

Workshop Manual

Audi A3 1997 ➤

5-speed manual gearbox 02K

Edition 01.2008

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List of Workshop Manual Repair Groups

Repair Group

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



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

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00 – Technical data

1 Gearbox identification

5-speed manual gearbox 02K is fitted in conjunction with 4-cylinder engines in the Audi A3 1997 >.

Allocation

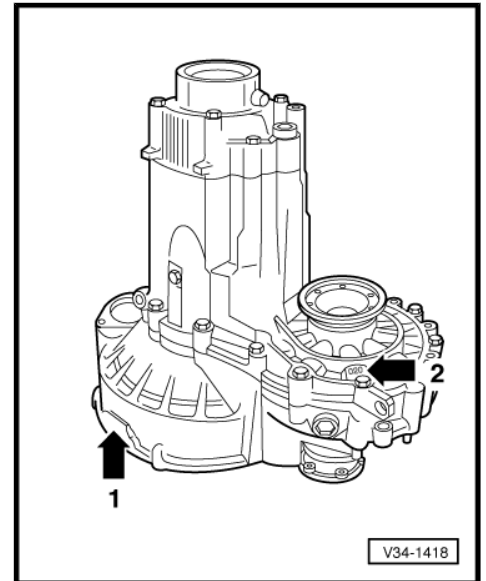
⇒ ["1.3 Code letters, allocation, transmission ratios, capacities", page 2](#).

1.1 Location of identification on gearbox up to 06.99

Code letters and date of manufacture of gearbox are given on the bottom of the clutch housing -arrow 1-

Manual gearbox 02K -arrow 2-

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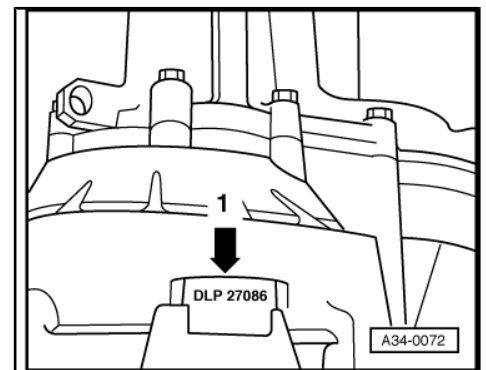
Code letters and date of manufacture of gearbox -arrow 1-

Example:	DLP	27	08	6
	Code letters	Day	Month	Year (1996) of manufacture

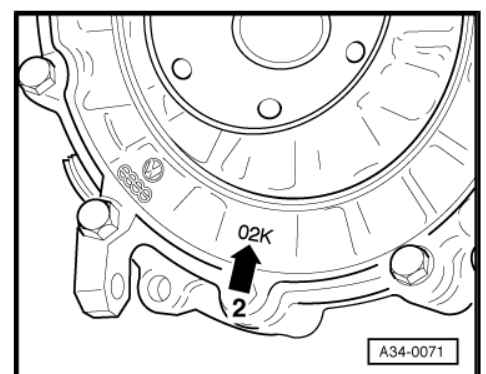
Additional data are production-related.



The gearbox code letters are also given on the vehicle data stickers.



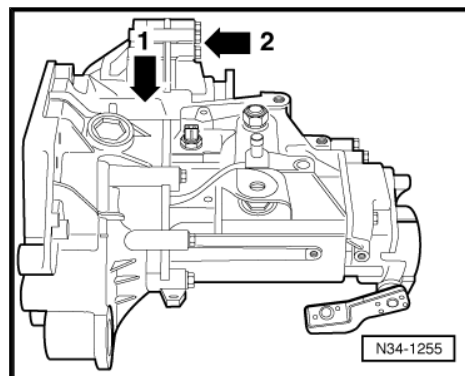
Manual gearbox 02K -arrow 2-



1.2 Location of identification on gearbox from 07.99 onwards

Code letters and date of manufacture of gearbox are given on the top of the clutch housing -arrow 1-

Manual gearbox 02K -arrow 2-



Code letters and date of manufacture of gearbox -arrow 1-

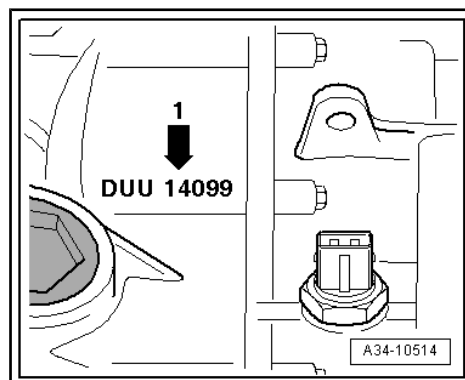
Example:	DUU	14	09	9
	Code letters	Day	Month	Year (1999) of manufacture

Additional data are production-related.

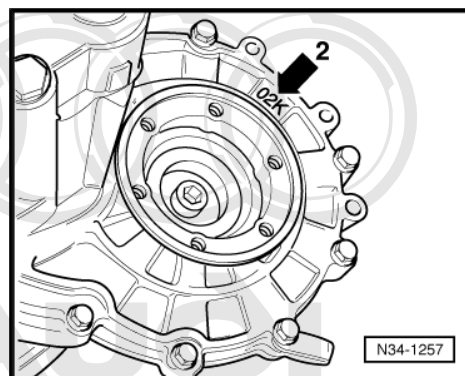


Note

The gearbox code letters are also given on the vehicle data stickers.



Manual gearbox 02K -arrow 2-



1.3 Code letters, allocation, transmission ratios, capacities

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Manual gearbox		5-speed 02K		
Code letters		DLP	DNZ 1)	DUU
Manufactured	from	09.96	09.96	08.98
	to	07.98	07.98	
Allocation	Model	Audi A3 1997 ►	Audi A3 1997 ►	Audi A3 1997 ►
	Engine	1.6 ltr. - 74 kW	1.6 ltr. - 74 kW	1.6 ltr. - 74 kW
Ratio: Z ₂ : Z ₁	Final drive	68 : 16 = 4.250	68 : 16 = 4.250	68 : 16 = 4.250
	1st gear	38 : 11 = 3.455	38 : 11 = 3.455	38 : 11 = 3.455
	2nd gear	35 : 18 = 1.944	35 : 18 = 1.944	35 : 18 = 1.944
	3rd gear	37 : 27 = 1.370	36 : 28 = 1.286	37 : 27 = 1.370
	4th gear	32 : 31 = 1.032	31 : 32 = 0.969	32 : 31 = 1.032
	5th gear	34 : 40 = 0.850	33 : 41 = 0.805	34 : 40 = 0.850

Manual gearbox		5-speed 02K		
Code letters		DLP	DNZ ¹⁾	DUU
	6th gear	-	-	-
	Reverse gear	38 : 12= 3.167	38 : 12= 3.167	38 : 12= 3.167
	Speedometer	15 : 7 = 2.143	15 : 7 = 2.143	15 : 7 = 2.143
Overall ratio i _{ov.} in top gear		3.613	3.421	3.613
Capacity		1.9 litres		
Clutch actuation		Hydraulic		
Drive shaft flange Ø		90 mm		
¹⁾ for France				
• The following data can be found in the ⇒ Electronic parts catalogue .				
◆ Gear oil specification				
◆ Correct type of clutch plate and pressure plate				

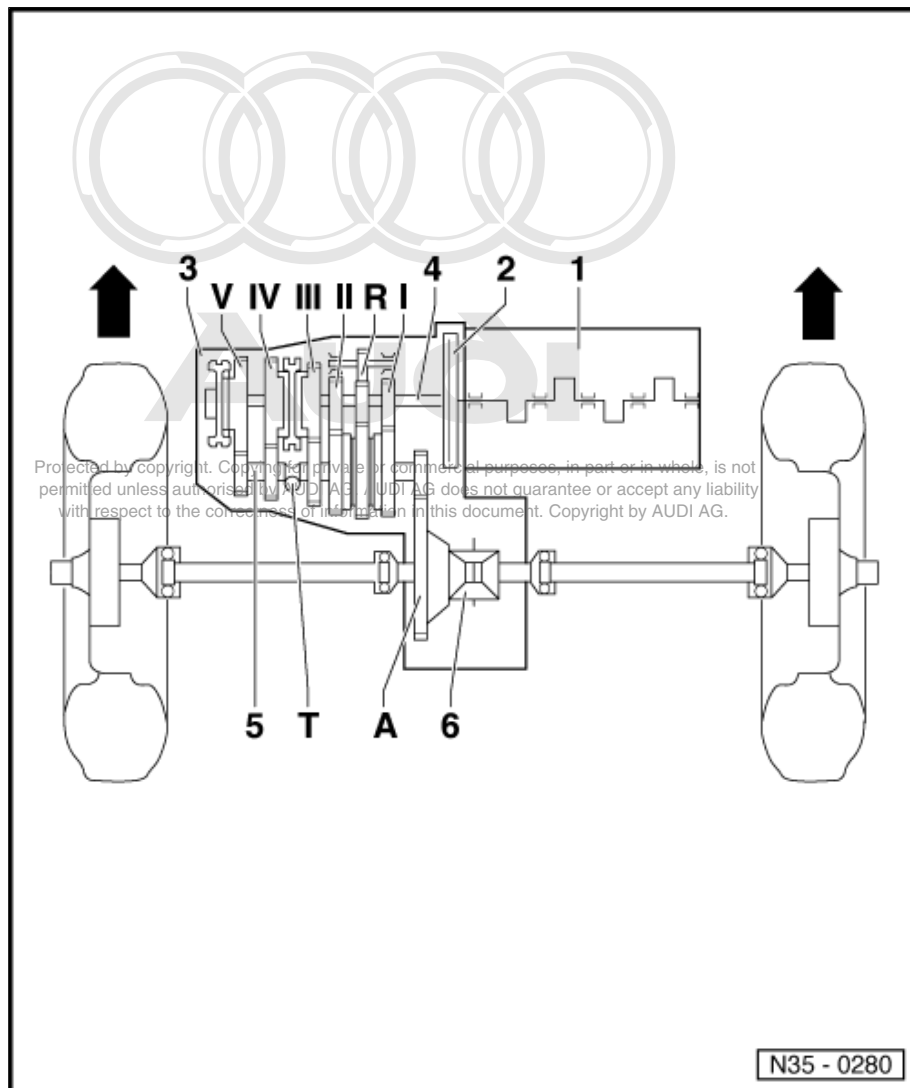
Manual gearbox		5-speed 02K		
Code letters		DUV		
Manufactured	from	11.98		
	to	05.00		
Allocation	Model Engine	Audi A3 1997 ▶ 1.6 ltr. - 74 kW		
Ratio: Z ₂ : Z ₁	Final drive	68 : 16 = 4.250		
	1st gear	38 : 11 = 3.455		
	2nd gear	35 : 18 = 1.944		
	3rd gear	36 : 28 = 1.286		
	4th gear	31 : 32 = 0.969		
	5th gear	33 : 41 = 0.805		
	6th gear	-		
	Reverse gear	38 : 12= 3.167		
	Speedometer	15 : 7 = 2.143		
Overall ratio $i_{ov.}$ in top gear		3.421		
Capacity		1.9 litres		
Clutch actuation		Hydraulic		
Drive shaft flange Ø		90 mm		
• The following data can be found in the ⇒ Electronic parts catalogue .				
◆ Gear oil specification				
◆ Correct type of clutch plate and pressure plate				

2 Transmission layout

Identification

-Arrows- point in direction of travel

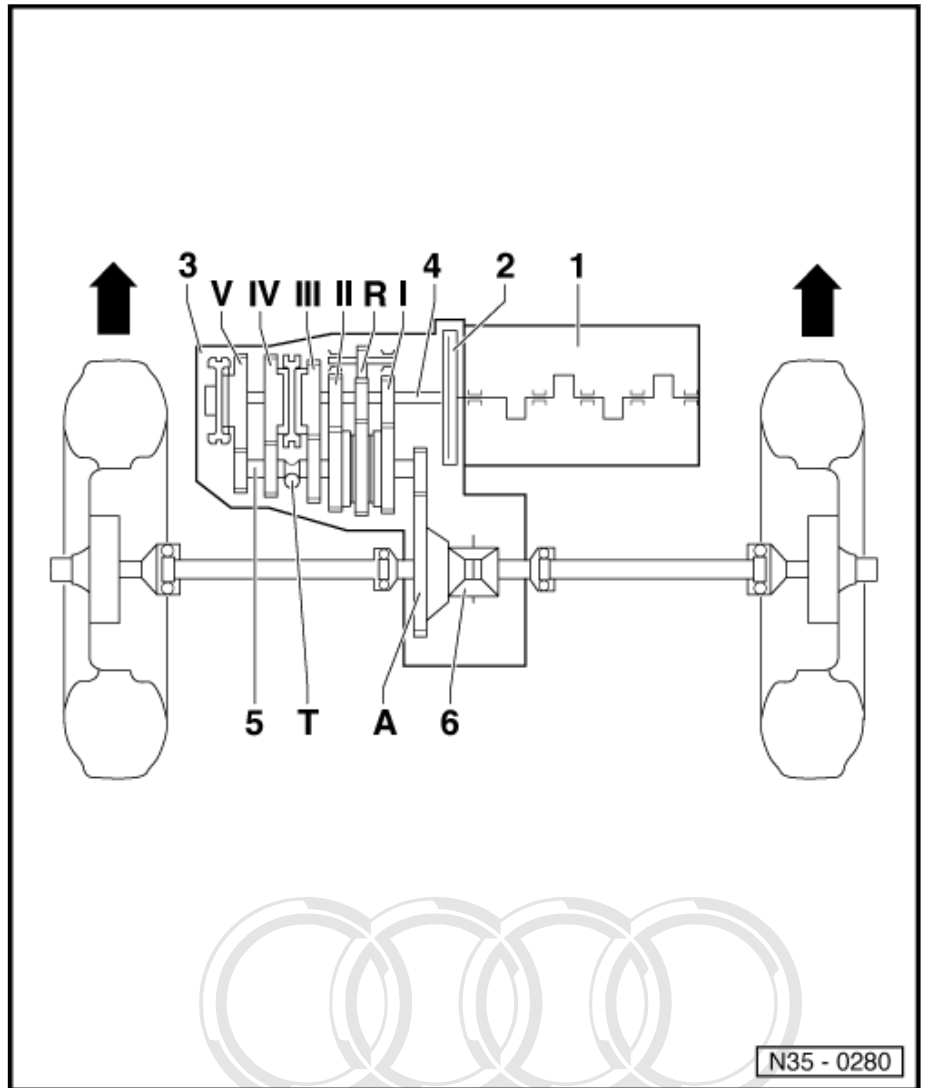
- 1 - Engine
- 2 - Clutch
- 3 - Manual gearbox
- 4 - Input shaft
- 5 - Output shaft / pinion shaft
- 6 - Differential



Ratio

-Arrows- point in direction of travel

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



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3 Calculating ratio "i"

Example:

	5th gear	Final drive
Drive gear	$ZG_1 = 40$	$ZA_1 = 16$
Driven gear	$ZG_2 = 34$	$ZA_2 = 68$

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

$$i_G = \text{gear ratio} = ZG_2 : ZG_1 = 34 : 40 = 0.850$$

$$i_A = \text{axle ratio} = ZA_2 : ZA_1 = 68 : 16 = 4.250$$

i_{ov} = overall ratio

$$i_{ov} = i_G \times i_A = 0.850 \times 4.250 = 3.613$$

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



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4 General repair instructions

Proper tools and the maximum possible care and cleanliness are essential for satisfactory gearbox repairs. The usual basic safety precautions also naturally apply when carrying out repair work.

A number of generally applicable instructions for the various repair procedures - which were previously repeated at numerous places in the Workshop Manual - are summarised here. They apply to the work described in this Manual.

Special tools

For a complete list of special tools used in this Workshop Manual
⇒ Workshop equipment and special tools catalogue .

Gearbox

- ◆ When installing, ensure that the dowel sleeves between the engine and gearbox are correctly located.
- ◆ When installing a new gearbox, check the oil level and fill up with oil if necessary ⇒ [page 69](#) .
- ◆ Capacity ⇒ [page 2](#) .



Note

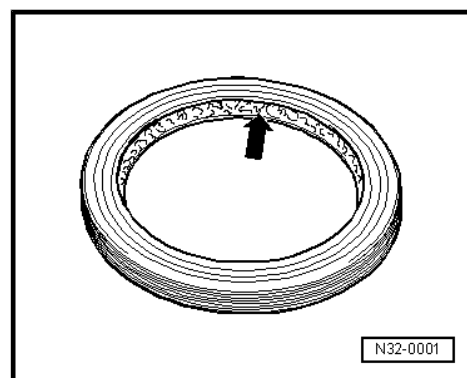
- ◆ If the oil level is topped up with the gearbox installed, check oil level as follows:
- ◆ Fill with oil to bottom lip of filler hole and refit screw plug. Start engine, engage a gear and allow gearbox to turn for approx. 2 minutes. Switch off engine and again top up oil to bottom lip of filler hole.

Sealants

- ◆ Thoroughly clean joint surfaces on gearbox housing etc. before applying sealant .
- ◆ Apply sealant -AMV 188 200 03- evenly and not too thickly.

O-rings, oil seals and gaskets

- ◆ Always renew O-rings, oil seals and gaskets.
- ◆ After removing gaskets and seals, always inspect the contact surface on the housing or shaft for burrs resulting from removal or for other signs of damage.
- ◆ Thoroughly clean housing joint surfaces before assembling.
- ◆ Before installing oil seals, lightly oil the outer circumference of the seal and fill the space between the sealing lips -arrow- about half full with grease -G 052 128 A1- .
- ◆ The open side of the oil seals faces toward the side with fluid filling.
- ◆ When installing a new oil seal, position the seal in the housing so that the sealing lip does not contact the shaft in the same place as the old seal (make use of insertion depth tolerances).
- ◆ Lightly lubricate O-rings before installation to prevent them from being trapped and damaged during assembly.
- ◆ After renewing seals and gaskets, check and, if necessary, top up oil level in gearbox ⇒ [page 69](#) .

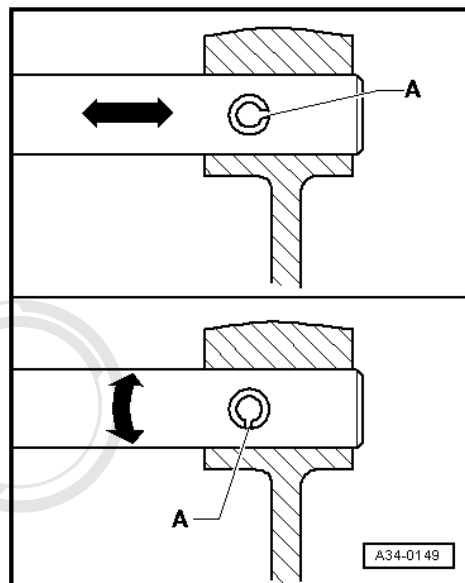


Locking elements

- ◆ Do not over-stretch circlips.
- ◆ Always renew circlips which have been damaged or over-stretched.
- ◆ Circlips must be properly seated in the base of the groove.
- ◆ Renew spring pins. Position: the slit -A- should be in line with the line of force -arrow-.

Nuts, bolts

- ◆ Loosen the nuts and bolts in reverse sequence to the specified tightening sequence.
- ◆ Nuts and bolts which secure covers and housings should be loosened and tightened in diagonal sequence and in stages if no tightening sequence is specified.
- ◆ Especially delicate parts, such as clutch pressure plates, must not be distorted. Loosen and tighten bolts and nuts in stages in diagonal sequence.
- ◆ The tightening torques stated apply to non-oiled nuts and bolts.
- ◆ Always renew self-locking bolts and nuts.
- ◆ Use a wire brush to clean the threads of bolts which are secured with locking fluid. Then apply locking fluid AMV 185 101 A1- to bolt threads before installing.
- ◆ Threaded holes which take self-locking bolts or bolts coated with locking fluid must be cleaned (using a tap or similar). Otherwise there is a danger of the bolts shearing off the next time they are removed. Select correct thread tap when cleaning threaded holes.



Bearings

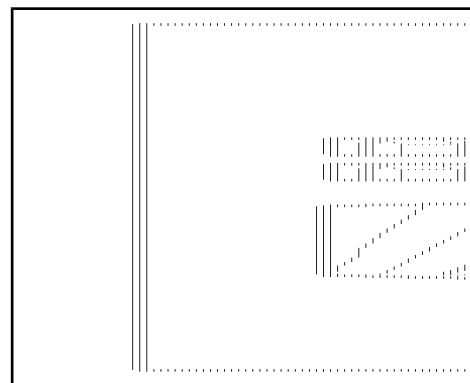
- ◆ Install needle bearings so the lettering (side with thicker metal) faces towards the installing tool.
- ◆ Install new tapered roller bearings as supplied; do not lubricate additionally with oil.
- ◆ Lubricate all bearings (except new tapered roller bearings) with gear oil before installing in gearbox.
- ◆ Always renew the tapered roller bearings on one shaft together and use new bearings from a single manufacturer.
- ◆ Use inductive heater -VAS 6414- to heat inner races to approx. 100°C before installing. Press home onto stop when installing so there is no axial clearance.
- ◆ Do not interchange the outer or inner races of bearings of the same size (the bearings are paired).

Shims

- ◆ Measure shims at several points with a micrometer. Tolerance variations make it possible to obtain the exact shim thickness required.
- ◆ Check for burrs and damage.
- ◆ Install only shims which are in perfect condition.

Synchro-rings

- ◆ Do not interchange. When re-using synchro-rings, always fit to the same gear wheel.
- ◆ Check for wear (gap -a-); renew if necessary.
- ◆ Check grooves on synchro-ring for wear (flattened sections in grooves).
- ◆ Make sure that the coating of coated synchro-rings is not damaged.
- ◆ Check chamfer on selector gear for scoring and visible traces of wear.
- ◆ Lubricate synchro-rings with gear oil before installing.



Gears, synchronising hubs, inner rings for selector gears

- ◆ Before installing, heat inner rings for selector gears to approx. 100° C using inductive heater -VAS 6414- .
- ◆ Use inductive heater -VAS 6414- to heat gear wheels and synchronising hubs to approx. 100°C before installing. Press home onto stop when installing so there is no axial clearance.
- ◆ Note correct installation position.

Selector gears

- ◆ After installing, check 1st to 5th selector gears for minimal axial play and freedom of movement.

Clutch actuation

- ◆ When removing gearbox, remove clutch slave cylinder without disconnecting pipes.
- ◆ Do not depress the clutch pedal after removing the slave cylinder if the hydraulic pipe is still connected. Otherwise the piston will be pressed out of the slave cylinder.
- ◆ Ensure that the pressure plate is kept straight: loosen and tighten bolts in a diagonal sequence and in several gradual stages.
- ◆ If the clutch pedal does not return to its initial position after releasing it (clutch pedal in rest position), you must bleed the clutch system (further measures [⇒ "1.1 Checking hydraulic clutch mechanism", page 11](#)).
- ◆ If the clutch has burnt out, thoroughly clean the bell housing, flywheel and parts of the engine facing the gearbox in order to prevent odours.



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30 – Clutch

1 Servicing clutch mechanism

I - Exploded view - pedal cluster

⇒ [“1.1 Checking hydraulic clutch mechanism”, page 11](#)

⇒ [“1.2 Exploded view - pedal cluster”, page 12](#)

⇒ [“1.3 Removing and installing clutch pedal switch F36 \(square housing\)”, page 13](#)

⇒ [“1.4 Removing and installing clutch pedal switch F36 \(round housing\)”, page 14](#)

⇒ [“1.5 Removing and installing over-centre spring \(LHD vehicles\)”, page 14](#)

⇒ [“1.6 Removing and installing over-centre spring \(RHD vehicles\)”, page 15](#)

⇒ [“1.7 Removing and installing clutch pedal \(LHD vehicles\)”, page 16](#)

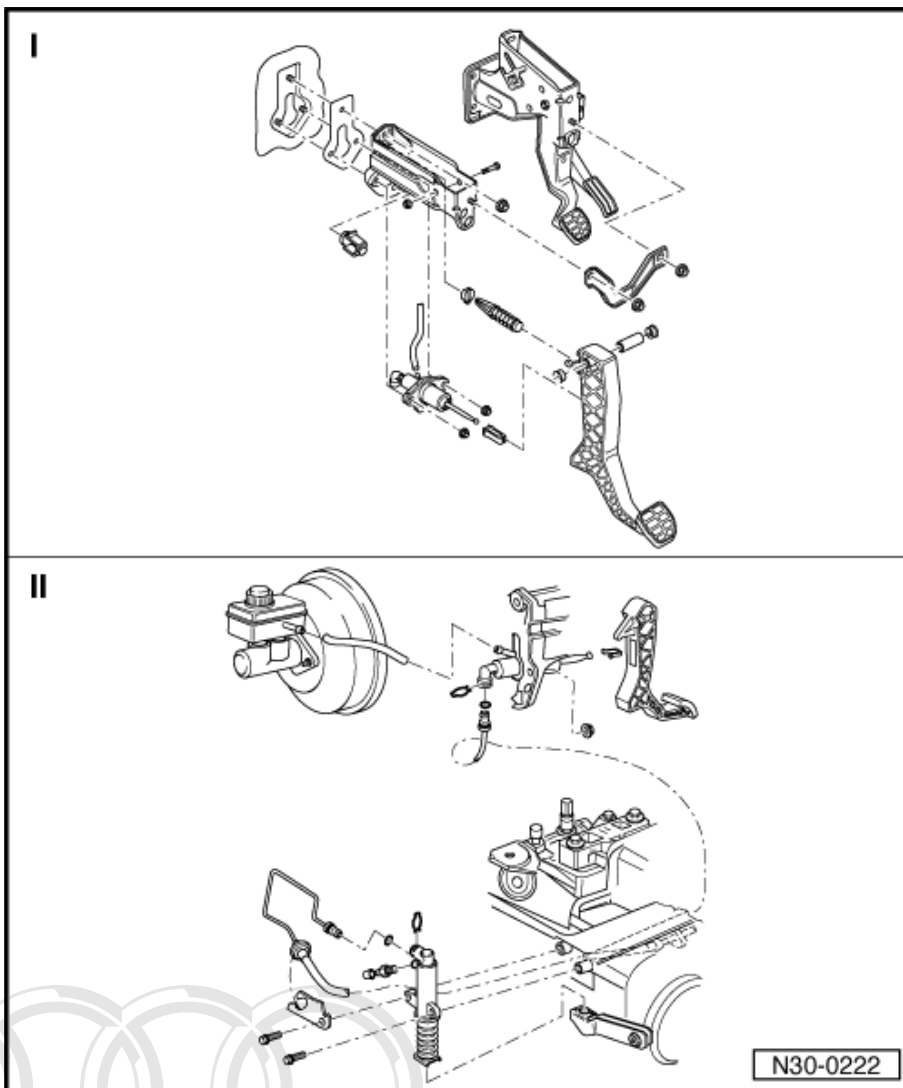
II - Exploded view - hydraulic system

⇒ [“1.8 Exploded view - hydraulic system”, page 17](#)

⇒ [“1.9 Removing and installing master cylinder”, page 18](#)

⇒ [“1.10 Removing and installing slave cylinder”, page 21](#)

⇒ [“1.11 Bleeding clutch system”, page 22](#)



Note

- ◆ *Before renewing the master or slave cylinder on the assumption that it is defective you must first check the clutch mechanism*
⇒ [page 11](#).

- ◆ *Disconnect battery earth strap.*
- ◆ *Note radio coding for vehicles with coded radio.*

- ◆ *Apply polycarbamide grease -G 052 142 A2- to all bearings and contact surfaces.*

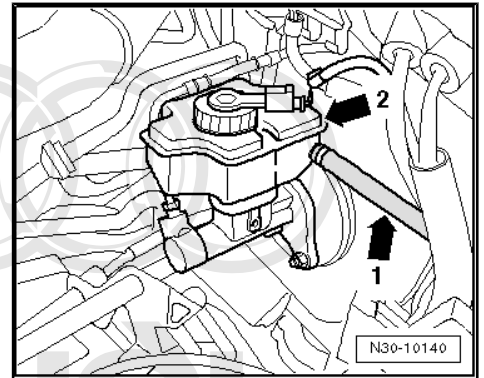
- ◆ *Make sure that no brake fluid escapes into the footwell, the plenum chamber or onto the gearbox below. If this does happen, clean the affected area thoroughly.*
- ◆ *When performing work in the footwell, put cloths on the carpet to protect it from possible brake fluid spills.*
- ◆ *Before working on pedal cluster, remove driver's storage compartment ➔ Rep. Gr. 68.*

1.1 Checking hydraulic clutch mechanism

- Make sure the pedal returns to its initial position and is not obstructed by additional floor mats or mats that have slipped out of position.
- Bleed the clutch system if necessary.
- First check brake fluid level in brake fluid reservoir.

Note

- ◆ *The clutch hydraulics are connected to one of the chambers -arrow 2- of the brake fluid reservoir via the supply hose -arrow 1-.*
- ◆ *If this chamber is empty or contains too little brake fluid, the system may be leaking.*
- Then check the following components of the hydraulic clutch mechanism for external leaks:
 - ◆ Supply hose between brake fluid reservoir and master cylinder
 - ◆ Master cylinder
 - ◆ Pipe/hose assembly between master cylinder and slave cylinder
 - ◆ Connections (plug-in connectors and threaded connections), including hidden connections
 - ◆ Slave cylinder

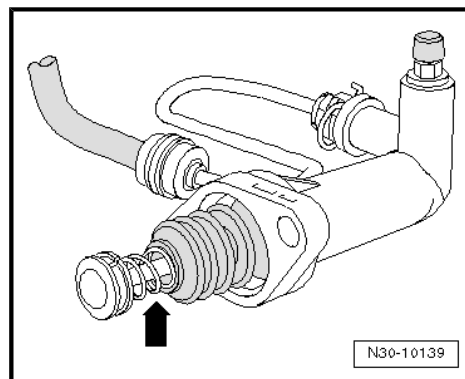


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Note

- ◆ *External leaks can be detected, for instance, by traces of brake fluid on or below the gearbox as well as on the noise insulation panel below the gearbox.*
- ◆ *Check correct routing of pipe/hose assembly between master cylinder and slave cylinder. The pipe/hose assembly must not be kinked or become trapped.*
- Then depress clutch pedal carefully; hold pedal in five different positions for approx. 20 seconds at each position over its full travel. Have a second person check the components of the hydraulic clutch mechanism ➔ [page 11](#) for visible leaks. At the same time the first person should check whether the clutch pedal yields under the foot at any of the held positions.

- Finally, detach slave cylinder from gearbox (do not open pipe connections) and check sleeve for traces of escaped brake fluid.
- Detach sleeve from plunger -arrow- to check for leaks.



1.2 Exploded view - pedal cluster

1 - Bulkhead

- ☐ With mounting for mounting bracket and master cylinder

2 - Gasket

- ☐ Always renew

3 - Mounting bracket

- ☐ For mounting clutch pedal

4 - Bolt

5 - Mounting bracket

- ☐ For mounting accelerator pedal and brake pedal

6 - Nut

- ☐ 25 Nm
- ☐ Self-locking
- ☐ Always renew

7 - Connecting plate

8 - Nut

- ☐ 25 Nm
- ☐ Self-locking
- ☐ Always renew

9 - Spacer bushes

10 - Bearing bush

11 - Clutch pedal

- ☐ Removing and installing ⇒ [page 16](#)

12 - Retaining clip

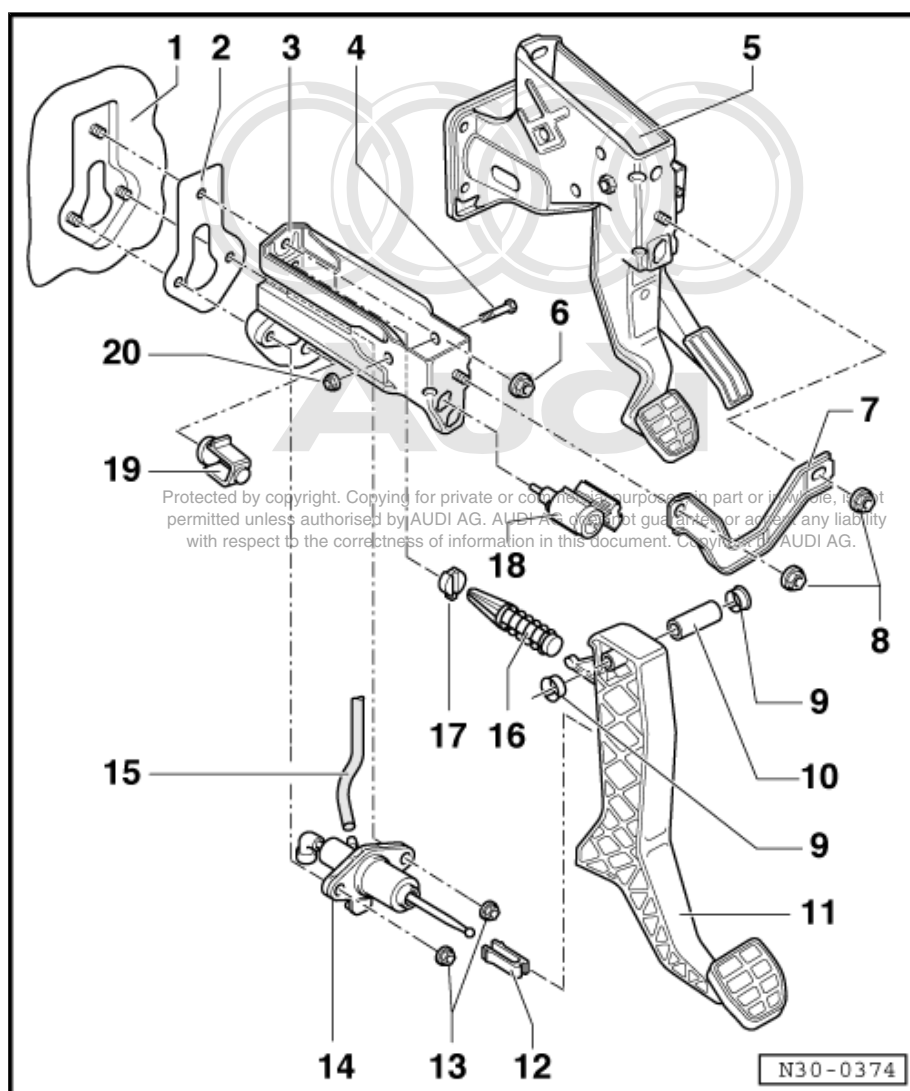
- ☐ Removing and installing ⇒ [Item 4 \(page 17\)](#)

13 - Nut

- ☐ 25 Nm
- ☐ Self-locking
- ☐ Always renew

14 - Master cylinder

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



15 - Supply hose

16 - Over-centre spring

- ☐ Removing and installing (LHD vehicles) ⇒ [page 14](#)
- ☐ Removing and installing (RHD vehicles) ⇒ [page 15](#)

17 - Over-centre spring mounting

- ☐ Install in mounting bracket
- ☐ When renewing, remove and install master cylinder ⇒ [page 18](#)

18 - Clutch pedal switch -F36-

- ☐ ⇒ ["1.3 Removing and installing clutch pedal switch F36 \(square housing\)", page 13](#)
- ☐ ⇒ ["1.4 Removing and installing clutch pedal switch F36 \(round housing\)", page 14](#)

19 - Stop

- ☐ For clutch pedal
- ☐ Installation position ⇒ [page 20](#)

20 - Nut

- ☐ 25 Nm
- ☐ Self-locking
- ☐ Always renew

1.3 Removing and installing clutch pedal switch -F36- (square housing)

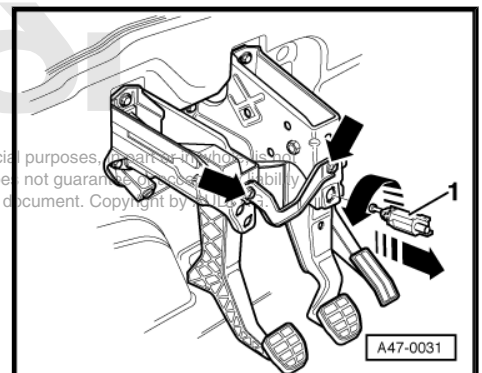


Note

To ensure a secure fit, the switch may only be fitted once.

Removing

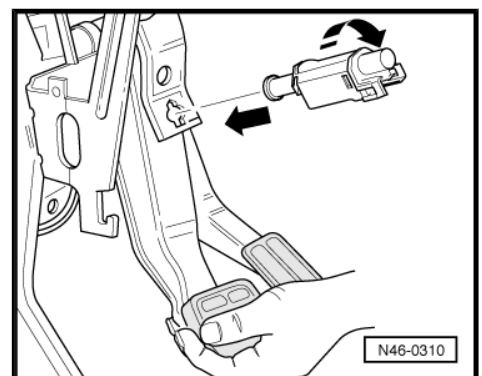
- Remove storage compartment on driver's side ⇒ General body repairs, interior; Rep. Gr. 68 .
- Unplug electrical connector from clutch pedal switch.
- Remove clutch pedal switch -1- by turning 90° anti-clockwise.



Installing

Installation is carried out in reverse sequence; note the following:

- Pull plunger of clutch pedal switch all the way out.
- Push clutch pedal down by hand.
- Insert switch in mounting hole and secure by turning clockwise through 90° -arrows-.
- Release clutch pedal
- Attach electrical connector to clutch pedal switch.
- Install storage compartment on driver's side ⇒ General body repairs, interior; Rep. Gr. 68 .



1.4 Removing and installing clutch pedal switch -F36- (round housing)



Note

Clutch pedal switch may only be fitted once so as to ensure a firm fit.

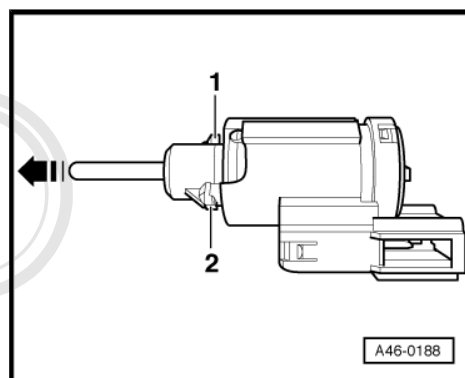
Removing

- Remove storage compartment on driver's side ⇒ General body repairs, interior; Rep. Gr. 68 .
- Unplug electrical connector from clutch pedal switch.
- Remove clutch pedal switch by turning anti-clockwise through 45°.

Installing

Installation is carried out in reverse sequence; note the following:

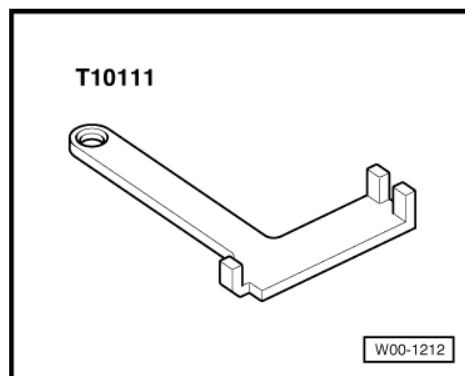
- Pull out plunger -arrow- all the way before installing clutch pedal switch.
- Insert retainer tabs -1- and -2- of switch in recesses provided in mounting hole and secure by turning clockwise through 45°.
- The clutch pedal should be in the normal position (i.e. not pressed down).
- Do not press brake pedal when installing.
- Plunger is adjusted automatically when clutch pedal switch is installed.
- Attach electrical connector to clutch pedal switch.
- Install storage compartment on driver's side ⇒ General body repairs, interior; Rep. Gr. 68



1.5 Removing and installing over-centre spring (LHD vehicles)

Special tools and workshop equipment required

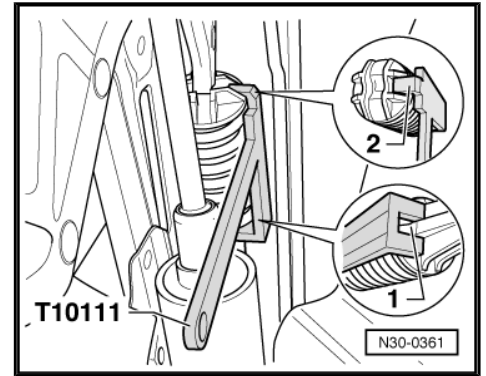
- ◆ Assembly clip -T10111-



Removing

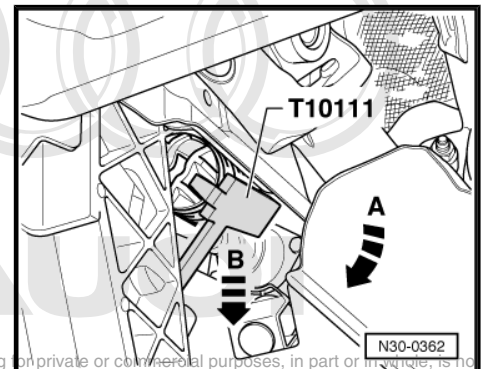
- Remove driver's storage compartment (bottom) ⇒ Rep. Gr. 68 .

- Fit assembly clip -T10111- from the right onto over-centre spring.
- Ensure that the assembly clip is correctly seated:
 - 1 - The rear part of assembly clip must be positioned on the over-centre spring so that the claws fit exactly over the rib -1-.
 - 2 - Lightly depress clutch pedal towards bulkhead.
- Engage the lug -2- of the assembly clip into the cut-out on the over-centre spring.
- Now depress the clutch pedal towards the bulkhead until the over-centre spring can be removed from below from the mountings on the mounting bracket and clutch pedal.
- Return clutch pedal to normal position.
- Turn over-centre spring together with assembly clip -T10111- in direction of -arrow A- and take out downwards in direction of -arrow B-.

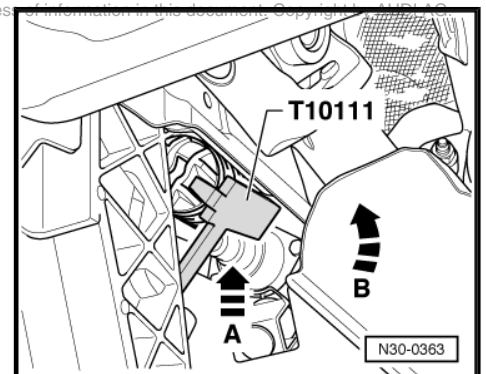


Installing

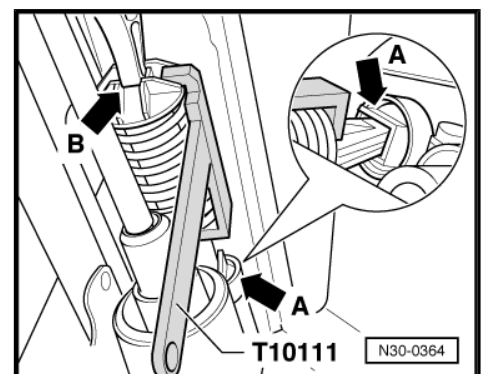
- Pull clutch pedal into the passenger compartment.



- Insert over-centre spring together with assembly clip -T10111- upwards (in direction of -arrow A-) into mounting bracket and then turn in direction of -arrow B-.



- Insert over-centre spring into rear mounting first -arrow A-.
- Operate clutch pedal until over-centre spring seats on mounting lug -arrow B- on clutch pedal.
- Return clutch pedal to normal position and remove assembly clip.
- Install driver's storage compartment (bottom) ⇒ Rep. Gr. 68 .



1.6 Removing and installing over-centre spring (RHD vehicles)

Removing

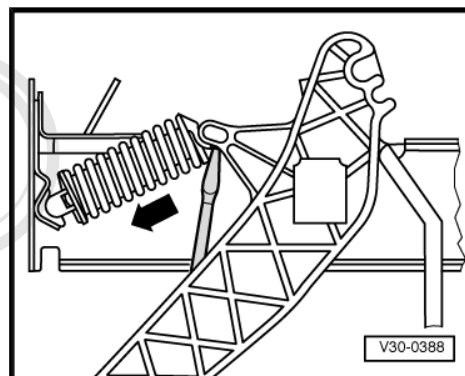
- Remove driver's storage compartment (bottom) ⇒ Rep. Gr. 68 .

- Insert a screwdriver between clutch pedal and over-centre spring.
- Operate clutch pedal and pry over-centre spring off pedal in direction of arrow.

Installing

Installation is carried out in reverse sequence; note the following:

- Operate clutch pedal.
- Insert over-centre spring in over-centre spring mounting and press into position on locating lug on clutch pedal.

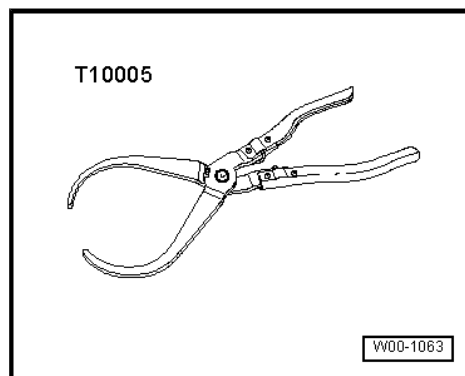


1.7 Removing and installing clutch pedal (LHD vehicles)

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Special tools and workshop equipment required

- ◆ Pliers -T10005-

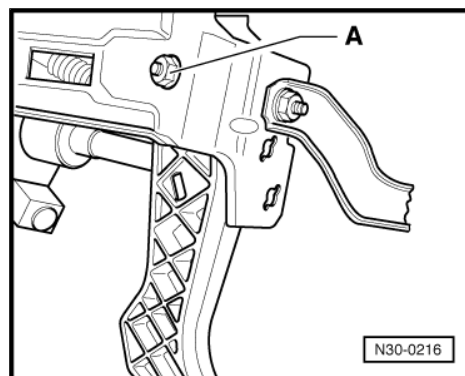


Removing

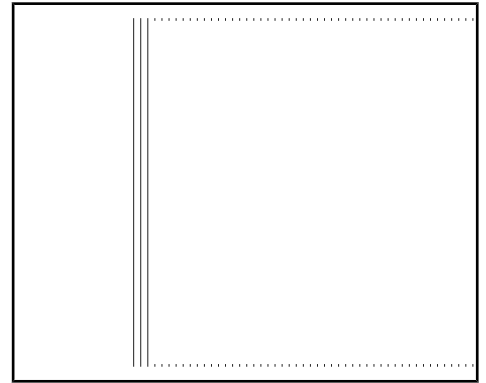
- If fitted, remove clutch pedal switch -F36-
⇒ [“1.3 Removing and installing clutch pedal switch F36 \(square housing\)”, page 13](#) or
⇒ [“1.4 Removing and installing clutch pedal switch F36 \(round housing\)”, page 14](#) .
- Remove over-centre spring ⇒ [page 14](#) or ⇒ [page 15](#) .
- Separate clutch pedal from master cylinder ⇒ [page 20](#) and push operating rod towards engine compartment as far as stop.
- Remove nut -A-.
- Pull out bolt until clutch pedal can be removed.

Installing

Installation is carried out in reverse sequence; note the following:



- The retaining clip -A- must be fitted to the master cylinder operating rod -B-.
- Press clutch pedal in -direction of arrow- until it engages. Ensure that it is properly locked.
- Install over-centre spring ⇒ [page 14](#) or ⇒ [page 15](#) .
- If fitted, install clutch pedal switch -F36- in mounting hole ⇒ ["1.3 Removing and installing clutch pedal switch F36 \(square housing\)", page 13](#) or ⇒ ["1.4 Removing and installing clutch pedal switch F36 \(round housing\)", page 14](#) .



1.8 Exploded view - hydraulic system

1 - Brake fluid reservoir

2 - Supply hose

3 - Master cylinder

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

4 - Retaining clip

- ☐ Renew only when master cylinder has been removed
- ☐ Removing ⇒ [page 18](#)
- ☐ Pressing on
⇒ [page 18](#)

5 - Clutch pedal

- ☐ Removing and installing
⇒ [page 16](#)

6 - Nut

- ☐ 25 Nm
- ☐ Self-locking
- ☐ Always renew

7 - Bracket

- ☐ Secured on body

8 - Release shaft

- ☐ Removing and installing
⇒ [page 104](#)

9 - Slave cylinder

- ☐ Removing and installing
⇒ [page 21](#)

10 - Flange bolt

- ☐ 25 Nm

11 - Retainer

12 - Pipe/hose assembly

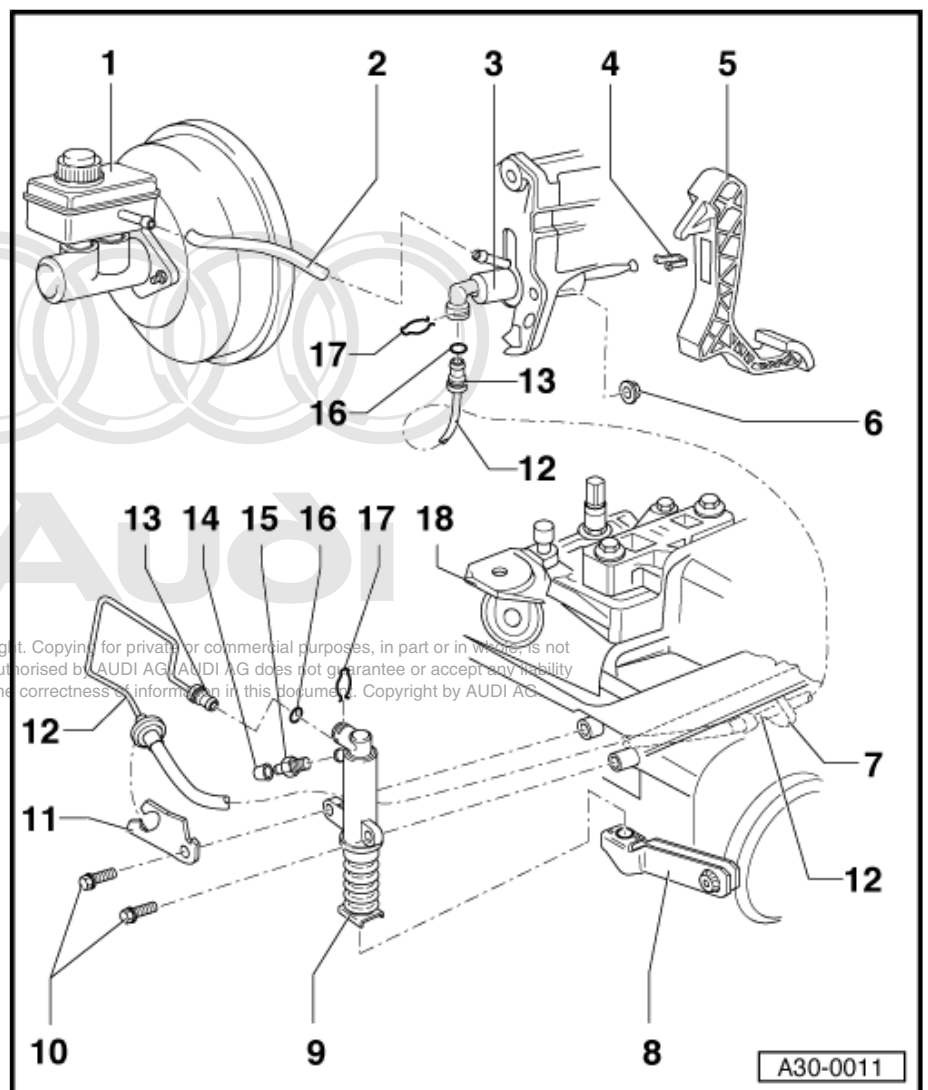
- ☐ Allocate according to ⇒ Electronic parts catalogue

13 - Pipe connection (plug-in type)

14 - Dust cap

15 - Bleeder valve

- ☐ Bleeding clutch system ⇒ [page 22](#)



16 - O-ring

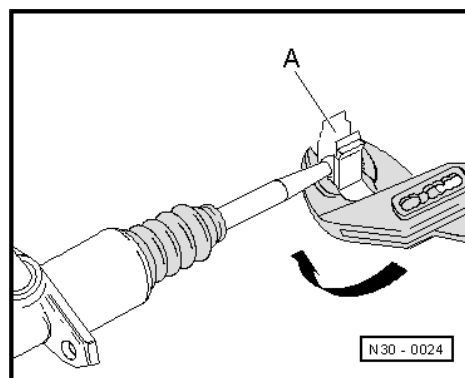
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing

17 - Clip

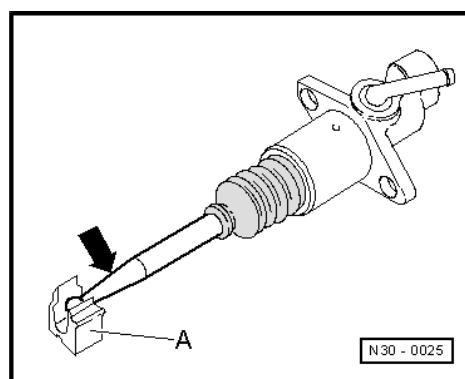
- ☐ Pull out retaining clip to disconnect pipe

18 - Gearbox

Levering retaining clip -A- off in direction of -arrow-

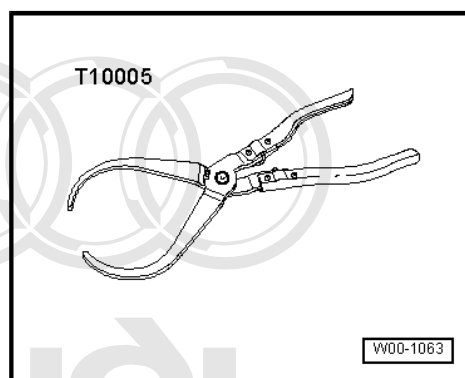


Pressing master cylinder operating rod into retaining clip -A- in -direction of arrow-

**1.9 Removing and installing master cylinder**

Special tools and workshop equipment required

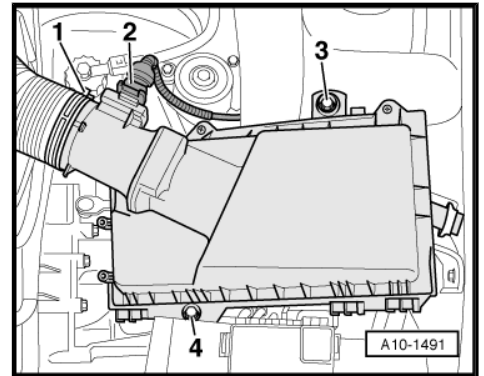
- ◆ Pliers -T10005-



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Removing

- Detach air hose -1- and connector -2- at air mass meter -G70- .
- Remove bolts -3- and -4- and detach air cleaner housing ⇒ Repair group 24 .



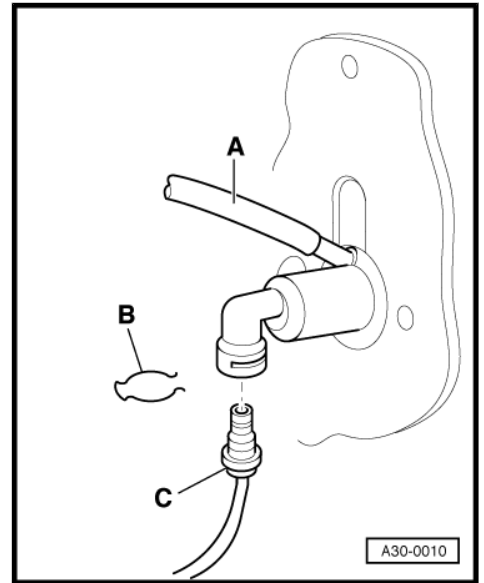
- Clamp off supply hose -A- coming from brake fluid reservoir using hose clamp -3094- .
- Disconnect supply hose -A- at master cylinder.
- Remove retaining clip -B- from master cylinder.
- Pull pipe/hose assembly -C- out of master cylinder and seal end of pipe.



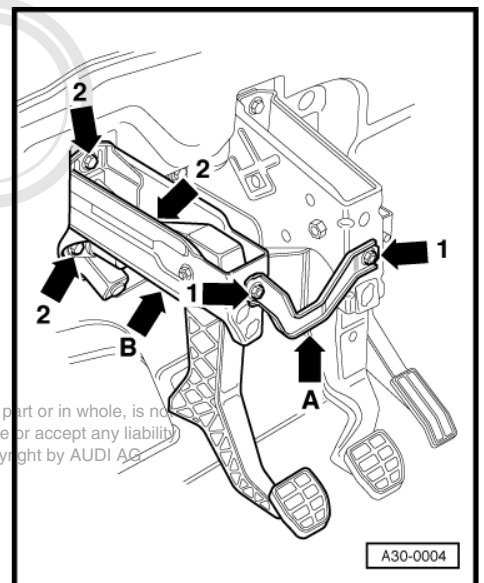
Note

In order to take out the master cylinder the entire clutch pedal assembly must be removed.

- Remove driver's storage compartment (bottom) ⇒ Rep. Gr. 68 .
- If fitted, remove clutch pedal switch -F36-
⇒ ["1.3 Removing and installing clutch pedal switch F36 \(square housing\)", page 13](#) or
⇒ ["1.4 Removing and installing clutch pedal switch F36 \(round housing\)", page 14](#) .

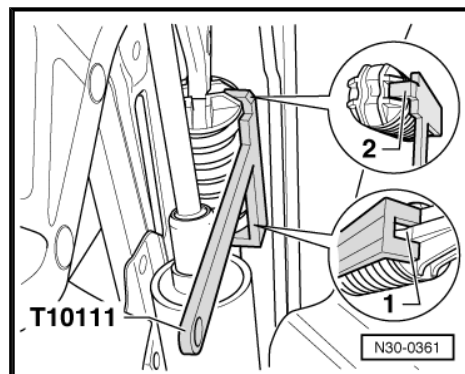


- Now remove complete clutch pedal mounting bracket as follows:
- First remove connecting plate -arrow A- -arrows 1-.
- Then remove securing nuts -arrows 2- for mounting bracket -arrow B-.
- Take off mounting bracket.



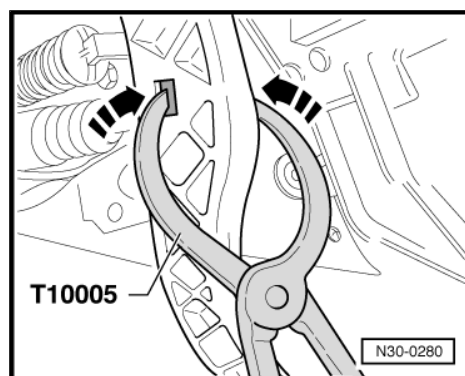
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- Remove over-centre spring using assembly clip -T10111- as follows:
 - 1 - The rear part of assembly clip must be positioned on the over-centre spring so that the claws fit exactly over the rib -1-.
 - 2 - Lightly depress clutch pedal towards clutch pedal stop.
- Engage the lug -2- of the assembly clip into the cut-out on the over-centre spring.

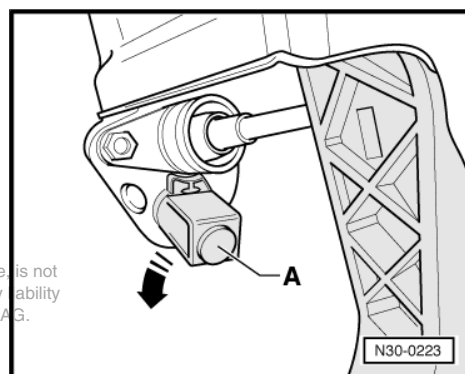


Release master cylinder operating rod from clutch pedal as follows:

- Carefully pull clutch pedal towards you. At the same time, press both sides of retaining clip inwards using pliers -T10005- -arrows-



- Turn stop -A- for clutch pedal in direction of arrow and remove.



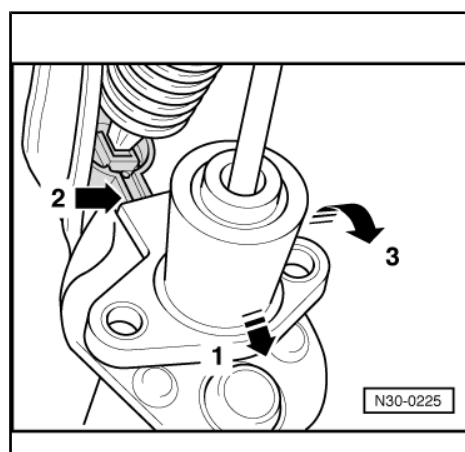
- Then push master cylinder in the direction of -arrow 1- onto stop.

It must not be covered in upper area by over-centre spring mounting -arrow 2-.

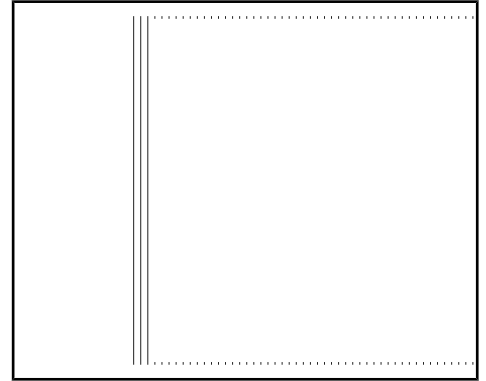
- Then swing master cylinder in direction of -arrow 3- out of mounting bracket.

Installing

Installation is carried out in reverse sequence; note the following:



- Retaining clip -A- must be fitted on operating rod -B- of master cylinder.
- Press clutch pedal in -direction of arrow- until it engages. Ensure that it is properly locked.
- Install over-centre spring ⇒ [page 14](#) or ⇒ [page 15](#) .

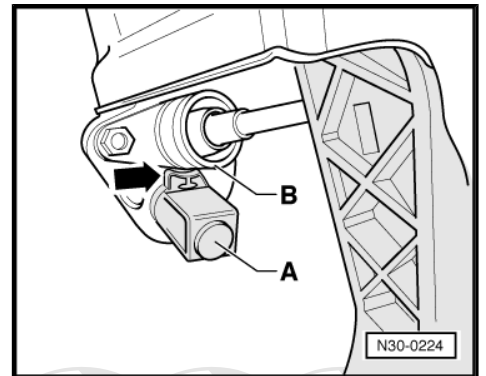


- Fit stop -A- for clutch pedal again.

Installation position:

The arm -arrow- points towards master cylinder -B-.

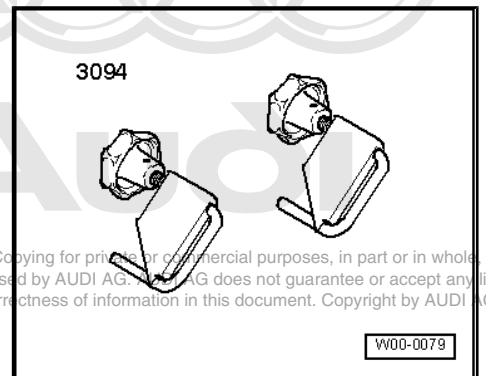
- Bleed clutch system after installing master cylinder ⇒ [page 22](#) .
- If fitted, install clutch pedal switch -F36- in mounting hole ⇒ [“1.3 Removing and installing clutch pedal switch F36 \(square housing\)”, page 13](#) or ⇒ [“1.4 Removing and installing clutch pedal switch F36 \(round housing\)”, page 14](#) .
- Install complete air cleaner housing ⇒ Repair group 24 .



1.10 Removing and installing slave cylinder

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm -3094-



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Removing

- Remove noise insulation below engine/gearbox.

- Detach pipe/hose assembly from bracket on clutch slave cylinder.
- Then remove bolts -arrows- and detach slave cylinder from release shaft on gearbox.
- Using hose clamp -3094- , clamp off pipe/hose assembly going to slave cylinder.
- Pull out clip ➔ [Item 17 \(page 18\)](#) and then pull pipe/hose assembly out of slave cylinder. Seal end of pipe.

Installing

Installation is carried out in reverse sequence; note the following:

- Press clip ➔ [Item 17 \(page 18\)](#) into slave cylinder as far as stop.
- Push hose/pipe assembly into clutch slave cylinder until it engages audibly.
- Lubricate end of plunger with MoS₂ grease.
- Fit slave cylinder to release shaft and secure onto gearbox.
- After installing slave cylinder, bleed clutch system ➔ [page 22](#) .
- Install noise insulation below engine/gearbox.

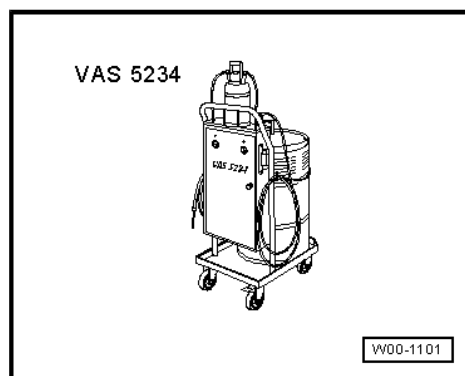
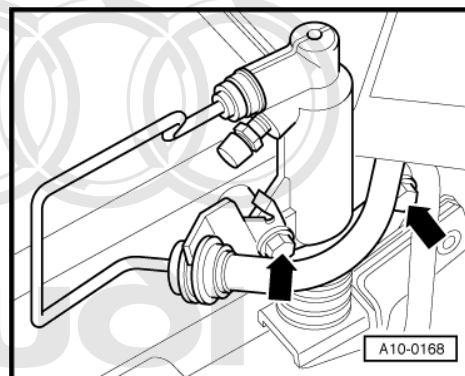
Tightening torque

Slave cylinder to gearbox	25 Nm
---------------------------	-------

1.11 Bleeding clutch system

Special tools and workshop equipment required

- ◆ Brake filling and bleeding equipment -VAS 5234- or brake filling and bleeding equipment -V.A.G 1869-



- ◆ Brake fluid specification ➔ Rep. Gr. 47 .

Procedure

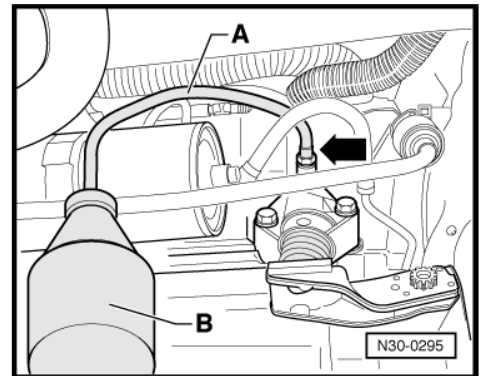
Note

- ◆ *Open the bleeder valve before switching on the bleeding appliance.*
 - ◆ *When performing the following steps, make sure that no brake fluid escapes onto the gearbox.*
 - ◆ *The clutch system must be bled after performing work on the hydraulic clutch mechanism.*
 - ◆ *Before bleeding the clutch system, pull back the clutch pedal to the normal position and top up brake fluid to "Max" marking on brake fluid reservoir.*
 - ◆ *The clutch system should be bled at the same intervals as the brake system.*
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- Connect brake filling and bleeding equipment -V.A.G 1869- or -VAS 5234- , but do not switch on at this stage.
 - To bleed system, use 670 mm bleeder hose -V.A.G 1238/B3- if necessary.
 - Then connect bleeder hose -A- to collector bottle -B- of brake bleeding equipment.
 - Connect bleeder hose to slave cylinder -arrow- and open bleeder valve.
 - Switch on bleeder appliance and allow about 100 cm³ of brake fluid to drain out.
 - Operating pressure 2.5 bar

Note

Ensure bleeder hose is correctly fitted during bleeding operation.

- Close bleeder valve.
- Depress clutch pedal several times after bleeding process is completed.
- Repeat bleeding procedure if necessary.



2 Servicing clutch

⇒ "2.1 Fault-finding on power transmission - complaints regarding defects on the clutch and clutch mechanism", page 24

⇒ "2.2 Exploded view - servicing clutch", page 29

⇒ "2.3 Removing and installing clutch", page 30

2.1 Fault-finding on power transmission - complaints regarding defects on the clutch and clutch mechanism



Note

Checking hydraulic clutch mechanism ⇒ [page 11](#) .

Before carrying out any clutch repairs, always check out the customer complaint and trace the cause of the fault. Investigate in each case whether the fault is caused by a defective clutch mechanism or by incorrect adjustment of the selector mechanism.

Complaint	Fault description	Fault rectification
Clutch pedal does not return to original position by itself	♦ Air in hoses/pipes.	– Bleed pipes/hoses; top up with brake fluid.
	♦ Leak in pipes/hoses, master cylinder or slave cylinder.	– Renew defective component, bleed pipes/hoses; top up with brake fluid.
	♦ Diaphragm spring of pressure plate is broken.	– Renew pressure plate.

Complaint	Fault description	Fault rectification
Excessive force is necessary to operate clutch pedal.	♦ Over-centre spring defective.	– Renew over-centre spring.
	♦ Increased clutch release pressure due to wear of clutch linings.	– Inform customer that clutch release force normally increases due to wear of clutch linings. – Renew clutch plate if the distance between clutch plate and rivets is less than 0.1 mm.
	♦ Pressure plate with incorrect type of spring.	– Allocate pressure plate according to ⇒ Electronic parts catalogue
	♦ Mechanically defective pressure plate/clutch plate.	– Renew defective components.
	♦ Clutch plate does not move freely or is stuck on splines.	– Check hub splines for damage (burrs). Renew clutch plate if necessary. – Clean hub splines and input shaft to remove corrosion and remnants of grease and coat with grease for clutch plate splines -G 000 100- . Move clutch plate backwards and forwards and remove excess grease.

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Complaint	Fault description	Fault rectification
	◆ Clutch push rod and release plate (pressure plate) do not move easily.	– Lightly coat contact points with grease for clutch plate splines - G 000 100- . – Lightly grease clutch push rod.

Complaint	Fault description	Fault rectification
Noises when operating the clutch	◆ Contact surface (tips of diaphragm springs) of pressure plate defective (bent, broken). Contact point of release plate off-centre.	– Renew pressure plate. – Check position of release plate. – Check dowel sleeves.
	◆ Engine/gearbox off-centre.	– Check dowel sleeves.
	◆ Clutch plate installed wrong way around.	– Install correctly.
	◆ Wrong clutch plate installed.	– Allocate clutch plate according to ⇒ Electronic parts catalogue .

Complaint	Fault description	Fault rectification
Grinding noises when engaging one of the forward gears or reverse gear; gear lever sticking, does not move freely; gears cannot be selected or clutch mechanism is without function	◆ Air in system, clutch does not disengage fully.	– Bleed system; check system, top up with brake fluid.
	◆ Leak in pipes/hoses, master cylinder or slave cylinder.	– Renew defective component, top up with brake fluid, bleed system.
	◆ Travel of clutch pedal is restricted (carpet, floor mat under pedal) it is not possible to floor clutch pedal	– Inform customer of the source of the fault.
	◆ Pressure plate is distorted due to incorrect installation, clutch plate deformed due to incorrect handling.	– Check components and renew if necessary, note position of centring pins. – If there is still a grinding noise, check clutch plate splines on input shaft for freedom of movement, repair gearbox if necessary.
	◆ Tips of diaphragm springs broken or bent (incorrect installation, release plate off-centre).	– Renew pressure plate. – Check release plate and renew if necessary. – Check dowel sleeves.
	◆ Insufficient length of clutch push rod due to wear	– Renew clutch push rod, check release bearing (in gearbox housing cover), renew if necessary. – Lightly coat contact points between clutch push rod and release bearing with grease -G 000 100- .

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Complaint	Fault description	Fault rectification
	◆ Clutch plate too thick.	– Allocate clutch plate according to ⇒ Electronic parts catalogue .
	◆ Clutch lining sticking to flywheel (stored for a lengthy period of time, high humidity).	– Lightly grind off friction surfaces for clutch linings or renew components if corrosion is excessive.
	◆ Clutch plate does not move freely or is stuck on splines. Hub corroded, damaged during installation. Hub splines worn on one side.	– Check hub splines for damage. Renew clutch plate if necessary. – Remove traces of corrosion and grease from hub and shaft. Lightly coat shaft with grease for clutch plate splines - G 000 100- . – Move clutch plate backwards and forwards and remove excess grease. – Check position of dowel sleeves if hub splines are worn. – Check pressure plate and renew if necessary.
	◆ Pressure plate does not move away from flywheel far enough (wrong pressure plate installed).	– Allocate pressure plate according to ⇒ Electronic parts catalogue
	◆ Offset of engine/gearbox assembly above tolerance (dowel sleeves not fitted), support plate of clutch plate deformed.	– Insert dowel sleeves before fitting gearbox. – Check clutch plate and pressure plate for damage. Renew if necessary.
	◆ Clutch linings have become loose due to excessive speed (shifting into lower gear at high speed). ◆ Clutch linings have come loose due to excessive clutch slip when driving off.	– Renew clutch plate. Inform customer of the source of the fault.

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Complaint	Fault description	Fault rectification
Load change shocks when accelerator is pressed briefly and when engine speed is reduced suddenly.	◆ Engine/gearbox mountings too soft.	– Inform customer of the source of the fault. Allocate mountings according to ⇒ Electronic parts catalogue , renew if necessary.
	◆ Uneven engine running.	– Check engine adjustments and rectify if necessary.
	◆ Clutch plate is fitted with damper to prevent loose gear rattling noises.	– Inform customer of the source of the fault.
	◆ Engine/gearbox off-centre.	– Check dowel sleeves and renew if necessary.

Complaint	Fault description	Fault rectification
Clutch slips, ineffective power transmission or vehicle does not move.	♦ Wrong clutch plate or wrong pressure plate installed.	– Allocate clutch plate and pressure plate according to ⇒ Electronic parts catalogue .
	♦ Clutch plate worn, burnt; pressure plate overheated, scores; pressure plate deformed due to incorrect installation; contact pressure of pressure plate insufficient; poor driving habits; normal wear.	– Renew clutch plate. – Renew pressure plate. – Inform customer of the source of the fault.
	♦ Oil on clutch plate, pressure plate, flywheel. Oil seal of engine or gearbox defective. Grease on contact surfaces due to excessive grease on hub.	– Renew clutch plate. – Clean contact surfaces of pressure plate and flywheel. – Renew oil seal, remove excessive grease from input shaft.
	♦ Clutch push rod seal in input shaft leaking. Bearing bush for clutch push rod in input shaft worn.	– Renew seal, clutch plate. – Check bearing bush for clutch push rod, renew if necessary. – Clean pressure plate and flywheel.
	♦ Clutch plate installed wrong way around.	– Install correctly, check clutch plate and renew if necessary.
	♦ Flywheel recessed too far or excessive wear on clutch contact surface.	– Allocate flywheel according to ⇒ Electronic parts catalogue . – Check clutch plate and pressure plate. Renew if necessary.

Complaint	Fault description	Fault rectification
Grabbing clutch, engine jolts	♦ Air in system.	– Bleed system, check brake fluid level, check system for leaks. – Renew defective component.
	♦ Uneven engine running.	– Check engine adjustments and rectify if necessary.
	♦ Poor driving habits, rpm too low when driving off.	– Inform customer of the source of the fault.
	♦ Wrong clutch plate installed.	– Allocate clutch plate according to ⇒ Electronic parts catalogue .
	♦ Engine/gearbox mountings too soft, worn.	– Check engine/gearbox mountings, if necessary allocate according to ⇒ Electronic parts catalogue .
	♦ Oil on clutch lining, contact surface of pressure plate and flywheel (oil escapes from clutch housing).	– Check oil seal for gearbox input shaft or crankshaft, renew if necessary. – Renew clutch plate, clean pressure plate and flywheel.
	♦ Pressure plate housing deformed during installation. Contact surface of pressure plate moves away only on one side.	– Check contact surface of clutch lining on flywheel, pressure plate and diaphragm spring, renew pressure plate if necessary.

Complaint	Fault description	Fault rectification
	◆ Excessive amount of grease applied to input shaft (traces of grease on clutch plate, pressure plate and flywheel).	– Remove grease on pressure plate and flywheel, renew components if damaged (marks caused by clutch judder, traces of overheating, scores). – Remove traces of grease from hub and shaft, apply a thin coat of grease for clutch plate splines -G 000 100- to shaft. – Move clutch plate backwards and forwards and remove excess grease.

Complaint	Fault description	Fault rectification
Clacking sound can be heard when releasing clutch pedal	◆ Mass of input shaft is accelerated due to sudden release of clutch pedal. Splines of meshing gears knock, the noise is increased on clutch plates with damper due to the damper moving to stop.	– Inform customer of the source of the fault.

Complaint	Fault description	Fault rectification
Noises can be heard when engine is idling	◆ Damper spring broken.	– Renew clutch plate.
	◆ Clutch plate installed without damper (rattling noises occur when engine is idling).	– Allocate clutch plate according to ⇒ Electronic parts catalogue .
	◆ Pressure plate deformed, broken, imbalance.	– Renew pressure plate.
	◆ Uneven engine running.	– Check adjustment of engine and rectify if necessary.
	◆ Offset of engine/gearbox assembly above tolerance (dowel sleeves not fitted).	– Insert dowel sleeves before fitting gearbox.
	◆ Intermediate plate contacts flywheel.	– Engage intermediate plate at sealing flange and push onto dowel sleeves.

2.2 Exploded view - servicing clutch



Note

- ◆ Before renewing the clutch plate and pressure plate refer to *Fault finding on power transmission - Complaints regarding clutch and clutch mechanism* ⇒ [page 24](#).
- ◆ Check that dowel sleeves for centralising engine/gearbox are in the cylinder block; install if necessary.
- ◆ If the dowel sleeves are not fitted, this will lead to gear-change problems, clutch malfunction and in some cases gearbox noise (gears will make rattling noises).
- ◆ Renew clutch plate and pressure plate if riveted fastening is damaged or loose.
- ◆ Allocate clutch plate and pressure plate according to ⇒ *Electronic parts catalogue*.
- ◆ Assemble clutch so that the flywheel centring pins locate in the thrust plate centring holes or centring slots. Otherwise the flywheel TDC will be incorrect.

1 - Twelve point bolt

- ☐ 20 Nm
- ☐ Loosen and tighten gradually in diagonal sequence

2 - Flywheel

- ☐ Removing and installing ⇒ Rep. Gr. 13
- ☐ Ensure that dowel pins fit tightly
- ☐ Contact surface for clutch lining must be free of scoring, oil and grease
- ☐ Installation depth of TDC sender must be adjusted according to size of flywheel. This is done by means of two different coloured screw plugs in the clutch housing. Allocation ⇒ [Item 15 \(page 100\)](#).

3 - Clutch plate

- ☐ Centralising ⇒ [page 32](#)
- ☐ For diameter, refer to ⇒ *Electronic parts catalogue*

4 - Clutch push rod

- ☐ Grease area around input shaft bearing bush

5 - Retaining ring

6 - Release plate

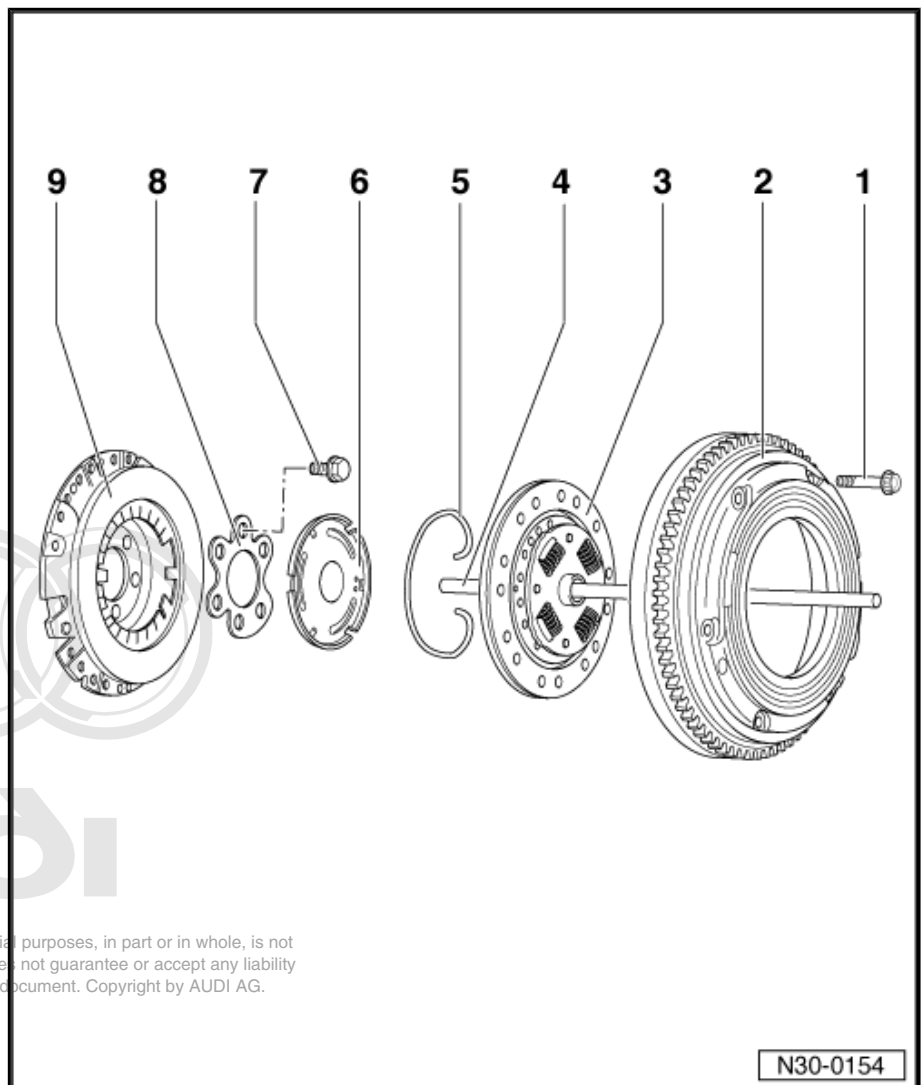
- ☐ Coat contact surface and clutch push rod mounting with a very thin coating of grease -G 000 100-.

7 - Bolt securing pressure plate to crankshaft

- ☐ Removing and installing ⇒ Rep. Gr. 13

8 - Intermediate plate

- ☐ Installation position ⇒ [page 31](#)



9 - Pressure plate

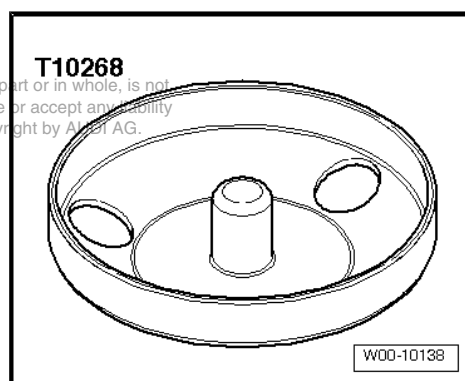
- ☐ Removing and installing ➔ [page 30](#)
- ☐ Maximum pressure plate distortion (at inside): 0.2 mm
- ☐ Renew pressure plate if rivets are damaged or loose.

2.3 Removing and installing clutch

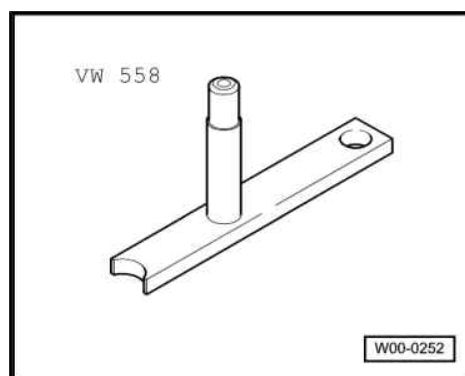
Special tools and workshop equipment required

- ◆ Centring disc -T10268-

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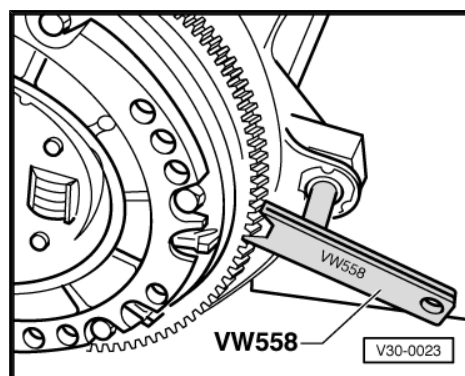


- ◆ Clutch counter-hold tool -VW 558-

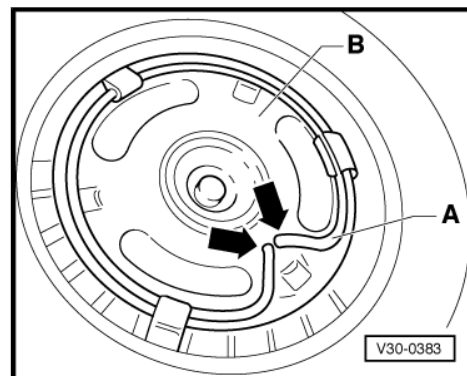


Removing

- Remove gearbox ➔ [page 49](#) .
- Lock flywheel using clutch counter-hold tool -VW 558- and remove flywheel.
- Take off clutch plate.



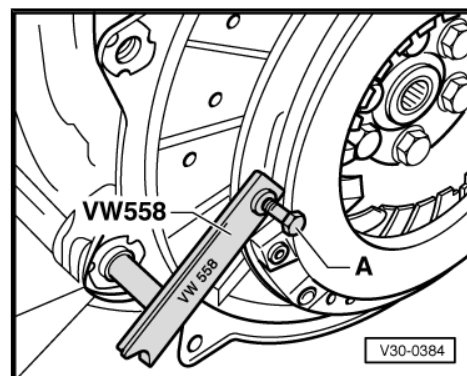
- Lever retaining clip -A- for release plate -B- out of holes -arrows- with a screwdriver and remove.
- Remove release plate -B-.



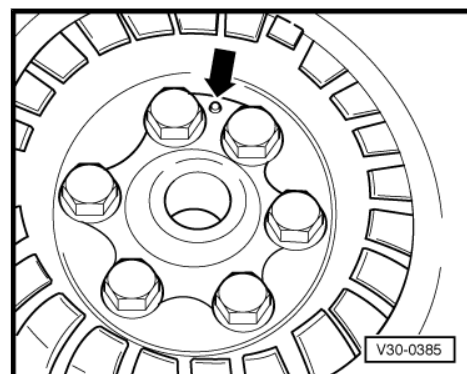
- Unbolt pressure plate, use clutch counter-hold tool -VW 558- on pressure plate and arrest with bolt -A-.
- Take off pressure plate and intermediate plate.

Installing

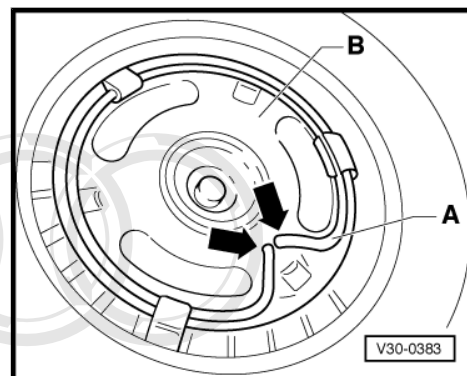
- Fit pressure plate.
- Fit intermediate plate.



- Installation position of intermediate plate: raised portion -arrow- points away from pressure plate.
- Insert new securing bolts.
- Tighten securing bolts, do this by arresting pressure plate with clutch counter-hold tool -VW 558- as for removing. Tightening torque for securing bolts ⇒ Rep. Gr. 13 .



- Fit release plate -B- and secure to pressure plate with retaining ring -A-. Insert wire ends into holes -arrows- in pressure plate.
- Coat clutch plate splines with a very thin film of grease -G 000 100- . Then move clutch plate backwards and forwards on gearbox input shaft until hub slides freely on shaft. It is important to remove excess grease.
- Fit clutch plate with flywheel onto pressure plate.

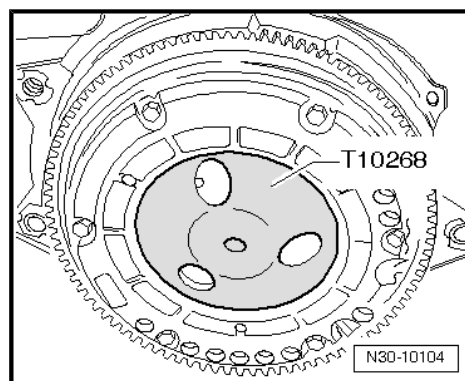




- Insert centring disk -T10268- and tighten flywheel bolts alternately and diagonally.

Tightening torques ➔ [page 29](#)

- Install gearbox ➔ [page 56](#) .



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34 – Controls, housing

1 Servicing selector mechanism

⇒ [“1.1 Installation position of selector mechanism”, page 33](#)

⇒ [“1.2 Exploded view - selector housing/gear lever”, page 36](#)

⇒ [“1.3 Removing and installing selector housing/selector rod”, page 37](#)

⇒ [“1.4 Removing and installing gear lever in selector housing”, page 39](#)

⇒ [“1.5 Exploded view - selector linkage and pivot points on gearbox”, page 40](#)

⇒ [“1.6 Adjusting selector mechanism”, page 45](#)

1.1 Installation position of selector mechanism

The coupling rod -C- serves as a counter support for the gate selection movement

Double headed arrow -A-: gear selection movement

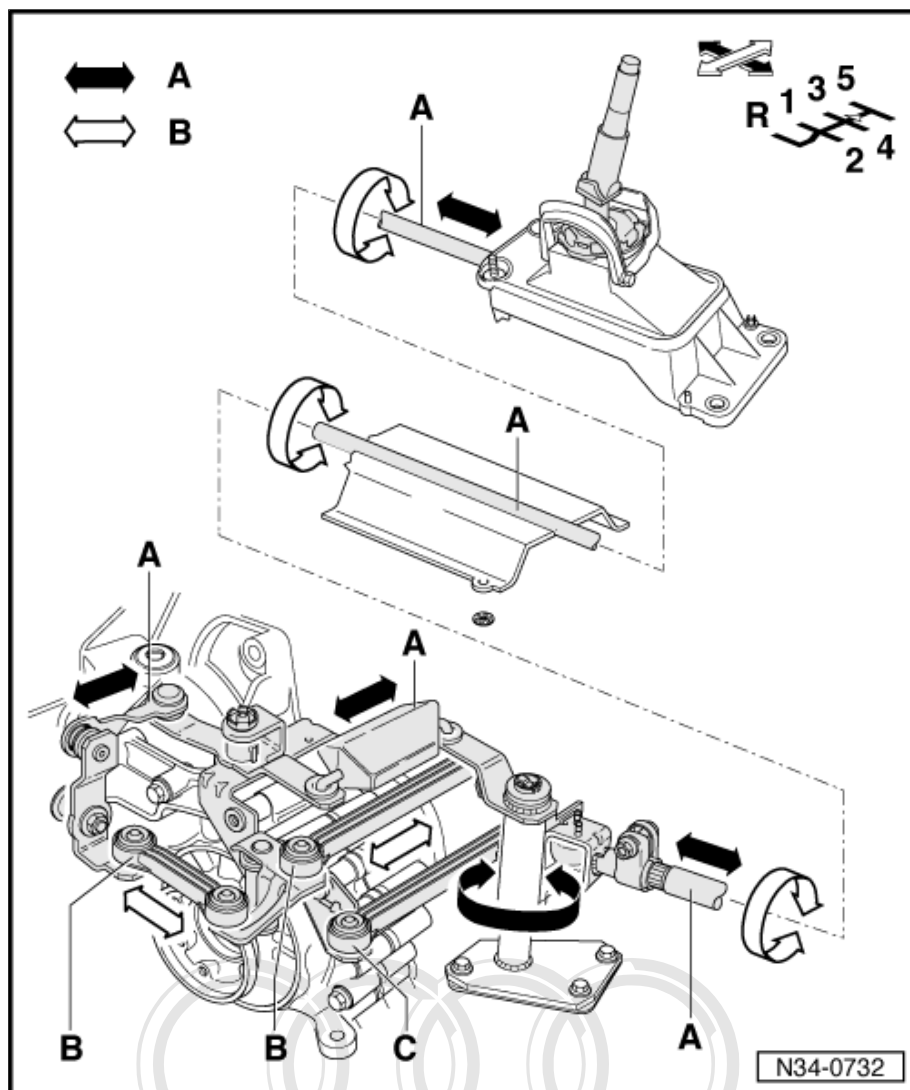
Double headed arrow -B-: gate selection movement



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A - Selector rods for gear selection movement

B - Coupling rods for gate selection movement



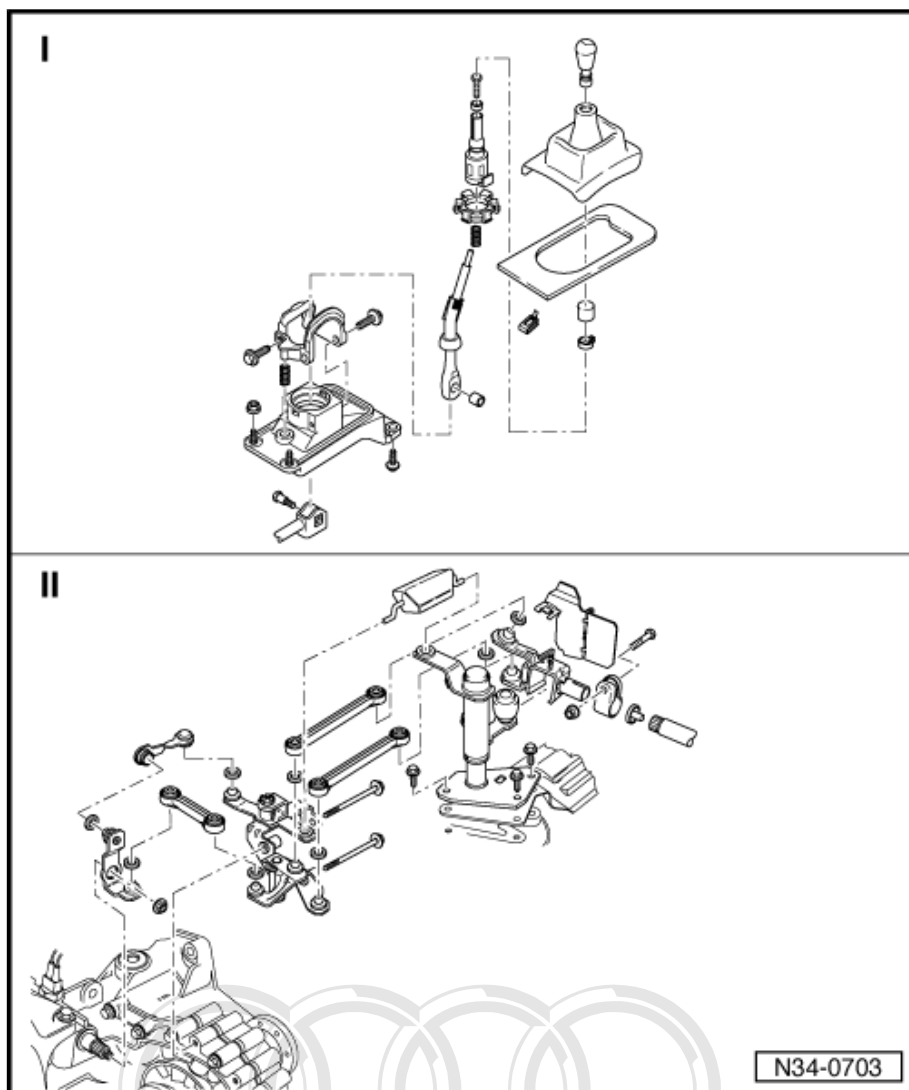
Note

- ◆ Note radio coding for vehicles with coded radio.
- ◆ Before working on selector mechanism in engine compartment, disconnect earth strap from battery ➔ Rep. Gr. 27.
- ◆ Follow the steps required when re-connecting the battery ➔ Rep. Gr. 27.

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I - Exploded view - selector
housing/gear lever
⇒ [page 36](#)

II - Exploded view - selector
linkage and pivot points on
gearbox ⇒ [page 40](#)



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Note

-G 000 450 02- to all bearings and c

Remove and install together with boot

- ❑ Remove and install together with gear knob
- ❑ Separating from gear knob ⇒ [page 37](#)
- ❑ Connect to gear knob before installing
⇒ [page 37](#)

- ❑ Allocate according to ⇒
Electronic parts cata-
logue

- ❑ Secures gear knob to gear lever

- ❑ Removing and installing in selector housing
⇒ [page 39](#)

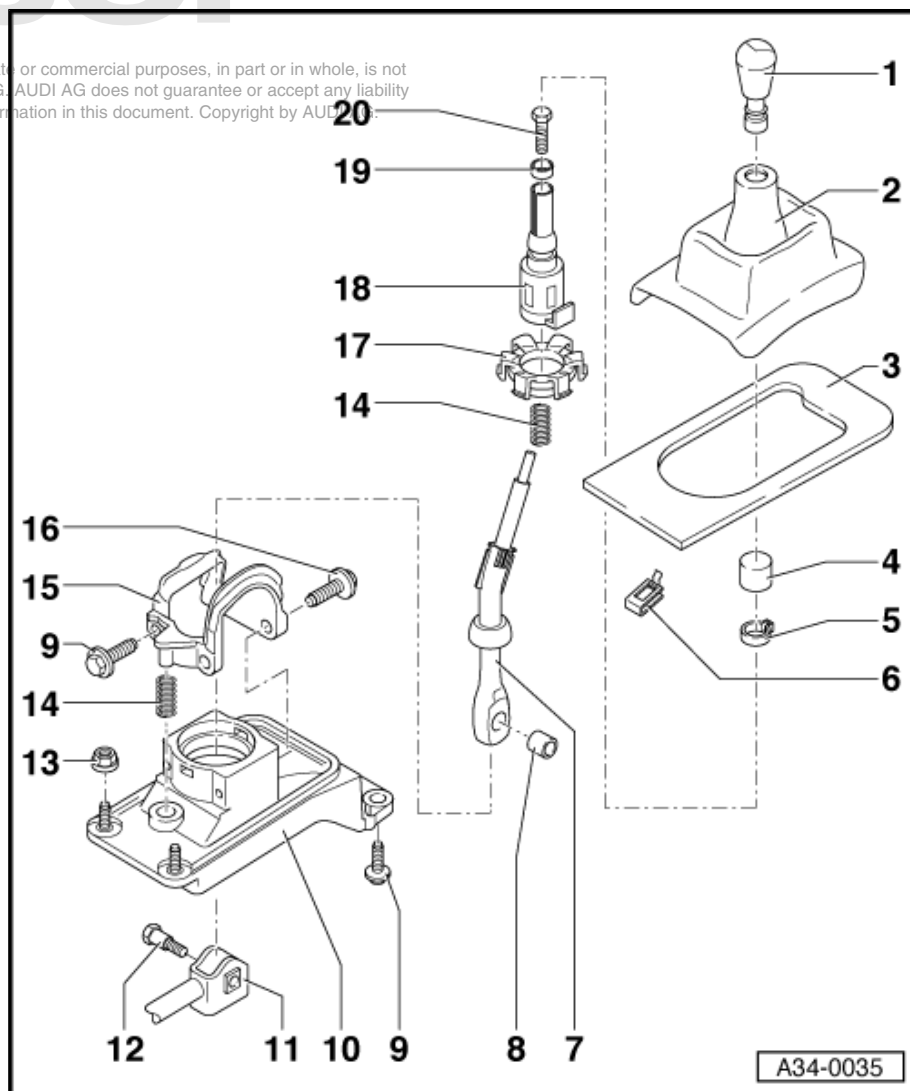
- ☐ 25 Nm
- ☐ M8 x 25

 20 Nm

25 Nm

 25 Nm

 M8 x 20



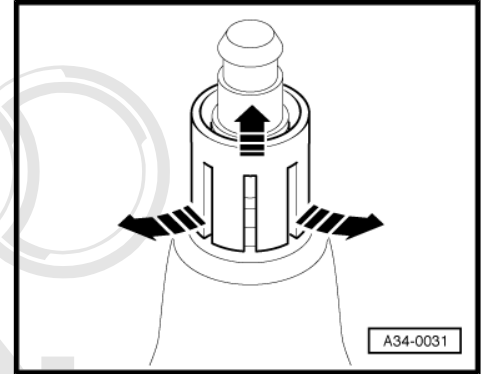
- 17 - Ball socket
- 18 - Sleeve
- 19 - Damper
- 20 - Torx socket head bolt
- 15 Nm

Detaching boot from gear knob and assembling

- Turn boot inside out.
- Carefully lever prongs with a screwdriver in direction of -arrow- and simultaneously pull gear knob out.

Assembly is carried out in the reverse order to removal; note the following:

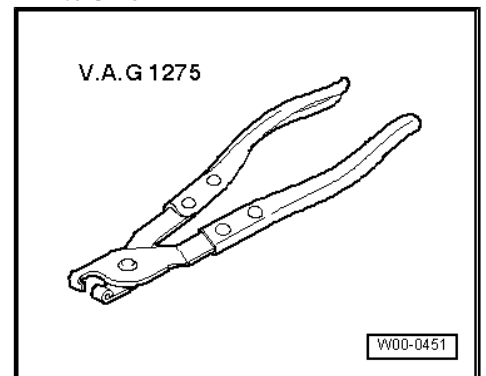
- Insert gear knob in boot.
- Push bush onto gear knob and engage.
- Install gear knob and boot together.



1.3 Removing and installing selector housing/selector rod

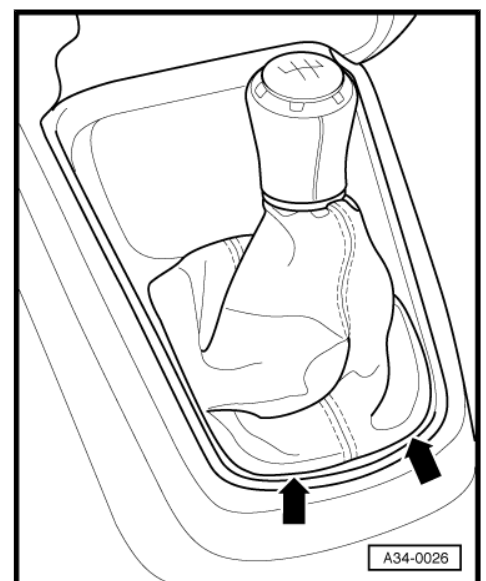
Special tools and workshop equipment required

- ◆ Hose clip pliers -V.A.G 1275-

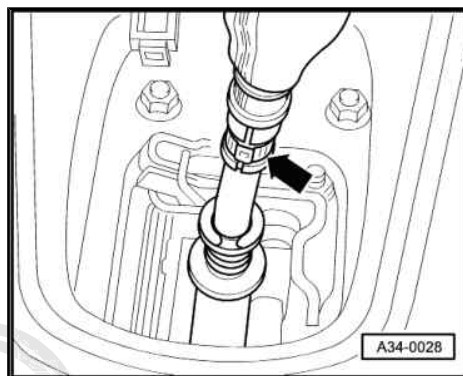


Removing

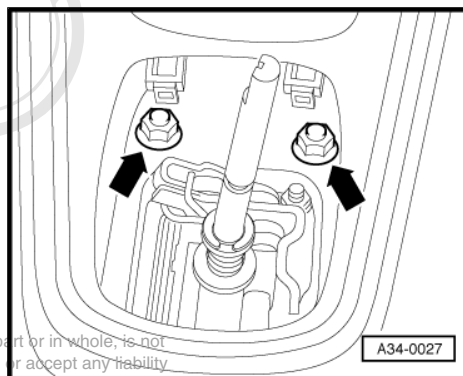
- Carefully pry gear lever boot off centre console -arrows-.
- Pull gear lever boot off centre console towards rear.



- Destroy clip -arrow- and pull off gear knob together with boot.
- Remove rubber cover, if fitted.

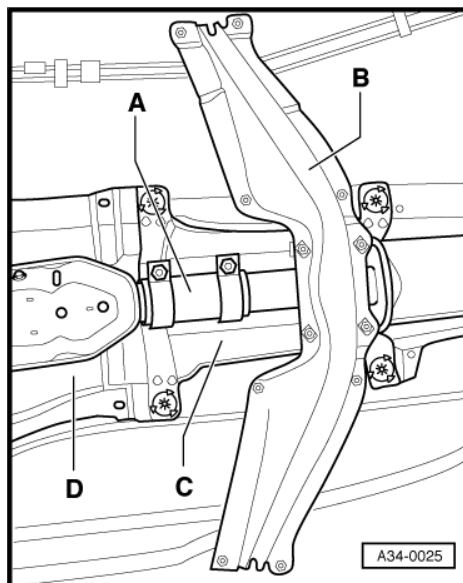


- Now remove securing nuts for selector housing -arrows-.



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- Disconnect front exhaust pipe -A- ⇒ Rep. Gr. 26 ; Removing and installing parts of exhaust system .
- Remove cross member -B- below exhaust system.
- Remove heat shield -D-.
- Detach front section of heat shield -C-.

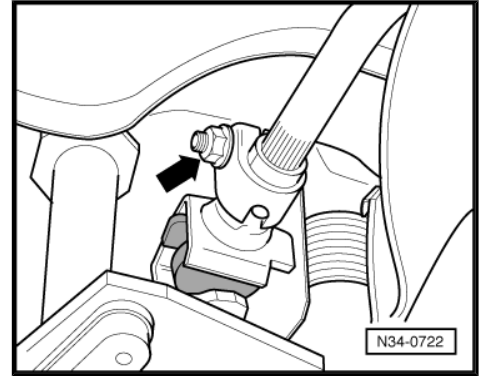


- Loosen clamp -arrow-. Detach connection between selector rod and gate selector lever.
- Unbolt selector housing from body.
- Pivot selector housing with selector rod downwards and remove.

Installing

Installation is carried out in reverse sequence; note the following:

- Align selector housing parallel to body.
- Distance to body must then be the same on both sides.
- Fit gear knob onto gear lever with new clip and tighten clip using hose clip pliers -V.A.G 1275- .



Tightening torques

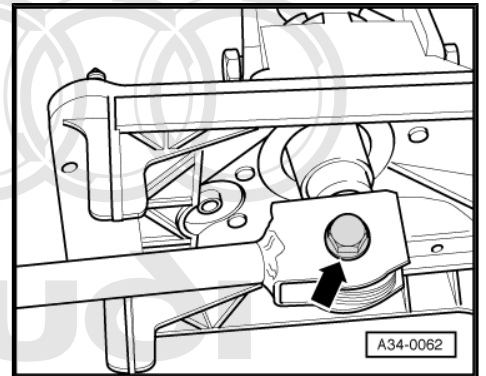
Selector housing to body Bolt M8	25 Nm
Selector housing to body Nut M8	25 Nm
Cross member to body	25 Nm
Selector rod to gate selector lever	20 Nm

1.4 Removing and installing gear lever in selector housing

- Selector housing is removed.

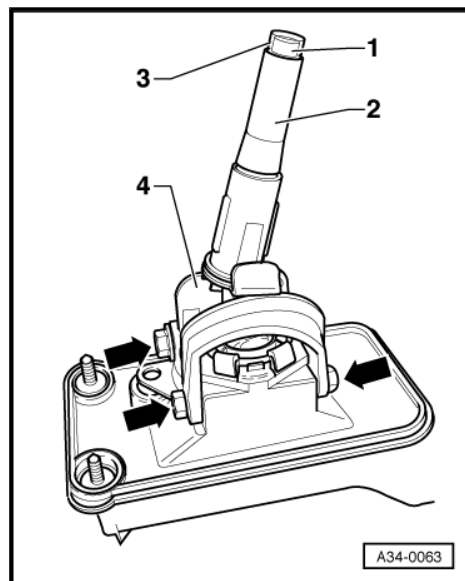
Removing

- Detach selector rod -arrow-.

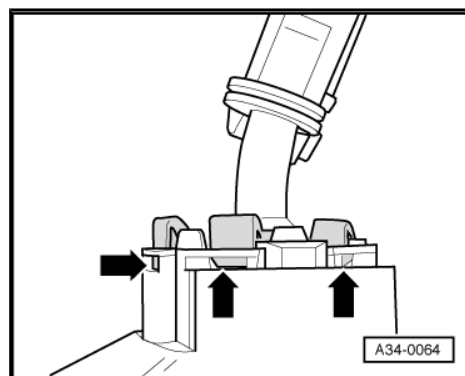


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- Then remove bolt -1-.
- Now remove sleeve -2- and damper -3-.
- Then remove stop -4- -arrows-.



- Push in all ball socket locating lugs in direction of -arrow-.
- Pull gear lever carefully out of selector housing.



- Then push ball socket off selector rod in direction of -arrow-.

Installing

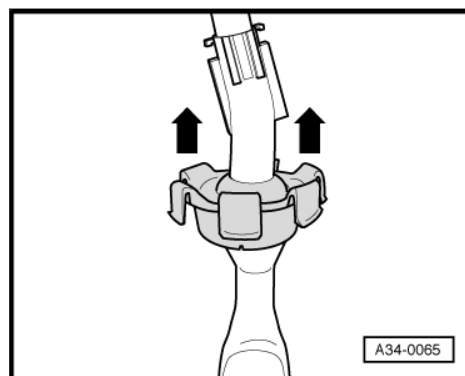
Perform installation in reverse sequence of removal.

Installing selector housing ⇒ [page 37](#) .

Adjusting selector mechanism ⇒ [page 45](#)

Tightening torques

Selector rod to gear lever	20 Nm
Gear lever stop to selector housing	25 Nm

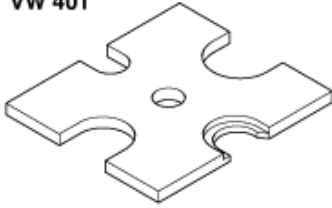
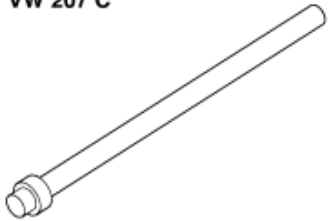
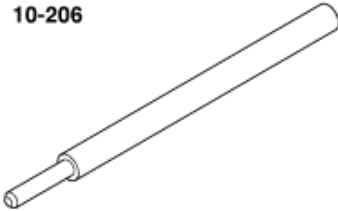


1.5 Exploded view - selector linkage and pivot points on gearbox

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Special tools and workshop equipment required

- ◆ Thrust plate -VW 401-
- ◆ Drift -VW 207 C-
- ◆ Drift -10 - 206-

VW 401 	VW 207 C 
10-206 	
	W34-0005



Note

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Lubricate bearings and surfaces in sliding contact with grease -G 000 450 02- .

1 - Nut

- ☐ 20 Nm
- ☐ Self-locking
- ☐ Always renew
- ☐ Secures gearbox selector lever to gearbox

2 - Gearbox selector lever

- ☐ Fits onto selector shaft only in one position

3 - Seal
4 - Coupling rod
5 - Front selector rod

- ☐ Removing bushes
⇒ [page 43](#)
- ☐ Installing bushes
⇒ [page 43](#)

6 - Support bracket

- ☐ With relay lever and intermediate lever
- ☐ Removing and installing relay lever and intermediate lever
⇒ [page 43](#)
- ☐ Removing bush for selector rod from intermediate lever
⇒ [page 44](#)
- ☐ Installing bush for selector rod in intermediate lever ⇒ [page 44](#)
- ☐ Modification: from 08.98 new support bracket
⇒ [page 44](#)

- ☐ Installing new support bracket on gearboxes up to 08.98 ⇒ [page 44](#)

7 - Coupling rod
8 - Front selector rod

- ☐ With damper weight

9 - Guard plate

- ☐ Fit onto gate selector lever

10 - Bolt

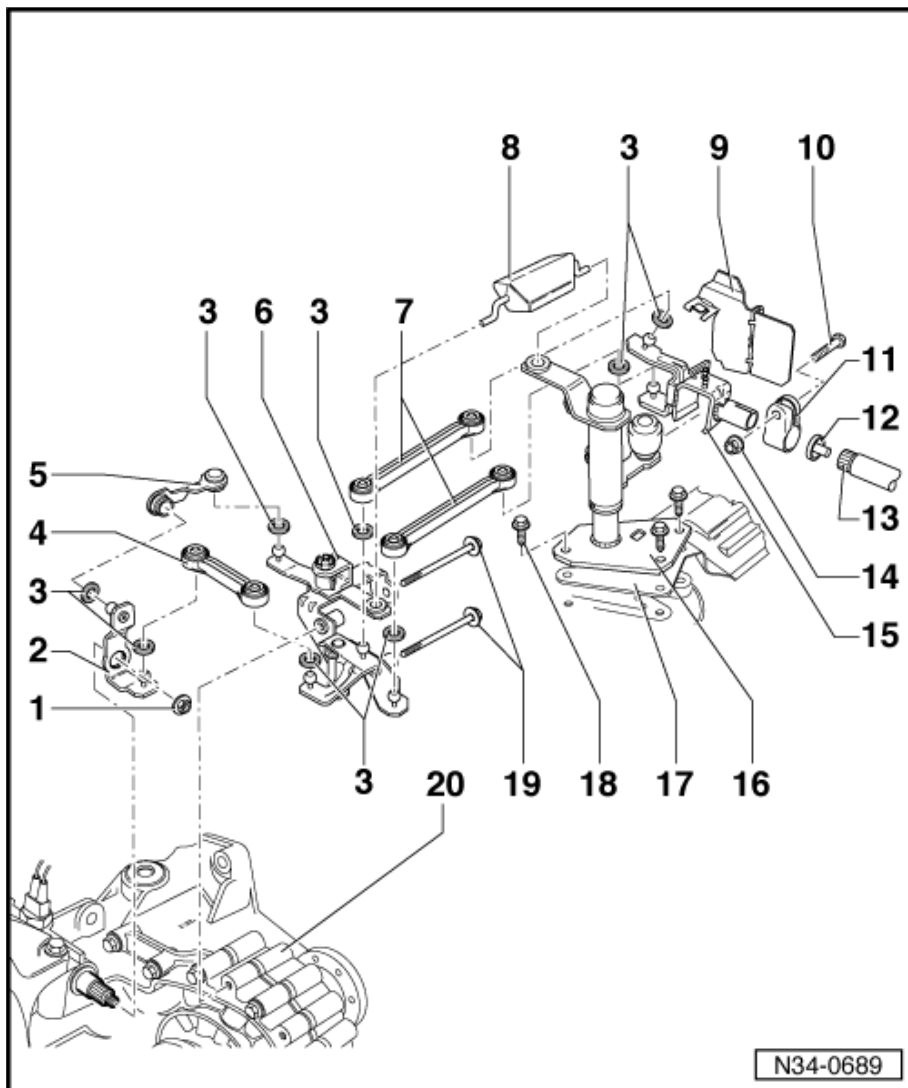
- ☐ Secures clamp to selector rod

11 - Clamp
12 - Plug
13 - Selector rod
14 - Hexagon flange nut

- ☐ 20 Nm
- ☐ Self-locking
- ☐ Secures clamp to selector rod

15 - Gate selector lever
16 - Mounting bracket

- ☐ With relay shaft



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- ☐ Removing and installing relay shaft ⇒ [page 45](#)
- ☐ Removing bush for selector rod from relay shaft ⇒ [page 44](#)
- ☐ Installing bush for selector rod in relay shaft ⇒ [page 44](#)

17 - Guard plate

18 - Bolt

- ☐ 25 Nm

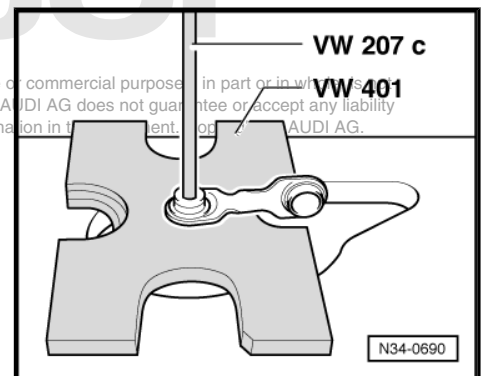
19 - Bolt

- ☐ 25 Nm
- ☐ Secures support bracket to gearbox

20 - Gearbox

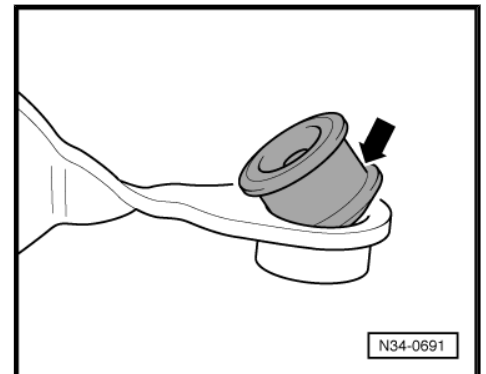
Pressing bushes out of selector rod

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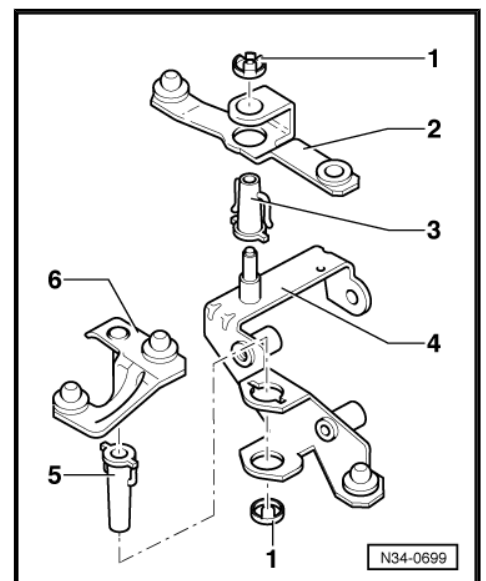
Pressing bushes into selector rod

- Coat bush lightly with grease and carefully press in collar of bush -arrow-.



Removing and installing relay lever and intermediate lever

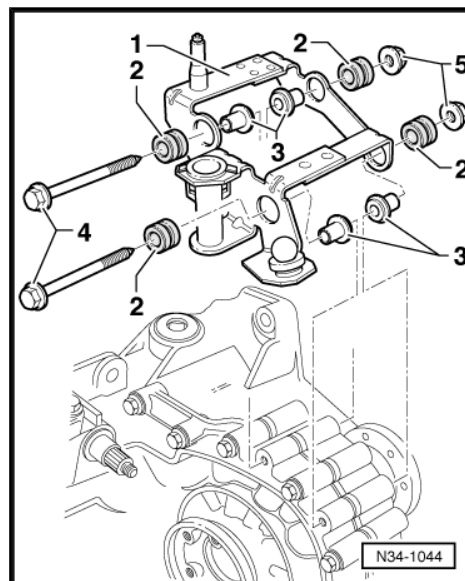
- 1 - Push on securing clip as far as stop.
- 2 - Intermediate lever
- 3 - Bearing bush; must engage in intermediate lever
- 4 - Support bracket
- 5 - Bearing bush; must engage in support bracket
- 6 - Relay lever



From 08.98 onwards, new support bracket for relay lever and intermediate lever

The new support bracket -1- is mounted in the rubber grommets -2- and bearing bushes -3-.

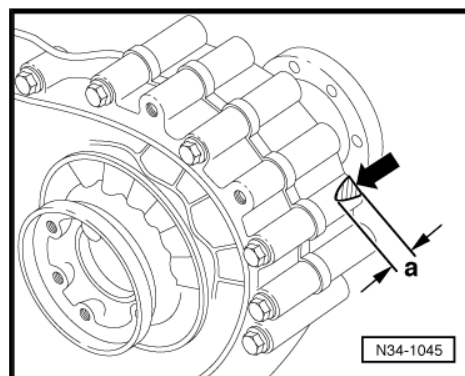
- 1 - Support bracket with larger mounting holes for rubber grommets and bearing bushes
- 2 - Rubber grommet
- 3 - Bearing bush
- 4 - Hexagon bolt M8 x 135
- 5 - Hexagon nut M8; always renew after removing



Installing new support bracket on gearboxes up to 08.98

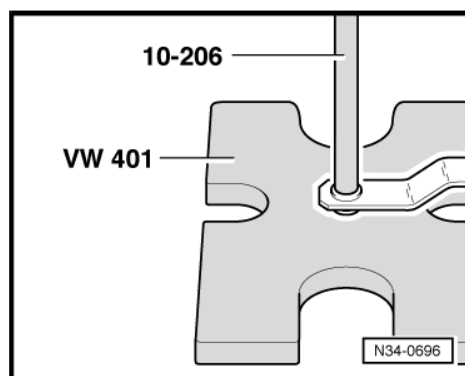
- Make a 2.5 mm deep chamfer on gearbox -arrow-.
- ◆ Dimension -a- = 20 mm

This prevents the coupling rods from contacting the gearbox when engaging 2nd and 4th gear.



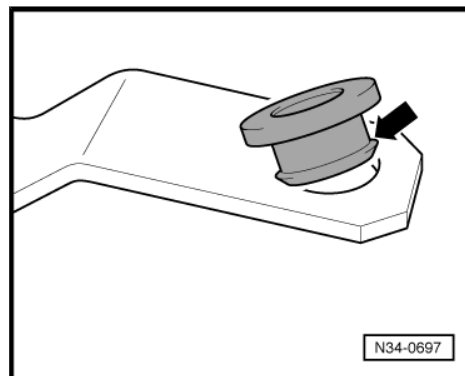
Pressing out bush for selector rod

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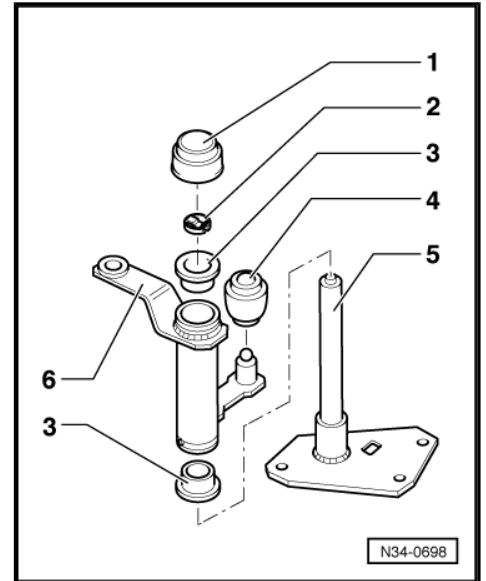
Pressing in bush for selector rod

- Coat bush lightly with grease and carefully press in collar of bush -arrow-.



Removing and installing relay shaft

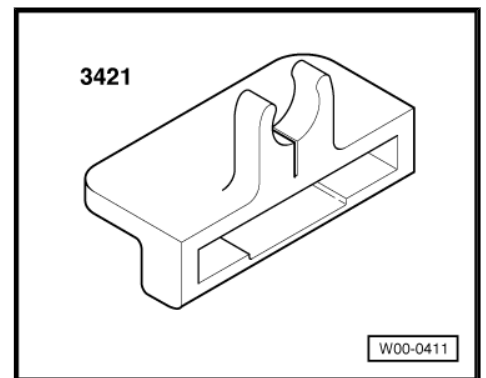
- 1 - Cap
- 2 - Push on securing clip as far as stop.
- 3 - Bearing bush
- 4 - Ball; use screwdriver to press off; press on as far as stop
- 5 - Mounting bracket
- 6 - Relay lever



1.6 Adjusting selector mechanism

Special tools and workshop equipment required

- ◆ Selector lever gauge -3421-

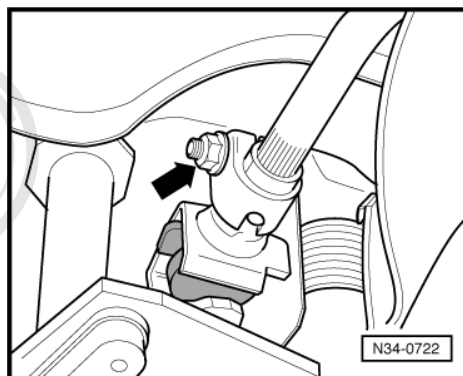


Note

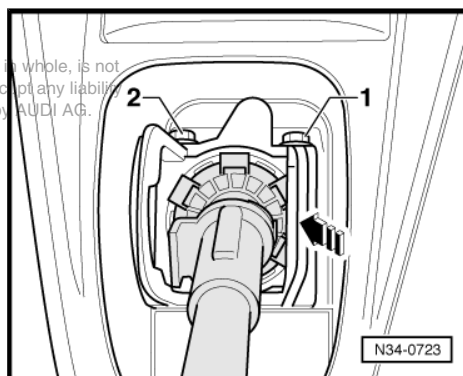
- ◆ *The following are prerequisites for correct gear lever alignment:*
- ◆ *Gear selector linkage must be in proper condition and undamaged.*
- ◆ *Selector mechanism must move freely.*
- ◆ *The gearbox, clutch and clutch mechanism must also be in proper condition.*
- Gearbox in neutral.

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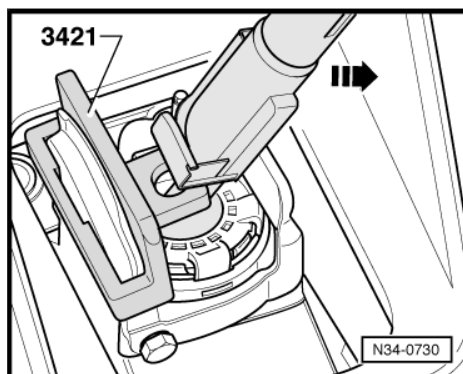
- Loosen clamp -arrow-. Connection between selector rod and gate selector lever should move freely.
- Pull gear lever boot off centre console.
- Remove rubber cover, if fitted.



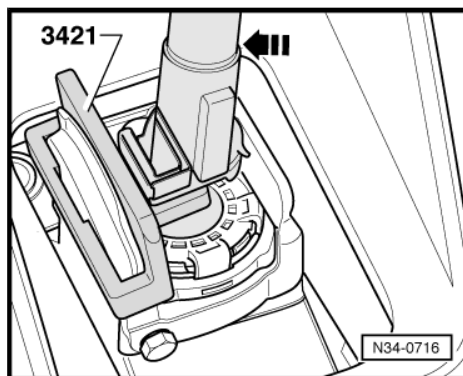
- Slacken bolts -1- and -2-.
- Press stop on right fully down in direction of -arrow-.
- Now tighten bolt -1- again.



- Press gear lever into 5th gear gate (direction of -arrow-) and fit selector lever gauge.
- Selector lever gauge must remain straight.



- Press gear lever into 3rd/4th gear gate (direction of -arrow-) and lock gear lever onto selector lever gauge.
- Align selector rod with gate selector lever.



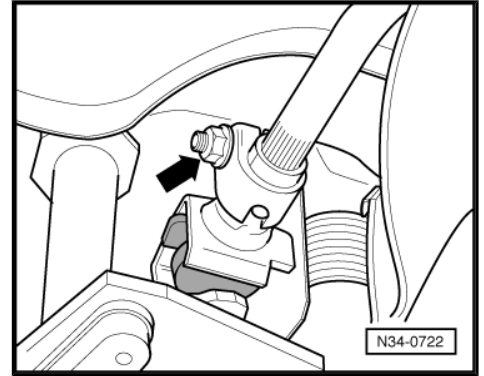
Note

Important: make sure that the gearbox is in neutral (no gear engaged).

- Tighten clamp -arrow-.

Parts must not be under tension.

- Remove selector lever gauge.
- Depress clutch.
- Engage reverse gear.



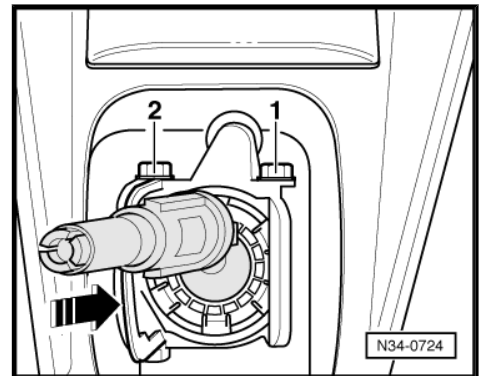
- Loosen bolt -1-.



Note

The left-hand side stop is then pushed down (direction of -arrow-).

- Now tighten bolts -1- and -2-.
- Disengage reverse gear.



Tightening torques

Clamp for selector rod	20 Nm
Gear lever stop to selector housing	25 Nm

Function

- With the gearbox in neutral, the gear lever should rest in the gate for 3rd and 4th gear.
- Depress clutch.
- Select all gears several times. Pay particular attention to the operation of the reverse gear locking mechanism.

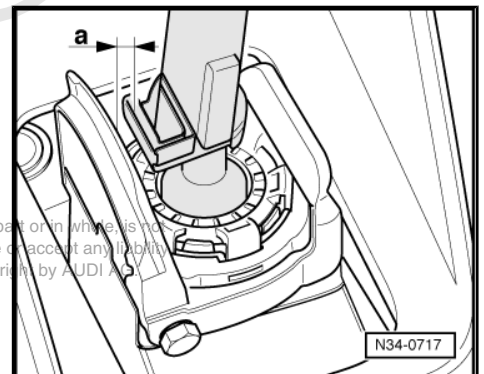
Should a gear fail to engage smoothly after repeated selection, continue as follows:

- Engage 1st gear.
- Take up play in selector mechanism by carefully pushing gear lever to the left.
- Distance -a- must then be 2.0 mm.
- If not, carry out fine adjustment ⇒ [page 47](#).

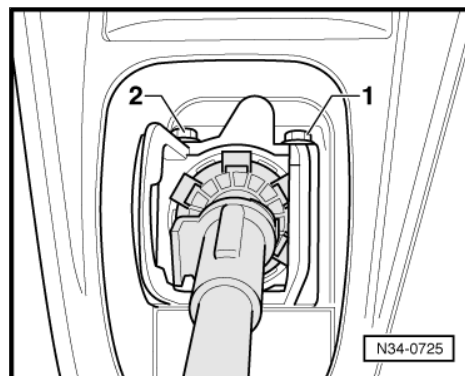
Fine adjustment

- With the gearbox in neutral, the gear lever should rest in the gate for 3rd and 4th gear.

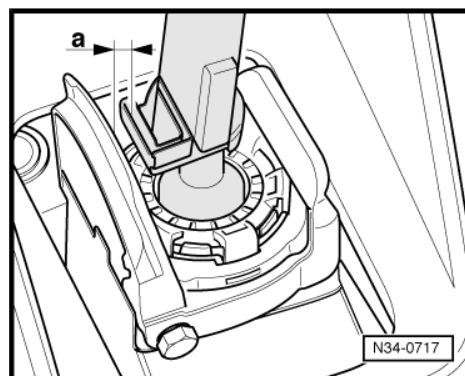
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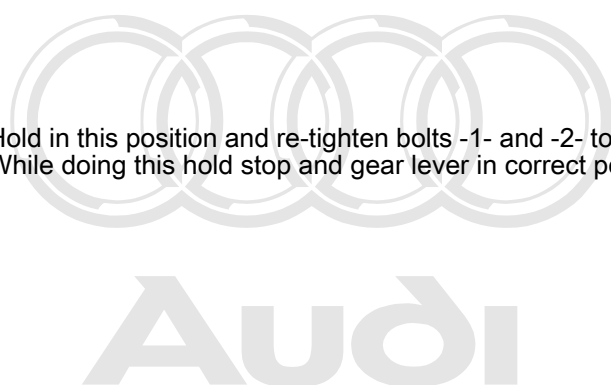
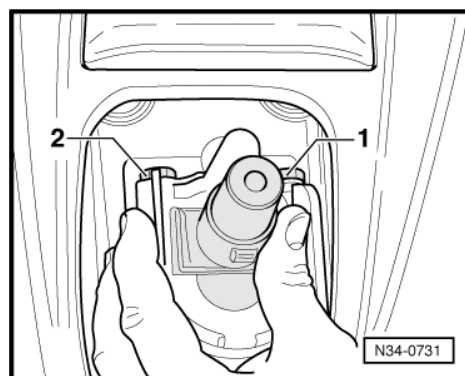
- Loosen bolts -1- and -2- just far enough so that the stop still remains in the new position when adjusting.
- Engage 1st gear.
- Take up play in selector mechanism by carefully pushing gear lever to the left.



- Set to dimension -a- (2.0 mm) by moving stop carefully.



- Hold in this position and re-tighten bolts -1- and -2- to 25 Nm. While doing this hold stop and gear lever in correct position.



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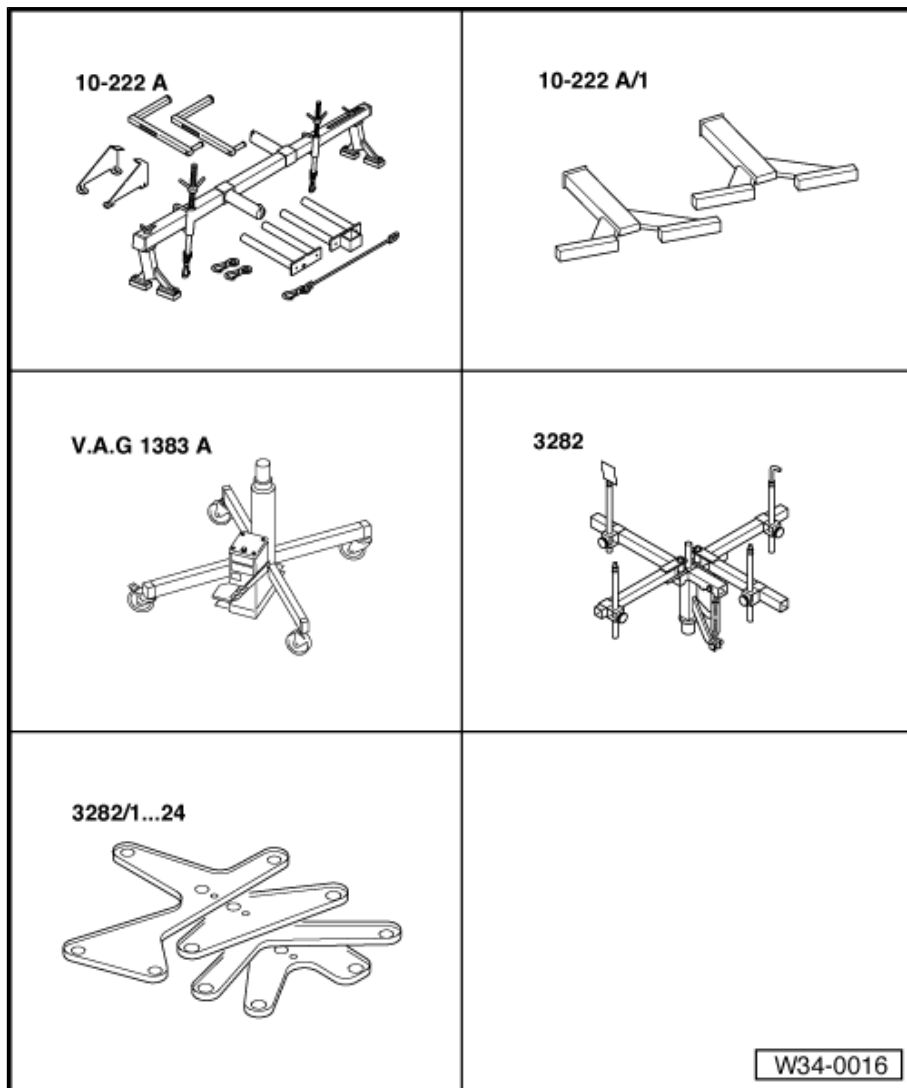
2 Removing and installing gearbox

⇒ "2.1 Removing gearbox", page 51

⇒ "2.2 Installing gearbox", page 56

Special tools and workshop equipment required

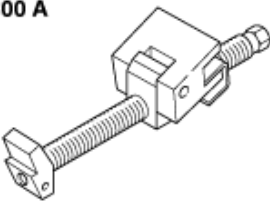
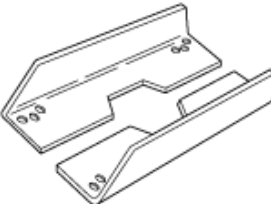
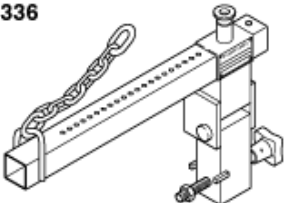
- ◆ Support bracket -10 - 222 A-
- ◆ Rack -10 - 222 A/1-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Gearbox support -3282-
- ◆ Adjustment plate -3282/5-



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Special tools and workshop equipment required

- ◆ Engine support -3300 A-
- ◆ Support rail -VW 457/1- (modifying ⇒ [page 50](#))
- ◆ Gearbox lifting tackle -3336-

3300 A 	VW 457 
3336 	
	W34-0017

Modifying support rail -VW 457/1-

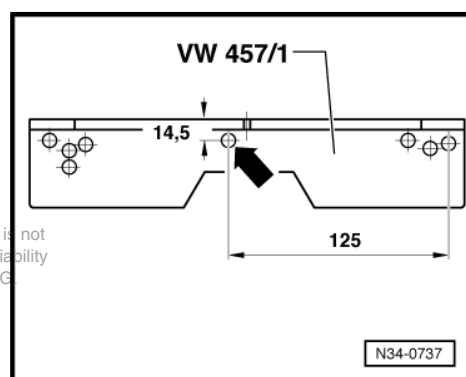
- Support rail -VW 457/1- is required to remove and install the gearbox.

A new drilling must be made in order to secure support rail -VW 457/1- to the subframe.

Dimensions are given in mm.

- If the hole is not present, drill a hole of 8.5 mm Ø -arrow- in support rail -VW 457/1- .

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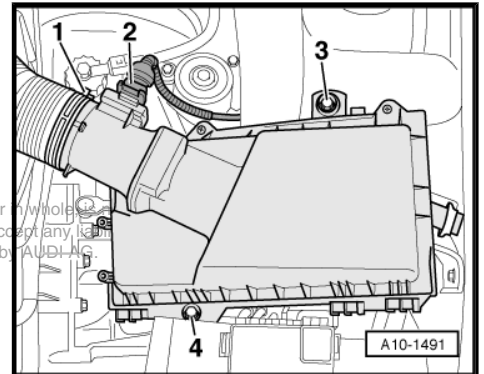
2.1 Removing gearbox

Note

All cable ties which are released or cut open when removing the gearbox must be refitted in the same position when installing the gearbox.

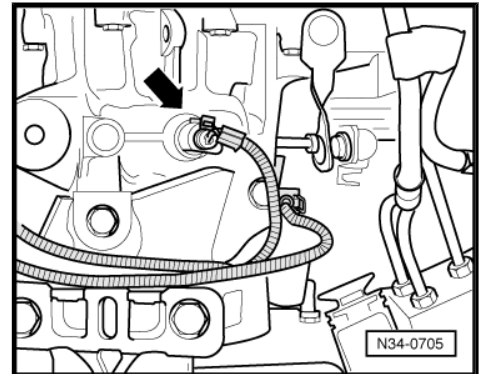
- Remove engine cover panel.
- Obtain radio code on vehicles with coded radio.
- With the ignition switched off, disconnect battery earth strap.
- Detach air hose -1- and connector -2- at air mass meter -G70-.
- Remove bolts -3- and -4- and detach air cleaner housing → Repair group 24.

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Up to gearbox build date 02 08 8

- Unplug connector from reversing light switch -F4- -arrow-.



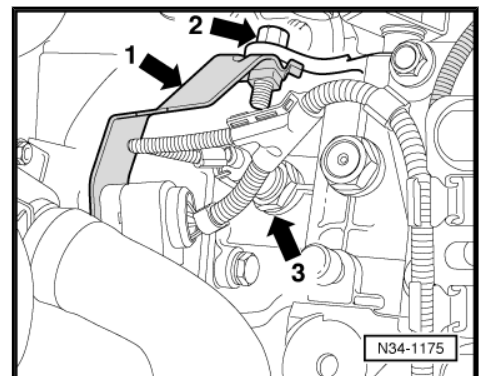
From gearbox build date 03 08 8 onwards

- Unplug connector from reversing light switch -F4- -arrow 3-.

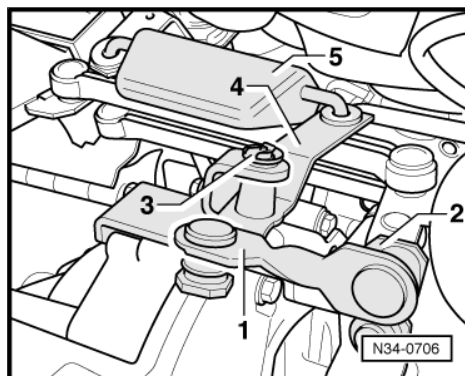
Note

Ignore -arrow 1- and -arrow 2-.

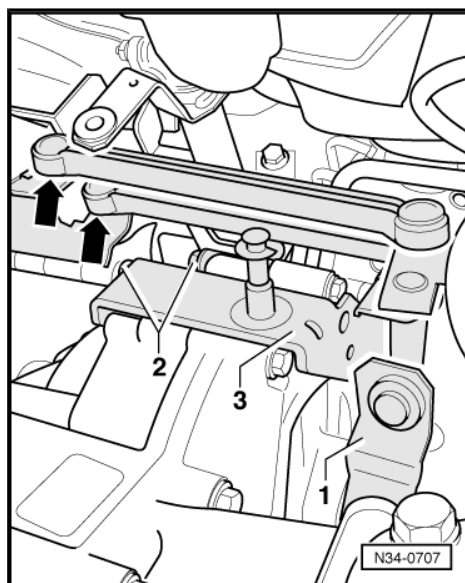
Continued for all vehicles



- Use screwdriver to lever off front selector rod -1- from gearbox selector lever -2-.
- Then remove securing clip -3-.
- Pull intermediate lever -4- off support bracket.
- Turn intermediate lever -4- and pull it off selector rod -5-.



- Then lever off both coupling rods -arrows-.
- Remove gearbox selector lever -1- from gearbox.
- Now remove the two bolts -2- for support bracket -3- on gearbox.
- Take off support bracket together with coupling rods and gearbox selector lever.

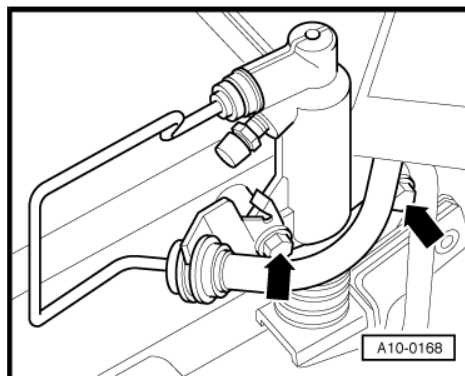


- Now remove slave cylinder -arrows-, move clear to the top and secure with wire. Do not disconnect pipes.

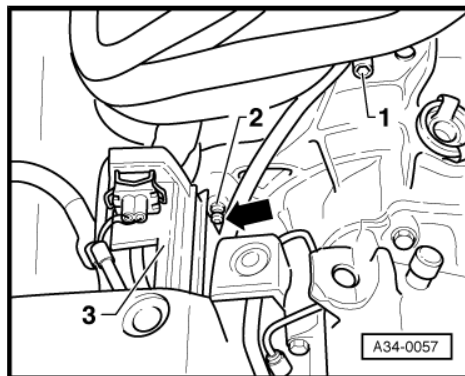


Note

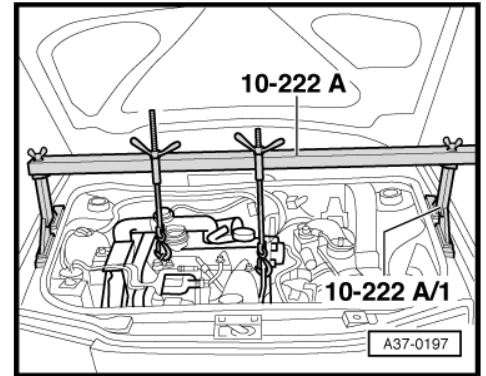
Do not depress clutch pedal.



- Detach earth strap at upper engine/gearbox connecting bolt -1-.
- Unbolt cable retainer -3- at starter -arrow- and place to one side.
- Then remove upper securing bolt -2- on starter.
- Remove all engine/gearbox connecting bolts which are accessible from above.
- If there are hoses and cable connections in area of engine lifting eyes for support bracket -10 - 222 A- , remove these now.



- Assemble support bracket -10 - 222 A- together with racks -10 - 222 A/1- .
- Partly take up weight of engine/gearbox assembly with the spindles.

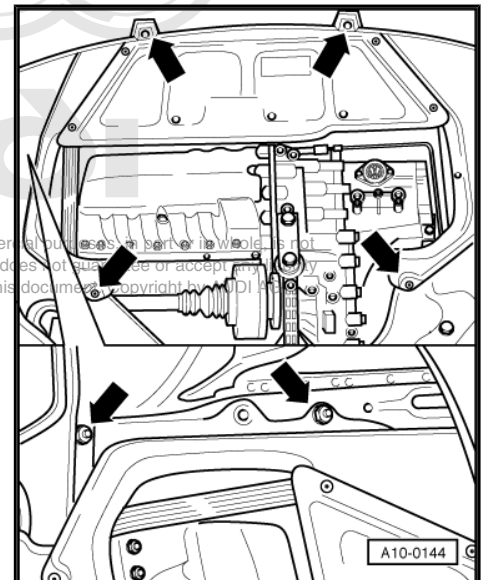
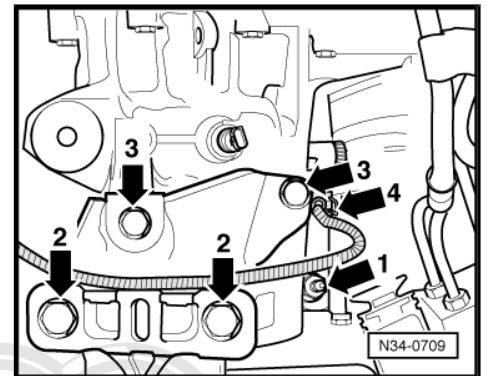


- Detach retainer for power steering pipe from rear bolt for gearbox bracket -arrow 1-.

 Note

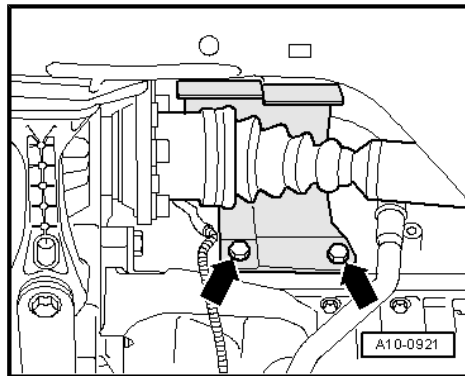
On some vehicles the retainer for the power steering pipe is fitted to the gearbox bracket.

- Remove hexagon bolts -arrows 2- from gearbox mounting on left side.
- Remove gearbox bracket -arrows 3- and -arrow 1-.
- Unplug connector from speedometer sender -G22- -arrow 4-.
- Disconnect all other electrical connections and earth wires from gearbox and from engine/gearbox securing bolts.
- Unscrew bolts -arrows- and remove noise insulation completely.
- Remove wheel housing liner (left-side).
- Remove starter => Rep. Gr. 27 .

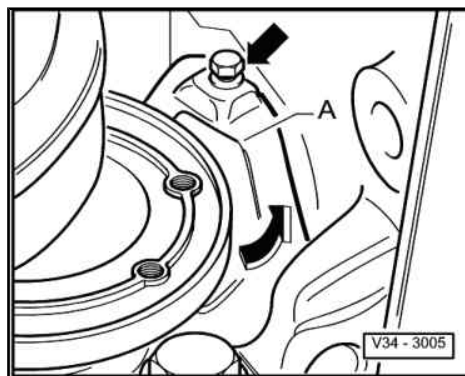


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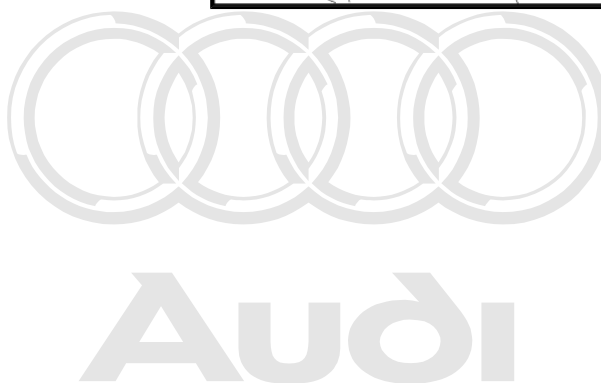
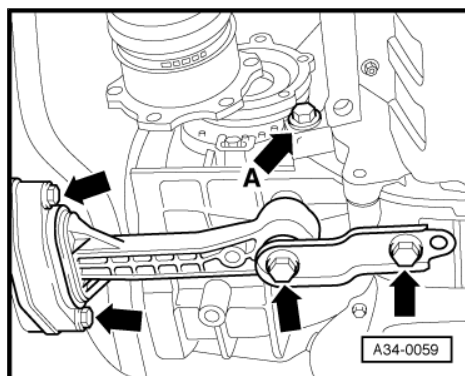
- If fitted, remove protective cover for right inner constant velocity joint -arrows-.
- Turn wheels onto left lock.
- Disconnect drive shafts from flange shafts and tie up as high as possible, taking care not to damage surface coating.



- Remove small cover plate -A- for flywheel behind right-hand flange shaft -arrows-.
- Remove catalytic converter ⇒ Rep. Gr. 26 .



- Remove pendulum support -arrows-.
- Remove rear engine/gearbox connecting bolt -arrow A-.
- Lower engine/gearbox assembly slightly using left-hand spindle.



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- Bolt support rail -VW 457/1- to both threaded holes for pendulum support securing bolts on subframe.
- Spacers totalling 6 mm must be inserted between subframe and support rail -VW 457/1- .

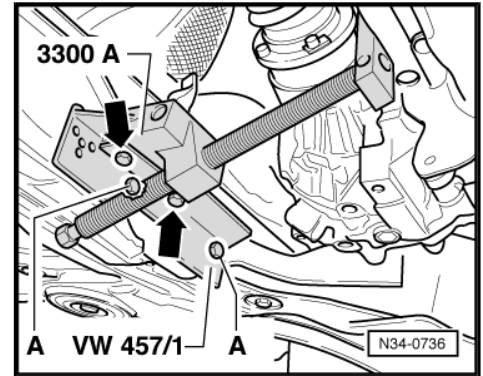
A - 2 hexagon bolts M8 x 25

- Fit engine support -3300 A- and secure -arrows-.
- Carefully press engine/gearbox unit forwards.

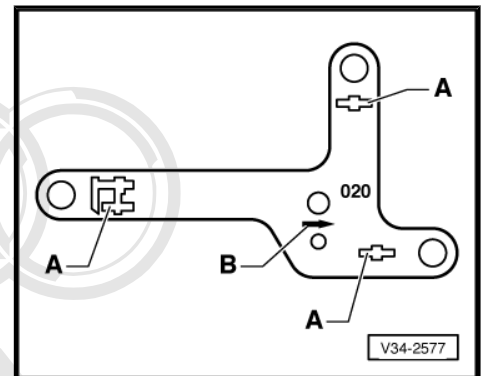


Note

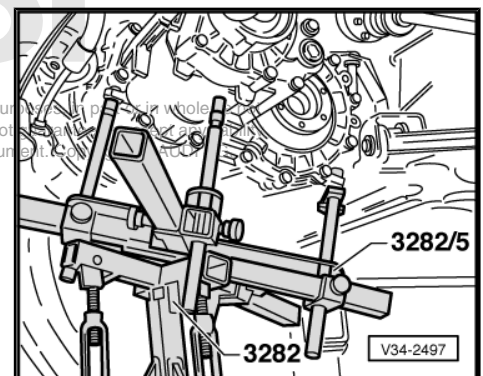
Do not damage power steering pipe when moving engine/gearbox assembly.



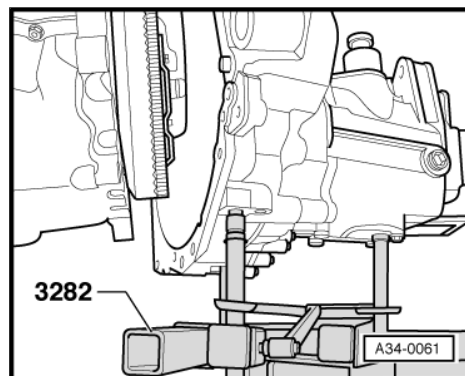
- Assemble gearbox jack with gearbox support -3282- , adjustment plate -3282/5- for "020" gearbox and support elements as follows:
- Place adjustment plate -3282/5- on gearbox support -3282- (adjustment plate only fits in one position).
- Align arms of gearbox support according to holes in adjustment plate.
- Bolt on support elements -A-, as illustrated on adjustment plate.



- Run gearbox jack under vehicle; arrow symbol -B- ➔ [page 55](#) , Fig. V34-2577 on adjustment plate points to front of vehicle.
- Align adjustment plate parallel to gearbox and lock safety support on gearbox.
- Remove bottom engine/gearbox connecting bolts.



- Push the gearbox off the dowel sleeves and swing carefully towards the subframe.
- Slightly lower gearbox and tilt via spindles of gearbox support -3282- .



- Then lower gearbox carefully, guiding right-hand flange shaft -A- past flywheel as illustrated and left-hand flange shaft -B- past subframe.
- When lowering the gearbox, change position of gearbox using the spindles on gearbox support -3282- .



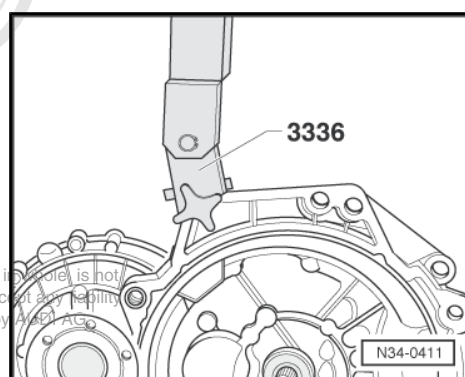
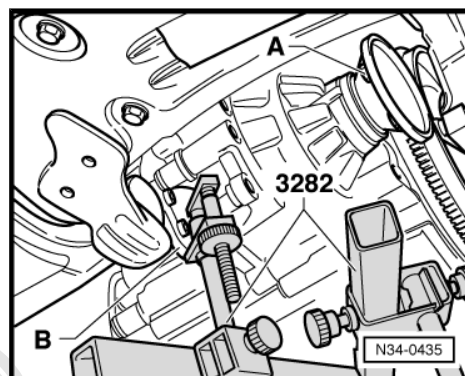
Note

Do not damage power steering pipe when lowering gearbox.

Transporting gearbox

Gearbox lifting tackle -3336- can be used to transport the gearbox and also when setting up gearbox support -3282- .

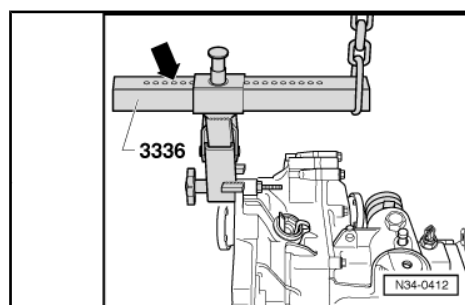
- Bolt gearbox lifting tackle -3336- to clutch housing.



- Set support arm on sliding bracket by means of locking pin -arrow-.

Number of holes visible = 6

- Take up gearbox with workshop hoist and gearbox lifting tackle -3336- .
- Set down gearbox as required (for example in transport container).



2.2 Installing gearbox

- Clean splines of input shaft and apply a thin coat of grease - G 000 100- .

It should be possible to push the clutch plate back and forth slightly on the input shaft.

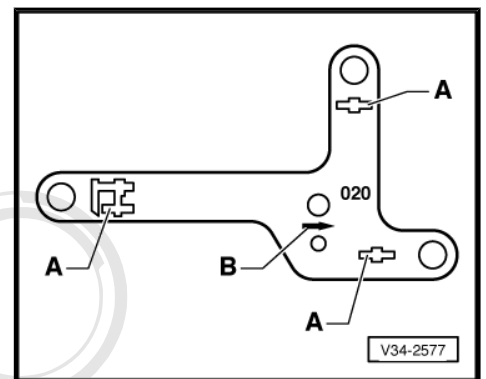
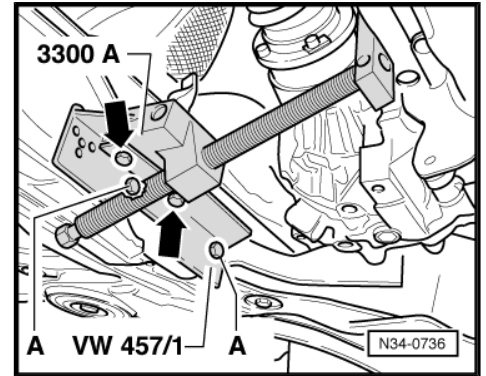
- Check that dowel sleeves for centralising engine/gearbox are in the cylinder block; install if necessary.

If the dowel sleeves are not fitted, this will lead to gear-change problems, clutch malfunction and in some cases gearbox noise (gears will make rattling noises).

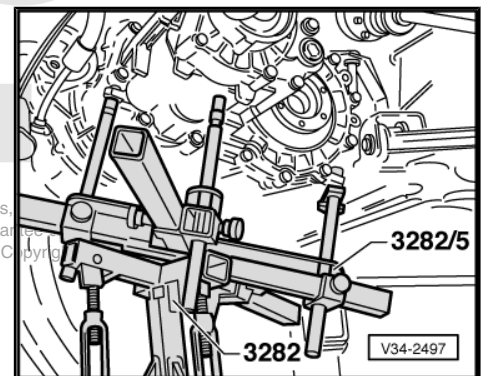
- Ensure that intermediate plate is correctly positioned on engine.
- Bolt support rail -VW 457/1- to both threaded holes for pendulum support securing bolts on subframe.
- Spacers totalling 6 mm must be inserted between subframe and support rail -VW 457/1- .

A - 2 x Hexagon bolts M 8 x 25

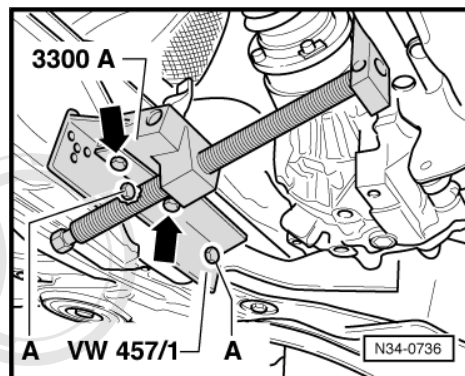
- Fit engine support -3300 A- and secure -arrows-.
- Press engine forward carefully.
- Assemble gearbox jack with gearbox support -3282- , adjustment plate -3282/5- for "020" gearbox and support elements as follows:
- Place adjustment plate -3282/5- on gearbox support -3282- (adjustment plate only fits in one position).
- Align arms of gearbox support according to holes in adjustment plate.
- Bolt on support elements -A-, as illustrated on adjustment plate.
- Place gearbox on gearbox jack.
- Align adjustment plate and gearbox parallel with one another and lock safety support on gearbox.



- Run gearbox jack under vehicle; arrow symbol -B- => [page 57](#) , Fig. V34-2577 on adjustment plate points to front of vehicle.
- Align adjustment plate parallel to gearbox and lock safety support on gearbox.
- Bring gearbox into position.
- Install bottom engine/gearbox securing bolts.



- Detach engine support -3300 A- -arrows-.
- Then remove bolts -A- and remove support rail -VW 457/1- .
- Install top engine/gearbox securing bolts.



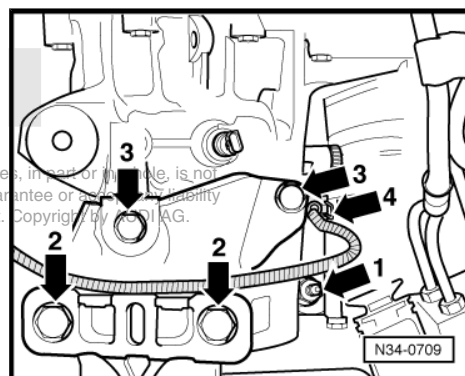
- Install gearbox bracket using new hexagon bolts -arrows 3- and -arrow 1-.
- Align engine/gearbox in installation position. To do this, tighten left-hand spindle on support bracket -10 - 222 A- .



Caution

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Before tightening bolts between gearbox mounting and gearbox bracket, the mounting and bracket must be aligned in an absolutely parallel position, otherwise the threads will be damaged.



- Fit new hexagon bolts -arrows 2- for left-hand assembly mounting in gearbox mounting and tighten to torque.



Note

When installing gearbox ensure engine/gearbox mountings are installed stress-free ⇒ Rep. Gr. 10 .



WARNING

Do not remove support bracket -10 - 222 A- until all bolts securing the engine/gearbox mountings (left and right) have been tightened to the specified torque.

- Attach connector to speedometer sender -G22- -arrow 4-.
- Attach retainer for power steering pipe at rear bolt -arrow 1- for gearbox bracket.

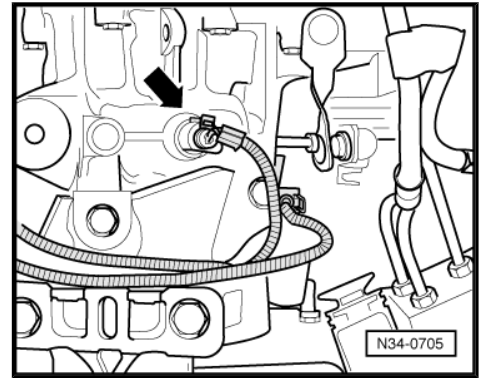


Note

On some vehicles the retainer for the power steering pipe is fitted to the gearbox bracket.

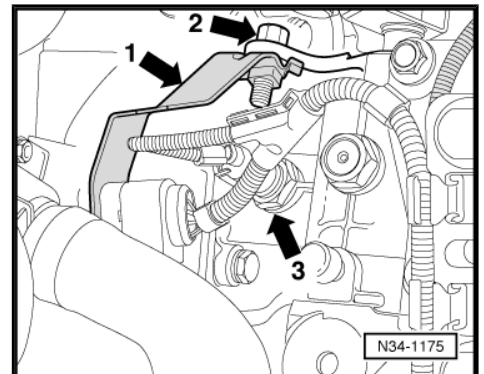
Up to gearbox build date 02 08 8

- Plug connector into reversing light switch -F4- -arrow-.

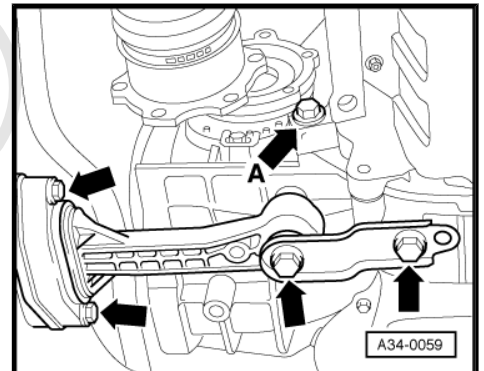


From gearbox build date 03 08 8 onwards

- Plug connector into reversing light switch -F4- -arrow 3-.



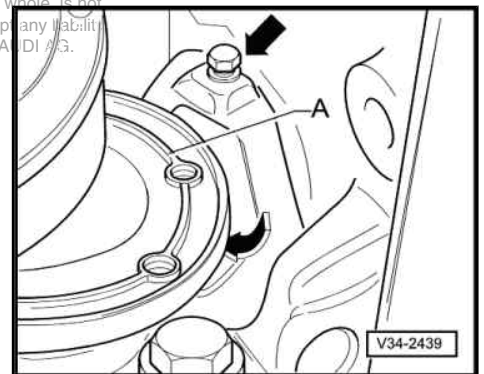
- Fit bottom bolt -arrow A- securing engine to gearbox and tighten to specified torque.
- Install pendulum support -arrows-.
- Use new bolts.



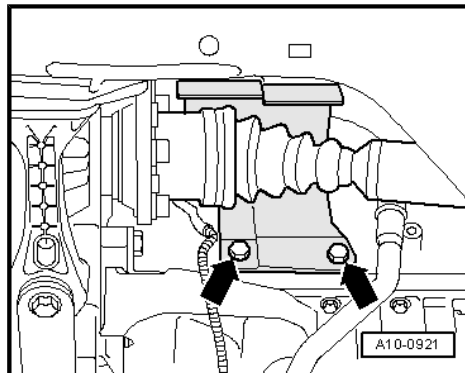
- Install small cover plate -A- behind flange shaft (right side) -arrows-.

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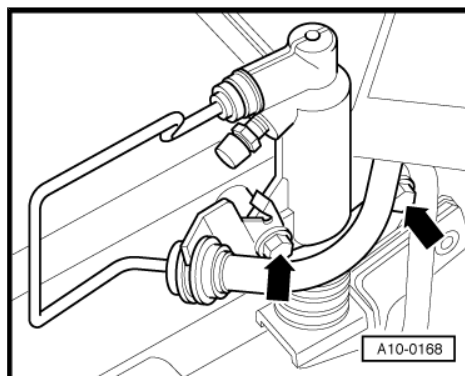
- Fit drive shafts to gearbox ⇒ Rep. Gr. 40 .



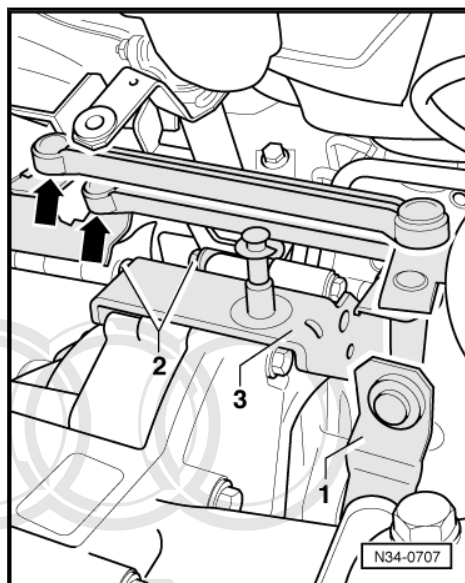
- Fit protective cover for right inner constant velocity joint -arrows- ⇒ Rep. Gr. 40
- Install catalytic converter ⇒ Rep. Gr. 26 .
- Install starter ⇒ Rep. Gr. 27 .



- Install slave cylinder -arrows-.
- Attach all electrical connections and earth wires to gearbox and to engine/gearbox securing bolts.

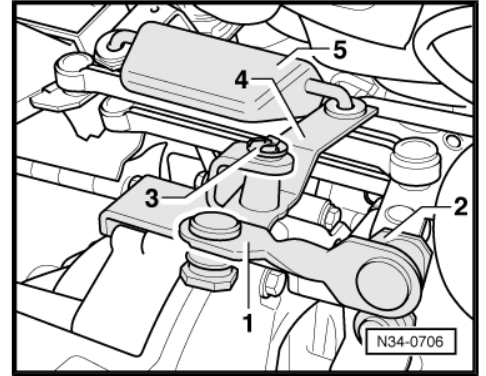


- Insert support bracket -3- together with coupling rods and gearbox selector lever -1-.
- Now fit the two bolts -2- for support bracket -3- on gearbox.
- Fit gearbox selector lever -1- onto gearbox.
- Then press on both coupling rods -arrows-.



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- Connect intermediate lever -4- to selector rod -5-.
 - Now fit intermediate lever -4- onto pin on support bracket.
 - Fit securing clip -3- onto stop.
 - Press front selector rod -1- onto gearbox selector lever -2-.
 - Install air cleaner ⇒ Rep. Gr. 24 .
 - Install engine cover panel.
 - Adjust selector mechanism ⇒ [page 45](#) .
 - Check gearbox oil ⇒ [page 69](#) .
 - Install noise insulation below engine/gearbox ⇒ Rep. Gr. 50 .
 - Reconnect earth strap to battery.
- ⇒ Rep. Gr. 27 .



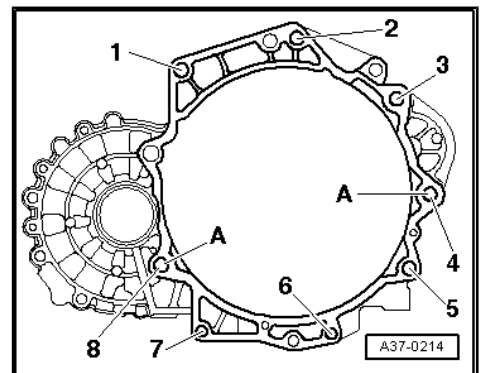
 Note

When the battery is reconnected, please remember to check and activate the vehicle equipment (radio, clock, convenience electrical systems etc.).

Tightening torques

Gearbox to engine

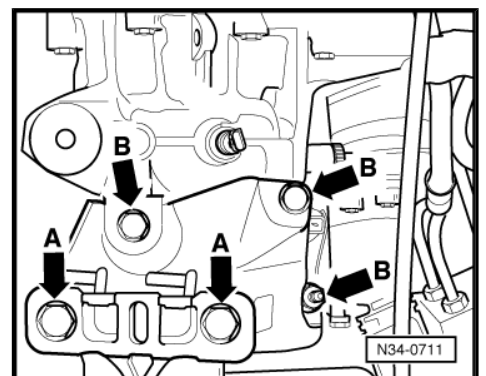
Item	Bolt	Qty.	Nm
1	M 12 x 65	1	80
2 1)	M 12 x 65	1	80
3 1)	M 12 x 140	1	80
4 1)	M 12 x 140	1	80
5	M 10 x 50	1	45
6	M 10 x 50	1	45
7	M 10 x 50	1	45
8	M 12 x 80	1	80
A	Dowel sleeves for centralising		
• 1) Bolt with stud M8			



Gearbox to body

- Renew bolts -A- and -B-.

Bolts -A-	60 Nm + 90° ¹⁾
Bolts -B-	50 Nm + 90° ¹⁾
• ¹⁾ 90° is equivalent to a quarter turn	



 Note

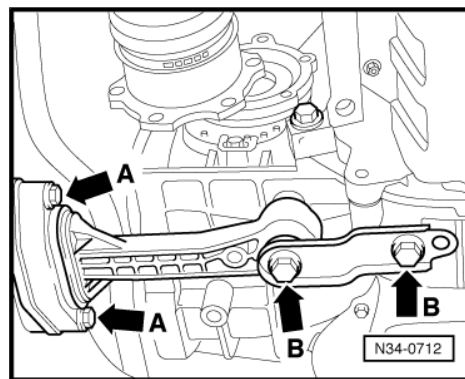
When installing gearbox ensure engine/gearbox mountings are installed stress-free ⇒ Rep. Gr. 10 .

Rear gearbox mounting

- Renew bolts -arrows A- and -arrows B-.

Bolts -arrows A-	20 Nm + 90° ¹⁾
Bolts -arrows B-	40 Nm + 90° ¹⁾
• ¹⁾ 90° is equivalent to a quarter turn	

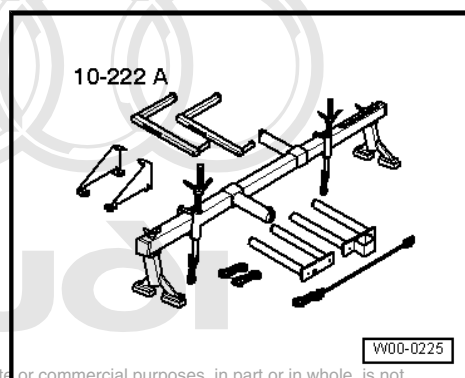
Cover plate for flywheel	10 Nm
Protective cover for right inner constant velocity joint to engine	M8 = 20 Nm M10 = 35 Nm
Slave cylinder to gearbox	25 Nm
Gearbox selector lever to gearbox ¹⁾	20 Nm
• ¹⁾ Renew nut	



2.3 Removing and installing gearbox mounting

Special tools and workshop equipment required

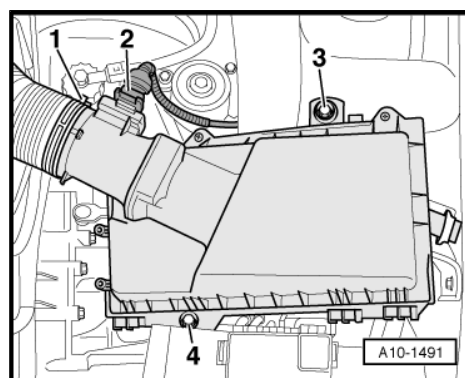
- ◆ Support bracket -10-222 A-



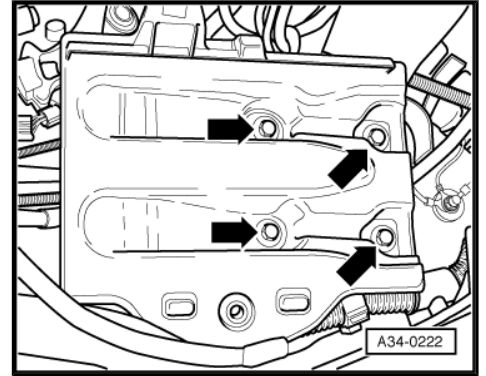
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Removing gearbox mounting

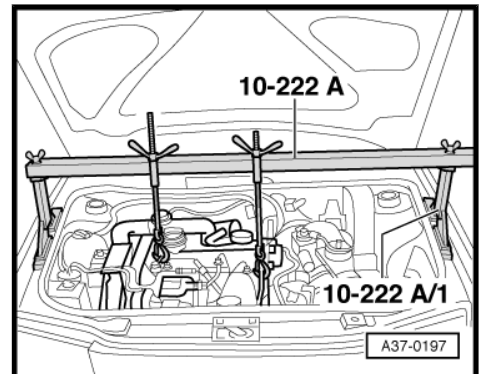
- Remove engine cover panel.
- Obtain radio code on vehicles with coded radio.
- With the ignition switched off, disconnect battery earth strap.
- Detach air hose -1- and connector -2- at air mass meter -G70-.
- Remove bolts -3- and -4- and detach air cleaner housing ⇒ Repair group 24 .



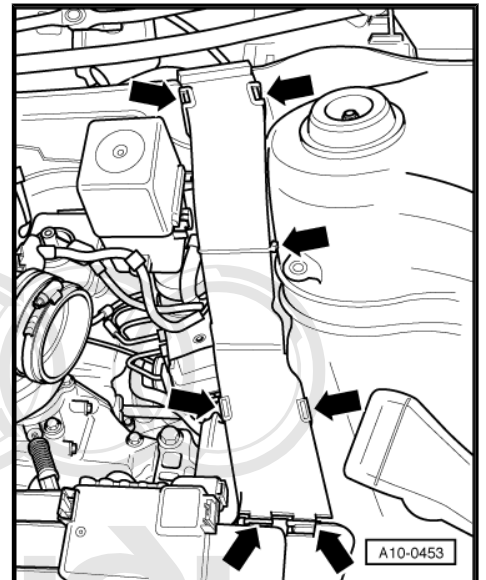
- Remove battery and battery tray -arrows- ⇒ Rep. Gr. 27 .
- If there are hoses and cable connections in area of engine lifting eyes for support bracket -10 - 222 A- , remove these now.



- Assemble support bracket -10 - 222 A- together with racks -10 - 222 A /1- .
- Attach spindles of support bracket to engine lifting eyes.
- Take up weight of engine/gearbox assembly via the spindles, but do not raise.



- Open wiring duct on left in engine compartment -arrows-.
- Move wiring in wiring duct and wiring duct clear far enough to be able to remove securing bolts for gearbox mounting.

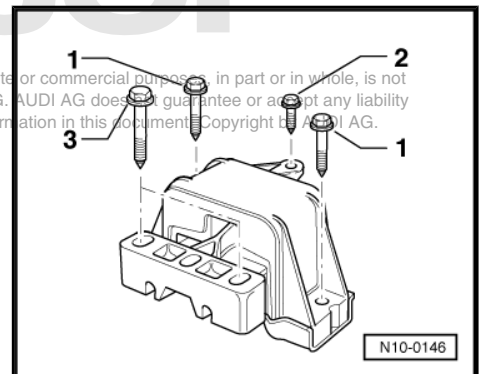


- Unscrew bolts -1...3- and remove gearbox mounting.

Installing gearbox mounting

Installation is carried out in reverse sequence; note the following:

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- Secure gearbox mounting to body with bolt -2- and new bolts -1-.

Bolts -1-	40 Nm + 90° 1) 2)
Bolt -2-	25 Nm
• 1) Renew bolts • 2) 90° is equivalent to a quarter turn	

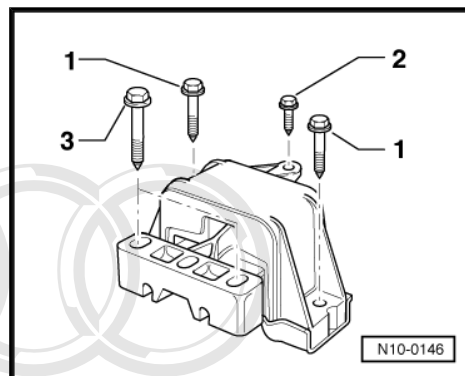
- Pull gearbox up to gearbox mounting with spindle on support bracket -10-222 A- to fit new bolts -3- to gearbox bracket.



Caution

Before tightening bolts -3- between gearbox mounting and gearbox bracket, the mounting and bracket must be aligned in an absolutely parallel position, otherwise the threads will be damaged. If necessary, push gearbox up at rear with trolley jack.

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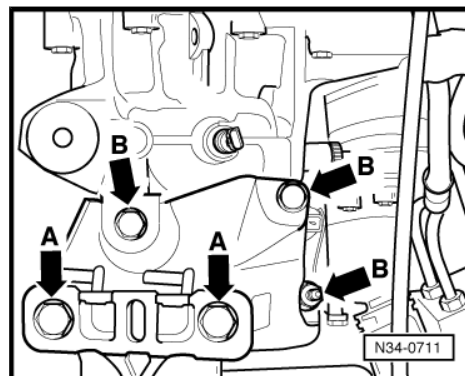
- Bolt gearbox bracket onto support arm of gearbox mounting using new bolts -arrows A-.

Bolts -arrows A-	60 Nm + 90° 1) 2)
• 1) Renew bolts • 2) 90° is equivalent to a quarter turn	



Note

When installing gearbox ensure engine/gearbox mountings are installed stress-free ⇒ Rep. Gr. 10 .



WARNING

Do not remove support bracket -10 - 222 A- until all bolts securing the engine/gearbox mountings (left and right) have been tightened to the specified torque.

- Install battery tray and battery ⇒ Rep. Gr. 27 .
- Install complete air cleaner housing ⇒ Repair group 24 .
- Install engine cover panel.
- Connect the battery.



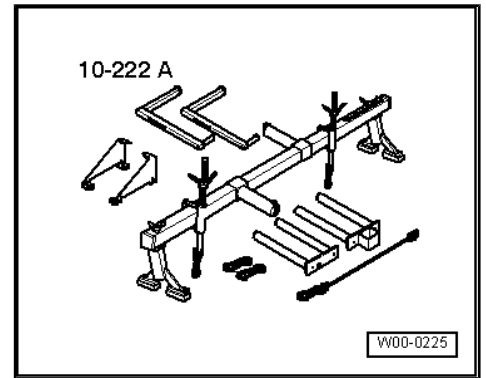
Note

When the battery is reconnected, please remember to check and activate the vehicle equipment (radio, clock, convenience electrical systems etc.).

2.4 Removing and installing gearbox bracket

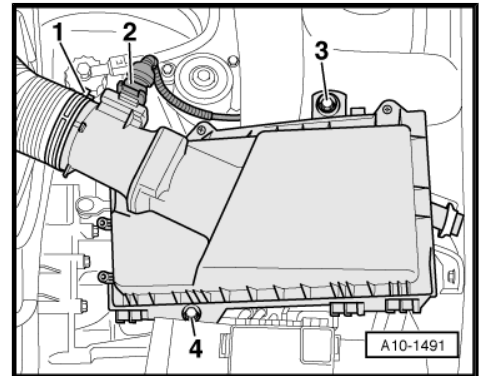
Special tools and workshop equipment required

◆ Support bracket -10-222 A-

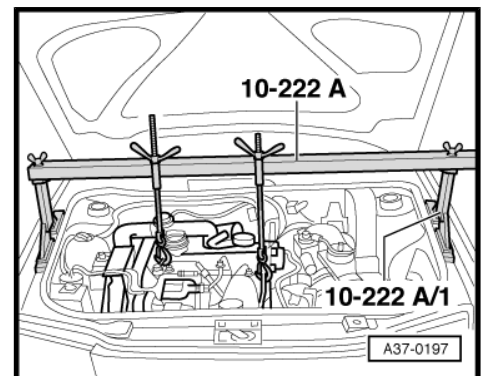


Removing gearbox bracket

- Remove engine cover panel.
- Obtain radio code on vehicles with coded radio.
- With the ignition switched off, disconnect battery earth strap.
- Detach air hose -1- and connector -2- at air mass meter -G70- .
- Remove bolts -3- and -4- and detach air cleaner housing ⇒ Repair group 24 .
- If there are hoses and cable connections in area of engine lifting eyes for support bracket -10 - 222 A- , remove these now.



- Assemble support bracket -10 - 222 A- together with racks -10 - 222 A /1- .
- Attach spindles of support bracket to engine lifting eyes.
- Take up weight of engine/gearbox assembly via the spindles, but do not raise.
- Remove centre noise insulation (below engine/gearbox) and left noise insulation ⇒ Rep. Gr. 50 .



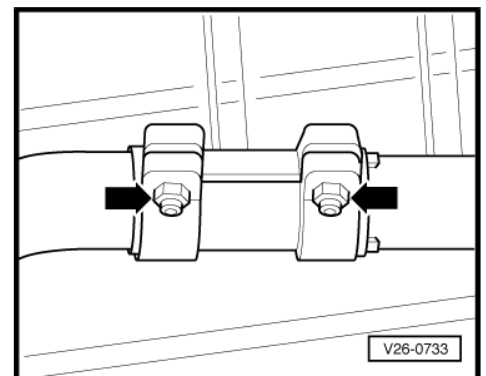
- Disconnect exhaust system at clamp -arrows-.



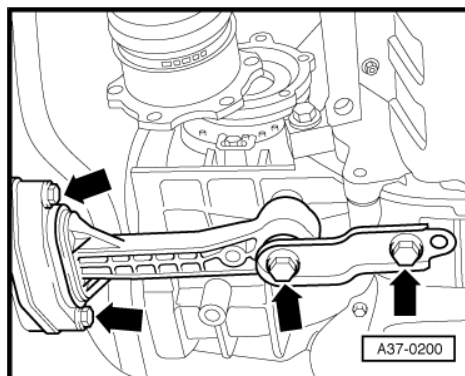
Note

The flexible pipe connection (de-coupling element) in the front exhaust pipe must not be bent more than 10 ° - otherwise it can be damaged.

- Tie up the front exhaust pipe.
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- Unbolt pendulum support -arrows-.

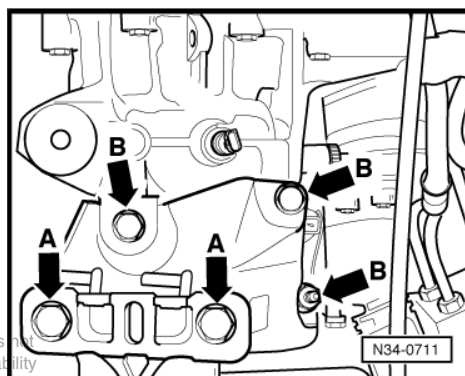


- Remove bolts -arrows A- at left mounting from gearbox mounting/gearbox bracket.
- Detach retainer for power steering pipe from rear bolt for gearbox bracket.


Note

On some vehicles the retainer for the power steering pipe is fitted to the gearbox bracket.

- Remove bolts -arrows A-.
- Lower engine/gearbox assembly via the spindles until gearbox bracket can be detached from gearbox.

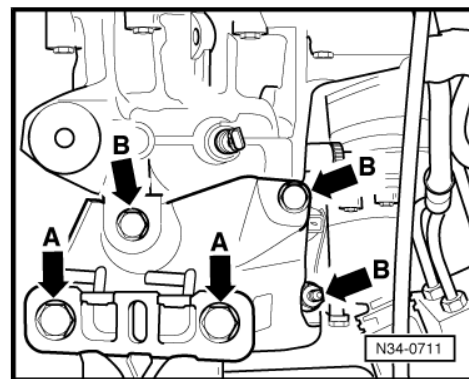

Installing gearbox bracket

Installation is carried out in reverse sequence; note the following:

- Renew bolts -arrows A- and -arrows B-.
- Initially hand-tighten new bolts -arrows B-.
- Then tighten bolts -arrows B- to specified torque.

Bolts -arrows B-	50 Nm + 90° 1) 2)
• 1) Renew bolts • 2) 90° is equivalent to a quarter turn	

- Pull gearbox up to gearbox mounting via spindle on support bracket -10-222 A- in order to fit new bolts -arrows A- in gearbox bracket.



Caution

Before tightening bolts between gearbox mounting and gearbox bracket, the mounting and bracket must be aligned in an absolutely parallel position, otherwise the threads will be damaged.

- Bolt gearbox bracket onto support arm of gearbox mounting using new bolts -arrows A-.



Note

When installing gearbox ensure engine/gearbox mountings are installed stress-free ⇒ Rep. Gr. 10.

Bolts -arrows B-	60 Nm + 90° 1) 2)
• 1) Renew bolts • 2) 90° is equivalent to a quarter turn	



WARNING

Do not remove support bracket -10- 222 A- until all bolts securing the engine/gearbox mountings (left and right) have been tightened to the specified torque.

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- Install pendulum support ⇒ [page 68](#).
- Assemble exhaust system and align so it is free of stress ⇒ Rep. Gr. 26.
- Install complete air cleaner housing ⇒ Repair group 24.
- Install engine cover panel.
- Connect the battery.



Note

When the battery is reconnected, please remember to check and activate the vehicle equipment (radio, clock, convenience electrical systems etc.).

- Install centre noise insulation (below engine/gearbox) and left noise insulation ⇒ Rep. Gr. 50 .

2.5 Removing and installing pendulum support

Removing pendulum support

- Remove centre noise insulation (below engine/gearbox) ⇒ Rep. Gr. 50 .
- Unscrew bolts -arrows- and detach pendulum support.

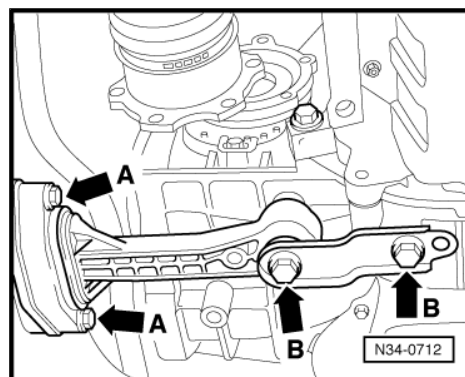
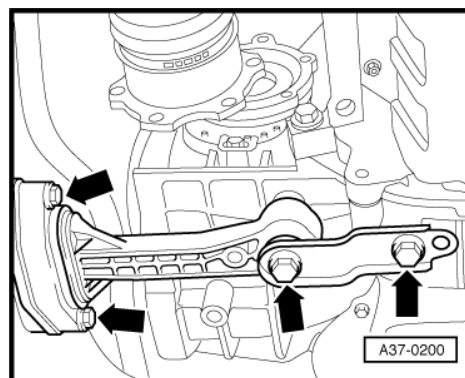
Installing pendulum support

Installation is carried out in reverse sequence; note the following:

- Secure pendulum support to subframe with new bolts -arrows A- and to gearbox -arrows B-.

Bolts -arrows A-	20 Nm + 90° 1) 2)
Bolts -arrows B-	40 Nm + 90° 1) 2)
• 1) Renew bolts • 2) 90° is equivalent to a quarter turn	

- Install centre noise insulation (below engine/gearbox) ⇒ Rep. Gr. 50 .



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3 Checking gearbox oil

For gear oil specification, refer to ⇒ Electronic parts catalogue .

- Turn steering to left onto full lock.
- Remove noise insulation (left-side) ⇒ Rep. Gr. 50 .
- Remove gear oil inspection plug -arrow-.

Oil level is correct when gearbox oil is up to bottom lip of filler hole.

- Screw in plug -arrow-.

Tightening torque

Oil filler plug	25 Nm
-----------------	-------

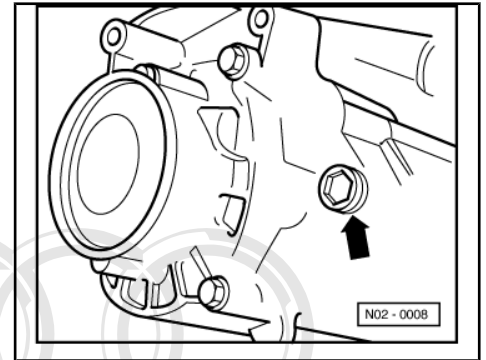
Note the following when filling with new oil:

- Remove plug -arrow-.
- Fill up gear oil to bottom lip of filler hole.
- Screw in plug -arrow-.
- Start engine, engage a gear and allow gearbox to turn for approx. 2 minutes.
- Switch off engine and remove plug -arrow-.
- Top up gear oil again to bottom lip of filler hole.
- Screw in plug -arrow-.

Tightening torque

Oil filler plug	25 Nm
-----------------	-------

- Install noise insulation (left-side) ⇒ Rep. Gr. 50 .



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4 Dismantling and assembling gearbox

4.1 General layout of gearbox

1 - Clutch housing

- Servicing ⇒ [page 99](#)

2 - Differential

- Dismantling and assembling ⇒ [page 131](#)

3 - Output shaft

- Dismantling and assembling ⇒ [page 117](#)

4 - Input shaft

- Dismantling and assembling ⇒ [page 109](#)

5 - 1st gear

6 - Reverse gear

7 - 2nd gear

8 - Gearbox housing cover

- Servicing ⇒ [page 104](#)

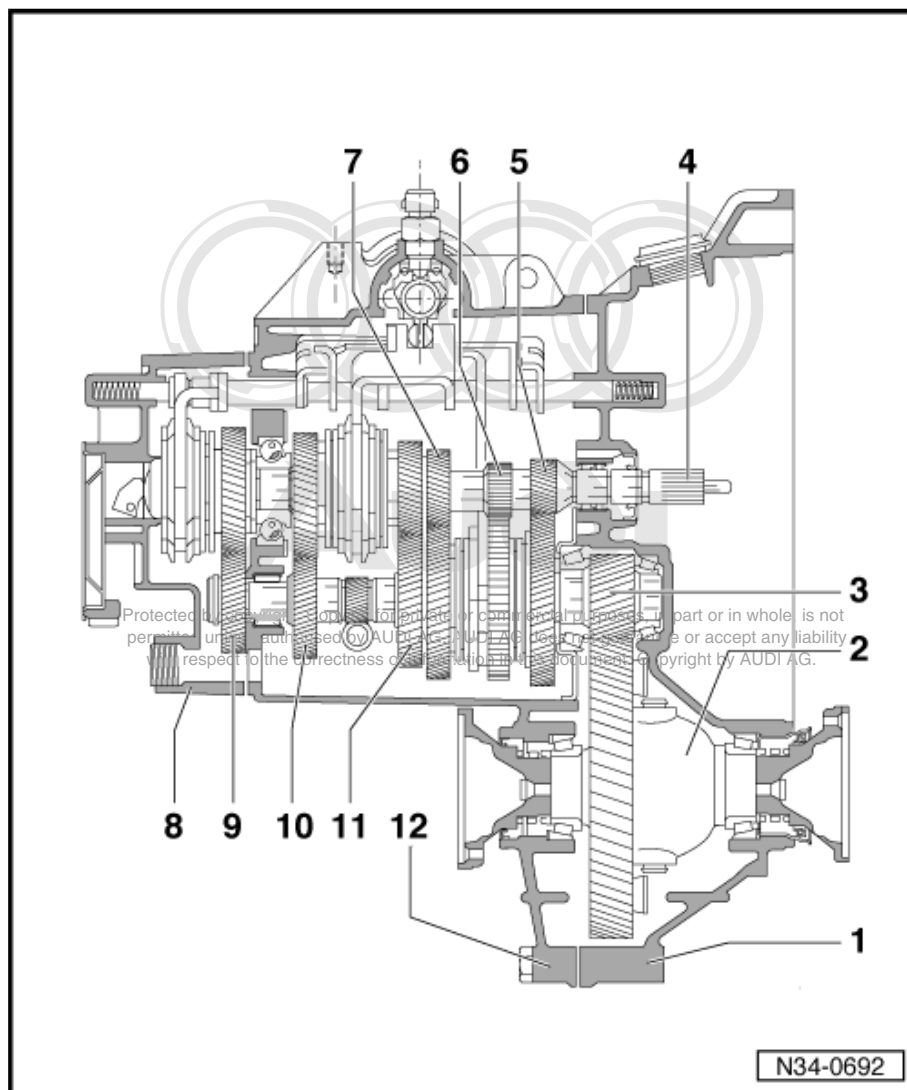
9 - 5th gear

10 - 4th gear

11 - 3rd gear

12 - Gearbox housing

- Servicing ⇒ [page 94](#)



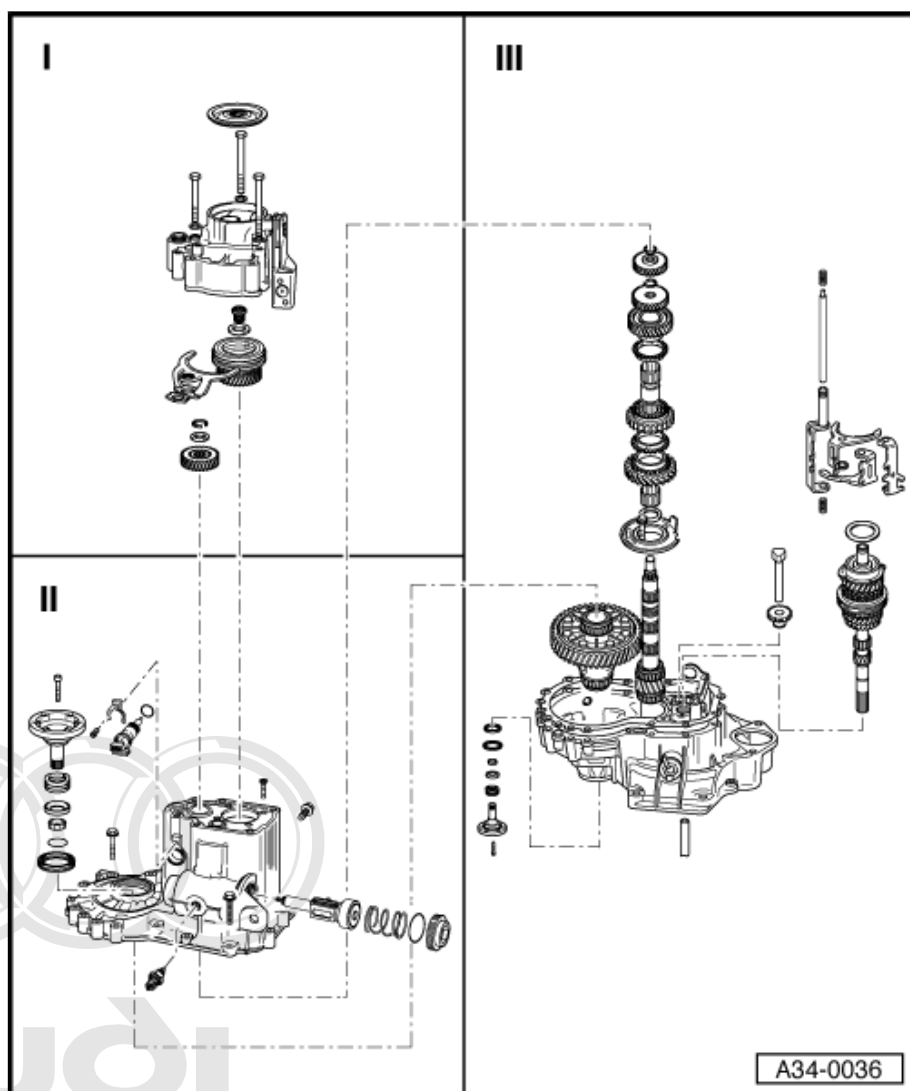
4.2 Exploded view

Sequence for dismantling and assembling ⇒ [page 76](#)

I - Removing and installing gearbox housing cover and 5th gear ⇒ [page 72](#)

II - Removing and installing gearbox housing and selector shaft ⇒ [page 73](#)

III - Removing and installing input shaft, output shaft, differential and selector forks ⇒ [page 75](#)



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4.3 Exploded view - removing and installing gearbox housing cover and 5th gear

1 - Bolt

- ☐ 25 Nm
- ☐ M8 x 50
- ☐ 4x

2 - Sealing cap

- ☐ Removing and installing
⇒ [page 76](#)
- ☐ Renew

3 - Bolt

- ☐ 25 Nm
- ☐ M8 x 85
- ☐ 2x

4 - Gearbox housing cover

- ☐ Servicing ⇒ [page 104](#)
- ☐ Removing and installing
⇒ [page 76](#)

5 - Locking collar/synchronising hub for 5th gear with check ring

- ☐ Dismantling and assembling
⇒ [page 109](#)

6 - Circlip

- ☐ Always renew circlips which have been damaged or over-stretched

7 - Thrust washer

8 - 5th gear wheel

- ☐ Install with groove facing up

9 - Locking plate

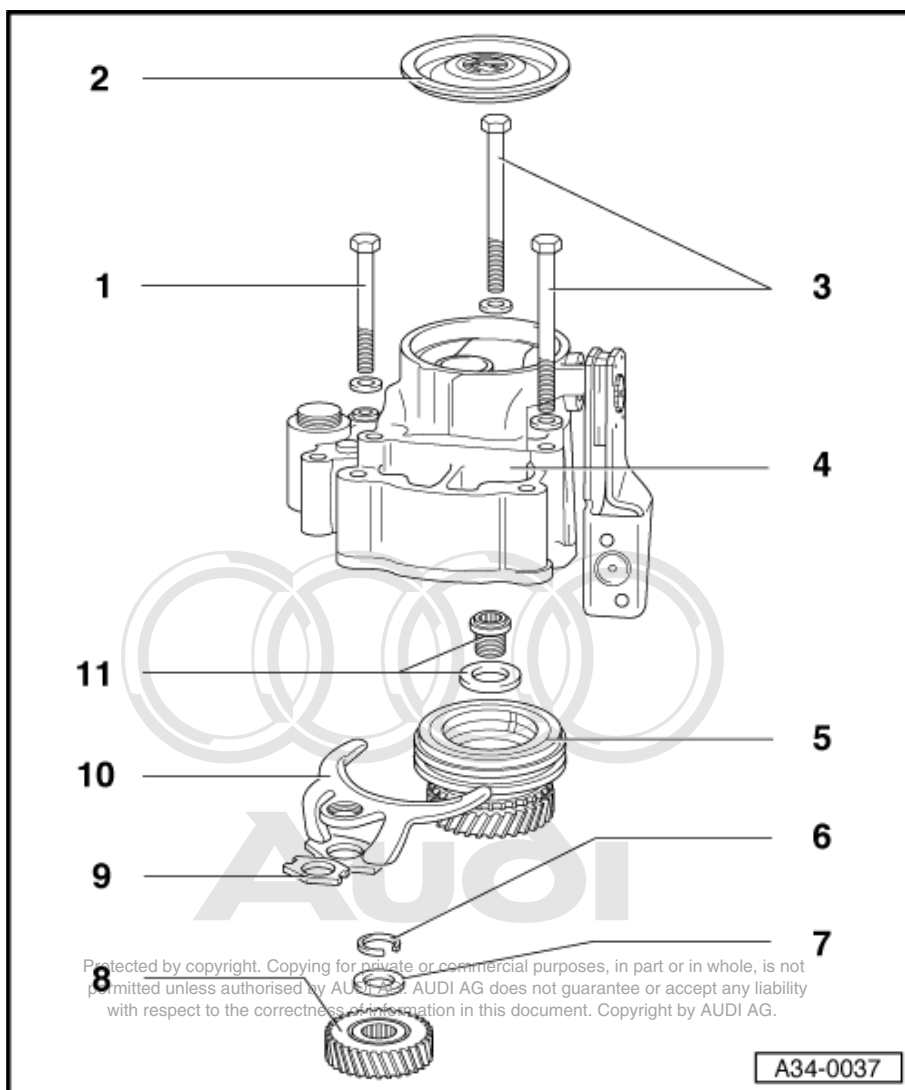
- ☐ Renew

10 - 5th gear selector fork

- ☐ Adjusting ⇒ [page 91](#)

11 - Bolt M17 x 1

- ☐ 150 Nm
- ☐ Self-locking
- ☐ Always renew
- ☐ Thread of new bolt is coated with locking fluid
- ☐ Note assembly sequence when loosening and tightening bolt ⇒ [page 76](#)



4.4 Exploded view - removing and installing gearbox housing and selector shaft

1 - Oval-head countersunk bolt

- ☐ 15 Nm
- ☐ M7 x 23
- ☐ 4x
- ☐ Tensioning plate/
grooved ball bearing to
gearbox housing

2 - Bolt

- ☐ 20 Nm
- ☐ For reverse gear shaft

3 - Gearbox housing

- ☐ Servicing ⇒ [page 94](#)
- ☐ From gearbox build date
03 08 8 onwards: with
additional threaded hole
for reversing light switch
-F4-
⇒ [Item 9 \(page 73\)](#)
- ☐ Installation of a gearbox
housing with additional
threaded hole for gear-
boxes up to gearbox
build date 02 08 8
⇒ [page 75](#)

4 - Sealing cap

- ☐ 50 Nm

5 - O-ring

- ☐ Always renew

6 - Spring

- ☐ Presses selector shaft
and gearbox selector
lever into gate for 3rd
and 4th gear

7 - Selector shaft

- ☐ Dismantling and assembling ⇒ [page 94](#)

8 - Bolt

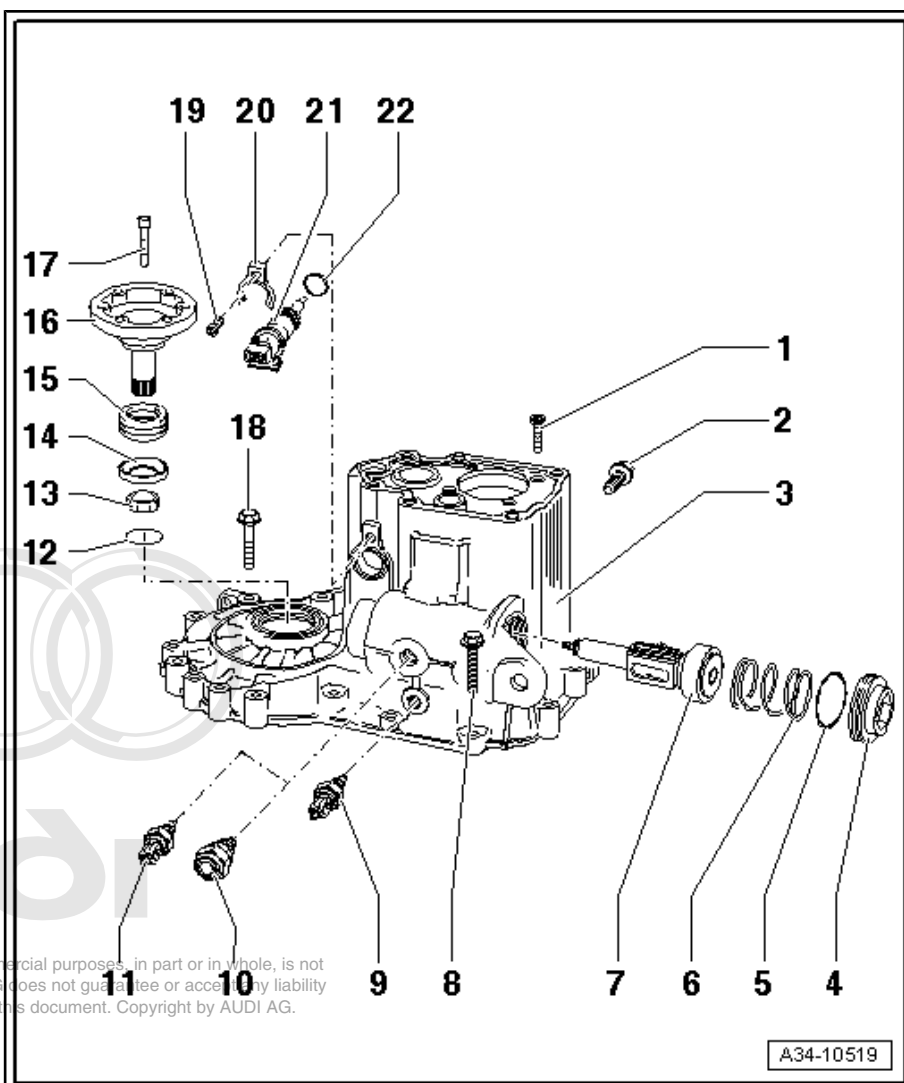
- ☐ 25 Nm
- ☐ M8 x 35
- ☐ 2x
- ☐ Screw in below locking bolt ⇒ [Item 11 \(page 74\)](#) or ⇒ [Item 10 \(page 73\)](#)

9 - Reversing light switch -F4-

- ☐ 23 Nm
- ☐ Fitted from gearbox build date 03 08 8 onwards

10 - Locking bolt

- ☐ 40 Nm
- ☐ For selector shaft
- ☐ Fitted from gearbox build date 03 08 8 onwards
- ☐ Apply sealant -AMV 188 200 03- when installing



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11 - Reversing light switch -F4- and locking bolt for selector shaft

- ☐ 23 Nm
- ☐ Fitted up to gearbox build date 02 08 8
- ☐ From gearbox build date 03 08 8, reversing light switch -F4- ⇒ [Item 9 \(page 73\)](#) and locking bolt ⇒ [Item 10 \(page 73\)](#) are supplied as two separate components ⇒ [page 74](#)
- ☐ Apply sealant -AMV 188 200 03- when installing

12 - Circlip

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

13 - Tapered ring

- ☐ With grooves to engage on thrust washer
- ☐ Installation position: Taper towards differential cage

14 - Thrust washer

- ☐ Installation position: Shoulder towards spring, lugs (if provided) towards tapered ring

15 - Spring

16 - Flange shaft

- ☐ Removing and installing ⇒ [page 127](#)

17 - Countersunk bolt

- ☐ 25 Nm

18 - Bolt

- ☐ 25 Nm
- ☐ M8 x 52
- ☐ 12x

19 - Bolt

- ☐ 5 Nm
- ☐ For speedometer drive ⇒ [Item 21 \(page 74\)](#)

20 - Bracket

21 - Speedometer drive

22 - O-ring

- ☐ Always renew

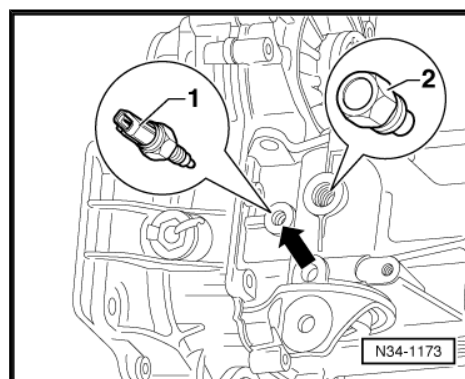
From gearbox build date 03 08 8 onwards, reversing light switch -F4- and locking bolt for selector shaft are supplied as two separate components:

- ◆ Reversing light switch -F4- -1-
- ◆ Locking bolt for selector shaft -2-

Tightening torques

Reversing light switch -F4- -1-	25 Nm
Locking bolt -2-	40 Nm

An additional threaded hole was provided in the gearbox housing for the new reversing light switch -F4- -arrow-.

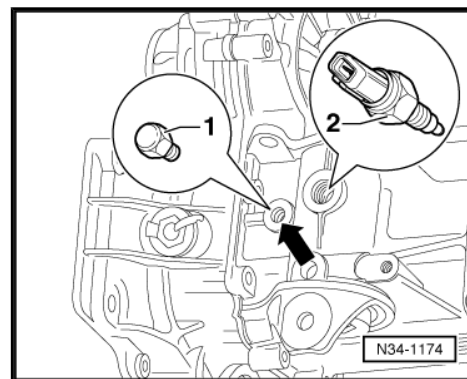


Installation of a gearbox housing with additional threaded hole for gearboxes up to gearbox build date 02 08 8

- Close the additional threaded hole -arrow- with a bolt M12 x 1.5.
- Then screw the previous locking bolt with the reversing light switch -F4- -2- into the gearbox housing instead of the new selector shaft locking bolt.

Tightening torques

Reversing light switch -F4- -2-	25 Nm
Hexagon bolt M12 x 1.5 -1-	25 Nm



4.5 Exploded view - Removing and installing input shaft, output shaft (pinion shaft), differential and selector forks

1 - Circlip

- ☐ Always renew circlips which have been damaged or over-stretched

2 - 4th gear wheel

- ☐ Installation position [⇒ page 88](#)

3 - Circlip

- ☐ For 3rd gear wheel
- ☐ Re-determining thickness [⇒ page 76](#)

4 - 3rd gear wheel

- ☐ Installation position [⇒ page 87](#)
- ☐ Adjusting axial clearance [⇒ page 76](#)

5 - 2nd speed selector gear

6 - Needle bearing

- ☐ For 2nd gear
- ☐ Pulling off inner race [⇒ page 76](#)
- ☐ Pressing on inner race [⇒ page 76](#)

7 - Locking collar with synchronising hub for 1st and 2nd gear

8 - 1st speed selector gear

9 - Thrust washer

- ☐ Installation position [⇒ page 76](#)

10 - Bolt

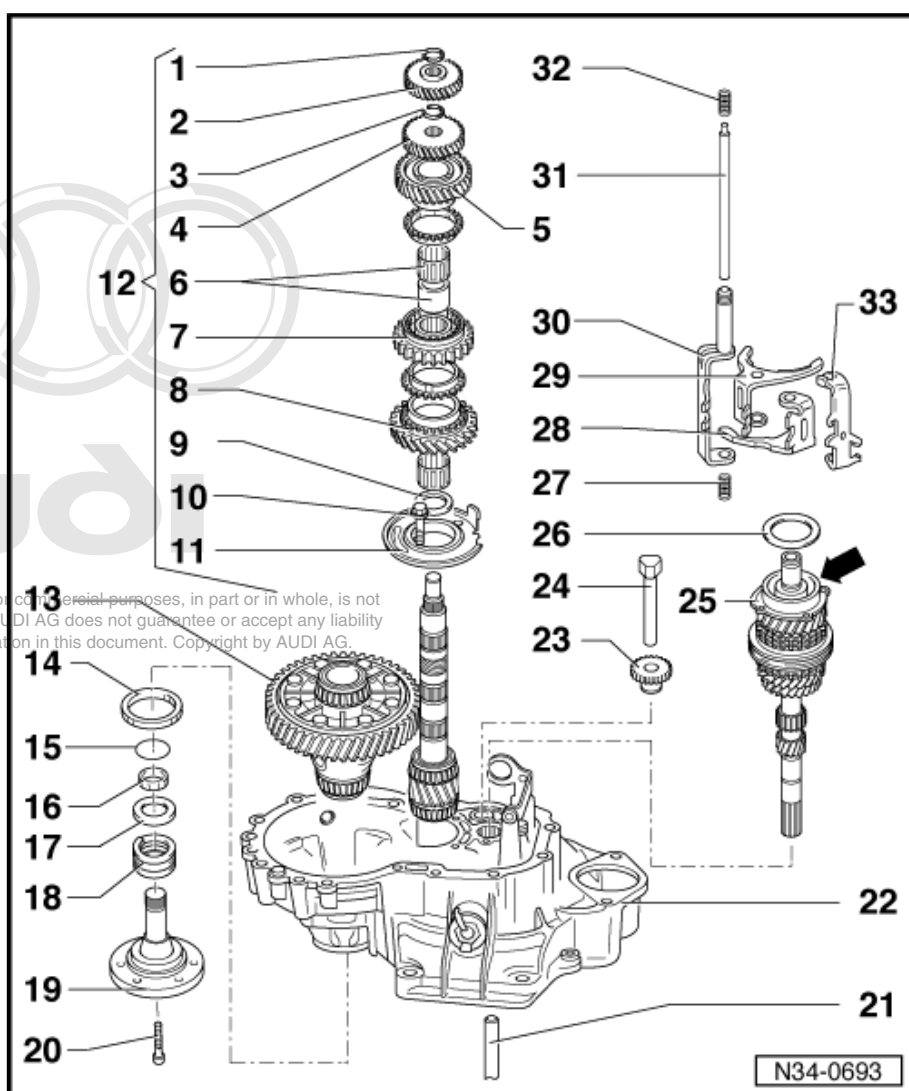
- ☐ 25 Nm and turn 90° further

11 - Bearing mounting

- ☐ With large tapered roller bearing outer race and stop for reverse gear wheel

12 - Output shaft, complete

- ☐ Dismantling and assembling [⇒ page 117](#)



13 - Differential

- ☐ Dismantling and assembling ⇒ [page 131](#)

14 - Oil seal

- ☐ Do not remove when dismantling and assembling gearbox
- ☐ Renewing ⇒ [page 127](#)

15 - Circlip

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

16 - Tapered ring

- ☐ With grooves to engage on thrust washer
- ☐ Installation position: Taper towards differential cage

17 - Thrust washer

- ☐ Installation position: Shoulder towards spring, lugs (if provided) towards tapered ring

18 - Spring

- ☐ For flange shaft

19 - Flange shaft

- ☐ Removing and installing ⇒ [page 127](#)

20 - Countersunk bolt

- ☐ 25 Nm
- ☐ Secures flange shaft

21 - Clutch push rod**22 - Clutch housing**

- ☐ Servicing ⇒ [page 99](#)

23 - Reverse gear wheel**24 - Reverse gear shaft****25 - Input shaft**

- ☐ Dismantling and assembling ⇒ [page 109](#)
- ☐ Press off grooved ball bearing -arrow- before installing ⇒ [Item 10 \(page 111\)](#)
- ☐ Installing new grooved ball bearing in gearbox housing ⇒ [page 88](#)

26 - Shim

- ☐ It is not necessary to adjust the input shaft. It is important, however, that the shim determined during production is re-installed after performing repairs. It is also possible that no shim is fitted. In this case, reassemble without a shim. When renewing the bearing or clutch housing or gearbox housing, it is no longer necessary to insert the shim.

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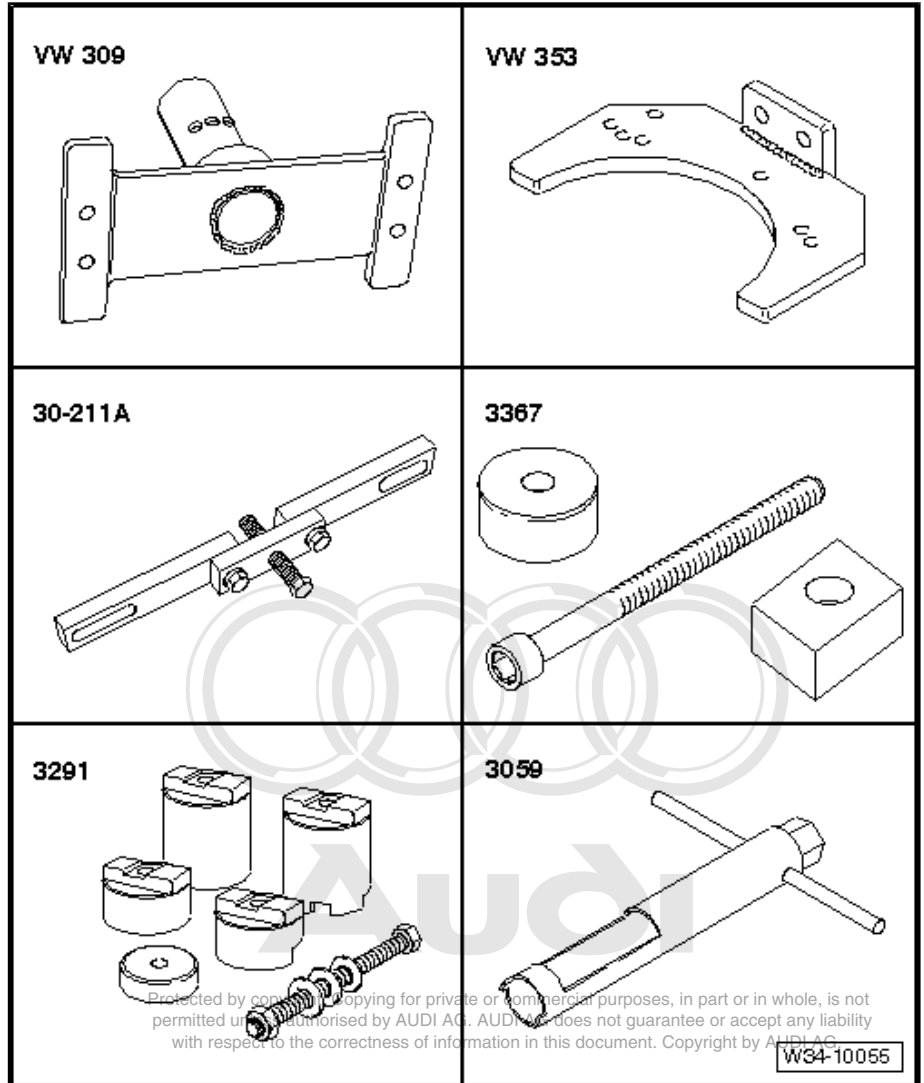
27 - Spring**28 - Selector fork for 1st and 2nd gear****29 - Selector fork for 3rd and 4th gear****30 - Selector bridge with selector tube for 5th gear****31 - Selector rod****32 - Spring****33 - Selector fork for reverse gear**

4.6 Dismantling and assembling sequence

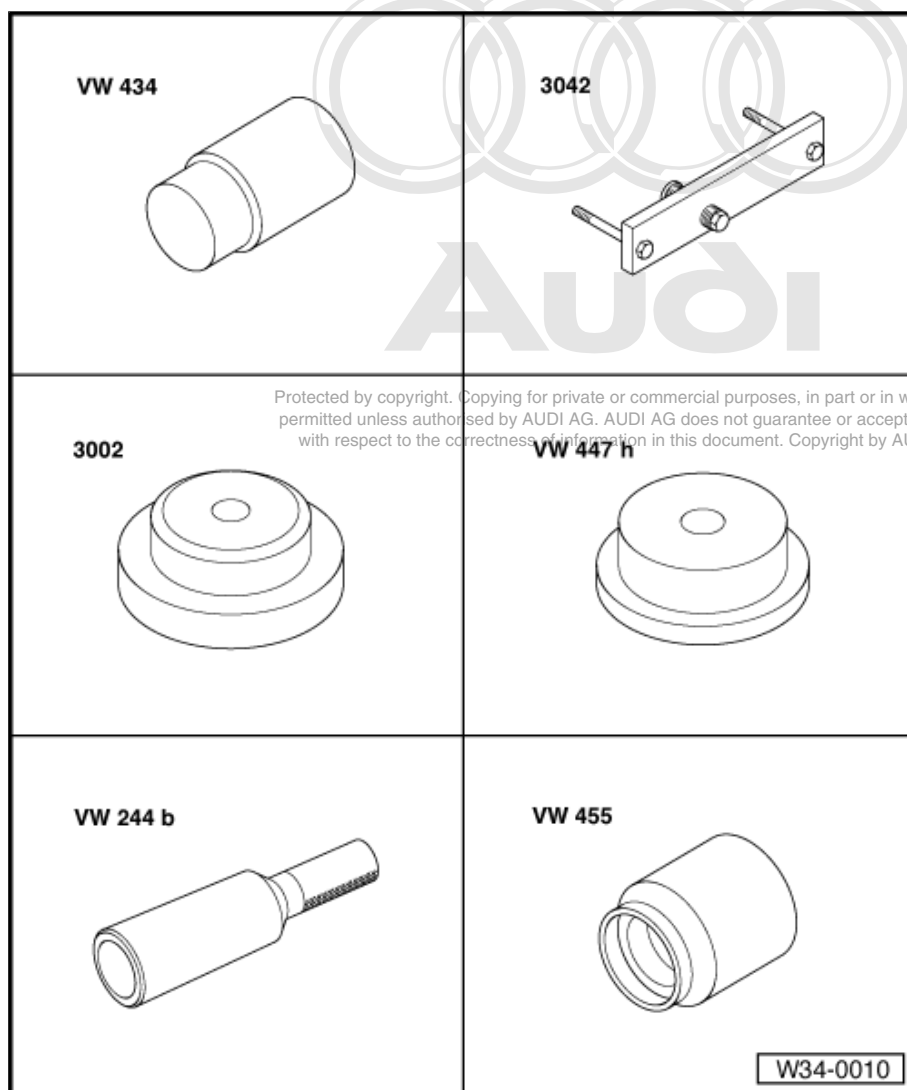
Removing and installing gearbox housing cover, gearbox housing, selector mechanism, input shaft, output shaft (pinion shaft), differential and selector forks

Special tools and workshop equipment required

- ◆ Support plate -VW 309-
- ◆ Gearbox support -VW 353-
- ◆ Support bridge -30 - 211 A-
- ◆ Fitting tool -3367/2-
- ◆ Spindle -3291-
- ◆ Box wrench -3059-

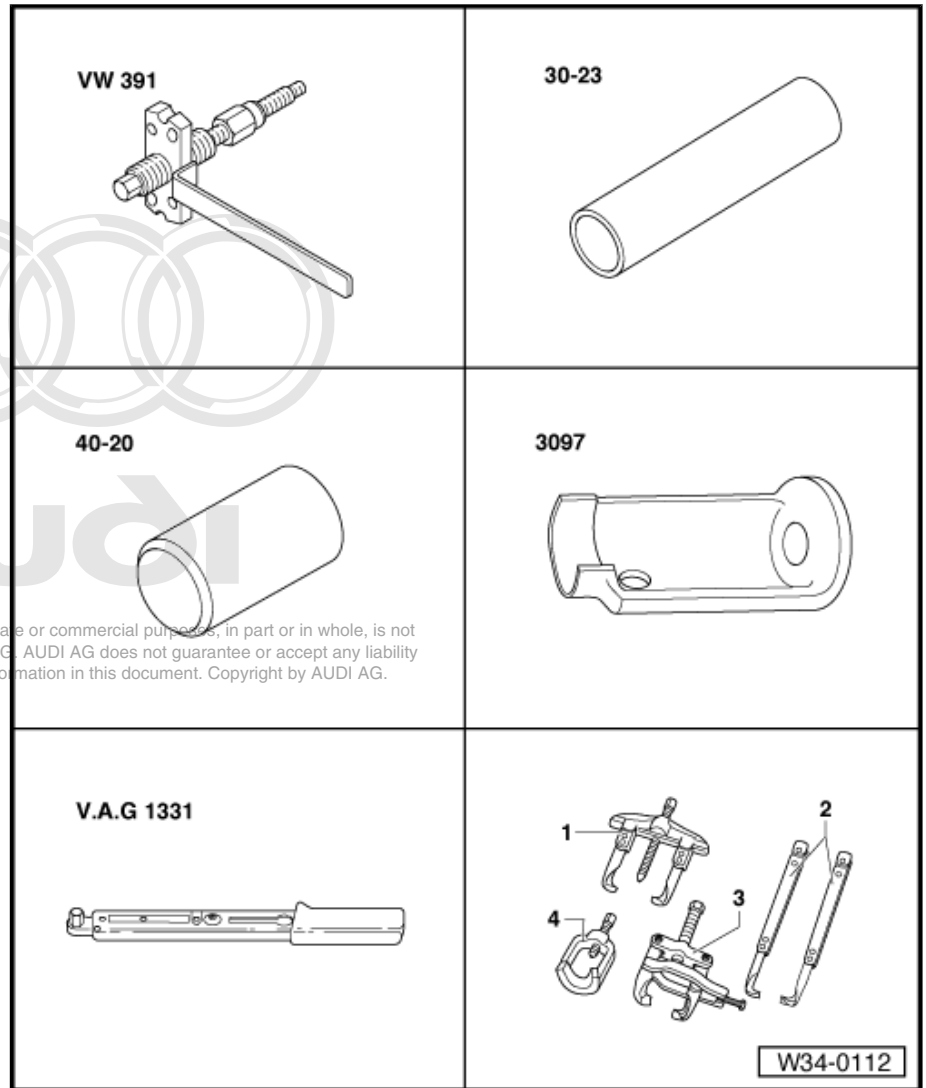


- ◆ Press tool -VW 434-
- ◆ Puller -3042-
- ◆ Thrust piece -3002-
- ◆ Thrust plate -VW 447 H-
- ◆ Drift sleeve -VW 244 B-
- ◆ Installing sleeve -VW 455-

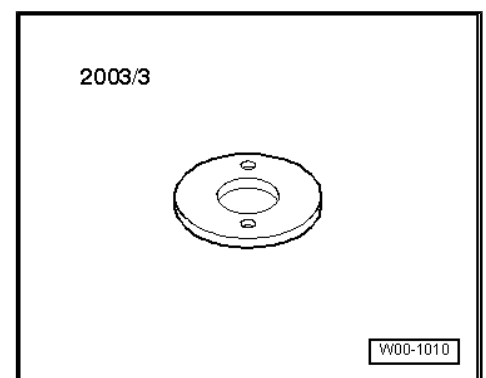


- ◆ Drive flange installing tool - VW 391-
- ◆ Extension -30 - 23-
- ◆ Drift sleeve -40 - 20-
- ◆ Fitting tool -3097-
- ◆ Torque wrench -V.A.G 1331-
- ◆ -1- Two-arm puller -Kukko 20/10-
- ◆ -2- Matra hooks -V/170-
- ◆ -2- Puller hook -Kukko 1-250-

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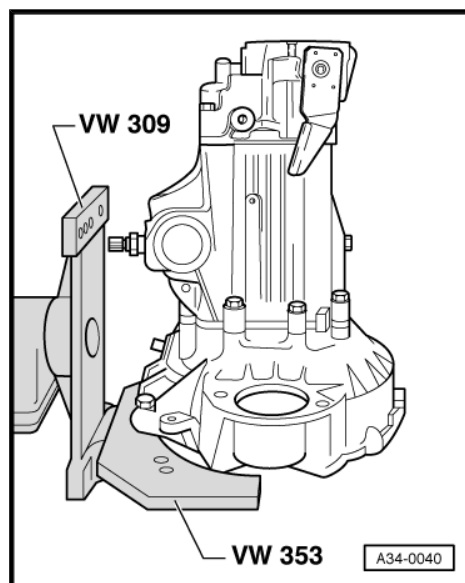
- ◆ Installing ring -2003/3-



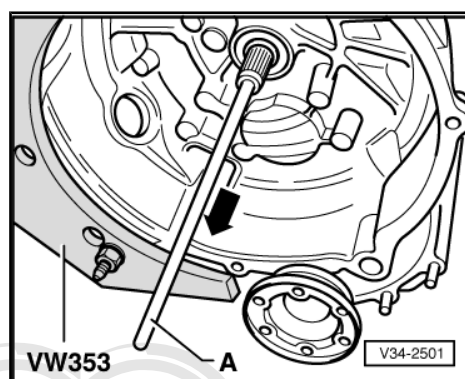
Dismantling

- Drain off gear oil.

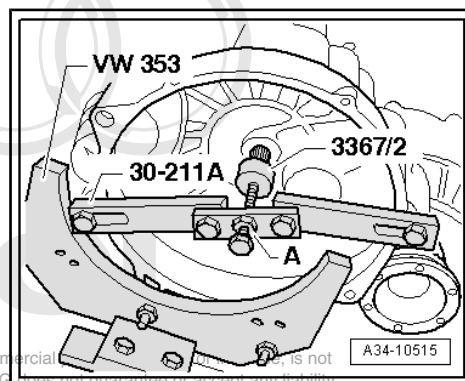
- Mount gearbox on assembly stand.



- Pull clutch push rod -A- out of input shaft.



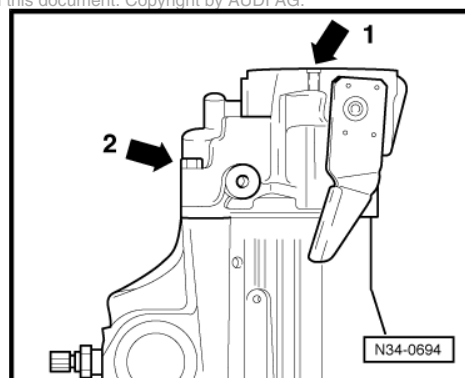
- Attach support bridge -30 - 211 A- for input shaft.
A - Lock nut M12
- Bring fitting tool -3367/2- into contact with input shaft by turning bolt, and tighten lock nut -A-.



- Pierce sealing cap -arrow 1- and lever out of gearbox housing cover.
- Unbolt gearbox housing cover -arrow 2- (6 bolts).


Note

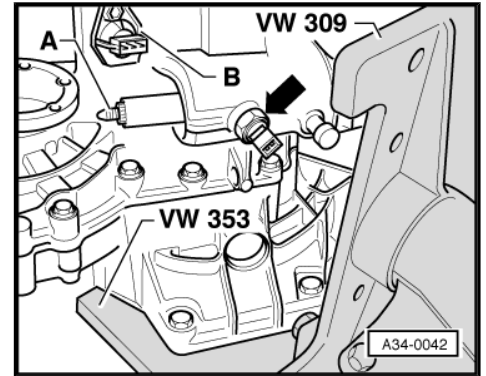
One of the 6 bolts is inside the cover.



- Remove speedometer drive -B-.

Up to gearbox build date 02 08 8

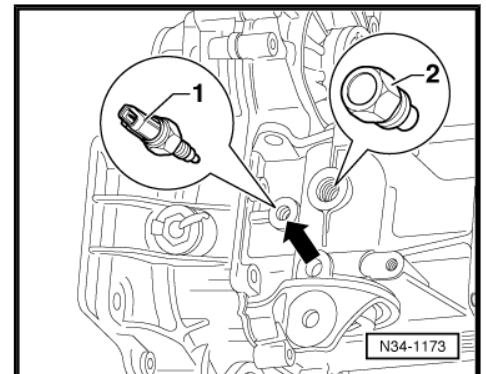
- Remove locking bolt for selector shaft -A- with reversing light switch -F4- -arrow-.



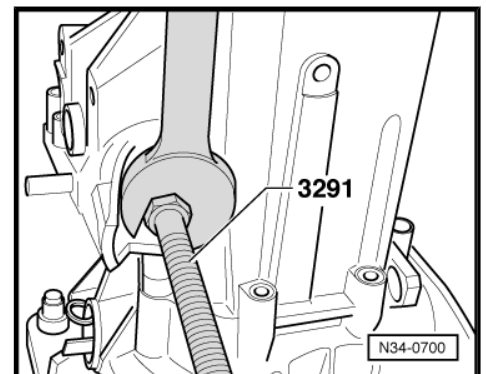
From gearbox build date 03 08 8 onwards

- Remove locking bolt for selector shaft -2-.
- Remove reversing light switch -F4- -1-.

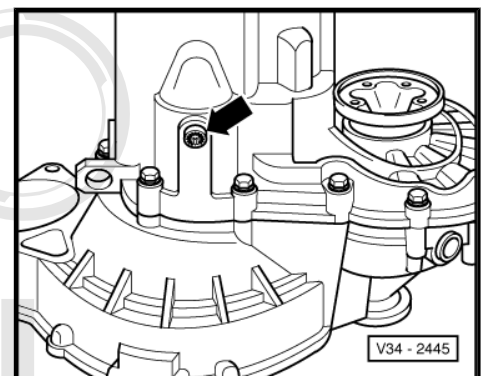
Continued for all gearboxes



- Unscrew selector shaft sealing cap and remove together with spring.
- Set selector shaft to neutral and pull out of gearbox housing.

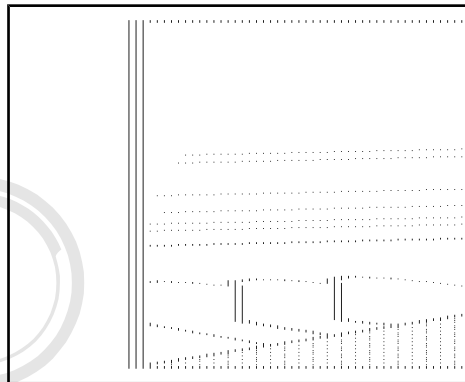


- Remove Torx bolt -arrow- securing reverse gear shaft.



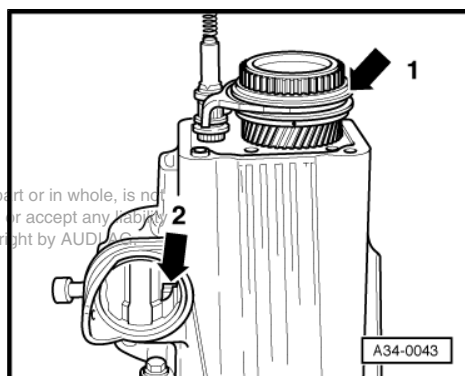
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- Remove both flange shafts.
- Take out flange shafts together with springs, thrust washers and tapered rings.

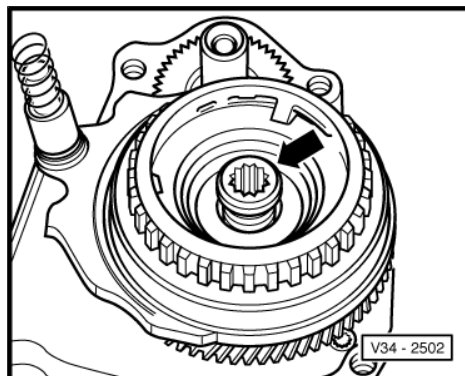


- Engage 5th gear -arrow 1-.
- Engage reverse gear -arrow 2- (forward selector jaw facing downwards).

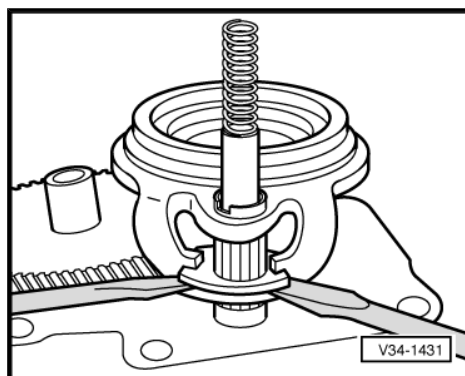
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- Remove bolt for synchronising hub -arrow- using 12 mm multi-point bit.



- Prise free locking plate for selector tube.



- Unscrew selector tube from selector fork (anti-clockwise).

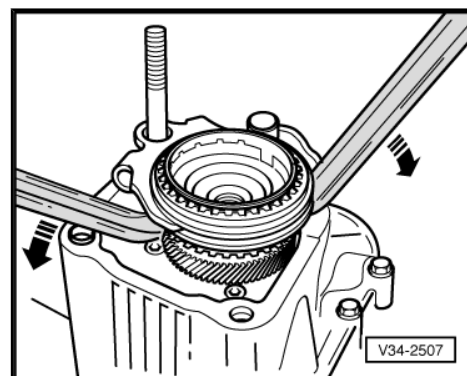
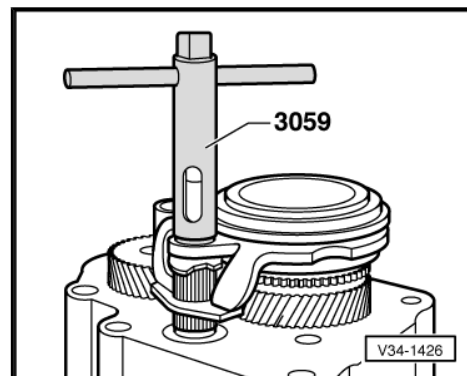


Note

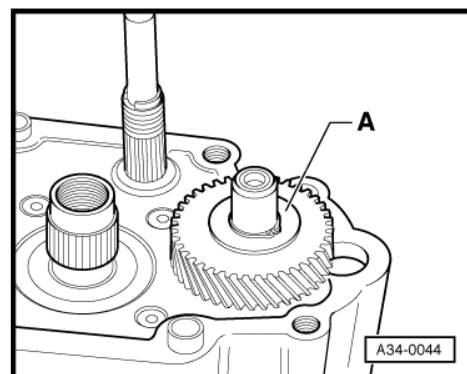
Do not pull selector rod out of selector tube.

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- Remove synchronising hub complete with selector gear and selector fork for 5th gear. If necessary, loosen slightly with 2 levers but take care not to damage sealing surfaces of housing.
- Note thrust washer for selector gear below synchronising hub.

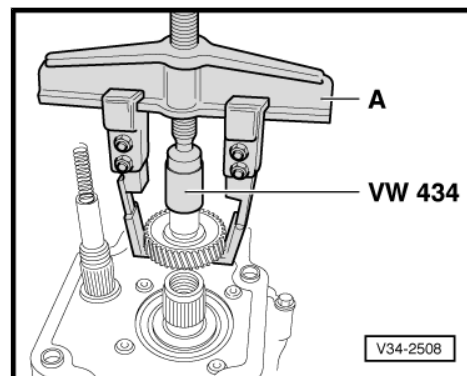


- Take off circlip and thrust washer -A- for 5th gear wheel.

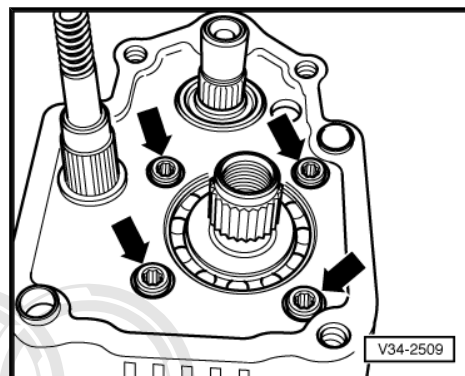


- Pull off 5th gear wheel.

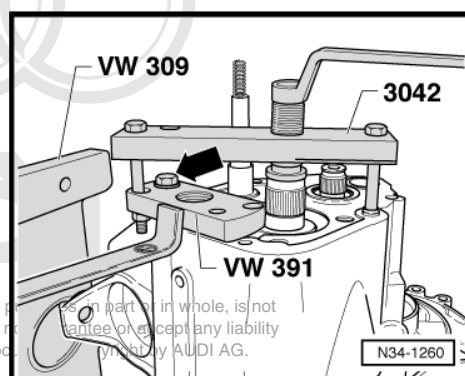
A - Two-arm puller, e.g. -Kukko 20/10- with hook -Matra V/170-



- Unbolt tensioning plate (support for input shaft ball bearing) -arrows-.
- Remove bolts securing gearbox housing to clutch housing.

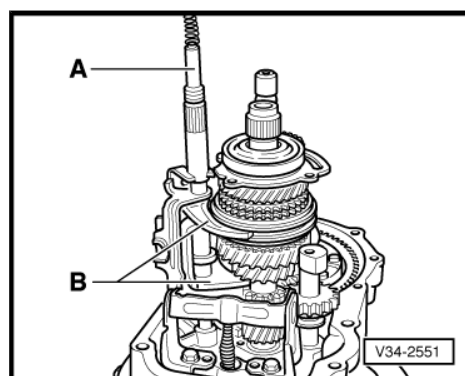


- Use bolt (M8) -arrow- to secure drive flange installing tool -VW 391- to gearbox housing. If necessary, remove dowel sleeve first.
- Secure puller -3042- as shown in illustration.
- Fit spindle of puller precisely into bore in input shaft.
- Pull off gearbox housing.

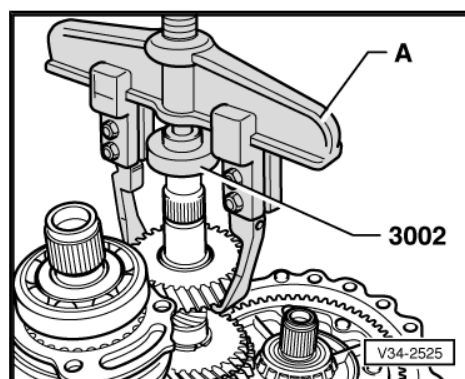


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- Pull selector rod -A- out of bore in clutch housing and swing out selector forks -B-.
- Remove circlip for 4th gear wheel/output shaft.



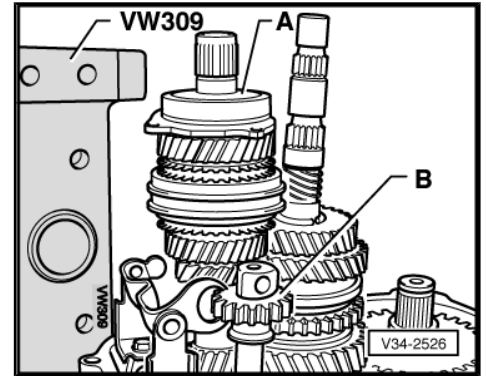
- Pull off 4th gear wheel.
- A - Two-arm puller , e.g. -Kukko 20/10- with hook -Matra V/170-



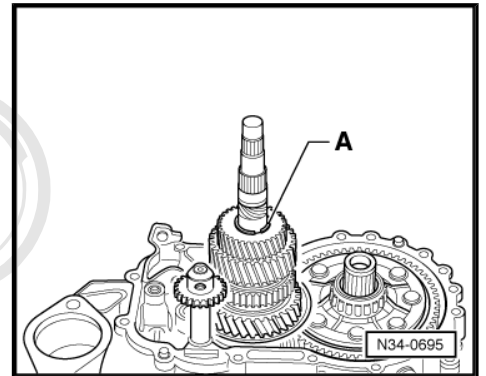
- Take out complete input shaft -A-.



Reverse gear -B- must not be engaged.



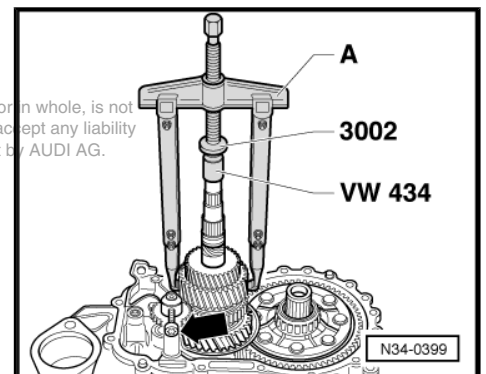
- Take off circlip -A- on 3rd gear wheel.



- Press off 3rd gear wheel via 2nd speed selector gear.

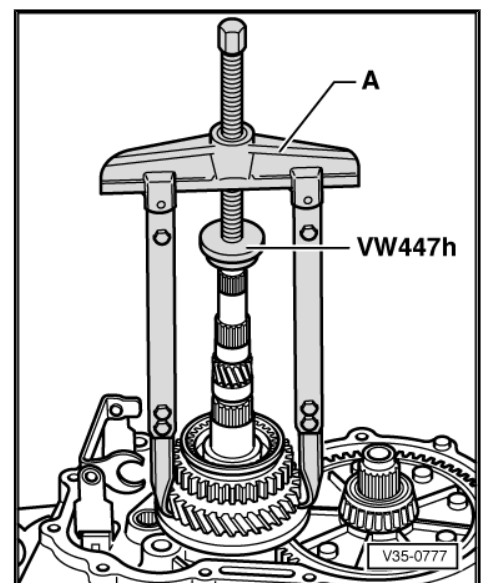
A - Two-arm puller , e.g. -Kukko 20/10- with 250 mm long hooks

- Take off synchro-ring and needle bearing.
- Drive out reverse gear shaft using a plastic hammer after screwing in bolt -arrow-.
- Take reverse gear wheel out of reverse lever.



- Remove synchronising hub/locking collar and 1st speed selector gear together with 2nd gear needle roller bearing inner race.

A - Two-arm puller , e.g. -Kukko 20/10- with 250 mm long hooks



- Unbolt bearing mounting -arrows- and take out output shaft.
Note thrust washer -1-.
- Take out differential.



Note

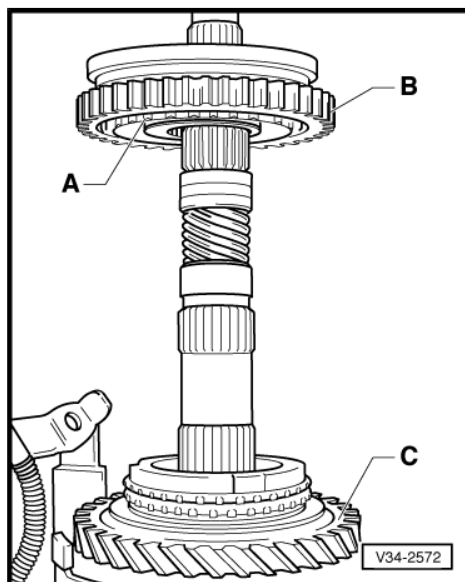
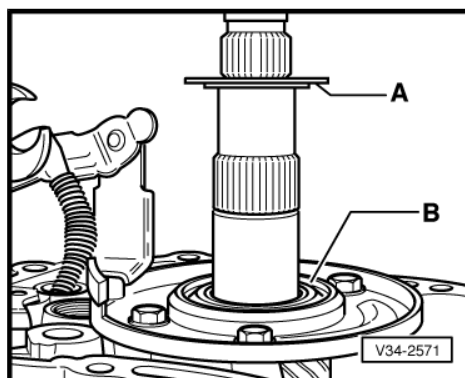
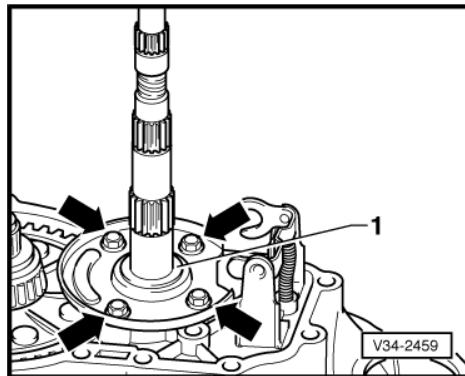
Make sure rivets on differential are seated tightly. If riveted fastenings are loose, the repair kit (connection final drive gear to differential cage) must be fitted → [Item 19 \(page 135\)](#) .

Assembling

- Insert differential.
- Insert output shaft.
- Tighten bolts for output shaft bearing mounting.
- Installation position of thrust washer for 1st speed selector gear needle bearing:
Shoulder -A- on inner diameter faces towards bearing mounting -B-.
- Fit thrust washer, needle bearing, selector gear and synchronizing for 1st gear.

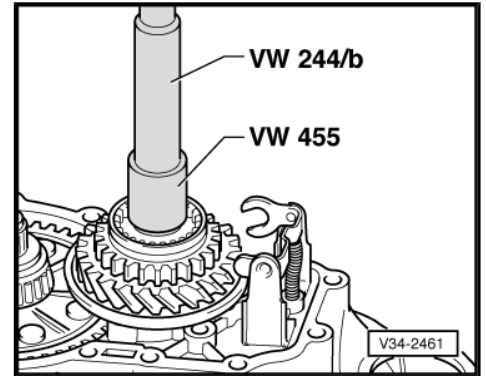
- Installation position of 1st/2nd gear locking collar/synchronising hub:

The identification groove on face -A- and the outer splines of locking collar -B- face towards 1st speed selector gear -C-.

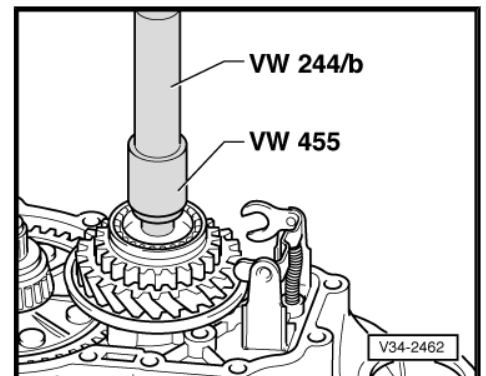


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- Heat 1st/2nd gear locking collar/synchronising hub to approx. 100 °C, fit and drive onto stop.
- Turn synchro-ring so that grooves align with locking pieces.
- Install reverse gear wheel, drive in shaft if necessary.



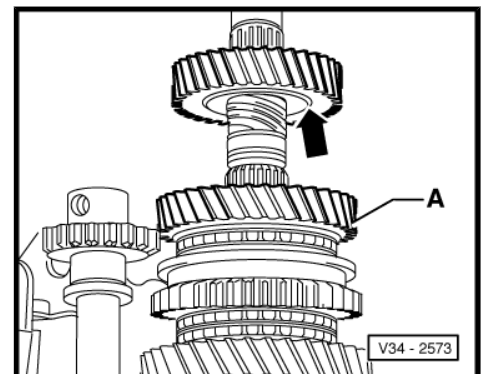
- Drive on needle bearing inner race for 2nd speed selector gear as far as stop.
- Fit needle bearing, synchro-ring, 2nd speed selector gear and 3rd gear wheel.



Installation position of 3rd gear wheel

Collar -arrow- towards 2nd speed selector gear -A-.

- Use drift sleeve -VW 244 B- to drive on 3rd gear wheel as far as stop.



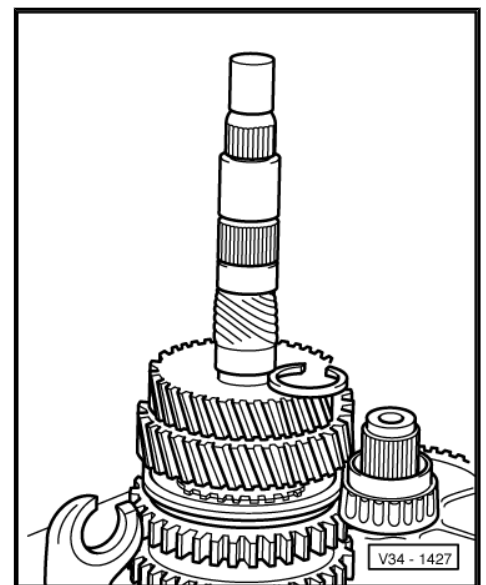
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Adjust axial play of 3rd gear wheel as follows:

- Determine thickest circlip which will still just fit and install.

Thickness (mm)	Identification
2.5	Brown
2.6	Black
2.7	Bright metal
2.8	Copper
2.9	Brass
3.0	Blue

Part No of circlips ⇒ Electronics parts catalogue .



- Attach support bridge -30 - 211 A- for input shaft.

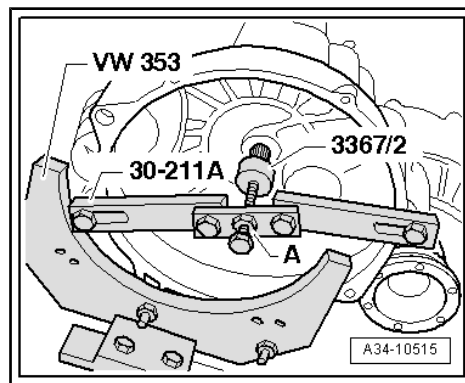

Note

In cases where input shaft has not been dismantled: Press off input shaft grooved ball bearing ⇒ [Item 10 \(page 111\)](#) .

- Fit complete input shaft but without grooved ball bearing.

A - Lock nut M12

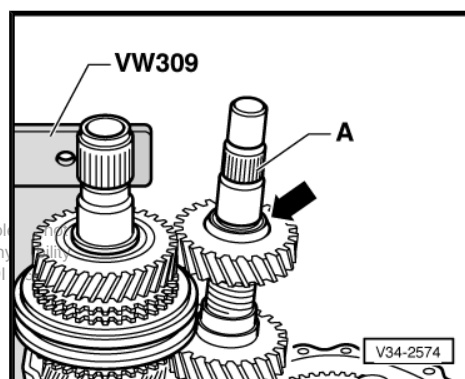
- Bring fitting tool -3367/2- into contact with input shaft by turning bolt, and tighten lock nut -A-.


Installation position of 4th gear wheel

Collar -arrow- faces towards 5th gear splines -A-.

- Fit 4th gear wheel on output shaft using extension -30 - 23- and secure with circlip.

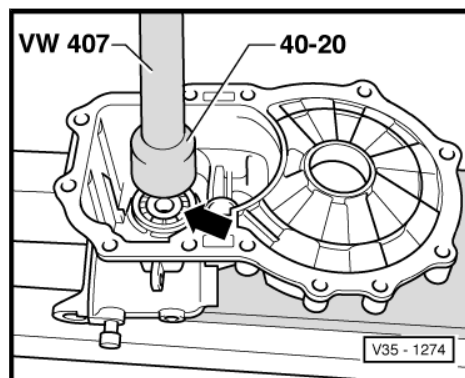
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- Press on input shaft grooved ball bearing.

Installation position:

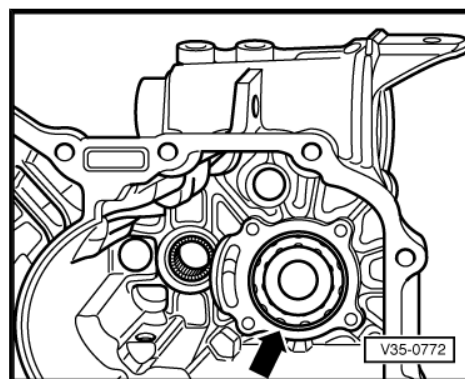
Wider collar on inner race -arrow- faces towards press tools.



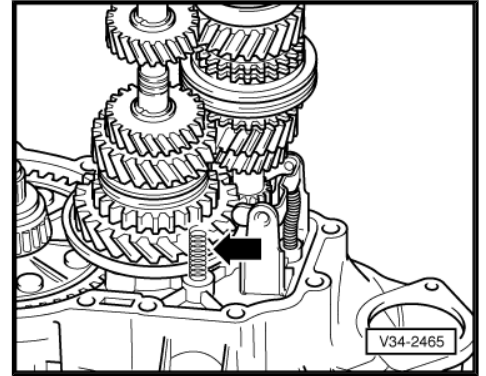
- Secure tensioning plate -arrow-.


Note

The tensioning plate can only be fitted in one position.



- Insert lower spring -arrow- for selector rod into clutch housing.



- Install selector fork set and align selector jaws.

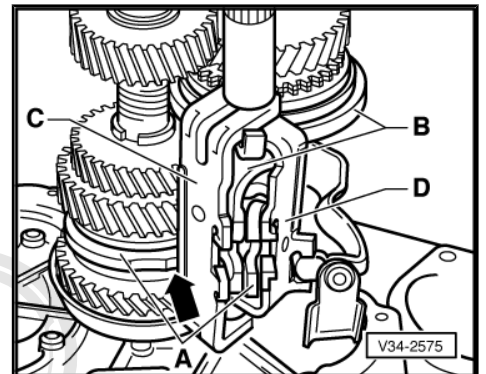
A - 1st/2nd gear selector fork -arrow- faces towards recess for selector bridge -C-

B - 3rd/4th gear selector fork

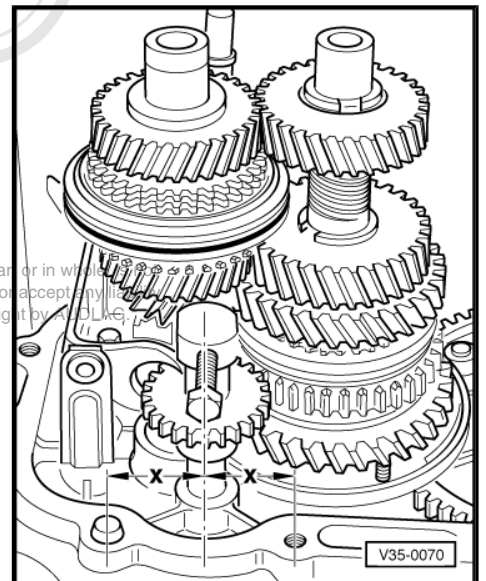
C - Selector bridge with selector tube for 5th gear

D - Reverse gear selector fork

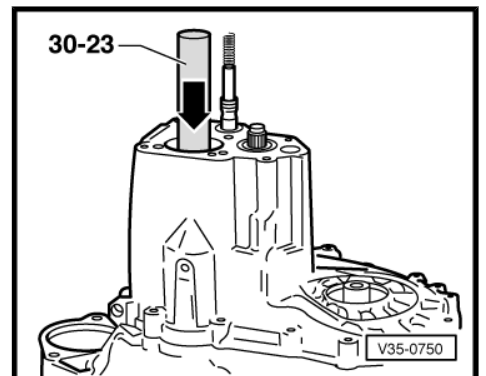
- Insert selector rod.



- Align reverse gear shaft. Distances -x- are equal.
- Apply sealant -AMV 188 200 03- evenly to sealing surface of clutch housing.



- Drive on gearbox housing.
- Secure reverse gear shaft.
- Tighten hexagon bolts for securing gearbox housing to specified torque.
- Re-tighten oval-head countersunk bolts on tensioning plate for grooved ball bearing to 15 Nm.
- Drive on 5th gear wheel.

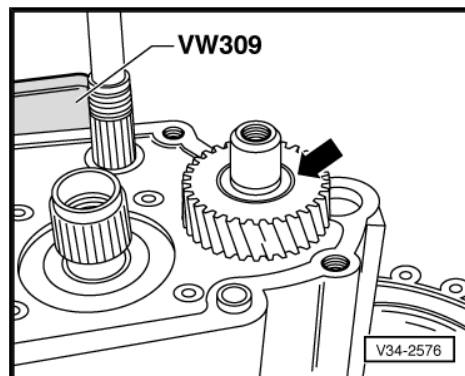


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Installation position:

Groove -arrow- faces upwards.

- Install thrust washer and circlip.
- Fit 5th gear synchronising hub complete with locking collar, 5th speed selector gear and selector fork and new securing plate.
- Use box wrench -3059- to screw selector tube clockwise into selector fork.

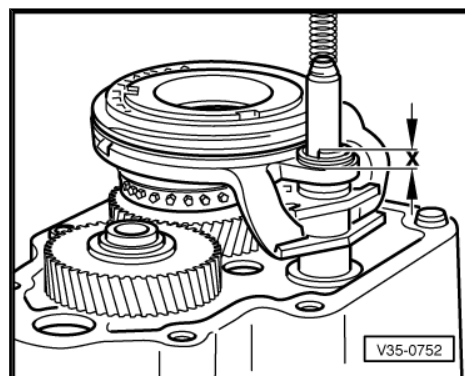


- Unscrew selector tube until it projects by -x- = 5.0 mm.

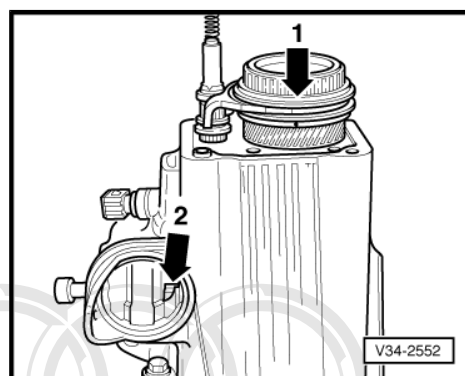


Note

Do not pull the selector rod out of the selector tube (this may happen if the box spanner is tilted), otherwise the selector forks in the gearbox will fall apart and the gearbox will have to be dismantled again. If necessary, hold the selector rod down with a screwdriver inserted through the side slot when taking off the box spanner.



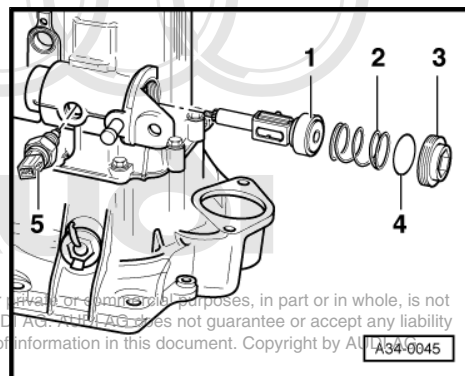
- Position new bolt for synchronising hub together with dished spring.
- The thread of the new bolt should already be coated with locking fluid. If necessary, coat bolt with locking fluid -D 000 600 A2-.
- Installation position of dished spring: the outer diameter (concave side) faces 5th gear.
- Engage 5th gear -arrow 1-.
- Engage reverse gear -arrow 2- (forward selector jaw facing downwards).
- Tighten bolt for synchronising hub with 12 mm multi-point bit.
- Set selector forks in neutral position.



- Carefully insert selector shaft -1- to make sure the selector shaft oil seal is not damaged. If necessary, slide shrink hose onto splines of selector shaft.
- Insert spring -2- for selector shaft and secure sealing cap -3- with new O-ring -4-.

Up to gearbox build date 02 08 8

- Apply sealant -AMV 188 200 03- and insert locking bolt for selector shaft/ reversing light switch -F4- -5-.



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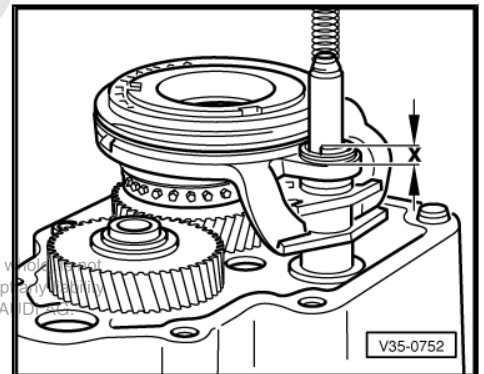
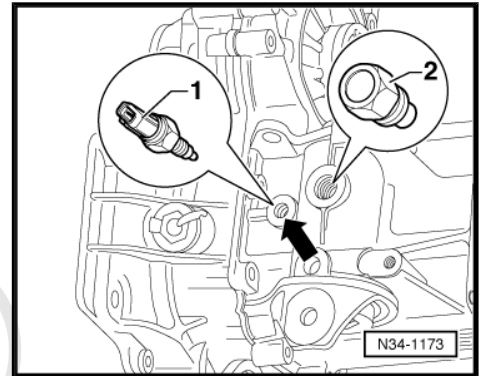
From gearbox build date 03 08 8 onwards

- Install reversing light switch -F4- -1-.
- Apply sealant -AMV 188 200 03- to locking bolt -2- for selector shaft and fit bolt.

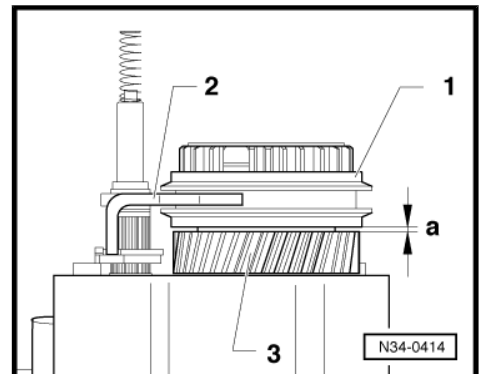
Continued for all gearboxes

Adjust 5th gear selector fork as follows:

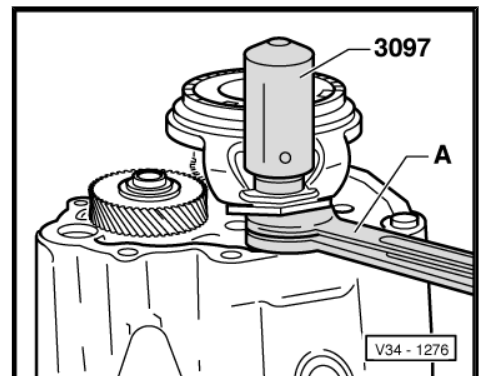
- Perform this adjustment with great care to avoid any risk of the gearbox "jumping out of gear".
- Check projection of selector tube - dimension -x- = 5.0 mm; adjust with box wrench -3059- , if necessary.
- Bolt gearbox selector lever to selector shaft and engage 5th gear (pull selector shaft fully out and turn to the left).



- Align locking collar -1- with selector fork -2- so there is no free play at 5th speed selector gear -3-.
- Check measurement: The distance -a- between locking collar and selector gear must be 1.3 mm. Adjust this distance if necessary by turning the selector tube.
- Disengage 5th gear. Locking collar should now be in the neutral position. Synchro-ring should move freely.



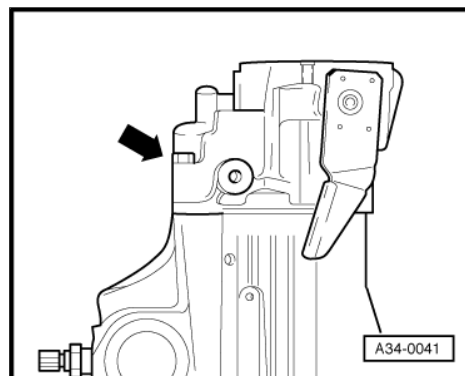
- Drive on new locking plate. Use suitable tools with a thickness of approx. 12 mm to support selector fork, e.g. two flat open-end spanners -A- (19 mm and 24 mm).
- Select all gears.
- Apply sealant -AMV 188 200 03- evenly to sealing surface of gearbox housing.



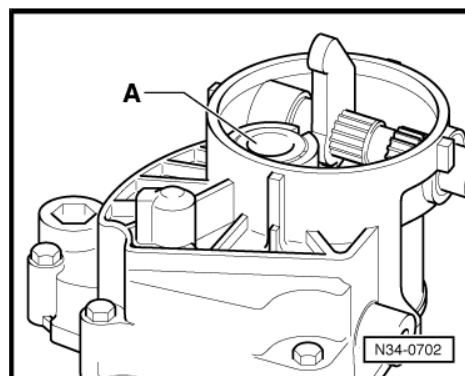
- Fit gearbox housing cover -arrow- (6 bolts).


Note

One of the 6 bolts is inside the cover.



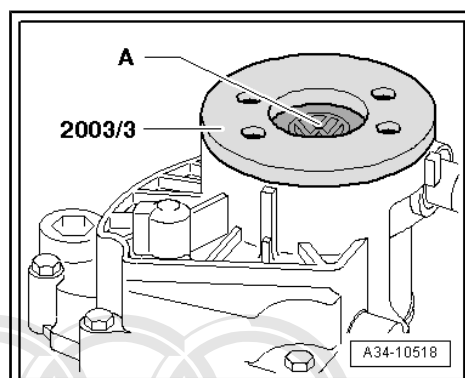
- Then insert release bearing -A- into gearbox housing cover.



- Drive on sealing cap -A- using installing ring -2003/3- .


Note

Sealing surface on gearbox housing cover must be free of grease.

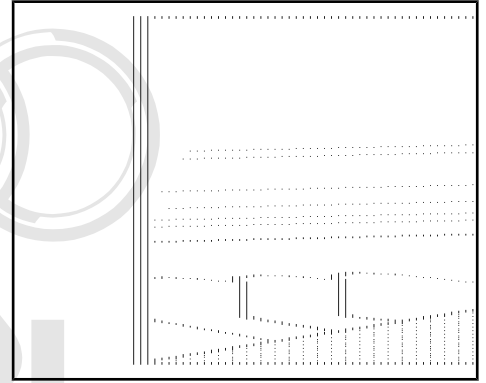


- Pack space between sealing lip and dust lip of oil seals for flange shafts half-full with sealing grease -G 052 128 A1- -arrow-.



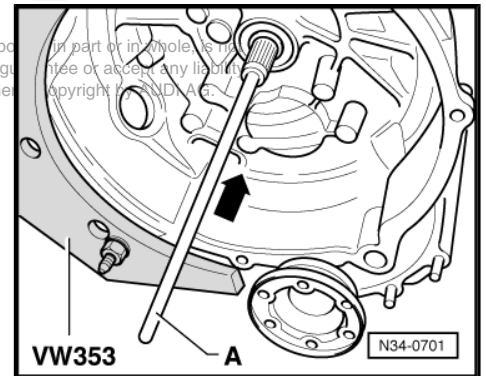
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- Install both flange shafts with springs, thrust washers and tapered rings.
- Remove support bridge -30 - 211 A- for input shaft.



- Guide clutch push rod -A- into input shaft.

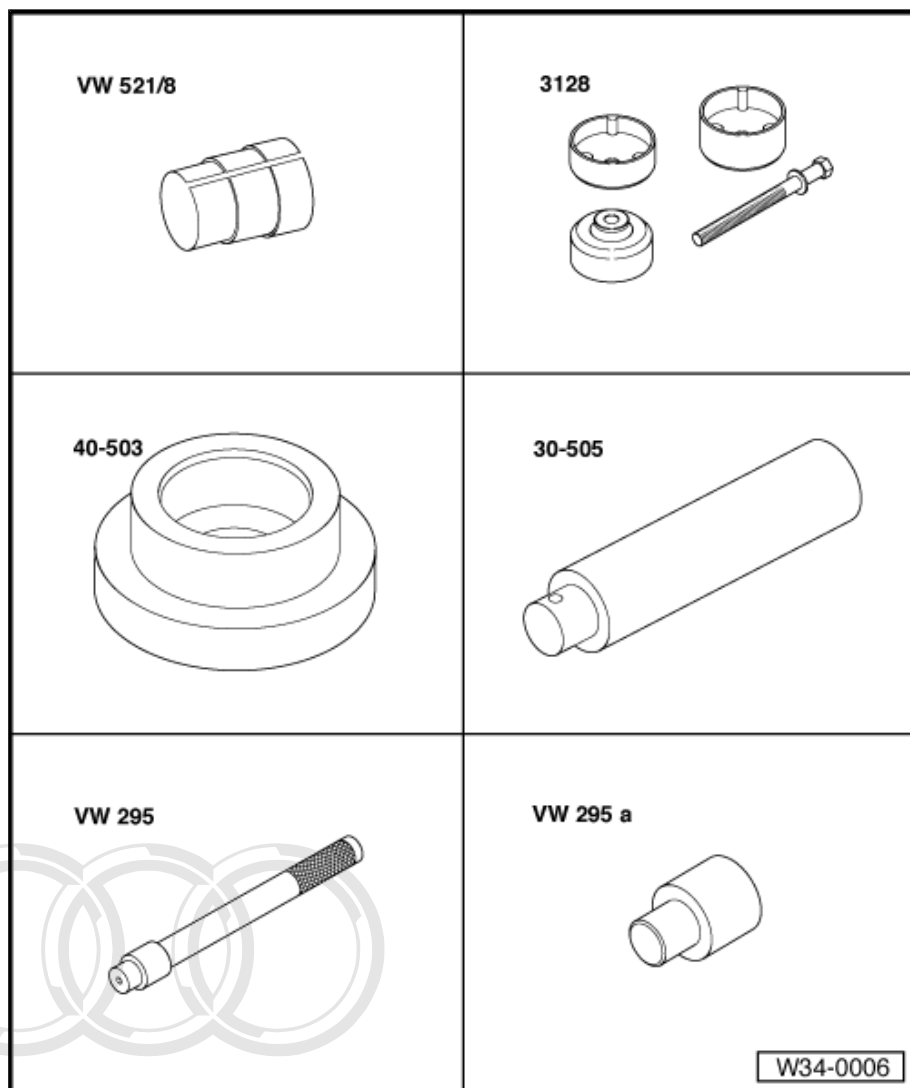
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5 Servicing gearbox housing and selector shaft

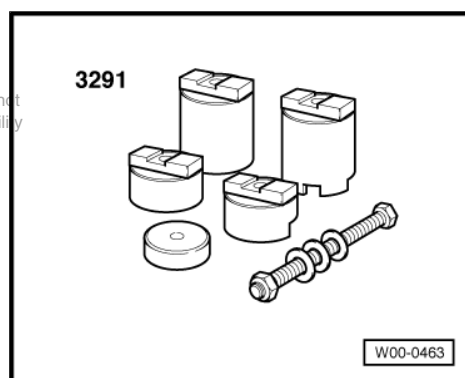
Special tools and workshop equipment required

- ◆ Crown wheel adjusting tool -VW 521-
- ◆ Fitting tool -3128-
- ◆ Installing tool -40-503-
- ◆ Mandrel -30-505-
- ◆ Drift -VW 295-
- ◆ Adapter -VW 295 A-

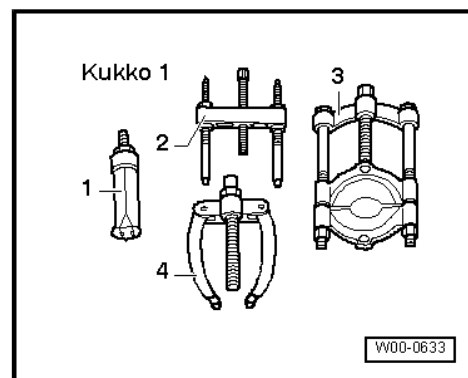


- ◆ Spindle from assembly tool -3291-

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◆ -1- Internal puller -Kukko 21/3-



◆ -4- Counter-support -Kukko 22/1-

1 - Gearbox housing

- ☐ If renewed: adjust differential ⇒ [page 139](#)
- ☐ From gearbox build date 03 08 8 onwards: with additional threaded hole for reversing light switch -F4- ⇒ [page 75](#)

2 - Dowel sleeve

- ☐ 2x

3 - Sleeve

- ☐ Remove using pliers
- ☐ Drive in onto stop

4 - Cap

- ☐ For gearbox breather

5 - Selector shaft

- ☐ Removing ⇒ [page 96](#)

6 - Stop cap

7 - Spring

8 - Retaining plate

- ☐ Hold retaining plate when releasing circlip ⇒ [Item 9 \(page 95\)](#). Then carefully release spring ⇒ [Item 7 \(page 95\)](#).

9 - Circlip

- ☐ Renew

10 - Needle bearing

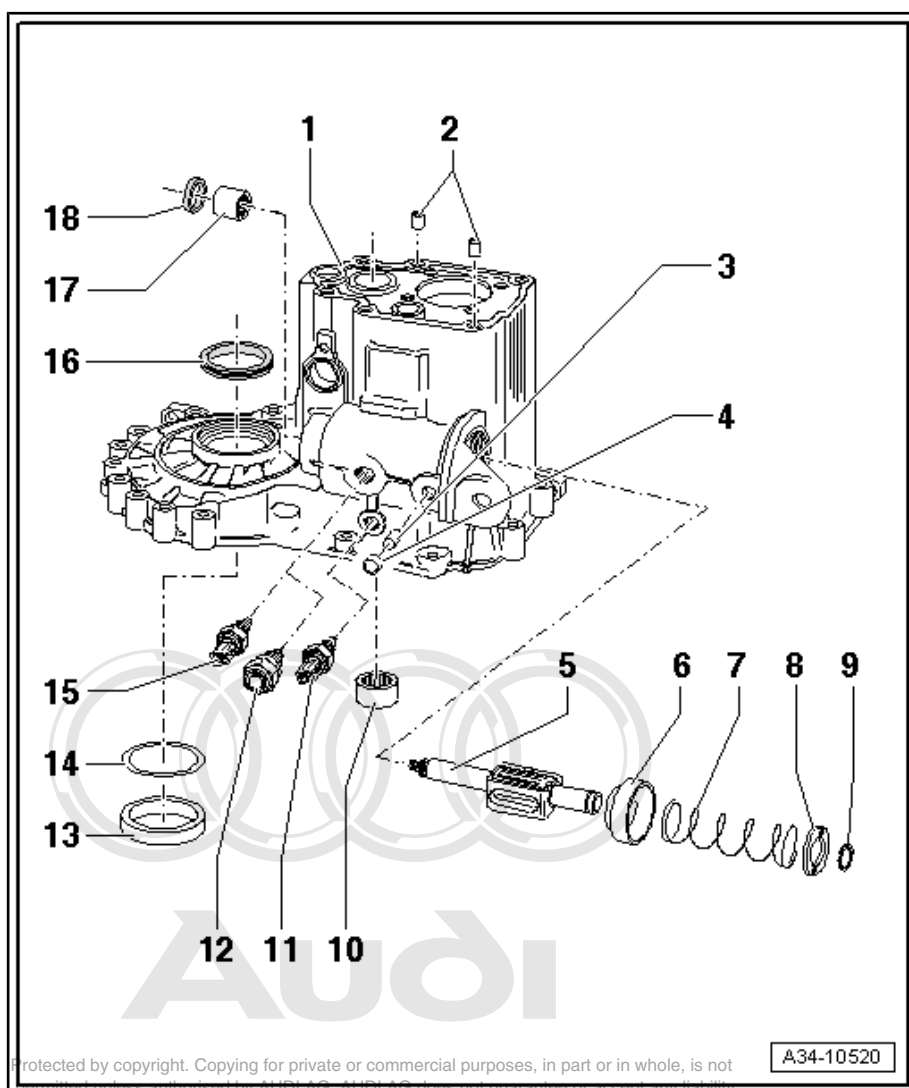
- ☐ For output shaft
- ☐ Removing ⇒ [page 98](#)
- ☐ Installing ⇒ [page 98](#)

11 - Reversing light switch -F4-

- ☐ 23 Nm
- ☐ Fitted from gearbox build date 03 08 8 onwards

12 - Locking bolt

- ☐ 40 Nm



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- ☐ For selector shaft
- ☐ Fitted from gearbox build date 03 08 8 onwards
- ☐ Apply sealant -AMV 188 200 03- when installing

13 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Removing and installing ⇒ [page 131](#)
- ☐ If renewed: adjust differential ⇒ [page 139](#)

14 - Shim "S1"

- ☐ Table of adjustments ⇒ [page 130](#)

15 - Reversing light switch -F4- and locking bolt for selector shaft

- ☐ 23 Nm
- ☐ Fitted up to gearbox build date 02 08 8
- ☐ From gearbox build date 03 08 8, reversing light switch -F4- and locking bolt are supplied as two separate components ⇒ [page 74](#)
- ☐ Apply sealant -AMV 188 200 03- when installing

16 - Oil seal

- ☐ For flange shaft
- ☐ Renewing ⇒ [page 127](#)

17 - Ball sleeve

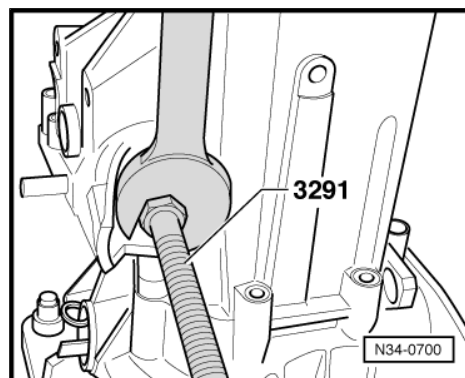
- ☐ For selector shaft
- ☐ Pulling out ⇒ [page 97](#)
- ☐ Drawing in ⇒ [page 97](#)

18 - Oil seal

- ☐ For selector shaft
- ☐ Can be renewed with gearbox in vehicle
- ☐ Removing ⇒ [page 97](#)
- ☐ Drawing in ⇒ [page 97](#)

Removing selector shaft

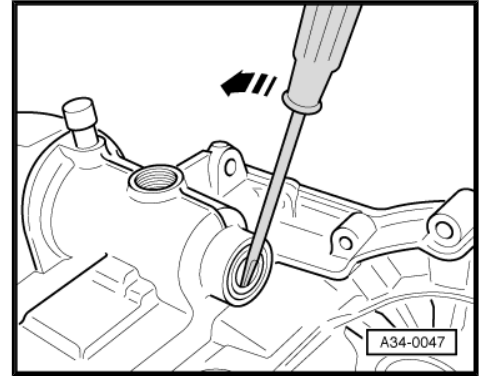
- Unscrew selector shaft sealing cap and remove together with spring.
- Set selector shaft to neutral and pull out of gearbox housing.



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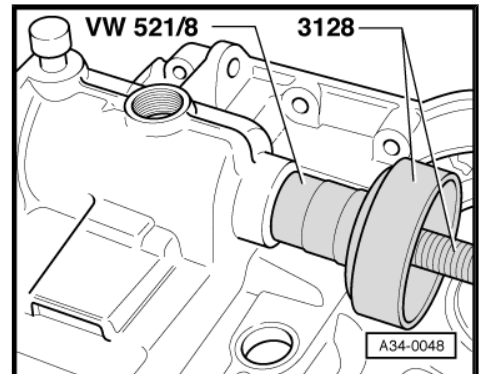
Removing selector shaft oil seal

- Lever out in direction of -arrow- with a screwdriver.



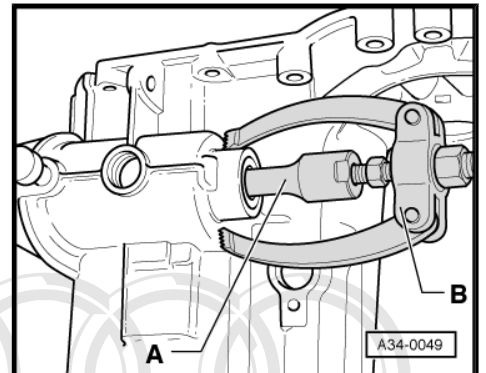
Pulling in selector shaft oil seal

- Pull in as far as stop.
- When gearbox is removed, drive in with -VW 521/8-.



Pulling out selector shaft ball sleeve

- A - Internal puller 18.5 ... 23.5 mm , e.g. -Kukko 21/3-
- B - Counter-support , e.g. -Kukko 22/1-

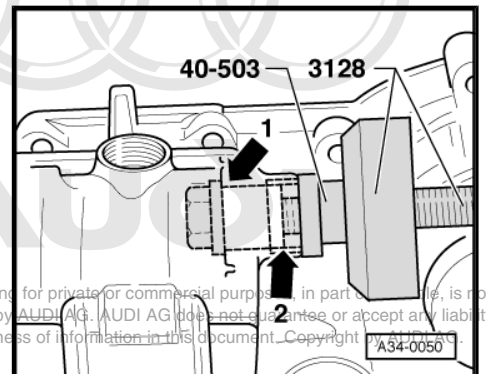


Pulling in selector shaft ball sleeve

- Pull in onto stop -arrow 1-.

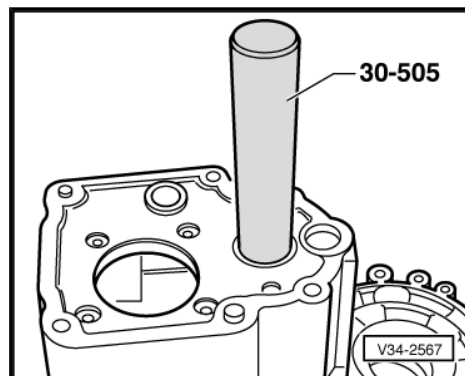
Installation position:

The ball sleeve projects out of the hole at the seal end -arrow 2-.

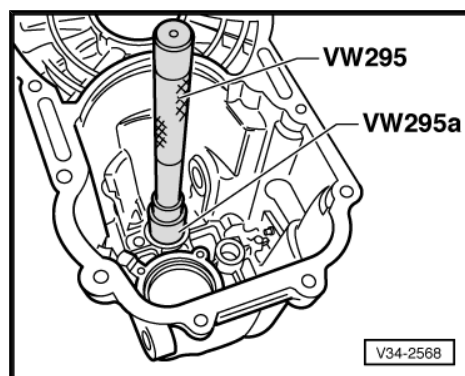


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Driving out needle bearing



Driving in needle bearing onto stop

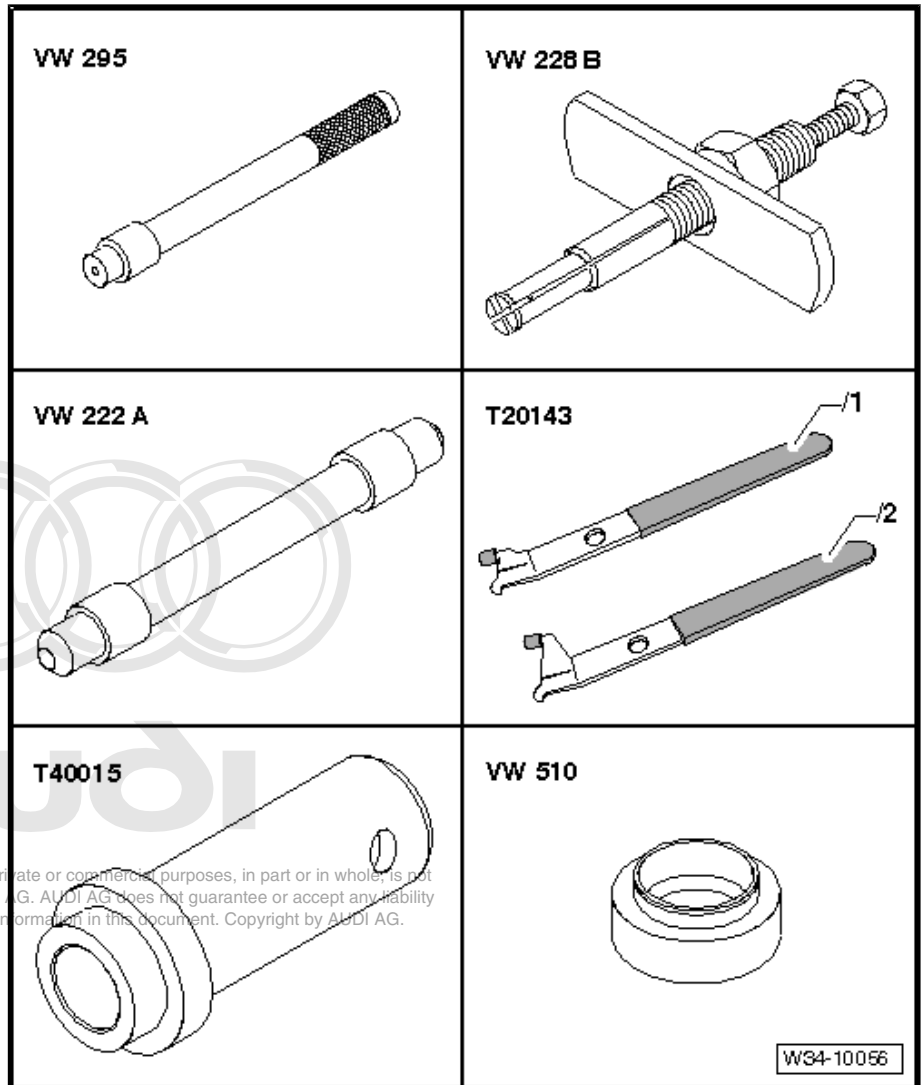


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6 Servicing clutch housing

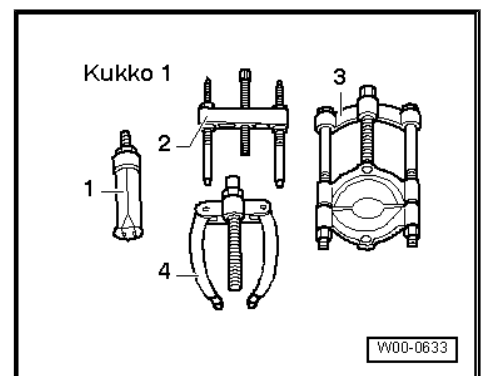
Special tools and workshop equipment required

- ◆ Drift -VW 295-
- ◆ Extractor -VW 228 B-
- ◆ Drift -VW 222 A-
- ◆ Puller hook -T20143/1- or oil seal extractor lever - VW 681-
- ◆ Thrust piece -T40015-
- ◆ Thrust pad -VW 510-



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- ◆ -1- Internal puller -Kukko 21/3-



- ◆ -4- Counter-support -Kukko 22/1-

1 - Oil drain plug

- ☐ 25 Nm
- ☐ Without magnet

2 - Dowel sleeve

- ☐ 2x

3 - Shim "S2"

- ☐ Always 1 mm thick

4 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Removing and installing
⇒ [page 131](#)
- ☐ If renewed: adjust differential
⇒ [page 139](#)

5 - Magnet

- ☐ Held in place by joint surface of housing
- ☐ Apply sealant -AMV 188 200 03- when installing

6 - Shim

- ☐ For output shaft
- ☐ Table of adjustments
⇒ [page 130](#)

7 - Tapered roller bearing outer race

- ☐ For output shaft
- ☐ Removing and installing
⇒ [page 117](#)
- ☐ If renewed: Adjust output shaft
⇒ [page 122](#)

8 - Needle bearing

- ☐ For input shaft
- ☐ Pulling out ⇒ [page 102](#)
- ☐ Driving in ⇒ [page 102](#)

9 - Bolt

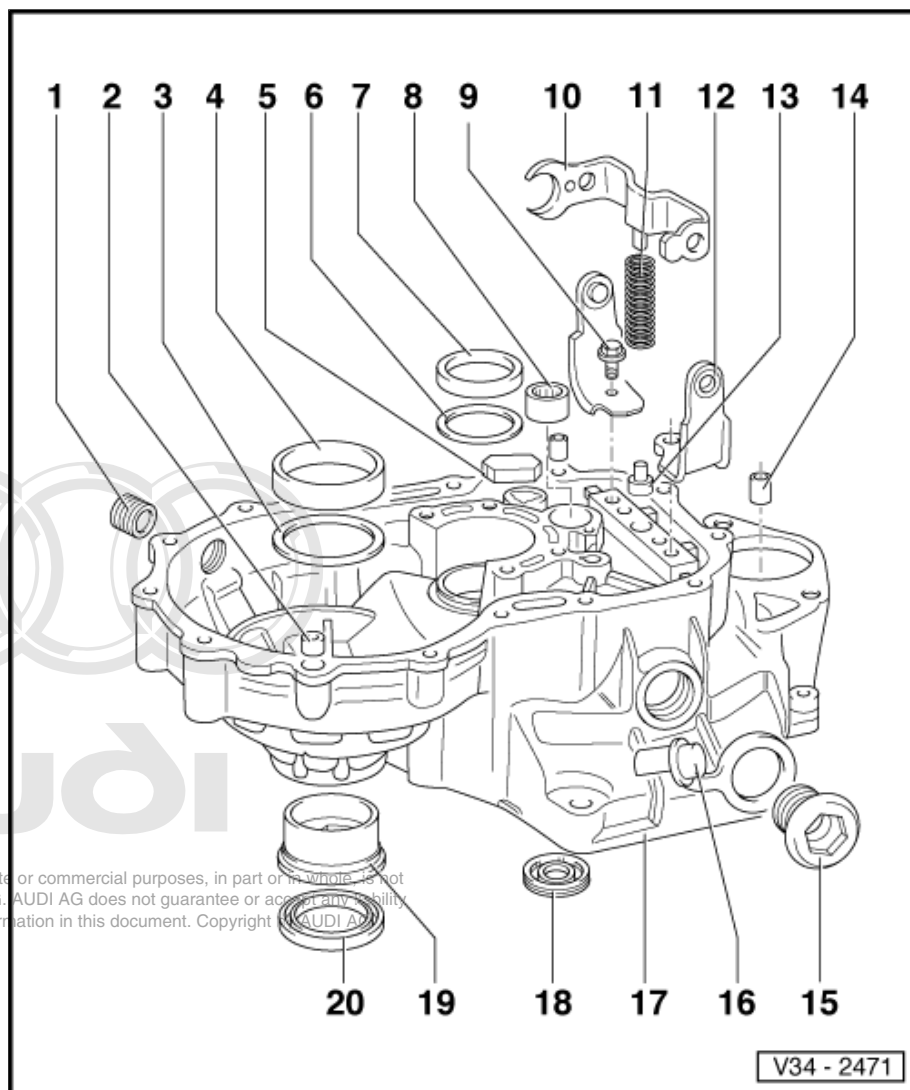
- ☐ 25 Nm
- ☐ With serrations under bolt head

10 - Reverse lever
11 - Spring
12 - Reverse lever support
13 - Sliding piece
14 - Starter bush

- ☐ Not fitted on all gearboxes
- ☐ Allocate according to ⇒ Electronic parts catalogue
- ☐ Pulling out ⇒ [page 102](#)
- ☐ Driving in ⇒ [page 102](#)
- ☐ Can be renewed with gearbox in vehicle

15 - Screw plug

- ☐ Green - Clutch diameter 210 mm



- ☐ White - Clutch diameter 190 and 200 mm



Note

It is important to allocate parts correctly, for example when fitting a replacement gearbox or transferring a clutch.

Consequences if incorrect plugs are installed:

1. White sealing plug - 210 mm Ø clutch

- The TDC sender will be destroyed and the markings on the flywheel will be damaged. Parts of the TDC-sender will remain in the clutch chamber.

2. Green sealing plug - 190 and 200 mm Ø clutch

- Tester does not display a readout or readout is inaccurate or fluctuates.

16 - Cap

17 - Clutch housing

- ☐ Install oil strainer ⇒ [page 101](#) .
- ☐ If replaced: ⇒ ["2 Table of adjustments", page 130](#)

18 - Input shaft oil seal

- ☐ Pulling out ⇒ [page 103](#)
- ☐ Driving in ⇒ [page 103](#)

19 - Sleeve

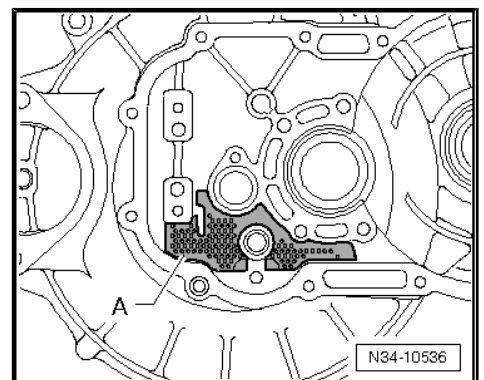
- ☐ For oil seal ⇒ [Item 20 \(page 101\)](#)
- ☐ Removing ⇒ [page 103](#)
- ☐ Driving in ⇒ [page 103](#)

20 - Oil seal

- ☐ For flange shaft
- ☐ Renewing ⇒ [page 127](#)

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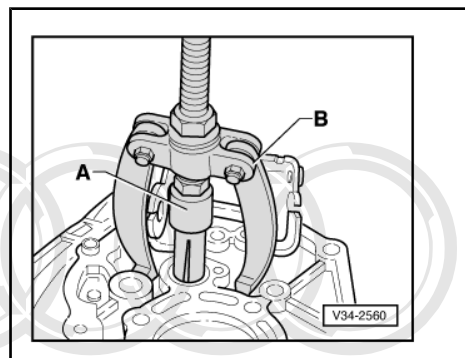
Insert oil strainer -A- in clutch housing



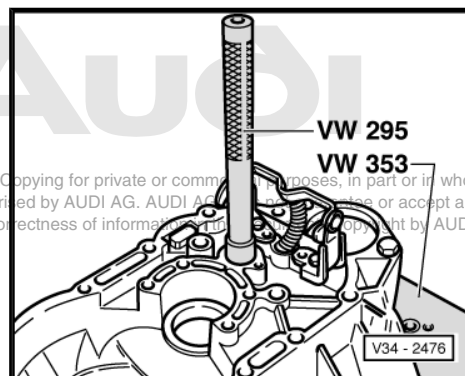
Pulling out input shaft needle bearing

A - Internal puller 18.5 ... 23.5 mm , e.g. -Kukko 21/3-

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

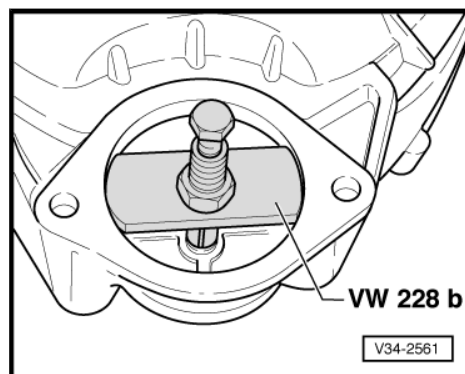


Driving in input shaft needle bearing

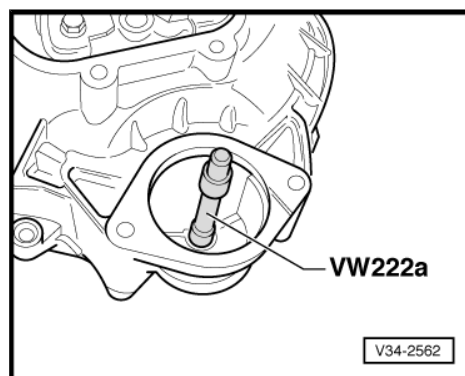


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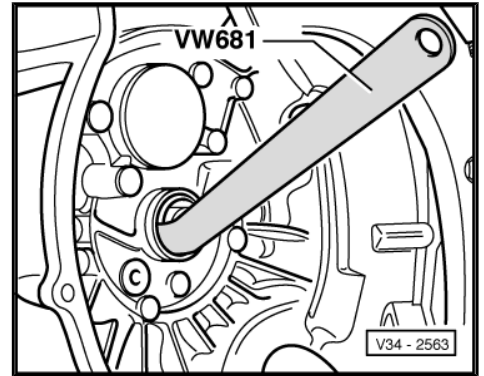
Pulling out starter bush



Driving in starter bush



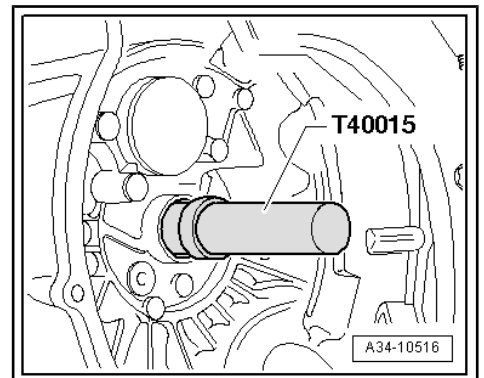
Pulling out oil seal for input shaft using oil seal extractor lever - VW 681- or puller hook -T20143/1- .



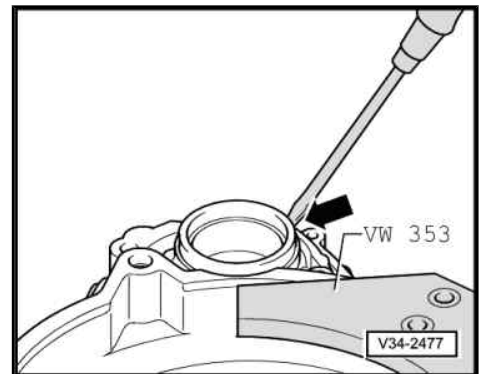
Driving in oil seal for input shaft



When gearbox is dismantled (with input shaft removed), oil seal for input shaft can also be driven in with sleeve -30 - 21- .

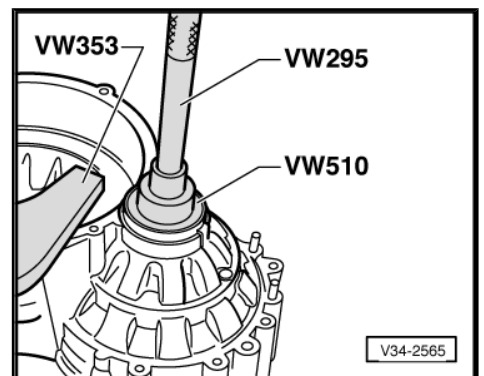


Levering out sleeve with screwdriver



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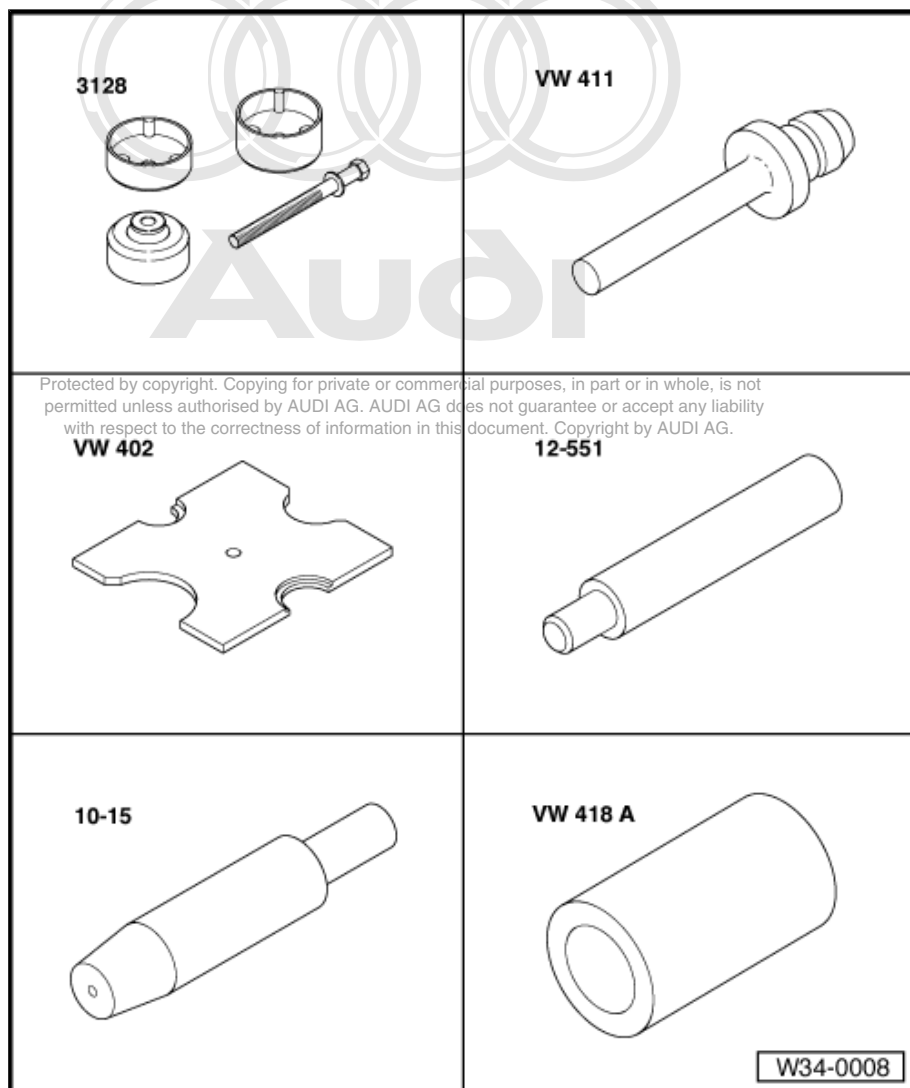
Driving in sleeve



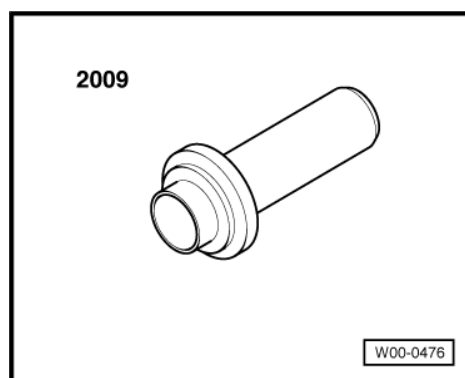
7 Servicing gearbox housing cover

Special tools and workshop equipment required

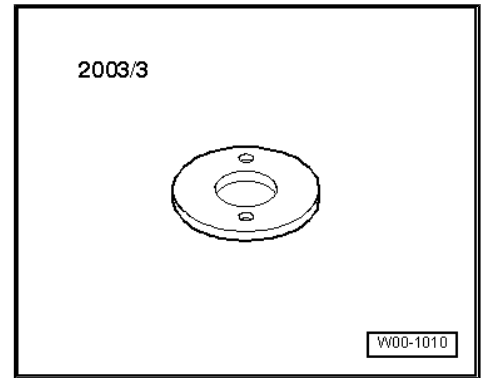
- ◆ Fitting tool -3128-
- ◆ Press tool -VW 411-
- ◆ Thrust plate -VW 402-
- ◆ Centring mandrel -12-551-
- ◆ Guide pin -10-15-
- ◆ Tube -VW 418 A-



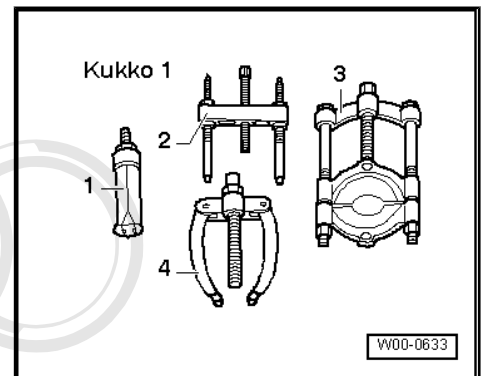
- ◆ Drift sleeve -2009-



◆ Installing ring -2003/3-



◆ -1- Internal puller -Kukko 21/02-



◆ -4- Counter-support -Kukko 22/1-

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1 - Sealing cap

- ☐ Always renew
- ☐ Removing: Pierce and lever out
- ☐ Installing ⇒ [page 107](#)

2 - Release bearing

- ☐ Can also be renewed with gearbox installed, after sealing cap
⇒ [Item 1 \(page 106\)](#) has been removed and slave cylinder has been detached

3 - Clutch lever

- ☐ Only fits in one position

4 - Small bearing bush

- ☐ Pulling out ⇒ [page 107](#)
- ☐ Pressing in ⇒ [page 108](#)

5 - Retaining clip

6 - Needle bearing

7 - Large bearing bush

- ☐ Pressing out ⇒ [page 107](#)
- ☐ Pressing in ⇒ [page 107](#)

8 - Seal

- ☐ Driving in ⇒ [page 108](#)
- ☐ Can be renewed with gearbox installed. To renew, remove release shaft
⇒ [Item 9 \(page 106\)](#)

9 - Release shaft

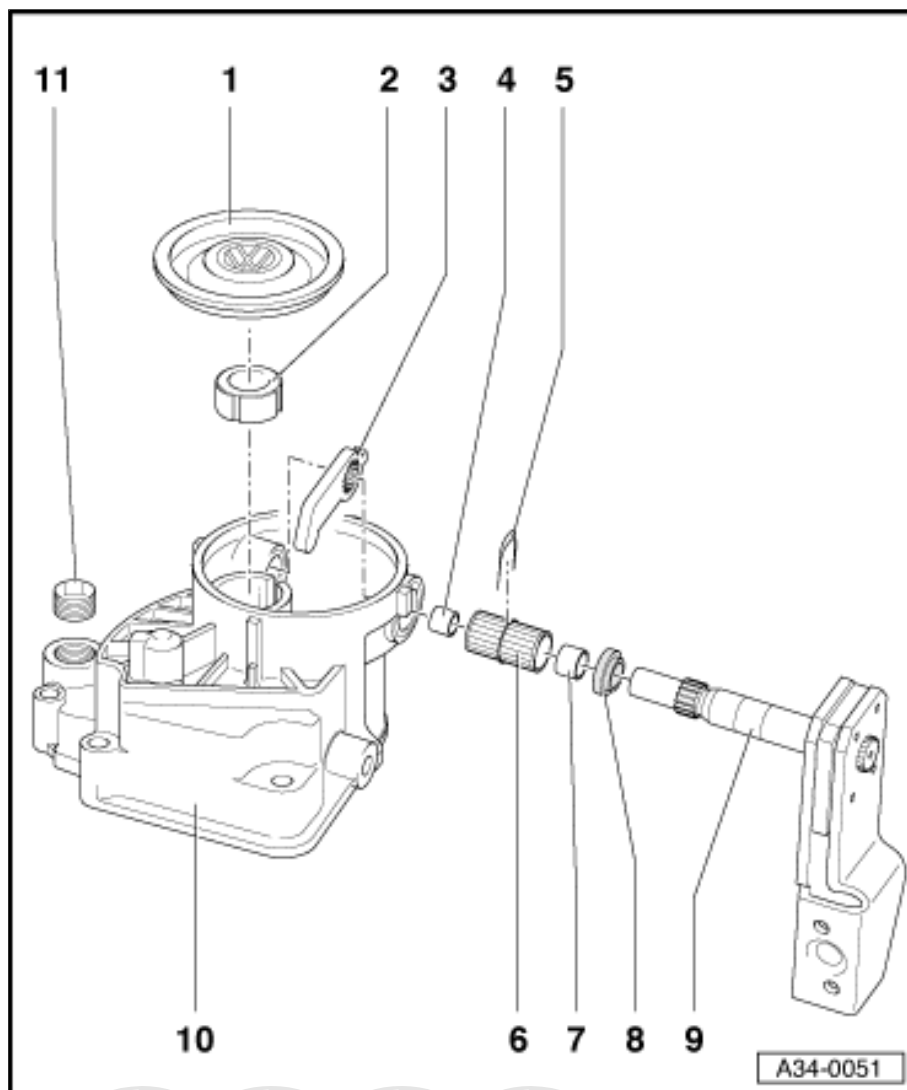
- ☐ Removing: detach sealing cap ⇒ [Item 1 \(page 106\)](#) and retaining clip ⇒ [Item 5 \(page 106\)](#) , pull out release shaft.

10 - Gearbox housing cover

- ☐ Only version with bearing bushes (⇒ [Item 7 \(page 106\)](#) and ⇒ [Item 4 \(page 106\)](#)) is available as a spare part

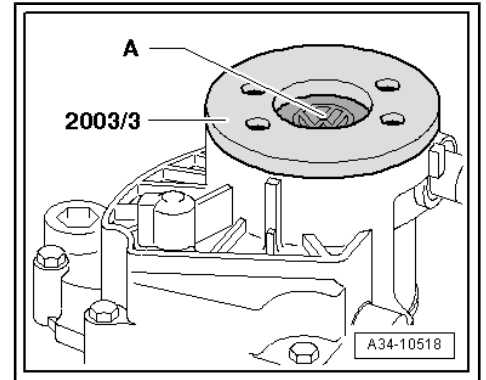
11 - Oil filler plug

- ☐ 25 Nm

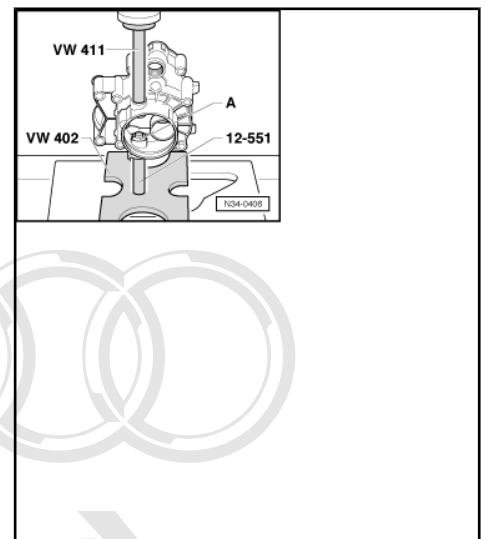


Installing sealing cap -A-

- Do not install sealing cap until gearbox housing cover has been fitted [⇒ page 76](#) .
- Sealing surface on gearbox housing cover must be free of grease.
- Drive on sealing cap -A- using installing ring -2003/3- .

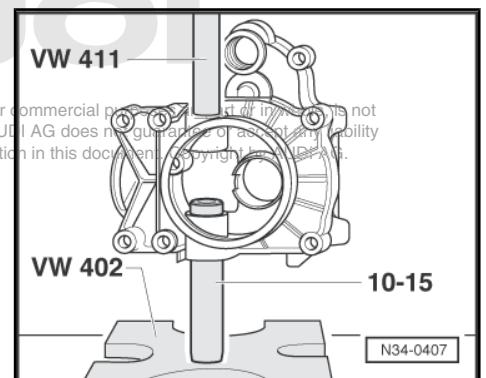


Pressing out large bearing bush -A-



Pressing in large bearing bush

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Pulling out small bearing bush

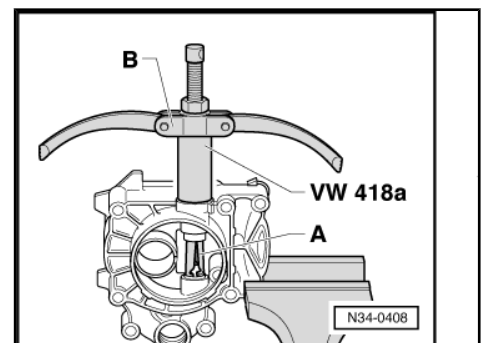
A - Internal puller 10 ... 14 mm , e.g. -Kukko 21/02-

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

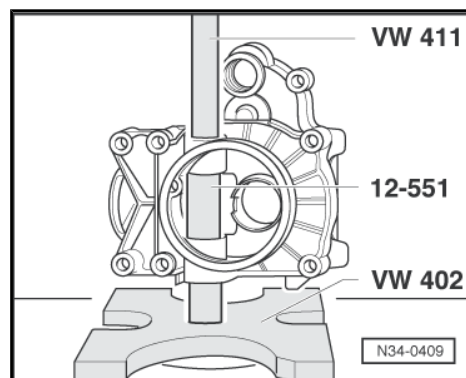


Note

The bush will be damaged when it is pulled out and must therefore always be renewed.

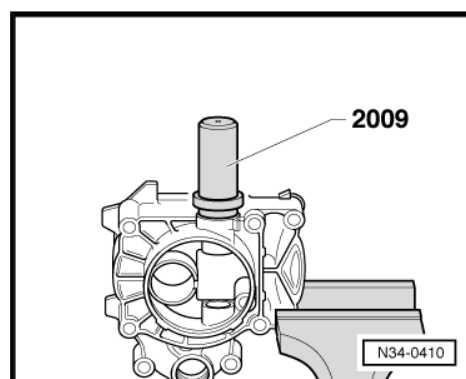


Pressing in small bearing bush



Driving in release shaft seal

- Clamp gearbox housing cover in vice using jaw covers.



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35 – Gears, shafts

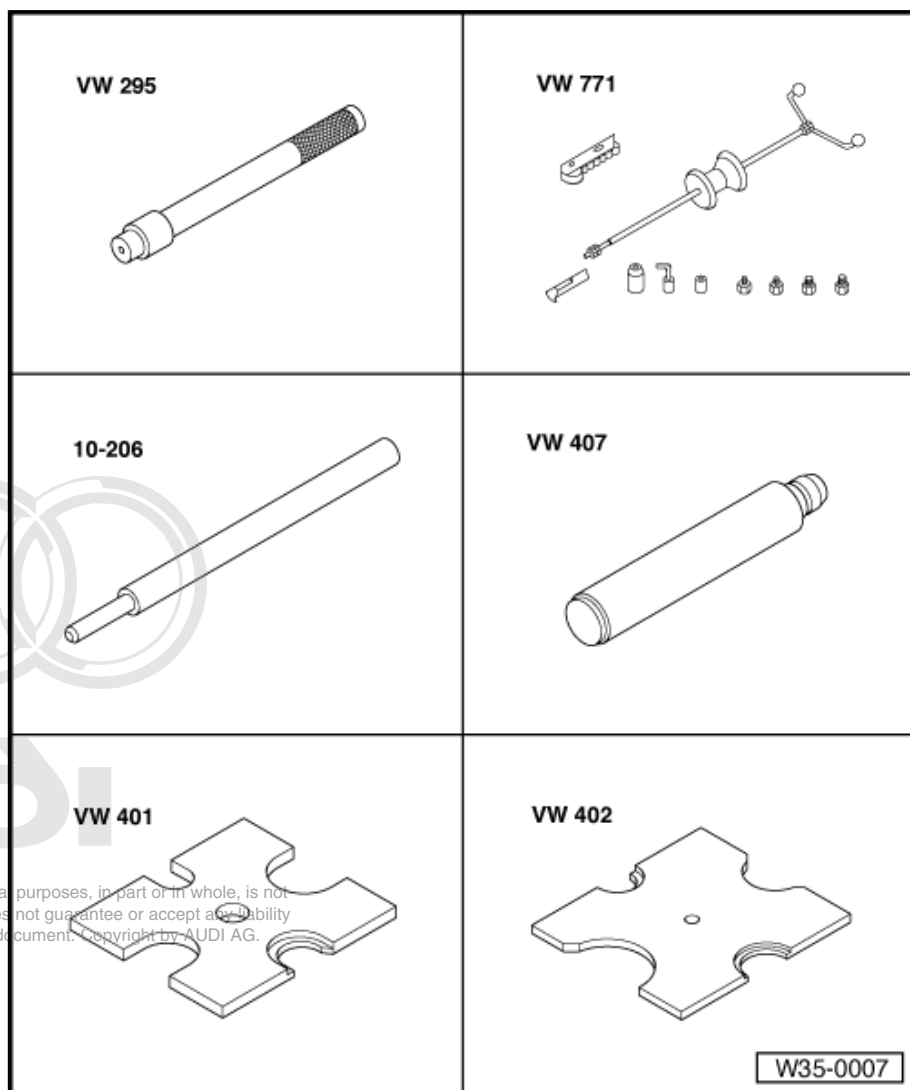
1 Input shaft

⇒ “1.1 Dismantling and assembling input shaft”, page 109

1.1 Dismantling and assembling input shaft

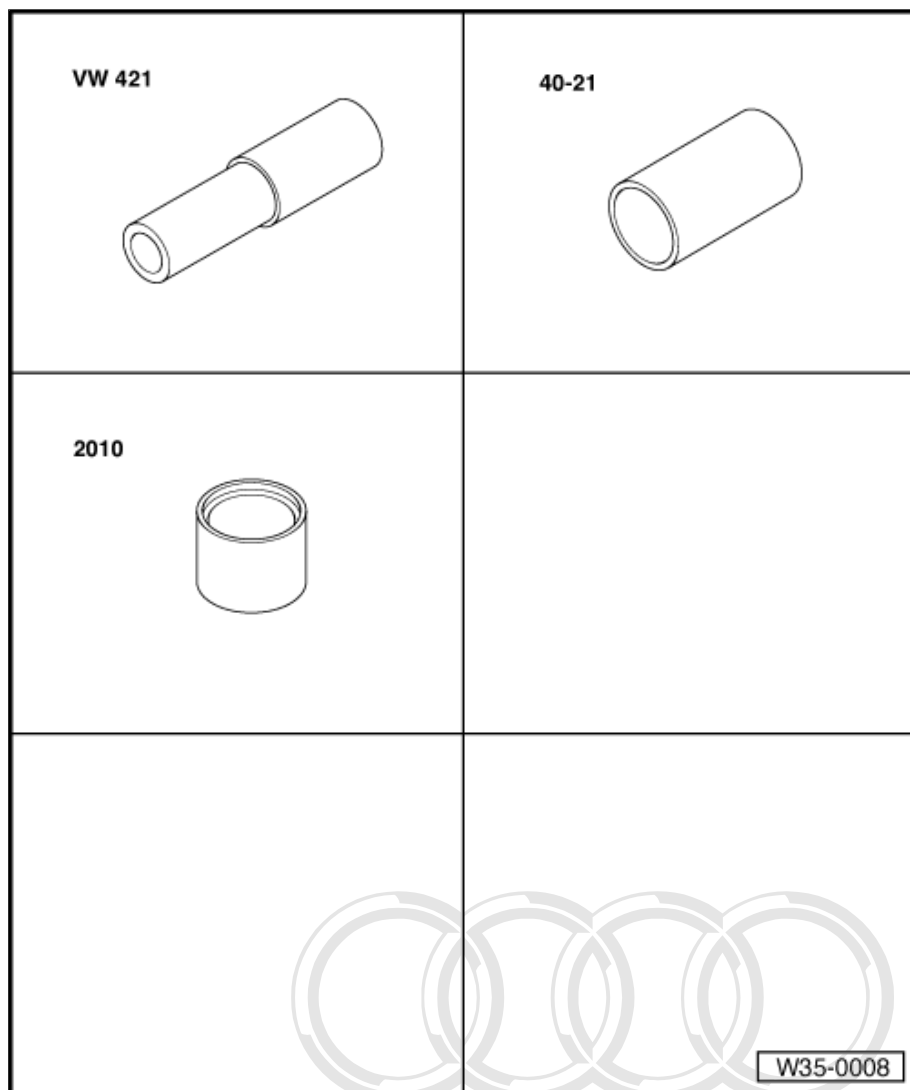
Special tools and workshop equipment required

- ◆ Drift -VW 295-
- ◆ Multi-purpose tool - VW 771-
- ◆ Drift -10 - 206-
- ◆ Press tool -VW 407-
- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-



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- ◆ Tube -VW 421-
- ◆ Drift sleeve -40 - 21-
- ◆ Tube -2010-



Note

- ◆ Refer to technical data when installing new gears ⇒ [page 2](#).
- ◆ Do not over-stretch circlip ⇒ [Item 14 \(page 111\)](#). Always renew circlips which have been damaged or over-stretched.

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1 - Bolt M17 x 1

- ☐ 150 Nm
- ☐ Self-locking
- ☐ Always renew
- ☐ Thread of new bolt is coated with locking fluid
- ☐ Removing and installing
⇒ [page 76](#)

2 - Dished spring

- ☐ Installation position: the outer diameter (concave side) faces 5th gear.

3 - 5th gear locking collar/synchronising hub

- ☐ Removing and installing
⇒ [page 76](#)

4 - Check ring

- ☐ Prevents locking pieces from moving out
- ☐ Removing ⇒ [page 116](#)
- ☐ Installing ⇒ [page 116](#)

5 - Spring

6 - 5th gear locking collar

- ☐ Installation position
⇒ [page 115](#)

7 - 5th gear synchronising hub

8 - Locking pieces

- ☐ 3x

9 - Oval-head countersunk bolt

- ☐ 15 Nm
- ☐ M7 x 23
- ☐ 4x

10 - Grooved ball bearing

- ☐ Pressing off ⇒ [page 114](#)
- ☐ Is pressed into gearbox housing when installing input shaft ⇒ [page 76](#)

11 - Tensioning plate

- ☐ Locks grooved ball bearing in place

12 - 4th speed selector gear

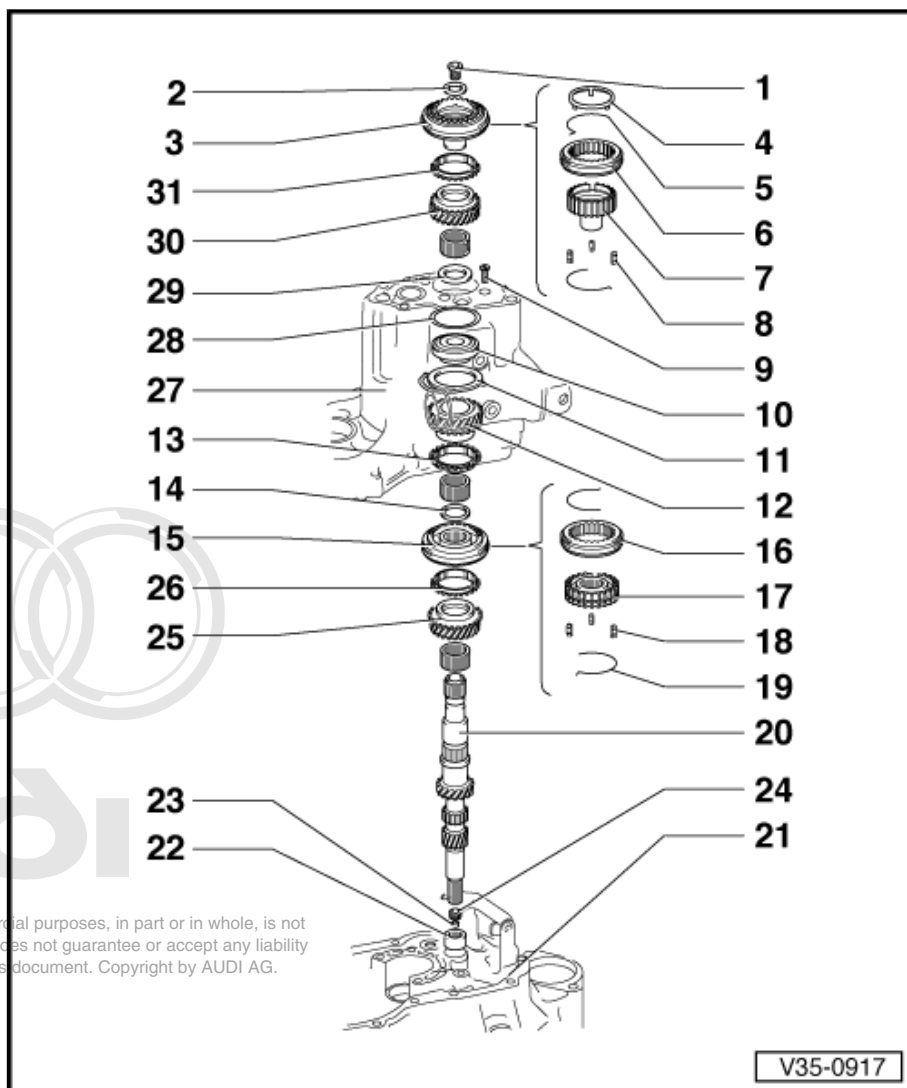
13 - 4th gear synchro-ring

- ☐ Checking for wear ⇒ [page 114](#)

14 - Circlip

15 - Locking collar with synchronising hub for 3rd and 4th gear

- ☐ Press off with 3rd speed selector gear ⇒ [page 114](#)
- ☐ Installation position of synchronising hub ⇒ [page 114](#)
- ☐ Assembling ⇒ [page 115](#)
- ☐ Pressing on ⇒ [page 115](#)



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16 - Locking collar**17 - Synchronising hub****18 - Locking pieces**

- ☐ 3x

19 - Spring**20 - Input shaft****21 - Clutch housing****22 - Needle bearing**

- ☐ For input shaft
- ☐ Removing and installing ⇒ [page 102](#)

23 - Seal for clutch push rod

- ☐ Can be renewed when gearbox is removed but not dismantled
- ☐ Lever out with screwdriver ⇒ [page 112](#)
- ☐ Installation position ⇒ [page 113](#)
- ☐ Driving in ⇒ [page 113](#)

24 - Bearing bush for clutch push rod

- ☐ Installation position ⇒ [page 113](#)
- ☐ Pulling out ⇒ [page 113](#)
- ☐ Can be renewed when gearbox is removed but not dismantled
- ☐ Driving in ⇒ [page 113](#)

25 - 3rd speed selector gear**26 - 3rd gear synchro-ring**

- ☐ Checking for wear ⇒ [page 114](#)

27 - Gearbox housing**28 - Shim**

- ☐ For input shaft
- ☐ Note ⇒ [Item 26 \(page 76\)](#)

29 - Thrust washer

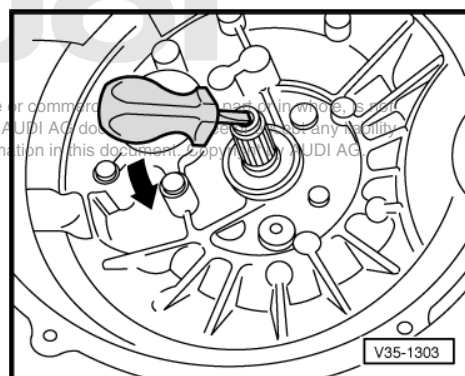
- ☐ Installation position ⇒ [page 115](#)
- ☐ After fitting 5th gear synchro-ring ⇒ [Item 31 \(page 112\)](#) , press 5th speed selector gear ⇒ [Item 30 \(page 112\)](#) onto synchronising hub ⇒ [Item 7 \(page 111\)](#)

30 - 5th speed selector gear**31 - 5th gear synchro-ring**

- ☐ Checking for wear ⇒ [page 114](#)

Levering out clutch push rod seal

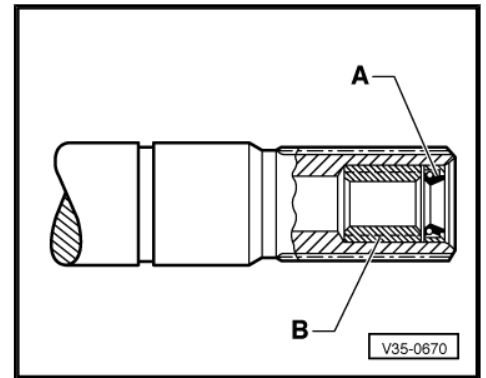
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Installation position of seal and bearing bush

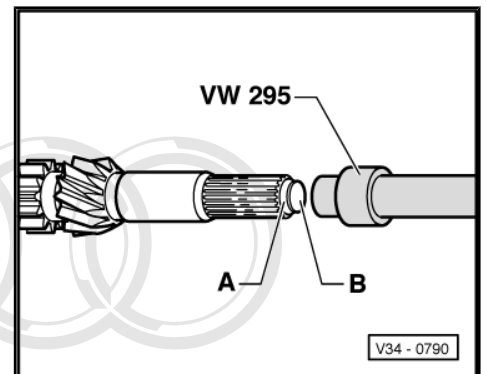
A - Seal for clutch push rod

B - Bearing bush for clutch push rod



Driving in clutch push rod seal

- Drive in seal -A- flush with the assembly plug -B- supplied. Take off assembly plug. The seal now has the specified installation depth of 0.8...1.3 mm. Lightly oil sealing lip.



Pulling out bearing bush for clutch push rod

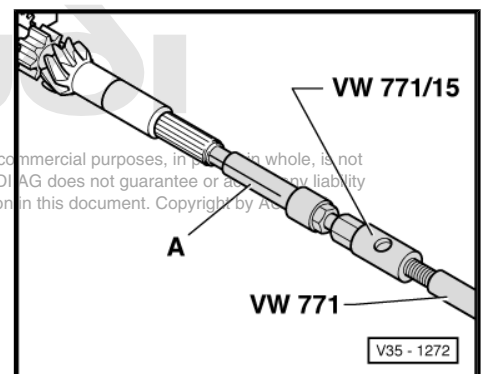
A - Internal puller 8 ... 12 mm , e.g. -Kukko 21/01-

- Use threaded adapter from counter support , e.g. -Kukko 22/1- for connecting internal puller and special tool -VW 771/15-



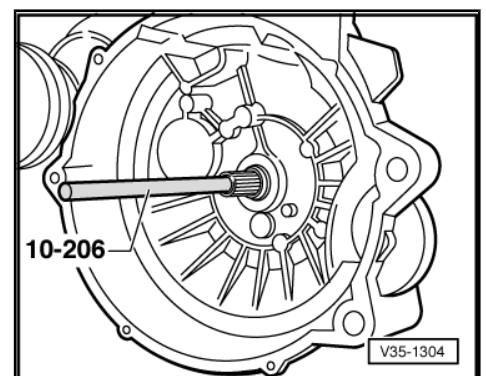
Note

With input shaft installed, pull out bearing bush using counter-support , e.g. -Kukko 22/1- via thrust pad -VW 512- .



Driving in bearing bush for clutch push rod

- Drive bearing bush approx. 7 mm into input shaft.



Pressing off grooved ball bearing

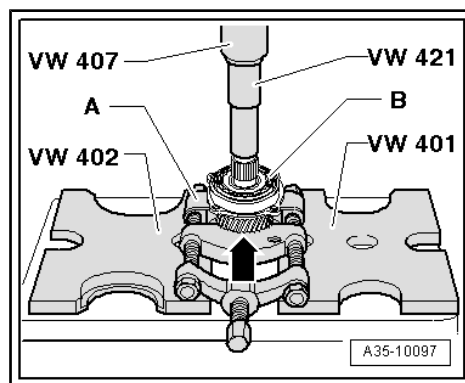


Note

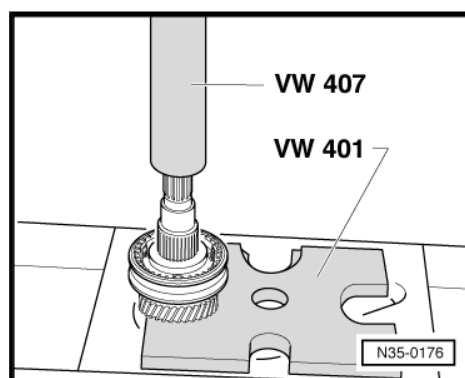
When pressing off, make sure that only the gear teeth of the selector gear -arrow- and not the dog teeth contact the splitter -A-. Otherwise the dog teeth will be damaged.

- Press off grooved ball bearing -B- with 4th speed selector gear.

A - Splitter 22...115 mm , e.g. -Kukko 17/2-



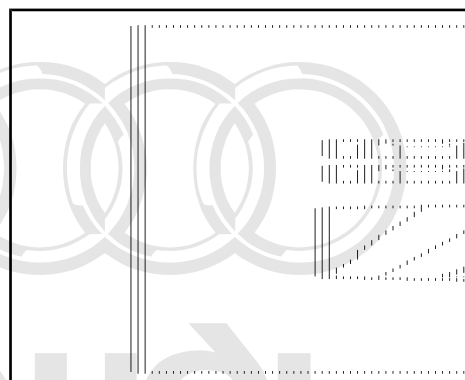
Pressing off 3rd and 4th gear synchronising hub/locking collar with 3rd speed selector gear



Checking synchro-ring for wear

- Press synchro-ring onto tapered seat on selector gear and measure gap -a- with a feeler gauge.

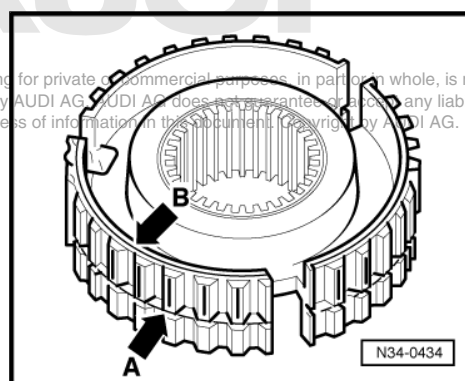
Gap -a-	Installation depth	Wear limit
3rd gear	1.15...1.75 mm	0.5 mm
4th gear	1.3...1.9 mm	
5th gear	1.3...1.9 mm	



Installation position of 3rd and 4th gear synchronising hub

The shorter teeth below the annular groove -arrow A- face toward 3rd gear.

The groove on the top -arrow B- faces towards 4th gear.

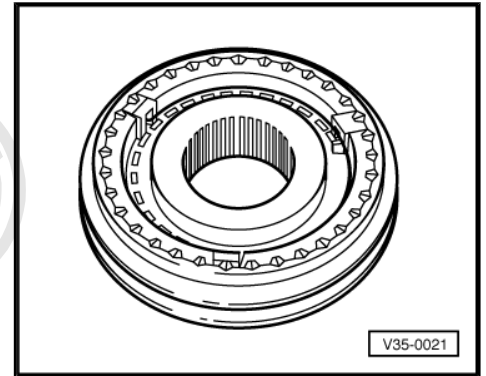


Assembling 3rd and 4th gear locking collar/synchronising hub

- Push locking collar over synchronising hub.

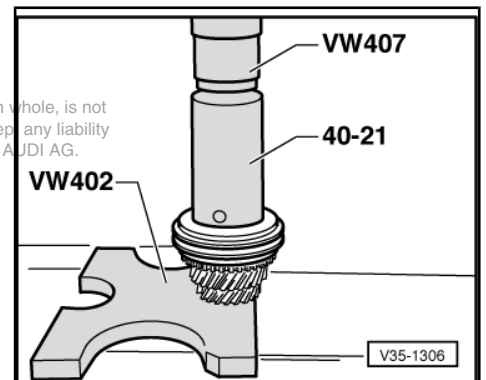
Recesses for locking pieces in synchronising hub and locking collar must align.

- Insert locking pieces and install springs offset at 120°. Angled end of spring must locate in hollow locking piece.



Pressing on 3rd and 4th gear synchronising hub with locking collar

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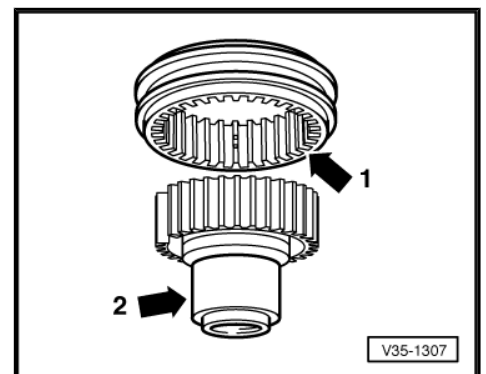
Installation position of 5th gear locking collar

- Push locking collar over synchronising hub.

Recesses for locking pieces in synchronising hub and locking collar must align.

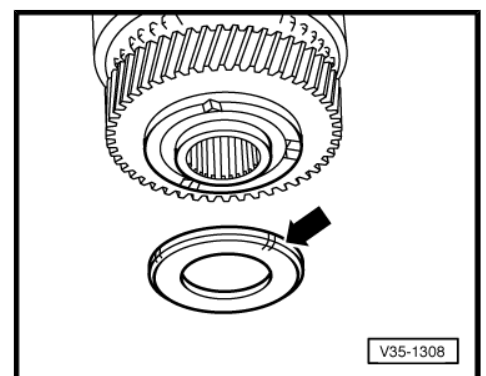
The chamfer on the spline -arrow 1- faces toward the shaft -arrow 2- of the 5th gear synchronising hub.

- Insert locking pieces and install springs offset at 120°. Angled end of spring must locate in hollow locking piece.



Installation position of thrust washer for 5th speed selector gear

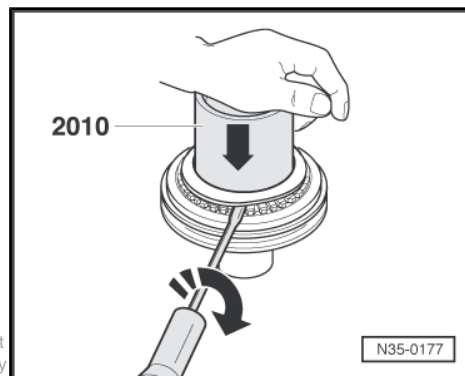
The chamfer -arrow- faces away from the selector gear.



Removing stop ring

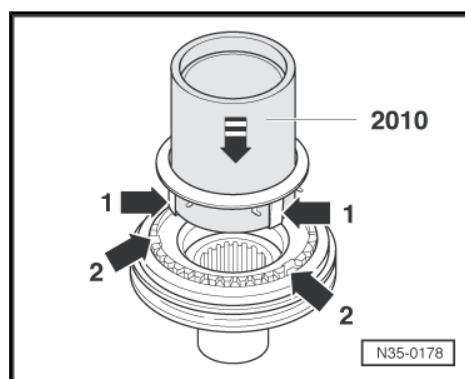
- Press tube -2010- into synchronising hub/stop ring. Lever stop ring out of synchronising hub from alternate sides.
- The stop ring must be positioned fully on the tube -2010-
⇒ [page 116](#)
- Take off stop ring together with tube -2010- .

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Installing stop ring

- Insert stop ring together with tube -2010- into 5th gear synchronising hub/locking collar. The projections -arrow 1- engage in the slots -arrow 2- for the locking pieces in the synchronising hub.
- Take off tube -2010- , the projections must lock in position in the synchronising hub when this is done.



2 Output shaft (pinion shaft)

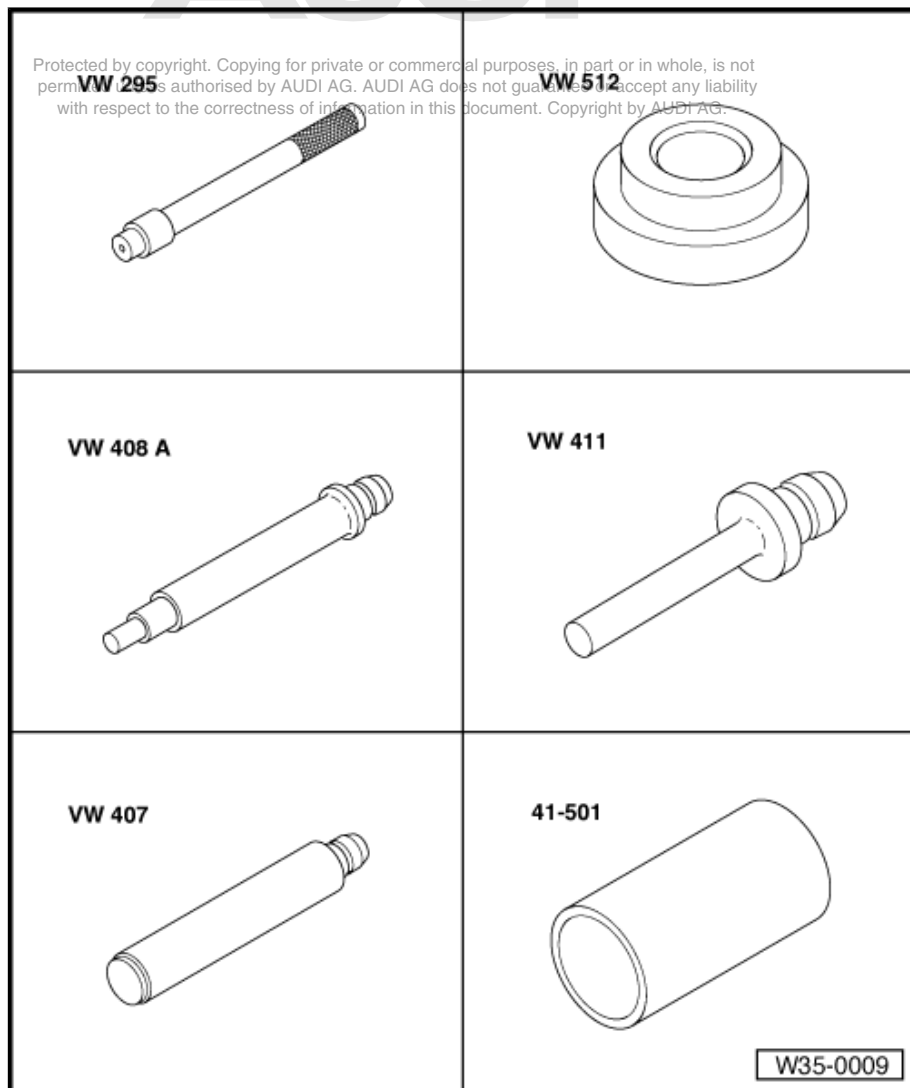
⇒ [“2.1 Dismantling and assembling output shaft \(pinion shaft\)”, page 117](#)

⇒ [“2.2 Adjusting output shaft”, page 122](#)

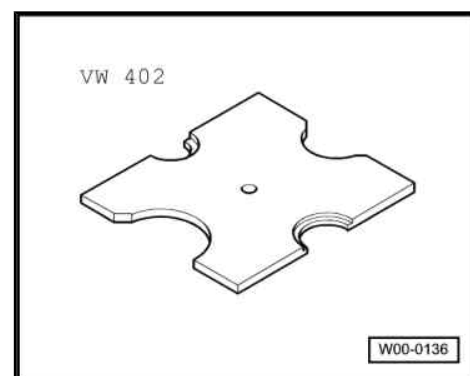
2.1 Dismantling and assembling output shaft (pinion shaft)

Special tools and workshop equipment required

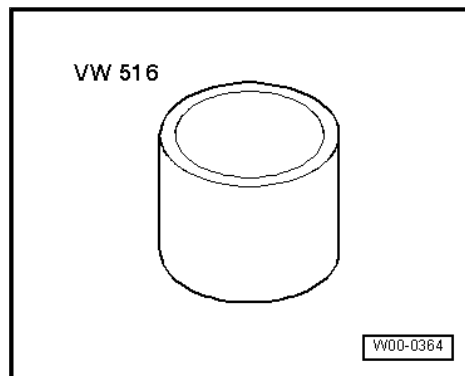
- ◆ Drift -VW 295-
- ◆ Thrust pad -VW 512-
- ◆ Press tool -VW 408 A-
- ◆ Press tool -VW 411-
- ◆ Press tool -VW 407-
- ◆ Drift sleeve -41 - 501-



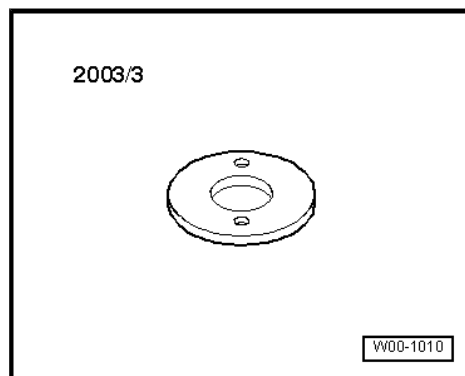
- ◆ Thrust plate -VW 402-



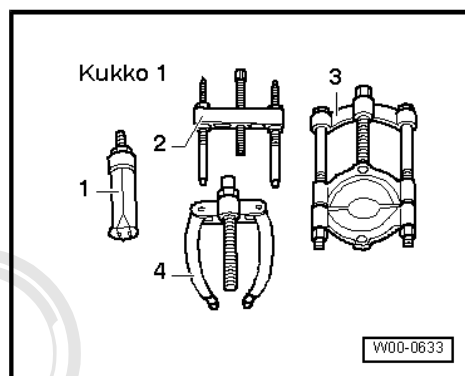
◆ Tube -VW 516-



◆ Installing ring -2003/3-



◆ -1- Internal puller -Kukko 21/6-



◆ -3- Splitter -Kukko 17/2-

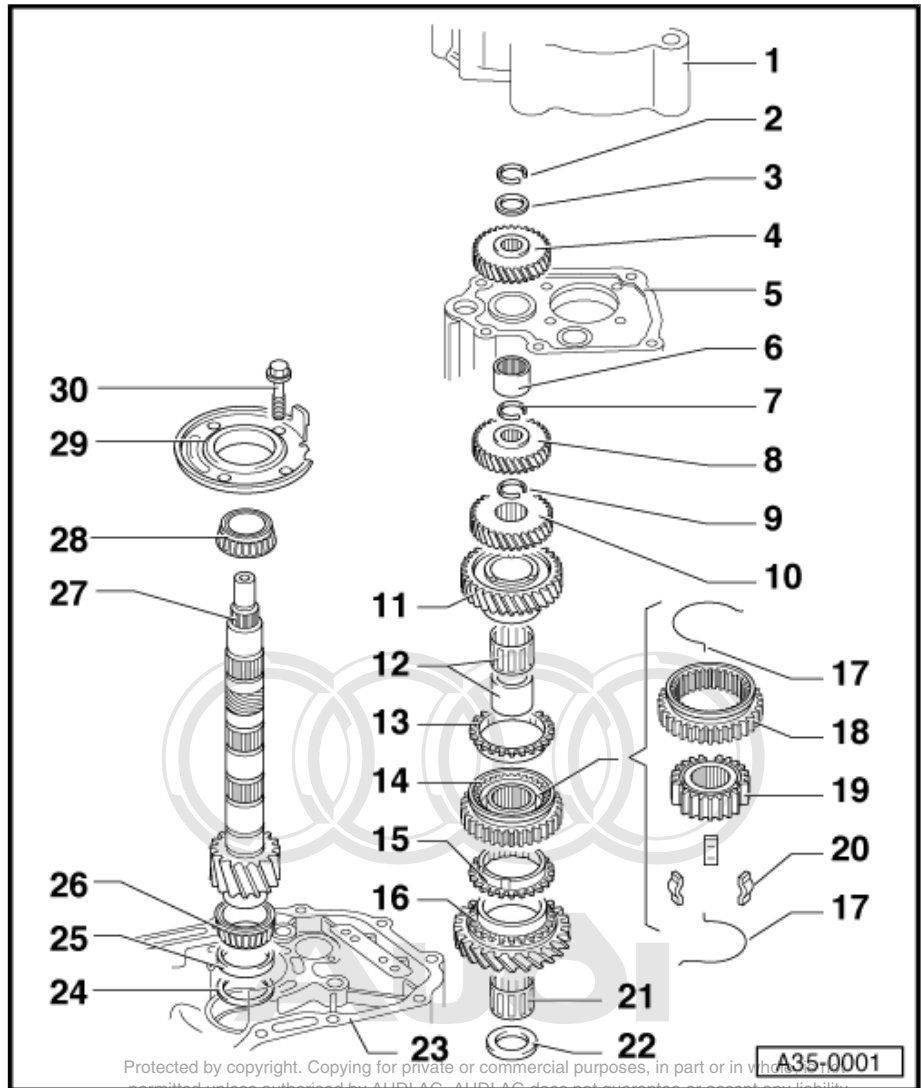
◆ -4- Counter-support -Kukko 22/2-



Note

- ◆ Refer to technical data ⇒ [page 2](#) when installing new gears or a new output shaft.
- ◆ Always renew both tapered roller bearings together.
- ◆ Do not over-stretch circlips. Always renew circlips which have been damaged or over-stretched.
- ◆ Carry out output shaft adjustment ⇒ [page 122](#) if the clutch housing, output shaft (final drive gear set) or tapered roller bearings have been renewed.

- 1 - Gearbox housing cover
- 2 - 5th gear wheel retaining ring
- 3 - Thrust washer
- 4 - 5th gear wheel
 - ☐ Removing and installing ⇒ [page 76](#)
- 5 - Gearbox housing
- 6 - Needle bearing
 - ☐ Removing and installing ⇒ [Item 10 \(page 95\)](#)
- 7 - 4th gear wheel retaining ring
- 8 - 4th gear wheel
 - ☐ Installation position ⇒ [page 88](#)
- 9 - 3rd gear wheel retaining ring
 - ☐ Re-determining thickness ⇒ [page 76](#)
- 10 - 3rd gear wheel
 - ☐ Installation position ⇒ [page 87](#)
 - ☐ Adjusting axial clearance ⇒ [page 76](#)
- 11 - 2nd speed selector gear
- 12 - Needle bearing for 2nd speed selector gear
 - ☐ Pulling off inner race ⇒ [page 76](#)
 - ☐ Pressing on inner race ⇒ [page 76](#)
- 13 - 2nd gear synchro-ring
 - ☐ Checking for wear ⇒ [page 120](#)
- 14 - Locking collar with synchronising hub for 1st and 2nd gear
 - ☐ Assembling locking collar/synchronising hub ⇒ [page 121](#) and ⇒ [page 121](#)
 - ☐ Removing and installing ⇒ [page 76](#)
- 15 - 1st gear synchro-ring
 - ☐ Checking for wear ⇒ [page 120](#)
 - ☐ Identification ⇒ [page 120](#)
- 16 - 1st speed selector gear
- 17 - Spring
- 18 - Locking collar
- 19 - Synchronising hub
- 20 - Locking pieces
 - ☐ 3x
- 21 - Needle bearing
 - ☐ For 1st gear



22 - Thrust washer

- ☐ Installation position ⇒ [page 76](#)

23 - Clutch housing

24 - Shim

- ☐ For output shaft
- ☐ Table of adjustments ⇒ [page 130](#)

25 - Small tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 121](#)
- ☐ Pressing in ⇒ [page 122](#)

26 - Small tapered roller bearing inner race

- ☐ Pressing off ⇒ [page 122](#)
- ☐ Pressing on ⇒ [page 122](#)

27 - Output shaft

- ☐ Is paired with final drive gear, always renew together as a set
- ☐ Adjusting ⇒ [page 122](#)

28 - Large tapered roller bearing inner race

- ☐ Pressing off ⇒ [page 122](#)
- ☐ Pressing on ⇒ [page 122](#)

29 - Bearing mounting

- ☐ With large tapered roller bearing outer race and stop for reverse gear wheel
- ☐ Only renew outer race together with large tapered roller bearing and bearing mounting

30 - Bolt

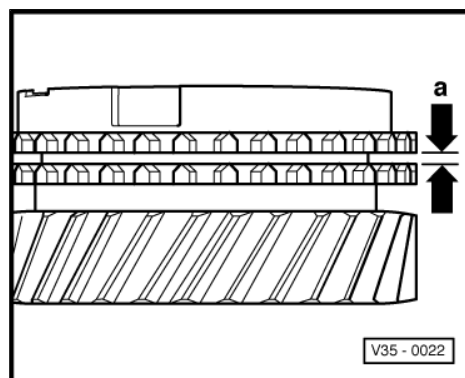
- ☐ 25 Nm and turn 90° further

Checking synchro-ring for wear

- Press synchro-ring onto tapered seat on selector gear and measure gap -a- with a feeler gauge.

Gap -a-	Installation depth	Wear limit
1st and 2nd gear	11 / 17 mm	0.5 mm

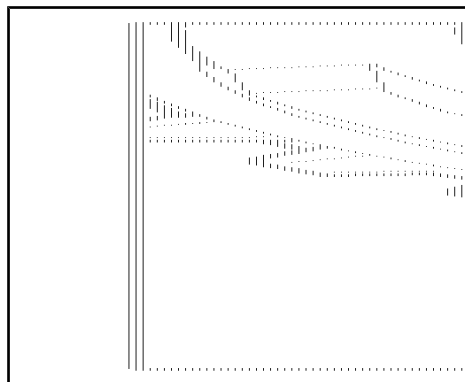
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Identifying 1st gear synchro-ring

Identification: 1 tooth missing -arrow- at 3 points.

This synchro-ring must only be fitted to 1st gear.



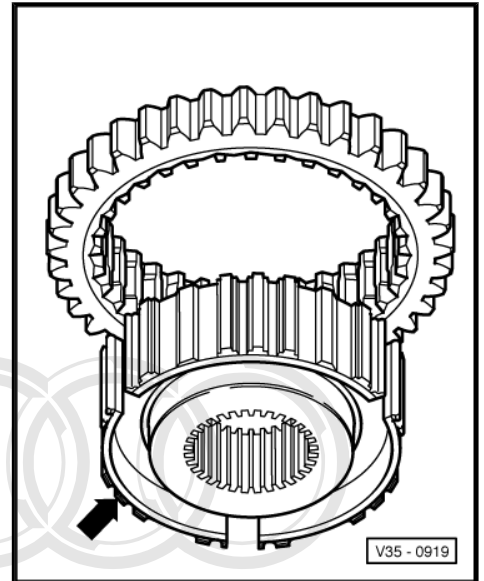
Assembling 1st and 2nd gear locking collar and synchronising hub

Installation position of synchronising hub:

Identification groove on face -arrow- faces toward outer splines of locking collar.

- Push locking collar over synchronising hub.

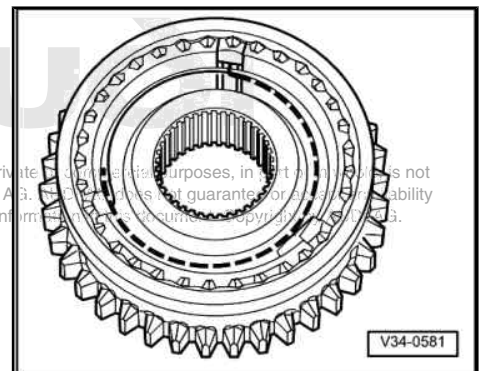
Recesses for locking pieces in synchronising hub and locking collar must align.



Assembling 1st and 2nd gear locking collar/synchronising hub

- Insert locking pieces and install springs offset at 120°. Angled end of spring must locate in hollow locking piece.

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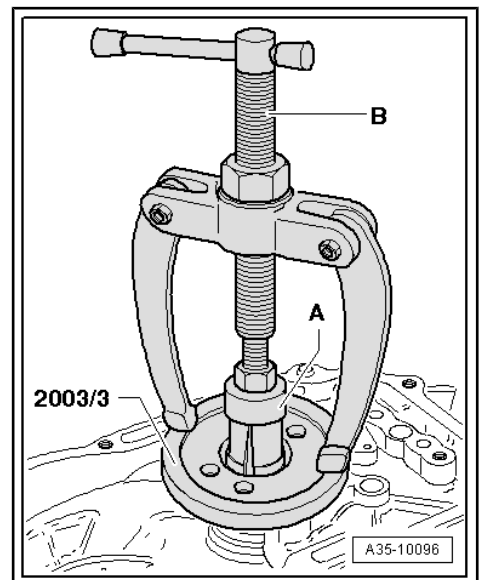
Pulling out small tapered roller bearing outer race

A - Internal puller 37 ... 46 mm , e.g. -Kukko 21/6-

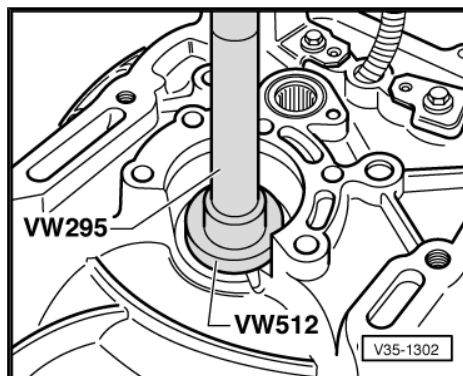
B - Counter-support , e.g. -Kukko 22/2-



Position installing ring -2003/3- on the mounting surface for the bearing mounting to prevent the legs of counter-support from damaging the clutch housing.



Pressing in small tapered roller bearing outer race



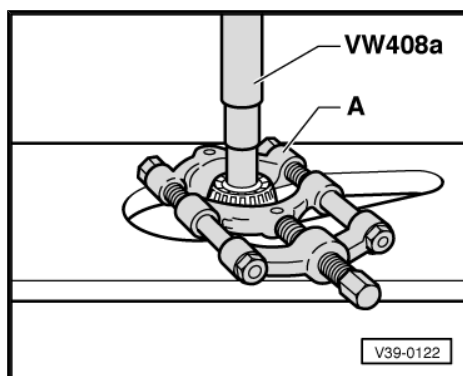
Pressing off small tapered roller bearing inner race

A - Splitter 22...115 mm , e.g. -Kukko 17/2-



Note

Inner race can also be pulled off using tapered roller bearing puller -V.A.G 1582- and grip -V.A.G 1582/5- .



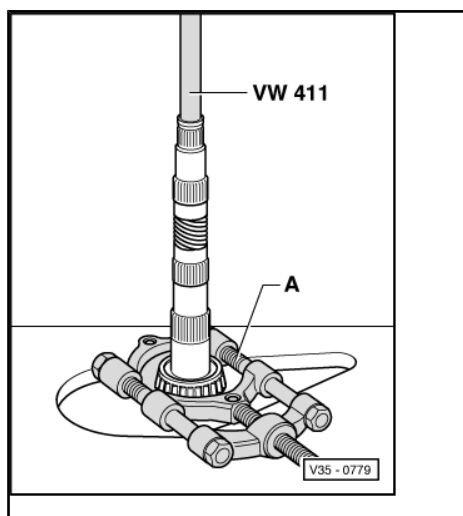
Pressing off large tapered roller bearing inner race

A - Splitter 22...115 mm , e.g. -Kukko 17/2-

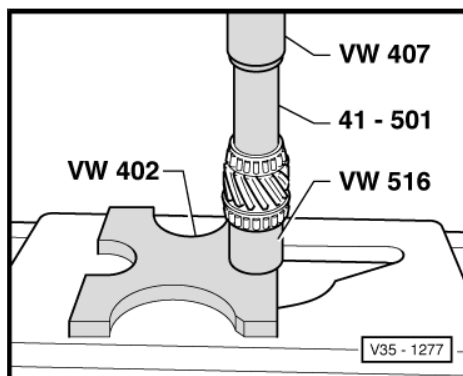


Note

Inner race can also be pulled off using tapered roller bearing puller -V.A.G 1582- and grip -V.A.G 1582/7- .



Heating small and large tapered roller bearing inner race to about 100°C, fitting and pressing home

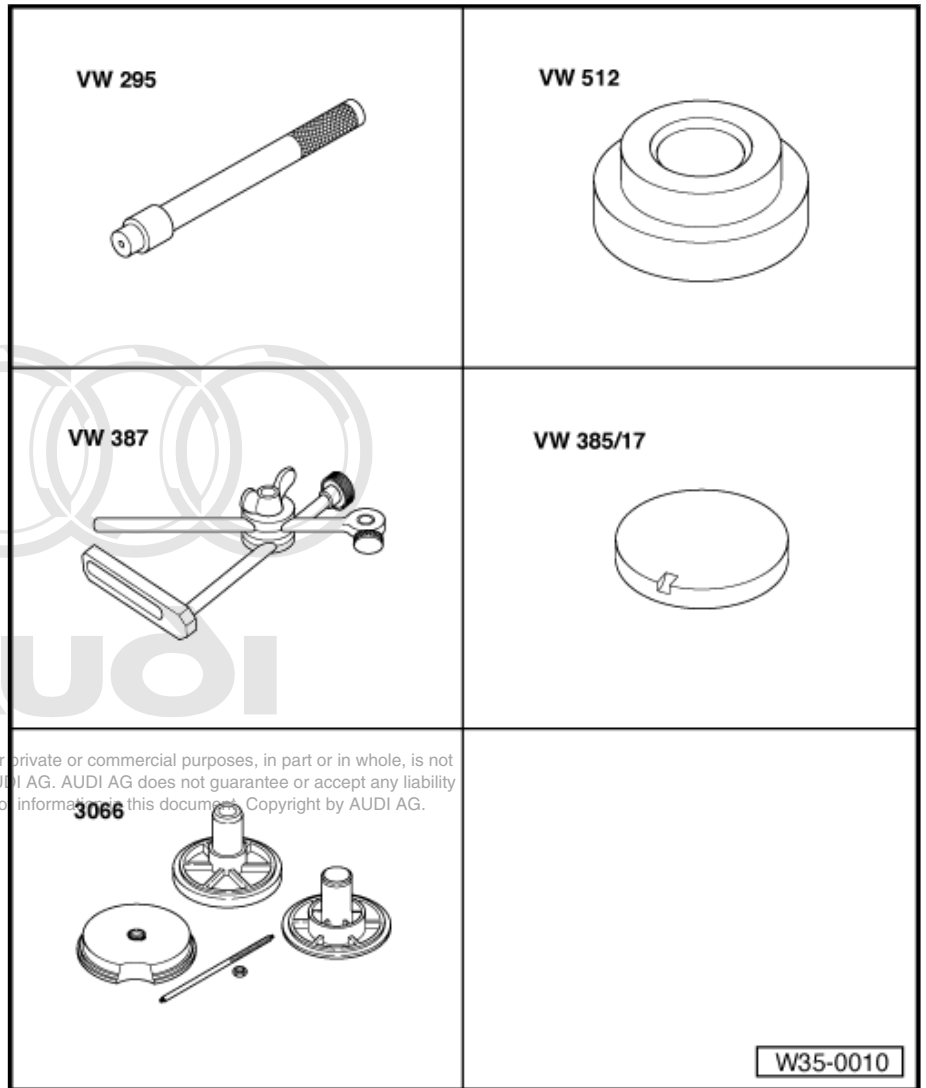


2.2 Adjusting output shaft

(Determining thickness of output shaft shim)

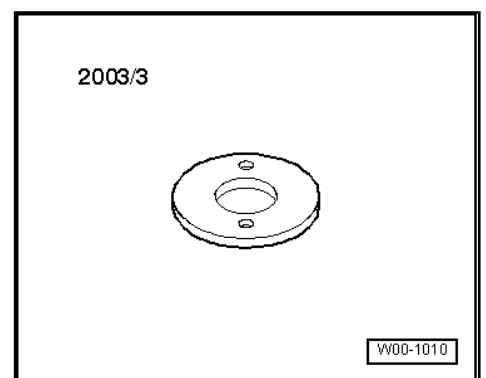
Special tools and workshop equipment required

- ◆ Drift -VW 295-
- ◆ Thrust pad -VW 512-
- ◆ Universal dial gauge bracket -VW 387-
- ◆ End measuring plate - VW 385/17-
- ◆ Spindle from assembly tool -3066-
- ◆ Dial gauge

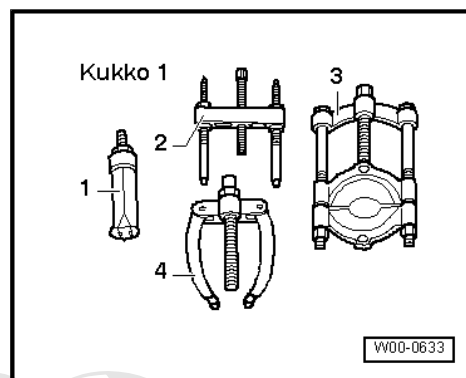


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- ◆ Installing ring -2003/3-



◆ -1- Internal puller -Kukko 21/6-



◆ -4- Counter-support -Kukko 22/2-

The output shaft must be re-adjusted when the following components have been renewed:

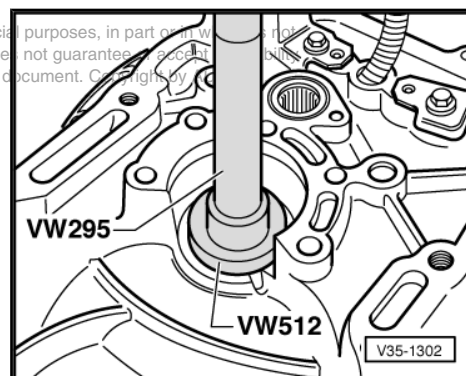
- ◆ Final drive gear set
- ◆ Clutch housing

or

- ◆ Tapered roller bearings

Table of adjustments ⇒ [page 130](#)

- Press small tapered roller bearing outer race together with a 0.65 mm thick shim fully into clutch housing
- Insert output shaft and tighten hexagon bolts for bearing mounting to 25 Nm.



- Mount dial gauge (3 mm measuring range) and set to “0” with 1 mm preload.
- A - Shim (0.65 mm thick)
- Move output shaft up and down; read off and note play indicated on dial gauge (in this example 0.35 mm).

 Note

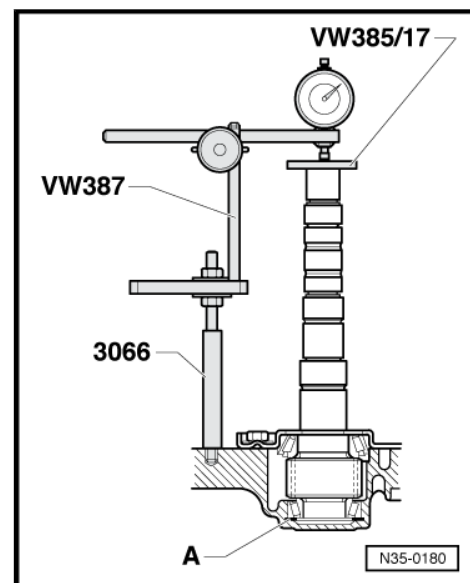
When taking measurements, do not turn the output shaft as the bearings will otherwise settle and falsify the measurement results.

Determining thickness of shim

The specified bearing preload is obtained by adding a constant preload figure (0.15 mm) to the measured value obtained (0.35 mm) and the thickness of the shim installed (0.65 mm).

Example:

Shim installed	0.65 mm
+ Measured value	0.35 mm
+ Preload (constant value)	0.15 mm
Thickness of shim	1.15 mm



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- Remove output shaft and pull out small tapered roller bearing outer race.

A - Internal puller 37 ... 46 mm , e.g. -Kukko 21/6-

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



Note

Position installing ring -2003/3- on the mounting surface for the bearing mounting to prevent the legs of counter-support from damaging the clutch housing.

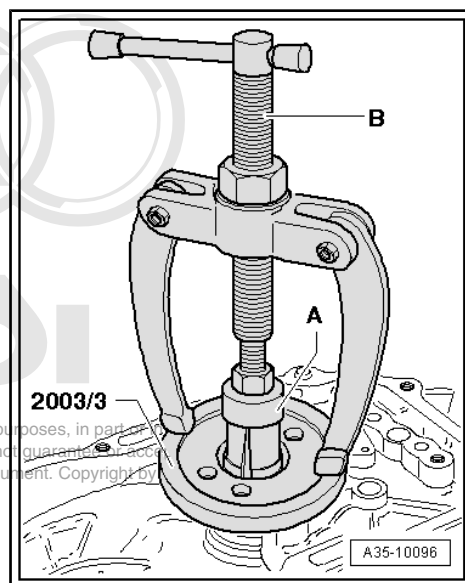
The following shims are available:

Thickness (mm)	Part No.
0.65	020 311 391 P
0.70	020 311 391 Q
0.75	020 311 391
0.80	020 311 391 A
0.85	020 311 391 B
0.90	020 311 391 C
0.95	020 311 391 D
1.00	020 311 391 E
1.05	020 311 391 F
1.10	020 311 391 G
1.15	020 311 391 H
1.20	020 311 391 J
1.25	020 311 391 K
1.30	020 311 391 L
1.35	020 311 391 M
1.40	020 311 391 N

Tolerance variations make it possible to obtain the exact shim thickness required.

If the size of the shim required is larger than those listed in the table, install two shims amounting to the correct value.

- Press in small tapered roller bearing outer race together with the correct shim (in example 1.15 mm) ⇒ [page 122](#) and install output shaft. Tighten hexagon bolts for bearing mounting in clutch housing to specified torque.



39 – Final drive - differential

1 Renewing flange shaft oil seals (gearbox installed)

⇒ [“1.1 Removing flange shaft oil seals”, page 127](#) .

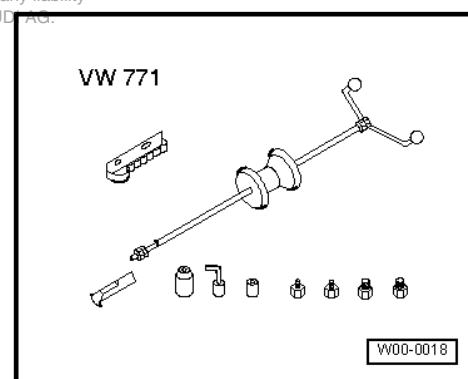
⇒ [“1.2 Installing flange shaft oil seals”, page 128](#) .

1.1 Removing flange shaft oil seals

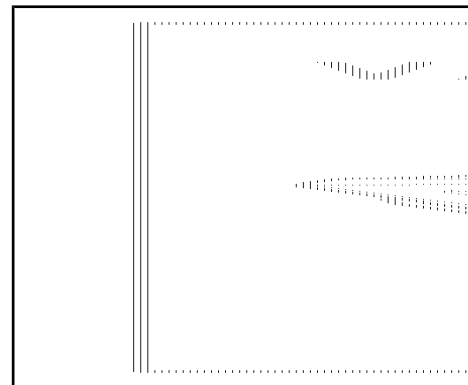
- Please observe general repair instructions ⇒ [page 7](#) .

Special tools and workshop equipment required

- ◆ Multi-purpose tool -VW 771-



- ◆ Puller hook -VW 771/37-
- ◆ Drip tray , e.g. -VAS 6208-



Before renewing left oil seal:

- Remove drive shaft ⇒ Rep. Gr. 40 .

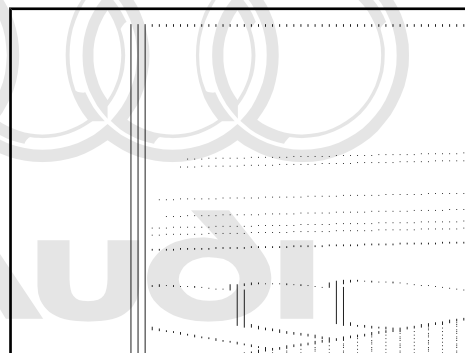
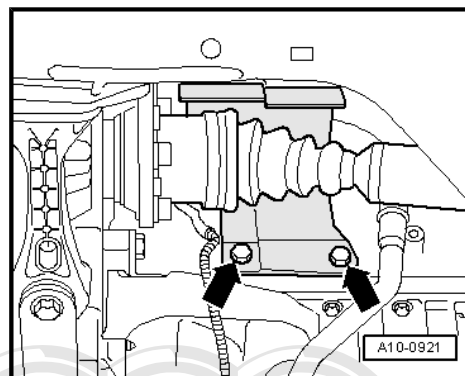
Before renewing right oil seal:

- Turn steering to full right lock.

- If fitted, remove protective cover for right inner constant velocity joint -arrows-.
- Unbolt drive shaft from flange shaft.
- Tie-up drive shaft as high as possible. Do not damage paint on drive shaft.

Continued for both oil seals:

- Place drip tray e.g. -VAS 6208- under the gearbox.
- Remove flange shaft securing bolt. To do this, screw two bolts into flange and counterhold flange shaft with tyre iron or other suitable lever.
- Pull out flange shaft and spring.

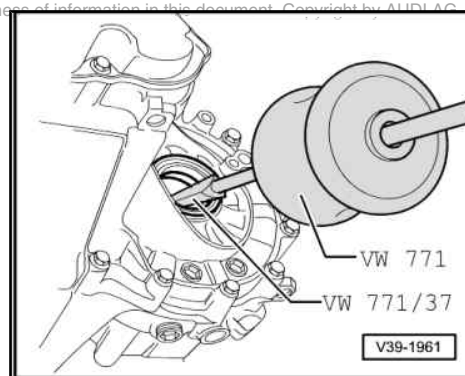


- Pull out flange shaft oil seal using multi-purpose tool -VW 771- and puller hook -VW 771/37- .



Note

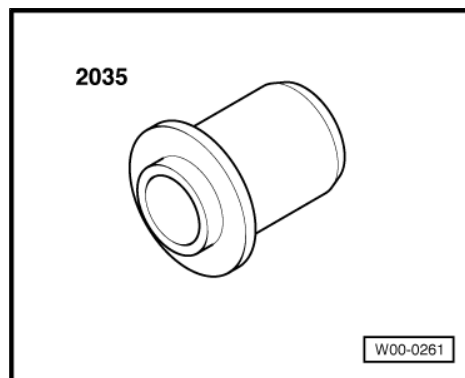
- ◆ Do not damage sleeve when pulling out right oil seal, otherwise leaks will occur.
- ◆ Renew sleeve if damaged ⇒ [Item 19 \(page 101\)](#)



1.2 Installing flange shaft oil seals

Special tools and workshop equipment required

- ◆ Drift sleeve -2035-



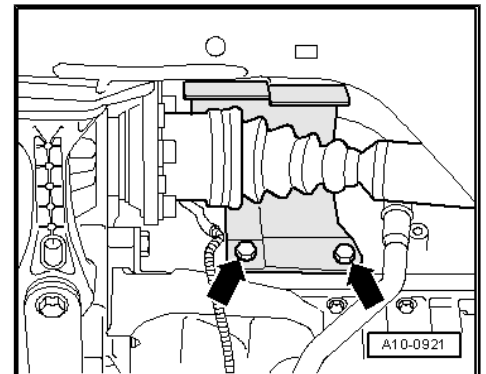
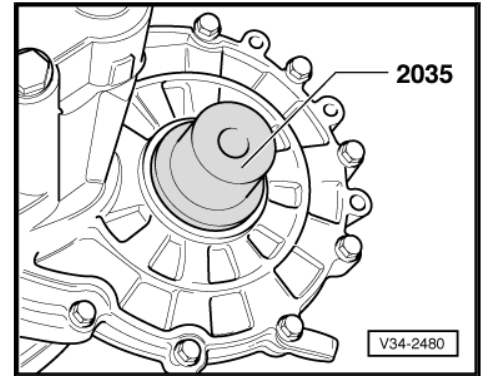
- ◆ Sealing grease -G 052 128 A1-

- Drive new oil seal into sleeve as far as stop. When doing this do not tilt seal.
- Pack space between sealing lip and dust lip half-full with sealing grease -G 052 128 A1- .
- Install flange shaft.
- Screw countersunk bolt into flange shaft / threaded piece.
- Install left drive shaft or attach right drive shaft to flange shaft
⇒ Rep. Gr. 40 .
- If fitted, attach protective cover for right inner constant velocity joint -arrows-.

Check gearbox oil level. If necessary, top up to bottom lip of filler hole ⇒ [page 69](#) .

Tightening torques

Flange shaft to gearbox (countersunk bolt)	25 Nm
Protective cover for right inner constant velocity joint to engine	20 Nm
	35 Nm



2 Table of adjustments



Note

If repairs have been carried out to the gearbox it is only necessary to adjust the output shaft or differential if components have been renewed which have a direct effect on the adjustment of the gearbox. Refer to the following table to avoid unnecessary adjustment work:

		Components requiring adjustment:	
		Output shaft ⇒ page 122	Differential (S ₁ + S ₂) ⇒ page 139
Components renewed:	Gearbox housing		x
	Clutch housing	x	x
	Tapered roller bearing for differential		x
	Output shaft (final drive set)	x	
	Differential cage		x
	Tapered roller bearing for output shaft	x	

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3 Differential

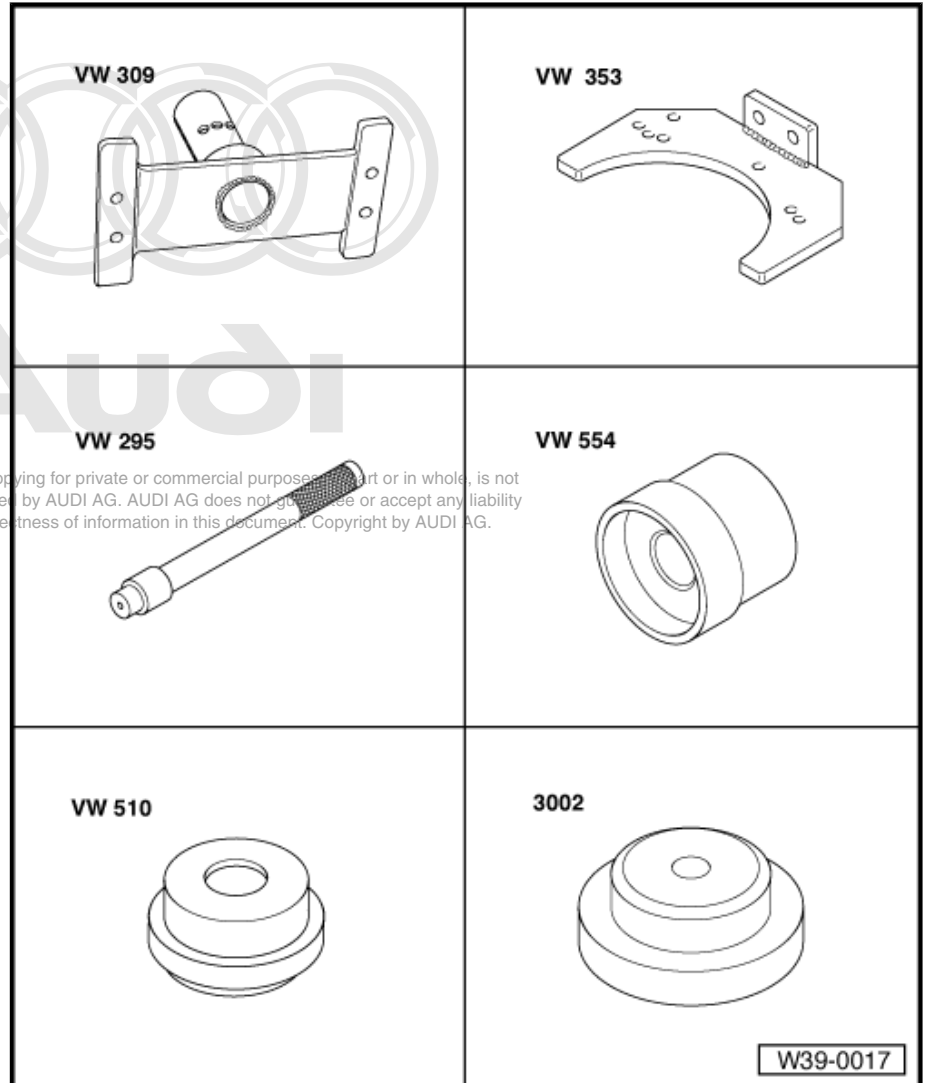
⇒ [“3.1 Exploded view - dismantling and assembling differential”, page 131](#)

⇒ [“3.2 Adjusting differential”, page 139](#)

3.1 Exploded view - dismantling and assembling differential

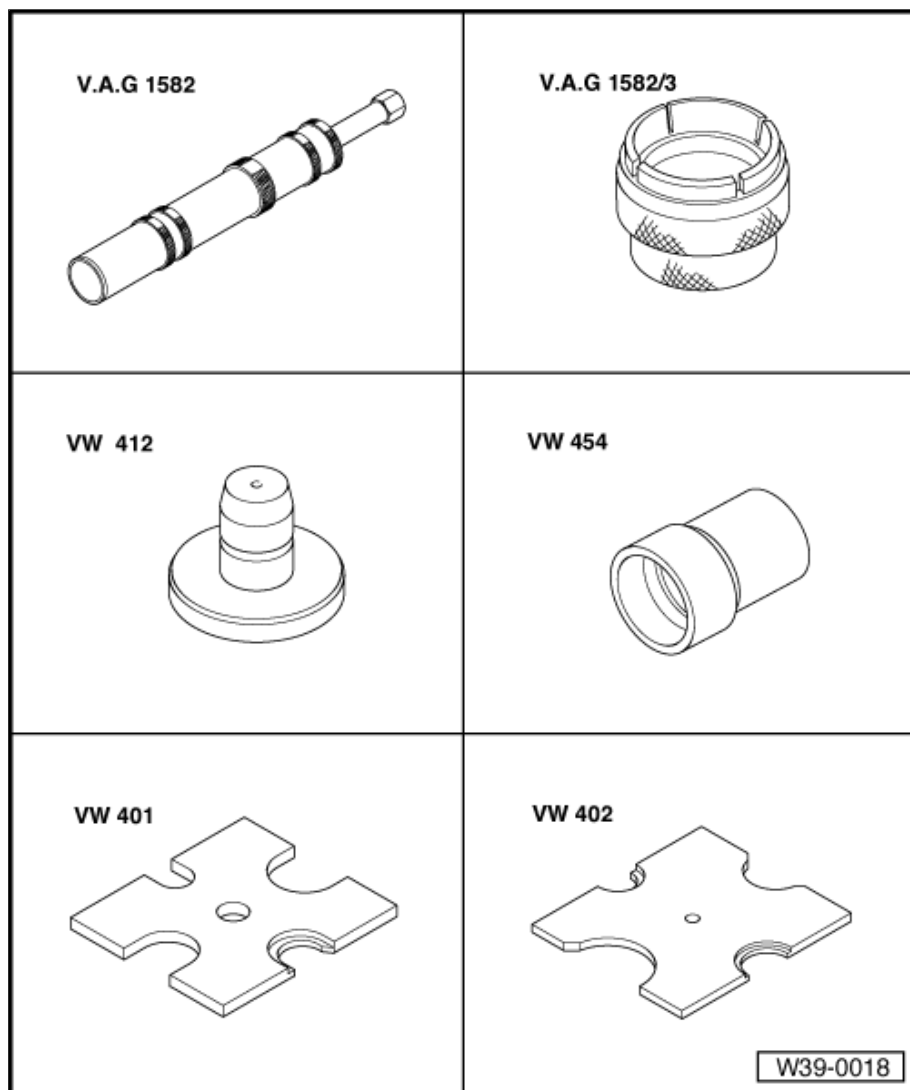
Special tools and workshop equipment required

- ◆ Support plate -VW 309-
- ◆ Gearbox support -VW 353-
- ◆ Drift -VW 295-
- ◆ Press tool -VW 554-
- ◆ Thrust pad -VW 510-
- ◆ Thrust piece -3002-

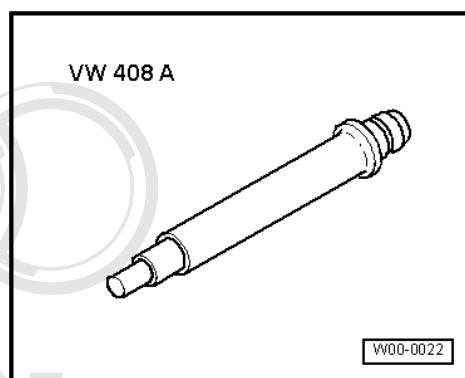


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- ◆ Puller -V.A.G 1582-
- ◆ Adapter -V.A.G 1582/4- instead of -V.A.G 1582/3-
- ◆ Press tool -VW 412-
- ◆ Press tool -VW 454-
- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-



- ◆ Press tool -VW 408 A-



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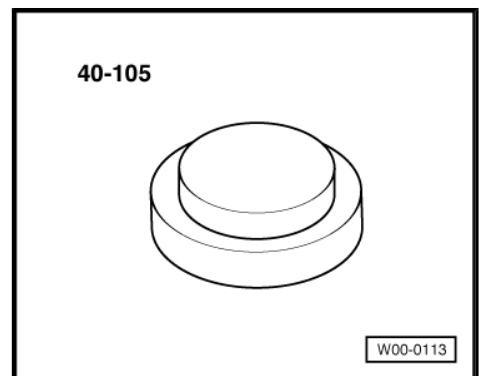
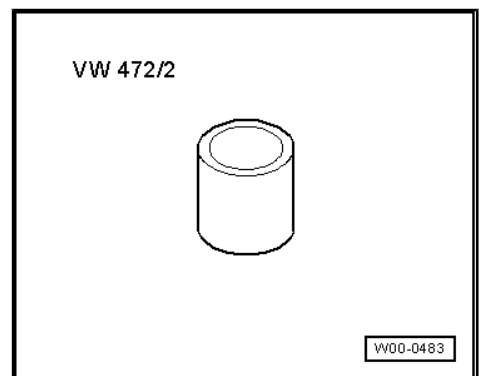
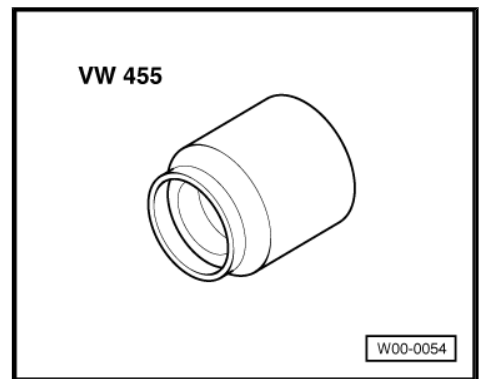
◆ Installing sleeve -VW 455-

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◆ Spacer sleeve -VW 472/2-

◆ Thrust plate -40 - 105-



Note

- ◆ Heat tapered roller bearing inner race to 100° C before installing.
- ◆ Always renew both tapered roller bearings together.
- ◆ Adjust differential if tapered roller bearings, differential cage, gearbox housing or clutch housing are renewed
⇒ [page 139](#).

1 - Countersunk bolt

- ☐ 25 Nm
- ☐ Screws into threaded piece
⇒ [Item 10 \(page 134\)](#)

2 - Flange shaft

- ☐ Removing and installing
⇒ [page 127](#)

3 - Spring for flange shaft

- ☐ Installed behind flange shafts

4 - Thrust washer

- ☐ Installation position
⇒ [page 139](#)

5 - Tapered ring

- ☐ With grooves to engage on thrust washer
- ☐ Installation position: Taper towards differential cage

6 - Circlip

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

7 - Gearbox housing

8 - One-piece thrust washer

- ☐ Lubricate with gear oil before installing

9 - Sun wheel

- ☐ Installing ⇒ [page 139](#)

10 - Threaded piece

- ☐ Installing ⇒ [page 139](#)

11 - Differential pinion pin

- ☐ Drive out with drift
- ☐ Installing ⇒ [page 139](#)

12 - Spring pin

- ☐ For securing differential pinion pin
- ☐ Removing and installing ⇒ [page 137](#)

13 - Planet pinion

- ☐ Installing ⇒ [page 139](#)

14 - Rivet

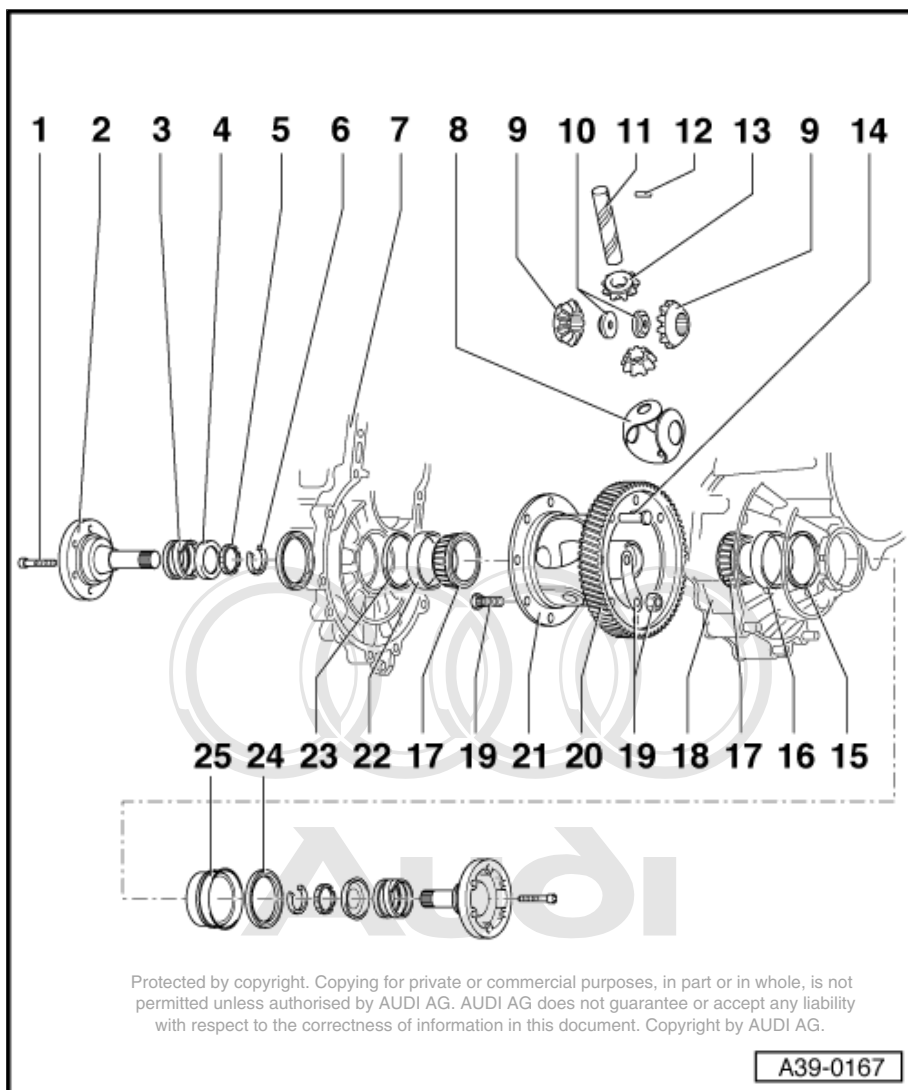
- ☐ Only on original, factory installed parts
- ☐ Drilling out ⇒ [page 137](#)

15 - Shim "S2"

- ☐ Always 1 mm thick

16 - Tapered roller bearing outer race

- ☐ Driving out ⇒ [page 135](#) , first remove sleeve (⇒ [Item 25 \(page 135\)](#))
- ☐ Driving in ⇒ [page 136](#)



17 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 136](#)
- ☐ Pressing on ⇒ [page 136](#)

18 - Clutch housing

19 - Repair kit

- ☐ Only for service repairs
- ☐ Installing ⇒ [page 138](#)
- ☐ Hexagon nut, 65 Nm

20 - Final drive gear

- ☐ Riveted in production
- ☐ Is paired with output shaft, only renew as a set
- ☐ Pressing off ⇒ [page 138](#)
- ☐ Installation position ⇒ [page 138](#)
- ☐ Heat to 100° C before installing.
- ☐ Fit to differential cage ⇒ [page 138](#)
- ☐ Bolted ⇒ [page 138](#)

21 - Differential cage

22 - Tapered roller bearing outer race

- ☐ Driving out ⇒ [page 137](#)
- ☐ Driving in ⇒ [page 137](#)

23 - Shim "S1"

- ☐ Determining thickness ⇒ [page 141](#)

24 - Oil seal

- ☐ Renewing ⇒ [page 127](#)

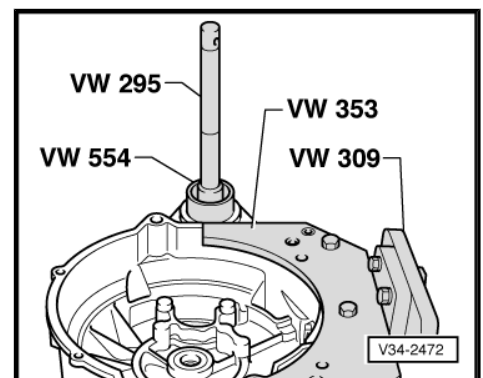
25 - Sleeve

- ☐ For oil seal
- ☐ Removing and installing ⇒ [Item 19 \(page 101\)](#)

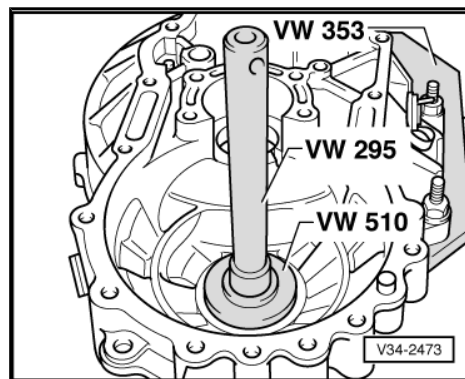
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Knocking tapered roller bearing outer race out of clutch housing

Remove sleeve first ⇒ [Item 19 \(page 101\)](#) .



Driving tapered roller bearing outer race into clutch housing



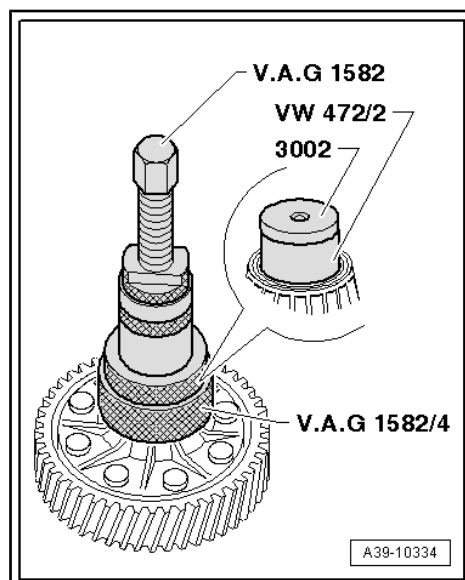
Pulling off tapered roller bearing inner races

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



Note

The procedure for pulling tapered roller bearing inner races off differential cage is the same for both bearings.

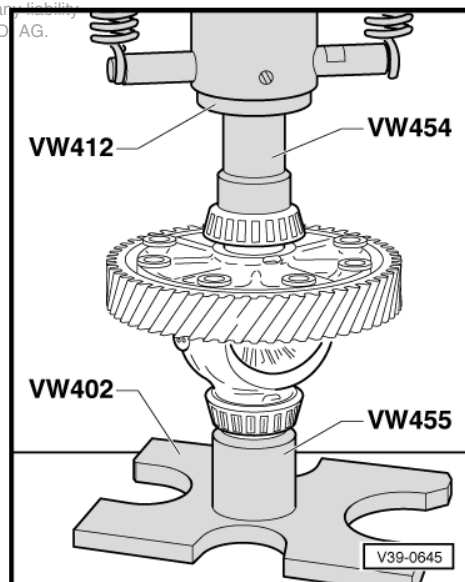


Pressing on tapered roller bearing inner races

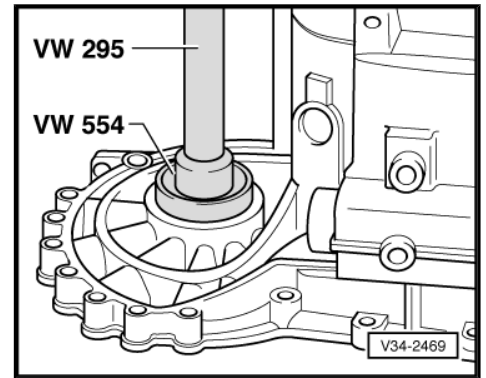


Note

The same tools are used for pressing on the tapered roller bearing inner races for the gearbox housing and clutch housing.

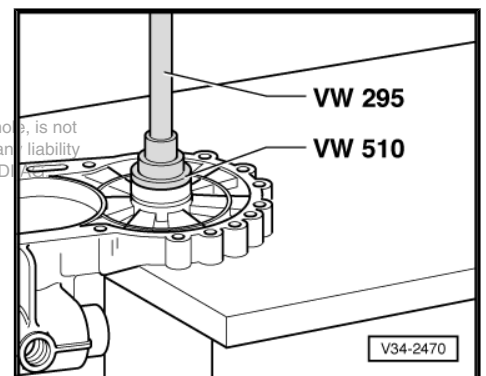


Driving tapered roller bearing outer race out of gearbox housing



Driving tapered roller bearing outer race into gearbox housing

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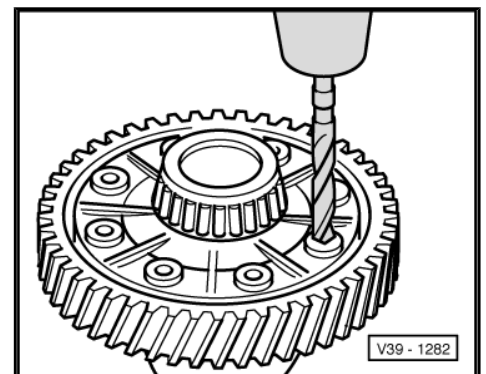
Drilling out rivet heads

- Drill out rivet heads from countersunk side with 12 mm drill and drive out rivets with a drift.



Note

Clean differential before and after drilling; protect tapered roller bearings from swarf.



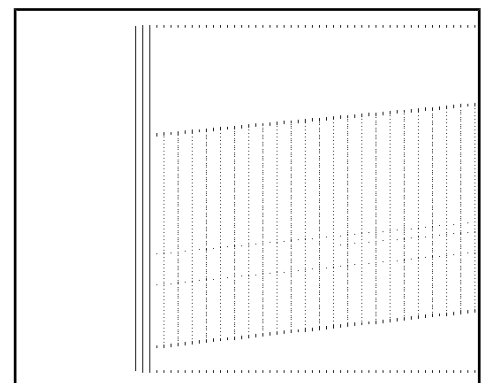
Removing and installing spring pin for differential pinion pin

Removing

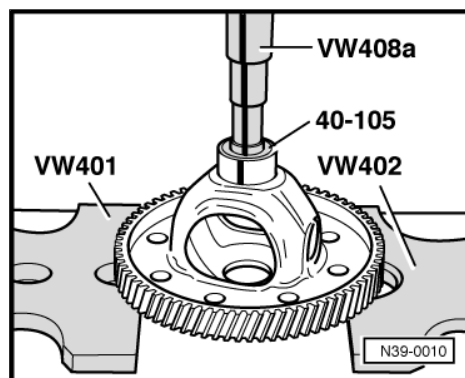
- Cover tapered roller bearing inner race to avoid damage and keep metal particles out of the bearing.
- Drive out spring pin with chisel, inserting chisel into annular groove.

Installing

- Drive fully into differential cage.

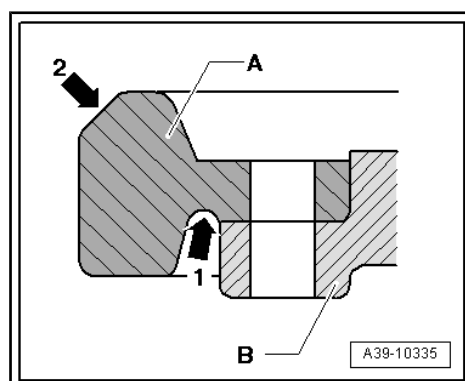


Pressing off final drive gear



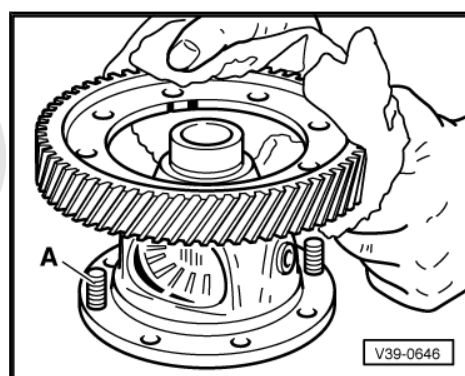
Installation position of final drive gear -A-

- Circular groove -arrow 1- faces joint surface on differential cage -B-.
- The chamfer -arrow 2- of final drive gear -A- faces upwards.



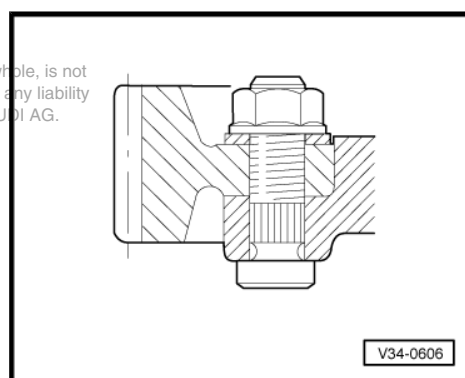
Heating final drive gear wheel to approx. 100 °C and installing

- Use bolts -A- from repair kit to guide final drive gear into position during installation.



Bolting final drive gear and differential cage together

Use special bolts with plates and nuts according to ➤ Electronic parts catalogue

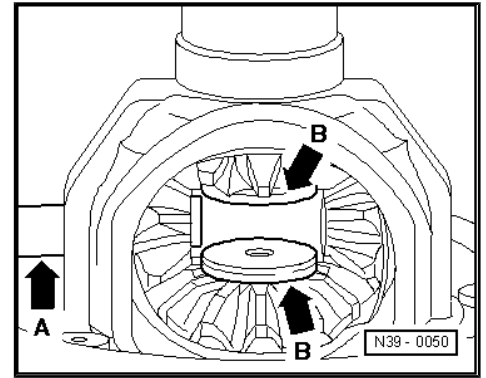


Installing differential bevel gears

- Lubricate one-piece thrust washer with gear oil and install.
- Install both sun wheels and secure (e.g. with flange shaft).
- Insert planet pinions (180° apart) and pivot into position.
- Push differential pinion pin -arrow A- in as far as first planet pinion.
- Fit threaded pieces -arrows B- in sun wheels.

Installation position: Stepped shoulder towards sun wheel

- Drive differential pinion pin into final position and secure with new spring pin.

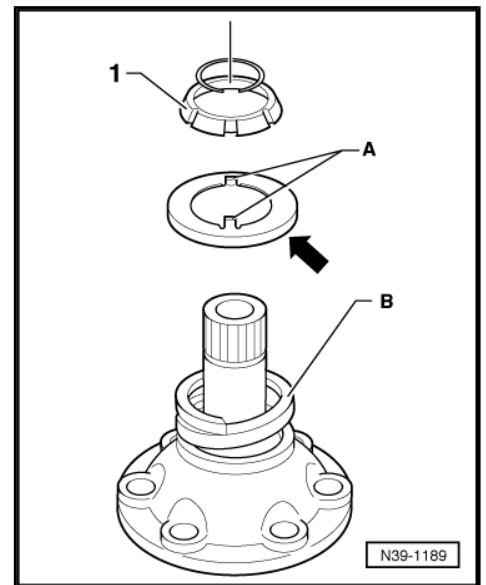


Installation position of thrust washer for tapered ring -1-

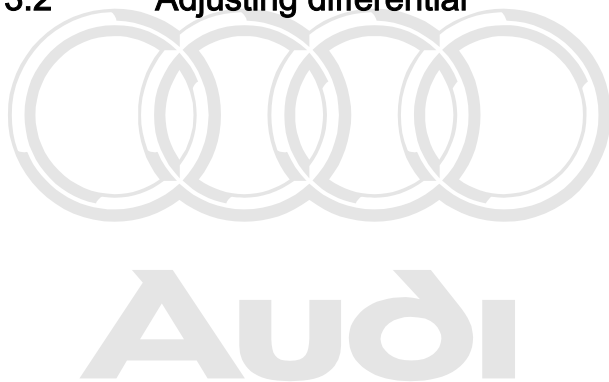
Collar -arrow- faces spring -B-.

Projections -A- are not present on some gearbox versions.

The projections -A- face towards tapered ring -1-.



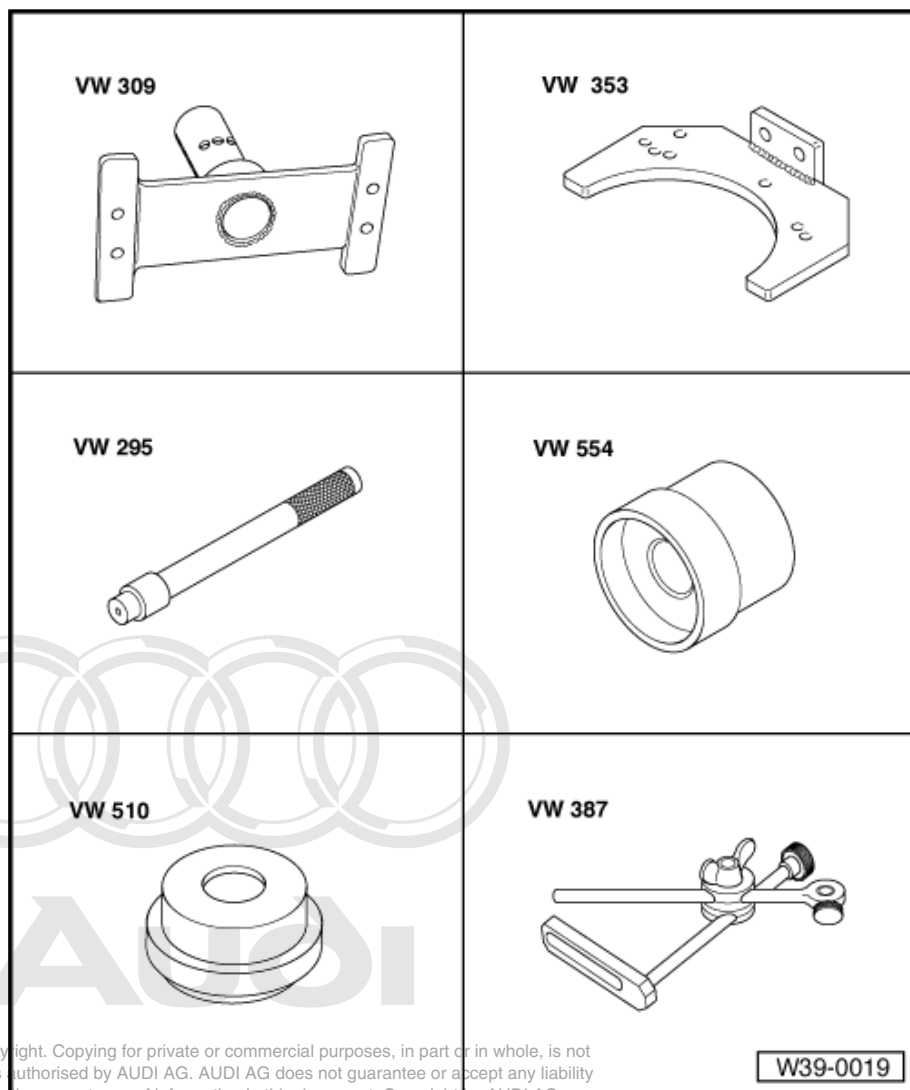
3.2 Adjusting differential



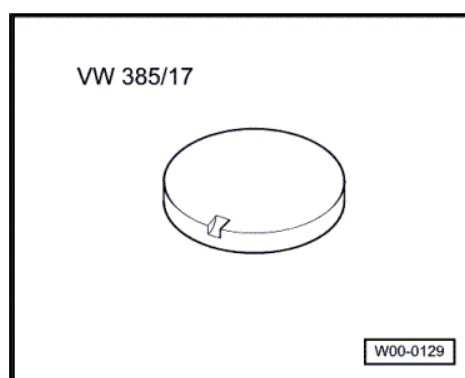
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Special tools and workshop equipment required

- ◆ Support plate -VW 309-
- ◆ Gearbox support -VW 353-
- ◆ Drift -VW 295-
- ◆ Press tool -VW 554-
- ◆ Thrust pad -VW 510-
- ◆ Universal dial gauge bracket -VW 387-



- ◆ End measuring plate -VW 385/17-



- ◆ Dial gauge

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

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

or the

◆ Differential tapered roller bearings

Table of adjustments ⇒ [page 130](#)

- Drive in tapered roller bearing outer race with shim “S₂” (always 1 mm thick) into clutch housing.



Note

The tapered roller bearing inner and outer races are paired. Do not interchange.

- Drive tapered roller bearing outer race without shim into gear-box housing.
- Install differential in clutch housing.
- Fit gearbox housing and tighten 5 bolts to specified torque.

- Attach dial gauge and set to “0” with a preload of 1 mm.
- Move differential up and down and read off and note play indicated on dial gauge. (0.90 mm in this example.)



Note

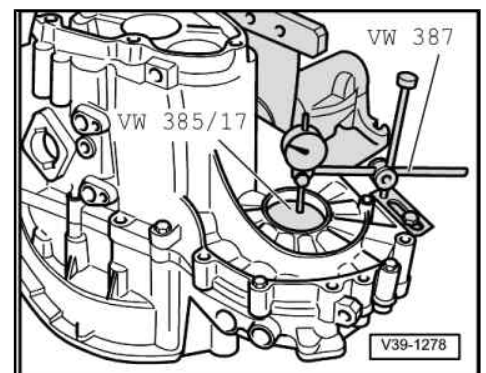
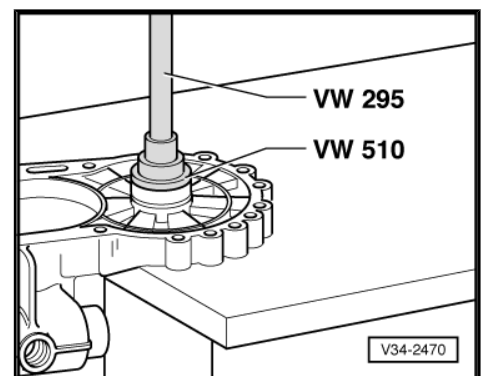
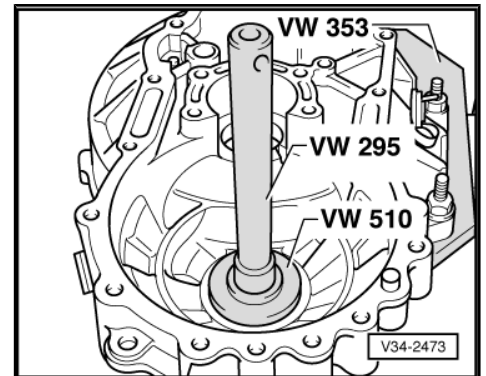
When performing measurements, do not turn the differential as the bearings will otherwise settle and falsify the measurement results.

Determining shim “S₁”

The specified bearing preload is achieved by adding a constant value (0.25 mm) to the measured value (0.90 mm in this example) to obtain the required thickness for “S₁”.

Example:

Measured value	0.90 mm
+ Preload (constant value)	0.25 mm
Thickness of shim “S ₁ ” =	1.15 mm



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- Detach gearbox housing and drive tapered roller bearing outer race out of gearbox housing.
- Install shim “S₁” of the calculated thickness, thickest shim first.

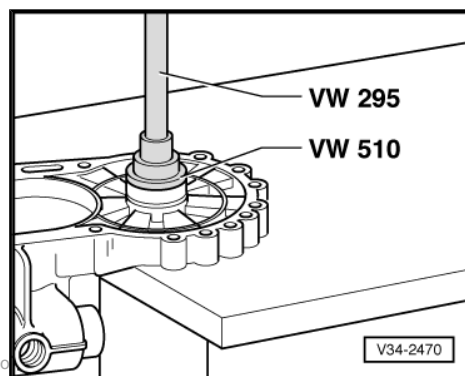
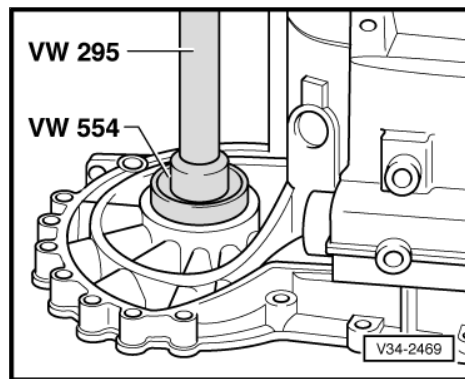
The following shims are available:

Thickness (mm)	Part No.
0.65	02K 409 210
0.70	02K 409 210 A
0.75	02K 409 210 B
0.80	02K 409 210 C
0.85	02K 409 210 D
0.90	02K 409 210 E
0.95	02K 409 210 F
1.00	02K 409 210 G
1.05	02K 409 210 H
1.10	02K 409 210 J
1.15	02K 409 210 K
1.20	02K 409 210 L
1.25	02K 409 210 M

Tolerance variations make it possible to obtain the exact shim thickness required.

If the size of the shim required is larger than those listed in the table, install two shims amounting to the correct value.

- Drive tapered roller bearing outer race with determined shim into gearbox housing



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