



Workshop Manual

Audi A1 2011 ➤

Audi A1 Sportback 2012 ➤

6-speed manual gearbox 0A8, front-wheel drive

Edition 03.2014

List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

30 - Clutch

34 - Controls, housing

35 - Gears, shafts

39 - Final drive - front 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 Identification

(ARL003741; Edition 03.2014)

⇒ [“1.1 Gearbox identification”, page 1](#)

1.1 Gearbox identification

The 6-speed manual gearbox 0A8, front-wheel drive is installed in the Audi A1 2011 ►

⇒ [“2.1 Allocation of gearbox to engine”, page 2](#) .

Location on gearbox

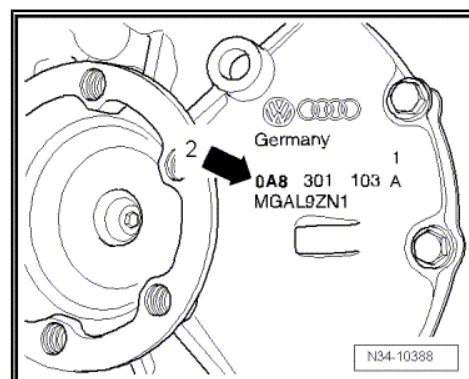
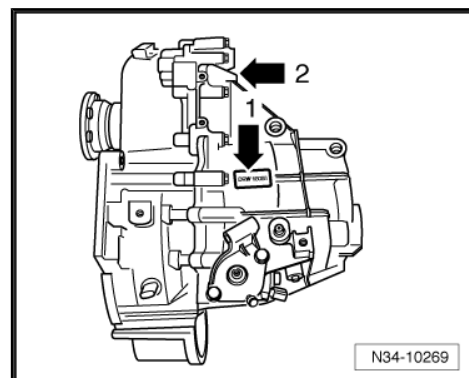
- ◆ Code letters and date of manufacture -arrow 1-
- ◆ Manual gearbox 0A8 -arrow 2-

Manual gearbox 0A8 -arrow 2-



Audi

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Code letters and production date of gearbox -arrow-

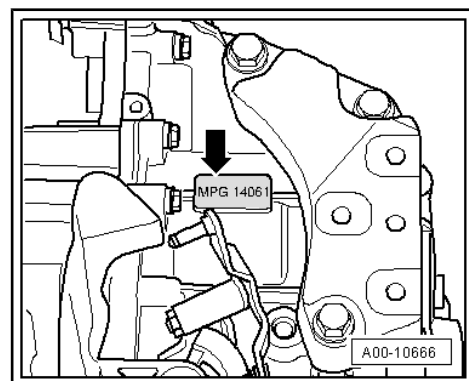
Example:	MPG	14	06	1
	Code letters	Day	Month	Year (2011) of manufacture

Additional data are manufacture-related.



Note

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





2 Technical data

⇒ "2.1 Allocation of gearbox to engine", page 2

⇒ "2.2 Capacities", page 3

⇒ "2.3 Calculating gear ratios", page 3

2.1 Allocation of gearbox to engine

Manual gearbox		6-speed 0A8 (front-wheel drive)		
Code letters		LNK	NJU	NKL
Manufactured	from to	09.11	03.13	09.11
Allocation	Model	Audi A1 2011 ►	Audi A1 2011 ►	Audi A1 2011 ►
	Engine	2.0 ltr. - 105 kW TDI	1.4 ltr. - 103 kW TFSI	2.0 ltr. - 100 kW TDI 2.0 ltr. - 105 kW TDI
Ratio	Final drive I for 1st to 4th gear	68 : 21 = 3.238	69 : 20 = 3.450	68 : 21 = 3.238
$Z_2 : Z_1 = i$	Final drive II for 5th/6th gear and reverse gear	68 : 26 = 2.615	69 : 25 = 2.760	68 : 26 = 2.615
The following data can be found in the ⇒ Electronic parts catalogue ♦ Individual gear ratios ♦ Allocation of drive shaft flanges ♦ Allocation of clutch type				

Manual gearbox		6-speed 0A8 (front-wheel drive)		
Code letters		PEG	QDN	
Manufactured	from to	01.13	04.13	
Allocation	Model	Audi A1 2011 ►	Audi A1 2011 ►	
	Engine	2.0 ltr. - 100 kW TDI 2.0 ltr. - 105 kW TDI	1.4 ltr. - 103 kW TFSI	
Ratio	Final drive I for 1st to 4th gear	68 : 21 = 3.238	69 : 20 = 3.450	
$Z_2 : Z_1 = i$	Final drive II for 5th/6th gear and reverse gear	68 : 26 = 2.615	69 : 25 = 2.760	
The following data can be found in the ⇒ Electronic parts catalogue ♦ Individual gear ratios ♦ Allocation of drive shaft flanges ♦ Allocation of clutch type				

2.2 Capacities

Manual gearbox	6-speed 0A8 (front-wheel drive)
Code letters	LNK, NJU, NKL, PEG, QDN
Capacity of manual gearbox	2.3 ltr.
♦ Gear oil specifications ⇒ Electronic parts catalogue	

2.3 Calculating gear ratios

Example:

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6-speed manual gearbox 0A8	6th gear	Final drive
Driving gear	$ZG_1 = 46$	$ZA_1 = 26$
Driven gear	$ZG_2 = 33$	$ZA_2 = 68$
$i = Z_2 : Z_1$	Z_1 = number of teeth on driving gear, Z_2 = number of teeth on driven gear	
i_G = gear ratio	$= ZG_2 : ZG_1$	$= 33 : 46$ $= 0.717$
i_A = axle ratio	$= ZA_2 : ZA_1$	$= 68 : 26$ $= 2.615$
i_{ov} = overall ratio	$= i_G \times i_A$	$= 0.717 \times 2.615$ $= 1.876$

3 Transmission layout

⇒ "3.1 Transmission layout - front-wheel drive", page 4

3.1 Transmission layout - front-wheel drive

Identification

-Arrows- point in direction of travel

1 - Engine

2 - Clutch

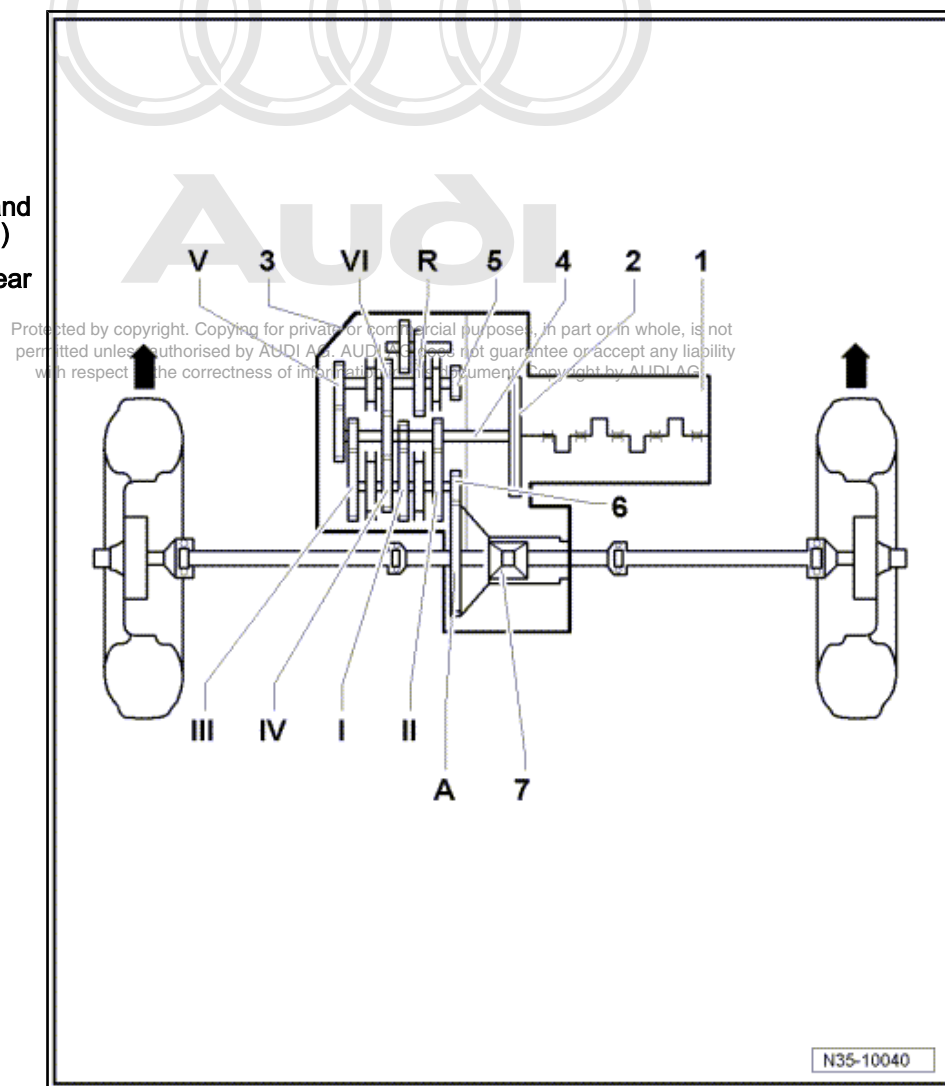
3 - Manual gearbox

4 - Input shaft

5 - Output shaft for 5th/6th and reverse gear (output shaft II)

6 - Output shaft for 1st-4th gear (output shaft I)

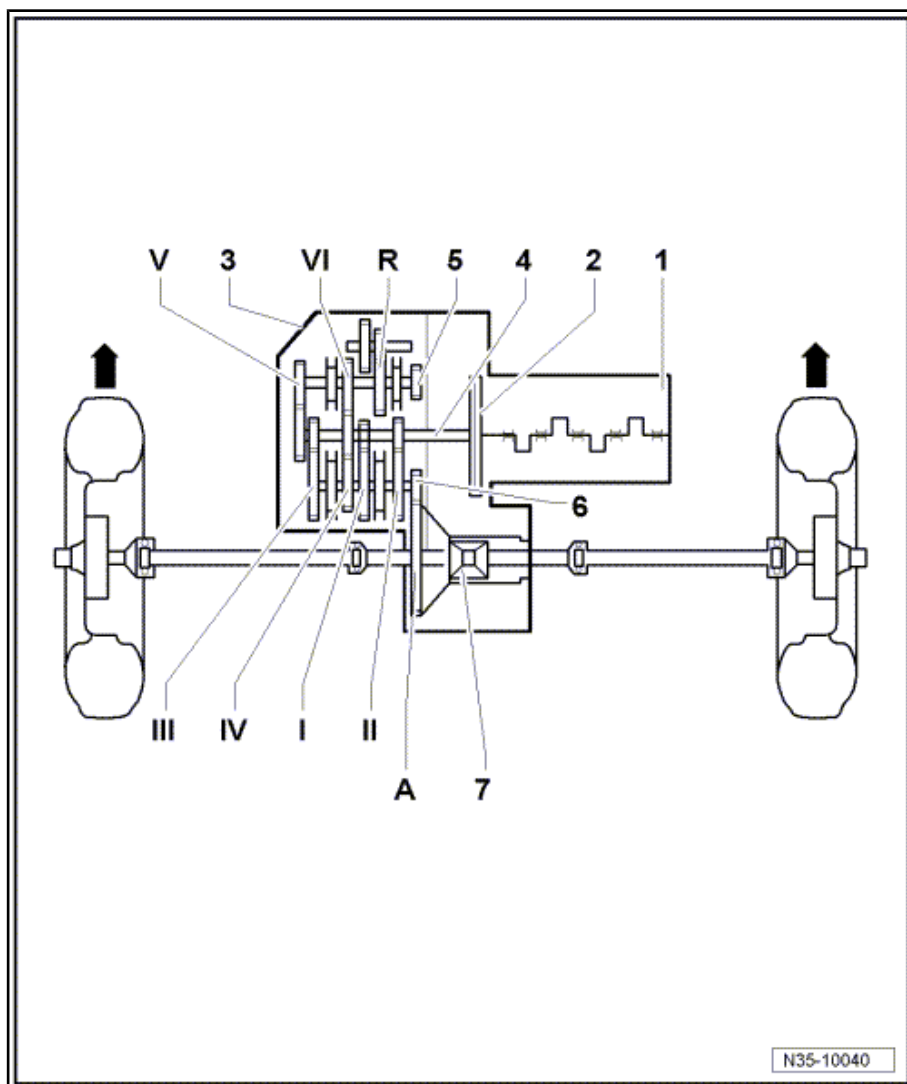
7 - Differential



Ratio

-Arrows- point in direction of travel

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



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4 Safety precautions

⇒ **"4.1 Safety precautions when working on vehicles with start/stop system", page 6**

4.1 Safety precautions when working on vehicles with start/stop system



WARNING

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

- ◆ *On vehicles with activated start/stop system (this is indicated by a message in the instrument cluster display), the engine may start automatically on demand.*
- ◆ *Therefore it is important to ensure that the start/stop system is deactivated when performing repairs (switch off ignition, if required switch on ignition again).*



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5 Repair instructions

⇒ ["5.1 General repair instructions", page 7](#)

⇒ ["5.2 Contact corrosion", page 11](#)

5.1 General repair instructions

Proper tools and the maximum possible care and cleanliness are essential for satisfactory repairs to the transmission units. 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

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

Gearbox

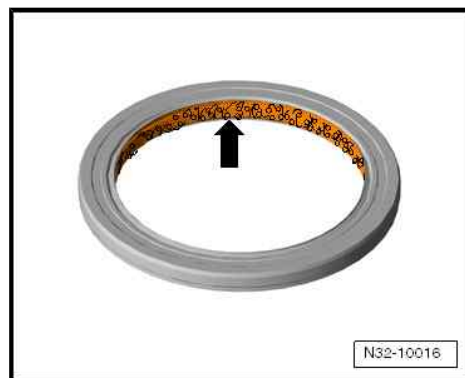
- ◆ When installing the gearbox, ensure that the dowel sleeves between the engine and the gearbox are correctly located.
- ◆ Allocate bolts and other components according to ⇒ Electronic parts catalogue .
- ◆ Clean contact surfaces when assembling mounting brackets and waxed components. The contact surfaces must be free of wax and grease.
- ◆ Thoroughly clean all joints and connections and the surrounding areas before dismantling.
- ◆ When installing a new gearbox, check the oil level and fill up with oil if necessary ⇒ [page 76](#) .
- ◆ Capacities ⇒ [page 3](#) , specifications ⇒ Electronic parts catalogue .

Sealants

- ◆ Thoroughly clean joint surfaces on gearbox housing etc. before applying sealing paste.
- ◆ Apply sealing paste - AMV 188 200 03- evenly and not too thick.
- ◆ Breather holes must remain free of sealing paste.

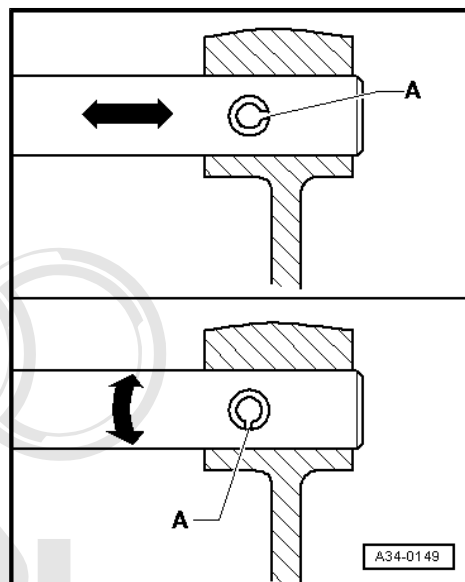
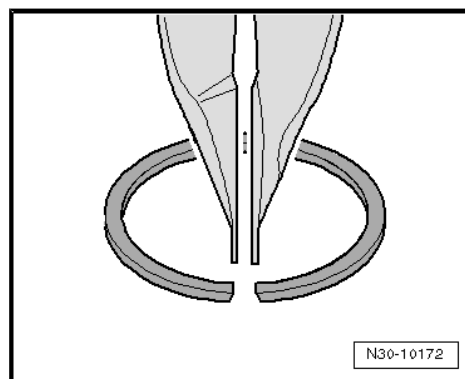
Oil seals, seals, O-rings and gaskets

- ◆ Always renew seals, O-rings 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.
- ◆ 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 seal should face the side containing the fluid.
- ◆ 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 installation depth tolerances).
- ◆ Lightly lubricate O-rings with oil before installation to prevent them being trapped during assembly.
- ◆ Check oil level after installing new gaskets, O-rings and oil seals ➔ [page 76](#) .



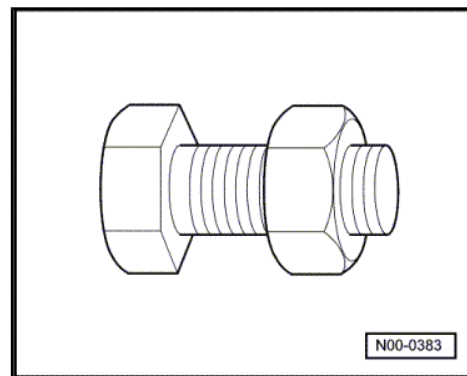
Locking elements

- ◆ Do not over-stretch circlips.
- ◆ Installation position for some circlips: the circlip is fitted so that the narrow part of the gap is at the top. This also gives the pliers a better grip when removing and installing.
- ◆ 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.
- ◆ Parts which are particularly sensitive (e.g. clutch pressure plate) must be kept straight. Loosen and tighten bolts and nuts in stages and in diagonal sequence.
- ◆ Always renew self-locking nuts and bolts.
- ◆ The tightening torques stated apply to non-oiled nuts and bolts.
- ◆ 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.
- ◆ For all threaded connections, ensure that (where applicable) the contact surfaces and the nuts and bolts are not coated with wax until after assembly is completed.



Bearings

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

Shims

- ◆ Use a micrometer to measure the shims at several points. 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.
- ◆ Install only shims which are in perfect condition.

Synchro-rings

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- ◆ Do not interchange synchro-rings. When reusing always fit to the same selector gear.
- ◆ Check for wear; renew if necessary.
- ◆ Check the grooves -arrow 1- on synchro-ring -A- and on inner ring for wear (flattened sections in grooves).
- ◆ Make sure that the coating of coated synchro-rings is not damaged.
- ◆ If an intermediate ring -B- is fitted, check the outer contact surface -arrow 2- and inner contact surface -arrow 3- of the intermediate ring for »scoring«, »visible traces of wear« and »blue discolouration (caused by overheating)«.
- ◆ Check cone on selector gear for scoring and visible traces of wear.
- ◆ Lubricate synchro rings with gear oil before installing.

Gear wheels

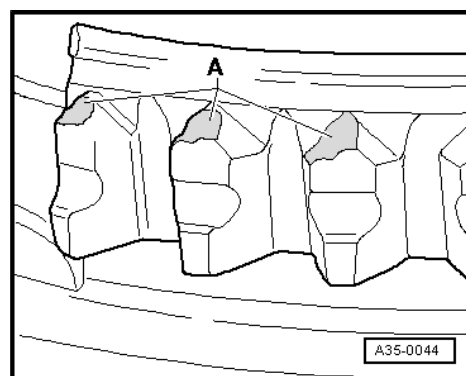
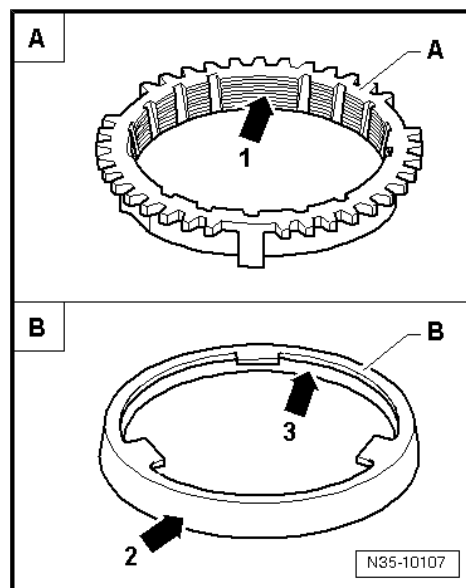
- ◆ Clean before pressing on.
- ◆ Use inductive heater VAS 6414- to heat to approx. 100 °C before installing. Press home onto stop when installing so there is no axial clearance.

Selector gears and locking collars

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

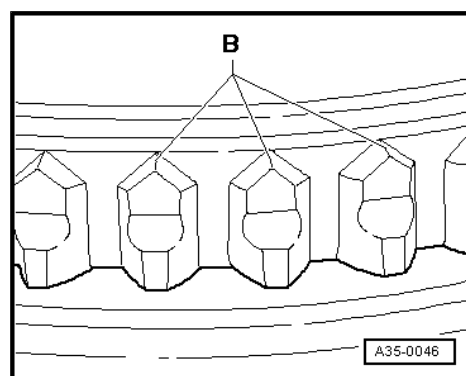
- ◆ Abnormal wear on synchro-ring or selector gear:

A - Worn chamfer on dog teeth of synchro-ring or selector gear.



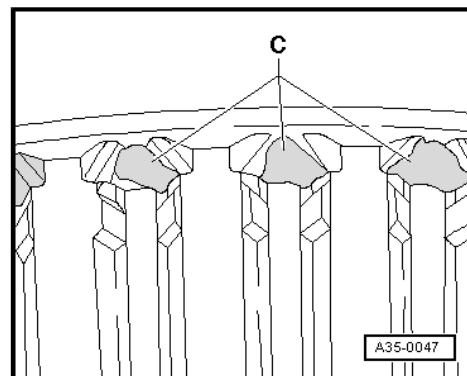
- ◆ In comparison: intact synchro-ring or selector gear:

B - Intact chamfer on dog teeth of synchro-ring or selector gear.



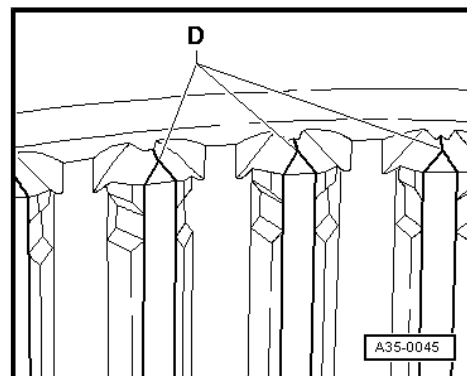
- ◆ Abnormal wear on locking collar:

C - Worn chamfer on internal splines of locking collar.



- ◆ In comparison: intact locking collar:

D - Intact chamfer on internal splines of locking collar.



Clutch mechanism, clutch

- ◆ Before renewing the clutch master cylinder or slave cylinder on the assumption that it is defective, you must first carry out the appropriate function check ➔ [page 30](#) .
- ◆ When removing gearbox, remove clutch slave cylinder without disconnecting pipes.
- ◆ Do not depress the clutch pedal after removing the clutch slave cylinder if the hydraulic pipe is still connected. Otherwise the piston will be pressed out of the clutch slave cylinder.
- ◆ 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 ➔ [page 30](#)).
- ◆ After installing the slave cylinder, carefully press the clutch pedal. If you feel an unusually strong point of resistance when depressing the clutch pedal, you must not press it down further. The plunger of the slave cylinder is likely to have been guided past the clutch release lever. The slave cylinder would then be destroyed once pedal force exceeds approx. 300 N.
- ◆ Ensure that the pressure plate is kept straight: loosen and tighten bolts in a diagonal sequence and in several gradual stages.
- ◆ If the clutch has burnt out, thoroughly clean the clutch housing, flywheel and parts of the engine facing the gearbox in order to prevent odour.
- ◆ Only blow out dual-mass flywheel with compressed air.

5.2 Contact corrosion

The gearbox housing and clutch housing are made of a magnesium alloy.

Contact corrosion can occur if unsuitable fasteners are used on the vehicle (bolts, nuts, washers etc.).

For this reason, only fasteners with a special surface coating are fitted.

Rubber or plastic parts and adhesives also consist of non-conductive materials.

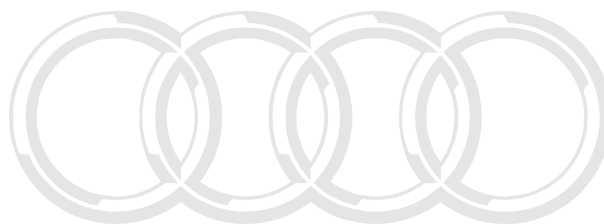
If you are not sure whether used parts can be re-installed, always fit new parts ➔ Electronic parts catalogue .

Please note:

- ◆ Use only genuine spare parts: these have been fully tested and are compatible with aluminium.



- ◆ We recommend the use of accessories approved by Audi.
- ◆ Damage resulting from contact corrosion is not covered by the warranty.



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6 Electrical components

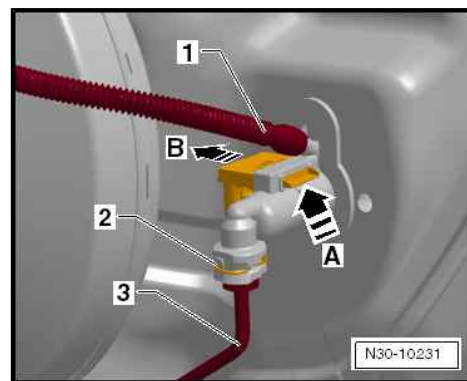
⇒ ["6.1 Overview of fitting locations - electrical components", page 13](#)

6.1 Overview of fitting locations - electrical components

Clutch position sender - G476-

Fitting location: the clutch position sender is attached to the clutch master cylinder.

⇒ ["1.10 Removing and installing clutch position sender G476 ", page 31](#)



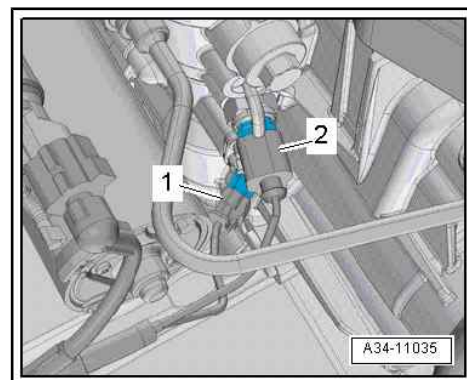
Gearbox neutral position sender - G701- and reversing light switch - F4-

Gearbox neutral position sender - G701- -1-

Reversing light switch - F4- -2-

Fitting location: behind starter on gearbox

⇒ ["6.4 Exploded view - selector unit", page 82](#)



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30 – Clutch

1 Clutch mechanism

⇒ [“1.1 Exploded view - pedal cluster”, page 14](#)

⇒ [“1.2 Exploded view - clutch hydraulics”, page 17](#)

⇒ [“1.3 Exploded view - clutch release mechanism”, page 19](#)

⇒ [“1.4 Removing and installing clutch pedal”, page 20](#)

⇒ [“1.5 Removing and installing mounting bracket”, page 22](#)

⇒ [“1.6 Removing and installing clutch slave cylinder together with release bearing”, page 26](#)

⇒ [“1.7 Removing and installing lines for clutch hydraulics”, page 26](#)

⇒ [“1.8 Bleeding clutch hydraulics”, page 28](#)

⇒ [“1.9 Checking clutch master cylinder and clutch slave cylinder”, page 30](#)

⇒ [“1.10 Removing and installing clutch position sender G476 ”, page 31](#)

1.1 Exploded view - pedal cluster

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1 - Clutch pedal

- ☐ Removing and installing with over-centre spring
⇒ [page 20](#)

2 - Retaining clip

- ☐ Only renew when clutch master cylinder has been removed
- ☐ Removing ⇒ [page 16](#)
- ☐ Pressing on
⇒ [page 16](#)

3 - Clutch master cylinder

- ☐ Removing and installing
⇒ ["1.5.1 Removing and installing mounting bracket with clutch master cylinder", page 22](#)

4 - Gasket

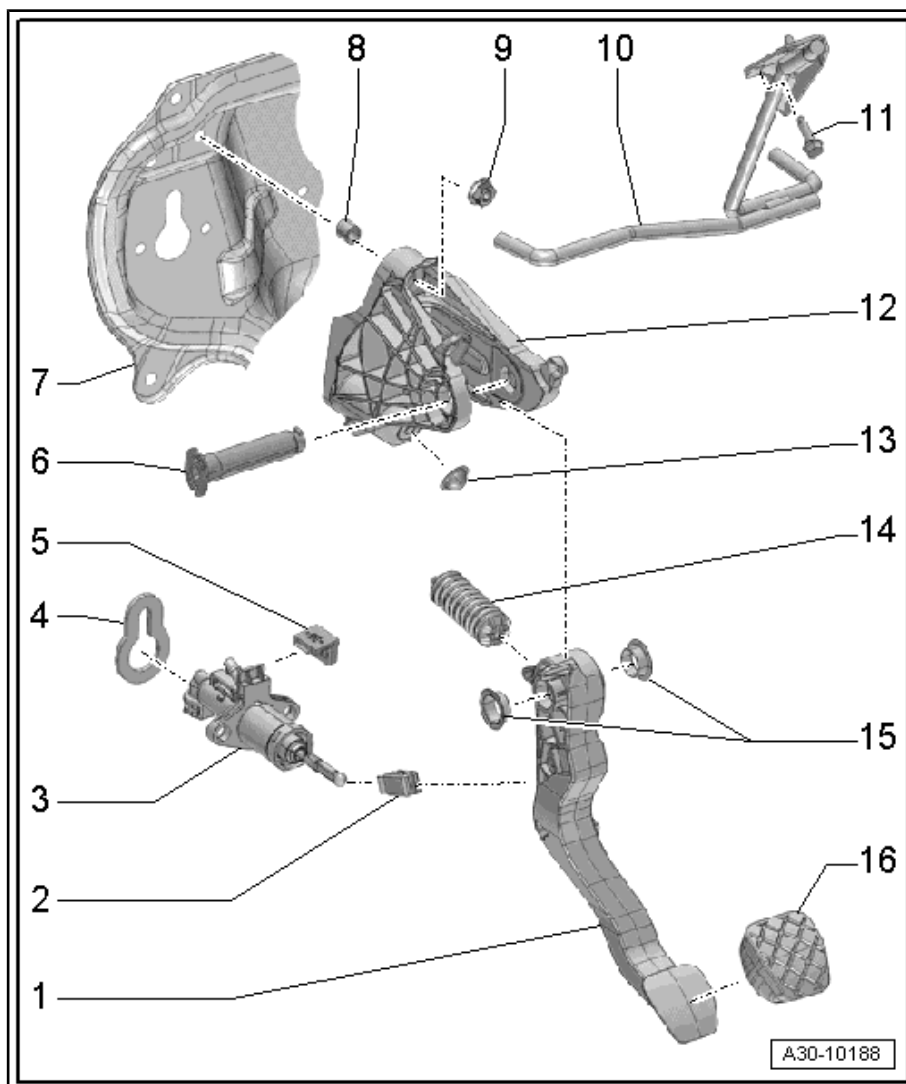
- ☐ Renew
- ☐ Glue onto clutch master cylinder

5 - Clutch position sender - G476-

- ☐ Removing and installing
⇒ [page 31](#)
- ☐ Checking in [\[Guided Fault Finding\]](#) ⇒ Vehicle diagnostic tester

6 - Pivot pin

- ☐ Cannot be removed without being damaged
- ☐ Renew



7 - Plenum chamber partition panel

- ☐ With mounting for mounting bracket and master cylinder

8 - Bush

- ☐ For top drilling in mounting bracket
- ☐ Bushes for bottom drilling in mounting bracket are installed in clutch master cylinder

9 - Nut

- ☐ 3x
- ☐ Self-locking
- ☐ Renew
- ☐ 25 Nm

10 - Crash bar

- ☐ Secured to steering column
- ☐ Different versions available; for correct version refer to ⇒ [Electronic parts catalogue](#)
- ☐ Removing and installing ⇒ [General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel](#)

11 - Bolt

- ☐ A nut is fitted on some versions ⇒ [Electronic parts catalogue](#)
- ☐ Tightening torque ⇒ [General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel](#)

12 - Mounting bracket

- ☐ Removing and installing with clutch master cylinder ➔ [page 22](#)
- ☐ Removing and installing without clutch master cylinder ➔ [page 24](#)

13 - Stop

- ☐ For clutch pedal

14 - Over-centre spring

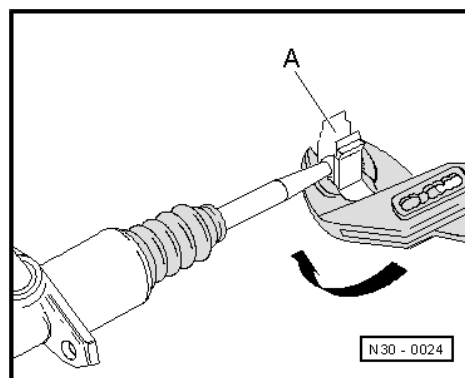
- ☐ Removing and installing ➔ [page 20](#)

15 - Bearing bushes

16 - Cap

Removing retaining clip

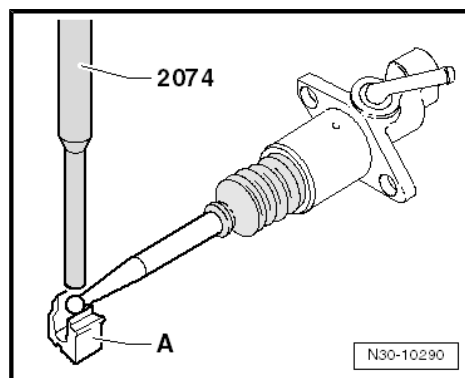
- Lever off retaining clip -A- -arrow-.



Pressing on retaining clip

- Carefully press retaining clip -A- onto operating rod for clutch master cylinder using punch - 2074 -.

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1.2 Exploded view - clutch hydraulics

⇒ ["1.2.1 Exploded view - clutch hydraulics, LHD vehicles", page 17](#)

⇒ ["1.2.2 Exploded view - clutch hydraulics, RHD vehicles", page 18](#)

1.2.1 Exploded view - clutch hydraulics, LHD vehicles

1 - Clutch slave cylinder with release bearing

- ☐ Can only be renewed after removing gearbox
- ☐ Removing and installing
⇒ [page 26](#)

2 - Bleeder connection

3 - O-ring

- ☐ Renew if damaged
- ☐ Lubricate with brake fluid before installing

4 - Retaining clip

- ☐ To remove and install pipe, pull out retaining clip as far as it will go

5 - Bleeder screw

- ☐ 4.5 Nm
- ☐ Bleeding clutch system
⇒ [page 28](#)

6 - Dust cap

7 - Retaining clip

- ☐ To remove and install pipe, pull out retaining clip as far as it will go

8 - O-ring

- ☐ Renew if damaged
- ☐ Lubricate with brake fluid before installing

9 - Brake fluid reservoir

10 - Seal

- ☐ Must be fitted in supply hose

11 - Supply hose

12 - Seal

- ☐ Must be fitted in supply hose

13 - Clutch master cylinder

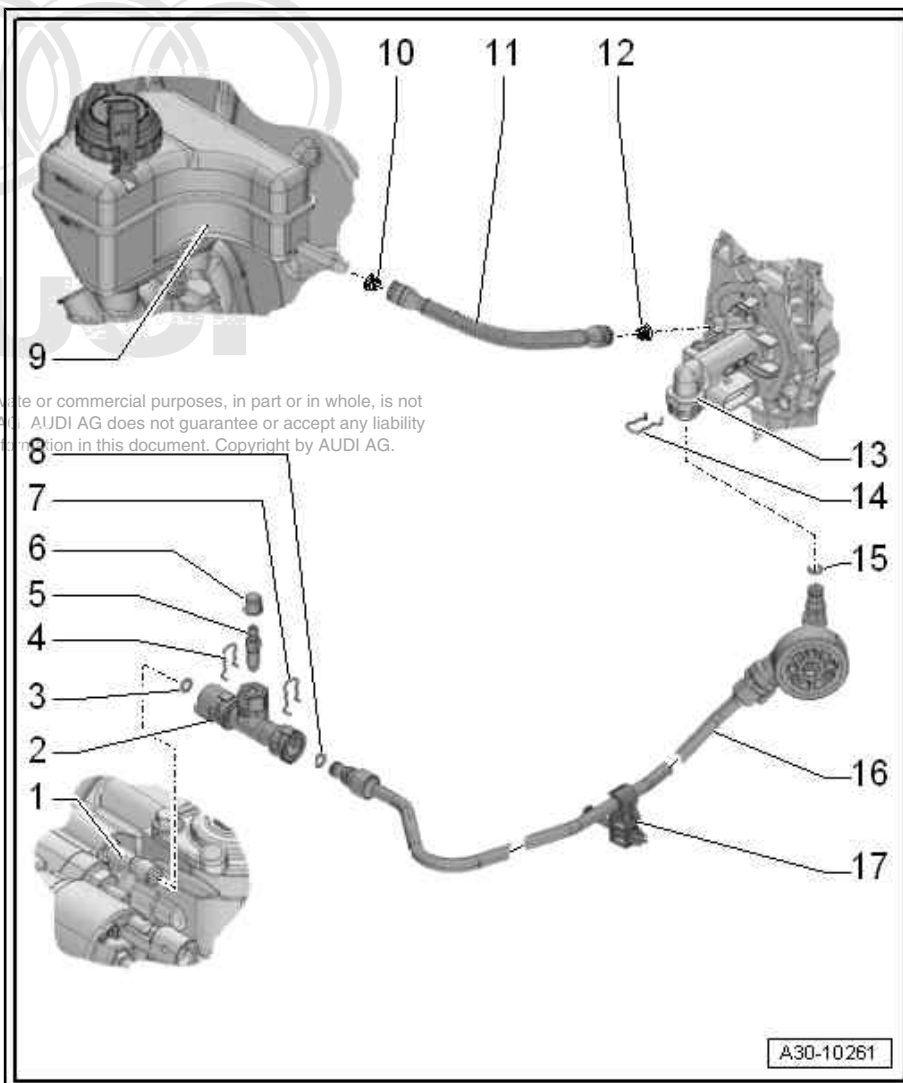
- ☐ Removing and installing
⇒ ["1.5.1 Removing and installing mounting bracket with clutch master cylinder", page 22](#)

14 - Retaining clip

- ☐ To remove and install pipe, pull out retaining clip as far as it will go

15 - O-ring

- ☐ Renew if damaged



- ☐ Lubricate with brake fluid before installing

16 - Pipe

- ☐ With frequency modulator
- ☐ Removing and installing ⇒ [page 26](#)

17 - Bracket

- ☐ Attached to body

1.2.2 Exploded view - clutch hydraulics, RHD vehicles

1 - Clutch slave cylinder with release bearing

- ☐ Can only be renewed after removing gearbox
- ☐ Removing and installing ⇒ [page 26](#)

2 - Bleeder connection

3 - O-ring

- ☐ Renew if damaged
- ☐ Lubricate with brake fluid before installing

4 - Retaining clip

- ☐ To remove and install pipe, pull out retaining clip as far as it will go

5 - Bleeder screw

- ☐ 4.5 Nm
- ☐ Bleeding clutch system ⇒ [page 28](#)

6 - Dust cap

7 - Retaining clip

- ☐ To remove and install pipe, pull out retaining clip as far as it will go

8 - O-ring

- ☐ Renew if damaged
- ☐ Lubricate with brake fluid before installing

9 - Brake fluid reservoir

10 - Seal

- ☐ Must be fitted in supply hose

11 - Supply hose

12 - Seal

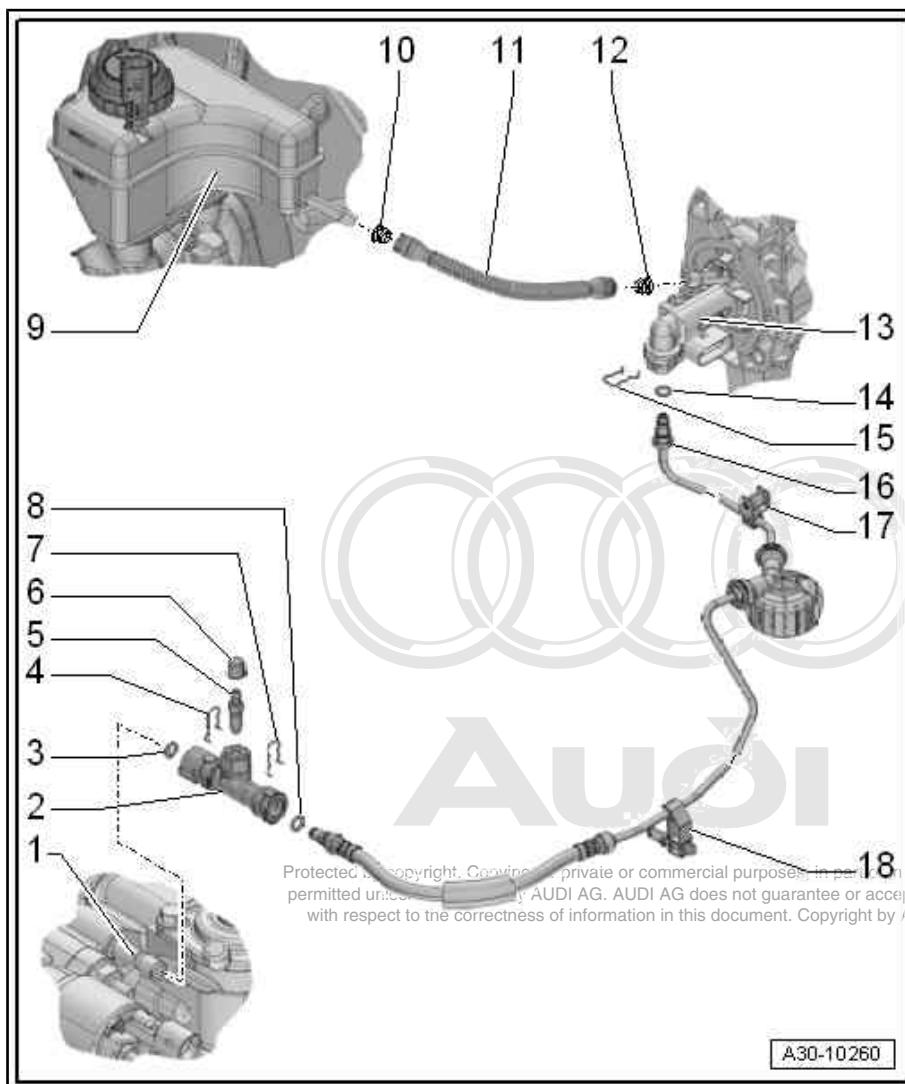
- ☐ Must be fitted in supply hose

13 - Clutch master cylinder

- ☐ Removing and installing ⇒ ["1.5.1 Removing and installing mounting bracket with clutch master cylinder", page 22](#)

14 - O-ring

- ☐ Renew if damaged



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A30-10260

- ☐ Lubricate with brake fluid before installing

15 - Retaining clip

- ☐ To remove and install pipe, pull out retaining clip as far as it will go

16 - Pipe/hose assembly

17 - Bracket

- ☐ Attached to body

18 - Bracket

- ☐ Attached to body

1.3 Exploded view - clutch release mechanism

1 - Clutch slave cylinder with release bearing

- ☐ Slave cylinder and release bearing are one unit and can only be renewed together
- ☐ Do not wash out bearing; wipe clean only
- ☐ If bearing is noisy, renew together with slave cylinder
- ☐ Removing and installing
⇒ [page 26](#)

2 - Bolt

- ☐ 3x
- ☐ Renew
- ☐ Tighten bolts carefully in several small steps and in diagonal sequence; make sure that mounting lugs on slave cylinder do not break off
- ☐ 12 Nm for metal clutch slave cylinder
- ☐ 15 Nm for plastic clutch slave cylinder

3 - Retaining clip

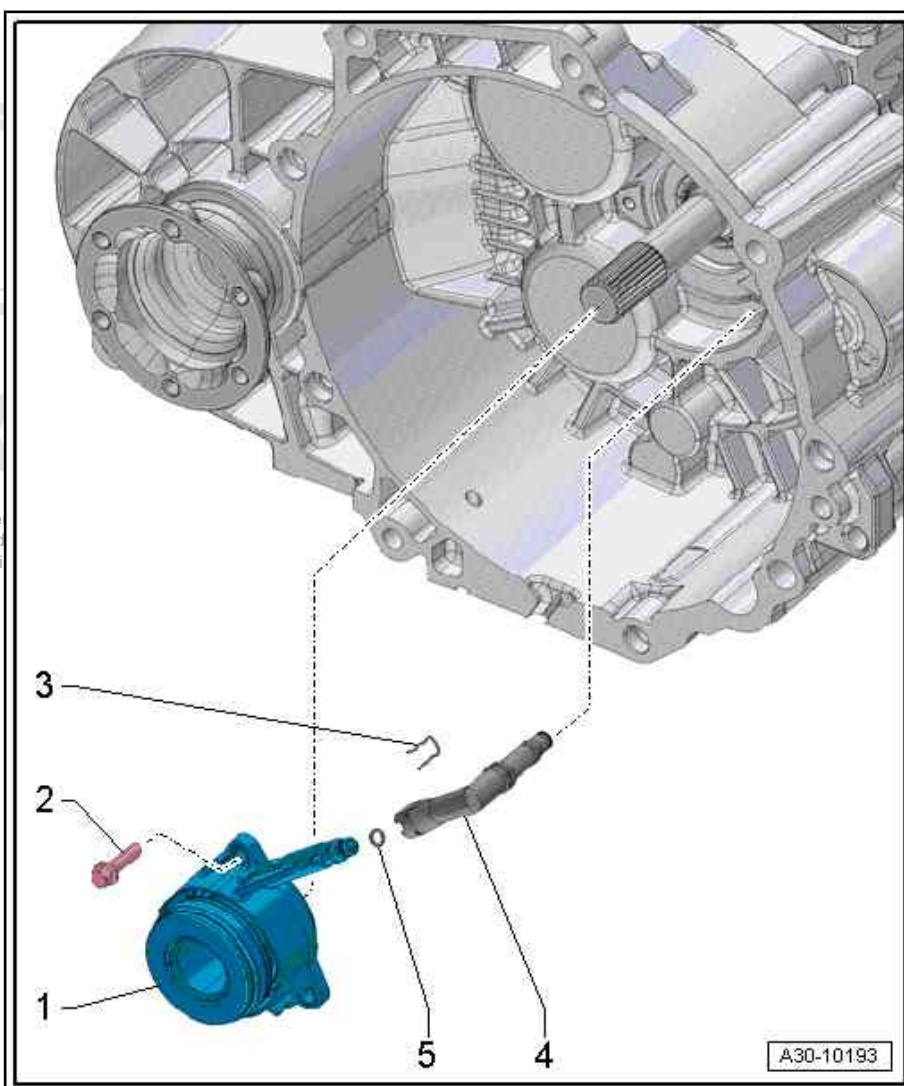
- ☐ To remove and install pipe, pull out retaining clip as far as it will go

4 - Pipe

- ☐ To clutch master cylinder
- ☐ Removing and installing
⇒ [page 26](#)

5 - O-ring

- ☐ Renew if damaged
- ☐ Lubricate with brake fluid before installing



1.4 Removing and installing clutch pedal

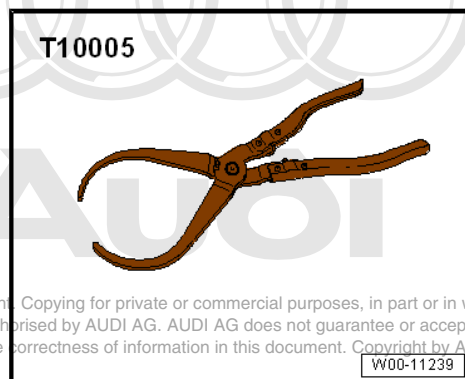


Note

If the over-centre spring is being removed on its own, the clutch pedal does not have to be separated from the clutch master cylinder.

Special tools and workshop equipment required

- ◆ Pliers - T10005-



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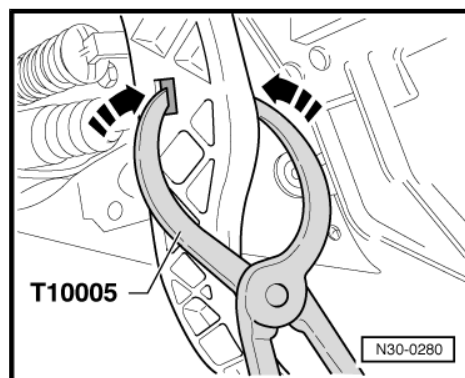
Removing



Note

Pivot pin for clutch pedal cannot be removed without being damaged.

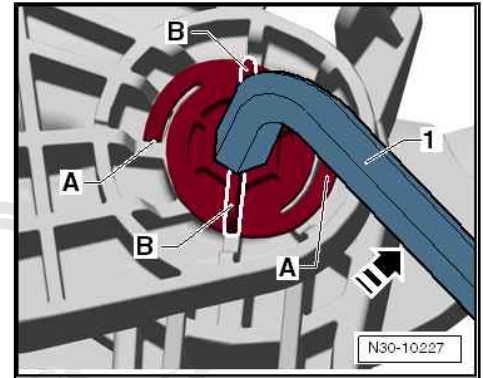
- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .
- Remove crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- To release operating rod for clutch master cylinder, pull clutch pedal slightly towards passenger compartment.
- Press both sides of retaining clip inwards using pliers - T10005- -arrows-.



- Using 8 mm Allen key -item 1-, turn pivot pin for clutch pedal anti-clockwise -arrow- until ears -B- are horizontal.

 Note

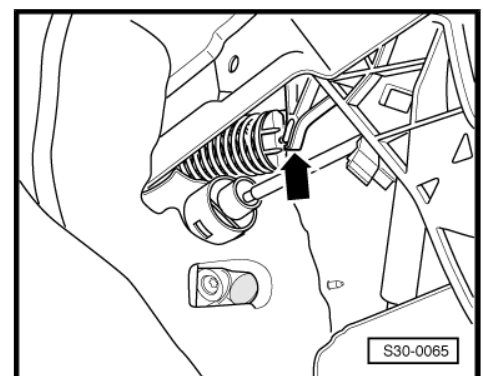
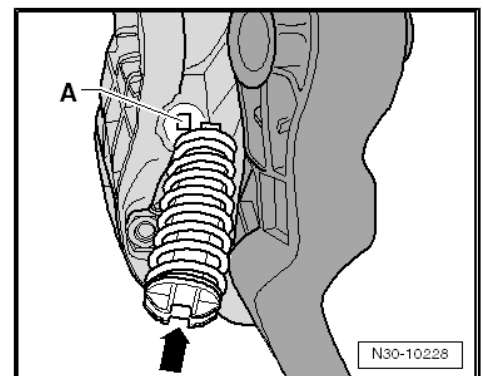
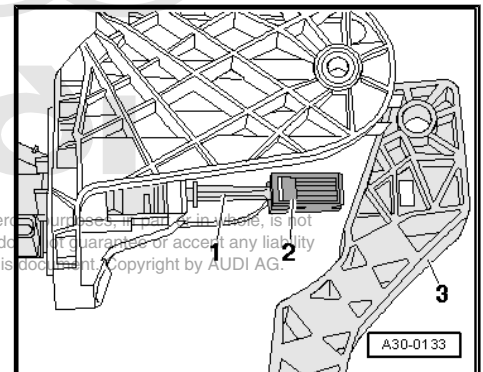
- ◆ *Retainers -A- will be destroyed when you do this.*
- ◆ *Renew pivot pin.*
- Move clutch pedal back and forth to pull out pivot pin.
- Remove over-centre spring and (if necessary) clutch pedal.



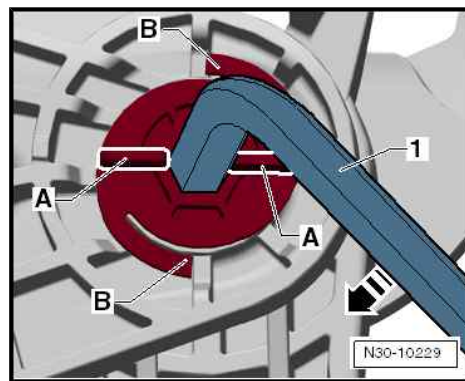
Installing

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

- Renew pivot pin.
- Bring clutch pedal into position at clutch master cylinder.
- The retaining clip -2- must be fitted on the master cylinder operating rod -1-.
- Press on clutch pedal so that retaining clip snaps into place in mounting on clutch pedal -3-.
- Working sideways from below, insert over-centre spring into mounting bracket at point -A- beside operating rod of clutch master cylinder and beside clutch pedal.
- The bearing recess -arrow- for the actuator on the clutch pedal must be vertical.
- Attach over-centre spring to actuator on clutch pedal -arrow-.



- Press clutch pedal slightly and slide in new pivot pin.
- Using 8 mm Allen key -item 1-, turn new pivot pin for clutch pedal clockwise -arrow- until ears -A- are vertical.
- Retainers -B- should engage audibly.
- Install crash bar ➔ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Install dash panel cover (driver side) ➔ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .



Tightening torques

- ◆ ➔ [“1.1 Exploded view - pedal cluster”, page 14](#)

1.5 Removing and installing mounting bracket

➔ [“1.5.1 Removing and installing mounting bracket with clutch master cylinder”, page 22](#)

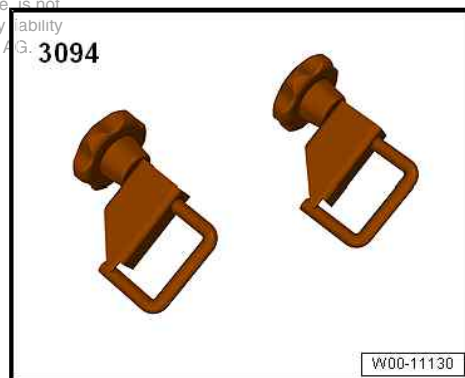
➔ [“1.5.2 Removing and installing mounting bracket without clutch master cylinder”, page 24](#)

1.5.1 Removing and installing mounting bracket with clutch master cylinder

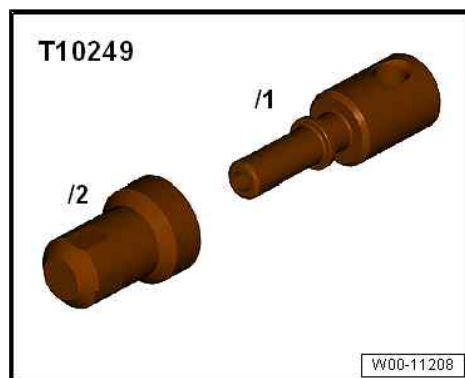
Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094

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- ◆ Sealing tool - T10249-

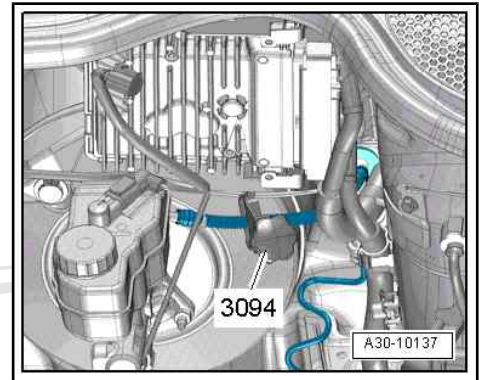


Removing

- Vehicles with 2.0 ltr. TDI engine: Remove air cleaner housing ➔ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

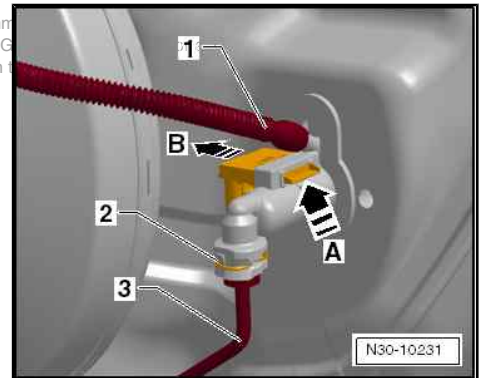
 Note

- ◆ *In the following steps make sure that no brake fluid escapes onto the longitudinal member or onto the gearbox below. If this does happen, clean the affected area thoroughly.*
- ◆ *Place a cloth underneath to catch escaping brake fluid.*
- Using hose clamp - 3094- , clamp off supply hose to clutch master cylinder.



 Note

- ◆ *Clamping off the supply hose with the hose clamp - 3094- will cause a permanent deformation.*
- ◆ *However, this does not damage the supply hose.*
- ◆ *After removing the hose clamp -3094- , the supply hose must be returned to its original shape.*
- Disconnect supply hose -1- from clutch master cylinder and plug hose using sealing tool - T10249/1- unless authorised by AUDI AG. AUDI AG is not liable for any damage or consequences arising from the use of this information, in particular with respect to the correctness of information in this document.
- Release retaining clip -2- with a screwdriver and disconnect pipe/hose assembly -3- from clutch master cylinder.
- Unclip clutch position sender - G476- -arrows A, B- and place it to one side with electrical connector attached.



 Note

-Item 1- can be disregarded.

- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .
- Remove crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .



Note

When working in the footwell, put cloths on the floor covering to protect it from possible brake fluid spills.

- Remove nuts -1, 2-.
- Remove mounting bracket -3- with clutch master cylinder.

Installing

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



Note

Renew self-locking nuts.

- Push supply pipe onto connection on clutch master cylinder so that retaining clip snaps into place.
- Pull on pipe to check that it is secure.
- Bleed clutch system ⇒ [page 28](#) .
- Install clutch position sender - G476- ⇒ [page 31](#) .
- Install crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Install dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

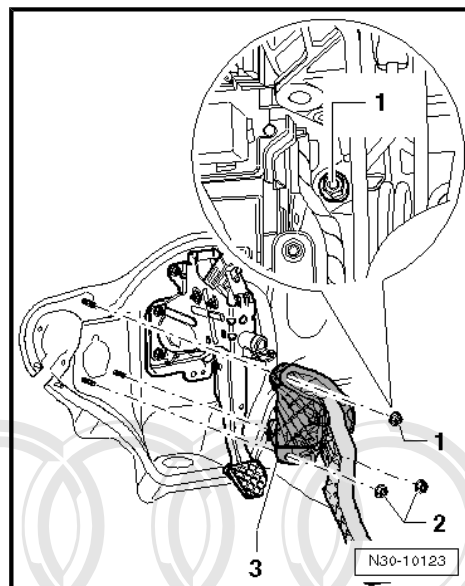
Tightening torques

- ♦ ⇒ ["1.1 Exploded view - pedal cluster", page 14](#)

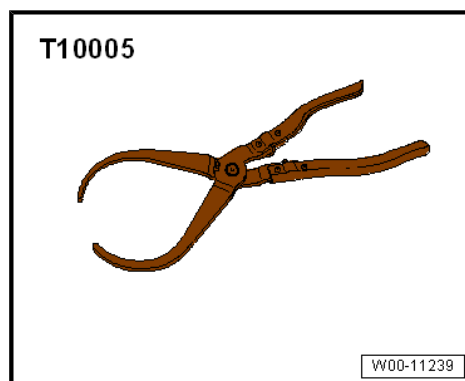
1.5.2 Removing and installing mounting bracket without clutch master cylinder

Special tools and workshop equipment required

- ♦ Pliers - T10005-



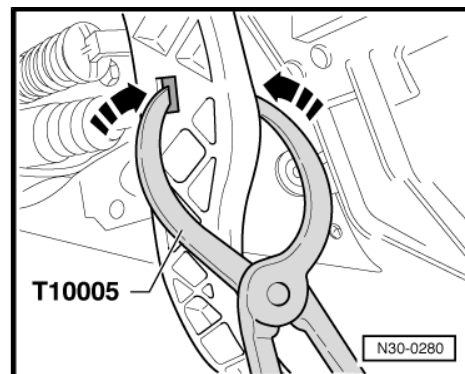
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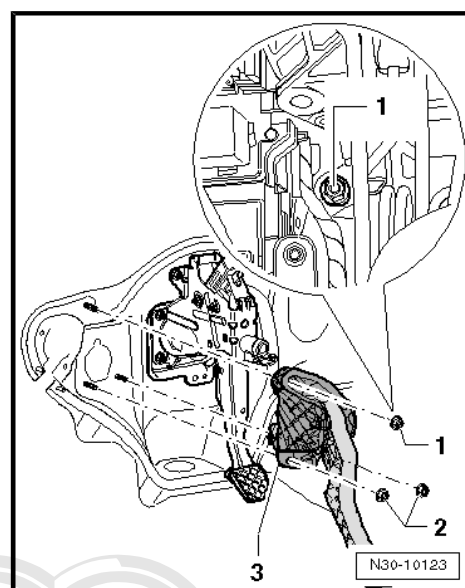
Removing

- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .

- Remove crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- To release operating rod for clutch master cylinder, pull clutch pedal slightly towards passenger compartment.
- Press both sides of retaining clip inwards using pliers - T10005- -arrows-.



- Remove nuts -1, 2-.
- Carefully remove mounting bracket -3- (to do this, get a second mechanic to counterhold clutch master cylinder until it is disengaged from mounting bracket).



Installing

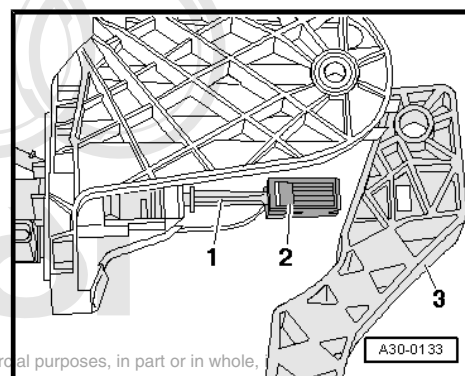
Installation is carried out in reverse sequence; note the following:



Note

Renew self-locking nuts.

- Bring clutch pedal into position at clutch master cylinder.
- The retaining clip -2- must be fitted on the master cylinder operating rod -1-.
- Press on clutch pedal so that retaining clip snaps into place in mounting on clutch pedal -3-.
- Install crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Install dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .



Tightening torques

- ◆ ⇒ ["1.1 Exploded view - pedal cluster", page 14](#)

1.6 Removing and installing clutch slave cylinder together with release bearing

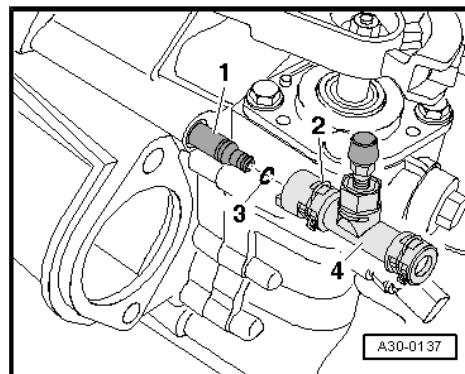


Note

Slave cylinder and release bearing are one unit and can only be renewed together.

Removing

- Gearbox removed
- Release retaining clip -2- with a screwdriver and pull bleeder connection -4- off pipe -1-.



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- Remove bolts -arrows-.
- Take off slave cylinder together with release bearing -A-.

Installing

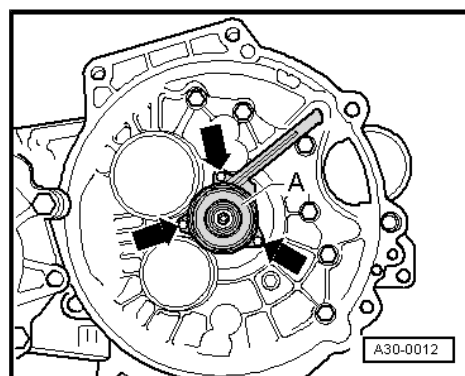
Installation is carried out in reverse sequence; note the following:



Caution

Risk of damage to clutch slave cylinder.

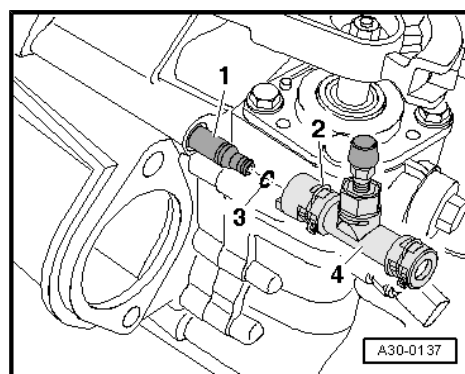
- ◆ *The bolts must only be tightened in small steps to avoid any risk of breaking off the mounting lugs -arrows- on the clutch slave cylinder.*



- Check O-ring -3- for damage and renew if necessary.
- Press bleeder connection -4- onto connection on pipe -1- so that retaining clip -2- snaps into place.
- Pull on bleeder connection to check it is secure.
- Bleed clutch system ➔ [page 28](#) .

Tightening torques

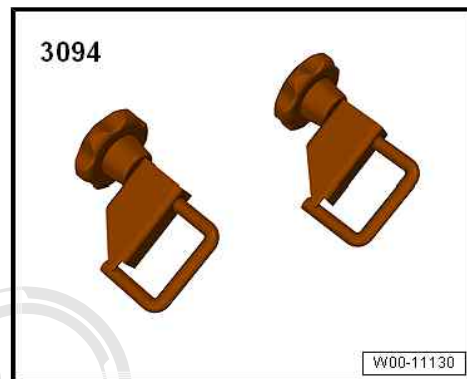
- ◆ ➔ [“1.3 Exploded view - clutch release mechanism”, page 19](#)



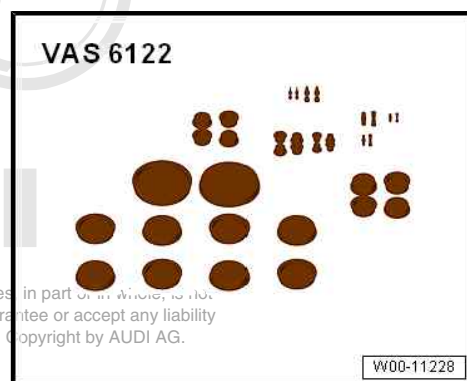
1.7 Removing and installing lines for clutch hydraulics

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



- ◆ Engine bung set - VAS 6122-



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Removing

- Vehicles with 2.0 ltr. TDI engine: Remove air cleaner housing
⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .



Note

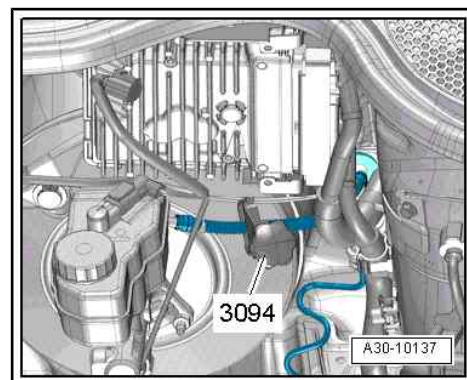
In the following steps make sure that no brake fluid escapes onto the longitudinal member or onto the gearbox below. If this does happen, clean the affected area thoroughly.

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



Note

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



- Place lint-free cloth under bleeder connection.
- Pull out retaining clip -arrow- as far as it will go and disconnect line -A- from bleeder connection.



Note

-Item B- can be disregarded.

- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .

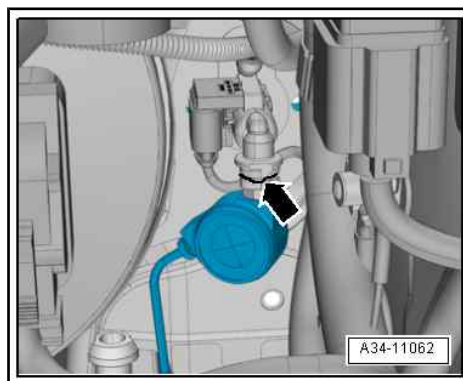
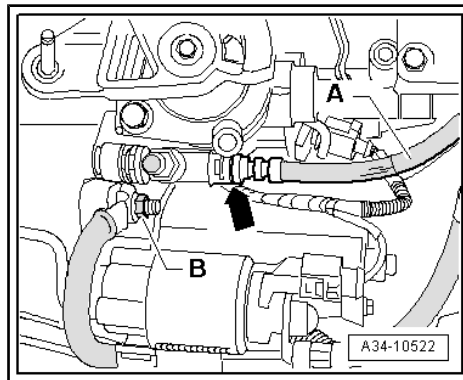
- Place lint-free cloth under clutch master cylinder.
- Pull out retaining clip -arrow- as far as it will go and disconnect line from clutch master cylinder.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



Caution

Catch escaping brake fluid.

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



- Move line clear and remove.

Installing

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



Note

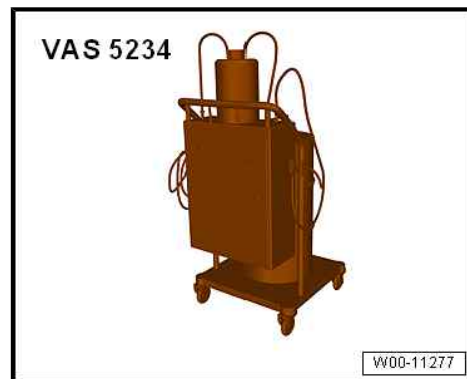
After removing the hose clamp - 3094- , the supply hose must be returned to its original shape.

- Push line onto connection on so that retaining clip snaps into place.
- Pull on pipe to check that it is secure.
- Bleed clutch system ⇒ [page 28](#) .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

1.8 Bleeding clutch hydraulics

Special tools and workshop equipment required

◆ Brake filling and bleeding equipment - VAS 5234-



◆ Brake fluid specification ⇒ Electronic parts catalogue .

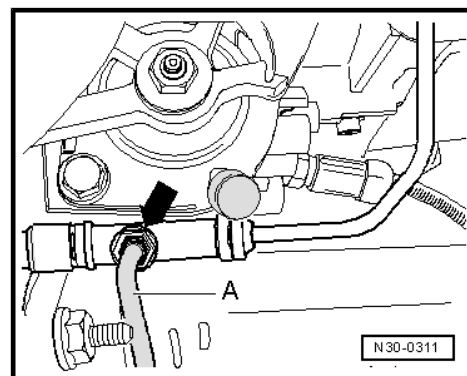
Procedure



Note

- ◆ *The clutch system must be bled after performing work on the hydraulic clutch mechanism.*
- ◆ *When performing the following steps, make sure that no brake fluid escapes onto the gearbox.*
- ◆ *Before bleeding the clutch system, top up the brake fluid reservoir to the "max." marking with brake fluid.*
- ◆ *The brake fluid in the clutch system should be changed at the same intervals as the brake fluid in the brake system ⇒ Maintenance ; Booklet 819 ; Description of work; Brake fluid: changing (every 2 years) .*

- Pull clutch pedal back to rest position.
- Remove cap from bleeder screw -arrow-.
- Connect bleeder hose -A- to pressure hose of fluid collector bottle.
- Switch on brake filling and bleeding equipment - VAS 5234- .
 - Operating pressure 2.0 bar
- Open bleeder screw.
- Pump clutch pedal rapidly all the way in and out by hand 15 to 20 times (approx. 2 times per second).
- Close bleeder screw.
- Switch off brake filling and bleeding equipment - VAS 5234- and relieve pressure from bleeding equipment.
- Pump clutch pedal all the way in and out 10 times with your foot.
- Check that clutch system is functioning properly.



Tightening torques

- ◆ ⇒ ["1.2 Exploded view - clutch hydraulics", page 17](#)

1.9 Checking clutch master cylinder and clutch slave cylinder



Note

Before you renew the clutch master cylinder or slave cylinder you must - in the case of the following faults - first carry out the appropriate checks.

Noises when operating the clutch:

- ◆ First check whether any noise is coming from the over-centre spring.
- ◆ If you hear a noise, remove over-centre spring and repeat check.
- ◆ Renew relevant component.

After releasing clutch pedal it still remains depressed / does not return to its initial position.

- ◆ Check whether the clutch pedal returns all the way to its initial position, thereby uncovering the vent opening in the master cylinder.
- ◆ The vent opening is integrated in the clutch master cylinder. It is not visible from the outside.
- ◆ The vent opening must be uncovered, otherwise the permanent self-bleeding function for the hydraulic clutch system will no longer be effective.
- ◆ Make the customer aware that the driver must NOT rest his/her foot on the clutch pedal for long periods of time. This could impair the self-bleeding function of the clutch system as the vent opening in the master cylinder can no longer function.
- ◆ The self-bleeding function of the clutch system can be impaired if the footwell trim or floor mats get trapped, if the clutch pedal switch jams or if the driver rests his foot on the clutch pedal for long periods of time.

Check the complete hydraulic system for leaks.

- ◆ Check brake fluid level in brake fluid reservoir.
- ◆ Check clutch master cylinder and slave cylinder as well as the pipe/hose assembly including connections for external leaks (visual inspection).
- ◆ Check joint between engine and gearbox for traces of brake fluid escaping from clutch slave cylinder.
- ◆ If you identify any leaks you must renew the leaking component.
- ◆ Bleed clutch system ⇒ [page 28](#) .

Pedal forces:

- ◆ approx. 140 N for complete service life of the clutch

High pedal force:

- ◆ Mechanical fault on pressure plate/clutch plate ⇒ [page 32](#) .

Clutch does not disengage or does not disengage fully:

- ◆ Air in hydraulic system: bleed clutch system ⇒ [page 28](#) and check hydraulic system for external and internal leaks.

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- ◆ Clutch plate does not move smoothly on input shaft splines (due to corrosion or dirt, etc.)
- ◆ Foreign body in clutch system
- ◆ Mechanical fault on pressure plate/clutch plate ➔ [page 32](#) .
- ◆ Wrong components used or components forgotten when carrying out repair work (e.g. intermediate plate or dowel sleeves).

1.10 Removing and installing clutch position sender - G476-

Removing

- Vehicles with 2.0 ltr. TDI engine: Remove air cleaner housing ➔ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Unclip clutch position sender - G476- -arrows A, B-.
- Unplug electrical connector and remove clutch position sender - G476- .



Note

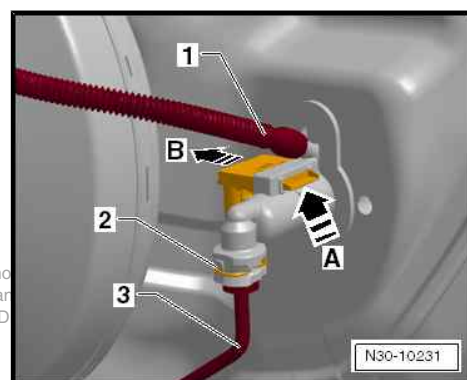
-Items 1, 2, and 3- can be disregarded.

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Installing

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

- Fit clutch position sender - G476- all the way onto clutch master cylinder (electrical connector should be plugged in beforehand).
- Clutch position sender should click into place -arrow A-.
- Check by pulling clutch position sender -arrow B-.
- Install air cleaner housing ➔ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .



2 Clutch

⇒ "2.1 Exploded view - clutch unit", page 32

⇒ "2.2 Removing and installing clutch", page 33

⇒ "2.3 Renewing input shaft oil seal", page 35

2.1 Exploded view - clutch unit

"Sachs" version

1 - Dual-mass flywheel

- ☐ Removing and installing
⇒ Rep. gr. 13 ; Cylinder block (gearbox end);
Removing and installing flywheel
- ☐ Ensure that dowel pins fit tightly
- ☐ Contact surface for clutch lining must be free of grooves, oil and grease
- ☐ Observe instructions for removal ⇒ [page 33](#)

2 - Clutch plate

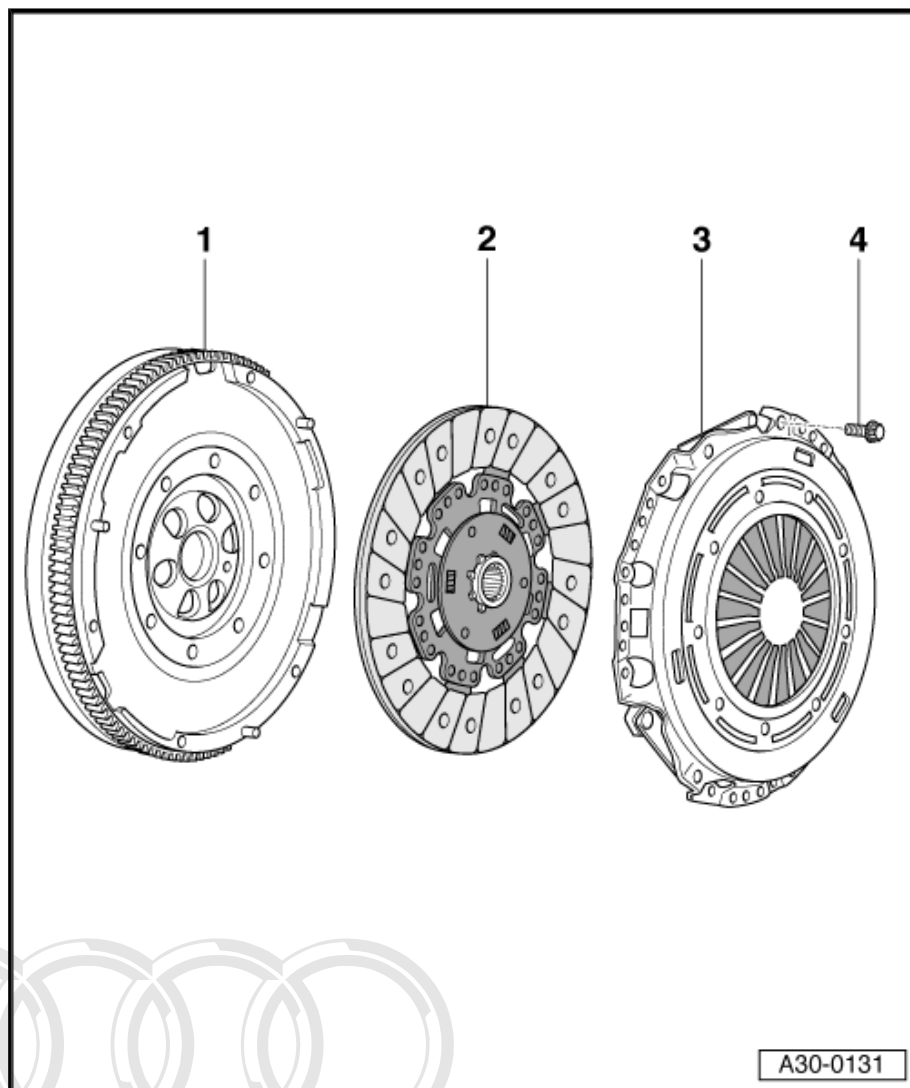
- ☐ Removing and installing
⇒ [page 33](#)
- ☐ Always renew clutch pressure plate as well
- ☐ Installation position
⇒ [page 33](#)
- ☐ For diameter of clutch plate, refer to ⇒ Electronic parts catalogue

3 - Pressure plate

- ☐ With adjustment mechanism
- ☐ Removing and installing
⇒ [page 33](#)
- ☐ Checking ends of diaphragm spring
⇒ [page 33](#)
- ☐ Checking spring connections and rivets
⇒ [page 33](#)
- ☐ Always renew clutch plate as well
- ☐ For correct version, refer to ⇒ Electronic parts catalogue

4 - Bolt

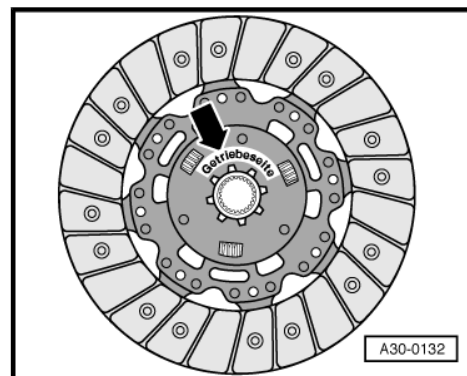
- ☐ Loosen and tighten bolts consecutively in steps of 90°
- ☐ M6: 13 Nm
- ☐ M7: 20 Nm



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Installation position of clutch plate

- Marking "Getriebeseite" (gearbox side) faces towards gearbox



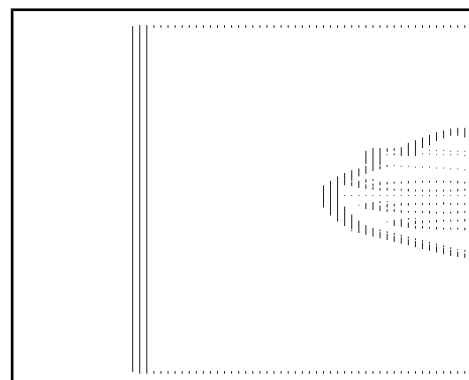
Checking ends of diaphragm spring

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



Note

If required, clutch pressure plate and clutch plate must always be renewed together. Select the correct clutch plate and clutch pressure plate according to engine code ⇒ Electronic parts catalogue .



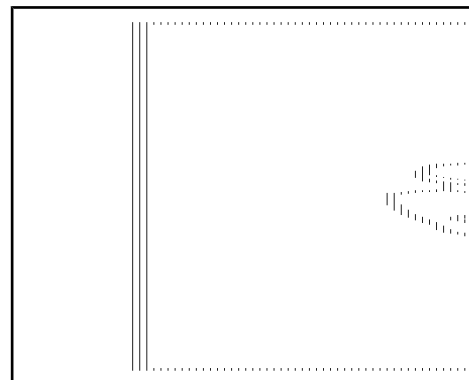
Checking spring connections and rivets

- Check spring connections between clutch pressure plate and cover for cracks and make sure rivet fastenings are seated tightly.
- Renew clutch pressure plate if spring connections are damaged or rivets are loose -arrows-.



Note

If required, clutch pressure plate and clutch plate must always be renewed together. Select the correct clutch plate and clutch pressure plate according to engine code ⇒ Electronic parts catalogue .



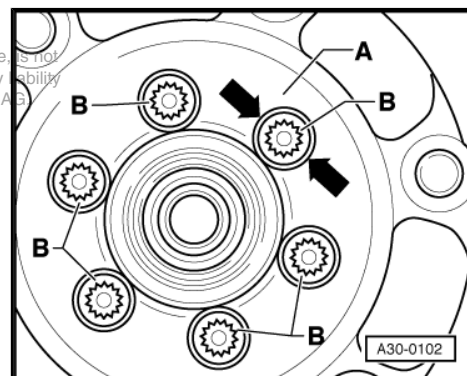
Instructions for removing dual-mass flywheel



Caution

Take care not to damage dual-mass flywheel.

- ◆ Remove bolts -B- by hand. Do not use a pneumatic wrench or impact wrench.
- ◆ When removing bolts, take care that the bolt heads do not come into contact with the dual-mass flywheel.
- ◆ Rotate dual-mass flywheel -A- so that bolts -B- are aligned centrally behind the holes -arrows-.



2.2 Removing and installing clutch

Special tools and workshop equipment required

◆ Counterhold tool - 3067-



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◆ Centring mandrel - T10097-



◆ Grease for clutch plate splines - G 000 100-

Removing

- Gearbox removed

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

- Apply counter-hold tool - 3067- in order to loosen bolts.
- Working clockwise, loosen all six bolts consecutively in steps of 90° ($\frac{1}{4}$ turn) until the clutch pressure plate is released.
- Take off clutch pressure plate and clutch plate.

Installing

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



Note

- ◆ *Always renew clutch plate and clutch pressure plate together and select the correct parts according to engine code ⇒ Electronic parts catalogue .*
 - ◆ *Clean input shaft splines and (in the case of used clutch plates) the hub splines. Remove corrosion and apply only a very thin coating of grease for clutch plate splines - G 000 100- to the splines. Then move clutch plate backwards and forwards on input shaft until hub moves freely on shaft. It is important to remove excess grease.*
 - ◆ *Clutch pressure plates have an anti-corrosion coating and are greased. With the exception of the friction surface for the clutch plate, the pressure plate must not be cleaned. Otherwise, the service life of the clutch will be considerably reduced.*
 - ◆ *The friction surface of the clutch pressure plate and the dual-mass flywheel must be cleaned (degreased) thoroughly.*
 - ◆ *Only blow out dual-mass flywheel with compressed air.*
 - ◆ *If the clutch has burnt out, thoroughly clean the clutch housing, flywheel and parts of the engine facing the gearbox in order to reduce the smell of burnt linings.*
 - ◆ *Clutch plate linings must make full contact with flywheel and friction surface of clutch pressure plate. Only then insert bolts.*
 - ◆ *Check that dowel sleeves for centralising engine/gearbox are in the cylinder block, install any missing dowel sleeves.*
 - ◆ *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).*
- Note installation position of clutch plate ⇒ [page 33](#) .
 - Use counterhold tool - 3067- .
 - Position clutch pressure plate on dowel pins.
 - Use centring mandrel - T10097- to centre clutch plate.

To prevent the clutch pressure plate from becoming distorted during installation (causes clutch grab when driving off), always adhere to the following procedure when attaching the clutch pressure plate:

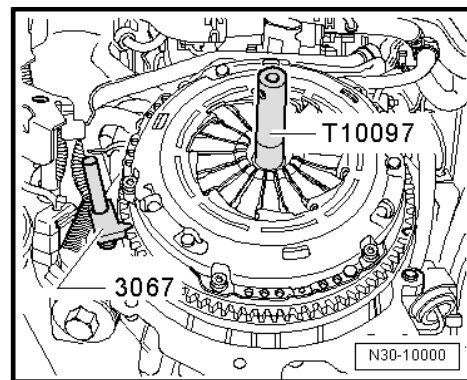
- Screw in all 6 bolts evenly by hand until bolt heads make contact with clutch pressure plate.
- Working clockwise, tighten all six bolts consecutively in steps of 90° (1/4 turn) until the housing makes contact with the flywheel.
- Tighten all 6 bolts to final torque consecutively in clockwise direction.

Tightening torques

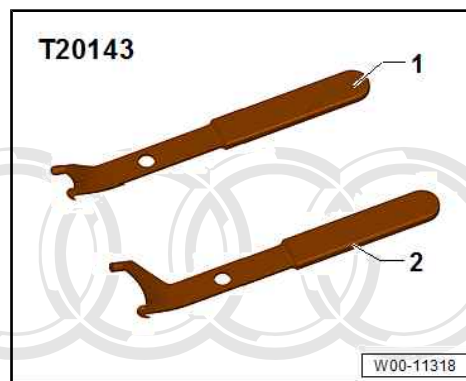
- ◆ ⇒ [“2.1 Exploded view - clutch unit”, page 32](#)

2.3 Renewing input shaft oil seal

Special tools and workshop equipment required



◆ Extractor tool - T20143/1-



◆ Thrust piece - T40008-



◆ Sealing grease - G 052 128 A1-

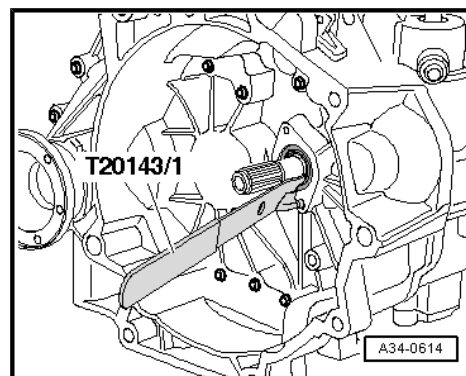
Removing

- Remove gearbox ➔ [page 56](#) .
- Remove slave cylinder with release bearing ➔ [page 26](#) .
- Pry out input shaft oil seal using extractor tool - T20143/1- .

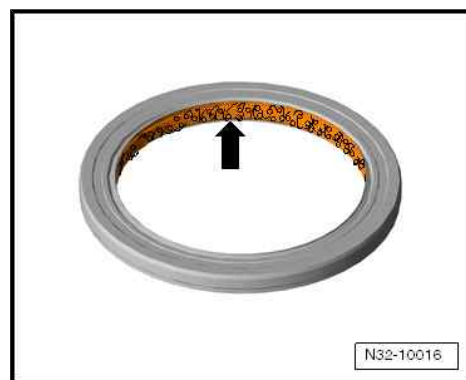


Note

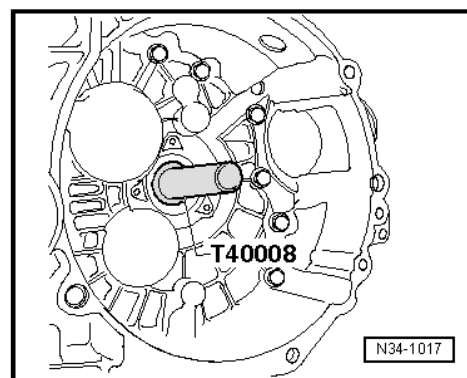
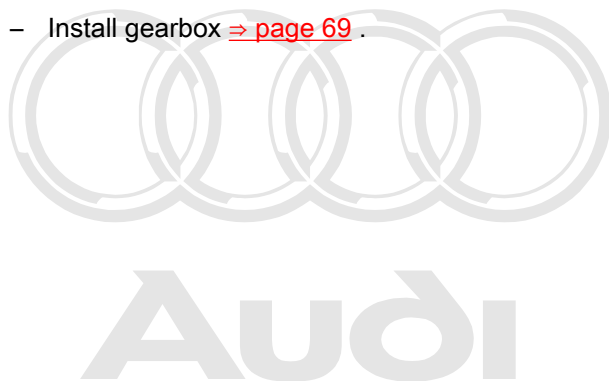
Take care not to damage contact surface for oil seal on input shaft.



- Pack space between sealing lip and dust lip -arrow- half-full with sealing grease - G 052 128 A1- .
- Lightly lubricate outer circumference of oil seal with gear oil.



- Drive in oil seal until flush using thrust piece - T40008- .
- Install slave cylinder with release bearing ⇒ [page 26](#) .
- Install gearbox ⇒ [page 69](#) .



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34 – Controls, housing

1 Selector mechanism

⇒ "1.1 Overview - selector mechanism", page 38

⇒ "1.2 Exploded view - gear knob and cover", page 39

⇒ "1.3 Exploded view - selector cables", page 39

⇒ "1.4 Exploded view - selector mechanism", page 41

⇒ "1.5 Removing and installing gear knob", page 43

⇒ "1.6 Removing and installing selector mechanism", page 44

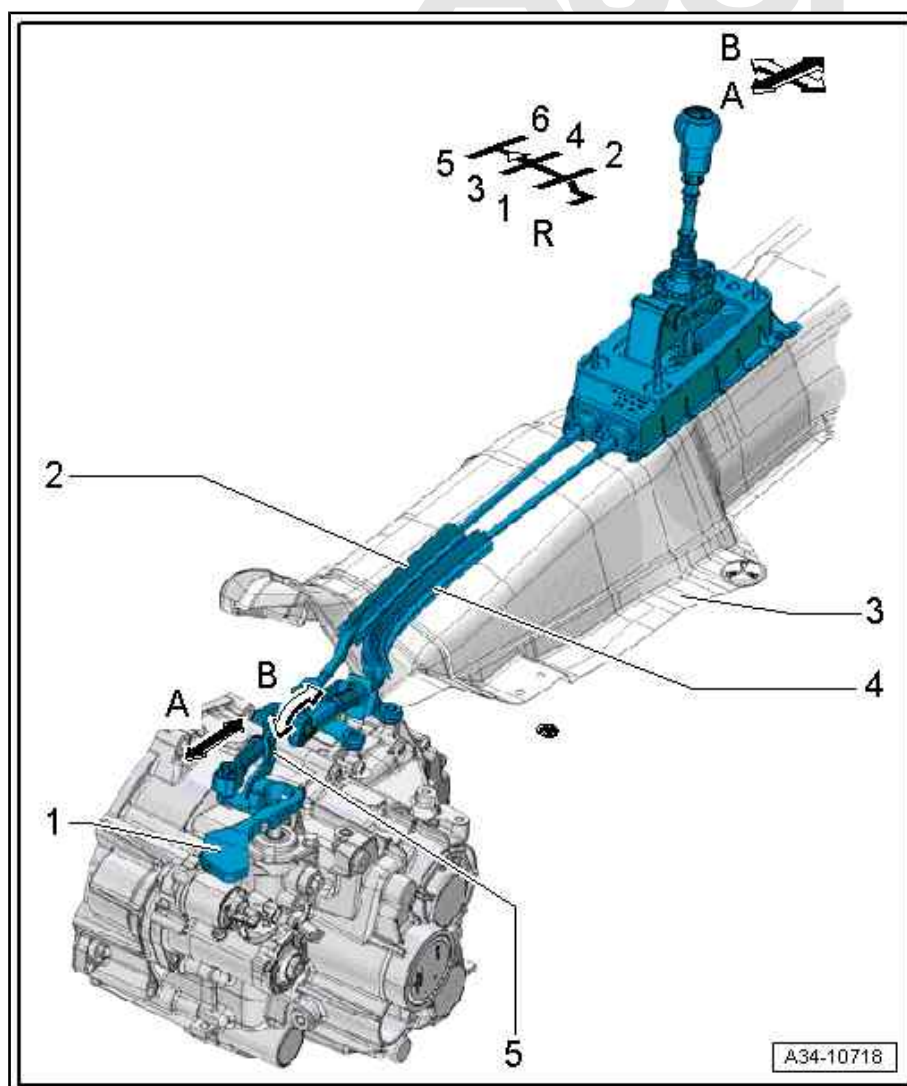
⇒ "1.7 Adjusting selector mechanism", page 45

⇒ "1.8 Dismantling and assembling selector mechanism", page 48

⇒ "1.9 Removing and installing selector cable", page 52

1.1 Overview - selector mechanism

- 1 - Gearbox selector lever
- 2 - Gear selector cable
 - ☐ For gear selection movement -arrows A-
- 3 - Heat shield
- 4 - Gate selector cable
 - ☐ For gate selection movement -arrows B-
- 5 - Gate relay lever



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1.2 Exploded view - gear knob and cover

1 - Gear lever

2 - Clip

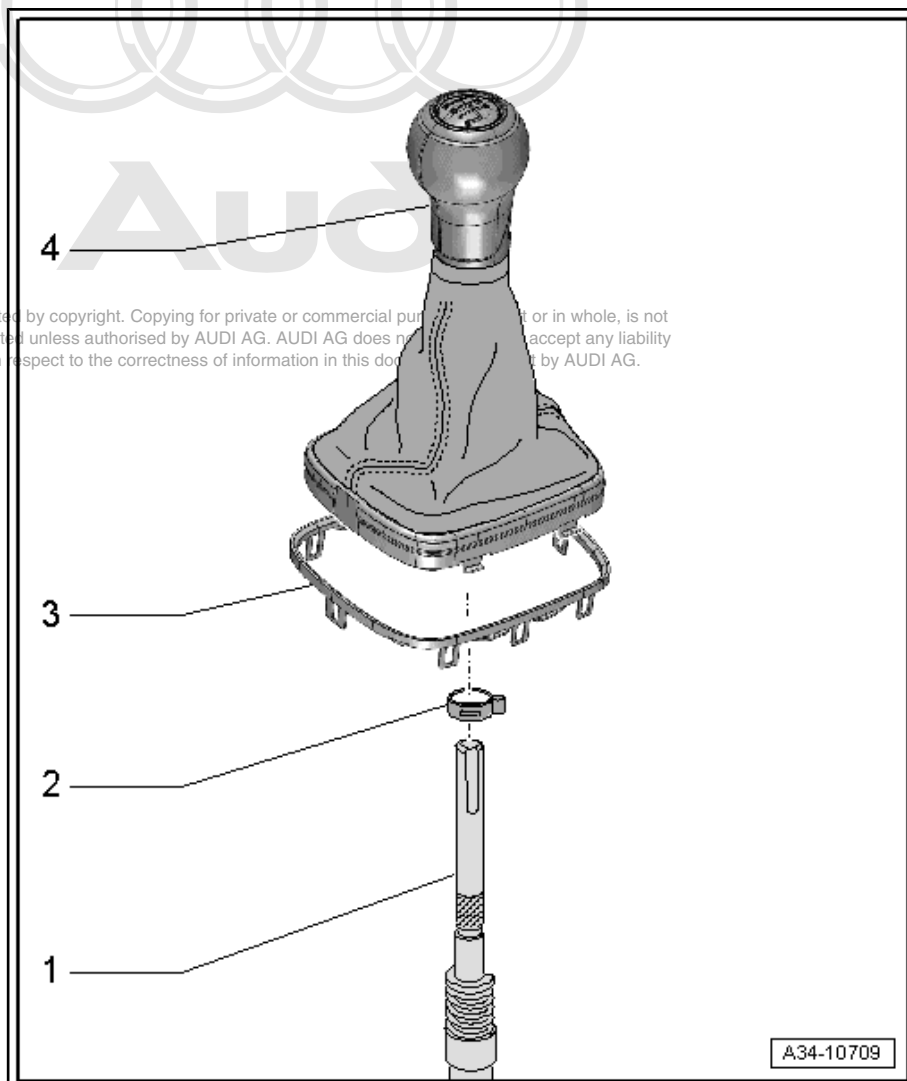
- ☐ Renew
- ☐ Must be the same as original equipment ⇒ Electronic parts catalogue

3 - Trim frame

- ☐ Removing and installing ⇒ General body repairs; interior; Rep. gr. 68 ; Centre console; Removing and installing trim panel for centre console

4 - Gear knob

- ☐ With gear lever boot
- ☐ Removing and installing ⇒ [page 43](#)



1.3 Exploded view - selector cables



Note

- ◆ Lubricate all bearings and moving surfaces.
- ◆ Select correct type of grease from ⇒ Electronic parts catalogue .

1 - Cable end-piece

- ☐ Secures gear selector cable to gearbox selector lever
- ☐ Detaching from gear selector cable
⇒ [page 41](#)

2 - Securing clip

- ☐ Removing ⇒ [page 41](#)
- ☐ Renew

3 - Retaining clips

- ☐ Renew

4 - Gear selector cable

- ☐ Detaching and securing at gearbox selector lever ⇒ [page 41](#)
- ☐ Removing and installing ⇒ [page 52](#)
- ☐ Adjusting ⇒ [page 45](#)

5 - Selector housing

6 - Retaining clips

- ☐ Renew

7 - Gate selector cable

- ☐ Detaching and securing at gate relay lever ⇒ [page 41](#)
- ☐ Removing and installing ⇒ [page 52](#)
- ☐ Adjusting ⇒ [page 45](#)

8 - Cable support bracket

9 - Bolt

- ☐ 20 Nm

10 - Grommet

11 - Bush

12 - Nut

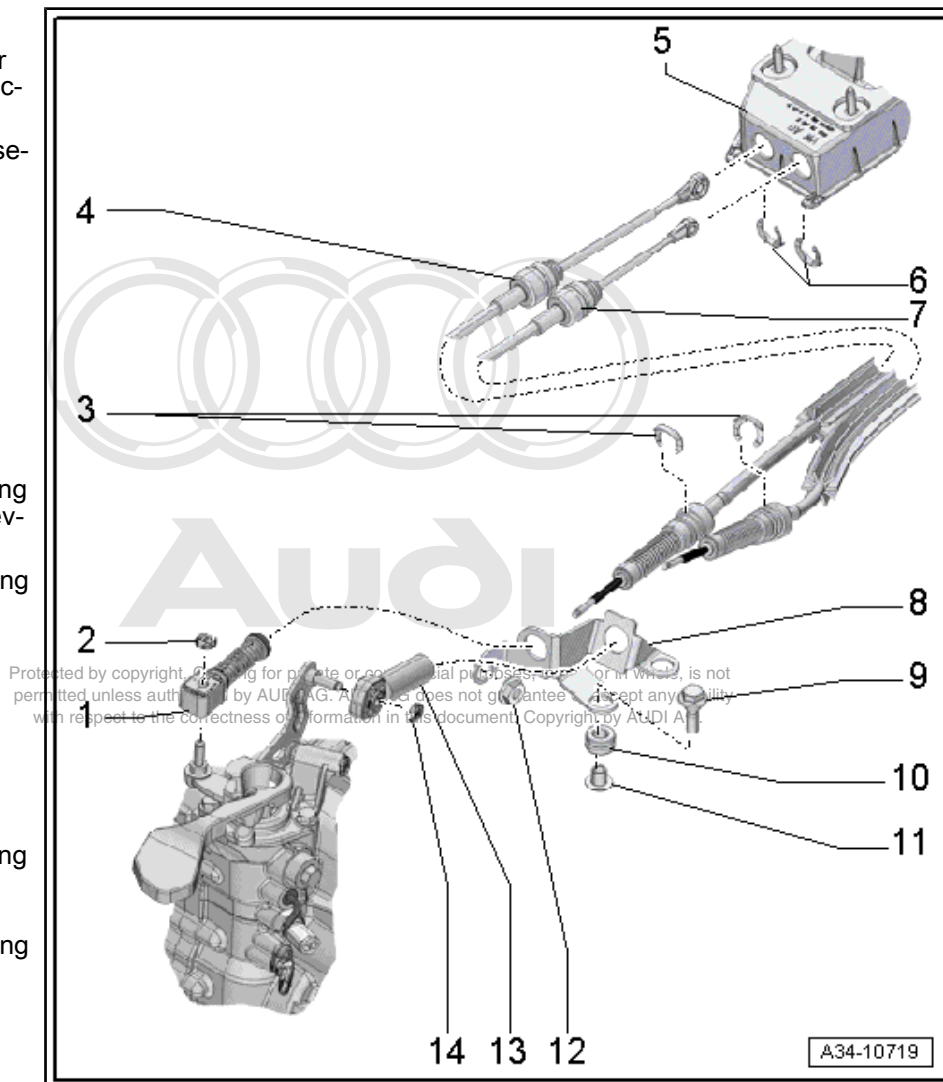
- ☐ 20 Nm

13 - Cable end-piece

- ☐ Secures gate selector cable to gate relay lever
- ☐ Detaching from gear selector cable ⇒ [page 41](#)

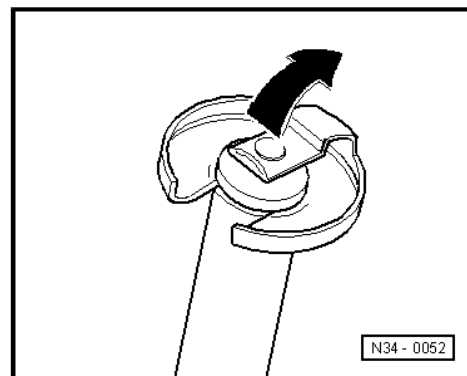
14 - Securing clip

- ☐ Removing ⇒ [page 41](#)
- ☐ Renew



Removing securing clip

- Lift up tab -arrow-.



Detaching and securing gear selector cable and gate selector cable

Detaching

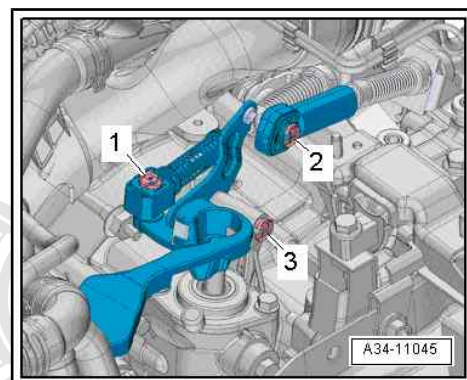
- Lift up tab on securing clip -1- to detach securing clip from gearbox selector lever and then pull gear selector cable off pin.
- Lift up tab on securing clip -2- to detach securing clip from gate relay lever and then pull gate selector cable off pin.

Securing



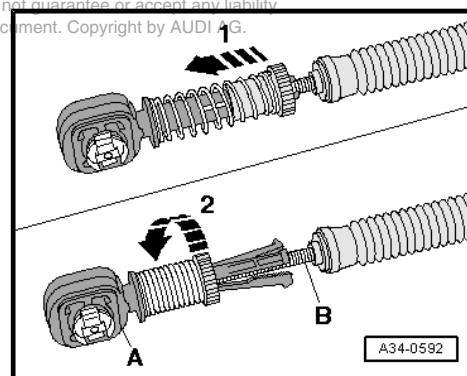
Note

- ◆ *Renew securing clips.*
- ◆ *Apply a small quantity of grease - G 000 450 02- to the pins.*
- ◆ *-Item 3- can be disregarded.*
- Press cable onto pin and secure with securing clip.



Detaching cable end-pieces from gear selector cable and gate selector cable

- Pull locking mechanism forwards -arrow 1- onto stop and then turn to left -arrow 2- to lock.
- Take cable -B- out of cable end-piece -A-.



1.4 Exploded view - selector mechanism



Note

- ◆ *Lubricate all bearings and moving surfaces.*
- ◆ *Select correct type of grease from ⇒ Electronic parts catalogue .*

1 - Floor plate

- ☐ Bend tabs open to remove
- ☐ Always renew after removing

2 - Gasket

- ☐ Renew

3 - Bush

- ☐ Fitted in gate selector cable
- ☐ Renew gate selector cable if bush is damaged

4 - Retaining clips

- ☐ Renew

5 - Gate selector cable

- ☐ Lever off gate selector lever
- ☐ Press onto gate selector lever inside selector mechanism
- ☐ Installation position
⇒ [page 38](#)

6 - Gear selector cable

- ☐ Lever off gear lever guide
- ☐ Press onto gear lever guide inside selector mechanism
- ☐ Installation position
⇒ [page 38](#)

7 - Gear lever guide
8 - Ball socket

- ☐ Will be damaged during removal
- ☐ Renew

9 - Spring
10 - Securing clip
11 - Damper
12 - Nut

- ☐ 4x
- ☐ M8 - 20 Nm

13 - Gasket

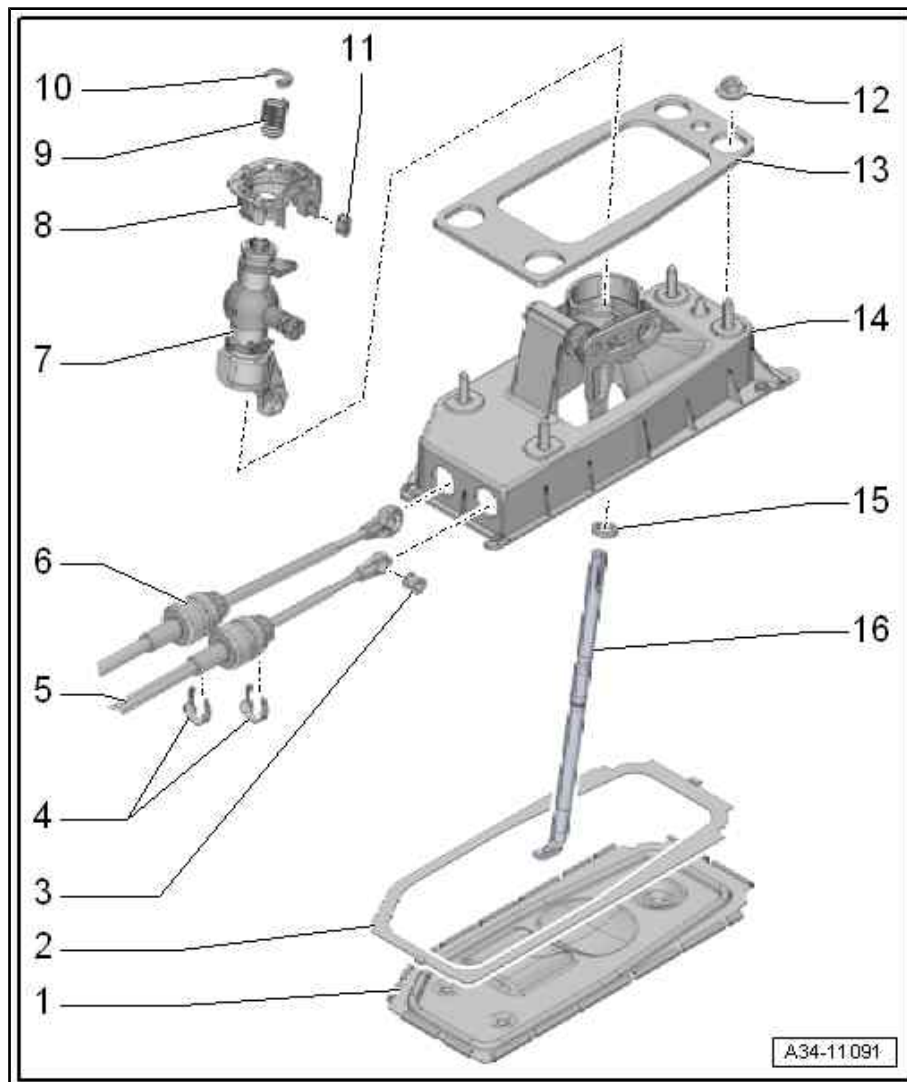
- ☐ Between selector housing and floor
- ☐ Self-adhesive
- ☐ Renew
- ☐ Glue onto selector housing

14 - Selector housing

- ☐ Removing and installing ⇒ [page 44](#)

15 - Damping washer

- ☐ Push onto gear lever as far as bottom stop



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16 - Gear lever

- ❑ Can be removed and installed without removing gear lever guide ➔ [Item 7 \(page 42\)](#)

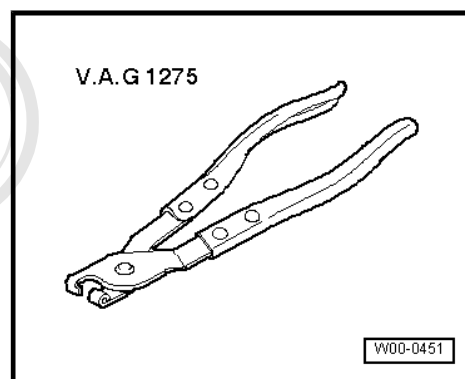
1.5 Removing and installing gear knob

Special tools and workshop equipment required

- ◆ Removal wedge - 3409-

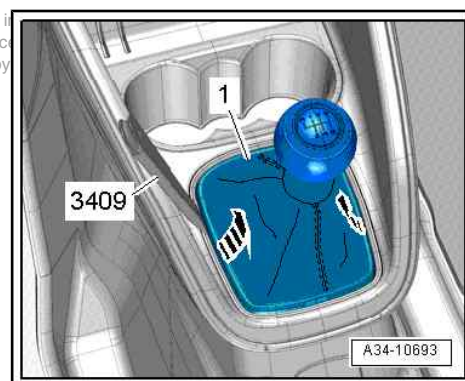


- ◆ Hose clip pliers - V.A.G 1275-

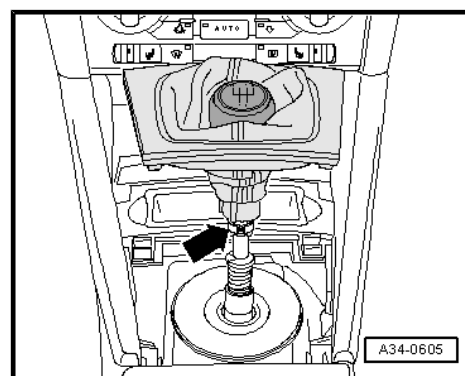


Removing

- Using removal wedge - 3409-, lift up gear lever boot -1- (as indicated by -arrows-) and turn inside out over gear knob.



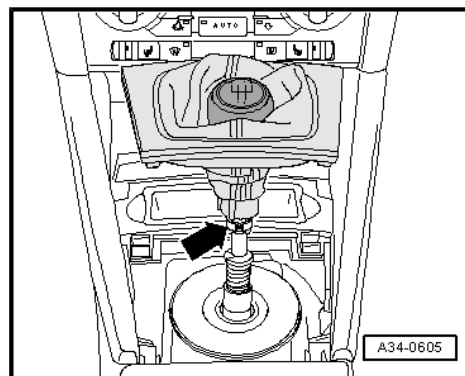
- Open clip -arrow- and pull off gear knob together with boot.



Installing

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

- Push gear knob together with boot onto gear lever as far as stop.
- Secure gear knob to gear lever with clip -arrow-, using hose clip pliers - V.A.G 1275- .



1.6 Removing and installing selector mechanism

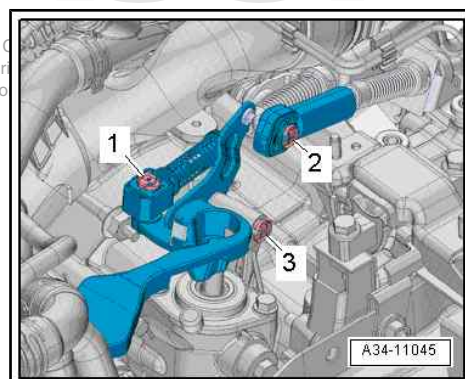
Removing

- Remove gear knob with gear lever boot ➔ [page 43](#) .
- Remove centre console ➔ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- Remove heat shield in centre tunnel ➔ General body repairs, exterior; Rep. gr. 66 ; Strips / trim panels / extensions; Exploded view - heat shield .
- Vehicles with 2.0 ltr. TDI engine: Remove air cleaner housing ➔ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Remove securing clips -1, 2-.
- Move gear selector cable and gate selector cable clear.

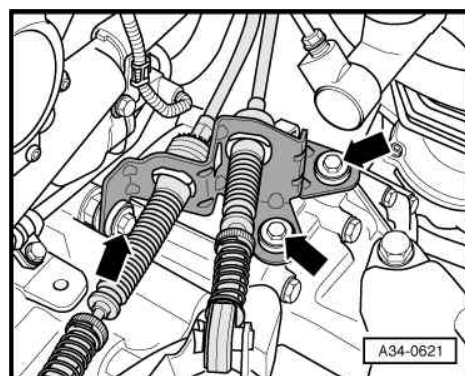


Note

-Item 3- can be disregarded.



- Remove bolts and nut -arrows- for cable support bracket.

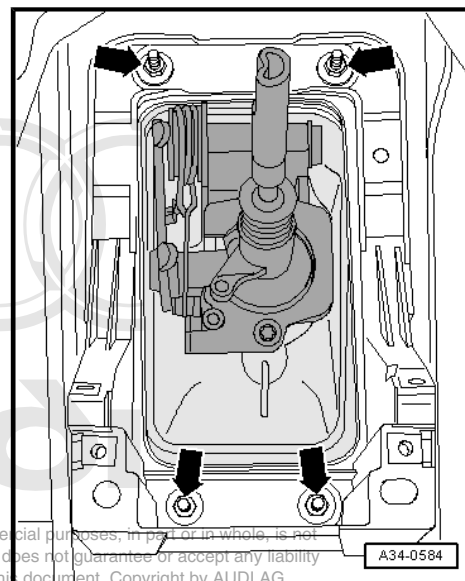


- Remove nuts -arrows- and detach selector mechanism from below.

Installing

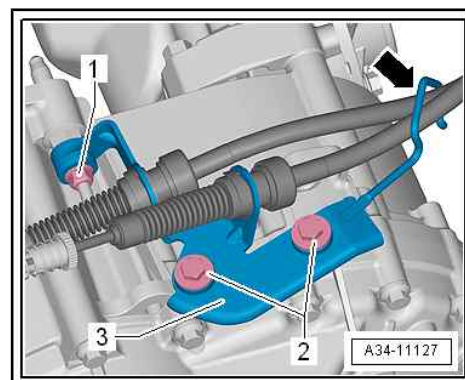
Installation is carried out in reverse sequence; note the following:

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

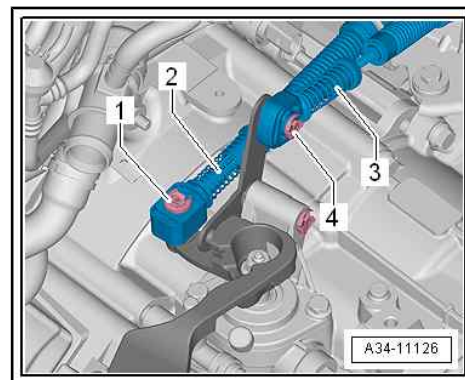


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- Secure cable support bracket -3- to gearbox. At the same time, hook cables into hook -arrow- (if fitted).



- Apply a small amount of grease to pins of gearbox selector lever and gate relay lever.
- Select correct type of grease from ⇒ Electronic parts catalogue .
- Fit gear selector cable -2- and gate selector cable -3- with new securing clips -1, 4- onto gear selector lever and gate relay lever.
- Adjust selector mechanism ⇒ [page 45](#) .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Install heat shield in centre tunnel ⇒ General body repairs, exterior; Rep. gr. 66 ; Strips / trim panels / extensions; Exploded view - heat shield .
- Install centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- Install gear knob with gear lever boot ⇒ [page 43](#) .



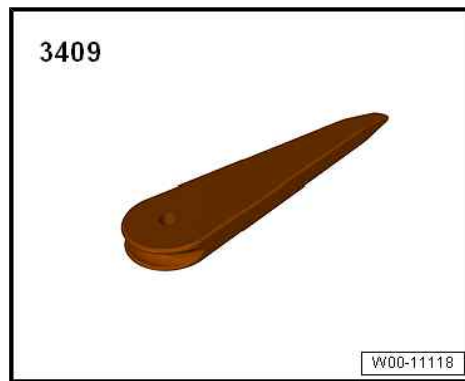
Tightening torques

- ◆ ⇒ [“1.3 Exploded view - selector cables”, page 39](#)
- ◆ ⇒ [“1.4 Exploded view - selector mechanism”, page 41](#)

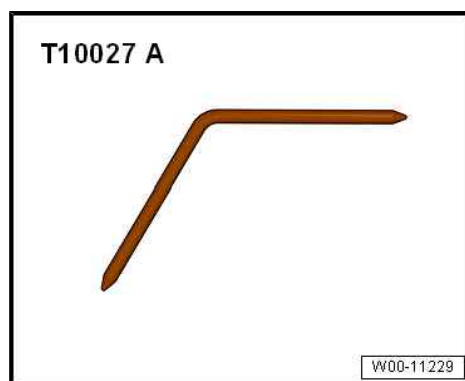
1.7 Adjusting selector mechanism

Special tools and workshop equipment required

◆ Removal wedge - 3409-



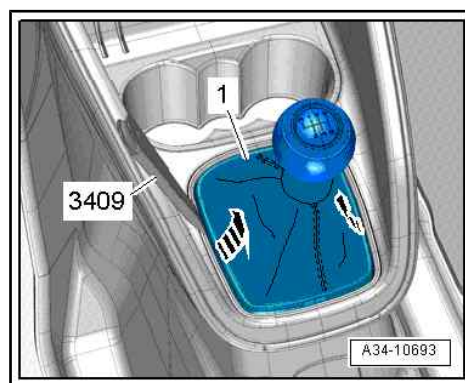
◆ Locking pin - T10027A-

**Requirements for adjustment**

- Gear selector linkage must be in proper condition and undamaged.
- Selector mechanism must move freely.
- Gearbox, clutch and clutch mechanism must be in proper condition.
- Gearbox in neutral.

Adjusting

- Using removal wedge - 3409- , lift up gear lever boot -1- (as indicated by -arrows-) and turn inside out over gear knob.
- Open ashtray (if fitted).
- With gearbox in neutral, move gear lever to the left into 1st/2nd gear gate.



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- If fitted, pull noise insulation slightly to one side.
- Fix gear lever in position with locking pin - T10027A- .



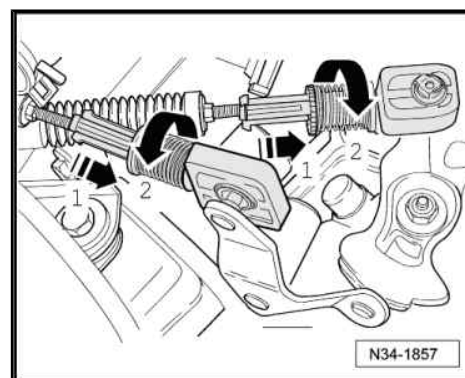
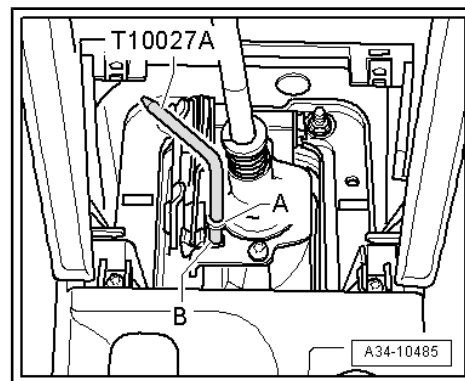
Note

The noise insulation panels are removed to give a better illustration.

- Vehicles with 2.0 ltr. TDI engine: Remove air cleaner housing
⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

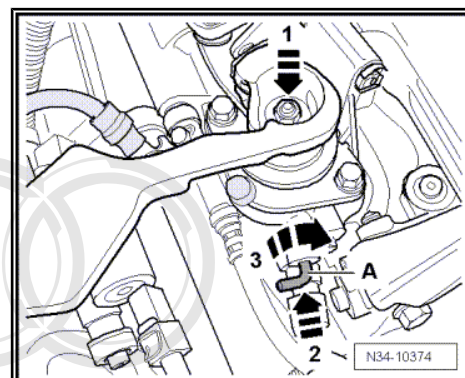
Release cable end-pieces for gear selector cable and gate selector cable as follows:

- Push locking sleeves on gear selector cable and gate selector cable forward as far as they will go -arrow 1-.
- Turn locking sleeve as far as stop in direction of -arrow 2- so that it engages.
- It should now be possible to move the cables in the cable end-pieces.
- Gearbox in neutral.

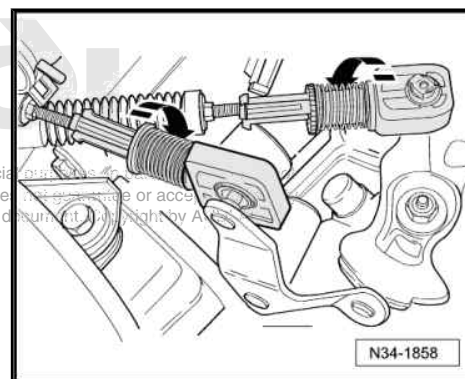


Lock selector shaft as follows:

- Push gearbox selector lever down into 1st/2nd gear gate -arrow 1-. At the same time, turn angled rod -A- in direction of -arrow 3- and press it inwards in direction of -arrow 2- until it engages.
- The selector shaft is then locked and can no longer be moved.
- Ensure that the gear selector cable and the gate selector cable are located free of tension in the cable end-pieces.



- Turn locking sleeves on gear selector cable and gate selector cable as far as they will go -arrows-.
- The spring presses the locking sleeve back into the original position.



Note

Cable adjustment is now complete.

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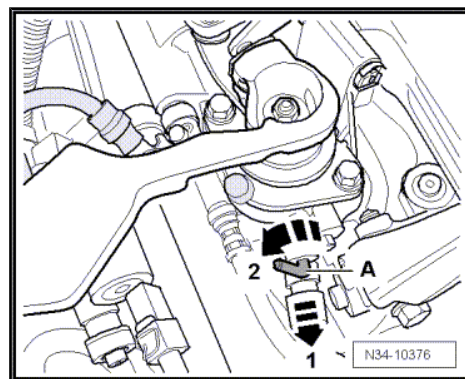
- Turn angled rod -A- back to initial position in direction of -arrow 2-, at the same time pulling it out in direction of -arrow 1-.
- Remove locking pin - T10027A- .

Checking adjustment

- With the gearbox in neutral, the gear lever should rest in the 3rd/4th gear gate.
- 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, readjust selector mechanism ➔ [page 45](#) .

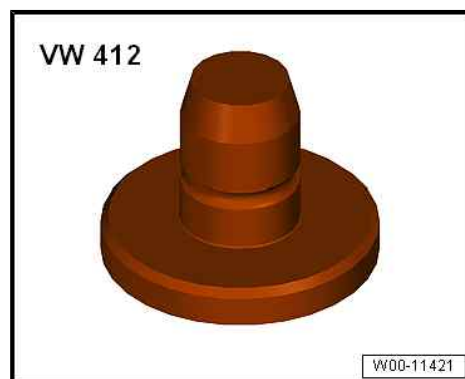
- Install air cleaner housing ➔ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .



1.8 Dismantling and assembling selector mechanism

Special tools and workshop equipment required

- ◆ Press tool - VW 412-



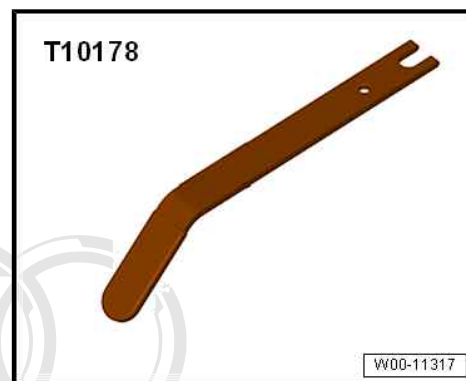
- ◆ Adapters - 10 - 222 A /25-



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◆ Assembly tool - T10178-



◆ Release tool - T10236-



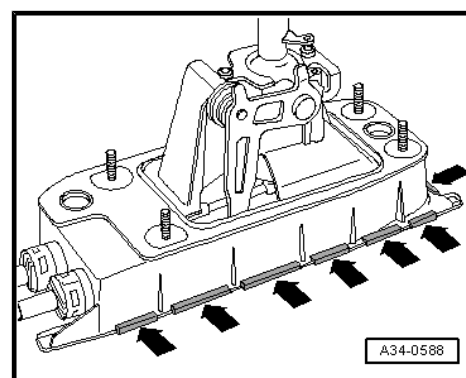
◆ Wedge - T10357-



◆ Counter-support Kukko series 16

Dismantling

- Selector mechanism removed ⇒ [page 44](#) .
- Open out tabs -arrows- all round with screwdriver and remove floor plate.
- Remove gasket.

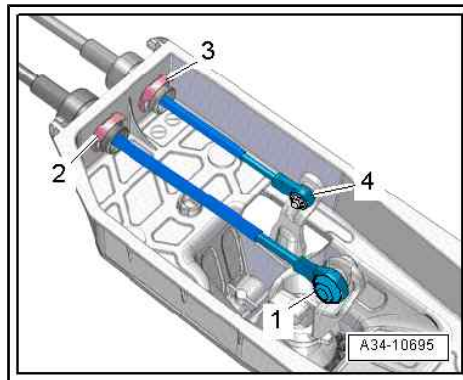


- Detach retaining clip -2-.
- Press off gear selector cable -1- using release tool - T10236- .

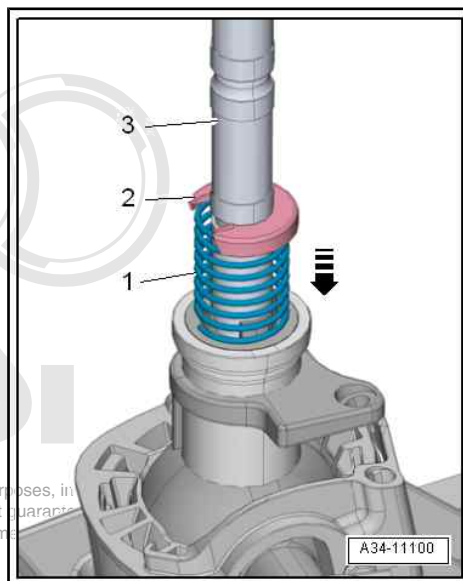


Note

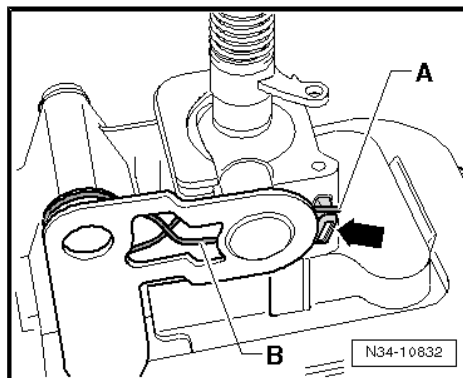
-Items 3 and 4- can be disregarded.



- Hold gear lever -3- firmly.
- Push spring -1- in direction of -arrow-.
- Remove securing clip -2-.
- Remove spring.



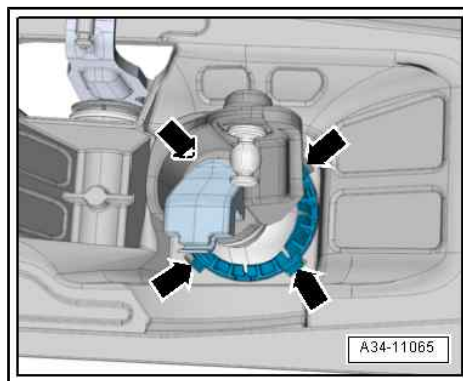
- Press arm -A- of spring to side until it is located next to damper -arrow-.
- Move gear lever to side and remove damper.



Note

A second mechanic is required for the following step.

- Working from below, release all four retaining lugs -arrows- on ball socket by applying a small screwdriver at each lug.
- At the same time press gear lever out of selector housing together with ball socket and gear lever guide.



- Press ball socket -2- off ball -1- in gear lever guide.
- To do so, pull ball socket upwards -arrow A- and turn ball socket in direction of -arrow B- to release it from gear lever guide.

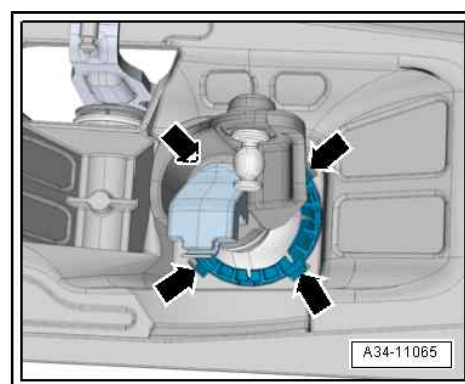
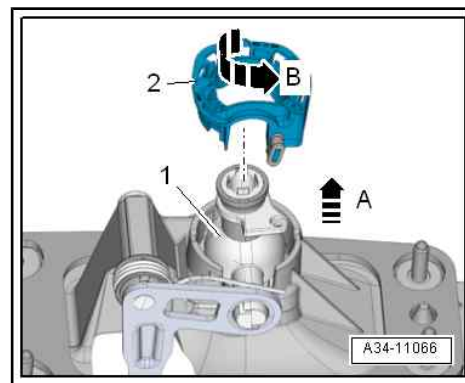
Assembling

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

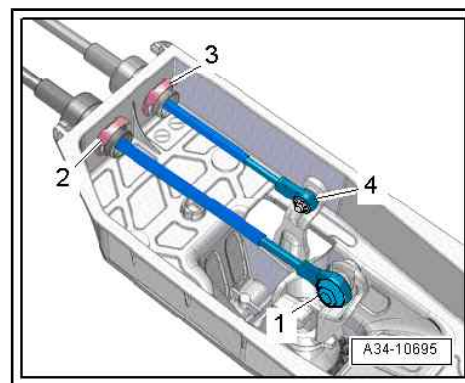


Note

- ◆ *Renew seals and gaskets.*
 - ◆ *Lubricate all bearings and moving surfaces.*
 - ◆ *Select correct type of grease from ⇒ Electronic parts catalogue .*
- First fit ball socket over ball in gear lever guide and then press ball socket into selector housing until retaining lugs -arrows- snap into place.



- Press gear selector cable -1- onto gearbox selector lever.
- Secure gear selector cable with retaining clip -2-.



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Install floor plate as follows:

- Fit gasket onto floor plate.



Caution

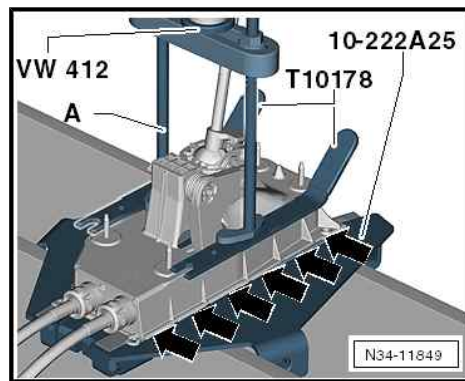
Risk of damage to selector housing and floor plate.

- ◆ **Apply only light pressure when pre-tensioning selector housing.**

- Secure selector mechanism and floor plate using tools, as shown in illustration.

A - Counter-support, e.g. Kukko series 16

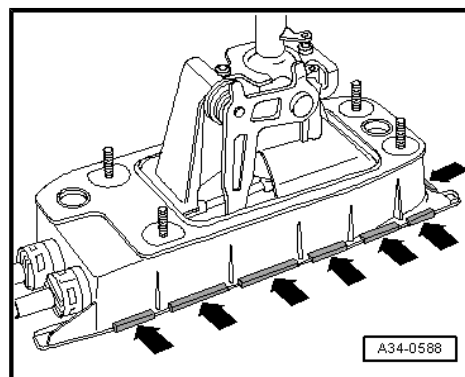
- Lever tabs -arrows- of floor plate over rim of selector housing on both sides using wedge - T10357- .
- Install selector mechanism ➔ [page 44](#) .



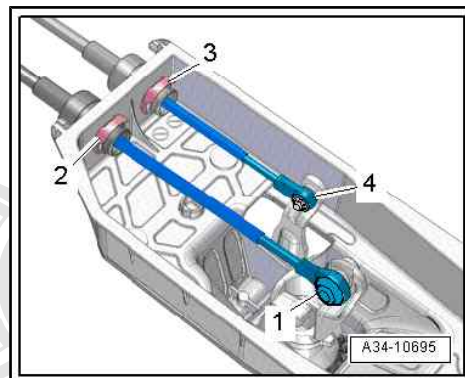
1.9 Removing and installing selector cable

Removing

- Remove selector mechanism ➔ [page 44](#) .
- Open out tabs -arrows- all round with screwdriver and remove floor plate.
- Remove gasket.

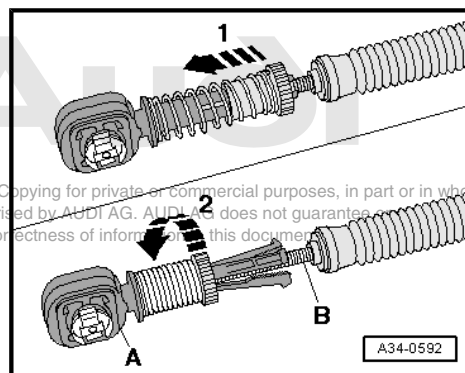


- Detach retaining clips -2, 3-.
- Press off gear selector cable -1- and gate selector cable -4- using a screwdriver.



Release cable end-pieces -A- for gate selector cable and gear selector cable -B- as follows:

- Push locking sleeve forwards as far as stop -arrow 1-.
- Turn locking sleeve clockwise as far as stop -arrow 2- so that it engages.
- Detach cable end-pieces from selector cables.



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- Pull off securing clips -1- and -2-.
- Detach cable support bracket from selector cables.

Installing

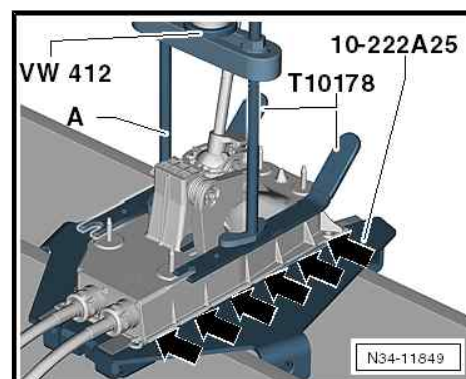
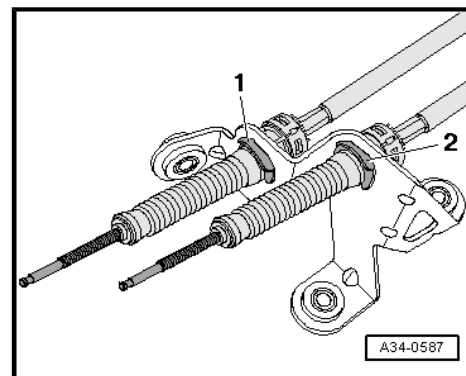
Installation is carried out in reverse sequence; note the following:



Note

Renew gate selector cable if bush ➔ [Item 3 \(page 42\)](#) is damaged.

- Fit gasket and install floor plate -arrows- ➔ [page 52](#) .
- Install selector mechanism ➔ [page 44](#) .



1.10 Renewing selector shaft oil seal

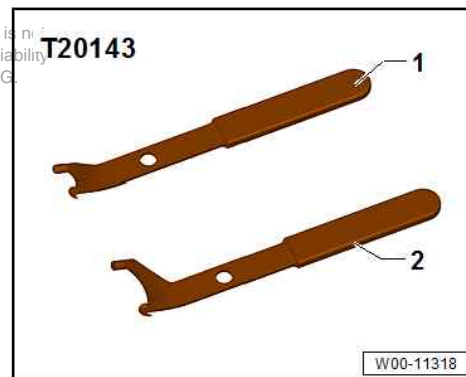
Special tools and workshop equipment required

- ◆ Tube - VW 423-



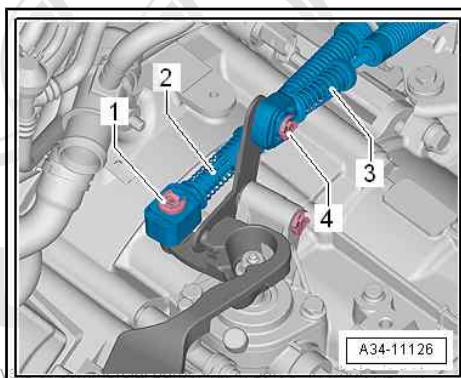
- ◆ Extractor tool - T20143/1-

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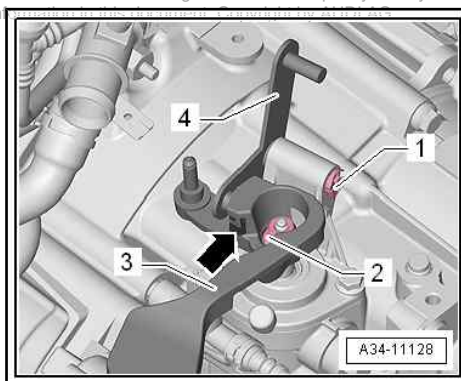


Removing

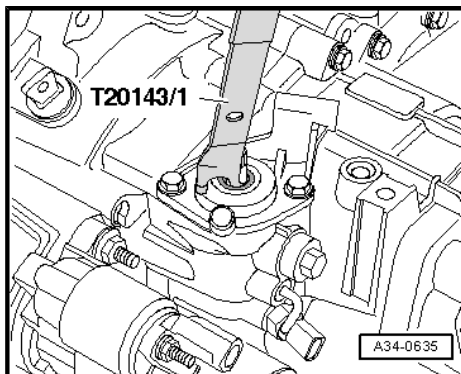
- Vehicles with 2.0 ltr. TDI engine: Remove air cleaner housing
⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Detach securing clip -1- and pull gear selector cable -2- off gearbox selector lever.
- Detach securing clip -4- and pull gate selector cable -3- off gate relay lever.



- Remove securing clip -1- and detach gate relay lever -4- together with slide block -arrow-.
- Remove gearbox selector lever -3- from selector shaft by removing nut -2-.

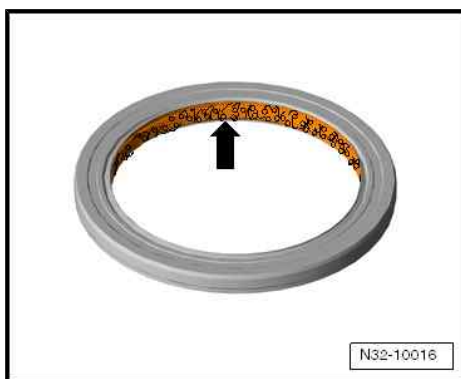


- Pull out selector shaft oil seal with extractor tool - T20143/1- .

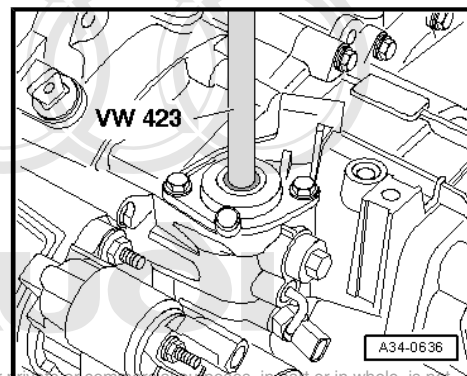


Installing

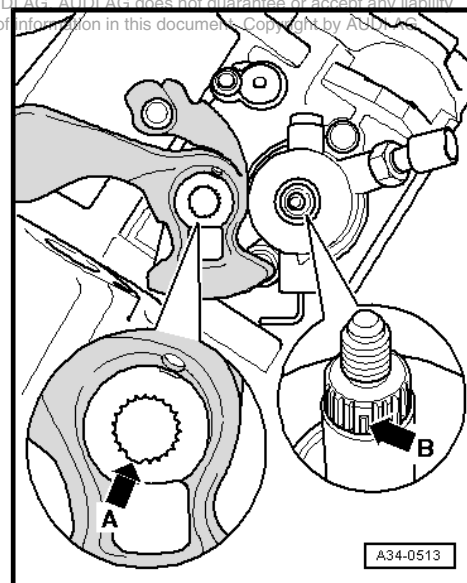
- Lightly oil outer circumference of new oil seal.
- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .



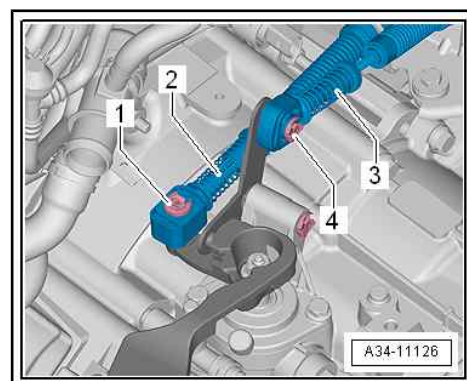
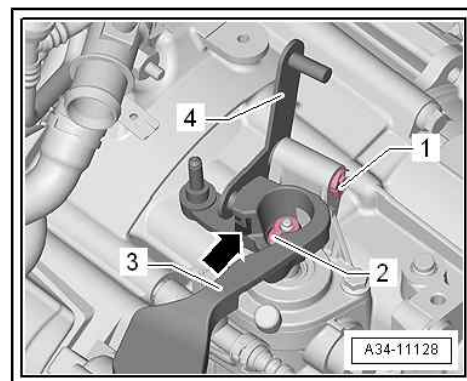
- Drive in oil seal with tube - VW 423- .



- Install gearbox selector lever so that the gap in the splines -arrow A- aligns with the wider spline -arrow B- on the selector shaft.



- Tighten new nut -2- securing gear selector lever -3- to selector shaft to specified torque ➔ [Item 9 \(page 82\)](#) .
- Before installing gate relay lever -4-, check that bearing bushes ➔ [Item 7 \(page 82\)](#) are fitted in selector unit.
- Lubricate bearings of gate relay lever and slide block -arrow- in gear selector lever. Select correct type of grease from ➔ Electronic parts catalogue .
- Fit new securing clip -1- on gate relay lever.
- Apply a small amount of grease to pins of gearbox selector lever and gate relay lever.
- Select correct type of grease from ➔ Electronic parts catalogue .
- Fit gear selector cable -2- and gate selector cable -3- with new securing clips -1, 4- onto gear selector lever and gate relay lever.
- Install air cleaner housing ➔ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .



2 Removing and installing gearbox

⇒ "2.1 Removing gearbox", page 56

⇒ "2.2 Installing gearbox", page 69

⇒ "2.3 Tightening torques for gearbox", page 72

2.1 Removing gearbox

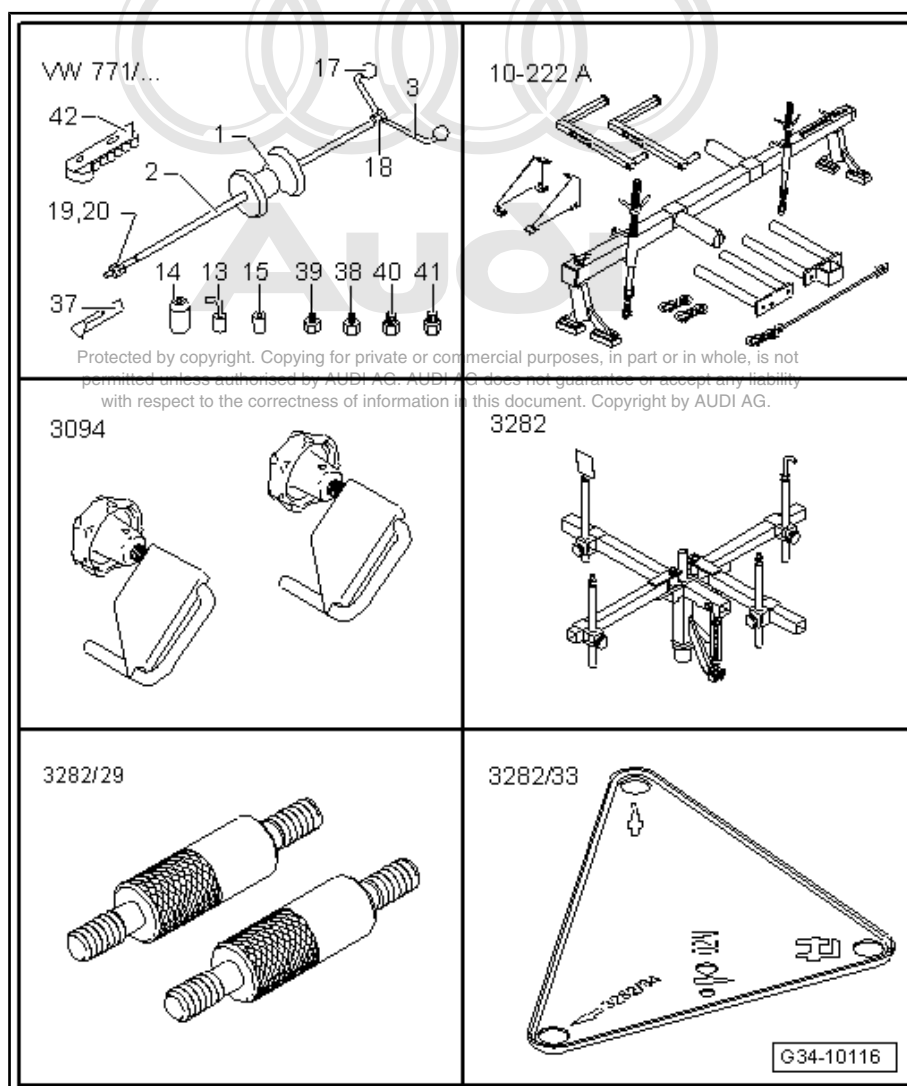
⇒ "2.1.1 Removing gearbox (vehicles with 1.4 ltr. TFSI engine)", page 56

⇒ "2.1.2 Removing gearbox (vehicles with 2.0 ltr. TDI engine)", page 61

2.1.1 Removing gearbox (vehicles with 1.4 ltr. TFSI engine)

Special tools and workshop equipment required

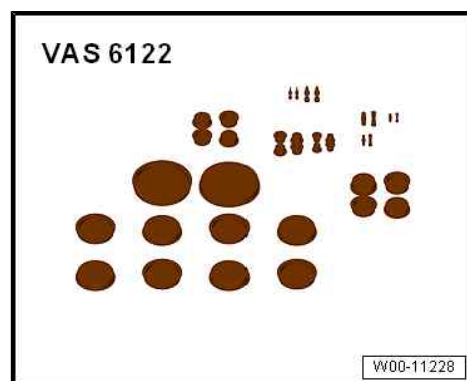
- ◆ Adapter -VW 771/40-
- ◆ Support bracket - 10 - 222 A-
- ◆ Hose clamps, up to 25 mm - 3094-
- ◆ Gearbox support - 3282-
- ◆ Pin - 3282/29-
- ◆ Adjustment plate - 3282/33-



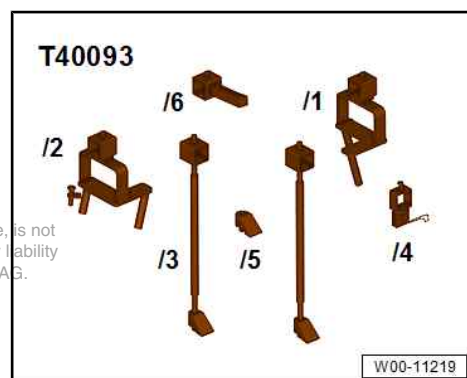
- ◆ Engine and gearbox jack - V.A.G 1383 A-



- ◆ Engine bung set - VAS 6122-



- ◆ Engine support bracket, supplementary set - T40093-



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Procedure



Note

Re-attach all cable ties at the same locations when re-installing.

- Remove air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .

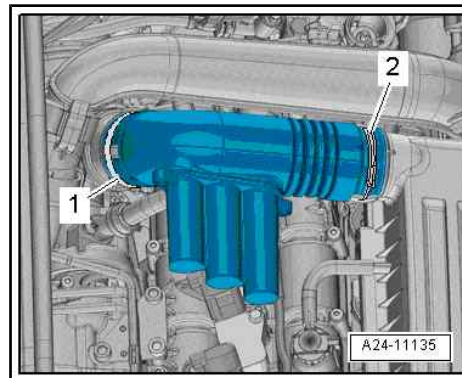
- Release hose clip -1- and remove air pipe.



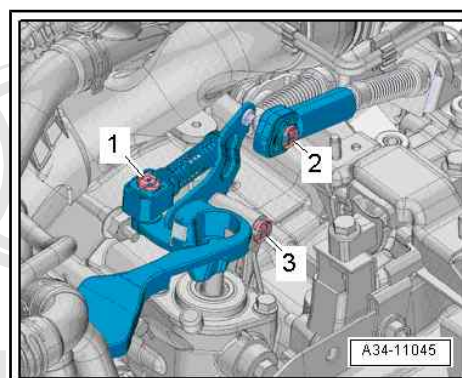
Note

-Item 2- can be disregarded.

- Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter
- Remove subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe with steering rack .
- Unbolt drive shafts (left and right) from flange shafts of gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .

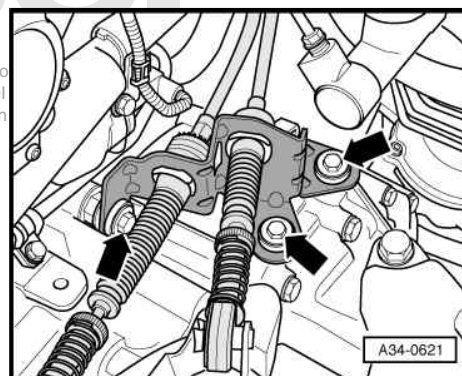


- Remove securing clips -1, 2-.
- Move gear selector cable and gate selector cable clear.
- Remove securing clip -3- and detach gate relay lever.



- Unscrew bolts and nut -arrows-, remove cable support bracket and place to one side together with cables.

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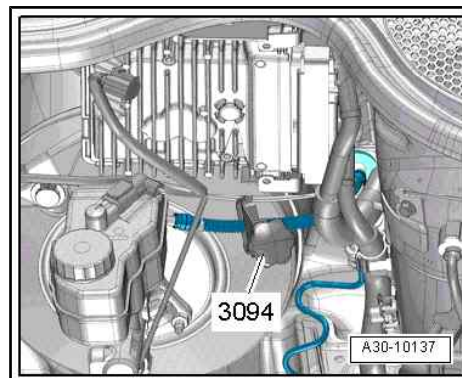


- Vehicles with plastic pipe between clutch master and slave cylinders: clamp off supply hose at brake fluid reservoir using hose clamp -3094- .



Note

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

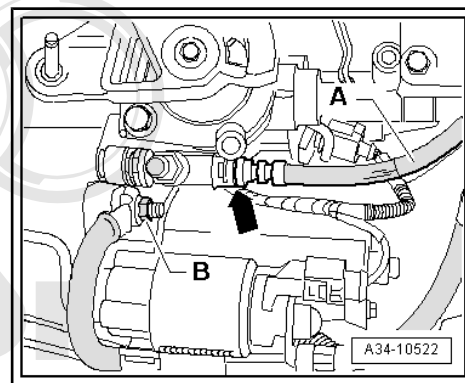


- Place lint-free cloth under bleeder connection.
- Pull retaining clip -arrow- out as far as stop.
- Pull plastic pipe or pipe/hose assembly -A- out of bleeder connection.

 Note

-Item B- can be disregarded.

- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



Caution

Catch escaping brake fluid.

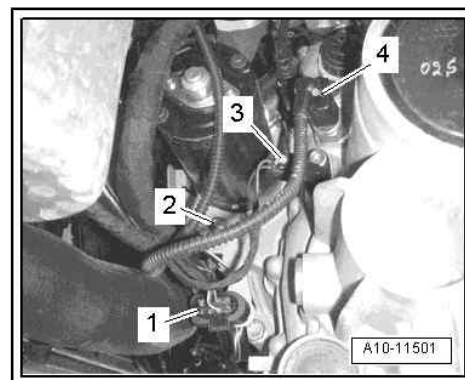
- ◆ **Do not operate clutch pedal after detaching pipe/hose assembly from bleeder connection on clutch slave cylinder.**

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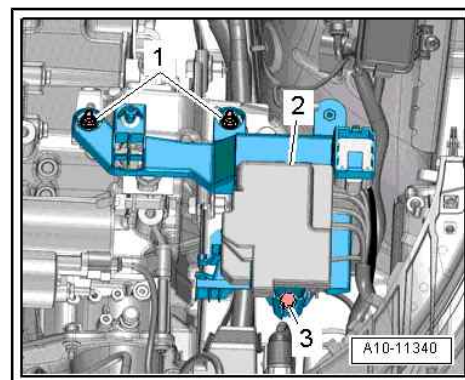
- Vehicles with start/stop system: unplug electrical connector -4- from gearbox neutral position sender - G701- .
- Unplug electrical connector -3- at reversing light switch - F4- .

 Note

-Items 1 and 2- can be disregarded.



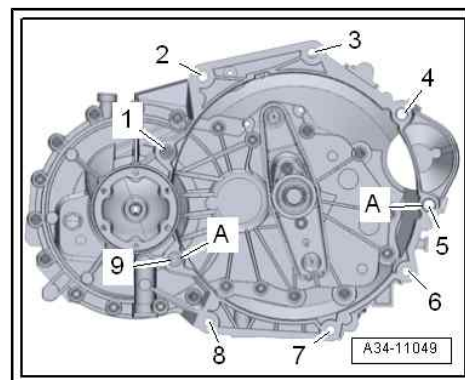
- Remove nuts -1- and bolt -3- and press electronics box -2- to one side.



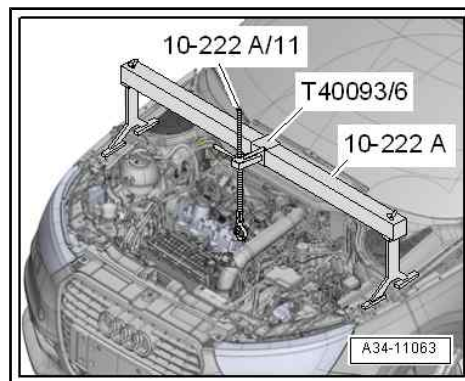
- Remove bolts -2 and 3- (accessible from above).

 Note

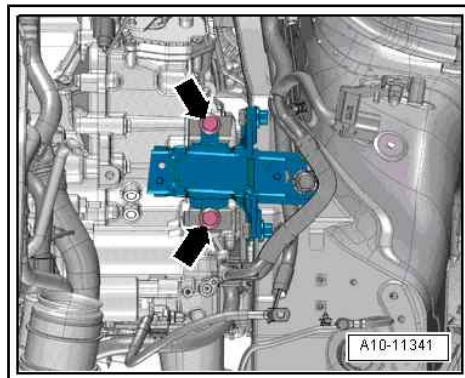
Other items can be disregarded.



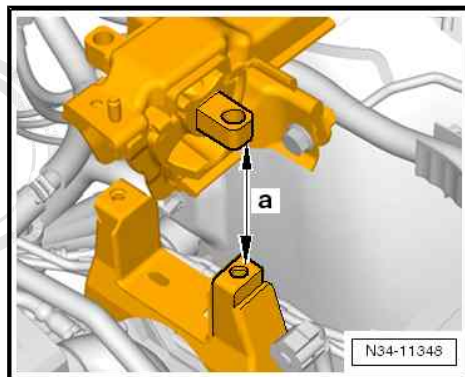
- Set up support bracket - 10 - 222 A- on wing mounting flanges, as shown in illustration.
- Engage hook of spindle - 10 - 222 A /11- in engine lifting eye (front left).
- Partly take up weight of engine/gearbox assembly.



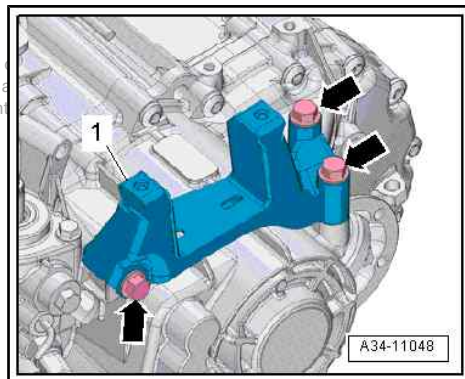
- Remove bolts -arrows- from gearbox mounting.



- Lower engine/gearbox assembly at spindle - 10 - 222 A /11- until distance -a- is obtained between gearbox support and gearbox mounting.
- Dimension -a- = 55 mm



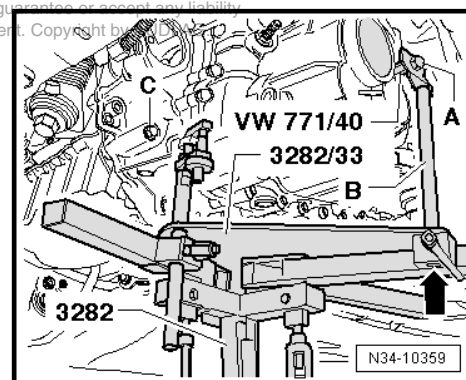
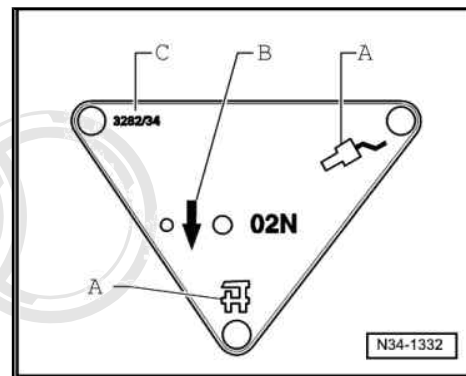
- Remove bolts -arrows- and detach gearbox support.



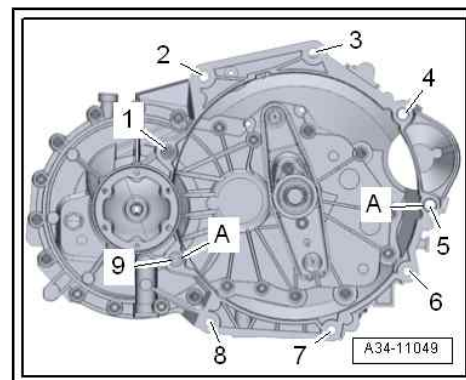
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To remove gearbox "0A8", set up gearbox support - 3282- with adjustment plate - 3282/33- .

- Insert gearbox support - 3282- in engine and gearbox jack - V.A.G 1383 A- .
- Align arms of gearbox support according to holes in adjustment plate.
- Bolt on support elements -A-, as illustrated on adjustment plate.
- In place of support element -C-, screw in pin - 3282/29- .
- Place engine and gearbox jack - V.A.G 1383 A- underneath vehicle.
- The arrow symbol -B- on the adjustment plate points in the direction of travel.
- Align adjustment plate - 3282/33- parallel with gearbox.
- Remove bolt -C- securing gearbox to engine.
- Secure adapter -VW 771/40- to threaded hole in gearbox housing, as shown in illustration.
- Secure gearbox to gearbox support - 3282- with bolt M10x20 -item A-.
- Pin -B- should be flush with underside of guide of gearbox support - 3282- -arrow-.
- Support gearbox from underneath by raising engine and gearbox jack -V.A.G 1383 A- .

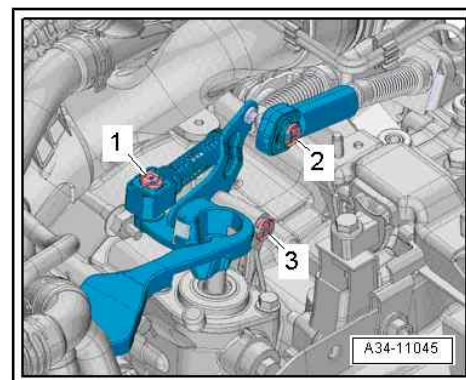


- Remove remaining engine/gearbox securing bolts -6 ... 9-.
- Press gearbox off dowel sleeves.
- Pull gearbox off engine.
- Lift engine slightly with spindle and push towards right side of vehicle, paying attention to refrigerant lines.
- Carefully lower gearbox using engine and gearbox jack - V.A.G 1383 A- .
- While lowering gearbox, adjust position of gearbox using spindles on gearbox support - 3282- .



Note

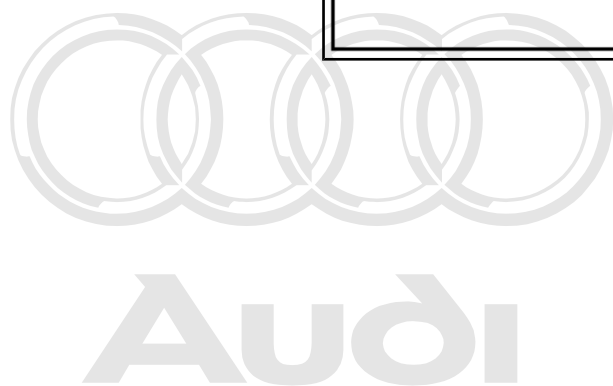
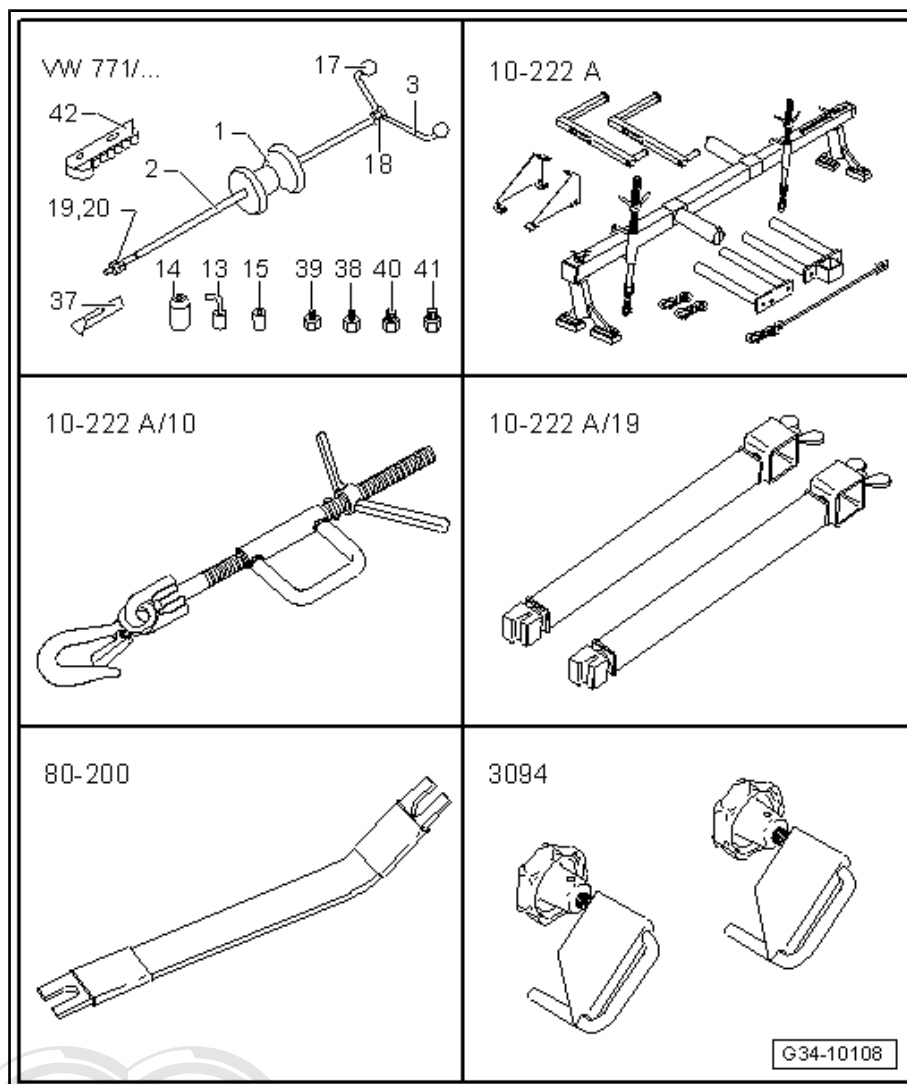
When installing a replacement gearbox, the gearbox selector lever and the gate relay lever have to be transferred from the old gearbox to the new one ➔ [page 39](#) .



2.1.2 Removing gearbox (vehicles with 2.0 ltr. TDI engine)

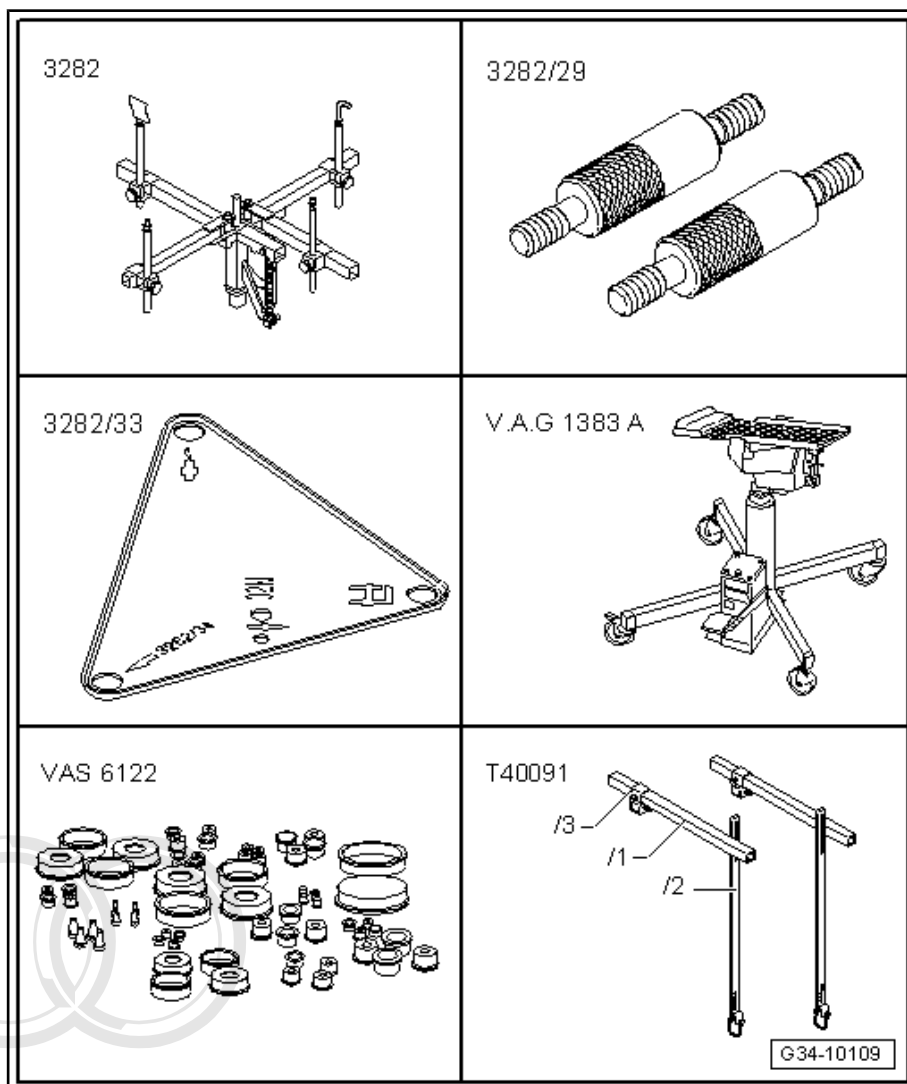
Special tools and workshop equipment required

- ◆ Adapter -VW 771/40-
- ◆ Support bracket - 10 - 222 A-
- ◆ Hook - 10 - 222 A /10-
- ◆ Adapter - 10 - 222 A /19-
- ◆ Removal lever - 80 - 200-
- ◆ Hose clamps, up to 25 mm - 3094-



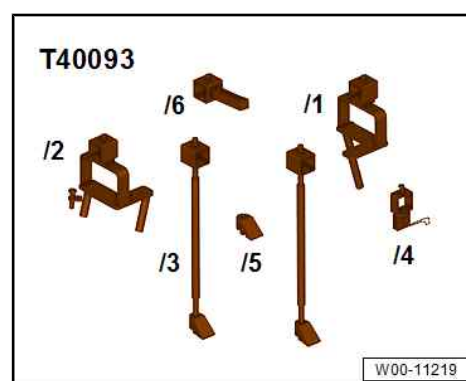
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- ◆ Gearbox support - 3282-
- ◆ Pin - 3282/29-
- ◆ Adjustment plate - 3282/33-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Engine bung set - VAS 6122-
- ◆ Engine support bracket, basic set - T40091-



- ◆ Engine support bracket, supplementary set - T40093-

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- ◆ Bolt M10x20

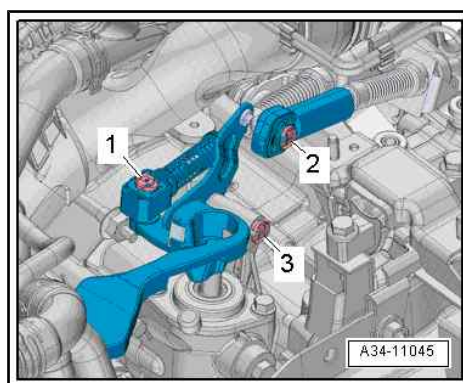
Procedure



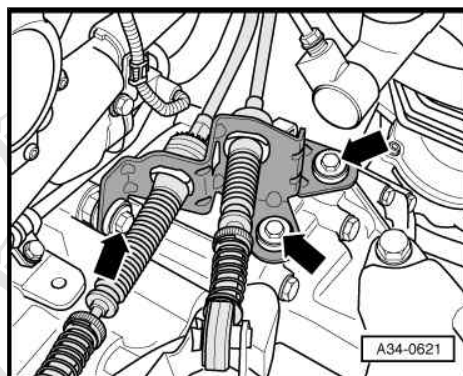
Note

Re-attach all cable ties at the same locations when re-installing.

- Remove engine cover panel ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter
- Remove radiator cowl ⇒ Rep. gr. 19 ; Radiators/radiator fans; Removing and installing radiator cowl .
- Remove subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe with steering rack .
- Remove flange shaft (right-side) ⇒ [page 180](#) .
- Unbolt drive shaft (left-side) from flange shaft of gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Remove securing clips -1, 2-.
- Move gear selector cable and gate selector cable clear.
- Remove securing clip -3- and detach gate relay lever.



- Unscrew bolts and nut -arrows-, remove cable support bracket and place to one side together with cables.



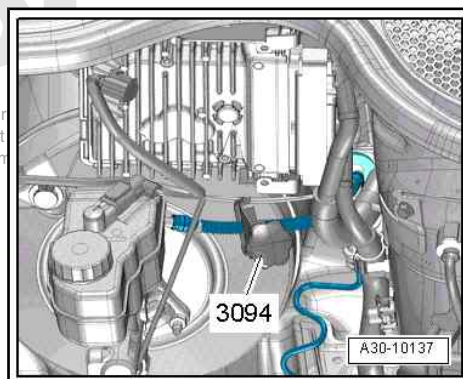
- Vehicles with plastic pipe between clutch master and slave cylinders: clamp off supply hose at brake fluid reservoir using hose clamp -3094- .



Note

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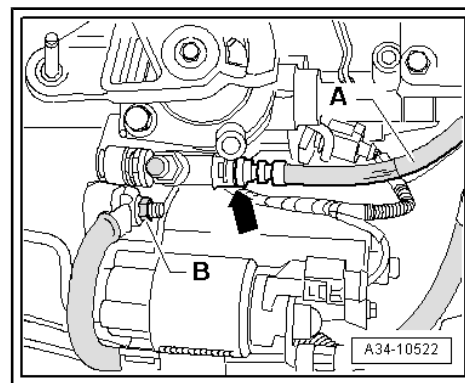
- ◆ *Clamping off the supply hose with the hose clamp - 3094- will cause a permanent deformation.*
- ◆ *However, this does not damage the supply hose.*
- ◆ *After removing the hose clamp -3094- , the supply hose must be returned to its original shape.*



- Place lint-free cloth under bleeder connection.
- Pull retaining clip -arrow- out as far as stop.
- Pull plastic pipe or pipe/hose assembly -A- out of bleeder connection.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .

 Note

-Item B- can be disregarded.



Caution

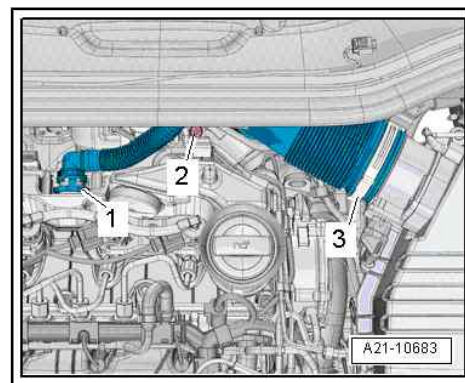
Catch escaping brake fluid.

- ◆ **Do not operate clutch pedal after detaching pipe/hose assembly from bleeder connection on clutch slave cylinder.**

- Press release tabs and disconnect crankcase breather hose -1-.
- Remove bolt -2-, swivel air pipe and connection to rear and detach from turbocharger.

 Note

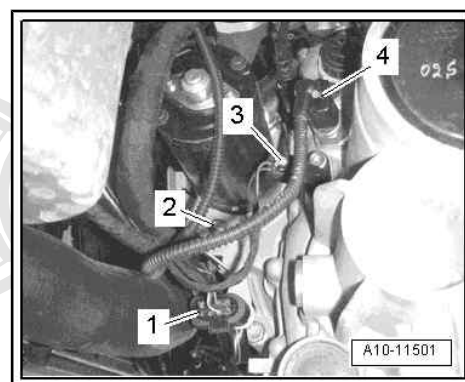
-Item 3- can be disregarded.



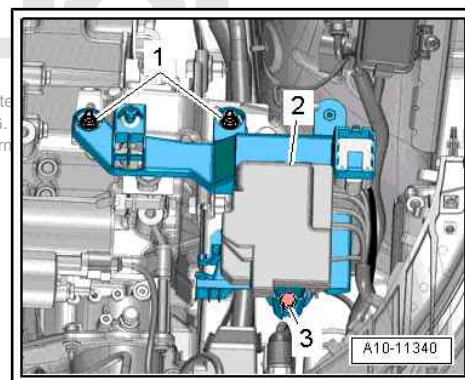
- Vehicles with start/stop system: unplug electrical connector -4- from gearbox neutral position sender - G701- .
- Unplug electrical connector -3- at reversing light switch - F4- .

 Note

-Items 1 and 2- can be disregarded.

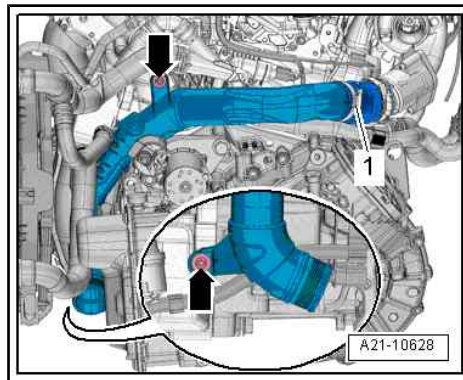


- Remove nuts -1- and bolt -3- and press electronics box -2- to one side.

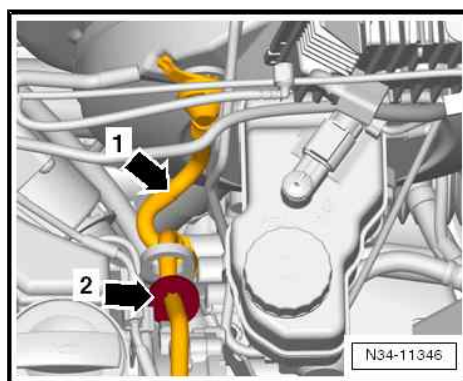


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- Remove bolts -arrows-.
- Move electrical wiring and hoses clear at air pipe (left-side) using removal lever - 80 - 200- .
- Release hose clip -3- and detach air pipe (left-side).



- Remove vacuum hose -arrow 1- (leading to brake servo) together with grommet -arrow 2-.

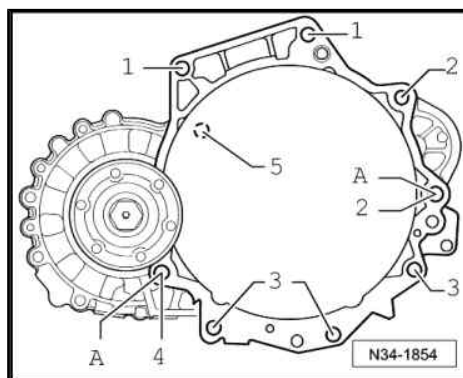


- Remove bolts -1- (accessible from above).



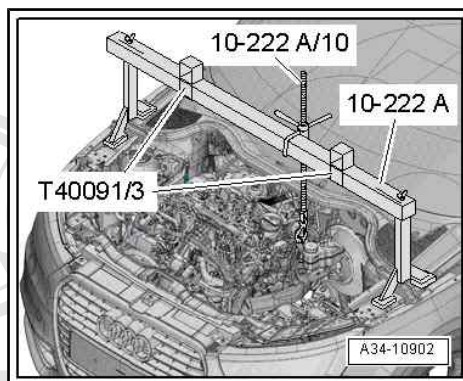
Note

Other items can be disregarded.

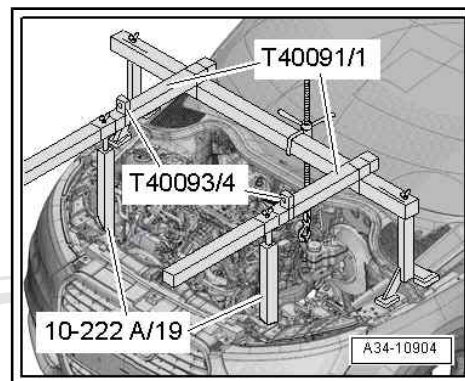


Vehicles without air conditioner:

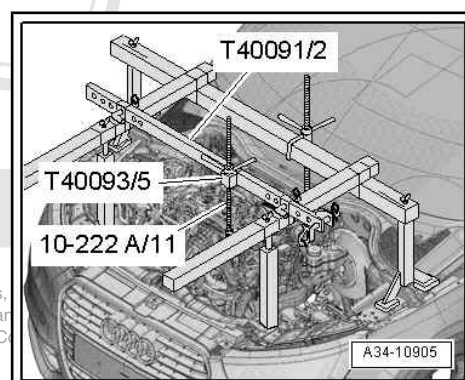
- Set up support bracket - 10 - 222 A- on wing mounting flanges, as shown in illustration.
- Engage hook of -10 - 222 A /10- in engine lifting eye (rear left).



- Attach remaining parts of support bracket as shown in illustration.



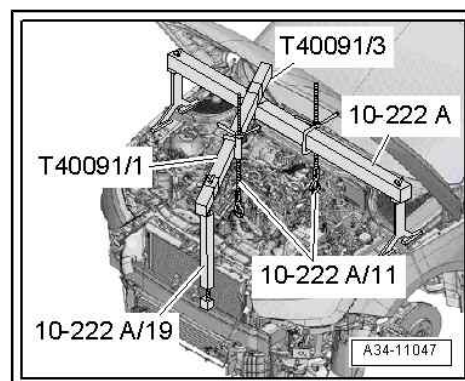
- Attach remaining parts of support bracket as shown in illustration.
- Engage hook of spindle - 10 - 222 A /11- in engine lifting eye (front left).
- Pre-tension hook - 10 - 222 A /10- and spindle - 10 - 222 A /11- .



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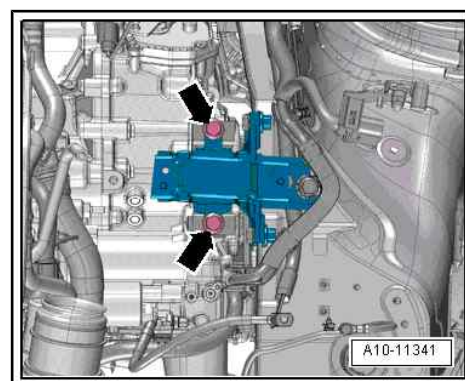
Vehicles with air conditioner:

- Remove bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
- Set up support bracket - 10 - 222 A- on top edges of body flanges (left and right) and on impact bar, as shown in illustration.
- Attach hooks of spindles -10 - 222 A /11- to engine lifting eyes.
- Apply light tension to spindles.

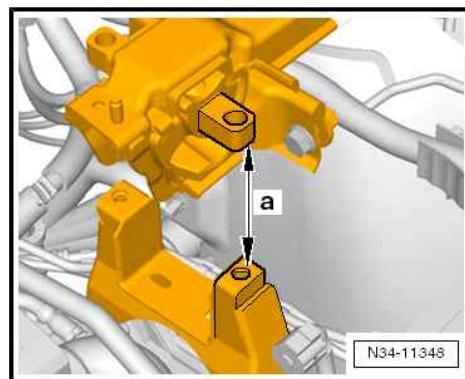


Continued for all vehicles:

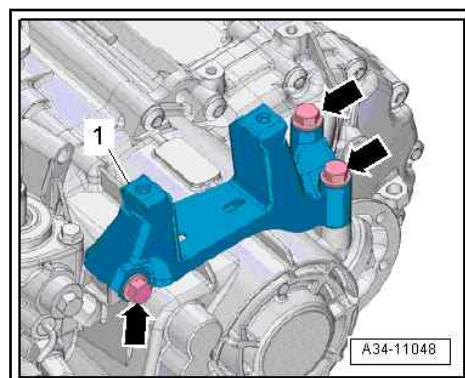
- Remove bolts -arrows- from gearbox mounting.



- Lower engine/gearbox assembly using spindle of support bracket - 10 - 222 A- until distance -a- is obtained between gearbox support and gearbox mounting.
- Dimension -a- = 100 mm ... 110 mm.

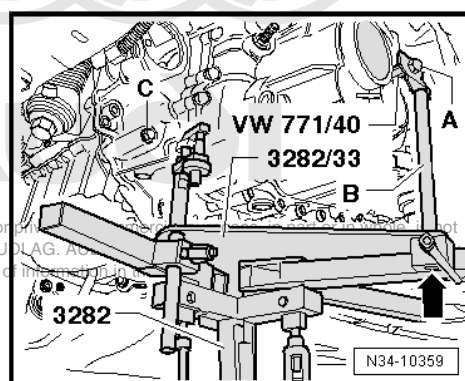
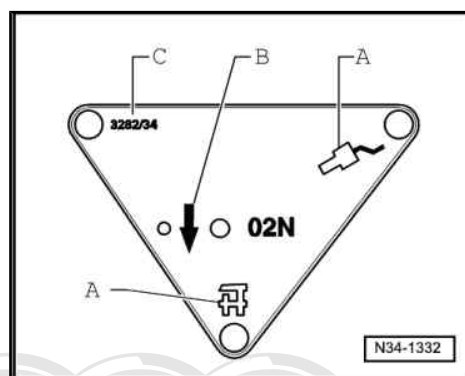


- Remove bolts -arrows- and detach gearbox support.

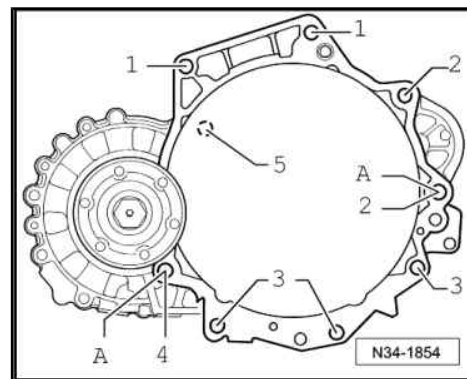


To remove gearbox "0A8", set up gearbox support - 3282- with adjustment plate - 3282/33- .

- Insert gearbox support - 3282- in engine and gearbox jack - V.A.G 1383 A- .
- Align arms of gearbox support according to holes in adjustment plate.
- Bolt on support elements -A-, as illustrated on adjustment plate.
- In place of support element -C-, screw in pin - 3282/29- .
- Place engine and gearbox jack - V.A.G 1383 A- underneath vehicle.
- The arrow symbol -B- on the adjustment plate points in the direction of travel.
- Align adjustment plate - 3282/33- parallel with gearbox.
- Remove bolt -C- securing gearbox to engine.
- Secure adapter -VW 771/40- to threaded hole in gearbox housing, as shown in illustration.
- Secure gearbox to gearbox support - 3282- with bolt M10x20 -item A-.
- Pin -B- should be flush with underside of guide of gearbox support - 3282- -arrow-.
- Support gearbox from underneath by raising engine and gearbox jack -V.A.G 1383 A- .

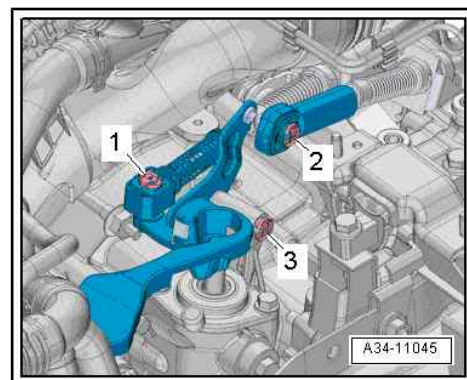


- Remove remaining engine/gearbox securing bolts -3, 4-.
- Press gearbox off dowel sleeves.
- Pull gearbox off engine.
- Lift engine slightly with spindles and push towards right side of vehicle, paying attention to refrigerant lines.
- Carefully lower gearbox using engine and gearbox jack - V.A.G 1383 A- .
- While lowering gearbox, adjust position of gearbox using spindles on gearbox support - 3282- .



Note

When installing a replacement gearbox, the gearbox selector lever and the gate relay lever have to be transferred from the old gearbox to the new one ➔ [page 39](#) .



2.2 Installing gearbox

Special tools and workshop equipment required

- ◆ Grease for clutch plate splines - G 000 100-

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



Note

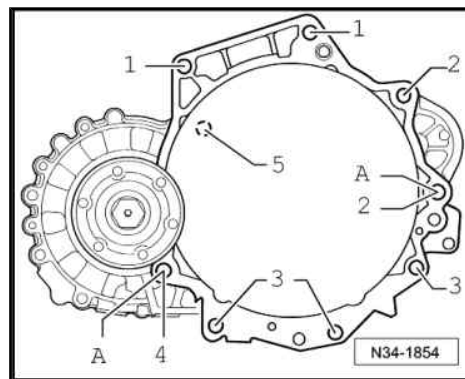
- ◆ *Renew bolts which are tightened by turning through a specified angle.*
- ◆ *Renew self-locking nuts and bolts, and seals, O-rings and gaskets.*
- ◆ *Secure all hose connections with the correct hose clips (as original equipment); refer to ➔ [Electronic parts catalogue](#) .*
- ◆ *Re-attach all cable ties at the same locations when re-installing.*
- ◆ *After removing the hose clamp - 3094- , the supply hose must be returned to its original shape.*
- Clean input shaft splines and (in the case of used clutch plates) the hub splines. Remove corrosion and apply only a very thin coating of grease for clutch plate splines - G 000 100- to the splines. Then move clutch plate backwards and forwards on input shaft until hub moves freely on shaft. It is important to remove excess grease.

- If not already fitted, install dowel sleeves -A- for centralising engine/gearbox in cylinder block.

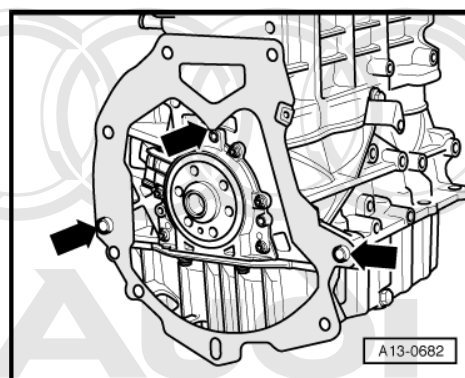


Note

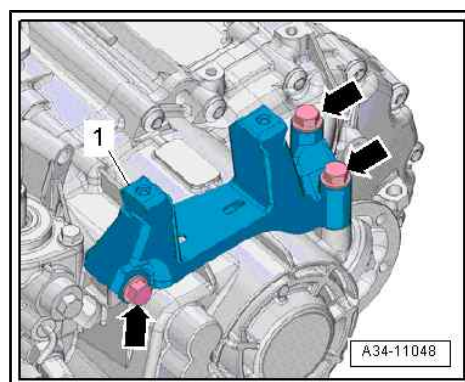
If the dowel sleeves are not fitted, this will lead to gear-change problems, clutch malfunction and in some cases gearbox noise (gears will make rattling noises).



- Make sure that intermediate plate is engaged on sealing flange -top arrow- and fitted onto dowel sleeves -bottom arrows-.
- Check clutch release bearing for wear and renew if necessary.
- Place engine and gearbox jack - V.A.G 1383 A- underneath vehicle.
- The arrow symbol on the adjustment plate points in the direction of travel.
- Remove flange shafts when installing a new gearbox or exchange gearbox.
- Check oil seals for flange shafts and renew if necessary: left-side ➔ [page 166](#) , right-side ➔ [page 168](#) .
- Carefully raise gearbox using engine and gearbox jack - V.A.G 1383 A- .
- Bring gearbox into position.
- Install bottom engine/gearbox securing bolts.
- Detach gearbox support - 3282- with adjustment plate - 3282/33- from gearbox after bolting gearbox and engine together.
- Install gearbox support -1- ➔ [page 73](#) .
- Install top engine/gearbox securing bolts.
- Raise engine/gearbox assembly via spindles of support bracket - 10 - 222 A- .



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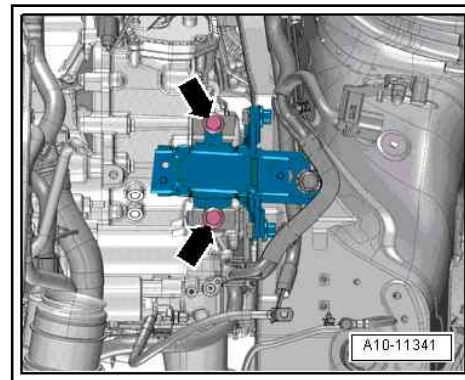
- Align engine/gearbox assembly in installation position. To do so, raise engine/gearbox until gearbox support makes full contact with gearbox mounting.



Caution

The threads in the gearbox support can be damaged if the bolts are not inserted straight.

- ◆ *Before fitting the bolts -arrows-, the gearbox support and the support arm of the gearbox mounting must be aligned absolutely parallel. If necessary, push the gearbox up at the rear with a trolley jack.*



- Bolt gearbox support to gearbox mounting ⇒ [page 73](#) .



WARNING

Risk of accident.

- ◆ *Do not remove support bracket - 10 - 222 A- until all bolts securing the left-hand engine/gearbox mounting have been tightened to the specified torque.*

- Install pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Removing and installing pendulum support .
- Install flange shafts: left-side ⇒ [page 179](#) , right-side ⇒ [page 180](#) .
- Secure drive shafts to flange shafts of gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft .
- Install subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe with steering rack .
- Install radiator cowl ⇒ Rep. gr. 19 ; Radiators/radiator fans; Removing and installing radiator cowl .
- Install bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
- Install starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Exploded view - starter .
- Assemble selector mechanism ⇒ [page 39](#) .
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Adjust selector mechanism ⇒ [page 45](#) .
- Check oil level in gearbox and top up with gear oil if necessary ⇒ [page 76](#) .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing or ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .

2.3 Tightening torques for gearbox



Note

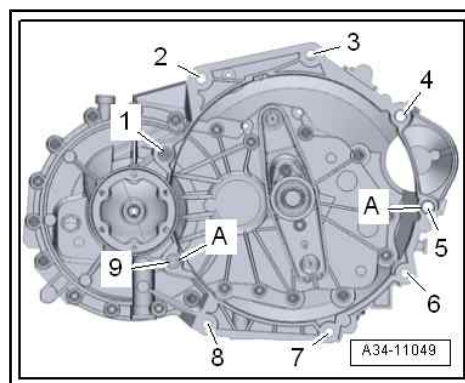
- ◆ Tightening torques apply only to lightly greased, oiled, phosphated or black-finished nuts and bolts.
- ◆ Additional lubricant such as engine or gear oil may be used, but do not use graphite lubricant.
- ◆ Do not use parts which have been degreased.
- ◆ Tolerance for tightening torques is $\pm 15\%$.

Securing manual gearbox 0A8 to 1.4 ltr. TFSI engine

Item	Bolt	Nm
1, 9	M12x65	80
2, 3	M12x150	80
4 1)2), 5 1)2)	M12x165	80
6	M10x110	40
7, 8	M10x50	40
A	Dowel sleeves for centralising	

- 1) Centre hex stud.
- 2) Also secures starter.

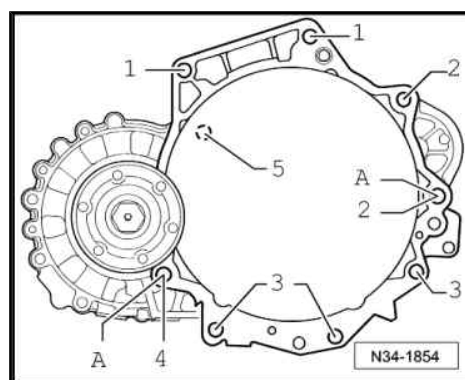
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Securing manual gearbox 0A8 to 2.0 ltr. TDI engine

Item	Bolt	Nm
1	M12x55	80
2 1)	M12x150	80
3	M10x50	40
4	M12x60	80
A	Dowel sleeves for centralising	

- 1) Also secures starter.



Note

-Item 5- can be disregarded.

3 Assembly mountings

⇒ ["3.1 Exploded view - assembly mountings", page 73](#)

3.1 Exploded view - assembly mountings

1 - Engine support

2 - Bolt

- ☐ Tightening torque ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

3 - Engine mounting

- ☐ With support arm
- ☐ Removing and installing ⇒ Rep. gr. 10 ; Assembly mountings; Removing and installing engine mounting

4 - Bolt

- ☐ Tightening torque ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

5 - Stud

- ☐ Tightening torque ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

6 - Bolt

- ☐ Tightening torque ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

7 - Pendulum support

- ☐ Removing and installing ⇒ Rep. gr. 10 ; Assembly mountings; Removing and installing pendulum support

8 - Bolt

- ☐ Tightening torque ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

9 - Bolt

- ☐ Tightening torque ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

10 - Bolt

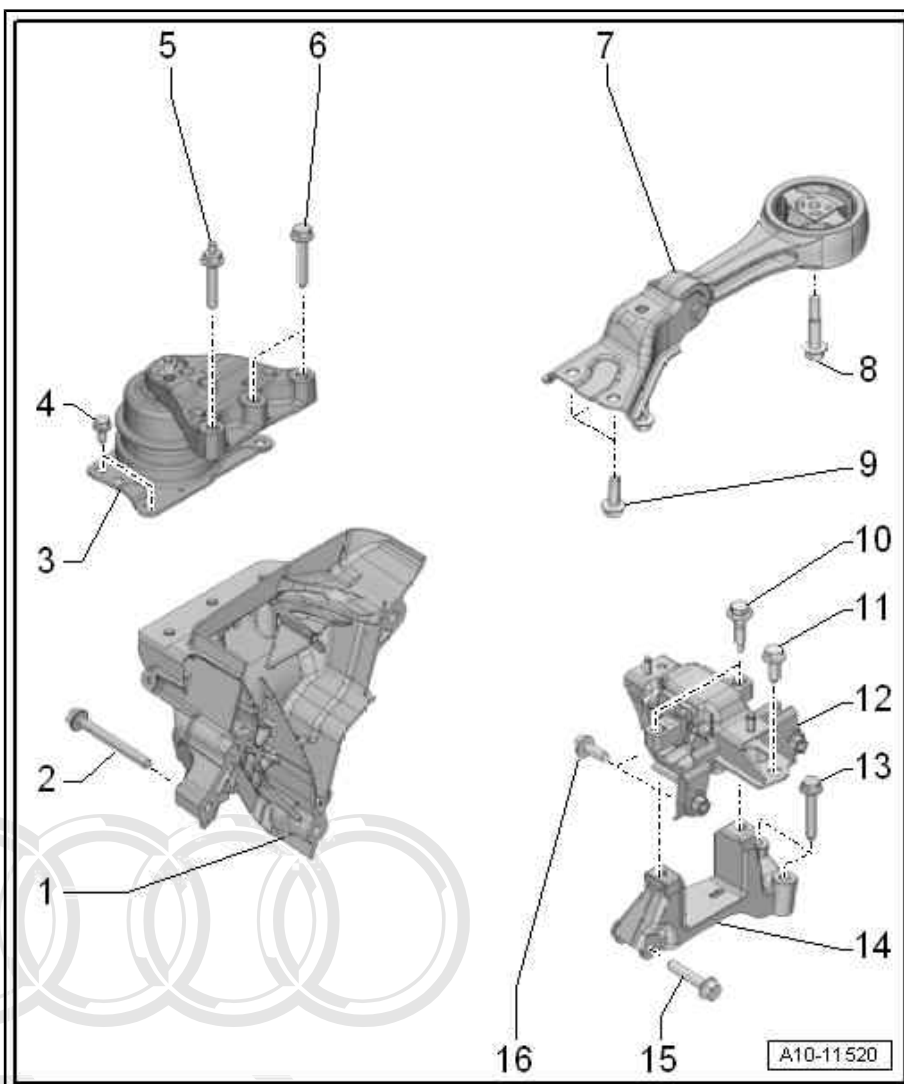
- ☐ Renew
- ☐ 40 Nm +90°

11 - Bolt

- ☐ Renew
- ☐ Tightening torque and sequence ⇒ [page 74](#)

12 - Gearbox mounting

- ☐ Removing and installing ⇒ Rep. gr. 10 ; Assembly mountings; Removing and installing gearbox mounting



13 - Bolt

- ☐ Renew
- ☐ 40 Nm +90°

14 - Gearbox support

- ☐ Removing and installing ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

15 - Bolt

- ☐ Renew
- ☐ 40 Nm +90°

16 - Bolt

- ☐ Renew
- ☐ Tightening torque and sequence ⇒ [page 74](#)

Gearbox mounting - tightening torque and sequence



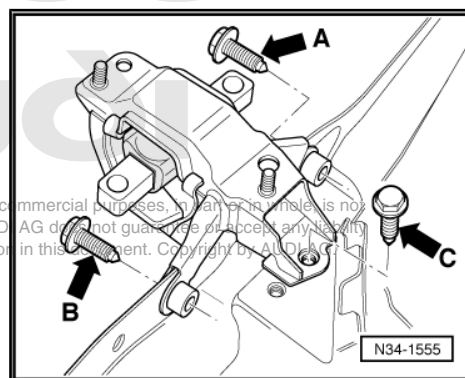
Note

Renew bolts which are tightened by turning through a specified angle.

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- Tighten bolts in 3 stages in the sequence shown.

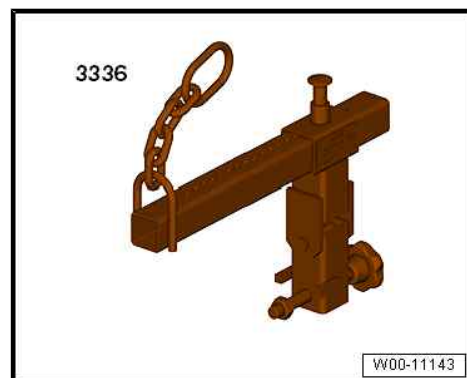
Stage	Bolts	Tightening torque/tightening angle
1.	-A, B, C-	Screw in by hand until contact is made
2.	-A, B, C-	50 Nm
3.	-A, B, C-	Turn 90° further



4 Transporting gearbox

Special tools and workshop equipment required

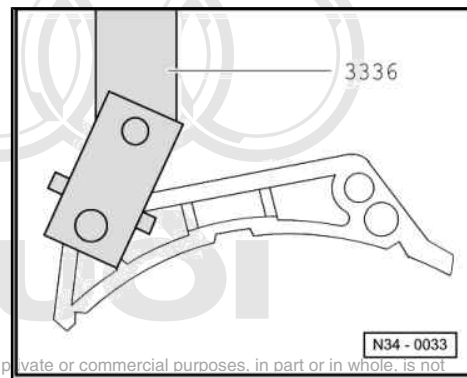
- ◆ Gearbox lifting tackle - 3336-



- ◆ Workshop hoist - VAS 6100-



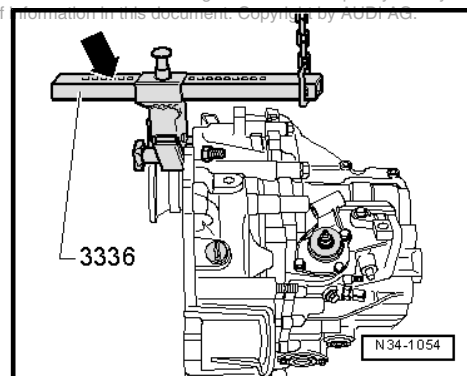
- Bolt gearbox lifting tackle - 3336- to clutch housing.



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

Number of holes visible = 6

- Lift gearbox with workshop hoist - VAS 6100- and gearbox lifting tackle - 3336- .
- Set down gearbox as required (for example in transport container).



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5 Gear oil

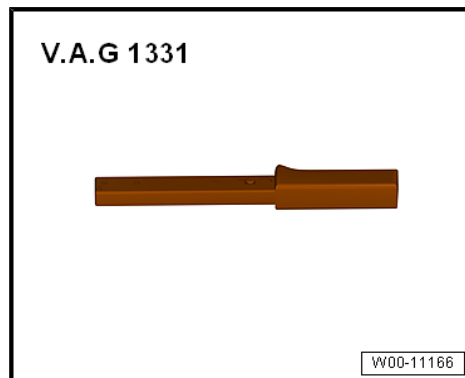
⇒ ["5.1 Checking gear oil level", page 76](#)

⇒ ["5.2 Draining and filling gear oil", page 76](#)

5.1 Checking gear oil level

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Multi-point bit - 3357-



Procedure

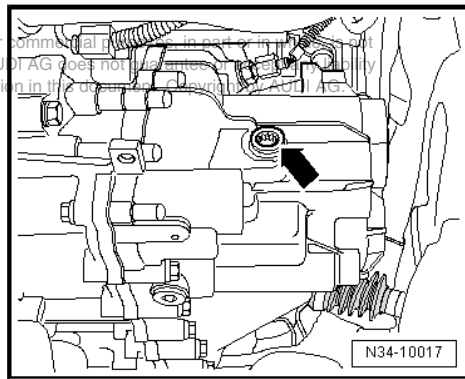
- Drive vehicle onto a four-column lifting platform or over an inspection pit (vehicle must be horizontal).
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove oil filler plug -arrow- to check gear oil level.

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

- Top up gear oil if necessary. Specifications ⇒ Electronic parts catalogue
- Fit new seal on oil filler plug -arrow- and tighten.

Tightening torques

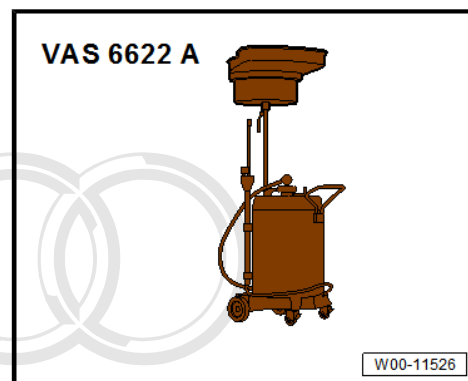
- ◆ ⇒ [Fig. "Different versions of oil filler/oil drain plug"" , page 111](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



5.2 Draining and filling gear oil

Special tools and workshop equipment required

- ◆ Used oil collection and extraction unit - VAS 6622A-



- ◆ Gear oil specifications ⇒ Electronic parts catalogue

Draining

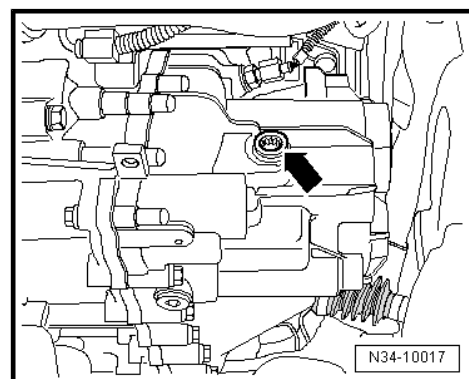
- Drive vehicle onto a four-column lifting platform or over an inspection pit (vehicle must be horizontal).
- Remove noise insulation ⇒ **General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .**
- Place used oil collection and extraction unit - VAS 6622A- below gearbox.
- Unscrew oil drain plug ⇒ **Item 3 (page 110)** and allow gear oil to drain.
- Fit new seal on oil drain plug and tighten.

Filling

- Unscrew oil filler plug -arrow-.
- Fill up gear oil to bottom lip of filler hole.
- Fit new seal on oil filler plug -arrow- and tighten.

Tightening torques

- ◆ ⇒ **Fig. ““Different versions of oil filler/oil drain plug””, page 111**
- ◆ ⇒ **General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation**



6 Dismantling and assembling gearbox

⇒ ["6.1 Schematic overview - gearbox", page 78](#)

⇒ ["6.2 Exploded view - gearbox", page 79](#)

⇒ ["6.3 Exploded view - gearbox housing and selector mechanism", page 80](#)

⇒ ["6.4 Exploded view - selector unit", page 82](#)

⇒ ["6.5 Exploded view - selector forks", page 84](#)

⇒ ["6.6 Exploded view - input shaft, output shafts, differential and selector rods", page 85](#)

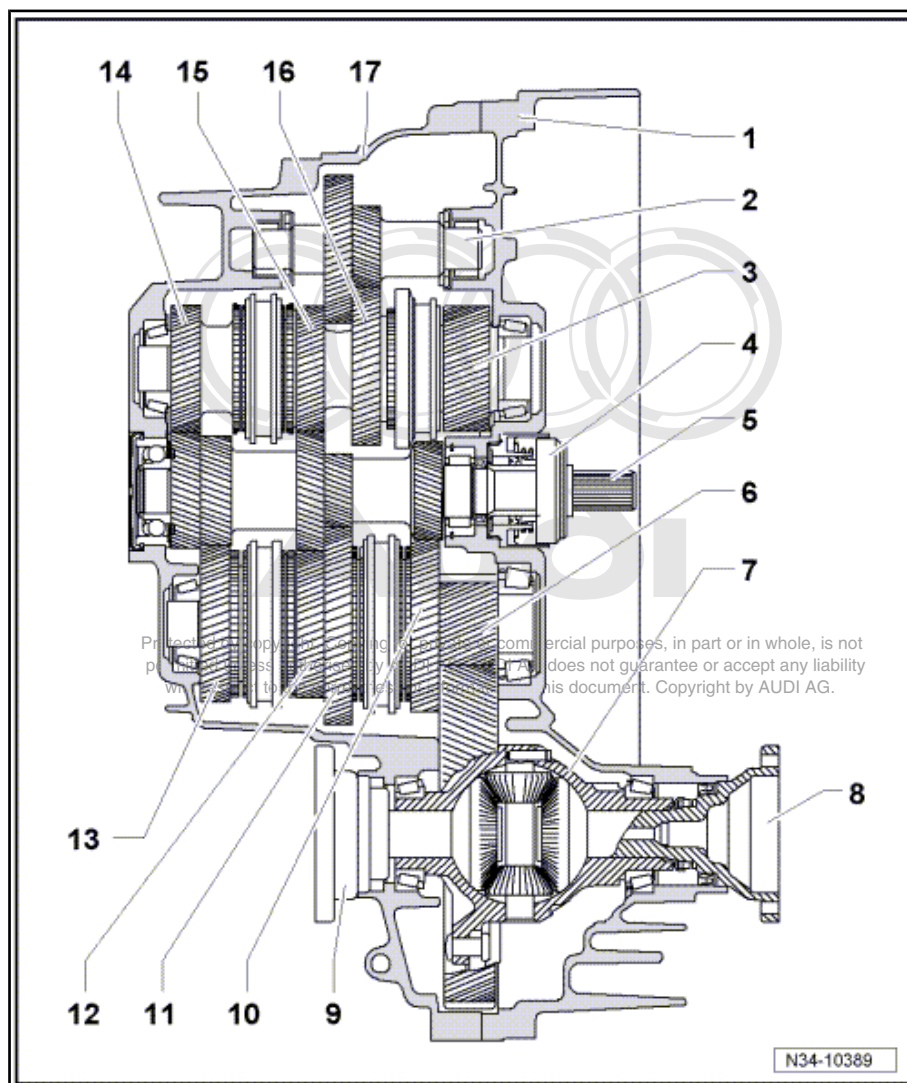
⇒ ["6.7 Servicing selector forks", page 87](#)

⇒ ["6.8 Removing and installing selector unit", page 88](#)

⇒ ["6.9 Dismantling and assembling gearbox", page 89](#)

6.1 Schematic overview - gearbox

- 1 - Clutch housing
- 2 - Reverse shaft
- 3 - Output shaft for 5th, 6th and reverse gears
- 4 - Slave cylinder with release bearing
- 5 - Input shaft
- 6 - Output shaft for 1st - 4th gear
- 7 - Differential
- 8 - Flange shaft (right-side)
- 9 - Flange shaft (left-side)
- 10 - 2nd speed selector gear
- 11 - 1st speed selector gear
- 12 - 4th speed selector gear
- 13 - 3rd speed selector gear
- 14 - 5th speed selector gear
- 15 - 6th speed selector gear
- 16 - Reverse selector gear
- 17 - Gearbox housing



6.2 Exploded view - gearbox

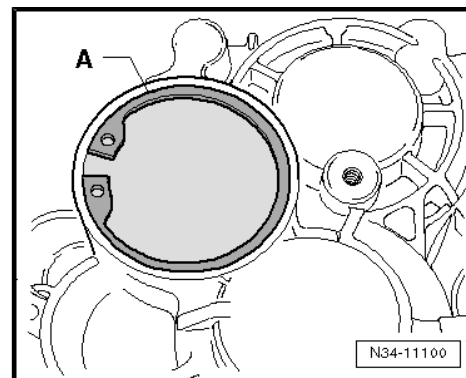


Note

On gearboxes manufactured from 21 01 8 onwards, the sealing cap for the input shaft is secured by a circlip -A-.

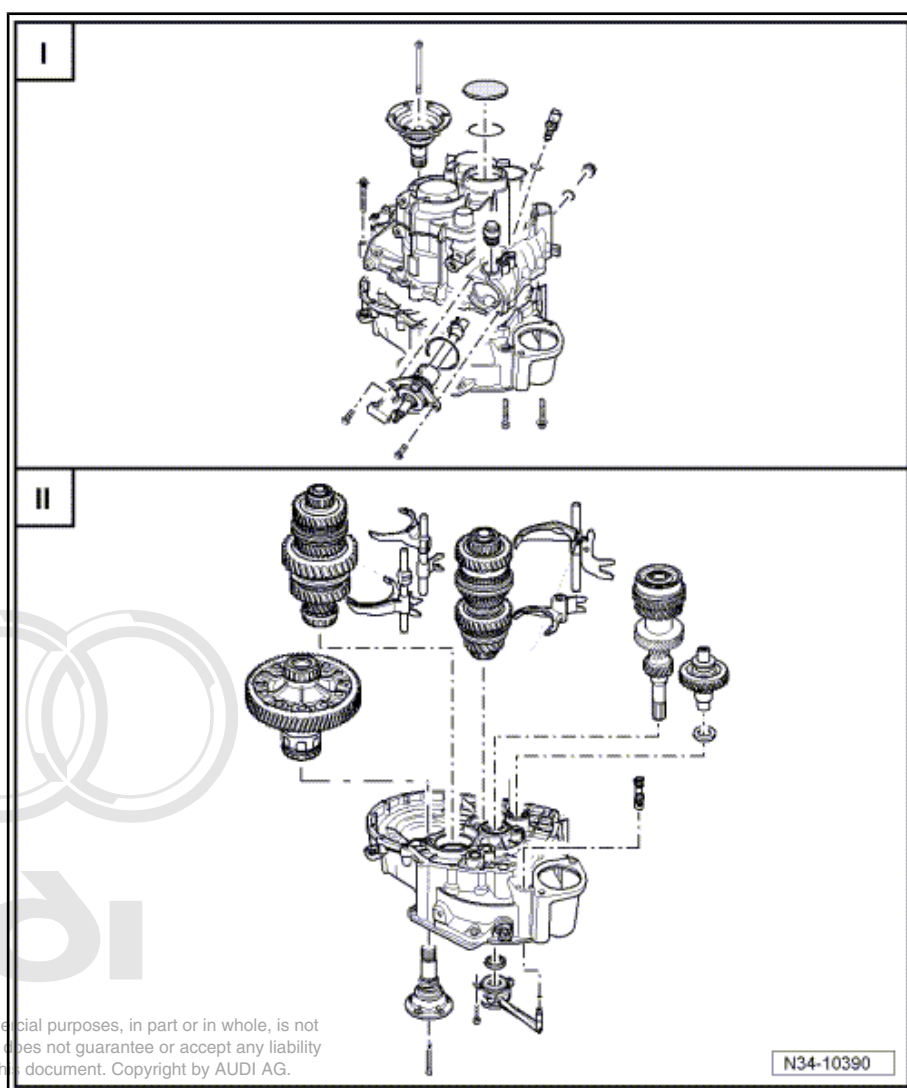
Assembly sequence for gearbox without circlip -A- for input shaft sealing cap ➔ [page 89](#)

Assembly sequence for gearbox with circlip -A- for input shaft sealing cap ➔ [page 89](#)



I - Removing and installing gearbox housing and selector mechanism - exploded view
➔ [page 80](#)

II - Removing and installing input shaft, output shafts, differential and selector rods - exploded view
➔ [page 85](#)



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6.3 Exploded view - gearbox housing and selector mechanism

1 - Countersunk bolt
⇒ [Item 11 \(page 171\)](#)

2 - Flange shaft with spring

- ☐ Removing and installing
⇒ [page 166](#)
- ☐ Assembling
⇒ [page 172](#)

3 - Circlip

- ☐ For sealing cap
⇒ [Item 4 \(page 80\)](#)
- ☐ Fitted in gearboxes manufactured from 21 01 8 onwards

4 - Sealing cap

- ☐ Secured by circlip in gearboxes manufactured from 21 01 8 onwards
- ☐ Removing and installing (without circlip)
⇒ [page 89](#)
- ☐ Removing and installing (with circlip)
⇒ [page 100](#)
- ☐ Select correct components from ⇒ Electronic parts catalogue .

5 - Circlip

- ☐ For grooved ball bearing on input shaft
⇒ [Item 1 \(page 125\)](#)

6 - Reversing light switch - F4-

- ☐ 20 Nm
- ☐ With captive seal (fitted shortly after gearbox was first introduced)

7 - Seal

- ☐ Not fitted on all gearboxes

8 - Oil drain plug

- ☐ Tightening torque ⇒ [page 111](#)

9 - Seal

- ☐ Always renew

10 - Locking bolt

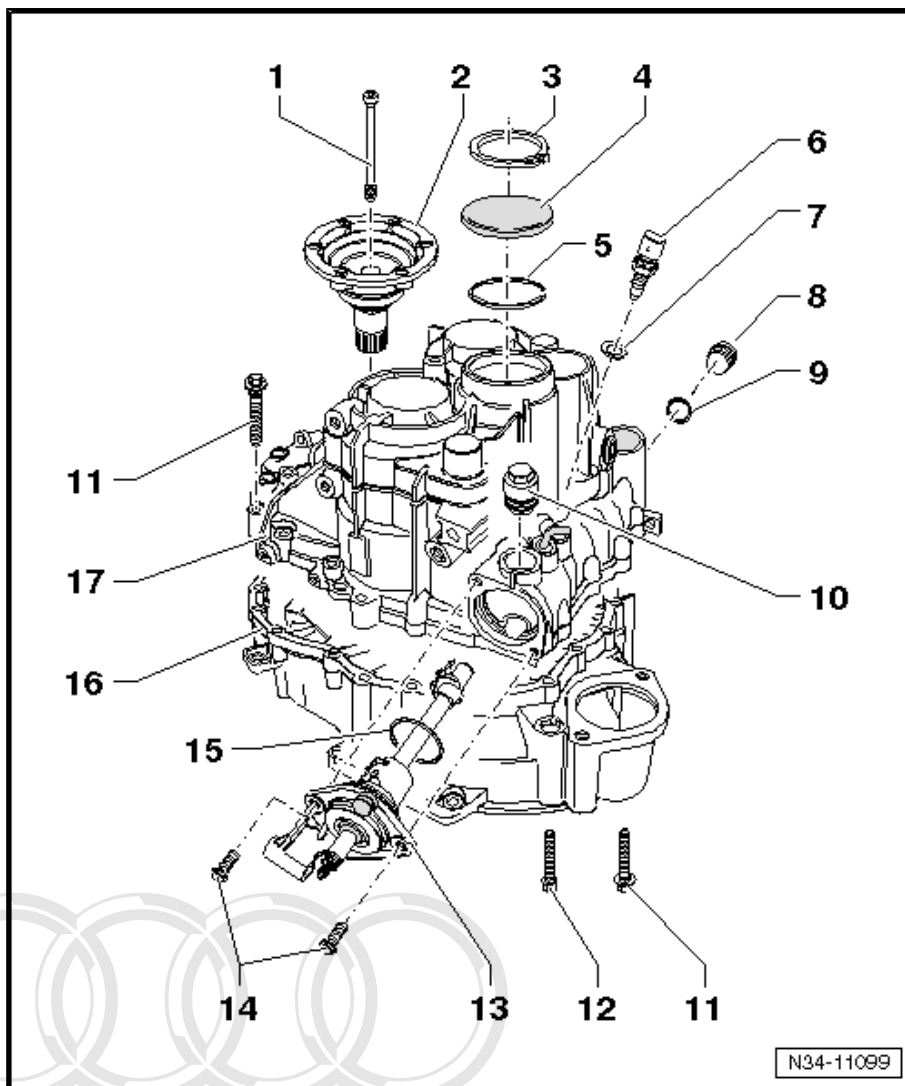
- ☐ 45 Nm
- ☐ For selector shaft

11 - Bolt

- ☐ 15 Nm + 90°
- ☐ Bolt with captive washer available as spare part
- ☐ Always renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Correct allocation of replacement bolts ⇒ [page 81](#)

12 - Bolt

- ☐ 15 Nm + 90°



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- ☐ Without washer
- ☐ Always renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Correct allocation of replacement bolts ⇒ [page 81](#)

13 - Selector unit

- ☐ Servicing ⇒ [page 82](#)
- ☐ Removing with gearbox in vehicle ⇒ [page 88](#)

14 - Bolt

- ☐ 20 Nm
- ☐ Always renew

15 - O-ring

- ☐ Always renew

16 - Clutch housing

- ☐ Servicing ⇒ [page 122](#)

17 - Gearbox housing

- ☐ Servicing ⇒ [page 114](#)

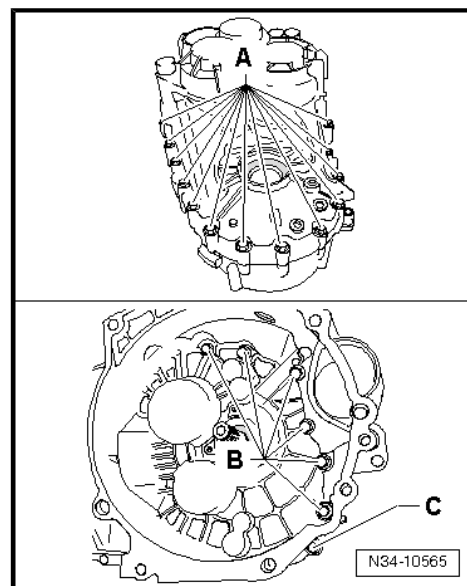
Correct allocation of replacement bolts

A - Bolt with captive washer

B - Bolt without washer

C - Bolt with captive washer

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6.4 Exploded view - selector unit

1 - Gearbox housing

2 - O-ring

- ☐ Renew

3 - Cap

- ☐ For gearbox breather

4 - Selector unit

- ☐ Consists of selector shaft and selector mechanism cover
- ☐ Components cannot be separated from each other
- ☐ Removing and installing
⇒ [page 88](#)

5 - Slide block

6 - Gate relay lever

- ☐ Installation position
⇒ [page 83](#)

7 - Bearing bush

8 - Gearbox selector lever

- ☐ Installation position
⇒ [page 83](#)

9 - Nut

- ☐ Self-locking
- ☐ Renew
- ☐ 23 Nm

10 - Oil seal

- ☐ Lever out with screwdriver
- ☐ Installing ⇒ [page 84](#)

11 - Bearing bush

12 - Securing clip

- ☐ Renew

13 - Bolt

- ☐ Renew
- ☐ 20 Nm

14 - Locking bolt

- ☐ For selector shaft
- ☐ 45 Nm

15 - Angled rod

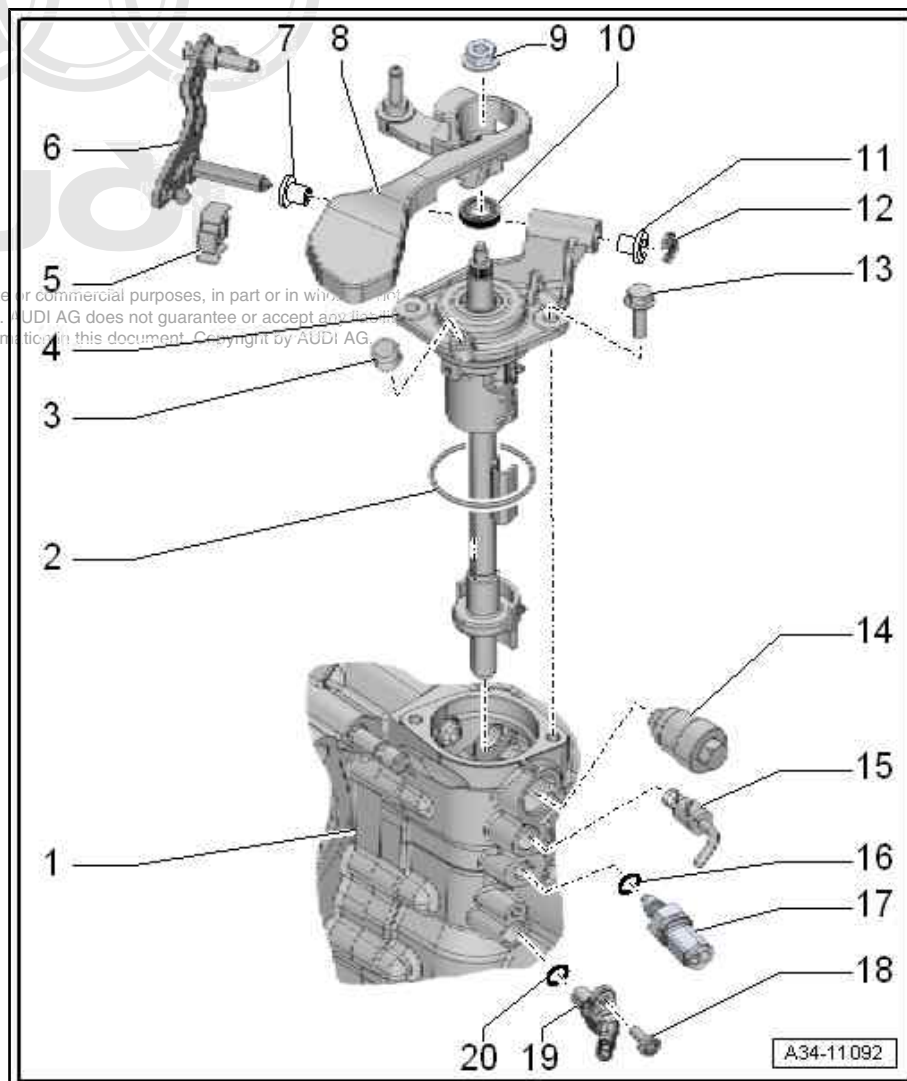
- ☐ For adjusting selector mechanism

16 - Seal

- ☐ Not fitted on all versions
- ☐ Renew

17 - Reversing light switch - F4-

- ☐ 20 Nm



- ❑ Lightly coat lug with MoS₂ grease

18 - Bolt

- ❑ 8 Nm

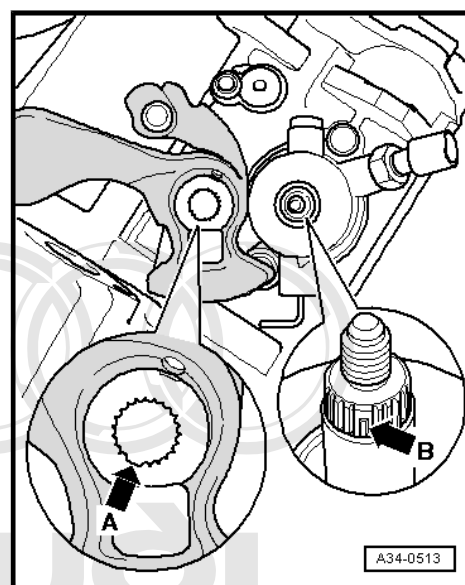
19 - Gearbox neutral position sender - G701-

20 - O-ring

- ❑ Renew

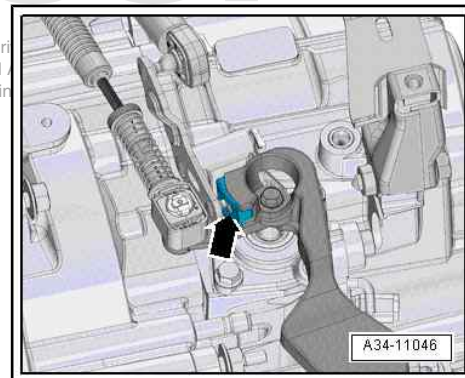
Installation position: gearbox selector lever/selector shaft

- When installing gearbox selector lever, make sure that the gap in the splines -arrow A- aligns with the wider spline -arrow B- on the selector shaft.



Installation position: gearbox selector lever/gate relay lever

- Gate relay lever locates in guide rail of gearbox selector lever via slide block -arrow-.
- Coat slide block and guide rail -arrow- with grease - G 000 450 02- .



Detaching and fitting gate relay lever

Detaching

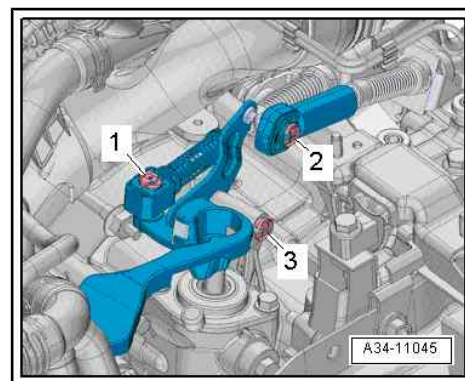
- Detach gear selector cable -1- and gate selector cable -2- ➔ [page 41](#) .
- Lift up tab on securing clip -3-, detach clip and pull off gate relay lever.

Securing



Note

- ◆ Renew securing clip.
- ◆ Apply a small quantity of grease - G 000 450 02- to the pin on the gate relay lever.

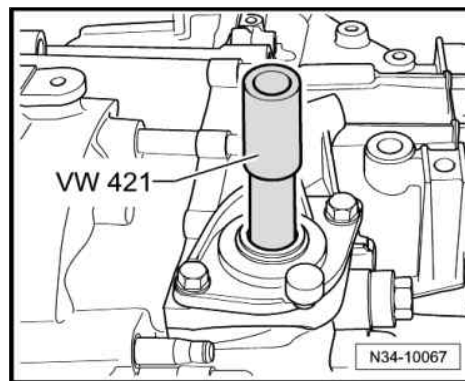


Installing oil seal (insert onto stop)



Note

You can also use the tube - VW 423- to fit the selector shaft oil seal.



6.5 Exploded view - selector forks

1 - Damper rubber

- ☐ Can be pulled out of and inserted into selector rod by hand

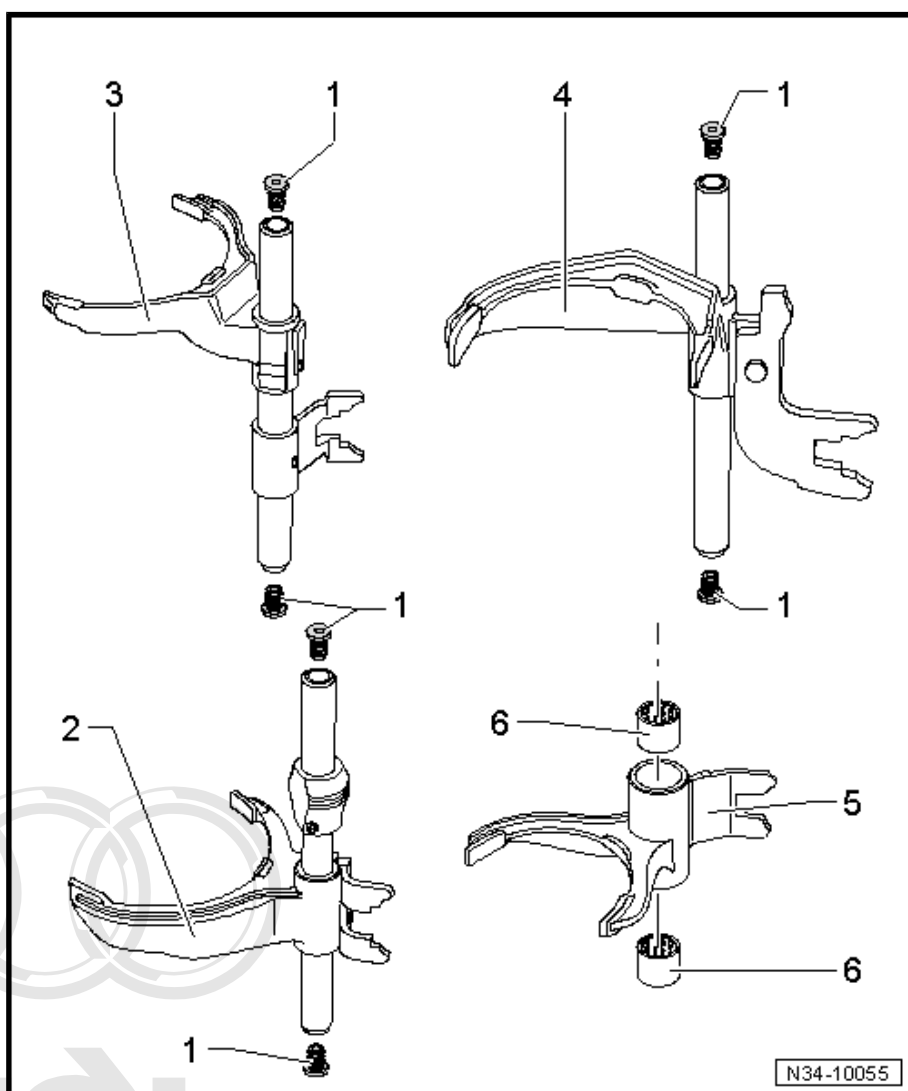
2 - Selector rod with selector fork for 1st and 2nd gear

3 - Selector rod with selector fork for 3rd and 4th gear

4 - Selector rod with selector fork for 5th and 6th gear

5 - Reverse gear selector fork

- ☐ Is mounted on shaft for reverse gear selector fork ➔ [page 105](#)
- ☐ Ball sleeve ➔ [Item 6 \(page 84\)](#) is not fitted from gearbox manufacturing date 06 03 6 onwards
- ☐ Gradually discontinued
- ☐ Different types of reverse gear selector forks are fitted according to version
- ☐ If shaft for reverse gear selector fork is not fitted, selector fork is mounted on selector rod for 5th/6th gear selector fork ➔ [page 106](#)
- ☐ Identification of different types of reverse gear selector forks ➔ [page 87](#)
- ☐ Select correct components from ➔ Electronic parts catalogue



6 - Ball sleeve

- ☐ Pulling out ➔ [page 88](#)
- ☐ Pressing in ➔ [page 88](#)

- ☐ Ball sleeve is not fitted from gearbox manufacturing date 06 03 6
- ☐ Gradually discontinued

6.6 Exploded view - input shaft, output shafts, differential and selector rods

1 - Output shaft for 1st - 4th gear

- ☐ Dismantling and assembling ⇒ [page 137](#)
- ☐ Installation position ⇒ [page 86](#)

2 - Selector rod with selector fork for 1st and 2nd gear

- ☐ Installation position ⇒ [page 86](#)

3 - Selector rod with selector fork for 3rd and 4th gear

- ☐ Installation position ⇒ [page 86](#)

4 - Output shaft for 5th, 6th and reverse gears

- ☐ Dismantling and assembling ⇒ [page 147](#)
- ☐ Installation position ⇒ [page 86](#)

5 - Selector rod with selector fork for 5th and 6th gear

- ☐ Installation position ⇒ [page 86](#)

6 - Reverse gear selector fork

- ☐ Installation position ⇒ [page 86](#)

7 - Input shaft

- ☐ Dismantling and assembling ⇒ [page 127](#)
- ☐ Always renew grooved ball bearing on input shaft
⇒ [Item 6 \(page 126\)](#)

8 - Reverse shaft

- ☐ With thrust washer

9 - Thrust washer

10 - Bleeder connection

- ☐ Connect to slave cylinder ⇒ [Item 14 \(page 85\)](#)

11 - Clutch housing

- ☐ Servicing ⇒ [page 122](#)

12 - Input shaft oil seal

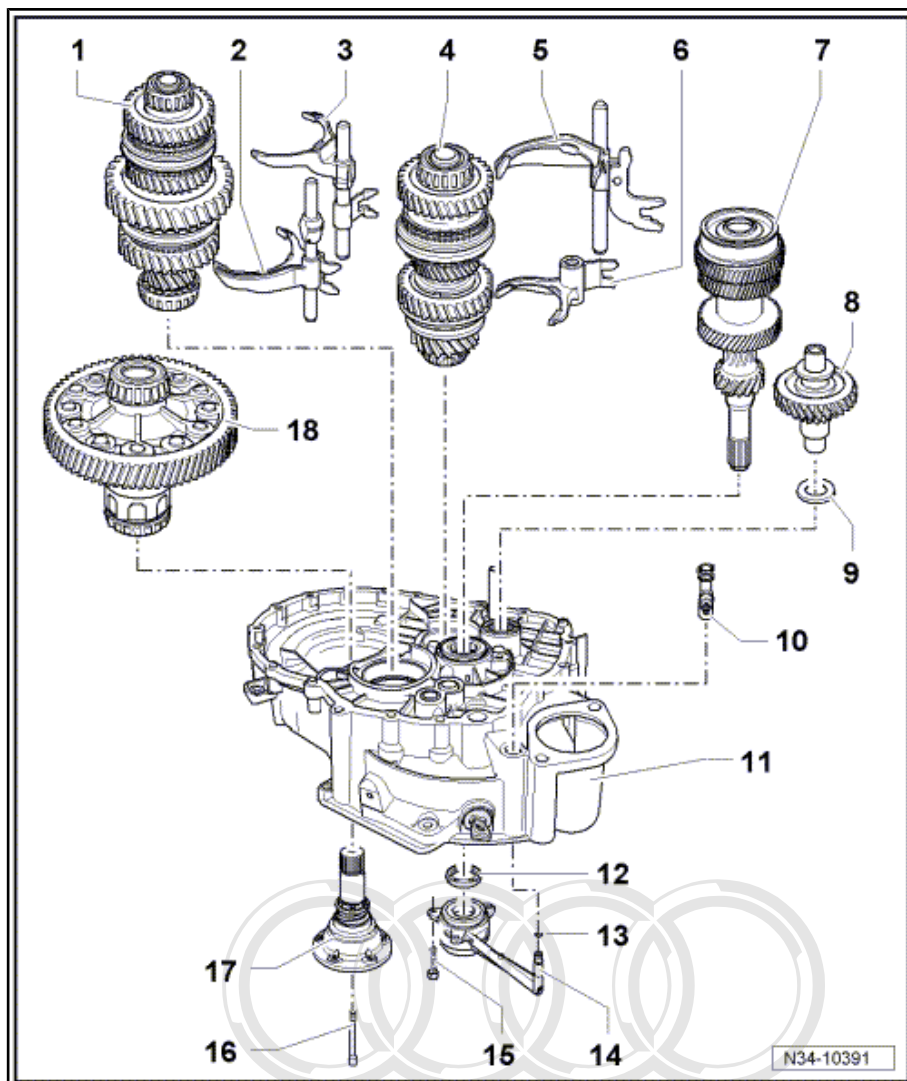
- ☐ Renewing ⇒ [page 35](#)

13 - O-ring

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

14 - Slave cylinder with release bearing

- ☐ Removing and installing ⇒ [page 26](#)



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15 - Bolt

- ☐ 3x
- ☐ Always renew
- ☐ Tightening torque ⇒ [Item 2 \(page 19\)](#)

16 - Countersunk bolt

- ☐ Removing and installing ⇒ [Item 11 \(page 171\)](#)

17 - Flange shaft with spring

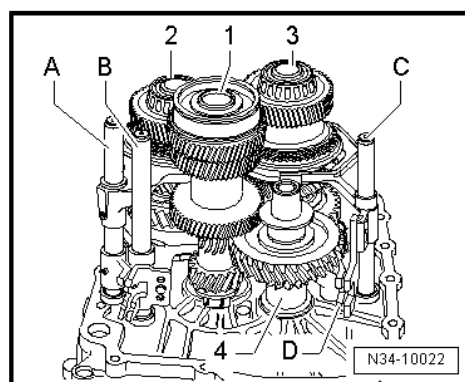
- ☐ Removing and installing ⇒ [page 168](#)
- ☐ Assembling ⇒ [page 172](#)

18 - Differential

- ☐ Dismantling and assembling ⇒ [page 172](#)

Installation position of shafts and selector rods in gearbox

- 1 - Input shaft
- 2 - Output shaft for 1st - 4th gear
- 3 - Output shaft for 5th/6th and reverse gear
- 4 - Reverse shaft
- A - Selector rod for 3rd and 4th gear
- B - Selector rod for 1st and 2nd gear
- C - Selector rod for 5th and 6th gear
- D - Reverse gear selector fork *)



1) From gearbox manufacturing date 25 05 9 onwards: mounted on selector rod for 5th/6th gear selector fork -C-. Identification of different types of reverse gear selector forks ⇒ [page 87](#)

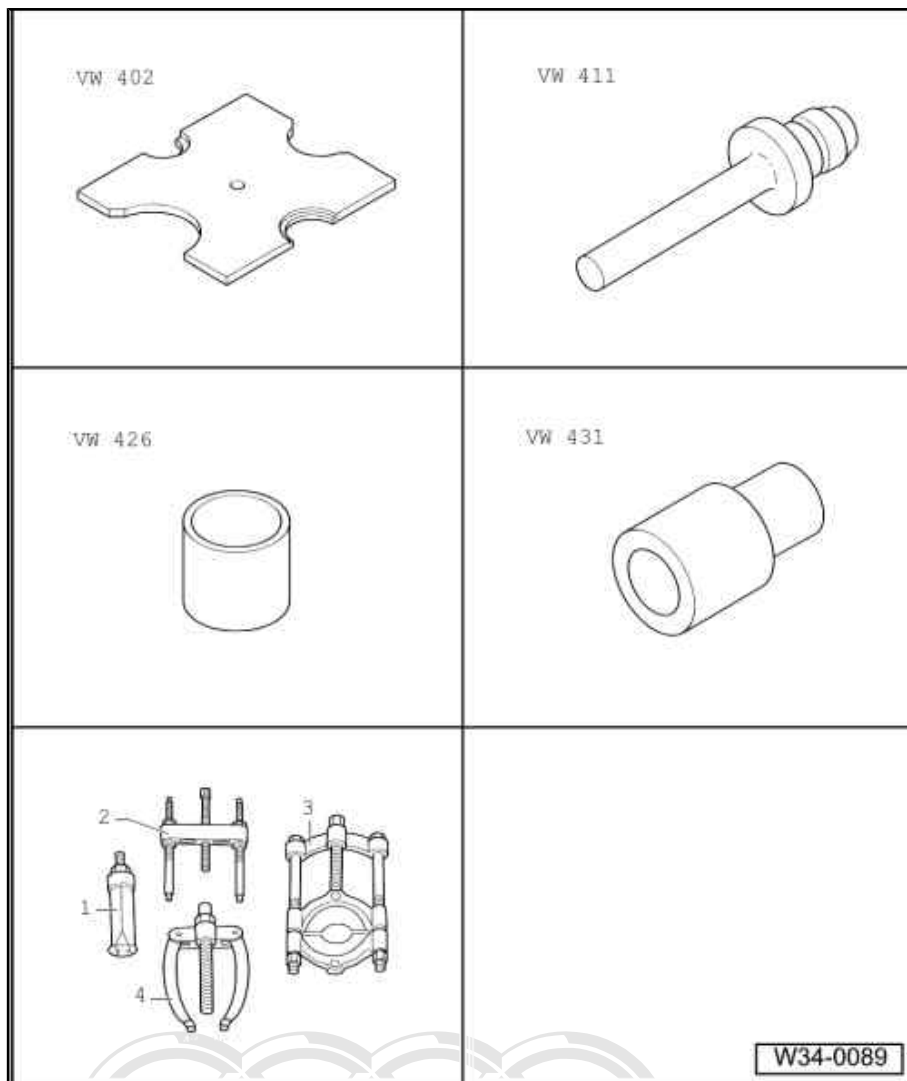


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6.7 Servicing selector forks

Special tools and workshop equipment required

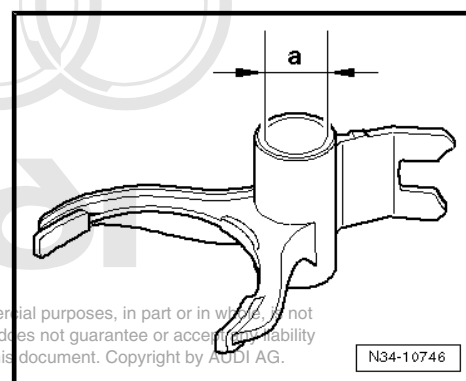
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 411-
- ◆ Tube - VW 426-
- ◆ Thrust piece - VW 431-
- ◆ -1- Internal puller - Kukko 21/3-
- ◆ -4- Counter-support - Kukko 22/1-



Identification of different types of reverse gear selector forks

Dimension "a" (mm)	Reverse gear selector fork	Mounting
24	With ball sleeve	On reverse gear selector fork shaft ⇒ page 105
18	Without ball sleeve	
15	Without ball sleeve	On selector rod with selector fork for 5th and 6th gear ⇒ page 106

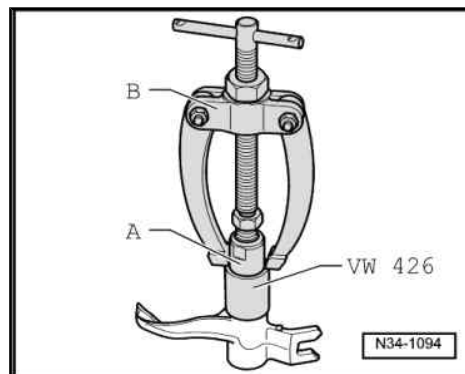
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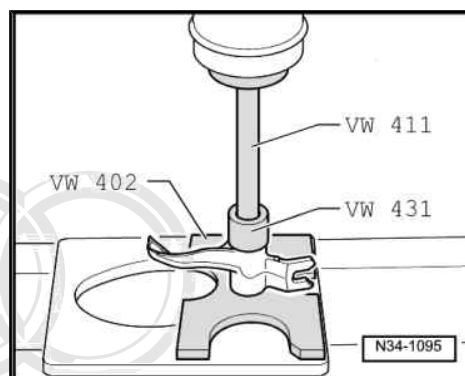
Pulling out ball sleeve for reverse gear selector fork (up to gearbox manufacturing date 05 03 6)

A - Internal puller 18 ... 23 mm , e.g. -Kukko 21/3-

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



Pressing in ball sleeve for reverse gear selector fork (up to gearbox manufacturing date 05 03 6)



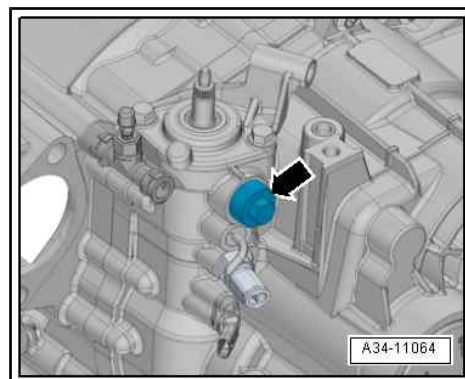
6.8 Removing and installing selector unit

Removing

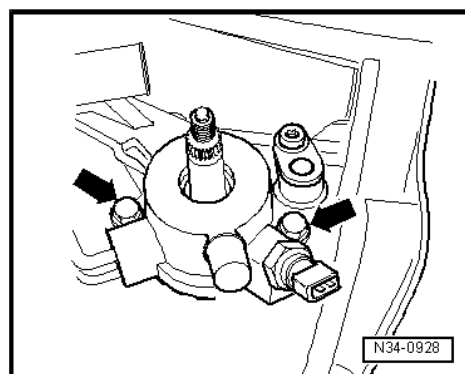
- Vehicles with 2.0 ltr. TDI engine: Remove air cleaner housing
⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

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- Remove gearbox selector lever. ⇒ [Item 8 \(page 82\)](#)
- Remove locking bolt -arrow-.



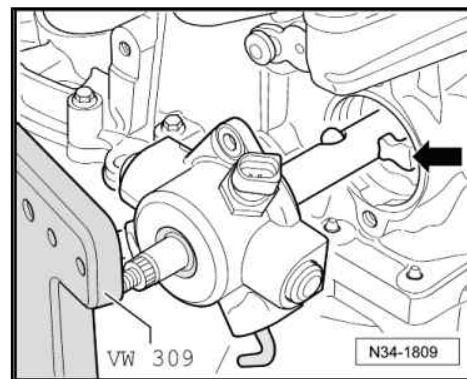
- Put selector shaft in neutral position.
- Remove bolts -arrows- and pull selector unit out of gearbox housing.



Installing

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

- Set selector plates in neutral position.
- Apply sealant - AMV 188 200 03- evenly to sealing surface of selector mechanism cover.
- Put selector shaft in neutral position.
- Position selector shaft so that selector finger -arrow- is engaged in selector plates.
- Install gearbox selector lever ⇒ [page 83](#) .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .



Tightening torques

- ◆ ⇒ [“6.4 Exploded view - selector unit”, page 82](#)

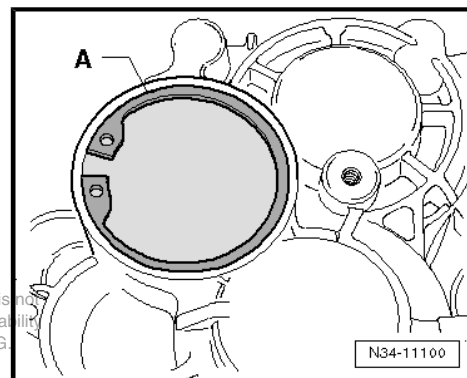
6.9 Dismantling and assembling gearbox

⇒ [“6.9.1 Dismantling and assembling gearbox \(version without circlip A for input shaft sealing cap\)”, page 89](#)

⇒ [“6.9.2 Dismantling and assembling gearbox \(version with circlip A for input shaft sealing cap\)”, page 100](#)

6.9.1 Dismantling and assembling gearbox (version without circlip -A- for input shaft sealing cap)

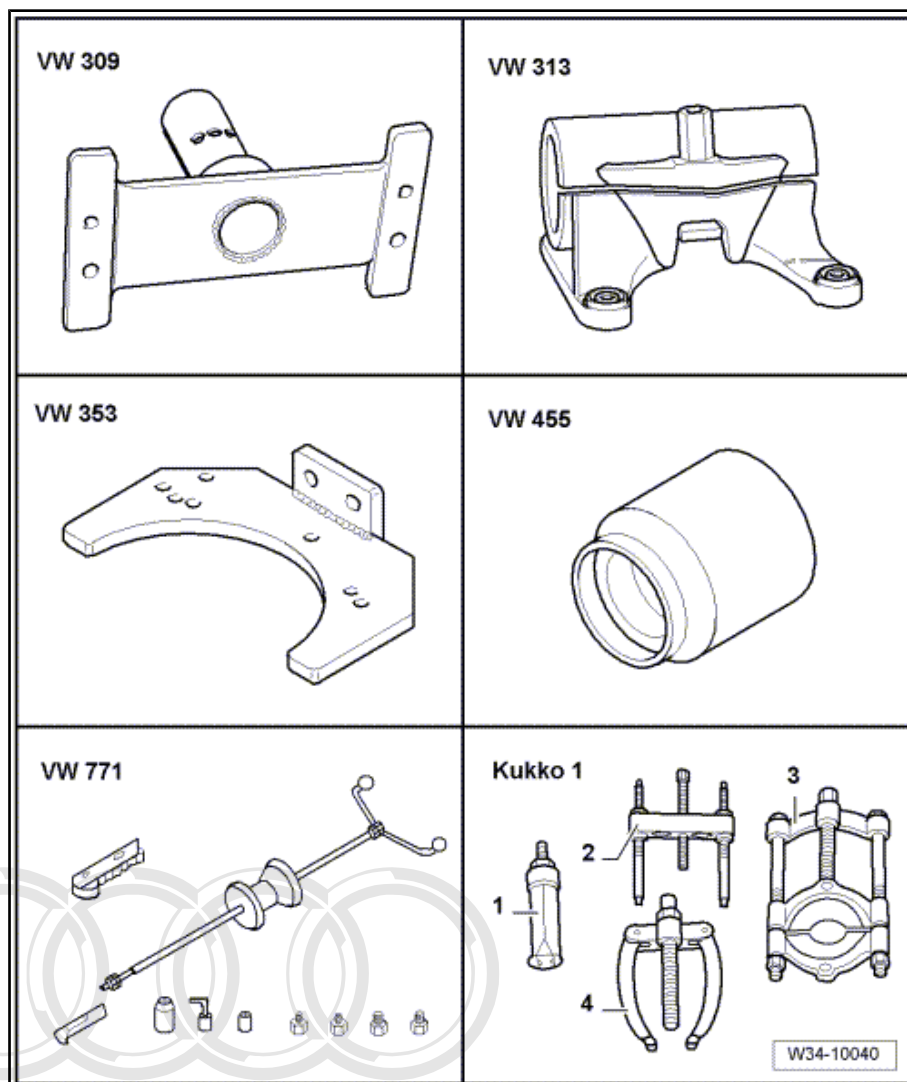
Removing and installing gearbox housing, selector mechanism,
input shaft, output shafts, differential and selector rods



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Special tools and workshop equipment required

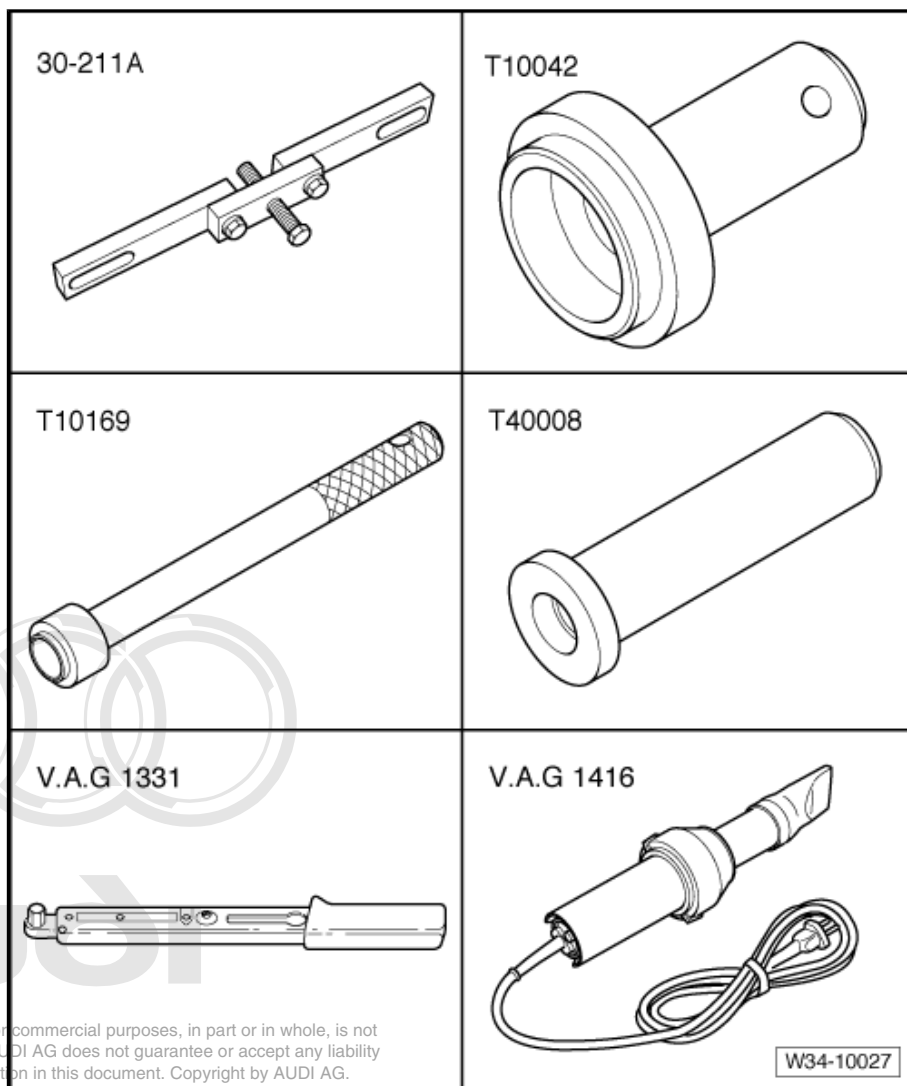
- ◆ Support plate - VW 309-
- ◆ Support clamp - VW 313-
- ◆ Gearbox support - VW 353-
- ◆ Installing sleeve - VW 455-
- ◆ Multi-purpose tool - VW 771-
- ◆ -1- Internal puller - Kukko 21/01-
- ◆ -3- Splitter - Kukko 17/0-
- ◆ -4- Counter-support - Kukko 22/1-



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- ◆ Support bridge - 30-211A-
- ◆ Thrust piece - T10042-
- ◆ Drift - T10169-
- ◆ Thrust piece - T40008-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Hot air blower - V.A.G 1416-

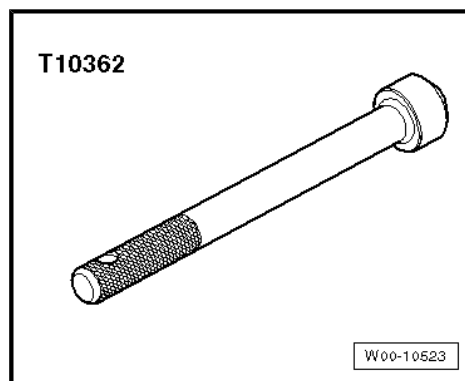


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- ◆ Oil seal extractor lever - VW 681-



- ◆ Or drift - T10362- instead of -T10169- ➔ [page 119](#)



Removing

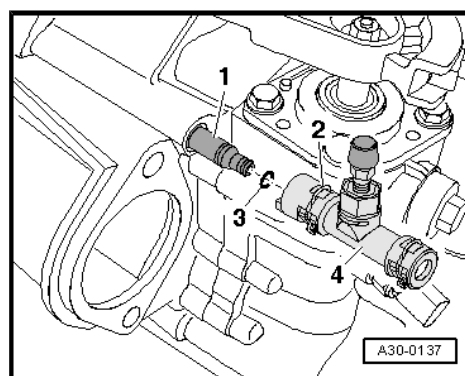
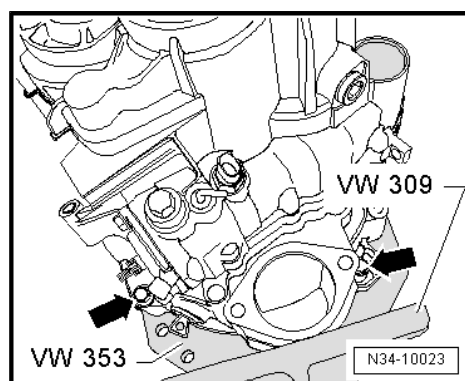
- Secure gearbox to assembly stand with bolts -arrows-.



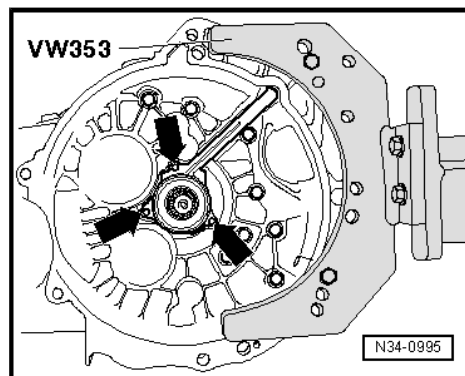
Note

If one of the bolt holes is not flush with the gearbox support , please insert a washer (or washers) between the bolt hole and the gearbox support .

- Turn gearbox on assembly stand so that oil drain plug faces downwards.
 - Place drip tray underneath.
 - Drain off gear oil.
 - Pull retaining clip -2- on bleeder connection -4- out as far as it will go.
 - Pull bleeder connection off slave cylinder connection -1-.
- Always renew O-ring -3-.

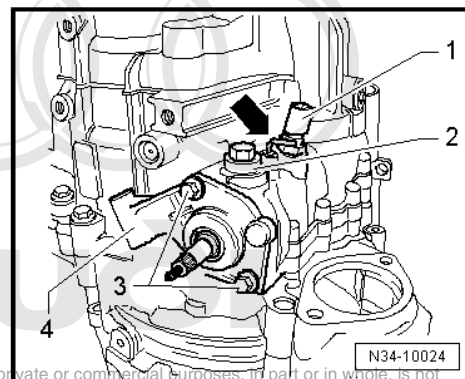


- Remove slave cylinder with release bearing -arrows-.



Make sure that the selector shaft is not locked in position by the angled rod -arrow- while carrying out the following steps.

- Put selector shaft in neutral position.
- Unscrew locking bolt -2-.
- Then remove bolts -3-.
- Remove reversing light switch - F4- -1-.
- Pull selector shaft -4- out of gearbox housing.
- Remove both flange shafts.



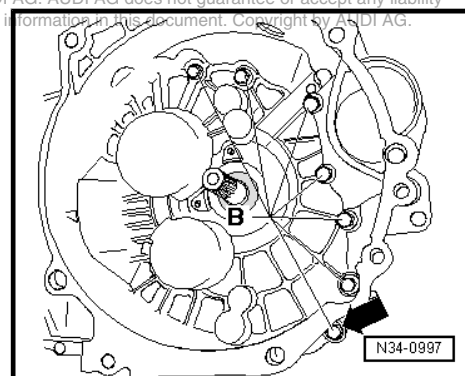
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- Remove bolts -B- securing gearbox housing from inside clutch housing.



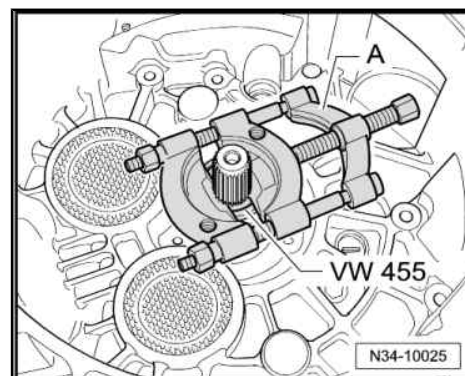
Note

The hexagon bolt -arrow- is located outside the joint flange. It is fitted with a washer.



- Lock input shaft by fitting installing sleeve - VW 455- over input shaft and against clutch housing.
- Tighten splitter -A-, e.g. -Kukko 17/0- behind splines on input shaft.

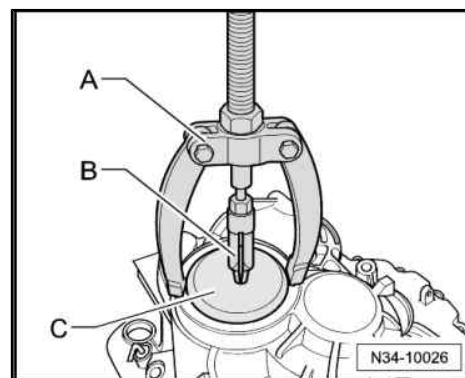
The rear side of the splitter must be in contact with installing sleeve (zero play).



- Pierce rubber in centre of sealing cap -C- with a screwdriver .
- Pull sealing cap out of gearbox housing.

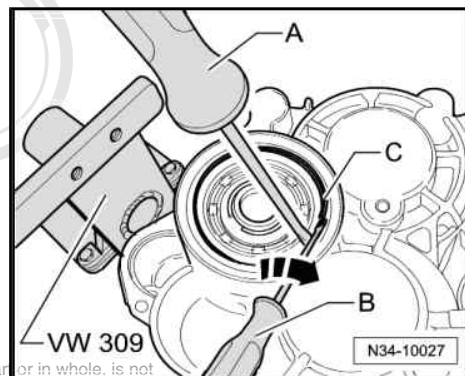
A - Counter-support , e.g. -Kukko 22/1-

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



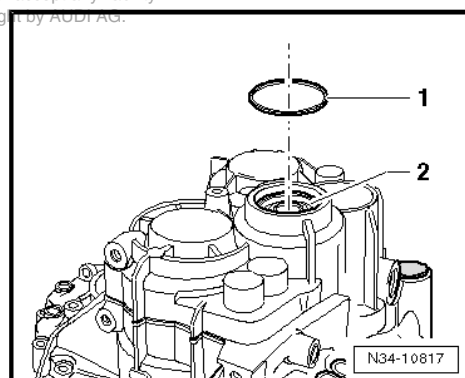
Detach circlip -C- from grooved ball bearing on input shaft/gearbox housing as follows:

- Hold one end of circlip with screwdriver -A-.
- Lever other end of circlip out of slot in grooved ball bearing in direction of -arrow- with 2nd screwdriver -B-.
- Lever circlip out further by repositioning screwdriver -B-.

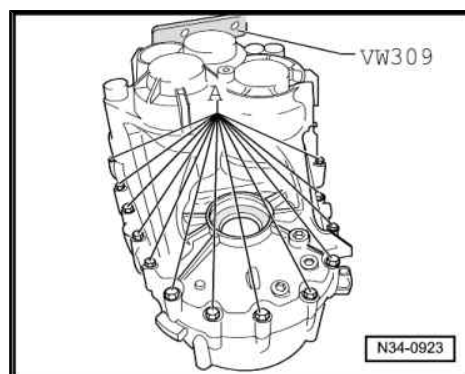


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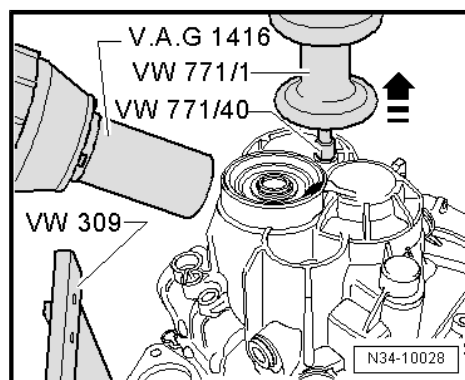
- Where fitted, detach spacer -1- from gearbox housing -2-.
- When renewing the gearbox housing, check whether the spacer has to be re-installed ⇒ [page 96](#).



- Remove gearbox housing/clutch housing securing bolts -A-.



- Screw adapter VW 771/40 into threaded hole in gearbox housing.
- Using hot air blower - V.A.G 1416- , heat area around seat of input shaft ball bearing in gearbox housing for approx. 10 minutes to approx. 100°C.
- Using multi-purpose tool VW 771/1 , pull gearbox housing off clutch housing in direction of -arrow-.



Note

If necessary, carefully apply a lever to the protruding flanges on alternate sides of the gearbox housing, taking care not to damage the sealing surfaces.

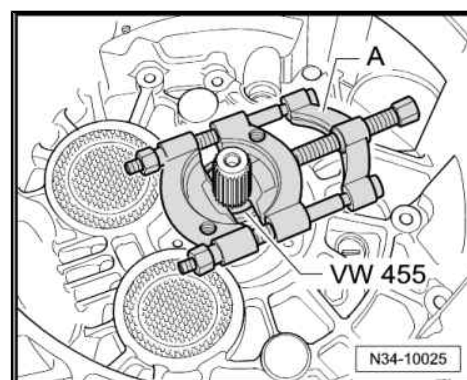
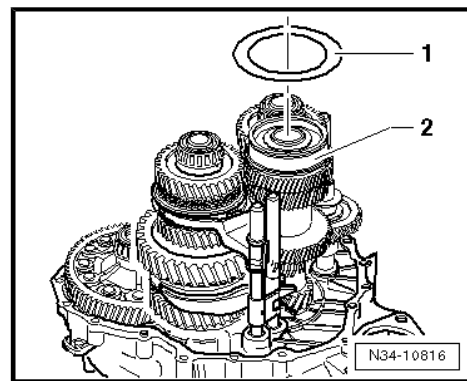
- If fitted, detach shim -1- from grooved ball bearing -2-.
- When renewing the gearbox housing, check whether the shim has to be re-installed ⇒ [page 96](#) .



- Remove splitter -A- and installing sleeve VW 455 from input shaft.

A second mechanic is required for removing the shafts from the clutch housing.

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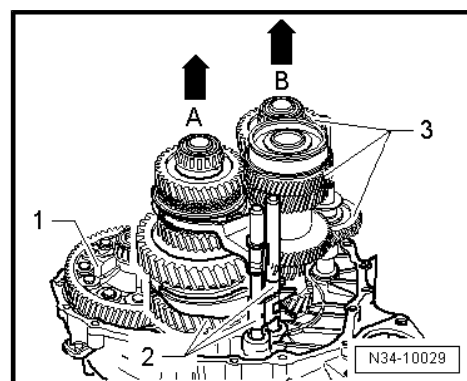


- Lift up differential -1- with your left hand.
- With your right hand, lift 1st - 4th gear output shaft together with selector rods -2- -arrow A-.
- At the same time, the second mechanic must lift the input shaft, reverse shaft and 5th/6th gear output shaft -3- out of the clutch housing together with the selector rods -arrow B-.



Note

If required, the differential can be put back in the clutch housing after lifting the shafts.



- Lever out input shaft oil seal using oil seal extractor lever - VW 681- .



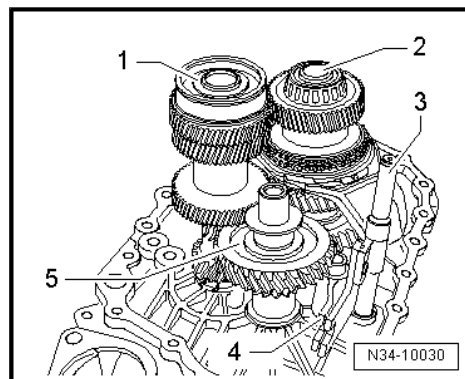
Note

*Always renew grooved ball bearing on input shaft
⇒ [Item 6 \(page 126\)](#) .*

Installing

- A new grooved ball bearing has been pressed onto the input shaft ⇒ [Item 6 \(page 126\)](#)

- Insert input shaft -1-, output shaft for 5th and 6th gear -2- together with selector rod -3-, selector fork -4- and reverse shaft -5-.



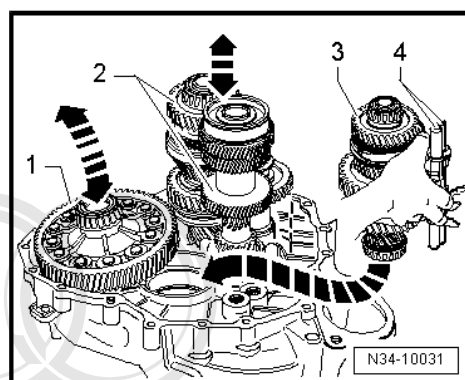
- Then install differential -1-.



Note

A second mechanic is required for installing the shafts in the clutch housing.

- Take 1st - 4th gear output shaft -3- with selector rods -4- in your right hand as illustrated.
- Lift differential slightly with your left hand.
- At the same time, have the second mechanic lift the input shaft and output shaft for 5th, 6th and reverse gear -2- slightly, together with the reverse shaft.
- Now insert 1st - 4th gear output shaft in direction of -arrow-.



The teeth of the input shaft, output shafts and final drive gear/differential must mesh.

- Now, together with second mechanic, locate shafts and differential in their bearing seats.

- Secure support bridge - 30-211A- for input shaft to clutch housing.



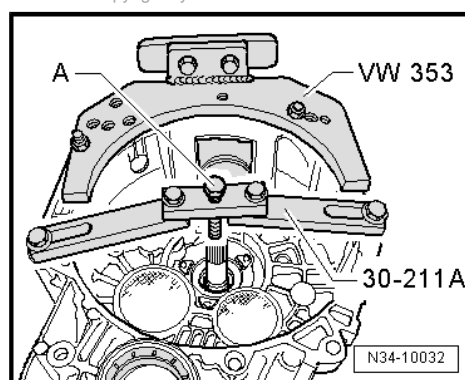
Note

Illustration shows clutch housing turned through 180° for clarity.

- Screw in bolt -A- until input shaft lifts slightly.

From gearbox manufacturing date 10 04 6 to 20 01 8:

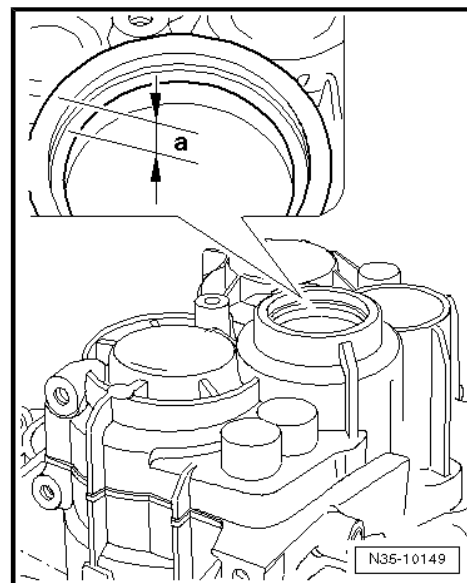
A shim is fitted on either side of grooved ball bearing for input shaft ⇒ **Item 6 (page 126)** .



Shim (top)	Outside diameter	78.6 mm
Shim (bottom)	Outside diameter	85 mm

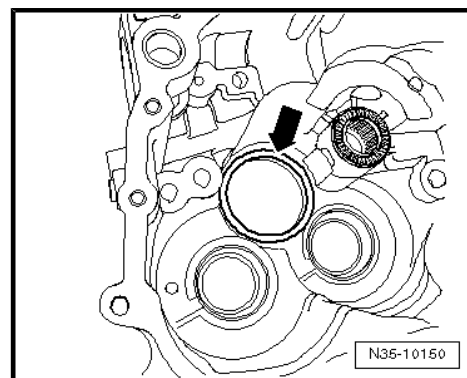
Measuring area above seat for grooved ball bearing

Area above grooved ball bearing	Dimension "a"	Shim (top)
Up to gearbox manufacturing date 09 04 6	10 mm	No
From gearbox manufacturing date 10 04 6 onwards	10.7 mm	Yes



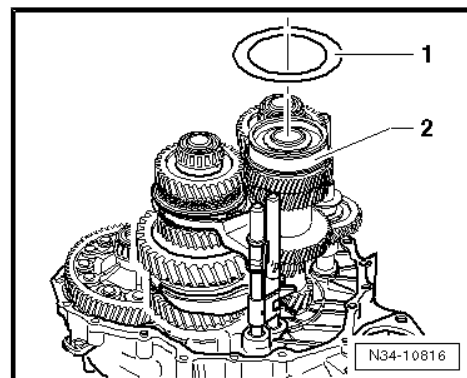
In the gearbox housing, the area below the seat for the grooved ball bearing has also been modified -arrow-

Area below bearing seat	Shim (bottom)
Up to gearbox manufacturing date 09 04 6	Not modified
From gearbox manufacturing date 10 04 6 onwards	Slightly deeper



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- If necessary, fit a shim (outer diameter = 85 mm) -1- onto grooved ball bearing -2-.
- Using hot air blower - V.A.G 1416- , heat area around seat of grooved ball bearing for input shaft in gearbox housing for approx. 10 minutes to 100°C.



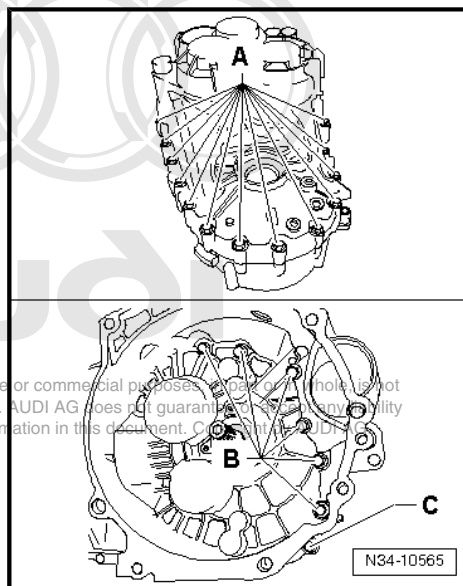
- Fit gearbox housing and tighten new bolts -A-, -B- and -C- to specified torque.

Allocation of bolts:

A - Bolt with captive washer

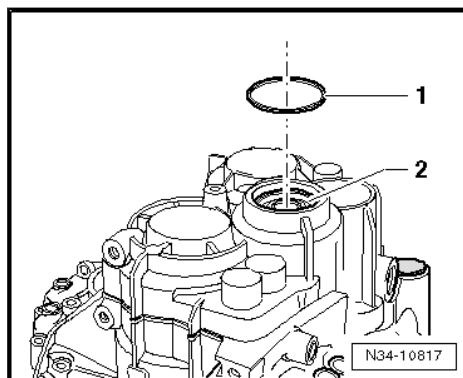
B - Bolt without washer

C - Bolt with captive washer

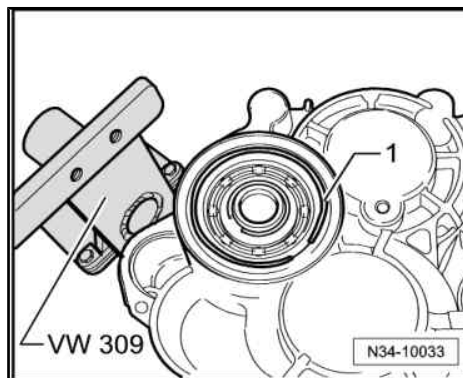


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- If a shim was fitted on the grooved ball bearing before installing the gearbox housing, a shim -1- (outer diameter = 78.6 mm) must also be fitted after installing the gearbox housing -2- ⇒ [page 96](#) .



- Install circlip -1- for input shaft grooved ball bearing.
- Remove support bridge - 30 -211A- for input shaft.
- If stop sleeve for selector shaft has been removed, drive it in now ⇒ [page 119](#) (drive in until tool reaches stop).
- Turn gearbox on assembly stand so that opening for selector shaft faces up.

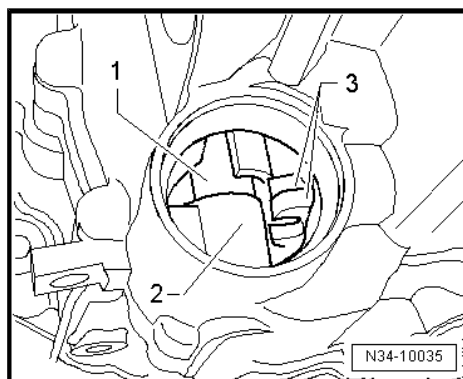


- Insert selector shaft -1- into bottom mounting -2- and into selector forks -3-.



Note

The sealing cap is removed to give a better illustration.

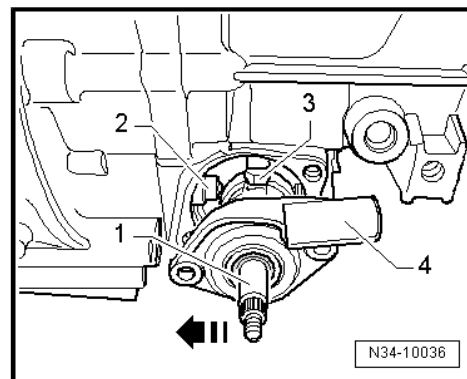


- Now push selector shaft -1- against stop sleeve -2- in direction of -arrow- and run selector finger -3- down through selector forks and onto stop.
- Selector mechanism cover -4- should be parallel to joint surface on gearbox housing.
- Selector shaft should move up and down easily (gate selector movement).

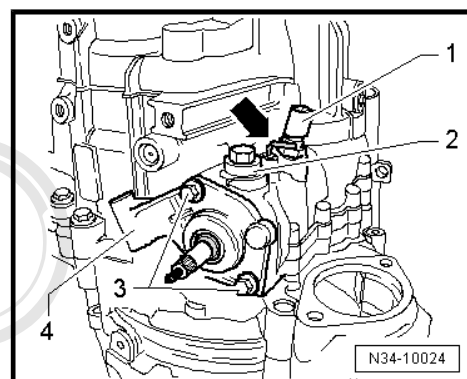


Note

If the selector mechanism cover is not parallel with the joint surface, the selector shaft is not seated in its bottom mounting.

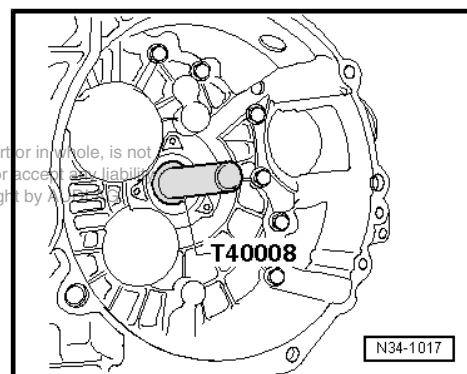


- Tighten bolts -3- for selector mechanism cover -4-.
- Screw in locking bolt -2-; angled rod -arrow- must be released.
- Install reversing light switch - F4- -1-.
- Install both flange shafts with springs, thrust washers and tapered rings.

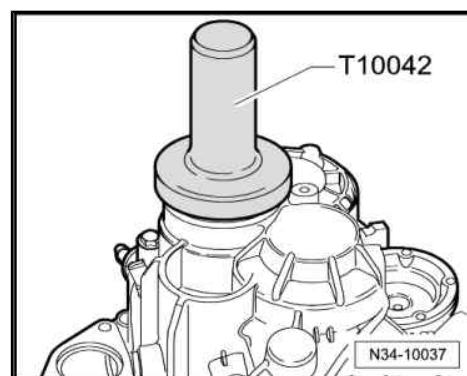


- Drive in input shaft oil seal.
- Install slave cylinder with release bearing ⇒ [page 19](#) .
- Select all gears.

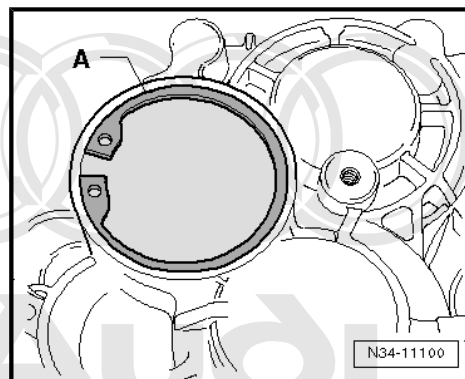
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- Drive sealing cap into gearbox housing onto stop.



6.9.2 Dismantling and assembling gearbox (version with circlip -A- for input shaft sealing cap)

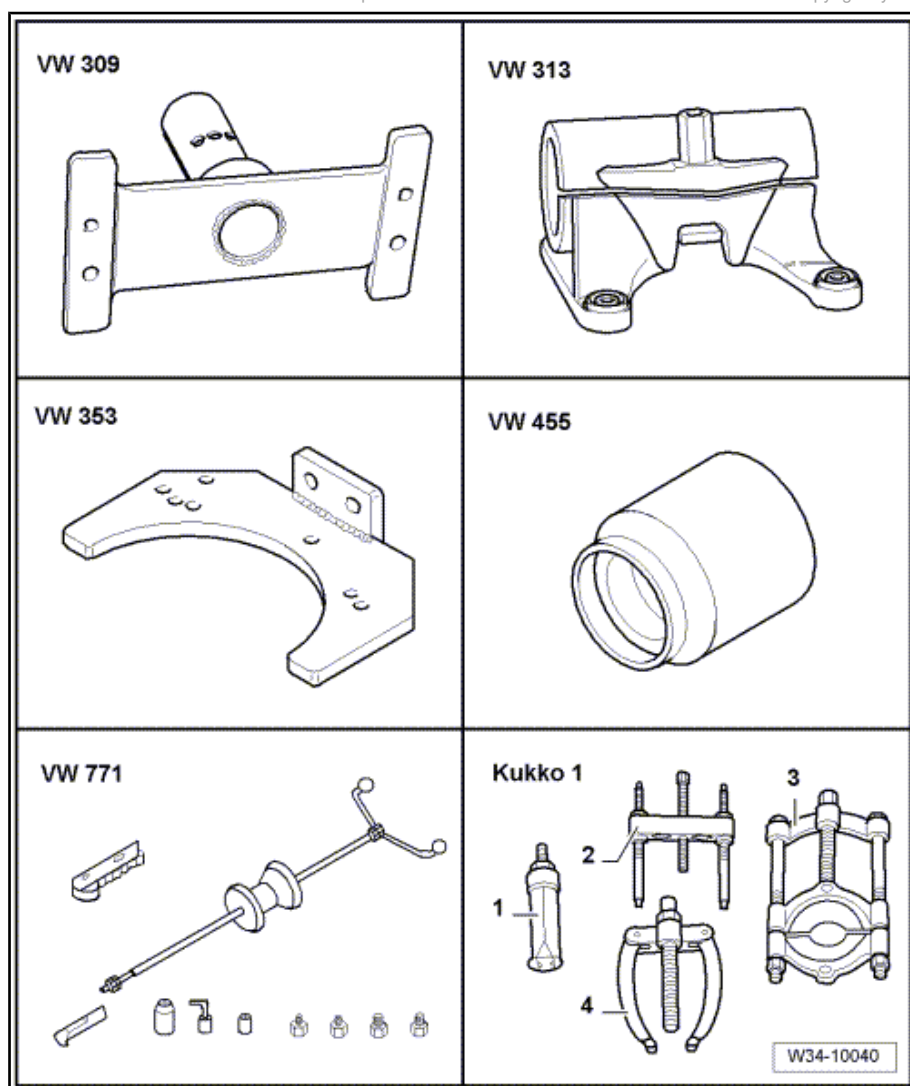


Removing and installing gearbox housing, selector mechanism, input shaft, output shafts, differential and selector rods

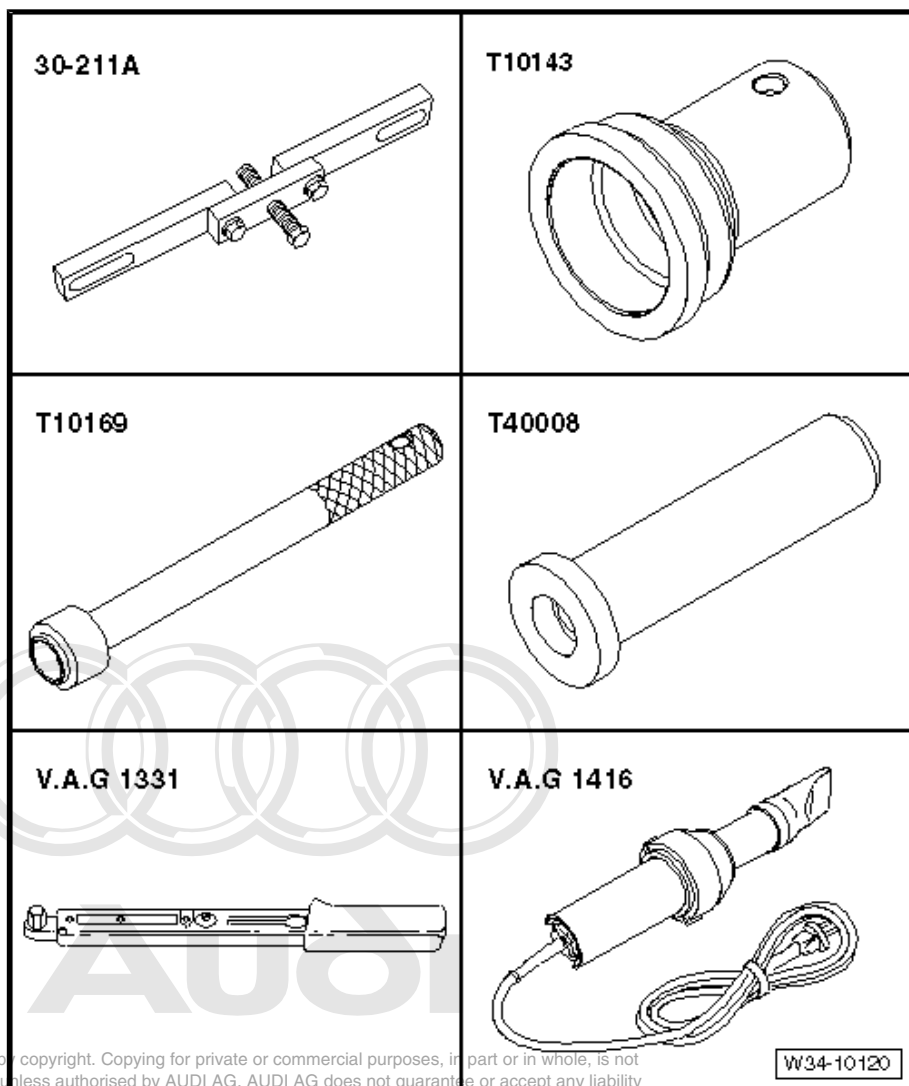
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Special tools and workshop equipment required

- ◆ Support plate - VW 309-
- ◆ Support clamp - VW 313-
- ◆ Gearbox support - VW 353-
- ◆ Installing sleeve - VW 455-
- ◆ Multi-purpose tool - VW 771-
- ◆ -1- Internal puller - Kukko 21/01-
- ◆ -3- Splitter - Kukko 17/0-
- ◆ -4- Counter-support - Kukko 22/1-



- ◆ Support bridge - 30-211A-
- ◆ Thrust piece - T10143-
- ◆ Drift - T10169-
- ◆ Thrust piece - T40008-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Hot air blower - V.A.G 1416-

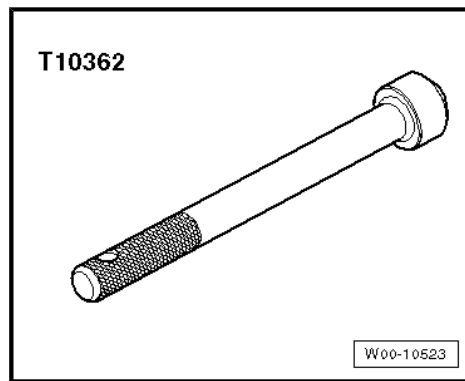


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- ◆ Oil seal extractor lever - VW 681-



- ♦ Or drift - T10362- instead of -T10169- ➔ [page 119](#)



Removing

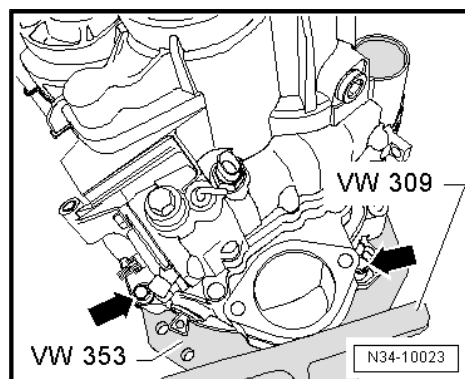
- Secure gearbox to assembly stand with bolts -arrows-.



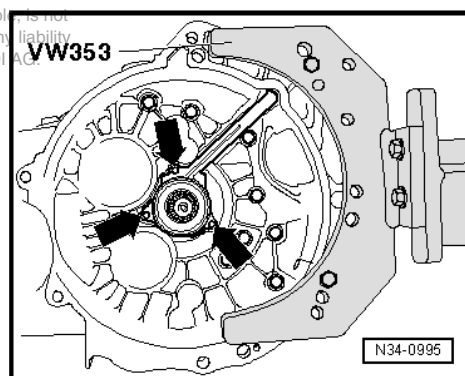
Note

If one of the bolt holes is not flush with the gearbox support , please insert a washer (or washers) between the bolt hole and the gearbox support .

- Turn gearbox on assembly stand so that oil drain plug faces downwards.
- Place drip tray underneath.
- Drain off gear oil.

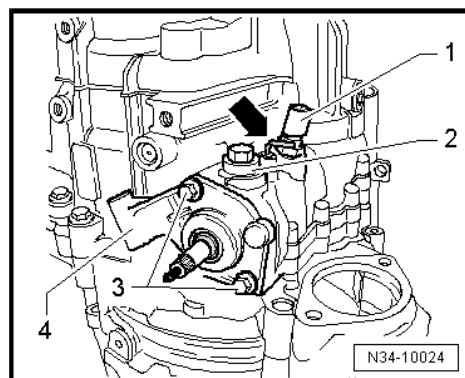


- Remove slave cylinder with release bearing -arrows-.



Make sure that the selector shaft is not locked in position by the angled rod -arrow- while carrying out the following steps.

- Put selector shaft in neutral position.
- Unscrew locking bolt -2-.
- Then remove bolts -3-.
- Remove reversing light switch - F4- -1-.
- Pull selector shaft -4- out of gearbox housing.
- Remove flange shafts.

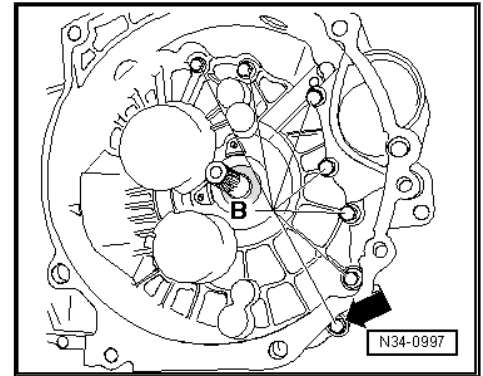


- Remove bolts -B- securing gearbox housing from inside clutch housing.



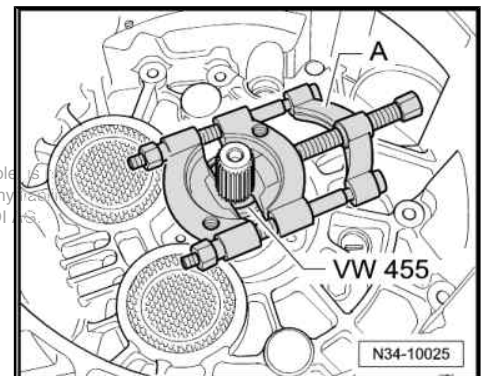
Note

One of the bolts -arrow- is outside the joint flange.

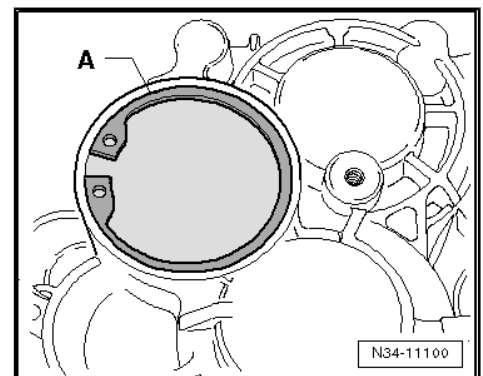


- Lock input shaft by fitting installing sleeve - VW 455- over input shaft and against clutch housing.
- Tighten splitter -A-, e.g. -Kukko 17/0- behind splines on input shaft.

The rear side of the splitter must be in contact with installing sleeve (zero play)



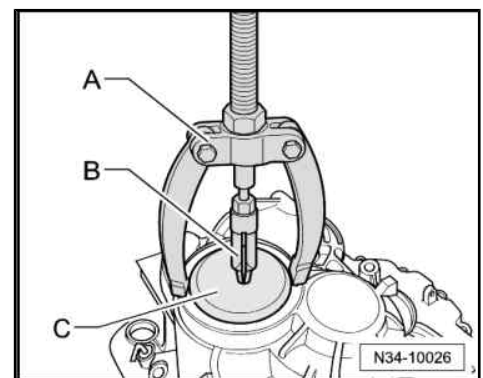
- Remove circlip -A- for input shaft sealing cap.



- Pierce rubber in centre of sealing cap -C- with a screwdriver .
- Pull sealing cap out of gearbox housing.

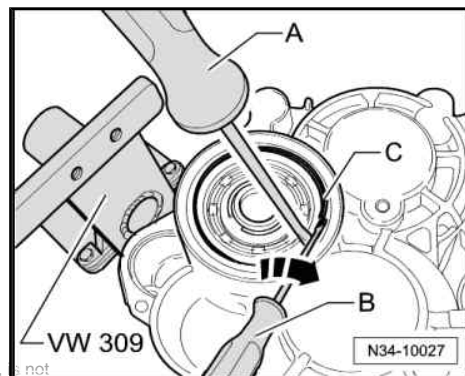
A - Counter-support , e.g. -Kukko 22/1-

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

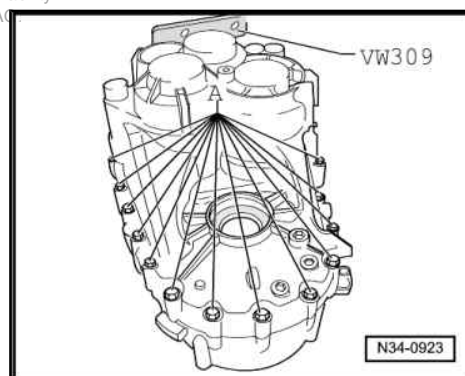


Detach circlip -C- from grooved ball bearing on input shaft/gearbox housing as follows:

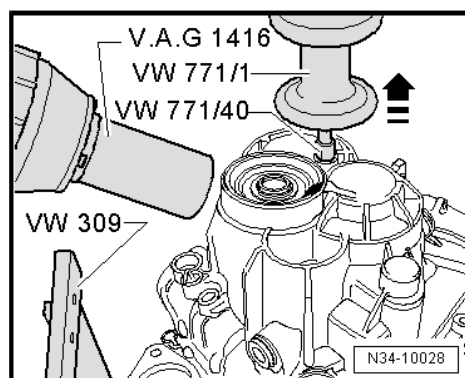
- Hold one end of circlip with screwdriver -A-.
- Lever other end of circlip out of slot in grooved ball bearing in direction of -arrow- with 2nd screwdriver -B-.
- Lever circlip out further by repositioning screwdriver -B-.



- Remove gearbox housing/clutch housing securing bolts -A-.



- Screw adapter VW 771/40 into threaded hole in gearbox housing.
- Using hot air blower - V.A.G 1416- , heat area around seat of input shaft ball bearing in gearbox housing for approx. 10 minutes to approx. 100°C.
- Using multi-purpose tool VW 771/1 , pull gearbox housing off clutch housing in direction of -arrow-.

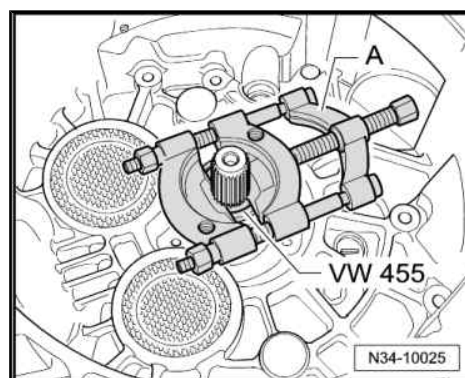


Note

If necessary, carefully apply a lever to the protruding flanges on alternate sides of the gearbox housing, taking care not to damage the sealing surfaces.

- Remove splitter -A- and installing sleeve VW 455 from input shaft.

A second mechanic is required for removing the shafts from the clutch housing.

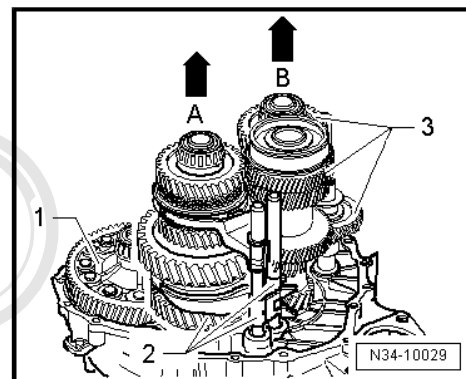


- Lift up differential -1- with your left hand. With your right hand, lift 1st - 4th gear output shaft together with selector rods -2- -arrow A-.
- At the same time, the second mechanic must lift the input shaft, reverse shaft and 5th/6th gear output shaft -3- out of the clutch housing together with the selector rods -arrow B-.



Note

If required, the differential can be put back in the clutch housing after lifting the shafts.



- Lever out input shaft oil seal using oil seal extractor lever - VW 681- .



Note

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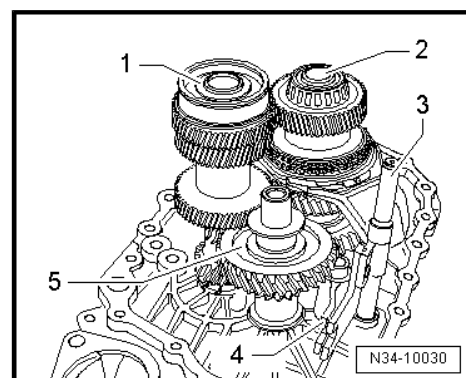
Always renew grooved ball bearing on input shaft

⇒ [Item 6 \(page 126\)](#) .

Installing

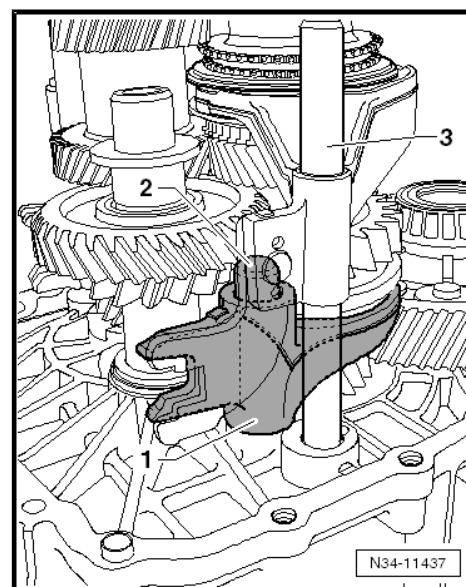
- A new grooved ball bearing has been pressed onto the input shaft ⇒ [Item 6 \(page 126\)](#) .
- Insert input shaft -1-, output shaft for 5th and 6th gear -2- together with selector rod -3-, selector fork -4- and reverse shaft -5-.

Observe different mountings of reverse gear selector fork.



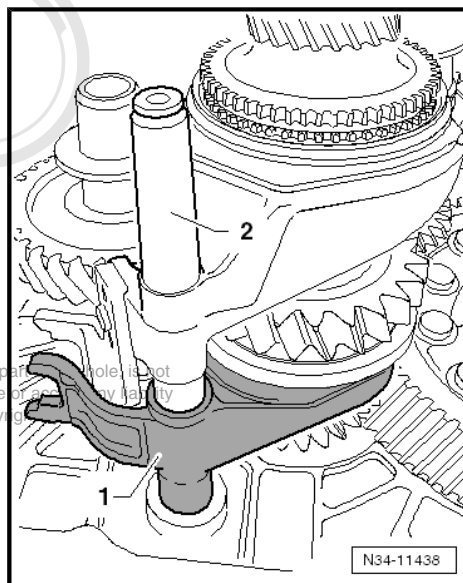
Reverse gear selector fork -1- is fitted on shaft -2- behind selector rod for 5th/6th gear -3-.

- Reverse gear selector fork -1- is fitted on shaft -2- behind selector rod for 5th/6th gear -3-.



Reverse gear selector fork -1- is fitted on selector rod with selector fork for 5th/6th gear -2-.

- Reverse gear selector fork -1- is fitted on selector rod with selector fork for 5th/6th gear -2-.



Continued for all vehicles:

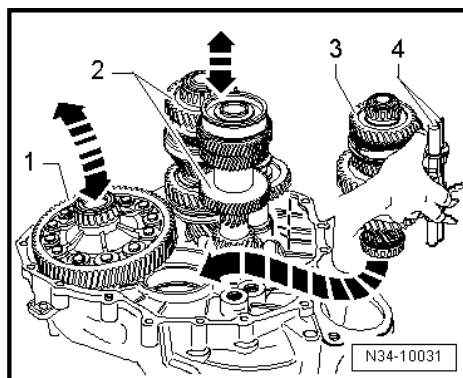
- Then install differential -1-.



Note

A second mechanic is required for installing the shafts in the clutch housing.

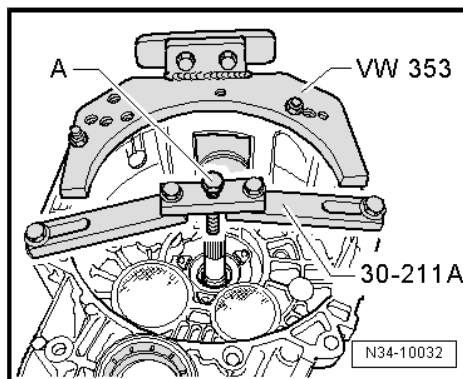
- Take 1st - 4th gear output shaft -3- with selector rods -4- in your right hand as illustrated.
- Lift differential slightly with your left hand.
- At the same time, have the second mechanic lift the input shaft and output shaft for 5th, 6th and reverse gear -2- slightly, together with the reverse shaft.
- Now insert 1st - 4th gear output shaft in direction of -arrow-.
- The teeth of the input shaft, output shafts and final drive gear/differential must mesh.
- Now, together with second mechanic, locate shafts and differential in their bearing seats.
- Secure support bridge - 30-211A- for input shaft to clutch housing.



Note

Illustration shows clutch housing turned through 180° for clarity.

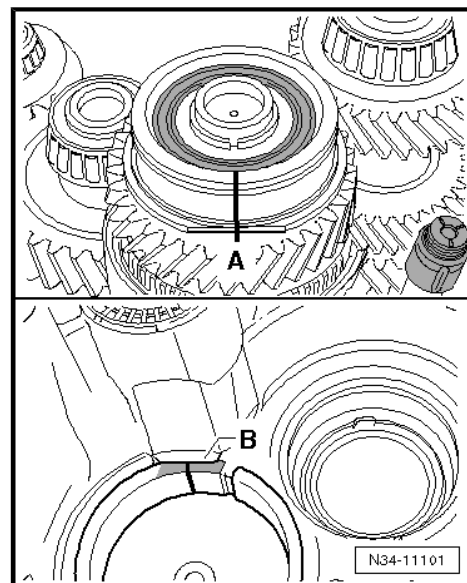
- Screw in bolt -A- until input shaft lifts slightly.



Grooved ball bearing for input shaft will fit into gearbox housing in one position only.

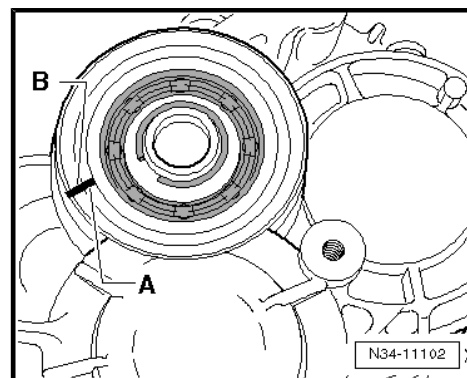
The grooved ball bearing and the bearing mounting are flattened on one side.

- If the sides are flattened -A- and -B-, a shim must not be fitted above or below the grooved ball bearing ➔ [page 130](#) .
- Flattened sides -A- on grooved ball bearing and bearing mounting -B- in gearbox housing must be aligned.
- Mark flattened sides with paint.
- Copy markings onto top area of grooved ball bearing and top area of bearing mounting on gearbox housing (➔ next illustration).
- Using hot air blower - V.A.G 1416- , heat area around seat of grooved ball bearing for input shaft in gearbox housing for approx. 10 minutes to 100°C.



Note

- ◆ Heating is necessary to ensure that grooved ball bearing is not damaged when installing gearbox housing.
- ◆ Apply sealing paste - AMV 188 200 03- evenly to sealing surface of clutch housing.
- ◆ Align marking -A- on grooved ball bearing with marking -B- on gearbox housing and fit gearbox housing.



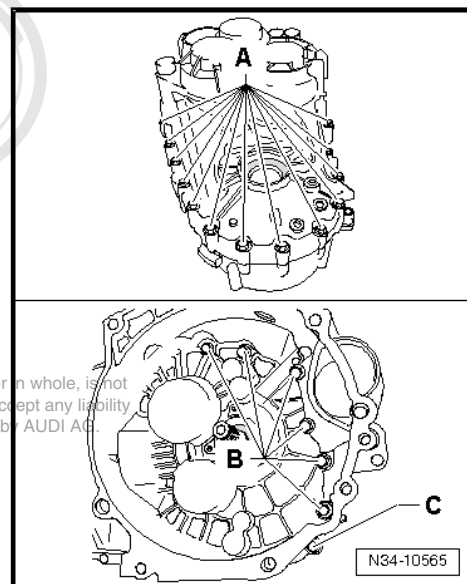
- Fit gearbox housing and tighten new bolts -A-, -B- and -C- to specified torque.

Allocation of bolts:

A - Bolt with captive washer

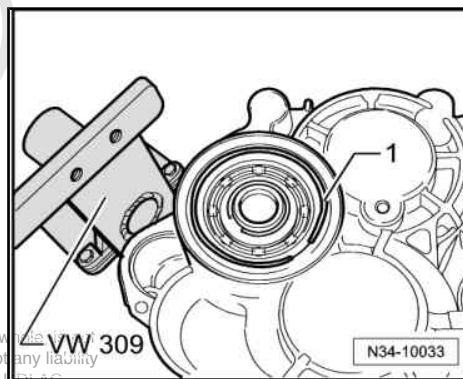
B - Bolt without washer

C - Bolt with captive washer



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- Install circlip -1- for input shaft grooved ball bearing.
- Attach support bridge - 30 - 211 A- for input shaft.
- If stop sleeve for selector shaft has been removed, drive it in now ➔ [page 119](#) (drive in until tool reaches stop).
- Turn gearbox on assembly stand so that opening for selector shaft faces up.

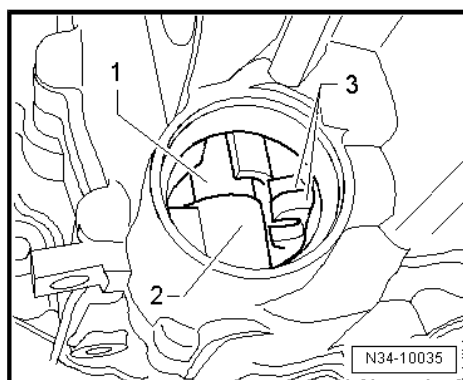


- Insert selector shaft -1- into bottom mounting -2- and into selector forks -3-.



Note

The sealing cap is removed to give a better illustration.

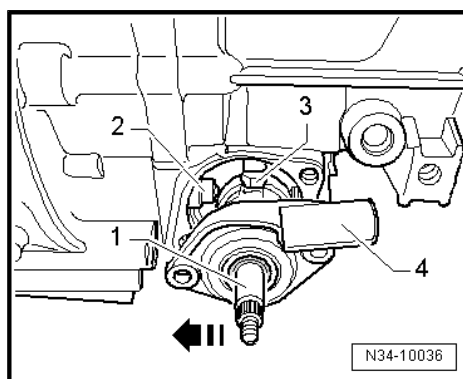


- Now push selector shaft -1- against stop sleeve -2- in direction of -arrow- and run selector finger -3- down through selector forks and onto stop.
- Selector mechanism cover -4- should be parallel to joint surface on gearbox housing.
- Selector shaft should move up and down easily (gate selector movement).

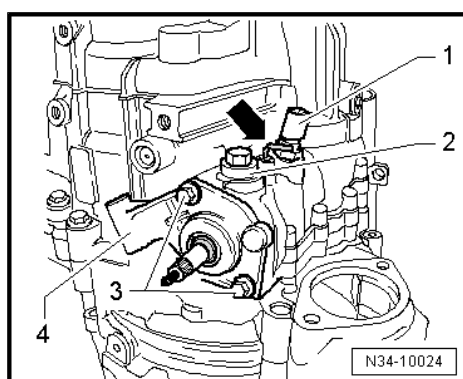


Note

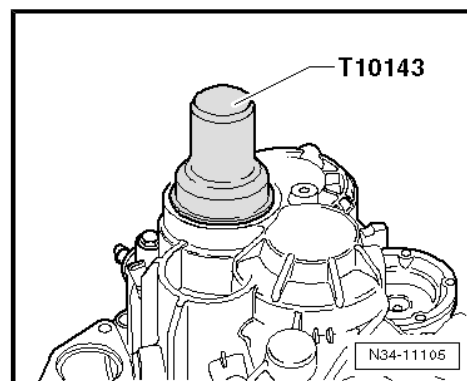
If the selector mechanism cover is not parallel with the joint surface, the selector shaft is not seated in its bottom mounting.



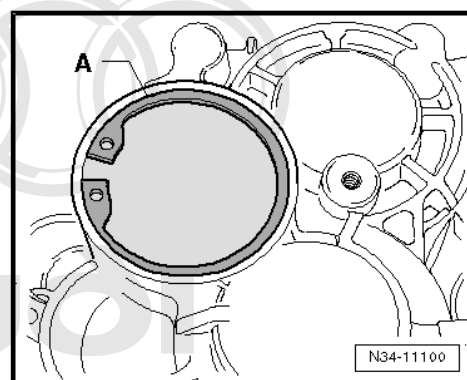
- Tighten bolts -3- for selector mechanism cover -4-.
- Screw in locking bolt -2-; angled rod -arrow- must be released.
- Install reversing light switch - F4- -1-.
- Install flange shafts together with springs, thrust washers and tapered rings.



- Drive sealing cap into gearbox housing onto stop.



- Secure sealing cap with circlip -A-.



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7 Gearbox housing, clutch housing

⇒ "7.1 Exploded view - gearbox housing", page 110

⇒ "7.2 Exploded view - clutch housing", page 112

⇒ "7.3 Servicing gearbox housing", page 114

⇒ "7.4 Servicing clutch housing", page 122

7.1 Exploded view - gearbox housing

1 - Gearbox housing

- ☐ If renewed: Adjust output shafts and differential ⇒ [page 182](#)
- ☐ Modifications in area of mounting for grooved ball bearing on input shaft
⇒ [Item 3 \(page 125\)](#)
- ☐ Select correct components from ⇒ Electronic parts catalogue

2 - Sealing cap

- ☐ Removing ⇒ [page 117](#)
- ☐ Driving in ⇒ [page 117](#)

3 - Oil drain plug

- ☐ Tightening torque
⇒ [page 111](#)

4 - Seal

- ☐ If fitted, always renew

5 - Oil filler plug

- ☐ Tightening torque
⇒ [page 111](#)

6 - Angled rod

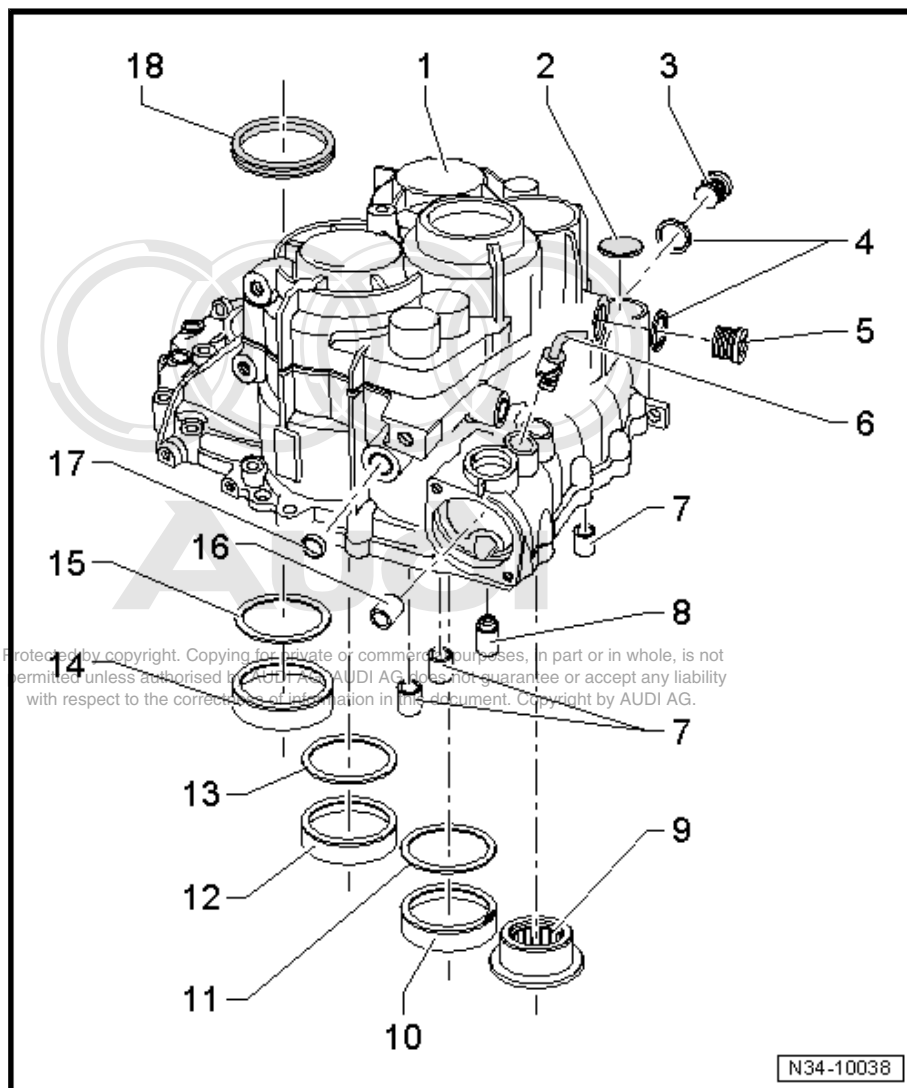
- ☐ For adjusting selector mechanism ⇒ [page 45](#)
- ☐ Can be renewed without dismantling gearbox
- ☐ Removing ⇒ [page 118](#)
- ☐ Installation position
⇒ [page 118](#)
- ☐ Driving in ⇒ [page 118](#)

7 - Bearing bush

- ☐ For selector rods
- ☐ Pulling out ⇒ [page 118](#)
- ☐ Driving in ⇒ [page 119](#)

8 - Stop sleeve

- ☐ Pressing out (gearbox dismantled) ⇒ [page 119](#)
- ☐ Driving out (gearbox not dismantled) ⇒ [page 119](#)
- ☐ Identification of different types of stop sleeve ⇒ [page 119](#)
- ☐ Driving in stop sleeve with shoulder ⇒ [page 120](#)
- ☐ Driving in stop sleeve without shoulder ⇒ [page 120](#)



9 - Needle bearing

- ☐ For reverse shaft
- ☐ Always renew after removing
- ☐ Pulling out ⇒ [page 120](#)
- ☐ Pressing in ⇒ [page 120](#)

10 - Tapered roller bearing outer race

- ☐ For 5th/6th and reverse gear output shaft
- ☐ Removing and installing ⇒ [page 147](#)
- ☐ If renewed: Adjust 5th/6th and reverse gear output shaft ⇒ [page 182](#)

11 - Shim

- ☐ For 5th/6th and reverse gear output shaft
- ☐ Table of adjustments ⇒ [page 182](#)

12 - Tapered roller bearing outer race

- ☐ For 1st - 4th gear output shaft
- ☐ Removing and installing ⇒ [page 137](#)
- ☐ If renewed: Adjust 1st - 4th gear output shaft ⇒ [page 157](#)

13 - Shim

- ☐ For 1st - 4th gear output shaft
- ☐ Table of adjustments ⇒ [page 182](#)

14 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Removing and installing ⇒ [page 172](#)
- ☐ If renewed: adjust differential ⇒ [page 175](#)

15 - Shim

- ☐ For differential
- ☐ Table of adjustments ⇒ [page 182](#)

16 - Bearing bush

- ☐ For selector shaft
- ☐ Pulling out ⇒ [page 121](#)
- ☐ Driving in ⇒ [page 121](#)

17 - Sealing plug

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

18 - Seal

- ☐ Renewing ⇒ [page 166](#)

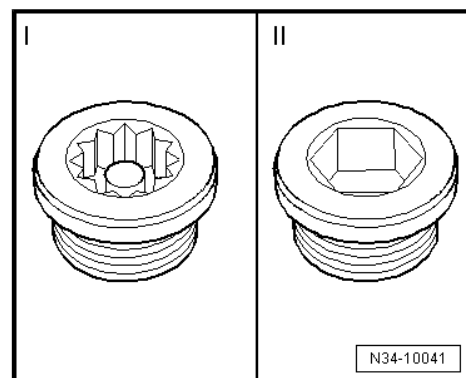
Different versions of oil filler/oil drain plug

I - Oil filler/ oil drain plug with multi-point socket

- 45 Nm

II - Oil filler/oil drain plug with hexagon socket

- 30 Nm



7.2 Exploded view - clutch housing

1 - Bearing bush

- ☐ For selector rods
- ☐ Always renew after removing
- ☐ Pulling out ⇒ [page 123](#)
- ☐ Driving in ⇒ [page 123](#)

2 - Reverse gear selector fork shaft

- ☐ Installed up to gearbox manufacturing date 24 05 9 ⇒ [page 105](#)
- ☐ Not installed from gearbox manufacturing date 25 05 9 onwards
- ☐ Reverse gear selector fork is then mounted together with selector fork for 5th/6th gear ⇒ [page 106](#)
- ☐ Shaft cannot be removed with workshop tools
- ☐ Up to gearbox manufacturing date 24 05 9: press in new shaft if a new clutch housing is fitted ⇒ [page 124](#)
- ☐ Select correct components from ⇒ Electronic parts catalogue

3 - Needle bearing

- ☐ For reverse shaft
- ☐ Always renew after removing
- ☐ Pulling out ⇒ [page 123](#)
- ☐ Pressing in ⇒ [page 123](#)

4 - Dowel sleeve

- ☐ 2x

5 - Clutch housing

- ☐ If renewed: Adjust output shafts and differential ⇒ [page 182](#)

6 - Input shaft oil seal

- ☐ Renewing ⇒ [page 35](#)

7 - Oil seal

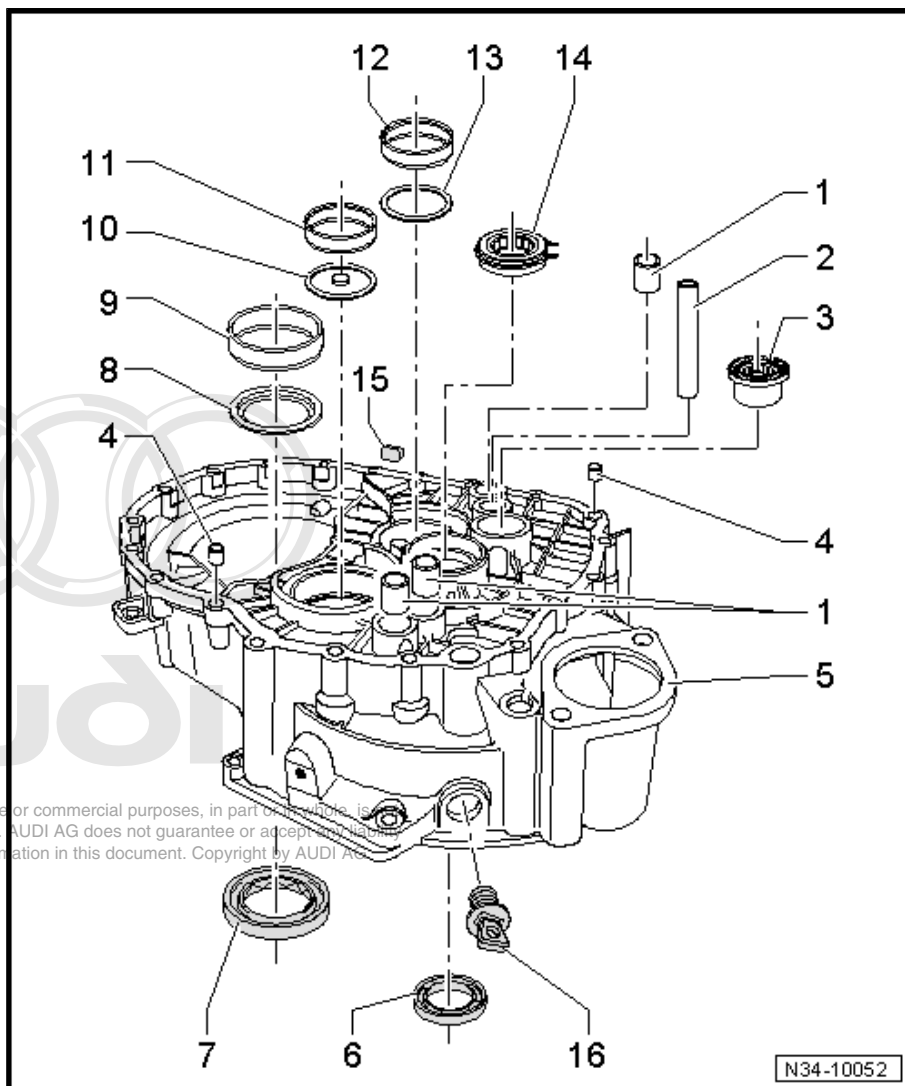
- ☐ For flange shaft (right-side)
- ☐ Renewing ⇒ [page 168](#)

8 - Shim

- ☐ For differential
- ☐ Installation position: Shoulder on inside diameter faces towards oil seal ⇒ [Item 7 \(page 112\)](#)

9 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Removing and installing ⇒ [page 172](#)



- ☐ If renewed: adjust differential ⇒ [page 175](#)

10 - Oil deflector plate

- ☐ Installation position: Shoulder on drilling faces towards output shaft

11 - Tapered roller bearing outer race

- ☐ For 1st - 4th gear output shaft
- ☐ Removing and installing ⇒ [page 137](#)
- ☐ If renewed: Adjust 1st - 4th gear output shaft ⇒ [page 157](#)

12 - Tapered roller bearing outer race

- ☐ For 5th/6th and reverse gear output shaft
- ☐ Removing and installing ⇒ [page 147](#)
- ☐ If renewed: Adjust 5th/6th and reverse gear output shaft ⇒ [page 161](#)

13 - Shim

- ☐ For 5th/6th and reverse gear output shaft
- ☐ Always 0.65 mm thick

14 - Roller bearing

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

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15 - Magnet

- ☐ Held in place by joint surface of housing

16 - Cap

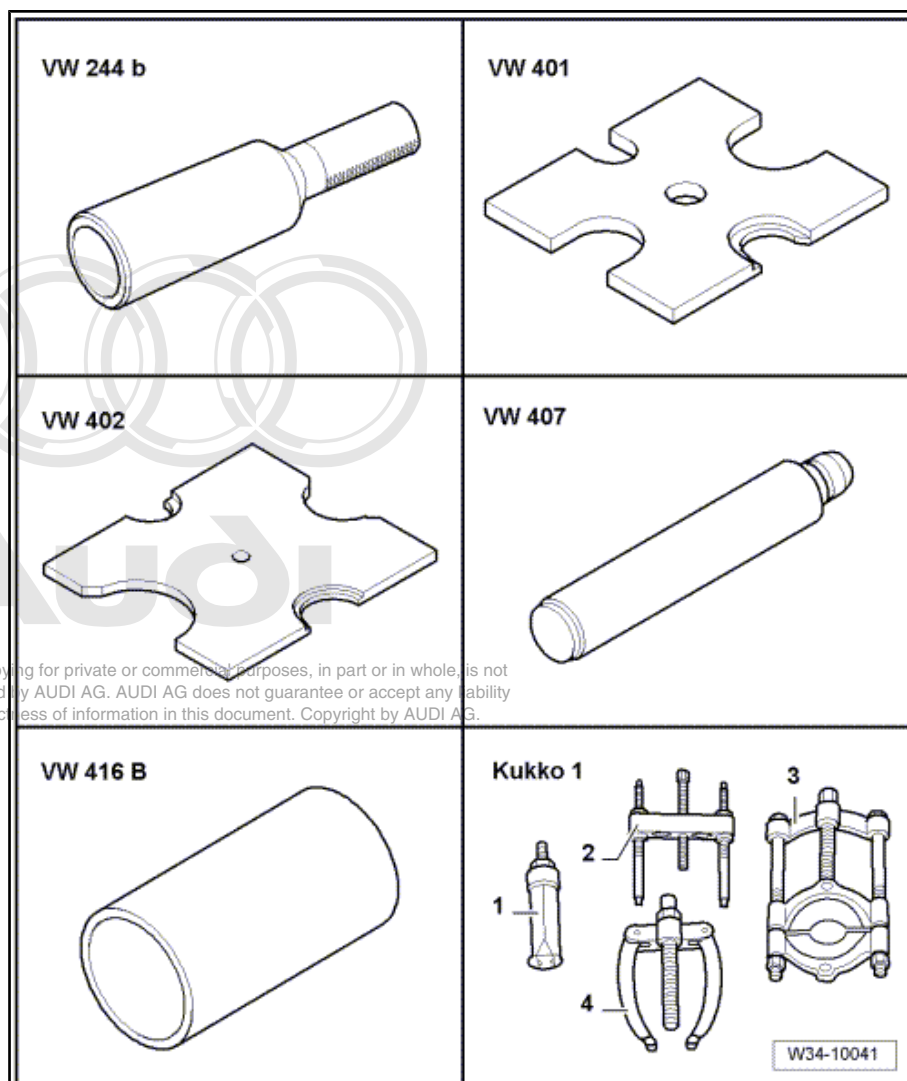
- ☐ Not fitted on all clutch housings

7.3 Servicing gearbox housing

Special tools and workshop equipment required

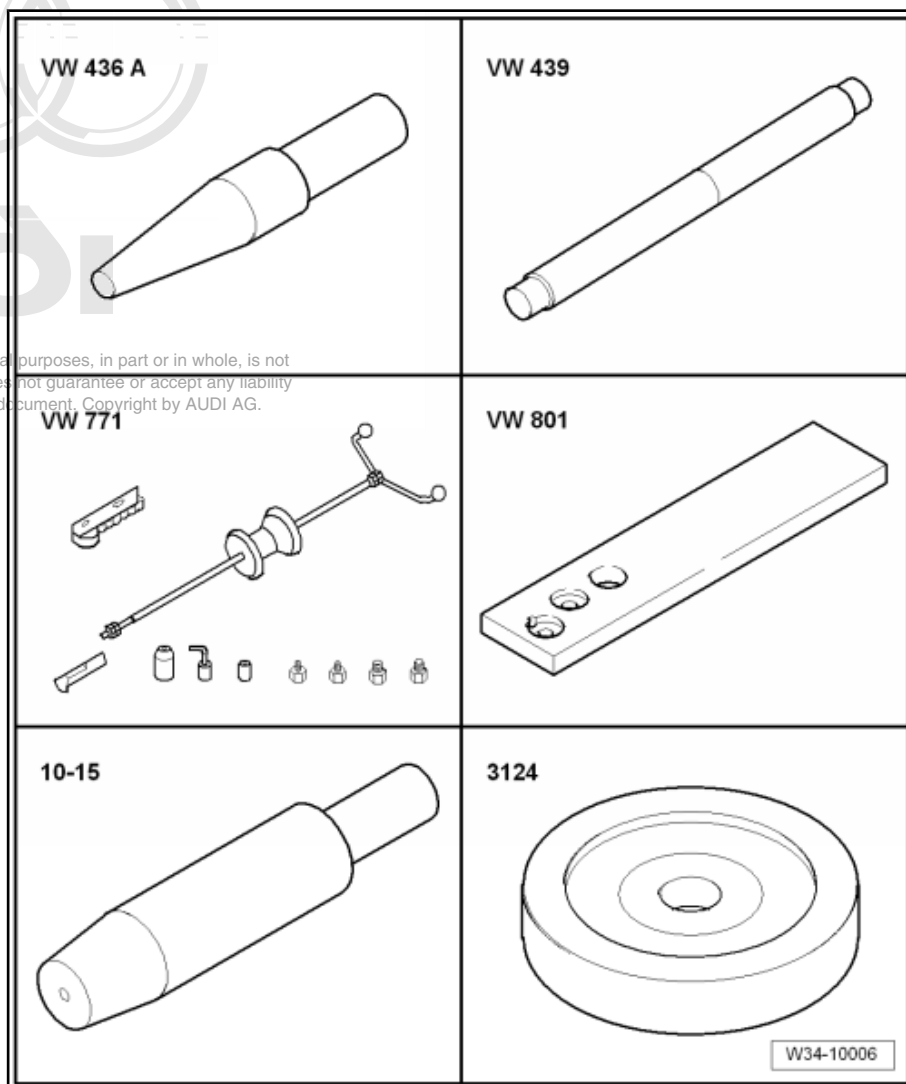
- ◆ Drift sleeve - VW 244B-
- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Tube - VW 416 B-
- ◆ -1- Internal puller - Kukko 21/2-
- ◆ -1- Internal puller - Kukko 21/4-
- ◆ -4- Counter-support - Kukko 22/2-

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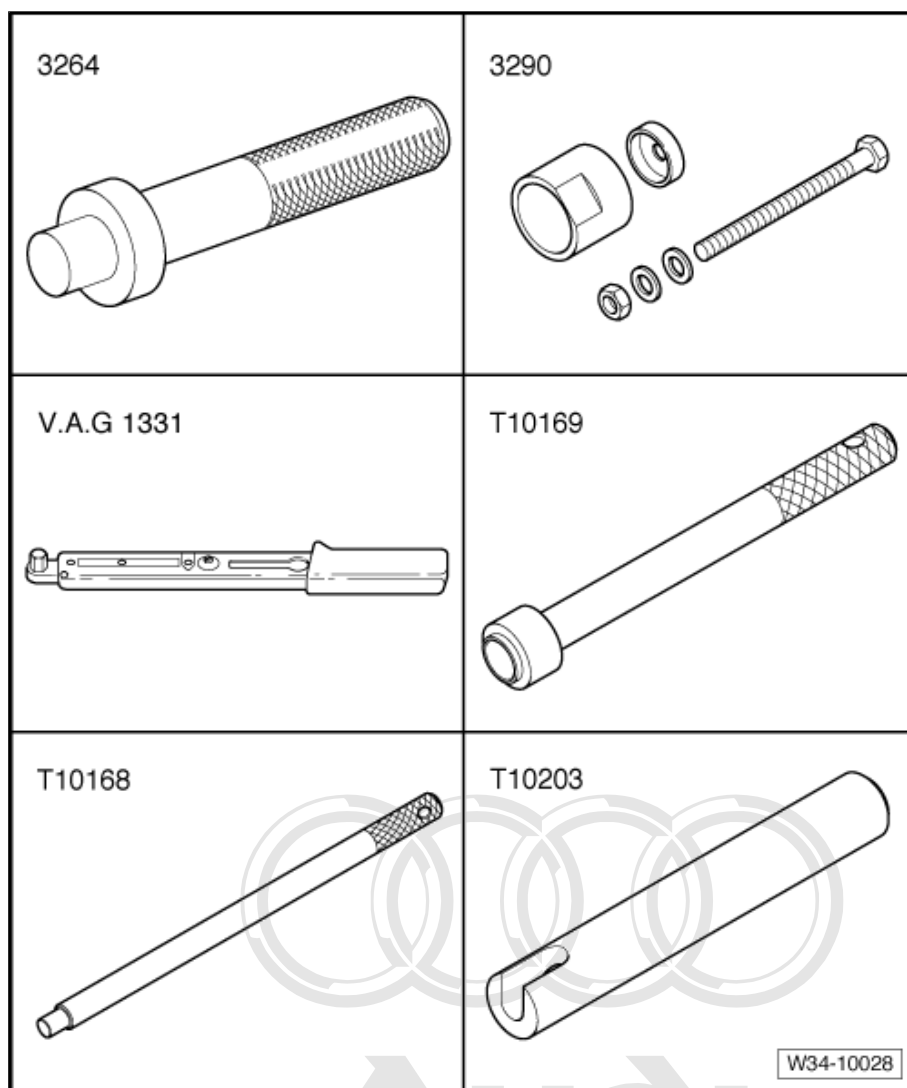


- ◆ Guide pin - VW 436A-
- ◆ Guide pin - VW 439-
- ◆ Multi-purpose tool - VW 771-
- ◆ Support plate - VW 801-
- ◆ Guide pin - 10-15-
- ◆ Thrust piece - 3124-

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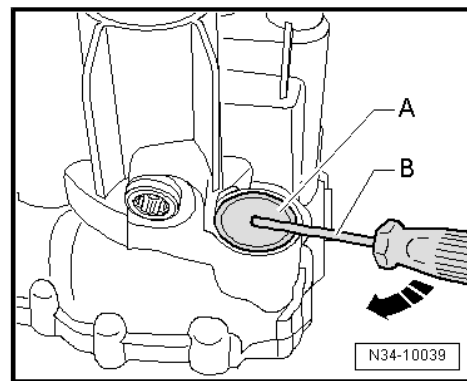
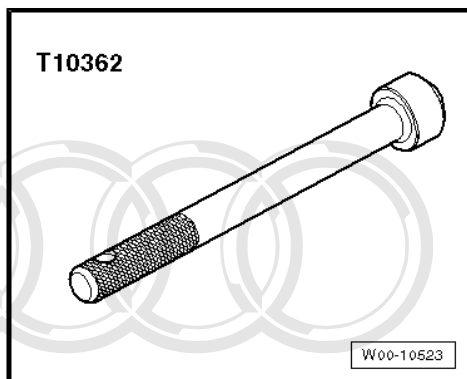


- ◆ Punch - 3264-
- ◆ Assembly tool - 3290-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Drift - T10168-
- ◆ Thrust piece - T10203-
- ◆ Drift - T10169-

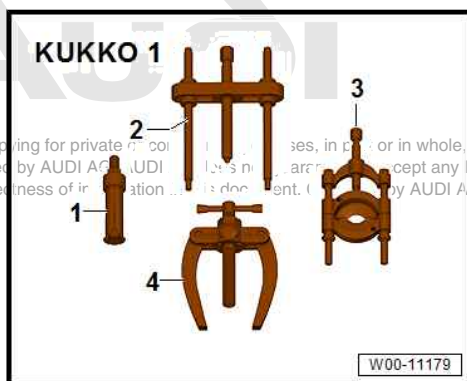


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- ◆ Or drift - T10362-
⇒ [page 119](#)



- ◆ -1- Internal puller -
Kukko 21/2-

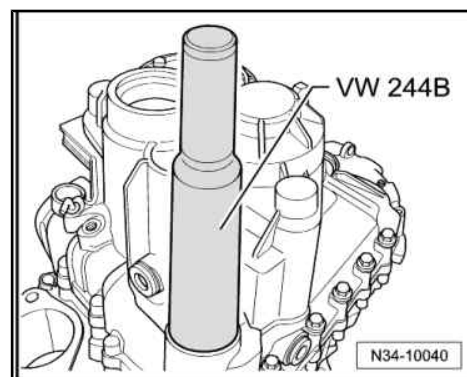


- ◆ -1- Internal puller -
Kukko 21/4-
- ◆ -4- Counter-support -
Kukko 22/2-

Removing sealing cap -A-

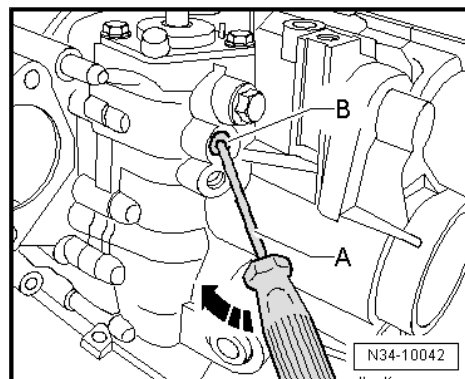
- Pierce rubber in centre of sealing cap with a screwdriver -B- and pry off sealing cap -in direction of arrow-

Driving in sealing cap onto stop



Removing angled rod for selector shaft

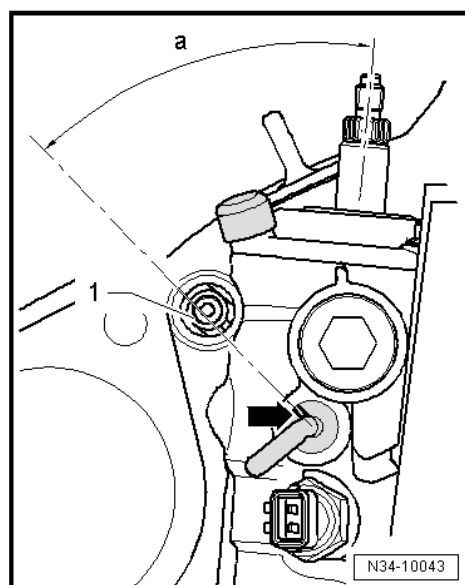
- Shear off rod in released position.
- Insert screwdriver -A- in bore for angled rod -B-.
- Lever out angled rod in direction of -arrow-.



Installation position of angled rod

- Marking on angled rod -arrow- must face towards connection on slave cylinder -1-.

Dimension -a- must be approx. 45°.



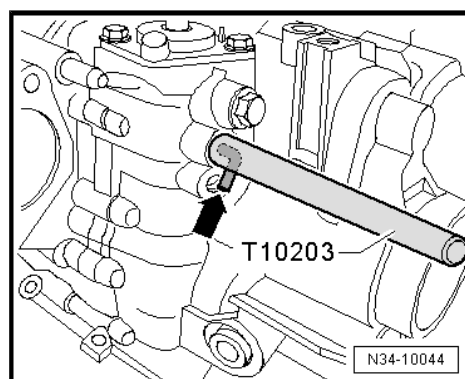
Driving in angled rod -arrow- for selector shaft as far as tool stop



Note

Angled rod must be in released position when driving in.

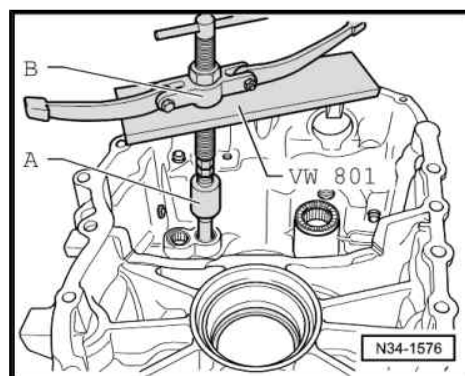
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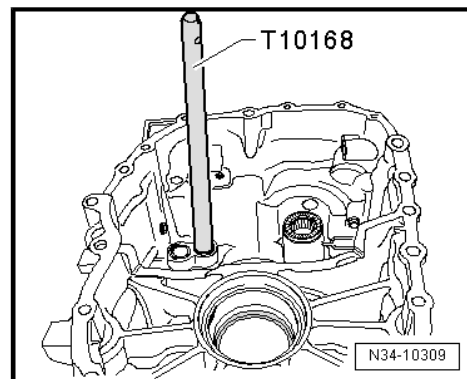
Pulling out bearing bush for selector rod

A - Internal puller 14.5 ... 18.5 mm , e.g. -Kukko 21/2-

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

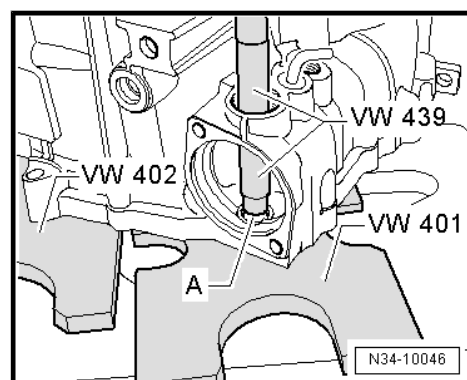


Driving in bearing bush for selector rod (drive in until tool contacts stop)



Pressing stop sleeve -A- out of gearbox housing

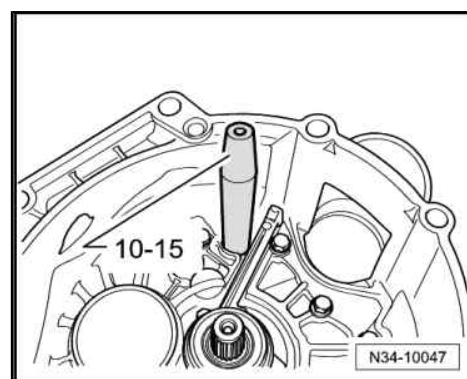
- Place gearbox housing on thrust plates - VW 401- and -VW 402- so that the dowel sleeves in the gearbox housing do not become damaged.



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Driving out stop sleeve (gearbox not dismantled) using guide pin - 10-15-

- Locking bolt and selector shaft removed
- Turn gearbox so that stop sleeve does not drop into gearbox.



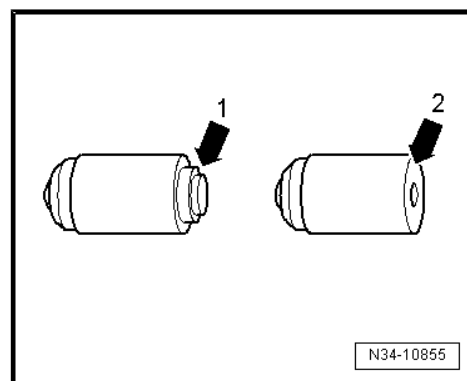
Identification of different types of stop sleeve

The following stop sleeves can be installed:

Stop sleeve with shoulder -arrow 1- ➔ [page 120](#)

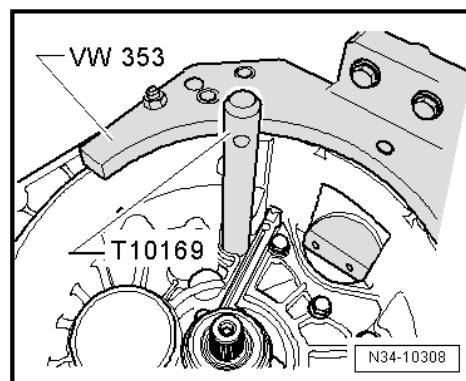
Stop sleeve without shoulder -arrow 2- ➔ [page 120](#)

Select correct components from ➔ Electronic parts catalogue .



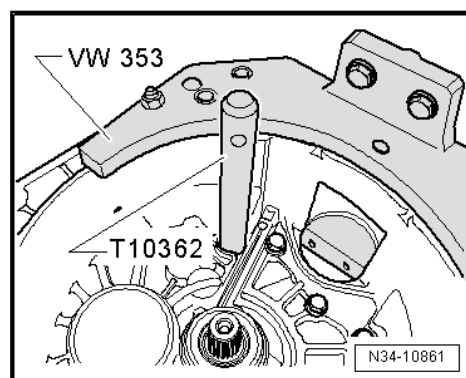
Driving in stop sleeve with shoulder as far as tool stop

- Gearbox housing bolted to clutch housing



Driving in stop sleeve without shoulder as far as tool stop

- Gearbox housing bolted to clutch housing



Pulling needle bearing for reverse shaft out of gearbox housing

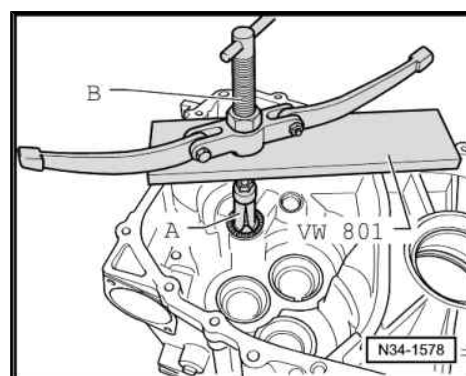
A - Internal puller 23.5 ... 30 mm , e.g. -Kukko 21/4-

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



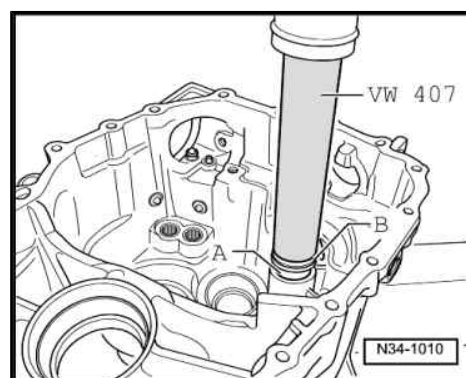
Note

The needle bearing is destroyed during removal and must be renewed.



Pressing needle bearing -A- into gearbox housing

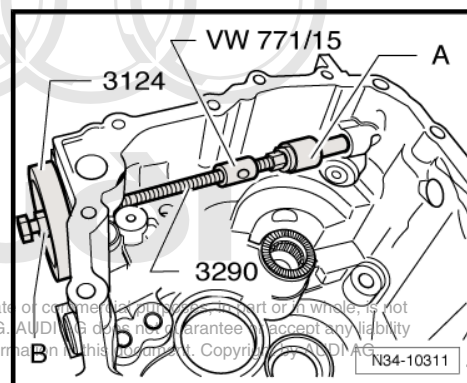
- Before pressing in, place reverse shaft thrust washer -A- onto needle bearing.
- Support gearbox housing with tube - VW 416 B- directly below bearing mounting.



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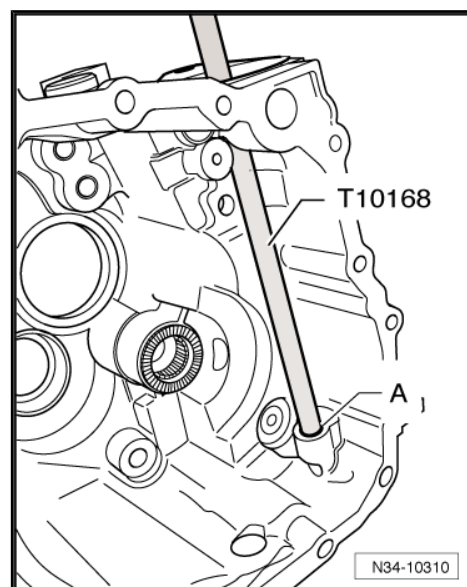
Pulling out selector shaft bearing bush

- Hold spindle of assembly tool - 3290- tight and turn nut -B-.
- A - Internal puller 14.5 ... 18.5 mm , e.g. -Kukko 21/2-



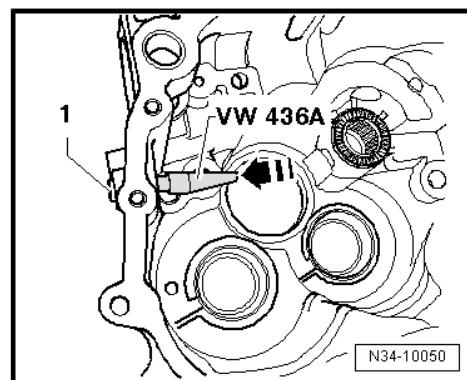
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Driving in bearing bush -A- for selector shaft until flush



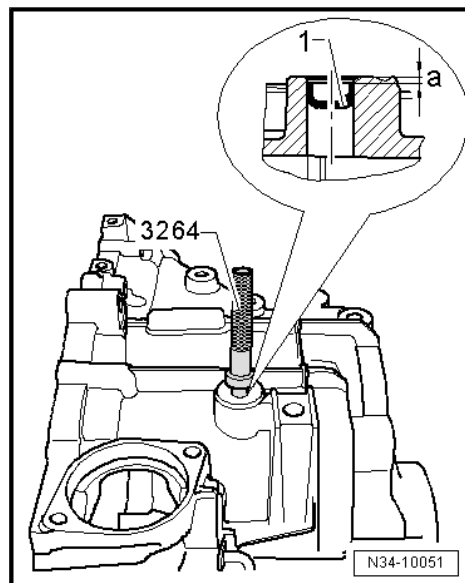
Driving out sealing plug -1-

- Drive out plug -1- from inside of gearbox housing -arrow-.



Driving in sealing plug -1-

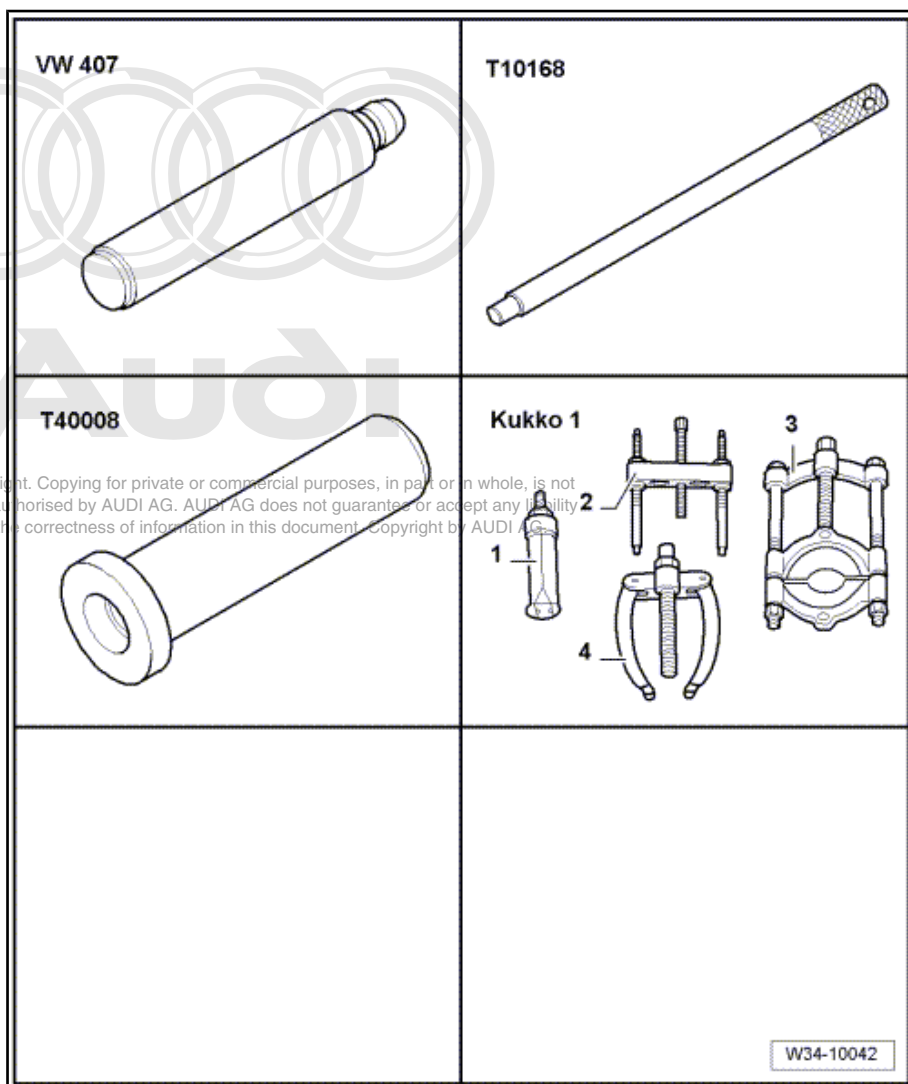
- Use punch - 3264- to drive in sealing plug to dimension -a- = approx. 3 mm below top edge of housing.



7.4 Servicing clutch housing

Special tools and workshop equipment required

- ◆ Press tool - VW 407-
- ◆ Drift - T10168-
- ◆ Thrust piece - T40008-
- ◆ -1- Internal puller - Kukko 21/2-
- ◆ -1- Internal puller - Kukko 21/4-
- ◆ -4- Counter-support - Kukko 22/2-

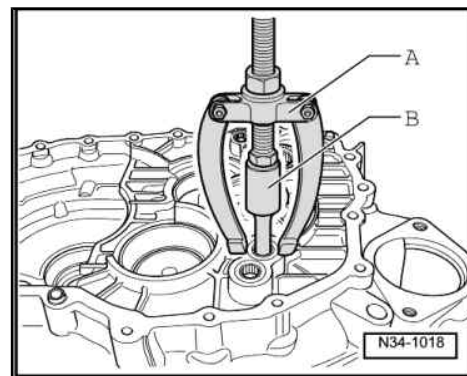


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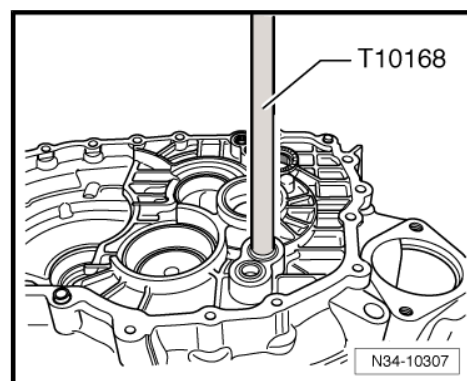
Pulling out bearing bush for selector rod

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

B - Internal puller 14.5 ... 18.5 mm , e.g. -Kukko 21/2-



Driving in bearing bush for selector rod (drive in until tool contacts stop)



Pulling needle bearing out of clutch housing

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

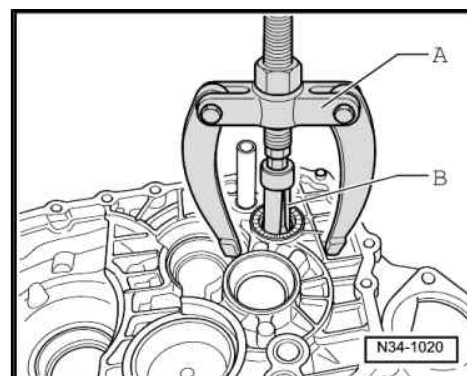
B - Internal puller 23.5 ... 30 mm , e.g. -Kukko 21/4-

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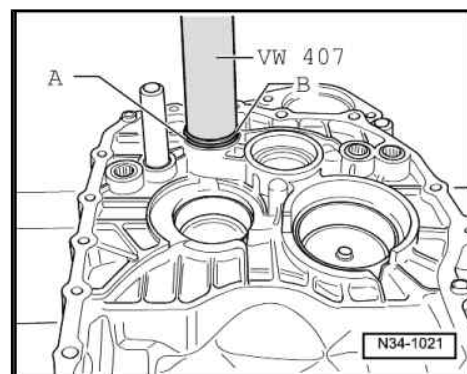
Note

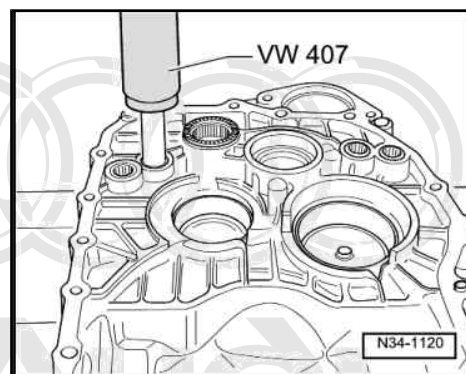
The needle bearing is destroyed during removal and must be renewed.



Pressing needle bearing -A- into clutch housing

- Before pressing in, place reverse shaft thrust washer -B- onto needle bearing.



Pressing reverse gear selector fork shaft into clutch housing

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35 – Gears, shafts

1 Input shaft

⇒ [“1.1 Exploded view - input shaft”, page 125](#)

⇒ [“1.2 Dismantling and assembling input shaft”, page 127](#)

1.1 Exploded view - input shaft



Note

Lubricate all bearings on input shaft with gear oil before installing.

1 - Circlip

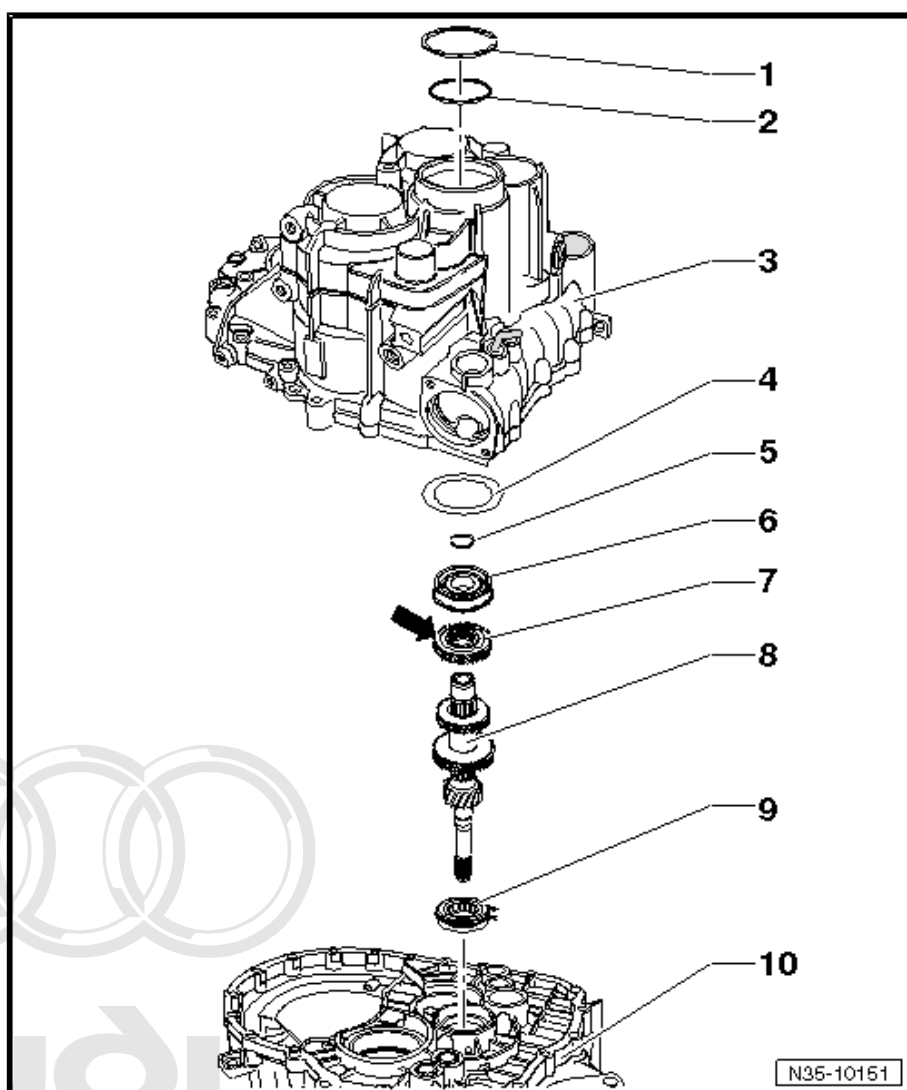
- ☐ For grooved ball bearing on input shaft
⇒ [Item 6 \(page 126\)](#)
- ☐ Removing and installing
⇒ [page 89](#)

2 - Shim

- ☐ Outside diameter = 78.6 mm
- ☐ Can only be fitted on modified gearbox housing (from gearbox manufacturing date 10 04 6 to 20 01 8) ⇒ [page 130](#)
- ☐ Select correct components from ⇒ Electronic parts catalogue

3 - Gearbox housing

- ☐ From gearbox manufacturing date 10 04 6 to 20 01 8: modified in area of seat for grooved ball bearing
⇒ [Item 6 \(page 126\)](#) to match shims
⇒ [Item 2 \(page 125\)](#) and
⇒ [Item 4 \(page 125\)](#)
⇒ [page 130](#)
- ☐ From gearbox manufacturing date 21 01 8 onwards, grooved ball bearing and bearing seat have flattened sides ⇒ [page 130](#)
- ☐ Select correct components from ⇒ Electronic parts catalogue



4 - Shim

- ☐ Outside diameter = 85 mm
- ☐ Can only be fitted on modified gearbox housing (from gearbox manufacturing date 10 04 6 to 20 01 8)
⇒ [page 130](#)
- ☐ Select correct components from ⇒ Electronic parts catalogue



5 - Circlip

- ☐ When grooved ball bearing ⇒ [Item 6 \(page 126\)](#) or input shaft ⇒ [Item 8 \(page 126\)](#) are renewed: determine thickness of required circlip ⇒ [page 130](#)

6 - Grooved ball bearing

- ☐ Always renew
- ☐ Pulling off ⇒ [page 128](#)
- ☐ Installation position ⇒ [page 129](#)
- ☐ Pressing on ⇒ [page 129](#)
- ☐ From gearbox manufacturing date 21 01 8 onwards, grooved ball bearing and bearing seat have flattened sides ⇒ [page 130](#)

7 - 5th gear wheel

- ☐ Pressing off ⇒ [page 129](#)
- ☐ Installation position: Circular slot -arrow- faces towards grooved ball bearing ⇒ [Item 6 \(page 126\)](#)
- ☐ Pressing on ⇒ [page 129](#)

8 - Input shaft

- ☐ With 3rd/4th and 6th gear wheels

9 - Roller bearing

- ☐ With circlip
- ☐ Pulling out ⇒ [page 130](#)
- ☐ Pressing in ⇒ [page 130](#)
- ☐ Installation position: Circlip in bearing faces towards input shaft

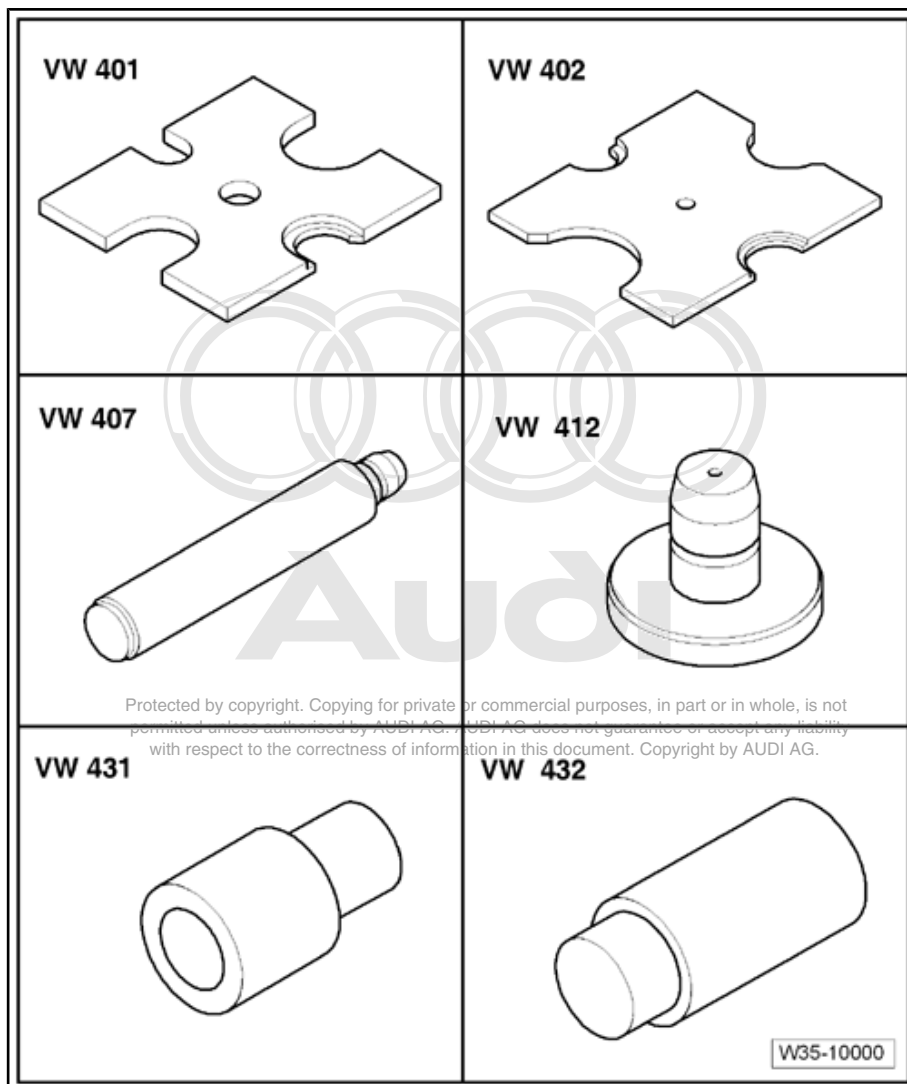
10 - Clutch housing

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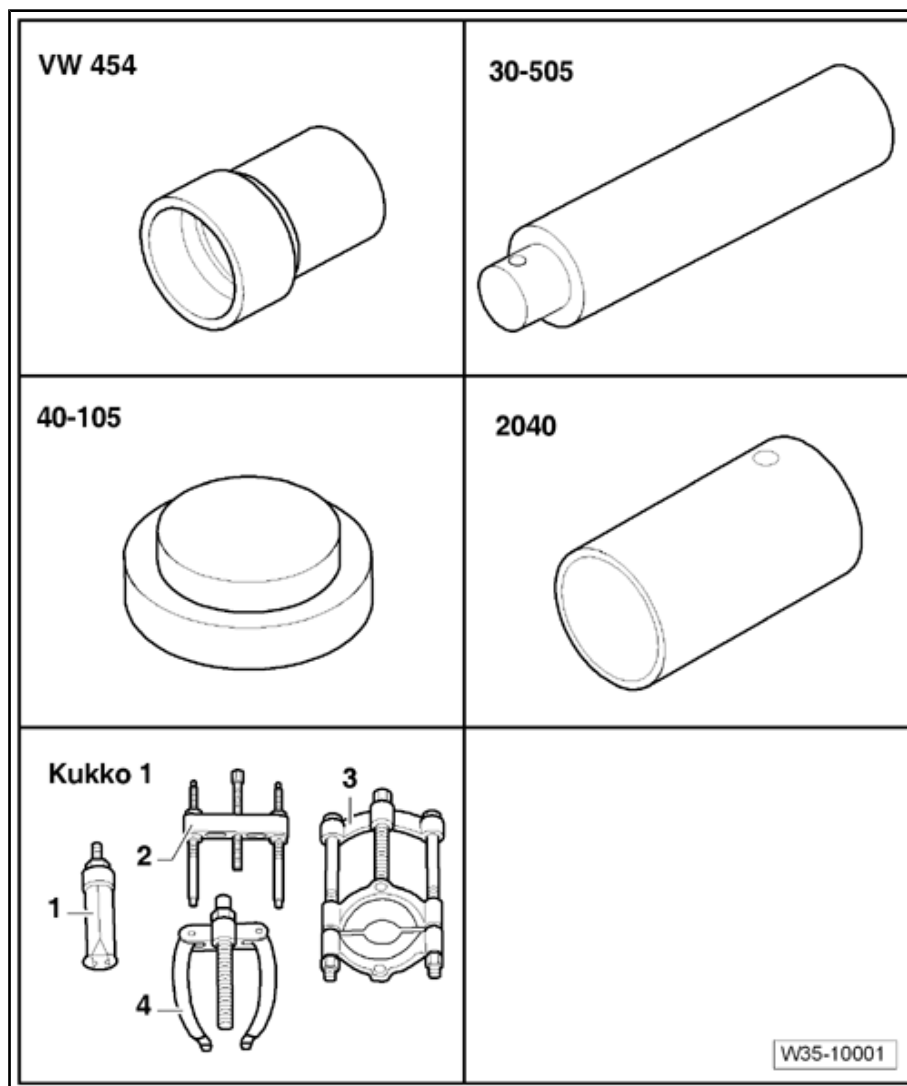
1.2 Dismantling and assembling input shaft

Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 412-
- ◆ Thrust piece - VW 431-
- ◆ Thrust piece - VW 432-



- ◆ Press tool - VW 454-
- ◆ Press tool - 30-505-
- ◆ Thrust plate - 40-105-
- ◆ Tube - 2040-
- ◆ -1- Internal puller - Kukko 21/5-
- ◆ -2- Puller - Kukko 18/1-
- ◆ -3- Splitter - Kukko 17/1-
- ◆ -3- Splitter - Kukko 17/2-
- ◆ -4- Counter-support - Kukko 22/2-

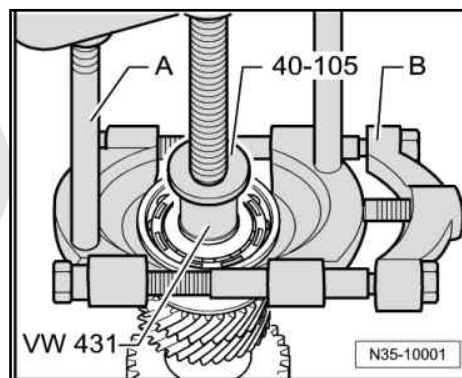


Pulling off grooved ball bearing

- First remove circlip from input shaft.
- Before setting up puller, position thrust piece - VW 431- and thrust plate - 40-105- on input shaft.
- Apply splitter -B- at circular slot for circlip in bearing.

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

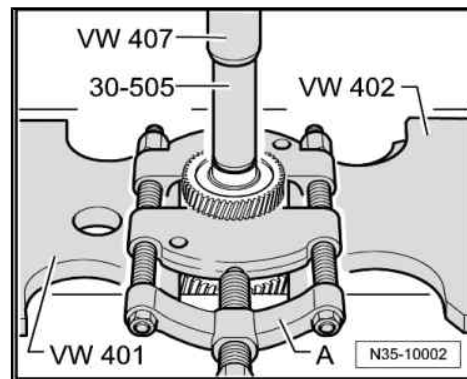
B - Splitter 12...75 mm , e.g. -Kukko 17/1-



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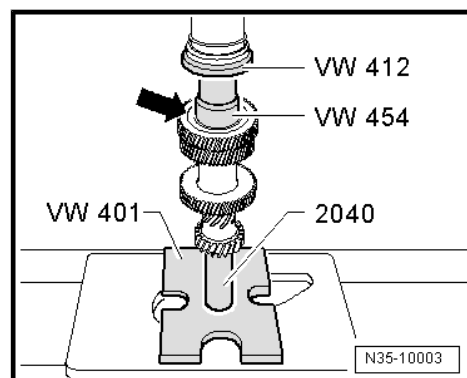
Pressing off 5th gear wheel

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



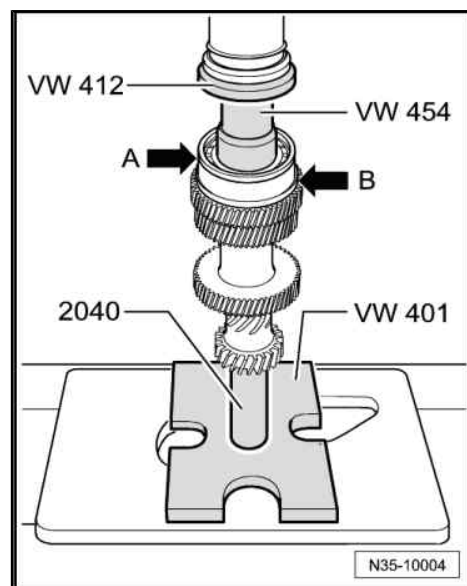
Pressing on 5th gear wheel

Slot -arrow- on gear wheel must face upwards.



Installation position of grooved ball bearing

Slot for circlip faces upwards -arrow A- and shoulder -arrow B- must face towards 5th gear wheel.

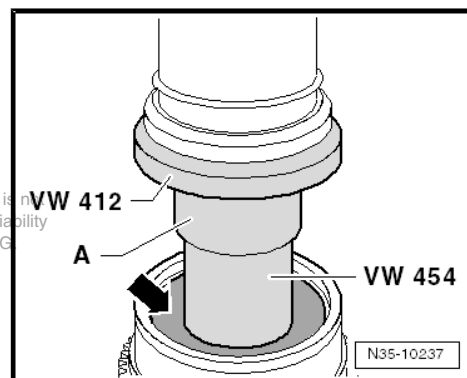


Pressing on grooved ball bearing

Grooved ball bearing with rubber ring -arrow-

Shoulder -A- faces towards press tool - VW 412- .

- Determine thickness of circlip for grooved ball bearing on input shaft (⇒ next illustration) and fit circlip.



Determining thickness of circlip for grooved ball bearing on input shaft

- Install a 1.86 mm thick circlip -A- in slot on input shaft and press circlip upwards.
- Measure gap between grooved ball bearing -B- and fitted circlip -A- using feeler gauge -C-.
- Remove circlip fitted for measurement.
- Select circlip from table.

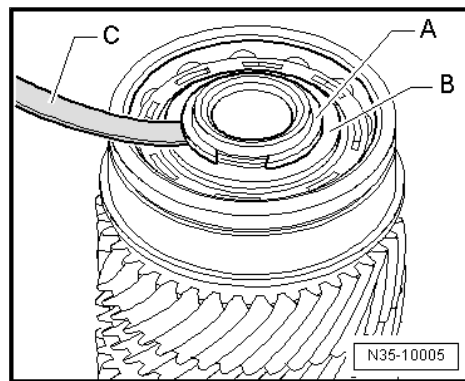


Note

Select circlips from ➔ *Electronic parts catalogue* .

The following circlips are available:

Measured value (mm)	Circlip thickness (mm)	Axial clearance (mm)
0.01 ... 0.05	1.86	0.01 ... 0.05
0.05 ... 0.07	1.89	0.01 ... 0.05
0.07 ... 0.10	1.92	0.01 ... 0.05
0.10 ... 0.13	1.95	0.01 ... 0.05
0.13 ... 0.16	1.98	0.01 ... 0.05

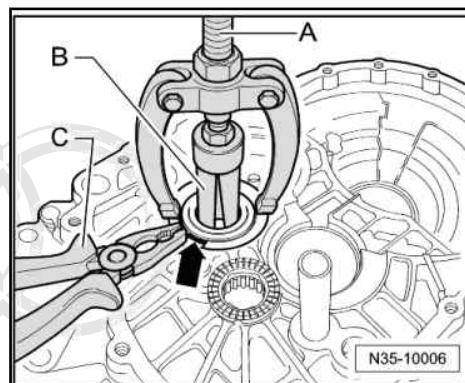


Pulling roller bearing out of clutch housing

- When pulling out, compress circlip -arrow- for roller bearing using pliers -C-.

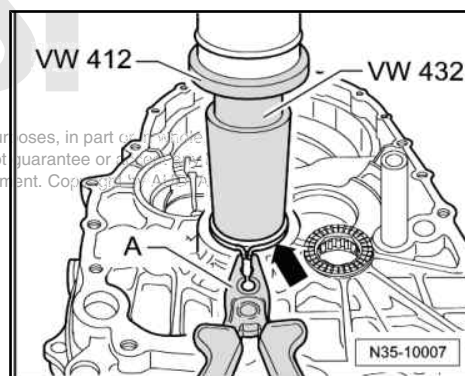
A - Counter-support , e.g. -Kukko 22/2-

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



Pressing roller bearing into clutch housing

- When pressing in, compress circlip -arrow- for roller bearing using pliers -A-.
- Remove the pliers before the roller bearing is in its final position. The circlip must engage in the groove in the clutch housing.



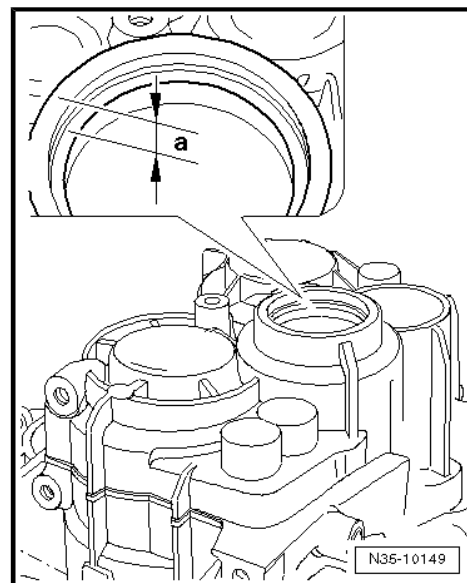
Modifications in area of grooved ball bearing

From gearbox manufacturing date 10 04 6 to approx. 20 01 8:

One shim above and one shim below bearing seat for grooved ball bearing ➔ [Item 6 \(page 126\)](#) .

Above bearing seat:

Bearing seat		Shim above bearing seat
Up to gearbox manufacturing date 09 04 6	Dimension "a" = 10 mm	No
From gearbox manufacturing date 10 04 6 to 20 01 8	Dimension "a" = 10.7 mm	Yes
Gearboxes manufactured from 21 01 8 onwards	Below bearing seat: Flattened side for grooved ball bearing	No

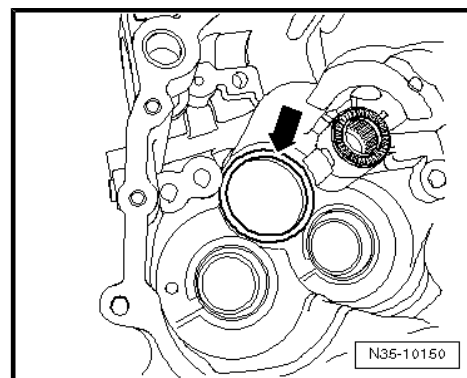


Below bearing seat -arrow-:

From gearbox manufacturing date 10 04 6 to approx. 20 01 8 slightly deeper

Bearing seat for grooved ball bearing -arrow- is slightly deeper to accommodate the shim below the bearing ⇒ [Item 6 \(page 126\)](#) .

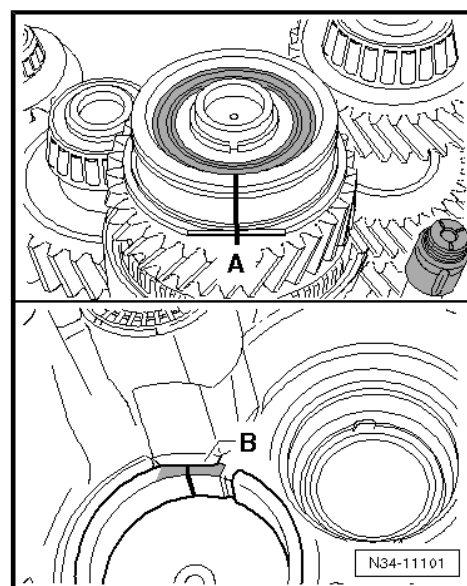
Below bearing seat		Shim below bearing seat
Up to gearbox manufacturing date 09 04 6	Not modified	No
From gearbox manufacturing date 10 04 6 to 20 01 8	Slightly deeper	Yes
Gearboxes manufactured from 21 01 8 onwards	Flattened side -B- for grooved ball bearing -A-	No



From gearbox manufacturing date 21 01 8 onwards, grooved ball bearing -A- and bearing seat -B- in gearbox housing have flattened sides.

- If sides are flattened, a shim must not be fitted above or below grooved ball bearing.

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2 Output shaft

⇒ "2.1 Exploded view - output shaft", page 132

⇒ "2.2 Dismantling and assembling output shaft", page 137

⇒ "2.3 Adjusting output shaft", page 157

2.1 Exploded view - output shaft

⇒ "2.1.1 Exploded view - output shaft for 1st - 4th gear", page 132

⇒ "2.1.2 Exploded view - output shaft for 5th, 6th and reverse gear", page 135

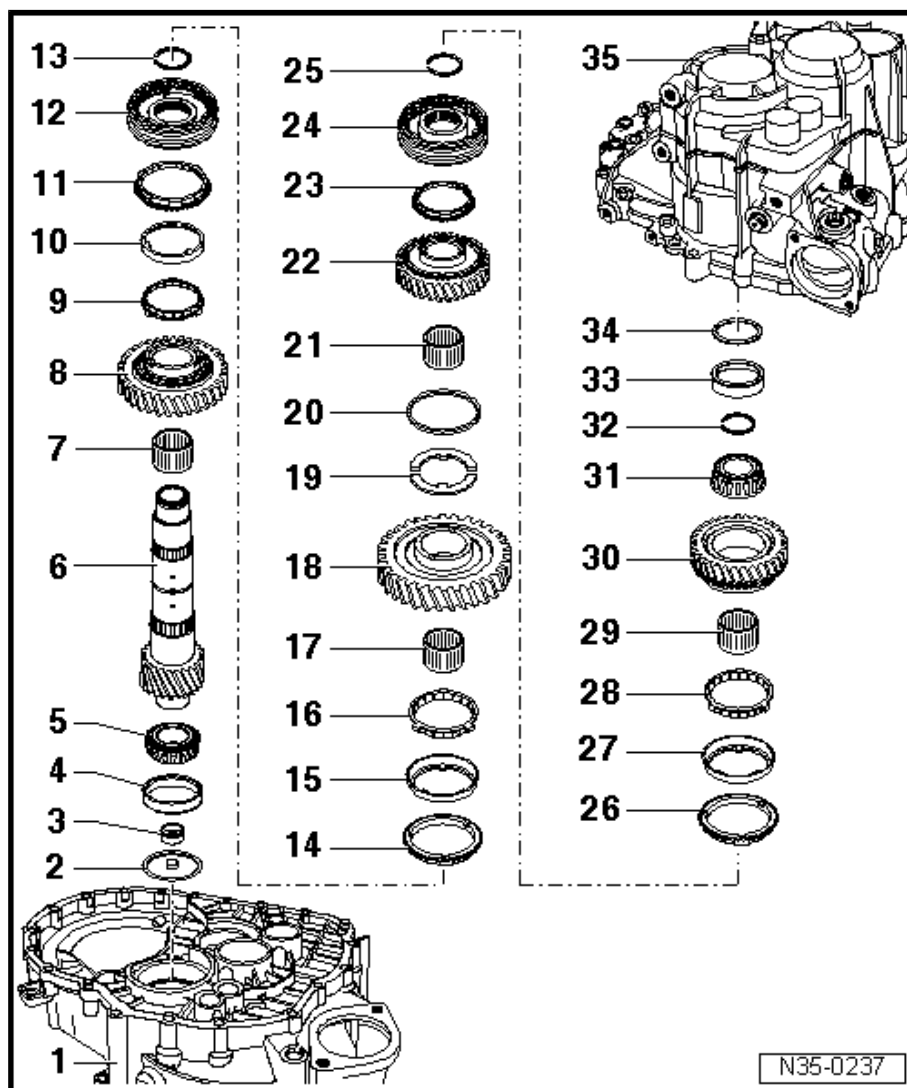
2.1.1 Exploded view - output shaft for 1st - 4th gear



Note

- ♦ Carry out output shaft adjustment ⇒ [page 157](#) if the output shaft or tapered roller bearings have been renewed.
- ♦ Always renew both tapered roller bearings together.

- 1 - Clutch housing
- 2 - Oil deflector plate
- 3 - Dished washer
 - ☐ Pulling out ⇒ [page 141](#)
 - ☐ Pressing in ⇒ [page 141](#)
- 4 - Tapered roller bearing outer race
 - ☐ Pulling out ⇒ [page 141](#)
 - ☐ Pressing in ⇒ [page 142](#)
- 5 - Tapered roller bearing inner race
 - ☐ Pressing off ⇒ [page 143](#)
 - ☐ Pressing on ⇒ [page 143](#)
- 6 - Output shaft
 - ☐ For 1st to 4th gear
 - ☐ Adjusting ⇒ [page 157](#)
- 7 - Needle bearing
 - ☐ For 2nd gear
- 8 - 2nd speed selector gear
- 9 - Synchro-ring
 - ☐ (Inner ring for 2nd gear)
 - ☐ Checking for wear ⇒ [page 143](#)
 - ☐ Check lugs for scoring
 - ☐ Installation position ⇒ [page 144](#)



10 - Outer ring for 2nd gear

- ☐ Fit on synchro-ring ⇒ [Item 9 \(page 132\)](#)
- ☐ Renew if scored or if there are visible traces of wear
- ☐ Installation position ⇒ [page 144](#)

11 - 2nd gear synchro-ring

- ☐ Checking for wear ⇒ [page 143](#)
- ☐ Installation position ⇒ [page 144](#)

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

- ☐ Press off together with 2nd speed selector gear after removing circlip ⇒ [Item 13 \(page 133\)](#) ⇒ [page 142](#)
- ☐ Dismantling ⇒ [page 144](#)
- ☐ Assembling locking collar/synchro-hub ⇒ [page 144](#)
- ☐ Installation position ⇒ [page 144](#)
- ☐ Pressing on ⇒ [page 145](#)

13 - Circlip

14 - 1st gear synchro-ring

- ☐ Checking for wear ⇒ [page 143](#)
- ☐ Assemble so that the recesses engage on the locking pieces on the locking collar ⇒ [Item 12 \(page 133\)](#)

15 - Outer ring for 1st gear

- ☐ Insert in synchro-ring ⇒ [Item 14 \(page 133\)](#) ; installation position ⇒ [page 145](#)
- ☐ Renew if scored or if there are visible traces of wear

16 - Synchro-ring

- ☐ (Inner ring for 1st gear)
- ☐ Checking for wear ⇒ [page 143](#)
- ☐ Check lugs for scoring
- ☐ Installation position ⇒ [page 145](#)

17 - Needle bearing

- ☐ For 1st gear

18 - 1st speed selector gear

- ☐ Installation position ⇒ [page 145](#)

19 - Thrust washers

- ☐ For 1st and 4th gear
- ☐ 2x
- ☐ Insert lug on thrust washer in hole on output shaft

20 - Securing clip

- ☐ Holds thrust washers ⇒ [Item 19 \(page 133\)](#) in position on output shaft

21 - Needle bearing

- ☐ For 4th gear

22 - 4th speed selector gear

23 - 4th gear synchro-ring

- ☐ Checking for wear ⇒ [page 146](#)

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

- ☐ Pull off together with 4th speed selector gear after removing circlip ⇒ [Item 25 \(page 134\)](#) ⇒ [page 142](#)
- ☐ Dismantling ⇒ [page 144](#)
- ☐ Installation position: Locking collar/synchro-hub ⇒ [page 146](#)
- ☐ Assembling locking collar/synchro-hub ⇒ [page 144](#) and ⇒ [page 144](#)

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- ☐ Pressing on ⇒ [page 146](#)

25 - Circlip

26 - 3rd gear synchro-ring

- ☐ Checking for wear ⇒ [page 143](#)

27 - Outer ring for 3rd gear

- ☐ Insert in synchro-ring ⇒ [Item 26 \(page 134\)](#) ; installation position ⇒ [page 145](#)
- ☐ Renew if scored or if there are visible traces of wear

28 - Synchro-ring

- ☐ (Inner ring for 3rd gear)
- ☐ Checking for wear ⇒ [page 143](#)
- ☐ Check lugs for scoring
- ☐ Installation position ⇒ [page 145](#)

29 - Needle bearing

- ☐ For 3rd gear

30 - 3rd speed selector gear

- ☐ Installation position ⇒ [page 145](#)

31 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 142](#)
- ☐ Pressing on ⇒ [page 146](#)

32 - Circlip

- ☐ When tapered roller bearing ⇒ [Item 31 \(page 134\)](#) or output shaft ⇒ [Item 6 \(page 132\)](#) are renewed: determine thickness of required circlip ⇒ [page 147](#)

33 - Tapered roller bearing outer race

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

34 - Shim

- ☐ Determining thickness ⇒ [page 157](#)

35 - Gearbox housing



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2.1.2 Exploded view - output shaft for 5th, 6th and reverse gear



Note

- ◆ Carry out output shaft adjustment ➔ [page 161](#) if the output shaft or tapered roller bearings have been renewed.
- ◆ Always renew both tapered roller bearings together.

1 - Clutch housing

2 - Shim

- ☐ Always 0.65 mm thick

3 - Tapered roller bearing outer race

- ☐ Pulling out ➔ [page 152](#)
- ☐ Pressing in ➔ [page 152](#)

4 - Tapered roller bearing inner race

- ☐ Pulling off ➔ [page 154](#)
- ☐ Pressing on ➔ [page 156](#)

5 - Output shaft

- ☐ For 5th, 6th and reverse gears
- ☐ Adjusting ➔ [page 161](#)

6 - Reverse gear synchro-hub

- ☐ Pressing off ➔ [page 153](#)
- ☐ Installation position ➔ [page 154](#)
- ☐ Pressing on ➔ [page 154](#)

7 - Circlip

8 - Reverse gear locking collar

- ☐ With synchro-ring

9 - Needle bearing

- ☐ For reverse selector gear

10 - Reverse selector gear

11 - Sleeve

- ☐ Press off with reverse selector gear ➔ [page 153](#)
- ☐ Installation position: Wide shoulder of sleeve faces towards reverse selector gear

Pressing on ➔ [page 154](#)

12 - Circlip

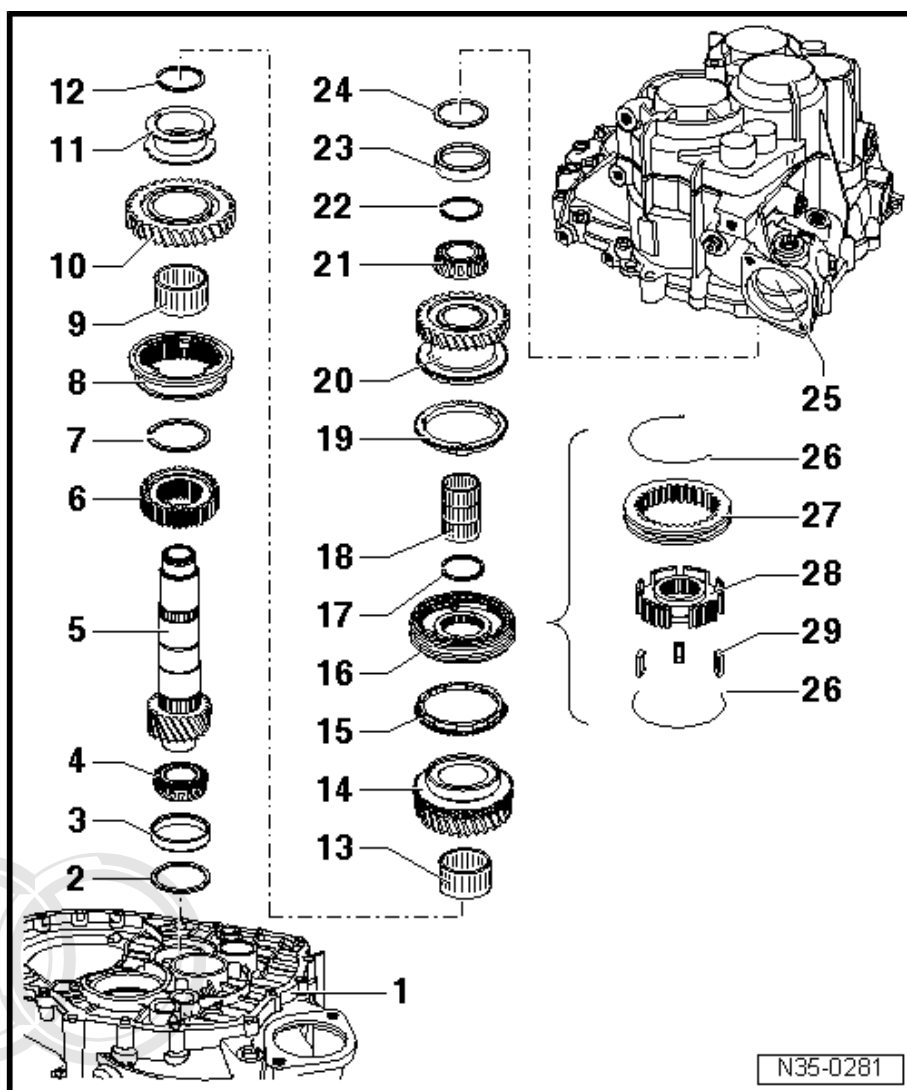
13 - Needle bearing

- ☐ For 6th gear

14 - 6th speed selector gear

15 - 6th gear synchro-ring

- ☐ Checking for wear ➔ [page 155](#)



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

- ☐ Press off together with 6th speed selector gear after removing circlip ⇒ [Item 17 \(page 136\)](#) ⇒ [page 153](#)
- ☐ Dismantling ⇒ [page 155](#)
- ☐ Assembling locking collar/synchro-hub ⇒ [page 155](#) and ⇒ [page 155](#)
- ☐ Pressing on ⇒ [page 155](#)

17 - Circlip**18 - Needle bearing**

- ☐ For 5th gear

19 - 5th gear synchro-ring

- ☐ Checking for wear ⇒ [page 155](#)

20 - 5th speed selector gear**21 - Tapered roller bearing inner race**

- ☐ Pulling off ⇒ [page 153](#)
 - ☐ Pressing on ⇒ [page 156](#)
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22 - Circlip

- ☐ When tapered roller bearing ⇒ [Item 21 \(page 136\)](#) or output shaft ⇒ [Item 5 \(page 135\)](#) are renewed: determine thickness of required circlip ⇒ [page 156](#)

23 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 156](#)
- ☐ Pressing in ⇒ [page 157](#)

24 - Shim

- ☐ Determining thickness ⇒ [page 161](#)

25 - Gearbox housing**26 - Spring**

- ☐ Installation position ⇒ [page 155](#)

27 - Locking collar**28 - Synchro-hub****29 - Locking pieces (3x)**

- ☐ Installation position ⇒ [page 155](#)

2.2 Dismantling and assembling output shaft

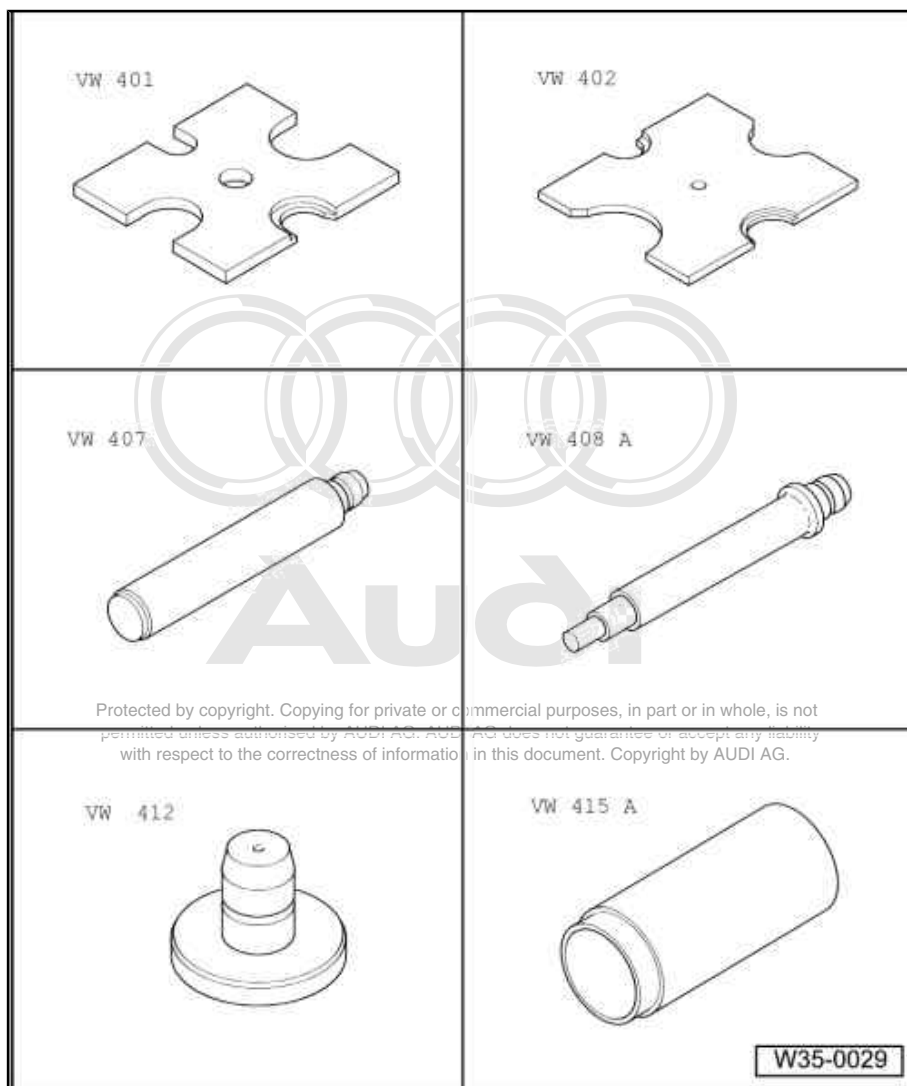
⇒ [“2.2.1 Dismantling and assembling output shaft for 1st - 4th gear”, page 137](#)

⇒ [“2.2.2 Dismantling and assembling output shaft for 5th, 6th and reverse gear”, page 147](#)

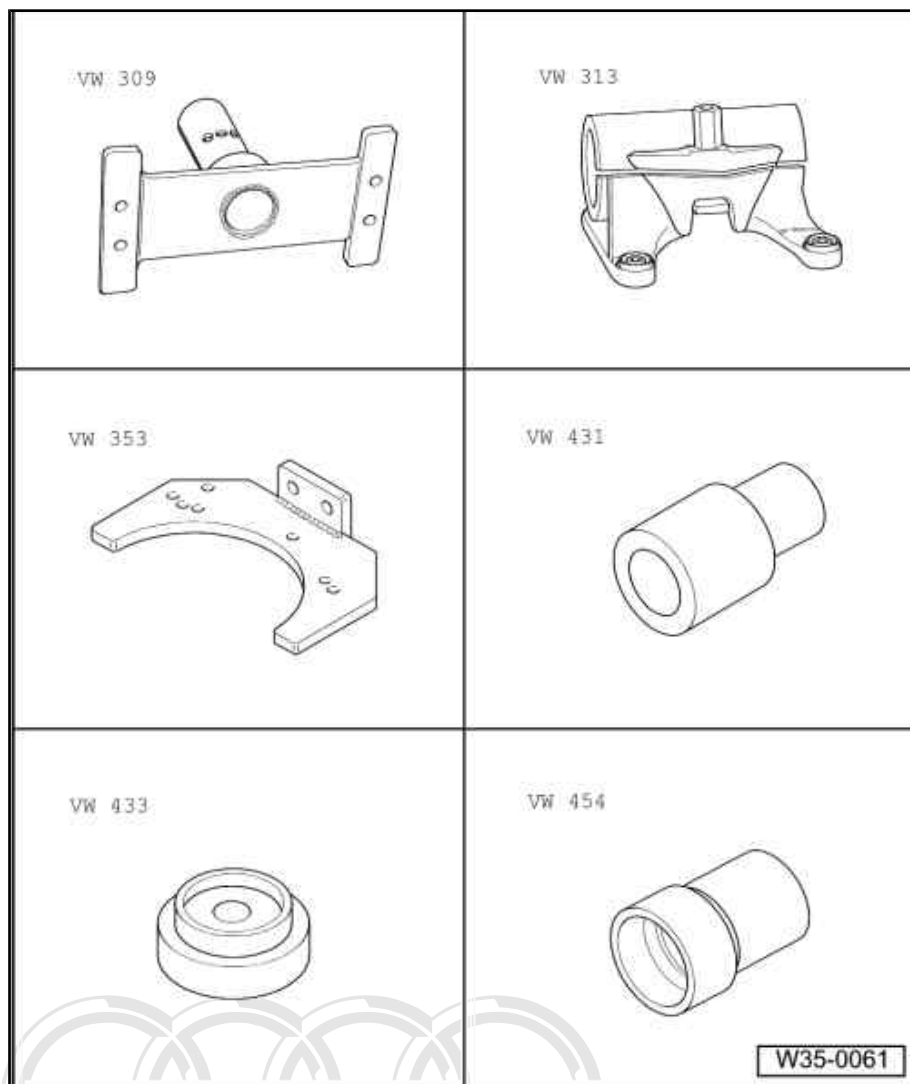
2.2.1 Dismantling and assembling output shaft for 1st - 4th gear

Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 408A-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 415 A-



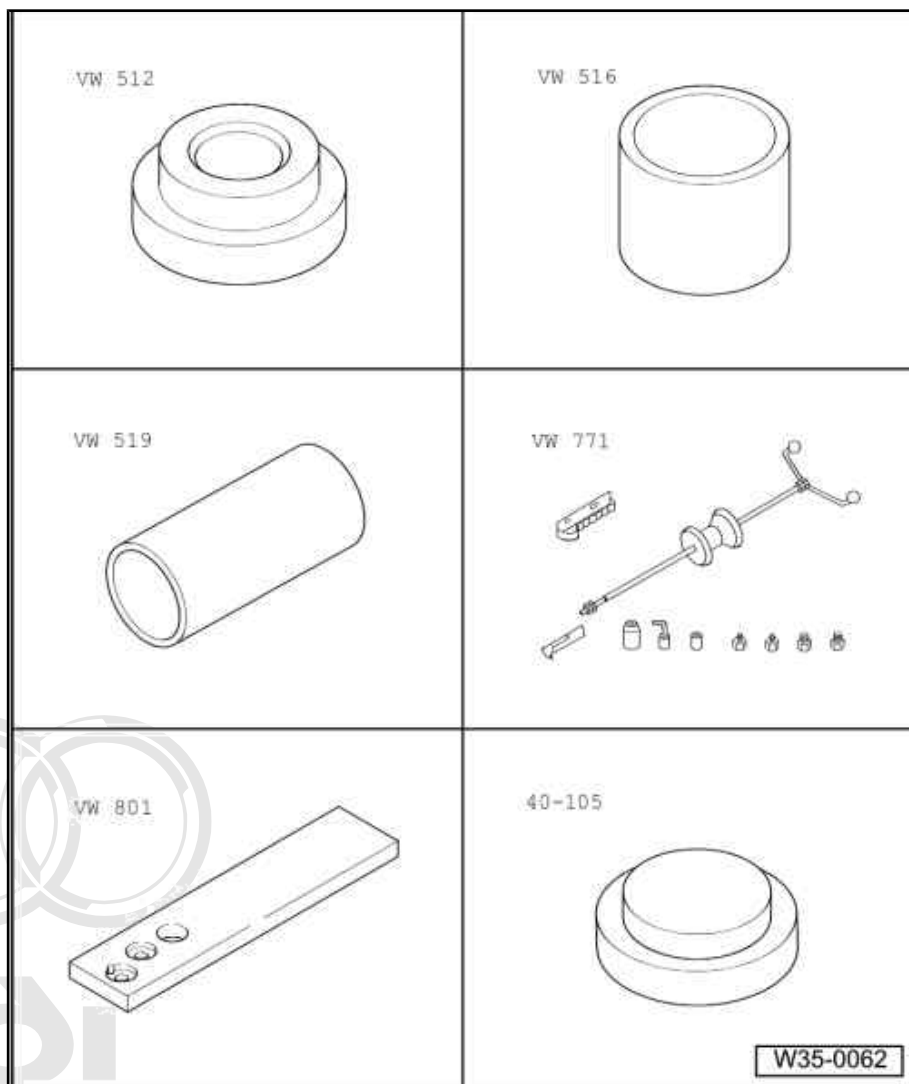
- ◆ Support plate - VW 309-
- ◆ Support clamp - VW 313-
- ◆ Gearbox support - VW 353-
- ◆ Thrust piece - VW 431-
- ◆ Press tool - VW 433-
- ◆ Press tool - VW 454-



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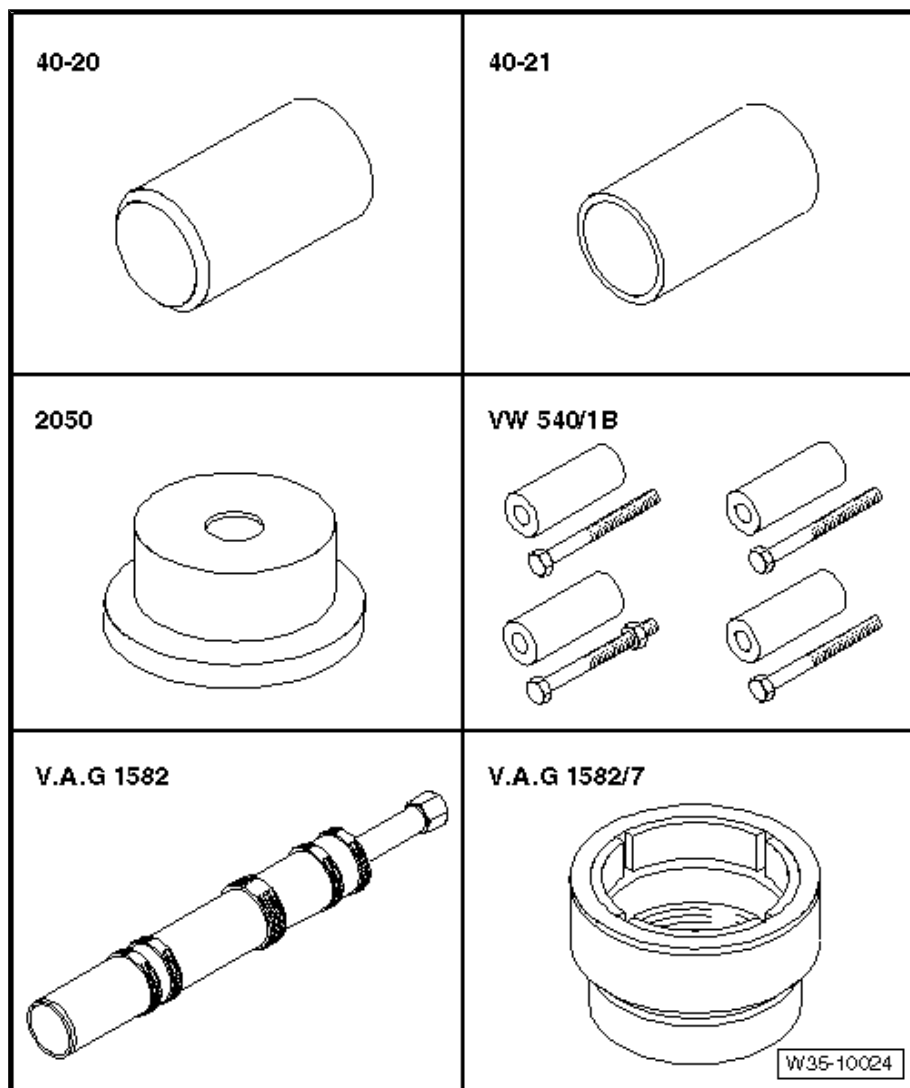
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- ◆ Thrust pad - VW 512-
- ◆ Tube - VW 516-
- ◆ Tube - VW 519-
- ◆ Multi-purpose tool - VW 771-
- ◆ Support plate - VW 801-
- ◆ Thrust plate - 40-105-



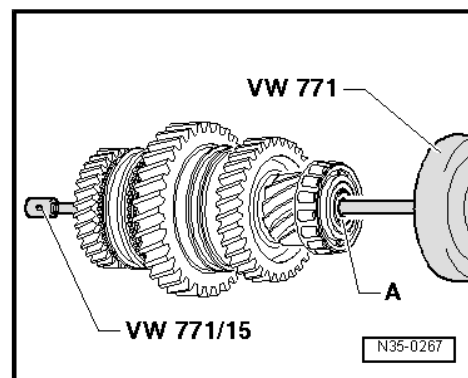
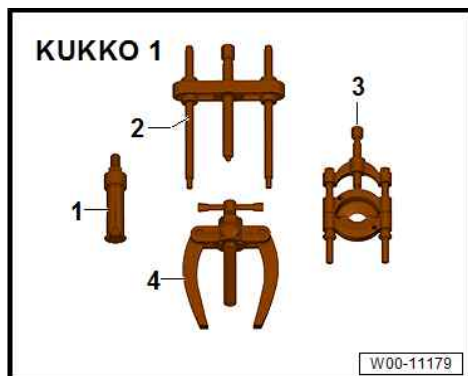
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- ◆ Drift sleeve - 40-20-
- ◆ Press tool - 40-21-
- ◆ Thrust piece - 2050-
- ◆ Engine and gearbox support supplement - VW 540/1 B-
- ◆ Tapered roller bearing puller - V.A.G 1582-
- ◆ Adapter - V.A.G 1582/7-



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- ◆ -1- Internal puller -
Kukko 21/7-

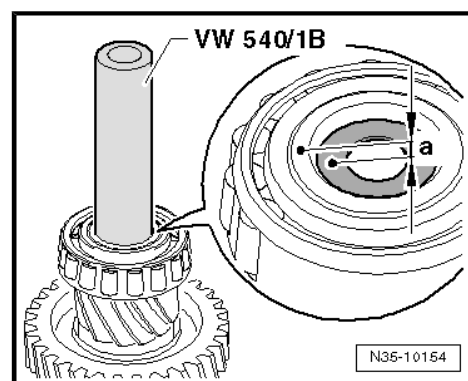


- ◆ -1- Internal puller -
Kukko 21/8-
- ◆ -2- Puller - Kukko
18/2-
- ◆ -3- Splitter - Kukko
17/2-
- ◆ -4- Counter-support -
Kukko 22/2-

**Pulling dished washer
-A- out of output shaft**

Pressing dished washer into output shaft

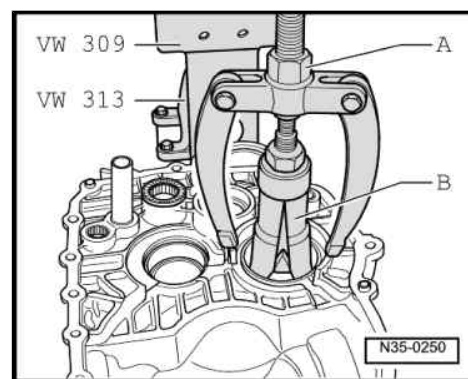
Dimension "a" = 2 mm



Pulling out tapered roller bearing outer race

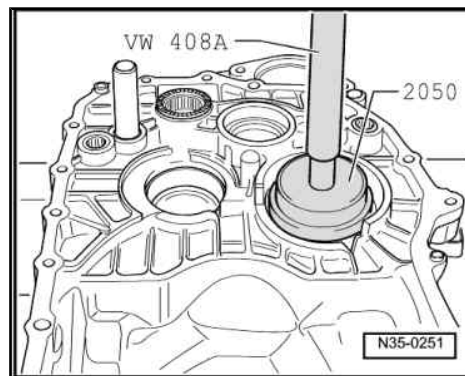
A - Counter-support , e.g. -Kukko 22/2-

B - Internal puller 56 ... 70 mm , e.g. -Kukko 21/8-



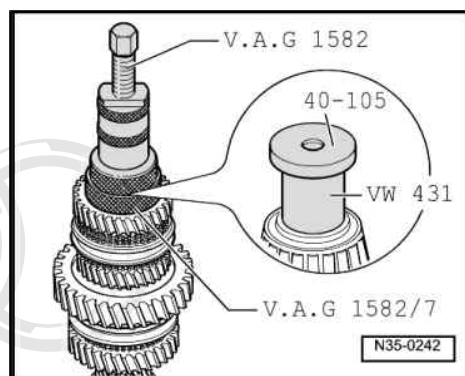
Pressing tapered roller bearing outer race into clutch housing

- Support clutch housing with drift sleeve - 40-20- directly below bearing mounting.



Pulling off tapered roller bearing inner race

- First remove circlip.
- Before applying puller, fit press tool - VW 431- in output shaft and place thrust plate - 40-105- on it.



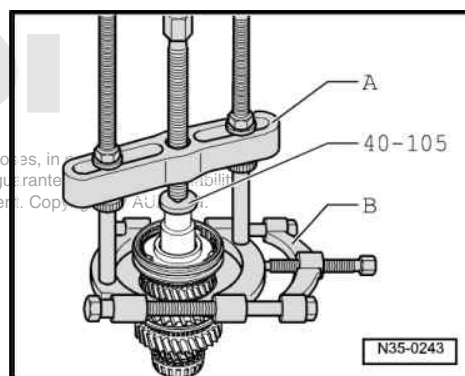
Pulling off 3rd and 4th gear synchro-hub/locking collar with 4th speed selector gear

- First remove circlip.

A - Puller , e.g. -Kukko 18/2-

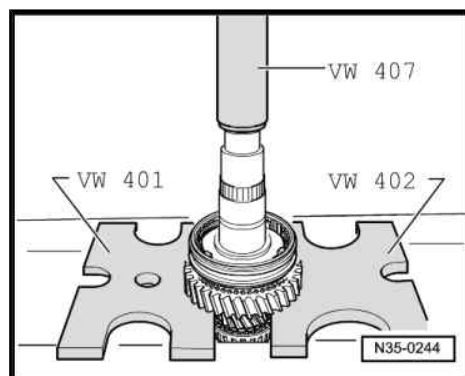
B - Splitter 22...115 mm , e.g. -Kukko 17/2-

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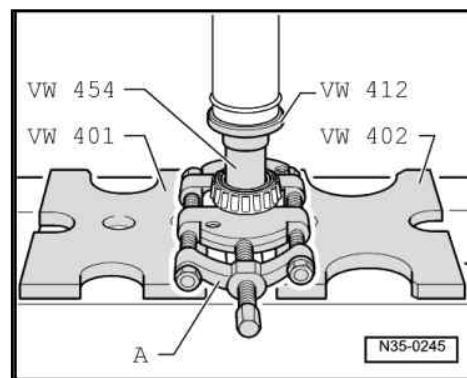
Pressing off 1st and 2nd gear locking collar and synchro-hub

After removing the circlip, press off 2nd speed selector gear and locking collar/synchro-hub together.

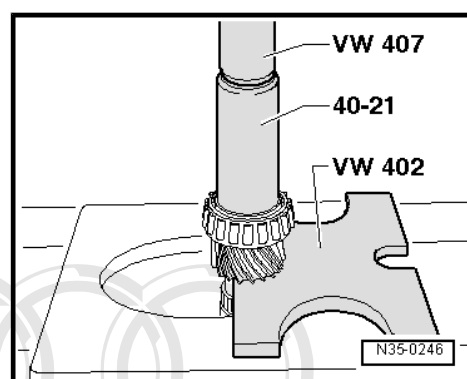


Pressing off tapered roller bearing inner race

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



Pressing on tapered roller bearing inner race



Checking inner ring for 1st, 2nd and 3rd gear for wear

- Press inner ring onto cone on selector gear and measure gap -a- using a feeler gauge.

Gap -a-	Installation depth	Wear limit
1st, 2nd and 3rd gear	0.75...1.25 mm	0.3 mm

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Checking 1st, 2nd and 3rd gear synchro-rings for wear

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

Gap -a-	Installation depth	Wear limit
1st, 2nd and 3rd gear	1.2...1.8 mm	0.5 mm

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

- Place inner ring -A- on 2nd speed selector gear.

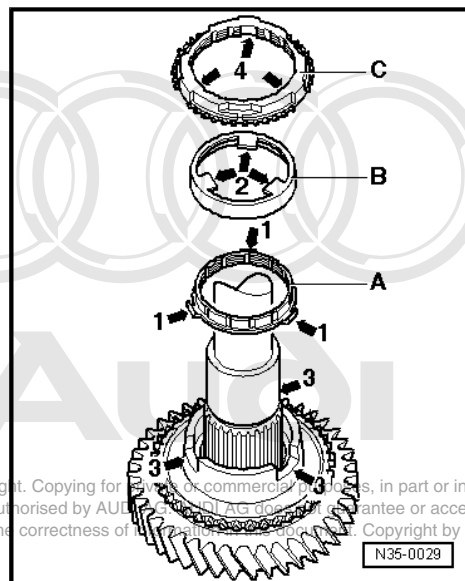
The angled lugs -arrows 1- point towards outer ring -B-.

- Fit outer ring -B-.

The lugs -arrows 2- lock in the slots -arrows 3- on the selector gear.

- Fit synchro-ring -C-.

The slots -arrows 4- locate on the lugs -arrows 1- of inner ring -A-.



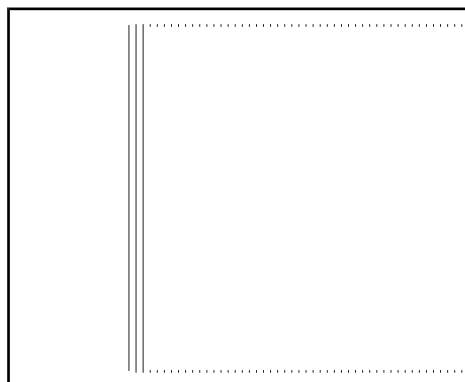
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Dismantling and assembling 1st/2nd gear and 3rd/4th gear locking collar/synchro-hub

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

- Slide locking collar over synchro-hub.

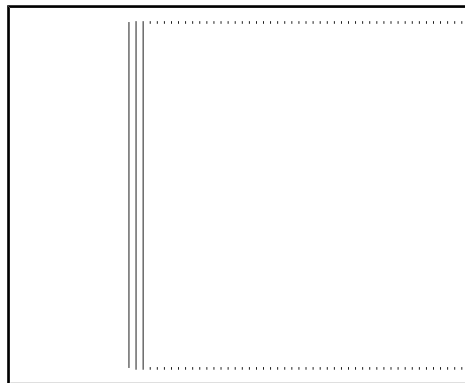
Recesses for locking pieces in synchro-hub and locking collar must align.



Assembling 1st/2nd gear and 3rd/4th gear locking collar/synchro-hub

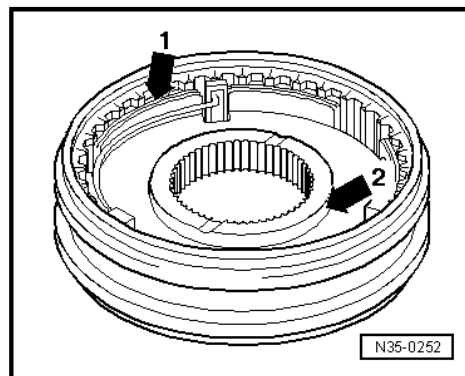
Locking collar is pushed over synchro-hub.

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



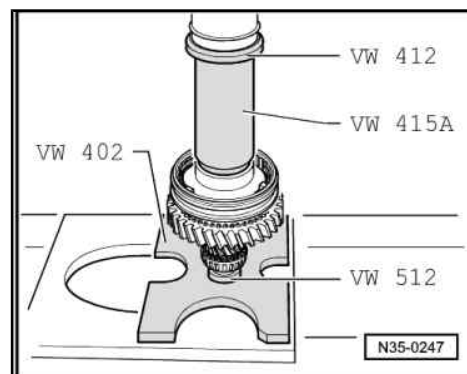
Installation position of 1st and 2nd gear locking collar/synchro-hub

Identification groove -arrow 1- and narrow shoulder -arrow 2- on synchro-hub point towards 1st gear.



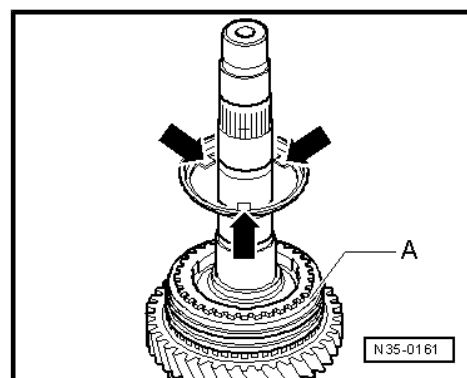
Pressing on 1st and 2nd gear locking collar/synchro-hub

- Fit circlip.



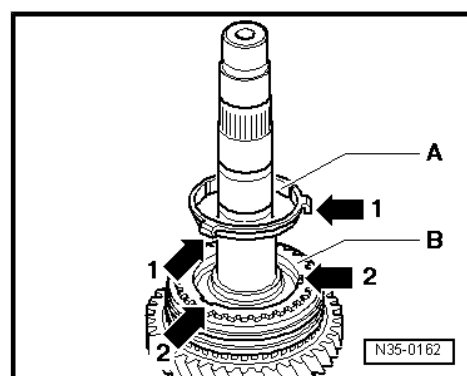
Installation position of 1st or 3rd gear outer ring

Lugs -arrows- face towards synchro-hub/locking collar -A-.



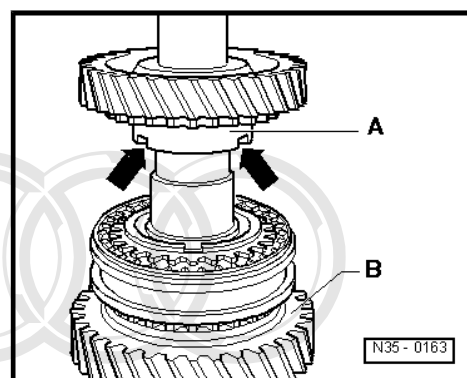
Installation position of synchro-ring -A- (inner ring for 1st or 3rd gear)

Lugs -arrows 1- locate in the recesses -arrows 2- in the synchro-ring -B-.



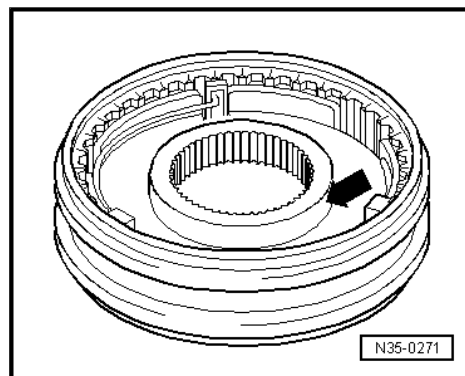
Installation position of 1st and 3rd speed selector gear

The higher shoulder -A- faces towards 2nd or 4th gear -B-. The recesses in the shoulder -arrows- engage on the lugs on the outer ring ➔ [page 145](#) .



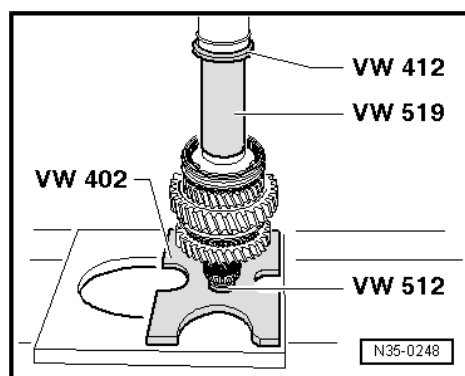
Installation position of 3rd and 4th gear locking collar/synchro-hub

The wider shoulder on the synchro-hub -arrow- faces towards 3rd gear.



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

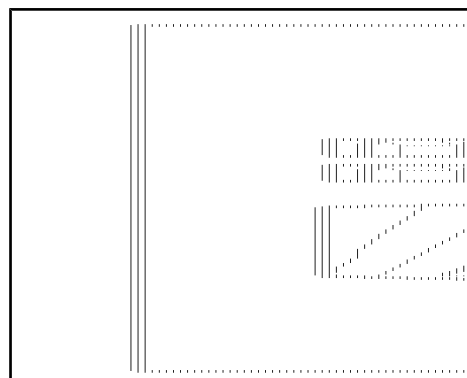
- Fit circlip.



Checking 4th gear synchro-ring for wear

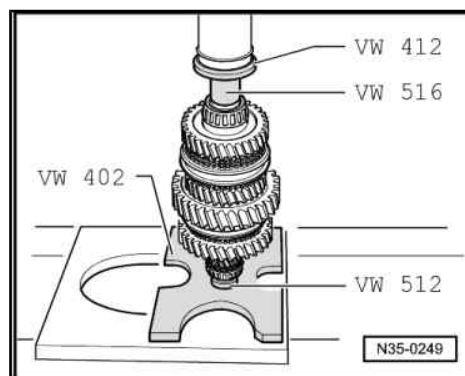
- Press synchro-ring onto cone on selector gear and measure gap -a- with a feeler gauge.

Gap -a-	Installation depth	Wear limit
4th gear	1.0...1.7 mm	0.5 mm



Pressing on tapered roller bearing inner race

- Determine thickness of required circlip ⇒ [page 147](#) and install circlip.



Determining thickness of circlip

- Determine the thickest circlip that will just fit and install it.

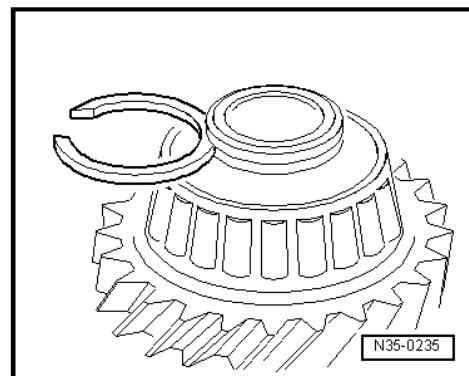


Note

Select circlips from ⇒ *Electronic parts catalogue* .

The following circlips are available:

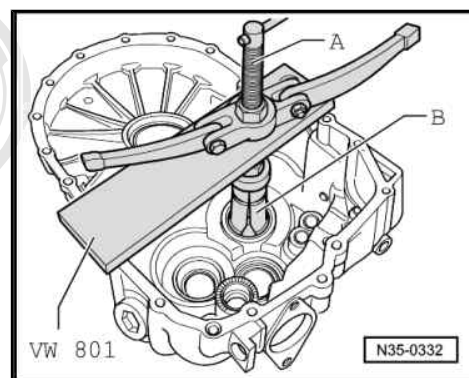
Thickness (mm)			
1.79	1.83	1.86	1.89
1.92	1.95	1.98	



Pulling tapered roller bearing outer race out of gearbox housing

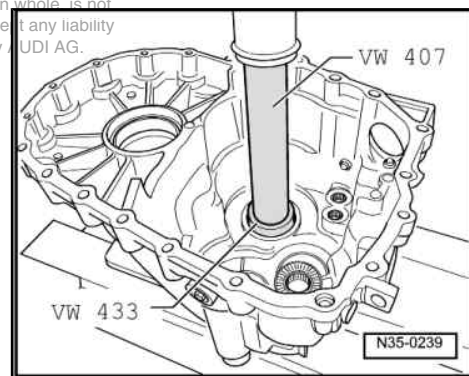
A - Counter-support , e.g. -Kukko 22/2-

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



Pressing tapered roller bearing outer race into gearbox housing

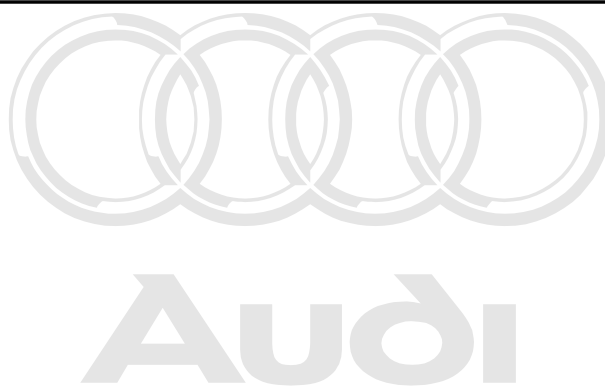
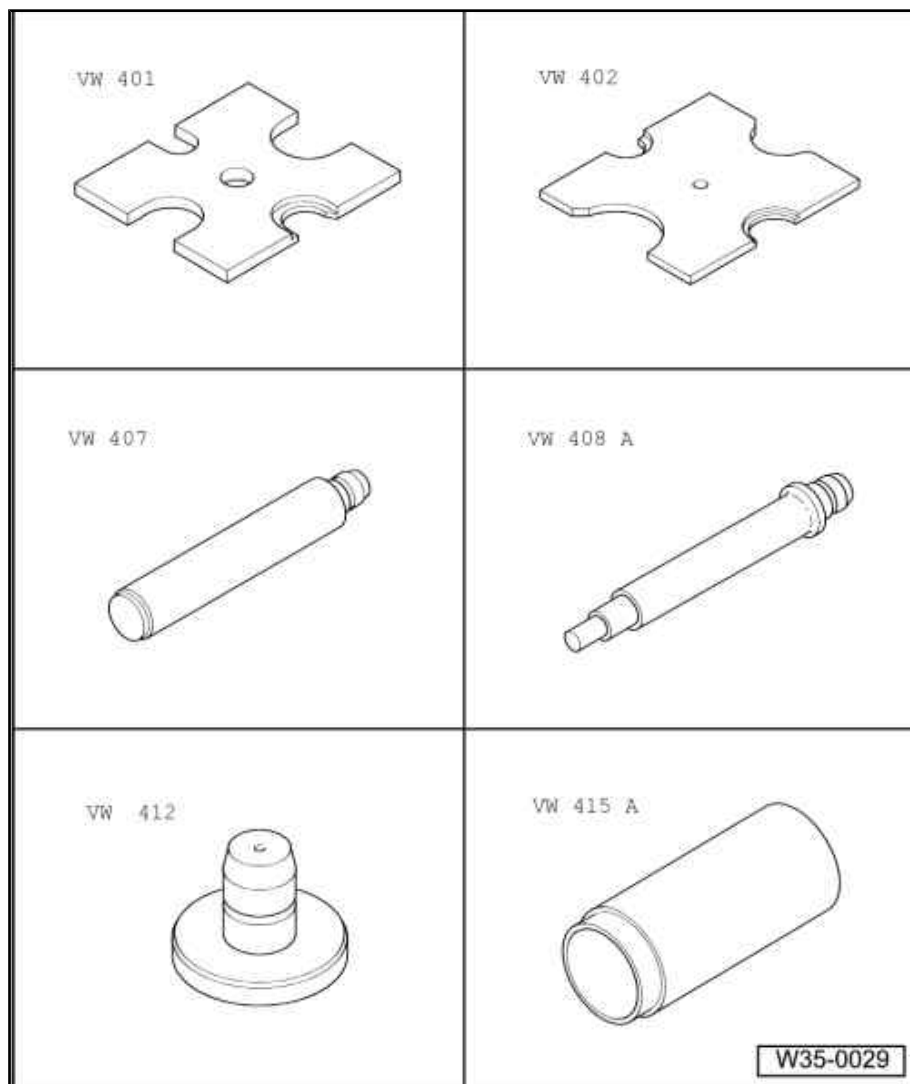
- Fit shim below outer race.
- Support gearbox housing with thrust piece - 2050- directly below bearing mounting.



2.2.2 Dismantling and assembling output shaft for 5th, 6th and reverse gear

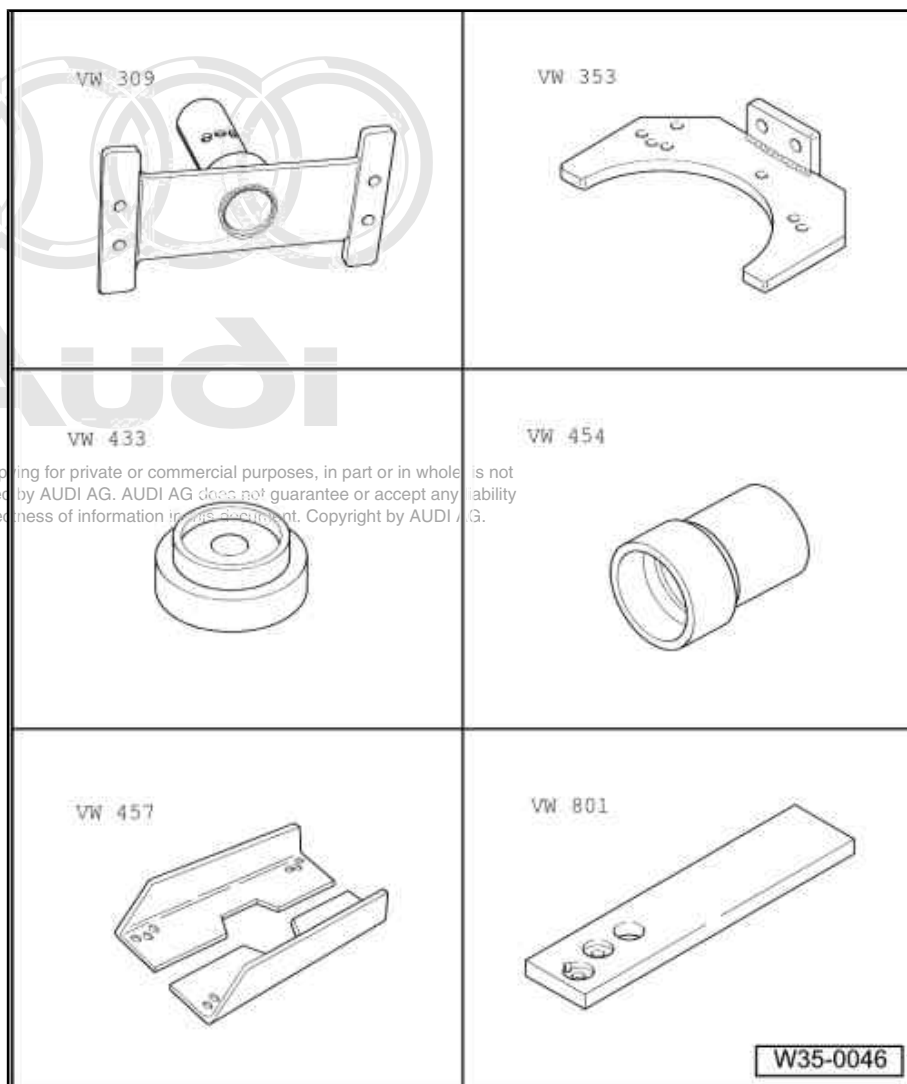
Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 408A-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 415A-



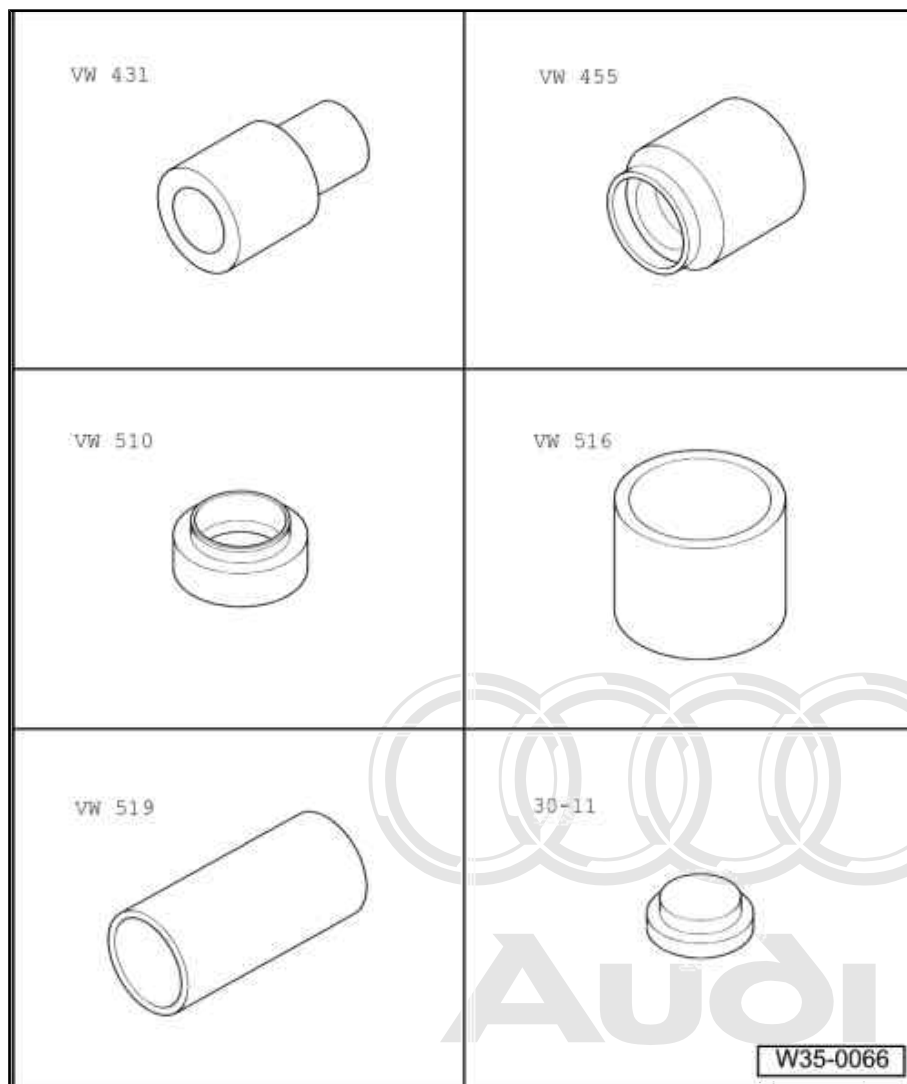
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- ◆ Support plate - VW 309-
- ◆ Gearbox support - VW 353-
- ◆ Press tool - VW 433-
- ◆ Press tool - VW 454-
- ◆ Support rails - VW 457-
- ◆ Support plate - VW 801-



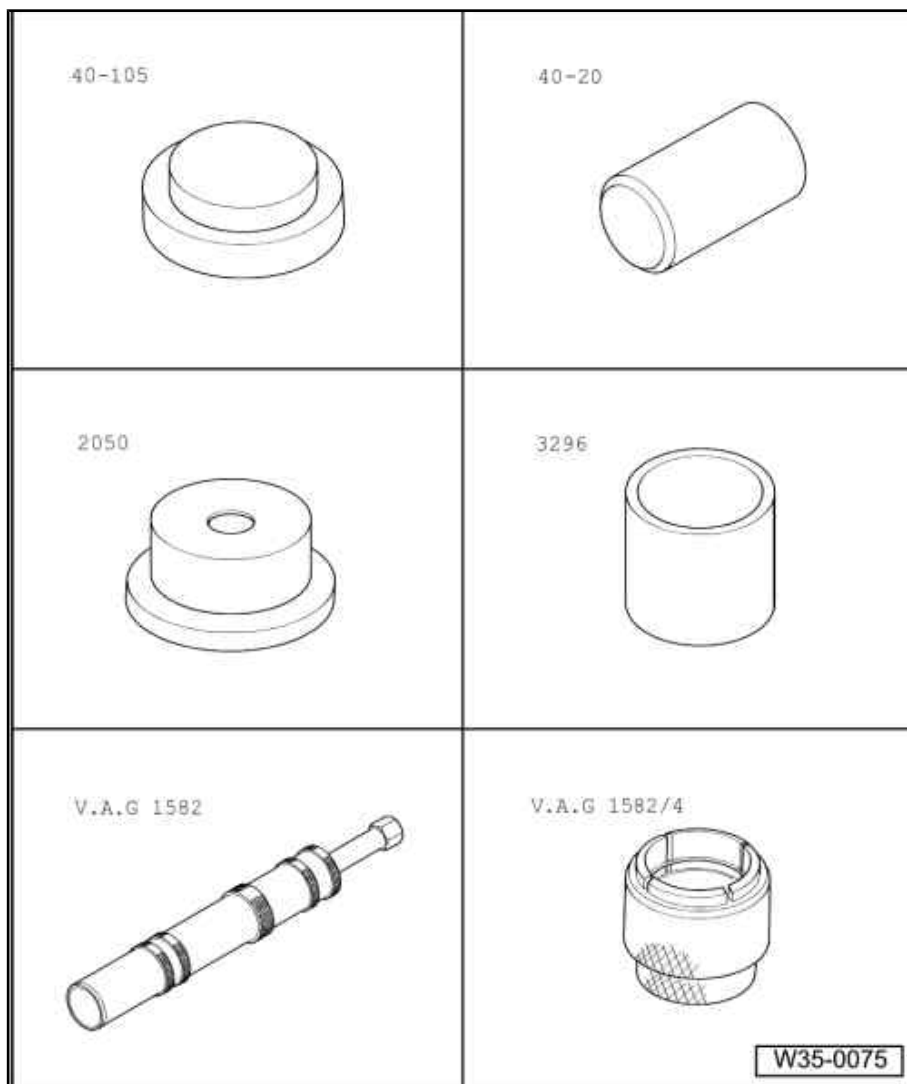
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- ◆ Thrust piece - VW 431-
- ◆ Installing sleeve - VW 455-
- ◆ Thrust pad - VW 510-
- ◆ Tube - VW 516-
- ◆ Tube - VW 519-
- ◆ Thrust plate - 30-11-



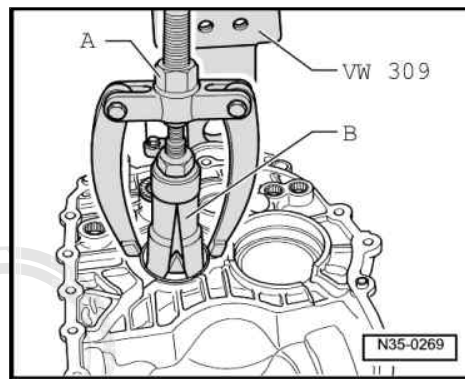
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- ◆ Thrust plate - 40-105-
- ◆ Drift sleeve - 40-20-
- ◆ Thrust piece - 2050-
- ◆ Tube - 3296-
- ◆ Tapered roller bearing puller - V.A.G 1582-
- ◆ Adapter - V.A.G 1582/4-



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- ◆ Adapter - V.A.G 1582/7-



- ◆ -1- Internal puller - Kukko 21/7-



- ◆ -3- Splitter - Kukko 17/2-
- ◆ -4- Counter-support - Kukko 22/2-

Pulling out tapered roller bearing outer race

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

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

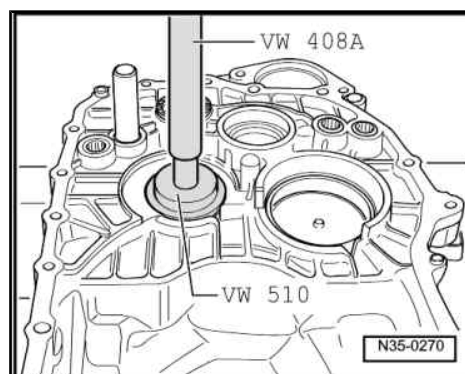


Note

*After pulling out, check
shim for damage and re-
new if necessary.*

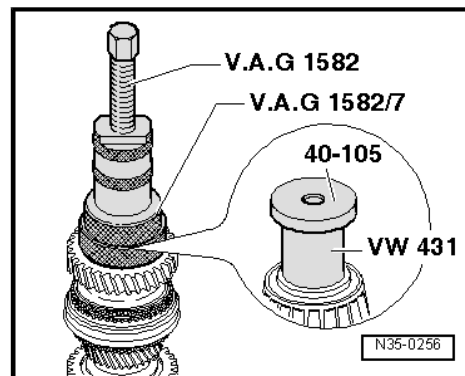
Pressing tapered roller bearing outer race into clutch housing

- Fit shim below outer race.
- Support clutch housing with drift sleeve - 40-20- directly below bearing mounting.



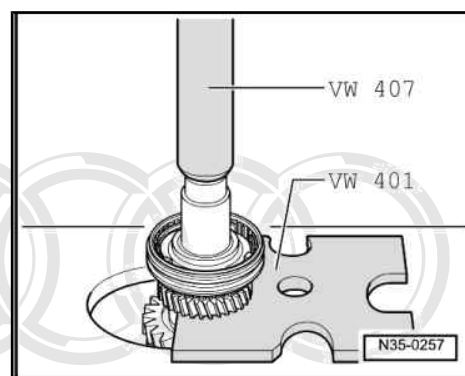
Pulling off tapered roller bearing inner race

- First remove circlip.
- Before setting up puller, position thrust piece - VW 431- and thrust plate - 40-105- on output shaft.



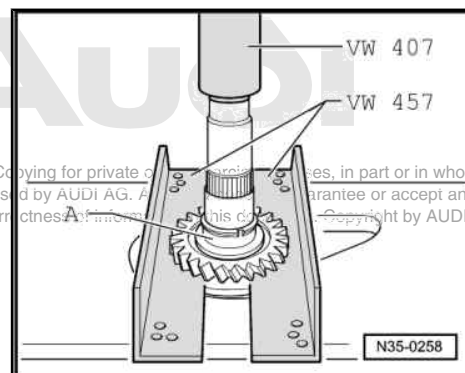
Pressing off 5th and 6th gear synchro-hub/locking collar with 6th speed selector gear

- First remove circlip.



Pressing off sleeve -A- with reverse selector gear

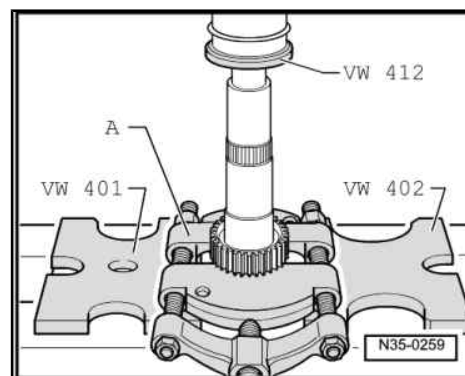
- First remove circlip.



Pressing off reverse gear synchro-hub

- First remove circlip.

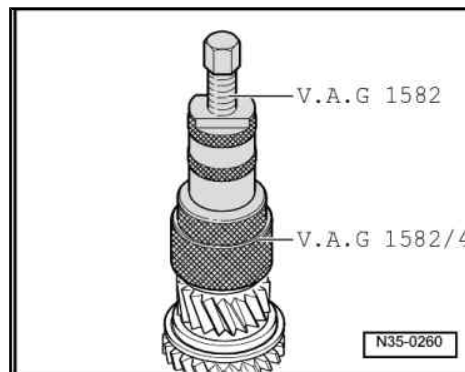
A - Splitter 22...115 mm , e.g. -Kukko 17/2-



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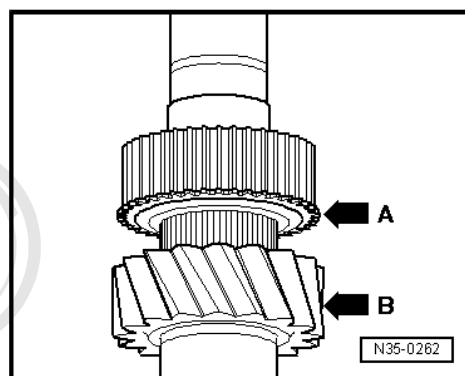
Pulling off tapered roller bearing inner race

- Before applying puller, place thrust plate - 30-11- on output shaft.



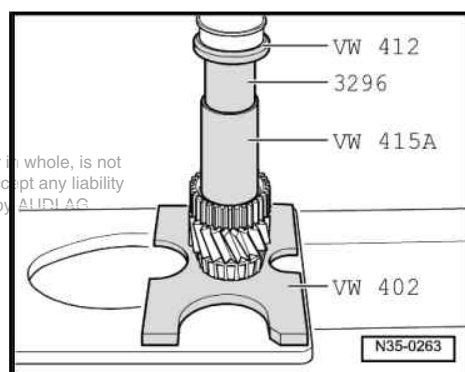
Installation position of reverse gear synchro-hub

Stop -arrow A- for reverse gear locking collar faces towards gear teeth on output shaft -arrow B-.



Pressing on reverse gear synchro-hub

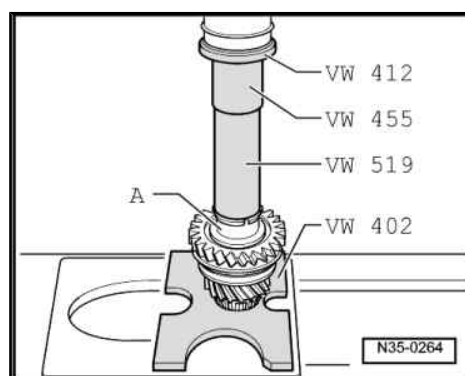
- Fit circlip.



Pressing on sleeve -A-

Installation position: Wide shoulder faces towards reverse selector gear

- Fit circlip.

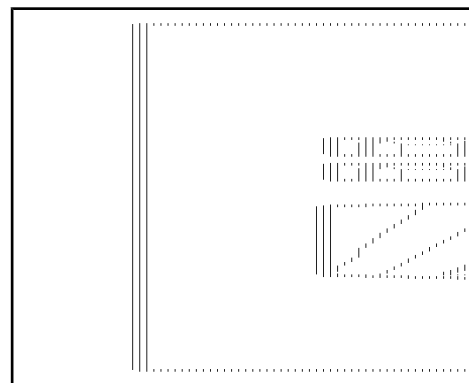


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Checking 5th and 6th gear synchro-ring for wear

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

Gap -a-	Installation depth	Wear limit
5th and 6th gear	1.0...1.7 mm	0.5 mm

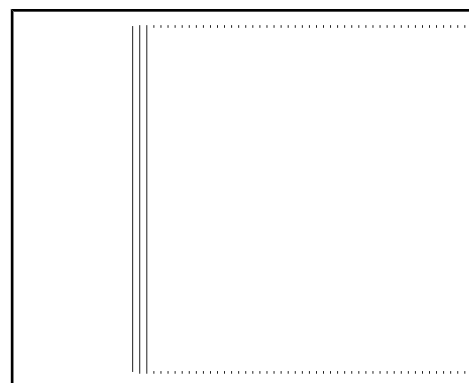


Dismantling and assembling 5th and 6th gear locking collar and synchro-hub

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

- Slide locking collar over synchro-hub.

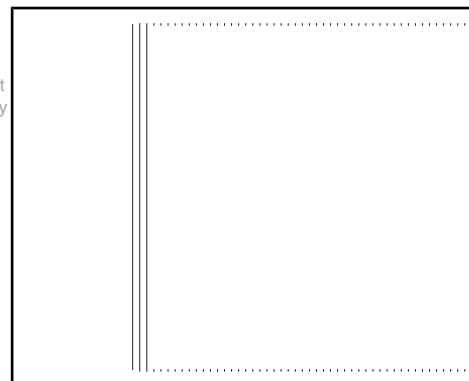
Recesses for locking pieces in synchro-hub and locking collar must align.



Assembling 5th and 6th gear locking collar/synchro-hub

Locking collar is pushed over synchro-hub.

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

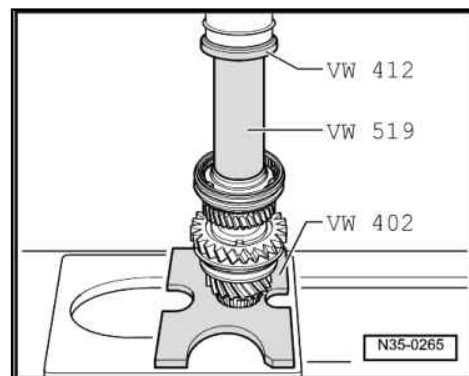


Pressing on 5th and 6th gear locking collar/synchro-hub

On some versions the outer diameter of the locking collar is chamfered.

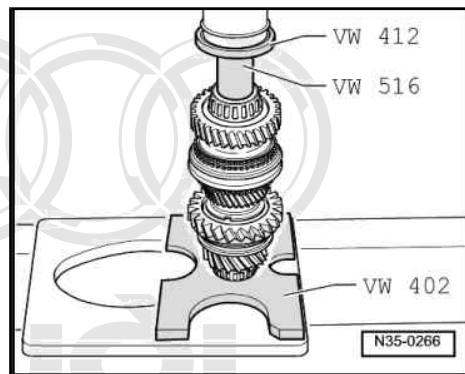
Installation position: Chamfer on outer diameter of locking collar faces towards 5th speed selector gear.

- Fit circlip.



Pressing on tapered roller bearing inner race

- Determine thickness of required circlip ⇒ [page 156](#) and install circlip.

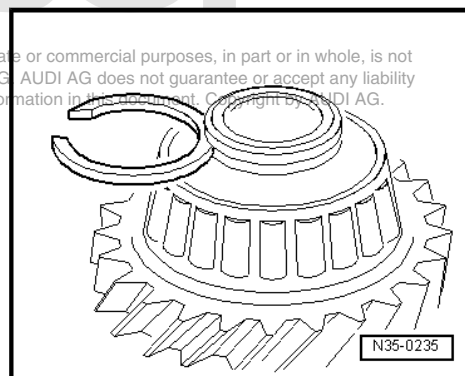


Determining thickness of circlip

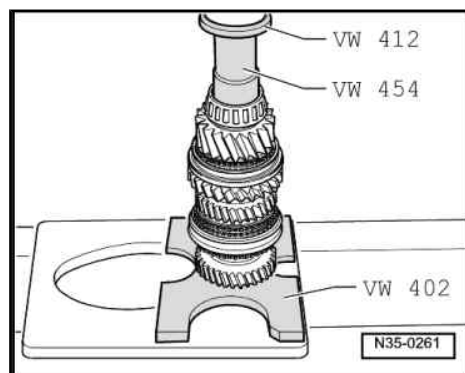
- Determine the thickest circlip that will just fit and install it
- Select circlip from table. For part numbers, refer to ⇒ [Electronic parts catalogue](#).

Circlips available

Thickness (mm)		
1.79	1.89	1.98
1.83	1.92	
1.86	1.95	



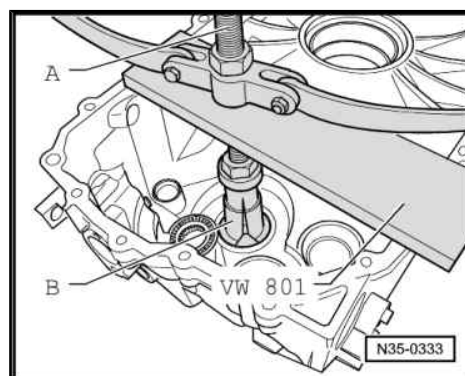
Pressing on tapered roller bearing inner race



Pulling tapered roller bearing outer race out of gearbox housing

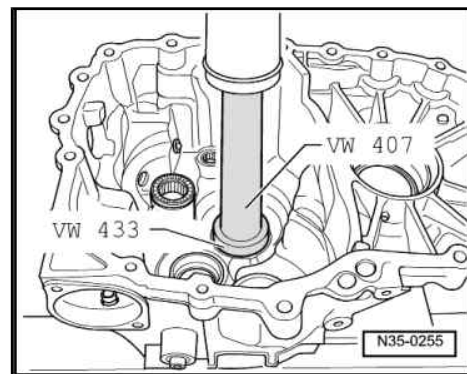
A - Counter-support , e.g. -Kukko 22/2-

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



Pressing tapered roller bearing outer race into gearbox housing

- Support gearbox housing with thrust piece - 2050- directly below bearing mounting.



2.3 Adjusting output shaft

⇒ [“2.3.1 Adjusting output shaft for 1st - 4th gear”, page 157](#)

⇒ [“2.3.2 Adjusting output shaft for 5th, 6th and reverse gear”, page 161](#)

2.3.1 Adjusting output shaft for 1st - 4th gear

(Determining thickness of output shaft shim)

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

- ◆ Gearbox housing
- ◆ Clutch housing
- ◆ Output shaft for 1st - 4th gear, or
- ◆ Tapered roller bearing for output shaft

Table of adjustments ⇒ [page 182](#)

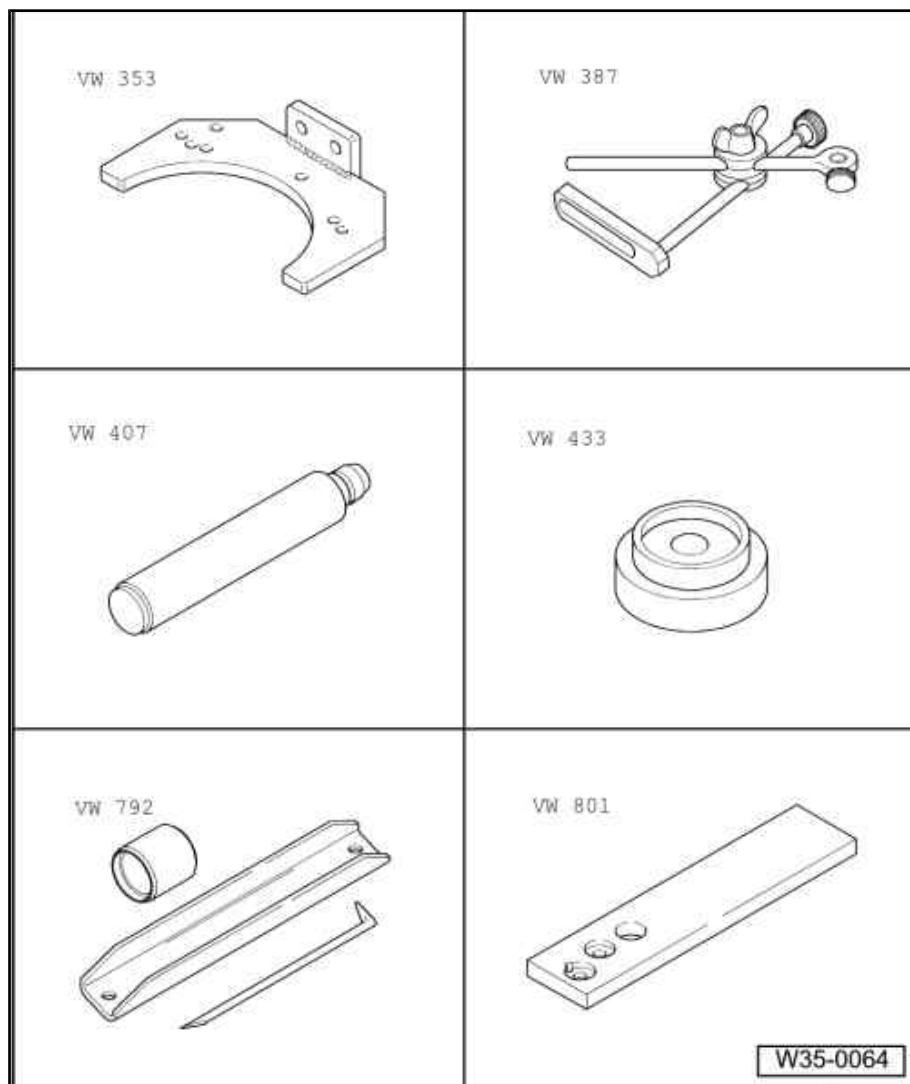


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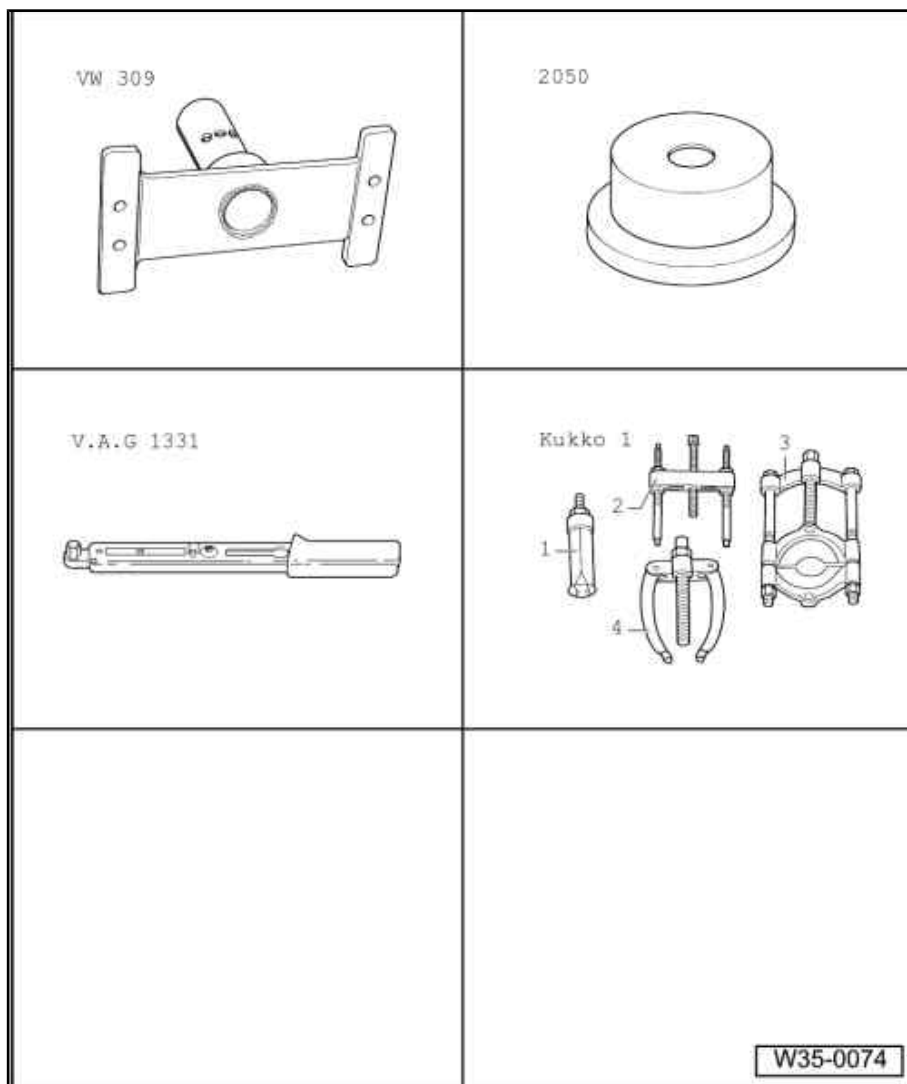
Special tools and workshop equipment required

- ◆ Gearbox support - VW 353-
- ◆ Universal dial gauge bracket - VW 387-
- ◆ Press tool - VW 407-
- ◆ Thrust piece - VW 433-
- ◆ Assembly device - VW 792-
- ◆ Support plate - VW 801-



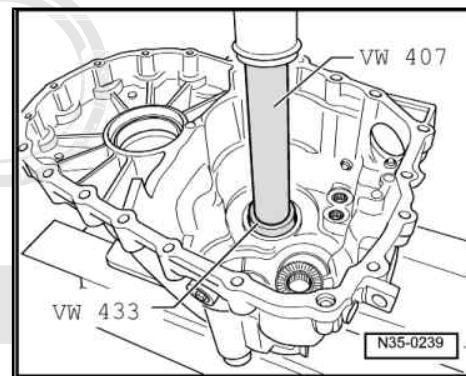
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- ◆ Support plate - VW 309-
- ◆ Thrust piece - 2050-
- ◆ Torque wrench - V.A.G 1331-
- ◆ -1- Internal puller - Kukko 21/7-
- ◆ -4- Counter-support - Kukko 22/2-



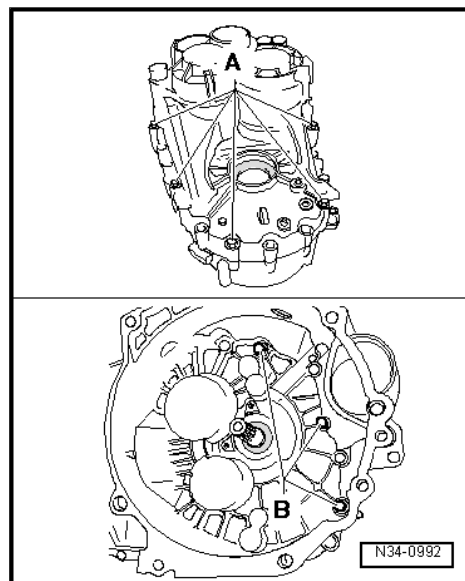
Requirements:

- Sealing surfaces of clutch and gearbox housings must be free of sealant.
- When taking measurements, install only the output shaft that is to be measured.
- Press tapered roller bearing outer race with shim (thickness 1.70 mm) into gearbox housing. Support gearbox housing with thrust piece - 2050- directly below bearing mounting.
- Fit complete 1st to 4th gear output shaft into clutch housing.



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- Fit gearbox housing and tighten bolts -A- and -B- diagonally to correct torque.

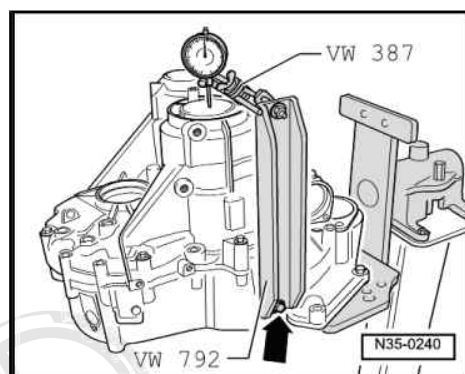


- Set up measuring tools and secure with bolt -arrow- to clutch housing.
- Set dial gauge (3 mm measuring range) to "0" with 1 mm preload.
- Loosen clutch housing/gearbox housing securing bolts diagonally until output shaft is free to move in gearbox housing.
- Read off play on gauge and note reading (example: 0.14 mm).



Note

If no play is indicated on dial gauge when clutch housing/gearbox housing securing bolts are loosened, fit a 1.95 mm shim (or if necessary a 2.20 mm shim) ⇒ Electronic parts catalogue for performing the measurement.



Determining thickness of shim

The specified bearing preload is attained by subtracting the measured value (0.14 mm) from the inserted shim (1.70 mm) and adding a constant value for preload (0.20 mm).

Example:

Inserted shim	1.70 mm
– Measured value	0.14 mm
+ Preload (constant value)	0.20 mm
Thickness of shim	1.76 mm

- Determine thickness of shim from table ⇒ [page 161](#) .

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- Detach gearbox housing and pull tapered roller bearing outer race out of gearbox housing.

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

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

- Remove inserted shim (1.70 mm thick) from gearbox housing.

Table of shims

Thickness (mm)		
1.45	1.75	2.05
1.50	1.80	2.10
1.55	1.85	2.15
1.60	1.90	2.20
1.65	1.95	2.25
1.70	2.00	

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

- Determine part number of shim from ➔ Electronic parts catalogue .

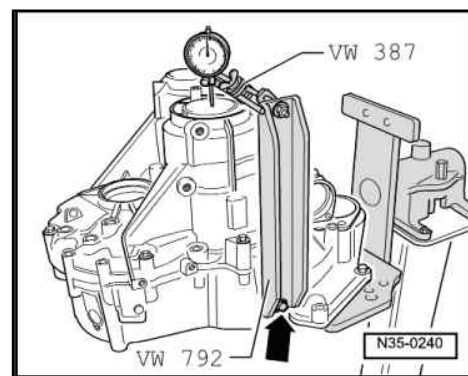
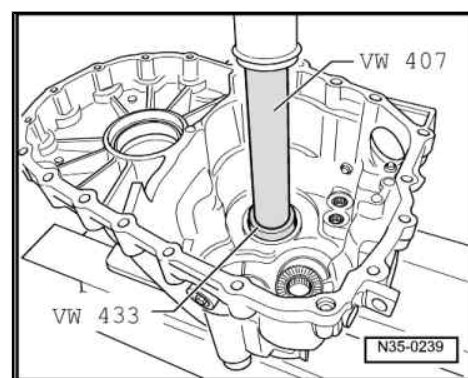
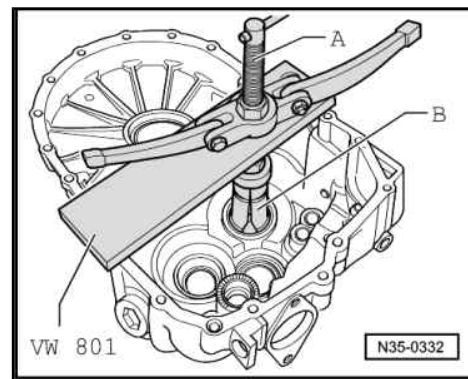
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Press in tapered roller bearing outer race together with the correct shim (in example 1.75 mm). Support gearbox housing with thrust piece - 2050- directly below bearing mounting.

Checking adjustment

- Required shim installed (thickness as determined above)

- Set up measuring tools and secure with bolt -arrow- to clutch housing.
- Set dial gauge (3 mm measuring range) to "0" with 1 mm pre-load.
- Loosen clutch housing/gearbox housing securing bolts diagonally until output shaft is free to move in gearbox housing.
- If the correct shim has been selected, the dial gauge should now indicate a value between 0.15 and 0.25 mm.



2.3.2 Adjusting output shaft for 5th, 6th and reverse gear

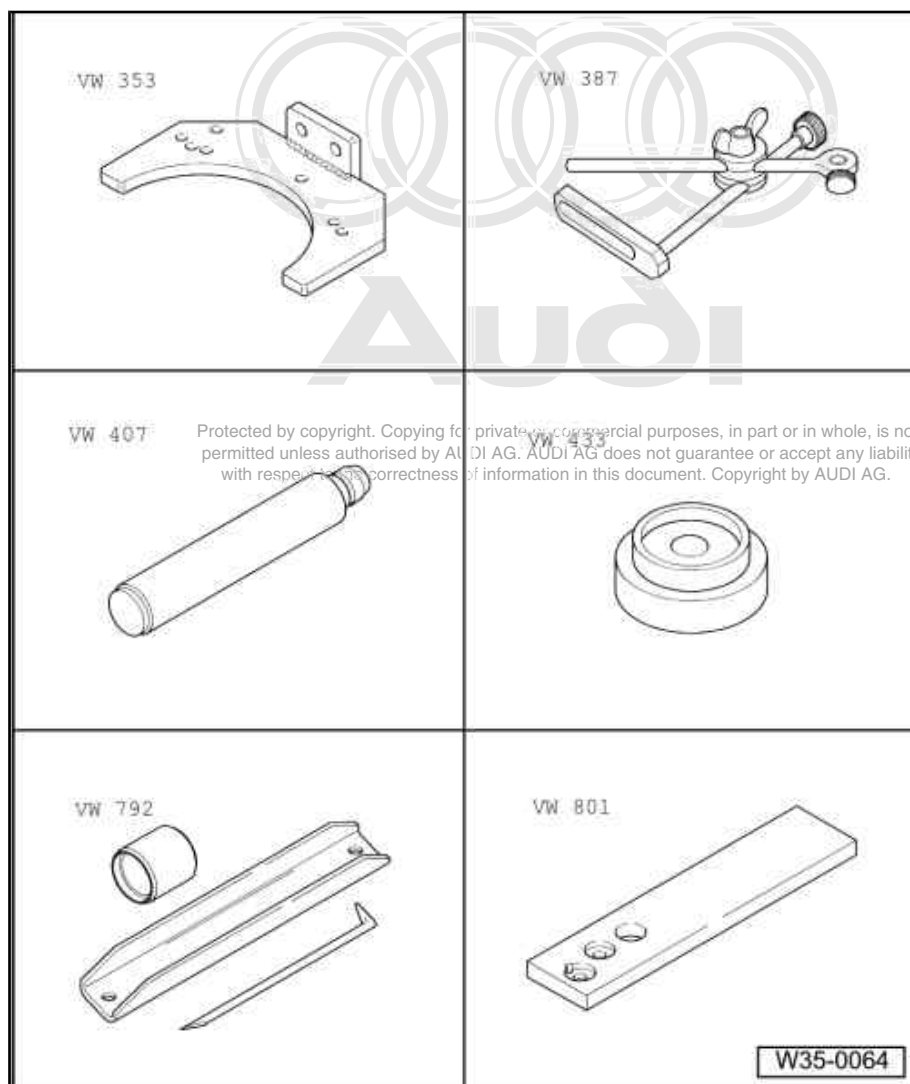
The output shaft must be re-adjusted when the following components are renewed:

- ◆ Gearbox housing
- ◆ Clutch housing
- ◆ Output shaft for 5th, 6th and reverse gears, or
- ◆ Tapered roller bearing for output shaft

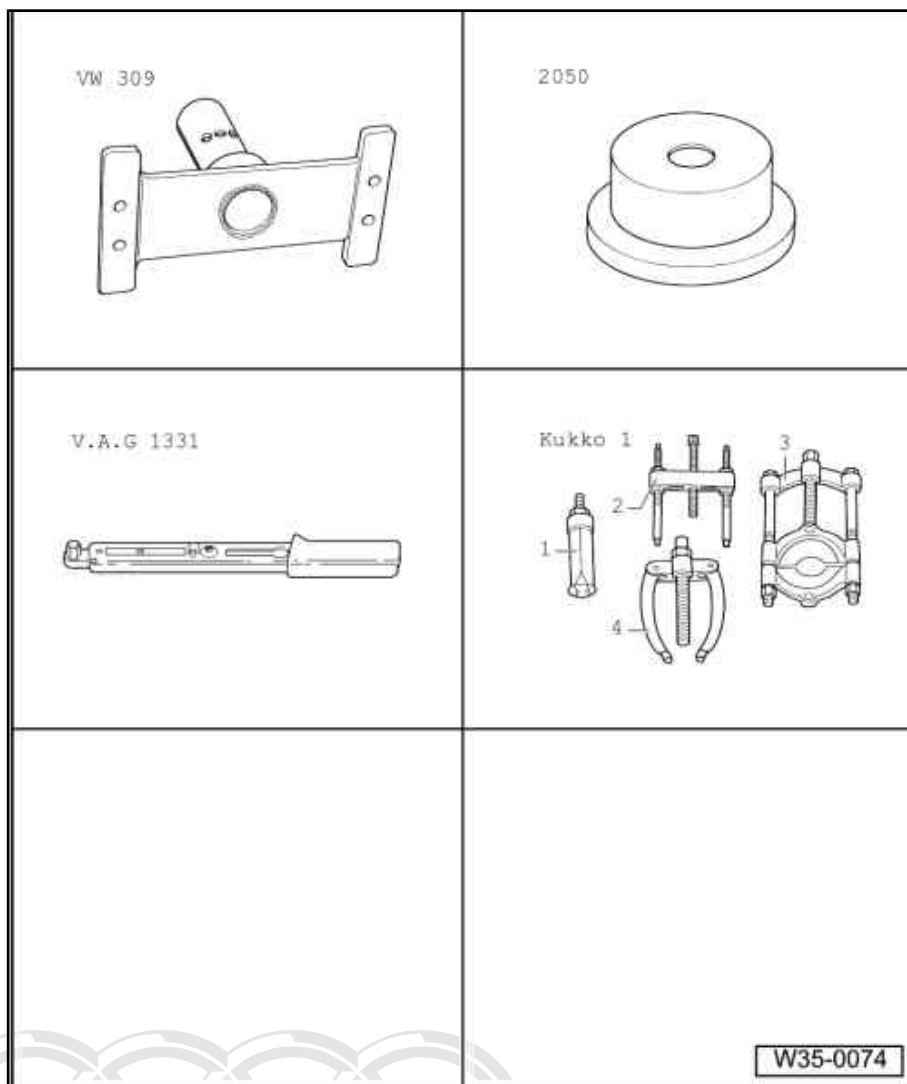
Table of adjustments ⇒ [page 182](#)

Special tools and workshop equipment required

- ◆ Gearbox support - VW 353-
- ◆ Universal dial gauge bracket - VW 387-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 433-
- ◆ Assembly tool - VW 792-
- ◆ Support plate - VW 801-

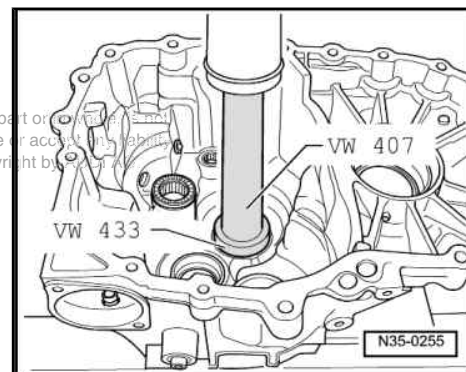


- ◆ Support plate - VW 309-
- ◆ Thrust piece - 2050-
- ◆ Torque wrench - V.A.G 1331-
- ◆ -1- Internal puller - Kukko 21/7-
- ◆ -4- Counter-support - Kukko 22/2-

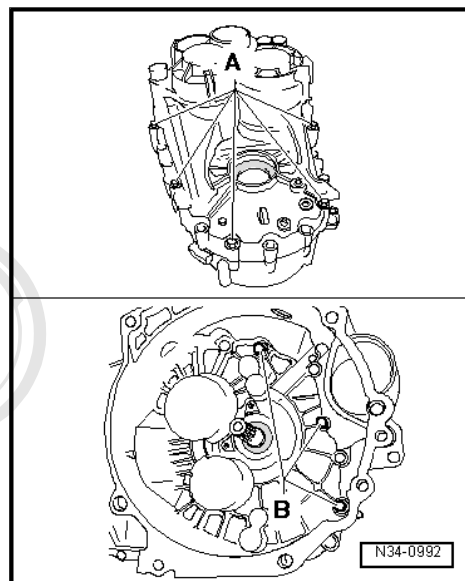


Requirements:

- Sealing surfaces of clutch and gearbox housings must be free of sealant.
- When taking measurements, install only the output shaft that is to be measured.
- Press tapered roller bearing outer race with shim (thickness 1.70 mm) into gearbox housing. Support gearbox housing with thrust piece - 2050- directly below bearing mounting.
- Insert complete 5th, 6th and reverse gear output shaft in clutch housing.



- Fit gearbox housing and tighten bolts -A- and -B- diagonally to correct torque.



- Attach measuring equipment. Put washers of a total thickness of 8 mm on bolt -arrow- securing assembly device - VW 792- to clutch housing.
- Set dial gauge (3 mm measuring range) to "0" with 1 mm preload.
- Loosen clutch housing/gearbox housing securing bolts diagonally until output shaft is free to move in gearbox housing.
- Read off play on gauge and note reading (example: 0.25 mm).



Note

- ♦ If no play is indicated on dial gauge when clutch housing/gearbox housing securing bolts are loosened, fit a 1.95 mm shim (or if necessary a 2.20 mm shim) for performing the measurement.
- ♦ Select correct shims from ⇒ *Electronic parts catalogue* .

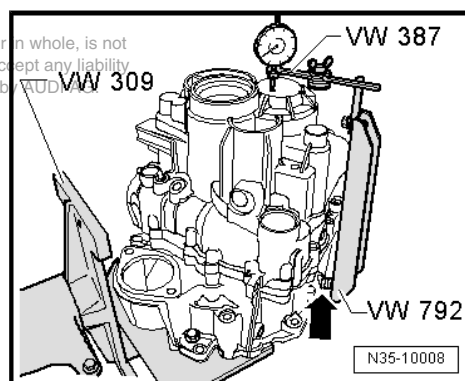
Determining thickness of shim

The specified bearing preload is attained by subtracting the measured value (0.25 mm) from the inserted shim (1.70 mm) and adding a constant value for preload (0.20 mm).

Example:

Inserted shim	1.70 mm
– Measured value	0.25 mm
+ Preload (constant value)	0.20 mm
Thickness of shim	1.65 mm

- Determine thickness of shim from table ⇒ [page 165](#) .



- Detach gearbox housing and pull tapered roller bearing outer race out of gearbox housing.

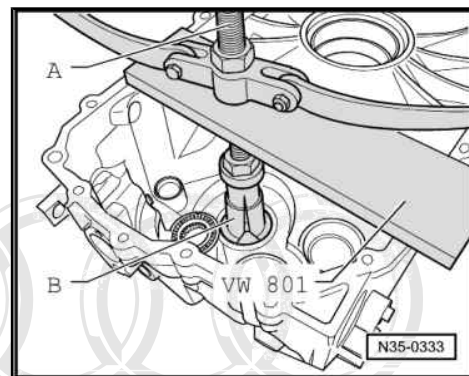
A - Counter-support , e.g. -Kukko 22/2-

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

- Remove inserted shim (1.70 mm thick) from gearbox housing.

Table of shims

Thickness (mm)		
1.50	1.80	2.10
1.55	1.85	2.15
1.60	1.90	2.20
1.65	1.95	2.25
1.70	2.00	
1.75	2.05	



- For part numbers, refer to ➔ Electronic parts catalogue .

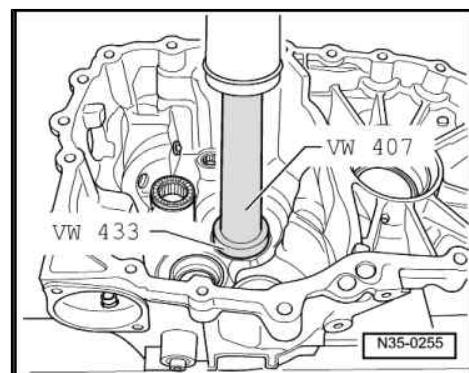
Tolerance variations make it possible to obtain the exact shim thickness required.

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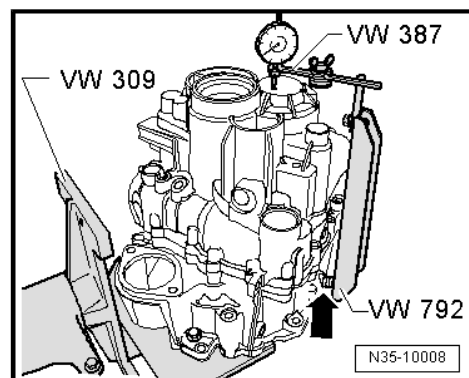
- Press in tapered roller bearing outer race together with the correct shim (in example 1.65 mm). Support gearbox housing with thrust piece - 2050- directly below bearing mounting.

Checking adjustment

- Required shim installed (thickness as determined above)



- Attach measuring equipment. Put washers of a total thickness of 8 mm on bolt -arrow- securing assembly device - VW 792- to clutch housing.
- Set dial gauge (3 mm measuring range) to "0" with 1 mm pre-load.
- Loosen clutch housing/gearbox housing securing bolts diagonally until output shaft is free to move in gearbox housing.
- If the correct shim has been selected, the dial gauge should now indicate a value between 0.15 and 0.25 mm.



39 – Final drive - front differential

1 Oil seals

⇒ "1.1 Overview of fitting locations - oil seals", page 166

⇒ "1.2 Renewing oil seal (left-side)", page 166

⇒ "1.3 Renewing oil seal (right-side)", page 168

1.1 Overview of fitting locations - oil seals

1 - Oil seal

- ☐ For input shaft
- ☐ Renewing ⇒ [page 35](#)

2 - Oil seal

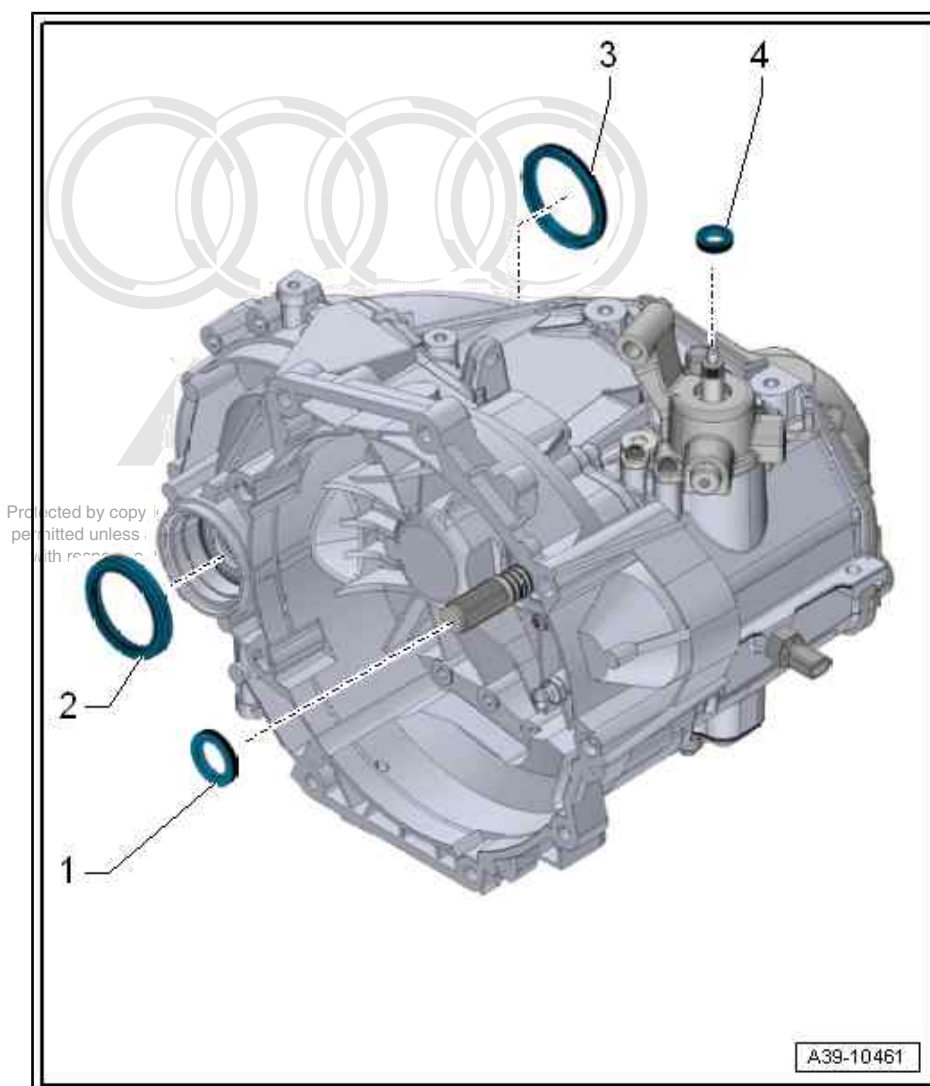
- ☐ For flange shaft (right-side)
- ☐ Renewing ⇒ [page 168](#)

3 - Oil seal

- ☐ For flange shaft (left-side)
- ☐ Renewing ⇒ [page 166](#)

4 - Oil seal

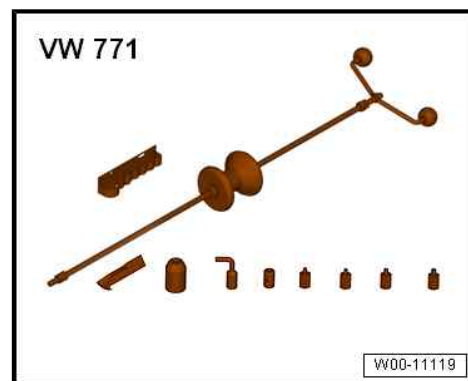
- ☐ For selector shaft
- ☐ Renewing ⇒ [page 84](#)



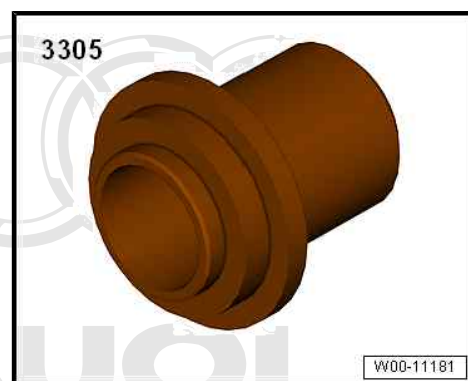
1.2 Renewing oil seal (left-side)

Special tools and workshop equipment required

- ◆ Multi-purpose tool - VW 771- with puller hook -VW 771/37-



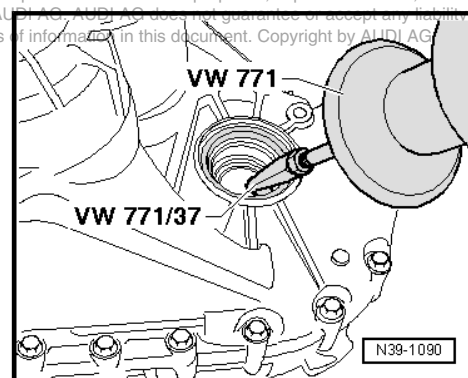
- ◆ Thrust piece - 3305-



- ◆ Sealing grease - G 052 128 A1-

Procedure

- Remove flange shaft (left-side) ➔ [page 179](#) .
- Pull out flange shaft oil seal using multi-purpose tool - VW 771- and puller hook -VW 771/37- .
- Clean contact surface and sealing surface.

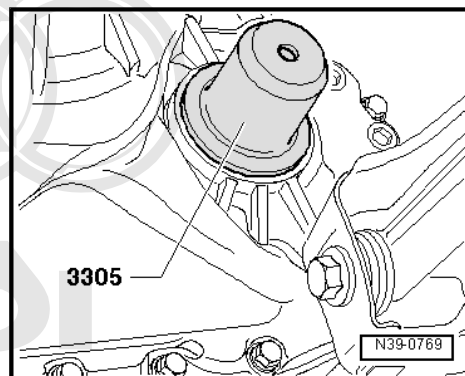


- Lightly oil outer circumference of new oil seal.
- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .



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- Drive in oil seal onto stop using thrust piece - 3305- . Take care to keep seal straight when installing.
- Install flange shaft (left-side) ⇒ [page 179](#) .
- Check oil level in gearbox and top up with gear oil if necessary ⇒ [page 76](#) .



1.3 Renewing oil seal (right-side)

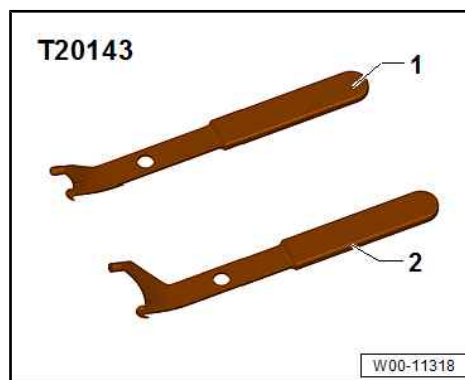
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Special tools and workshop equipment required

- ◆ Drift sleeve - 3158-



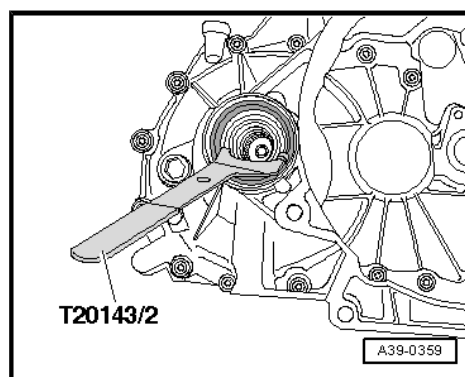
- ◆ Extractor tool - T20143-



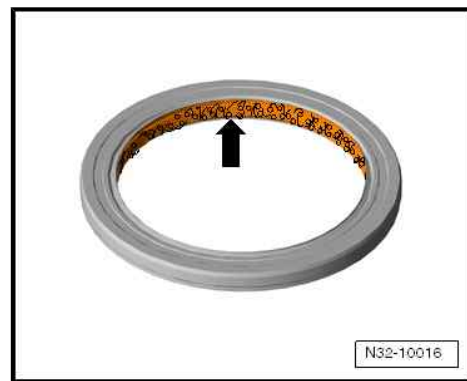
- ◆ Sealing grease - G 052 128 A1-

Procedure

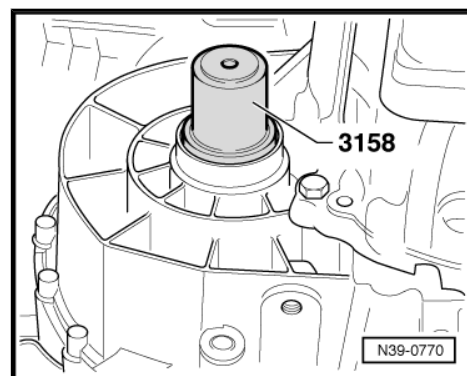
- Remove flange shaft (right-side) ⇒ [page 180](#) .
- Use extractor tool -T20143/2- to pull out flange shaft oil seal.
- Clean contact surface and sealing surface.



- Lightly oil outer circumference of new oil seal.



- Drive in oil seal onto stop using drift sleeve - 3158- . Take care to keep seal straight when installing.
- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .
- Install flange shaft (right-side) ➤ [page 180](#) .
- Check oil level in gearbox and top up with gear oil if necessary ➤ [page 76](#) .



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2 Differential

⇒ "2.1 Exploded view - differential", page 170

⇒ "2.2 Dismantling and assembling differential", page 172

⇒ "2.3 Adjusting differential", page 175

⇒ "2.4 Removing and installing flange shaft (left-side)",
page 179

⇒ "2.5 Removing and installing flange shaft (right-side)",
page 180

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2.1 Exploded view - differential



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 175](#).

1 - Gearbox housing

2 - Shim

- ☐ For differential
- ☐ Determining thickness
⇒ [page 175](#)

3 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 174](#)
- ☐ Pressing in
⇒ [page 175](#)

4 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 174](#)
- ☐ Pressing on
⇒ [page 174](#)

5 - Differential cage

- ☐ With riveted final drive gear

6 - Tapered roller bearing inner race

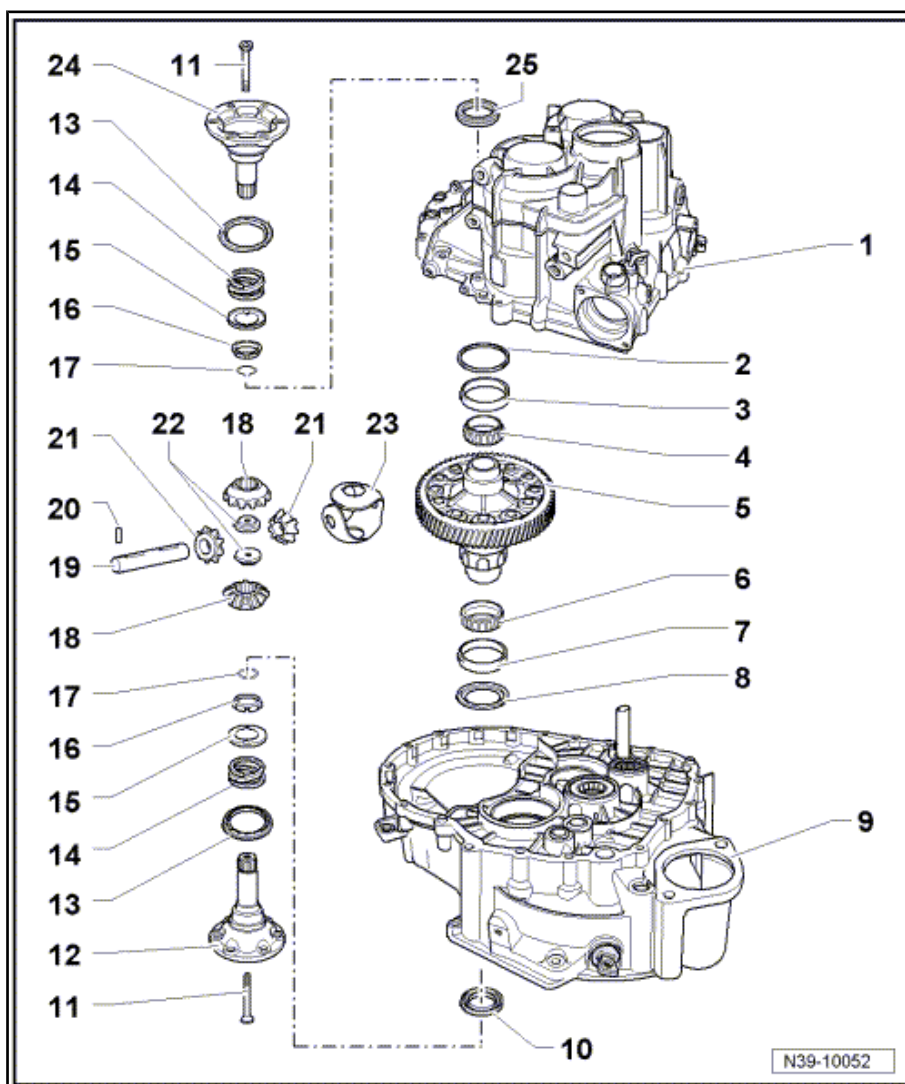
- ☐ Pulling off ⇒ [page 174](#)
- ☐ Pressing on
⇒ [page 174](#)

7 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 173](#)
- ☐ Pressing in
⇒ [page 174](#)

8 - Shim

- ☐ Always 0.65 mm thick
- ☐ Installation position:
Shoulder on inside diameter faces towards oil seal ⇒ [Item 10 \(page 171\)](#)



9 - Clutch housing

10 - Oil seal

- ☐ For flange shaft (right-side)
- ☐ Different diameters for left and right
- ☐ Renewing with gearbox installed ⇒ [page 168](#)

11 - Countersunk bolt

- ☐ 33 Nm
- ☐ Screws into threaded piece ⇒ [Item 22 \(page 171\)](#)

12 - Flange shaft (right-side)

- ☐ Do not interchange; left and right flange shafts are different

13 - Protective ring

- ☐ Protects flange shaft oil seal against dirt
- ☐ Prise off on alternate sides using a screwdriver
- ☐ Installation position: Recess faces away from tapped holes in flange shaft
- ☐ Press on by hand as far as stop
- ☐ Must engage in flange shaft

14 - Spring for flange shaft

- ☐ Installed behind flange shaft

15 - Thrust washer

- ☐ Installation position: Shoulder towards spring, lugs towards tapered ring

16 - Tapered ring

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

17 - Circlip

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

18 - Sun wheel

- ☐ Installing ⇒ [page 175](#)

19 - Differential pinion pin

- ☐ Drive out with drift
- ☐ Installing ⇒ [page 175](#)

20 - Spring pin

- ☐ For securing differential pinion pin
- ☐ Removing and installing ⇒ [page 175](#)

21 - Planet pinion

- ☐ Removing and installing ⇒ [page 175](#)

22 - Threaded piece

- ☐ Installing ⇒ [page 175](#)

23 - One-piece thrust washer

- ☐ Lubricate with gear oil before installing

24 - Flange shaft (left-side)

- ☐ Do not interchange; left and right flange shafts are different

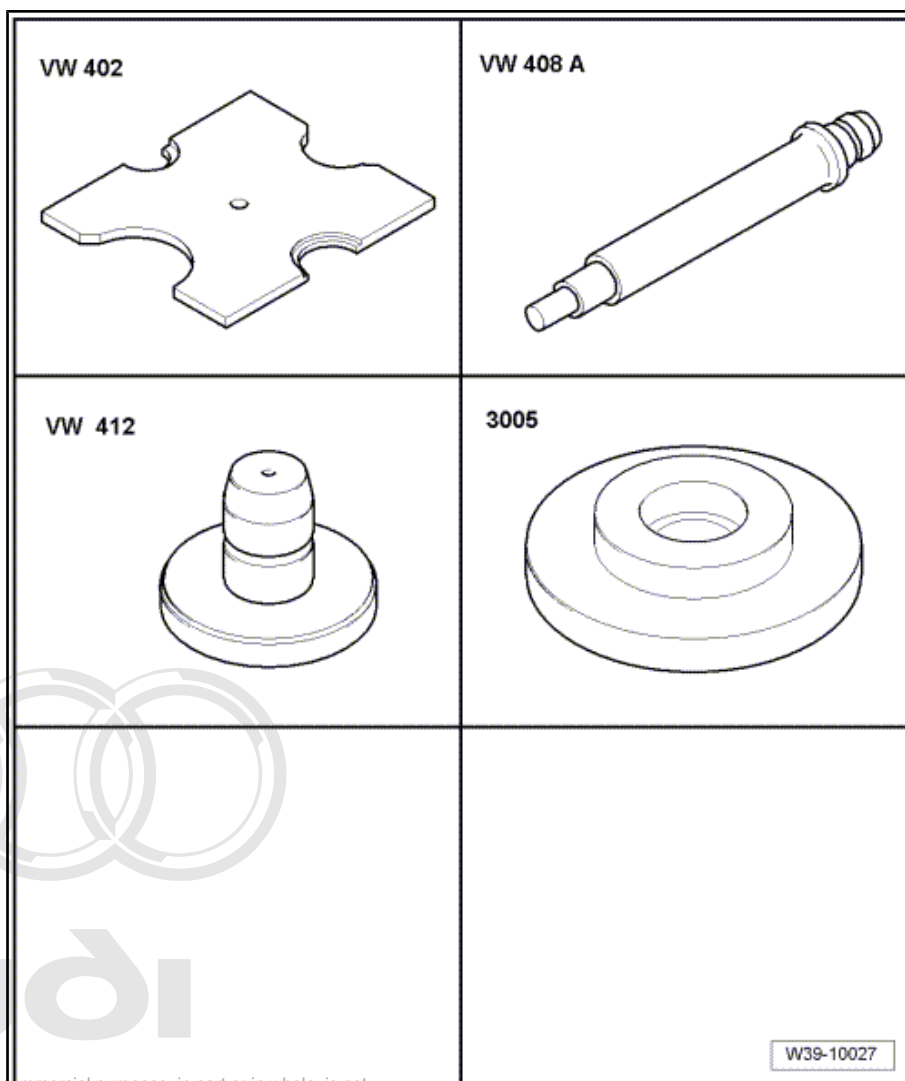
25 - Oil seal

- ☐ For flange shaft (left-side)
- ☐ Different diameters for left and right
- ☐ Renewing with gearbox installed ⇒ [page 166](#)

2.2 Dismantling and assembling differential

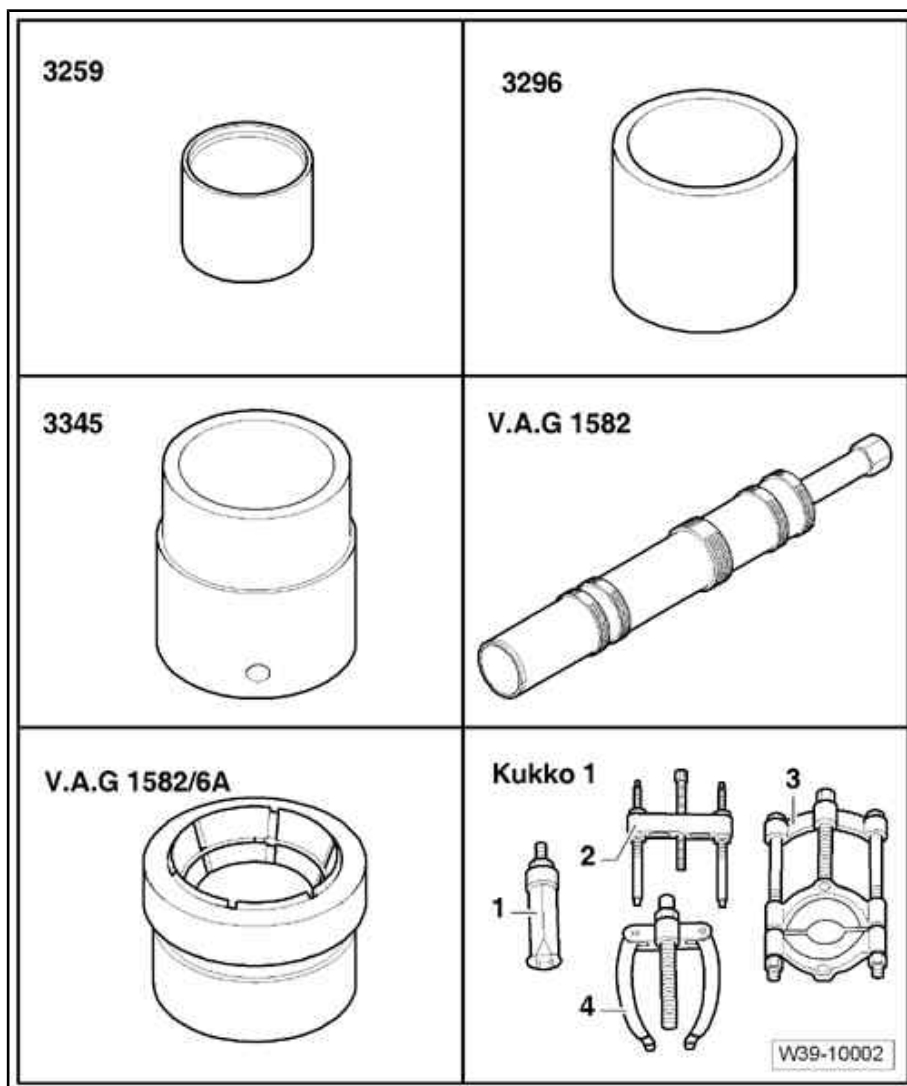
Special tools and workshop equipment required

- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 412-
- ◆ Thrust plate - 3005-



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- ◆ Tube - 3259-
- ◆ Tube - 3296-
- ◆ Tube - 3345-
- ◆ Tapered roller bearing puller - V.A.G 1582-
- ◆ Adapter - V.A.G 1582/6A-
- ◆ -1- Internal puller - Kukko 21/7-
- ◆ -2- Puller - Kukko 18/1-
- ◆ -3- Splitter - Kukko 17/1-
- ◆ -4- Counter-support - Kukko 22/2-



Pulling tapered roller bearing outer race out of clutch housing

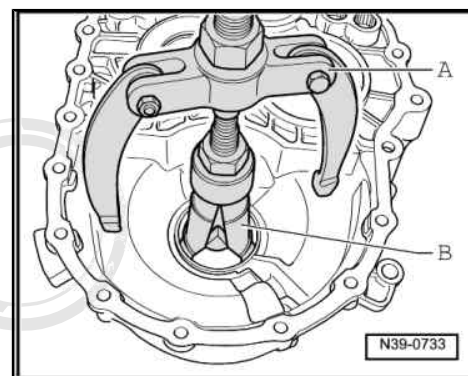
A - Counter-support , e.g. -Kukko 22/2-

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



Note

After pulling out, check shim for damage and renew if necessary.



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Pressing tapered roller bearing outer race into clutch housing

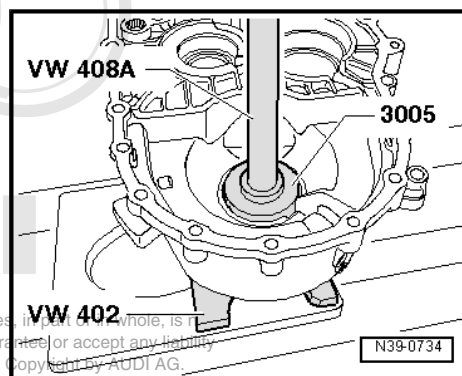
- First install shim.



Note

Observe installation position of shim; shoulder on inner diameter faces seal.

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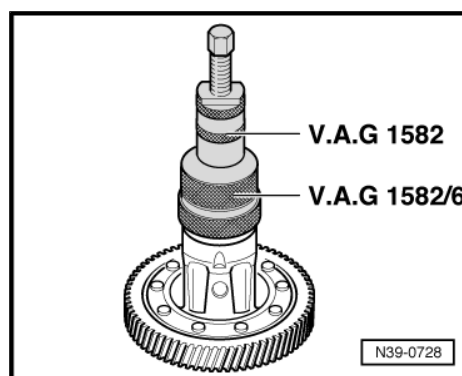
Pulling off tapered roller bearing inner races

- Before applying puller, place thrust plate - 40-105- on differential cage.



Note

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

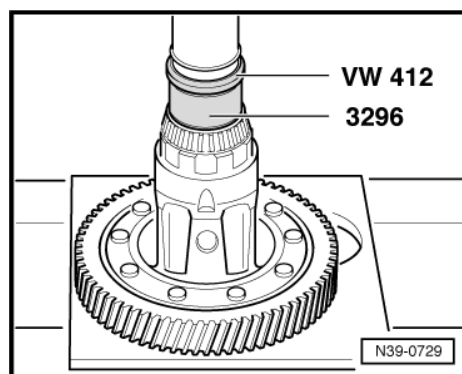


Pressing on tapered roller bearing inner races



Note

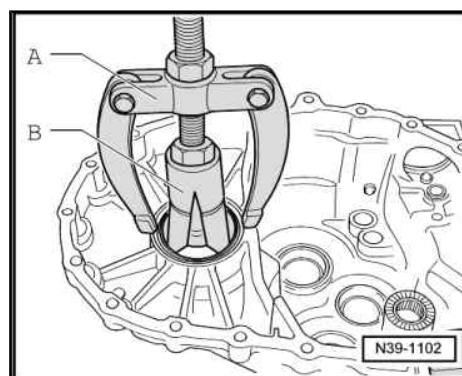
The same tools are used for pressing on the tapered roller bearing inner races for the gearbox housing and clutch housing.



Pulling tapered roller bearing outer race out of gearbox housing

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

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

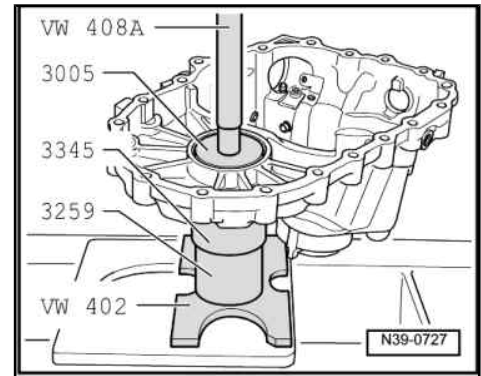


Pressing tapered roller bearing outer race into gearbox housing

- Support gearbox housing with tube - 3345- directly below bearing mounting.



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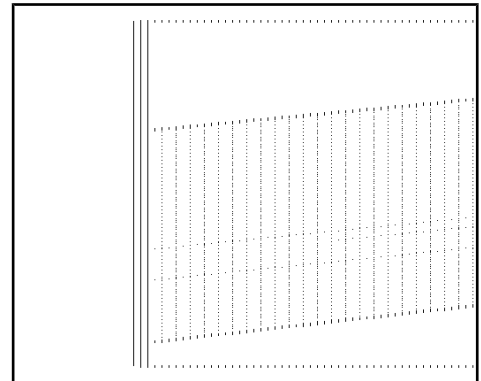
Removing and installing spring pin for differential pinion pin

Removing

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

Installing

- Drive fully into differential cage.

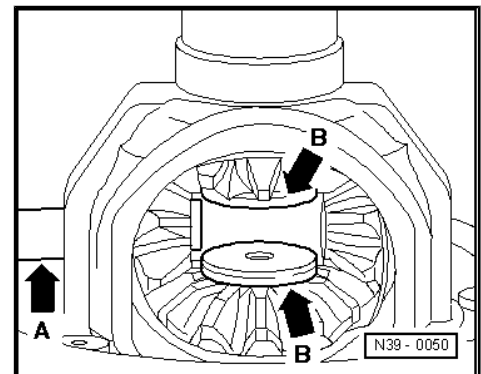


Installing differential bevel gears

- Lubricate one-piece thrust washer with gear oil and install.
- Install both sun wheels and secure (e.g. with flange shaft).
- Fit 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 spring pin.



2.3 Adjusting differential

The differential has to be readjusted when the following components are renewed:

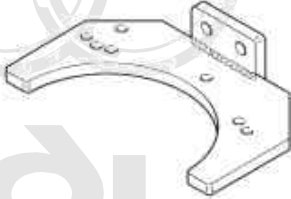
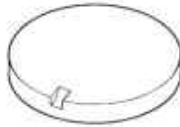
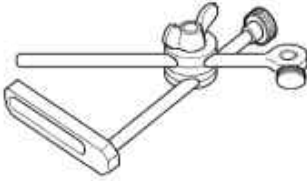
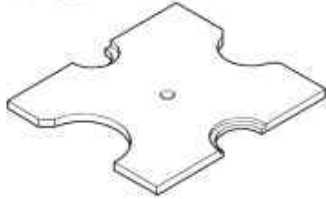
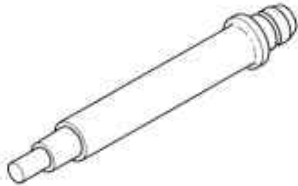
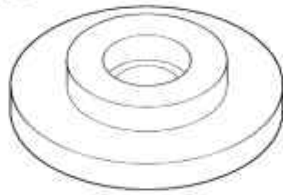
- ◆ Gearbox housing
- ◆ Clutch housing
- ◆ Differential cage, or
- ◆ Tapered roller bearings for differential

Table of adjustments ⇒ [page 182](#)

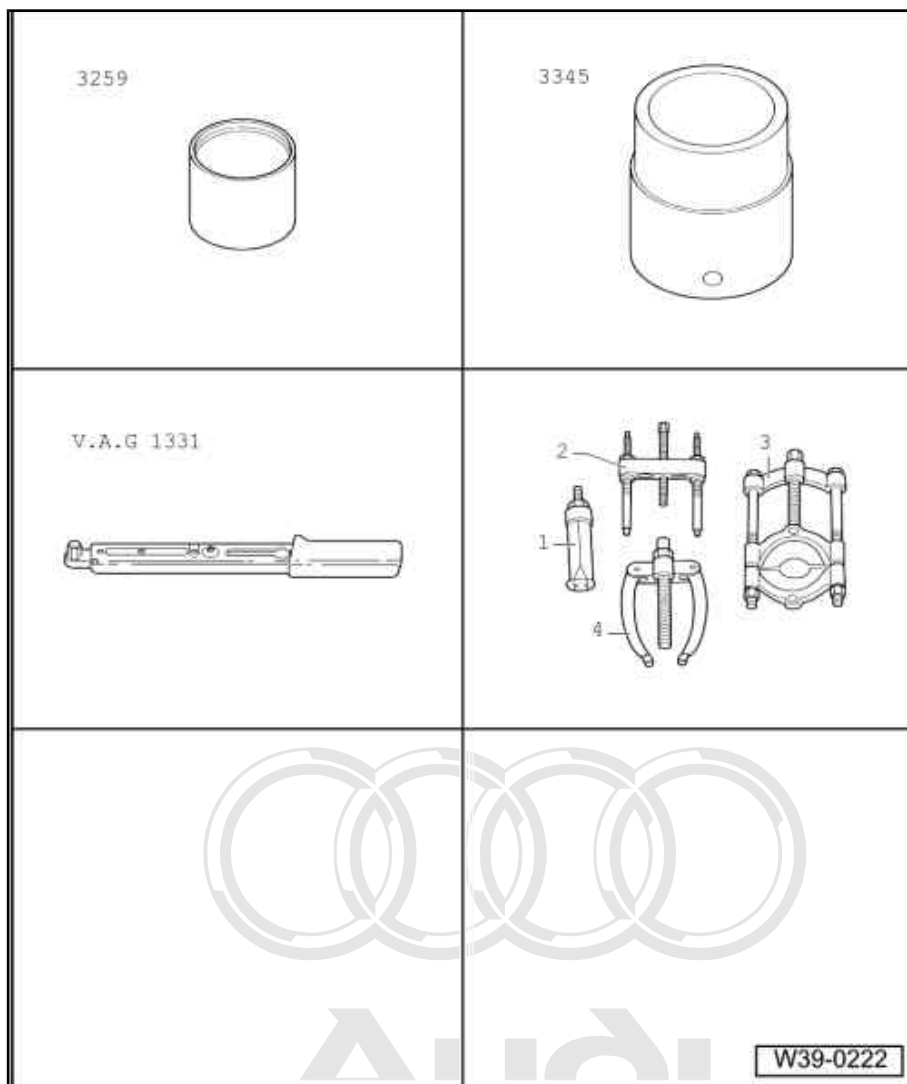
Special tools and workshop equipment required

- ◆ Gearbox support - VW 353-
- ◆ End measuring plate - VW 385/17-
- ◆ Universal dial gauge bracket - VW 387-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 408 A-
- ◆ Thrust plate - 3005-

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VW 353 	VW 385/17 
VW 387 	VW 402 
VW 408 A 	3005  W39-0221

- ◆ Tube - 3259-
- ◆ Tube - 3345-
- ◆ Torque wrench - V.A.G 1331-
- ◆ -1- Internal puller 46 ... 58 mm - Kukko 21/7-
- ◆ -4- Counter-support - Kukko 22/2-

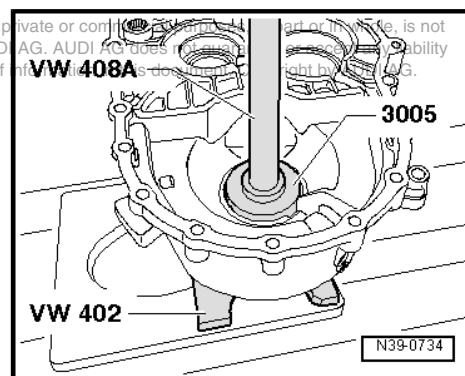


- Press tapered roller bearing outer race with shim into clutch housing ⇒ [page 173](#).

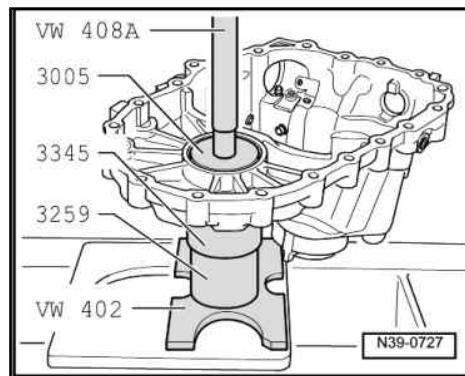


Note

Observe installation position of shim; shoulder on inner diameter faces seal.



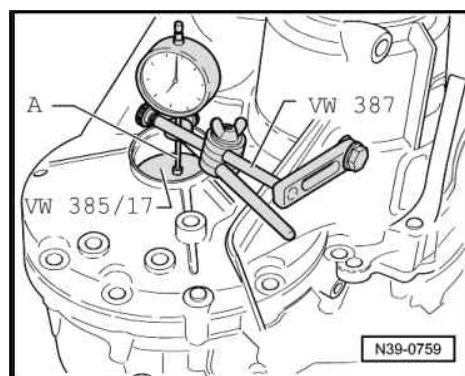
- Press tapered roller bearing outer race without shim into the gearbox housing
- Install differential in clutch housing.
- Fit gearbox housing and tighten 5 bolts to specified torque
⇒ [Item 11 \(page 80\)](#) and ⇒ [Item 12 \(page 80\)](#) .
- Press differential towards clutch housing; hold in this position and turn eight times.
- Press differential towards gearbox housing; hold in this position and turn eight times.



- Attach dial gauge and set to “0” with a preload of 1 mm.

A - Dial gauge extension, 30 mm

- Move differential up and down and note play indicated on dial gauge (in this example: 0.70 mm).



Determining thickness of shim

The specified bearing preload is obtained by adding a constant figure (0.25 mm) to the reading indicated.

Example:

Measured value	0.70 mm
+ Preload (constant value)	0.25 mm
Thickness of shim =	0.95 mm

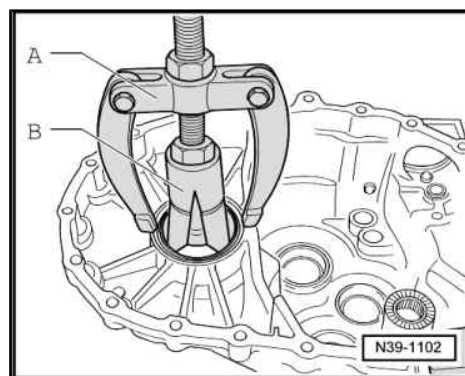
- Take off gearbox housing.
- Pull tapered roller bearing outer race out of gearbox housing.
- A - Counter-support , e.g. -Kukko 22/2-
- B - Internal puller 46 ... 58 mm , e.g. -Kukko 21/7-
- Determine part number of shim from ⇒ Electronic parts catalogue .
- Install shims of the calculated thickness, thickest shim first.

The following shims are available.

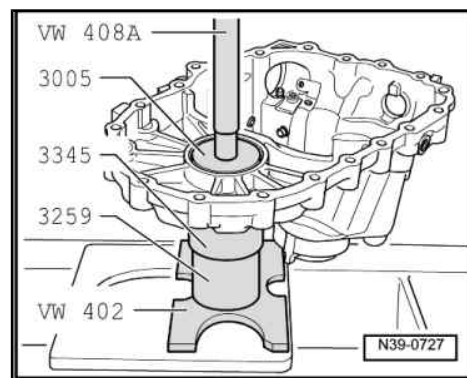
Shim thickness (mm)			
0.65	0.85	1.05	1.25
0.70	0.90	1.10	
0.75	0.95	1.15	
0.80	1.00	1.20	

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

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



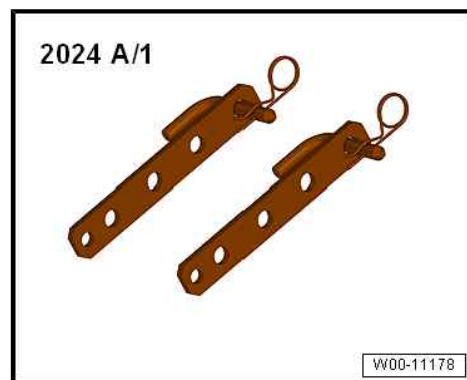
- Press outer race in again and tighten gearbox housing to specified torque ⇒ [Item 11 \(page 80\)](#) and ⇒ [Item 12 \(page 80\)](#) .



2.4 Removing and installing flange shaft (left-side)

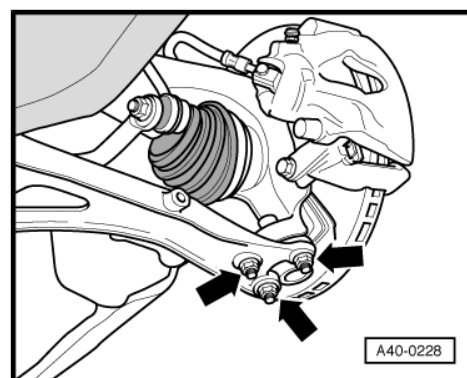
Special tools and workshop equipment required

- ◆ Hook -2024 A /1-



Removing

- Gearbox in vehicle
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove wheel housing liner (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .
- Unbolt drive shaft (left-side) from flange shaft of gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Remove nuts -arrows- securing swivel joint (left-side).
- If fitted, unscrew nut on bracket for front left vehicle level sender - G78- .
- Disengage swivel joint (left-side) from wishbone.



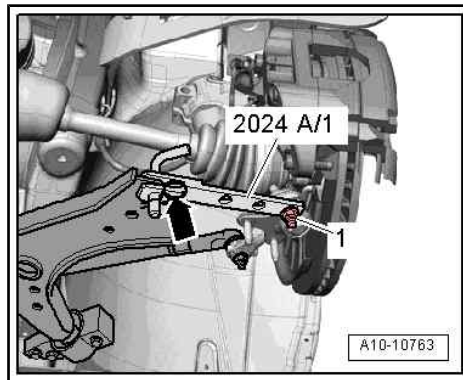
- Swivel suspension strut (left-side) outwards and support with hook -2024 A/1- as shown in illustration.



WARNING

Risk of accident if parts of support are not properly secured.

- ◆ *Secure locking pin and swivel joint with retaining clip -arrow- and nut -1-.*



- Tie up drive shaft (left-side).



Note

Make sure you do not damage surface coating on drive shaft.

- Remove bolt -arrow- securing flange shaft (left-side). To do so, screw two bolts into flange and counterhold flange shaft with suitable lever.
- Pull out flange shaft together with spring, thrust washer and tapered ring.

Installing

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

- Push flange shaft in against spring pressure and secure with bolt.

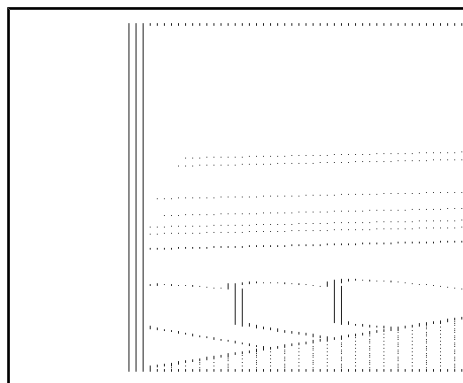
Tightening torques

- ◆ ⇒ [Item 11 \(page 171\)](#)
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Lower wishbone, swivel joint; Exploded view - lower wishbone, swivel joint
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Exploded view - wheel housing liner (front)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

2.5 Removing and installing flange shaft (right-side)

Removing

- Gearbox in vehicle
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

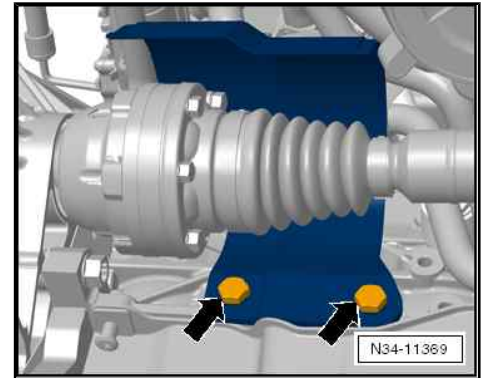


- If fitted, remove bolts -arrows- and detach heat shield for drive shaft (right-side).
- Unbolt drive shaft (right-side) from flange shaft of gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Tie up drive shaft (right-side).



Note

Make sure you do not damage surface coating on drive shaft.

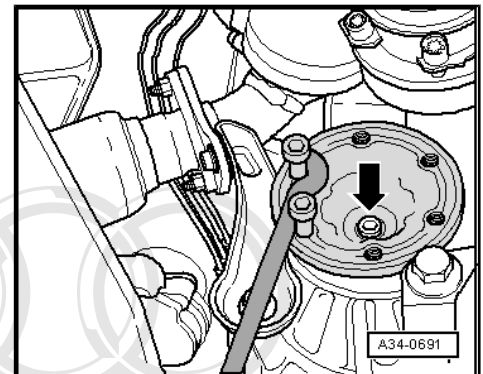


- Remove bolt -arrow- securing flange shaft (right-side). To do so, screw 2 bolts into flange and counterhold flange shaft with suitable lever.
- Pull out flange shaft together with spring, thrust washer and tapered ring.

Installing

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

- Push flange shaft in against spring pressure and secure with bolt.



Tightening torques

- ◆ ⇒ [Item 11 \(page 171\)](#)
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

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3 Table of adjustments



Note

If repairs have been carried out on the gearbox, it is only necessary to adjust the output shaft for 1st - 4th gear, the output shaft for 5th, 6th and reverse gear or the 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 for 1st - 4th gear ⇒ page 157	Output shaft for 5th, 6th and reverse gears ⇒ page 161	Differential ⇒ page 175
Components renewed:	Gearbox housing	x	x	x
	Clutch housing	x	x	x
	Output shaft for 1st - 4th gear	x		
	Output shaft for 5th, 6th and reverse gears		x	
	Differential cage			x
	Tapered roller bearing for 1st - 4th gear output shaft	x		
	Tapered roller bearing for 5th/6th and reverse gear output shaft		x	
	Tapered roller bearings for differential			x

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