

Workshop Manual Audi A1 2011 ➤

5-speed manual gearbox 02R, 0A4

Edition 05.2017

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List of Workshop Manual Repair Groups

Repair Group

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

(ARL005268; Edition 05.2017)

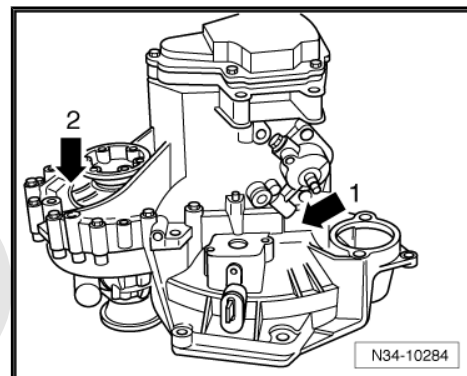
⇒ [“1.1 Gearbox identification”, page 1](#)

1.1 Gearbox identification

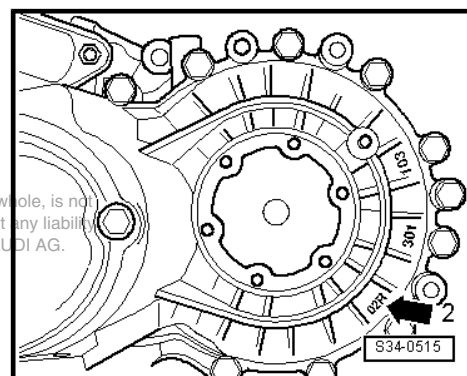
The 5-speed manual gearbox 02R and 0A4 is installed in the Audi A1 2011 ► ⇒ [“2.1 Allocation of gearbox to engine”, page 3](#).

Location on gearbox

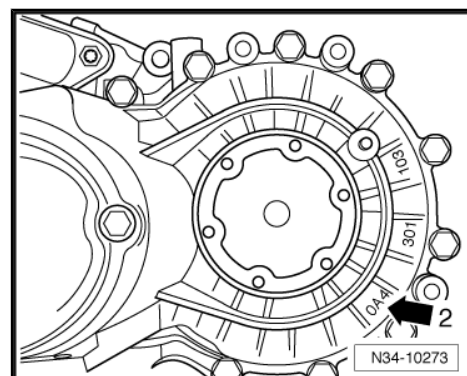
- ◆ Code letters and date of manufacture -arrow 1-
- ◆ Manual gearbox 02R or 0A4 -arrow 2-



Manual gearbox 02R -arrow 2-



Manual gearbox 0A4 -arrow 2-



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Code letters and date of manufacture of gearbox

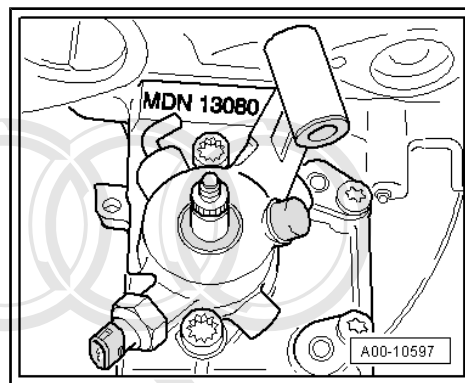
Example:	MDN	13	08	0
	Code letters	Day	Month	Year (2010) of manufacture

Additional data depend on manufacture.



Note

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



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2 Technical data

⇒ "2.1 Allocation of gearbox to engine", page 3

⇒ "2.2 Capacities", page 4

2.1 Allocation of gearbox to engine

⇒ "2.1.1 Allocation for 5-speed 02R", page 3

⇒ "2.1.2 Allocation for 5-speed 0A4", page 3

2.1.1 Allocation for 5-speed 02R

Manual gearbox		5-speed 02R		
Code letters		MDN	MZM	PPH
Allocation	Model	Audi A1 2011 ►	Audi A1 2011 ►	Audi A1 2011 ►
	Engine	1.6 ltr. - 66 kW TDI, 1.6 ltr. - 77 kW TDI	1.6 ltr. - 66 kW TDI, 1.6 ltr. - 77 kW TDI	1.6 ltr. - 85 kW TDI
Ratio Z1 : Z2	Final drive	60 : 19 = 3.158	60 : 19 = 3.158	60 : 19 = 3.158
The following data can be found in the ⇒ Electronic parts catalogue ♦ Production dates ♦ Individual gear ratios ♦ Allocation of drive shaft flanges ♦ Allocation of clutch type				

Manual gearbox		5-speed 02R		
Code letters		QXR	RSY	
Allocation	Model	Audi A1 2011 ►	Audi A1 2011 ►	
	Engine	1.6 ltr. - 85 kW TDI	1.6 ltr. - 85 kW TDI	
Ratio Z1 : Z2	Final drive	60 : 19 = 3.158	60 : 19 = 3.158	
The following data can be found in the ⇒ Electronic parts catalogue ♦ Production dates ♦ Individual gear ratios ♦ Allocation of drive shaft flanges ♦ Allocation of clutch type				

2.1.2 Allocation for 5-speed 0A4

Manual gearbox		5-speed 0A4		
Code letters		PHB	QYC	RTE
Allocation	Model	Audi A1 2011 ►	Audi A1 2011 ►	Audi A1 2011 ►
	Engine	1.4 ltr. - 66 kW TDI	1.4 ltr. - 66 kW TDI	1.4 ltr. - 66 kW TDI
Ratio Z1 : Z2	Final drive	61 : 18 = 3.389	61 : 18 = 3.389	61 : 18 = 3.389



Manual gearbox	5-speed 0A4
The following data can be found in the ⇒ Electronic parts catalogue	
◆ Production dates	
◆ Individual gear ratios	
◆ Allocation of drive shaft flanges	
◆ Allocation of clutch type	

2.2 Capacities

Manual gearbox	5-speed manual gearbox 02R and 0A4
Capacity of manual gearbox (gearbox completely dismantled)	2.0 ltr.
Capacity of manual gearbox ⇒ page 103 (gearbox partially dismantled)	1.8 ltr.
◆ Gear oil specifications ⇒ Electronic parts catalogue	

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3 Transmission layout

⇒ ["3.1 Transmission layout - front-wheel drive", page 5](#)

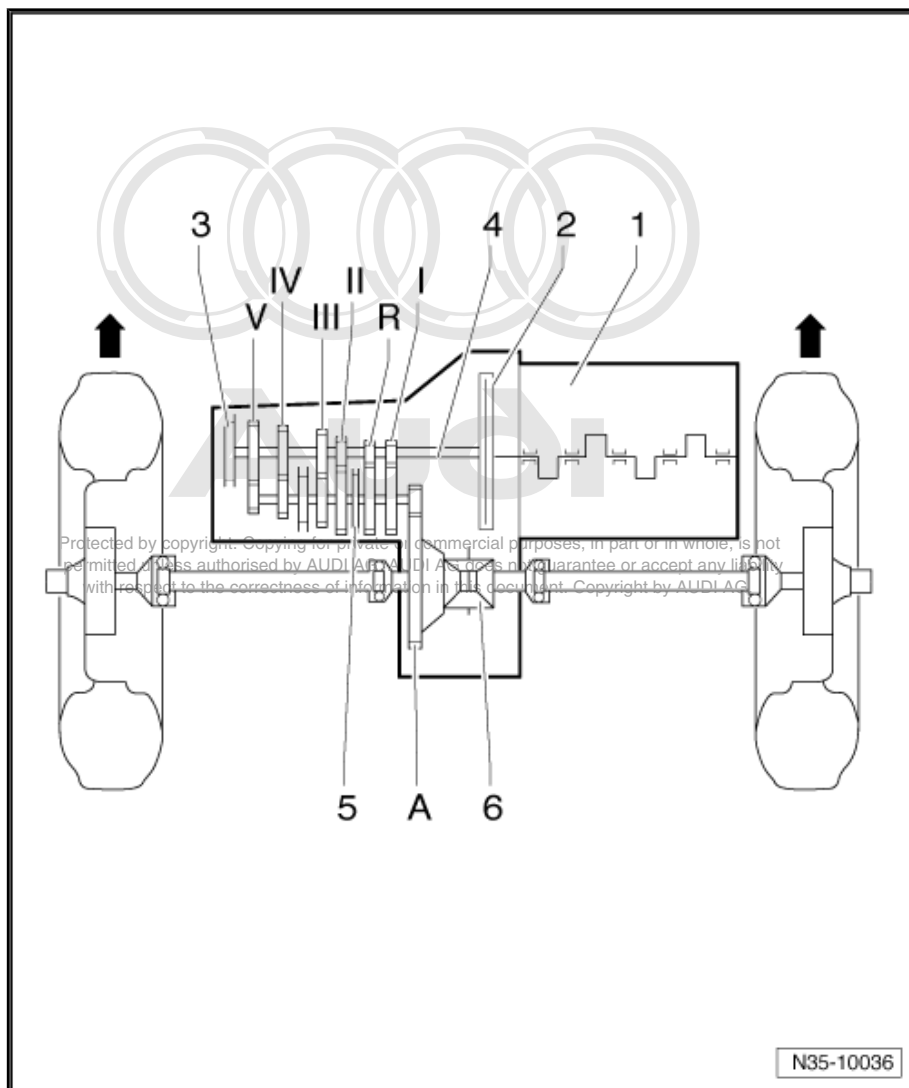
3.1 Transmission layout - front-wheel drive



Note

-Arrows- point in direction of travel

- 1 - Engine
- 2 - Clutch
- 3 - Manual gearbox
- 4 - Input shaft
- 5 - Output shaft
- 6 - Differential
- I - 1st gear
- II - 2nd gear
- III - 3rd gear
- IV - 4th gear
- V - 5th gear
- R - Reverse gear
- A - Final drive



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

Risk of injury - engine may start unexpectedly

The engine can start unexpectedly if the vehicle's start/stop system is activated. A message in the instrument cluster indicates whether the start/stop system is activated.

- To deactivate the start/stop system, switch off the ignition.



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5 Repair instructions

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

⇒ ["5.2 Contact corrosion", page 12](#)

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

- ◆ For a complete list of special tools used in this Workshop Manual ⇒ [Workshop equipment and special tools](#)
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Gearbox

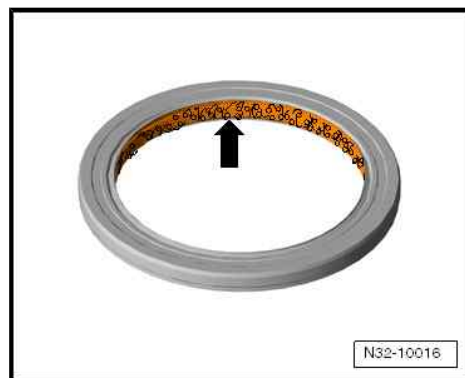
- ◆ When installing the gearbox, ensure that the dowel sleeves between the engine and the gearbox are correctly located.
- ◆ Allocate bolts and other components according to ⇒ [Electronic parts catalogue](#) .
- ◆ Clean contact surfaces when assembling mounting brackets and waxed components. The contact surfaces must be free of wax and grease.
- ◆ Thoroughly clean all joints and connections and the surrounding areas before disconnecting.
- ◆ When installing a new gearbox, check the oil level and fill up with oil if necessary ⇒ [page 103](#) .
- ◆ Capacities ⇒ [page 4](#) , specifications ⇒ [Electronic parts catalogue](#) .

Sealant

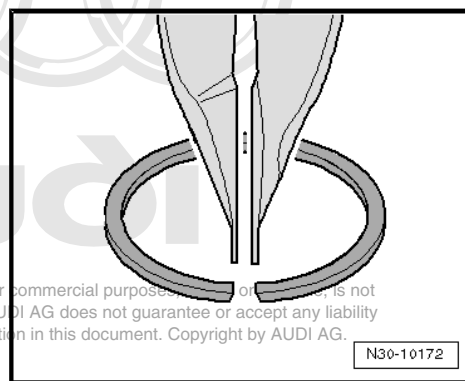
- ◆ Thoroughly clean joint surfaces on gearbox housing etc. before applying sealing paste.
- ◆ Apply sealing paste - AMV 188 200 03- evenly and not too thick.
- ◆ Breather holes must remain free of sealing paste.

Oil seals, seals, O-rings and gaskets

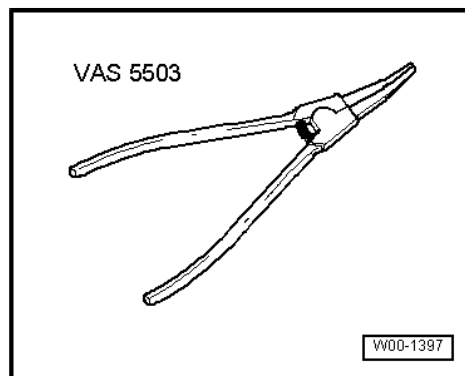
- ◆ Always renew O-rings, oil seals and gaskets after removal.
- ◆ After removing gaskets and seals, always inspect the contact surface on the housing or shaft for burrs resulting from removal or for other signs of damage.
- ◆ Before installing oil seals, lightly oil the outer circumference of the seal 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 103](#) .



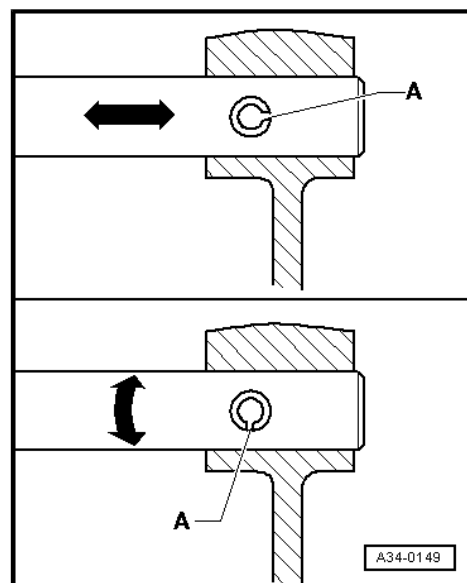
Locking elements



- ◆ 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.
- ◆ To facilitate assembly, use circlip pliers - VAS 5503A- .
- ◆ Always renew circlips which have been damaged or over-stretched.
- ◆ Circlips must be properly seated in the base of the groove.



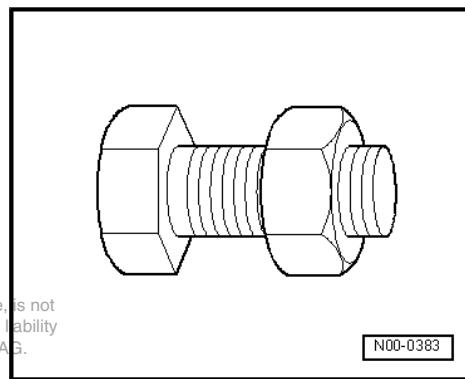
- ◆ Renew spring pins. Position: the slit -A- should be in line with the line of force -arrow-.



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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

- ◆ 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

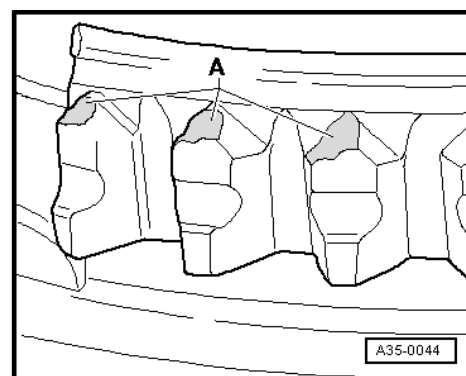
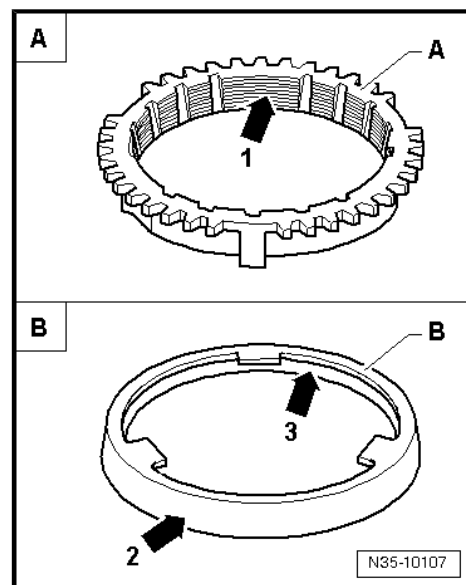
- ◆ Clean before pressing on.
- ◆ Use inductive heater - VAS 6414- to heat to approx. 100°C before installing. Press home onto stop when installing so there is no axial clearance.

Selector gears and locking collars

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

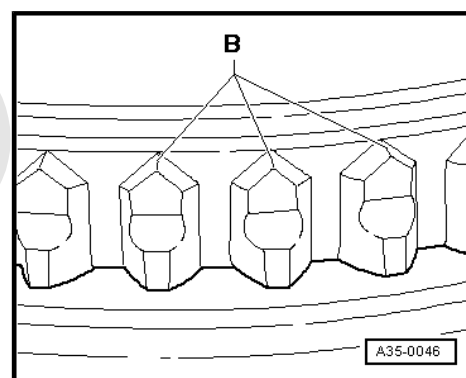
- ◆ Abnormal wear on synchro-ring or selector gear:

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



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

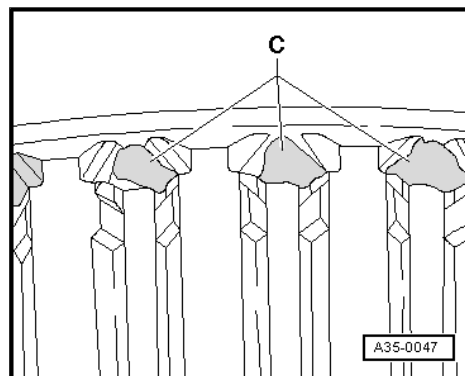
B - Intact chamfer on dog teeth of synchro-ring or selector gear.



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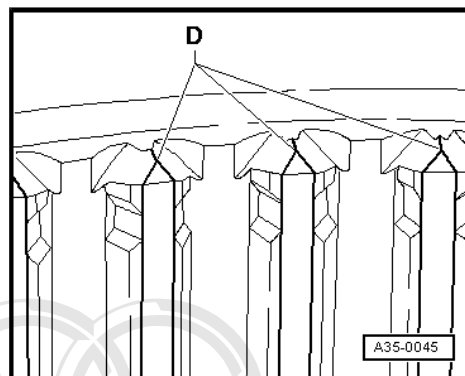
- ◆ Abnormal wear on locking collar:

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 41](#) .
- ◆ 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 41](#)).
- ◆ After installing the slave cylinder, carefully press the clutch pedal. If you feel an unusually strong point of resistance when pressing 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.

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5.2 Contact corrosion

The gearbox housing and clutch housing are made of an aluminium or magnesium alloy.

Contact corrosion can occur if unsuitable fasteners are used (e.g. bolts, nuts, washers, etc.).

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

In addition, rubber components, plastic components and adhesives are made of non-conductive material.

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 caused by contact corrosion is not covered by warranty.



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6 Electrical components

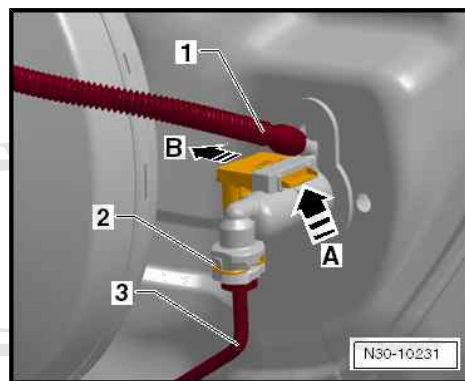
⇒ ["6.1 Overview of fitting locations - electrical components", page 14](#)

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.

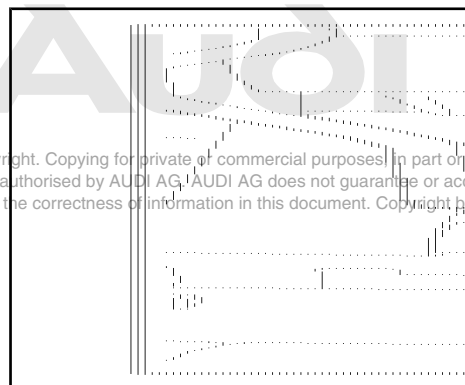
⇒ ["1.13 Removing and installing clutch position sender G476 ", page 42](#)



Reversing light switch - F4-

Fitting location: The reversing light switch - F4- -arrow- is located in the selector unit cover.

⇒ ["6.5 Exploded view - selector unit", page 113](#)

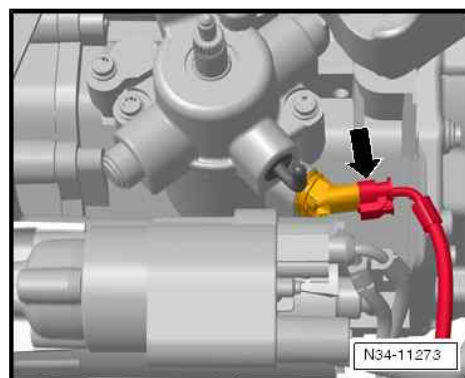


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Gearbox neutral position sender - G701-

Fitting location: The gearbox neutral position sender - G701- -arrow- is located behind the starter on the gearbox.

⇒ ["6.4 Exploded view - gearbox housing and selector mechanism", page 112](#)



30 – Clutch

1 Clutch mechanism

⇒ [“1.1 Exploded view - pedal cluster”, page 15](#)

⇒ [“1.2 Exploded view - clutch hydraulics”, page 19](#)

⇒ [“1.3 Exploded view - clutch release mechanism”, page 21](#)

⇒ [“1.4 Removing and installing clutch pedal”, page 22](#)

⇒ [“1.5 Removing and installing over-centre spring”, page 26](#)

⇒ [“1.6 Removing and installing mounting bracket”, page 27](#)

⇒ [“1.7 Removing and installing bearing bush”, page 30](#)

⇒ [“1.8 Removing and installing clutch master cylinder”,
page 32](#)

⇒ [“1.9 Removing and installing clutch slave cylinder”, page 36](#)

⇒ [“1.10 Removing and installing lines for clutch hydraulics”, page
38](#)

⇒ [“1.11 Bleeding clutch hydraulics”, page 40](#)

⇒ [“1.12 Checking clutch master cylinder and clutch slave cylinder”, page 41](#)

⇒ [“1.13 Removing and installing clutch position sender G476 ”,
page 42](#)

⇒ [“1.14 Servicing clutch release mechanism”, page 43](#)

1.1 Exploded view - pedal cluster

⇒ [“1.1.1 Exploded view - pedal cluster, vehicles up to model year
2014”, page 15](#)

⇒ [“1.1.2 Exploded view - pedal cluster, vehicles from model year
2015 onwards”, page 18](#)

1.1.1 Exploded view - pedal cluster, vehicles up to model year 2014

1 - Clutch pedal

- ☐ Removing and installing with over-centre spring
⇒ [page 22](#)

2 - Mounting

- ☐ Renew only when clutch master cylinder has been removed
- ☐ Removing ⇒ [page 17](#)
- ☐ Pressing on
⇒ [page 17](#)

3 - Clutch master cylinder

- ☐ Removing and installing
⇒ [page 32](#)

4 - Gasket

- ☐ Renew
- ☐ Glue onto clutch master cylinder

5 - Clutch position sender - G476-

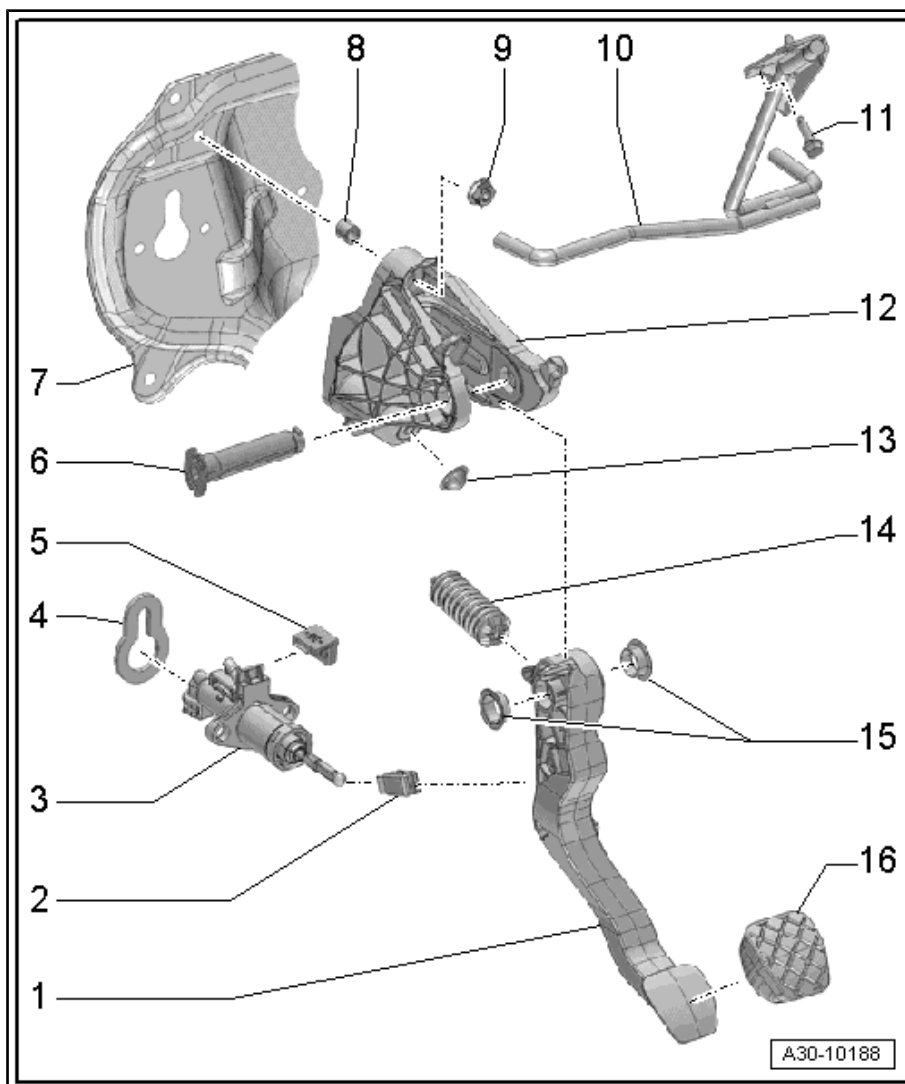
- ☐ Removing and installing
⇒ [page 42](#)
- ☐ Checking in [Guided Fault Finding](#) ⇒ vehicle diagnostic tester

6 - Pivot pin

- ☐ Cannot be removed without being damaged

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 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 32](#)

- ☐ Removing and installing without clutch master cylinder ⇒ [page 27](#)

13 - Stop

- ☐ For clutch pedal

14 - Over-centre spring

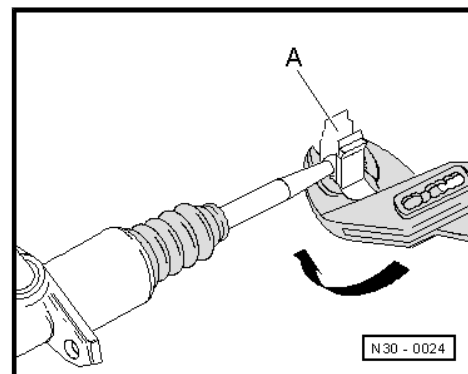
- ☐ Removing and installing ⇒ [page 22](#)

15 - Bearing bushes

16 - Cap

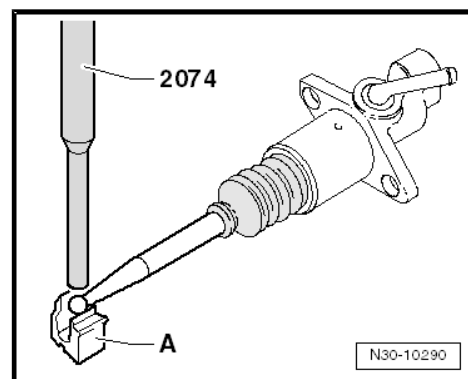
Removing retaining clip

- 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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1.1.2 Exploded view - pedal cluster, vehicles from model year 2015 onwards

1 - Bearing bush

2 - Over-centre spring

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

3 - Pivot pin

- ☐ For clutch pedal
- ☐ Cannot be removed without being damaged

4 - Clutch master cylinder

- ☐ Removing and installing
⇒ [page 33](#)
- ☐ Removing and installing bearing bush
⇒ [page 30](#)

5 - Gasket

- ☐ Renew
- ☐ Glue onto clutch master cylinder

6 - Plenum chamber partition panel

- ☐ With mounting for mounting bracket and master cylinder

7 - Clutch position sender - G476-

- ☐ Removing and installing

8 - Bush

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

9 - Mounting bracket

- ☐ Removing and installing ⇒ [page 29](#)

10 - Nut

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

11 - Stop

- ☐ For clutch pedal

12 - Bearing bush

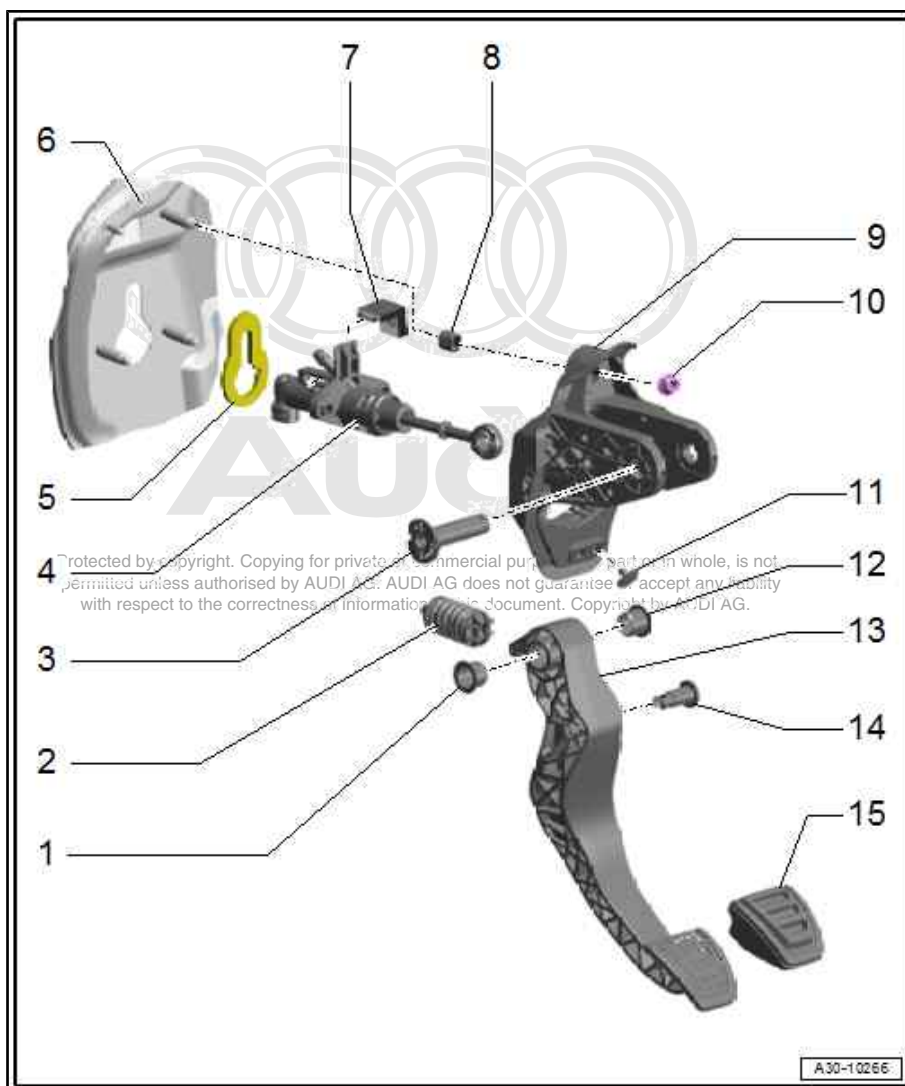
13 - Clutch pedal

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

14 - Locking pin

- ☐ Renew after removing

15 - Cap



1.2 Exploded view - clutch hydraulics



Note

The installation position on a left-hand drive vehicle is shown as an example.

1 - Bolt

- ☐ 2x
- ☐ 20 Nm

2 - Clutch slave cylinder

- ☐ Different versions available; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 36](#)

3 - Gearbox

4 - Clip

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

5 - Clip

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

6 - Brake fluid reservoir

7 - Seal

- ☐ Not available separately
- ☐ Renew supply hose -item 8- if damaged

8 - Supply hose

9 - Seal

- ☐ Not available separately
- ☐ Renew supply hose -item 8- if damaged

10 - Clutch master cylinder

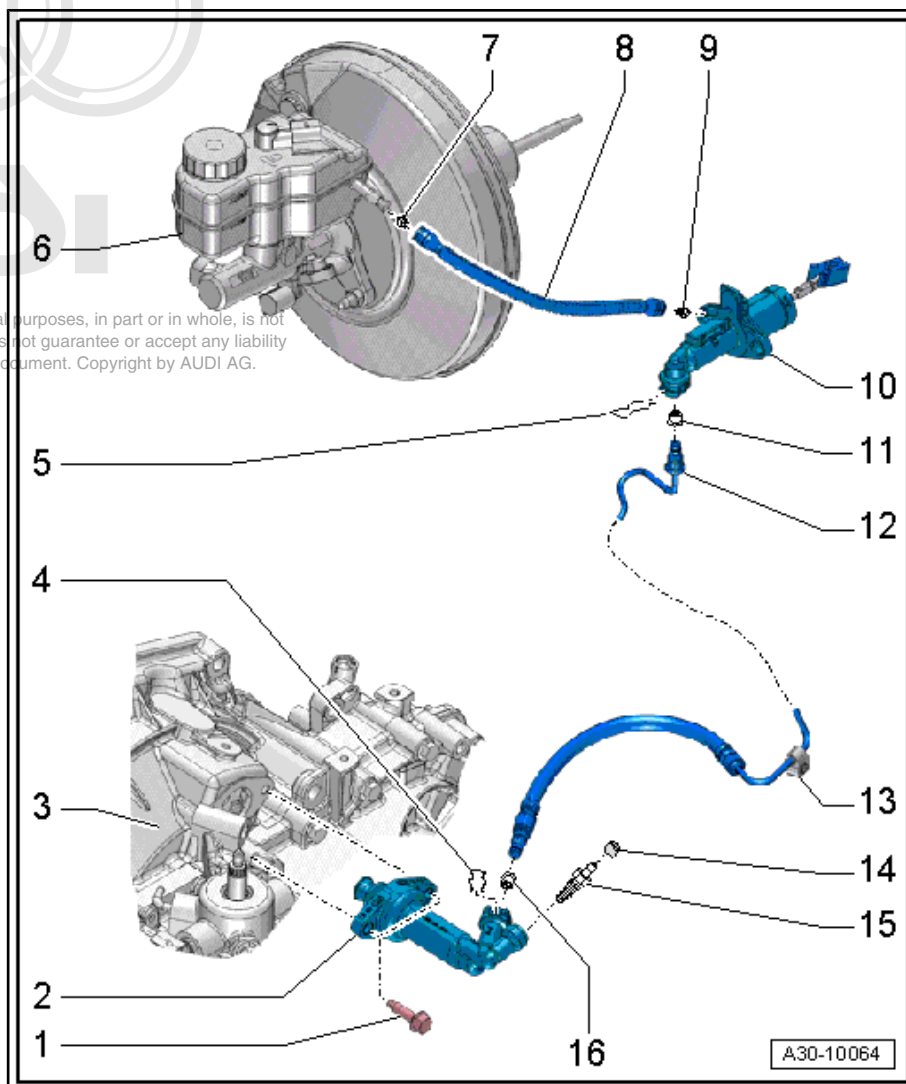
- ☐ Different versions available; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 32](#)

11 - Seal / O-ring

- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing
- ☐ Renew seal / O-ring if damaged
- ☐ Whether a seal or an O-ring is used depends on the type of connection ⇒ [page 20](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue

12 - Pipe/hose assembly

- ☐ Removing and installing ⇒ [page 38](#)
- ☐ Disconnecting from clutch master cylinder and clutch slave cylinder ⇒ [page 20](#)



13 - Bracket

- ☐ For pipe/hose assembly

14 - Dust cap

15 - Bleeder screw

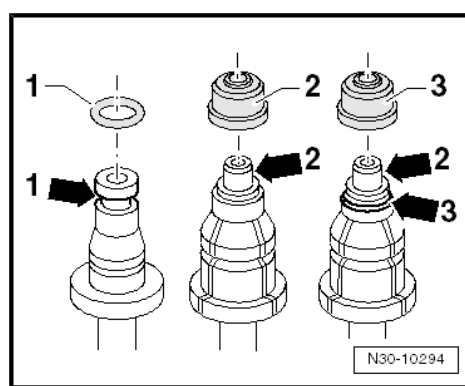
- ☐ Bleeding clutch system ⇒ [page 40](#)
- ☐ 6 Nm

16 - Seal / O-ring

- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing
- ☐ Renew seal / O-ring if damaged
- ☐ Whether a seal or an O-ring is used depends on the type of connection ⇒ [page 20](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue

O-rings or seals for pipe/hose assemblies

Item	Type of connection
-1-	Connection with annular groove -arrow 1-
-2-	Connection with shoulder -arrow 2-
-3-	Connection with shoulder -arrow 2- and annular groove -arrow 3-
• Connection with annular groove -arrow 1- and -arrow 3-: seal / O-ring must be inserted in groove.	



Disconnecting and connecting pipe/hose assembly from/to clutch master cylinder/clutch slave cylinder

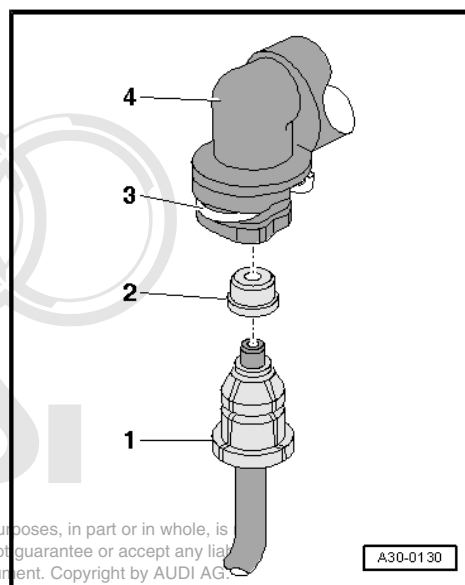
- To remove, release retaining clip -3- with a screwdriver and disconnect pipe/hose assembly -1- from clutch master cylinder/slave cylinder -4-.



Note

Renew damaged seals or O-rings -2-.

- Press pipe/hose assembly -1- into connection on clutch slave cylinder or master cylinder -4- so that retaining clip -3- snaps into place.
- Pull on pipe to check that it is secure.



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1.3 Exploded view - clutch release mechanism

1 - Gearbox

2 - Ball-head pin

- ☐ 25 Nm
- ☐ Remove existing grease from contact surface of release lever
- ☐ Lubricate surface which contacts ball-head pin with grease - G 000 100-

3 - Oil seal

- ☐ For input shaft
- ☐ Pressed into guide sleeve
- ☐ Renewing ⇒ [page 163](#)

4 - Guide sleeve

- ☐ With vulcanised O-ring
- ☐ With oil seal for input shaft -item 3-
- ☐ Renew guide sleeve if O-ring is damaged

5 - Retaining spring

- ☐ Secure to clutch release lever

6 - Bolt

- ☐ 20 Nm

7 - Clutch release lever

- ☐ Remove and install together with release bearing ⇒ [page 43](#)
- ☐ Remove existing grease
- ☐ Lubricate surface which contacts ball-head pin with MoS₂ grease

8 - Release bearing

- ☐ Do not wash out bearing; wipe clean only
- ☐ Renew bearing if noisy
- ☐ Lubricate surfaces which contact release lever with MoS₂ grease
- ☐ Detaching/attaching on release lever ⇒ [page 43](#)

9 - Bolt

- ☐ Tightening torque ⇒ [Item 1 \(page 19\)](#)

10 - Clutch slave cylinder

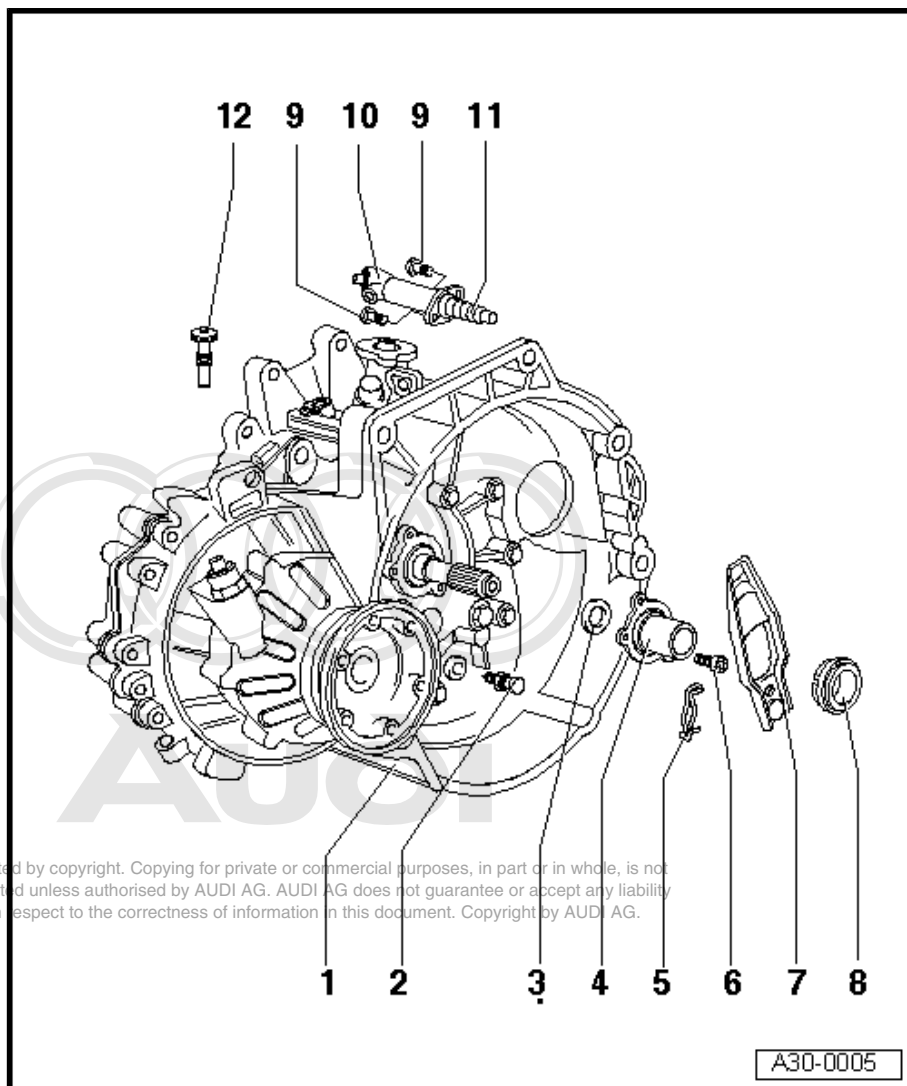
- ☐ Removing and installing ⇒ [page 36](#)

11 - Plunger

- ☐ Lubricate end of plunger with MoS₂ grease

12 - Assembly bolt

- ☐ Secures clutch release lever while installing new or replacement gearbox
- ☐ Unscrew after gearbox has been installed



1.4 Removing and installing clutch pedal

⇒ "1.4.1 Removing and installing clutch pedal - vehicles up to model year 2014", page 22

⇒ "1.4.2 Removing and installing clutch pedal - vehicles from model year 2015 onwards", page 24

1.4.1 Removing and installing clutch pedal - vehicles up to model year 2014



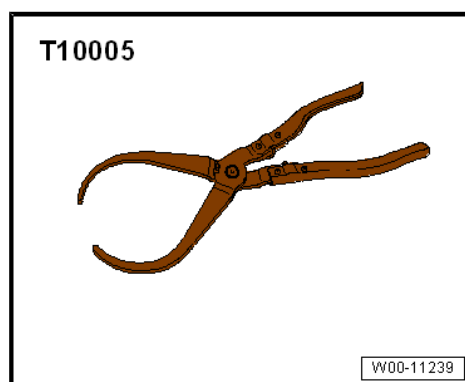
Note

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

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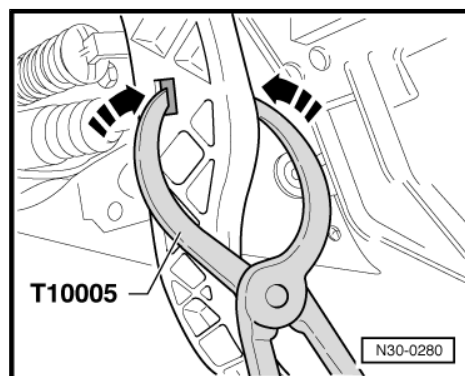
Special tools and workshop equipment required

- ◆ Pliers - T10005-



Removing

- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/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.

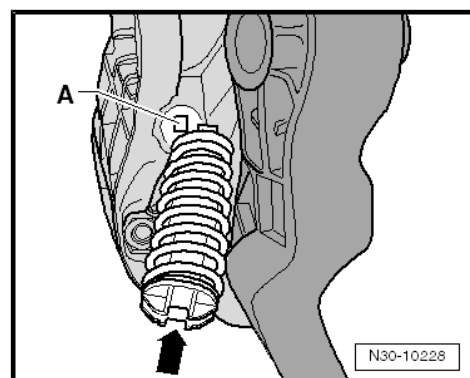
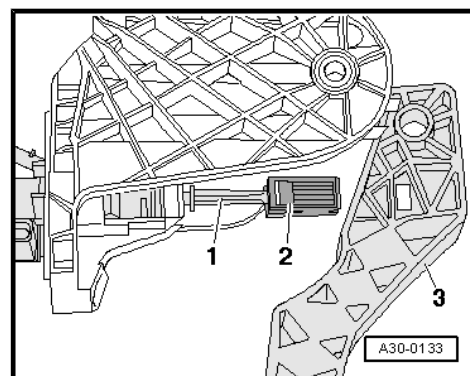
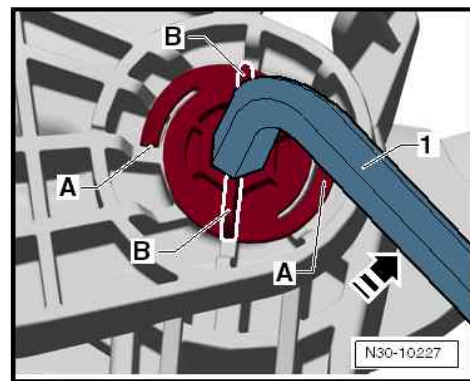
 Note

- ◆ *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.

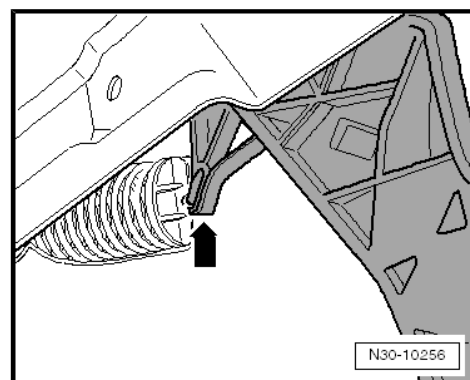
Installing

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.

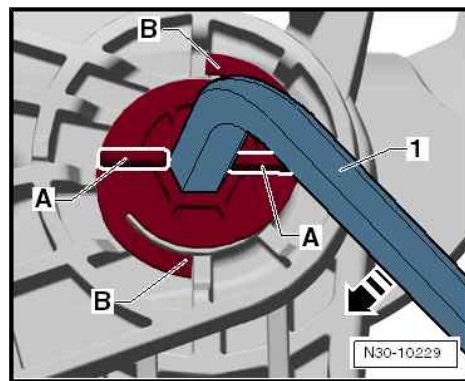


- Attach over-centre spring to actuator on clutch pedal -arrow-.



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- 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 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .



Tightening torques

- ♦ ⇒ [“1.1 Exploded view - pedal cluster”, page 15](#)

1.4.2 Removing and installing clutch pedal - vehicles from model year 2015 onwards

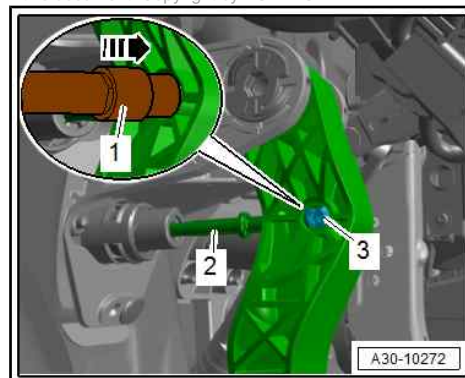
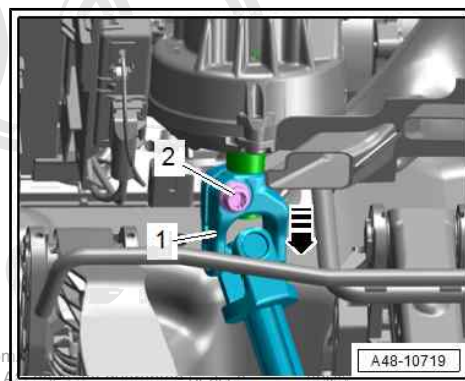


Note

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

Removing

- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .
- Remove bolt -2-.
- Detach intermediate steering shaft -1- from steering column -arrow- and place to one side.
- Remove crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Remove locking pin -3- of operating rod for clutch master cylinder; to do so, release catch using an 8 mm socket -item 1-.



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- Using 8 mm Allen key, turn pivot pin -3- for clutch pedal anti-clockwise until arrows on mounting bracket -2- and pivot pin are in line with each other, as shown in illustration.

 Note

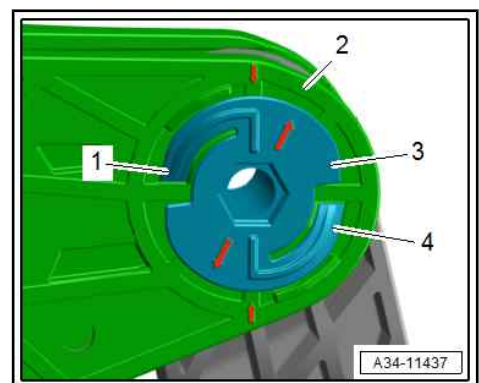
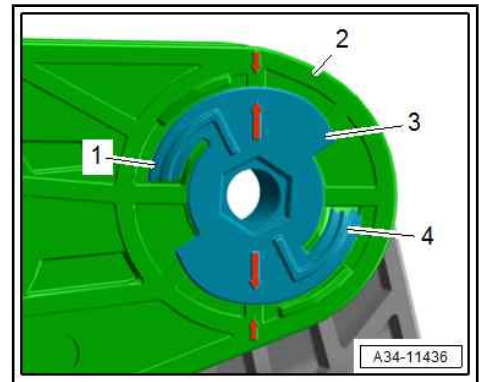
This will damage the retainers -1, 4- irreparably.

- Move clutch pedal back and forth to pull out pivot pin.
- Remove clutch pedal.

Installing

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

- Renew pivot pin and locking pin.
- Move clutch pedal into installation position and slide in new pivot pin -3-.
- Using 8 mm Allen key, turn pivot pin for clutch pedal clockwise until retainers -1, 4- engage audibly.
- Arrows on mounting bracket -1- must be offset, as shown in illustration.

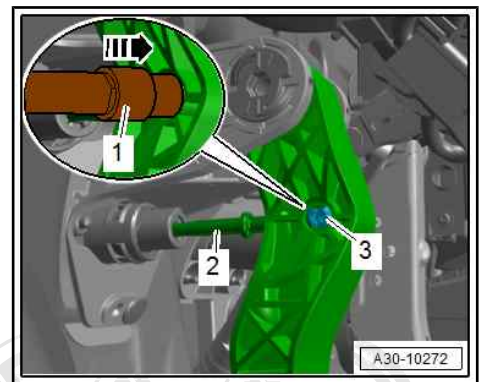


- Press clutch pedal until operating rod -2- for clutch master cylinder has reached installation position.
- Press in new locking pin -3- so that it engages audibly.

 Note

Items marked -1- and -arrow- can be disregarded.

- Install crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Install intermediate steering shaft ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .
- Install dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .



1.5 Removing and installing over-centre spring

⇒ "1.5.1 Removing and installing over-centre spring - vehicles up to model year 2014", page 26

⇒ "1.5.2 Removing and installing over-centre spring - vehicles from model year 2015 onwards", page 26

1.5.1 Removing and installing over-centre spring - vehicles up to model year 2014



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.

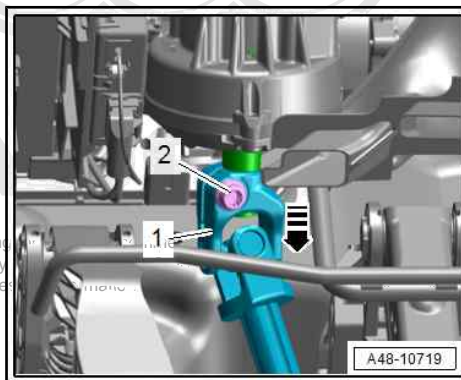
⇒ "1.4.1 Removing and installing clutch pedal - vehicles up to model year 2014", page 22.

1.5.2 Removing and installing over-centre spring - vehicles from model year 2015 onwards

Removing

- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .
- Remove bolt -2-.
- Detach intermediate steering shaft -1- from steering column -arrow- and place to one side.
- Remove crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .

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- Remove locking pin -3- of operating rod for clutch master cylinder; to do so, release catch using an 8 mm socket -item 1-.
- Swivel clutch pedal towards rear and remove over-centre spring.

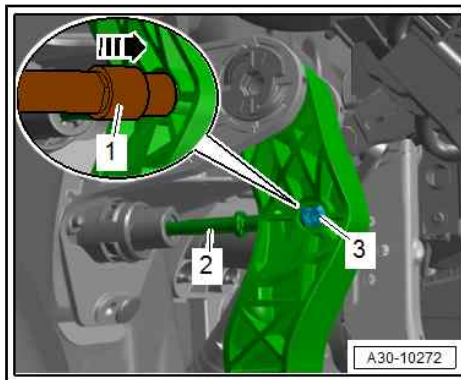
Installing

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

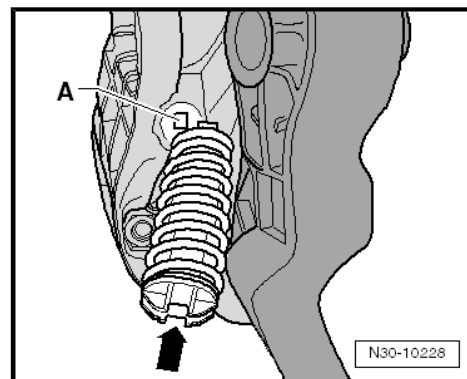


Note

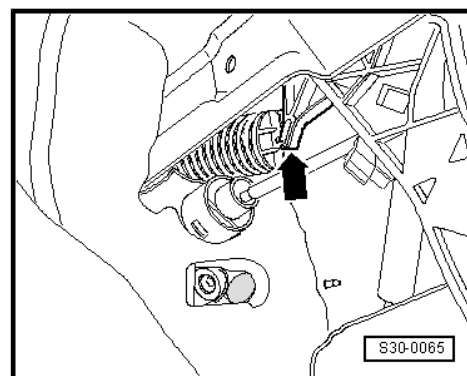
Renew locking pin.



- 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.
- Bearing recess -arrow- for actuator lug of clutch pedal must be vertical.



- Attach over-centre spring to mounting lug on clutch pedal -arrow-.



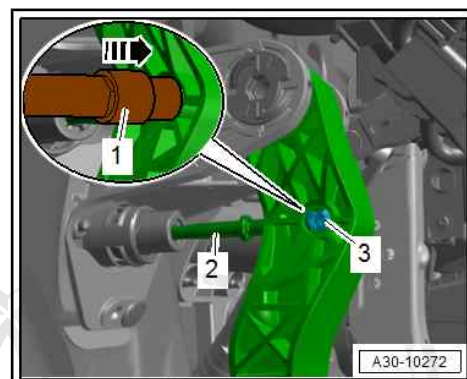
- Press clutch pedal until operating rod -2- for clutch master cylinder has reached installation position.
- Press in new locking pin -3- so that it engages audibly.



Note

Items marked -1- and -arrow- can be disregarded.

- Install crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Install intermediate steering shaft ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .
- Install dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .



1.6 Removing and installing mounting bracket

⇒ **"1.6.1 Removing and installing mounting bracket - vehicles up to model year 2014", page 27**

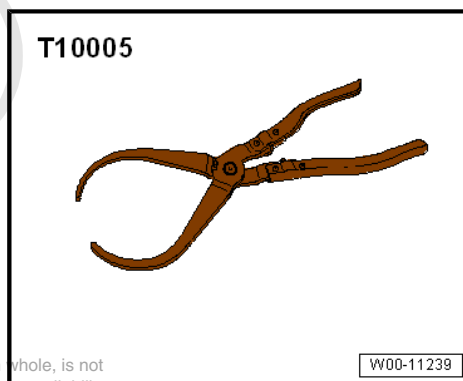
⇒ **"1.6.2 Removing and installing mounting bracket - vehicles from model year 2015 onwards", page 29**

1.6.1 Removing and installing mounting bracket - vehicles up to model year 2014

Special tools and workshop equipment required

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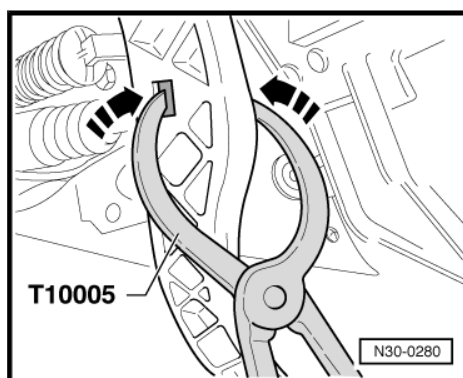
◆ Pliers - T10005-



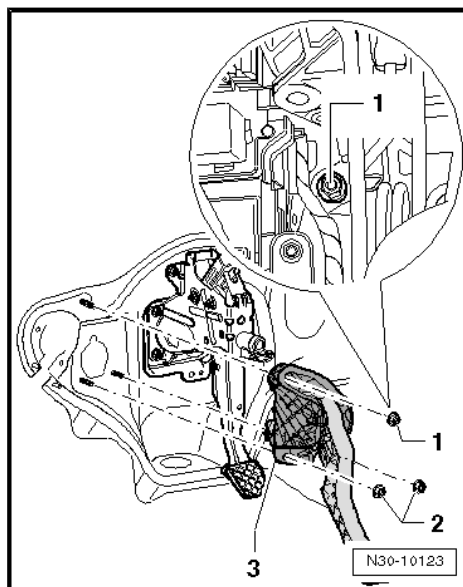
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Removing

- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/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).
- Detach clutch master cylinder from mounting bracket.



Installing

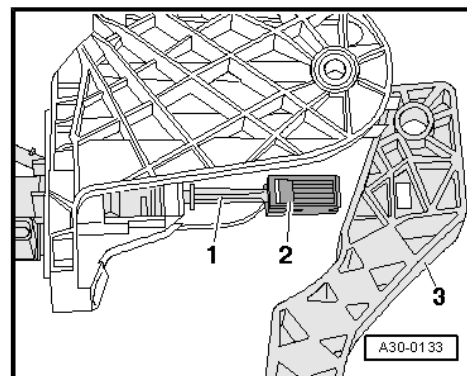
Installation is carried out in reverse sequence; note the following:



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 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .



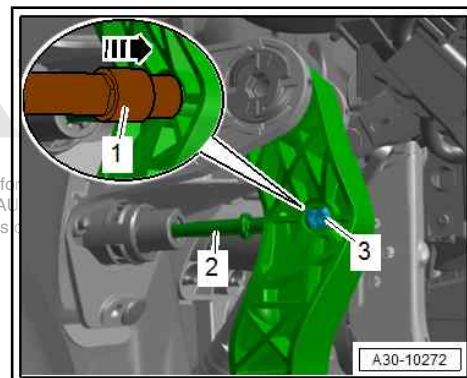
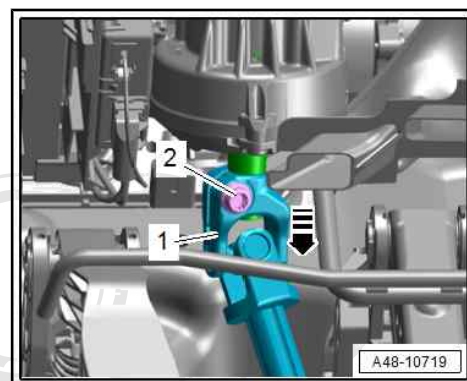
Tightening torques

- ◆ ⇒ [“1.1 Exploded view - pedal cluster”, page 15](#)

1.6.2 Removing and installing mounting bracket - vehicles from model year 2015 onwards

Removing

- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .
- Remove bolt -2-.
- Detach intermediate steering shaft -1- from steering column -arrow- and place to one side.
- Remove crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Remove locking pin -3- of operating rod for clutch master cylinder; to do so, release catch using an 8 mm socket -item 1-.



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- 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 order; note the following:



Note

Renew self-locking nuts and locking pin.

- Bring mounting bracket into position at clutch master cylinder and secure it.
- Press clutch pedal until operating rod -2- for clutch master cylinder has reached installation position.
- Press in new locking pin -3- so that it engages audibly.



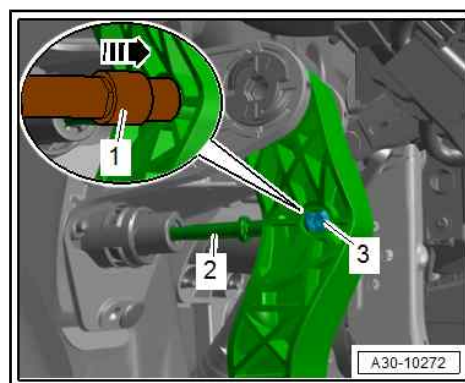
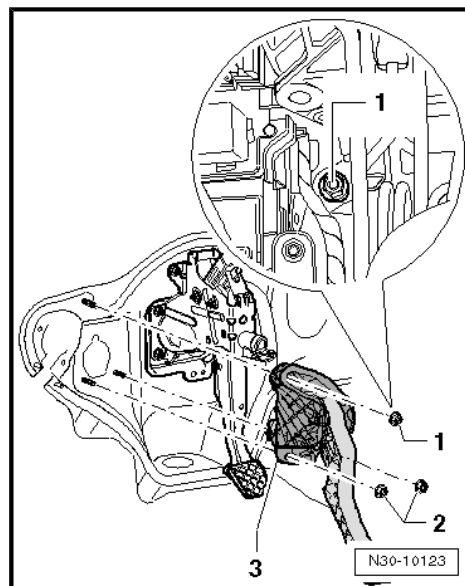
Note

Items marked -1- and -arrow- can be disregarded.

- Install crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Install intermediate steering shaft ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .
- Install dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

Tightening torques

- ♦ ⇒ [“1.1.2 Exploded view - pedal cluster, vehicles from model year 2015 onwards”, page 18](#)



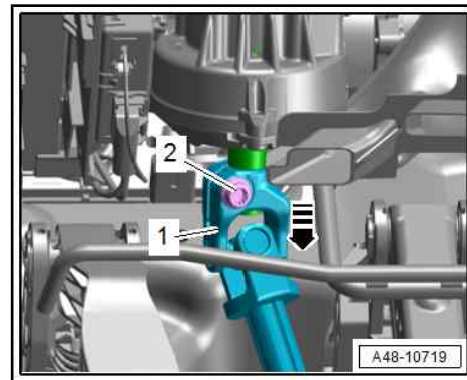
1.7 Removing and installing bearing bush

Removing

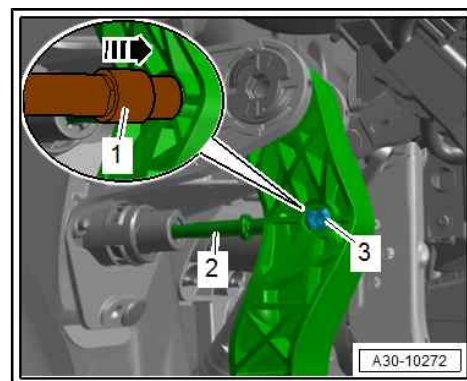
- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

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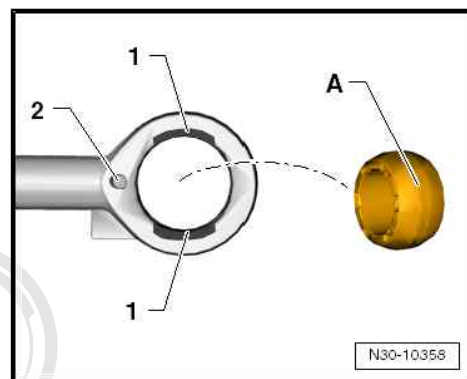
- Remove bolt -2-.
- Detach intermediate steering shaft -1- from steering column -arrow- and place to one side.
- Remove crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .



- Remove locking pin -3- of operating rod for clutch master cylinder; to do so, release catch using an 8 mm socket -item 1-.
- Swivel clutch pedal towards rear.

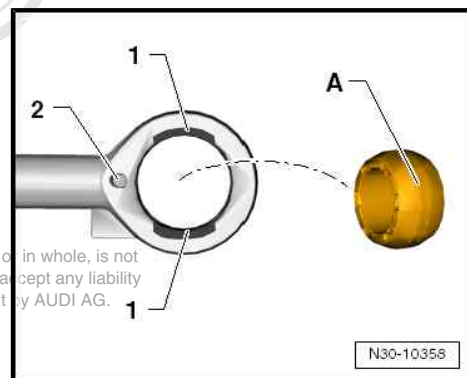


- Turn plunger of clutch master cylinder so that recesses -1- and pin -2- are visible.
- Recesses -1- and pin -2- point in the same direction.
- Remove bearing bush -A- from recesses -1-.



Installing

- Turn plunger of clutch master cylinder so that recesses -1- and pin -2- are visible.
- Recesses -1- and pin -2- point in the same direction.
- Insert bearing bush -A- into recesses -1- and pivot into position.
- Install over-centre spring ⇒ [page 26](#)



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1.8 Removing and installing clutch master cylinder

⇒ "1.8.1 Removing and installing clutch master cylinder - vehicles up to model year 2014", page 32

⇒ "1.8.2 Removing and installing clutch master cylinder - vehicles from model year 2015 onwards", page 33

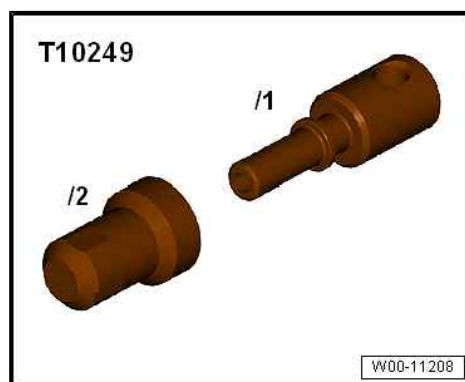
1.8.1 Removing and installing clutch master cylinder - vehicles up to model year 2014

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



- ◆ Sealing tool - T10249-



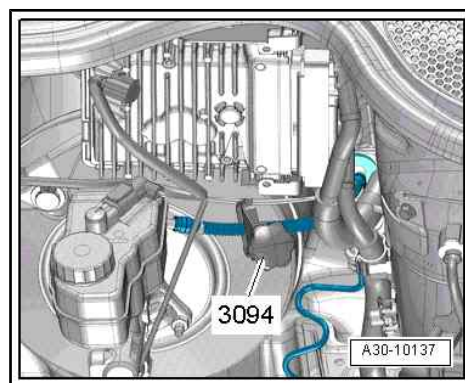
Removing

- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

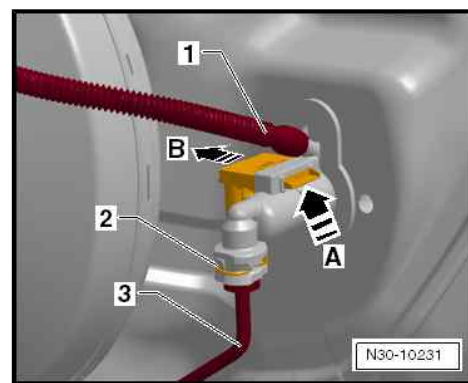


Note

- ◆ 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.



- Disconnect supply hose -1- from clutch master cylinder and plug hose using sealing tool - T10249/1- .
- 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.
- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/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.
- Detach clutch master cylinder from mounting bracket.

Installing

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

Note

Renew self-locking nuts.

- Push pipe/hose assembly onto connection on clutch master cylinder so that retaining clip snaps into place.
- Pull on pipe to check that it is secure.
- Install crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Bleed clutch system ⇒ [page 40](#) .
- Install clutch position sender - G476- ⇒ [page 42](#) .
- Install dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/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 .

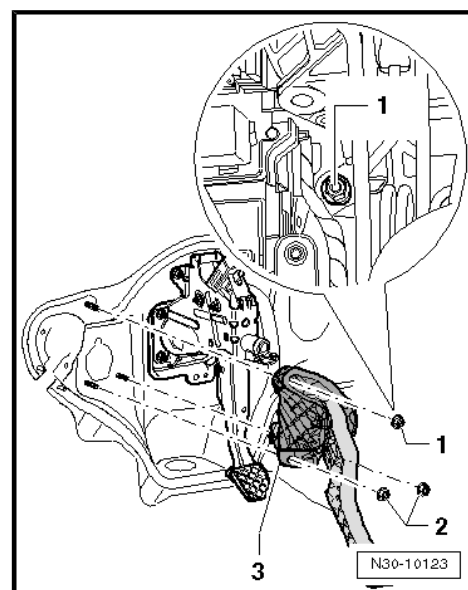
Tightening torques

- ◆ ⇒ [“1.1 Exploded view - pedal cluster”, page 15](#)

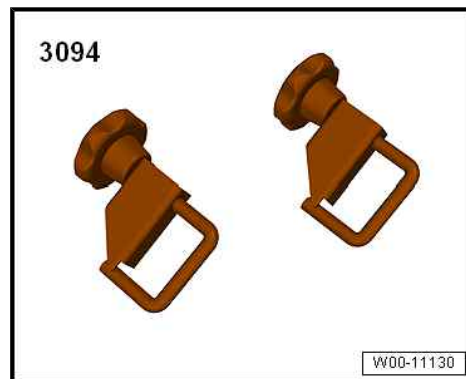
1.8.2 Removing and installing clutch master cylinder - vehicles from model year 2015 onwards

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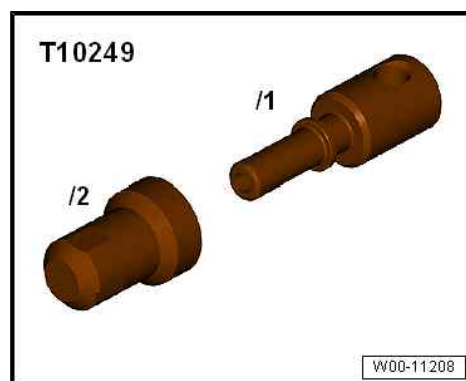
Special tools and workshop equipment required



- ◆ Hose clamps, up to 25 mm - 3094-



- ◆ Sealing tool - T10249-

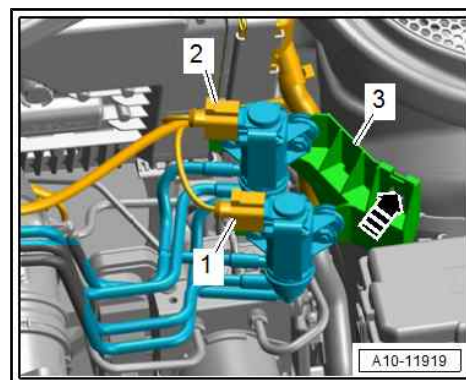


Removing

- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

Vehicles with 1.4 ltr. TDI engine (EA288):

- Unplug electrical connectors:
- 1 - For turbocharger air recirculation valve - N249-
- 2 - For variable intake manifold flap changeover valve - N239-
- Release fastener -arrow-, detach bracket -3- with air recirculation valves upwards and move it to one side.

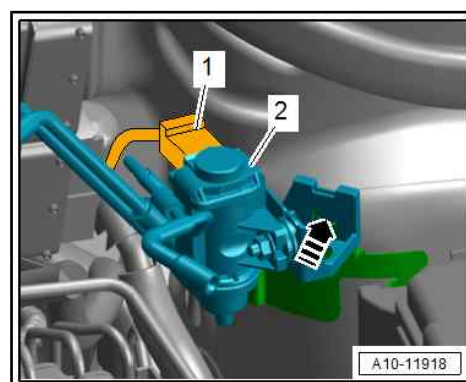


Vehicles with 1.6 ltr. TDI engine (EA288):

- Unplug electrical connector -1- on turbocharger air recirculation valve - N249- item 2-
- Release fastener -arrow- detach bracket with air recirculation valve and move it to one side.

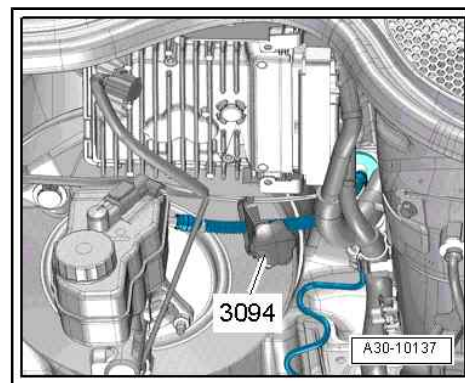
Continued for all vehicles:

- Remove engine control unit - J623- from bracket and tie to one side ⇒ Rep. gr. 23 ; Engine control unit; Removing and installing engine control unit - J623- .



 Note

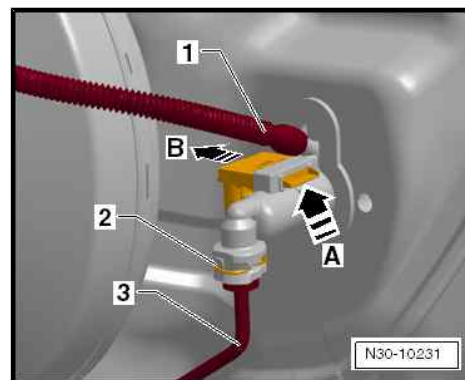
- ◆ *In the following steps make sure that no brake fluid escapes onto the longitudinal member or onto the gearbox below. If this does happen, clean the affected area thoroughly.*
- ◆ *Place a cloth underneath to catch escaping brake fluid.*
- Using hose clamp -3094- , clamp off supply hose to clutch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



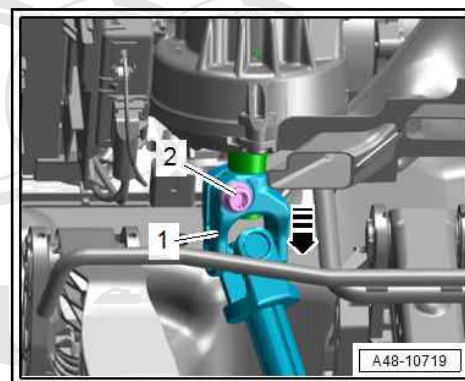
 Note

- ◆ *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.*

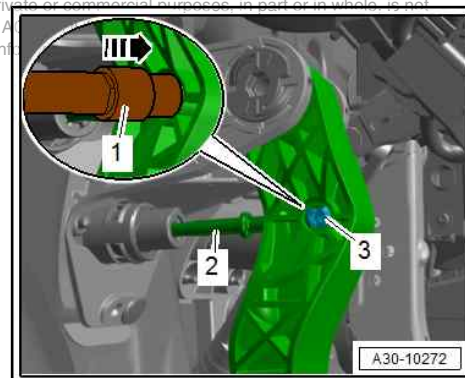
- Disconnect supply hose -1- from clutch master cylinder and plug hose using sealing tool - T10249/1- .
- Release retaining clip -2- with a screwdriver and disconnect pipe/hose assembly -3- from clutch master cylinder.
- Unclip clutch position sender - G476- -arrows A, B- and place it to one side with electrical connector attached.
- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .



- Remove bolt -2-.
- Detach intermediate steering shaft -1- from steering column -arrow- and place to one side.
- Remove crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .



- Remove locking pin -3- of operating rod for clutch master cylinder; to do so, release catch using an 8 mm socket -item 1-.



 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.
- Detach clutch master cylinder from mounting bracket.

Installing

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

 Note

Renew self-locking nuts.

- Clip clutch master cylinder into mounting bracket.
- Bring mounting bracket -3- and clutch master cylinder into installation position and tighten nuts -1, 2-.
- Press clutch pedal until operating rod -2- for clutch master cylinder has reached installation position.
- Press in new locking pin -3- so that it engages audibly.

 Note

Items marked -1- and -arrow- can be disregarded.

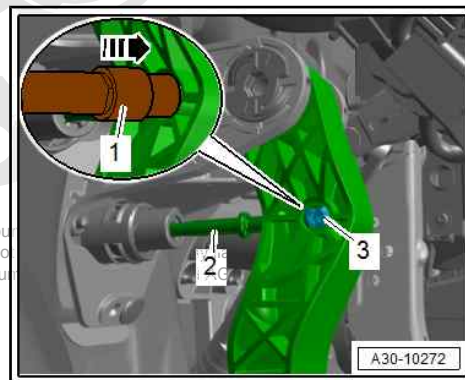
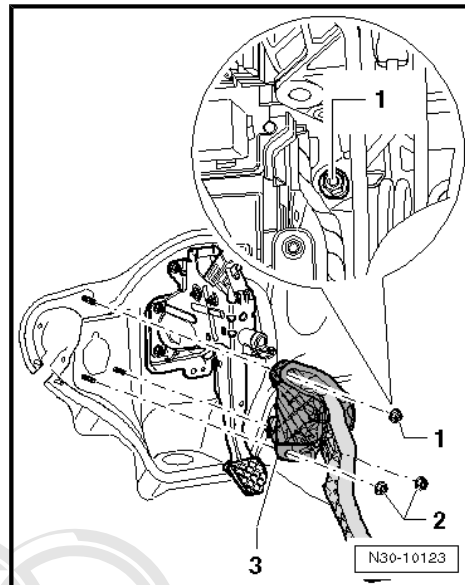
- Install crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Install intermediate steering shaft ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .
- Install dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .
- Connect pipe/hose assembly ⇒ [page 20](#) .
- Bleed clutch system ⇒ [page 40](#) .
- Install engine control unit - J623- ⇒ Rep. gr. 23 ; Engine control unit; Removing and installing engine control unit - J623- .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

Tightening torques

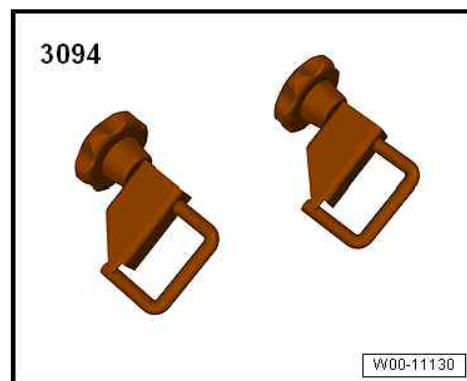
- ♦ ⇒ ["1.1.2 Exploded view - pedal cluster, vehicles from model year 2015 onwards", page 18](#)

1.9 Removing and installing clutch slave cylinder

Special tools and workshop equipment required



- ◆ Hose clamps, up to 25 mm - 3094-

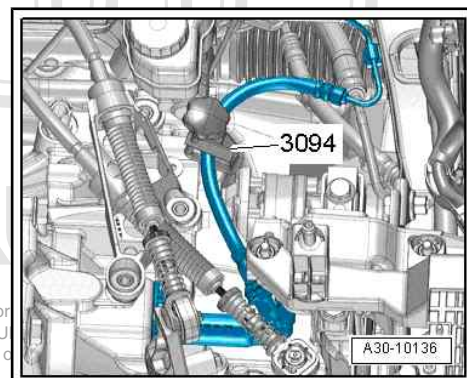


Removing

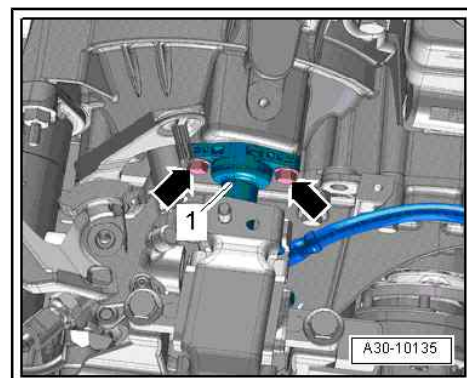


Note

- ◆ *If you suspect a defective clutch slave cylinder, perform function test prior to renewing → [page 41](#) .*
- ◆ *If the slave cylinder is removed from gearbox with the pipe/hose assembly still attached, make sure you do not press the clutch pedal. Otherwise, the piston will be pressed out of the slave cylinder and be destroyed.*
- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Clamp off hose on pipe/hose assembly between clutch master cylinder and slave cylinder using hose clamp - 3094- .



- Remove bolts -arrows- and detach clutch slave cylinder -1-.



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Note

- ◆ *Make sure that no brake fluid escapes onto the gearbox. If this does happen, clean the affected area thoroughly.*
- ◆ *Place a cloth underneath to catch escaping brake fluid.*
- Release retaining clip -3- with a screwdriver and disconnect pipe/hose assembly -1- from connection -4-.

Note

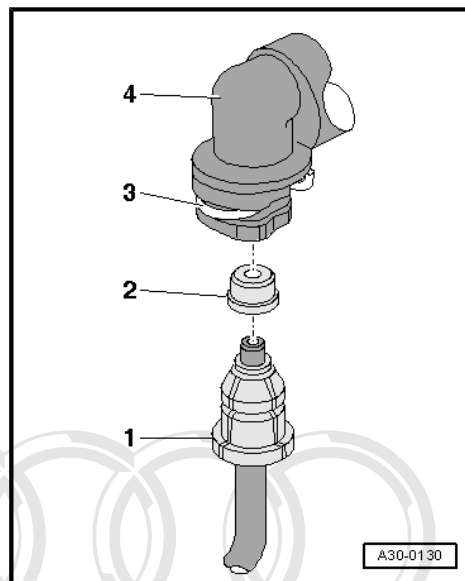
Disregard -item 2-.



Caution

Risk of brake fluid escaping.

- ◆ *Do not press clutch pedal after removing clutch slave cylinder.*



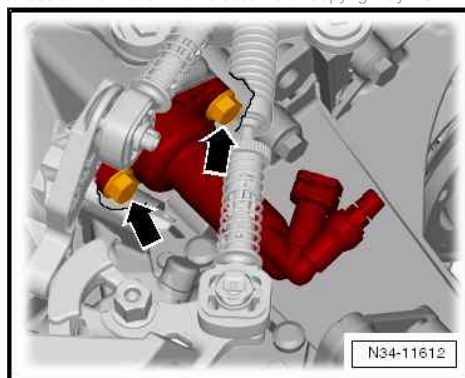
Installing

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

- Connect pipe/hose assembly to clutch slave cylinder
 ⇒ [page 20](#) .
- Lubricate end of plunger with MoS₂ grease.
- Install slave cylinder and tighten bolts -arrows- to specified torque.
- Bleed clutch system ⇒ [page 40](#) .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

Tightening torques

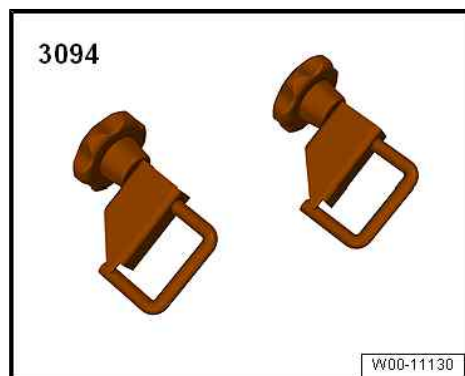
- ◆ ⇒ [“1.2 Exploded view - clutch hydraulics”, page 19](#)



1.10 Removing and installing lines for clutch hydraulics

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



Removing

- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .



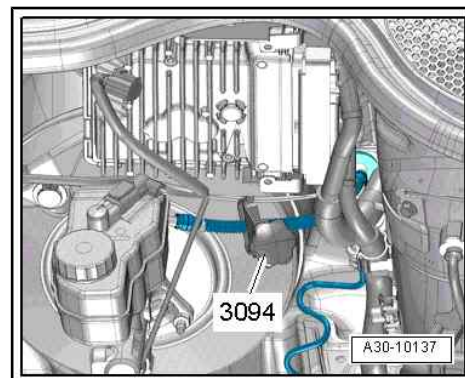
Note

- ◆ *Make sure that no brake fluid escapes onto the gearbox. 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.*



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



Caution

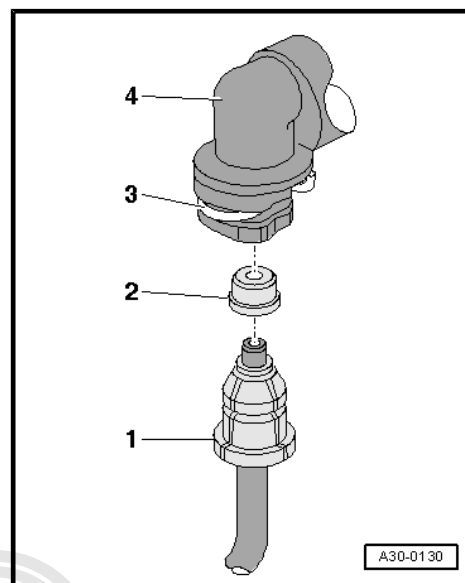
Risk of brake fluid escaping.

- ◆ *Do not press clutch pedal after removing clutch slave cylinder.*

Installing

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

- Connect pipe/hose assembly to clutch master cylinder and clutch slave cylinder ⇒ [page 20](#) .
- Bleed clutch system ⇒ [page 40](#) .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .



1.11 Bleeding clutch hydraulics



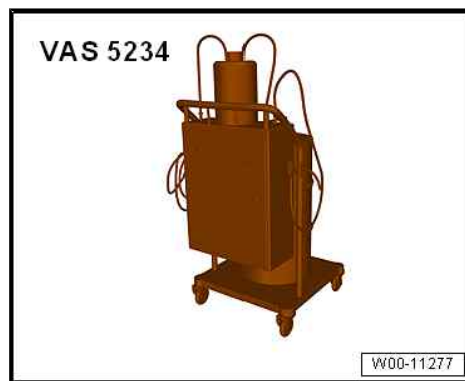
Note

- ◆ *The clutch system must be bled after performing work on the hydraulic clutch mechanism.*
- ◆ *In the following steps make sure that no brake fluid escapes onto the longitudinal member or onto the gearbox below.*
- ◆ *Before bleeding clutch system, top up brake fluid reservoir to "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) .*

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Special tools and workshop equipment required

- ◆ Brake filling and bleeding equipment - VAS 5234-



- ◆ Brake fluid specification ⇒ Electronic parts catalogue .

Procedure

- Pull clutch pedal back to rest position.
- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Connect up brake filling and bleeding equipment - VAS 5234- .

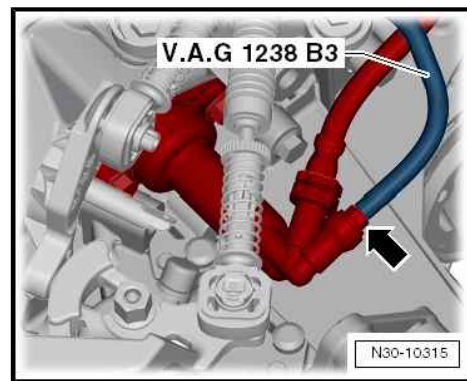
- Remove protective cap and connect 670 mm bleeder hose - V.A.G 1238/B3- to bleeder connection -arrow-.
- Connect bleeder hose to collector bottle of brake bleeding unit.



Note

Installation position of breather differs depending on version.

- Switch on brake bleeding unit.
- ◆ Operating pressure 2.0 bar
- Open bleeder screw.
- Bleed off about 100 cm³ of brake fluid.
- Close bleeder screw.
- Rapidly pump clutch pedal through full range of travel 10 to 15 times.
- Open bleeder screw once again.
- Bleed off a further 50 cm³ of brake fluid.
- Tighten bleeder screw, disconnect bleeder hose and fit protective cap.
- Detach brake filling and bleeding equipment - VAS 5234- from brake fluid reservoir.
- Depress clutch pedal several times after bleeding process is completed.
- Repeat bleeding procedure if necessary.
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .



Tightening torques

- ◆ ⇒ ["1.2 Exploded view - clutch hydraulics", page 19](#)

1.12 Checking clutch master cylinder and clutch slave cylinder

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 pressed / 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).
- ◆ If you identify any leaks you must renew the leaking component.
- ◆ Bleed clutch system ⇒ [page 40](#) .

Pedal forces:

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

High pedal force:

- ◆ Mechanical fault on pressure plate/clutch plate ⇒ [page 49](#) .

Clutch does not disengage or does not disengage fully:

- ◆ Air in hydraulic system: bleed clutch system ⇒ [page 40](#) and check hydraulic system for external and internal leaks.
- ◆ 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 45](#) .
- ◆ Wrong components were installed when carrying out repair work (e.g. clutch plate, clutch pressure plate and dual-mass flywheel are not from the same manufacturer); allocation ⇒ Electronic parts catalogue .
- ◆ Components were forgotten when carrying out repair work (e.g. intermediate plate or dowel sleeves).
- ◆ Clutch plate was installed incorrectly when carrying out repair work.

1.13 Removing and installing clutch position sender - G476-

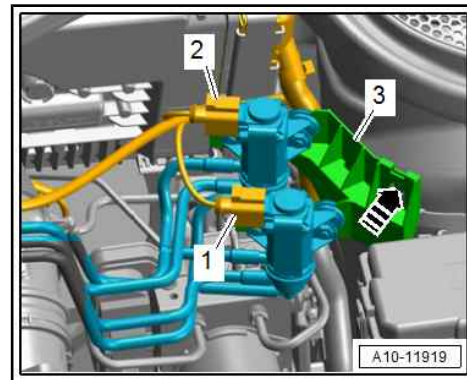
Removing

- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

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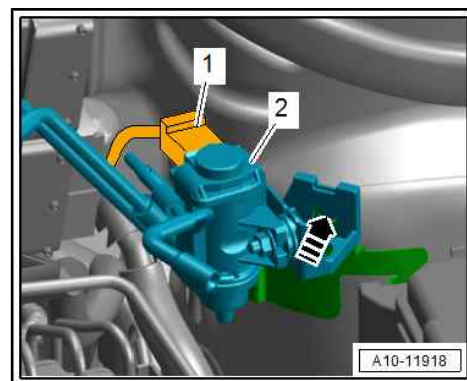
Vehicles with 1.4 ltr. TDI engine (EA288):

- Unplug electrical connectors:
- 1 - For turbocharger air recirculation valve - N249-
- 2 - For variable intake manifold flap changeover valve - N239-
- Release fastener -arrow-, detach bracket -3- with air recirculation valves upwards and move it to one side.



Vehicles with 1.6 ltr. TDI engine (EA288):

- Unplug electrical connector -1- on turbocharger air recirculation valve - N249- -item 2-.
- Release fastener -arrow-, detach bracket with air recirculation valve and move it to one side.



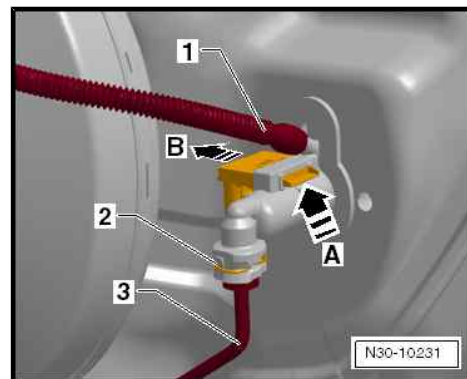
Continued for all vehicles:

- Remove engine control unit - J623- from bracket and tie to one side ⇒ Rep. gr. 23 ; Engine control unit; Removing and installing engine control unit - J623- .
- Unclip clutch position sender - G476- -arrows A, B-.
- Unplug electrical connector and remove clutch position sender - G476- .



Note

Disregard -items 1, 2, 3-.



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 engine control unit - J623- ⇒ Rep. gr. 23 ; Engine control unit; Removing and installing engine control unit - J623- .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

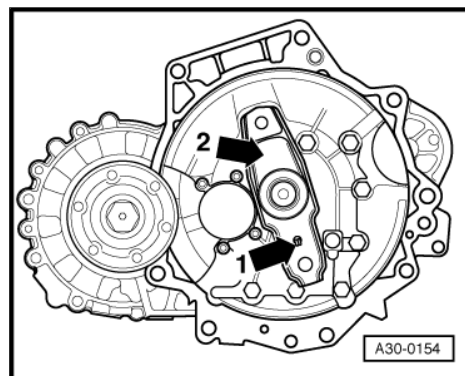
1.14 Servicing clutch release mechanism

Removing

- Gearbox removed

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- Disengage spring -arrow 1-.
- Pull off clutch release lever -arrow 2- and clutch release bearing.

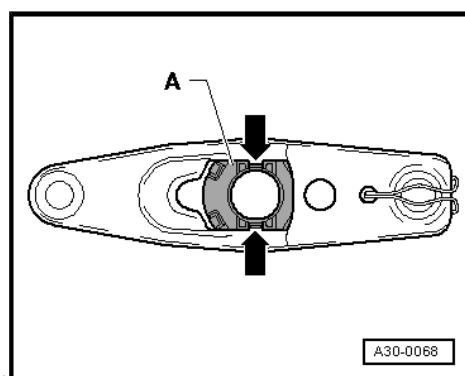


- Press retaining hooks -arrows- together on reverse side of clutch release lever and remove release bearing -A- from clutch release lever.

Installing

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

- To install, press release bearing -A- into clutch release lever until retaining hooks -arrows- engage.



Note

Lubricate surface on release lever which contacts ball-head pin with MoS₂ grease.

2 Clutch

⇒ ["2.1 Exploded view - clutch unit", page 45](#)

⇒ ["2.2 Removing and installing clutch", page 49](#)

2.1 Exploded view - clutch unit

⇒ ["2.1.1 Exploded view - Sachs version clutch", page 45](#)

⇒ ["2.1.2 Exploded view - LuK version clutch with dual-mass fly-wheel", page 47](#)

⇒ ["2.1.3 Exploded view - LuK version clutch with one-piece fly-wheel", page 49](#)

2.1.1 Exploded view - Sachs version clutch



Note

Observe notes ⇒ [page 49](#).

1 - Dual-mass flywheel

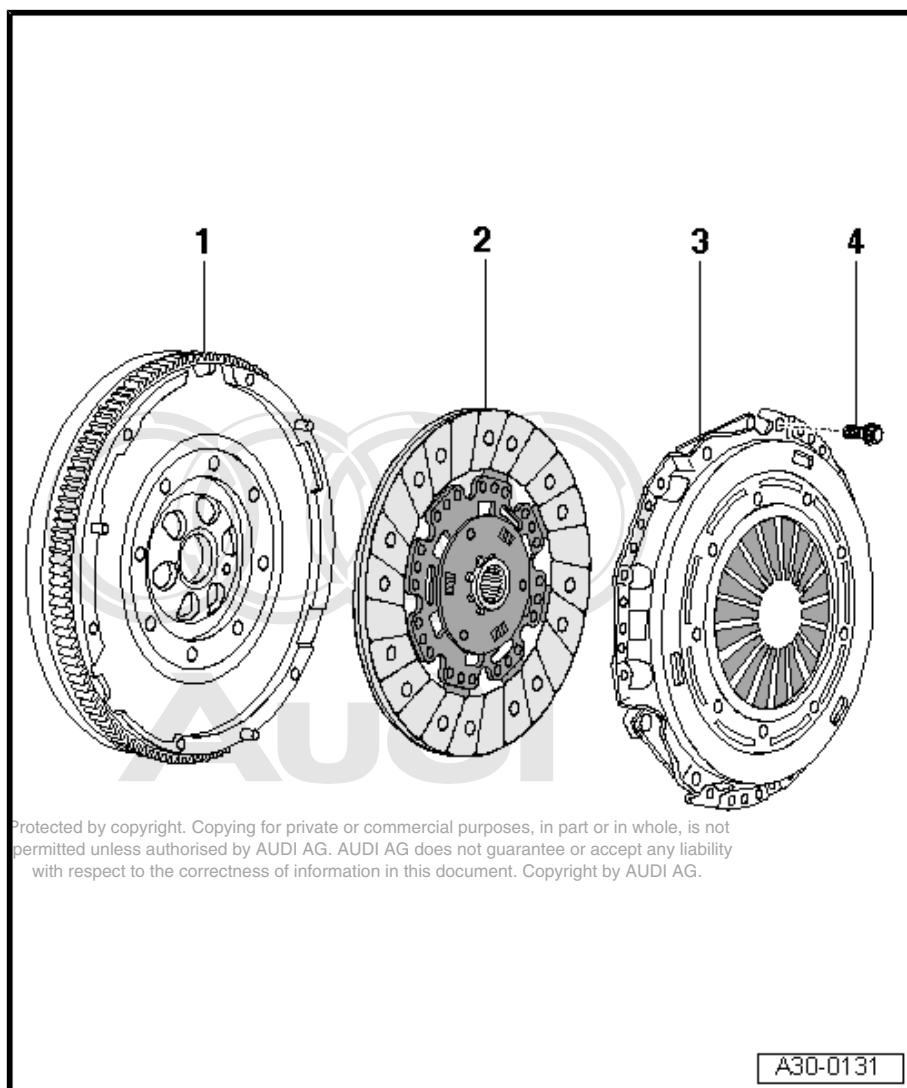
- ☐ Removing and installing
⇒ Rep. gr. 13 ; Cylinder block (gearbox end);
Removing and installing flywheel
- ☐ Ensure that dowel pins fit tightly
- ☐ Contact surface for clutch lining must be free of grooves, oil and grease
- ☐ Observe instructions for removal ⇒ [page 47](#)

2 - Clutch plate

- ☐ Removing and installing
⇒ [page 49](#)
- ☐ Always renew clutch pressure plate as well
- ☐ Installation position
⇒ [page 46](#)
- ☐ For diameter of clutch plate, refer to ⇒ Electronic parts catalogue

3 - Clutch pressure plate

- ☐ With adjustment mechanism
- ☐ Identification
⇒ [page 46](#)
- ☐ Removing and installing
⇒ [page 49](#)
- ☐ Checking ends of diaphragm spring
⇒ [page 46](#)
- ☐ Checking spring connections and rivets ⇒ [page 47](#)
- ☐ Always renew clutch plate as well



- ❑ For correct version, refer to ⇒ Electronic parts catalogue

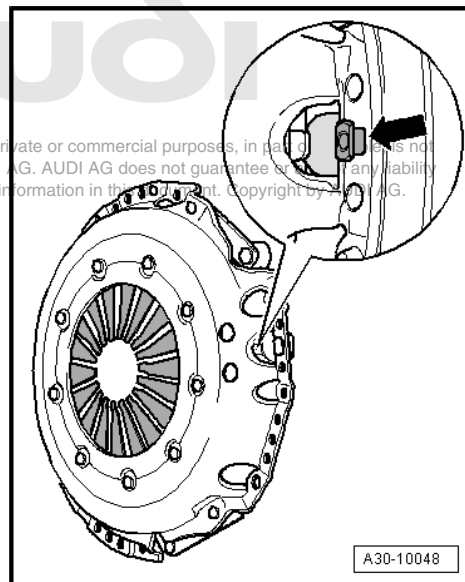
4 - Bolt

- ❑ M6 - 13 Nm
- ❑ M7 - 20 Nm
- ❑ 6x
- ❑ Loosen and tighten consecutively in steps of 90°

Identification of Sachs clutch version

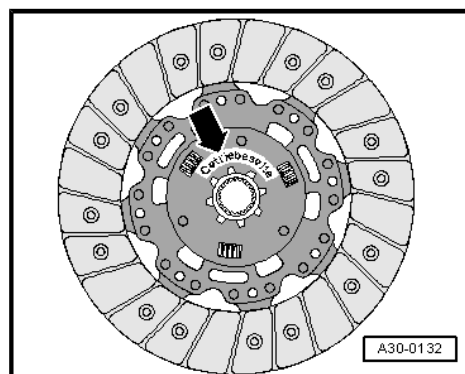
- ◆ Clutch pressure plate with stop mechanism (position sensor)
-arrow-.

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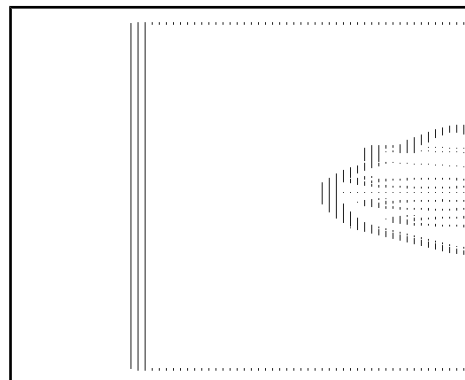
Installation position of clutch plate

- Marking "Getriebeseite" (gearbox side) and the protruding spring cage face towards gearbox.



Checking ends of diaphragm spring

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



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-.

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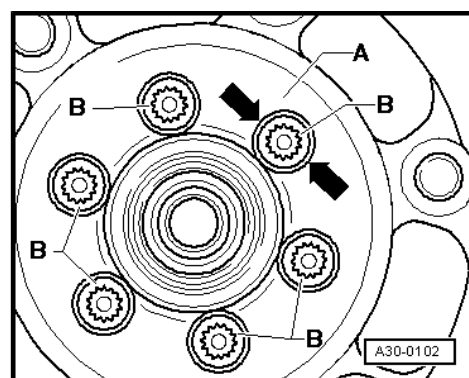
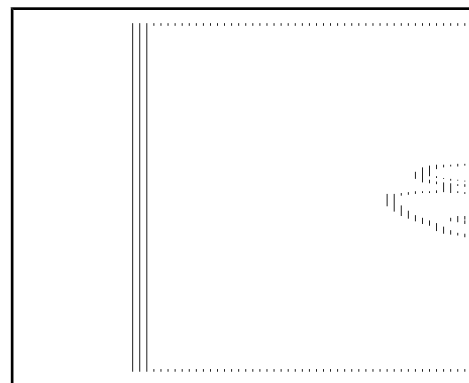
Instructions for removing dual-mass flywheel



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-.**



2.1.2 Exploded view - LuK version clutch with dual-mass flywheel



Note

The dual-mass flywheel, clutch pressure plate and clutch plate are matched together; components from another manufacturer must not be installed on the same vehicle.

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

2 - Clutch plate

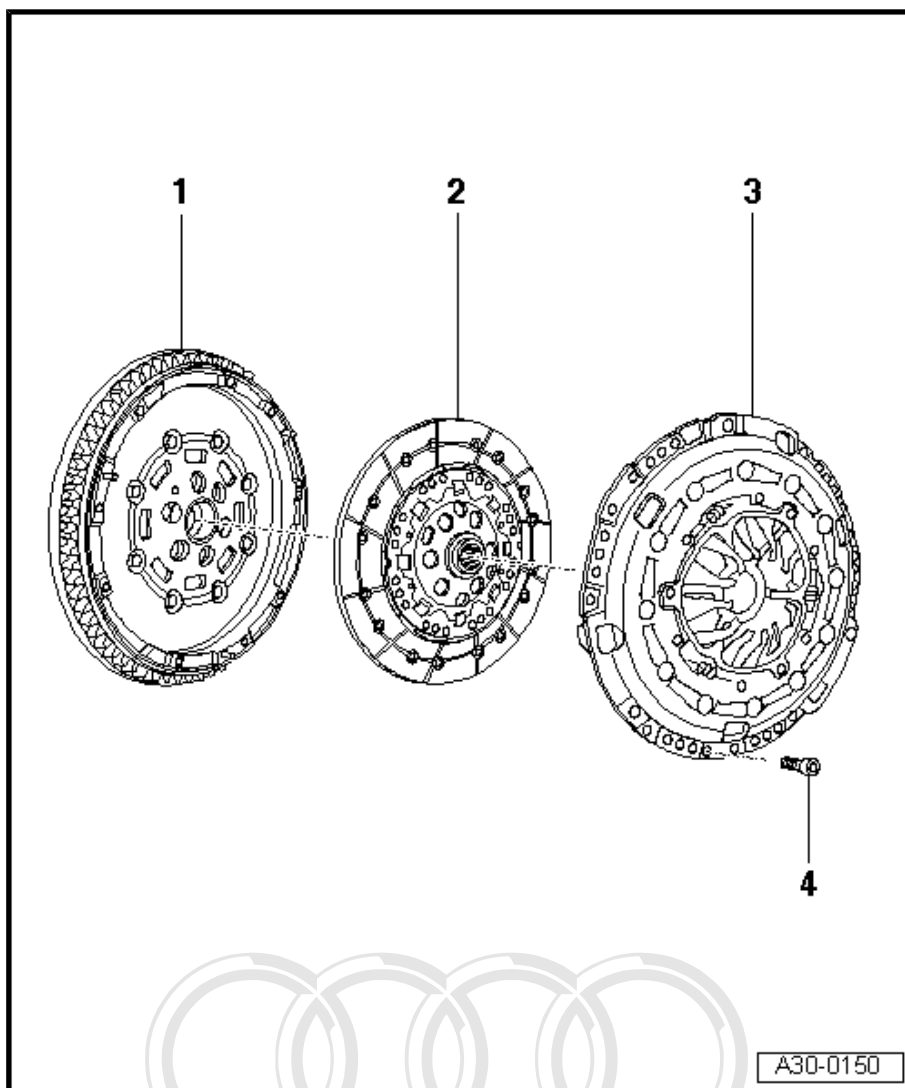
- ☐ Removing and installing
⇒ [page 53](#)
- ☐ Always renew clutch pressure plate as well
- ☐ Allocate according to engine code ⇒ Electronic parts catalogue
- ☐ Installation position
⇒ [page 56](#)
- ☐ Lightly grease splines

3 - Clutch pressure plate

- ☐ With adjustment mechanism
- ☐ Removing and installing
⇒ [page 53](#)
- ☐ Checking ends of diaphragm spring
⇒ [page 56](#)
- ☐ Checking spring connections and rivets
⇒ [page 56](#)
- ☐ Checking metal ring
⇒ [page 57](#)
- ☐ Always renew clutch plate as well
- ☐ Allocate according to engine code ⇒ Electronic parts catalogue
- ☐ Only fits on flywheel in one position
- ☐ Contact surface for clutch lining must be free of grooves, oil and grease

4 - Bolt

- ☐ Loosen and tighten consecutively in steps of 90°
- ☐ M6: 13 Nm
- ☐ M7: 20 Nm
- ☐ 6x



2.1.3 Exploded view - LuK version clutch with one-piece flywheel

1 - 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

2 - Clutch plate

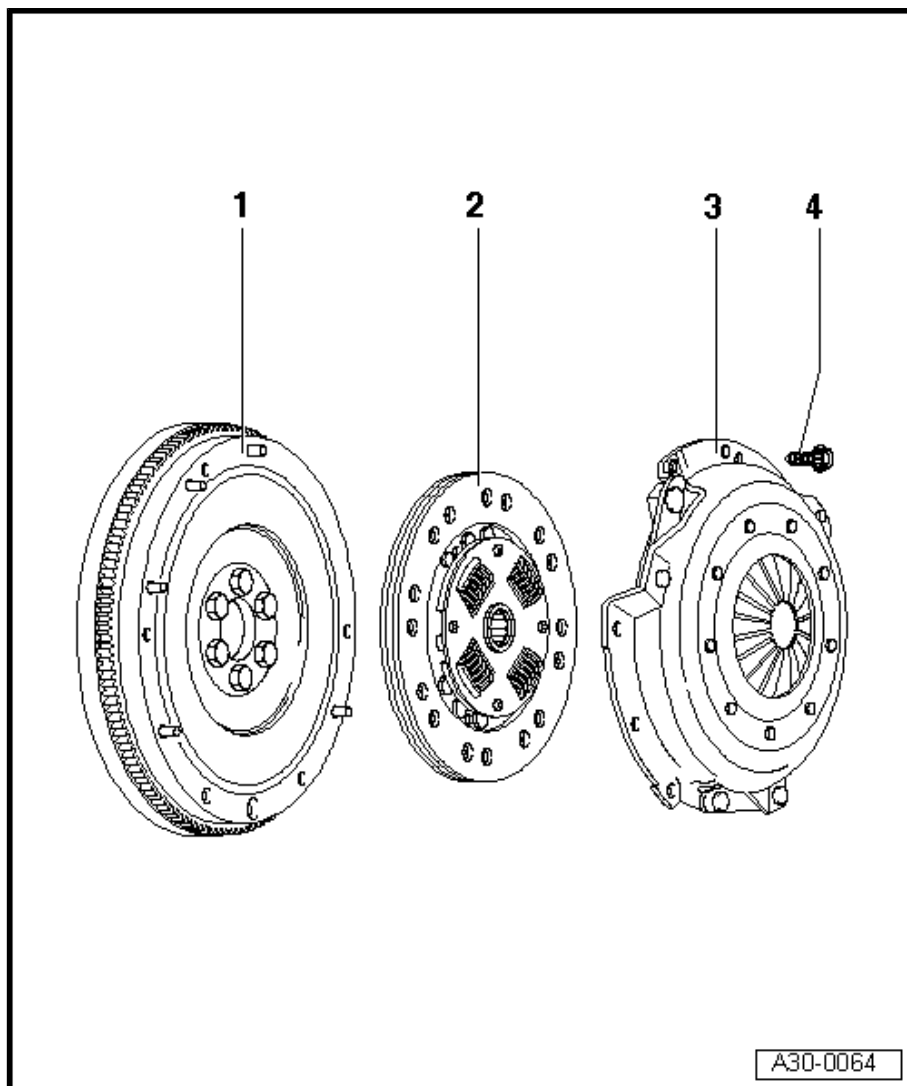
- ☐ For correct version, re-
fer to ⇒ Electronic parts
catalogue
- ☐ Installation position
⇒ [page 46](#)
- ☐ Removing and installing
⇒ [page 57](#)

3 - Clutch pressure plate

- ☐ For correct version, re-
fer to ⇒ Electronic parts
catalogue
- ☐ Removing and installing
⇒ [page 57](#)
- ☐ Checking ends of dia-
phragm spring
⇒ [page 46](#)
- ☐ Checking spring con-
nections and rivets
⇒ [page 47](#)

4 - Bolt

- ☐ M6 - 13 Nm
- ☐ M7 - 20 Nm
- ☐ 6x
- ☐ Loosen and tighten consecutively in steps of 90°



2.2 Removing and installing clutch

⇒ ["2.2.1 Removing and installing Sachs version clutch",
page 49](#)

⇒ ["2.2.2 Removing and installing LuK version clutch with dual-
mass flywheel", page 53](#)

⇒ ["2.2.3 Removing and installing LuK version clutch with one-
piece flywheel", page 57](#)

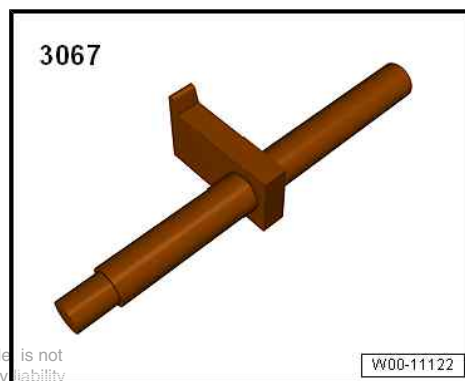
2.2.1 Removing and installing Sachs version clutch

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Special tools and workshop equipment required



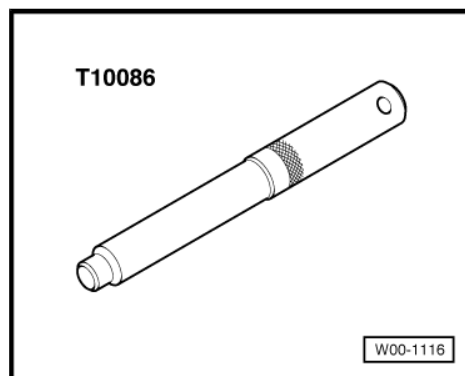
- ◆ Counterhold tool - 3067-



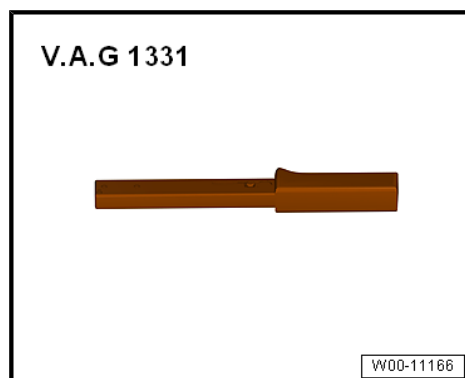
- ◆ Centring mandrel - T10097-



- ◆ Or, for crankshaft with small centring diameter: centring mandrel - T10086-



- ◆ Torque wrench - V.A.G 1331-



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

Removing

- Gearbox removed

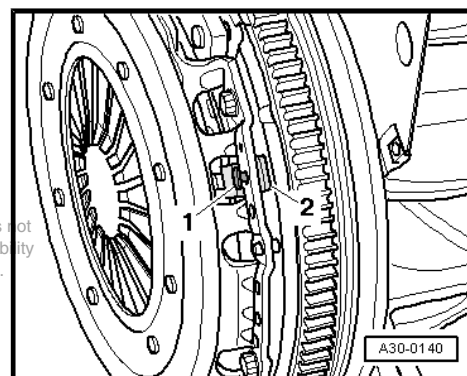
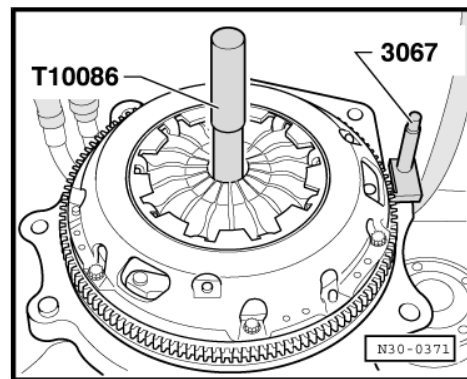
- Attach counterhold tool - 3067- before loosening bolts.

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:

- Consecutively loosen all 6 bolts in clockwise direction in 90° stages until the clutch pressure plate is released.
- Stop -2- with pin -1- should come loose when bolts are slackened.
- If the stop does not come loose, push the pin towards the dual-mass flywheel.
- Take off clutch pressure plate and clutch plate.

Installing

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



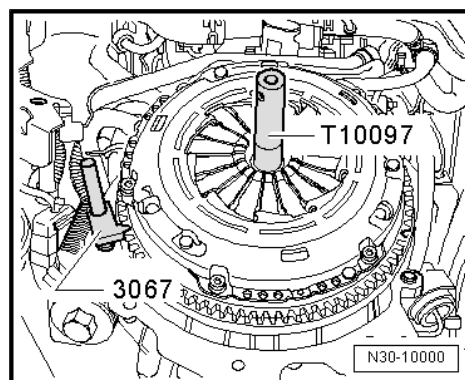
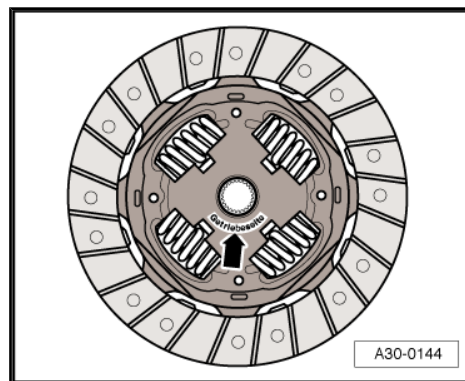


Note

- ◆ Refer to general repair instructions ⇒ [page 7](#).
- ◆ The dual-mass flywheel, clutch pressure plate and clutch plate are matched together; components from another manufacturer must not be installed on the same vehicle.
- ◆ Always renew clutch plate and clutch pressure plate together and select the correct parts according to engine code ⇒ *Electronic parts catalogue*.
- ◆ To avoid damaging clutch pressure plate when removing and installing, observe assembly instructions ⇒ ["2.2.1 Removing and installing Sachs version clutch", page 49](#).
- ◆ Renew clutch plate and pressure plate if riveted fastening is damaged or loose.
- ◆ 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.
- ◆ 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.
- ◆ Check that dowel sleeves for centralising engine/gearbox are in the cylinder block; install if necessary.
- ◆ If the dowel sleeves are not fitted, this will lead to gear-change problems, clutch malfunction and in some cases gearbox noise (gears will make rattling noises).
- ◆ Installation position of clutch plate: protruding spring cage / marking "Getriebeseite" (gearbox side), if provided, faces towards pressure plate.
- ◆ Clutch plate linings must make full contact with flywheel and friction surface of clutch pressure plate. Only then insert bolts.

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- Use counterhold tool - 3067- .
- For crankshaft with small centring diameter, use centring mandrel - T10086- .
- Position pressure plate on centring pins.
- Use centring mandrel - T10097- to centre clutch plate.

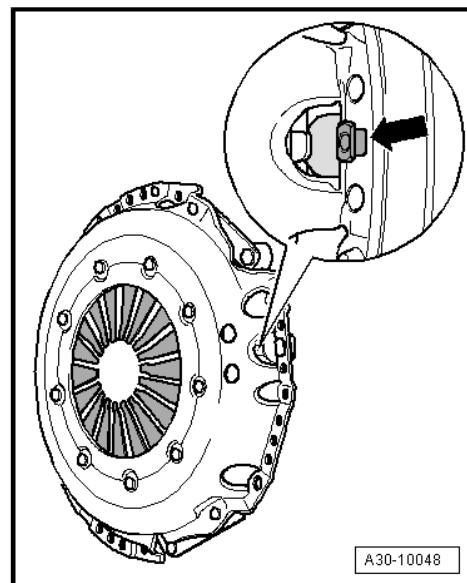


To prevent the clutch pressure plate from becoming distorted during installation (causes clutch grab when driving off), always adhere to the following procedure when attaching the clutch pressure plate:

- Make sure that the stop pin (position sensor) -arrow- is free to move.
- Screw in all 6 bolts evenly by hand until bolt heads make contact with clutch pressure plate.
- Tighten all 6 bolts consecutively in clockwise direction and in steps of 90° until housing makes contact with flywheel.
- The stop pin -arrow- should then lift away from the clutch pressure plate.
- Tighten all 6 bolts to final torque consecutively in clockwise direction.

Tightening torques

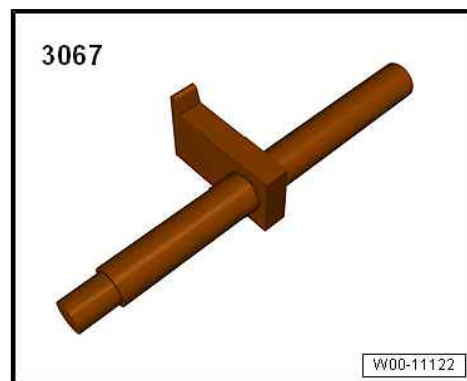
- ◆ ⇒ ["2.1.1 Exploded view - Sachs version clutch", page 45](#)



2.2.2 Removing and installing LuK version clutch with dual-mass flywheel

Special tools and workshop equipment required

- ◆ Counterhold tool - 3067-

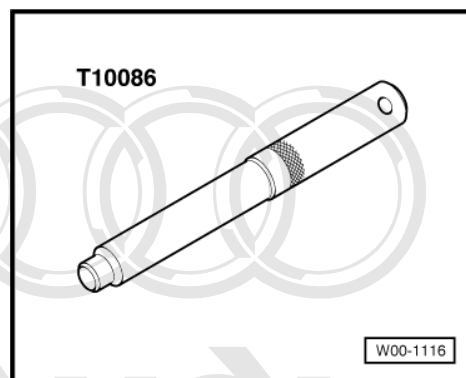


- ◆ Centring mandrel - 3190 A-

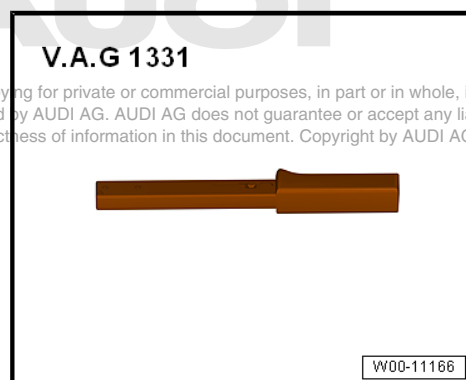


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- ◆ Or, for crankshaft with small centring diameter: centring mandrel - T10086-



- ◆ Torque wrench - V.A.G 1331-



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

Removing

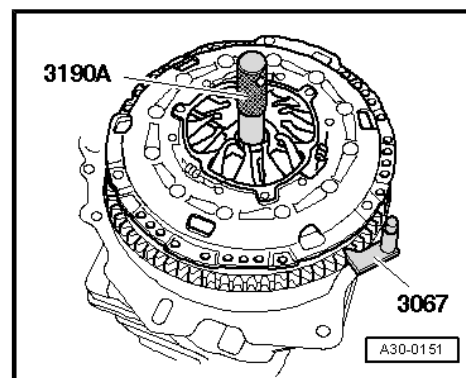
- Gearbox removed
- Attach counterhold tool - 3067- before loosening bolts.

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

- Consecutively loosen all 6 bolts in clockwise direction in 90° stages until the clutch pressure plate is released.
- Take off clutch pressure plate and clutch plate.

Installing

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

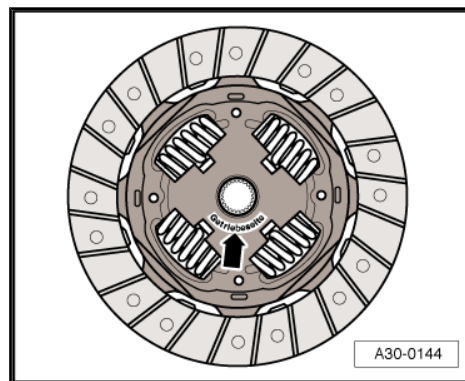


Note

- ◆ *Select the correct clutch plate and clutch pressure plate according to engine code → Electronic parts catalogue .*
- ◆ *Clean input shaft splines and hub splines on used clutch plates, remove corrosion and apply an extremely thin coat of clutch plate grease - 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 clutch 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 flywheel must be cleaned (degreased) thoroughly.*
- ◆ *If the clutch has burnt out, thoroughly clean the gearbox housing in area of clutch and parts of the engine facing the gearbox in order to prevent odours.*
- ◆ *Only blow out dual-mass flywheel with compressed air.*
- ◆ *Clutch plate linings must make full contact with flywheel and friction surface of clutch pressure plate. Only then insert bolts.*
- ◆ *Tighten securing bolts gradually in diagonal sequence to avoid damaging centring holes in pressure plate and centring pins on flywheel.*
- ◆ *Check that dowel sleeves for centralising engine/gearbox are in the cylinder block, install if necessary.*
- ◆ *If the dowel sleeves are not fitted, this will lead to gear-change problems, clutch malfunction and in some cases gearbox noise (gears will make rattling noises).*

Installation position of clutch plate

- Marking "Getriebeseite" (gearbox side) and the protruding spring cage face towards gearbox.



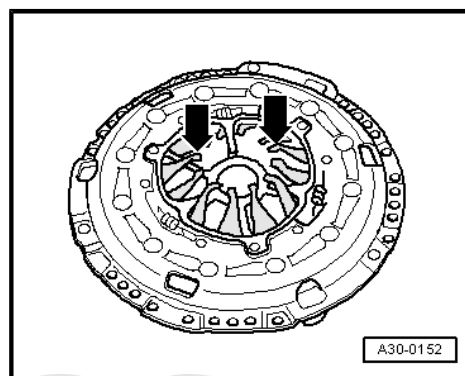
Checking ends of diaphragm spring

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



Note

Select the correct clutch plate and clutch pressure plate according to engine code ⇒ *Electronic parts catalogue*.



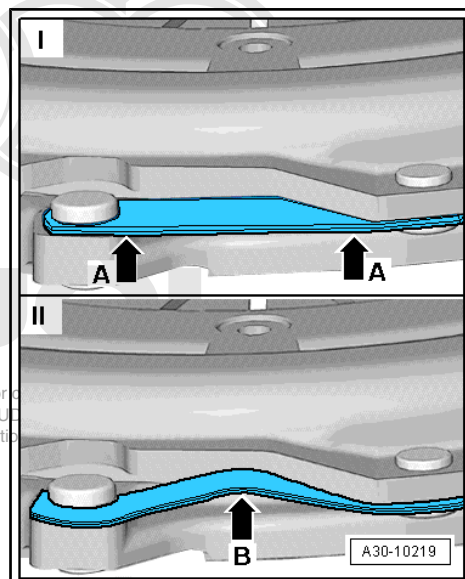
Checking spring connections and rivets

I - Springs OK

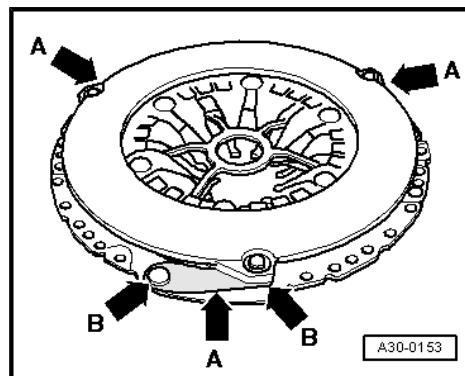
- Slight kinking on the outside -arrows A- is normal on production parts.

II - Springs damaged

- Renew clutch pressure plate if springs are broken or badly bent -arrow B-.

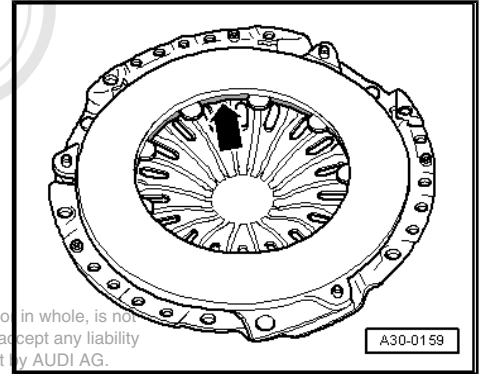


- Check that riveting -arrows B- is secure at all springs -arrows A-.
- Renew clutch pressure plate if riveting -arrows B- is loose.



Checking metal ring

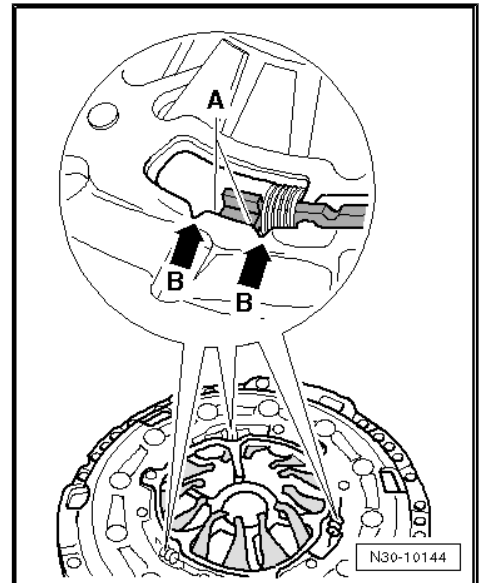
- Check metal ring -arrow- in pressure plate for damage.
- Renew pressure plate if metal ring is broken.



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Checking position of adjustment mechanism (new pressure plates only)

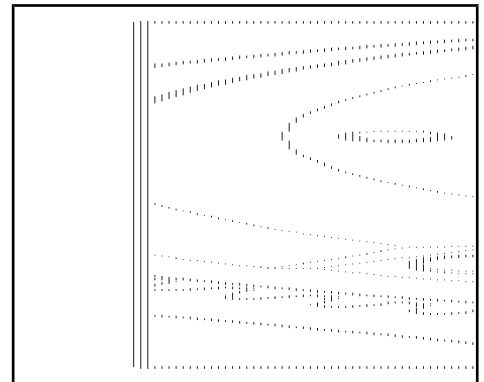
- The two edges -A- of the adjuster ring should be located between the two notches -arrows B-.
- If the adjuster ring is in a different position on a new pressure plate, the pressure plate and clutch plate must not be installed.
- The position of the adjuster ring can be outside the notches on used clutches.



- Reverse position of counterhold tool - 3067- when installing.
- Position clutch pressure plate on dowel pins.
- Use centring mandrel - 3190 A- to centralise clutch plate.
- For crankshaft with small centring diameter, use centring mandrel - T10086- .

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.
- Tighten all bolts consecutively in clockwise direction and in steps of 90° until housing makes contact with flywheel.
- Consecutively tighten all bolts to final setting in clockwise direction.



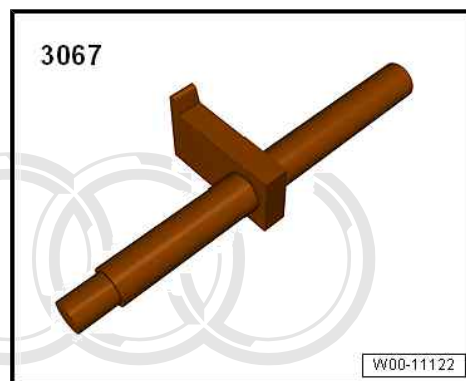
Tightening torques

- ◆ ⇒ [“2.1.2 Exploded view - LuK version clutch with dual-mass flywheel”, page 47](#)

2.2.3 Removing and installing LuK version clutch with one-piece flywheel

Special tools and workshop equipment required

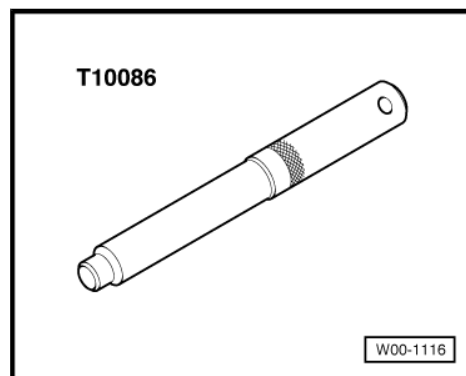
- ◆ Counterhold tool - 3067-



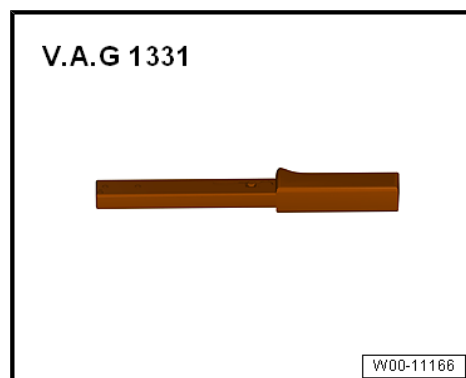
- ◆ Centring mandrel - 3190 A-



- ◆ Or, for crankshaft with small centring diameter: centring mandrel - T10086-



- ◆ Torque wrench - V.A.G 1331-



- ◆ 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 ad-

here to the following procedure when unbolting the clutch pressure plate:

- Apply counter-hold tool - 3067- in order to loosen bolts.



Note

Reverse position of counter-hold tool - 3067- when removing.

- Working clockwise, loosen all six bolts consecutively in steps of 90° (1/4 turn) until the clutch pressure plate is released.
- Take off clutch pressure plate and clutch plate.

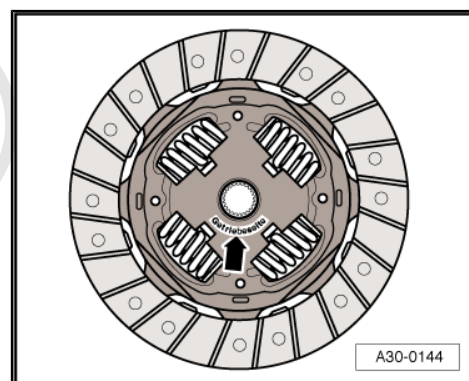
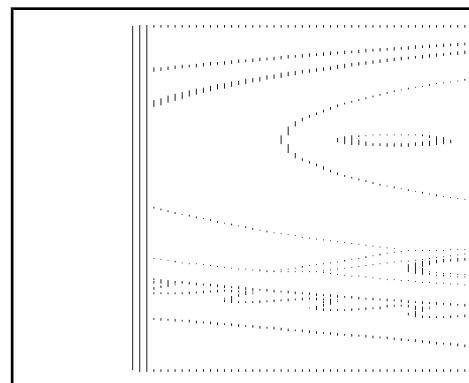
Installing

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

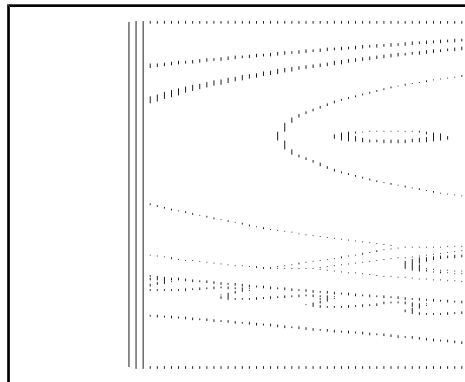


Note

- ◆ Refer to general repair instructions → [page 7](#).
- ◆ The flywheel, pressure plate and clutch plate are matched together; components from another manufacturer must not be installed on the same vehicle.
- ◆ Always renew clutch plate and clutch pressure plate together and select the correct parts according to engine code → *Electronic parts catalogue*.
- ◆ Renew clutch plate and pressure plate if riveted fastening is damaged or loose.
- ◆ 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.
- ◆ 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.
- ◆ Check that dowel sleeves for centralising engine/gearbox are in the cylinder block; install if necessary.
- ◆ If the dowel sleeves are not fitted, this will lead to gear-change problems, clutch malfunction and in some cases gearbox noise (gears will make rattling noises).
- ◆ Installation position of clutch plate: protruding spring cage / marking "Getriebeseite" (gearbox side), if provided, faces towards pressure plate.
- ◆ Clutch plate linings must make full contact with flywheel and friction surface of clutch pressure plate. Only then insert bolts.



- Use counterhold tool - 3067- .
- Position pressure plate on centring pins.
- Use centring mandrel - 3190 A- to centre clutch plate.
- For crankshaft with small centring diameter, use centring mandrel - T10086- .
- 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

- ◆ ⇒ [“2.1.3 Exploded view - LuK version clutch with one-piece flywheel”, page 49](#)



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34 – Controls, housing

1 Selector mechanism

- ⇒ ["1.1 Overview - selector mechanism", page 61](#)
- ⇒ ["1.2 Exploded view - gear knob and cover", page 62](#)
- ⇒ ["1.3 Exploded view - selector cables", page 62](#)
- ⇒ ["1.4 Exploded view - selector mechanism", page 67](#)
- ⇒ ["1.5 Removing and installing gear knob", page 69](#)
- ⇒ ["1.6 Removing and installing selector mechanism", page 70](#)
- ⇒ ["1.7 Dismantling and assembling selector mechanism", page 72](#)
- ⇒ ["1.8 Removing and installing selector cable", page 76](#)
- ⇒ ["1.9 Adjusting selector mechanism", page 77](#)
- ⇒ ["1.10 Renewing selector shaft oil seal", page 79](#)

1.1 Overview - selector mechanism

1 - Selector unit

- ☐ Exploded view
⇒ [page 113](#)

2 - Selector cables

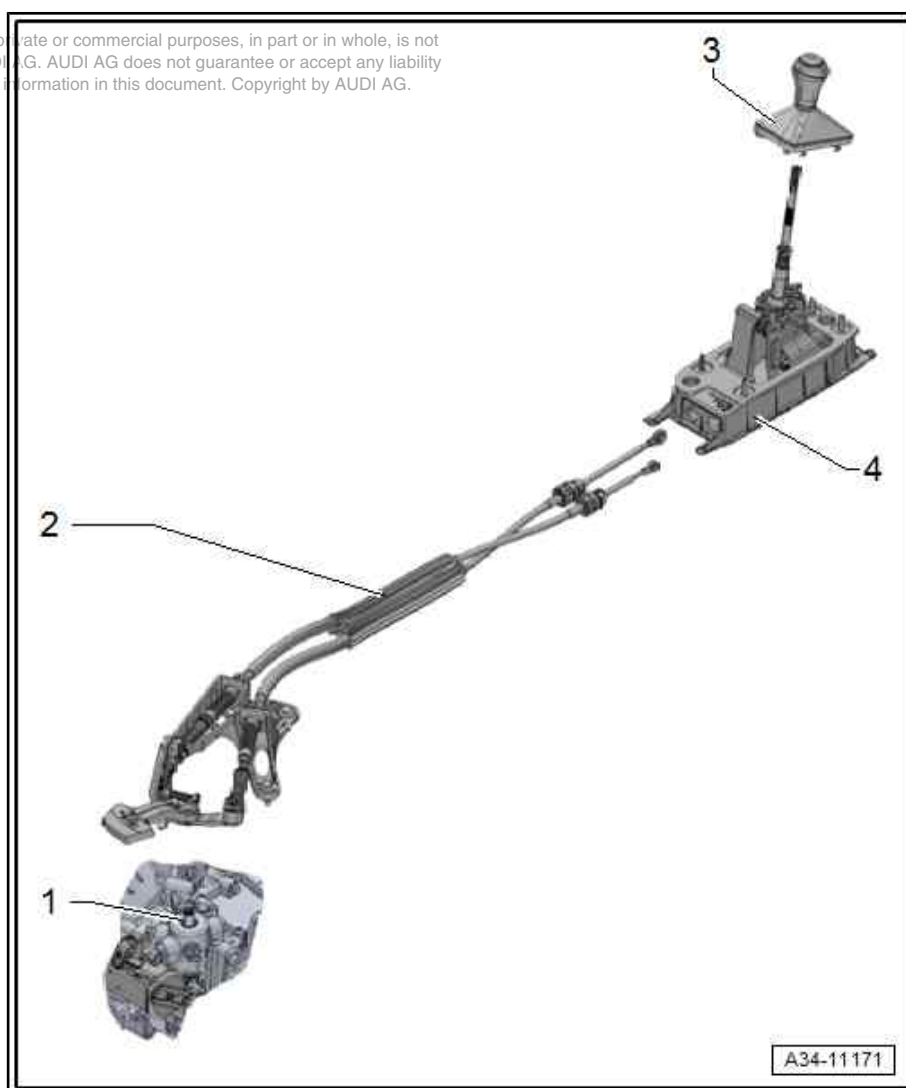
- ☐ With support bracket, gate relay lever and gearbox selector lever
- ☐ Exploded view
⇒ [page 62](#)

3 - Gear knob and boot

- ☐ Exploded view
⇒ [page 62](#)

4 - Selector mechanism

- ☐ Exploded view
⇒ [page 67](#)



1.2 Exploded view - gear knob and cover

1 - Gear lever

2 - Clip

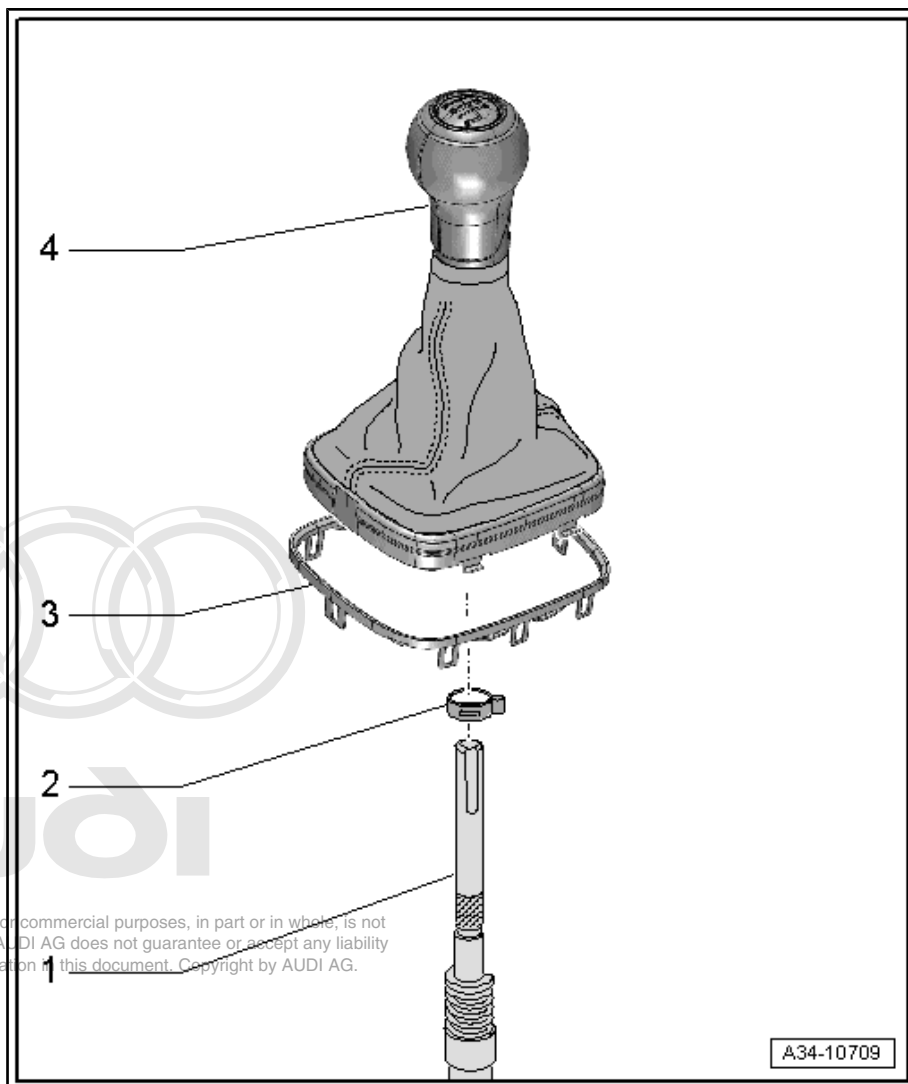
- ☐ Secures gear knob to gear lever
- ☐ Secure with hose clip pliers - V.A.G 1275-
- ☐ Renew
- ☐ Must be the same as original equipment ⇒ Electronic parts catalogue

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 69](#)



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1.3 Exploded view - selector cables



Note

Lubricate all bearings and moving surfaces with grease - G 000 450 02-.

1 - Selector mechanism cover

- ☐ Exploded view
⇒ [page 113](#)

2 - Slide block

3 - Gate relay lever

- ☐ Installation position
⇒ [page 65](#)
- ☐ Detaching and securing gate relay lever at gearbox selector lever
⇒ [page 66](#)
- ☐ Lubricate all bearings and moving surfaces with grease - G 000 450 02-.

4 - Cable end-piece

- ☐ Secures gate selector cable to gate relay lever
- ☐ Allocation ⇒ [page 64](#)
- ☐ Detaching from gate selector cable
⇒ [page 65](#)
- ☐ Levering off gate relay lever ⇒ [page 67](#)
- ☐ Pressing onto gate relay lever ⇒ [page 67](#)

5 - Gearbox selector lever

- ☐ With damper weight
- ☐ Fitting ⇒ [page 65](#)
- ☐ Installation position
⇒ [page 65](#)
- ☐ After installing, adjust selector mechanism
⇒ [page 77](#)

6 - Nut

- ☐ Self-locking
- ☐ Renew
- ☐ 20 Nm

7 - Cable end-piece

- ☐ Secures gear selector cable to gearbox selector lever
- ☐ Allocation ⇒ [page 64](#)
- ☐ Detaching from gear selector cable ⇒ [page 65](#)

8 - Securing clip

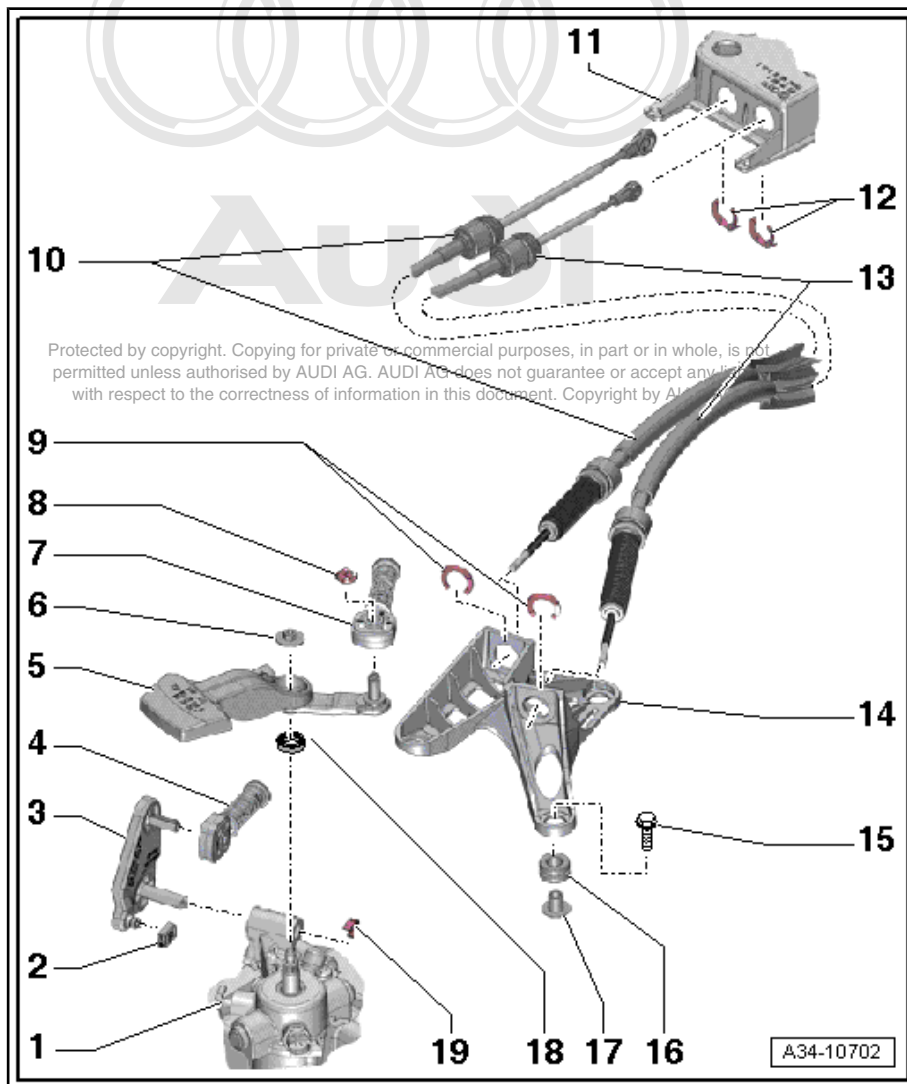
- ☐ Removing ⇒ [page 66](#)
- ☐ Renew

9 - Retaining clips

- ☐ Renew

10 - Gear selector cable

- ☐ Detaching and securing at gearbox selector lever ⇒ [page 66](#)
- ☐ Removing and installing ⇒ [page 76](#)
- ☐ Adjusting ⇒ [page 77](#)



11 - Selector housing

12 - Retaining clips

- ☐ Renew

13 - Gate selector cable

- ☐ Removing and installing ⇒ [page 76](#)
- ☐ Adjusting ⇒ [page 77](#)

14 - Cable support bracket

- ☐ Different versions available; for correct version refer to ⇒ Electronic parts catalogue

15 - Bolt

- ☐ 20 Nm

16 - Grommet

17 - Bush

18 - Oil seal

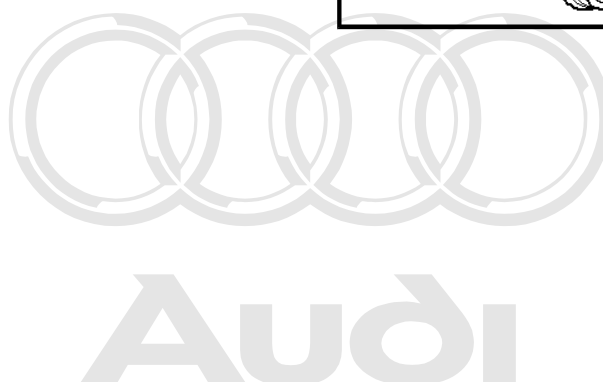
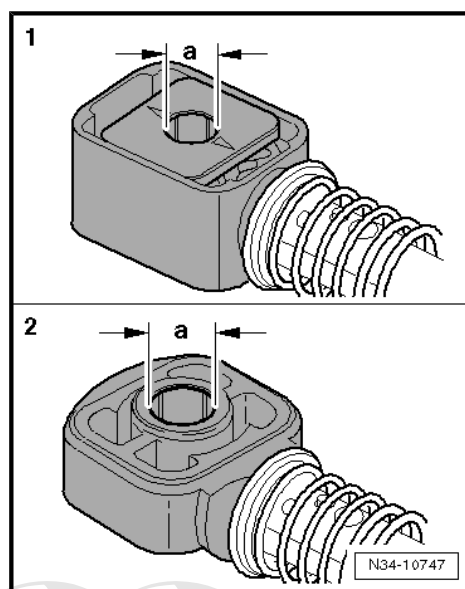
- ☐ Renewing ⇒ [page 122](#)

19 - Clip

Identification of cable end-pieces

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

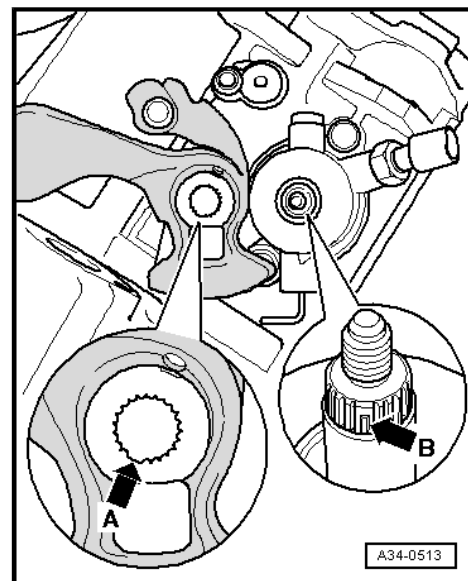
Cable end-piece for:	Dimension "a"
-1- Gear selector cable to gearbox selector lever	8.5 mm
-2- Gate selector cable to gate relay lever	10 mm



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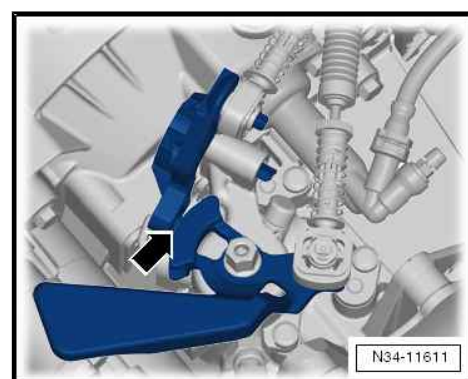
Installing gearbox selector lever

- 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.



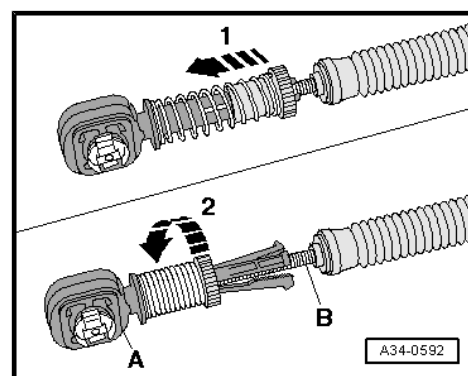
Installation position: gearbox selector lever/gate relay lever

- 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 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-.



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Detaching and securing gear selector cable at gearbox selector lever

Detaching

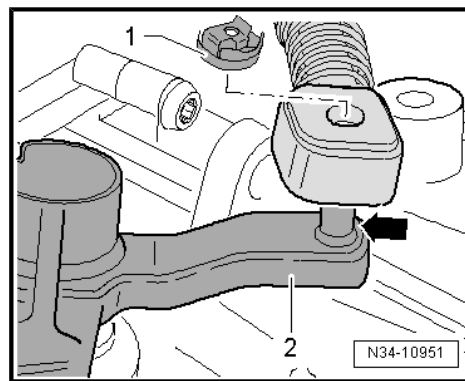
- Lift up tab and detach securing clip -1- for gear selector cable from gearbox selector lever -2-.
- Pull gear selector cable off pin -arrow-.

Securing



Note

- ◆ *Renew securing clip for gear selector cable.*
- ◆ *Apply a small amount of grease - G 000 450 02- to pin -arrow-.* Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.
- Push gear selector cable onto gearbox selector lever -2- and secure with securing clip -1-.



Detaching and securing gate relay lever at gearbox selector lever

Detaching

- Remove clip -arrow 1- and take off gate relay lever together with cable end-piece.
- The gate relay lever must be removed before detaching the cable end-piece ⇒ [page 67](#) .

Securing



Note

Lubricate all bearings and moving surfaces with grease - G 000 450 02- .

- Insert gate relay lever with cable end-piece as far as stop.
- Press on clip -arrow 1-, making sure it engages securely.



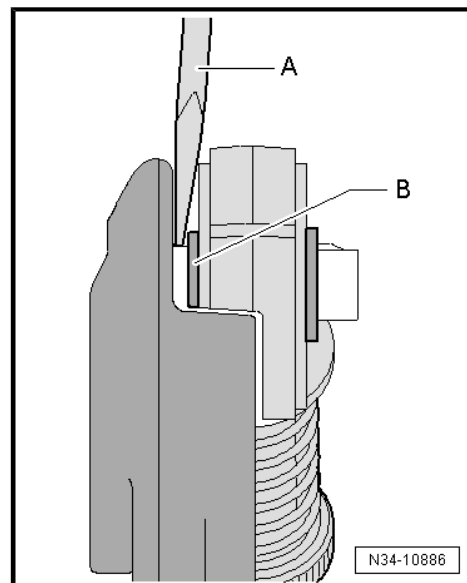
Note

-Arrow 2- can be disregarded.



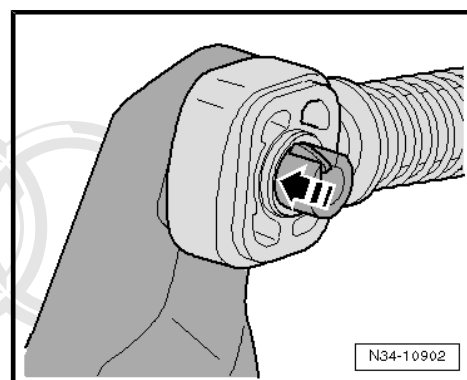
Levering cable end-piece for gate selector cable off gate relay lever

- Gate relay lever removed
- Apply plain slot screwdriver -A- between bush -B- and gate relay lever.



Pressing cable end-piece for gate selector cable onto gate relay lever

- Gate relay lever removed
- Press on cable end-piece only at bush -arrow-.
- Cable end-piece must move freely on gate relay lever.
- Cable end-piece must be behind detent.
- Ensure that components engage securely.



1.4 Exploded view - selector mechanism



Note

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Lubricate bearings and moving surfaces with grease - G 000 450 02 -

1 - Floor plate

- ☐ Bend tabs open to remove
- ☐ Always renew
- ☐ Installing ⇒ [page 75](#)

2 - Gasket

- ☐ Always renew

3 - Bush

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

4 - Retaining clip

- ☐ Renew

5 - Gate selector cable

- ☐ Lever off gate selector lever
- ☐ Press onto gate selector lever inside selector mechanism
- ☐ Installation position ⇒ [page 61](#)

6 - Gear selector cable

- ☐ Lever off gear lever guide
- ☐ Press onto gear lever guide inside selector mechanism
- ☐ Installation position ⇒ [page 61](#)

7 - Gear lever guide
8 - Ball socket

- ☐ Will be damaged during removal
- ☐ Renew

9 - Spring
10 - Securing clip

- ☐ Removing and installing ⇒ [page 69](#)

11 - Damper
12 - Nut

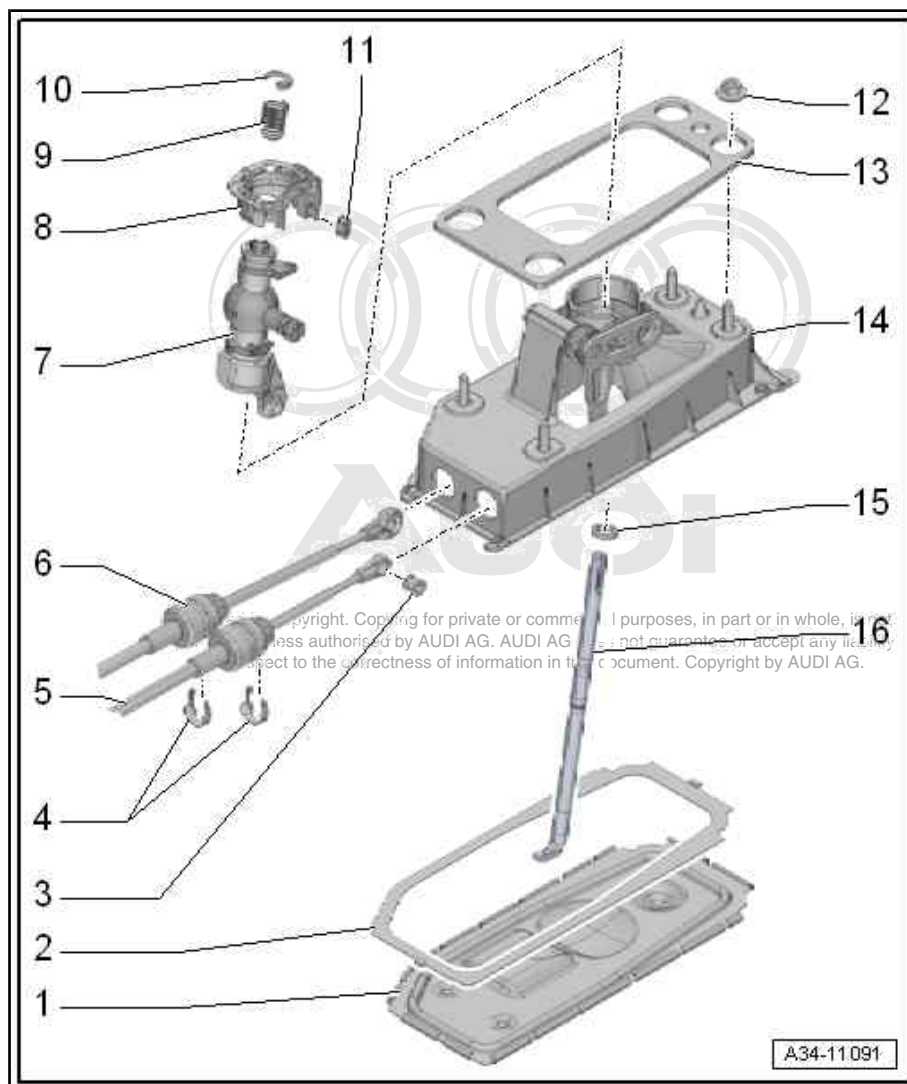
- M6 - 8 Nm
- M8 - 20 Nm
- ☐ 4x

13 - Gasket

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

14 - Selector housing

- ☐ With spring and gate selector lever
- ☐ Spring and gate selector lever cannot be removed



A34-11091

- ❑ Removing and installing ⇒ [page 70](#)

15 - Damping washer

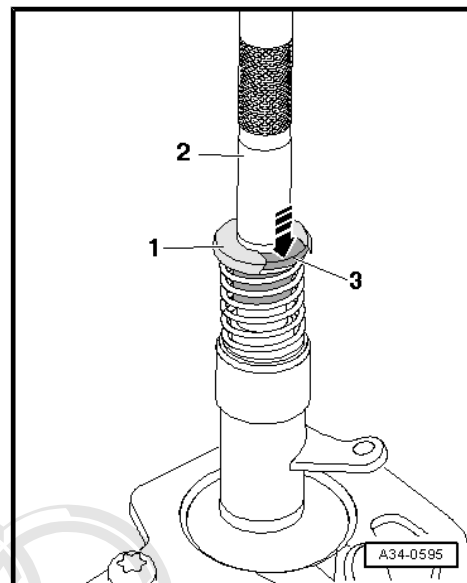
- ❑ Push onto gear lever as far as stop

16 - Gearbox selector lever

- ❑ Can be removed and installed without removing gear lever guide ⇒ [Item 7 \(page 68\)](#)

Removing and installing securing clip

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



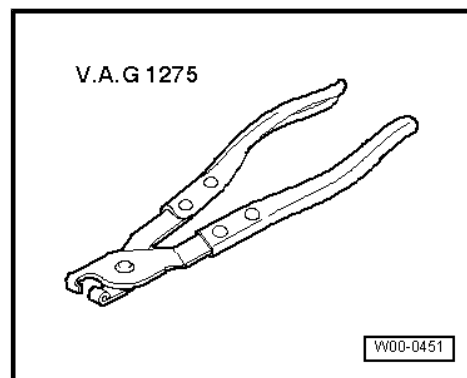
1.5 Removing and installing gear knob

Special tools and workshop equipment required

- ◆ Removal wedge - 3409-

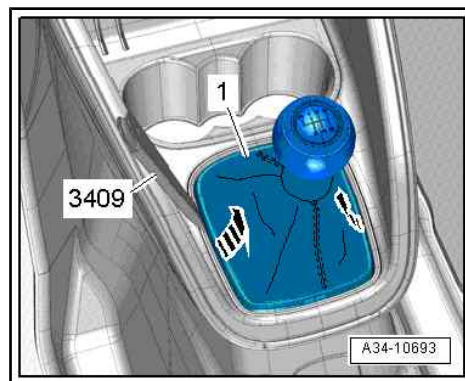


- ◆ Hose clip pliers - V.A.G 1275-

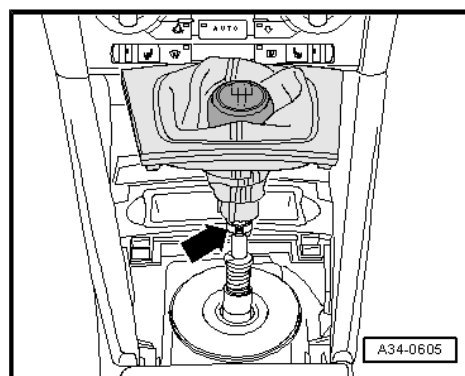


Removing

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



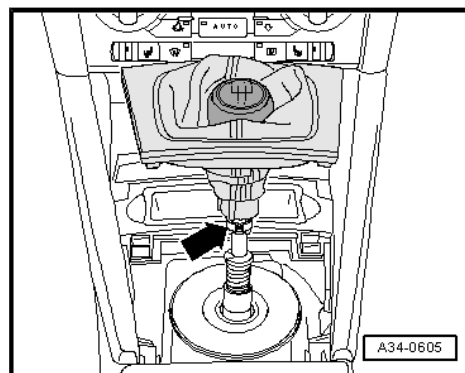
- Open clip -arrow- and pull off gear knob together with boot.



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 69](#) .
- 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 .

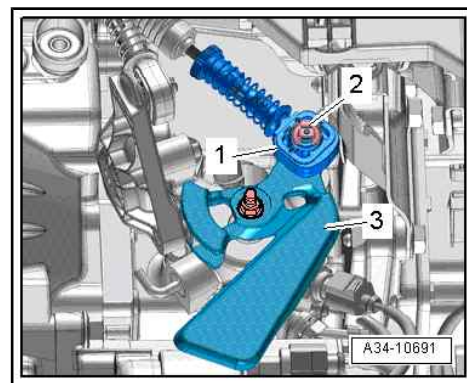
Vehicles with 1.6 ltr. TDI engine (EA189) or 1.6 ltr. TDI engine (EA288):

- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

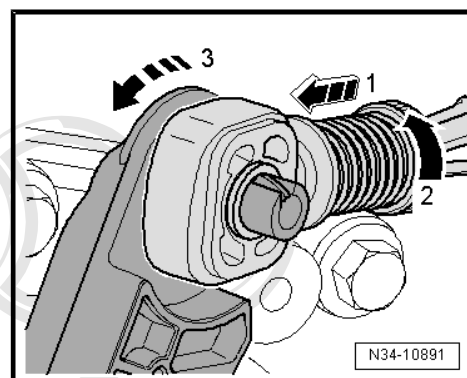
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Continued for all vehicles:

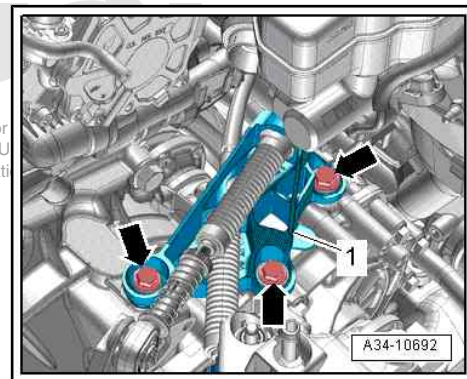
- Remove securing clip -2-.
- Pull gear selector cable -1- off gearbox selector lever -3-.



- To avoid damage to the gate selector cable, the cable end-piece must be separated from the gate selector cable before removal.
- Pull locking mechanism forwards -arrow 1- onto stop and then turn to left -arrow 2- to lock.
- Push gate relay lever forwards in direction of -arrow 3-.



- Remove bolts -arrows- for cable support bracket -1-.



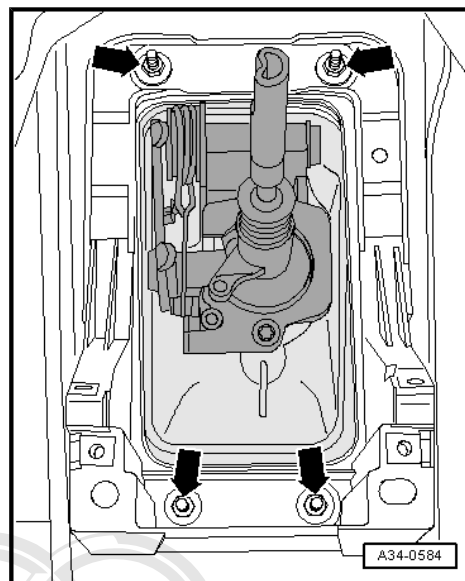
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- Remove nuts -arrows- and detach selector mechanism from below.

Installing

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

- Install gate selector cable and gear selector cable
⇒ [page 76](#) .
- Adjust selector mechanism ⇒ [page 77](#) .
- 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 69](#) .



Tightening torques

- ♦ ⇒ ["1.4 Exploded view - selector mechanism", page 67](#)

1.7 Dismantling and assembling selector mechanism

Special tools and workshop equipment required

- ♦ Press tool - VW 412-

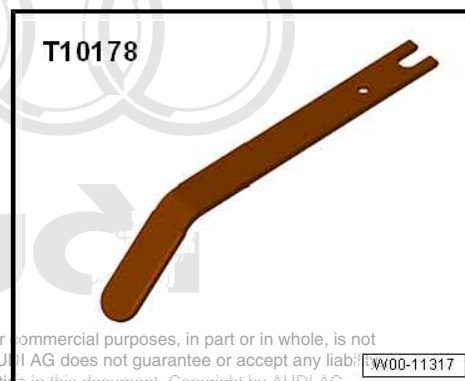
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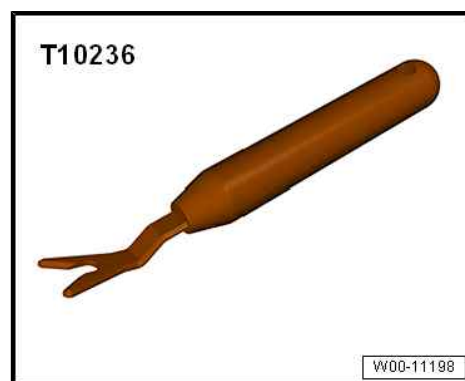
- ♦ Adapters - 10 - 222 A /25-



◆ Assembly tool - T10178-



◆ Release tool - T10236-



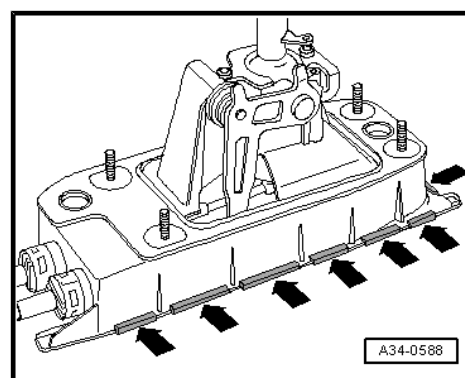
◆ Wedge - T10357-



◆ Counter-support Kukko series 16

Dismantling

- Selector mechanism removed ⇒ [page 70](#) .
- Open out tabs -arrows- all round with screwdriver and remove floor plate.
- Remove gasket.

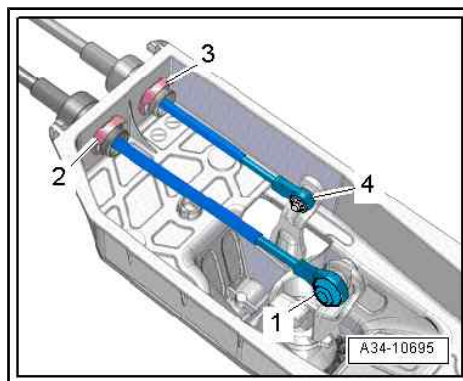


- Detach retaining clip -2-.
- Press off gear selector cable -1- using release tool - T10236- .

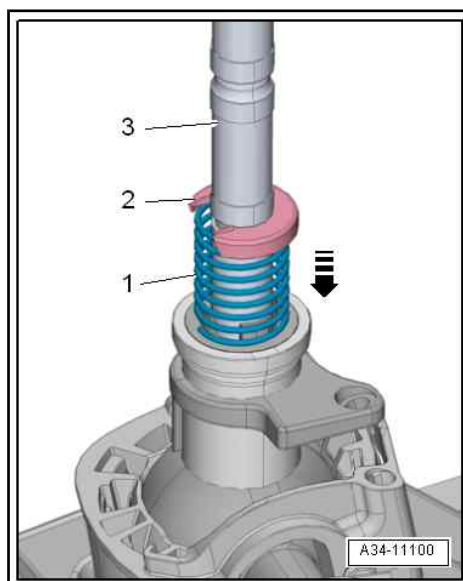


Note

Disregard items -3 and 4-.

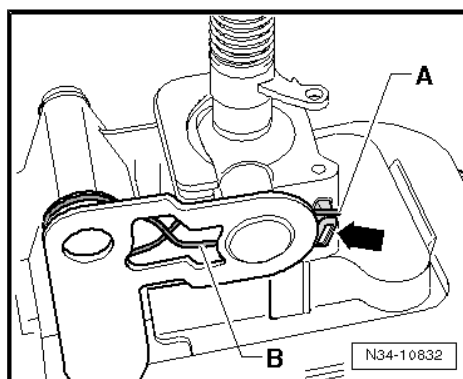


- Hold gear lever -3- firmly.
- Push spring -1- in direction of -arrow-.
- Remove securing clip -2-.
- Remove spring.



- Press arm -A- of spring to side until it is located next to damper -arrow-.

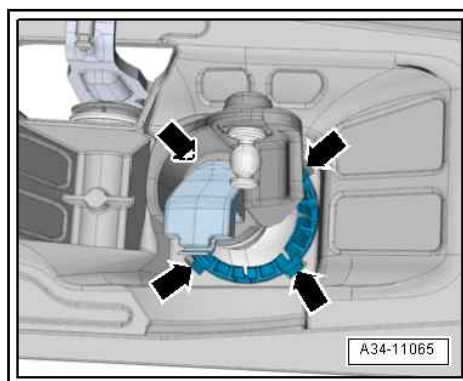
- **Move gear lever to side and remove damper.**



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.

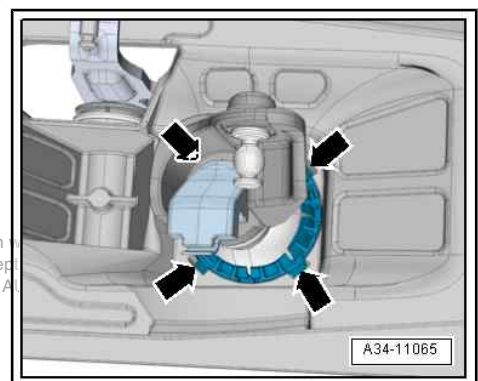
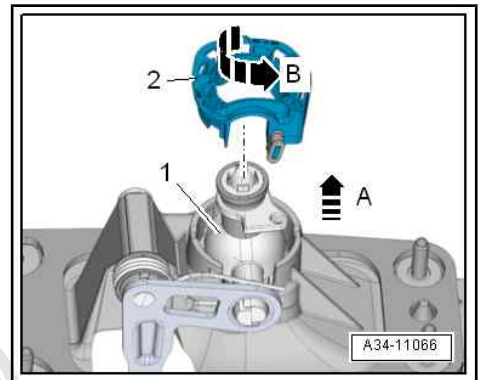
Assembling

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



Note

- ◆ *Renew seals and gaskets.*
- ◆ *Lubricate bearings and moving surfaces with grease - G 000 450 02- .*
- 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.

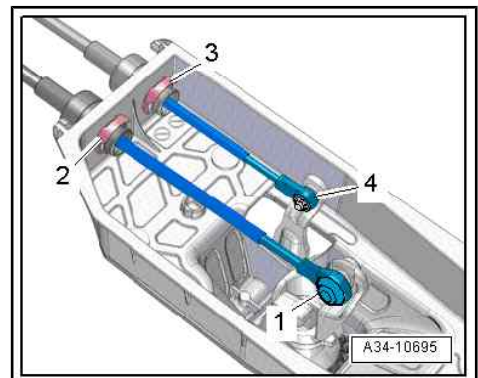


- Press gear selector cable -1- onto gearbox selector lever.
- Secure gear selector cable with retaining clip -2-.



Note

Disregard items -3 and 4-.



Fitting floor plate

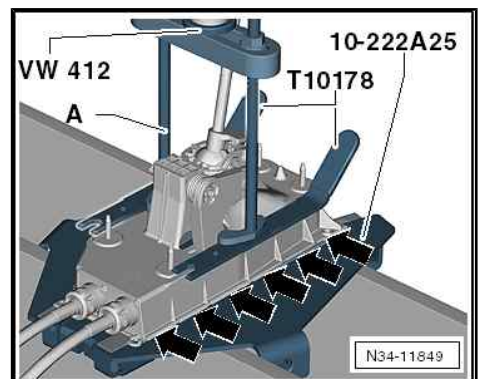
- Fit gasket onto floor plate.



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.

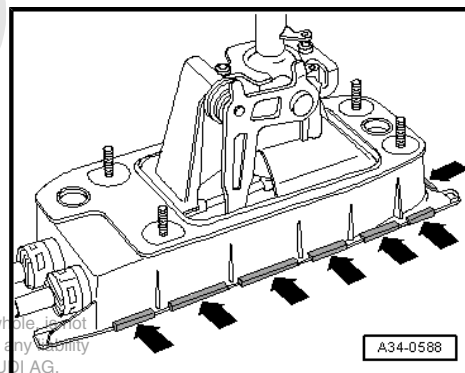
A - Counter-support, e.g. Kukko series 16

- Lever tabs -arrows- of floor plate over rim of selector housing on both sides using wedge - T10357- .
- Install selector mechanism ⇒ [page 70](#) .

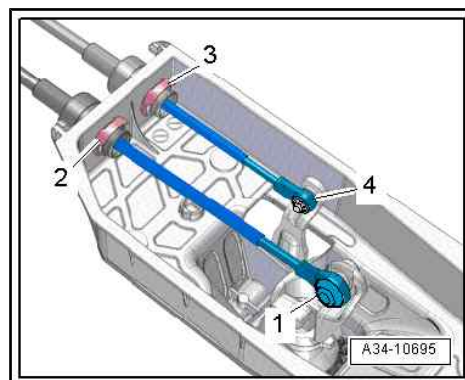
1.8 Removing and installing selector cable

Removing

- Remove selector mechanism ⇒ [page 70](#) .
- Open out tabs -arrows- all round with screwdriver and remove floor plate.
- Remove gasket.

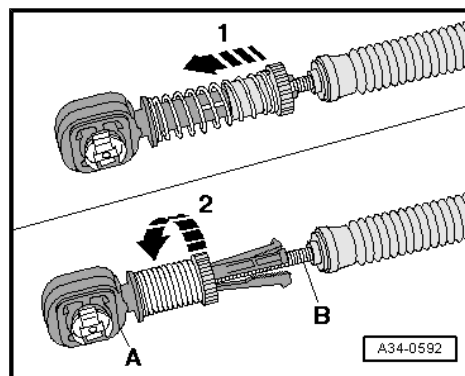


- Detach retaining clips -2, 3-.
- Press off gear selector cable -1- and gate selector cable -4- using a screwdriver.



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.



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

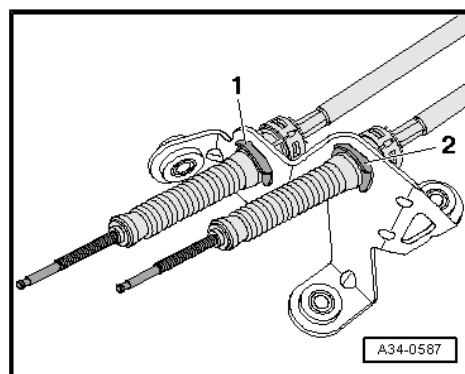
Installing

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

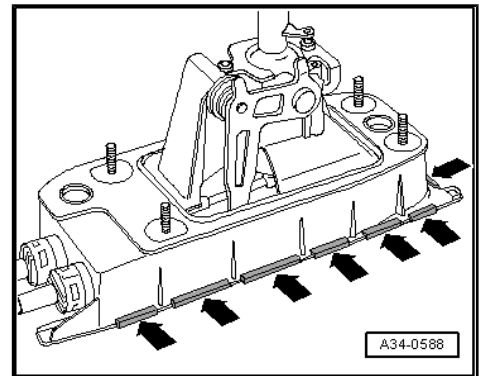


Note

Renew gate selector cable if bush ⇒ [Item 3 \(page 68\)](#) is damaged.



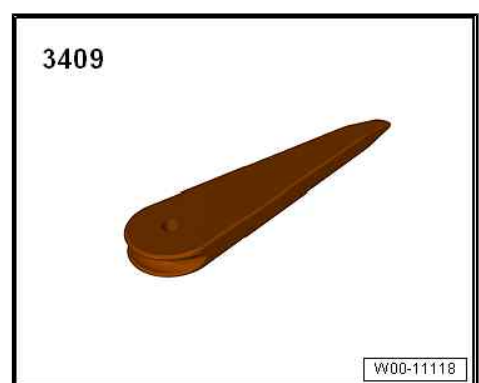
- Fit gasket and install floor plate -arrows- ⇒ [page 75](#) .
- Install selector mechanism ⇒ [page 70](#) .
- Adjust selector mechanism ⇒ [page 77](#) .



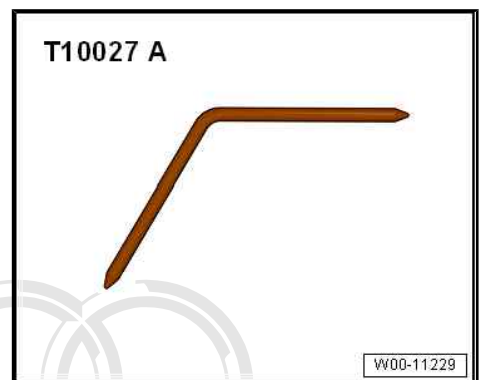
1.9 Adjusting selector mechanism

Special tools and workshop equipment required

- ◆ Removal wedge - 3409-



- ◆ Locking pin - T10027A-



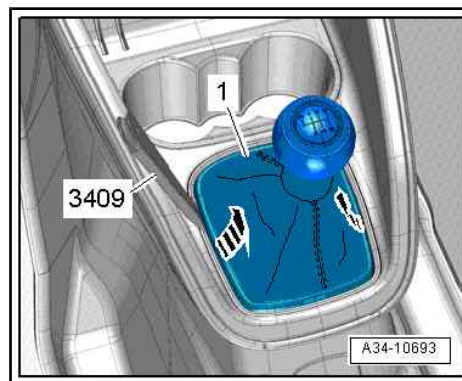
Adjustment conditions

- 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.

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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.



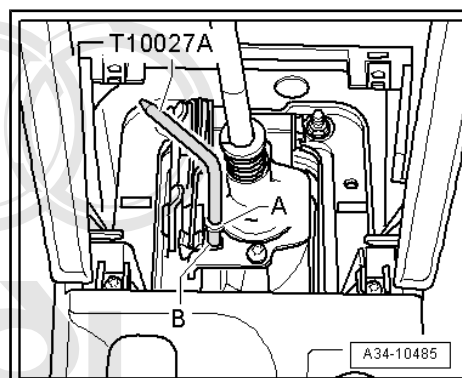
- If fitted, pull noise insulation slightly to one side.
- Fix gear lever in position with locking pin - T10027A- .



Note

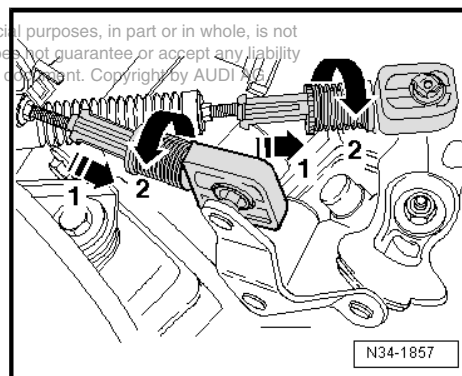
The noise insulation panels are removed to give a better illustration.

- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .



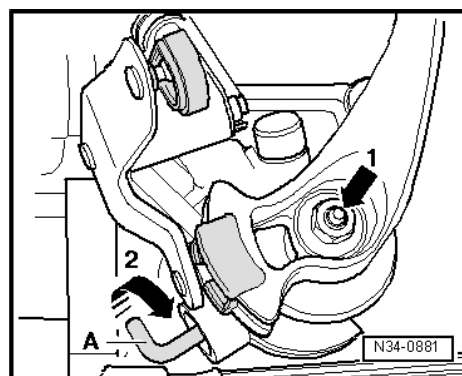
Release cable end-pieces for gear selector cable and gate selector cable as follows:

- 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:

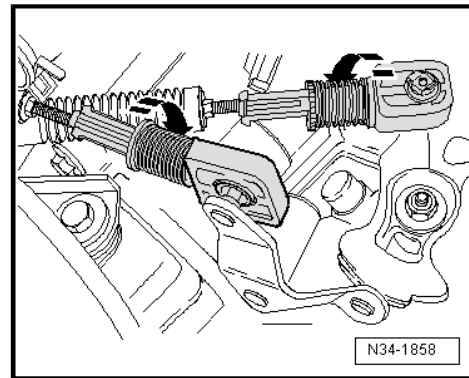
- Push gearbox selector lever down into 1st/2nd gear gate -arrow 1-. At the same time, turn angled rod -A- in direction of -arrow 2- until it engages.
- The selector shaft is then locked and can no longer be moved.
- Ensure that the gear selector cable and the gate selector cable are located free of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



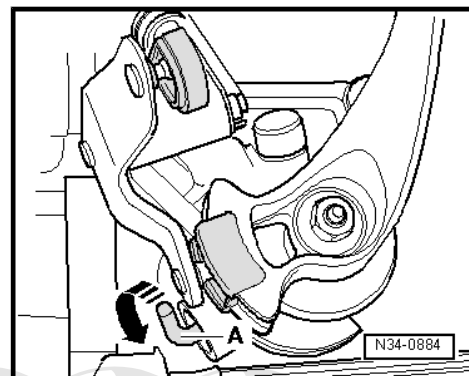
Cable adjustment is now complete.



- Turn angled rod -A- back to original position in direction of -arrow-.
- Remove locking pin - T10027A- .

Checking adjustment

- With the gearbox in neutral, the gear lever should rest in the 3rd/4th gear gate.
- Press clutch pedal.
- 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 77](#) .

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

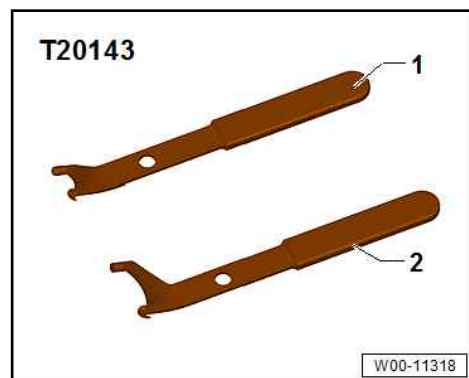
1.10 Renewing selector shaft oil seal

Special tools and workshop equipment required

- ♦ Tube - VW 423-



- ♦ Extractor lever - T20143/1-



Procedure

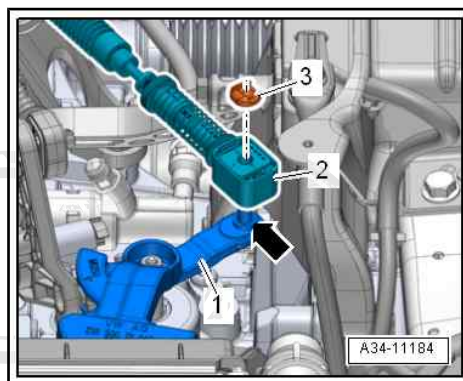
- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

Vehicles from model year 2015 onwards:

- Remove mounting for jump start terminal and air cleaner housing ⇒ Electrical system; Rep. gr. 27 ; Jump start terminal; Removing and installing jump start terminal .

Continued for all vehicles:

- Detach securing clip -3- from gearbox selector lever -1- and pull gear selector cable -2- off pin -arrow-.
- Remove gate relay lever ⇒ [page 66](#) .

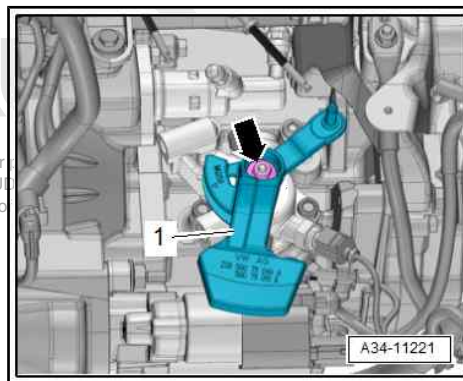


- Remove nut -arrow- and detach gearbox selector lever -1-.

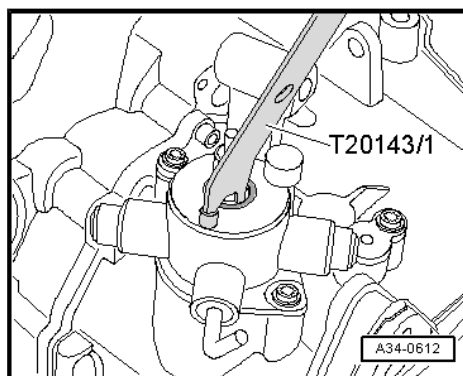


Note

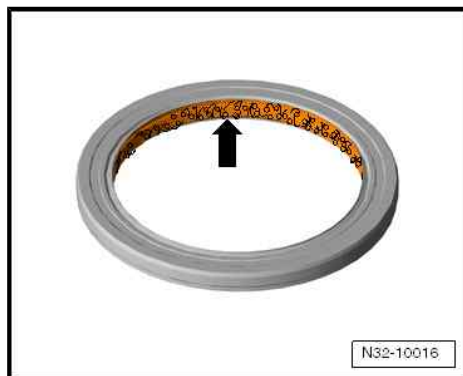
If gearbox selector lever cannot be removed, use a commercially available puller.



- Pry out oil seal using extractor tool - T20143/1- .



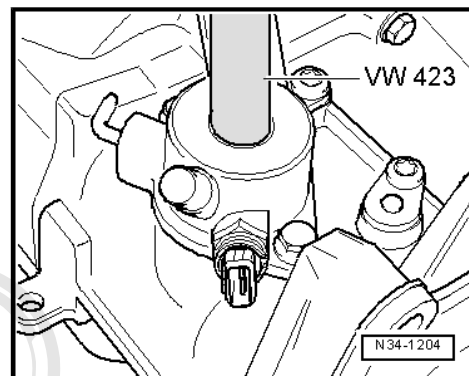
- Lightly oil outer circumference of new oil seal.
- Pack space between sealing lip and dust lip -arrow- half full with sealing grease; for sealing grease refer to ⇒ Electronic parts catalogue .



- Drive in oil seal with tube - VW 423- .
- Install gearbox selector lever ⇒ [page 65](#) .
- Install gate relay lever ⇒ [page 66](#) .
- Install mounting for jump start terminal and air cleaner housing
⇒ Electrical system; Rep. gr. 27 ; Jump start terminal; Removing and installing jump start terminal .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .

Tightening torques

- ◆ ⇒ ["1.3 Exploded view - selector cables", page 62](#)



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2 Removing and installing gearbox

⇒ ["2.1 Removing gearbox", page 82](#)

⇒ ["2.2 Installing gearbox", page 93](#)

⇒ ["2.3 Tightening torques for gearbox", page 96](#)

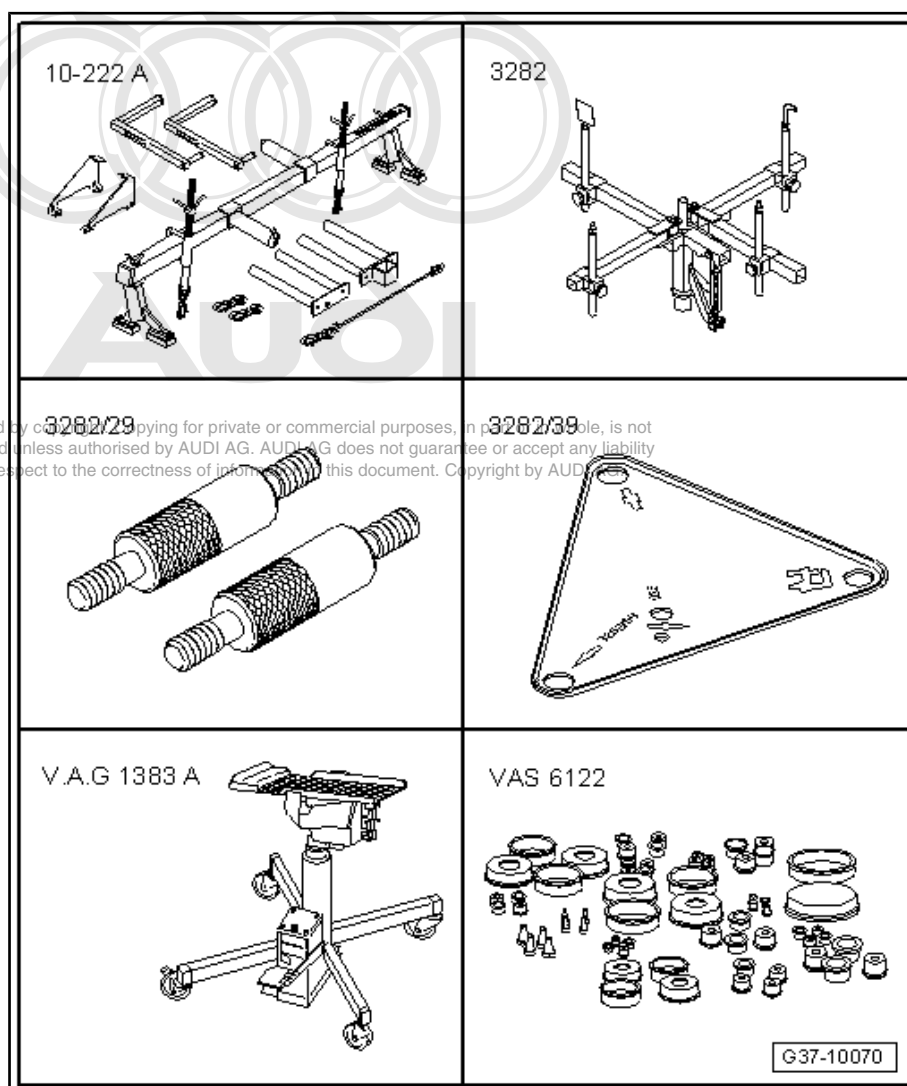
2.1 Removing gearbox

⇒ ["2.1.1 Removing gearbox - vehicles with 1.6 ltr. TDI engine \(EA189\)", page 82](#)

⇒ ["2.1.2 Removing gearbox - vehicles with 1.4 ltr./1.6 ltr. TDI engine \(EA288\)", page 88](#)

2.1.1 Removing gearbox - vehicles with 1.6 ltr. TDI engine (EA189)

Special tools and workshop equipment required



- ◆ Support bracket - 10 - 222 A-
- ◆ Gearbox support - 3282-
- ◆ Pin - 3282/29-
- ◆ Adjustment plate - 3282/39-
- ◆ Engine/gearbox jack - VAS 6931- or -V.A.G 1383 A-

◆ Engine bung set - VAS 6122-

Procedure



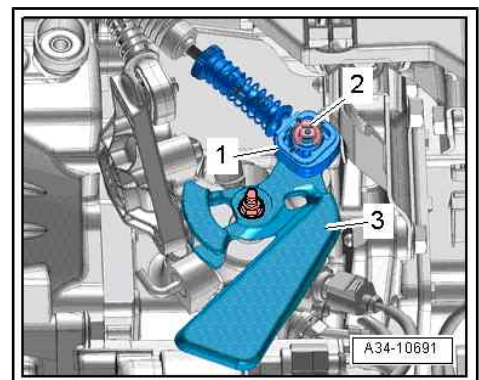
Note

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

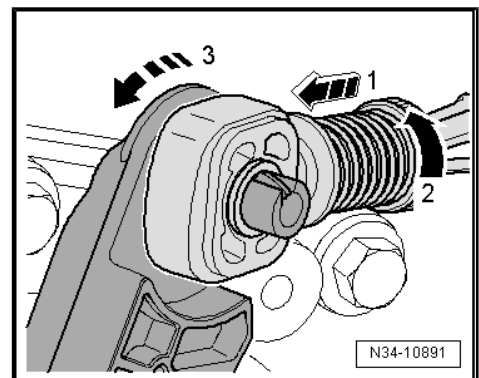
- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter
- Remove radiator cowl ⇒ Rep. gr. 19 ; Radiators/radiator fans; Removing and installing radiator cowl .
- Remove flange shafts: left side ⇒ [page 203](#) ; right side ⇒ [page 204](#) .
- Seal off openings with sealing plug from engine bung set - VAS 6122- .
- Remove securing clip -2-.

- Pull gear selector cable -1- off gearbox selector lever -3-.

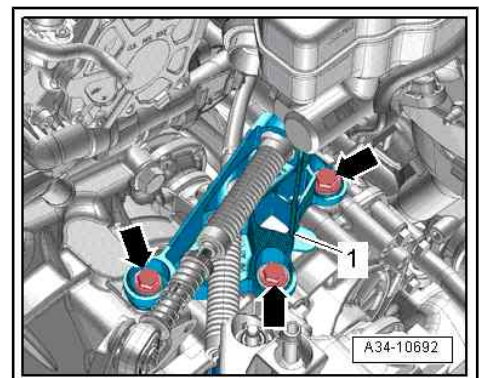
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- To avoid damage to the gate selector cable, the cable end-piece must be separated from the gate selector cable before removal.
- Pull locking mechanism forwards -arrow 1- onto stop and then turn to left -arrow 2- to lock.
- Push gate relay lever forwards in direction of -arrow 3-.



- Unscrew bolts -arrows-, remove cable support bracket -1- and place to one side together with cables.



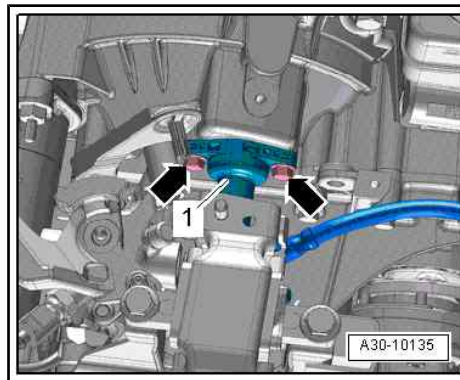
- Remove bolts -arrows-, detach clutch slave cylinder -1- and place to one side. Do not disconnect pipes.



Caution

Risk of irreparable damage to clutch slave cylinder.

- ◆ *Do not press clutch pedal after removing clutch slave cylinder.*

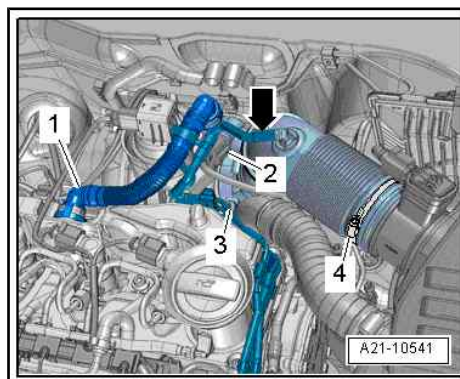


- Version for cold countries: unplug electrical connector -2-.
- Press release tabs and detach crankcase breather hose -1-.
- Detach vacuum hose -arrow-.
- Remove bolt -3-, swivel air pipe and connection to rear and detach from turbocharger.

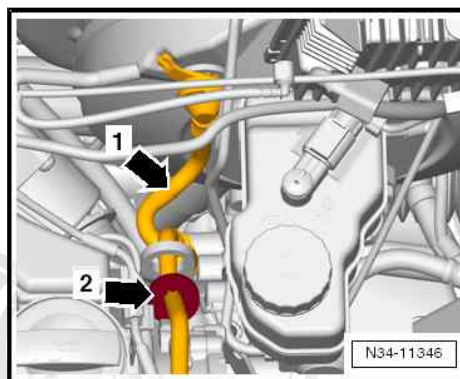


Note

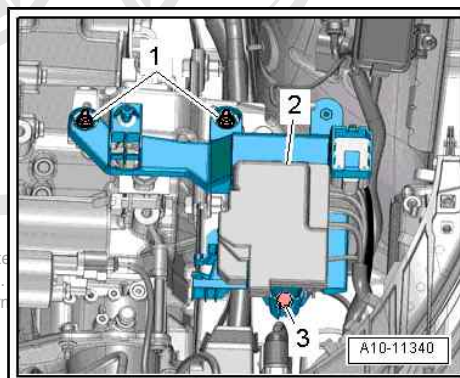
Disregard -item 4-.



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



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



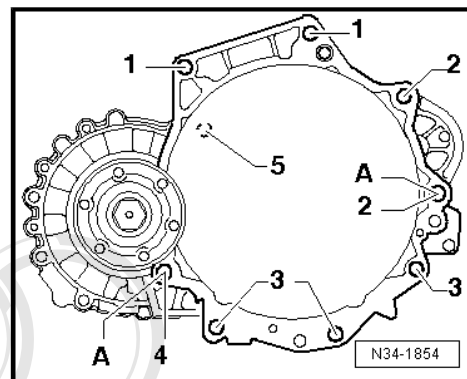
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- Remove bolts -1- (accessible from above).



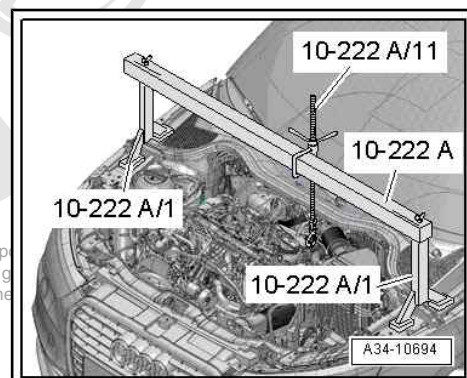
Note

Other items can be disregarded.

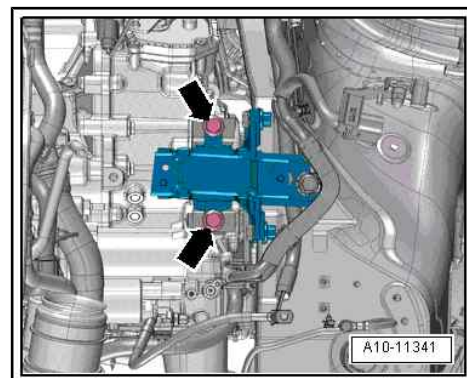


- Set up support bracket - 10 - 222 A- on wing mounting flanges, as shown in illustration.
- Engage hook of spindle - 10 - 222 A /11- in engine lifting eye (rear left).

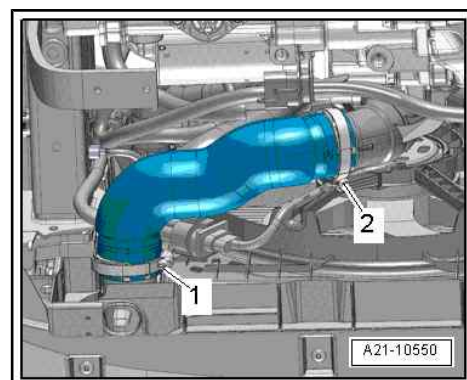
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- Remove bolts -arrows- from gearbox mounting.



- Release hose clips -1- and -2- and remove air hose.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



Vehicles with start/stop system:

- Unplug electrical connector -2- from gearbox neutral position sender - G701- .

Continued for all vehicles:

- Unplug electrical connector -3- at reversing light switch - F4- .



Note

Disregard -item 1-.

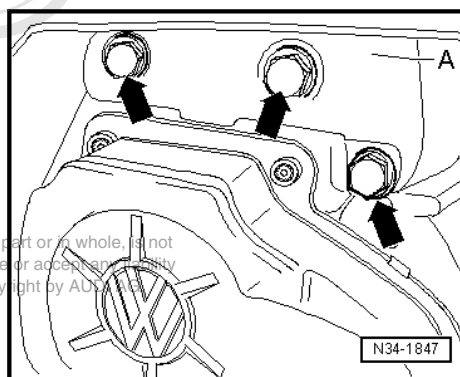
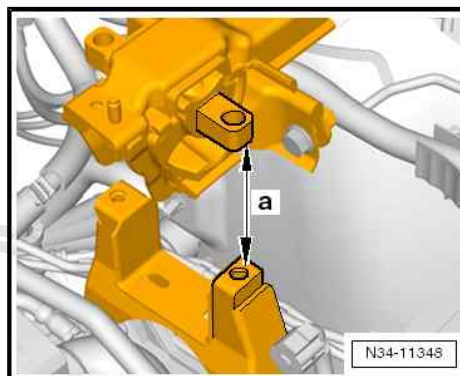
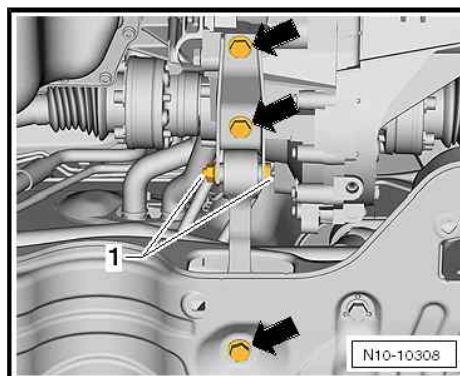
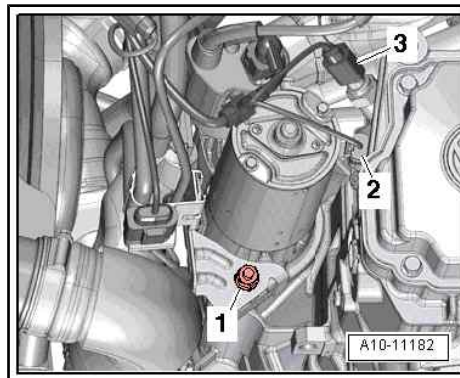


WARNING

Risk of accident.

- ◆ *The bolted connection -1- must not be slackened.*

- Remove bolts -arrows- and detach pendulum support.
- 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- = 50 mm
- Remove bolts -arrows- and detach gearbox support -A-.



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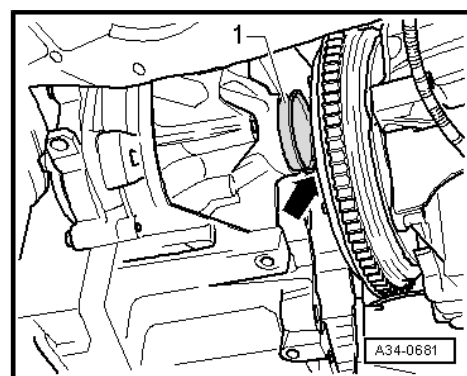
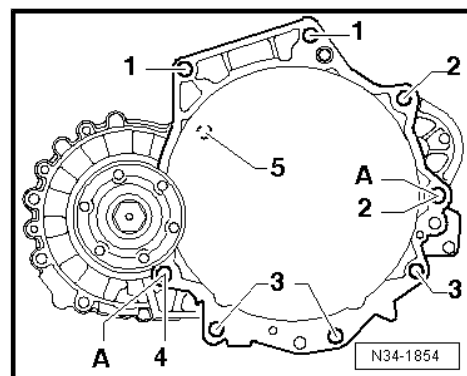
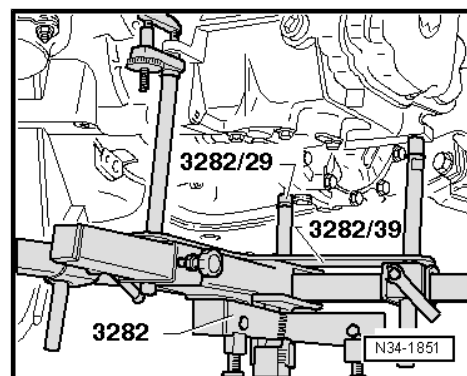
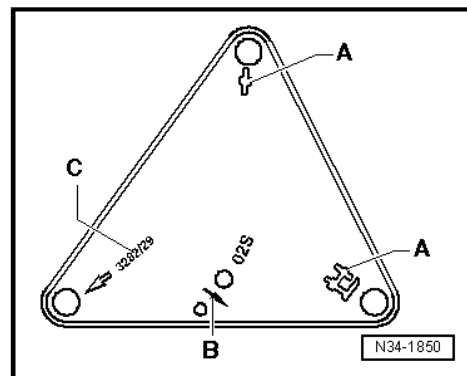
To remove gearbox 02R, set up gearbox support - 3282- with adjustment plate - 3282/39- .

- Insert gearbox support - 3282- in engine and gearbox jack .
- Align arms of gearbox support according to holes in adjustment plate.
- Screw in support elements -A- and pin - 3282/29- -C- as illustrated on adjustment plate.
- Place engine and gearbox jack underneath vehicle.
- The arrow symbol -B- on the adjustment plate points in the direction of travel.
- Align adjustment plate - 3282/39- parallel to gearbox and lock safety support on gearbox.
- Screw pin - 3282/29- into hole for bolt securing pendulum support to gearbox.
- Support gearbox from underneath by raising engine and gearbox jack.

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- Remove remaining engine/gearbox securing bolts -3- and -4-.
- Press gearbox off dowel sleeves.
- Pull gearbox off engine.

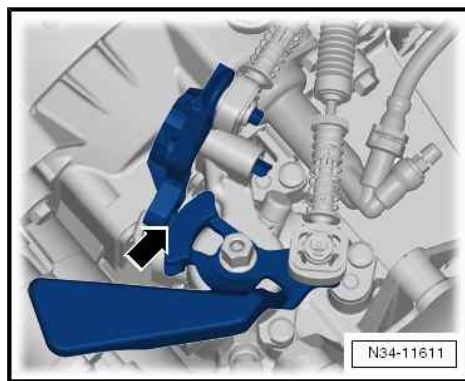
- Carefully lower gearbox using engine and gearbox jack and ensure sufficient clearance between sleeve -1- and clutch pressure plate -arrow- to prevent damage.
- While lowering gearbox, adjust position of gearbox using spindles on gearbox support - 3282- . If necessary, press engine forwards slightly.





Note

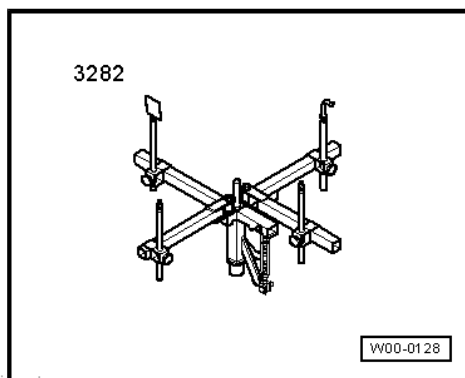
When installing a replacement gearbox, the gearbox selector lever and the gate relay lever have to be transferred from the old gearbox to the new one ⇒ [page 62](#).



2.1.2 Removing gearbox - vehicles with 1.4 ltr./1.6 ltr. TDI engine (EA288)

Special tools and workshop equipment required

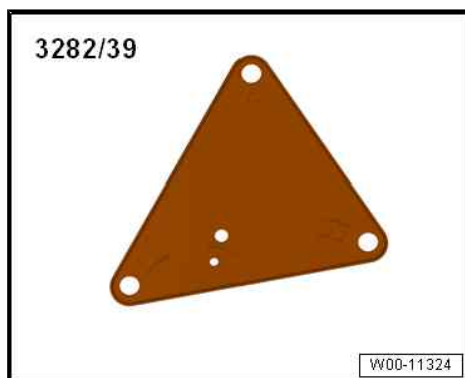
- ◆ Gearbox support - 3282-



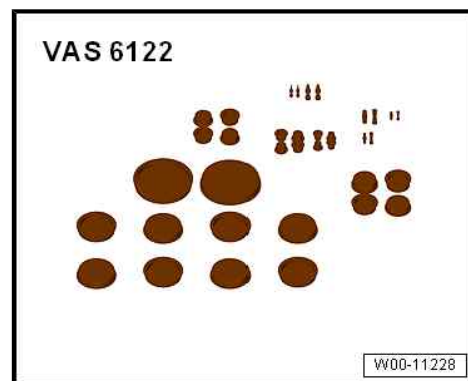
- ◆ Pin - 3282/29-



- ◆ Adjustment plate - 3282/39-



◆ Engine bung set - VAS 6122-



◆ Engine and gearbox jack - VAS 6931-



Procedure

Note

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

- Remove mounting for jump start terminal and air cleaner housing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Removing and installing electronics box .
- Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter

Vehicles with 1.4 ltr. TDI engine (EA288):

- Remove flange shafts: left side ⇒ [page 203](#) ; right side ⇒ [page 204](#) .
- Seal off openings with sealing plug from engine bung set - VAS 6122-

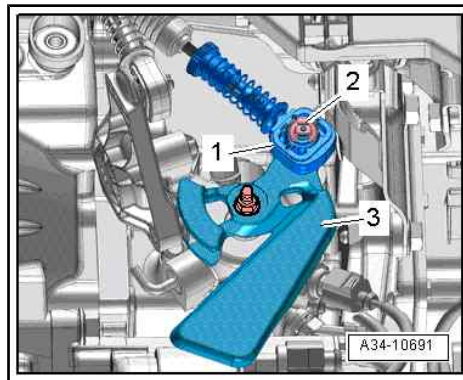
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Vehicles with 1.6 ltr. TDI engine (EA288):

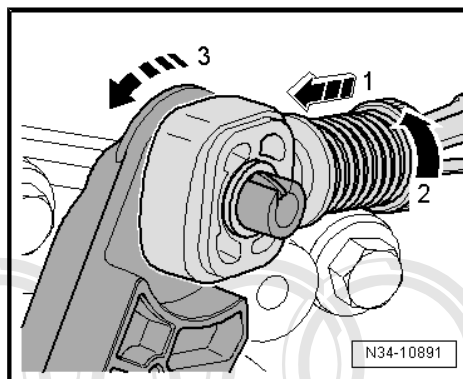
- Remove subframe without steering rack ⇒ Rep. gr. 40 ; Subframe; Removing and installing subframe without steering rack .

Continued for all vehicles:

- Remove securing clip -2-.
- Pull gear selector cable -1- off gearbox selector lever -3-.



- To avoid damage to the gate selector cable, the cable end-piece must be separated from the gate selector cable before removal.
- Pull locking mechanism forwards -arrow 1- onto stop and then turn to left -arrow 2- to lock.
- Push gate relay lever forwards in direction of -arrow 3-.

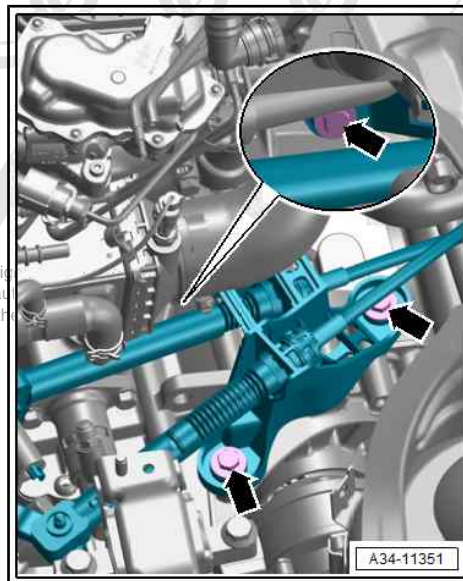


- Unscrew bolts -arrows-, detach cable support bracket and place to one side together with cables.



Note

The installation position on a vehicle with 1.4 ltr. TDI engine is shown as an example.



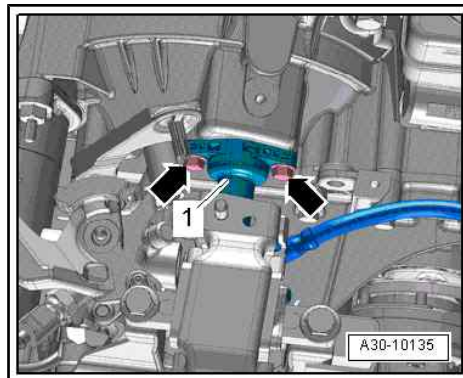
- Remove bolts -arrows-, detach clutch slave cylinder -1- and place to one side. Do not disconnect pipes.



Caution

Risk of irreparable damage to clutch slave cylinder.

- ◆ ***Do not press clutch pedal after removing clutch slave cylinder.***

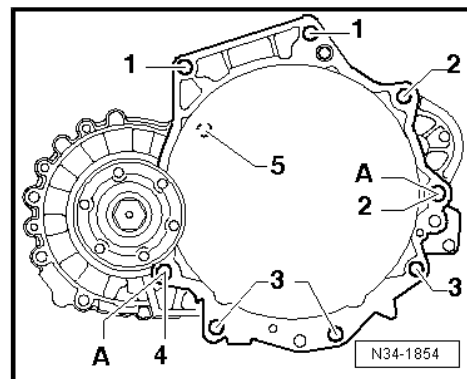


- Remove bolts -1- (accessible from above).

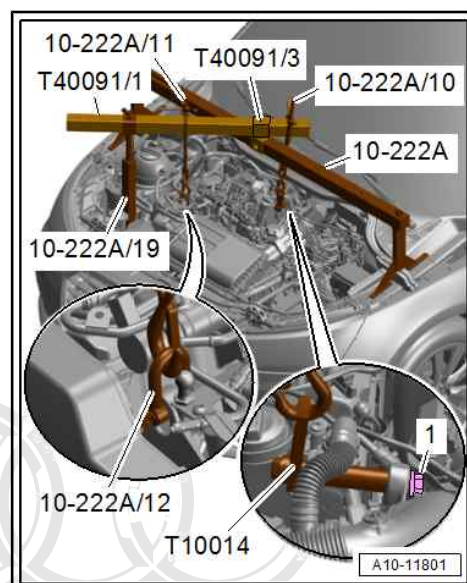


Note

Other items can be disregarded.

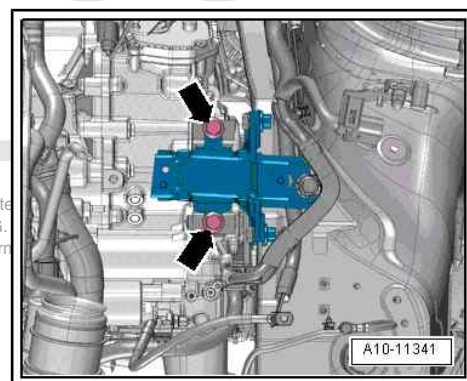


- Support engine in installation position ⇒ Rep. gr. 10 ; Assembly mountings; Supporting engine in installation position .



- Remove bolts -arrows- from gearbox mounting.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .

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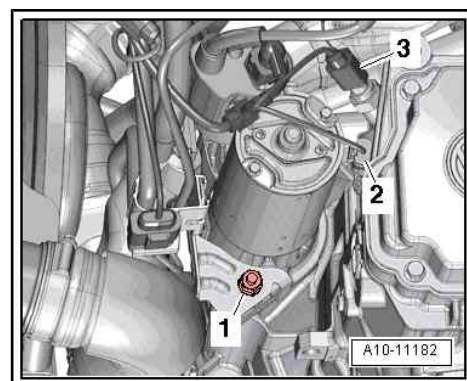


- Unplug electrical connector -2- from gearbox neutral position sender - G701- .
- Unplug electrical connector -3- at reversing light switch - F4- .



Note

Disregard -item 1-.



Vehicles with 1.4 ltr. TDI engine:

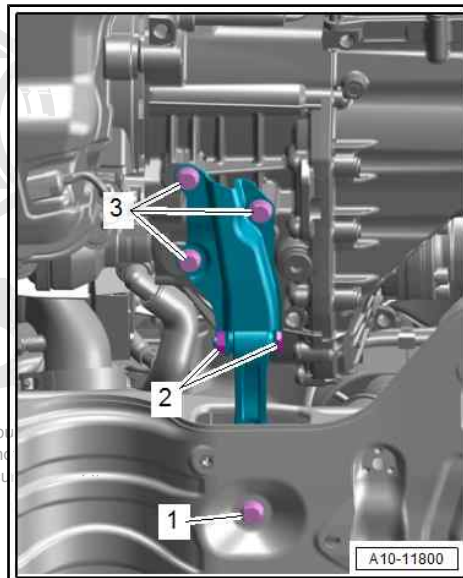
- Unscrew bolts -1 and 3- and remove pendulum support.



Note

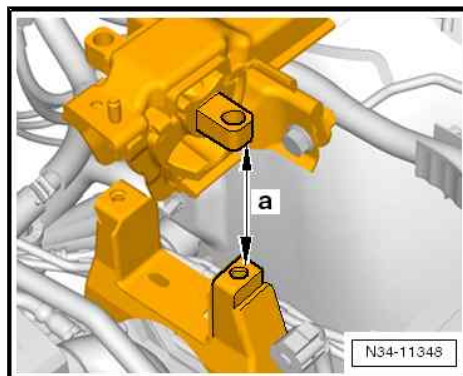
The bolted connection -2- must not be slackened.

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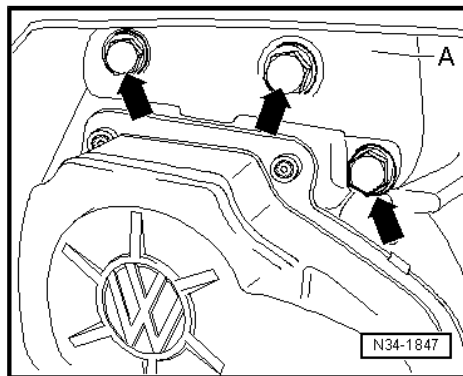


Continued for all vehicles:

- Lower engine/gearbox assembly using spindle of support bracket - 10-222A- until distance -a- is obtained between gearbox support and gearbox mounting.
- Dimension -a- = 50 mm

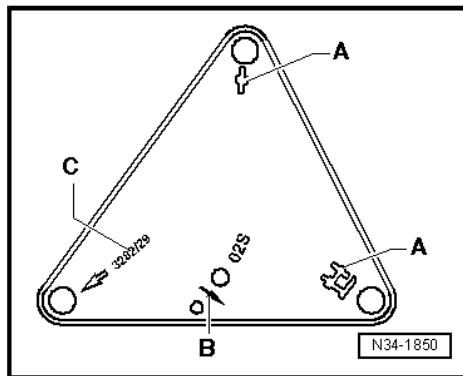


- Remove bolts -arrows- and detach gearbox support -A-.

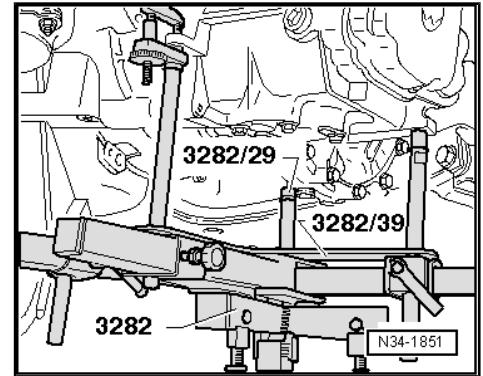


To remove gearbox 02R, set up gearbox support - 3282- with adjustment plate - 3282/39- .

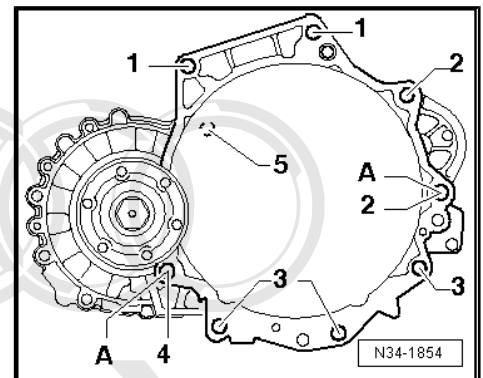
- Insert gearbox support - 3282- in engine and gearbox jack .
- Align arms of gearbox support according to holes in adjustment plate.
- Screw in support elements -A- and pin - 3282/29- -C- as illustrated on adjustment plate.
- Place engine and gearbox jack underneath vehicle.
- The arrow symbol -B- on the adjustment plate points in the direction of travel.



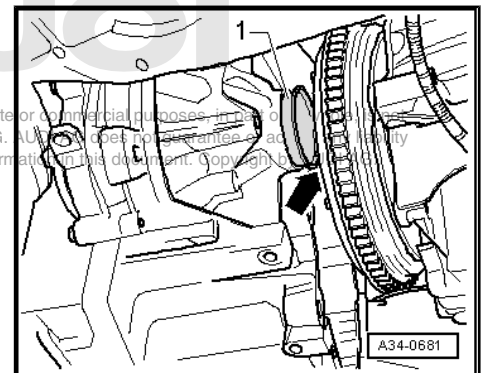
- Align adjustment plate - 3282/39- parallel to gearbox and lock safety support on gearbox.
- Screw pin - 3282/29- into hole for bolt securing pendulum support to gearbox.
- Support gearbox from underneath by raising engine and gearbox jack.



- Remove remaining engine/gearbox securing bolts -3- and -4-.
- Press gearbox off dowel sleeves.
- Pull gearbox off engine.

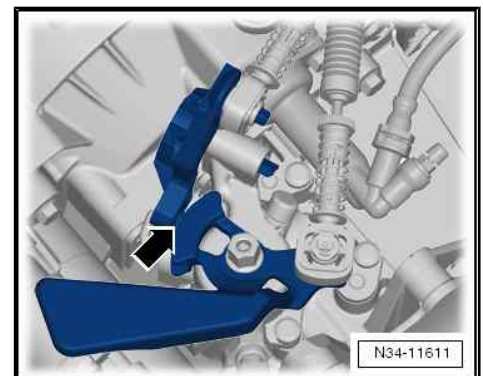


- Carefully lower gearbox using engine and gearbox jack and ensure sufficient clearance between sleeve -1- and clutch pressure plate -arrow- to prevent damage.
- While lowering gearbox, adjust position of gearbox using spindles on gearbox support - 3282- . If necessary, press engine forwards slightly.



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 62](#) .



2.2 Installing gearbox

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



Note

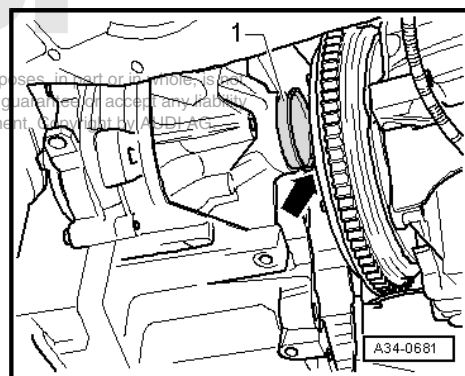
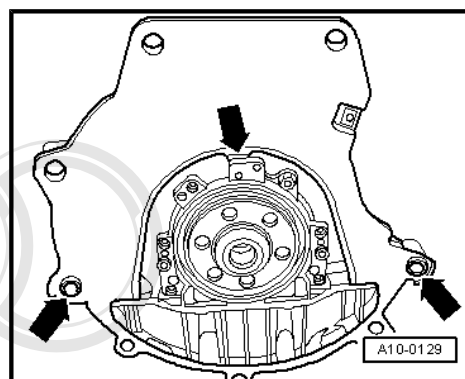
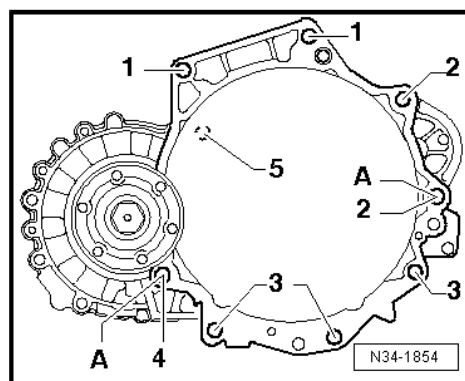
- ◆ *Renew bolts which are tightened by turning through a specified angle.*
 - ◆ *Renew self-locking nuts and bolts, and seals, O-rings and gaskets.*
 - ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*
 - ◆ *Re-attach all cable ties at the same locations when re-installing.*
 - ◆ *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.*
- Check that dowel sleeves -A- for centralising engine/gearbox are in the cylinder block; install any missing dowel sleeves.



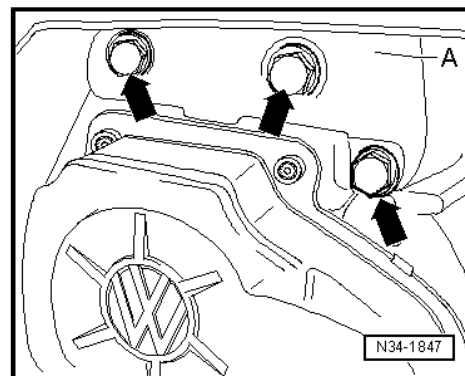
Note

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 the intermediate plate is engaged on the sealing flange and fitted on the dowel sleeves -arrows-.
- Check clutch release bearing for wear and renew if necessary.
- Lubricate surface which contacts ball-head pin with MoS₂ grease.
- Place engine and gearbox jack 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 187](#) , right-side ⇒ [page 189](#) .
- Carefully lift gearbox using engine and gearbox jack and ensure sufficient clearance between sleeve -1- and clutch pressure plate -arrow- to prevent damage.
- Bring gearbox into position.
- Install bottom engine/gearbox securing bolts.
- Detach gearbox support - 3282- with adjustment plate - 3282/39- from gearbox after bolting gearbox and engine together.



- Install gearbox support -A- ⇒ [page 98](#) .
- Install top engine/gearbox securing bolts.
- Raise engine/gearbox assembly via spindle of support bracket - 10 - 222 A- .



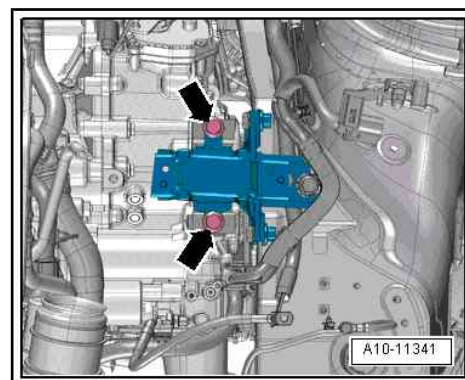
- Align engine/gearbox assembly in installation position. To do so, raise engine/gearbox until gearbox support makes full contact with gearbox mounting.



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 98](#) .

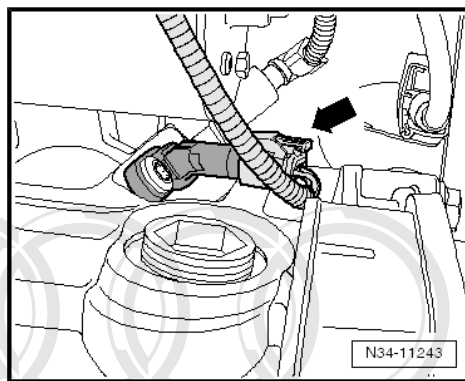


WARNING

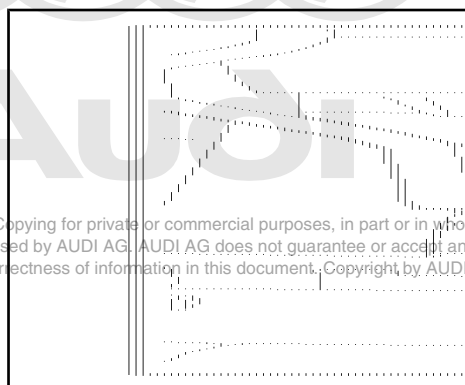
Do not remove support bracket - 10-222A- until all bolts securing the left-hand engine/gearbox mounting have been tightened to the specified torque.

- Install pendulum support ⇒ Rep. gr. 10 ; Assembly mountings; Removing and installing pendulum support .
- Install flange shafts: left-side ⇒ [page 203](#) , right-side ⇒ [page 204](#) .
- Secure drive shafts to flange shafts of gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft .
- If previously fitted, bolt on heat shield for drive shaft (right-side) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft .
- Install clutch slave cylinder ⇒ [page 36](#) .
- Install radiator cowl ⇒ Rep. gr. 19 ; Radiator/radiator fan; Removing and installing radiator cowl .
- Install subframe ⇒ Rep. gr. 40 ; Subframe; Removing and installing subframe without steering rack .
- Install starter ⇒ Electrical system; Rep gr. 27 ; Starter; Exploded view - starter .

- Gearbox for vehicles with start/stop system: plug connector -arrow- into gearbox neutral position sender - G701- .



- Plug connector -3- onto reversing light switch - F4- .
- Assemble selector mechanism ⇒ [page 62](#) .
- Adjust selector mechanism ⇒ [page 77](#) .
- Check oil level in gearbox and top up with gear oil if necessary ⇒ [page 103](#) .
- Install mounting for jump start terminal and air cleaner housing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Removing and installing electronics box .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .



2.3 Tightening torques for gearbox

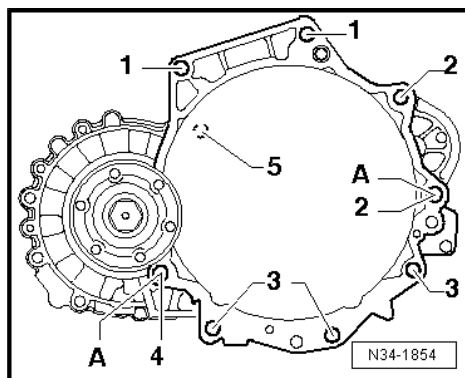


Note

- ◆ 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 $\pm 15\%$.

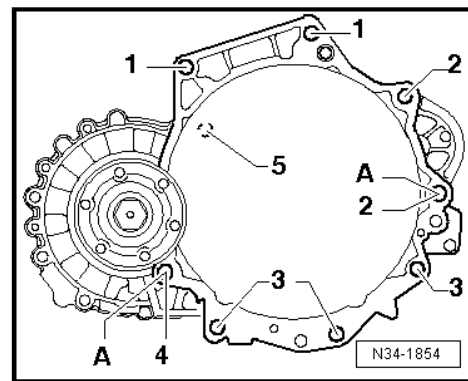
Securing manual gearbox 02R to 1.6 ltr. TDI engine (EA189)

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. • Disregard -item 5-.		



Securing manual gearbox 02R or 0A4 to 1.4 ltr./1.6 ltr. TDI engine (EA288)

Item	Bolt	Nm
1, 4	M12x60	80
2 ¹⁾	M12x65	80
3	M10x55	40
A	Dowel sleeves for centralising	
• 1) Also secures starter. • Disregard -item 5-.		



Assembly mountings ⇒ [page 98](#)



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3 Assembly mountings

⇒ "3.1 Exploded view - assembly mountings", page 98

3.1 Exploded view - assembly mountings

⇒ "3.1.1 Exploded view - assembly mountings, vehicles with 1.6 ltr. TDI engine (EA189)", page 98

⇒ "3.1.2 Exploded view - assembly mountings, vehicles with 1.4 ltr./1.6 ltr. TDI engine (EA288)", page 100

3.1.1 Exploded view - assembly mountings, vehicles with 1.6 ltr. TDI engine (EA189)

1 - Engine support

2 - Bolt

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

3 - Engine mounting

- ❑ 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 - Support arm

6 - Nut

- ❑ Only loosen this part if engine mounting -item 3- is to be renewed
- ❑ Tightening torque ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

7 - Stud

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

8 - Bolt

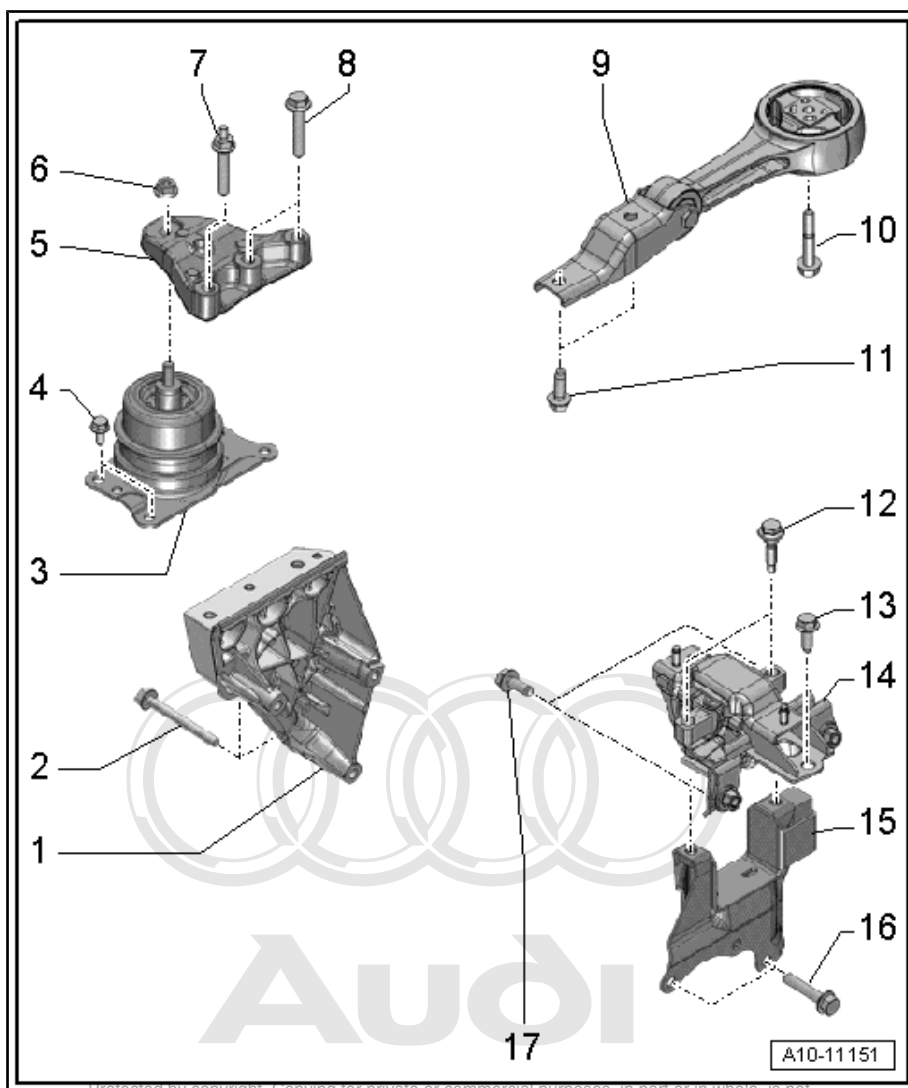
- ❑ Tightening torque ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

9 - Pendulum support

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

10 - Bolt

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



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11 - Bolt

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

12 - Bolt

- ☐ Renew
- ☐ 40 Nm + 90°

13 - Bolt

- ☐ Renew
- ☐ Tightening torque and sequence ⇒ [page 99](#)

14 - Gearbox mounting

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

15 - Gearbox support

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

16 - Bolt

- ☐ Renew

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Bolt M10 x 52 - 8.8

- ☐ 40 Nm + 90°

Bolt M10 x 75 - 10.9

- ☐ 50 Nm + 90°

17 - Bolt

- ☐ Renew
- ☐ Tightening torque and sequence ⇒ [page 99](#)

Gearbox mounting - tightening torque and sequence

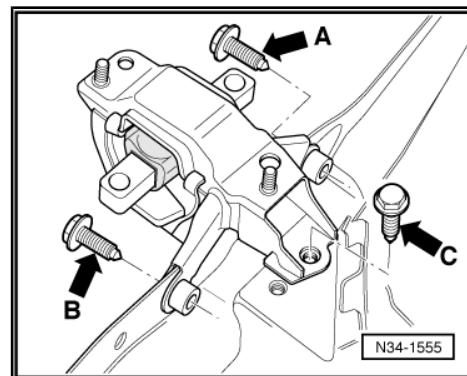


Note

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

- Tighten bolts in 3 stages in the sequence shown:

Stage	Bolts	Tightening torque/angle specification
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



3.1.2 Exploded view - assembly mountings, vehicles with 1.4 ltr./1.6 ltr. TDI engine (EA288)

1 - Engine support

- ❑ Different versions available; for correct version refer to ⇒ Electronic parts catalogue

2 - Bolt

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

3 - Engine mounting

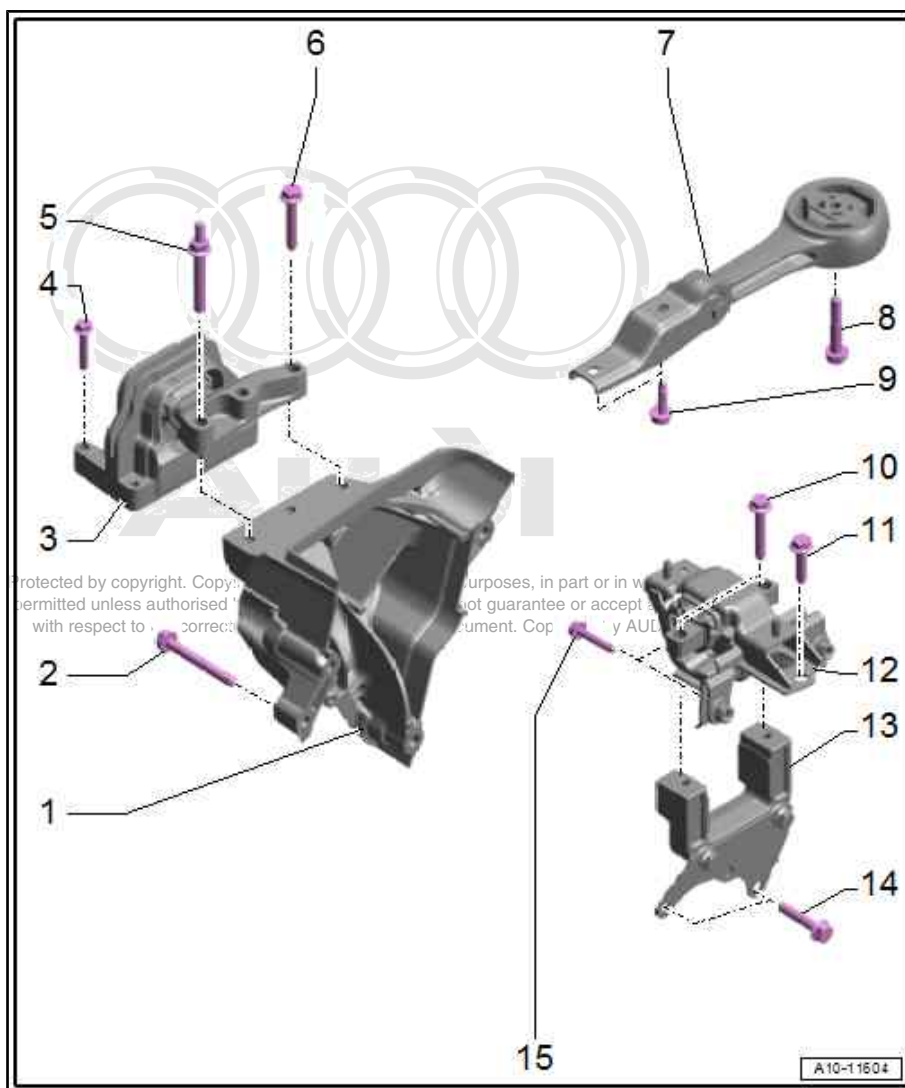
- ❑ Removing and installing ⇒ Rep. gr. 10 ; Assembly mountings; Removing and installing engine mounting

4, 5, 6 - Bolt

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

7 - Pendulum support

- ❑ Different versions available; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ Rep. gr. 10 ; Assembly mountings; Removing and installing pendu-



lum support

8, 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 99](#)

12 - Gearbox mounting

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

13 - Gearbox support

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

14 - Bolt

- ☐ Renew

Bolt M10 x 52 - 8.8

- ☐ 40 Nm + 90°

Bolt M10 x 75 - 10.9

- ☐ 50 Nm + 90°

15 - Bolt

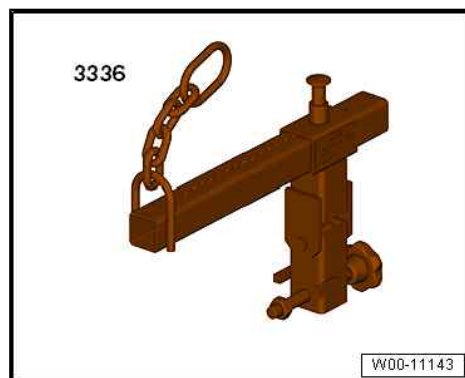
- ☐ Renew
- ☐ Tightening torque and sequence ⇒ [page 99](#)

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4 Transporting gearbox

Special tools and workshop equipment required

- ◆ Gearbox lifting tackle - 3336-



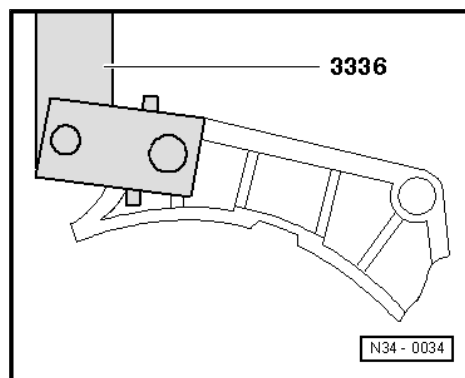
- ◆ Workshop hoist - VAS 6100-



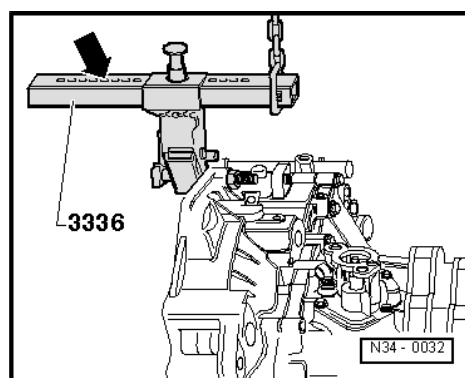
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Procedure

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



- Set support arm on sliding bracket by means of locking pin -arrow-.
- Number of holes visible = 5
- Lift gearbox with workshop hoist - VAS 6100- and gearbox lifting tackle - 3336- .



5 Gear oil

⇒ [“5.1 Checking gear oil level”, page 103](#)

⇒ [“5.2 Draining and filling gear oil”, page 104](#)

5.1 Checking gear oil level

⇒ [“5.1.1 Checking gear oil level - 5-speed manual gearbox 02R”, page 103](#)

⇒ [“5.1.2 Checking gear oil level - 5-speed manual gearbox 0A4”, page 103](#)

5.1.1 Checking gear oil level - 5-speed manual gearbox 02R

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- Gearbox allocation ⇒ [page 3](#)

Special tools and workshop equipment required

- ◆ Gear oil specifications ⇒ Electronic parts catalogue

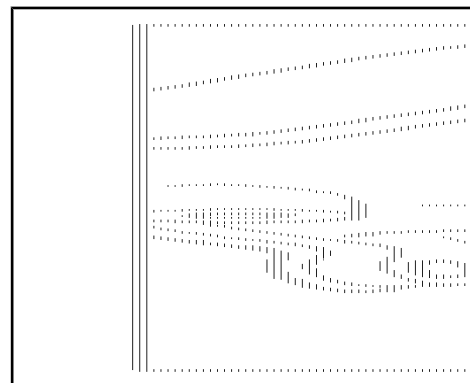
Procedure

- 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.

The oil level is correct when the gearbox is filled up to the lower edge of the oil filler hole.

- Tighten oil filler plug -arrow- to specified torque
⇒ [Item 3 \(page 142\)](#) .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



5.1.2 Checking gear oil level - 5-speed manual gearbox 0A4

- Gearbox allocation ⇒ [page 3](#)

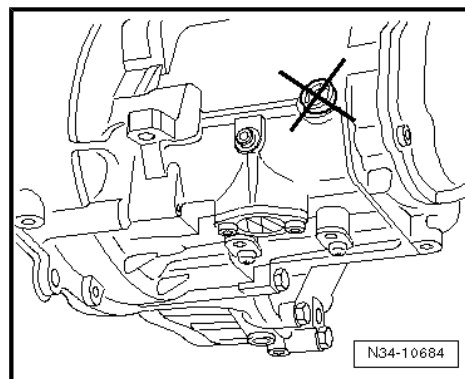
Special tools and workshop equipment required

- ◆ Gear oil specifications ⇒ Electronic parts catalogue

Procedure

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

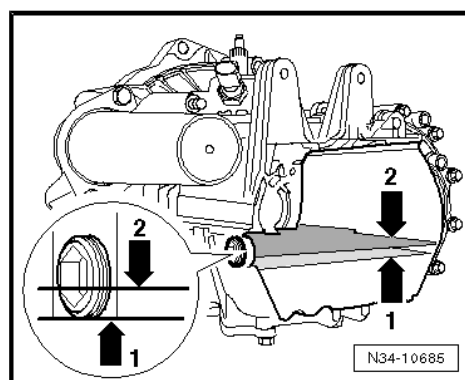
It is not possible to check the gear oil level by removing the oil filler plug.



Due to the inclination of the engine/gearbox assembly, the oil level -arrow 2- will be above the lower edge of the filler hole -arrow 1-.

The gear oil level can only be checked by draining the gear oil completely and then filling up again

⇒ ["5.2.1 Draining and filling gear oil - 5-speed manual gearbox 02R", page 104](#) .



5.2 Draining and filling gear oil

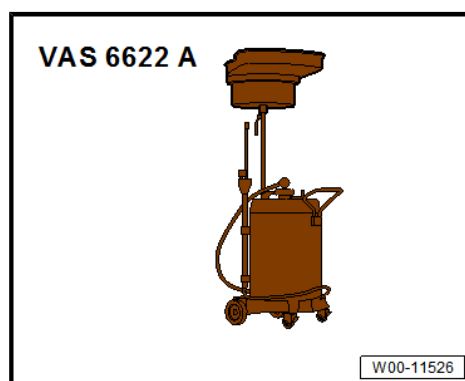
⇒ ["5.2.1 Draining and filling gear oil - 5-speed manual gearbox 02R", page 104](#)

⇒ ["5.2.2 Draining and filling gear oil - 5-speed manual gearbox 0A4", page 105](#)

5.2.1 Draining and filling gear oil - 5-speed manual gearbox 02R

Special tools and workshop equipment required

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



- ◆ Gear oil specifications ⇒ Electronic parts catalogue

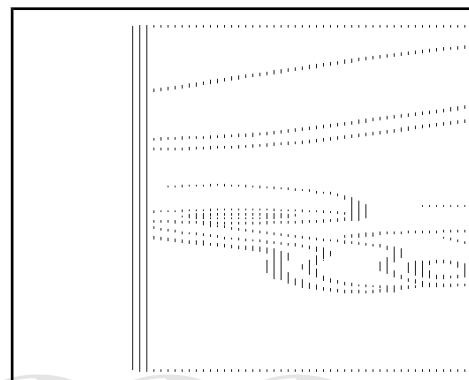
Draining

- 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 15 \(page 143\)](#) and allow gear oil to drain.
- Tighten oil drain plug to specified torque ⇒ [Item 15 \(page 143\)](#) .

Filling

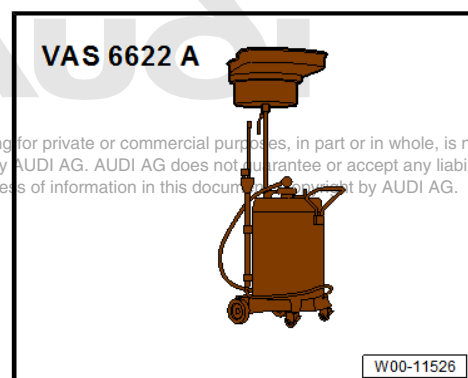
- Unscrew oil filler plug -arrow-.
- Fill up gear oil to bottom lip of filler hole.
- Screw in oil filler plug -arrow-.
- Start engine, engage a gear and allow gearbox to turn for approx. 2 minutes.
- Switch off engine and remove plug -arrow-.
- Top up gear oil again to bottom lip of filler hole.
- Tighten plug -arrow- to specified torque ⇒ [Item 3 \(page 142\)](#) .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



5.2.2 Draining and filling gear oil - 5-speed manual gearbox 0A4

Special tools and workshop equipment required

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



- ◆ Gear oil specifications ⇒ Electronic parts catalogue

Clean gearbox.

Draining

- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Clean gearbox in vicinity of oil drain plug.
- Place used oil collection and extraction unit - VAS 6622A- below gearbox.



Caution

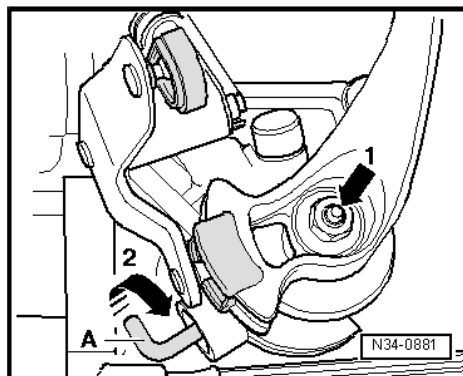
A pivot pin for the selector forks in the gearbox must be removed in order to drain the gear oil.

The selector shaft must be locked to prevent the position of the selector forks from being changed, e.g. due to accidental operation of the selector mechanism.

The selector shaft is locked as follows:

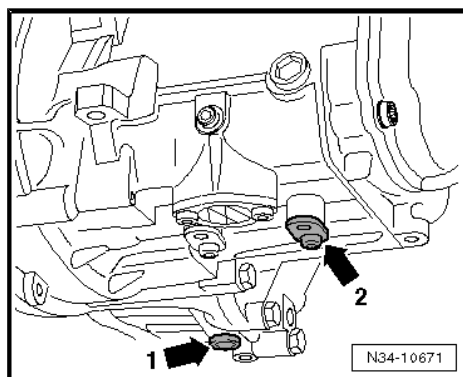
- Press selector shaft down (direction of -arrow 1-).
- While pressing selector shaft down, move angled rod -A- upwards in direction of -arrow 2-. At the same time press angled rod carefully into selector shaft until it engages.
- The selector shaft is now locked.

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Use a clean container (capacity approx. 3.0 ltr.) with a graduated scale to collect gear oil.

- Remove oil drain plug -arrow 1-, then remove pivot pin -arrow 2- for selector forks and drain off gear oil.
- Install pivot pin -arrow 2- for selector forks with a new O-ring ⇒ [page 112](#).
- Screw in oil drain plug -arrow 1- and tighten to specified torque ⇒ [Item 15 \(page 143\)](#).

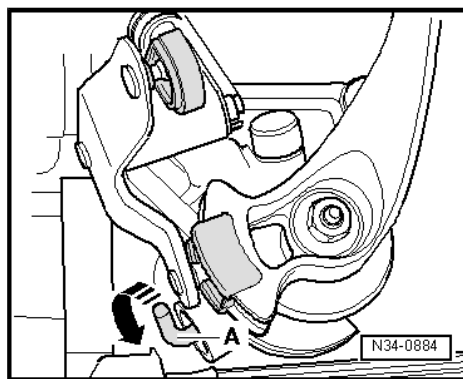


- Now turn angled rod -A- back to original position (direction of -arrow-) so that selector shaft can move freely again.

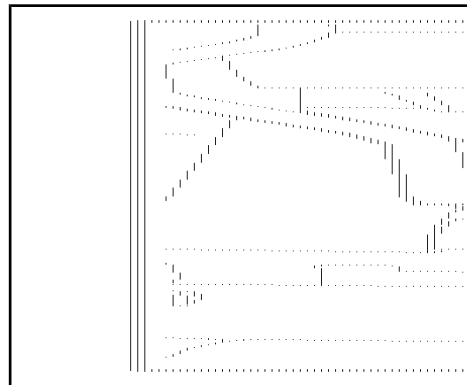
Fill up gear oil.

- Oil drain plug must be tightened.
- Pivot pin for selector forks must be fitted with a new O-ring ⇒ [page 112](#).

Add gear oil to container until amount of gear oil in container is 1.8 ltr.



- Remove reversing light switch - F4- -arrow-.
- Fit hose (length approx. 600 mm, outside diameter 10 mm) to funnel (commercially available).
- Insert hose in mounting hole of reversing light switch - F4- and fill gearbox with gear oil.
- Re-install reversing light switch - F4- -arrow-
⇒ [Item 2 \(page 113\)](#) .
- Check operation of selector mechanism ⇒ [page 79](#) .
- Install air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



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6 Dismantling and assembling gearbox

⇒ [“6.1 Schematic overview - gearbox”, page 108](#)

⇒ [“6.2 Exploded view - gearbox”, page 109](#)

⇒ [“6.4 Exploded view - gearbox housing and selector mechanism”, page 112](#)

⇒ [“6.6 Exploded view - input shaft, output shafts, differential and selector rods”, page 114](#)

⇒ [“6.7 Exploded view - selector forks”, page 115](#)

⇒ [“6.5 Exploded view - selector unit”, page 113](#)

⇒ [“6.8 Servicing selector forks”, page 116](#)

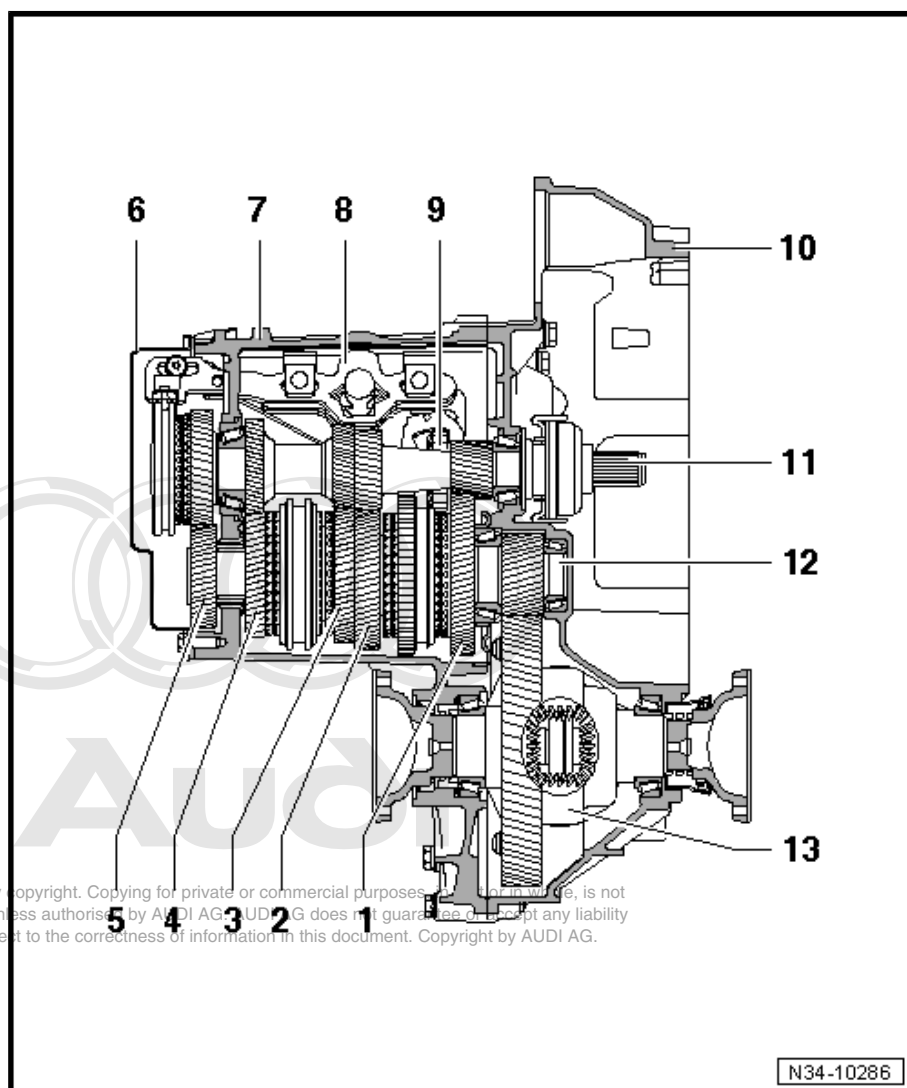
⇒ [“6.9 Removing and installing selector unit”, page 119](#)

⇒ [“6.10 Servicing selector unit”, page 121](#)

⇒ [“6.12 Dismantling and assembling gearbox”, page 128](#)

6.1 Schematic overview - gearbox

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



6.2 Exploded view - gearbox

Sequence for dismantling and assembling ⇒ [page 128](#)

I -

⇒ ["6.3 Exploded view - 5th gear and gearbox housing cover", page 110](#)

⇒ ["6.11 Removing and installing 5th gear", page 122](#)

II -

⇒ ["6.4 Exploded view - gearbox housing and selector mechanism", page 112](#)

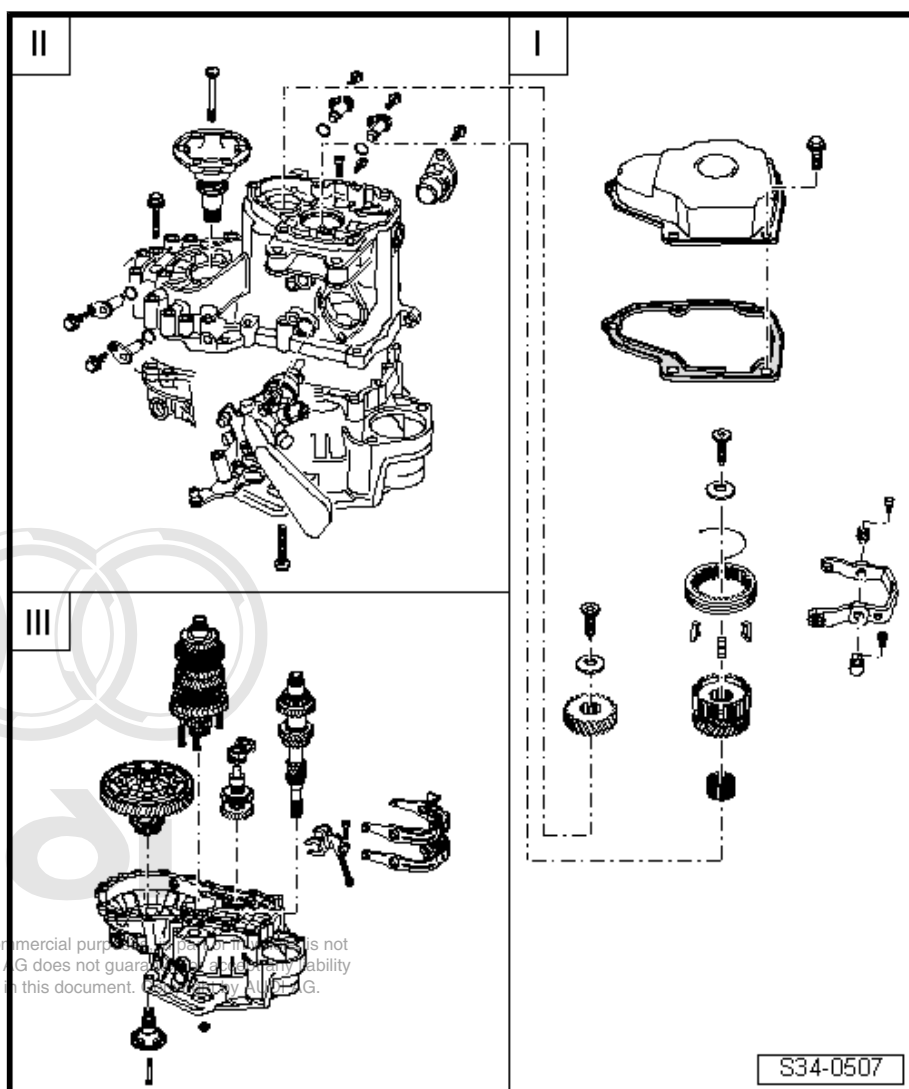
III -

⇒ ["6.6 Exploded view - input shaft, output shafts, differential and selector rods", page 114](#)

⇒ ["6.7 Exploded view - selector forks", page 115](#)

⇒ ["6.8 Servicing selector forks", page 116](#)

⇒ ["6.12 Dismantling and assembling gearbox", page 128](#)



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6.3 Exploded view - 5th gear and gearbox housing cover

1 - Bolt

- ☐ 18 Nm
- ☐ For gearbox housing cover

2 - Gearbox housing cover

- ☐ With magnet on some versions ⇒ [page 111](#)



Note

- ◆ Please note that oil will escape when the cover for gearbox housing is detached if the gearbox is installed.
- ◆ Because of this, the gear oil must be drained and the gearbox filled with new gear oil ⇒ [page 104](#)

3 - Gasket

4 - Bolt

- ☐ 80 Nm and 90°
- ☐ Always renew
- ☐ Fitted piece on bolt head holds dished spring in position
- ☐ Use thread tap to remove any remaining locking fluid from threaded holes for bolts securing synchro-hub and 5th gear wheel. Otherwise there is a risk that the bolts will shear off

5 - Dished spring

- ☐ Installing ⇒ [page 140](#)

6 - Socket head bolt

- ☐ 25 Nm
- ☐ For pivot pin to gearbox housing

7 - Pivot pin

8 - 5th gear selector fork

- ☐ Dismantling and assembling ⇒ [page 115](#)
- ☐ Adjusting ⇒ [page 141](#)

9 - Spring

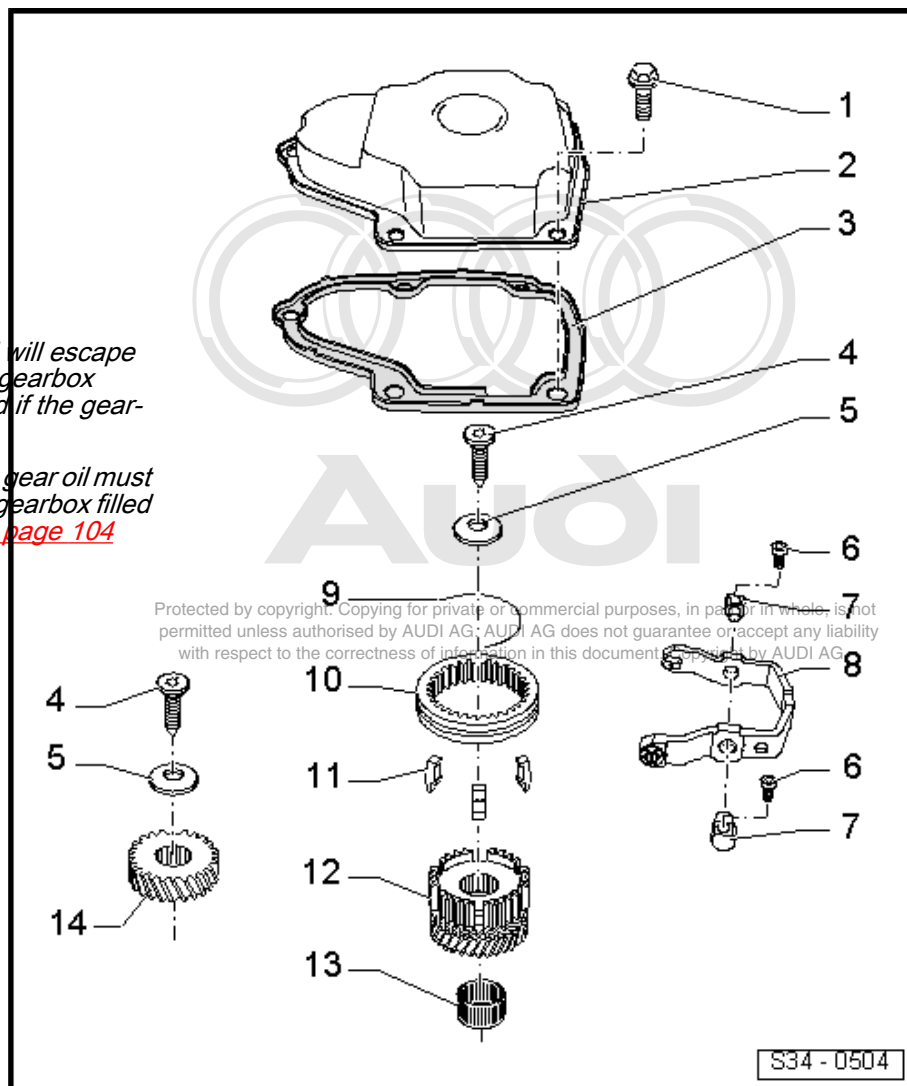
- ☐ Offset version
- ☐ Installing ⇒ [page 158](#)

10 - 5th gear locking collar

- ☐ Installation position ⇒ [page 158](#)
- ☐ Adjusting ⇒ [page 141](#)

11 - Locking pieces (3x)

- ☐ Installation position ⇒ [page 157](#)



12 - Synchro-hub with 5th speed selector gear and synchro-ring

- ☐ Pulling off together with gearbox housing ⇒ [page 128](#)
- ☐ Pulling off individually ⇒ [page 122](#)
- ☐ Dismantling and assembling ⇒ [page 158](#)

13 - Needle bearing

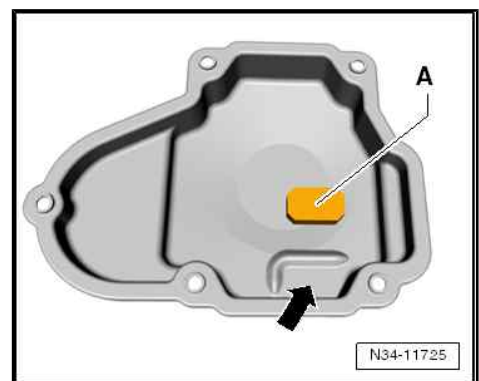
14 - 5th gear wheel

- ☐ Pulling off together with gearbox housing ⇒ [page 128](#)
- ☐ Pulling off individually ⇒ [page 122](#)
- ☐ Installation position ⇒ [page 139](#)

Gearbox housing cover with magnet -A-

The magnet can only be fitted in a cover with a recess -arrow-.

When the cover is installed, the magnet is held in position by the securing bolt for the pivot pin for the 5th gear selector fork.



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6.4 Exploded view - gearbox housing and selector mechanism

1 - Countersunk bolt

- 25 Nm

2 - Flange shaft with spring

- Removing and installing
⇒ [page 187](#)
- Assembling
⇒ [page 192](#)

3 - Torx socket head bolt

- 25 Nm
- For reverse shaft support
- Self-locking
- Always renew

4 - Torx socket head bolt

- 30 Nm
- For reverse shaft support
- Self-locking
- Always renew

5 - O-ring

- Always renew

6 - Pivot pin

7 - Bolt

- 25 Nm

8 - Bolt

- 25 Nm

9 - Sealing cap

10 - Gearbox housing

- Pulling off together with 5th gear ⇒ [page 128](#)
- Servicing ⇒ [page 142](#)

11 - Bolt

- 5 Nm

12 - Gearbox neutral position sender - G701-

- For vehicles with start/stop system

13 - Clutch housing

- Servicing ⇒ [page 142](#)

14 - Hexagon bolt

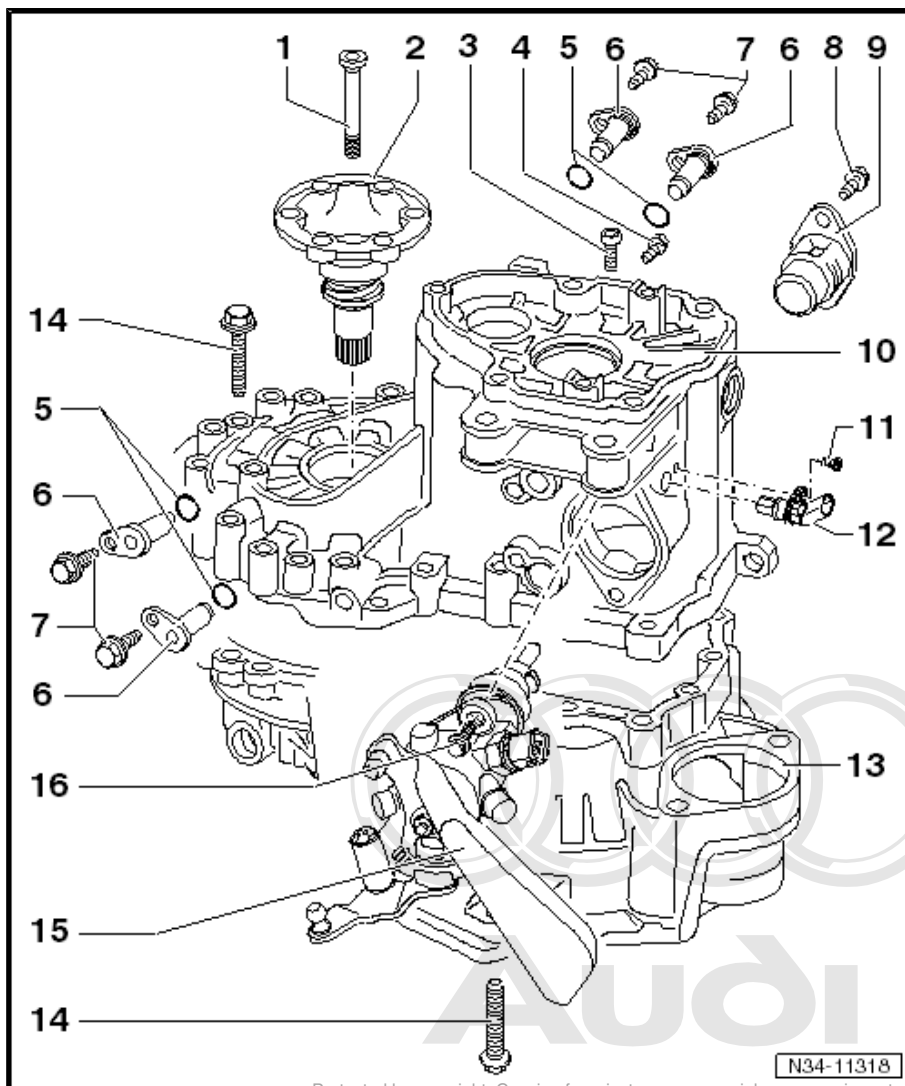
- 25 Nm and 90°

15 - Selector mechanism

- Servicing ⇒ [page 113](#)

16 - Bolt

- 25 Nm



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6.5 Exploded view - selector unit

1 - Selector unit

- ☐ Consists of selector shaft and selector mechanism cover
- ☐ Components cannot be separated from each other
- ☐ Removing and installing
⇒ [page 119](#)

2 - Reversing light switch - F4-

- ☐ 20 Nm
- ☐ Lightly coat lug with MoS₂ grease

3 - Angled rod

- ☐ For adjusting selector mechanism
- ☐ Removing ⇒ [page 121](#)
- ☐ Pressing in
⇒ [page 122](#)

4 - Gate relay lever

- ☐ Installation position
⇒ [page 65](#)

5 - Clip

6 - Oil seal

- ☐ Lever out with screwdriver
- ☐ Installing ⇒ [page 122](#)

7 - Nut

- ☐ Removing and installing
⇒ [Item 6 \(page 63\)](#)

8 - Gearbox selector lever

- ☐ Install so that gap in splines aligns with selector shaft ⇒ [page 120](#)
- ☐ Installation position ⇒ [page 65](#)

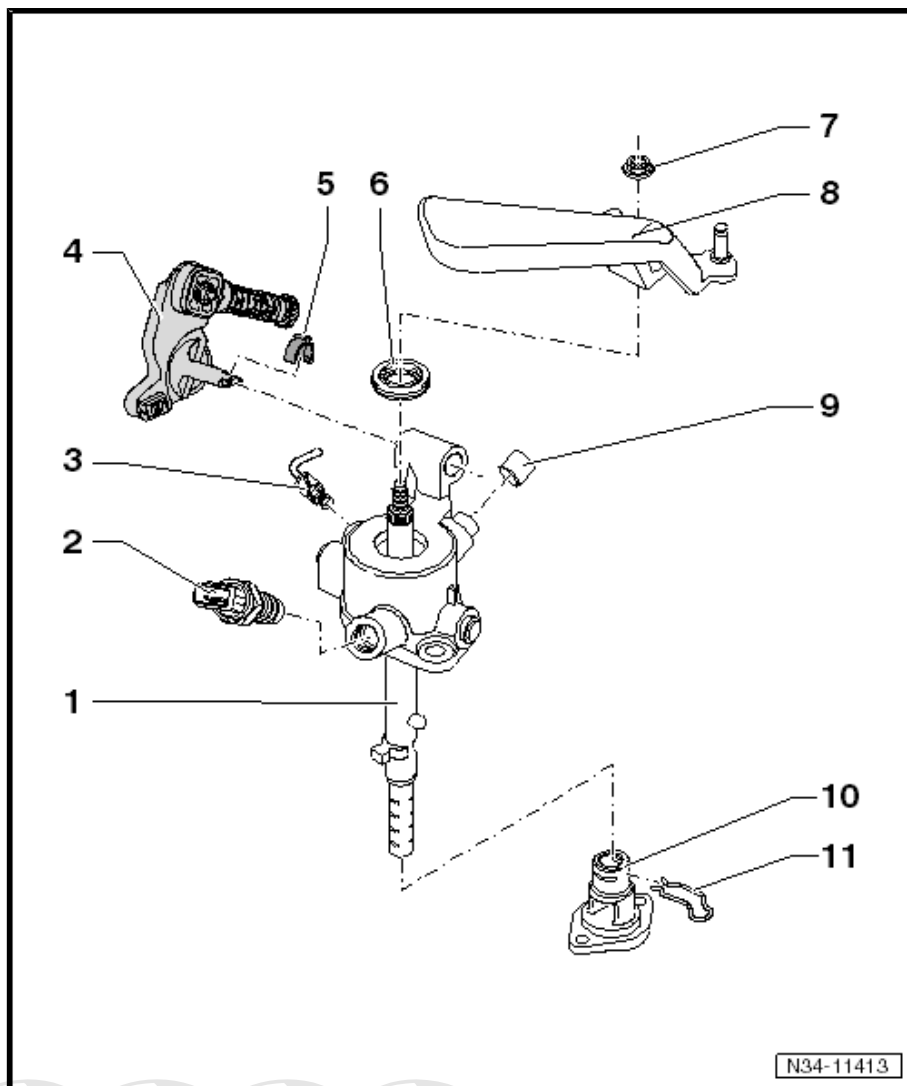
9 - Cap

- ☐ For gearbox breather

10 - Sealing cap

11 - Spring

- ☐ Not fitted on all gearboxes
- ☐ If fitted, install in cover plate



N34-11413

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

1 - Differential

- ☐ Dismantling and assembling ⇒ [page 192](#)

2 - O-ring

- ☐ 4x
- ☐ Always renew

3 - Output shaft

- ☐ Dismantling and assembling ⇒ [page 168](#)

4 - Reverse shaft support

- ☐ Dismantling and assembling ⇒ [page 184](#)

5 - Reverse shaft

- ☐ Dismantling and assembling ⇒ [page 184](#)

6 - Input shaft

- ☐ Dismantling and assembling ⇒ [page 153](#)

7 - Reverse gear selector fork

- ☐ Dismantling and assembling ⇒ [page 115](#)
- ☐ Installation position ⇒ [page 136](#)

8 - Torx socket head bolt

- ☐ 25 Nm

9 - Selector mechanism

- ☐ (Selector forks)
- ☐ Dismantling and assembling ⇒ [page 115](#)

10 - Clutch housing

- ☐ Servicing ⇒ [page 142](#)

11 - Nut

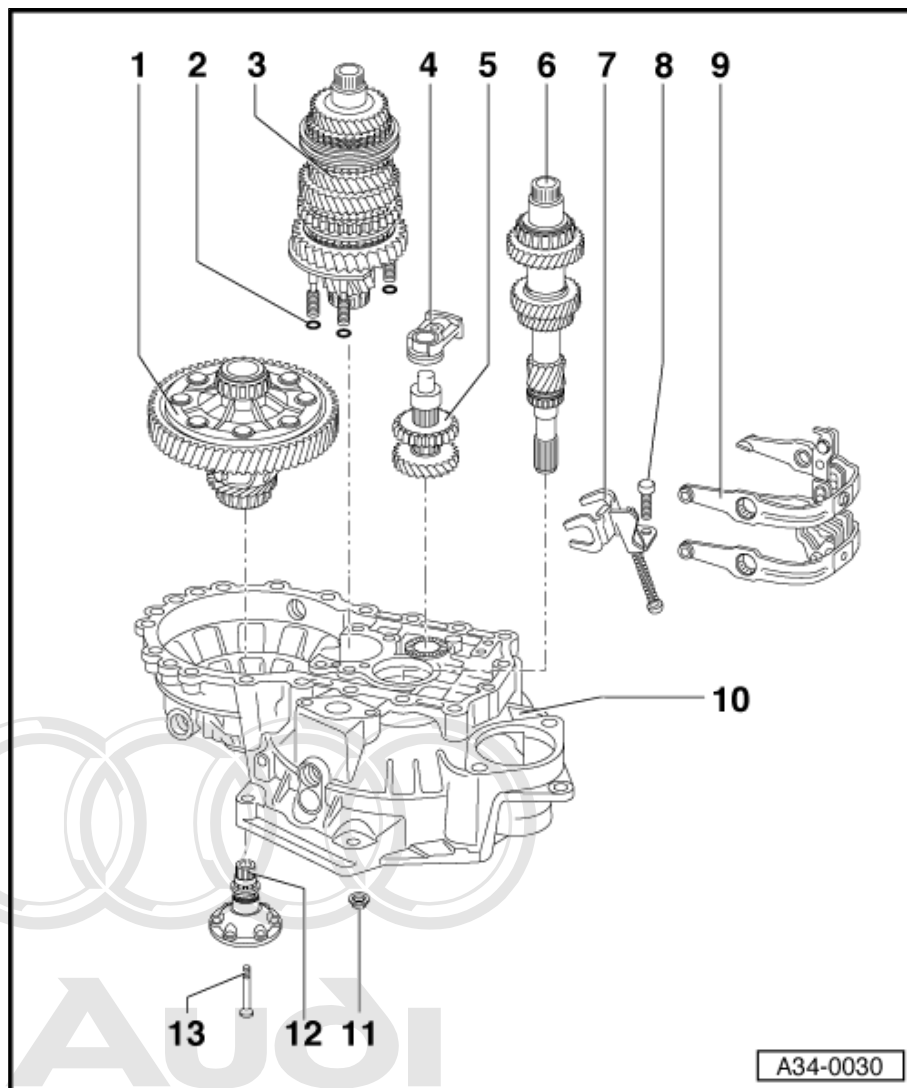
- ☐ 25 Nm and 90°
- ☐ 4 nuts for bearing mounting
- ☐ Always renew

12 - Flange shaft with spring

- ☐ Removing and installing ⇒ [page 187](#)
- ☐ Assembling ⇒ [page 192](#)

13 - Countersunk bolt

- ☐ 25 Nm



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6.7 Exploded view - selector forks



The selector fork cluster (⇒ [Item 7 \(page 115\)](#)) does not have to be dismantled in order to remove and install the detent segments, clamping washers and angular contact ball bearings.

1 - 5th gear detent segment

- ☐ Identification ⇒ [page 117](#)
- ☐ Detent segment should turn freely after clamping washer is installed

2 - Clamping washer

- ☐ Always renew
- ☐ Removing ⇒ [page 118](#)
- ☐ Installing ⇒ [page 118](#)

3 - 5th gear selector fork

- ☐ Adjusting

4 - Bolt

- ☐ 25 Nm

5 - 5th gear selector jaw

6 - Angular contact ball bearing

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- ☐ Removing ⇒ [page 118](#)
- ☐ Pressing inner race into outer race ⇒ [page 118](#)
- ☐ Installing ⇒ [page 119](#)

7 - Selector fork cluster with selector plates

8 - 1st/2nd gear detent segment

- ☐ Identification ⇒ [page 117](#)
- ☐ The segment must rotate freely after installing the lock washer

9 - 3rd/4th gear detent segment

- ☐ Identification ⇒ [page 117](#)
- ☐ The segment must rotate freely after installing the lock washer

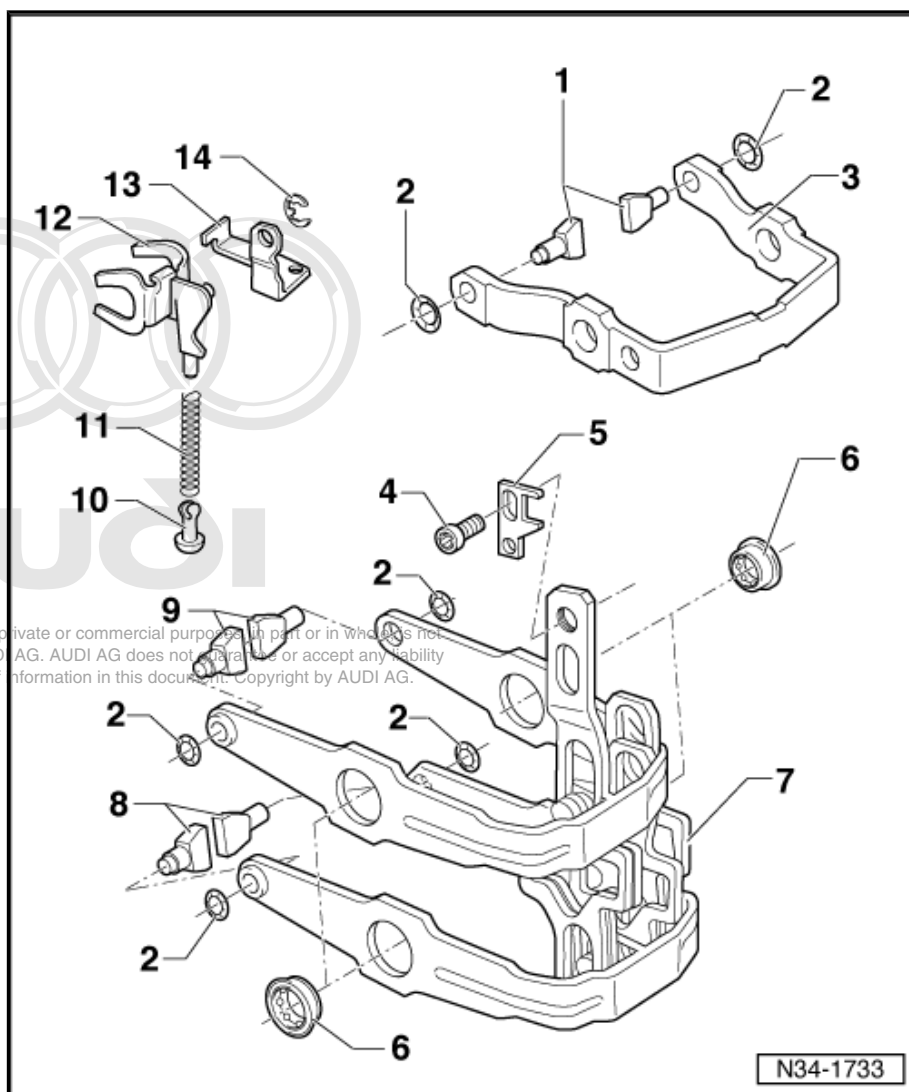
10 - Sliding piece

11 - Spring

12 - Reverse gear selector fork

13 - Support for reverse gear selector fork

14 - Circlip



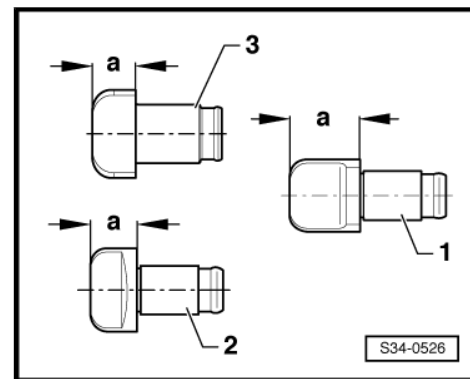
6.8 Servicing selector forks

Special tools and workshop equipment required

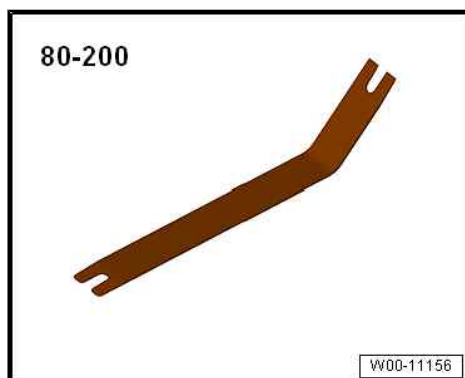


- ◆ Thrust plate - VW 402-
- ◆ Thrust piece - 3290/1-
- ◆ Assembly tool - 3301-
- ◆ Thrust piece - VW 431-
- ◆ Spacer sleeve - VW 472/2-
- ◆ Drift - 10 - 206-

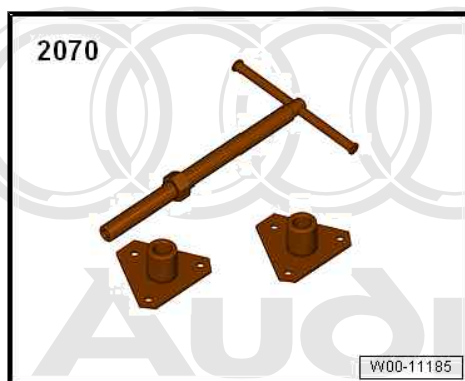
- ◆ Assembly mandrel - 10 - 508-



- ◆ Removal lever - 80 - 200-



- ◆ Tensioning device - 2070-



Identification of detent segments

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Dimension -a-

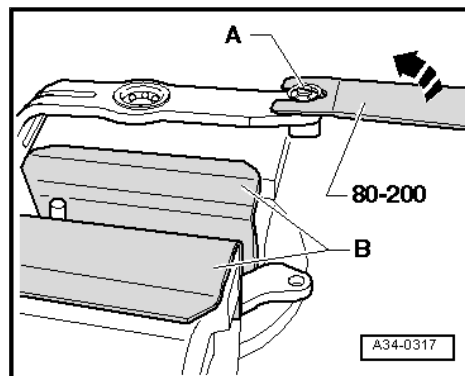
1 - Detent segments, 1st/
2nd gear = 11.4 mm

2 - Detent segments,
3rd/4th gear = 7.7 mm

3 - Detent segment, 5th
gear = 6.0 mm or 12.1
mm

Removing lock washer

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



Installing lock washer

- Push lock washer into groove in detent segment using socket driver.

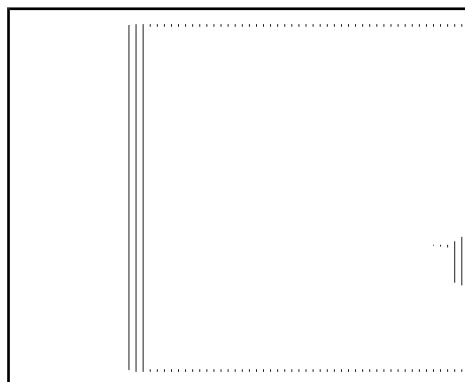


Note

Detent segment should turn freely after lock washer is installed.

A - Socket driver, 10 mm

B - Protective jaw covers



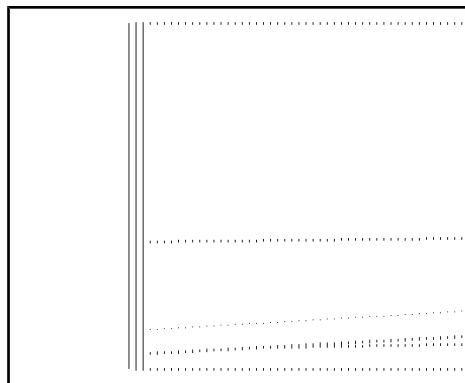
Removing angular contact ball bearing



Note

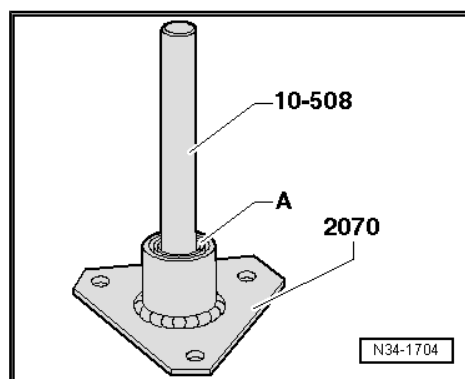
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Do not bend selector forks when removing and installing the ball bearing.



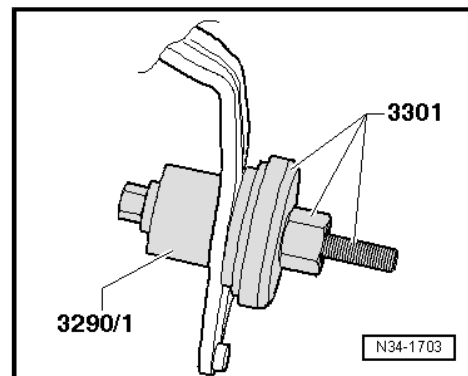
Pressing inner race -A- of angular contact ball bearing into outer race

Inner race must engage positively in outer race.



Pulling angular contact ball bearing into selector fork (insert onto stop)

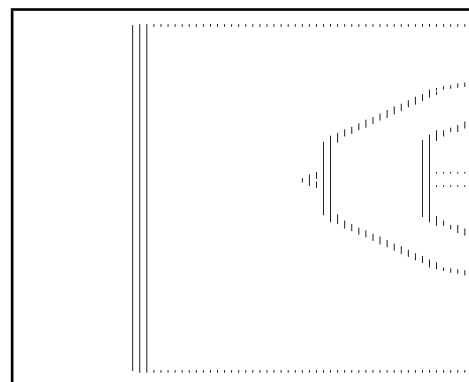
Recess in thrust piece - 3290/1- points towards ball bearing.



Selector forks with detent segments installed

	Dimension -a- (mm)
1st/2nd gear selector fork	87.2 ... 87.4
3rd/4th gear selector fork	93.6 ... 93.8

For identification of detent segments ⇒ [page 117](#)



6.9 Removing and installing selector unit

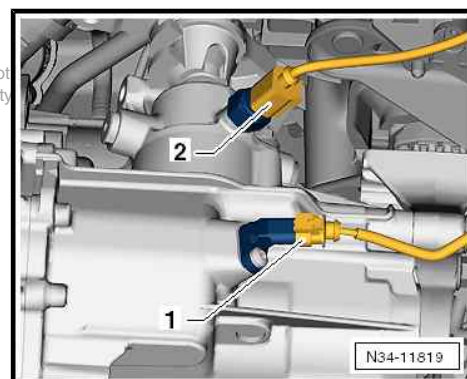
Removing

Vehicles from model year 2015 onwards:

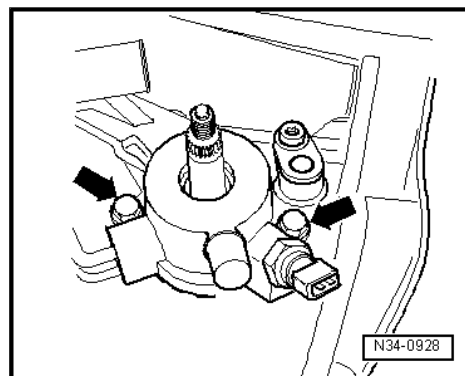
- Remove mounting for jump start terminal and air cleaner housing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Removing and installing electronics box .

Continued for all vehicles:

- Remove gate relay lever ⇒ [page 66](#) .
- Remove gearbox selector lever ⇒ [Item 8 \(page 113\)](#) .
- Unplug electrical connectors (illustration shows a different gearbox).
- **If fitted, unplug connector 1 from gearbox neutral position sender - G701- .**
- Unplug connector -2- from reversing light switch - F4- .
- Remove gearbox neutral position sender - G701- -1- .



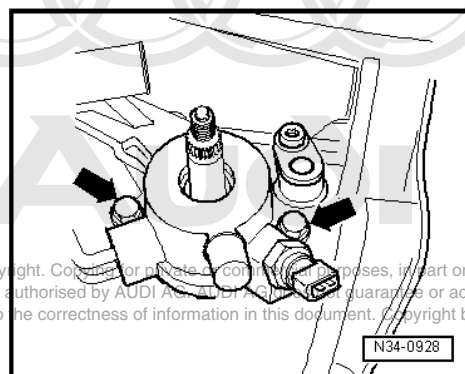
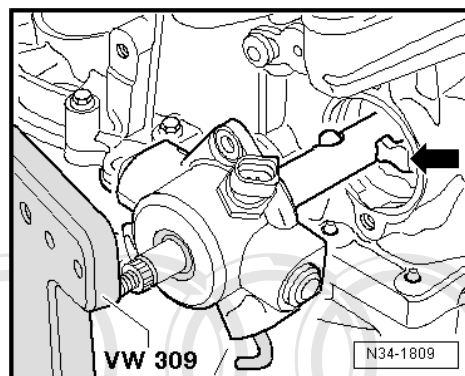
- Put selector shaft in neutral position. Then remove bolts -arrows- and pull selector unit out of gearbox housing.



Installing

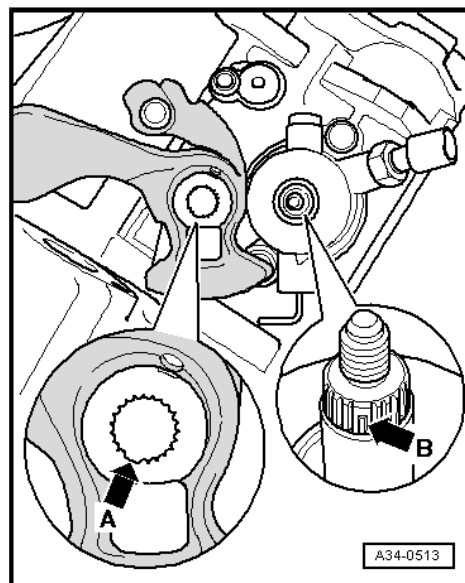
Install selector unit as follows:

- 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.
- Secure selector mechanism cover -arrows- (tightening torque: 25 Nm).



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- Install gearbox selector lever.
- 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.
- Install gate relay lever ⇒ [page 66](#) .
- Install mounting for jump start terminal and air cleaner housing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Removing and installing electronics box .



6.10 Servicing selector unit

Special tools and workshop equipment required

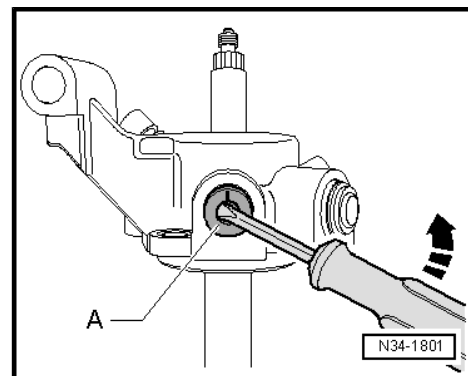
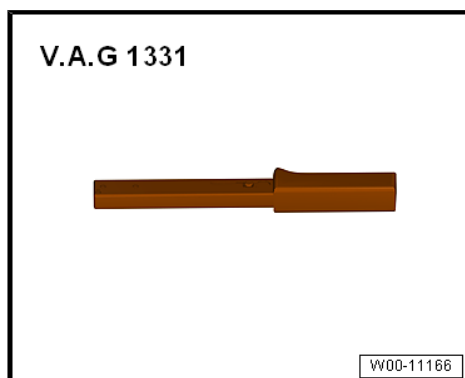
- ◆ Tube - VW 423-



- ◆ Tube - T10203-



- ◆ Torque wrench - V.A.G 1331-



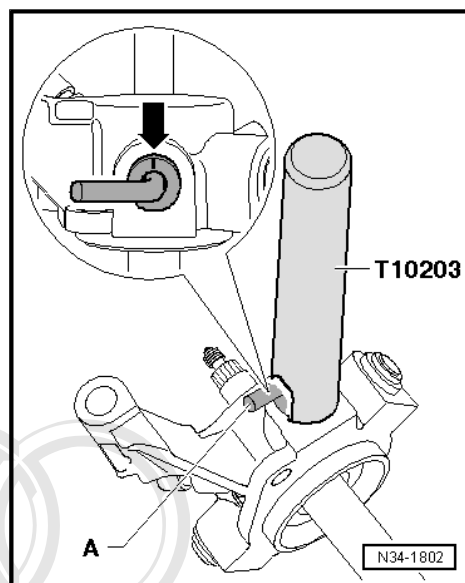
Removing angled rod -A- from selector mechanism cover

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

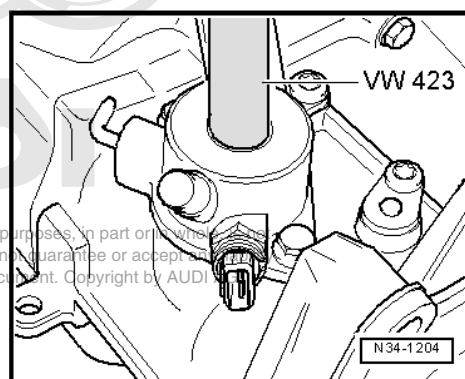
Pressing angled rod -A- into selector mechanism cover

Installation position:

Marking -arrow- points to upper section of selector shaft.



Installing oil seal (insert onto stop)



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6.11 Removing and installing 5th gear



Note

- ◆ If only the 5th gear has to be removed, please refer to the work sequence described below.
- ◆ If the gearbox housing has to be removed, please refer to the procedure: *Dismantling and assembling complete gearbox* ⇒ [page 128](#).

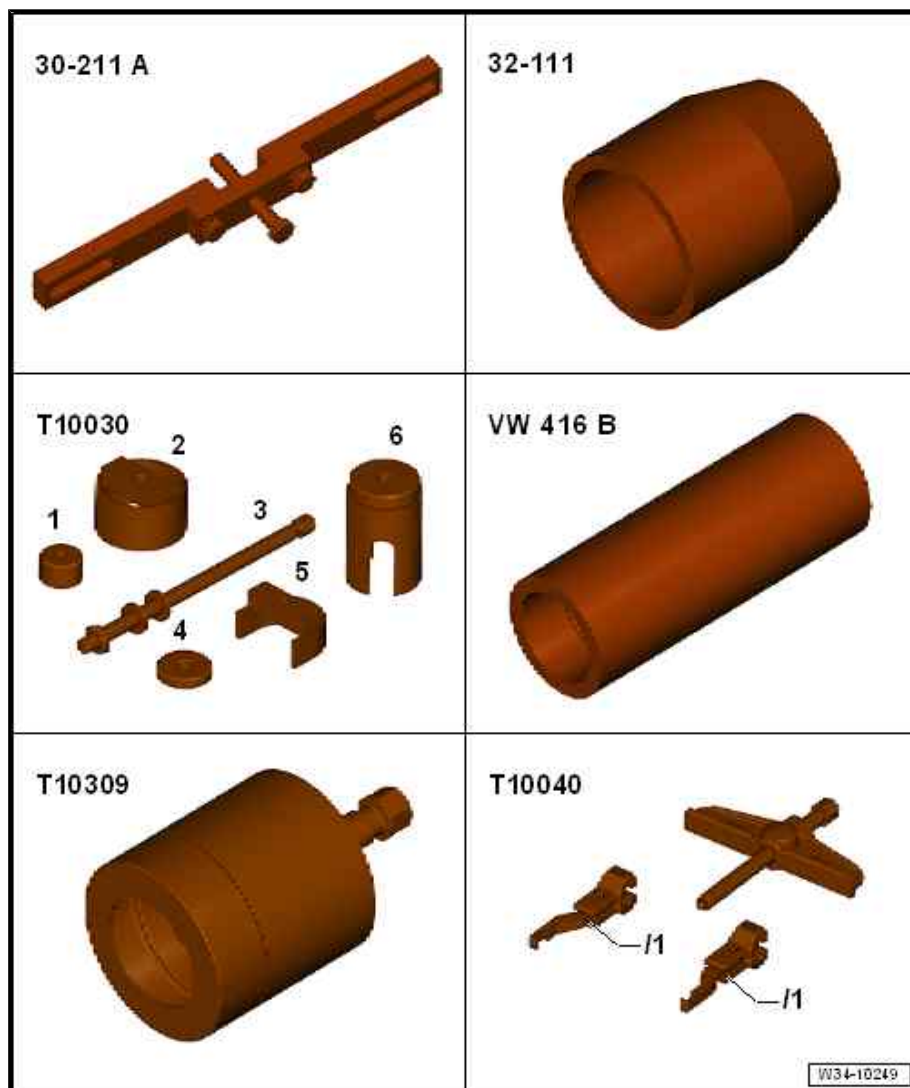
Special tools and workshop equipment required



- ◆ Retaining plate - VW 309-
- ◆ Gearbox support - VW 353-
- ◆ Punch - VW 295-
- ◆ Drift sleeve - VW 244 B-
- ◆ Hot air blower - V.A.G 1416-
- ◆ Torque wrench - V.A.G 1331-



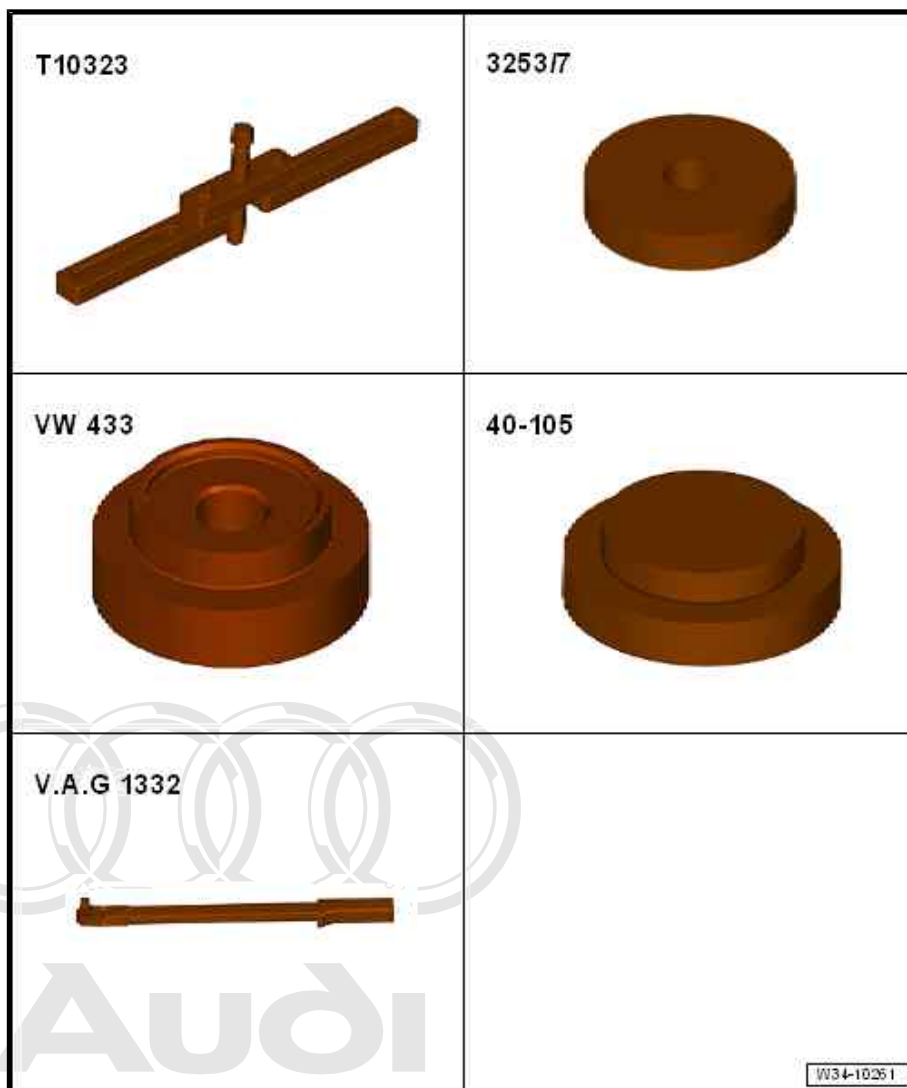
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- ◆ Support bridge - 30-211A-
- ◆ Thrust piece - 32 - 111-
- ◆ Thrust piece - T10030/4-
- ◆ Thrust piece of assembly tool - T10030/4-
- ◆ Tube - VW 416 B-
- ◆ Puller - T10309-
- ◆ Two-arm puller - T10040-
- ◆ With claws - T10040/2A-



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- ◆ Support bridge - T10323
- ◆ Assembly tool - 3253/7-
- ◆ Thrust piece - VW 433-
- ◆ Thrust plate - 40 - 105-
- ◆ Torque wrench - V.A.G 1332-
- ◆ Stud M8 x 100 mm

Removing

- Remove clutch release lever and release bearing ⇒ [page 21](#) .

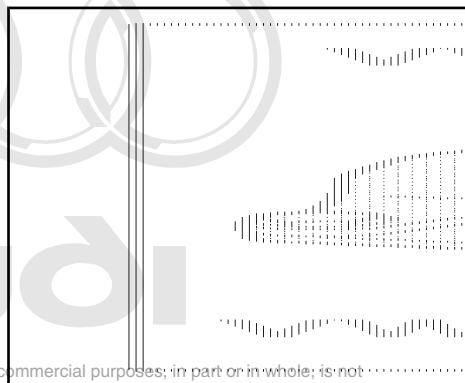
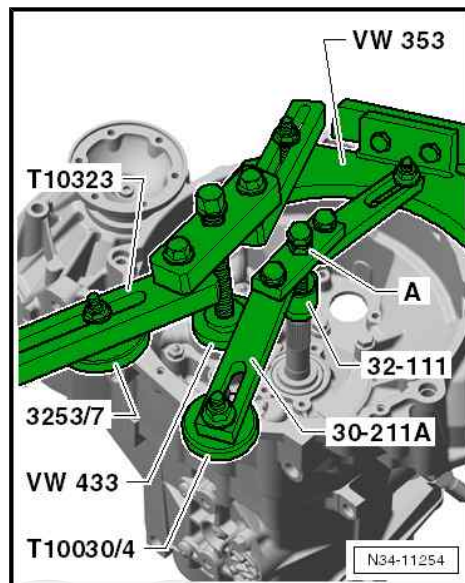
- The bearings of the input shaft and output shaft must not be damaged when removing and installing 5th gear.
- For this reason, when attaching the gearbox to gearbox support - VW 353- , you must first attach the following tools to provide the necessary support:

Below input shaft:

- ◆ Support bridge - 30-211A-
- ◆ Thrust piece - 32 - 111-
- ◆ Thrust piece - T10030/4-
- The input shaft should not be supported by the thrust piece - 32 - 111- until it becomes necessary later on.

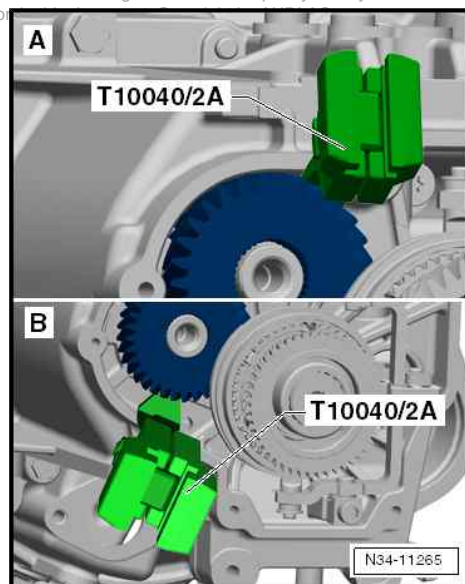
Below bearing mounting for output shaft:

- ◆ Support bridge - T10323-
- ◆ Assembly tool - 3253/7-
- ◆ Thrust piece - VW 433-
- Secure gearbox on gearbox support - VW 353- .
- Unbolt gearbox housing cover -arrow-.



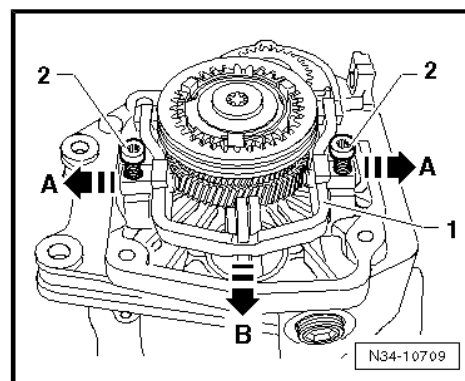
- Check whether claws - T10040/2A- can be applied correctly below 5th gear wheel.

If claws - T10040/2A- cannot be applied correctly:	
-A- Claws - T10040/2A- foul against: ◆ side of gearbox housing ◆ ribs in gearbox housing below gear wheel	In this case the 5th gear synchro-hub, 5th gear wheel and gearbox housing have to be removed together ⇒ page 128 .
-B- Claws - T10040/2A- foul against ribs in gearbox housing below gear wheel.	
If claws - T10040/2A- can be applied correctly:	
5th gear can be removed separately ⇒ page 127	



Removing 5th gear separately

- Remove 5th gear selector fork as follows:
- Cover over openings with a cloth.
- Move selector fork -1- to neutral.
- Then remove both bolts -2- for pivot pins.
- Pull out pivot pins in direction of -arrows A-.
- Take out selector fork in direction of -arrow B-.

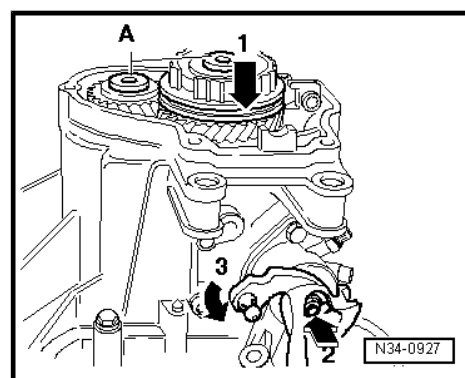


- Remove bolts -A- for synchro-hub and 5th gear wheel, to do this select 5th gear -arrow 1- and 1st gear -arrows 2- and -3-.
- After engaging both gears the input shaft and output shaft are locked; the synchro-hub and gear wheel cannot turn. The two bolts can now be loosened.



Note

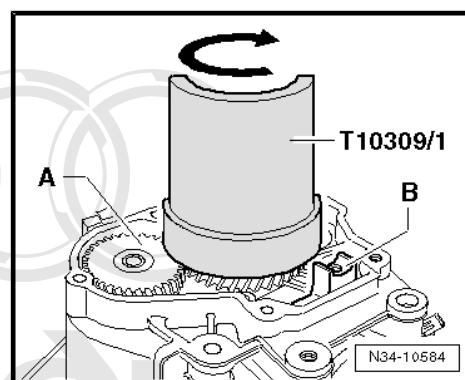
If the shafts are not being renewed, carefully clean residual locking compound out of tapped holes using a thread tap.



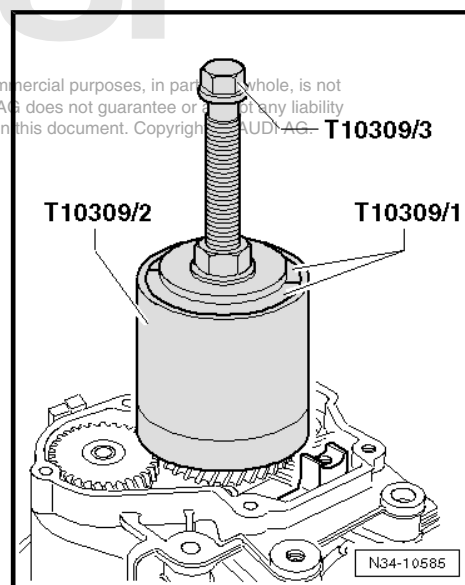
Pulling off synchro-hub for 5th gear together with locking collar and locking pieces

Use puller - T10309- .

- First insert shell half - T10309/1- between 5th gear wheel -A- and mounting for 5th gear selector fork -B-.
- Shell half - T10309/1- must be positioned underneath synchro-ring.
- If necessary, press shell half into end position.
- Then turn shell half - T10309/1- to opposite side in direction of -arrow-.



- Introduce thread insert - T10309/3- into shell half .
- Now fit second shell half - T10309/1- and slide tube - T10309/2- onto tool.
- Please check synchro-hub for damage after removal.
- Renew synchro-ring for 5th gear.
- Remove 5th speed selector gear with needle bearing.



- Pull off 5th gear wheel.
- First fit claws -A-.
- B - Hexagon bolt (M10 x 20), 17 mm



Note

Ensure that the claws do not bend outwards when pulling off the gear wheel. Check 5th gear wheel for damage after removal.

Installing

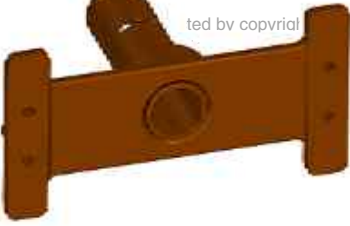
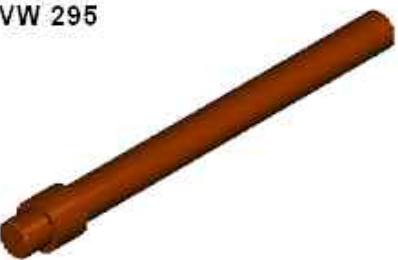
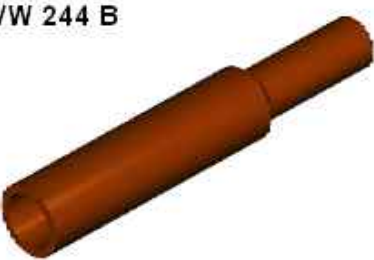
Installing 5th gear ⇒ [page 138](#) .

- Install gearbox housing cover ⇒ [page 110](#) .
- Install clutch release lever and release bearing ⇒ [page 21](#) .
- Fill up gear oil ⇒ [page 104](#) .

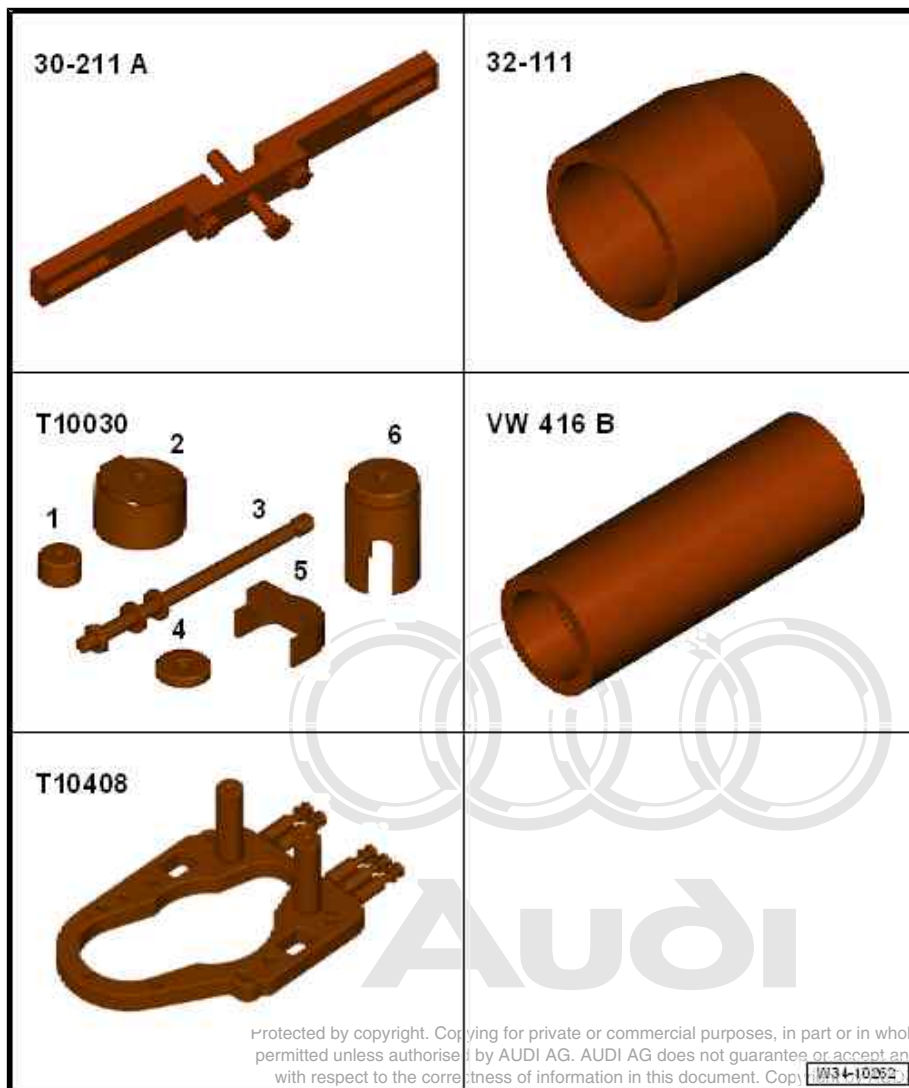
6.12 Dismantling and assembling gearbox

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

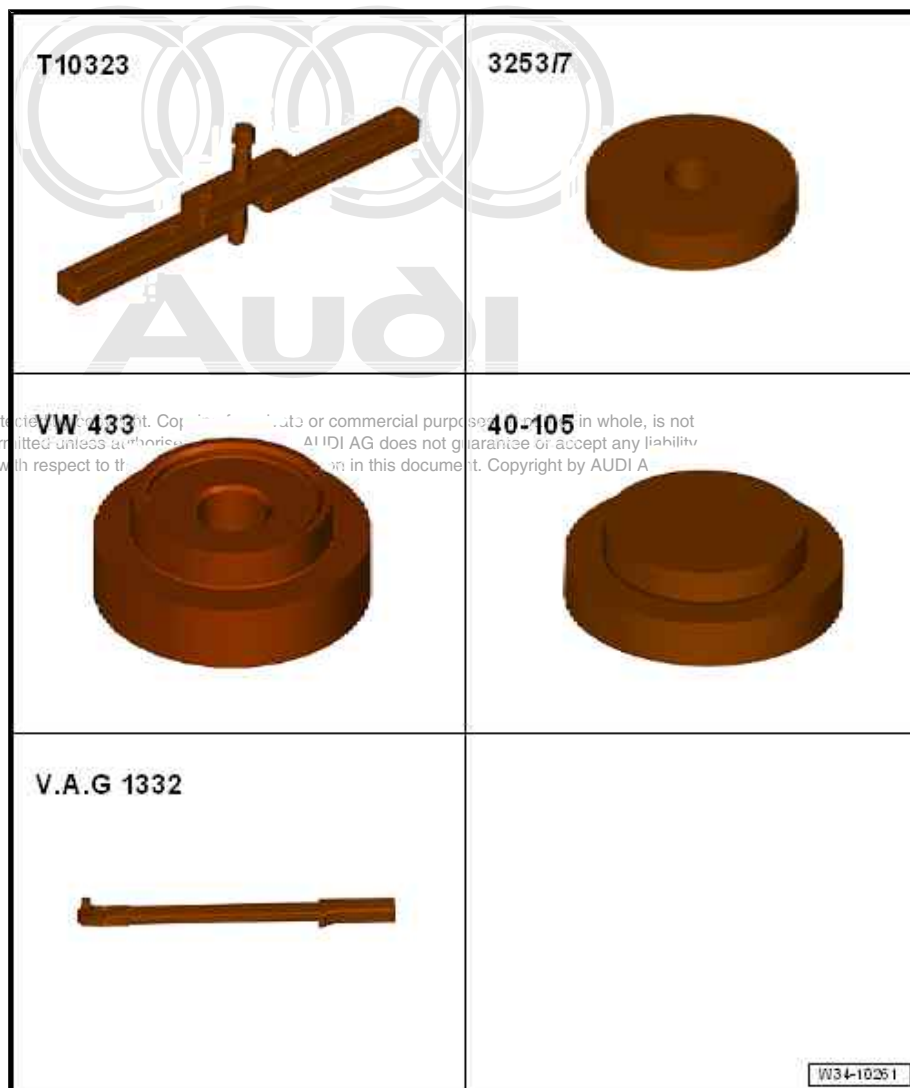
Special tools and workshop equipment required

VW 309 A 	VW 353 
VW 295 	VW 244 B 
V.A.G 1416 	V.A.G 1331 

- ◆ Retaining plate - VW 309-
- ◆ Gearbox support - VW 353-
- ◆ Pin - VW 295-
- ◆ Drift sleeve - VW 244 B-
- ◆ Hot air blower - V.A.G 1416-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Stud M8 x 100 mm



- ◆ Support bridge - 30-211A-
- ◆ Thrust piece - 32 - 111-
- ◆ Thrust piece of assembly tool - T10030/4-
- ◆ Tube - VW 416 B-
- ◆ Puller plate - T10408-
- ◆ Spacers - T10408/1-
- ◆ Thrust blocks - T10408/2-
- ◆ Brackets - T10408/3-



- ◆ Support bridge - T10323-
- ◆ Assembly tool - 3253/7-
- ◆ Thrust piece - VW 433-
- ◆ Torque wrench - V.A.G 1332-
- ◆ Puller - VAS 251 417- , or e.g. puller -Kukko 18/1-



- ◆ Hexagon bolts M7 x 35 with washers

Dismantling

- Remove clutch release lever, release bearing and guide sleeve → [page 21](#) .
- The bearings of the input shaft and output shaft must not be damaged when removing and installing 5th gear.
- For this reason, when attaching the gearbox to gearbox support - VW 353- , you must first attach the following tools to provide the necessary support:

Below input shaft:

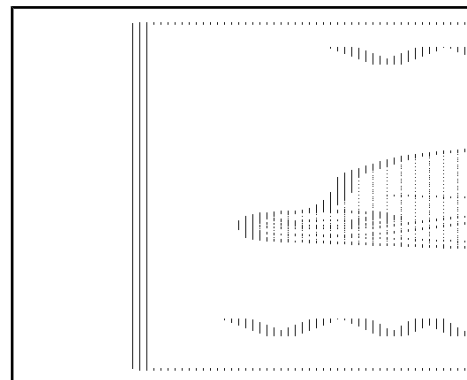
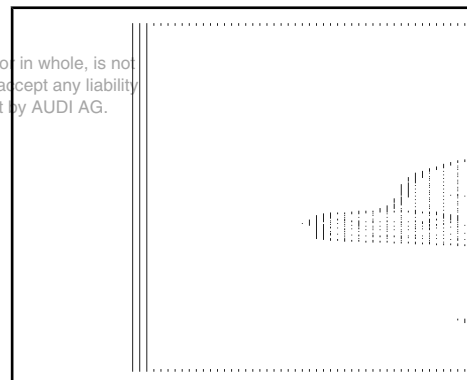
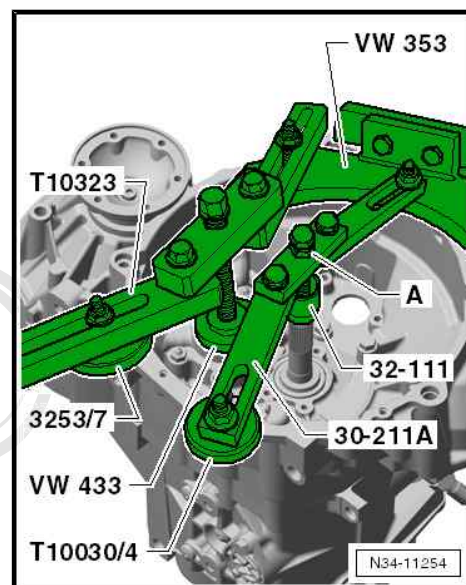
- ◆ Support bridge - 30-211A-
- ◆ Thrust piece - 32 - 111-
- ◆ Thrust piece - T10030/4-
- Secure bolt of support bridge - 30-211A- with lock nut -A-.

Below bearing mounting for output shaft:

- ◆ Support bridge - T10323-
- ◆ Assembly tool - 3253/7-
- ◆ Thrust piece - VW 433-

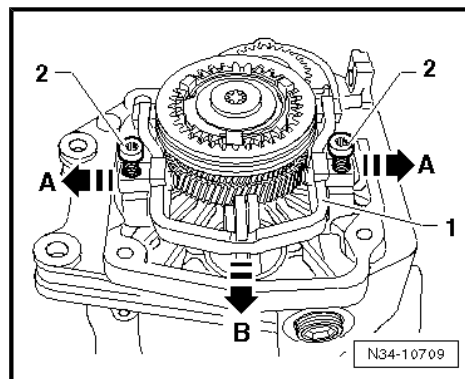
- Secure gearbox on gearbox support - VW 353- .
- Place drip tray -V.A.G 1306- underneath.
- Unscrew oil filler plug and oil drain plug.
- Drain off gear oil.

- Unbolt gearbox housing cover -arrow-.



Remove 5th gear selector fork as follows:

- Cover over openings with a cloth.
- Move selector fork -1- to neutral.
- Then remove both bolts -2- for pivot pins.
- Pull out pivot pins in direction of -arrows A-.
- Take out selector fork in direction of -arrow B-.



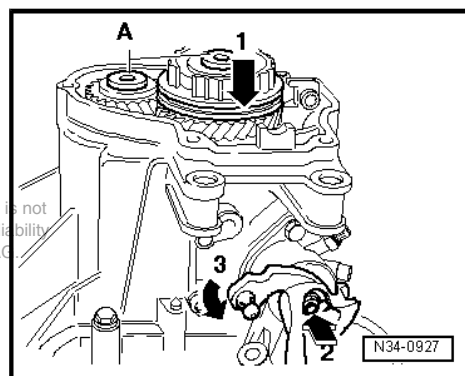
- Remove bolts -A- for synchro-hub and 5th gear wheel, to do this select 5th gear -arrow 1- and 1st gear -arrows 2- and 3-.
- After engaging both gears the input shaft and output shaft are locked; the synchro-hub and gear wheel cannot turn. The two bolts can now be loosened.



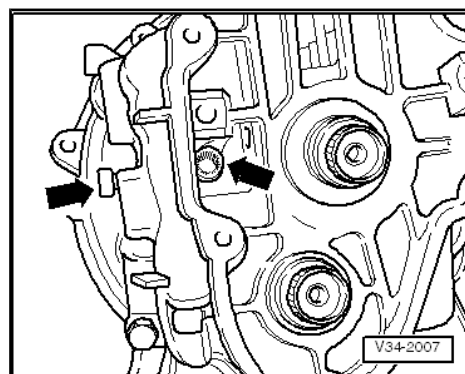
Note

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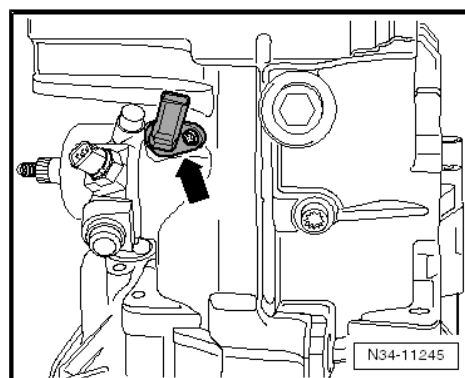
If the shafts are not being renewed, carefully clean residual locking compound out of tapped holes using a thread tap.



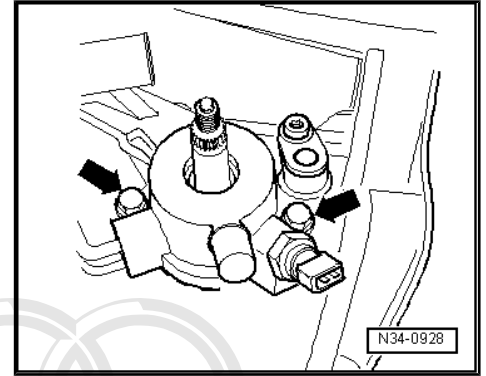
- Remove both bolts -arrows- for reverse shaft support.



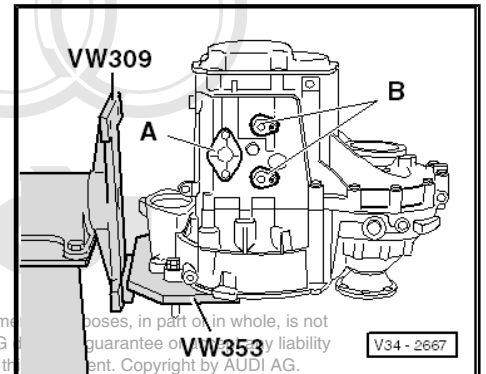
- Gearbox for vehicles with start/stop system: remove gearbox neutral position sender - G701- -arrow-.



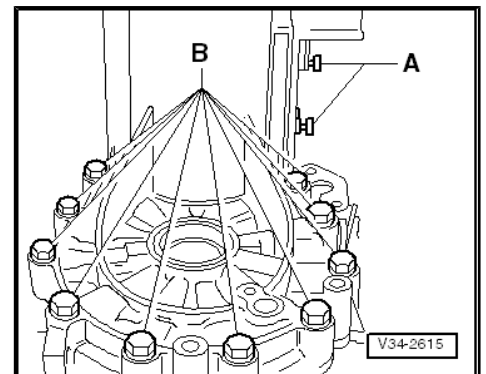
- Remove selector shaft with selector mechanism cover. To do this, set selector shaft in neutral position. Then remove bolts -arrows- and pull selector shaft out of gearbox housing.



- Remove cover plate -A- and pivot pins -B- from underside of gearbox.



- Remove pivot pins -A- on top side of gearbox and bolts -B- securing gearbox housing to clutch housing (near differential).

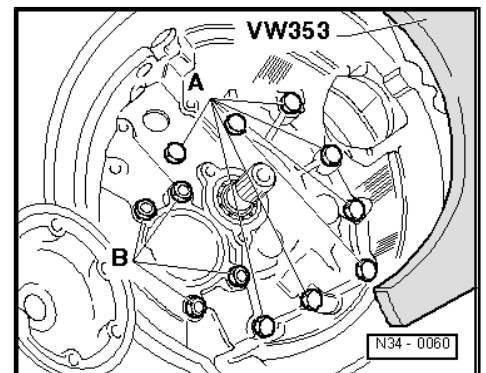


- Remove bolts -A- securing gearbox housing from inside clutch housing.

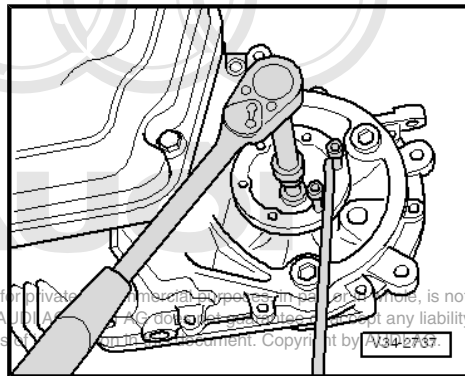


Note

Do not remove nuts -B- for output shaft bearing mounting.



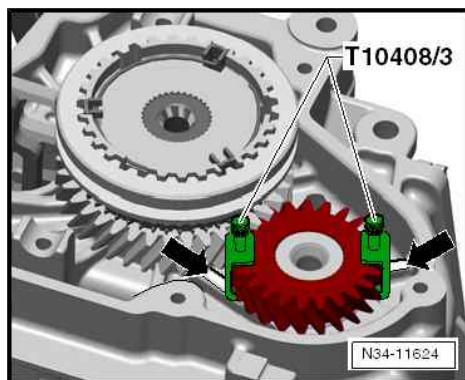
- Remove both flange shafts.
- Take out flange shafts together with springs, thrust washers and tapered rings.



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Pull off the following components, together with the gearbox housing:

- ◆ 5th gear synchro-hub
- ◆ 5th gear wheel
- You must secure the two brackets - T10408/3- to the 5th gear wheel.
- Always position the brackets above 2 opposite ribs on the housing -arrows-.

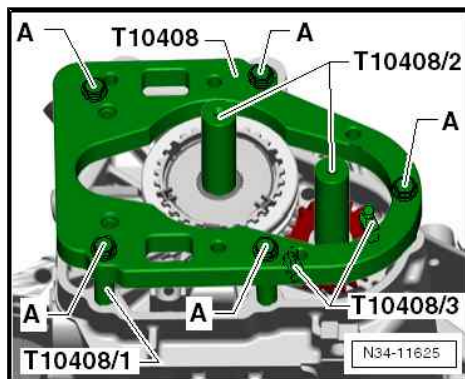


Note

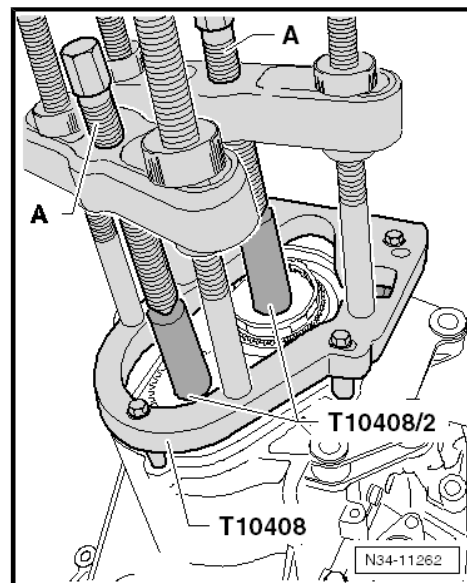
- ◆ A needle bearing is located underneath the 5th gear wheel.
- ◆ Please secure the two brackets . This will prevent the needle bearing from coming into contact with the 5th gear wheel when the gearbox housing is pulled off.

Use puller plate - T10408- together with the following special tools:

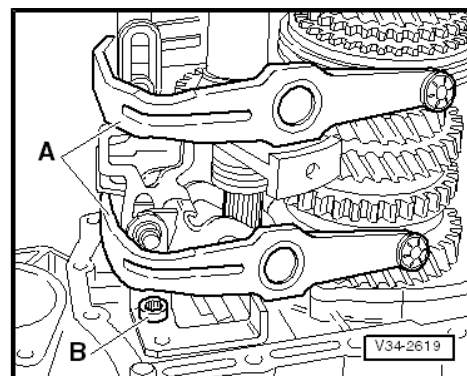
- ◆ Spacers - T10408/1-
- ◆ Thrust pieces - T10408/2-
- ◆ Brackets - T10408/3-
- ◆ Puller Kukko 18/2
- Screw the 5 spacers - T10408/1- into threaded holes for gearbox housing cover.
- Bolt puller plate - T10408- onto spacers - T10408/1- .
- A - Hexagon bolts M7 x 35 with washers
- Tightening torque: 18 Nm



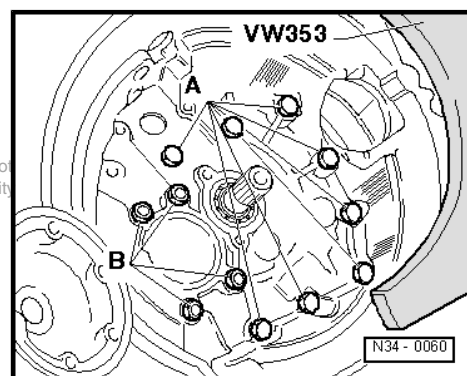
- Fit thrust blocks - T10408/2- on shafts.
- Attach puller - VAS 251 417- or e.g. puller - Kukko 18/1- -A-.
- Pull off 5th gear synchro-hub, 5th gear wheel and gearbox housing by tightening spindles -A- alternately (about 12 turn at a time).
- If necessary, heat 5th gear wheel using hot air blower - V.A.G 1416- before pulling off.



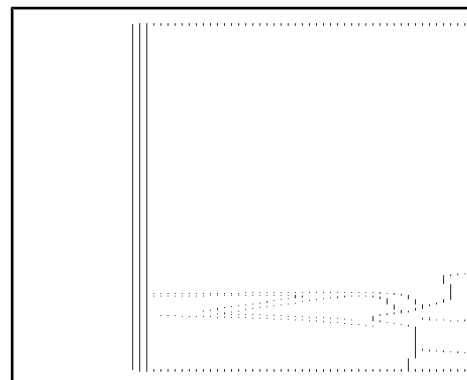
- Remove selector forks -A- together with selector plates.
- Unscrew bolt for reverse gear selector mechanism -B-.



- Remove nuts -B- for output shaft bearing mounting.



- Remove reverse gear -A-, input shaft -B- and output shaft -C- one after the other from clutch housing.
- Take out differential.



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Assembling

- Fit differential.
- Always renew O-rings -arrows- for output shaft bearing mounting.



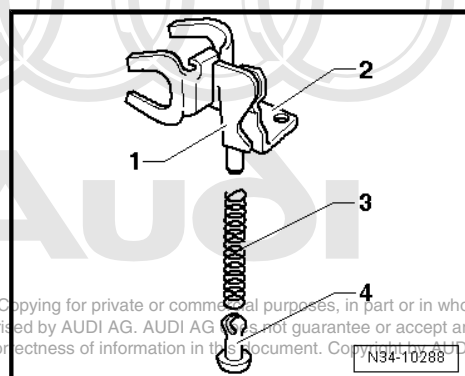
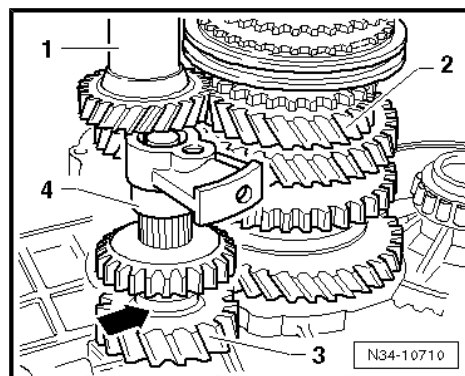
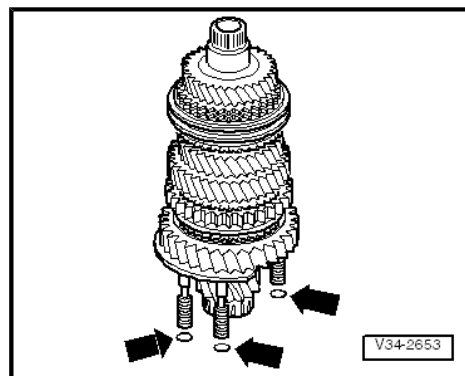
Note

The illustration only shows 3 of the 4 O-rings.

- Insert input shaft -1- and output shaft -2- together.
- Tighten nuts for output shaft bearing mounting to torque
⇒ [Item 11 \(page 114\)](#).
- Place reverse gear wheel -3- on needle bearing in clutch housing.

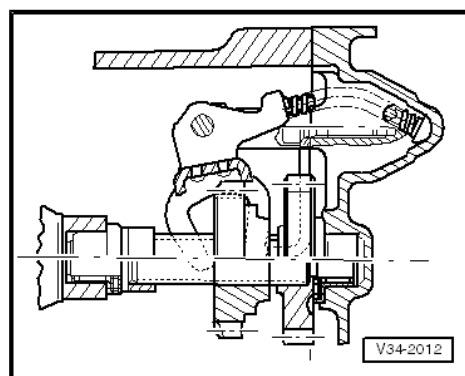
Shoulder -arrow- faces away from clutch housing.

- Check that reverse shaft -4- is complete ⇒ [page 184](#); do not fit reverse shaft support onto reverse shaft yet.
- Insert reverse shaft in clutch housing.
- Clean locking fluid residue from all tapped holes in reverse shaft support (residue can be removed using a tap).
- Install reverse shaft support.
- Fit reverse gear selector fork -1- with support for reverse gear selector fork -2-, spring -3- and slide -4-.

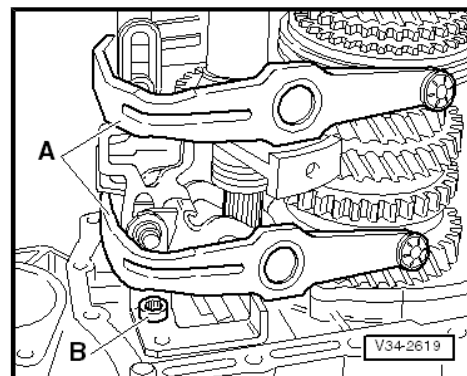


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Installation position: reverse gear



- Tighten bolt for reverse gear selector mechanism -B- to specified torque ⇒ [Item 8 \(page 114\)](#).
- Install selector forks -A- together with selector plates.



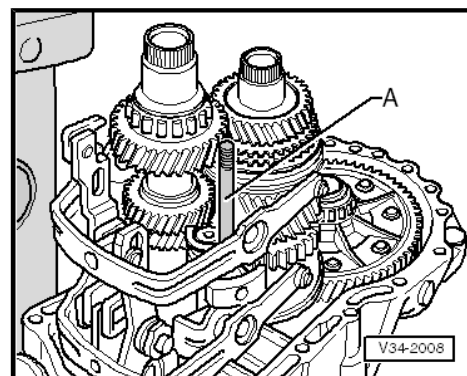
- Screw M8 x 100 mm stud -A- into reverse shaft support so that support is aligned after fitting gearbox housing.
- Align selector plates.



Note

The detent segments must be positioned in the grooves on the locking collars.

- Apply sealant -AMV 188 200 03- evenly to sealing surface of clutch housing.
- Fit and secure gearbox housing. Tightening torque ⇒ [Item 14 \(page 112\)](#)

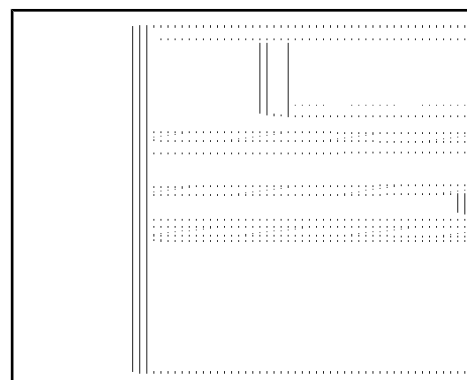


Install bolts for reverse shaft support -arrow- as follows:

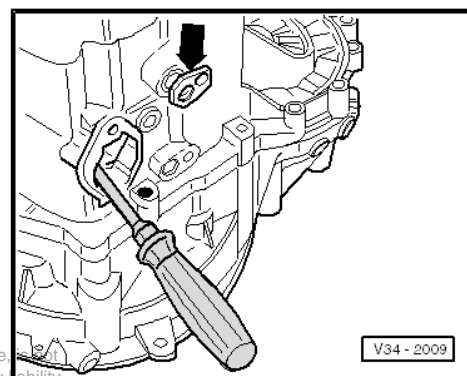
- Fit bolt -a-.
- Remove stud -A- (⇒ top illustration).
- Fit bolt -b- hand-tight.

Tightening sequence:

- 1 - Bolt -a- 30 Nm
- 2 - Bolt -b- 25 Nm



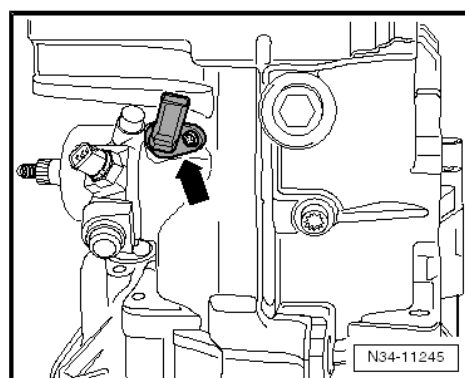
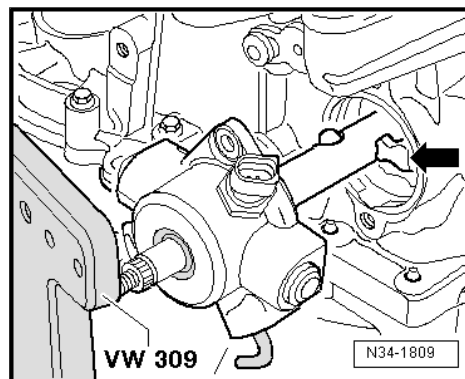
- Install pivot pins -arrow- for selector forks. To do this align selector mechanism using a screwdriver so that the relevant pivot pin can be inserted.
- Apply sealant -AMV 188 200 03- evenly to sealing surface of cover plate.
- Fit cover plate for selector shaft.



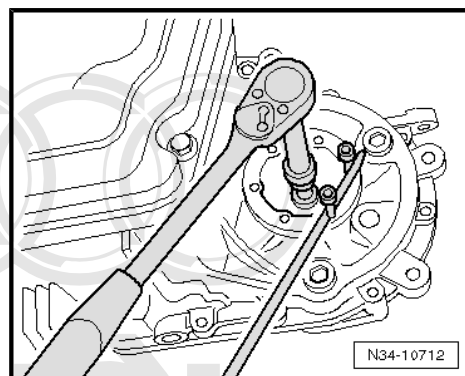
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Install selector unit as follows:

- 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.
- Tighten selector mechanism cover to specified torque
⇒ [Item 16 \(page 112\)](#) .
- Gearbox for vehicles with start/stop system: fit gearbox neutral position sender - G701- -arrow- and tighten securing bolt to specified torque ⇒ [Item 11 \(page 112\)](#) .



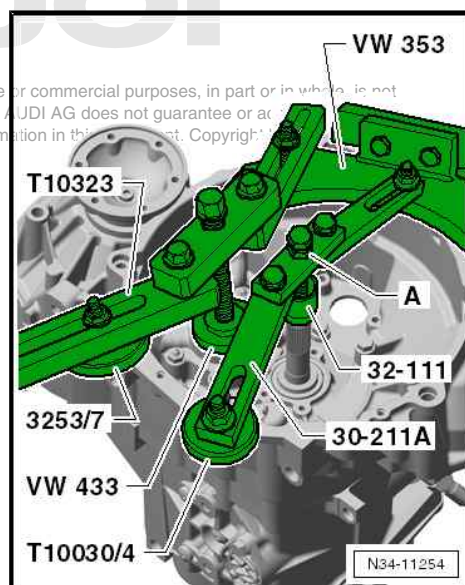
- Install both flange shafts with springs, thrust washers and tapered rings ⇒ [Item 1 \(page 112\)](#) .
- Install release bearing guide sleeve, clutch release lever and release bearing ⇒ [page 21](#) .



Installing 5th gear

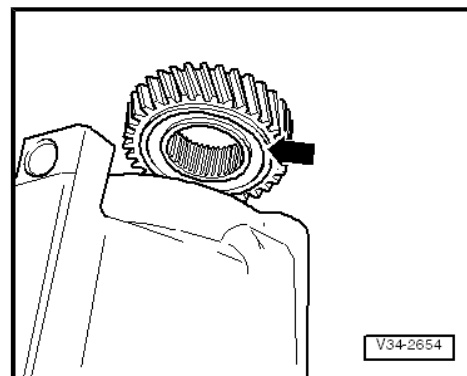
- Please ensure that the support bridge - 30-211A- and support bridge - T10323- are fitted.

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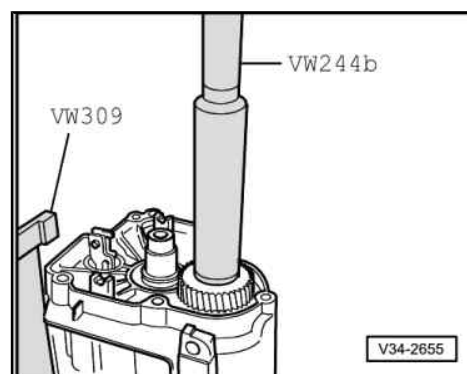


Installation position of 5th gear wheel

The groove running round the gear wheel -arrow- faces to the gearbox housing.



- Drive on 5th gear wheel.

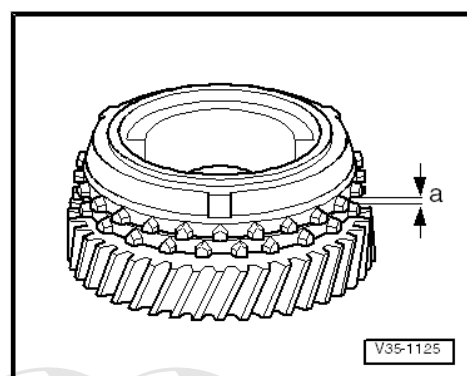


Checking 5th gear synchro-ring

- Before re-installing selector gear and synchro-ring for 5th gear, press the synchro-ring onto the cone of the selector gear and measure gap -a- with a feeler gauge.

Gap -a-	Installation depth	Wear limit
5th gear	1.1 ... 1.7 mm	0.5 mm

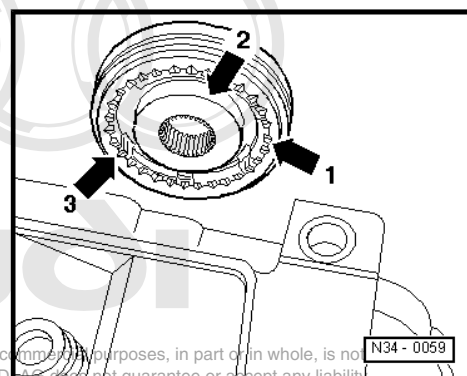
- Install 5th speed selector gear with needle bearing.
- Fit 5th gear synchro-ring on selector gear.
- If previously dismantled, assemble 5th gear synchro-hub/locking collar before installing [⇒ page 158](#).



Installation position of 5th gear synchro-hub/locking collar

The pointed teeth of the locking collar -arrow 1- and the high shoulder of the synchro-hub -arrow 2- face the gearbox housing.

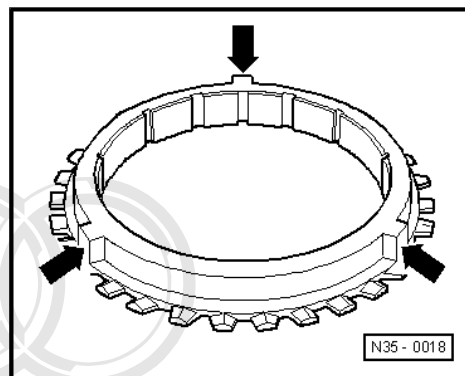
The retainers in the synchro-hub -arrow 3- align with the cast locking pieces on the synchro-ring (-arrows- in the illustration below).



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5th gear synchro-ring with cast locking pieces -arrows-

- Cover all openings with a cloth to prevent dirt etc. from entering the gearbox.



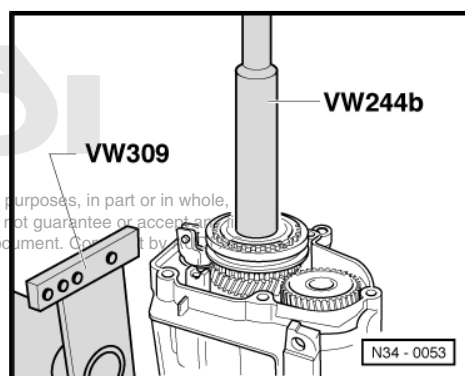
- Knock on 5th gear synchro-hub.



Note

When driving on, ensure clearance for synchro-ring.

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- Loosen support for input shaft.



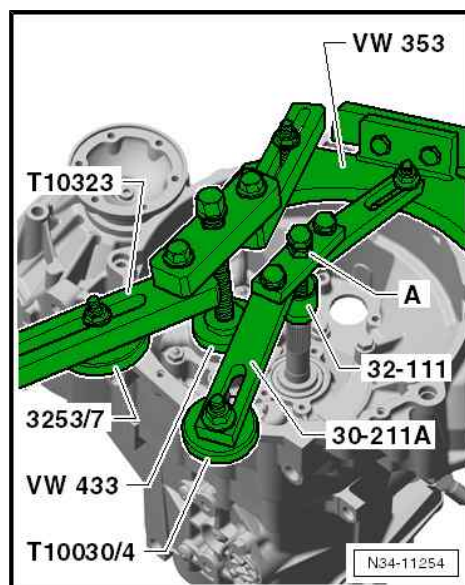
WARNING

Wear protective gloves.

- Use thread tap to remove any remaining locking fluid from threaded holes for bolts securing synchro-hub and 5th gear wheel.

Otherwise there is a risk that the bolts will shear off.

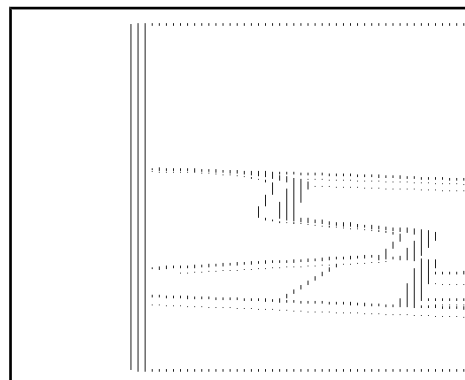
- Screw in securing bolts for synchro-hub and 5th gear wheel.



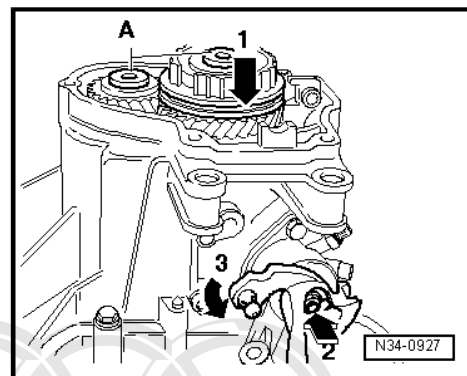
Installation position of dished springs for securing bolts for 5th gear wheel and synchro-hub

Concave side -arrows- faces 5th gear.

- Tighten securing bolts for synchro-hub and 5th gear wheel to specified torque ⇒ [page 110](#).

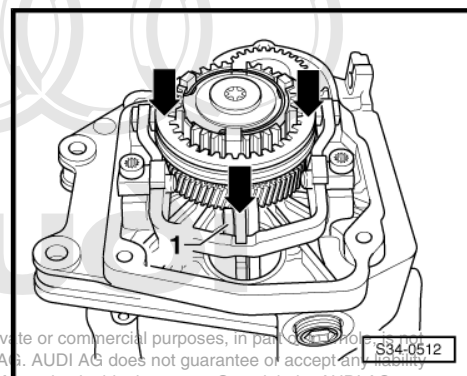


- Tighten bolts -A- for synchro-hub and 5th gear wheel to specified torque ⇒ [Item 4 \(page 110\)](#) ; to do this select 5th gear -arrow 1- and 1st gear -arrows 2- and -3-.
- After engaging both gears the input shaft and output shaft are locked; the synchro-hub and gear wheel cannot turn. The two bolts can now be tightened.
- Install 5th gear selector fork.



Adjusting 5th gear

- Engage 5th gear. Loosen bolt -1-. Press locking collar and selector jaws in direction of arrow, then tighten bolt -1- to 25 Nm.
- Check adjustment: It should not be possible to slide a 0.2 mm feeler gauge between locking collar and selector gear. Repeat adjustment if necessary.
- Disengage 5th gear. Locking collar should now be in the neutral position. Synchro-ring should move freely.
- Select all gears.
- Install gearbox housing cover ⇒ [page 110](#).
- Install release bearing guide sleeve ⇒ [page 21](#).
- Install clutch release lever and release bearing ⇒ [page 21](#).
- Fill up gear oil ⇒ [page 104](#).



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7 Gearbox housing, clutch housing

⇒ ["7.1 Exploded view - gearbox housing and clutch housing", page 142](#)

⇒ ["7.2 Servicing gearbox housing", page 144](#)

⇒ ["7.3 Servicing clutch housing", page 149](#)

7.1 Exploded view - gearbox housing and clutch housing

1 - Gearbox housing

- ☐ Adapted to roller bearing for output shaft
- ☐ Allocate according to ⇒ Electronic parts catalogue (ETKA)
- ☐ If renewed: Adjust input shaft and differential ⇒ [page 207](#)

2 - Needle bearing

- ☐ For output shaft
- ☐ Roller bearing with or without circlip
- ☐ Identifying roller bearings fitted as output shaft bearings in gearbox housing ⇒ [page 144](#)
- ☐ Removing and installing roller bearing without circlip ⇒ [page 145](#)
- ☐ Removing and installing roller bearing with circlip ⇒ [page 146](#)

3 - Oil filler plug

- ☐ 35 Nm

4 - Tapered roller bearing outer race

- ☐ For output shaft
- ☐ Removing and installing ⇒ [page 168](#)
- ☐ If renewed: Adjust output shaft ⇒ [page 178](#)

5 - Shim

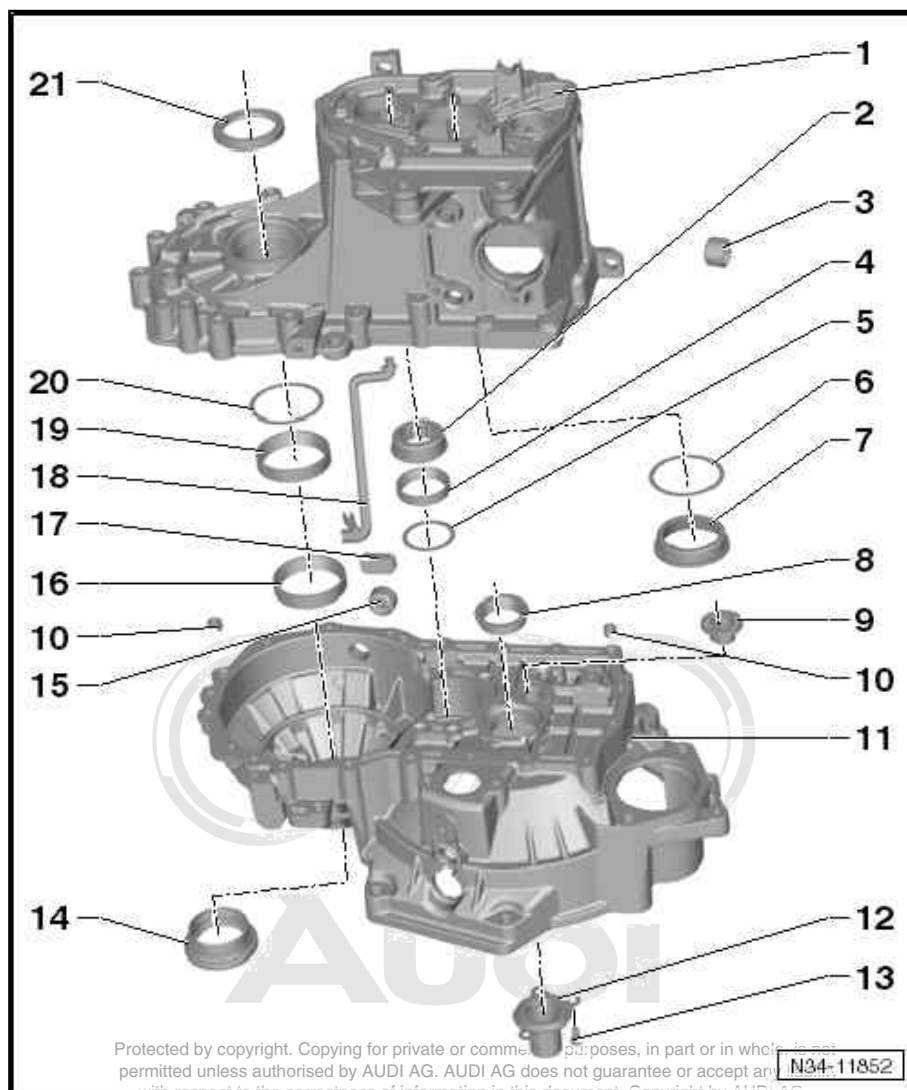
- ☐ For output shaft
- ☐ Table of adjustments ⇒ [page 207](#)

6 - Shim

- ☐ For input shaft
- ☐ Table of adjustments ⇒ [page 158](#)

7 - Tapered roller bearing outer race

- ☐ For input shaft
- ☐ Removing and installing ⇒ [page 153](#)
- ☐ If renewed: Adjust input shaft ⇒ [page 158](#)



8 - Tapered roller bearing outer race

- ☐ For input shaft
- ☐ Removing and installing ⇒ [page 153](#)
- ☐ If renewed: Adjust input shaft ⇒ [page 158](#)

9 - Needle bearing

- ☐ Removing and installing ⇒ [page 184](#)

10 - Dowel sleeve

- ☐ 2x

11 - Clutch housing

- ☐ If renewed ⇒ table of adjustments ⇒ [page 207](#)

12 - Guide sleeve

- ☐ With input shaft oil seal and vulcanised O-ring
- ☐ Renewing seal ⇒ [page 163](#)
- ☐ Remove guide sleeve in order to renew oil seal
- ☐ Renew guide sleeve if O-ring is damaged

13 - Socket head bolt

- ☐ Removing and installing ⇒ [Item 6 \(page 21\)](#)

14 - One-piece oil seal and sleeve

- ☐ Renew oil seal together with sleeve
- ☐ Removing ⇒ [page 150](#)
- ☐ Installing ⇒ [page 150](#)

15 - Oil drain plug

- ☐ 35 Nm

16 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Pressing out and pressing in ⇒ [page 192](#)
- ☐ If renewed: adjust differential ⇒ [page 200](#)

17 - Magnet

- ☐ Held in place by joint surface of housing

18 - Oil collector

- ☐ Not fitted on all versions
- ☐ Installing oil collector in gearbox housing ⇒ [page 144](#)

19 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Pressing out and pressing in ⇒ [page 192](#)
- ☐ If renewed: adjust differential

⇒ [page 200](#)

20 - Shim

- ☐ For differential
- ☐ Table of adjustments ⇒ [page 207](#)

21 - Oil seal

- ☐ Renewing ⇒ [page 187](#)

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7.2 Servicing gearbox housing

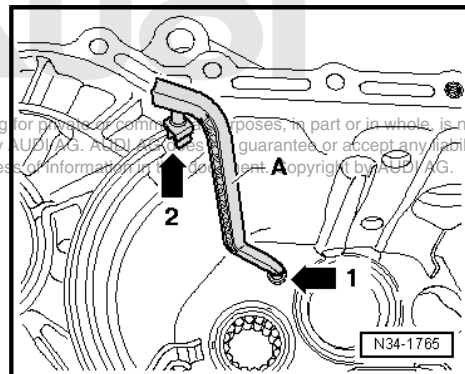
⇒ [“7.2.1 Identification of output shaft bearings in gearbox housing”, page 144](#)

⇒ [“7.2.2 Removing and installing roller bearing without circlip”, page 145](#)

⇒ [“7.2.3 Removing and installing roller bearing with circlip”, page 146](#)

Installing oil collector -A- in gearbox housing

- Insert oil collector simultaneously into bore -arrow 1- and groove -arrow 2-.



7.2.1 Identification of output shaft bearings in gearbox housing

The following roller bearings are fitted as output shaft bearings:

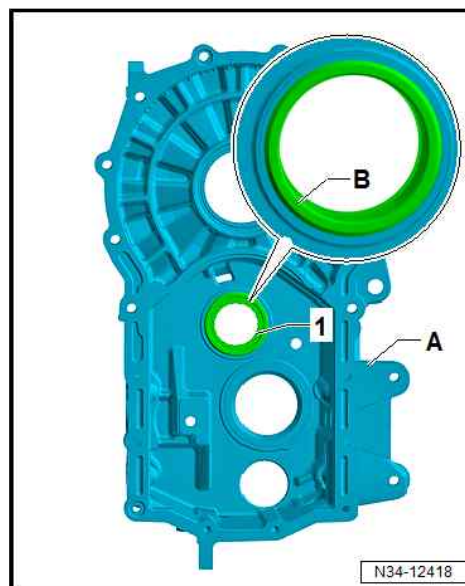
Roller bearing -1- without circlip

A - Gearbox housing with shoulder for outer race

B - Roller bearing outer race

Removing and installing roller bearing without circlip

⇒ [page 145](#)



Roller bearing -1- with circlip

A - Gearbox housing with groove for circlip

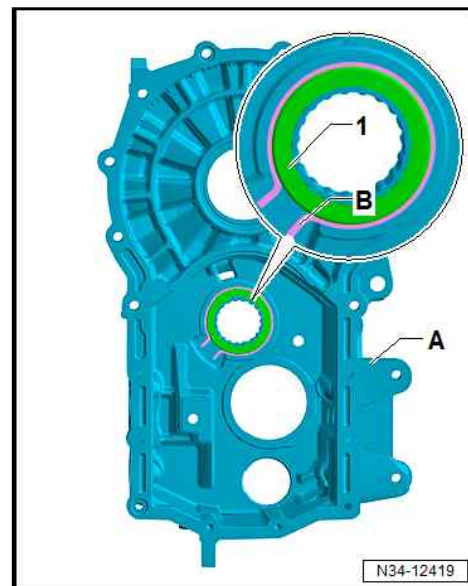
B - Circlip for roller bearing

Removing and installing roller bearing with circlip ⇒ [page 146](#)



Note

For allocation of gearbox housing and roller bearing, refer to ⇒ Electronic parts catalogue (ETKA) .



7.2.2 Removing and installing roller bearing without circlip

◆ Pin - VW295-



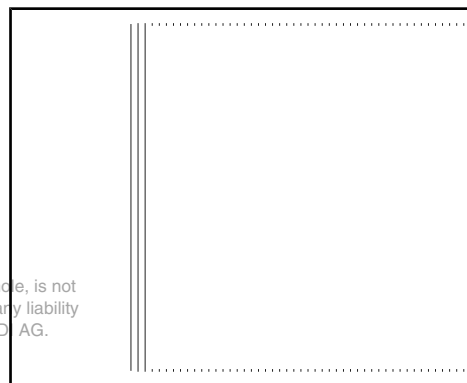
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◆ Pressure washer - VW 447 H-



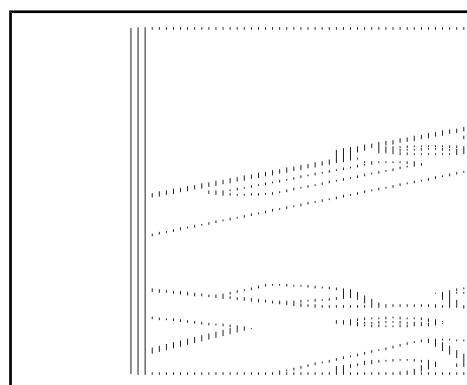
◆ Thrust pad - VW 512-



Driving out roller bearing without circlip

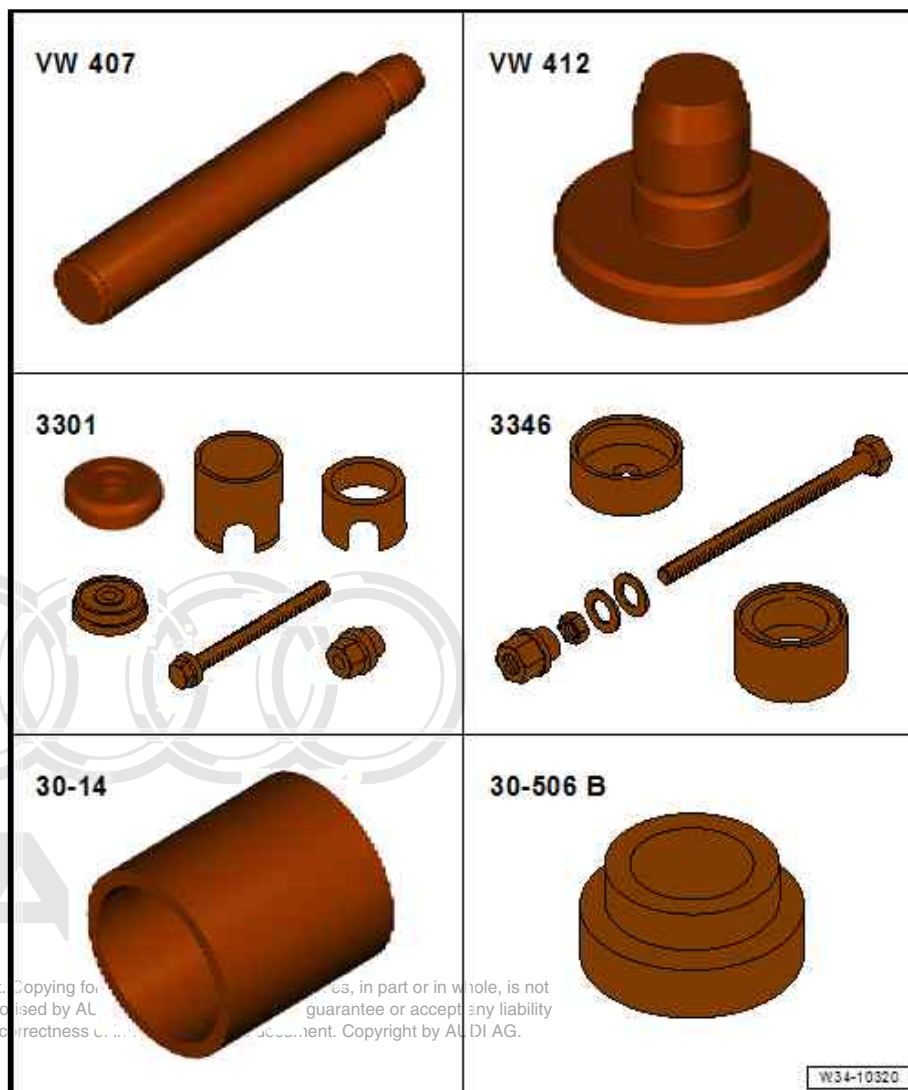
Driving in roller bearing without circlip as far as stop

- Secure needle bearing in gearbox housing at three points (120° offset) with a punch.



7.2.3 Removing and installing roller bearing with circlip

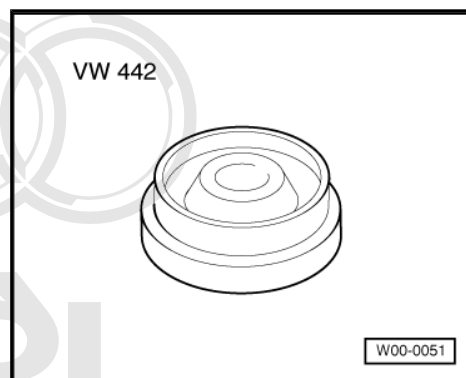
Special tools and workshop equipment required



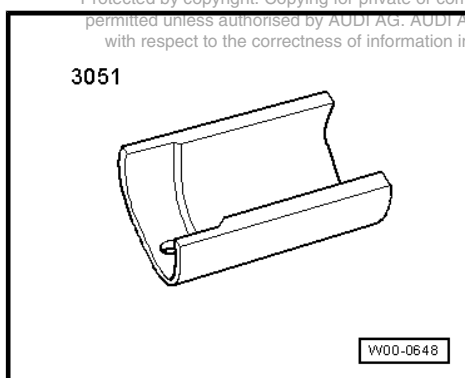
- ◆ Press tool - VW407-
- ◆ Press tool - VW412-
- ◆ Thrust pad from assembly tool - 3301-
- ◆ Assembly tool - 3346-
- ◆ Tube - 30-14-
- ◆ Press tool - 30-506B-
- ◆ Thrust plate - VW402-



◆ Thrust piece - VW442-

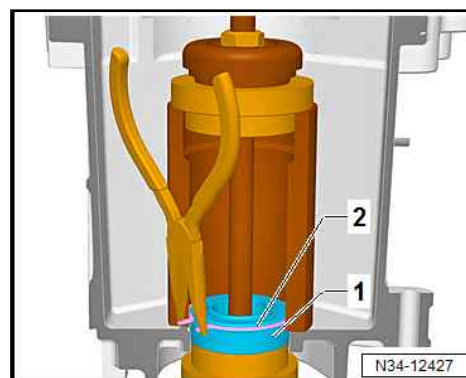
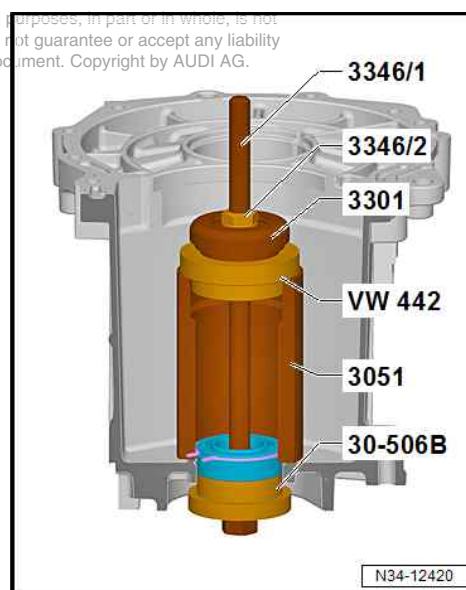


◆ Thrust piece - 3051-



Removing roller bearing
with circlip

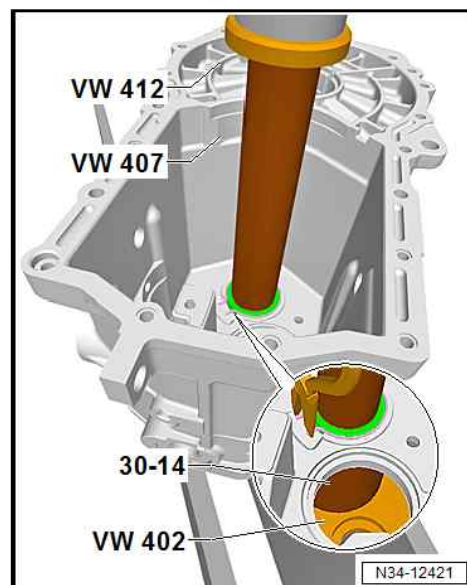
- When pulling circlip -1- out, compress circlip -2- using pliers.



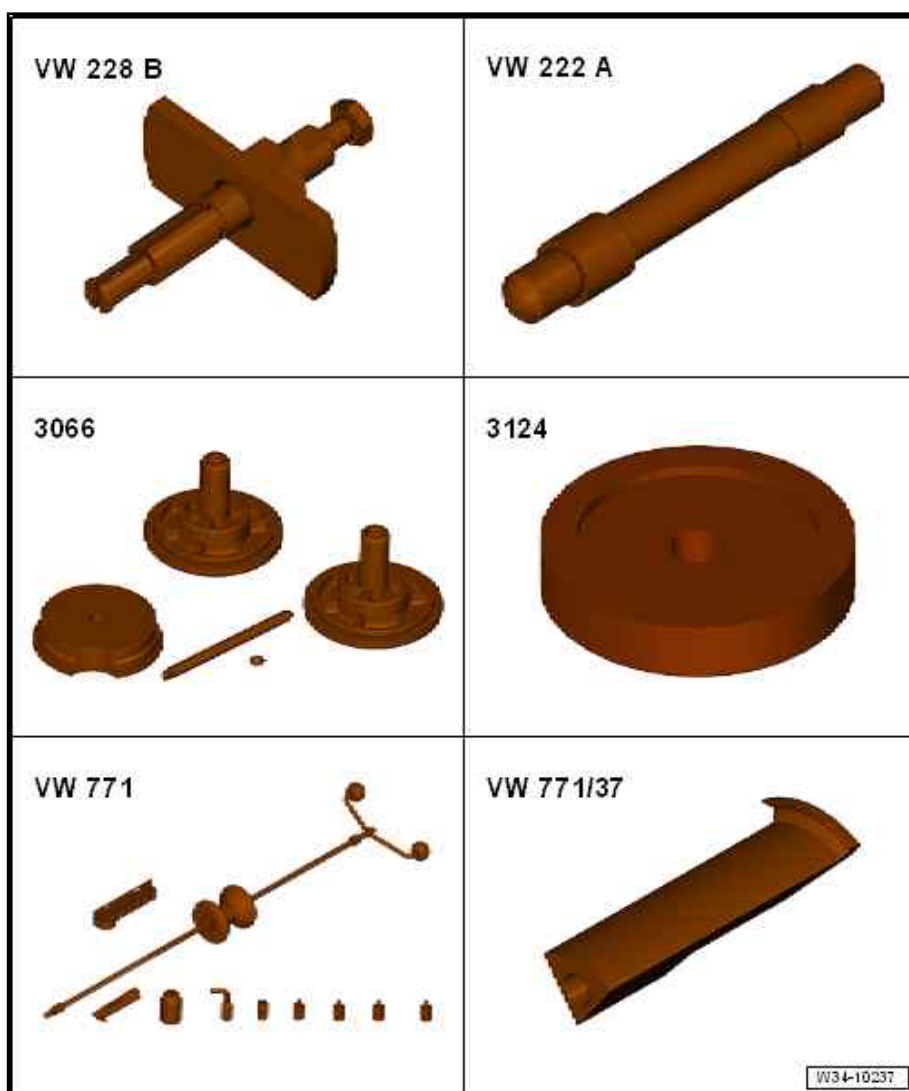
Pressing in roller bearing with circlip

- Place gearbox housing on tube - 30-14- in vicinity of roller bearing.
- Compress circlip and press roller bearing in until circlip is clipped into annular groove.

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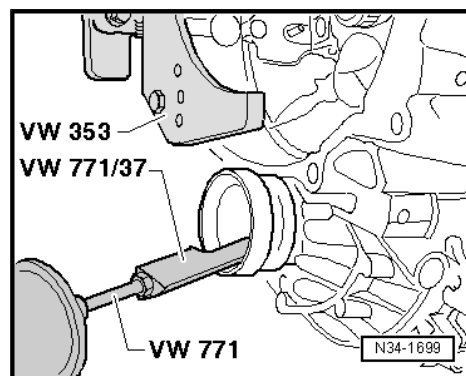
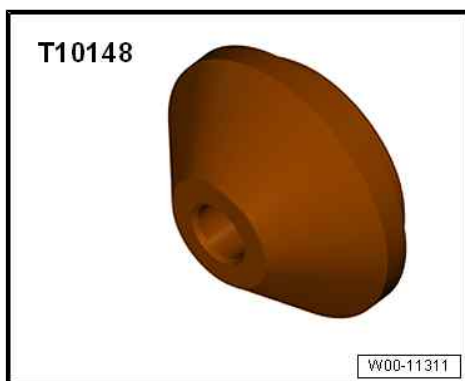


7.3 Servicing clutch housing



◆ Puller - VW 228 B- (not used on this gearbox)

- ◆ Drift - VW 222 A- (not used on this gearbox)
- ◆ Assembly device - 3066- (assembly device spindle)
- ◆ Thrust piece - 3124- (not used on this gearbox)
- ◆ Multi-purpose tool - VW 771-
- ◆ Extractor hook - VW 771/37-
- ◆ Thrust piece - T10148-



Pulling out sleeve and oil seal

A shoulder is located on inside diameter of sleeve.

- Position extractor hook - VW 771/37- behind shoulder inside sleeve.
- While pulling up, press extractor hook - VW 771/37- firmly in against sleeve.

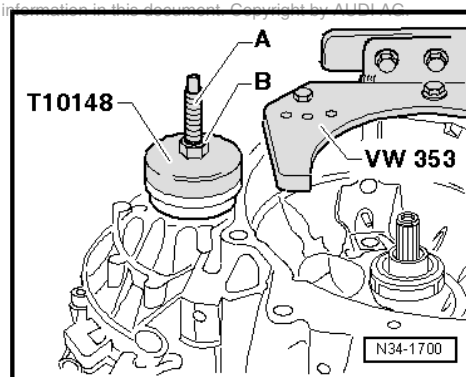
Drawing in sleeve and oil seal

- Clean seat for oil seal in gearbox.
- Screw spindle -A- from assembly device - 3066- into threaded piece in differential.
- Turn nut -B- and pull sleeve in onto stop with thrust piece - T10148- .



Note

If gearbox has been dismantled, press in sleeve onto stop using thrust piece - T10148- .



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35 – Gears, shafts

1 Input shaft

⇒ [“1.1 Exploded view - input shaft”, page 151](#)

⇒ [“1.2 Dismantling and assembling input shaft”, page 153](#)

⇒ [“1.3 Adjusting input shaft”, page 158](#)

1.1 Exploded view - input shaft



Note

- ◆ *When fitting new gear wheels or input shaft, refer to technical data ⇒ [page 3](#) and ⇒ [Electronic parts catalogue](#).*
- ◆ *The input shaft must be re-adjusted if the position of tapered roller bearings is affected when renewing parts. Refer to table of adjustments ⇒ [page 207](#).*

1 - Clutch housing

2 - Tapered roller bearing outer race

- ☐ Pressing out
⇒ [page 154](#)
- ☐ Pressing in
⇒ [page 155](#)

3 - Tapered roller bearing inner race

- ☐ Pressing off
⇒ [page 155](#)
- ☐ Pressing on
⇒ [page 155](#)

4 - Input shaft

- ☐ Adjusting ⇒ [page 158](#)

5 - 3rd gear wheel

- ☐ Installation position:
Collar faces 4th gear
- ☐ Pressing off
⇒ [page 156](#)
- ☐ Pressing on
⇒ [page 156](#)

6 - Circlip

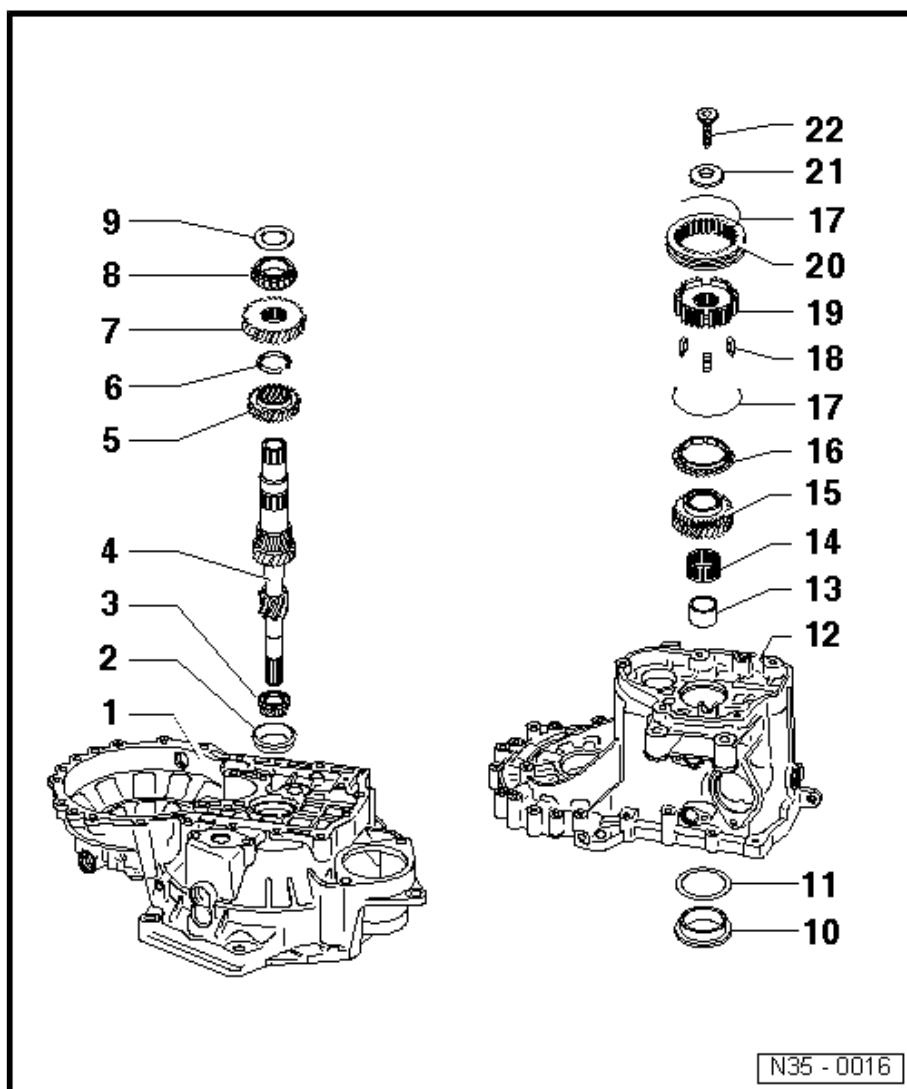
- ☐ Always renew

7 - 4th gear wheel

- ☐ Pressing off with tapered roller bearing outer race and sleeve
⇒ [page 155](#)
- ☐ Pressing on
⇒ [page 156](#)
- ☐ Shoulder faces towards 3rd gear

8 - Tapered roller bearing inner race

- ☐ Pressing off with 4th gear wheel and sleeve ⇒ [page 155](#)



- ☐ Pressing on ⇒ [page 156](#)

9 - Thrust washer

10 - Tapered roller bearing outer race

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

11 - Shim

- ☐ Determining thickness ⇒ [page 158](#)

12 - Gearbox housing

13 - Sleeve

- ☐ For needle bearing
- ☐ Press off with 4th gear wheel and tapered roller bearing inner race ⇒ [page 155](#)
- ☐ Pressing on ⇒ [page 157](#)
- ☐ Fit thrust washer ⇒ [Item 9 \(page 152\)](#) before installing

14 - Needle bearing

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15 - 5th speed selector gear

- ☐ Pull off together with 5th gear synchro-hub ⇒ [page 128](#)

16 - 5th gear synchro-ring

- ☐ With cast locking pieces ⇒ [page 140](#)
- ☐ Checking for wear ⇒ [page 139](#)

17 - Spring

- ☐ Offset version ⇒ [page 158](#)
- ☐ Installation position ⇒ [page 158](#)

18 - Locking pieces (3x)

- ☐ Installation position ⇒ [page 157](#)

19 - 5th gear synchro-hub

- ☐ Pulling off individually ⇒ [page 122](#)
- ☐ Pulling off together with gearbox housing ⇒ [page 128](#)
- ☐ Dismantling and assembling ⇒ [page 157](#)

20 - 5th gear locking collar

- ☐ Removing and installing ⇒ [page 128](#)

21 - Dished spring

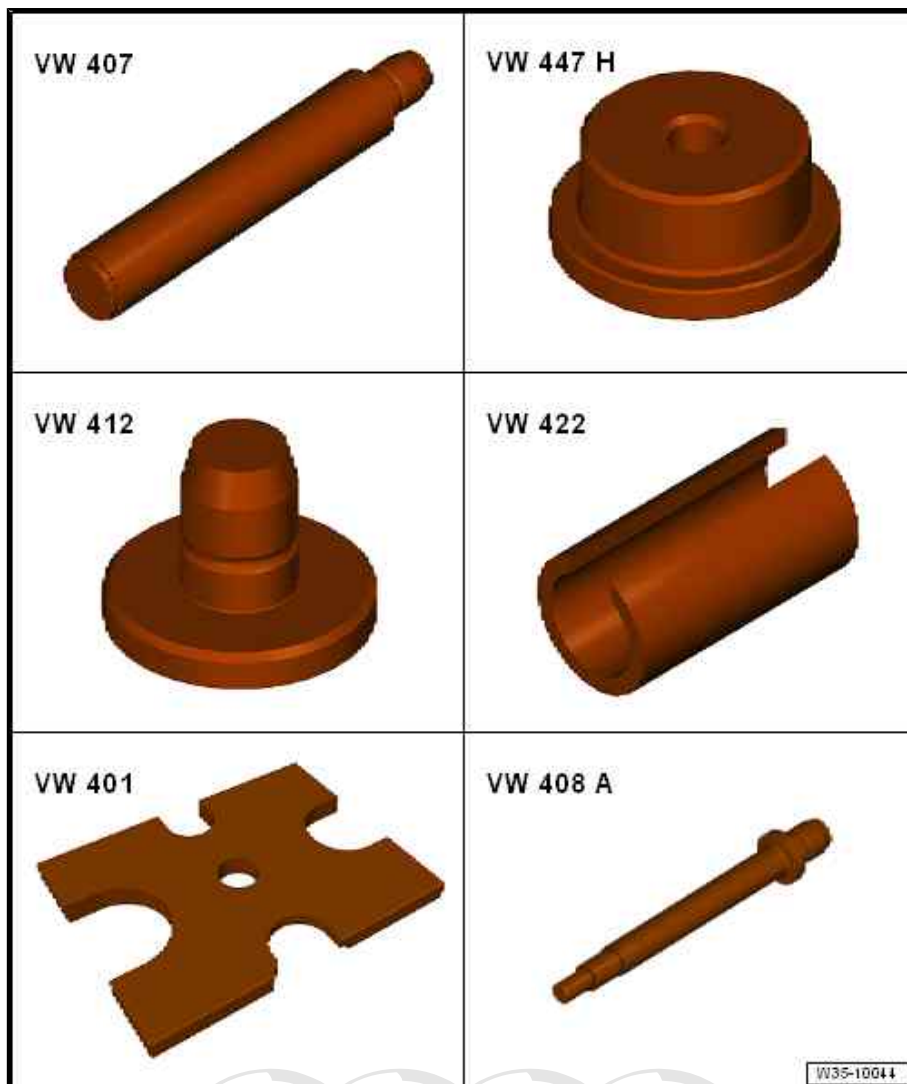
- ☐ Installation position ⇒ [page 140](#)

22 - Bolt

- ☐ Tightening torque ⇒ [Item 4 \(page 110\)](#)
- ☐ Always renew
- ☐ Fitted piece on bolt head holds dished spring in position ⇒ [page 140](#)

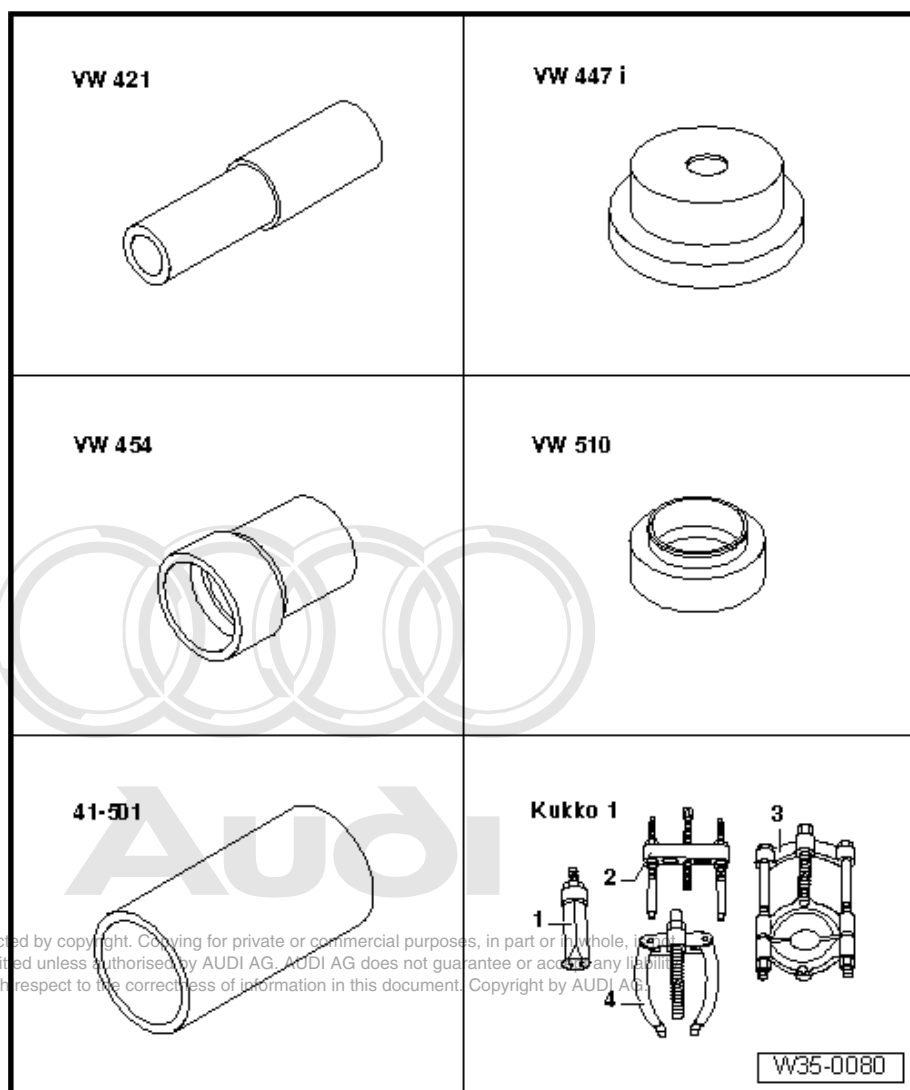
1.2 Dismantling and assembling input shaft

Special tools and workshop equipment required



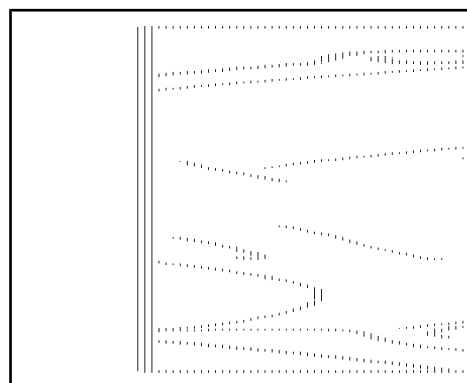
- ◆ Press tool - VW 407-
- ◆ Pressure washer - VW 447 H-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 422-
- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 408 A-

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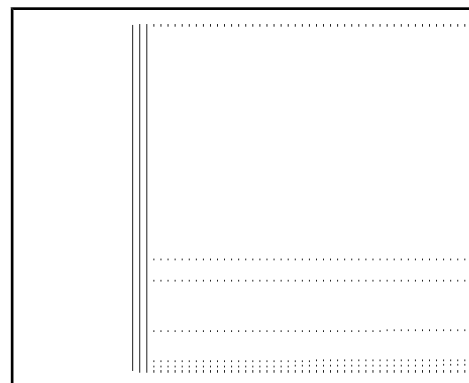


- ◆ Tube - VW 421-
- ◆ Thrust piece - VW 454-
- ◆ Pressure washer - VW 447 i-
- ◆ Pressure washer - VW 510-
- ◆ Drift sleeve - 41-501-
- ◆ Splitter - VAS 251 409- -3-, or e.g. splitter - Kukko 17/1-

Pressing out tapered roller bearing outer race



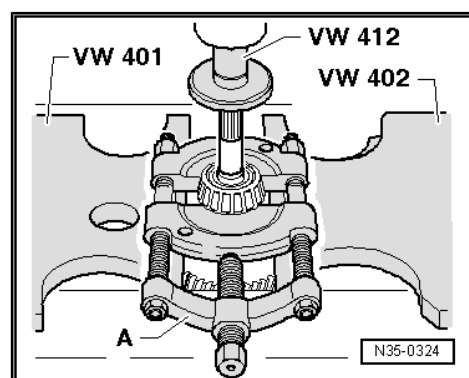
Pressing in tapered roller bearing outer race



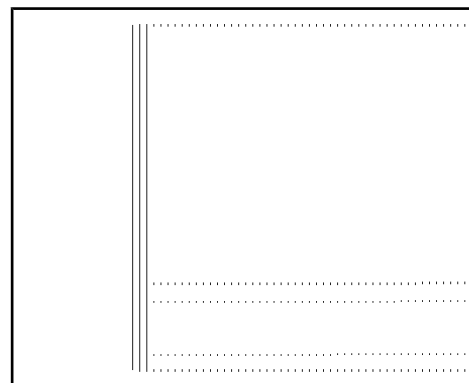
Pressing off tapered roller bearing inner race

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

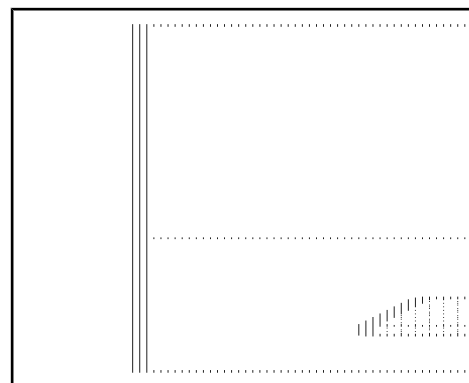
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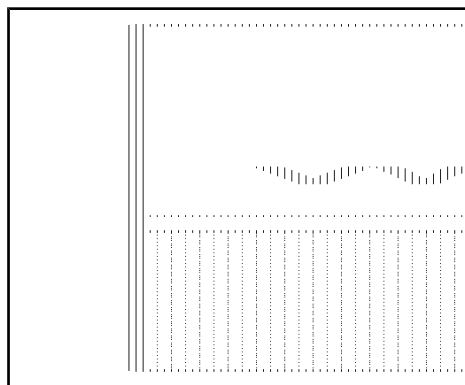
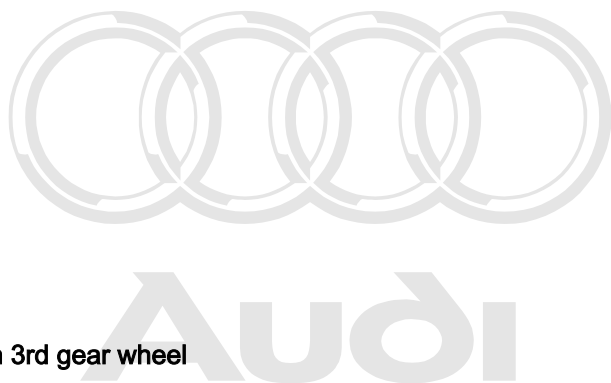
Pressing on tapered roller bearing inner race



Pressing off 4th gear wheel with tapered roller bearing and sleeve

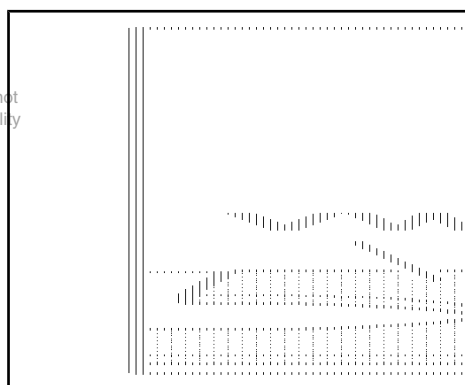


Pressing off 3rd gear wheel



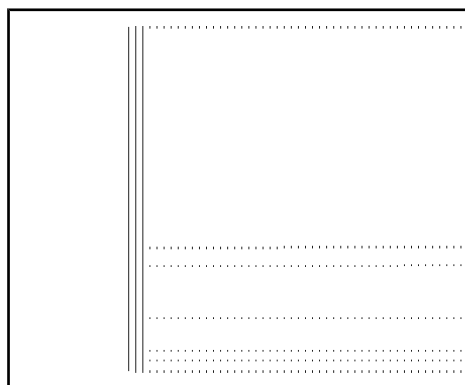
Pressing on 3rd gear wheel

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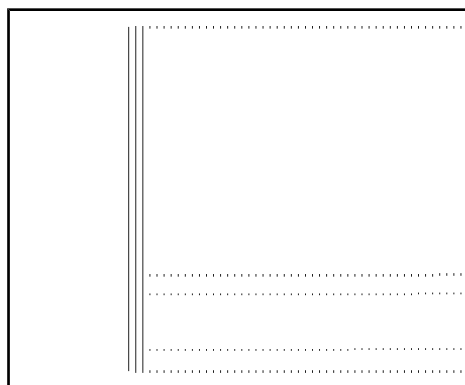


Pressing on 4th gear wheel

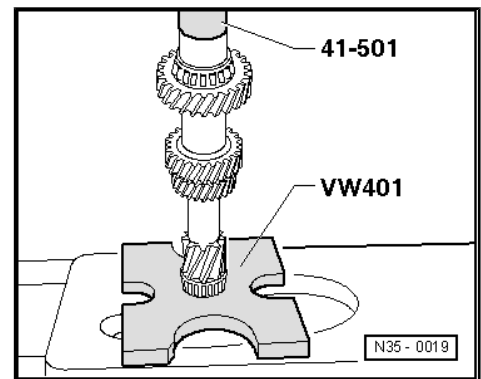
Shoulder faces towards 3rd gear.



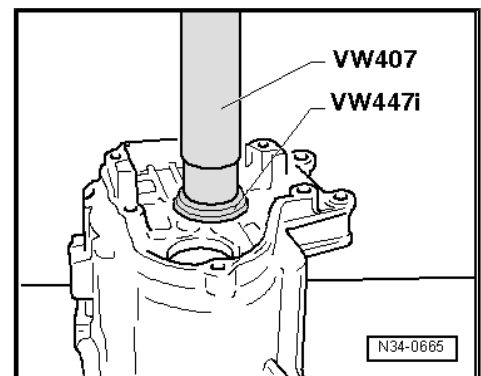
Pressing on tapered roller bearing inner race



Pressing on sleeve for needle bearing

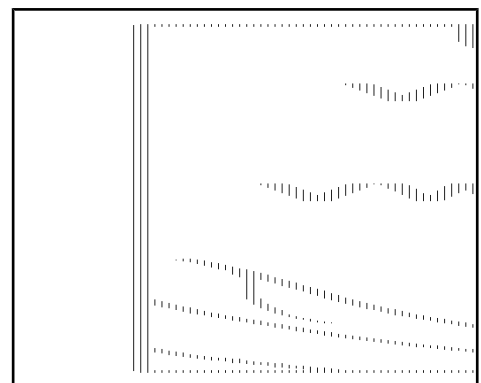


Pressing out tapered roller bearing outer race



Pressing in tapered roller bearing outer race

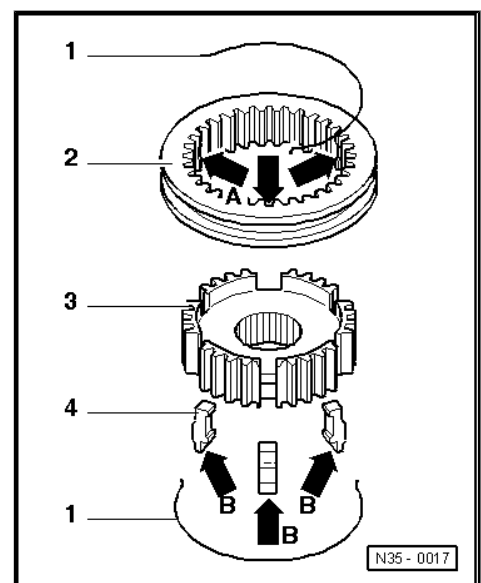
- Install with shim after adjusting input shaft.



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5th gear synchromesh

- 1 - Springs for locking pieces
- 2 - Locking collar with 3 recesses -arrows A- for locking pieces -4-
- 3 - Synchro-hub
- 4 - Locking pieces - Installation position: The thin extension -arrow B- faces the pointed teeth of the locking collar -2-

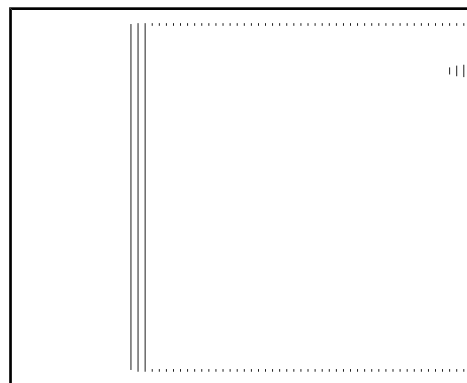


Assembling 5th gear locking collar/synchro-hub

- Slide locking collar over synchro-hub.

Pointed teeth -A- and shoulder -B- of synchro-hub face in same direction. The recesses for the locking pieces in locking collar and synchro-hub must be aligned ([⇒ page 157](#)).

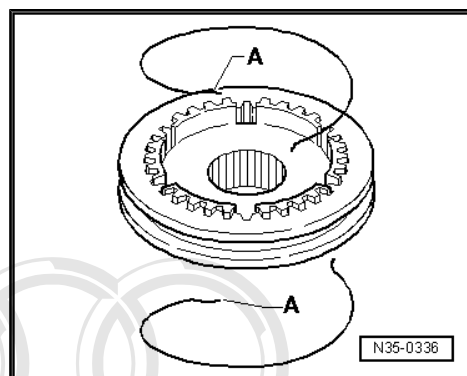
- Fit locking pieces (installation position: [⇒ page 157](#)).
- Insert springs offset by 120° underneath lug -C-. Angled ends of spring must be in front of locking pieces -arrows-.



Installing offset springs -A-

This type of spring is fitted on both sides.

- The springs are only used together with hollow locking pieces (with internal recess).
- Fit locking pieces (installation position: [⇒ page 157](#)).

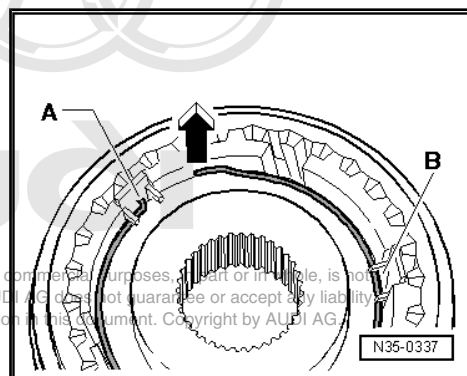


Installation position of springs:

- Insert springs offset by 120°.
- Angled end -A- of spring must locate in hollow locking piece.

Spring must be fitted under lug -B- of locking pieces.

The offset end must always point away from synchro-hub (in direction of -arrow-).



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1.3 Adjusting input shaft

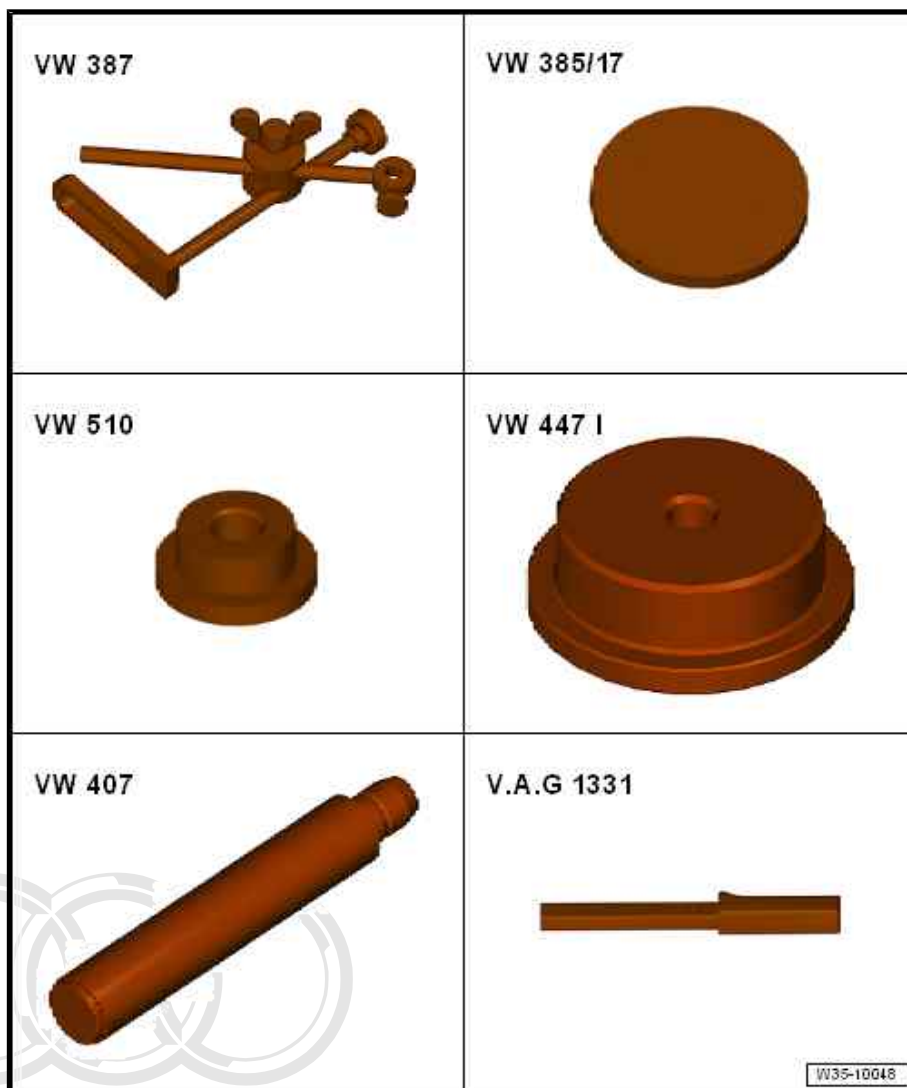
(Determining thickness of shim for input shaft)

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

- ◆ Gearbox housing
- ◆ Clutch housing
- ◆ Input shaft
- ◆ 4th gear wheel
- ◆ Tapered roller bearings for input shaft

Table of adjustments [⇒ page 207](#)

Special tools and workshop equipment required



◆ Universal dial gauge bracket - VW 387-

◆ End measuring plate - VW 385/17-

◆ Thrust pad - VW 510-

◆ Pressure washer - VW 447 I-

◆ Press tool - VW 407-

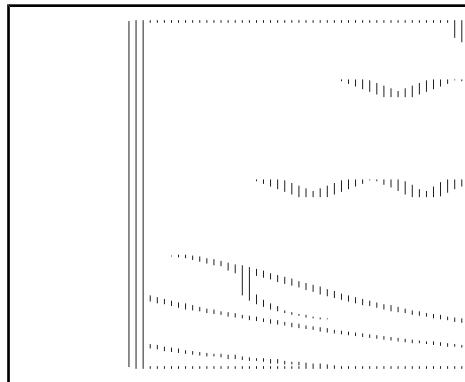
◆ Torque wrench - V.A.G 1331-

◆ Dial gauge

Requirement:

- Sealing surfaces of clutch and gearbox housings must be free of sealant.

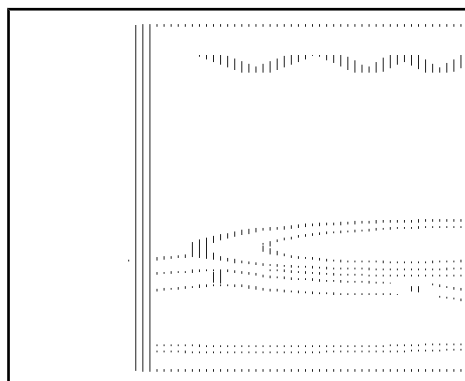
- Press tapered roller bearing outer race without shim onto stop in gearbox housing.
- Install input shaft in clutch housing and put on gearbox housing. Tighten hexagon bolts to 25 Nm, then turn 90° further.



- Fit measuring appliance and dial gauge in clutch housing.
- Before measurement, rotate input shaft to allow tapered roller bearings to settle. Set dial gauge to "0" with 1 mm preload.

**Note**

This procedure must be repeated for each subsequent measurement, as otherwise the dial gauge will not return to its original setting.



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- Push input shaft towards dial gauge in direction of -arrow-.
- Read off and note play indicated on dial gauge (in this example: 1.21 mm).

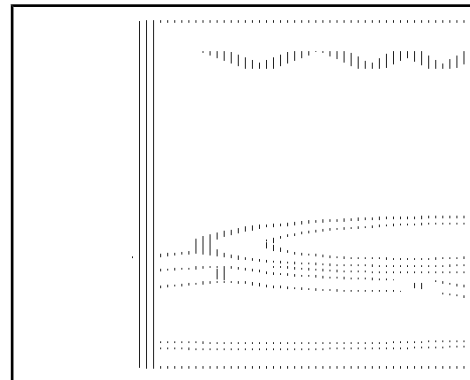
 Note

Dial gauge does not return to original setting by itself.

Determine thickness of shim.

Example:

Bearing clearance (measured value)	Thickness of shim according to table
1.21 mm	1.175 mm



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Table of shims

Bearing clearance	Shim
Measured value (mm)	Thickness (mm)
0.671 ... 0.699	0.650
0.700 ... 0.724	0.675
0.725 ... 0.749	0.700
0.750 ... 0.774	0.725
0.775 ... 0.799	0.750
0.800 ... 0.824	0.775
0.825 ... 0.849	0.800
0.850 ... 0.874	0.825
0.875 ... 0.899	0.850
0.900 ... 0.924	0.875
0.925 ... 0.949	0.900
0.950 ... 0.974	0.925
0.975 ... 0.999	0.950
1.000 ... 1.024	0.975
1.025 ... 1.049	1.000
1.050 ... 1.074	1.025
1.075 ... 1.099	1.050
1.100 ... 1.124	1.075
1.125 ... 1.149	1.100
1.150 ... 1.174	1.125
1.175 ... 1.199	1.150
1.200 ... 1.224	1.175
1.225 ... 1.249	1.200
1.250 ... 1.274	1.225
1.275 ... 1.299	1.250
1.300 ... 1.324	1.275
1.325 ... 1.349	1.300
1.350 ... 1.374	1.325
1.375 ... 1.399	1.350
1.400 ... 1.424	1.375
1.425 ... 1.449	1.400
1.450 ... 1.474	1.425
1.475 ... 1.499	1.450
1.500 ... 1.524	1.475
1.525 ... 1.549	1.500
1.550 ... 1.574	1.525
1.575 ... 1.599	1.550
1.600 ... 1.624	1.575
1.625 ... 1.649	1.600
1.650 ... 1.674	1.625
1.675 ... 1.699	1.650
1.700 ... 1.724	1.675


Note

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Select correct shims from ⇒ *Electronic parts catalogue* .

- Remove input shaft and press tapered roller bearing outer race out of gearbox housing using thrust plate - VW 447 i- .
- Insert shim of correct thickness.

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

- Press tapered roller bearing outer race together with the correct shim (1.175 mm in example) into gearbox housing using thrust pad - VW 510- .
- Fit gearbox housing and tighten hexagon head bolts to 25 Nm and then turn 90° further.

Checking adjustment

- Install measuring appliance and dial gauge.
- Rotate input shaft to allow tapered roller bearings to settle.
- Press input shaft in direction of arrow.
- Bearing clearance should be min. 0.01 ... max. 0.09 mm.



Note

If no bearing clearance is measurable, but the input shaft has perceptible play and turns freely, the adjustment is acceptable.

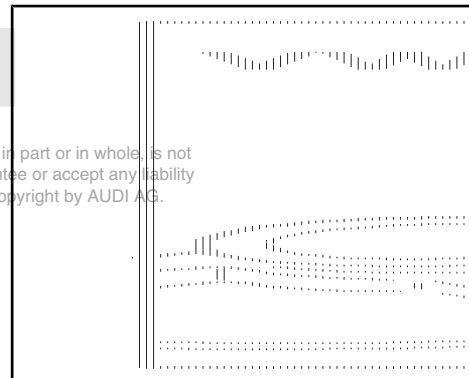
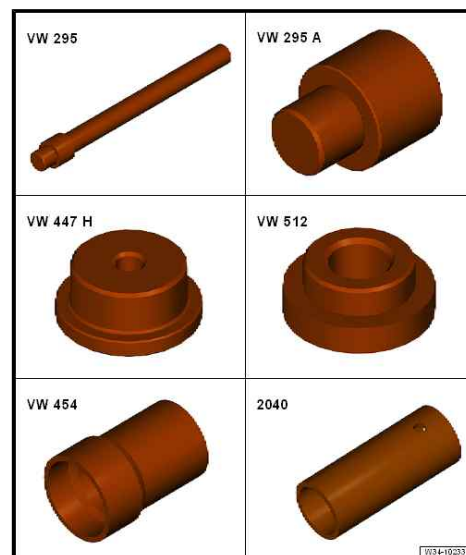


Table of shims

1.4 Renewing input shaft oil seal

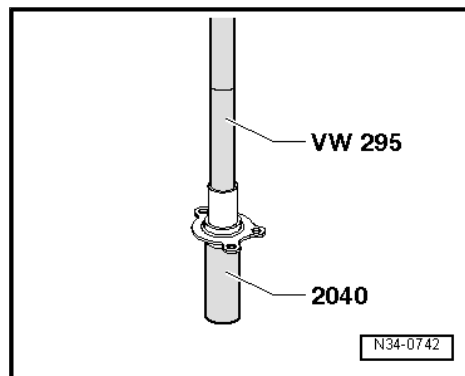


Special tools and workshop equipment required

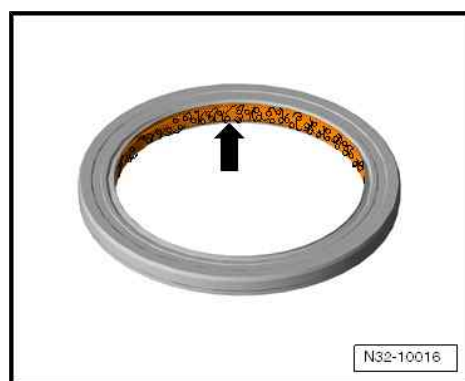
- ◆ Punch - VW 295-
- ◆ Adapter - VW 295 A-
- ◆ Thrust piece - VW 454-
- ◆ Tube - 2040-
- ◆ Sealing grease
- ◆ Select correct type of grease from ⇒ Electronic parts catalogue (ETKA) .
- ◆ Not required: thrust plate - VW 447 H- and thrust plate - VW 512-
- Remove gearbox.
- Remove clutch release lever with release bearing
⇒ [page 43](#) .

- Remove guide sleeve.

Driving oil seal out of guide sleeve

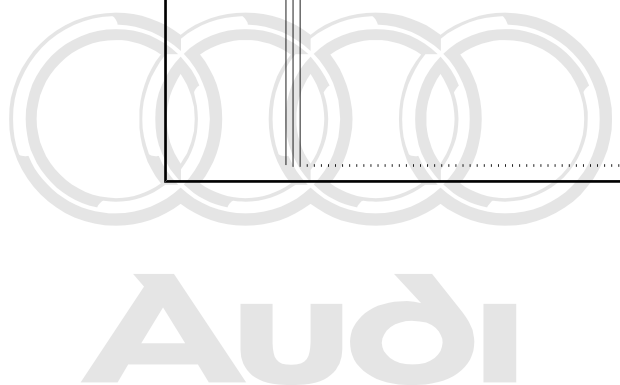
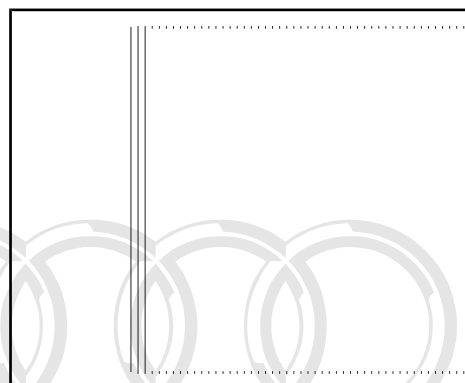


- Pack space between sealing lip and dust lip -arrow- half full with sealing grease .
- Lightly lubricate outer circumference of oil seal with gear oil.



Driving oil seal into guide sleeve (drive in onto stop)

- Install guide sleeve ⇒ [page 21](#) .
- Install clutch release lever with release bearing ⇒ [page 43](#) .
- Install gearbox ⇒ Rep. gr. 34 ; Removing and installing gearbox .



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2 Output shaft

⇒ ["2.1 Exploded view - output shaft", page 165](#)

⇒ ["2.2 Dismantling and assembling output shaft", page 168](#)

⇒ ["2.3 Adjusting output shaft", page 178](#)

2.1 Exploded view - output shaft



Note

- ◆ The output shaft is dismantled as follows:- Position splitter under 2nd speed selector gear (⇒ [Item 21 \(page 166\)](#)) and press off as described in ⇒ [page 172](#). Remove circlip ⇒ [Item 17 \(page 166\)](#). Then press off locking collar and synchro-hub for 1st and 2nd gear as shown in ⇒ [page 173](#).
- ◆ Refer to ⇒ [Electronic parts catalogue and technical data ⇒ page 3](#) when installing new gears or a new output shaft.
- ◆ Always renew both tapered roller bearings together.

1 - Nut

- ☐ 25 Nm and 90°
- ☐ 4 nuts for bearing mounting
- ☐ Always renew

2 - Clutch housing

3 - Shim

- ☐ For output shaft
- ☐ Table of adjustments
⇒ [page 207](#)

4 - Small tapered roller bearing outer race

- ☐ Removing ⇒ [page 171](#)
- ☐ Pressing in
⇒ [page 172](#)
- ☐ If renewed: Adjust output shaft ⇒ [page 178](#)
- ☐ Pay attention to different versions when adjusting
⇒ [page 180](#)

5 - Small tapered roller bearing inner race

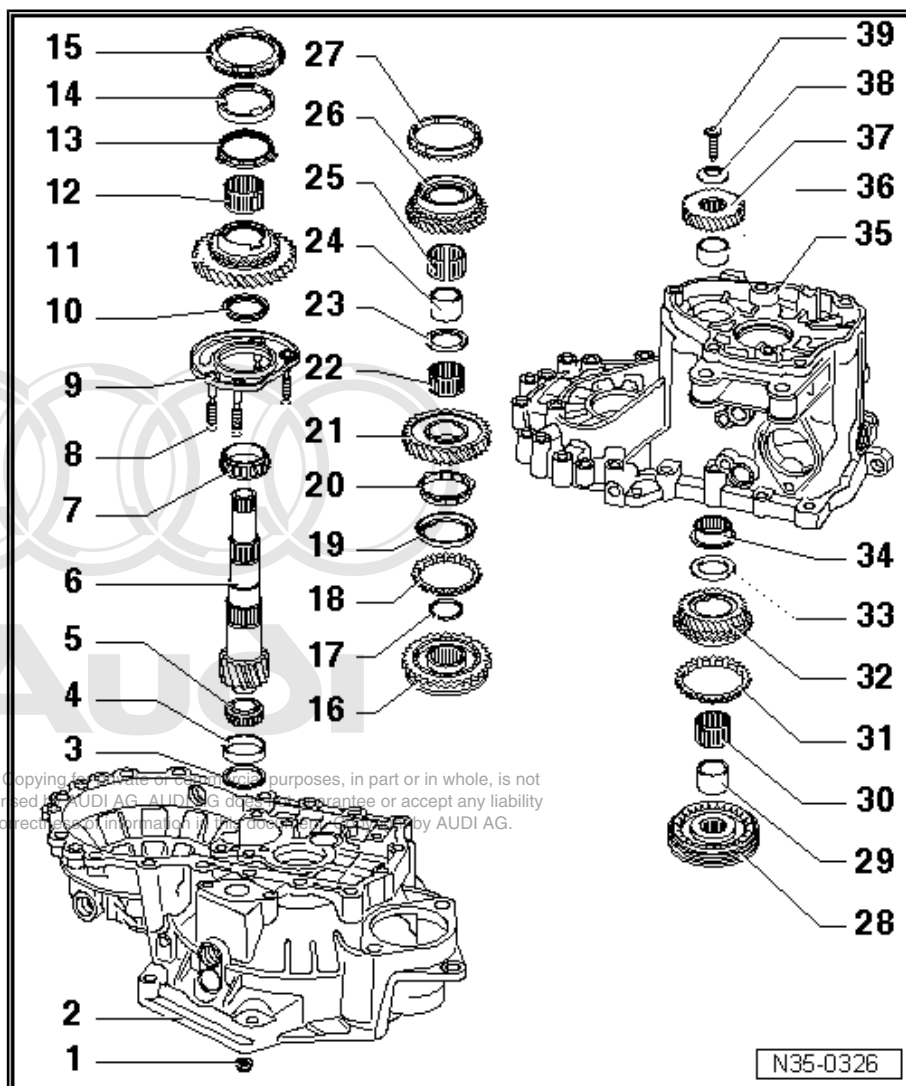
- ☐ Pulling off ⇒ [page 172](#)
- ☐ Pressing on
⇒ [page 172](#)

6 - Output shaft

- ☐ Is paired with final drive gear, only renew as a set
- ☐ Adjusting ⇒ [page 178](#)

7 - Large tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 173](#)
- ☐ Pressing on ⇒ [page 173](#)



8 - O-ring

- ☐ Place O-rings (4x) on bolts for bearing mounting

9 - Bearing mounting

- ☐ With large tapered roller bearing outer race and bolts
- ☐ Only renew outer race together with large tapered roller bearing and bearing mounting

10 - Thrust washer

- ☐ Shoulder on thrust washer faces towards tapered roller bearing

11 - 1st speed selector gear**12 - Needle bearing**

- ☐ For 1st gear

13 - Synchro-ring

- ☐ (Inner ring for 1st gear)
- ☐ Installation position ⇒ [page 173](#)
- ☐ Checking for wear ⇒ [page 174](#)
- ☐ Check lugs for scoring

14 - Outer ring for 1st gear

- ☐ Installation position ⇒ [page 173](#)
- ☐ Checking for wear ⇒ [page 174](#)
- ☐ Renew if scored or if there are visible traces of wear

15 - 1st gear synchro-ring

- ☐ Installation position ⇒ [page 173](#)
- ☐ Checking for wear ⇒ [page 174](#)

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

- ☐ Press off together with bearing mounting ⇒ [Item 17 \(page 166\)](#) after removing circlip ⇒ [page 173](#)
- ☐ Dismantling ⇒ [page 174](#)
- ☐ Assembling locking collar/synchro-hub ⇒ [page 174](#) , ⇒ [page 175](#) and ⇒ [page 175](#)
- ☐ Installation position ⇒ [page 175](#)
- ☐ Pressing on ⇒ [page 175](#)

17 - Circlip

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18 - 2nd gear synchro-ring

- ☐ Checking for wear ⇒ [page 174](#)
- ☐ Assemble so that the recesses engage on the locking pieces on the locking collar ⇒ [Item 16 \(page 166\)](#)

19 - Outer ring for 2nd gear

- ☐ Insert in synchro-ring ⇒ [Item 18 \(page 166\)](#)
- ☐ Installation position ⇒ [page 176](#)
- ☐ Renew if scored or if there are visible traces of wear

20 - Synchro-ring

- ☐ (Inner ring for 2nd gear)
- ☐ Checking for wear ⇒ [page 174](#)
- ☐ Check lugs for scoring
- ☐ Installation position ⇒ [page 176](#)

21 - 2nd speed selector gear

- ☐ Installation position ⇒ [page 176](#)

22 - Needle bearing

- ☐ For 2nd gear

23 - Thrust washer

24 - Sleeve for 3rd gear needle bearing

- ☐ Pressing off with 2nd speed selector gear ⇒ [page 172](#)
- ☐ Pressing on ⇒ [page 176](#)

25 - Needle bearing

- ☐ For 3rd gear

26 - 3rd speed selector gear

27 - 3rd gear synchro-ring

- ☐ Checking for wear ⇒ [page 177](#)

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

- ☐ Pressing off with 2nd speed selector gear and 3rd speed selector gear ⇒ [page 172](#)
- ☐ Dismantling ⇒ [page 177](#)
- ☐ Assembling locking collar/synchro-hub ⇒ [page 177](#) , ⇒ [page 177](#) and ⇒ [page 177](#)
- ☐ Installation position: Locking collar/synchro-hub ⇒ [page 178](#)
- ☐ Pressing on ⇒ [page 178](#)

29 - Sleeve

- ☐ For needle bearing
- ☐ Pressing off with locking collar and synchro-hub for 3rd and 4th gear ⇒ [page 172](#)
- ☐ Pressing on ⇒ [page 178](#)

30 - Needle bearing

- ☐ For 4th gear

31 - 4th gear synchro-ring

- ☐ Checking for wear ⇒ [page 177](#)

32 - 4th speed selector gear

33 - Thrust washer

34 - Roller bearing

- ☐ For output shaft
- ☐ Roller bearing with or without circlip
- ☐ Identifying roller bearings fitted as output shaft bearings in gearbox housing ⇒ [page 144](#)
- ☐ Removing and installing roller bearing without circlip ⇒ [page 145](#)
- ☐ Removing and installing roller bearing with circlip ⇒ [page 146](#)

35 - Gearbox housing

36 - Sleeve

- ☐ For roller bearing for output shaft
- ☐ Pressing off ⇒ [page 172](#)
- ☐ Pressing on ⇒ [page 178](#)

37 - 5th gear wheel

- ☐ Pulling off individually ⇒ [page 122](#)
- ☐ Pulling off together with gearbox housing ⇒ [page 128](#)

38 - Dished spring

- ☐ Installation position ⇒ [page 140](#)

39 - Bolt

- ☐ Tightening torque ⇒ [Item 4 \(page 110\)](#)
- ☐ Always renew
- ☐ Fitted piece on bolt head holds dished spring in position ⇒ [page 140](#)
- ☐ Removing and installing ⇒ [page 128](#)

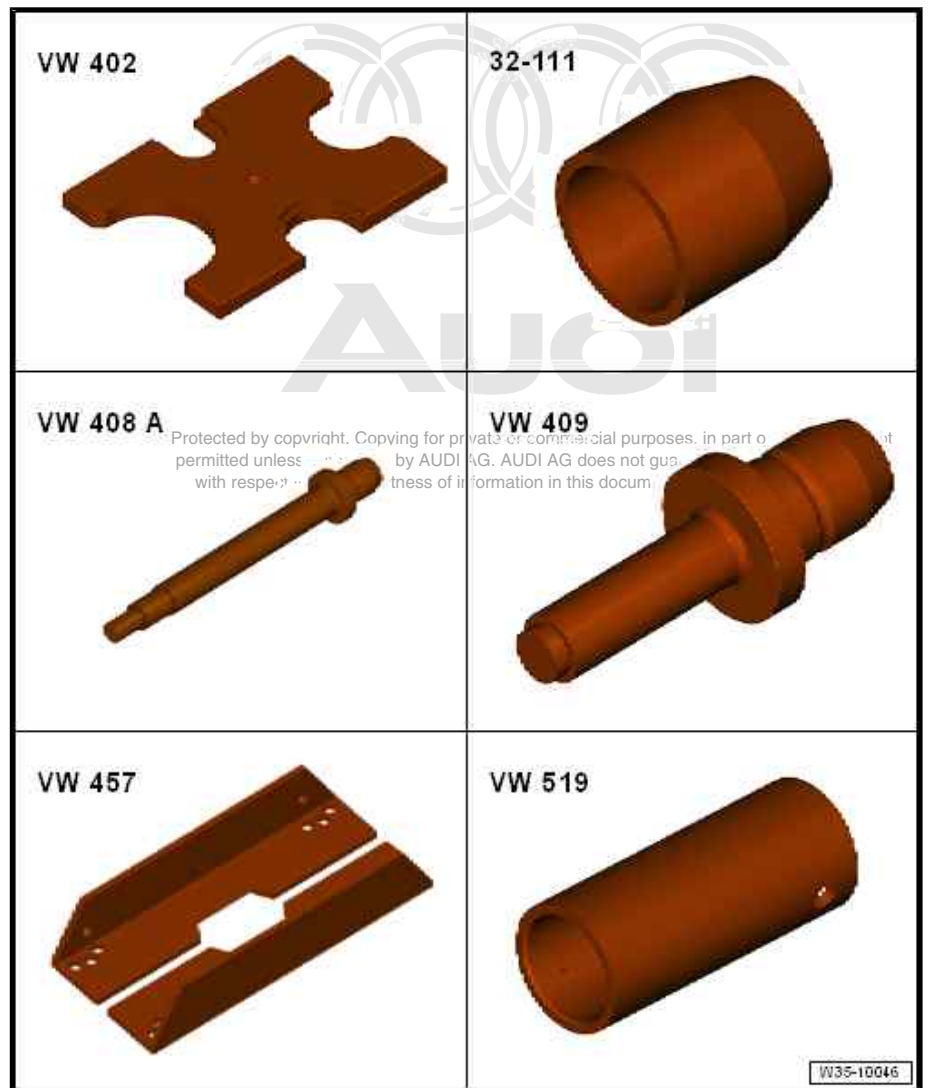
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2.2 Dismantling and assembling output shaft

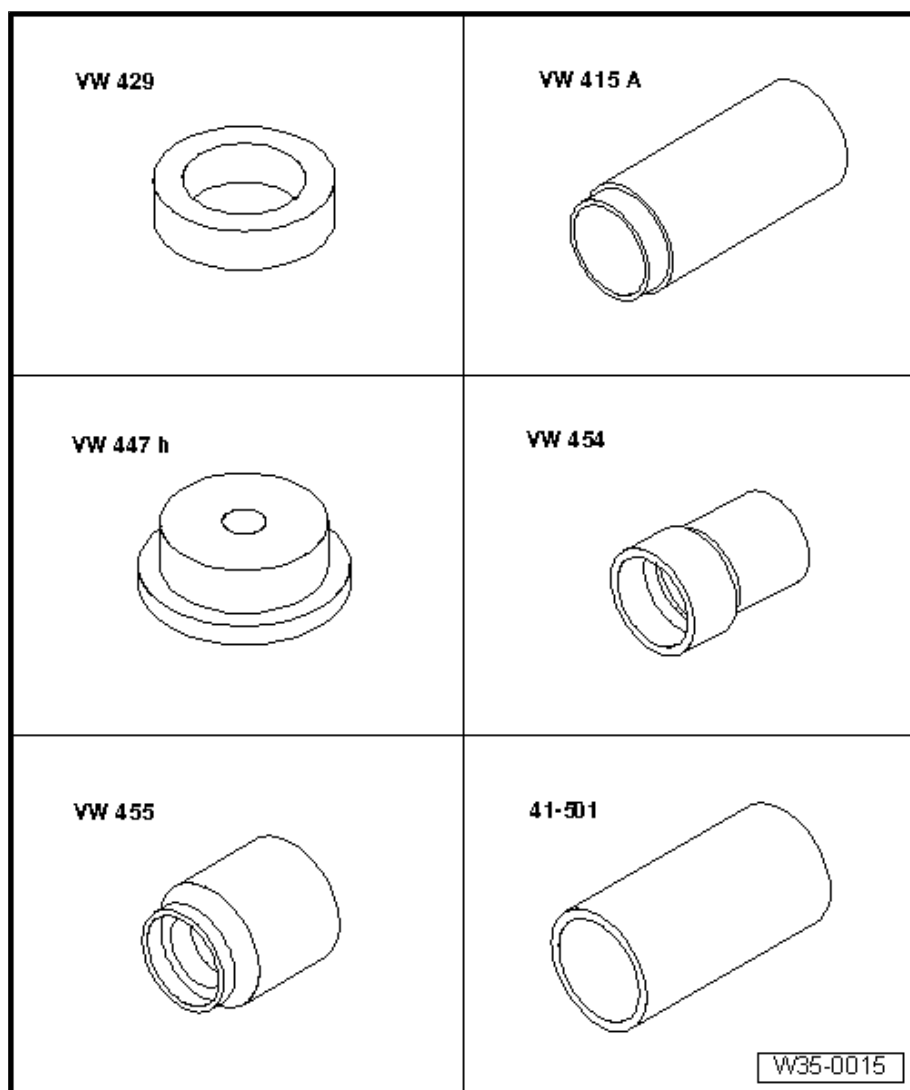
Special tools and workshop equipment required



- ◆ Press tool - VW 407-
- ◆ Press tool - VW 412-
- ◆ Thrust plate - VW 512-
- ◆ Puller - V.A.G 1582-
- ◆ Adapter - V.A.G 1582/4-
- ◆ Adapter - V.A.G 1582/5-



- ◆ Thrust plate - VW 402-
- ◆ Thrust piece - 32 - 111-
- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 409-
- ◆ Support rails - VW 457-
- ◆ Tube - VW 519-

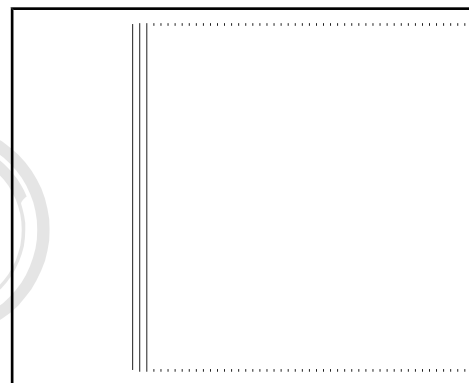


- ◆ Thrust ring - VW 429-
- ◆ Tube - VW 415 A-
- ◆ Pressure washer - VW 447 H-
- ◆ Thrust piece - VW 454-
- ◆ Installing sleeve - VW 455-
- ◆ Drift sleeve - 41-501-



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- ◆ Internal puller - VAS 251 613-, or e.g. internal puller - Kukko 21/6-



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



- ◆ Splitter - VAS 251 411-, or e.g. splitter 22 ... 115 mm - Kukko 17/2-

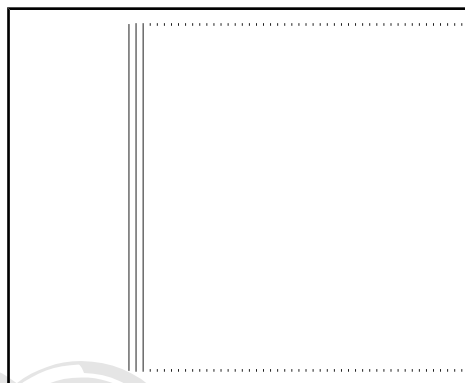


Pulling out small tapered roller bearing outer race

A - Internal puller - VAS 251 613-, or e.g. internal puller - Kukko 21/6-

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

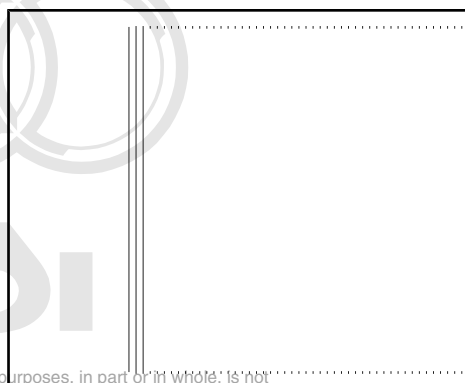
Pressing in small tapered roller bearing outer race



Pulling off small tapered roller bearing inner race

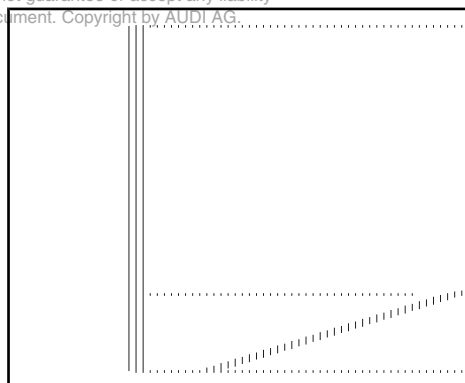
A - Soft jaws/vice

- Fit adapter and apply tension to it behind bearing rollers, then turn bearing and re-tension adapter.



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Pressing on small tapered roller bearing inner race



Pressing off 3rd and 4th gear synchro-hub/locking collar; 2nd, 3rd and 4th speed selector gears with needle bearing sleeve for output shaft

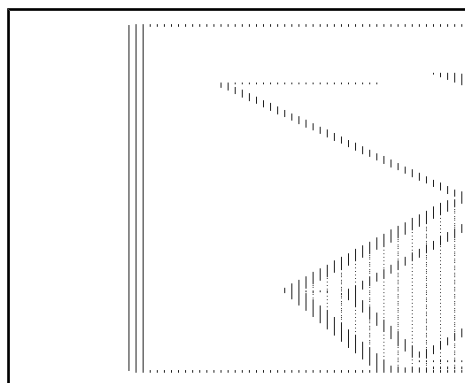
A - Splitter - VAS 251 411- , or e.g. splitter 22 ... 115 mm - Kukko 17/2-

B - Hexagon bolt (M10 x 20), 17 mm



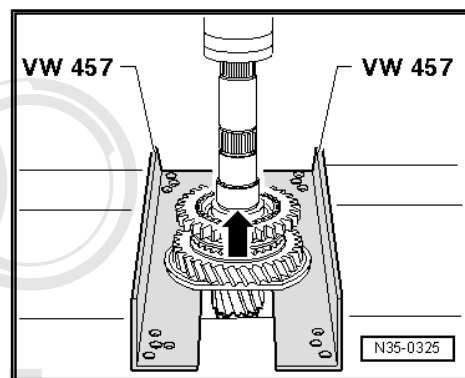
Note

Support splitter so that the 1st and 2nd gear locking collar is not pulled off at the same time.



Pressing off locking collar with synchro-hub and bearing mounting

- First remove circlip -arrow-.

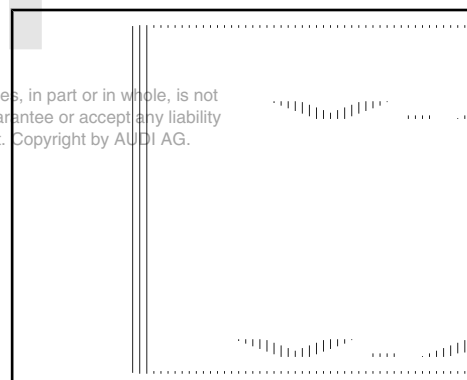


Pulling off large tapered roller bearing inner race

A - Soft jaws

- Before applying puller, insert an M10 x 20 hexagon bolt in output shaft hole.

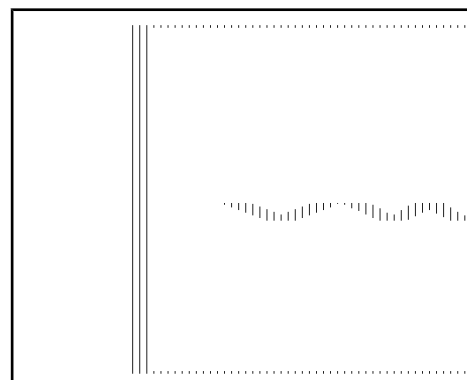
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Pressing on large tapered roller bearing inner race

-A- Thrust washer

- Fit thrust washer before pressing on inner race. Shoulder faces towards inner race.



Installation position of inner ring, outer ring and synchro-ring for 1st gear

- Place inner ring -A- on 1st speed selector gear.

The angled tabs -arrow 1- point towards the outer ring -B-.

- Fit outer ring -B-.

The tabs -arrow 2- lock in the recesses -arrow 3- of the selector gear.

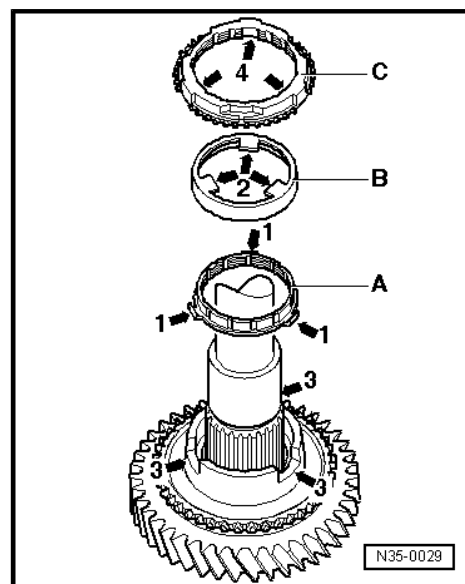
- Fit synchro-ring -C-.

The recesses -arrow 4- locate on the tabs -arrow 1- of the inner ring -A-.



Note

If components are not being renewed, make sure they are re-installed on the same gear.



Checking inner ring for 1st and 2nd 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 and 2nd gear	0.75 ... 1.25 mm	0.3 mm

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Checking 1st and 2nd gear synchro-ring 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 and 2nd gear	1.2 ... 1.8 mm	0.5 mm

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

1 - Spring

Select correct spring from ⇒ Electronic parts catalogue .

Assembling version used together with hollow locking pieces (with internal recess) ⇒ [page 175](#)

Assembling version used together with solid locking pieces (no internal recess) ⇒ [page 175](#)

2 - Locking collar

3 - Synchro-hub

4 - Locking piece

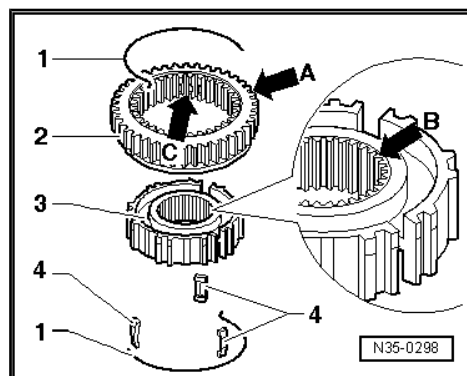
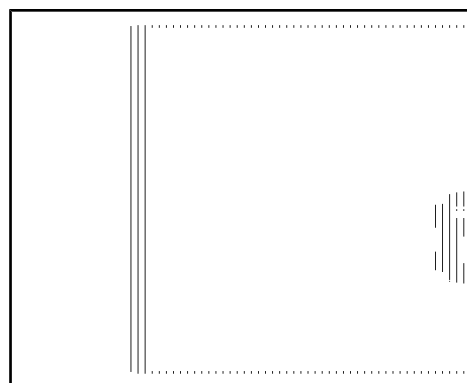
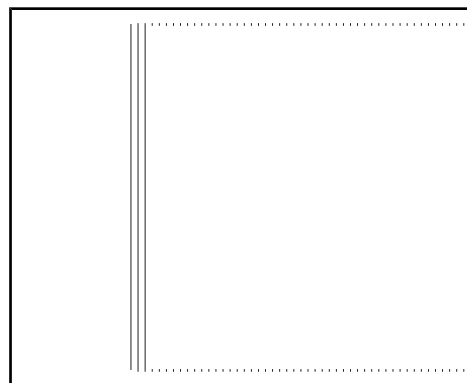
Select locking pieces from ⇒ Electronic parts catalogue .

Shoulders on synchro-hub are of equal width on both sides.

The shoulder on one side is chamfered -arrow B-.

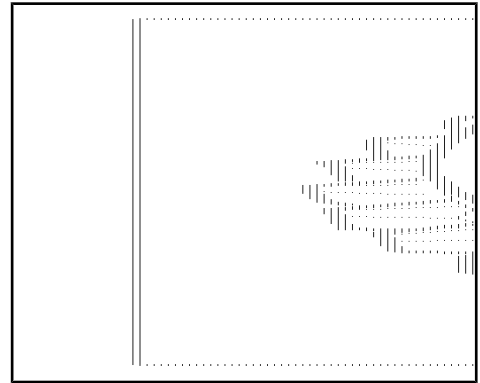
When assembled, the chamfer on the shoulder of the synchro-hub and the external teeth on the locking collar -arrow A- face in the same direction.

The recesses for the locking pieces on synchro-hub and locking collar -arrow C- must align.



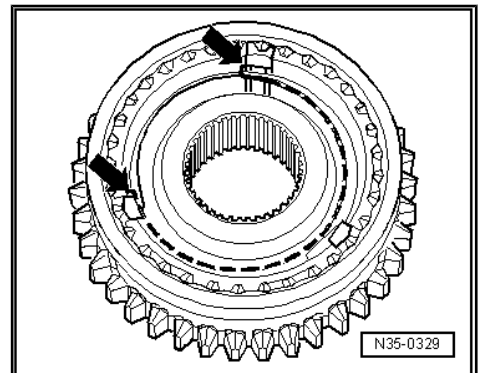
Assembling locking collar/synchro-hub for 1st and 2nd gear (version with hollow locking pieces)

- 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.



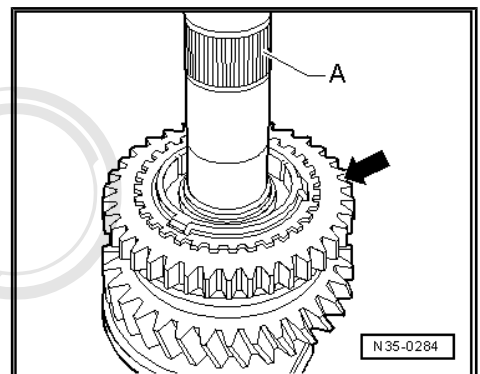
Assembling locking collar/synchro-hub for 1st and 2nd gear (version with solid locking pieces: no internal recess)

- Locking collar is pushed over synchro-hub.
- Insert locking pieces and install springs offset at 120°. Angled ends of spring must be in front of locking pieces -arrows-.



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

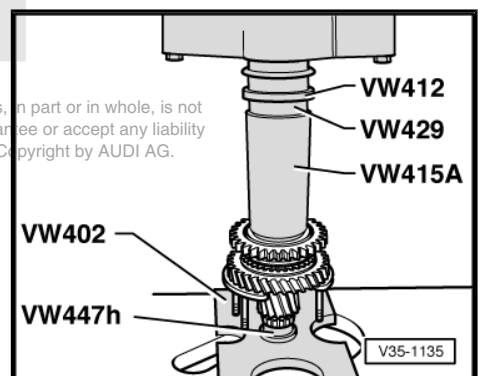
Splines on locking collar -arrow- point to splines for 3rd/4th gear synchro-hub -A-.



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

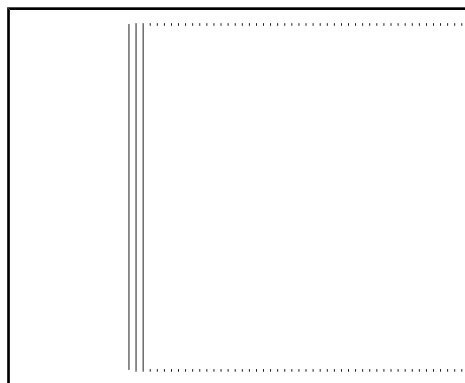
Turn synchro-ring so that grooves align with locking pieces.

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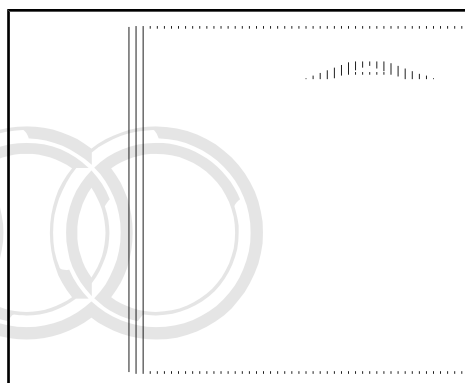
Installation position of 2nd gear outer ring

The lugs -arrows- face towards 1st gear -A-.



Installation position of synchro-ring (inner ring for 2nd gear) -A-

The lugs -arrow 1- locate in the recesses -arrow 2- in the synchro-ring -B-.

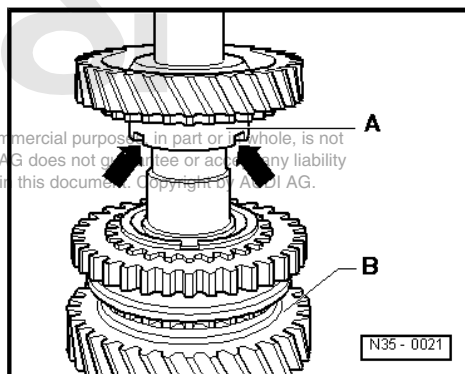


Installation position of 2nd speed selector gear

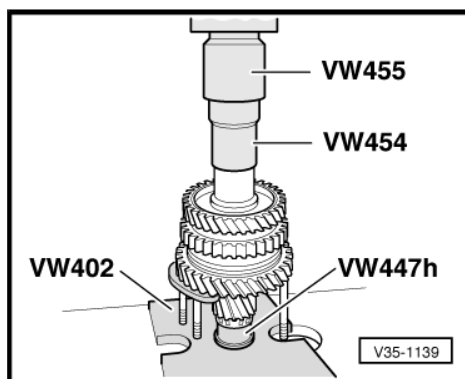
The higher shoulder -A- faces towards 1st gear -B-. The recesses in the shoulder -arrows- engage on the lugs on the outer ring

⇒ [page 176](#) .

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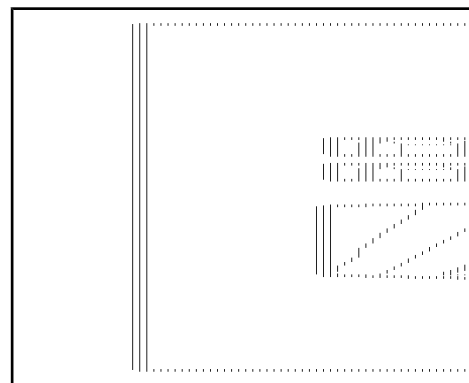
Pressing on sleeve for 3rd gear needle bearing



Checking 3rd and 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
3rd gear/4th gear	1.0 ... 1.7 mm	0.5 mm



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

1 - Spring

Select correct spring from ⇒ Electronic parts catalogue .

Assembling version used together with hollow locking pieces (with internal recess) ⇒ [page 175](#)

Assembling version used together with solid locking pieces (no internal recess) ⇒ [page 175](#)

2 - Locking piece

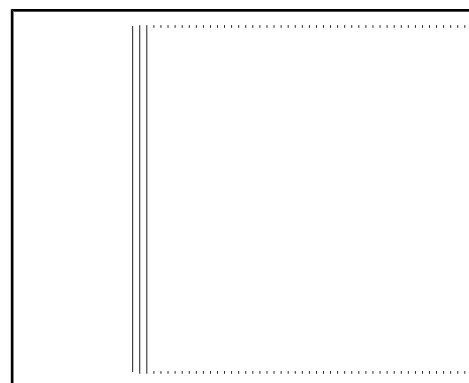
Select locking pieces from ⇒ Electronic parts catalogue

3 - Locking collar

4 - Synchro-hub

- Slide locking collar over synchro-hub.

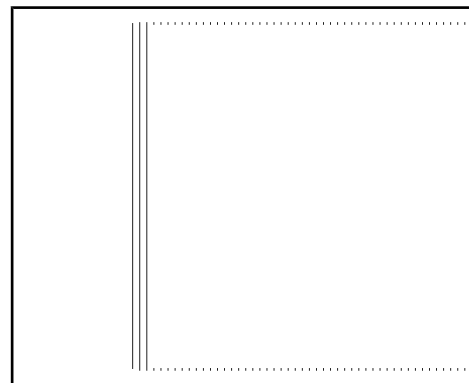
Recesses for locking pieces in synchro-hub and locking collar must align.



Assembling locking collar/synchro-hub for 3rd and 4th gear (version with hollow locking pieces)

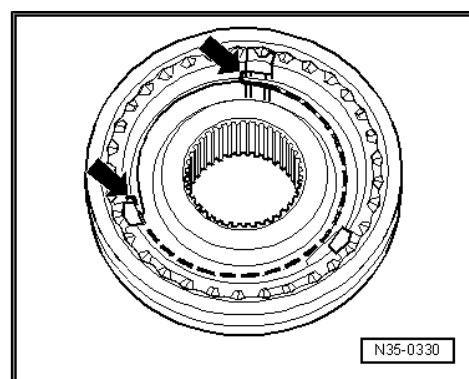
Locking collar is pushed over synchro-hub.

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



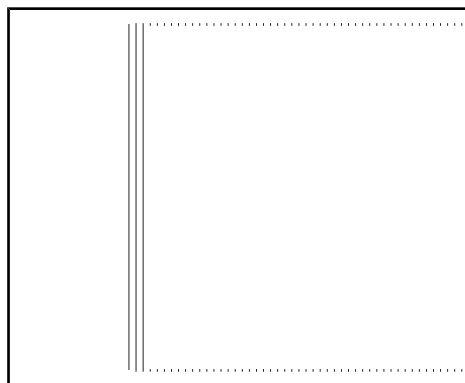
Assembling locking collar/synchro-hub for 3rd and 4th gear (version with solid locking pieces: no internal recess)

- Locking collar is pushed over synchro-hub.
- Insert locking pieces and install springs offset at 120°. Angled ends of spring must be in front of locking pieces -arrows-.

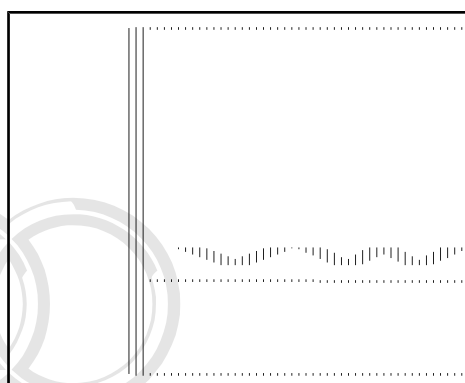


Installation position of 3rd and 4th gear locking collar and synchro-hub

Chamfer -arrow- faces towards 4th gear.

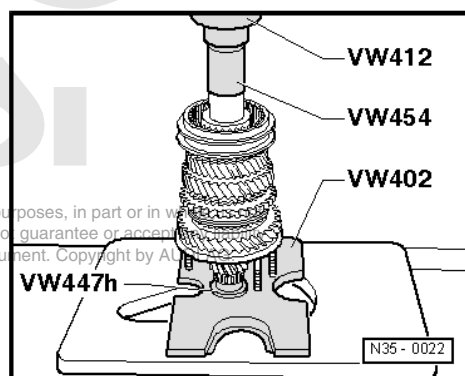


Pressing on 3rd and 4th gear synchro-hub with locking collar

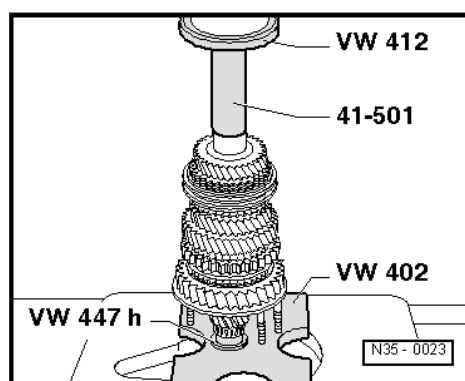


Pressing on sleeve for 4th gear needle bearing

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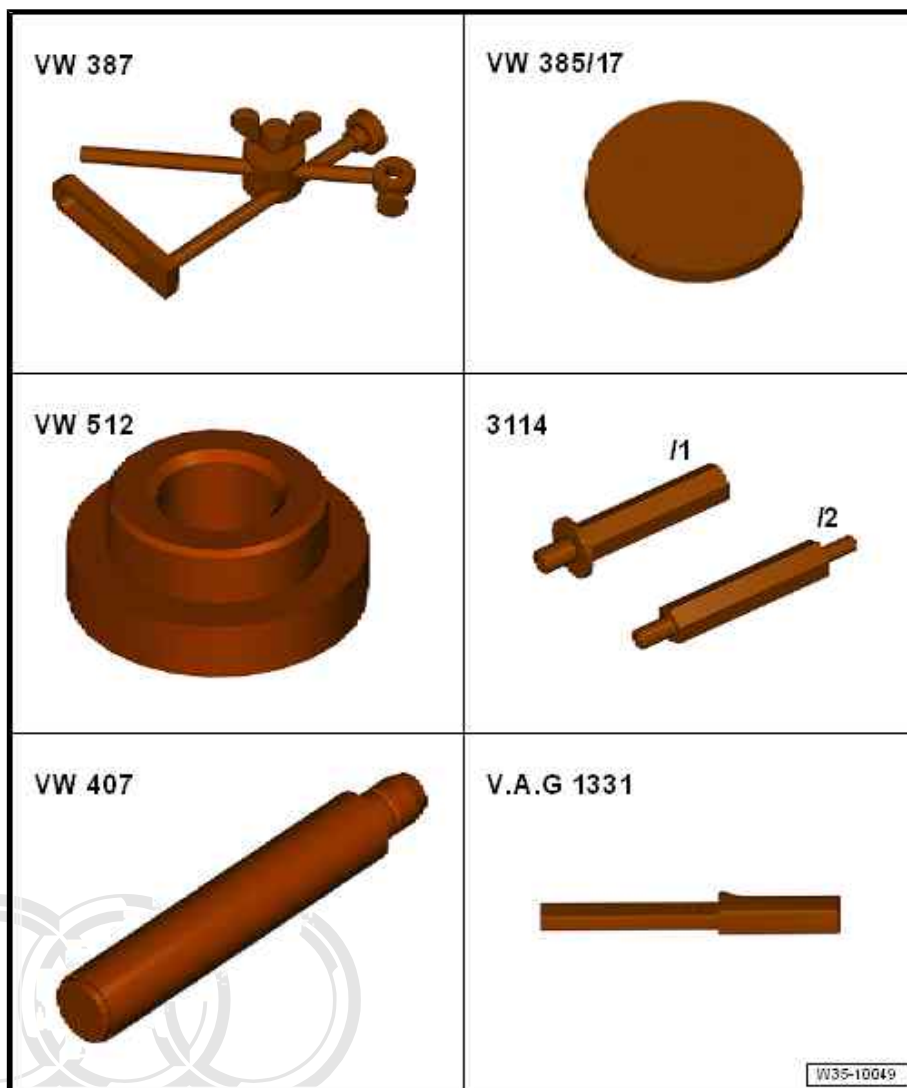
Pressing on sleeve for needle bearing/output shaft



2.3 Adjusting output shaft

(Determining thickness of output shaft shim)

Special tools and workshop equipment required



- ◆ Universal dial gauge bracket - VW 387-
- ◆ End measuring plate - VW 385/17-
- ◆ Thrust pad - VW 512-
- ◆ Straightening tool - 3114/2-
- ◆ Press tool - VW 407-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Dial gauge

- ◆ Internal puller - VAS 251 613- , or e.g. internal puller - Kukko 21/6-



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



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

- ◆ Final drive gear set
- ◆ Clutch housing

Or

- ◆ Tapered roller bearings

Table of adjustments ⇒ [page 207](#)

Requirements:

- Sealing surfaces of clutch and gearbox housings must be free of sealant .

Note distinction between tapered roller bearings

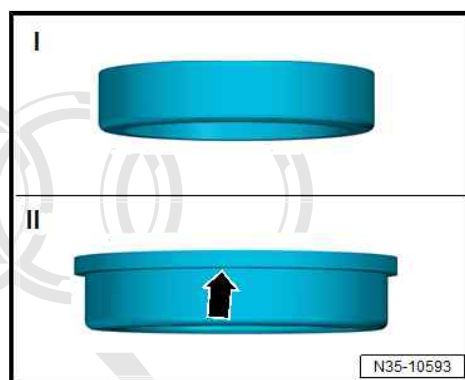
- ◆ I = Tapered roller bearing outer race without shoulder
- ◆ II = Tapered roller bearing outer race with shoulder -arrow-

Tapered roller bearing outer race without shoulder

- Press small tapered roller bearing outer race together with 0.60 mm shim onto stop in clutch housing ⇒ [page 172](#) .

Tapered roller bearing outer race with shoulder

- Press small tapered roller bearing outer race together with 0.65 mm shim onto stop in clutch housing ⇒ [page 172](#) .



All versions (continued):

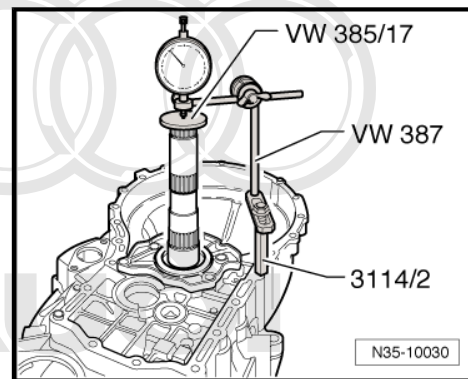
- Insert output shaft and tighten nuts for bearing mounting
⇒ [Item 11 \(page 114\)](#).
- Turn output shaft approx. 20 to 30 turns in one direction.



Note

- ◆ *The output shaft has to be turned in one direction to seat the rollers in the tapered roller bearing in one direction.*
- ◆ *This requires 20 to 30 turns.*
- ◆ *If this is neglected, the measurement will not be correct.*

- Mount dial gauge (3 mm measuring range) and set to "0" with 1 mm preload.
- Move output shaft up and down and read off and note play indicated on dial gauge.



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Determining thickness of shim

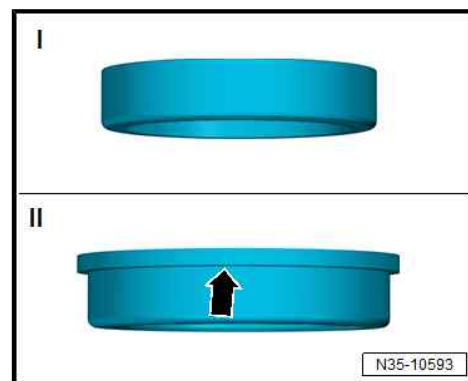
The specified bearing preload is obtained by adding the measured value to the thickness of the shim installed (0.65 mm or 0.60 mm).

Tapered roller bearing outer race without shoulder = item -I-.

Example	
Bearing clearance = (shim 0.600 mm + measured value 0.330 = 0.930 mm)	Thickness of shim according to table
0.930 mm	1.000 mm

Table of shims

Measured value	Thickness of shim (mm)
... 0.000	0.600
0.000 ... 0.629	0.650
0.630 ... 0.679	0.700
0.680 ... 0.729	0.750
0.730 ... 0.779	0.800
0.780 ... 0.829	0.850
0.830 ... 0.879	0.900
0.880 ... 0.929	0.950
0.930 ... 0.979	1.000
0.980 ... 1.029	1.050
1.030 ... 1.079	1.100
1.080 ... 1.129	1.150
1.130 ... 1.179	1.200
1.180 ... 1.229	1.250
1.230 ... 1.279	1.300
1.280 ... 1.329	1.350
1.330 ... 1.342	1.400

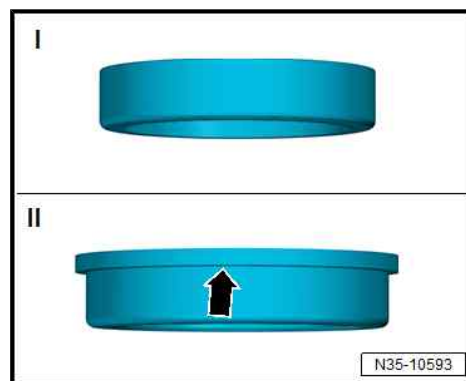


Tapered roller bearing outer race with shoulder -arrow- = item -II-.

Example	
Bearing clearance = (shim 0.650 mm + measured value 0.230 = 0.880 mm)	Thickness of shim according to table
0.880 mm	0.950 mm

Table of shims

Measured value	Thickness of shim (mm)
... 0.000	0.650
0.000 ... 0.679	0.700
0.680 ... 0.729	0.750
0.730 ... 0.779	0.800
0.780 ... 0.829	0.850
0.830 ... 0.879	0.900
0.880 ... 0.929	0.950
0.930 ... 0.979	1.000
0.980 ... 1.029	1.050
1.030 ... 1.079	1.100
1.080 ... 1.129	1.150
1.130 ... 1.179	1.200
1.180 ... 1.229	1.250
1.230 ... 1.279	1.300
1.280 ... 1.329	1.350
1.330 ... 1.379	1.400
1.380 ... 1.429	1.450



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All vehicles (continued)



Note

Select correct shims from ⇒ *Electronic parts catalogue*.

- Remove output shaft and pull out small tapered roller bearing outer race ⇒ [page 171](#).
- Insert shim(s) of correct thickness. Where two shims are inserted, insert thickest first.
- If the original shim is to be refitted, check the shim for damage.
- Press in small tapered roller bearing outer race together with the correct shim ⇒ [page 172](#) and install output shaft.
- Tighten nut for bearing mounting in clutch housing.

Tightening torques

- ◆ Bearing mounting to clutch housing ⇒ [Item 11 \(page 114\)](#)

3 Reverse shaft

⇒ [“3.1 Exploded view - reverse shaft”, page 183](#)

⇒ [“3.2 Dismantling and assembling reverse shaft”, page 184](#)

3.1 Exploded view - reverse shaft



Note

After removal, always renew needle bearings in clutch housing and in reverse shaft support.

1 - Clutch housing

2 - Needle bearing

- ☐ Pulling out ⇒ [page 185](#)
- ☐ Pressing in
⇒ [page 185](#)

3 - Reverse gear wheel

4 - Circlip

- ☐ Always renew if removed

5 - Reverse selector gear

- ☐ Remove circlip before renewing
- ☐ Shoulder faces towards reverse gear wheel

6 - Reverse shaft

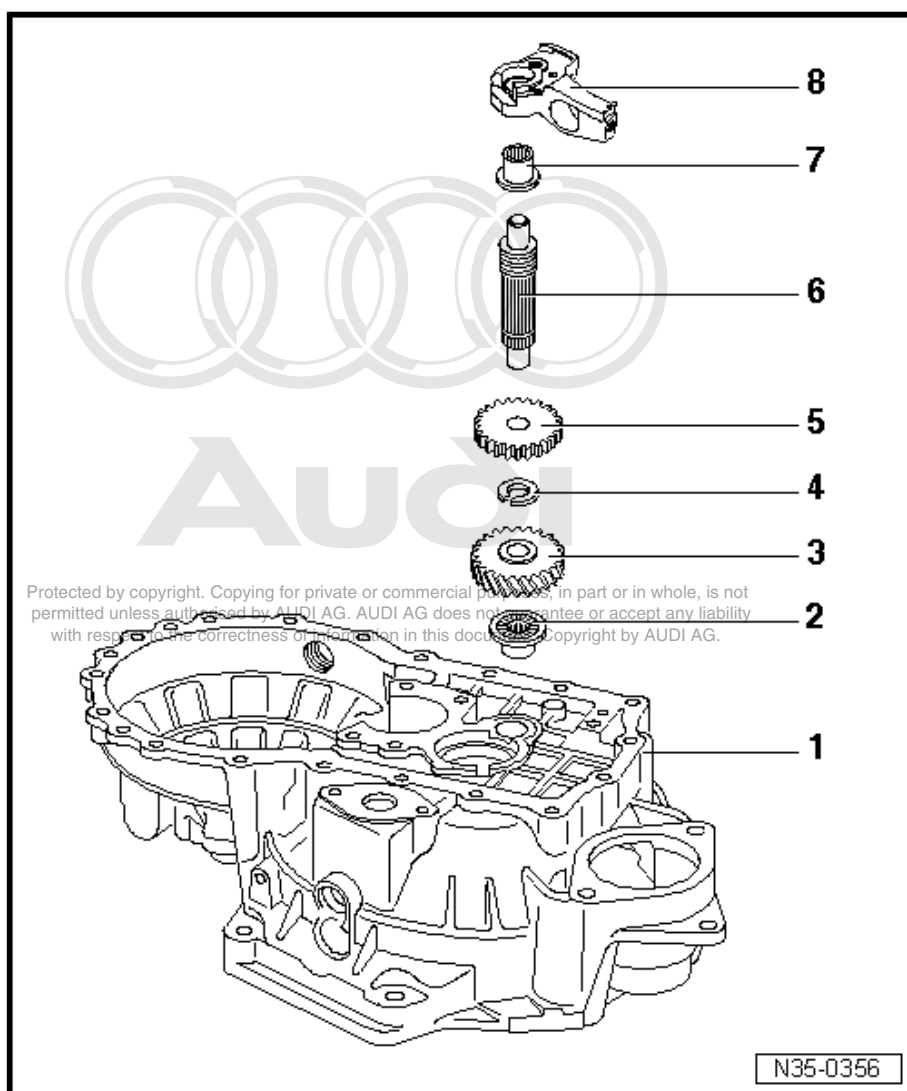
- ☐ Removing ⇒ [page 128](#)

7 - Needle bearing

- ☐ Pressing out
⇒ [page 186](#)
- ☐ Pressing in
⇒ [page 186](#)

8 - Reverse shaft support

- ☐ Removing and installing
⇒ [page 128](#)



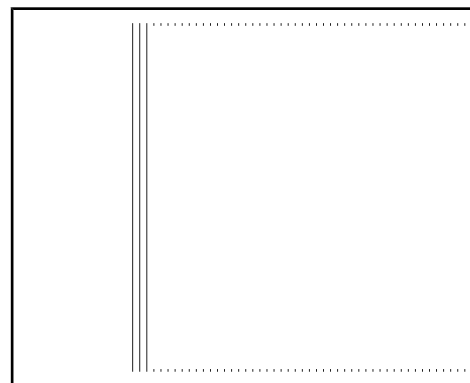
3.2 Dismantling and assembling reverse shaft

Special tools and workshop equipment required



- ◆ Thrust piece - VW 454-
- ◆ Pressure washer - VW 447 H-
- ◆ Press tool - VW 411-
- ◆ Centring mandrel - 12 - 551-
- ◆ Thrust plate - VW 401-
- ◆ Press tool - VW 408 A-

- ◆ Internal puller - VAS 251 605- , or e.g. internal puller - Kukko 21/2-



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



Pulling needle bearing out of clutch housing

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

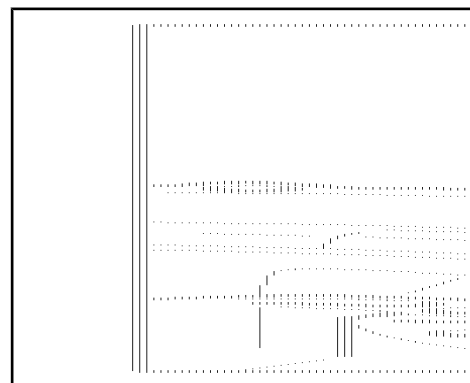
B - Internal puller - VAS 251 605- , or e.g. internal puller - Kukko 21/2-

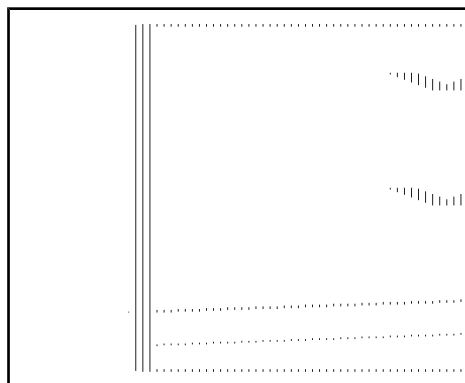
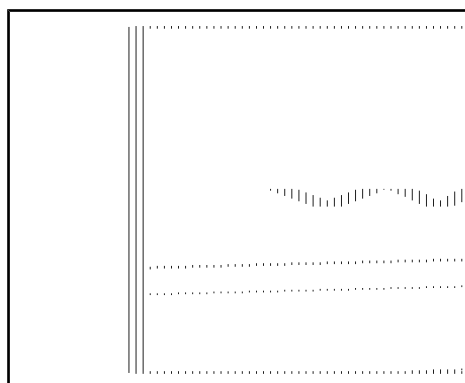


Note

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

Pressing needle bearing -A- into clutch housing



Pressing needle bearing out of reverse shaft support**Pressing needle bearing into reverse shaft support**

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39 – Final drive - front differential

1 Oil seals

⇒ [“1.1 Overview of fitting locations - oil seals”, page 187](#)

⇒ [“1.2 Renewing oil seal \(left-side\)”, page 187](#)

⇒ [“1.3 Renewing oil seal \(right-side\)”, page 189](#)

1.1 Overview of fitting locations - oil seals

1 - Oil seal

- ☐ For input shaft
- ☐ Renewing ⇒ [page 163](#)

2 - Oil seal

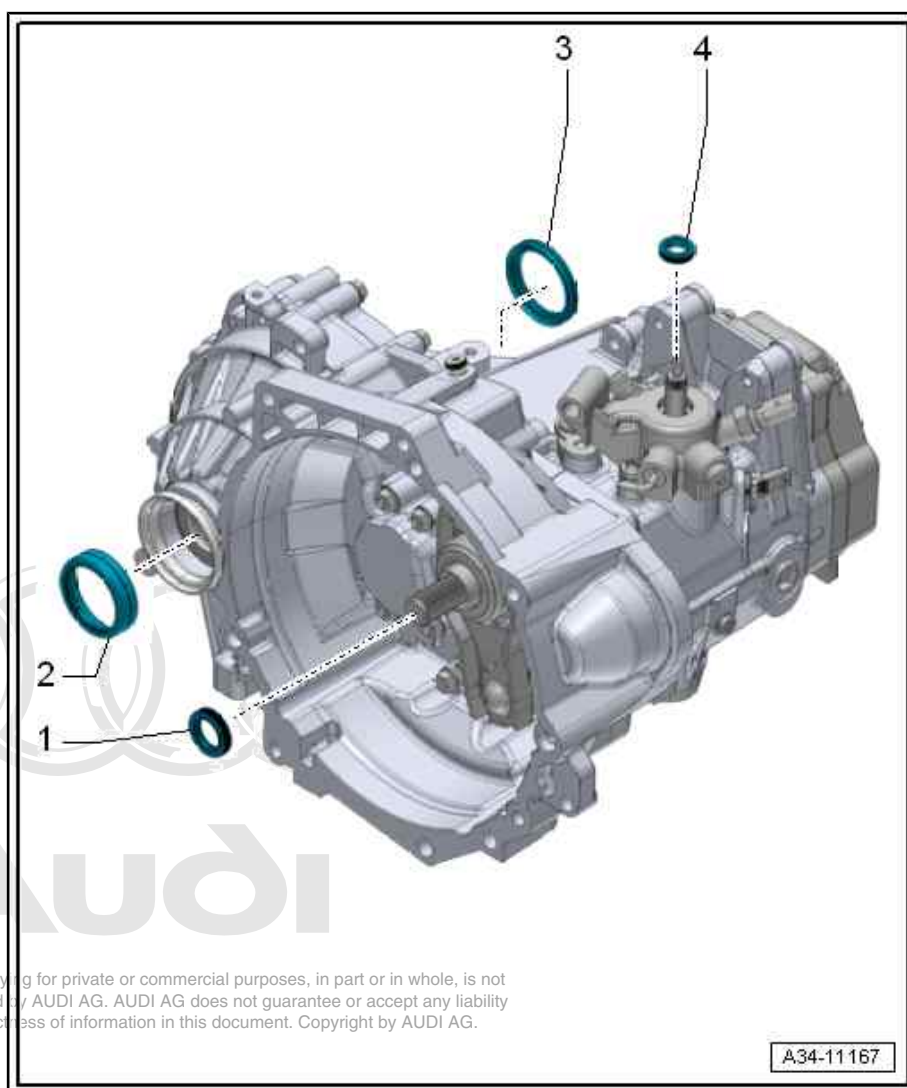
- ☐ With sleeve
- ☐ For flange shaft (right-side)
- ☐ Renewing ⇒ [page 189](#)

3 - Oil seal

- ☐ For flange shaft (left-side)
- ☐ Renewing ⇒ [page 187](#)

4 - Oil seal

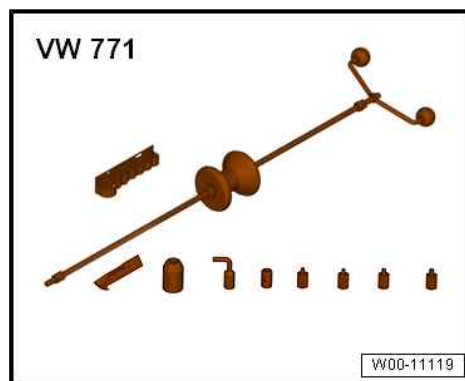
- ☐ For selector shaft
- ☐ Renewing ⇒ [page 79](#)



1.2 Renewing oil seal (left-side)

Special tools and workshop equipment required

◆ Multi-purpose tool - VW 771-



◆ Extractor hook -VW 771/37-

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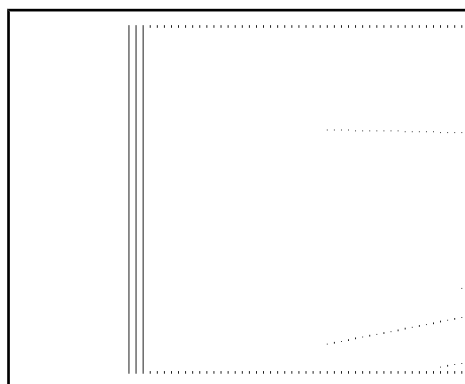
◆ Thrust piece - T10160-



◆ Sealing grease - G 052 128 A1-

Procedure

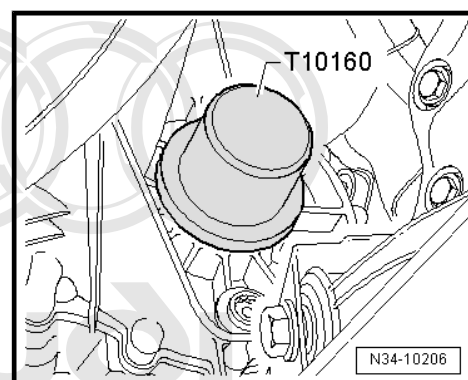
- Remove flange shaft (left-side) ⇒ [page 203](#) .
- Pull out flange shaft oil seal using multi-purpose tool - VW 771- and extractor hook -VW 771/37- .
- Clean contact surface and sealing surface.



- 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- .



- Drive in oil seal onto stop using thrust piece - T10160- . Take care to keep seal straight when installing.
- Install flange shaft (left-side) ⇒ [page 203](#) .
- Check oil level in gearbox and top up with gear oil if necessary ⇒ [page 103](#) .

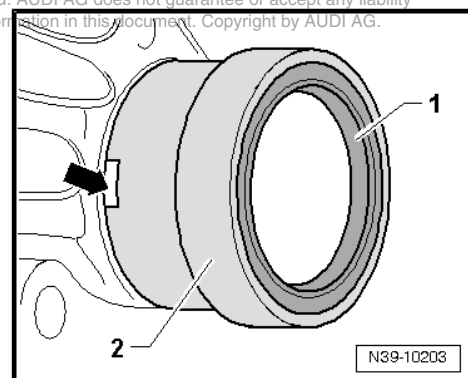


1.3 Renewing oil seal (right-side)

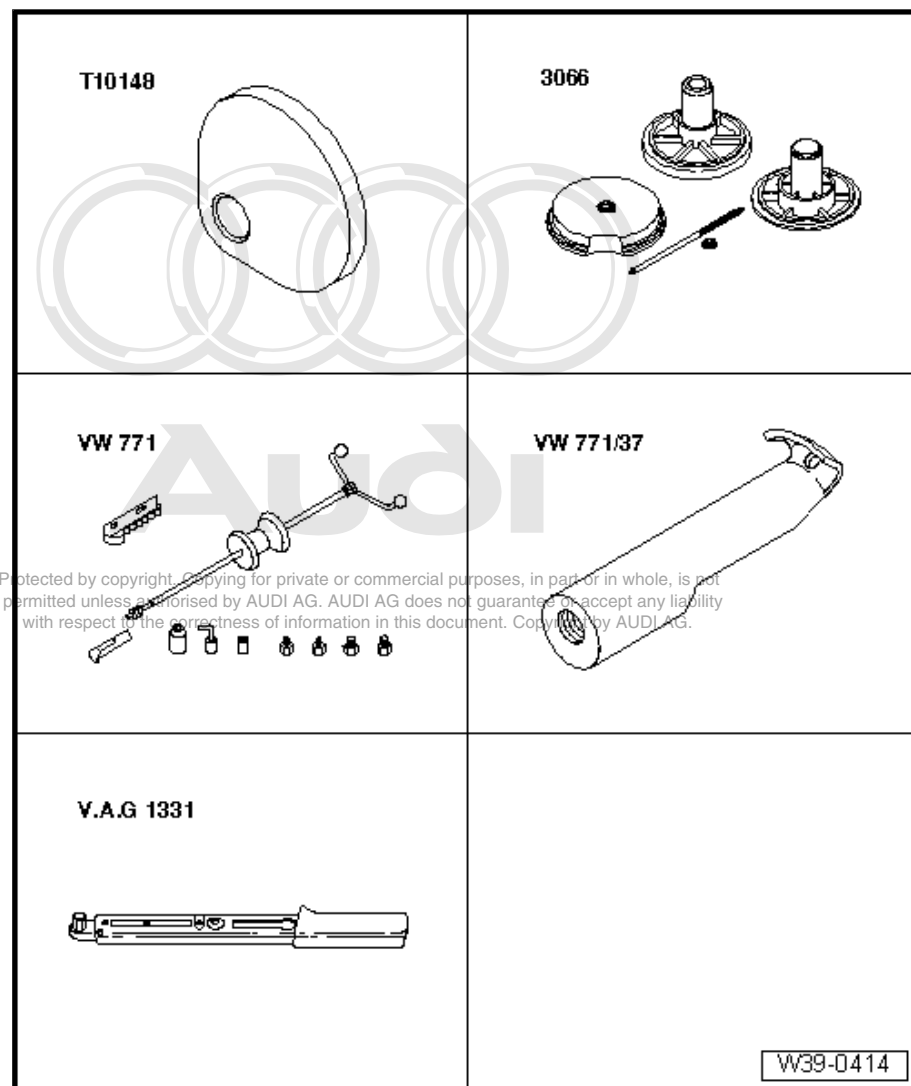


Note

Oil seal -1- and sleeve -2- are combined as one unit and cannot be separated.



Special tools and workshop equipment required



- ◆ Thrust piece - T10148-
- ◆ Spindle from assembly device - 3066-
- ◆ Multi-purpose tool - VW 771-
- ◆ Extractor hook - VW 771/37-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Nut M12
- ◆ Sealing grease - G 052 128 A1-

Procedure

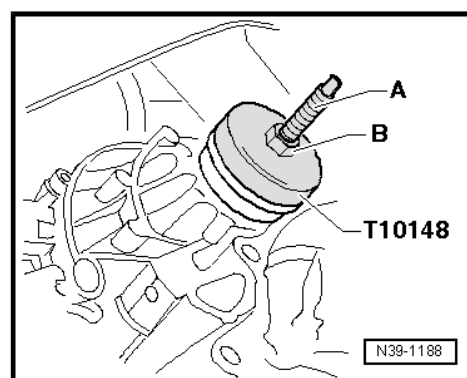
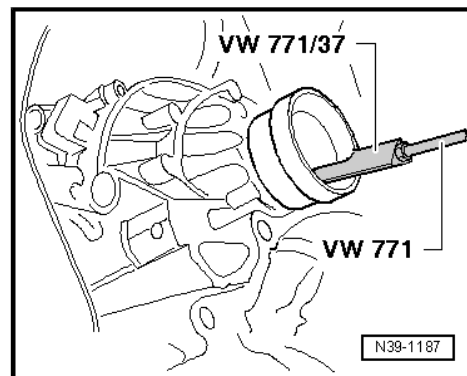
- Remove flange shaft (right-side) ⇒ [page 204](#) .
- Pull out flange shaft oil seal together with sleeve.



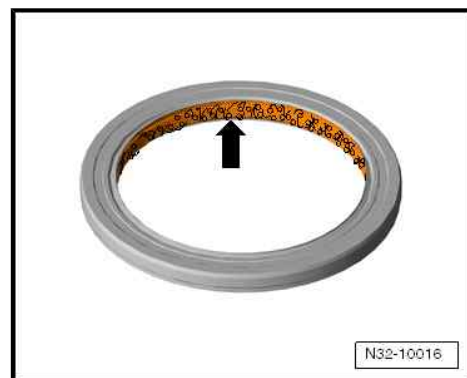
Note

A shoulder is located on inside diameter of sleeve.

- Position extractor hook - VW 771/37- immediately behind shoulder inside sleeve.
- While pulling out, press extractor hook -VW 771/37- firmly in against sleeve.
- Clean contact surface and sealing surface.
- Screw spindle -A- from assembly device - 3066- into threaded piece in differential.
- Draw in oil seal with sleeve as far as stop using thrust piece - T10148- by turning M12 nut -item B-.



- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .
- Install flange shaft (right-side) ⇒ [page 204](#) .
- Check oil level in gearbox and top up with gear oil if necessary ⇒ [page 103](#) .



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2 Differential

⇒ "2.1 Exploded view - differential", page 192

⇒ "2.2 Dismantling and assembling differential", page 194

⇒ "2.3 Adjusting differential", page 200

⇒ "2.4 Removing and installing flange shaft (left-side)", page 203

⇒ "2.5 Removing and installing flange shaft (right-side)", page 204

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 ⇒ [page 207](#) if tapered roller bearings, differential cage, gearbox housing or clutch housing are being renewed.

1 - Gearbox housing

2 - Shim

- ☐ For differential
- ☐ Determining thickness
⇒ [page 200](#)

3 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 197](#)
- ☐ Pressing in
⇒ [page 198](#)

4 - Tapered roller bearing inner race

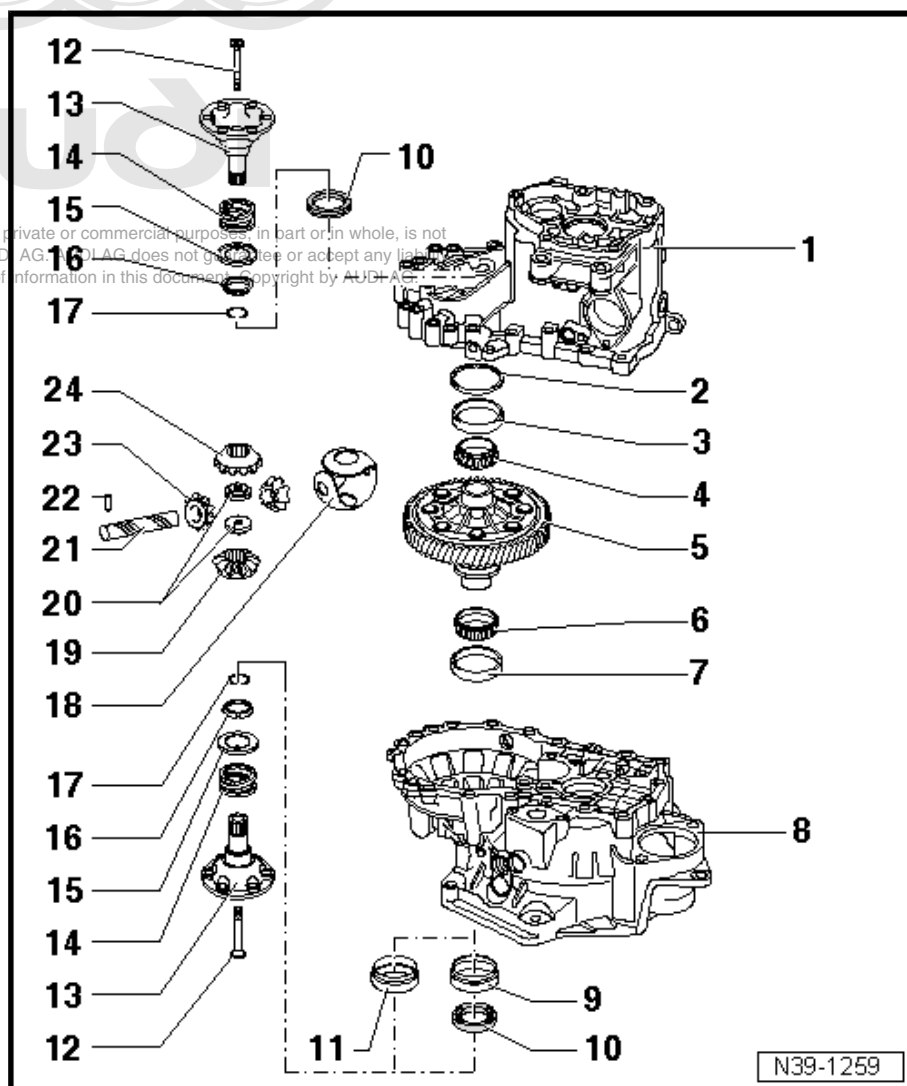
- ☐ Pulling off ⇒ [page 197](#)
- ☐ Pressing on
⇒ [page 197](#)

5 - Differential cage

- ☐ With final drive gear
- ☐ Differential cage is matched to one-piece thrust washer
⇒ [page 199](#)
- ☐ Hole for spring pin is matched to length of spring pin ⇒ [page 198](#)
- ☐ Allocate according to ⇒ Electronic parts catalogue

6 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 197](#)
- ☐ Pressing on
⇒ [page 197](#)



7 - Tapered roller bearing outer race

- ☐ Pressing out ⇒ [page 196](#)
- ☐ Pressing in ⇒ [page 197](#)

8 - Clutch housing

9 - Sleeve

- ☐ Not a separate part
- ☐ One-piece oil seal and sleeve ⇒ [Item 11 \(page 193\)](#)

10 - Oil seal

- ☐ Not a separate part
- ☐ One-piece oil seal and sleeve ⇒ [Item 11 \(page 193\)](#)

11 - One-piece oil seal and sleeve

- ☐ If oil seal is damaged, renew both sleeve and oil seal ⇒ [page 189](#)

12 - Countersunk bolt

- ☐ 25 Nm
- ☐ Screws into threaded piece ⇒ [Item 20 \(page 193\)](#)

13 - Flange shaft

- ☐ Removing and installing ⇒ [page 187](#)

14 - Spring for flange shaft

- ☐ Installed behind flange shafts

15 - Thrust washer

- ☐ Installation position ⇒ [page 200](#)

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 - One-piece thrust washer

- ☐ Lubricate with gear oil before installing
- ☐ One-piece thrust washer has a projection on some versions ⇒ [page 199](#)

19 - Sun wheel

- ☐ Installing ⇒ [page 199](#)
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20 - Threaded piece

- ☐ Installing ⇒ [page 199](#)

21 - Differential pinion pin

- ☐ Removing in conjunction with short spring pin ⇒ [page 198](#)
- ☐ Removing in conjunction with long spring pin ⇒ [page 199](#)
- ☐ Installing ⇒ [page 199](#)

22 - Clamping sleeve

- ☐ For securing differential pinion pin
- ☐ Spring pins of two different lengths are fitted
- ☐ Identification of different types of spring pin ⇒ [page 198](#)
- ☐ Short spring pin: removing and installing ⇒ [page 198](#)
- ☐ Long spring pin: is sheared off on removal ⇒ [page 199](#)
- ☐ Long spring pin: installing ⇒ [page 199](#)

23 - Planet pinion

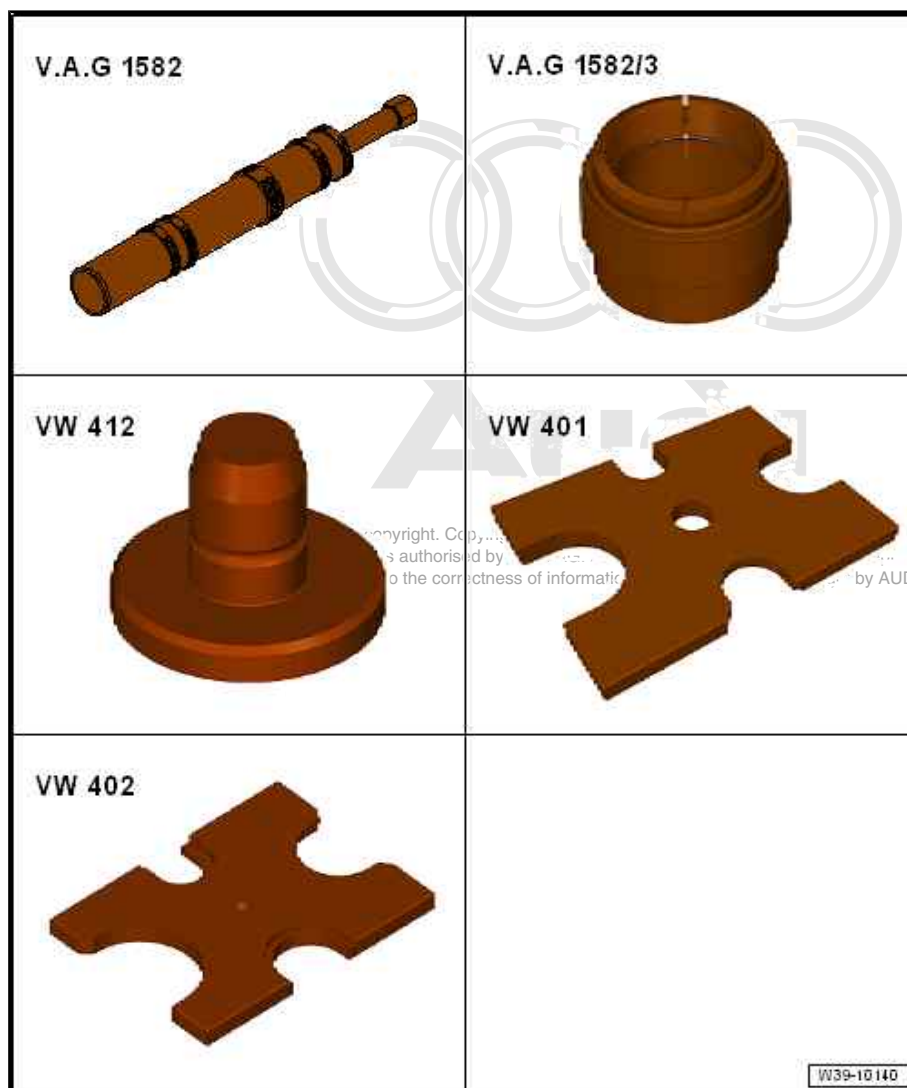
- ☐ Installing ⇒ [page 199](#)

24 - Sun wheel

- Installing ⇒ [page 199](#)

2.2 Dismantling and assembling differential

Special tools and workshop equipment required

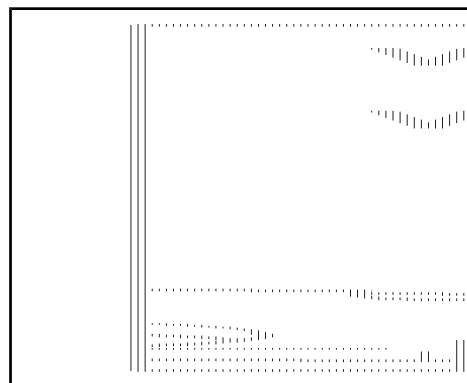
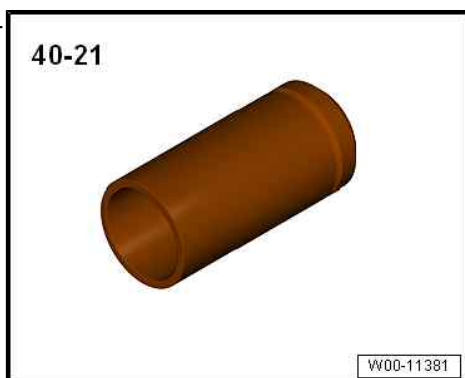


- ◆ Tapered roller bearing puller - V.A.G 1582-
- ◆ Adapter - V.A.G 1582/3-
- ◆ Press tool - VW 412-
- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-

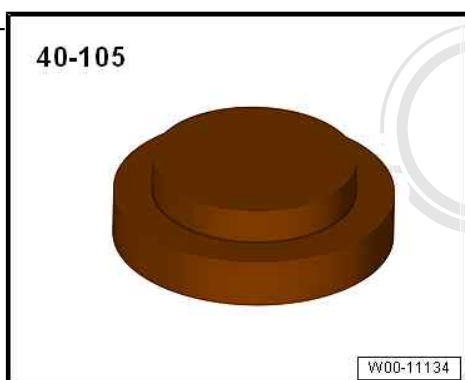


- ◆ Press tool - VW 408 A-
- ◆ Thrust piece - VW 473-
- ◆ Thrust plate - 30 - 205-
- ◆ Sleeve - 3144-
- ◆ Thrust piece - 2007-
- ◆ Torque wrench - V.A.G 1332-

- ◆ Drift sleeve - 40 - 21-



- ◆ Thrust plate - 40-105-



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



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

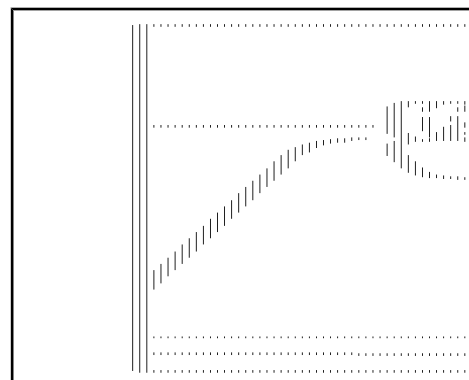


Pressing tapered roller bearing outer race out of clutch housing

- First remove sleeve together with oil seal for flange shaft.

Pressing tapered roller bearing outer race into clutch housing

No shim is installed on the clutch housing side.



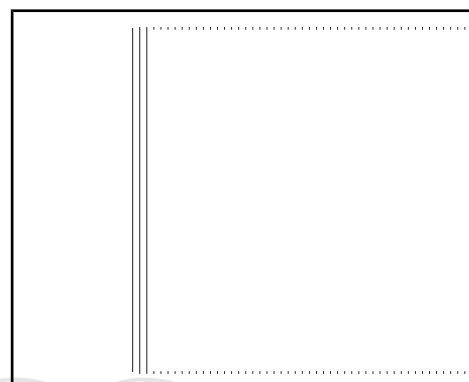
Pulling off tapered roller bearing inner races

- Before setting up the 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.

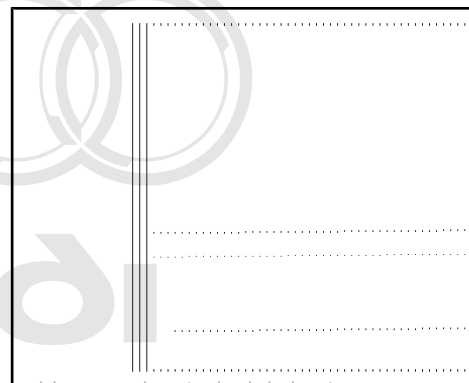


Pressing on tapered roller bearing inner races



Note

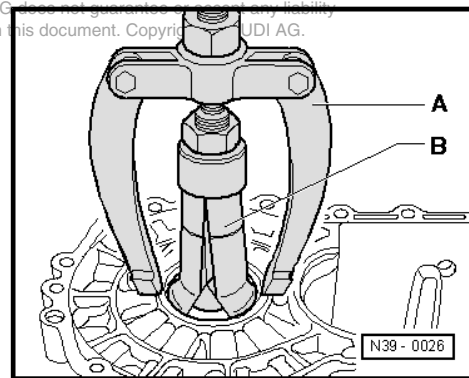
The same special tools are used for pressing on tapered roller bearing inner races for gearbox housing and clutch housing.



Pulling tapered roller bearing outer race out of gearbox housing

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

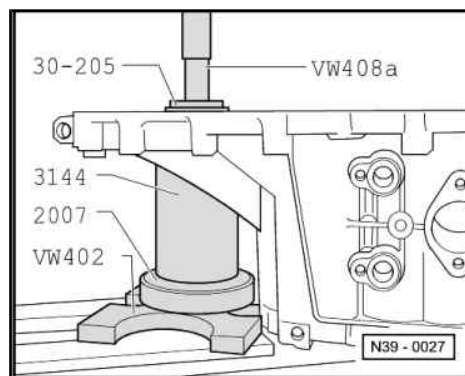
B - Internal puller - VAS 251 615- , or e.g. internal puller - Kukko 21/7-



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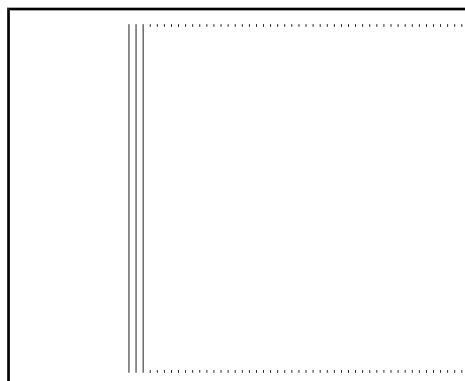
Pressing tapered roller bearing outer race into gearbox housing

- Fit shim below outer race.
- Support gearbox housing with sleeve - 3144- directly below bearing mounting.



Identification of different types of spring pin

Dimension "a" (mm)	Identification
28.5 (short spring pin), removing and installing ⇒ page 198	Annular groove -arrows-
36.0 (long spring pin), removing ⇒ page 199 , installing ⇒ page 199	No annular groove

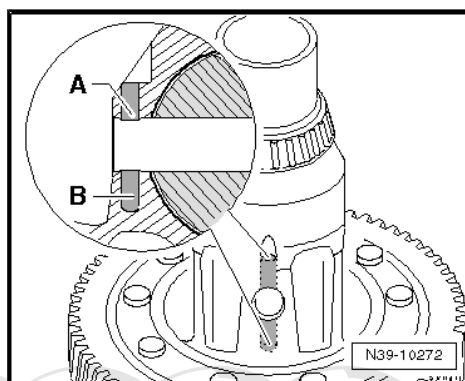


Identification of differential cage

- Check drilling for spring pin in differential cage.

The drilling in the differential cage has been modified to accommodate the longer spring pin.

Hole	Length of spring pin (mm)
-A-	28.5 (short spring pin)
-A- and -B-	36.0 (long spring pin)



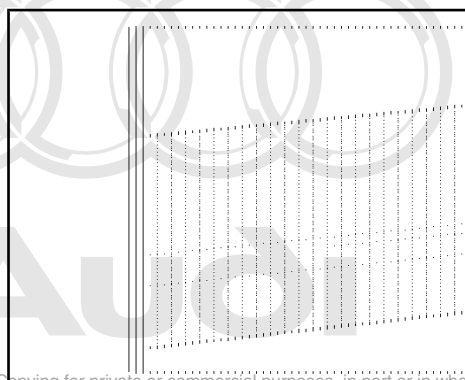
Spring pin with annular groove (short spring pin): removing and installing

Removing

- Cover up tapered roller bearing inner race and speedometer drive wheel to keep out metal particles and to prevent damage.
- Drive out spring pin with chisel, inserting chisel into annular groove.

Installing

- Drive fully into differential cage.

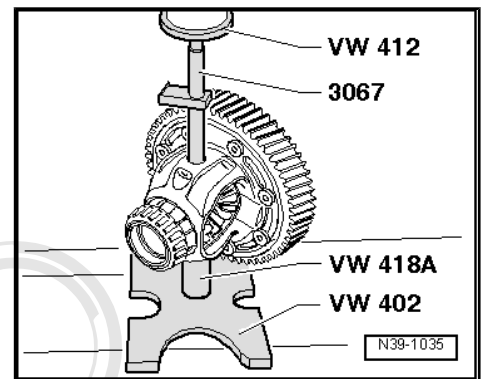


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Removing spring pin without annular groove (long spring pin): press out differential pinion pin.

The spring pin is sheared off when it is pressed out.

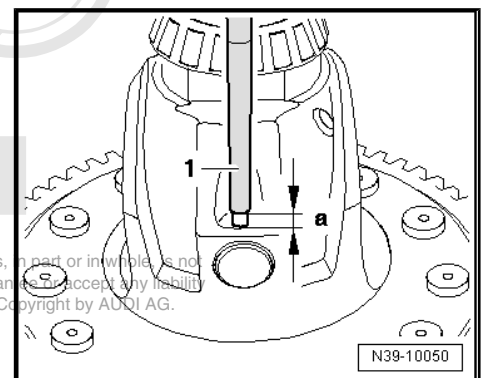
- Drive the remaining part of the spring pin out of the differential cage.



Installing spring pin without annular groove (long spring pin)

- Align hole in differential pinion pin with drilling in differential cage.
- Use a punch -1- to drive in new spring pin to dimension -a- = 3.0 mm.
- The spring pin must not come into contact with the gearbox when the differential cage is installed.

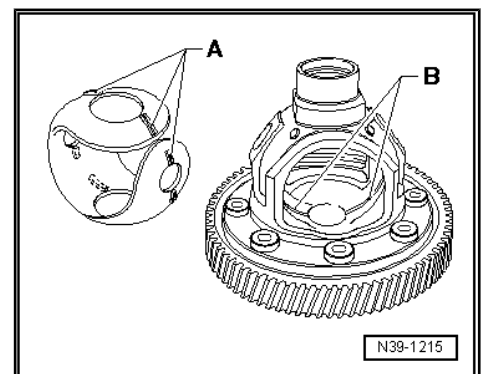
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On some versions the one-piece thrust washer has a projection next to the holes -A-.

In this case the differential cage has a corresponding annular slot -B-.

- Lubricate one-piece thrust washer with gear oil and install.
- Position one-piece thrust washer so it engages in slot -B- in differential cage.

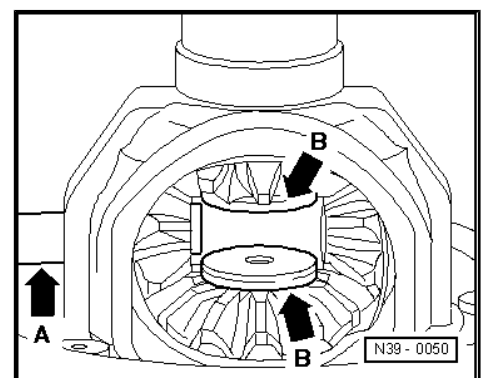


Installing differential bevel gears and differential pinion pin

- 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.

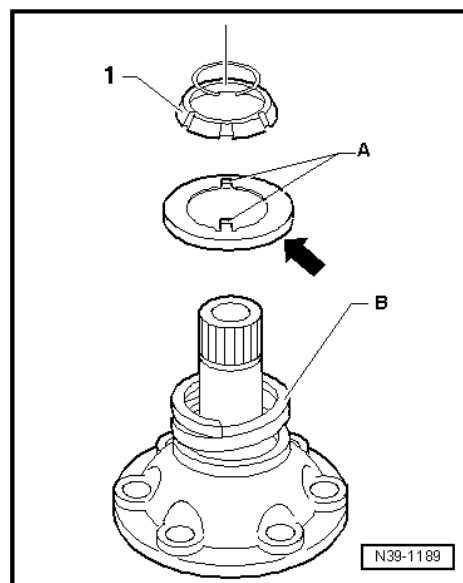


Installation position of thrust washer for tapered ring -1-

Collar -arrow- faces spring -B-.

Some gearbox versions have projections -A-.

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



2.3 Adjusting differential

Special tools and workshop equipment required

VW 385/17



VW 387



VW 407



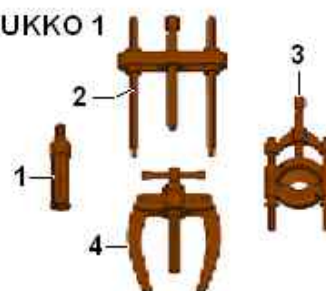
30-205



V.A.G 1331



KUKKO 1



W39-10 133

◆ Universal dial gauge bracket - VW 387-

- ◆ End measuring plate - VW 385/17-
- ◆ Press tool - VW 407-
- ◆ Thrust plate - 30 - 205-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Internal puller - VAS 251 615- -1-, or e.g. internal puller - Kukko 21/7-
- ◆ Counter-support - VAS 251 623- -4-, or e.g. counter-support - Kukko 22/2-
- ◆ Dial gauge

The differential has to be readjusted when the following components are renewed:

- ◆ Gearbox housing
- ◆ Clutch housing
- ◆ Differential cage
- ◆ Tapered roller bearings for differential

Table of adjustments ⇒ [page 207](#)

- Press tapered roller bearing outer race without shim into gearbox housing using thrust plate - 30 - 205- ⇒ [page 198](#)



Note

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

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- Press tapered roller bearing outer race into clutch housing ⇒ [page 197](#) using thrust plate - 30 - 205- .
- Install differential in clutch housing.
- Place gearbox housing in position and tighten 5 bolts to 25 Nm.

- Attach dial gauge and set to “0” with a preload of 1 mm.
- Move differential up and down and read off and note play indicated on dial gauge. (0.70 mm in this example.)

Select required shim from table

Example:

Bearing clearance (measured value)	Thickness of shim according to table
0.70 mm	0.95 mm

Table of shims

Bearing clearance	Shim
Measured value (mm)	Thickness (mm)
0.303 ... 0.449	0.650
0.450 ... 0.499	0.700
0.500 ... 0.549	0.750
0.550 ... 0.599	0.800
0.600 ... 0.649	0.850
0.650 ... 0.699	0.900
0.700 ... 0.749	0.950
0.750 ... 0.799	1.000
0.800 ... 0.849	1.050
0.850 ... 0.899	1.100
0.900 ... 0.949	1.150
0.950 ... 0.999	1.200
1.000 ... 1.049	1.250
1.050 ... 1.099	1.300
1.100 ... 1.149	1.350
1.150 ... 1.199	1.400



Note

- ♦ Select correct shims from ⇒ *Electronic parts catalogue*.
- ♦ Tolerance variations make it possible to obtain the exact shim thickness required.
- Detach gearbox housing and pull tapered roller bearing outer race out of gearbox housing.

Pulling tapered roller bearing outer race out of gearbox housing

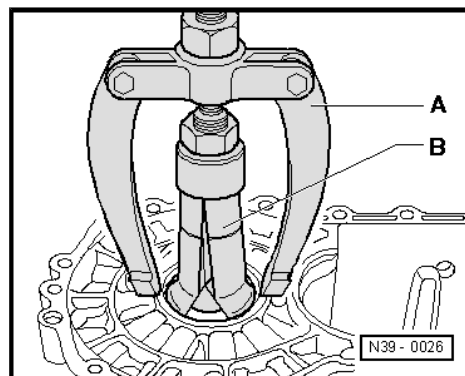
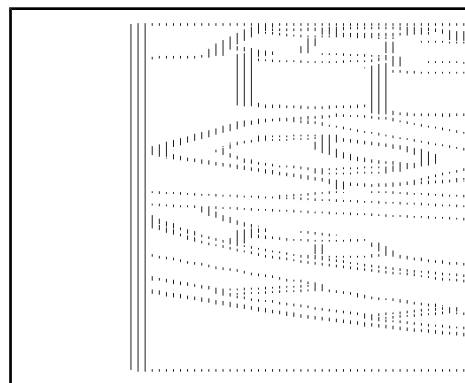
A - Counter-support - VAS 251 623- , or e.g. counter-support - Kukko 22/2-

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

- Insert shim of correct thickness.

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

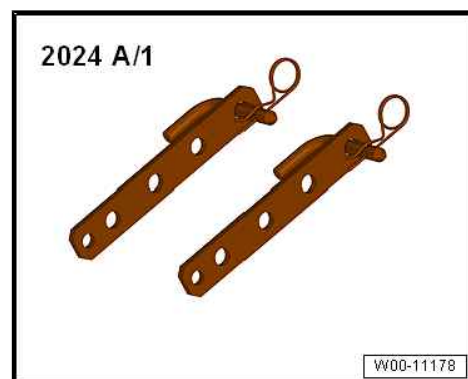
- Press in outer race of differential tapered roller bearing again and secure gearbox housing ⇒ [page 198](#).



2.4 Removing and installing flange shaft (left-side)

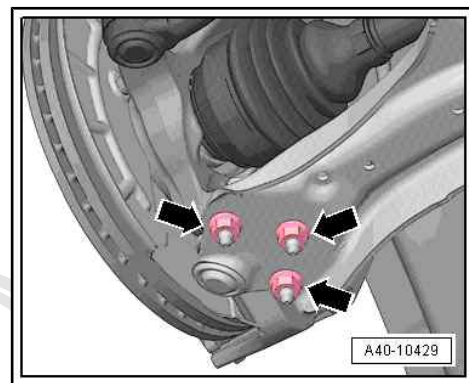
Special tools and workshop equipment required

- ◆ Extension -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.



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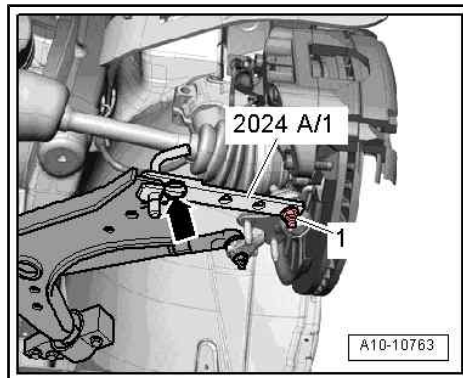
- Swivel suspension strut (left-side) outwards and support with extension -2024 A /1- as shown in illustration.



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

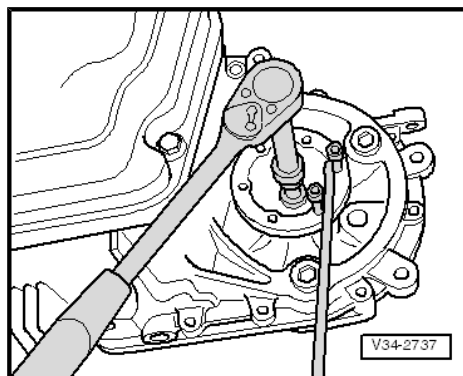
Make sure you do not damage surface coating on drive shaft.

- 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

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

- Push flange shaft in against spring pressure and secure with bolt.



Tightening torques

- ◆ ⇒ ["2.1 Exploded view - differential", page 192](#)
- ◆ ⇒ 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 liners; 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)

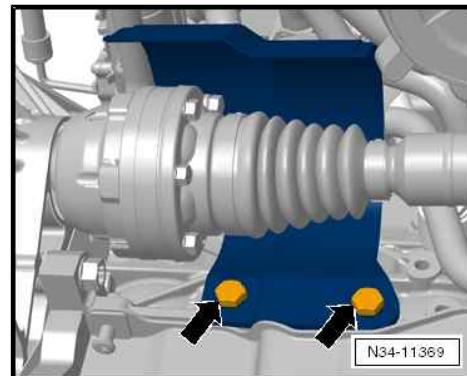
Special tools and workshop equipment required

- ◆ Extension -2024 A/1 for vehicles with 1.4 ltr./1.6 ltr. TDI engine (EA288)



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 .



Vehicles with 1.4 ltr./1.6 ltr. TDI engine (EA288):

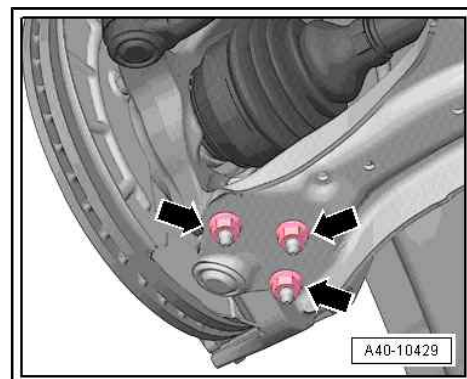


Note

The following illustrations show the left side of the vehicle.

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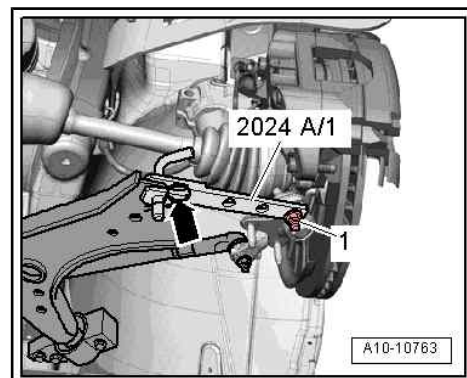
- Remove nuts -arrows- securing swivel joint (right-side).
- Disengage swivel joint (right-side) from wishbone.
- Swivel suspension strut (right-side) outwards and support with extension -2024 A /1- , as shown in illustration.



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 (right-side).



Note

Make sure you do not damage surface coating on drive shaft.

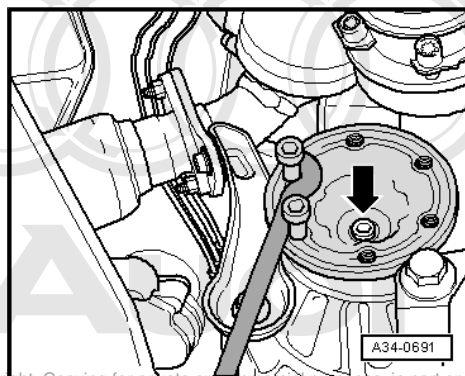
Continued for all vehicles:

- 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.



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Tightening torques

- ◆ ⇒ ["2.1 Exploded view - differential", page 192](#)
- ◆ ⇒ 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
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing heat shield for drive shaft
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

3 Table of adjustments

 Note

When performing repairs on the gearbox it is only necessary to re-adjust the input shaft, output shaft or differential if components have been renewed which have a direct effect on the adjustment of the gearbox. Refer to the following table to avoid unnecessary adjustment work:

		Components requiring adjustment:		
		Input shaft ⇒ page 158	Output shaft ⇒ page 178	Differential ⇒ page 200
Components renewed:	Gearbox housing	x		x
	Clutch housing	x	x	x
	Input shaft	x		
	Output shaft (final drive gear set)		x	
	Differential cage			x
	Tapered roller bearing for input shaft	x		
	Tapered roller bearing for output shaft		x	
	Tapered roller bearing for differential			x
	4th gear wheel	x		



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