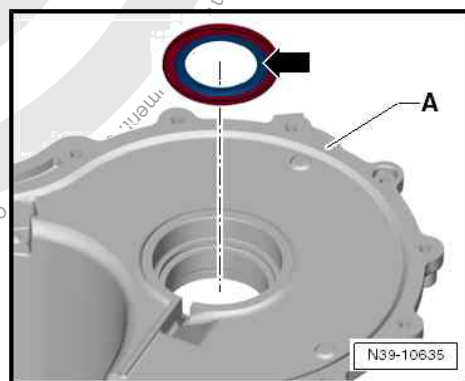
◆ Differential cage

or the

◆ Tapered roller bearing of differential

**Insert new baffle plate**

**Installation position: shoulder -arrow- faces away from housing**  
**-A-**

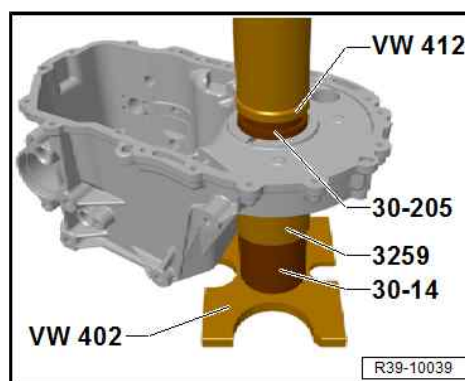


- Pressing tapered roller bearing outer race (gear wheel slide) into gearbox housing.



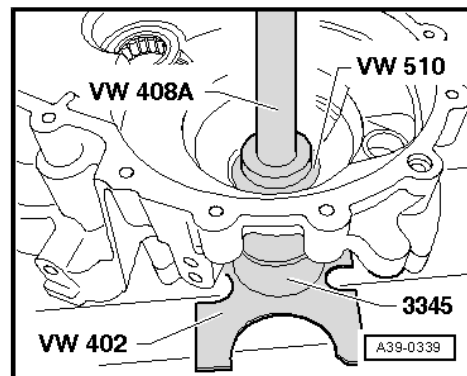
**Note**

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

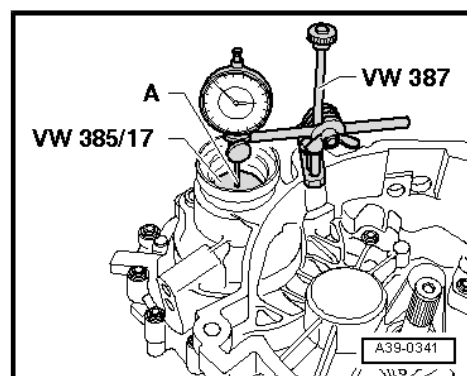




- Press tapered roller bearing outer race (opposite gear-wheel side) without shim into clutch housing; for manual gearbox 0DQ, without baffle plate as well.
- Set clutch housing directly on pressure plate - VW 402-
- Insert differential in gearbox housing.
- Fit clutch housing and tighten the 5 bolts.



- 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 for bearing.
  - Move differential up and down. Read and note play indicated on dial gauge (example: 1.50 mm)



### Determining thickness of shim

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

#### Example:

Measured value	1.50 mm
+ Preload (constant)	0.35 mm
Thickness of shim =	1.85 mm

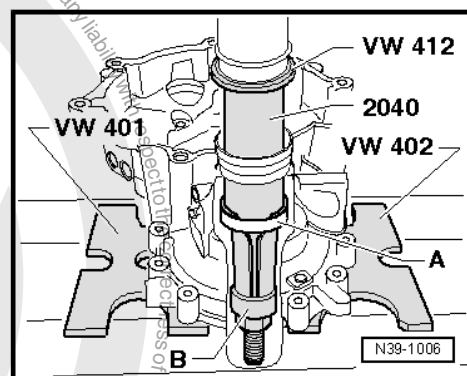
- Remove clutch housing and press out tapered roller bearing outer race -A-.

B - Internal puller - VAS 251 615- , or e.g. internal puller - 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 new baffle plate (shown here in conjunction with gearbox housing)**

**Installation position: shoulder -arrow- faces away from housing -A-**

- Insert correct shim (in example 1.85 mm) and press tapered roller bearing outer race into clutch housing again.
- Bolt clutch housing to gearbox housing.

### Specified torques

- ♦ Gearbox housing to clutch housing ⇒ [page 79](#)

