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Workshop Manual Audi A1 2011 ➤

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

Edition 06.2017

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

(ARL005326; Edition 06.2017)

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

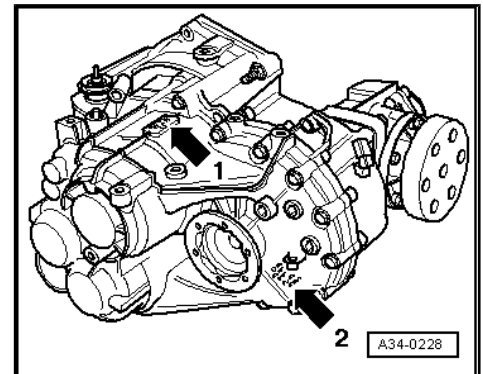
1.1 Gearbox identification

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

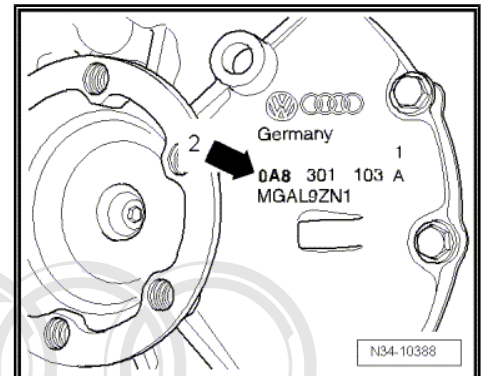
⇒ [“2.1 Allocation of gearbox to engine”, page 2](#).

Location on gearbox

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



Manual gearbox 0A8 -arrow 2-



Code letters and production date of gearbox -arrow-

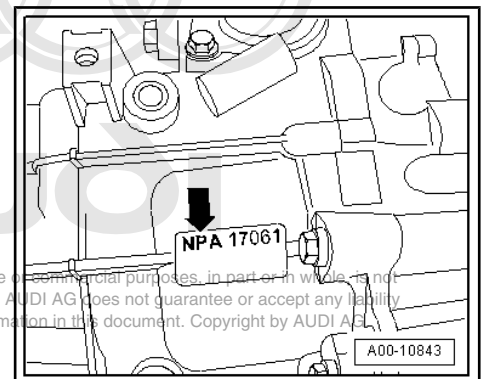
Example:	NPA	17	06	1
	Code letters	Day	Month	Year (2011) of manufacture

Additional data depend on manufacture.



Note

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





2 Technical data

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

⇒ "2.2 Capacities", page 2

⇒ "2.3 Calculating gear ratios", page 2

2.1 Allocation of gearbox to engine

Manual gearbox		6-speed 0A8, four-wheel drive		
Code letters		NPA	PRY	
Manufactured from to		03.12	01.14	
Allocation Model		Audi A1 2011 ►	Audi A1 2011 ►	
	Engine	2.0 ltr. - 188 kW TFSI	2.0 ltr. - 170 kW TFSI	
Ratio	Final drive I for 1st to 4th gear	72 : 17 = 4.235	71 : 18 = 3.944	
$Z_2 : Z_1 = i$	Final drive II for 5th/6th gear/ reverse gear	72 : 22 = 3.273	71 : 23 = 3.087	
The following data can be found in the ⇒ Electronic parts catalogue ♦ Individual gear ratios ♦ Allocation of flange shafts ♦ Allocation of clutch type ♦ Rear final drive identification				

2.2 Capacities

Manual gearbox	6-speed 0A8, four-wheel drive
Capacity of manual gearbox (gearbox completely dismantled)	2.30 ltr.
Capacity of manual gearbox (gearbox partially dismantled)	2.15 ltr.
♦ Gear oil specifications ⇒ Electronic parts catalogue	

Bevel box	6-speed 0A8, four-wheel drive
Capacity of bevel box	0.9 ltr.
♦ Gear oil specifications for bevel box ⇒ Electronic parts catalogue	

2.3 Calculating gear ratios

Example:

6-speed manual gearbox 0A8	6th gear	Final drive
Driving gear	$ZG_1 = 34$	$ZA_1 = 22$
Driven gear	$ZG_2 = 31$	$ZA_2 = 72$

$i = Z_2 : Z_1$	Z_1 = number of teeth on driving gear, Z_2 = number of teeth on driven gear	
i_G = gear ratio	$= Z_{G2} : Z_{G1}$	$= 31 : 34$ $= 0.912$
i_A = axle ratio	$= Z_{A2} : Z_{A1}$	$= 72 : 22$ $= 3.273$
i_{ov} = overall ratio	$= i_G \times i_A$	$= 0.912 \times 3.273$ $= 2.985$

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3 Transmission layout

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

3.1 Transmission layout - four-wheel drive

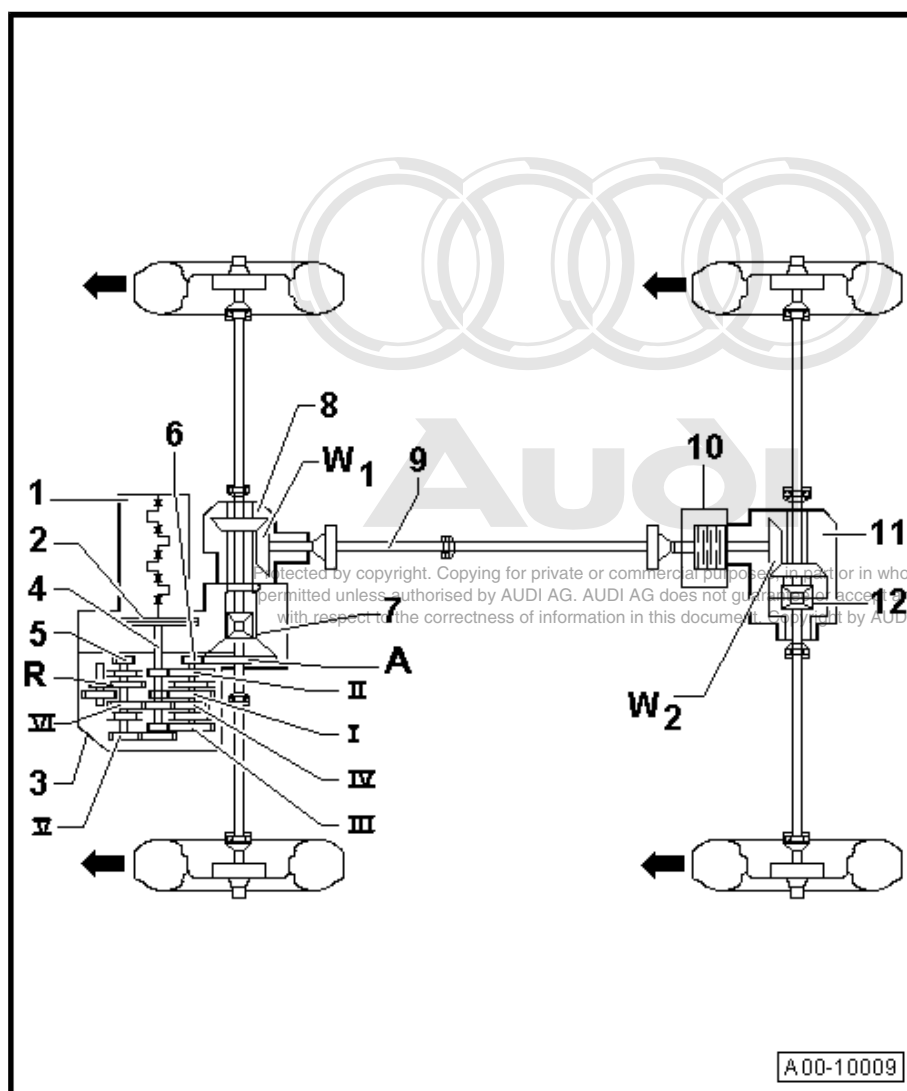
Identification and ratio



Note

-Arrows- point in direction of travel.

- 1 - Engine
- 2 - Clutch
- 3 - Manual gearbox
- 4 - Input shaft
- 5 - Output shaft II for 5th, 6th and reverse gear
- 6 - Output shaft I for 1st - 4th gear
- 7 - Differential
- 8 - Bevel box
- 9 - Propshaft
- 10 - Four-wheel drive coupling
- 11 - Rear final drive
- 12 - Differential
- I - 1st gear
- II - 2nd gear
- III - 3rd gear
- IV - 4th gear
- V - 5th gear
- VI - 6th gear
- R - Reverse gear
- A - Final drive
- W1 - Front bevel gears
- W2 - Rear bevel gears



A00-10009

4 Safety precautions

⇒ [“4.1 Safety precautions when working on vehicles with start/stop system”, page 5](#)

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



WARNING

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

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



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5 Repair instructions

⇒ ["5.1 General repair instructions", page 6](#)

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

5.1 General repair instructions

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

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

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Special tools

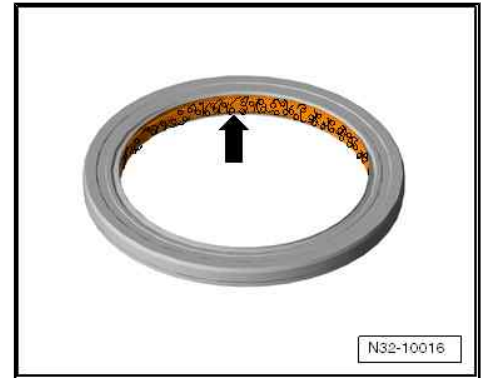
- ◆ For a complete list of special tools used in this Workshop Manual ⇒ Workshop equipment and special tools .

Gearbox

- ◆ Thoroughly clean all joints and connections and the surrounding areas before disconnecting.
- ◆ When installing the gearbox, ensure that the dowel sleeves between the engine and the gearbox are correctly located.
- ◆ For allocation of bolts and other components, refer to ⇒ Electronic parts catalogue .
- ◆ Clean contact surfaces when assembling mounting brackets and waxed components. The contact surfaces must be free of wax and grease.
- ◆ After installing a replacement gearbox with bevel box, check oil level in gearbox ⇒ [page 95](#) and gear oil level in bevel box ⇒ [page 217](#) .
- ◆ For gear oil specification, refer to ⇒ Electronic parts catalogue .
- ◆ Capacities ⇒ [page 2](#) .

Oil seals, seals, O-rings and gaskets

- ◆ Always renew O-rings, oil seals and gaskets after removal.
- ◆ After removing gaskets and oil seals, always inspect the contact surface on housings or shafts for burrs resulting from removal or for other signs of damage and rectify any damage found.
- ◆ 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 such 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.
- ◆ After installing new gaskets, O-rings and oil seals, check oil level in manual gearbox ⇒ [page 95](#) and bevel box ⇒ [page 217](#) .

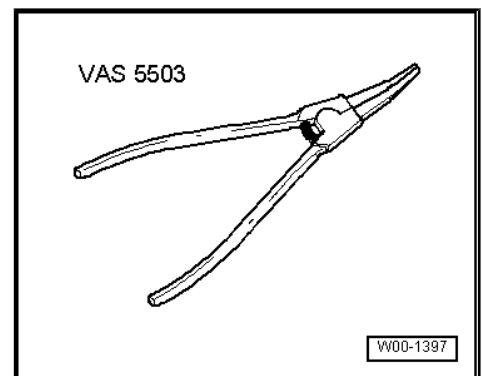
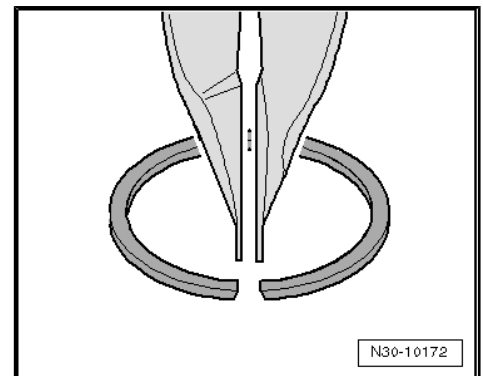


Sealant

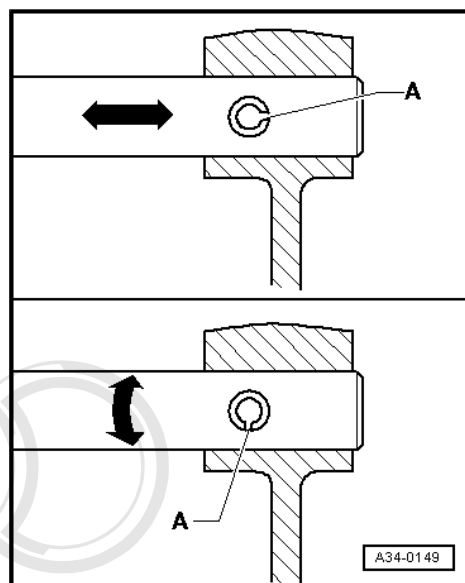
- ◆ Thoroughly clean housing contact surfaces before applying sealing paste.
- ◆ Apply sealing paste - AMV 188 001 02- evenly and not too thickly.
- ◆ Breather holes must remain free of sealing paste.

Locking elements

- ◆ Do not over-stretch circlips.
- ◆ Installation position for some circlips: the circlip is fitted so that the narrow part of the gap is at the top. This also gives the pliers a better grip when removing and installing.
- ◆ Always renew circlips which have been damaged or over-stretched.
- ◆ Circlips must be properly seated in the base of the groove.
- ◆ To facilitate assembly, use circlip pliers - VAS 5503A- .



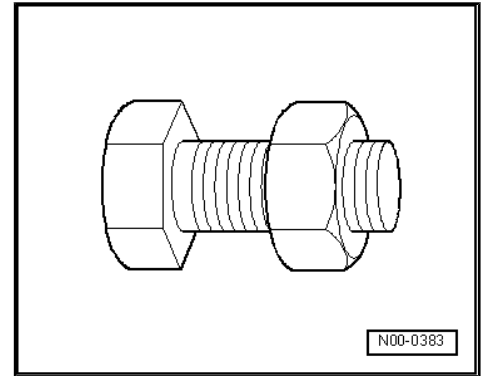
- ◆ Renew spring pins. Position: the slit -A- should be in line with the line of force -arrow-.



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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.
- ◆ Renew self-locking nuts and bolts.
- ◆ The tightening torques stated apply to non-oiled nuts and bolts.
- ◆ Use a wire brush to clean the threads of bolts which are secured with locking fluid. Then apply locking fluid - AMV 185 101 A1- to bolt threads before installing.
- ◆ Threaded holes which take self-locking bolts or bolts coated with locking fluid must be cleaned (using a thread 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.
- ◆ Parts which are particularly sensitive (e.g. clutch pressure plates) must be kept straight, and bolts securing them must be loosened and tightened one after the other in stages of 90°.



Bearings

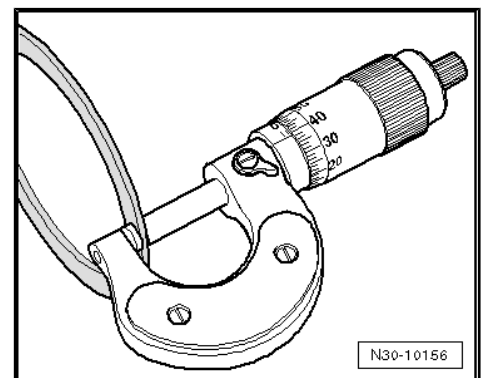
- ◆ Install new tapered roller bearings as supplied; do not lubricate additionally with oil.
- ◆ Lubricate all bearings (except tapered roller bearings) with gear oil before installing in gearbox.
- ◆ Use inductive heater - VAS 6414- to heat inner races of tapered roller bearings to approx. 100°C before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

Synchro-rings

- ◆ Do not interchange. When reusing synchro-rings, always fit to the same selector gear.
- ◆ Check for wear; renew if necessary.
- ◆ Lubricate with gear oil before installing.



Checking synchro-rings for 1st to 3rd gear

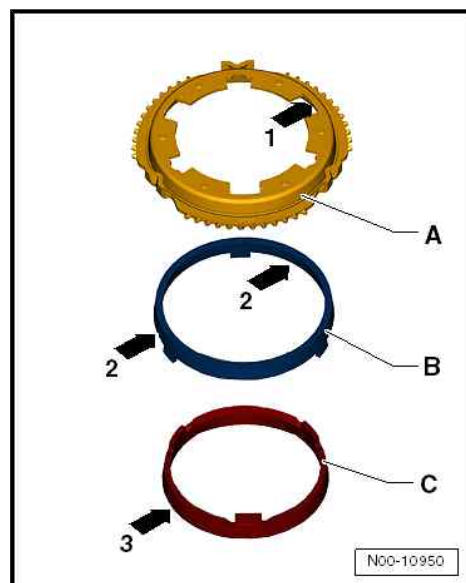
- ◆ Check contact surface -arrow 1- on synchro-ring -A- and contact surface -arrow 3- on inner ring -C- for grooves or scoring.
- ◆ Check coated contact surfaces -arrows 2- on outer ring -B- for damage (flattened sections, missing particles of friction lining).

Gear wheels, synchro-hubs

- ◆ 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.
- ◆ Note correct installation position.

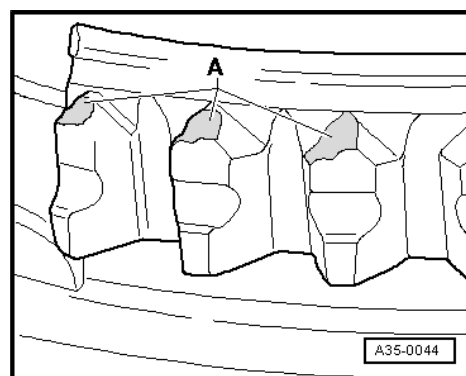
Selector gears and locking collars

- ◆ After installing, check 1st to 6th speed selector gears for minimal axial play and freedom of movement.



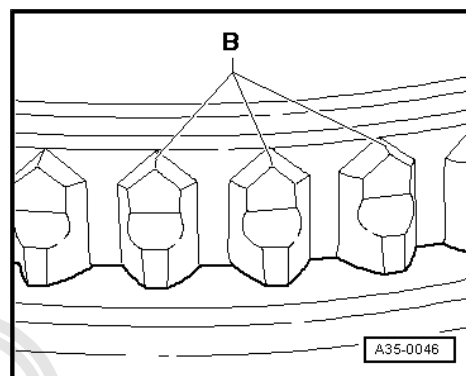
- ◆ Abnormal wear on synchro-ring or selector gear:

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



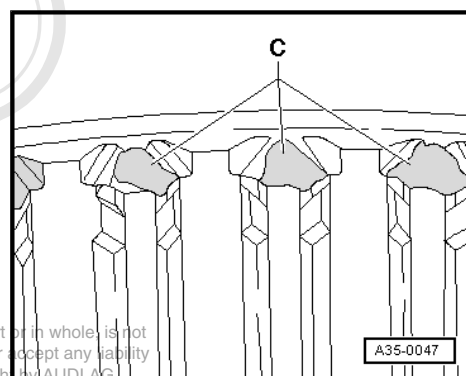
- ◆ In comparison: intact synchro-ring or selector gear:

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



- ◆ Abnormal wear on locking collar:

C - Worn chamfer on internal splines of locking collar.



- ◆ In comparison: intact locking collar:

D - Intact chamfer on internal splines of locking collar.

Clutch mechanism, clutch

- ◆ If the clutch pedal does not return to its initial position after releasing it (clutch pedal in rest position), you must bleed the clutch system (further measures ⇒ ["1.11 Checking clutch master cylinder and clutch slave cylinder", page 39](#)).

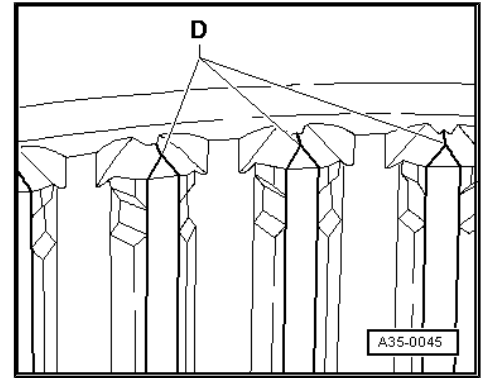
- ◆ Ensure that the pressure plate is kept straight: loosen and tighten bolts consecutively in steps of 90°.

- ◆ 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.

- ◆ 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 dual-mass flywheel must be cleaned (degreased) thoroughly.



5.2 Contact corrosion

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:

- ◆ The gearbox housing and clutch housing are made of a magnesium alloy.
- ◆ Use only genuine spare parts: these have been fully tested and are compatible with aluminium.
- ◆ We recommend the use of accessories approved by Audi.



Caution

Damage caused by contact corrosion is not covered by the warranty.

6 Electrical components

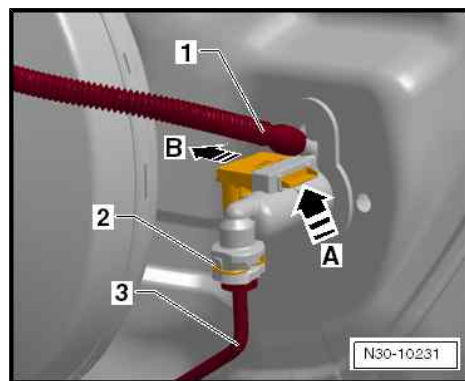
⇒ ["6.1 Overview of fitting locations - electrical components", page 12](#)

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.

⇒ ["1.12 Removing and installing clutch position sender G476 ", page 40](#)



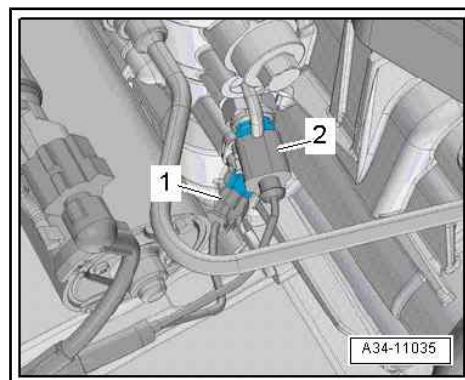
Gearbox neutral position sender - G701- and reversing light switch - F4-

Gearbox neutral position sender - G701- -1-

Reversing light switch - F4- -2-

Fitting location: behind starter on gearbox

⇒ ["8.3 Exploded view - gearbox housing and selector mechanism", page 112](#)



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30 – Clutch

1 Clutch mechanism

⇒ [“1.1 Exploded view - pedal cluster”, page 13](#)

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

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

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

⇒ [“1.5 Removing and installing over-centre spring”, page 24](#)

⇒ [“1.6 Removing and installing mounting bracket”, page 26](#)

⇒ [“1.7 Removing and installing clutch master cylinder”,
page 29](#)

⇒ [“1.9 Removing and installing lines for clutch hydraulics”,
page 35](#)

⇒ [“1.8 Removing and installing clutch slave cylinder together with
release bearing”, page 34](#)

⇒ [“1.10 Bleeding clutch hydraulics”, page 38](#)

⇒ [“1.11 Checking clutch master cylinder and clutch slave cylinder”,
page 39](#)

⇒ [“1.12 Removing and installing clutch position sender G476”,
page 40](#)

1.1 Exploded view - pedal cluster

⇒ [“1.1.1 Exploded view - pedal cluster, Audi A1 quattro”,
page 13](#)

⇒ [“1.1.2 Exploded view - pedal cluster, Audi S1”, page 16](#)

1.1.1 Exploded view - pedal cluster, Audi A1 quattro

1 - Clutch pedal

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

2 - Mounting

- ❑ Only renew when clutch master cylinder has been removed
- ❑ Removing ⇒ [page 15](#)
- ❑ Pressing on
⇒ [page 15](#)

3 - Clutch master cylinder

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

4 - Gasket

- ❑ Renew
- ❑ Glue onto clutch master cylinder

5 - Clutch position sender - G476-

- ❑ Removing and installing
⇒ [page 40](#)
- ❑ Checking in [Guided Fault Finding](#) ⇒ vehicle diagnostic tester

6 - Pivot pin

- ❑ Cannot be removed without being damaged
- ❑ Renew

7 - Plenum chamber partition panel

- ❑ With mounting for mounting bracket and master cylinder

8 - Bush

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

9 - Nut

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

10 - Crash bar

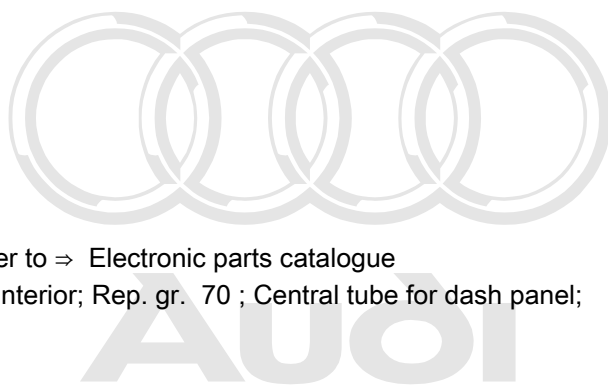
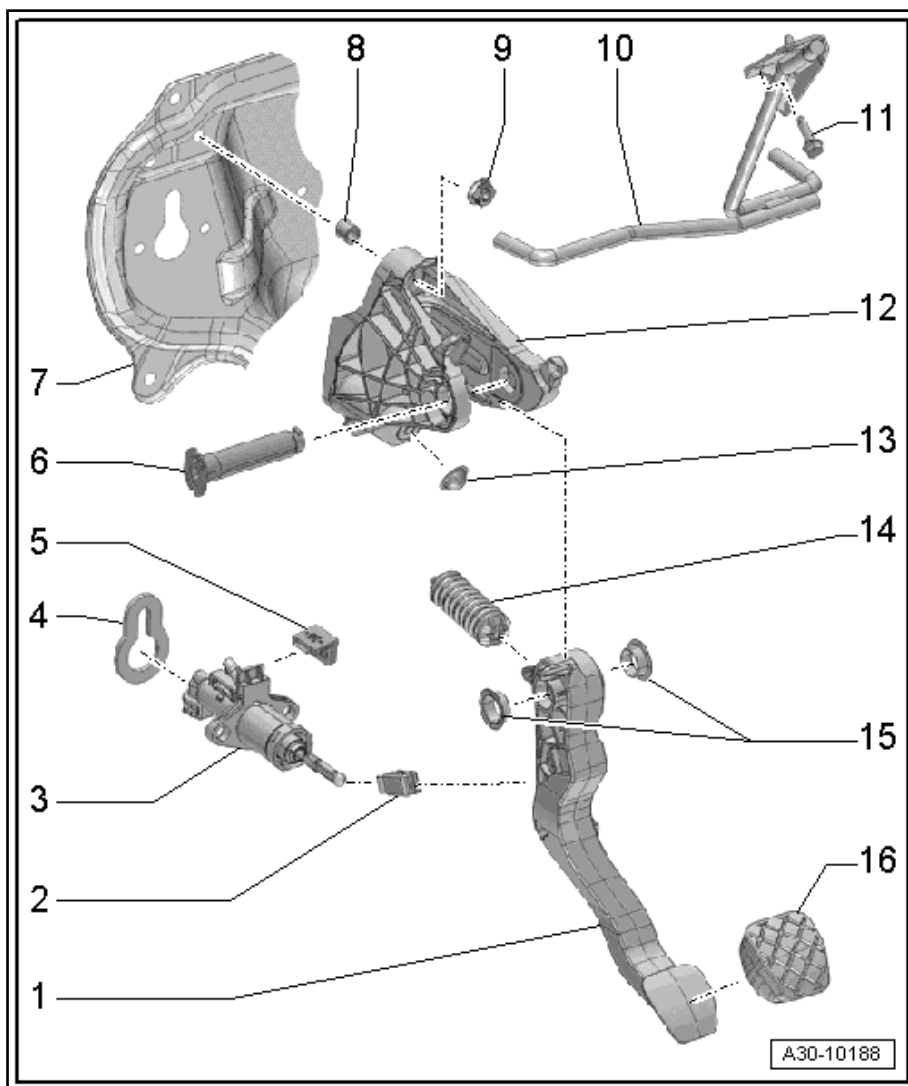
- ❑ Secured to steering column
- ❑ Different versions available; for correct version refer to ⇒ [Electronic parts catalogue](#)
- ❑ Removing and installing ⇒ [General body repairs, interior](#); Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel

11 - Bolt or nut

- ❑ For correct version, refer to ⇒ [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 29](#)



- ❑ Removing and installing without clutch master cylinder ⇒ [page 26](#)

13 - Stop

- ❑ For clutch pedal

14 - Over-centre spring

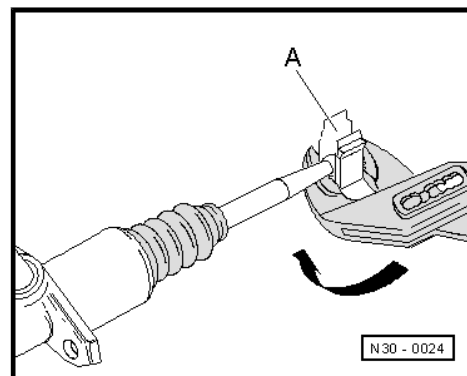
- ❑ Removing and installing ⇒ [page 20](#)

15 - Bearing bushes

16 - Cap

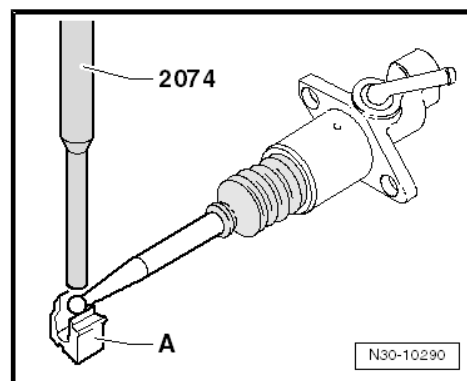
Removing retaining clip

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



Pressing on retaining clip

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



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1.1.2 Exploded view - pedal cluster, Audi S1

1 - Bearing bush

2 - Over-centre spring

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

3 - Pivot pin

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

4 - Clutch master cylinder

- ☐ Removing and installing
⇒ [page 31](#)

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
⇒ [page 40](#)
- ☐ Checking in [Guided Fault Finding](#) ⇒ vehicle diagnostic tester

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 28](#)

10 - Nut

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

11 - Stop

- ☐ For clutch pedal

12 - Bearing bush

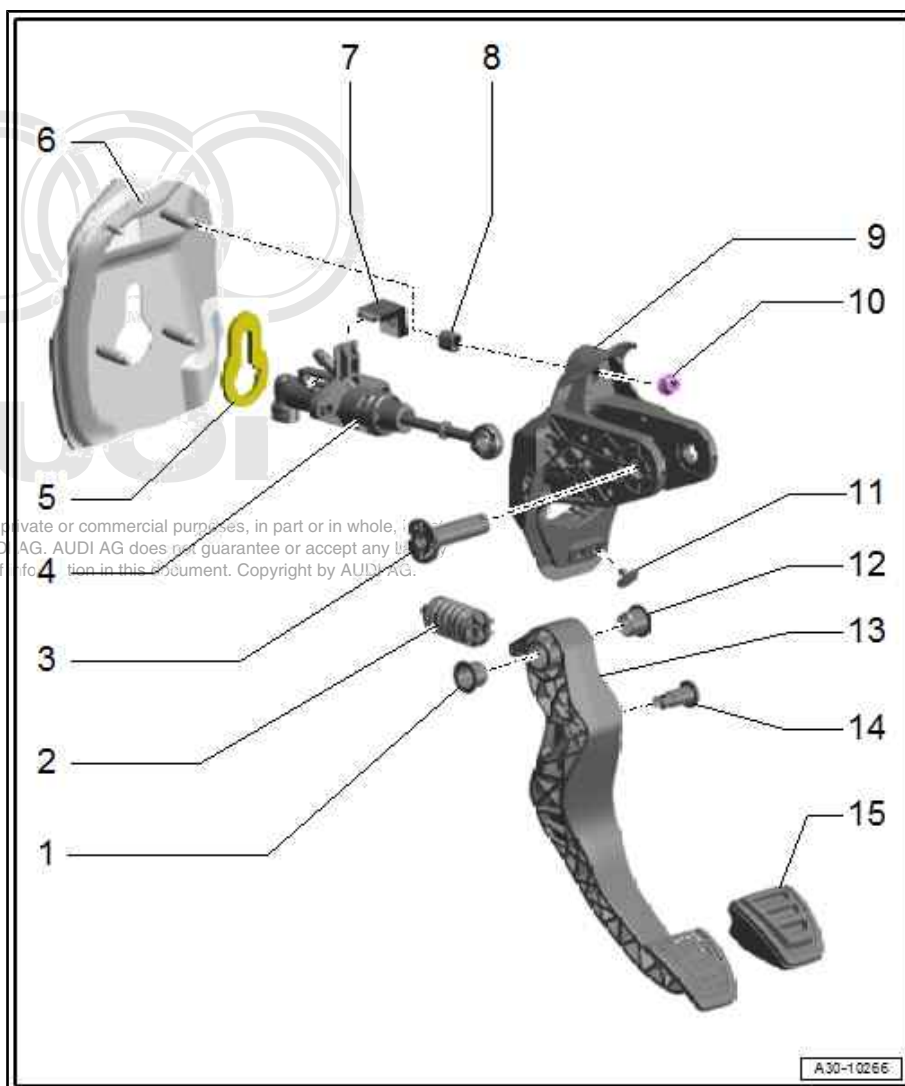
13 - Clutch pedal

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

14 - Locking pin

- ☐ Renew

15 - Cap



1.2 Exploded view - clutch hydraulics



Note

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

1 - Clutch slave cylinder with release bearing

- ☐ Can only be renewed after removing gearbox
- ☐ Removing and installing ⇒ [page 34](#)

2 - Breather

3 - Retaining clip

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

4 - Bleeder screw

- ☐ 4.5 Nm
- ☐ Bleeding clutch system ⇒ [page 38](#)

5 - Dust cap

6 - Retaining clip

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

7 - Seal or O-ring

- ☐ Different versions according to type of connection; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Renew if damaged

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☐ Push onto pipe connection

- ☐ Lubricate with brake fluid before installing

8 - Brake fluid reservoir

9 - Gasket

- ☐ Must be fitted in supply hose

10 - Supply hose

11 - Gasket

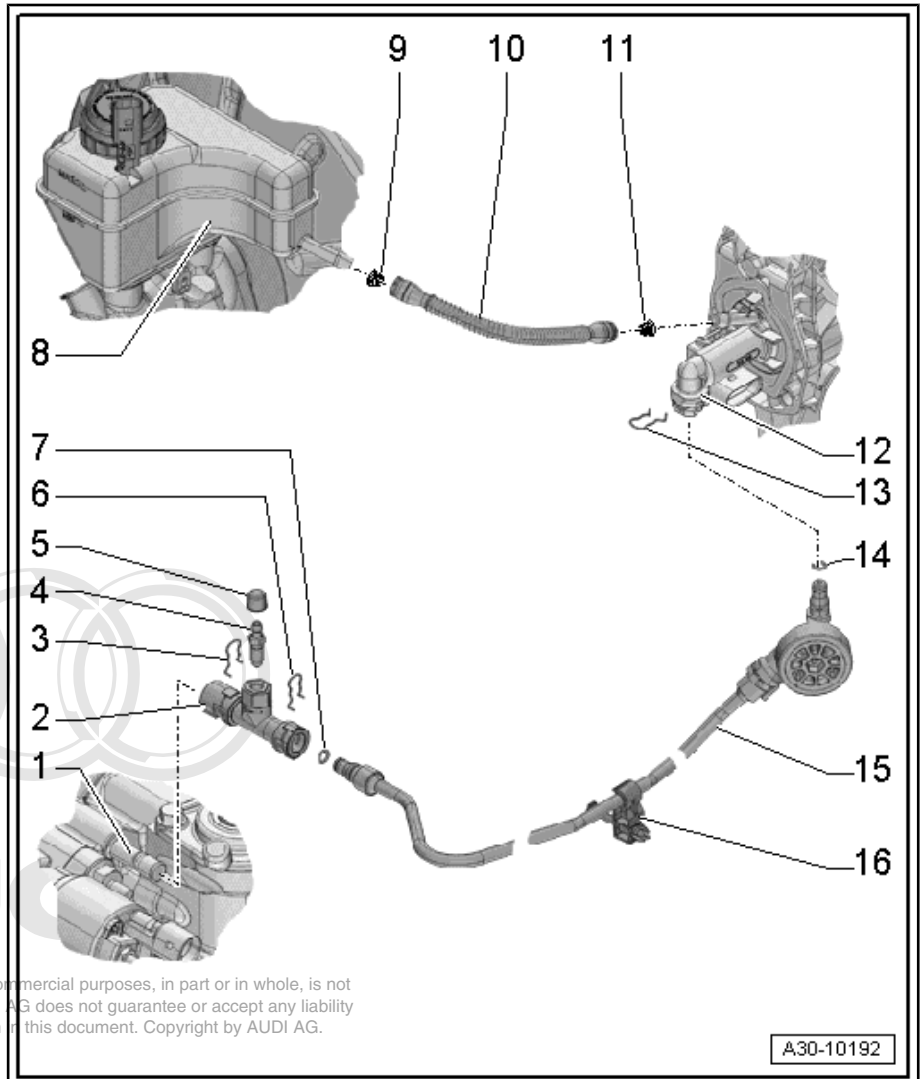
- ☐ Must be fitted in supply hose

12 - Clutch master cylinder

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

13 - Retaining clip

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



A30-10192

14 - Seal or O-ring

- ☐ Different versions according to type of connection; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Renew if damaged
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing

15 - Pipe/hose assembly

- ☐ Removing and installing ⇒ [page 35](#)

16 - Bracket

- ☐ Attached to body

Disconnecting and connecting pipe/hose assembly from/to clutch master cylinder or bleeder connection

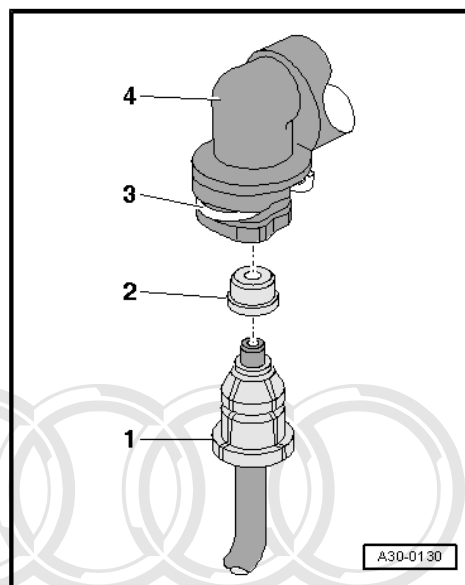
- To remove, release retaining clip -3- with a screwdriver and disconnect pipe/hose assembly -1- from clutch master cylinder -4- or bleeder connection.



Note

Renew damaged seals or O-rings -2-.

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



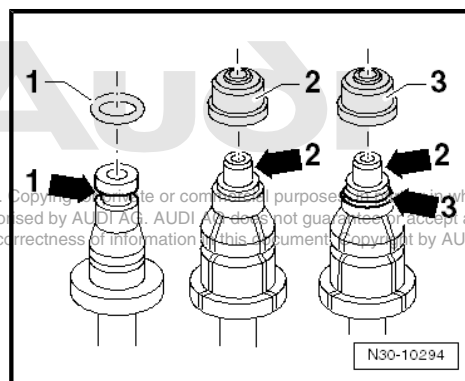
Pipe/hose assembly with O-ring or seal

- ◆ Pipe connection -arrow 1- and O-ring -1-
- ◆ Pipe connection with shoulder -arrow 2- and seal -2-
- ◆ Pipe connection with shoulder -arrow 2-, annular groove -arrow 3- and seal -3-



Note

On the connection with annular groove -arrow 3- the seal must be inserted in the groove.



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1.3 Exploded view - clutch release mechanism

1 - Clutch slave cylinder with release bearing

- ☐ Slave cylinder and release bearing are one unit and can only be renewed together
- ☐ Do not wash out bearing; wipe clean only
- ☐ If bearing is noisy, renew together with slave cylinder
- ☐ Removing and installing [⇒ page 34](#)
- ☐ For some clutch slave cylinders, divided supply line [⇒ page 20](#)
- ☐ For some gearboxes, release bearing with additional plastic disc [⇒ page 20](#), clutch pressure plate is matched accordingly [⇒ page 20](#)
- ☐ For correct version, refer to [⇒ Electronic parts catalogue](#)

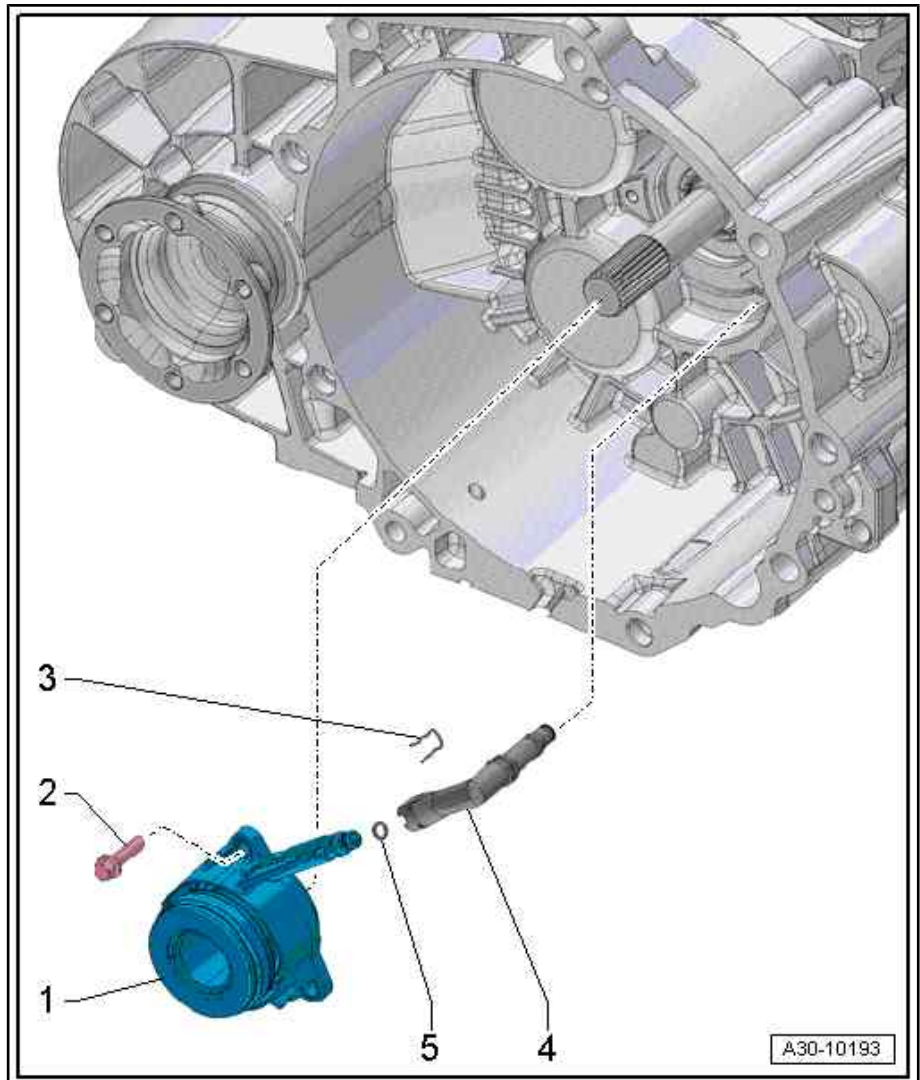
2 - Bolt

- ☐ 3x
- ☐ Always renew
- ☐ Tighten bolts carefully in several small steps and in diagonal sequence to avoid breaking off mounting lugs on slave cylinder.
- ☐ 12 Nm for metal clutch slave cylinder (with no locking fluid)
- ☐ 15 Nm for plastic clutch slave cylinder (with locking fluid)



Note

Select correct thread pitch of bolt when cleaning tapped holes for bolts in clutch housing.



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3 - Retaining clip

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

4 - Pipe/hose assembly

- ☐ Connected to bleeder connection [⇒ Item 2 \(page 17\)](#)
- ☐ Removing and installing [⇒ page 35](#)

5 - O-ring or seal

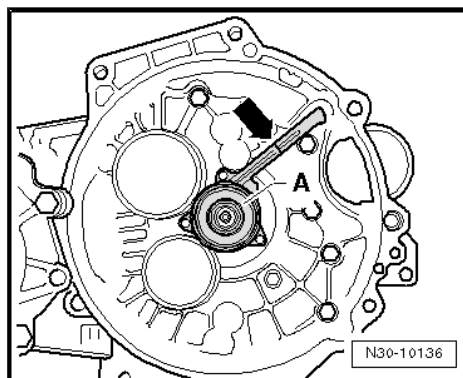
- ☐ Different versions according to type of connection; for correct version refer to [⇒ Electronic parts catalogue](#)
- ☐ Renew if damaged
- ☐ Push onto pipe connection

- ❑ Lubricate with brake fluid before installing

Clutch slave cylinder -A- with divided supply line

The supply line for some clutch slave cylinders is divided in the area of the -arrow-.

For correct version, refer to ⇒ Electronic parts catalogue



Release bearing with additional plastic disc (on some gearboxes)

Identification: projections -arrow- on plastic disc.

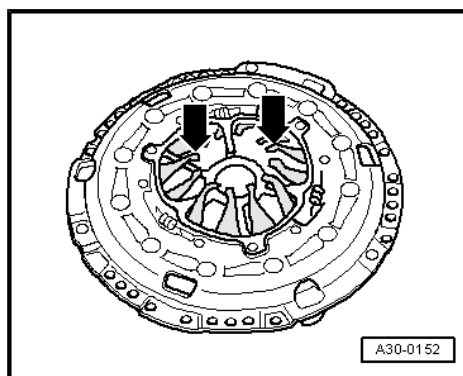


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For release bearing with additional plastic disc only: tips of diaphragm springs on clutch pressure plate (-arrows-), slightly lower overall height

- Release bearing with additional plastic disc and clutch pressure plate with tips of diaphragm springs of slightly lower overall height must only be installed together.

For correct version, refer to ⇒ Electronic parts catalogue



1.4 Removing and installing clutch pedal

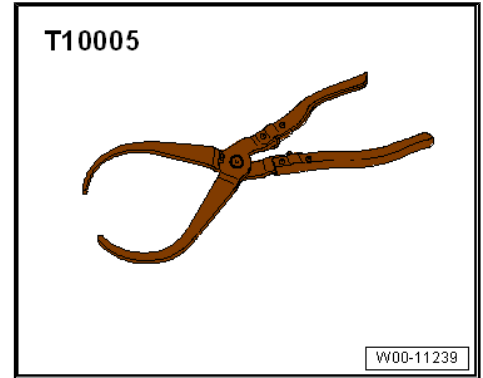
⇒ ["1.4.1 Removing and installing clutch pedal, Audi A1 quattro", page 20](#)

⇒ ["1.4.2 Removing and installing clutch pedal, Audi S1", page 22](#)

1.4.1 Removing and installing clutch pedal, Audi A1 quattro

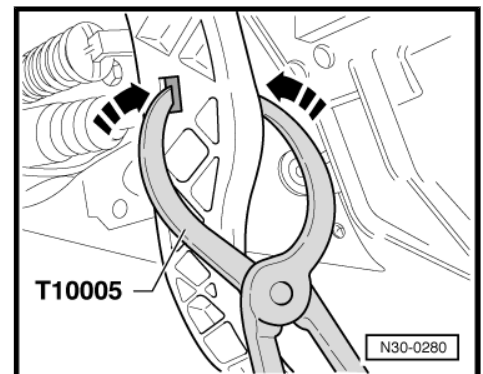
Special tools and workshop equipment required

◆ 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.



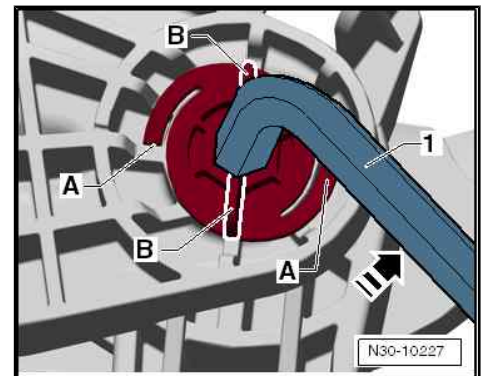
Note

- ◆ *Retainers -A- will be destroyed when you do this.*

- ◆ *Renew pivot pin.*

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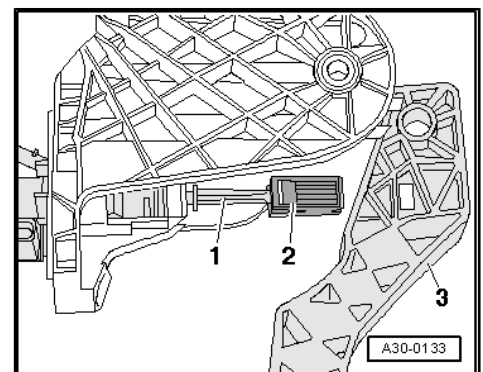
- **Move clutch pedal back and forth to pull out pivot pin.**
- Remove over-centre spring and (if necessary) clutch pedal.



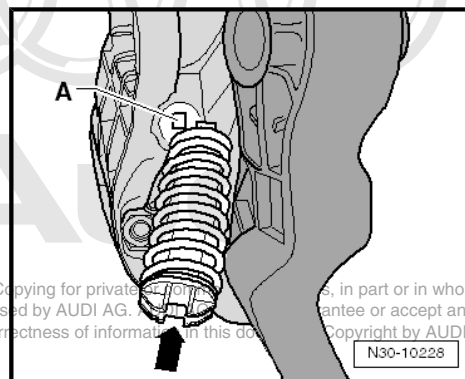
Installing

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-.

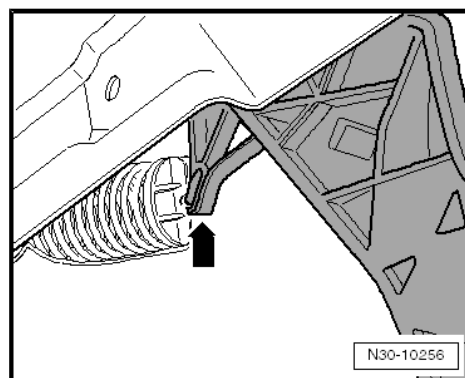


- Working sideways from below, insert over-centre spring into mounting bracket at point -A- beside operating rod of clutch master cylinder and beside clutch pedal.
- The bearing recess -arrow- for the actuator on the clutch pedal must be vertical.

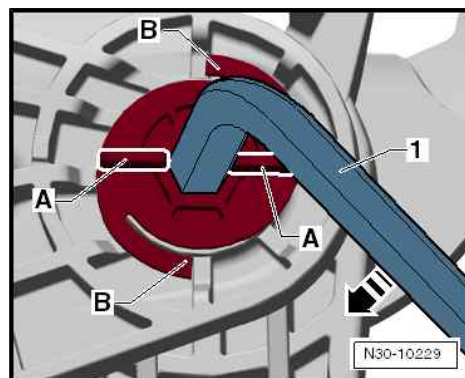


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- Attach over-centre spring to actuator on clutch pedal -arrow-.



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



Tightening torques

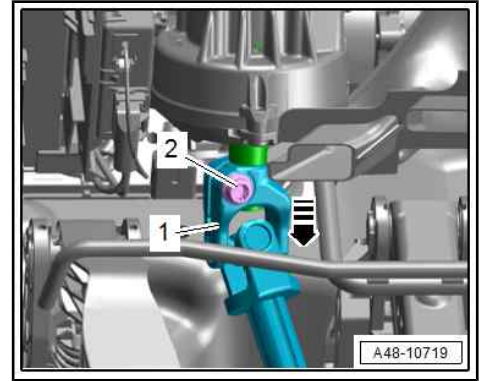
- ♦ ⇒ [“1.1.1 Exploded view - pedal cluster, Audi A1 quattro”, page 13](#)

1.4.2 Removing and installing clutch pedal, Audi S1

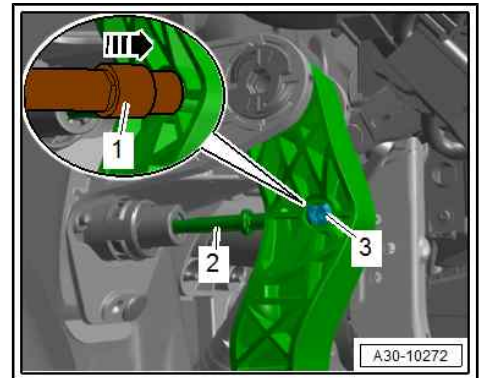
Removing

- 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-.



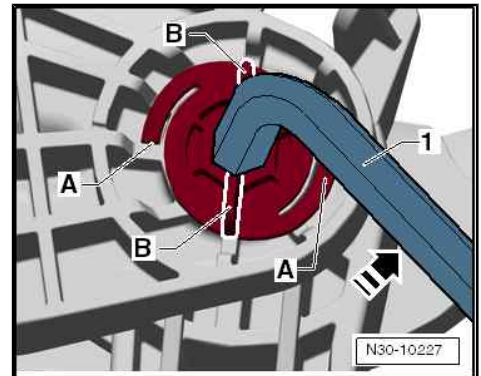
- Using 8 mm Allen key -item 1-, turn pivot pin for clutch pedal anti-clockwise -arrow- until ears -B- are horizontal.



Note

- ◆ Retainers -A- will be destroyed when you do this.
- ◆ Renew pivot pin.

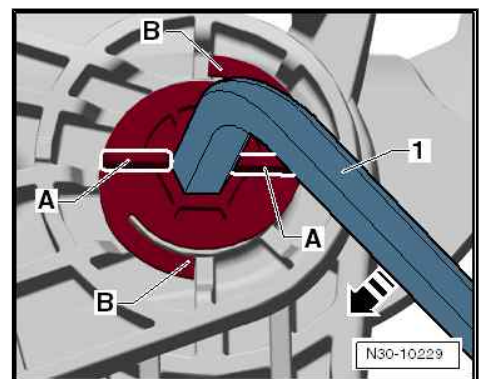
- Move clutch pedal back and forth to pull out pivot pin.
- Remove clutch pedal.



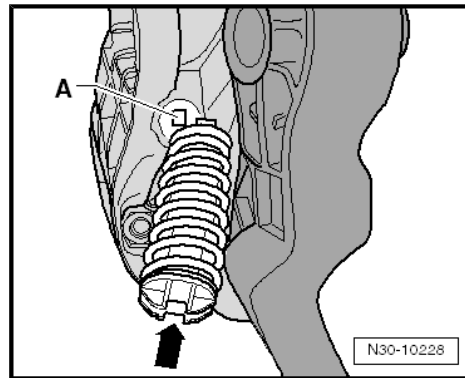
Installing

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

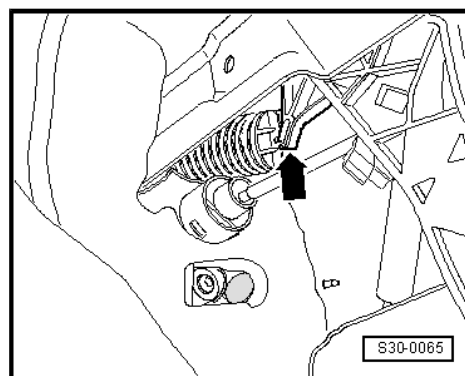
- Renew pivot pin and locking pin.
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- Move clutch pedal into installation position and slide in new pivot pin.
- Using 8 mm Allen key -item 1-, turn pivot pin for clutch pedal clockwise -arrow- until ears -A- are vertical.
- Retainers -B- should engage audibly.



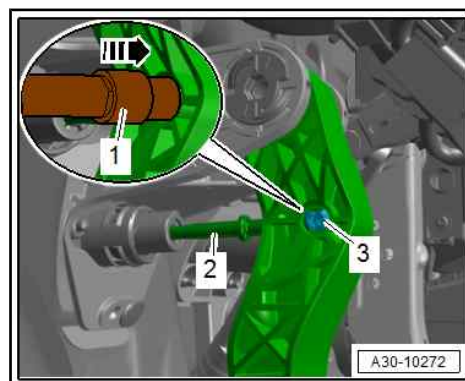
- Working sideways from below, insert over-centre spring into mounting bracket at point -A- beside operating rod of clutch master cylinder and beside clutch pedal.
- Bearing recess -arrow- for actuator lug of clutch pedal must be vertical.



- 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.



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Note

Disregard -item 1-.

- 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, Audi A1 quattro”, page 24](#)

⇒ [“1.5.2 Removing and installing over-centre spring, Audi S1”, page 25](#)

1.5.1 Removing and installing over-centre spring, Audi A1 quattro

- The clutch pedal must be removed in order to remove the over-centre spring
⇒ [“1.4.1 Removing and installing clutch pedal, Audi A1 quattro”, page 20](#) .

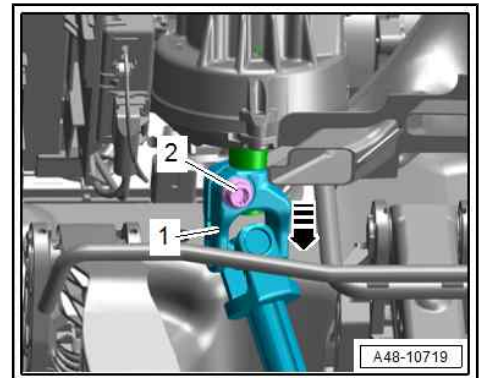
 Note

It is not necessary to detach the clutch master cylinder from the clutch pedal in order to remove the over-centre spring.

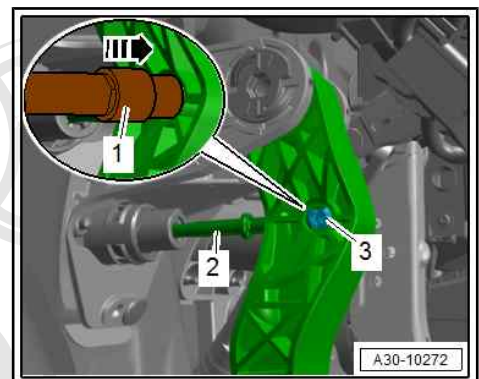
1.5.2 Removing and installing over-centre spring, Audi S1

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-.
- Swivel clutch pedal towards rear and remove over-centre spring.



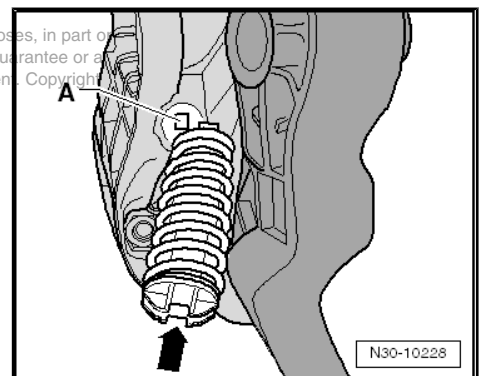
Installing

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

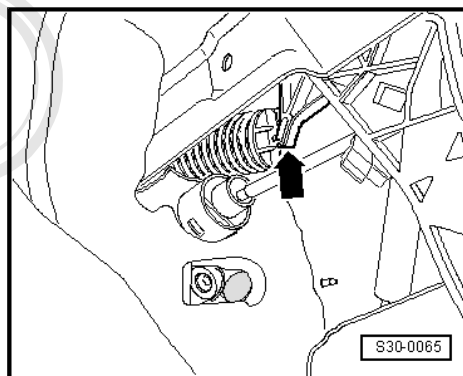
 Note

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-.



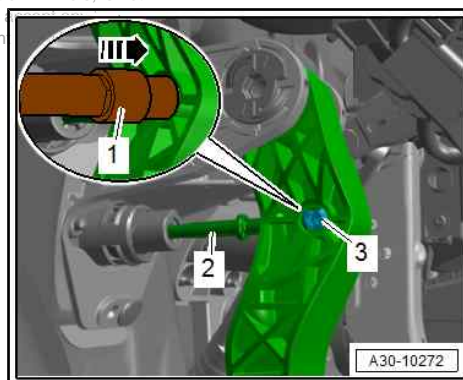
- Press clutch pedal until operating rod -2- for clutch master cylinder has reached installation position.
- Press in new locking pin -3- so that it engages audibly.



Note

Disregard -item 1-.

- 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

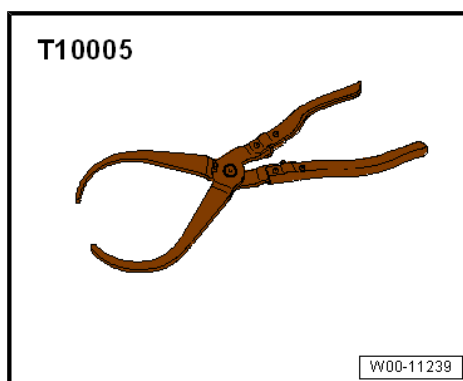
⇒ ["1.6.1 Removing and installing mounting bracket, Audi A1 quattro", page 26](#)

⇒ ["1.6.2 Removing and installing mounting bracket, Audi S1", page 28](#)

1.6.1 Removing and installing mounting bracket, Audi A1 quattro

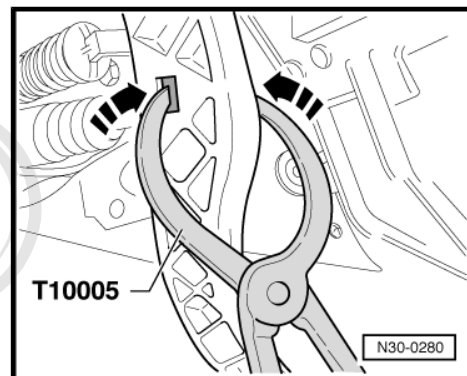
Special tools and workshop equipment required

- ◆ Pliers - T10005-



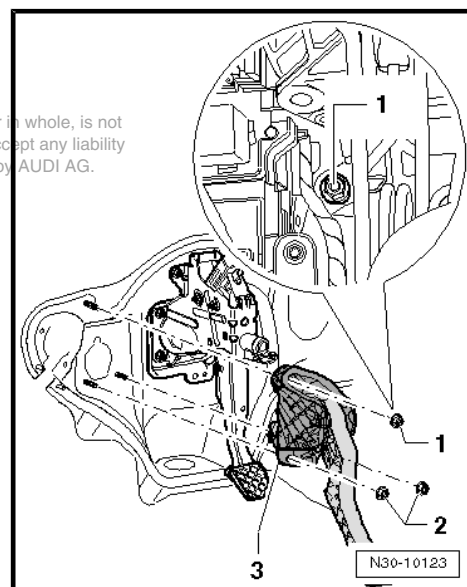
Removing

- 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-.



- Remove nuts -1 and 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).

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Installing

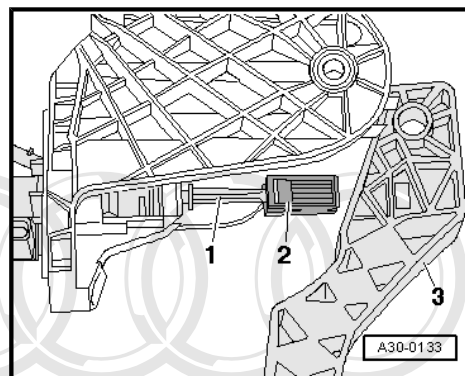
Installation is carried out in reverse sequence; note the following:



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).



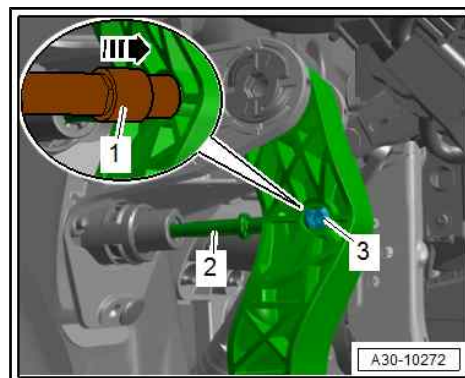
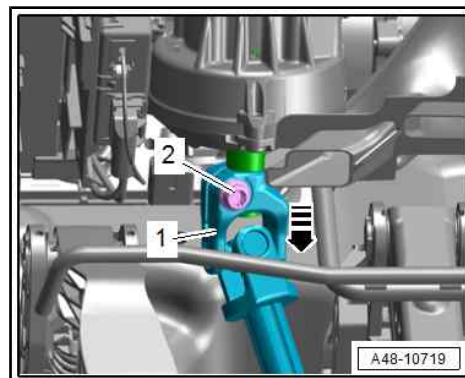
Tightening torques

- ♦ ⇒ [“1.1.1 Exploded view - pedal cluster, Audi A1 quattro”, page 13](#)

1.6.2 Removing and installing mounting bracket, Audi S1

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-.



- Remove nuts -1 and 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

Disregard -item 1-.

- 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, Audi S1", page 16](#)

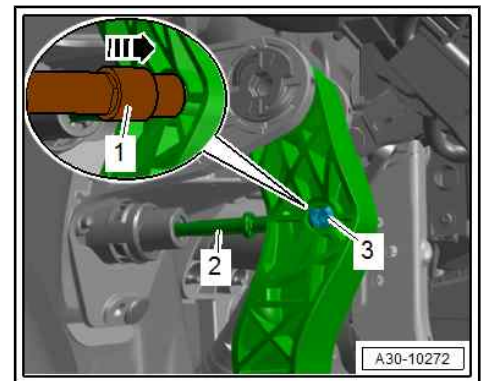
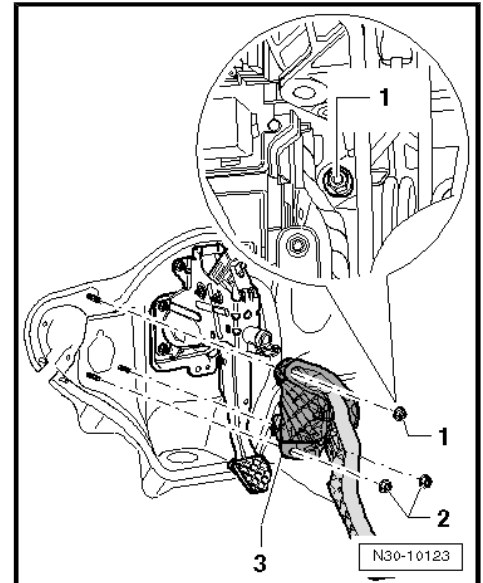
1.7 Removing and installing clutch master cylinder

⇒ ["1.7.1 Removing and installing clutch master cylinder, Audi A1 quattro", page 29](#)

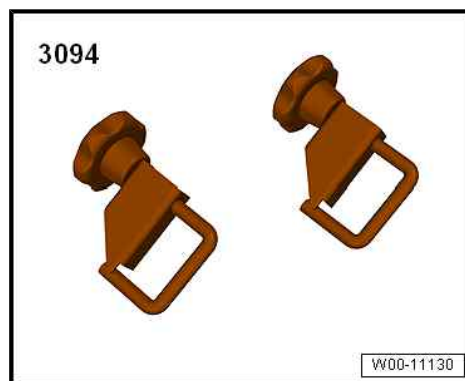
⇒ ["1.7.2 Removing and installing clutch master cylinder, Audi S1", page 31](#)

1.7.1 Removing and installing clutch master cylinder, Audi A1 quattro

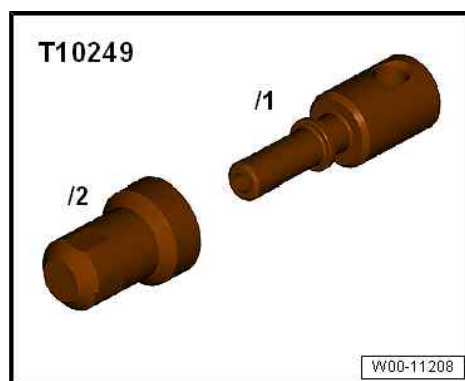
Special tools and workshop equipment required



- ◆ Hose clamps, up to 25 mm - 3094-



- ◆ Sealing tool - T10249-



Removing

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



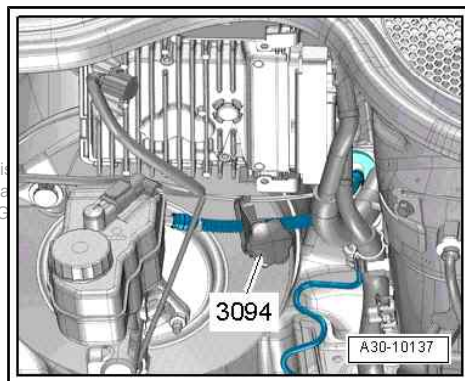
Note

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

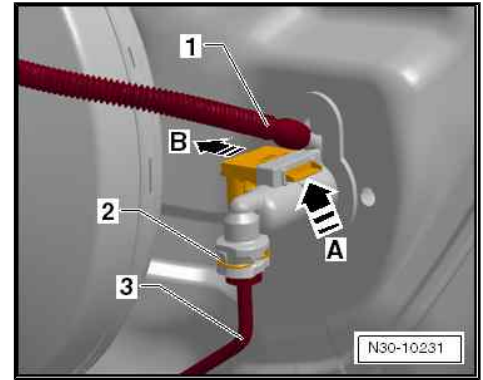


Note

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



- Disconnect supply hose -1- from clutch master cylinder and plug hose using sealing tool - T10249/1- .
- 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 and 2-.
- Remove mounting bracket -3- with clutch master cylinder.

Installing

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

Note

Renew self-locking nuts.

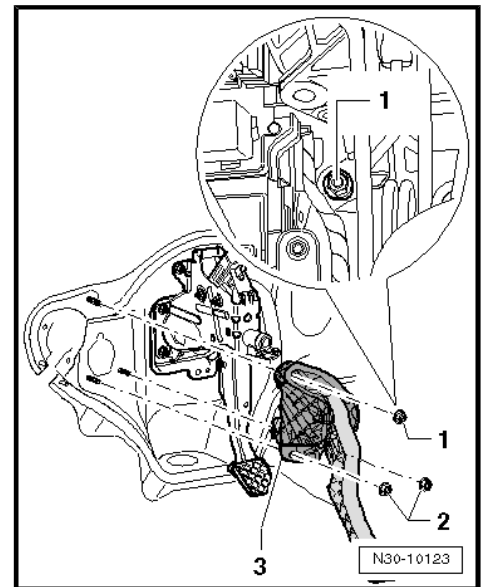
- Push pipe/hose assembly onto connection on clutch master cylinder so that retaining clip snaps into place.
- Pull on pipe to check that it is secure.
- Install crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Bleed clutch system ⇒ [page 38](#) .
- Install clutch position sender - G476- ⇒ [page 40](#) .
- 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. 24 ; Air cleaner; Removing and installing air cleaner housing .

Tightening torques

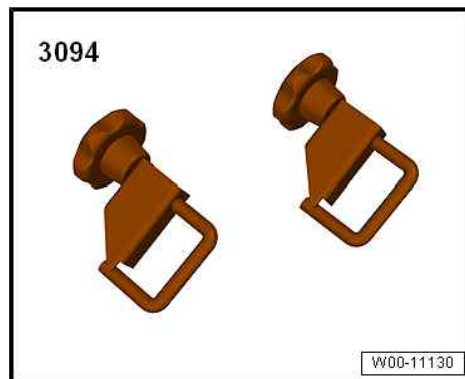
- ♦ ⇒ [“1.1.1 Exploded view - pedal cluster, Audi A1 quattro”, page 13](#)

1.7.2 Removing and installing clutch master cylinder, Audi S1

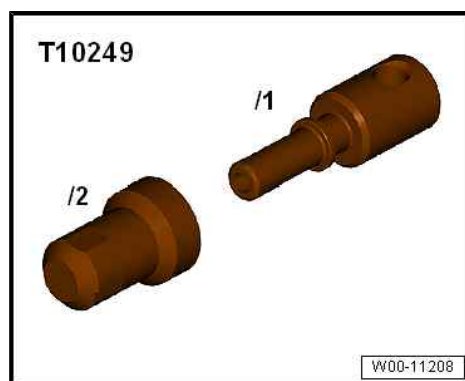
Special tools and workshop equipment required



- ◆ Hose clamps, up to 25 mm - 3094-



- ◆ Sealing tool - T10249-



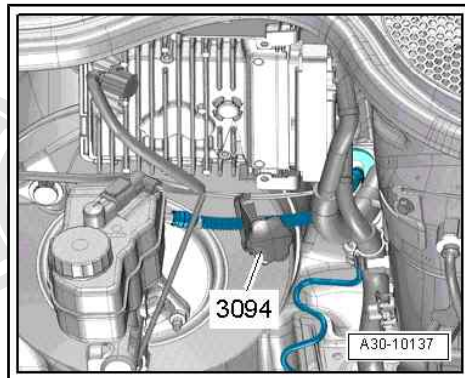
Removing

- Remove air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .
- Remove engine control unit - J623- from bracket and tie to one side ⇒ Rep. gr. 24 ; 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.

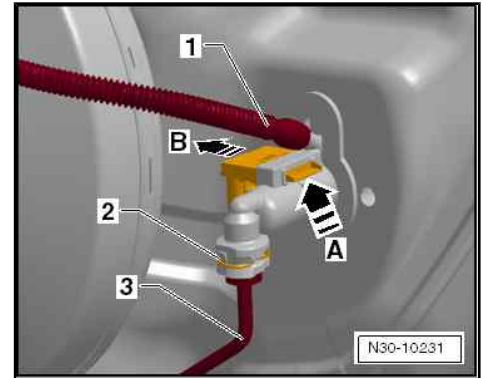


Note

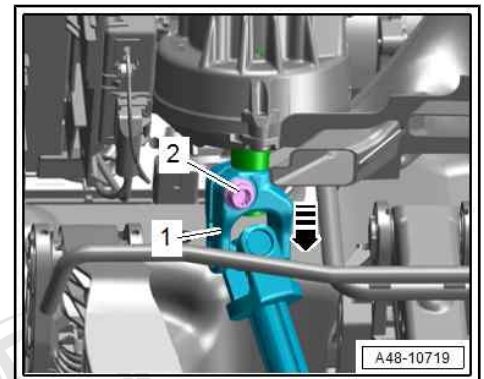
- ◆ *Clamping off the supply hose with the hose clamp - 3094- will cause a permanent deformation.*
- ◆ *However, this does not damage the supply hose.*
- ◆ *After removing the hose clamp -3094- , the supply hose must be returned to its original shape.*

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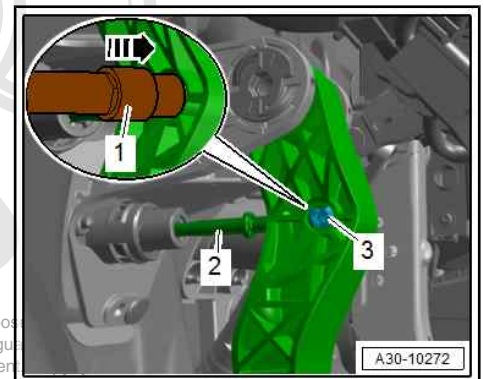
- Disconnect supply hose -1- from clutch master cylinder and plug hose using sealing tool - T10249/1- .
- Release retaining clip -2- with a screwdriver and disconnect pipe/hose assembly -3- from clutch master cylinder.
- Unclip clutch position sender - G476- -arrows A, B- and place it to one side with 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-.



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Note

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

- Remove nuts -1 and 2-.
- 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-.
- 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 18](#) .
- Bleed clutch system ⇒ [page 38](#) .
- Install engine control unit - J623- ⇒ Rep. gr. 24 ; Engine control unit; Removing and installing engine control unit - J623- .
- Install air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .

Tightening torques

- ♦ ⇒ [“1.1.2 Exploded view - pedal cluster, Audi S1”, page 16](#)

1.8 Removing and installing clutch slave cylinder together with release bearing

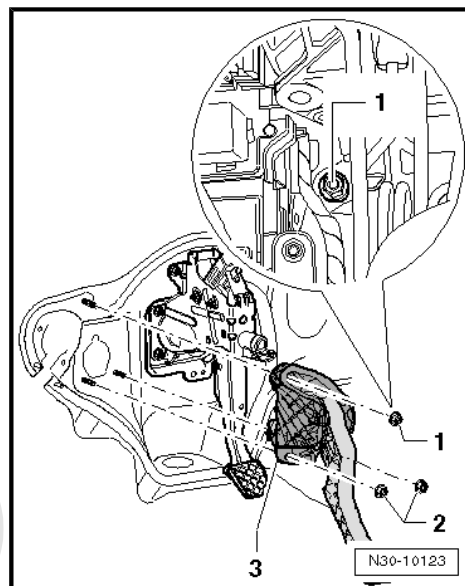


Note

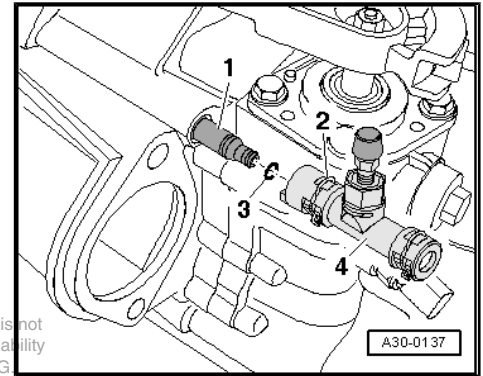
Slave cylinder and release bearing are one unit and can only be renewed together.

Removing

- Gearbox removed



- Release retaining clip -2- with a screwdriver and pull bleeder connection -4- off slave cylinder -1-.



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

Installing

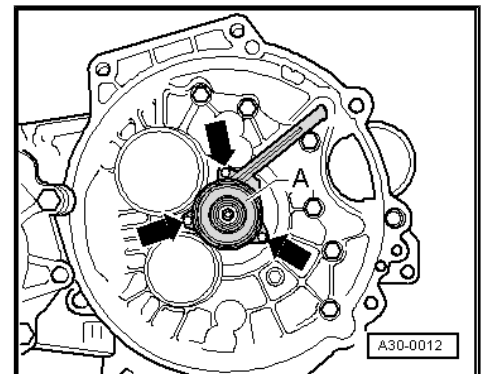
Installation is carried out in reverse order; note the following:



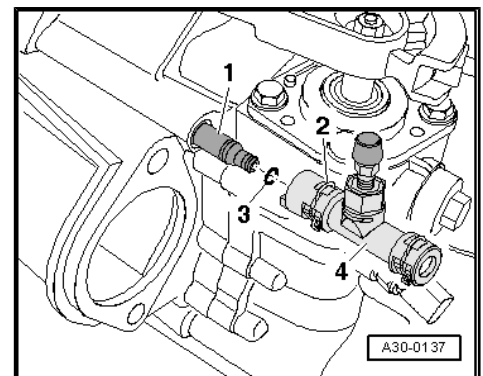
Caution

Risk of damage to clutch slave cylinder.

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



- Bolt on clutch slave cylinder with release bearing -arrows-; tightening torque: ⇒ [Item 2 \(page 19\)](#) .
- Check seal or O-ring -3- for damage and renew if necessary.
- Press bleeder connection -4- onto connection on clutch slave cylinder -1- so that retaining clip -2- snaps into place.
- Pull on bleeder connection to check it is secure.
- Bleed clutch system ⇒ [page 38](#) .



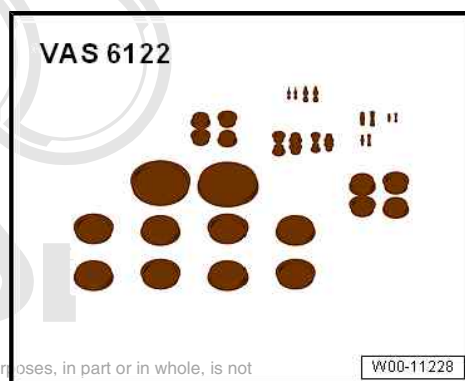
1.9 Removing and installing lines for clutch hydraulics

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-

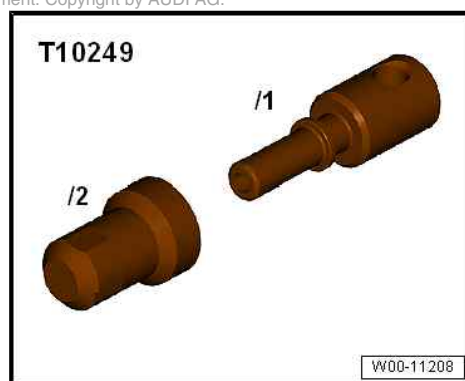


- ◆ Engine bung set - VAS 6122-



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- ◆ Sealing tool - T10249-

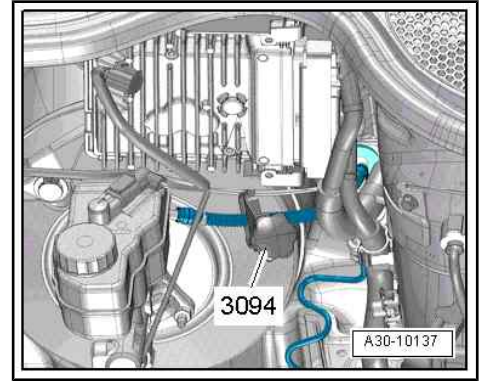


Removing

- Remove air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .
- Audi S1: Remove engine control unit - J623- from bracket and tie to one side ⇒ Rep. gr. 24 ; Engine control unit; Removing and installing engine control unit - J623- .

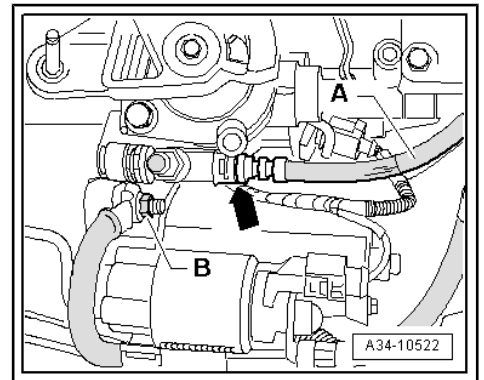
 Note

- ◆ *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.
- Disconnect supply hose from clutch master cylinder and plug hose using sealing tool - T10249/1- .



 Note

- ◆ *Clamping off the supply hose with the hose clamp - 3094- will cause a permanent deformation.*
- ◆ *However, this does not damage the supply hose.*
- ◆ *After removing the hose clamp -3094- , the supply hose must be returned to its original shape.*
- Place lint-free cloth under bleeder connection.
- Pull out retaining clip -arrow- as far as it will go and disconnect pipe/hose assembly -A- from bleeder connection.



 Note

- *-Item B- can be disregarded.*
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



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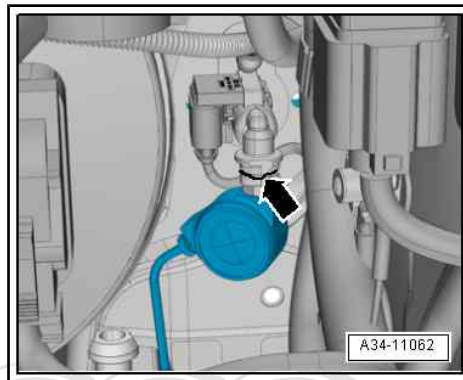
- Place lint-free cloth under clutch master cylinder.
- Pull out retaining clip -arrow- as far as it will go and disconnect line from clutch master cylinder.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



Caution

Catch escaping brake fluid.

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



- Move pipe/hose assembly clear and remove.

Installing

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



Note

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

- Connect pipe/hose assembly ⇒ [page 18](#) .
- Bleed clutch system ⇒ [page 38](#) .
- Audi S1: Install engine control unit ⇒ Rep. gr. 24 ; Engine control unit; Removing and installing engine control unit - J623- .
- Install air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .

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1.10 Bleeding clutch hydraulics

Special tools and workshop equipment required

- ◆ Brake filling and bleeding equipment - VAS 5234-



- ◆ Brake fluid specification ⇒ Electronic parts catalogue .

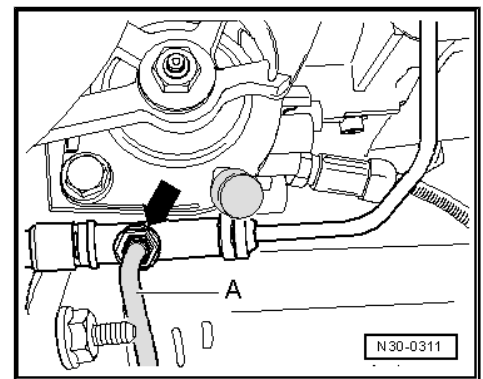
Procedure



Note

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

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



Tightening torques

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

1.11 Checking clutch master cylinder and clutch slave cylinder



Note

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

Noises when operating the clutch:

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

- ◆ Renew relevant component.

After releasing clutch pedal it still remains 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).
- ◆ Check joint between engine and gearbox for traces of brake fluid escaping from clutch slave cylinder.
- ◆ If you identify any leaks you must renew the leaking component.
- ◆ Bleed clutch system ⇒ [page 38](#) .

Pedal forces:

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

High pedal force:

- ◆ Mechanical fault on pressure plate/clutch plate ⇒ [page 42](#) .

Clutch does not disengage or does not disengage fully:

- ◆ Air in hydraulic system: bleed clutch system ⇒ [page 38](#) 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 42](#) .
- ◆ Wrong components used or components forgotten when carrying out repair work (e.g. intermediate plate or dowel sleeves).

1.12 Removing and installing clutch position sender - G476-

Removing

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

- Audi S1: Remove engine control unit - J623- from bracket and tie to one side ⇒ Rep. gr. 24 ; 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- .

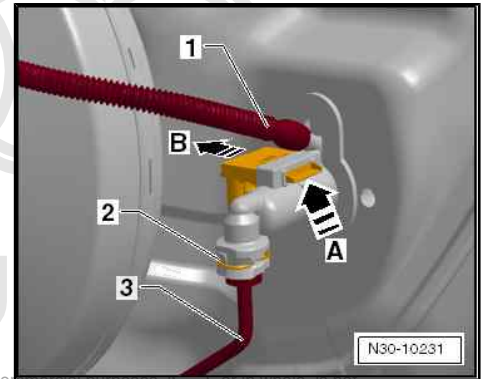
 Note

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-.
- Audi S1: Install engine control unit - J623- ⇒ Rep. gr. 24 ; Engine control unit; Removing and installing engine control unit - J623- .
- Install air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .



2 Clutch

⇒ [“2.1 Identifying different makes of clutch”, page 42](#)

⇒ [“2.2 Exploded view - clutch unit”, page 43](#)

⇒ [“2.3 Removing and installing clutch”, page 47](#)

⇒ [“2.4 Renewing input shaft oil seal”, page 54](#)

2.1 Identifying different makes of clutch



Note

The clutch fitted in the vehicle is supplied by either “Sachs” or “LuK”.

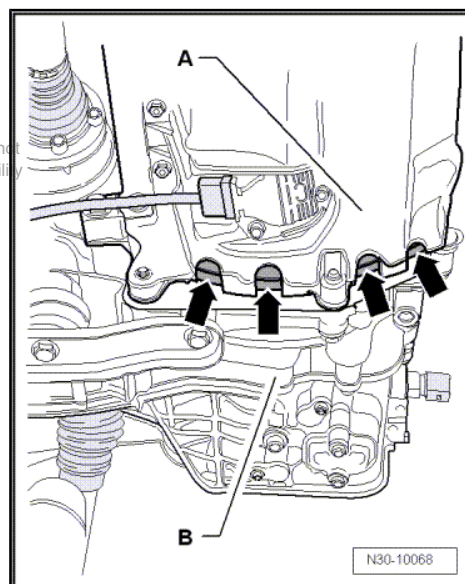
With gearbox installed, the clutch version fitted can be distinguished as follows:

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

A number of recesses -arrows- are located in lower area of sump between engine -A- and gearbox -B-.

- Check the contour of the flywheel visible through the recesses.

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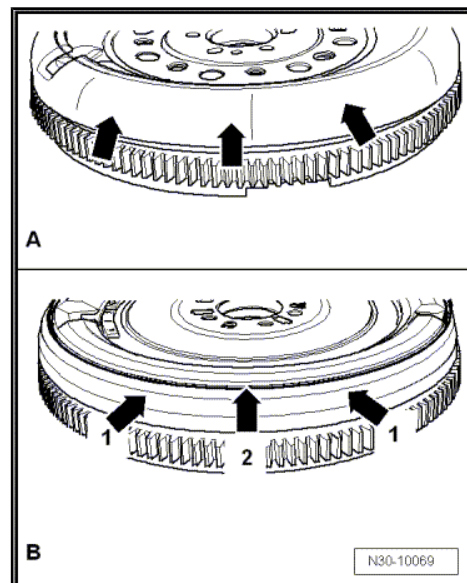


A - round contour -arrows- = Sachs version clutch

Exploded view - Sachs version clutch ⇒ [page 43](#)

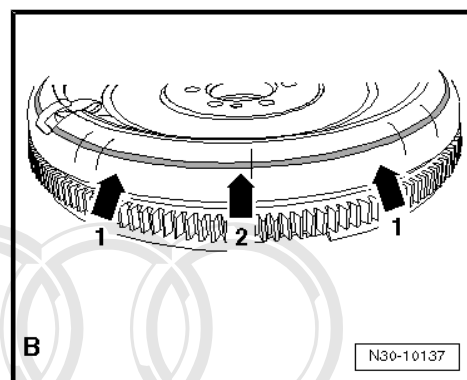
B - square contour -arrows 1- and annular groove -arrow 2- = LuK version clutch

Exploded view - LuK version clutch ⇒ [page 45](#)



Round contour -arrows 1- and annular groove -arrow 2- = LuK version clutch = -B-

Exploded view - LuK version clutch ⇒ [page 45](#)



2.2 Exploded view - clutch unit

⇒ [“2.2.1 Exploded view - Sachs version clutch”, page 43](#)

⇒ [“2.2.2 Exploded view - LuK version clutch”, page 45](#)

2.2.1 Exploded view - Sachs version clutch



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.

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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

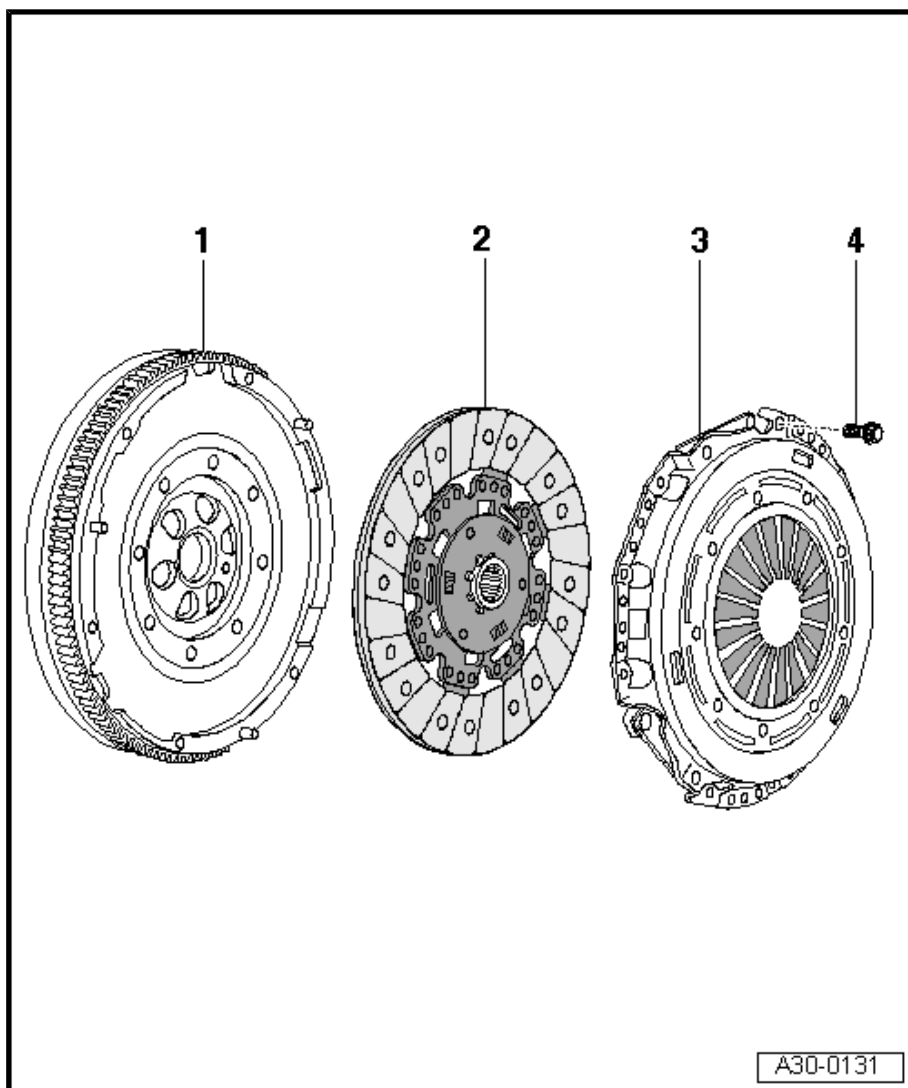
- ☐ Always renew clutch pressure plate as well
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Removing and installing
⇒ [page 47](#)
- ☐ Installation position
⇒ [page 49](#)

3 - Clutch pressure plate

- ☐ With adjustment mechanism
- ☐ Identification
⇒ [page 45](#)
- ☐ Removing and installing
⇒ [page 47](#)
- ☐ Always renew clutch plate as well
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Checking ends of diaphragm spring ⇒ [page 49](#)
- ☐ Checking spring connections and rivets ⇒ [page 49](#)
- ☐ Checking wire ring or sheet-metal ring ⇒ [page 50](#)
- ☐ Release bearing with additional plastic disc ⇒ [page 20](#) , pressure plate is matched accordingly
⇒ [page 20](#)
- ☐ Contact surface for clutch lining must be free of grooves, oil and grease

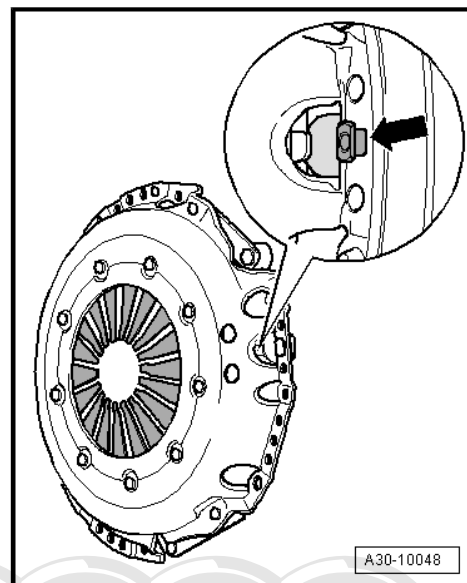
4 - Bolt

- ☐ Loosen and tighten consecutively in steps of 90°
- ☐ M 6 - 13 Nm
- ☐ M 7 - 20 Nm
- ☐ 6x



Identification of self-adjusting Sachs version clutch

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



2.2.2 Exploded view - LuK version clutch



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.

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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

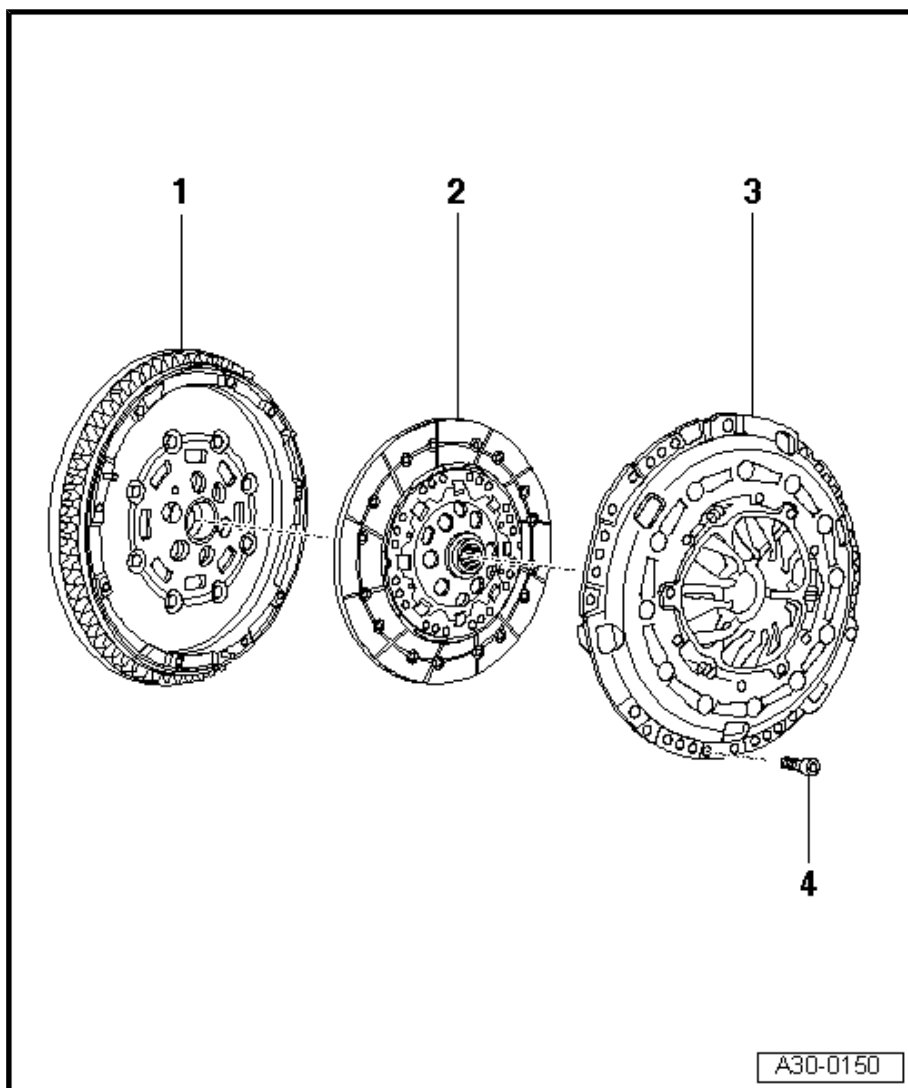
- ☐ Removing and installing
⇒ ["2.3 Removing and installing clutch", page 47](#)
- ☐ Always renew clutch pressure plate as well
- ☐ Allocate according to engine code ⇒ Electronic parts catalogue
- ☐ Installation position
⇒ [page 53](#)
- ☐ Lightly grease splines

3 - Clutch pressure plate

- ☐ With adjustment mechanism
- ☐ Removing and installing
⇒ ["2.3 Removing and installing clutch", page 47](#)
- ☐ Checking ends of diaphragm spring
⇒ [page 53](#)
- ☐ Checking spring connections and rivets ⇒ [page 53](#)
- ☐ Checking metal ring ⇒ [page 54](#)
- ☐ Always renew clutch plate as well
- ☐ Allocate according to engine code ⇒ Electronic parts catalogue
- ☐ Only fits on flywheel in one position
- ☐ Release bearing with additional plastic disc ⇒ [page 20](#) , pressure plate is matched accordingly
⇒ [page 20](#)
- ☐ 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



2.3 Removing and installing clutch

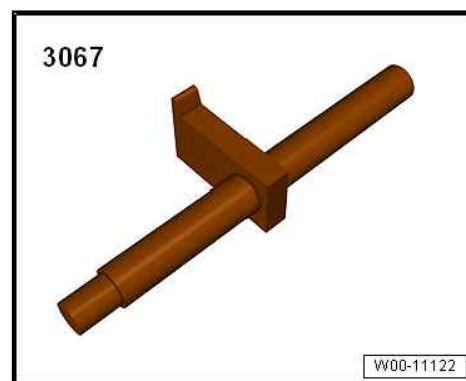
⇒ [“2.3.1 Removing and installing Sachs version clutch”, page 47](#)

⇒ [“2.3.2 Removing and installing LuK version clutch”, page 50](#)

2.3.1 Removing and installing Sachs version clutch

Special tools and workshop equipment required

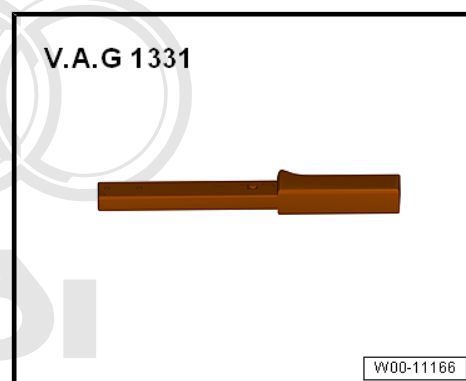
- ◆ Counterhold tool - 3067-



- ◆ Centring mandrel - T10097-



- ◆ Torque wrench - V.A.G 1331-



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

Removing

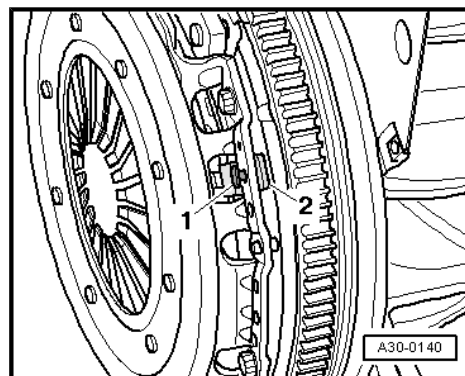
- Gearbox removed

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- 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.
- 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 pressure plate and clutch plate.



Installing

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

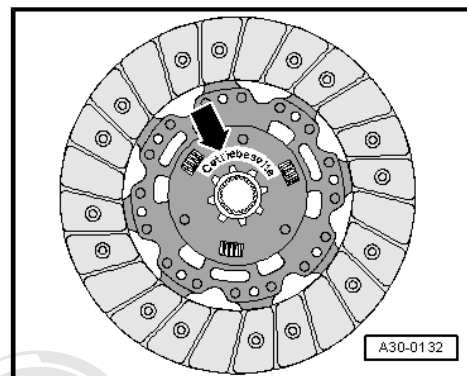


Note

- ◆ *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).*

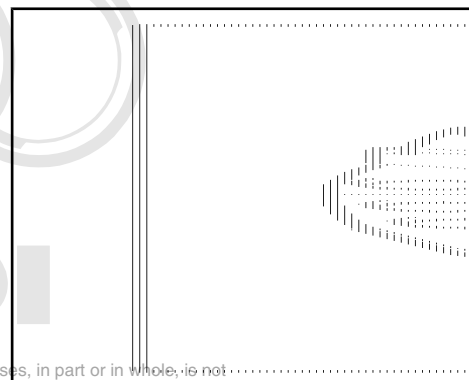
Installation position of clutch plate

- 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.



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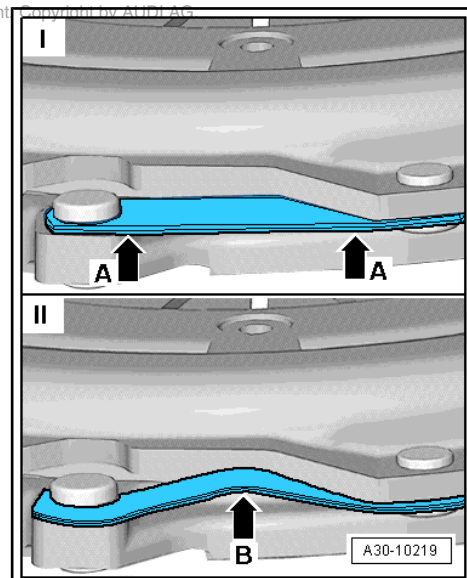
Checking spring connections and rivets

I - Springs OK

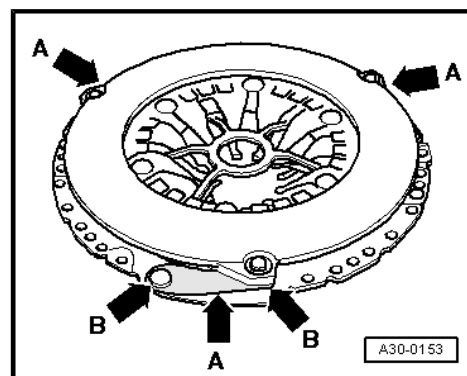
- Slight kinking on the outside -arrows A- is normal on production parts.

II - Springs damaged

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

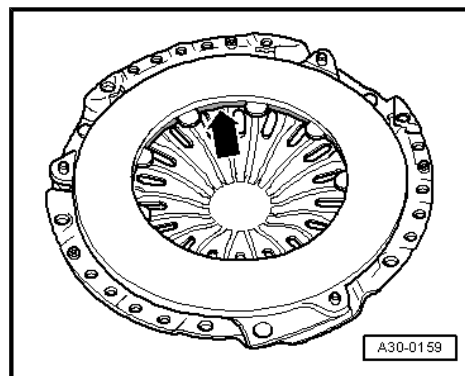


- Check that riveting -arrows B- is secure at all springs -arrows A-.
- Renew clutch pressure plate if riveting -arrows B- is loose.

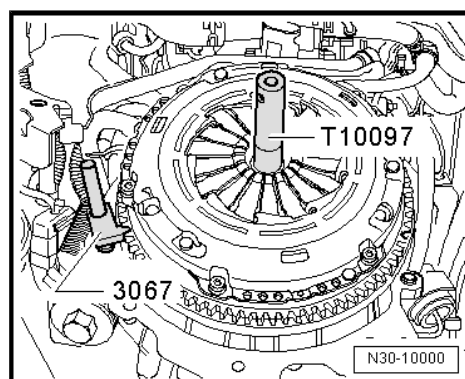


Checking wire ring or sheet-metal ring

- Check wire ring or sheet-metal ring -arrow- in clutch pressure plate for damage.
- Renew clutch pressure plate if wire ring or sheet-metal ring is broken.

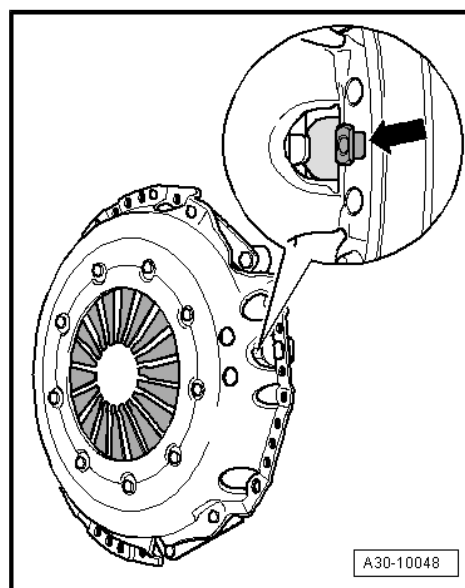


- Reverse position of counterhold tool - 3067- when installing.
- Position clutch pressure plate on dowel pins.
- Use centring mandrel - 3190 A- to centralise clutch plate.



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 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 pressure plate.
- Consecutively tighten all bolts to final setting in clockwise direction.
- Install gearbox.



Tightening torques

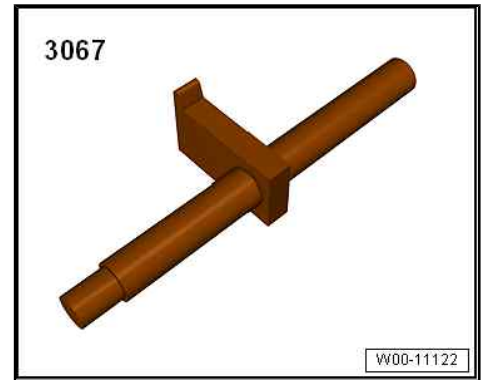
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► 2.2.1 Exploded view - Sachs version clutch, page 43

2.3.2 Removing and installing LuK version clutch

Special tools and workshop equipment required

◆ Counterhold tool - 3067-



◆ Centring mandrel - T10097-



◆ Torque wrench - V.A.G 1331-



◆ Grease for clutch plate splines - G 000 100-

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Removing

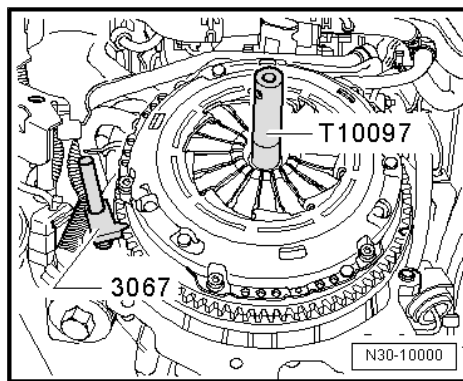
- Gearbox removed
- Attach counterhold tool - 3067- before loosening bolts.

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:



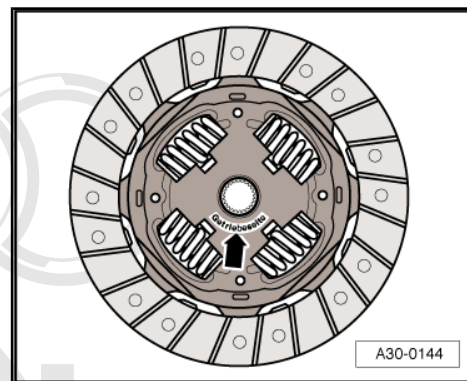
Note

- ◆ *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).*

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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

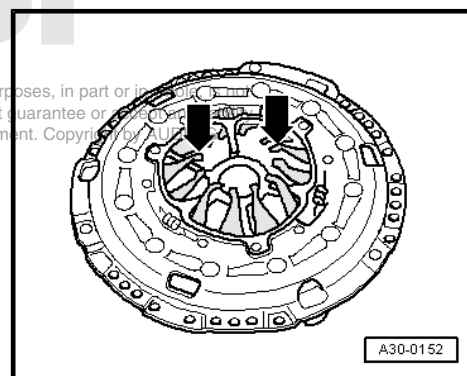
- Wear up to half the thickness of the diaphragm spring -arrows- is permissible.

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Note

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



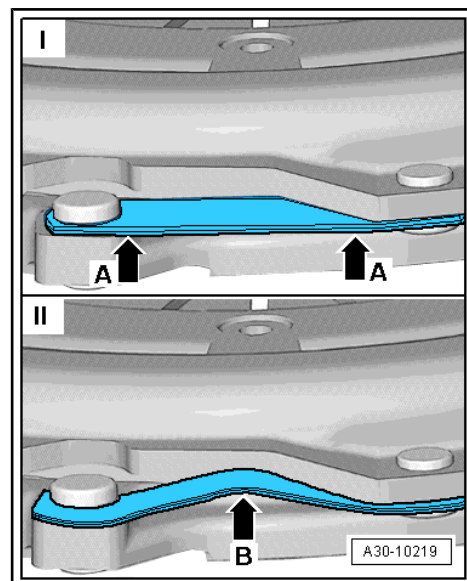
Checking spring connections and rivets

I - Springs OK

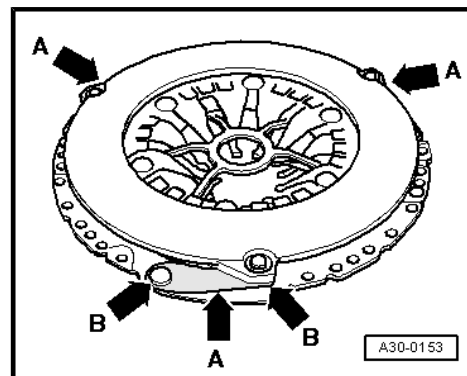
- Slight kinking on the outside -arrows A- is normal on production parts.

II - Springs damaged

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

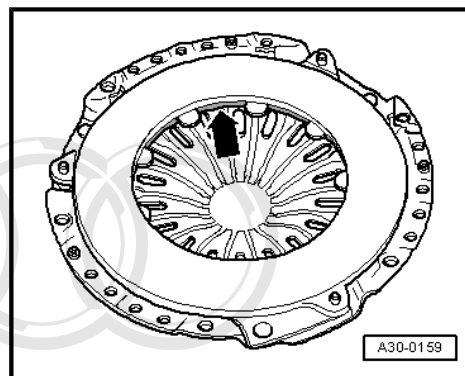


- Check that riveting -arrows B- is secure at all springs -arrows A-.
- Renew clutch pressure plate if riveting -arrows B- is loose.



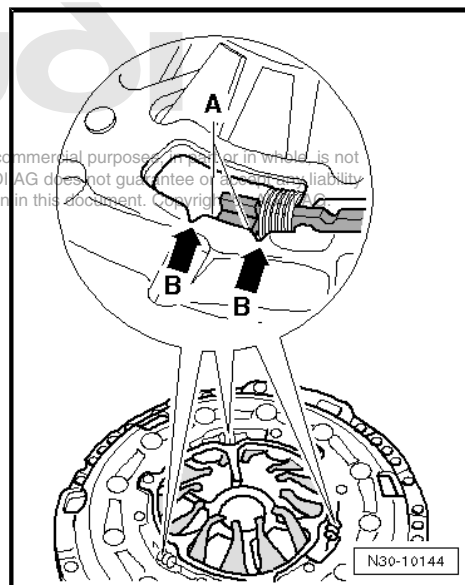
Checking metal ring

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



Checking position of adjustment mechanism (new pressure plates only)

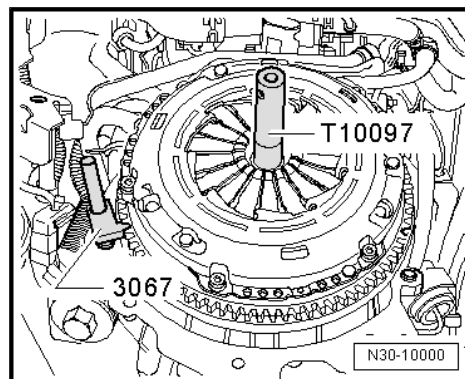
- The two edges -A- of the adjuster ring should be located between the two notches -arrows B-.
- If the adjuster ring is in a different position on a new pressure plate, the pressure plate and clutch plate must not be installed.
- The position of the adjuster ring can be outside the notches on used clutches.



- Reverse position of counterhold tool - 3067- when installing.
- Position clutch pressure plate on dowel pins.
- Use centring mandrel - 3190 A- to centralise clutch plate.

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.



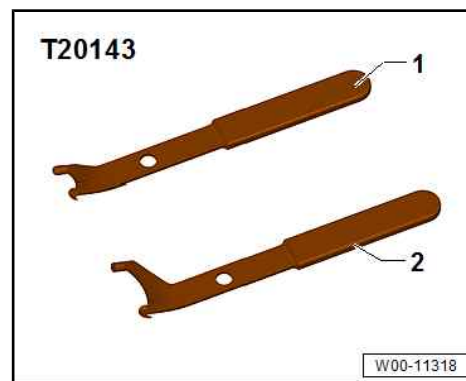
Tightening torques

- ♦ ⇒ [“2.2.2 Exploded view - LuK version clutch”, page 45](#)

2.4 Renewing input shaft oil seal

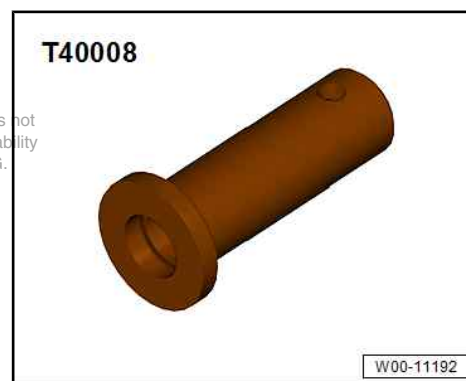
Special tools and workshop equipment required

◆ Extractor tool - T20143/1-



◆ Thrust piece - T40008-

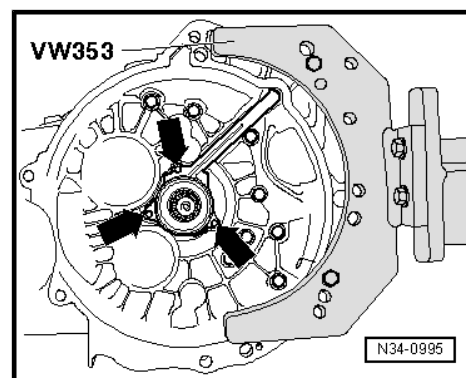
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◆ Sealing grease - G 052 128 A1-

Removing

- Gearbox is removed
- Remove clutch slave cylinder with release bearing
⇒ [page 34](#) .

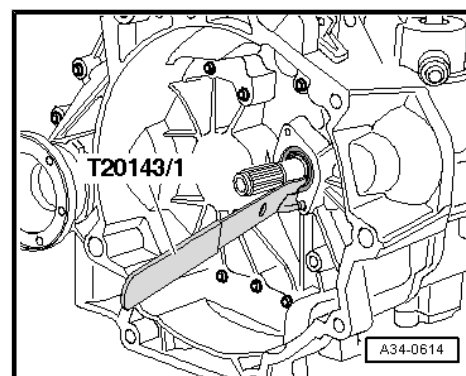


- Use extractor tool - T20143/1- to pull out input shaft oil seal.

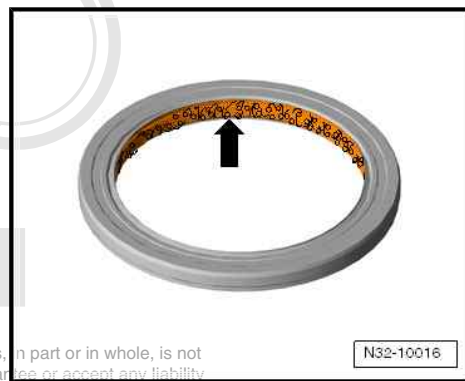


Note

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

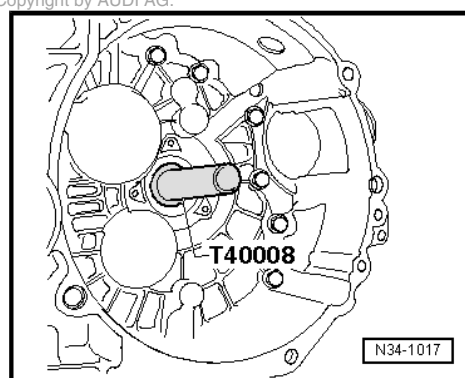


- Lightly oil outer circumference of new oil seal.
- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .



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- Drive in oil seal until flush with thrust piece - T40008- .
- Install clutch slave cylinder with release bearing ⇒ [page 34](#) .



34 – Controls, housing

1 Selector mechanism

⇒ [“1.1 Overview - selector mechanism”, page 57](#)

⇒ [“1.2 Exploded view - gear knob and cover”, page 58](#)

⇒ [“1.3 Exploded view - selector cables”, page 59](#)

⇒ [“1.4 Exploded view - selector mechanism”, page 62](#)

⇒ [“1.5 Removing and installing gear knob”, page 64](#)

⇒ [“1.6 Removing and installing selector mechanism”, page 65](#)

⇒ [“1.7 Adjusting selector mechanism”, page 67](#)

⇒ [“1.8 Checking selector mechanism”, page 69](#)

⇒ [“1.9 Renewing selector shaft oil seal”, page 69](#)

⇒ [“1.10 Dismantling and assembling selector mechanism”, page 72](#)

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⇒ [“1.11 Removing and installing selector cable”, page 76](#)

1.1 Overview - selector mechanism

1 - Gearbox selector lever

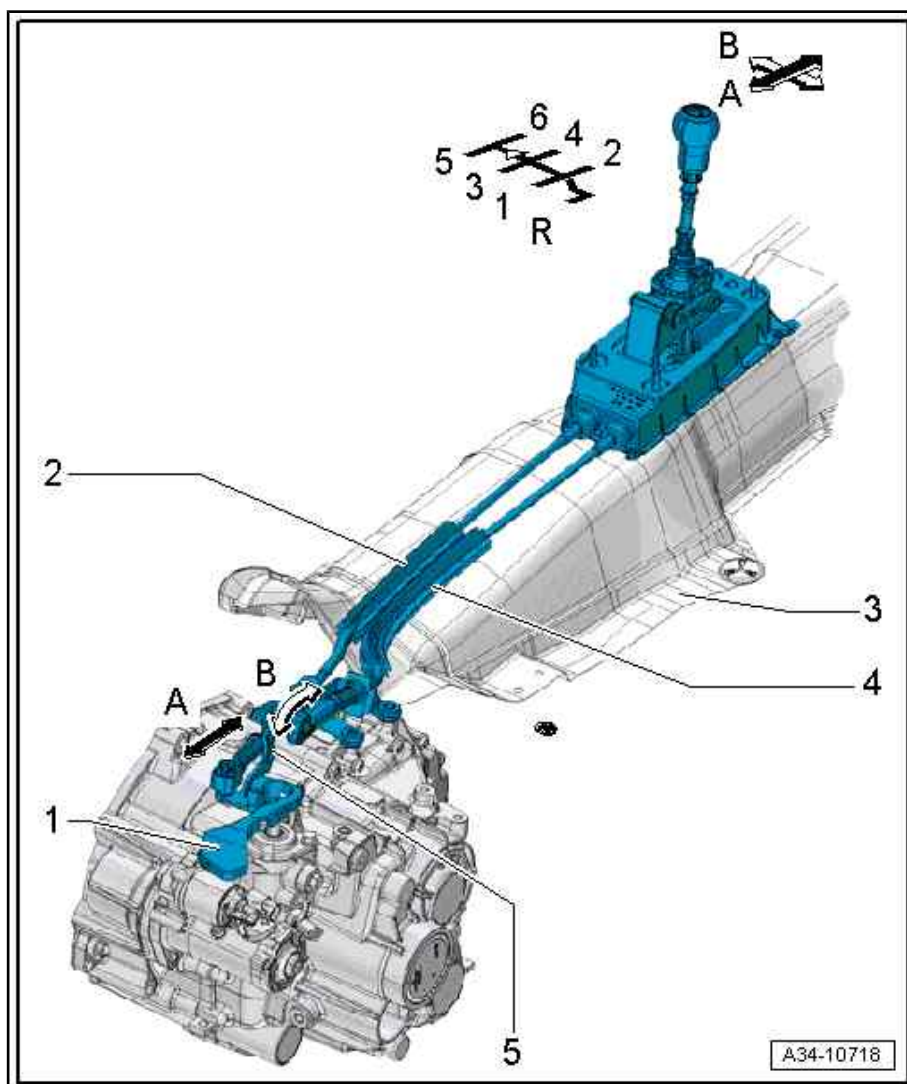
2 - Gear selector cable

- ☐ For gear selection movement -arrows A-

3 - Heat shield

4 - Gate selector cable

- ☐ For gate selection movement -arrows B-



5 - Gate relay lever

1.2 Exploded view - gear knob and cover

1 - Gear lever

2 - Clip

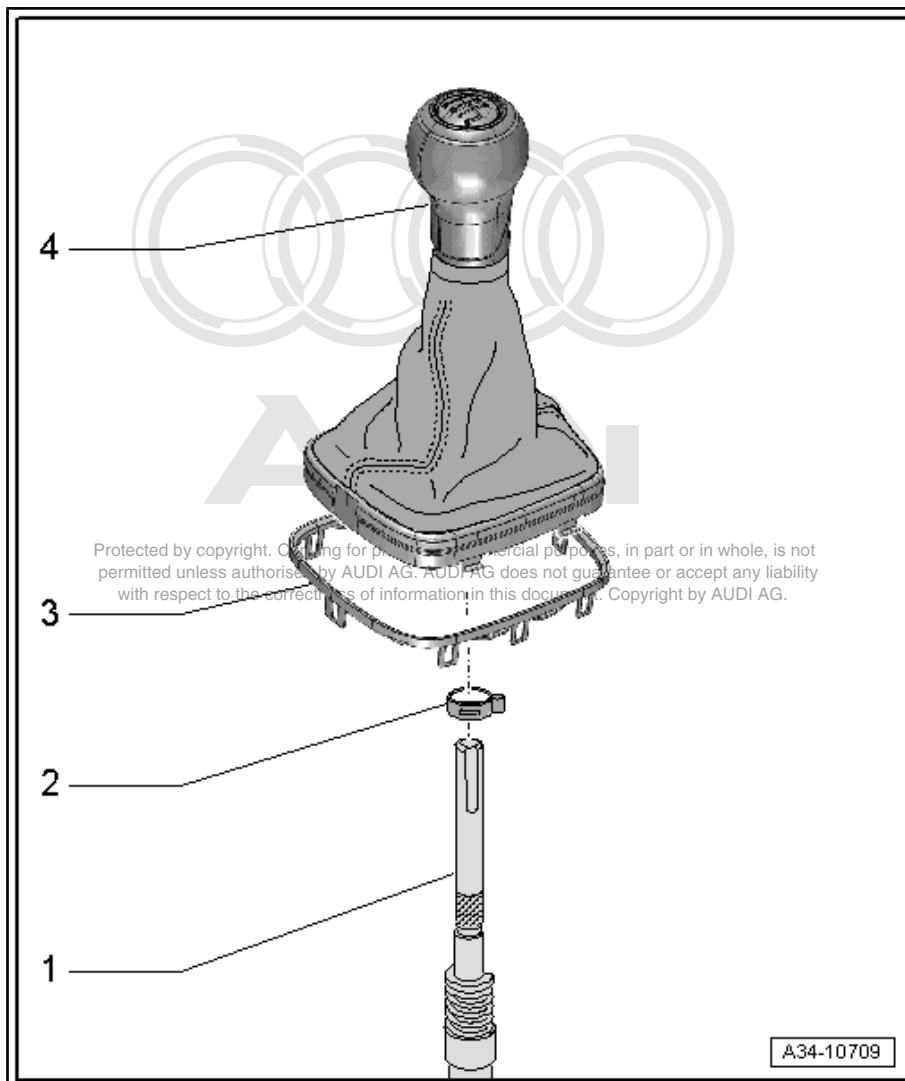
- ☐ Renew
- ☐ Must be the same as original equipment ⇒ Electronic parts catalogue

3 - Trim frame

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

4 - Gear knob

- ☐ With gear lever boot
- ☐ Removing and installing
⇒ [page 64](#)



1.3 Exploded view - selector cables



Note

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

1 - Selector unit

- ☐ ⇒ "8.7 Removing and installing selector unit", page 117
- ☐ ⇒ "1.9 Renewing selector shaft oil seal", page 69

2 - Bearing bush

- ☐ Insert in selector unit

3 - Slide block

- ☐ Installation position
⇒ page 62

4 - Gate relay lever

- ☐ Installation position
⇒ page 62
- ☐ Grease before installing
- ☐ After installing, adjust selector mechanism
⇒ page 67

5 - Securing clip

- ☐ Removing ⇒ page 60
- ☐ Renew

6 - Cable end-piece

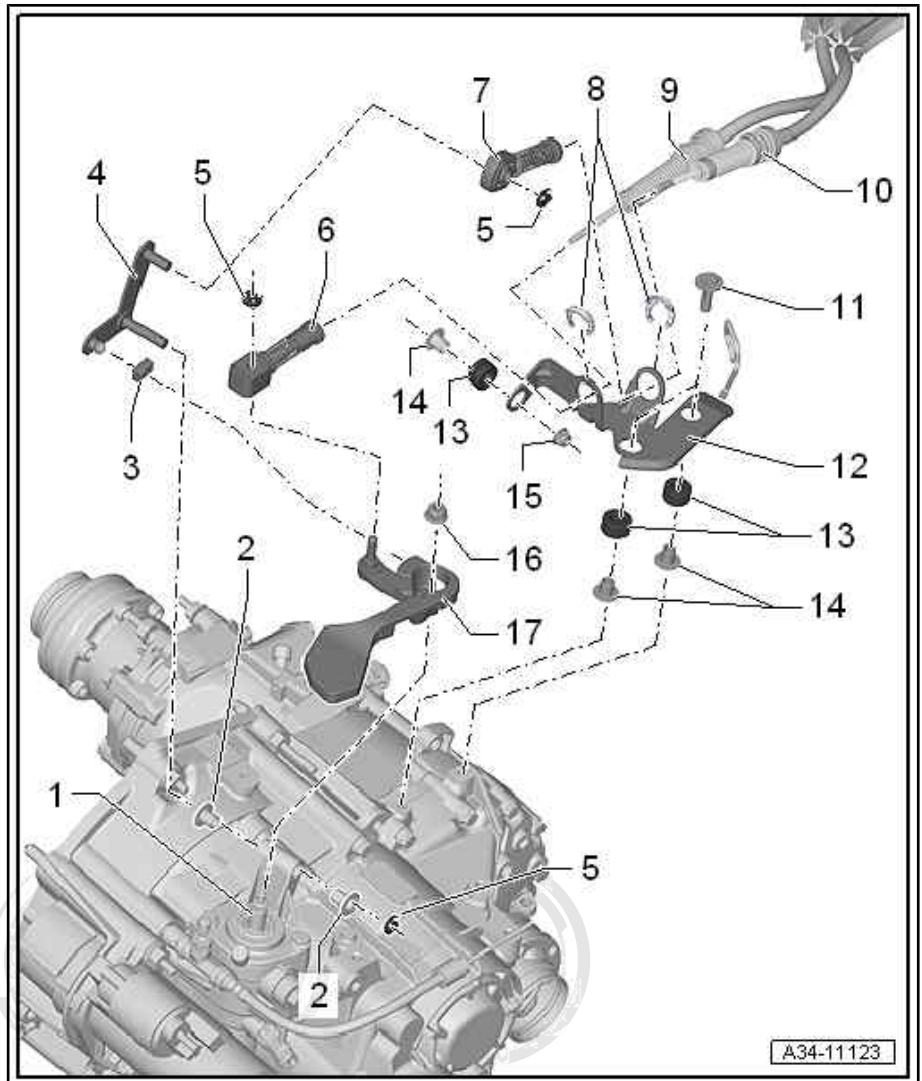
- ☐ Secures gear selector cable to gearbox selector lever
- ☐ Detaching from gear selector cable
⇒ page 61
- ☐ After installing, adjust selector mechanism
⇒ page 67
- ☐ Do not interchange; cable end-pieces securing gate selector cable to gate relay lever and gear selector cable to gearbox selector lever are different
- ☐ Allocation ⇒ page 61

7 - Cable end-piece

- ☐ Secures gate selector cable to gate relay lever
- ☐ Detaching from gear selector cable ⇒ page 61
- ☐ After installing, adjust selector mechanism ⇒ page 67
- ☐ Do not interchange; cable end-pieces securing gate selector cable to gate relay lever and gear selector cable to gearbox selector lever are different
- ☐ Allocation ⇒ page 61

8 - Securing clip

- ☐ Take care not to damage selector cables when removing.
- ☐ Renew



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9 - Gear selector cable

- ☐ Connect to cable end-piece ⇒ [Item 6 \(page 59\)](#)
- ☐ Installation position ⇒ [page 57](#)
- ☐ Removing and installing ⇒ [page 76](#)

10 - Gate selector cable

- ☐ Connect to cable end-piece ⇒ [Item 7 \(page 59\)](#)
- ☐ Installation position ⇒ [page 57](#)
- ☐ Removing and installing ⇒ [page 76](#)

11 - Bolt

- ☐ 20 Nm
- ☐ For cable support bracket
- ☐ 2x

12 - Cable support bracket**13 - Grommet****14 - Bush****15 - Nut**

- ☐ 20 Nm
- ☐ For cable support bracket

16 - Nut

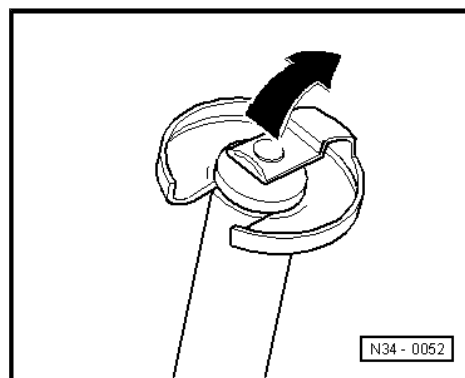
- ☐ 23 Nm
- ☐ Self-locking
- ☐ Always renew

17 - Gearbox selector lever

- ☐ Install so that gap in splines aligns with selector shaft ⇒ [page 61](#)
- ☐ Grease before installing ⇒ [page 62](#)
- ☐ After installing, adjust selector mechanism ⇒ [page 67](#)
- ☐ Installation position ⇒ [page 62](#)

Removing securing clip

- Lift up tab -arrow-.

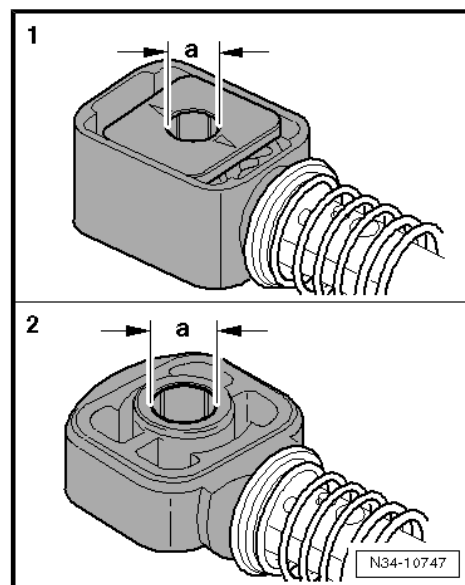


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Identification of cable end-pieces

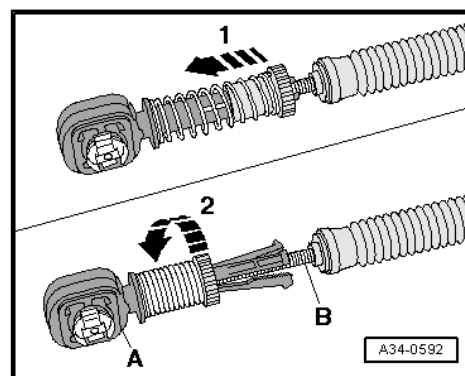
The holes in the cable end-pieces have different diameters.

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



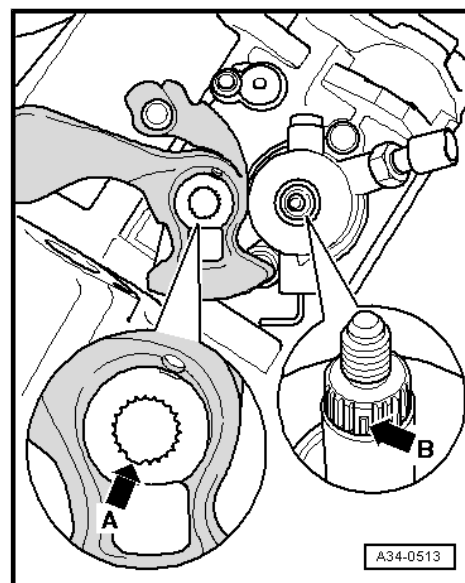
Detaching cable end-pieces from gear selector cable and gate selector cable

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



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.



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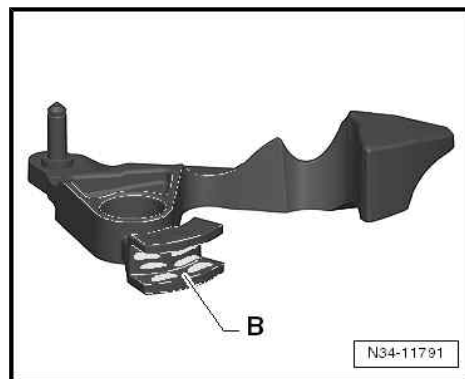
Greasing gearbox selector lever

- Thoroughly lubricate guide rail -B- of gearbox selector lever into which slide block of gate relay lever engages.
- Select correct type of grease from ⇒ Electronic parts catalogue .



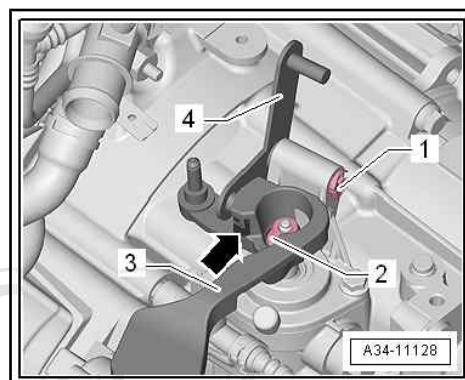
Note

Illustration of gearbox selector lever may differ from actual components.



Installation position: gearbox selector lever/gate relay lever

- Gearbox selector lever -3- is secured to selector shaft with nut -2-.
- Gate relay lever -4- locates in guide rail of gearbox selector lever via slide block -arrow-.
- Secure gate relay lever with new securing clip -1-.



1.4 Exploded view - selector mechanism



Note

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

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1 - Floor plate

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

2 - Gasket

- ☐ Renew after removing

3 - Bush

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

4 - Retaining clips

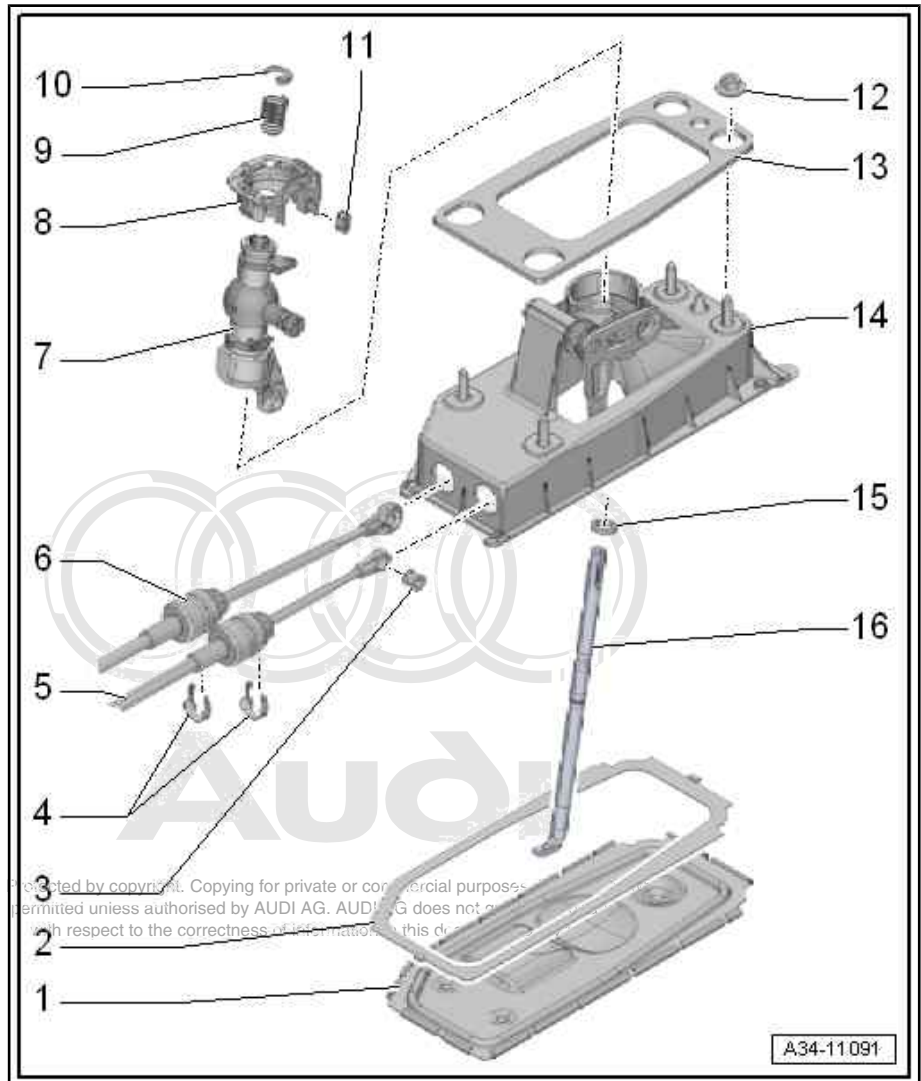
- ☐ Take care not to damage selector cables when removing.
- ☐ Renew after removing

5 - Gate selector cable

- ☐ Lever off gate selector lever
- ☐ Press onto gate selector lever inside selector mechanism
- ☐ Installation position
⇒ [page 57](#)

6 - Gear selector cable

- ☐ Lever off gear lever guide
- ☐ Press onto gear lever guide inside selector mechanism
- ☐ Installation position
⇒ [page 57](#)



7 - Gear lever guide

8 - Ball socket

- ☐ Will be damaged during removal
- ☐ Renew

9 - Spring

10 - Securing clip

11 - Damper

12 - Nut

- ☐ 4x
- ☐ 20 Nm

13 - Gasket

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

14 - Selector housing

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

- ❑ Removing and installing ⇒ [page 65](#)

15 - Damping washer

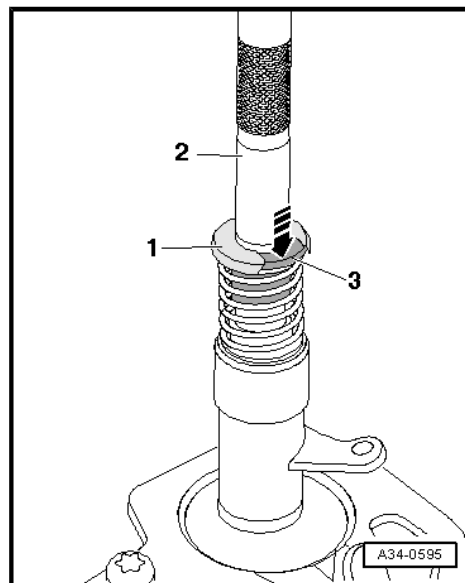
- ❑ Push onto gear lever as far as stop

16 - Gearbox selector lever

- ❑ Can be removed and installed without removing gear lever guide ⇒ [Item 7 \(page 63\)](#)

Removing and installing securing clip

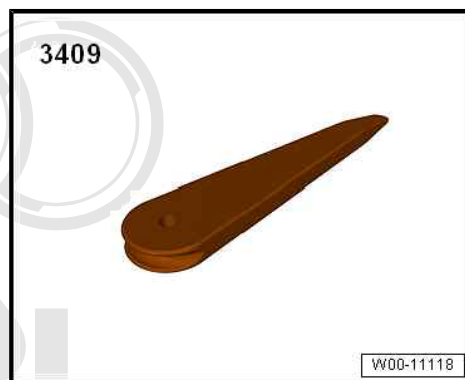
- Hold gear lever -2- firmly.
- Push bush -3- in direction of -arrow-.
- Remove securing clip -1-.



1.5 Removing and installing gear knob

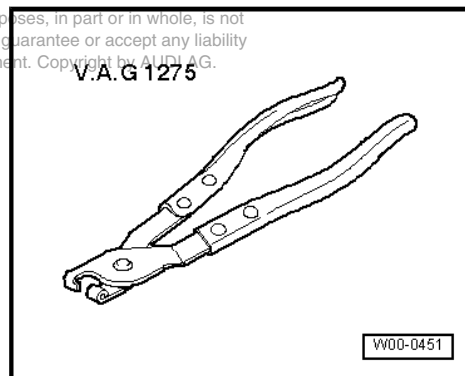
Special tools and workshop equipment required

- ◆ Removal wedge - 3409-



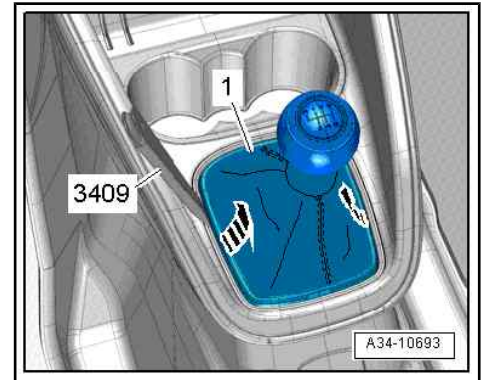
- ◆ Hose clip pliers - V.A.G 1275

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Removing

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

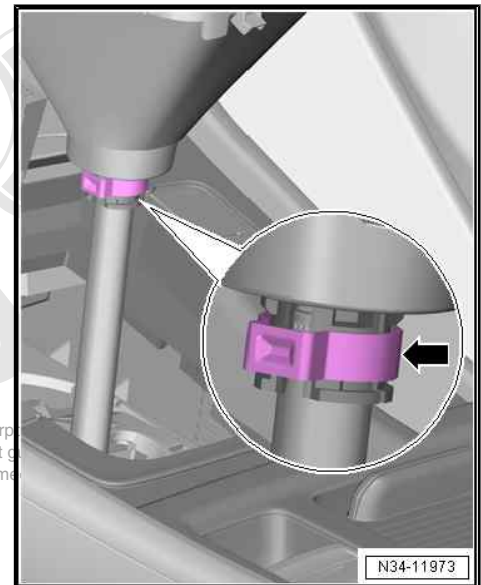


- Open clip -arrow- and pull off gear knob together with boot.

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- .



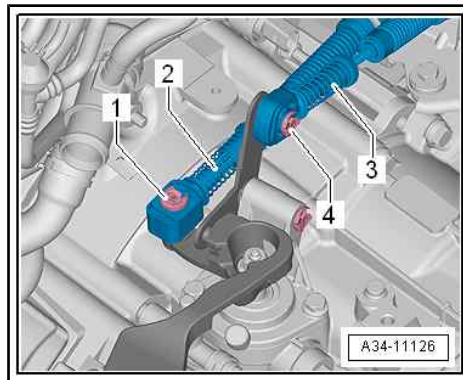
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1.6 Removing and installing selector mechanism

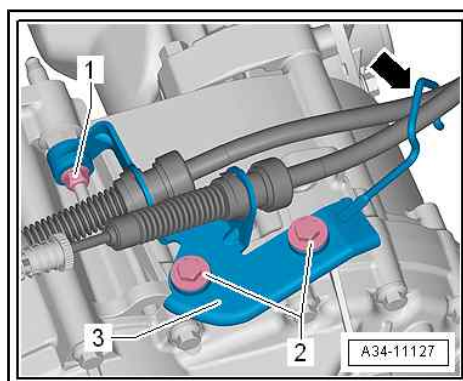
Removing

- Remove gear knob with gear lever boot ⇒ [page 64](#) .
- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- Remove propshaft ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .
- Remove heat shield in centre tunnel ⇒ General body repairs, exterior; Rep. gr. 66 ; Strips / trim panels / extensions; Exploded view - heat shield .
- Remove air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .

- Detach securing clip -1- and pull gear selector cable -2- off gearbox selector lever.
- Detach securing clip -4- and pull gate selector cable -3- off gate relay lever.



- Unscrew nut -1- and bolts -2- for support bracket -3-.

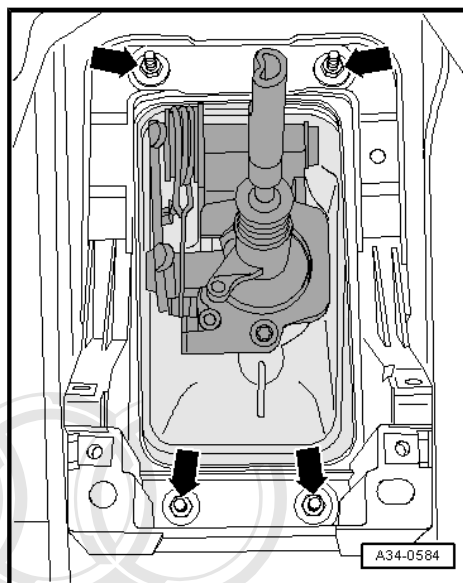


- Remove nuts -arrows- and detach selector mechanism from below.

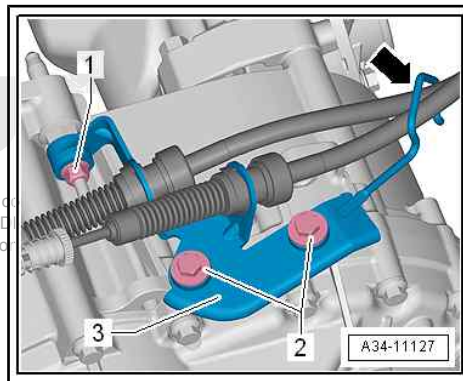
Installing

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

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

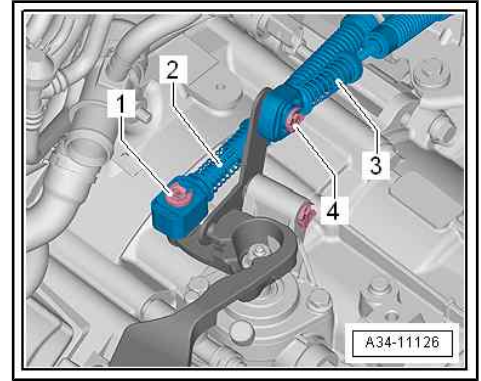


- Secure cable support bracket -3- to gearbox. At the same time, hook cables into hook -arrow-.



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- Apply a small amount of grease to pins of gearbox selector lever and gate relay lever.
- Select correct type of grease from ⇒ Electronic parts catalogue .
- Fit gear selector cable -2- and gate selector cable -3- with new securing clips -1, 4- onto gear selector lever and gate relay lever.
- Adjust selector mechanism ⇒ [page 67](#) .
- Install air cleaner housing ⇒ Rep. gr. 24 ; 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 propshaft ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .
- 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 64](#) .



Tightening torques

- ◆ ⇒ ["1.4 Exploded view - selector mechanism", page 62](#)
- ◆ ⇒ ["1.3 Exploded view - selector cables", page 59](#)

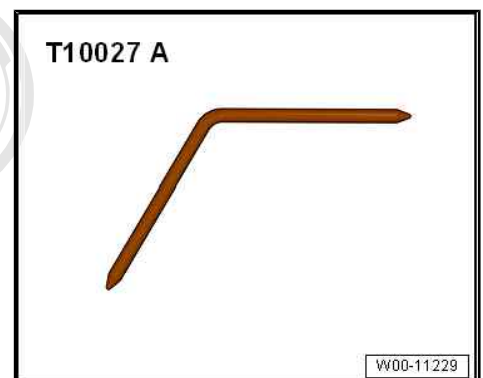
1.7 Adjusting selector mechanism

Special tools and workshop equipment required

- ◆ Removal wedge - 3409-



- ◆ Locking pin - T10027 A-



Adjustment conditions

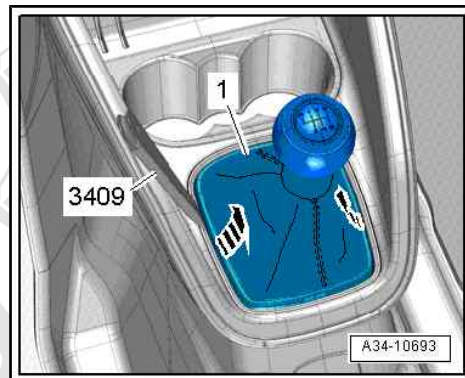
- Gear selector linkage must be in proper condition and undamaged.

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

Adjusting

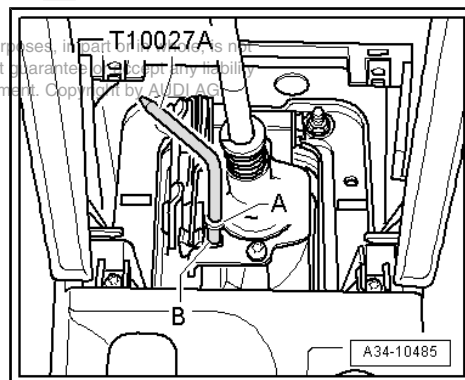
- Using removal wedge - 3409- , lift up gear lever boot -1- (as indicated by -arrows-) and turn inside out over gear knob.
- Open ashtray (if fitted).
- With gearbox in neutral, move gear lever to the left into 1st/2nd gear gate.



- If fitted, pull noise insulation slightly to one side.

- Fix gear lever in position with locking pin T10027 A-

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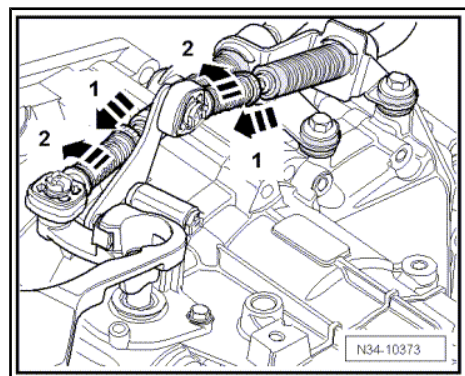
Note

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

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

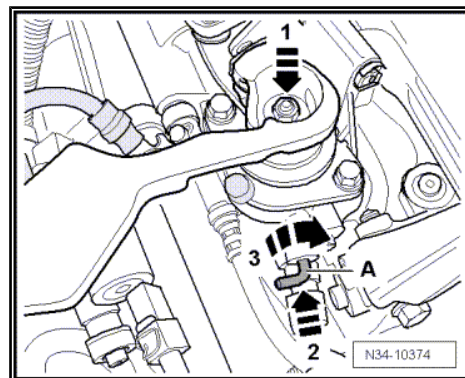
Release cable end-pieces for gear selector cable and gate selector cable as follows:

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



Lock selector shaft as follows:

- Push gearbox selector lever down into 1st/2nd gear gate -arrow 1-. At the same time, turn angled rod -A- in direction of -arrow 3- and press it 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.



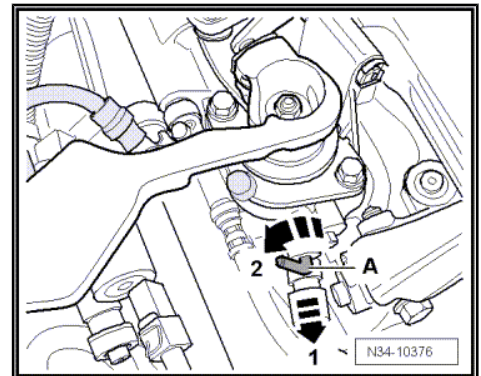
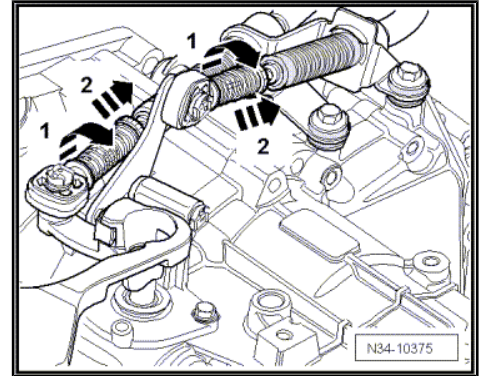
- Turn locking sleeves on gear selector cable and gate selector cable as far as they will go -arrows 1-.
- The spring presses the locking sleeve into normal position -arrows 2-.



Note

Cable adjustment is now complete.

- Turn angled rod -A- back to initial position in direction of -arrow 2-, at the same time pulling it out of selector shaft slightly in direction of -arrow 1-.
- Remove locking pin - T10027 A- .
- Check selector mechanism ⇒ [page 69](#) .
- Install air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .



1.8 Checking selector mechanism

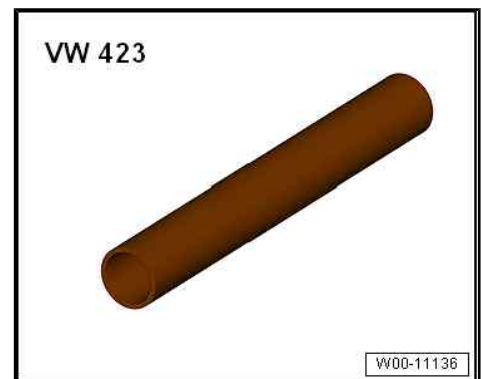
- With the gearbox in neutral, the gear lever should rest in the 3rd/4th gear gate.
- Press clutch pedal.
- Select all gears several times. Pay particular attention to the operation of the reverse gear locking mechanism.
- The gear lever should return by itself from the reverse gear gate to the 3rd/4th gear gate.

Should a gear fail to engage smoothly after repeated selection, readjust selector mechanism ⇒ [page 67](#) .

1.9 Renewing selector shaft oil seal

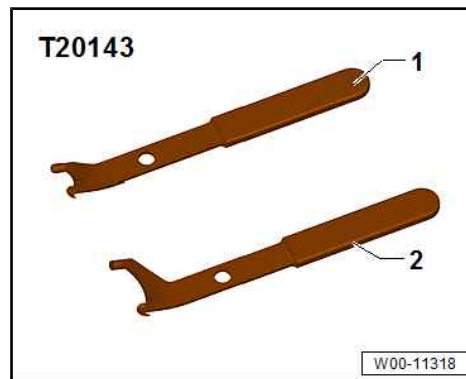
Special tools and workshop equipment required

- ◆ Tube - VW 423-



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- ◆ Extractor tool - T20143/1-

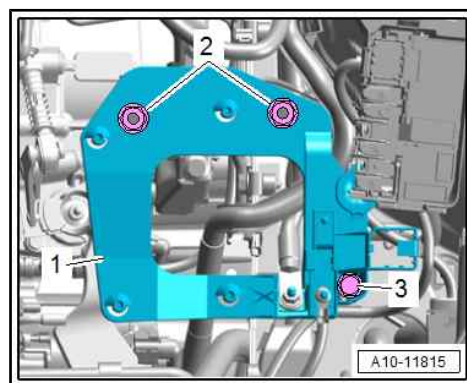


Removing

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

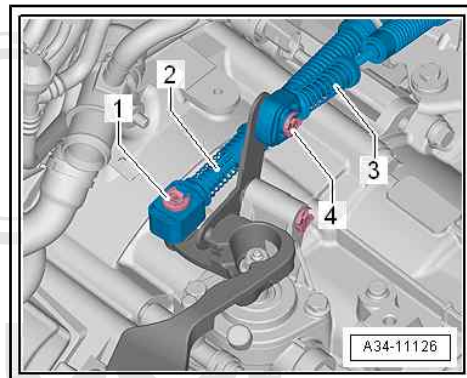
Audi S1:

- Unscrew nuts -2- and bolt -3-.
- Push bracket -1- for air cleaner housing slightly to one side.

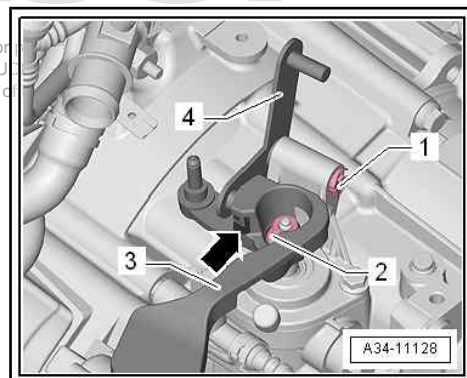


Continued for all vehicles:

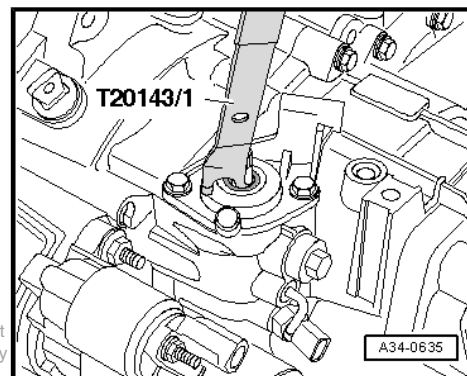
- Detach securing clip -1- and pull gear selector cable -2- off gearbox selector lever.
- Detach securing clip -4- and pull gate selector cable -3- off gate relay lever.



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



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



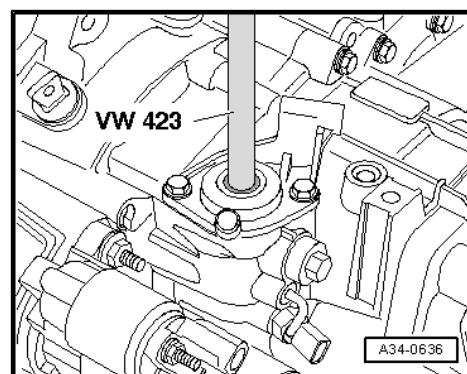
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Installing

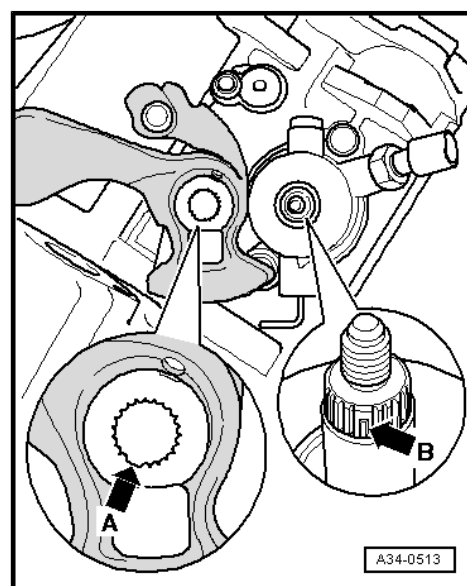
- Lightly oil outer circumference of new oil seal.
- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .



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



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

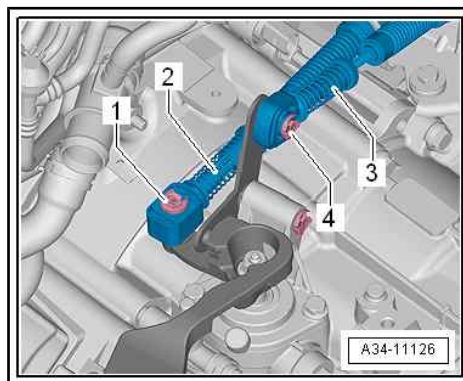
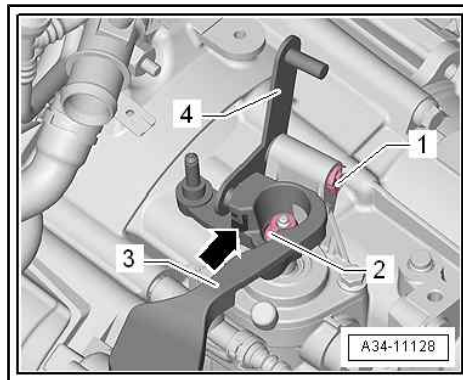


- Tighten new nut -2- securing gear selector lever -3- to selector shaft to specified torque ⇒ [Item 16 \(page 60\)](#) .
- Before installing gate relay lever -4-, check that bearing bushes ⇒ [Item 2 \(page 59\)](#) are fitted in selector unit.
- Lubricate bearings of gate relay lever and slide block -arrow- in gear selector lever. Select correct type of grease from ⇒ Electronic parts catalogue .
- Fit new securing clip -1- on gate relay lever.

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

Identification of cable end-pieces ⇒ [page 61](#)

- Apply a small amount of grease to pins of gearbox selector lever and gate relay lever.
- Select correct type of grease from ⇒ Electronic parts catalogue .
- Fit gear selector cable -2- and gate selector cable -3- with new securing clips -1, 4- onto gear selector lever and gate relay lever.
- Adjust selector mechanism ⇒ [page 67](#) .
- Install air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .



1.10 Dismantling and assembling selector mechanism

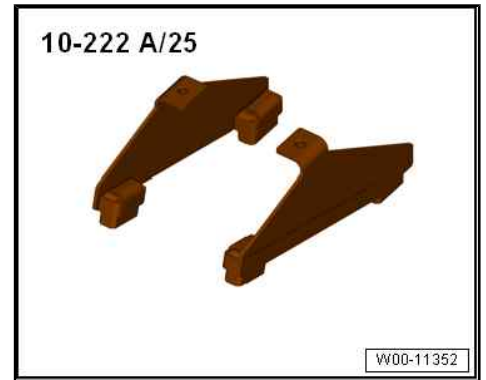
Special tools and workshop equipment required

- ◆ Press tool - VW 412-



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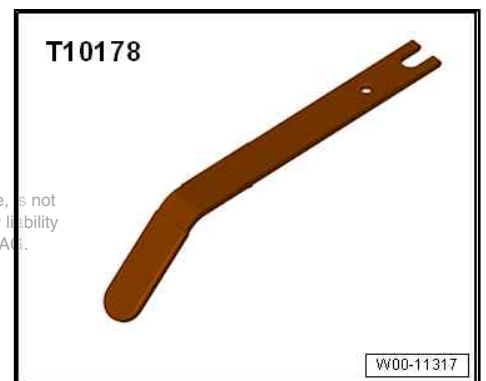
◆ Adapters - 10 - 222 A /25-



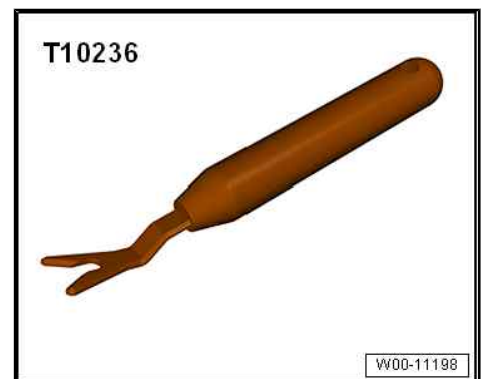
◆ Assembly tool - T10178-



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◆ Release tool - T10236-



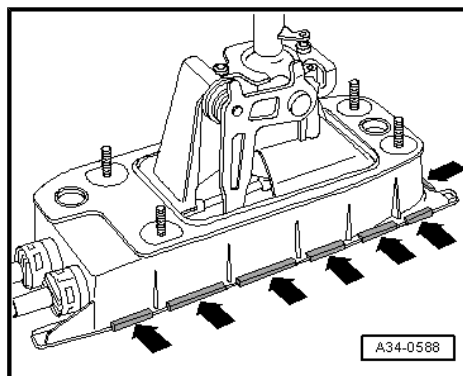
◆ Wedge - T10357-



◆ Counter-support Kukko series 16

Dismantling

- Selector mechanism removed ⇒ [page 65](#) .
- Open out tabs -arrows- all round with screwdriver and remove floor plate.
- Remove gasket.



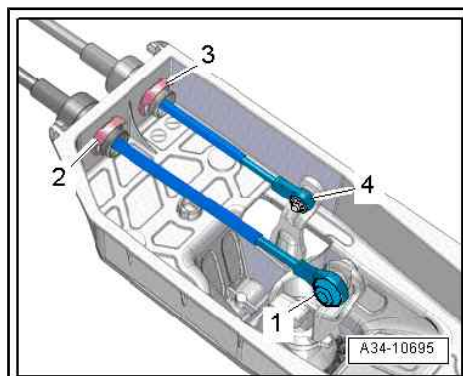
- Detach retaining clip -2-.
- Press off gear selector cable -1- using release tool - T10236- .



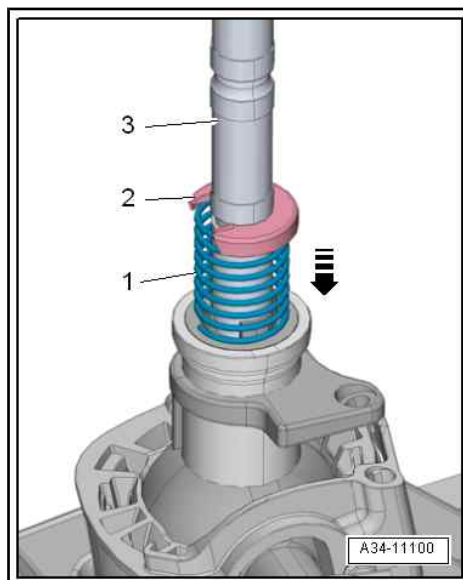
Note

Disregard items -3 and 4-.

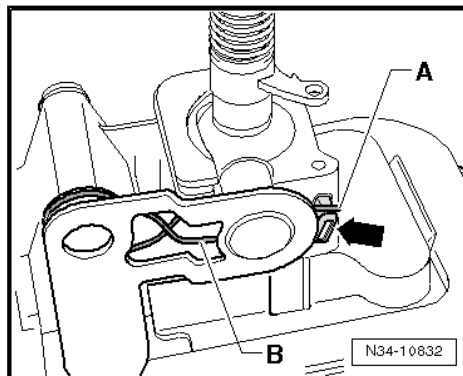
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- Hold gear lever -3- firmly.
- Push spring -1- in direction of -arrow-.
- Remove securing clip -2-.
- Remove spring.



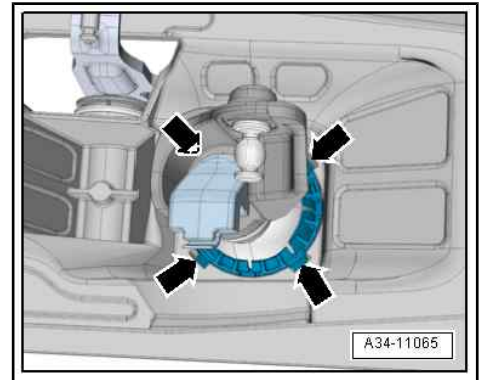
- Press arm -A- of spring to side until it is located next to damper -arrow-.
- Move gear lever to side and remove damper.



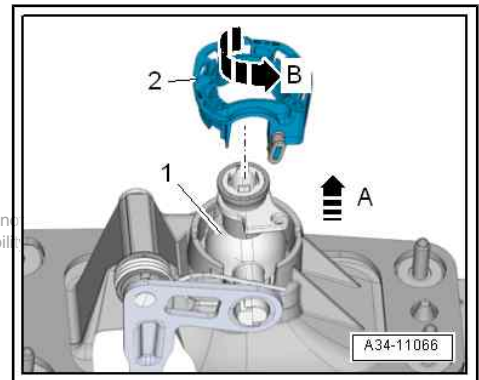
 Note

A second mechanic is required for the following step.

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



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

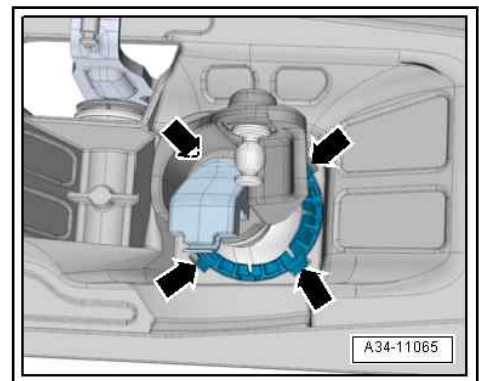


Assembling

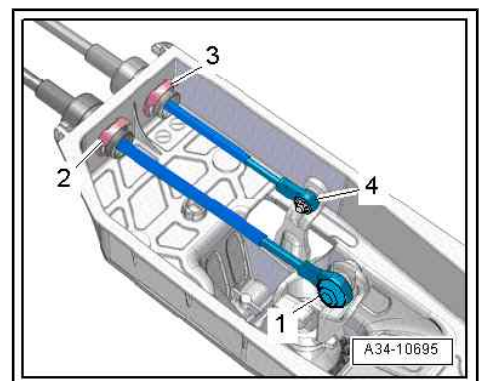
Assembly is carried out in reverse sequence; note the following:

 Note

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



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



Install floor plate as follows:

- Fit gasket onto floor plate.



Caution

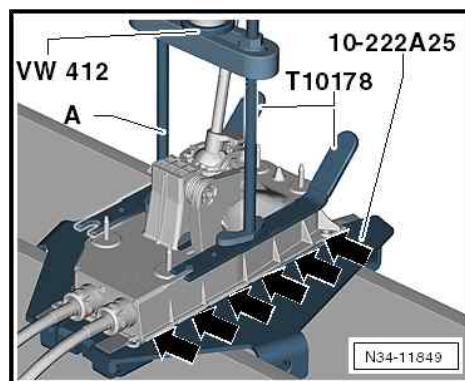
Risk of damage to selector housing and floor plate.

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

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

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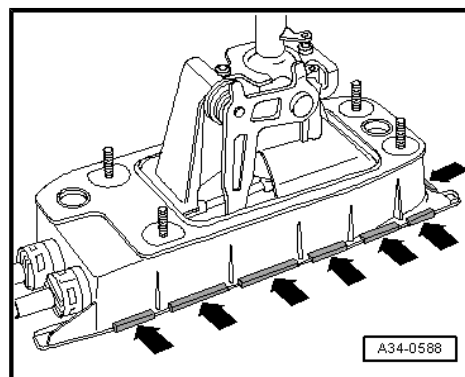
- Counter-support, e.g. Kukko series 16
- Lever tabs -arrows- of floor plate over rim of selector housing on both sides using wedge - T10357- .
- Install selector mechanism ⇒ [page 65](#) .



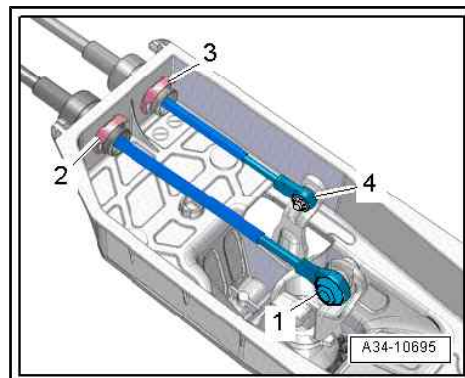
1.11 Removing and installing selector cable

Removing

- Remove selector mechanism ⇒ [page 65](#) .
- Open out tabs -arrows- on floor plate all round with screwdriver and remove floor plate.
- Remove gasket.

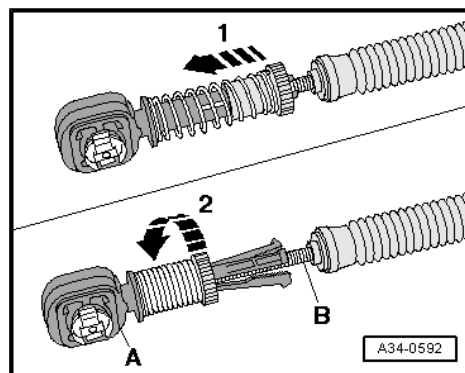


- Detach retaining clips -2, 3-.
- Press off gear selector cable -1- and gate selector cable -4- using a screwdriver.



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 as far as it will go in direction of 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

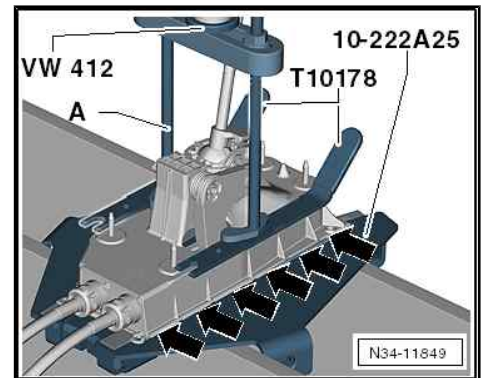
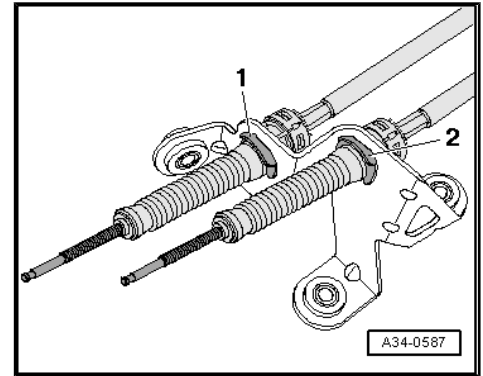
Installation is carried out in reverse sequence; note the following:



Note

Renew gate selector cable if bush $\Rightarrow$ [Item 3 \(page 63\)](#) is damaged.

- Fit gasket and install floor plate -arrows- $\Rightarrow$ [page 76](#) .
- Install selector mechanism $\Rightarrow$ [page 65](#) .



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2 Removing and installing gearbox

⇒ ["2.1 Removing gearbox", page 78](#)

⇒ ["2.2 Installing gearbox", page 84](#)

⇒ ["2.3 Tightening torques for gearbox", page 89](#)

2.1 Removing gearbox

⇒ ["2.1.1 Removing gearbox, Audi A1 quattro", page 78](#)

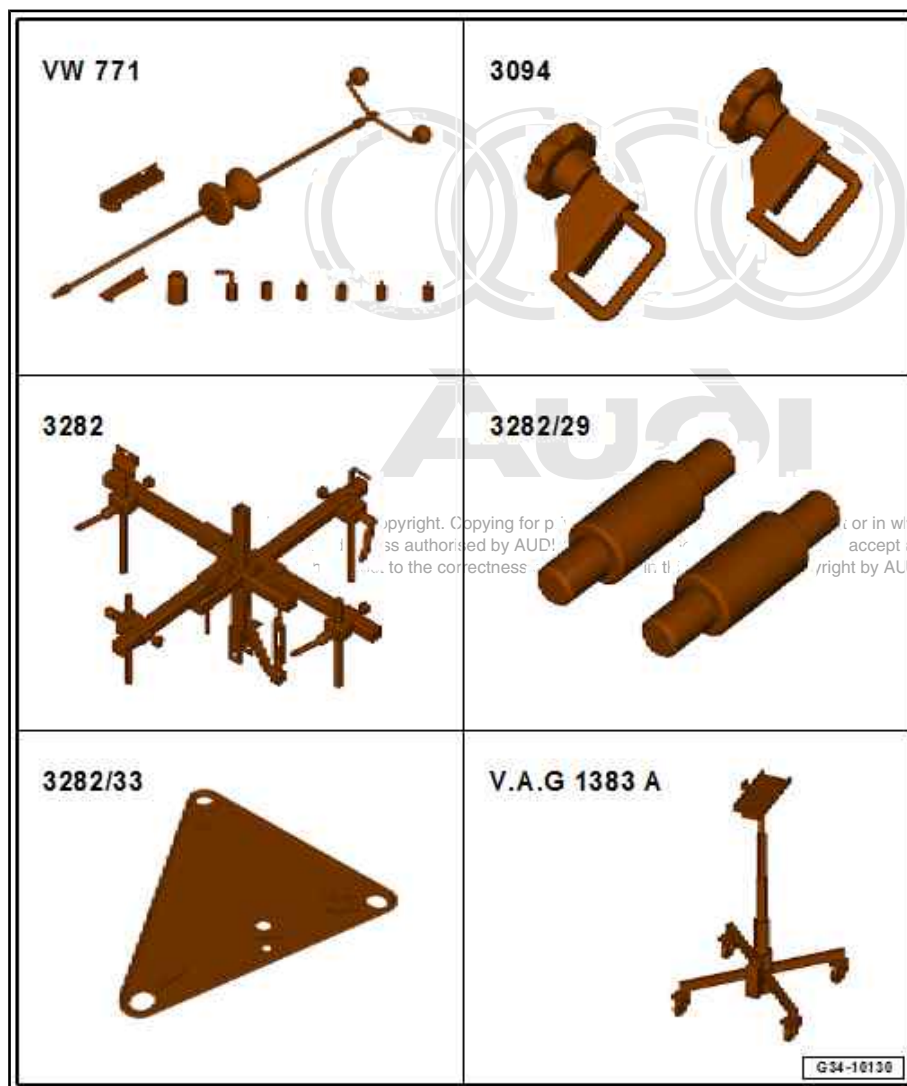
⇒ ["2.1.2 Removing gearbox, Audi S1", page 78](#)

2.1.1 Removing gearbox, Audi A1 quattro

- The gearbox and the engine are removed together, and the gearbox is then separated from the engine ⇒ Rep. gr. 10 ; Removing and installing engine; Separating engine and gearbox .

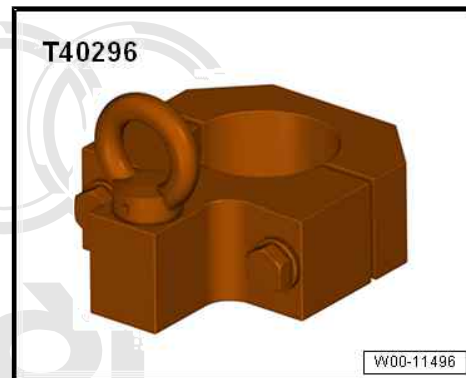
2.1.2 Removing gearbox, Audi S1

Special tools and workshop equipment required



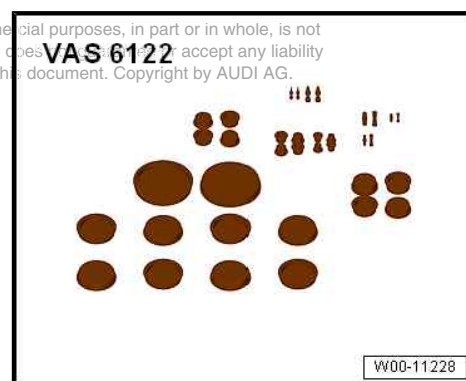
- ◆ Multi-purpose tool - VW 771-
- ◆ Hose clamps, up to 25 mm - 3094-

- ◆ Gearbox support - 3282-
- ◆ Pin - 3282/29-
- ◆ Adjustment plate - 3282/33-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Tensioning device - T40296-



- ◆ Engine bung set - VAS 6122-

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Procedure



Note

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

- Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter
- Disconnect exhaust system at clamp -arrow- and tie up front exhaust pipe to underbody.

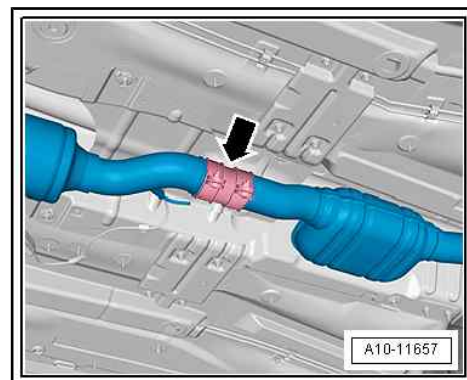


Caution

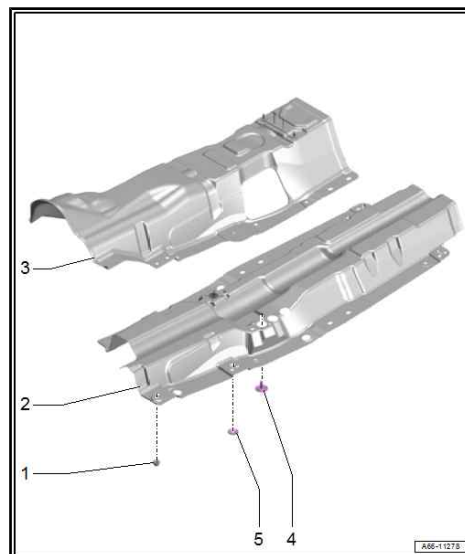
Risk of damage to flexible joint.

- ◆ ***The flexible joint must not be bent further than 10°.***
- ◆ ***Do not subject flexible joint to tensile load.***
- ◆ ***Take care not to damage wire mesh on flexible joint.***

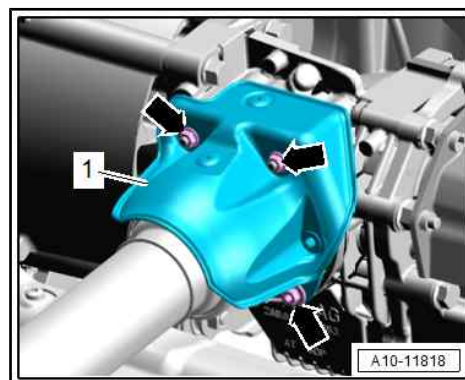
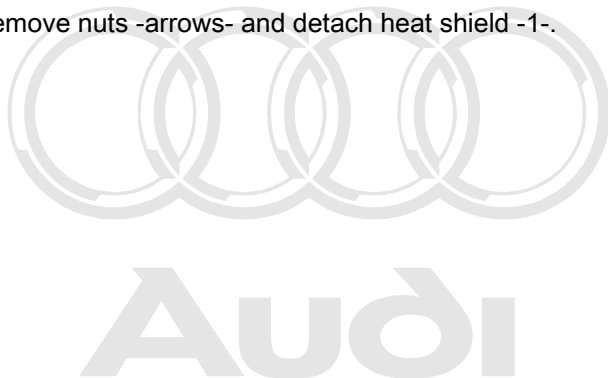
- Remove subframe with steering rack ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe with steering rack .



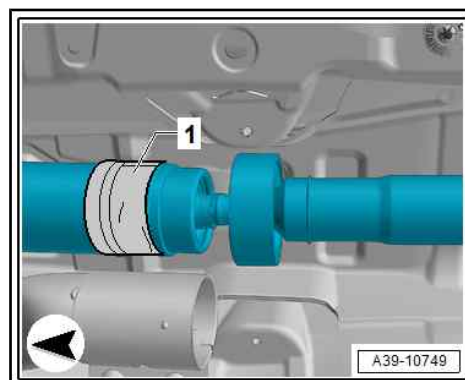
- Remove heat shield for propshaft -2- ⇒ General body repairs, exterior; Rep. gr. 66 ; Strips / trim panels / extensions; Exploded view - heat shield .



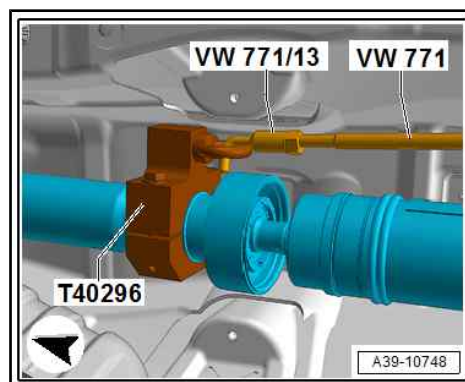
- Remove nuts -arrows- and detach heat shield -1-.



- Wrap adhesive tape around propshaft in front of centre bearing and secure clamp - T40296- .



- Hook multi-purpose tool - VW 771- with extension -VW 771/13- into clamp - T40296- and knock out propshaft towards rear. Press engine/gearbox assembly towards front when doing so.
- Tie propshaft up to underbody.

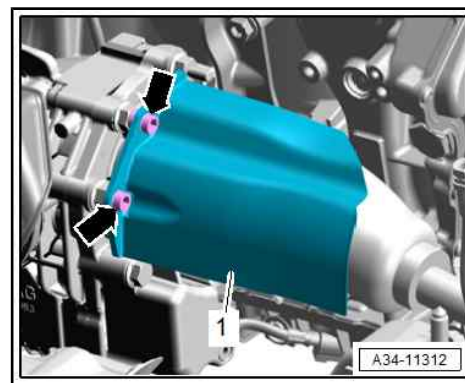


- Remove nuts -arrows- and detach heat shield -1- for drive shaft (right-side).
- Unbolt drive shaft (left and right) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Tie up drive shafts towards rear.

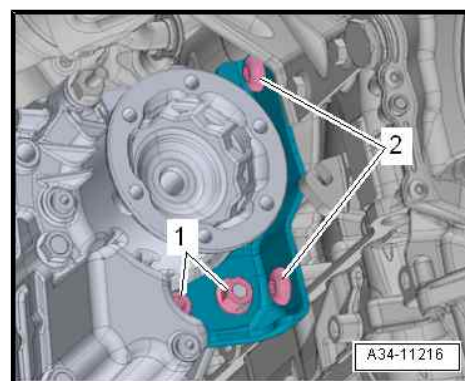


Note

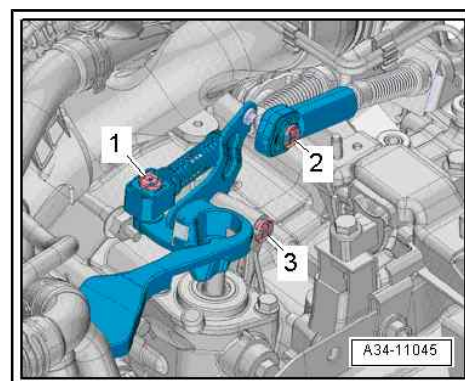
Make sure you do not damage surface coating on drive shafts and propshaft.



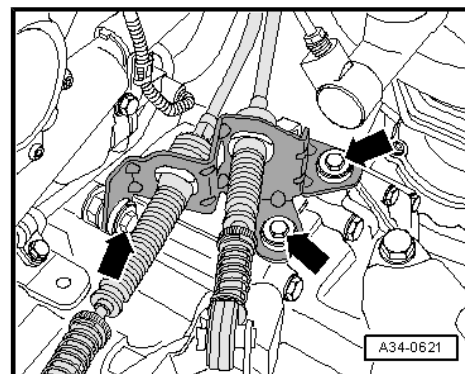
- Remove bolts -1, 2- and detach bracket for bevel box.



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



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

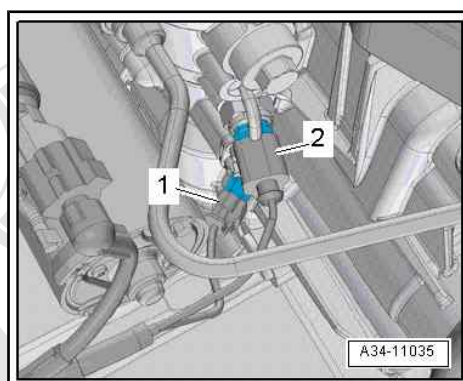
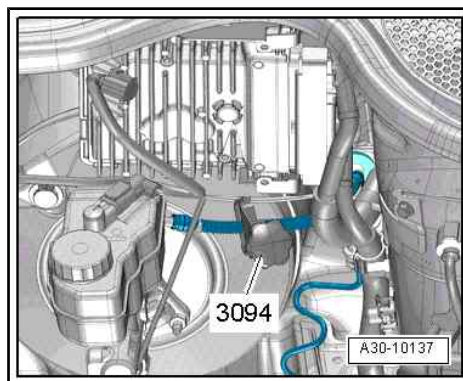


- Clamp off supply hose at brake fluid reservoir using hose clamp -3094- .

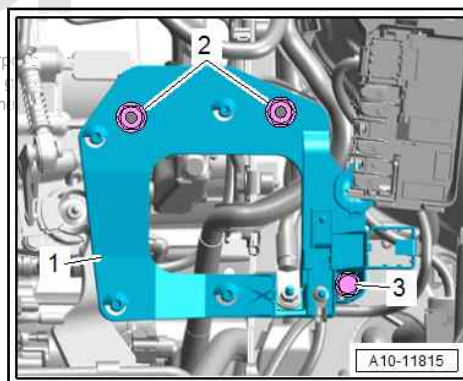


Note

- ◆ *Clamping off the supply hose with the hose clamp - 3094- will cause a permanent deformation.*
- ◆ *However, this does not damage the supply hose.*
- ◆ *After removing the hose clamp -3094- , the supply hose must be returned to its original shape.*
- Pull plastic pipe out of bleeder connection.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .
- Unplug electrical connector -1- from gearbox neutral position sender - G701- .
- Unplug electrical connector -2- at reversing light switch - F4- .



- Unscrew nuts -2- and bolt -3-.
- Push bracket -1- for air cleaner housing slightly to one side.



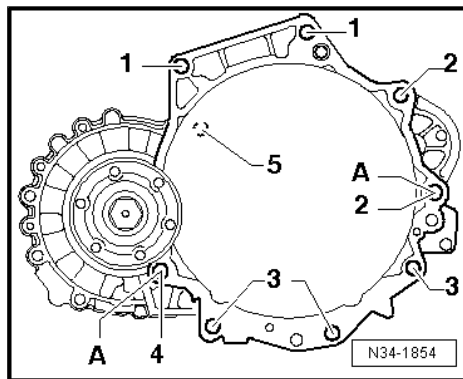
- Remove bolts -1- (accessible from above).



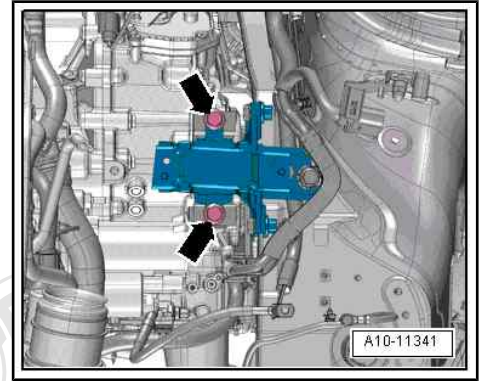
Note

Other items can be disregarded.

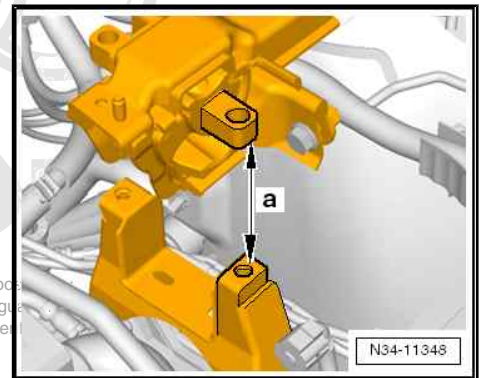
- Support engine in installation position ⇒ Rep. gr. 10 ; Assembly mountings; Supporting engine in installation position .



- Remove bolts -arrows- from gearbox mounting.

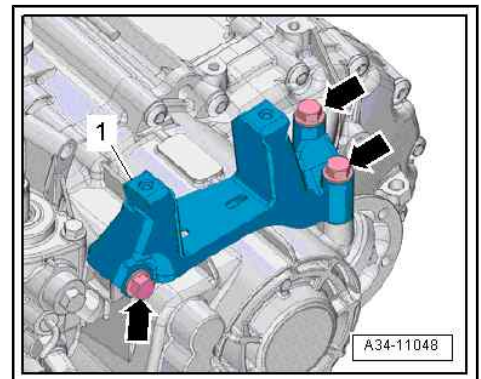


- Lower engine/gearbox assembly at spindle - 10 - 222 A /11- until distance -a- is obtained between gearbox support and gearbox mounting.
- Dimension -a- = 60 mm



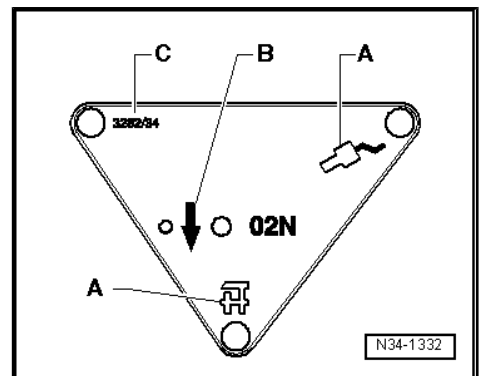
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- Remove bolts -arrows- and detach gearbox support.



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

- Insert gearbox support - 3282- in engine and gearbox jack - V.A.G 1383 A- .
- Align arms of gearbox support according to holes in adjustment plate.
- Bolt on support elements -A-, as illustrated on adjustment plate.
- In place of support element -C-, screw in pin - 3282/29- .
- Place engine and gearbox jack - V.A.G 1383 A- underneath vehicle.
- The arrow symbol -B- on the adjustment plate points in the direction of travel.
- Align adjustment plate - 3282/33- parallel with gearbox.



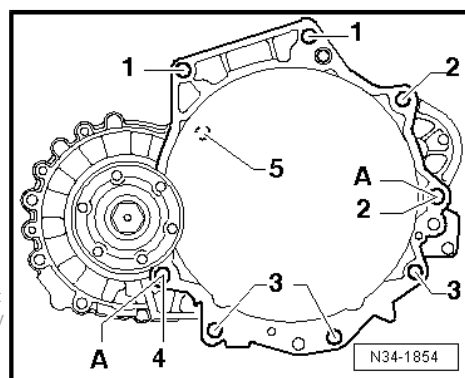
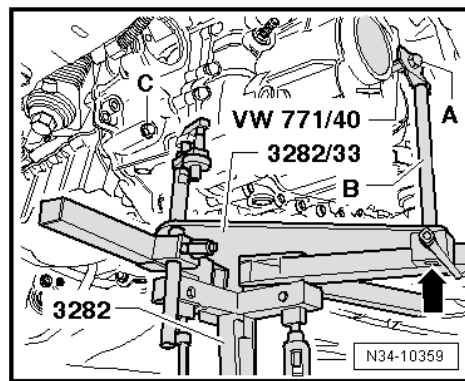
- Remove bolt -C- securing gearbox to engine.
- Secure adapter -VW 771/40- to threaded hole in gearbox housing, as shown in illustration.
- Secure gearbox to gearbox support - 3282- with bolt M10x20 -item A-.
- Pin -B- should be flush with underside of guide of gearbox support - 3282- -arrow-.
- Support gearbox from underneath by raising engine and gearbox jack -V.A.G 1383 A- .
- Remove remaining engine/gearbox securing bolts -3, 4-.



Note

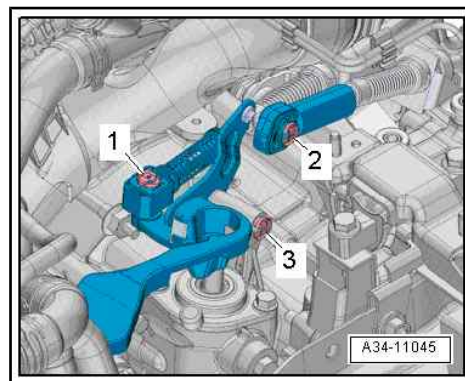
Unscrew bolt -4- using a jointed socket wrench, 18 mm (3/8 inch).

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



Note

When installing a replacement gearbox, the gearbox selector lever and the gate relay lever have to be transferred from the old gearbox to the new one ⇒ [page 59](#) .



2.2 Installing gearbox

⇒ [“2.2.1 Installing gearbox, Audi A1 quattro”, page 84](#)

⇒ [“2.2.2 Installing gearbox, Audi S1”, page 85](#)

2.2.1 Installing gearbox, Audi A1 quattro

Special tools and workshop equipment required

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

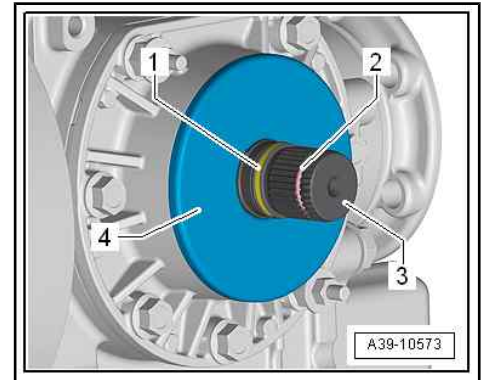
Procedure

- Tightening torques for installing gearbox ⇒ [page 89](#)
- Install gearbox together with engine ⇒ Rep. gr. 10 ; Removing and installing engine; Installing engine .

- A new O-ring -1- and circlip -2- must be fitted on rear splined shaft -3- of bevel box.
- Lubricate splines of rear splined shaft with grease for clutch plate splines - G 000 100- .

 Note

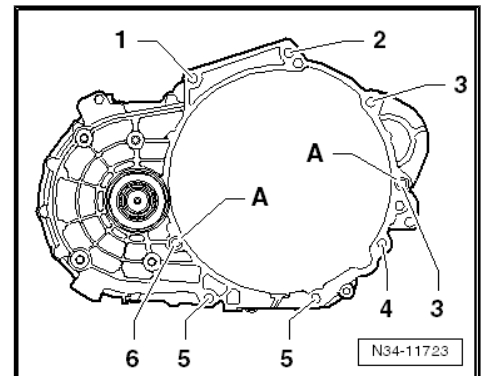
- ◆ *Before installing gearbox, check oil seals for leaks and renew if necessary.*
- ◆ *Check cover -4- in front of oil seal for rear splined shaft for damage and renew if necessary.*
- Clean input shaft splines and (in the case of used clutch plates) the hub splines. Remove corrosion and apply only a very thin coating of grease for clutch plate splines - G 000 100- to the splines. Then move clutch plate backwards and forwards on input shaft until hub moves freely on shaft. It is important to remove excess grease.
- If not already fitted, install dowel sleeves -A- for centralising engine/gearbox in cylinder block.



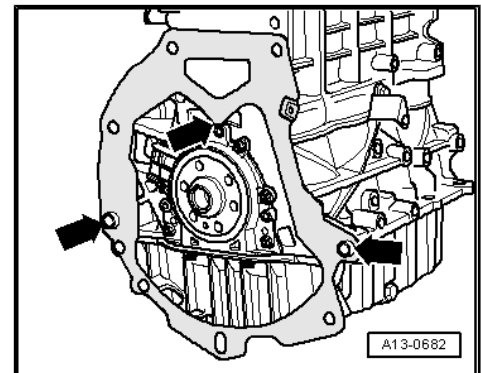
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 Note

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



- Make sure that intermediate plate is engaged on sealing flange -top arrow- and fitted onto dowel sleeves -bottom arrows-.
- Check release bearing for wear. If necessary, renew clutch slave cylinder with release bearing ⇒ [page 34](#) .
- Bleed clutch system ⇒ [page 38](#) .
- Adjust selector mechanism ⇒ [page 67](#) .
- Check oil level in gearbox and top up with gear oil if necessary ⇒ [page 95](#) .
- Check gear oil level in bevel box ⇒ [page 217](#) .



2.2.2 Installing gearbox, Audi S1

Special tools and workshop equipment required

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

Procedure

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

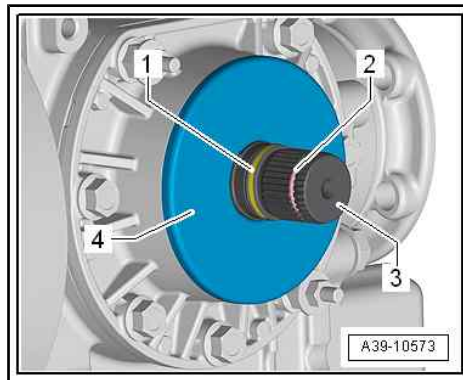
- Tightening torques for installing gearbox ⇒ [page 89](#)

- A new O-ring -1- and circlip -2- must be fitted on rear splined shaft -3- of bevel box.
- Lubricate splines of rear splined shaft with grease for clutch plate splines - G 000 100- .



Note

- ◆ *Before installing gearbox, check oil seals for leaks and renew if necessary.*
- ◆ *Check cover -4- in front of oil seal for rear splined shaft for damage and renew if necessary.*
- 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.



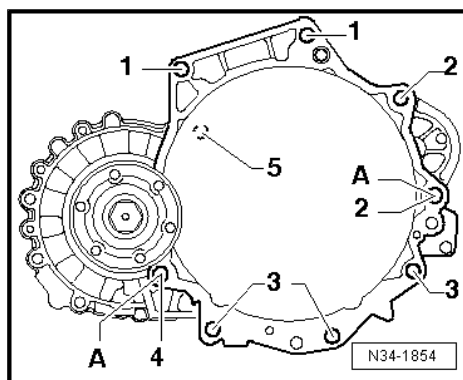
Note

- ◆ *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.*
- ◆ *After removing the hose clamp - 3094- , the supply hose must be returned to its original shape.*
- If not already fitted, install dowel sleeves -A- for centralising engine/gearbox in cylinder block.

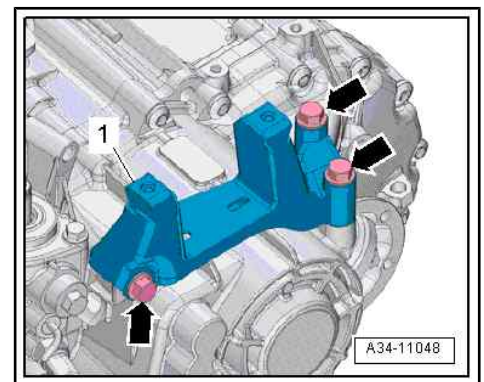
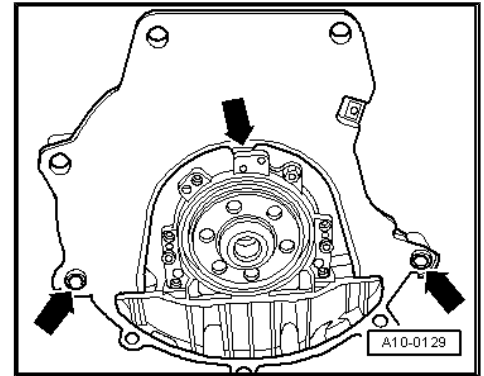


Note

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



- Make sure that intermediate plate is engaged on sealing flange -top arrow- and fitted onto dowel pins -bottom arrows-.
- Check clutch release bearing for wear and renew if necessary.
- Place engine and gearbox jack - V.A.G 1383 A- underneath vehicle.
- The arrow symbol on the adjustment plate points in the direction of travel.
- Remove flange shafts when installing a new gearbox or exchange gearbox.
- Check oil seals for flange shafts and renew if necessary: left-side ⇒ [page 191](#) , right-side ⇒ [page 223](#) .
- Carefully raise gearbox using engine and gearbox jack - V.A.G 1383 A- .
- Bring gearbox into position.
- Install bottom engine/gearbox securing bolts.
- Detach gearbox support - 3282- with adjustment plate - 3282/33- from gearbox after bolting gearbox and engine together.
- Install gearbox support -1-
⇒ ["3 Assembly mountings", page 91](#) .
- Install top engine/gearbox securing bolts.
- Raise engine/gearbox assembly via spindles of support bracket - 10 - 222 A- .



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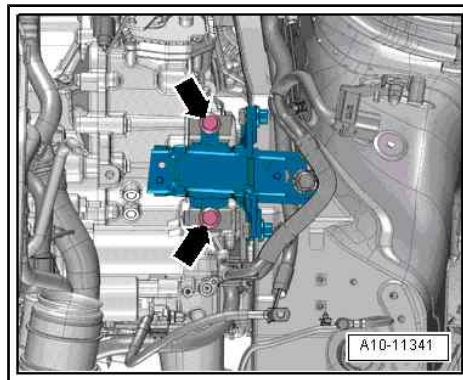
- Align engine/gearbox assembly in installation position. To do so, raise engine/gearbox until gearbox support makes full contact with gearbox mounting.



Caution

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

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



- Bolt gearbox support to gearbox mounting
⇒ [“3 Assembly mountings”, page 91](#) .



WARNING

Risk of accident!

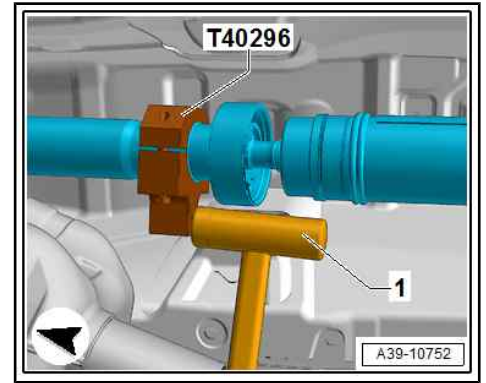
- ◆ *Do not remove support bracket - 10 - 222 A- until all bolts securing the left-hand engine/gearbox mounting have been tightened to the specified torque.*

- Secure drive shafts to gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft .
- Install starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Exploded view - starter .
- Assemble selector mechanism ⇒ [page 59](#) .
- Attach propshaft. To do so, unscrew hook from clamp - T40296- .



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- Fit propshaft onto output shaft/shaft bevel gear in bevel box.
- Using a plastic hammer -1-, strike clamp - T40296- repeatedly until propshaft engages on output shaft.
- Propshaft must be locked in place; it should not be possible to pull it off bevel box by hand.
- Detach clamp - T40296- and adhesive tape from propshaft.
- Secure heat shields to bevel box
⇒ "6.1 Exploded view - bevel box", page 97 .
- Install heat shield for propshaft ⇒ General body repairs, exterior; Rep. gr. 66 ; Strips / trim panels / extensions; Exploded view - heat shield .
- Install subframe with steering rack ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe with steering rack .
- Adjust selector mechanism ⇒ page 67 .
- Check oil level in gearbox and top up with gear oil if necessary
⇒ page 95 .
- Install air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .



2.3 Tightening torques for gearbox



Note

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

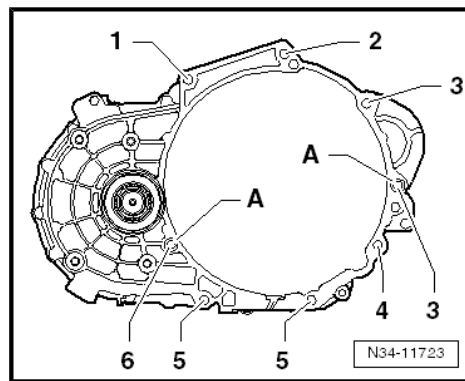
Component		Nm
Bolts and nuts	M6	9
	M7	15
	M8	20
	M10	40
	M12	65

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Gearbox/engine attachment, Audi A1 quattro

Item	Bolt	Nm
1 ¹⁾	M12 x 55	80
2 ²⁾	M12 x 55 ³⁾	80
3 ^{2) 4)}	M12 x 165	80
4	M10 x 105	40
5	M10 x 50	40
6 ⁵⁾	M12 x 70	80
A	Dowel sleeves for centralising	

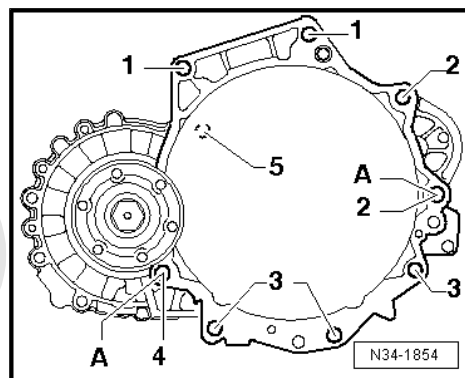
- 1) Bolt with long stud M8
- 2) Bolt with short stud M8
- 3) Or bolt M12 x 50
- 4) Also secures starter.
- 5) Screwed into gearbox from engine side



Gearbox/engine attachment, Audi S1

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

- 1) Also secures starter.



Note

Disregard -item 5-.

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3 Assembly mountings

⇒ ["3.1 Exploded view - assembly mountings", page 91](#)

3.1 Exploded view - assembly mountings

1 - Engine support

2 - Bolt

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

3 - Engine mounting

- ☐ 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 - Centre hex 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

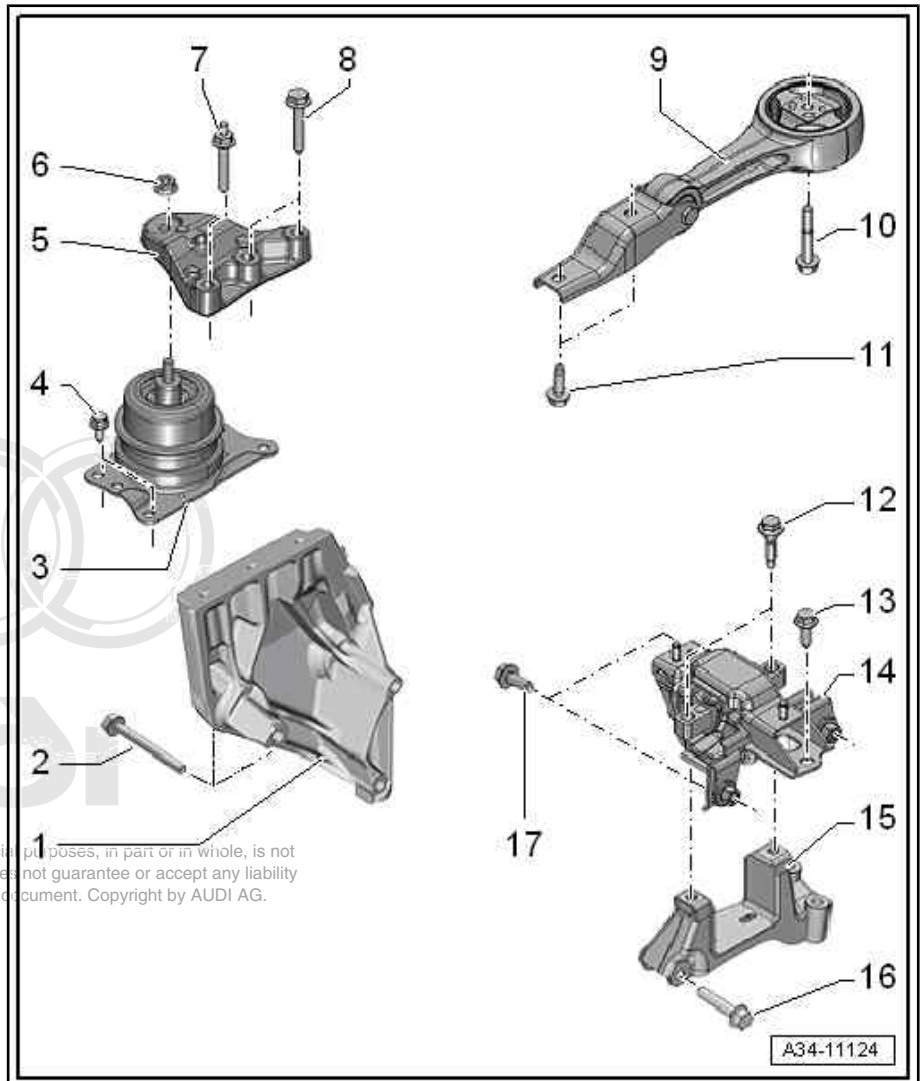
- ☐ Tightening torque ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

11 - Bolt

- ☐ Tightening torque ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings
- ☐ Gearbox with thread insert ⇒ [page 92](#)

12 - Bolt

- ☐ Renew
- ☐ 40 Nm +90°



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13 - Bolt

- ☐ Renew
- ☐ Tightening torque and sequence ⇒ [page 92](#)

14 - Gearbox mounting

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

15 - Gearbox bracket

16 - Bolt

- ☐ Renew
- ☐ 40 Nm +90°

17 - Bolt

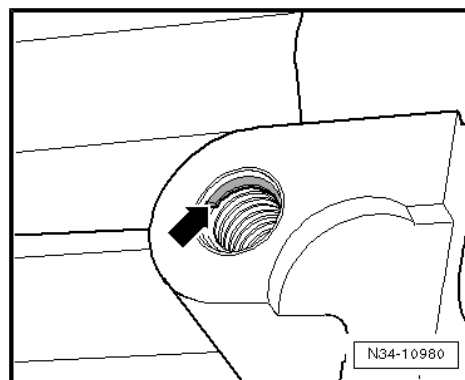
- ☐ Renew
- ☐ Tightening torque and sequence ⇒ [page 92](#)

Gearbox with thread insert (e.g. "HeliCoil") for securing pendulum support



Note

- ◆ Thread inserts (e.g. "HeliCoil") are fitted in the bolt holes for the pendulum support.
- ◆ These can be recognised by the shoulder on the first thread turn -arrow-.



Gearbox mounting - tightening torque and sequence

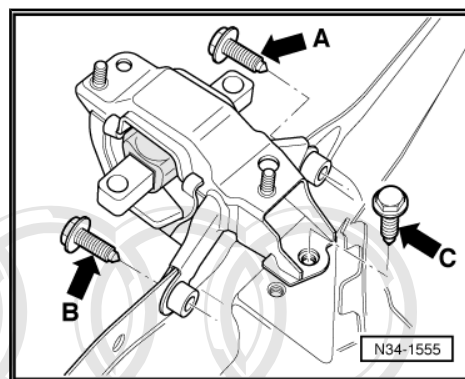


Note

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



4 Transporting gearbox

Special tools and workshop equipment required

- ◆ Gearbox lifting tackle - 3336-

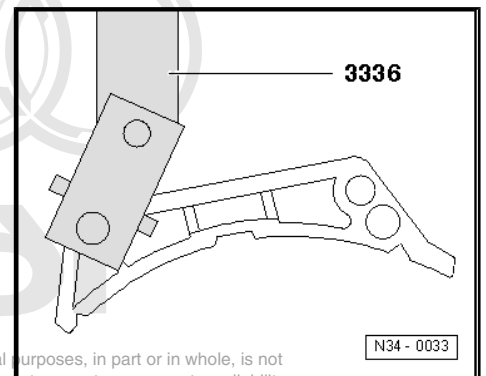


- ◆ Workshop hoist - VAS 6100-



Procedure

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

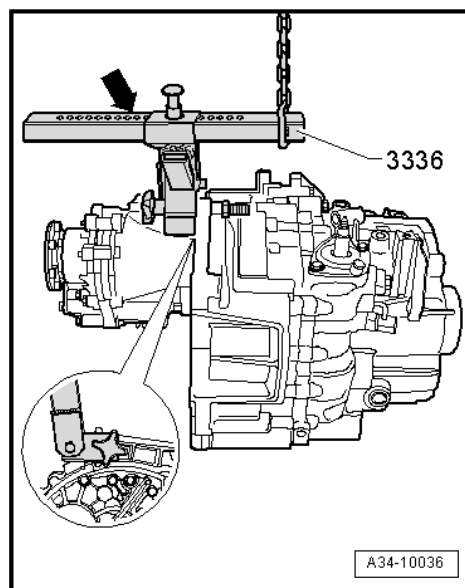


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- Set support arm on sliding bracket by means of locking pin -arrow-.

Number of holes visible = 9

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



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5 Gear oil

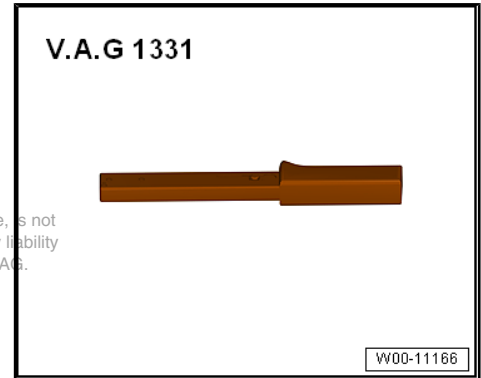
⇒ ["5.1 Checking gear oil level", page 95](#)

⇒ ["5.2 Draining and filling gear oil", page 95](#)

5.1 Checking gear oil level

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



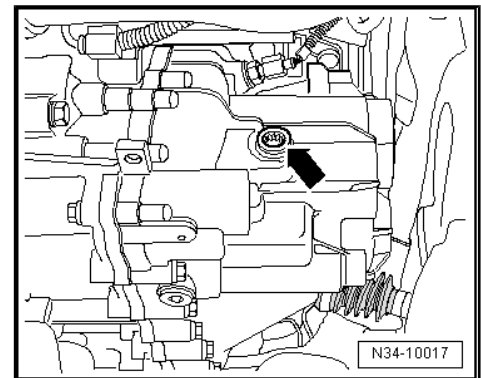
- ◆ Gear oil specifications ⇒ Electronic parts catalogue

Procedure

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

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

- Top up gear oil if necessary. Specifications ⇒ Electronic parts catalogue
- Tighten plug -arrow- to specified torque
⇒ [Item 4 \(page 136\)](#) .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



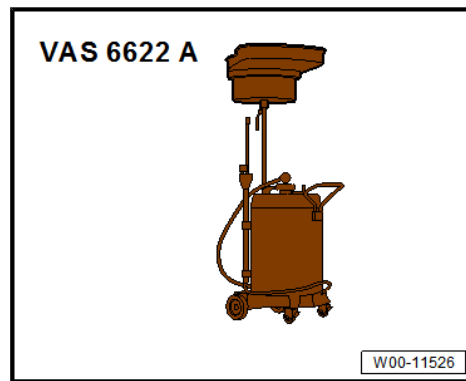
5.2 Draining and filling gear oil

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



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



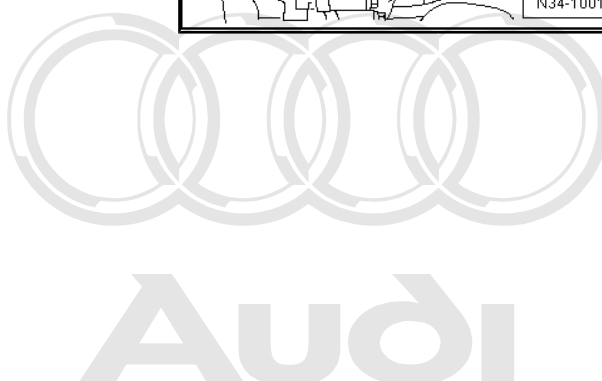
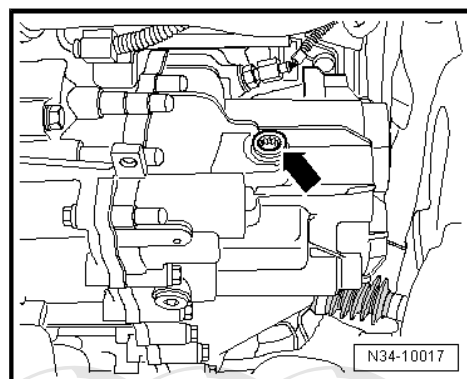
- ◆ Gear oil specifications ⇒ Electronic parts catalogue

Draining

- Drive vehicle onto a four-column lifting platform or over an inspection pit (vehicle must be horizontal).
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Place used oil collection and extraction unit - VAS 6622A- below gearbox.
- Unscrew oil drain plug ⇒ [Item 3 \(page 136\)](#) and allow gear oil to drain.
- Tighten oil drain plug to specified torque ⇒ [Item 3 \(page 136\)](#) .

Filling

- Unscrew oil filler plug -arrow-.
- Fill up gear oil to bottom lip of filler hole.
- Tighten oil filler plug -arrow- to specified torque ⇒ [Item 4 \(page 136\)](#) .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



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6 Bevel box

⇒ ["6.1 Exploded view - bevel box", page 97](#)

⇒ ["6.2 Removing bevel box", page 98](#)

⇒ ["6.3 Installing bevel box", page 104](#)

6.1 Exploded view - bevel box

1 - Bolt

- ☐ Tightening torque and sequence ⇒ [page 108](#)

2 - Bolt

- ☐ Tightening torque and sequence ⇒ [page 108](#)

3 - Seal

4 - Oil drain plug

- ☐ Tightening torque ⇒ [Item 3 \(page 221\)](#)

5 - Bolt

- ☐ Tightening torque ⇒ [Item 13 \(page 195\)](#)

6 - Seal

7 - Oil filler plug

- ☐ Tightening torque ⇒ [Item 5 \(page 221\)](#)

8 - Heat shield

- ☐ For drive shaft

9 - Nut

- ☐ Tightening torque ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing heat shield for drive shaft

10 - Heat shield

- ☐ For propshaft

11 - Nut

- ☐ 9 Nm

12 - Bevel box

- ☐ Removing ⇒ [page 101](#)
- ☐ Installing ⇒ [page 107](#)

13 - Circlip

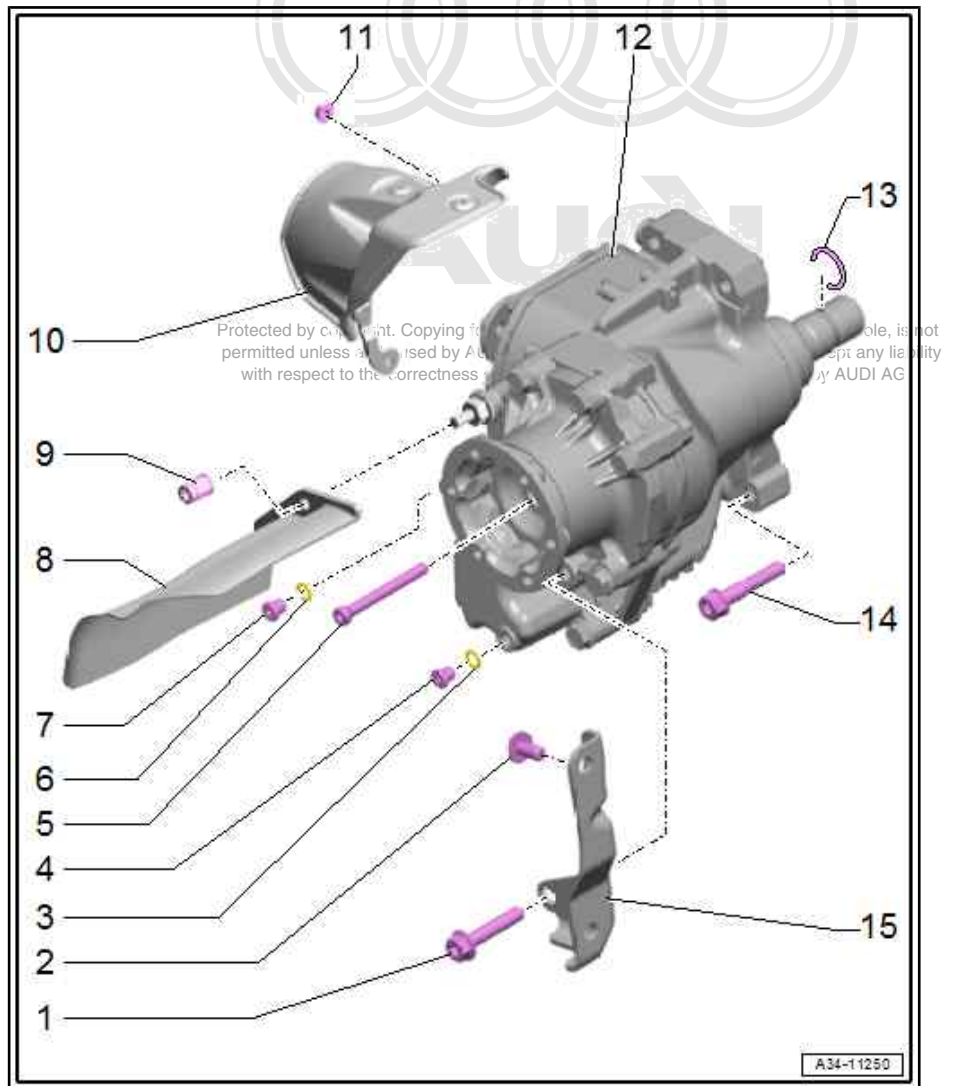
- ☐ Renew after removing

14 - Bolt

- ☐ Renew after removing
- ☐ Tightening torque ⇒ [page 108](#)

15 - Bracket

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



6.2 Removing bevel box

⇒ [“6.2.1 Removing bevel box, Audi A1 quattro”, page 98](#)

⇒ [“6.2.2 Removing bevel box, Audi S1”, page 101](#)

6.2.1 Removing bevel box, Audi A1 quattro

Special tools and workshop equipment required

- ◆ Socket (8 mm) - 3247-



- ◆ Socket 6 mm - T10107 A-



Removing

- Remove bevel box together with gearbox and engine ⇒ Rep. gr. 10 ; Removing and installing engine; Removing engine .

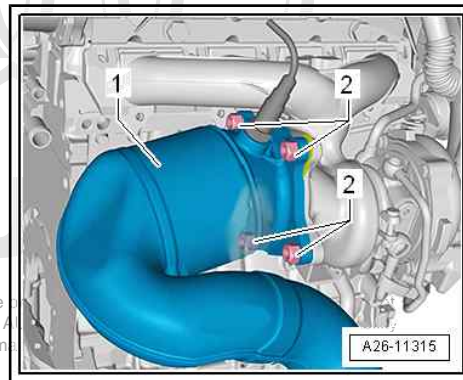


Caution

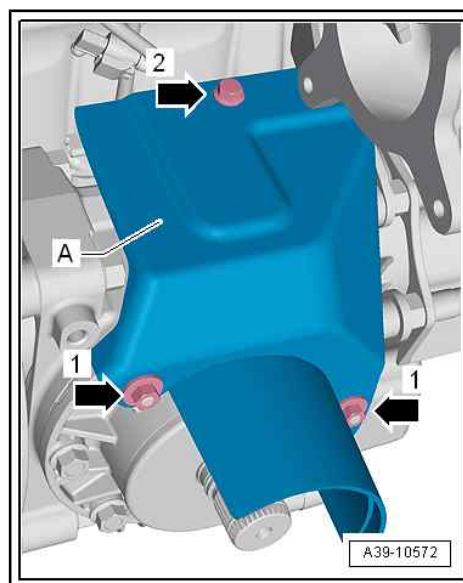
Risk of damage to flexible joint:

- ◆ ***The flexible joint must not be bent further than 10°.***
- ◆ ***Do not subject flexible joint to tensile load.***
- ◆ ***Take care not to damage wire mesh on flexible joint.***

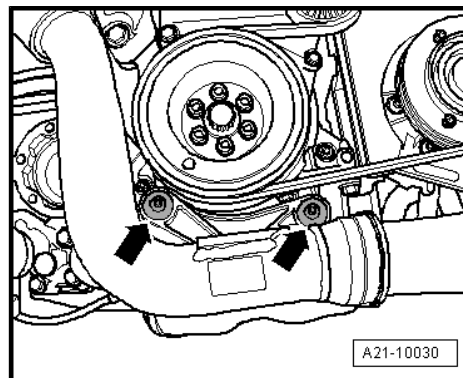
- Remove nuts -2- securing front exhaust pipe to turbocharger.
- Remove front exhaust pipe -1- with catalytic converter and front silencer.



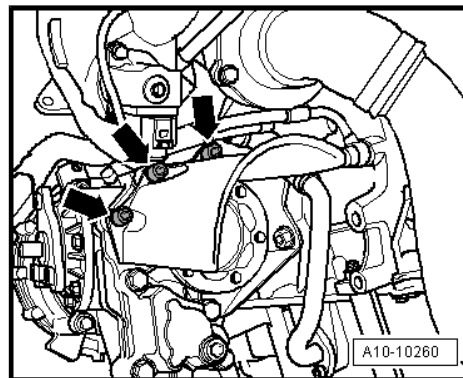
- Detach heat shield -A- for propshaft from bevel box. To do so, unscrew nuts -arrows 1- and bolt -arrow 2-.



- Remove bolts -arrows- and detach air pipe from turbocharger.



- Detach heat shield for drive shaft (right-side) from bevel box -arrows- using hexagon key extension, 8 mm - 3247- .

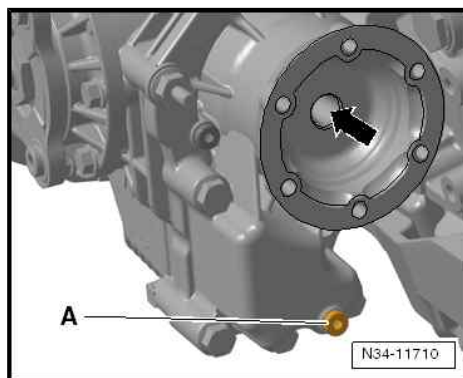
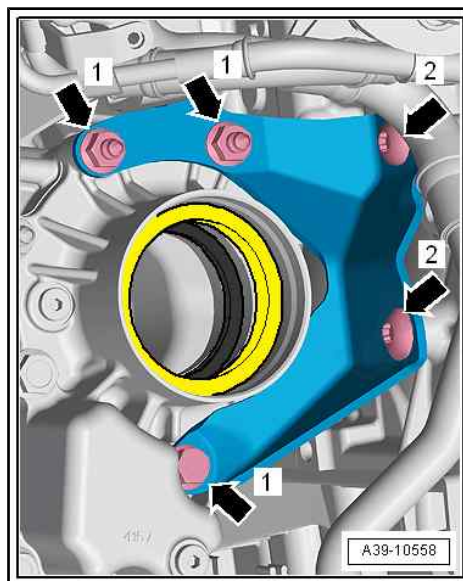


- Remove bolts -1, 2- and detach bracket for bevel box.

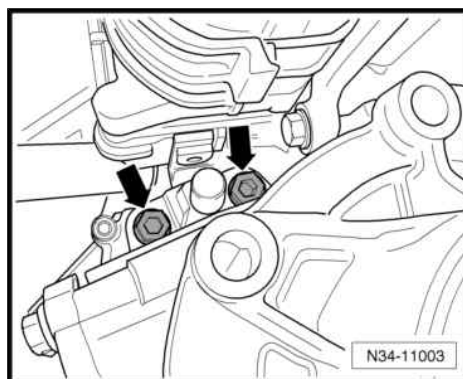


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- Using socket and extended bit - T10107 A- , remove bolt -arrow- securing flange shaft (right-side). To do so, screw two bolts into flange and counterhold flange shaft with suitable lever.

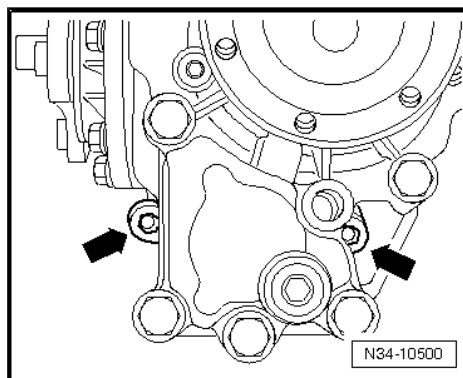


- Unscrew bolts (top) -arrows- securing bevel box to gearbox.



- Unscrew bolts (bottom) -arrows- securing bevel box to gearbox.
- Carefully push bevel box away from gearbox, making sure it does not fall down.
- Pull off bevel box together with flange shaft (right-side).

Install bevel box ⇒ [page 104](#) .



6.2.2 Removing bevel box, Audi S1

Special tools and workshop equipment required

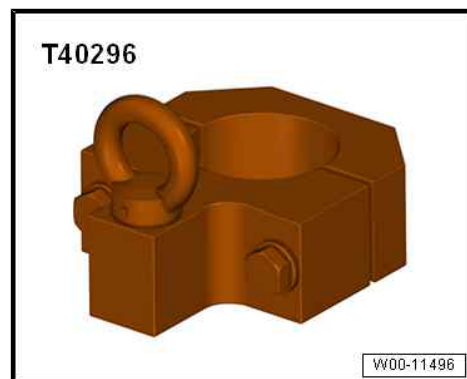
- ◆ Socket 6 mm - T10107 A-



- ◆ Multi-purpose tool - VW 771- with extension -VW 771/13-



- ◆ Tensioning device - T40296-



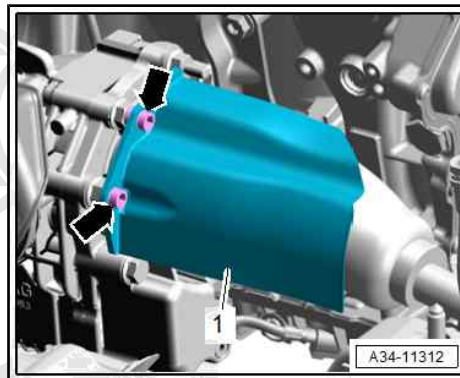
Procedure

- Remove subframe with steering rack ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe with steering rack .
- Remove catalytic converter with front silencer ⇒ Rep. gr. 26 ; Emission control system; Removing and installing catalytic converter .

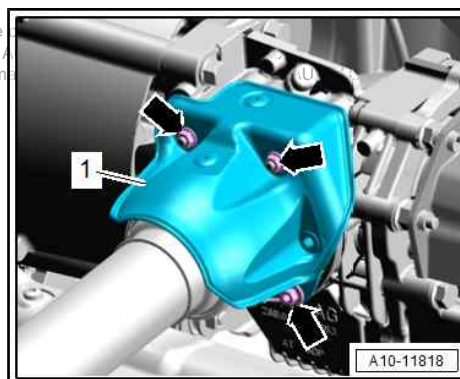
- Remove nuts -arrows- and detach heat shield -1- for drive shaft (right-side).
- Detach drive shaft (right-side) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Tie up drive shaft towards rear.


Note

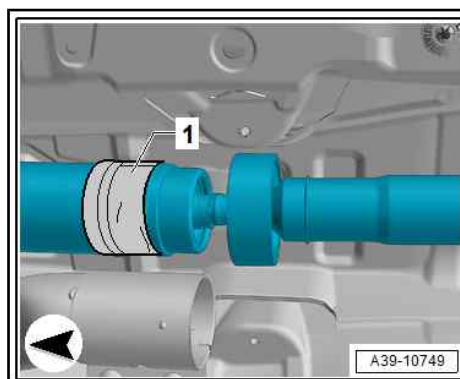
Make sure you do not damage surface coating on drive shaft.



- Remove nuts -arrows- and detach heat shield -1-.



- Wrap adhesive tape around propshaft in front of centre bearing and secure clamp - T40296- .

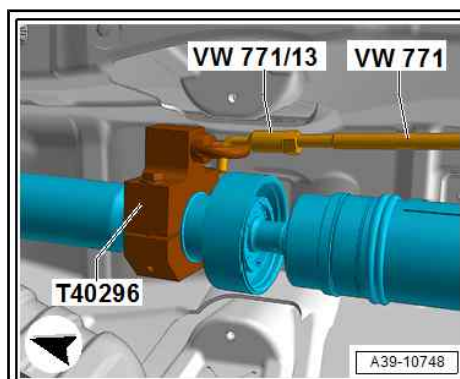


- Hook multi-purpose tool - VW 771- with extension -VW 771/13- into clamp - T40296- and knock out propshaft towards rear. Press engine/gearbox assembly towards front when doing so.

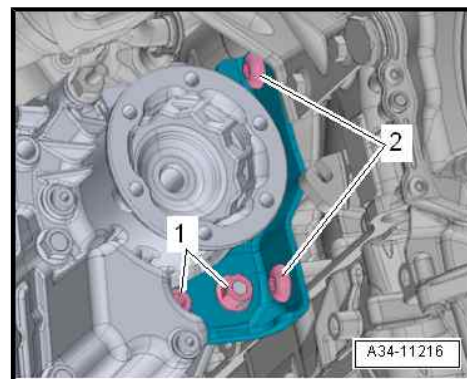

Note

Make sure you do not damage surface coating on propshaft.

- Tie propshaft up to underbody.

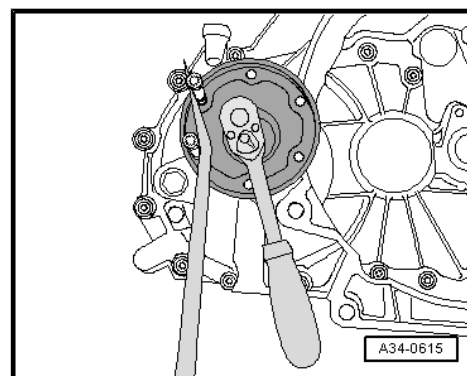


- Remove bolts -1, 2- and detach bracket for bevel box.

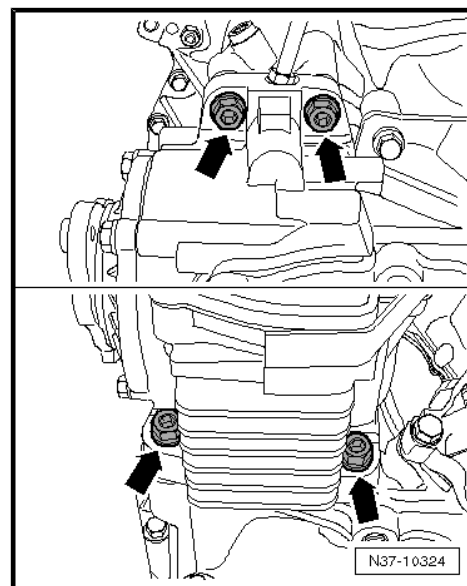


- Using socket and extended bit - T10107 A- , remove bolt securing flange shaft (right-side). To do so, screw two bolts into flange and counterhold flange shaft with suitable lever.

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- Remove bolts -arrows- securing bevel box to gearbox.
- Carefully push bevel box away from gearbox, making sure it does not fall down.
- Pull off bevel box together with flange shaft (right-side).
- Install bevel box ⇒ [page 107](#) .



6.3 Installing bevel box

⇒ [“6.3.1 Installing bevel box, Audi A1 quattro”, page 104](#)

⇒ [“6.3.2 Installing bevel box, Audi S1”, page 107](#)

6.3.1 Installing bevel box, Audi A1 quattro

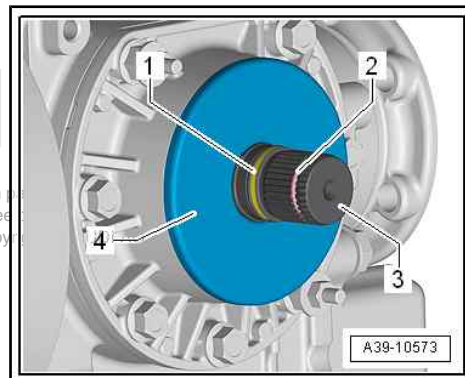
Installation is carried out in the reverse order; note the following:

- A new O-ring -1- and circlip -2- must be fitted on rear splined shaft -3- of bevel box.
- Lubricate splines of rear splined shaft with grease for clutch plate splines - G 000 100- .



Note

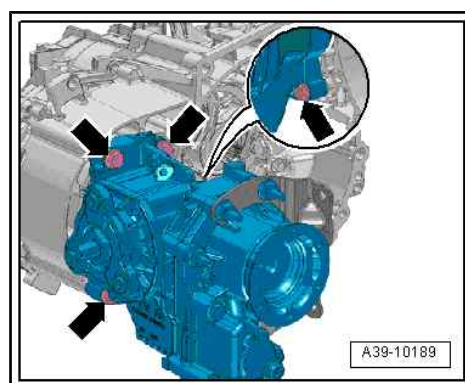
- ◆ *Before installing bevel box, check oil seals for leaks and renew if necessary.*
- ◆ *Check cover -4- in front of oil seal for rear splined shaft for damage and renew if necessary.*
- Push bevel box fully onto gearbox, ensuring that splines of bevel box input shaft and differential are centred when brought together.
- If the teeth are correctly positioned and the components are located centrally, the bevel box will slide against the gearbox onto the stop.



Caution

Risk of irreparable damage to bevel box housing.

- ◆ *Do not use the securing bolts to pull the bevel box onto the gearbox. This could cause the bevel box to tilt and the securing eyes could break off.*
- Secure bevel box to gearbox with new bolts -arrows-. Tightening torque ⇒ [Item 12 \(page 195\)](#)

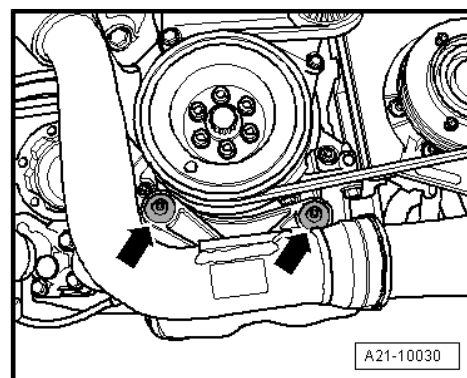
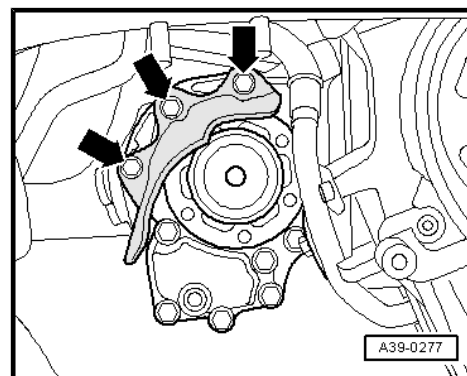
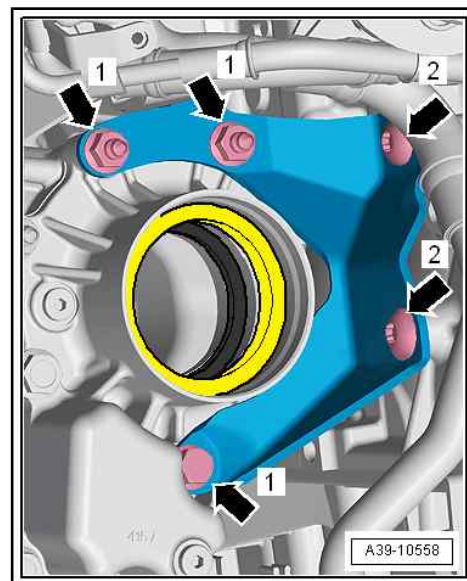


- Bolt gearbox carrier for bevel box to engine and bevel box, adhering to correct tightening sequence -arrows 1- and -arrows 2- => [page 106](#) .

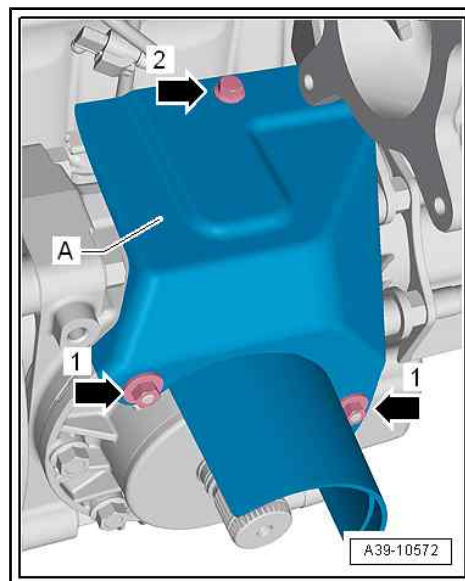


- Attach heat shield for drive shaft (right-side) to bevel box, tightening the 2 nuts -arrows- to 20 Nm.
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- Attach air pipe (right-side) to turbocharger, tightening bolts -arrows- to specified torque => Rep. gr. 21 ; Charge air system; Exploded view - charge air system .

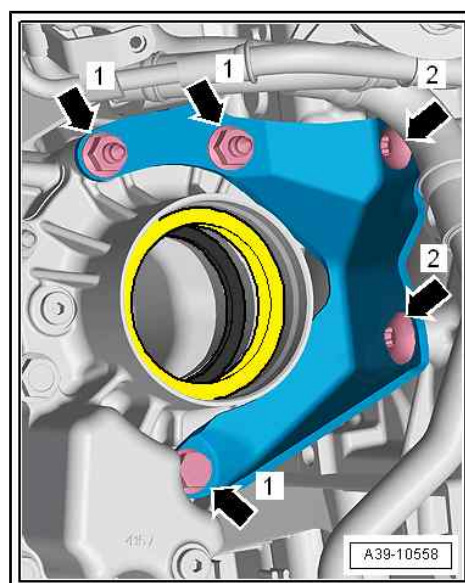


- Attach heat shield -A- for propshaft to bevel box. To do so, first tighten nuts -arrows A-, then bolt -arrow B- to 8 Nm.
- Then connect front exhaust pipe with catalytic converter and front silencer to turbocharger ⇒ Rep. gr. 26 ; Emission control system; Removing and installing catalytic converter .
- Install gearbox with engine ⇒ Rep. gr. 10 ; Removing and installing engine; Installing engine .
- Check gear oil level ⇒ [page 217](#) .



Tightening torque and sequence for bolts securing gearbox carrier to engine and bevel box

- Screw in bolts -arrows 1- and -arrows 2- hand-tight.
- Tighten bolts -arrows 1- to 40 Nm.
- Tighten bolts -arrows 2- to 40 Nm.



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6.3.2 Installing bevel box, Audi S1

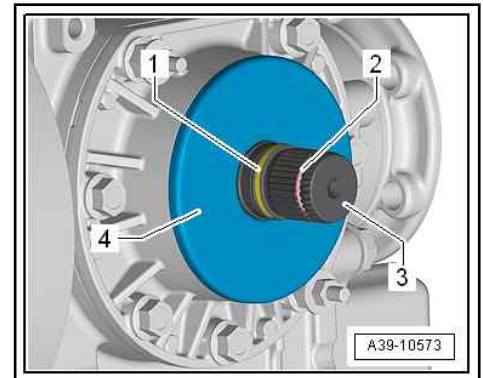
Procedure

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

- A new O-ring -1- and circlip -2- must be fitted on rear splined shaft -3- of bevel box.
- Lubricate splines of rear splined shaft with grease for clutch plate splines - G 000 100- .

Note

- ◆ *Before installing bevel box, check oil seals for leaks and renew if necessary.*
- ◆ *Check cover -4- in front of oil seal for rear splined shaft for damage and renew if necessary.*
- Push bevel box fully onto gearbox, ensuring that splines of bevel box input shaft and differential are centred when brought together.
- If the teeth are correctly positioned and the components are located centrally, the bevel box will slide against the gearbox onto the stop.



Caution

Risk of irreparable damage to bevel box housing.

- ◆ *Do not use the securing bolts to pull the bevel box onto the gearbox. This could cause the bevel box to tilt and the securing eyes could break off.*

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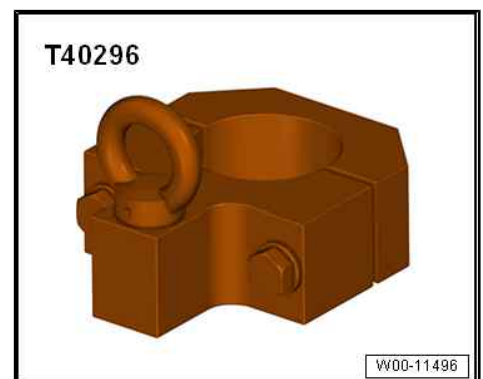


Caution

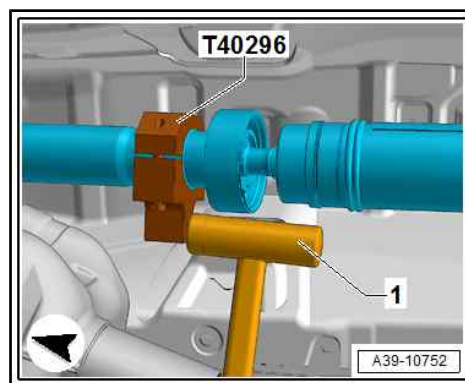
The oil seal between the bevel box and the gearbox can be damaged.

- ◆ *Turn flange shaft while fitting bevel box with flange shaft (right-side) onto gearbox.*

- Bolt bevel box to gearbox.
- Attach propshaft. To do so, unscrew hook from clamp - T40296- .



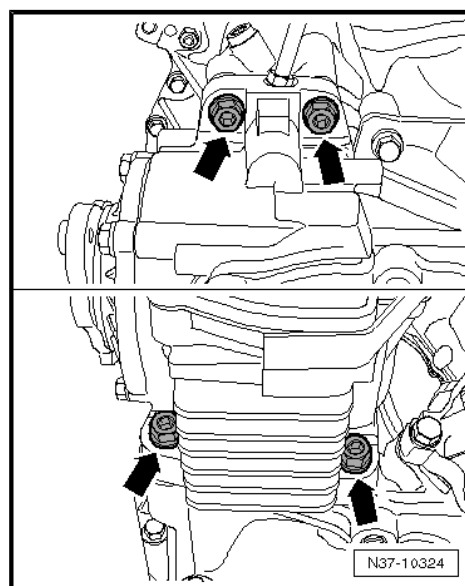
- Fit propshaft onto output shaft/shaft bevel gear in bevel box.
- Using a plastic hammer -1-, strike clamp - T40296- repeatedly until propshaft engages on output shaft.
- Propshaft must be locked in place; it should not be possible to pull it off bevel box by hand.
- Detach clamp - T40296- and adhesive tape from propshaft.
- Secure heat shield to bevel box
⇒ ["6.1 Exploded view - bevel box", page 97](#) .
- Install subframe with steering rack ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe with steering rack .
- Check gear oil level ⇒ [page 217](#) .



Tightening torque for bevel box to gearbox

- Tighten bolts in stages as follows:

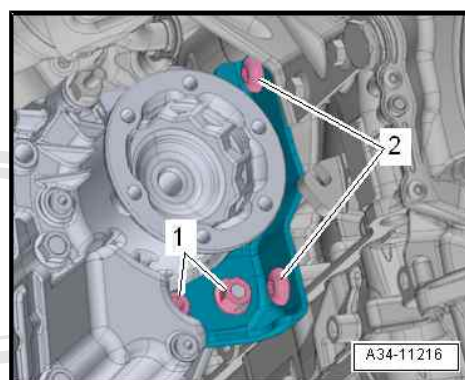
Stage	Bolts	Tightening torque/angle specification
1.	-arrows-	Screw in by hand until contact is made
2.	-arrows-	40 Nm
3.	-arrows-	Turn 90° further



Tightening torque and sequence: bracket for bevel box

- Tighten bolts in stages as follows:

Stage	Bolts	Tightening torque
1.	-1-	Screw in by hand until contact is made
2.	-2-	40 Nm
3.	-1-	40 Nm



Additional tightening torques

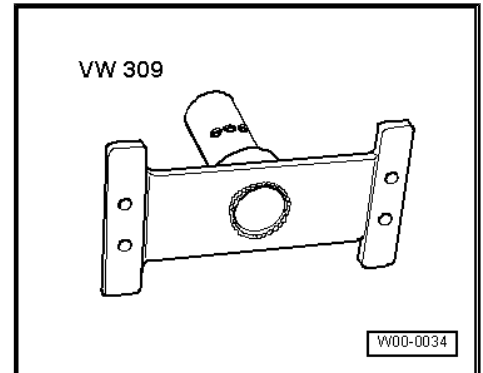
- ◆ ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings
- ◆ Catalytic converter and front silencer ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers .
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing heat shield for drive shaft

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7 Securing to engine and gearbox support

Special tools and workshop equipment required

- ◆ Retaining plate - VW 309-



- ◆ Gearbox support - VW 353-



- ◆ Engine and gearbox support - VAS 6095-

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Procedure

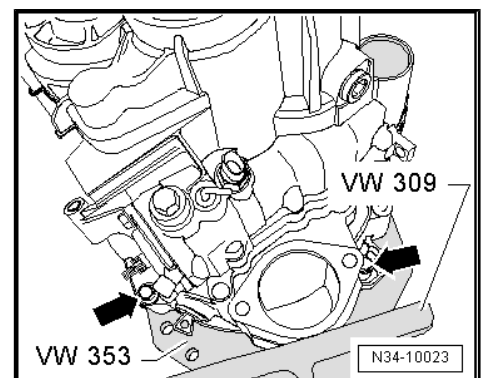
- Secure gearbox to gearbox support - VW 353- and support plate - VW 309- -arrows-.



Note

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

- Insert support plate - VW 309- in engine and gearbox support - VAS 6095-.



8 Dismantling and assembling gearbox

⇒ ["8.1 Schematic overview - gearbox", page 110](#)

⇒ ["8.2 Exploded view - gearbox", page 111](#)

⇒ ["8.3 Exploded view - gearbox housing and selector mechanism", page 112](#)

⇒ ["8.4 Exploded view - selector unit", page 114](#)

⇒ ["8.5 Exploded view - selector forks", page 115](#)

⇒ ["8.6 Exploded view - input shaft, output shafts, differential and selector rods", page 116](#)

⇒ ["8.7 Removing and installing selector unit", page 117](#)

⇒ ["8.8 Dismantling and assembling gearbox", page 121](#)

8.1 Schematic overview - gearbox

1 - Clutch housing

2 - Reverse shaft

3 - Output shaft for 5th, 6th and reverse gear

4 - Clutch slave cylinder with release bearing

5 - Input shaft

6 - Output shaft for 1st - 4th gear

7 - Differential

8 - Bevel box
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9 - Flange shaft (right-side)

10 - Bevel gear with input shaft

11 - Shaft bevel gear/output shaft

□ With splines -arrow-

12 - Flange shaft (left-side)

13 - 2nd speed selector gear

14 - 1st speed selector gear

15 - 4th speed selector gear

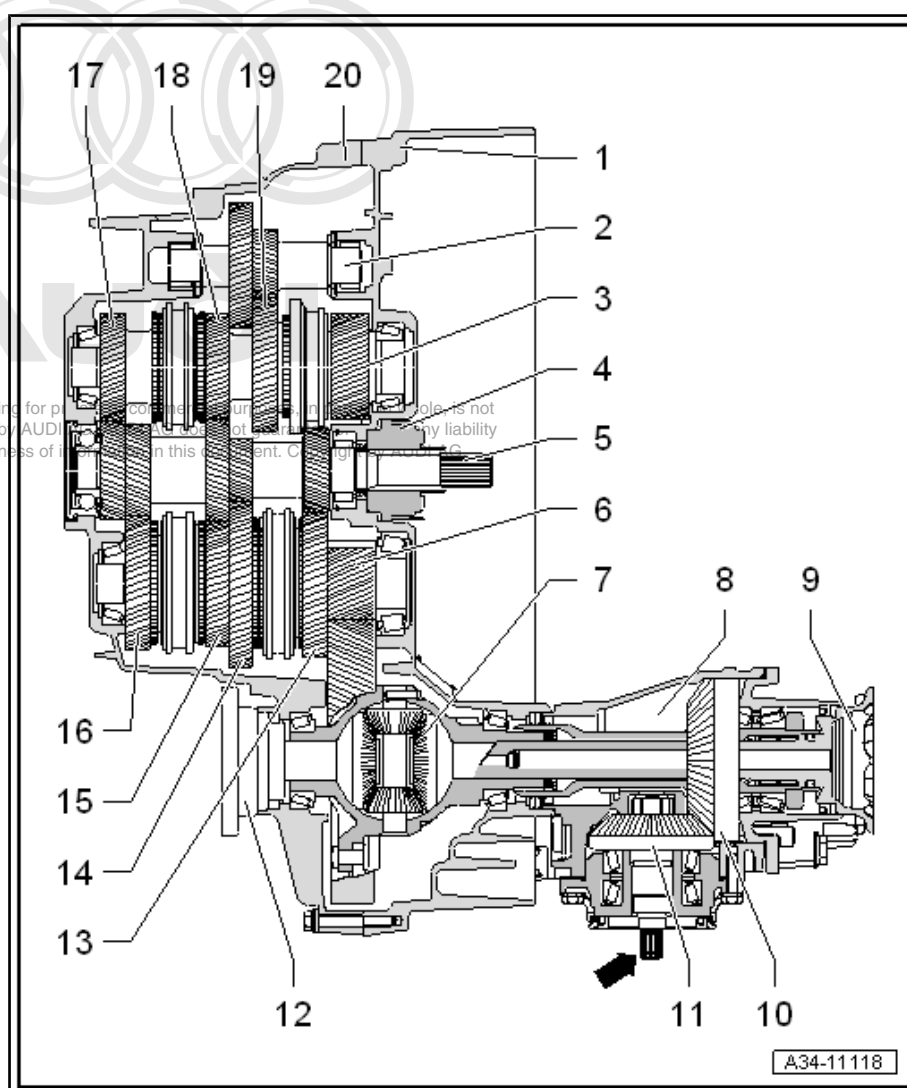
16 - 3rd speed selector gear

17 - 5th speed selector gear

18 - 6th speed selector gear

19 - Reverse selector gear

20 - Gearbox housing

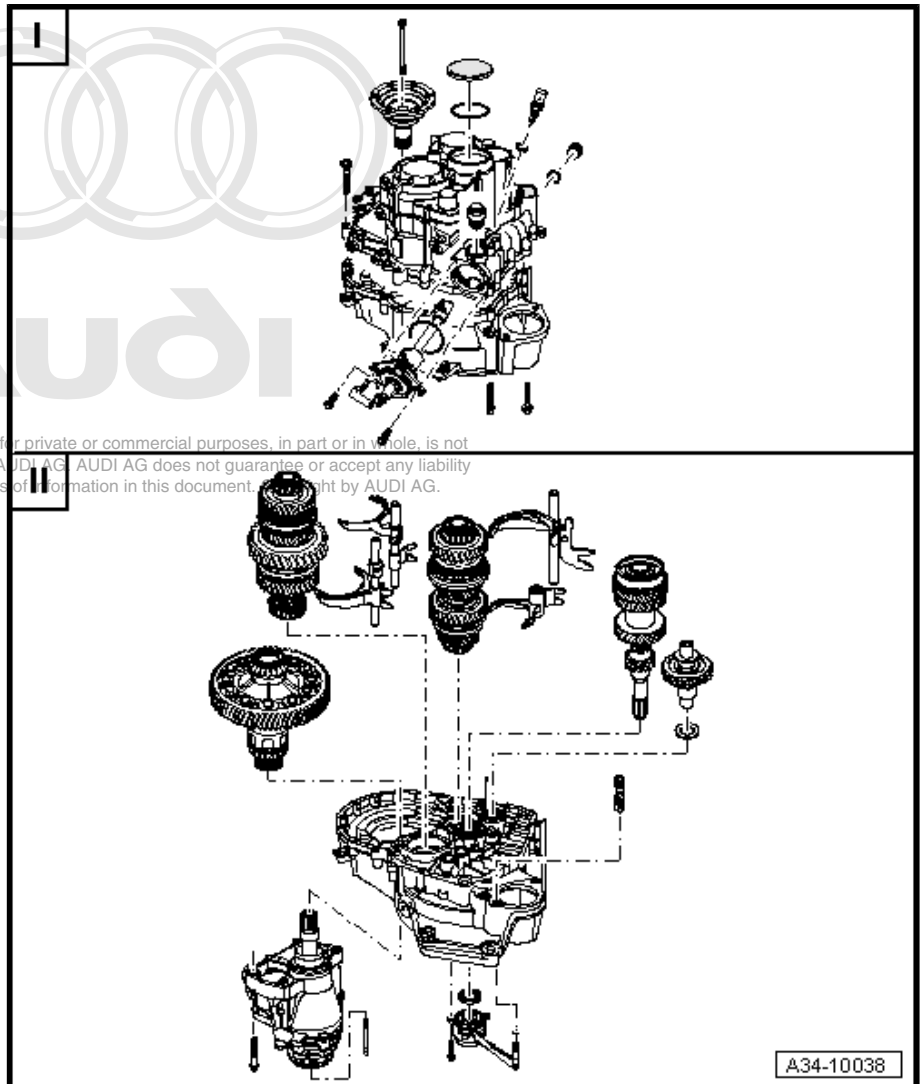


8.2 Exploded view - gearbox

I - Exploded view - gearbox housing and selector unit
⇒ [page 112](#)

II - Exploded view - input shaft, output shafts, differential, bevel box and selector rods
⇒ [page 116](#)

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8.3 Exploded view - gearbox housing and selector mechanism

1 - Countersunk bolt

- ☐ Tightening torque
⇒ [Item 13 \(page 195\)](#)

2 - Flange shaft (left-side) with spring

- ☐ Removing and installing
⇒ [page 207](#)
- ☐ Assembling
⇒ [page 194](#)

3 - Circlip

- ☐ For sheet-metal sealing cap ⇒ [page 121](#)
- ☐ Not fitted on version with plastic sealing cap

4 - Filler cap

- ☐ Sheet metal or plastic
⇒ [page 121](#)
- ☐ Sheet metal version: secured with circlip
⇒ [Item 3 \(page 112\)](#)
- ☐ Plastic version: circlip
⇒ [Item 3 \(page 112\)](#) not fitted
- ☐ Select correct components from ⇒ Electronic parts catalogue .

5 - Circlip

- ☐ For grooved ball bearing on input shaft
⇒ [Item 4 \(page 149\)](#)

6 - Reversing light switch - F4-

- ☐ 20 Nm

7 - Seal

- ☐ Not fitted on all versions
- ☐ Renew after removing

8 - Oil drain plug

- ☐ Tightening torque ⇒ [Item 3 \(page 136\)](#)

9 - Seal

- ☐ Renew after removing

10 - Bolt

- ☐ 6 Nm

11 - Gearbox neutral position sender - G701-

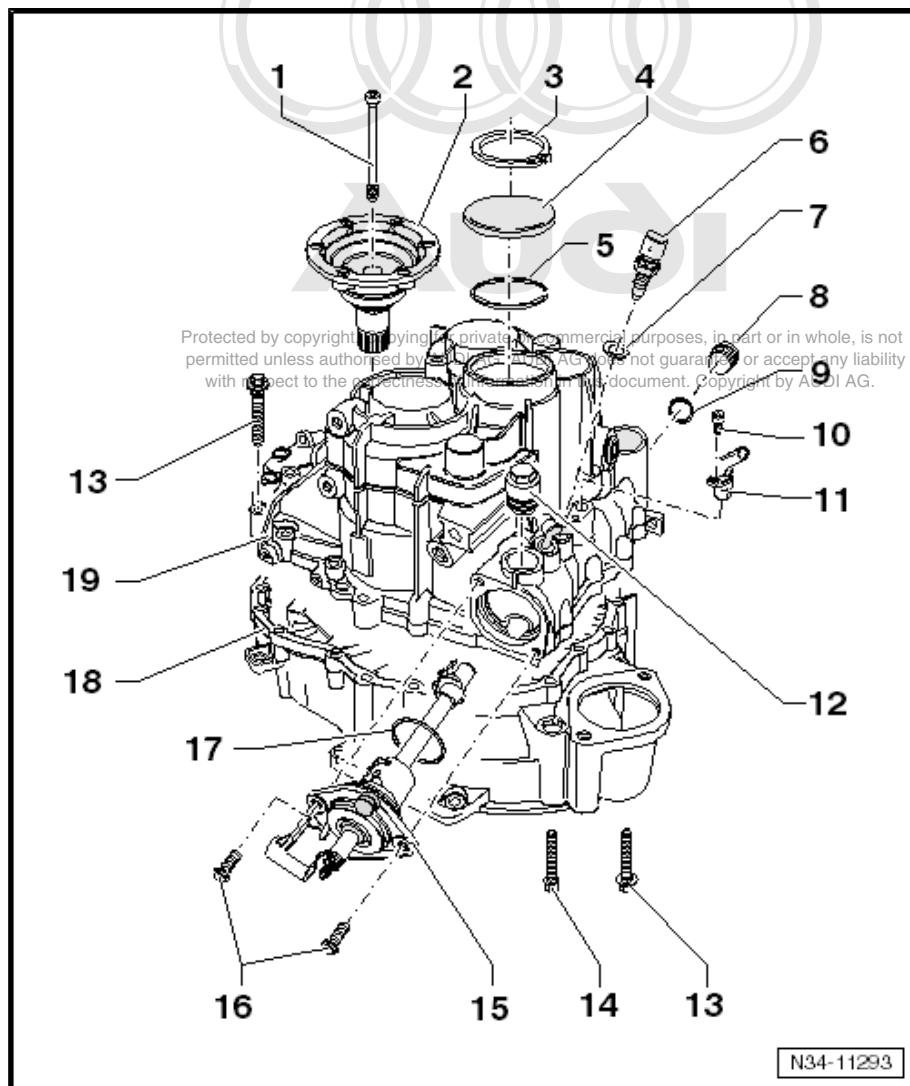
- ☐ Not fitted on all equipment versions

12 - Locking bolt

- ☐ For selector shaft
- ☐ Plastic: 30 Nm
- ☐ Renew

13 - Bolt

- ☐ Aluminium bolt M 9



- ☐ Renew after removing
- ☐ 15 Nm and turn 180° further

14 - Bolt

- ☐ Aluminium bolt M 9
- ☐ Renew after removing
- ☐ 15 Nm and turn 180° further

15 - Selector unit

- ☐ (Selector shaft with selector mechanism cover)
- ☐ Servicing ⇒ [page 114](#)
- ☐ Removing and installing (with gearbox installed) ⇒ [page 117](#)

16 - Bolt

- ☐ Renew after removing
- ☐ 20 Nm

17 - O-ring

- ☐ Renew after removing

18 - Clutch housing

- ☐ Servicing ⇒ [page 146](#)

19 - Gearbox housing

- ☐ Servicing ⇒ [page 136](#)



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8.4 Exploded view - selector unit

1 - Gearbox housing

2 - Bearing bush

- ☐ For selector shaft
- ☐ Removing and installing
⇒ [Item 15 \(page 137\)](#)

3 - O-ring

- ☐ Fit in circular slot on selector mechanism cover
- ☐ Lubricate with gear oil
- ☐ Renew

4 - Cap

- ☐ For gearbox breather

5 - Bolt

- ☐ For selector unit on gearbox housing
- ☐ Tightening torque
⇒ [Item 16 \(page 113\)](#)
- ☐ Always renew

6 - Oil seal

- ☐ Lever out with screwdriver
- ☐ Installing ⇒ [page 71](#)
- ☐ Renewing (with gearbox installed) ⇒ [page 69](#)

7 - Selector unit

- ☐ Consists of selector shaft and selector mechanism cover
- ☐ Components cannot be separated from each other
- ☐ Can be removed and installed with gearbox in vehicle ⇒ [page 117](#)

8 - Locking bolt

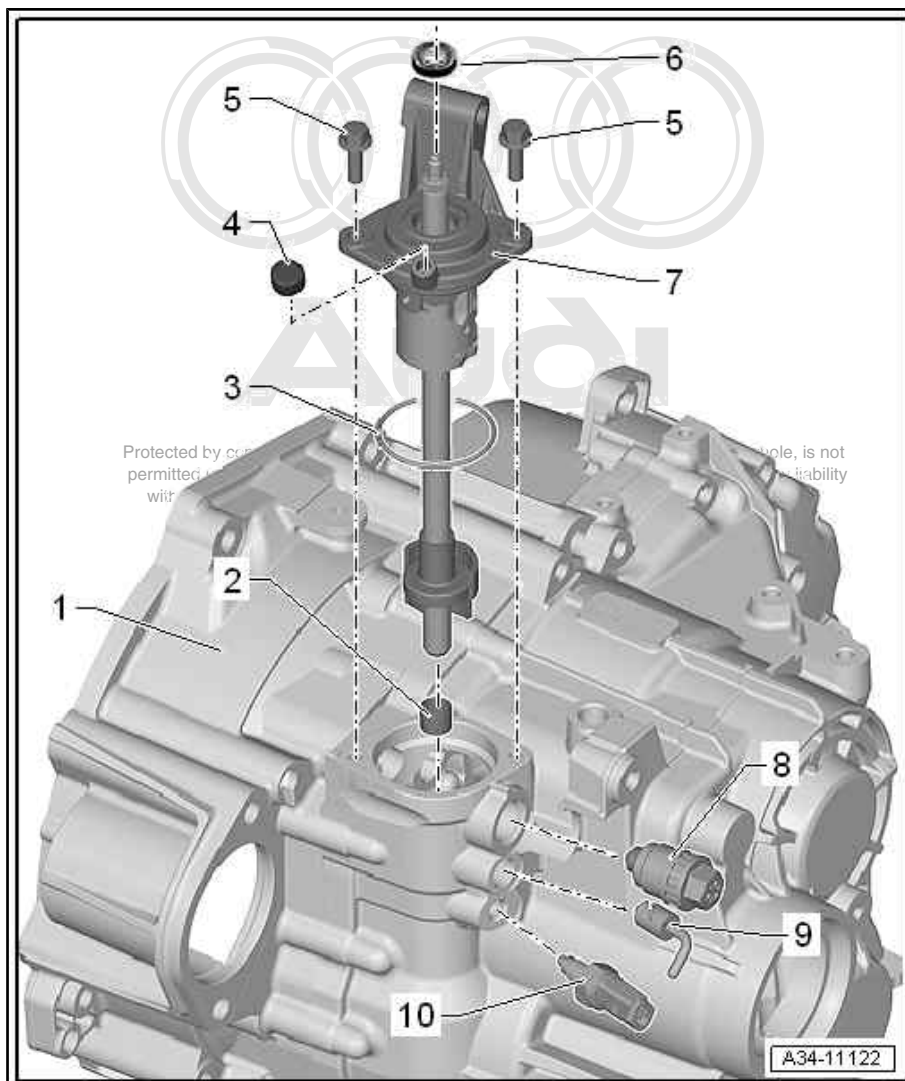
- ☐ For selector shaft
- ☐ Tightening torque ⇒ [Item 12 \(page 112\)](#)
- ☐ Renew

9 - Angled rod

- ☐ For adjusting selector mechanism ⇒ [page 67](#)
- ☐ Removing and installing ⇒ [Item 5 \(page 136\)](#)

10 - Reversing light switch - F4-

- ☐ 20 Nm



8.5 Exploded view - selector forks

1 - Damper rubber

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

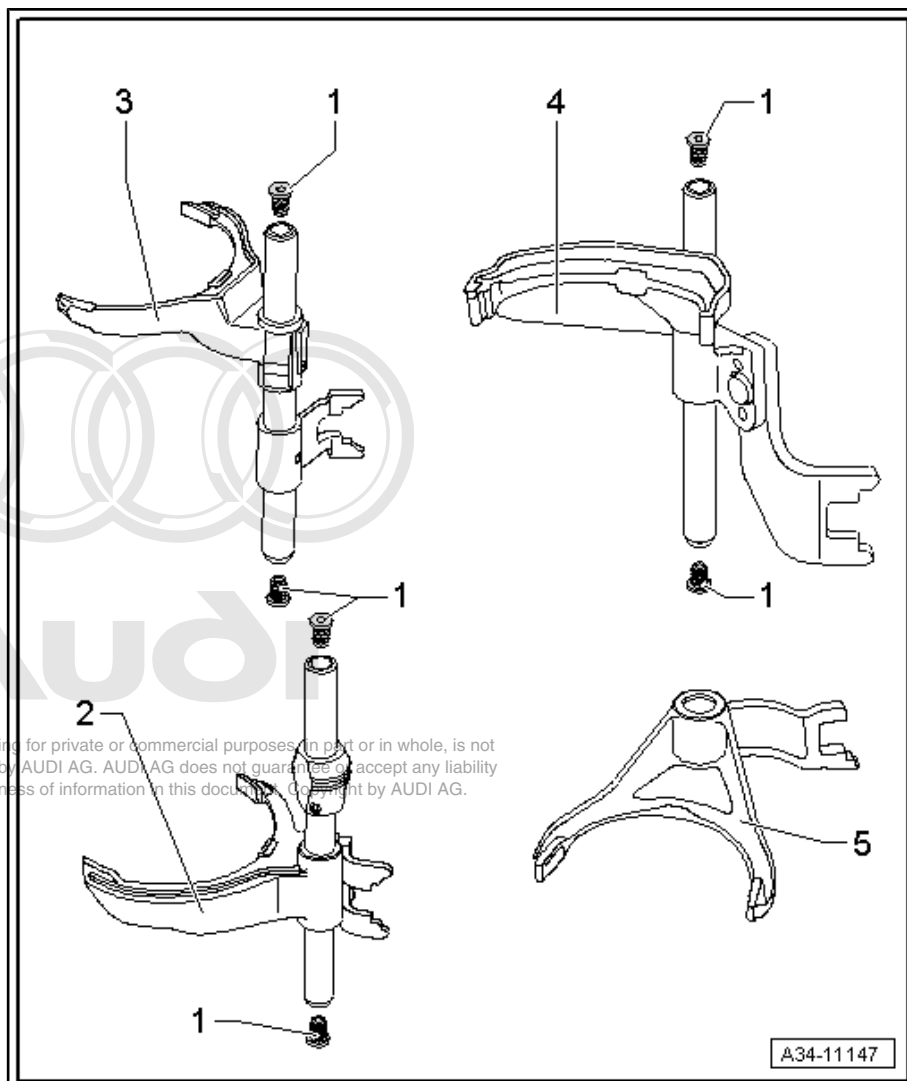
2 - Selector rod with selector fork for 1st and 2nd gear

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

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

5 - Reverse gear selector fork

- ☐ Mounted on selector rod with selector fork for 5th and 6th gear
⇒ [page 117](#)



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

1 - Output shaft for 1st - 4th gear

- ☐ Dismantling and assembling ⇒ [page 155](#)
- ☐ Installation position ⇒ [page 117](#)

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

- ☐ Installation position ⇒ [page 117](#)

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

- ☐ Installation position ⇒ [page 117](#)

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

- ☐ Dismantling and assembling ⇒ [page 172](#)
- ☐ Installation position ⇒ [page 117](#)

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

- ☐ Installation position ⇒ [page 117](#)

6 - Reverse gear selector fork

- ☐ Installation position ⇒ [page 117](#)

7 - Input shaft

- ☐ Dismantling and assembling ⇒ [page 149](#)
- ☐ Always renew grooved ball bearing on input shaft ⇒ [Item 4 \(page 149\)](#)

8 - Thrust washer

9 - Reverse shaft

- ☐ Fit before installing thrust washer ⇒ [Item 8 \(page 116\)](#)

10 - Thrust washer

11 - Breather

- ☐ Connect to clutch slave cylinder ⇒ [Item 15 \(page 117\)](#)

12 - Clutch housing

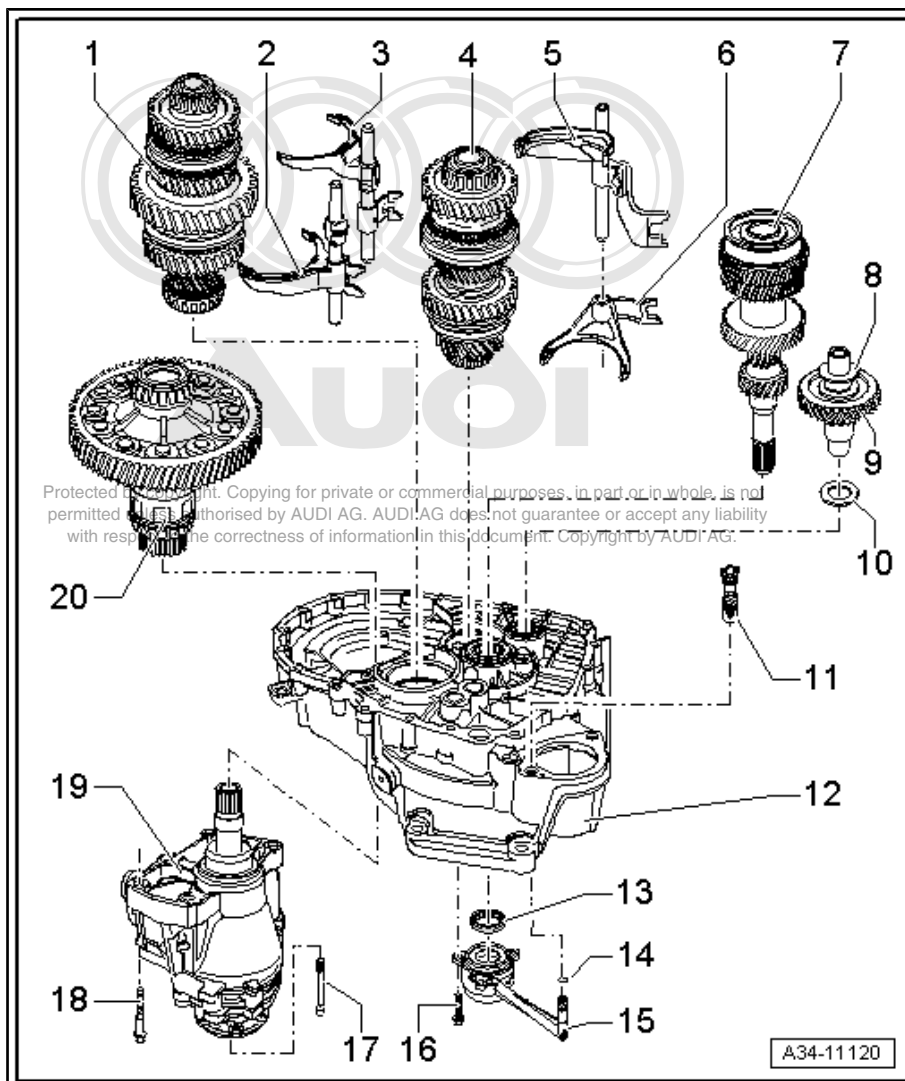
- ☐ Servicing ⇒ [page 146](#)

13 - Input shaft oil seal

- ☐ Renewing ⇒ [page 54](#)

14 - O-ring or seal

- ☐ Renew damaged O-rings or seals
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing
- ☐ For correct version, refer to ⇒ [Electronic parts catalogue](#)



15 - Clutch slave cylinder with release bearing

16 - Bolt

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

17 - Countersunk bolt

- ☐ Tightening torque ⇒ [Item 13 \(page 195\)](#)

18 - Bolt

- ☐ Tightening torque ⇒ [Item 12 \(page 195\)](#)
- ☐ 4x
- ☐ Renew

19 - Bevel box

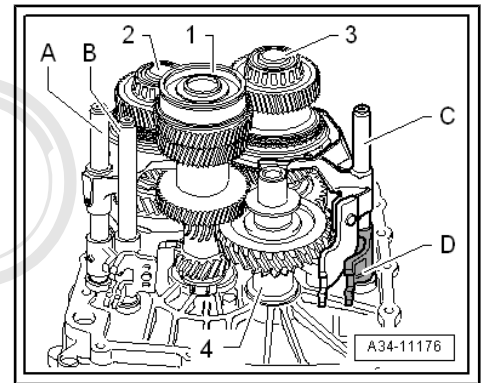
- ☐ Removing and installing (with gearbox removed) ⇒ [page 97](#)
- ☐ Exploded view - oil seals and bearing for flange shaft (right-side) in bevel box ⇒ [page 223](#)

20 - Differential

- ☐ Dismantling and assembling ⇒ [page 194](#)

Installation position of shafts and selector rods in gearbox

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



Note

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Reverse gear selector fork - item D- is fitted on selector rod for 5th/6th gear -item C-.

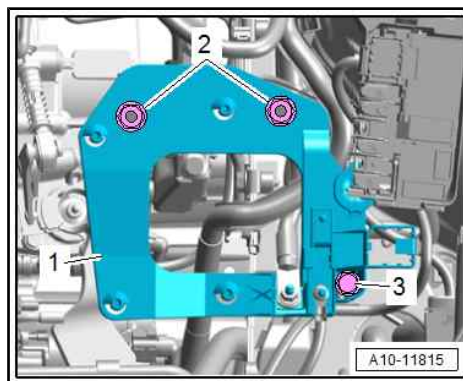
8.7 Removing and installing selector unit

Removing

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

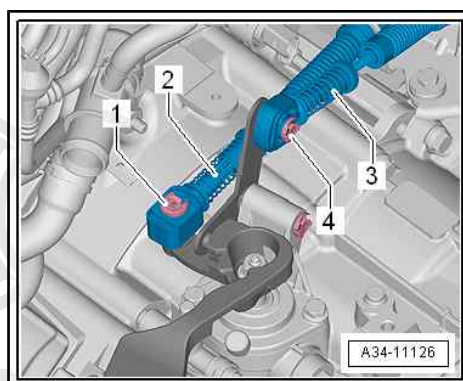
Audi S1:

- Unscrew nuts -2- and bolt -3-.
- Push bracket -1- for air cleaner housing slightly to one side.



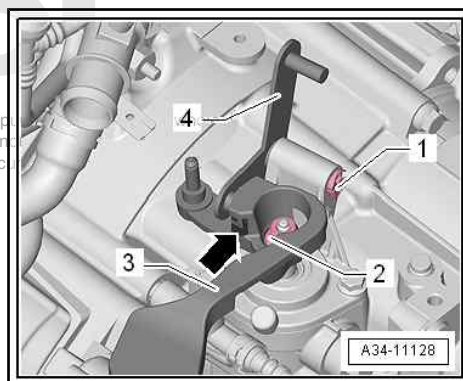
Continued for all vehicles:

- Detach securing clip -1- and pull gear selector cable -2- off gearbox selector lever.
- Detach securing clip -4- and pull gate selector cable -3- off gate relay lever.



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

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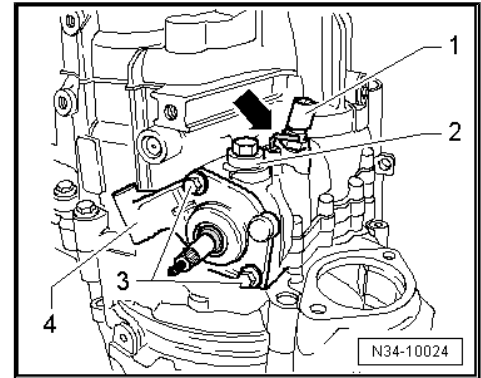


- Put selector shaft in neutral position.
- Unplug connector from reversing light switch - F4- .
- Remove reversing light switch - F4- -1-.
- Remove locking bolt -2-.
- Remove bolts -3-.



Caution

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



- Pull selector shaft with selector mechanism cover -4- (selector unit) out of gearbox housing.

Installing

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

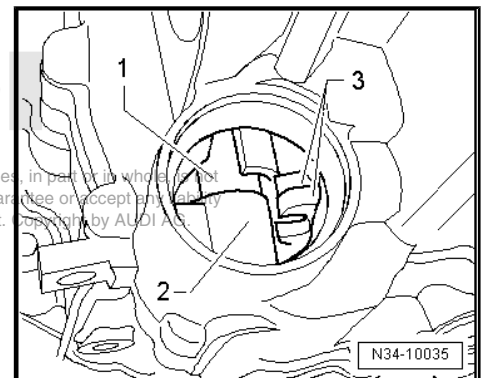
- A new O-ring must be fitted in circular slot on selector mechanism cover.
- Put selector shaft in neutral position.
- Insert selector shaft -1- into bottom mounting -2- and into selector forks -3-.



Note

The sealing cap ⇒ Item 2 (page 136) is removed to give a better illustration.

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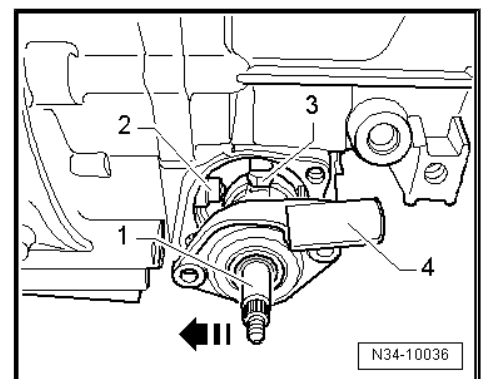


- Now push selector shaft -1- against stop sleeve -2- in direction of -arrow- and run selector finger -3- down through selector forks and onto stop.
- Selector mechanism cover -4- should be parallel to joint surface on gearbox housing.
- Selector shaft should move up and down easily (gate selector movement).

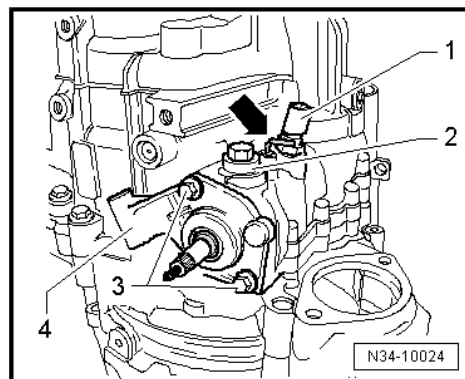


Note

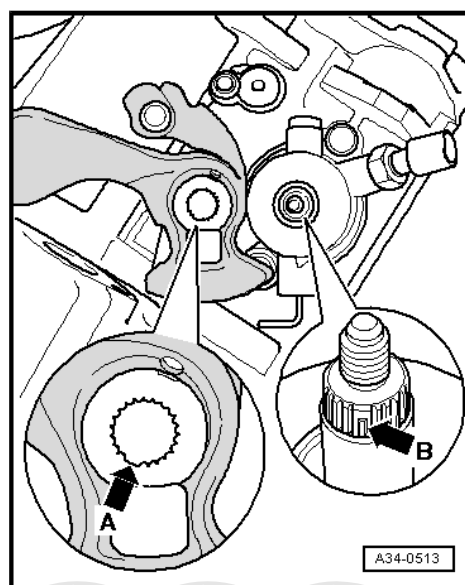
If the selector mechanism cover is not parallel with the joint surface, the selector shaft is not seated in its bottom mounting.



- Tighten bolts -3- for selector mechanism cover -4-.
- Screw in locking bolt -2-; angled rod -arrow- must be released.
- Install reversing light switch - F4- -1- and plug in connector.



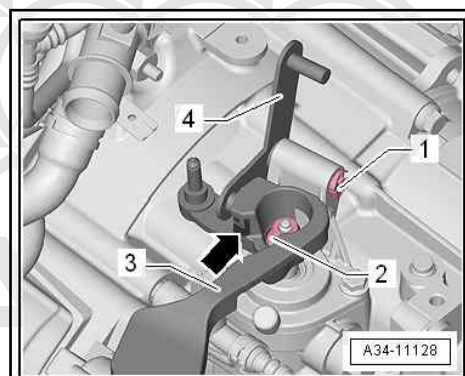
- Install gearbox selector lever so that the gap in the splines -arrow A- aligns with the wider spline -arrow B- on the selector shaft.



- Tighten new nut -2- securing gear selector lever -3- to selector shaft to specified torque ⇒ [Item 16 \(page 60\)](#) .
- Before installing gate relay lever -4-, check that bearing bushes ⇒ [Item 2 \(page 59\)](#) are fitted in selector unit.
- Lubricate bearings of gate relay lever and slide block -arrow- in gear selector lever. Select correct type of grease from ⇒ Electronic parts catalogue .
- Fit new securing clip -1- on gate relay lever.

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

Identification of cable end-pieces ⇒ [page 61](#)



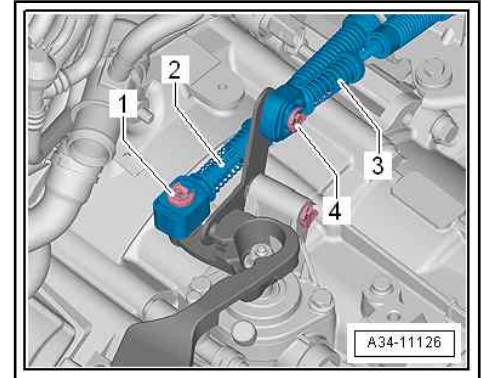
- Apply a small amount of grease to pins of gearbox selector lever and gate relay lever.
- Select correct type of grease from ⇒ Electronic parts catalogue .

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- Fit gear selector cable -2- and gate selector cable -3- with new securing clips -1, 4- onto gear selector lever and gate relay lever.
- Adjust selector mechanism ⇒ [page 67](#) .
- Install air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .

Tightening torques

- ◆ ⇒ ["8.4 Exploded view - selector unit", page 114](#)



8.8 Dismantling and assembling gearbox

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

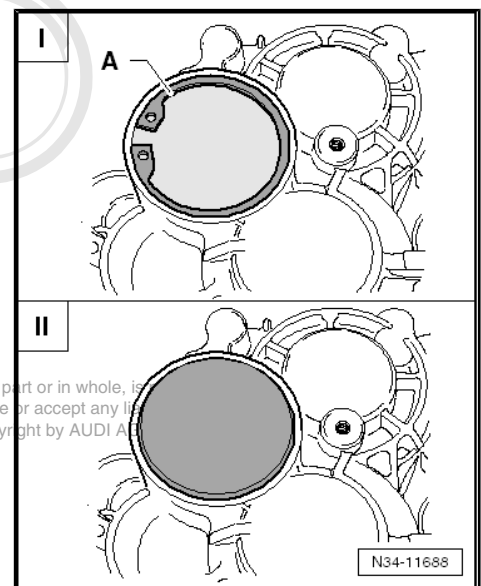


Note

Depending on version, a sheet-metal sealing cap or a plastic sealing cap may be fitted for the input shaft.

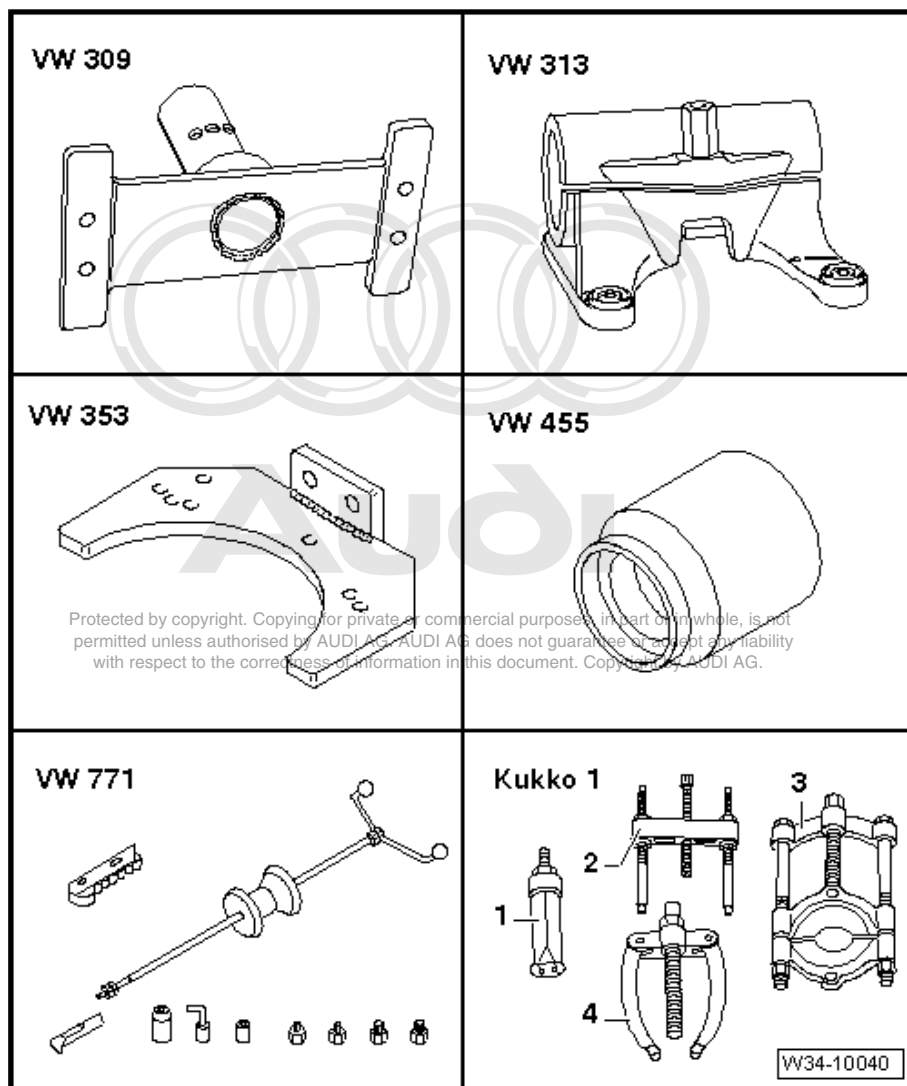
Circlip -A- is no longer fitted with plastic sealing cap for input shaft.

- ◆ -I- = Sheet metal sealing cap for input shaft with circlip -A-
- ◆ -II- = Plastic sealing cap for input shaft without circlip

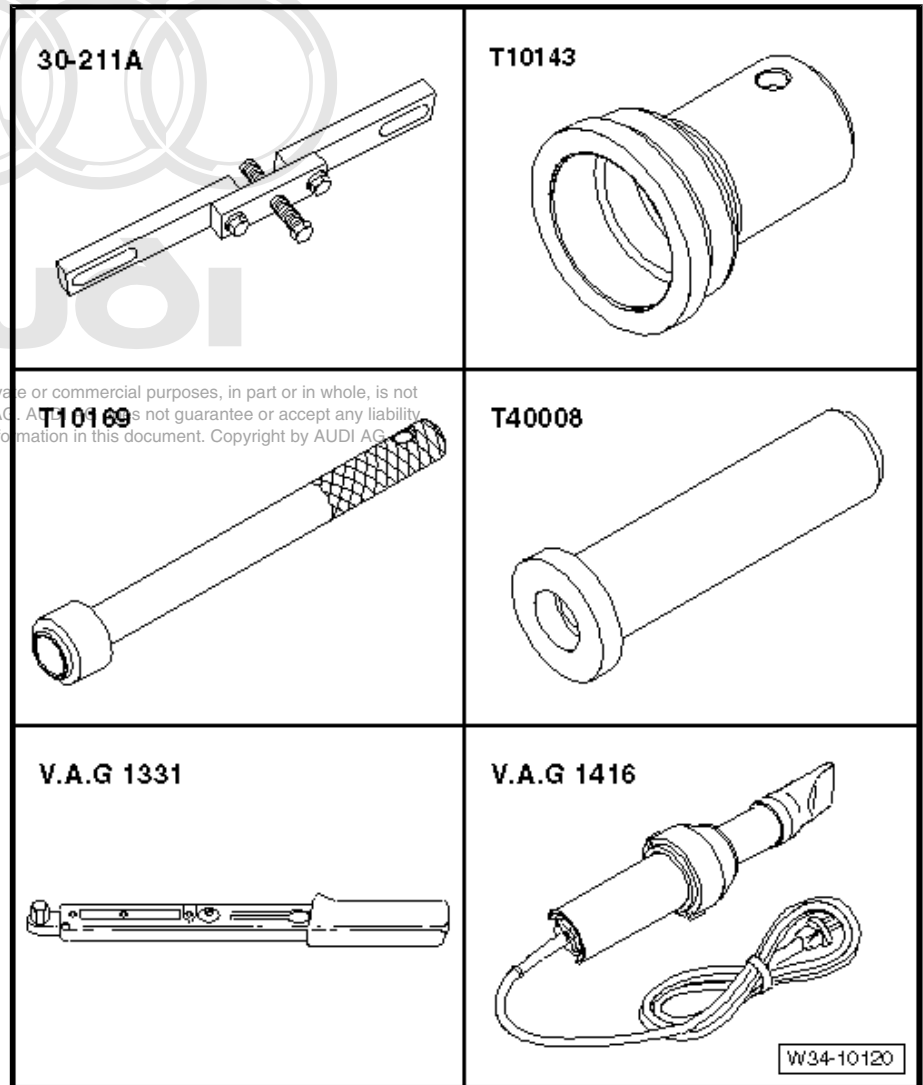


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Special tools and workshop equipment required

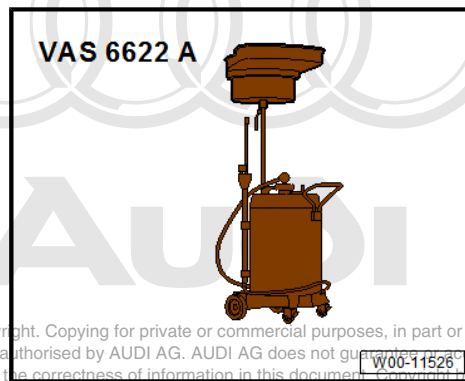


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- ◆ Support bridge - 30-211A-
- ◆ Thrust piece - T10143- or thrust piece - T10180-
- ◆ Drift - T10169-
- ◆ Or drift - T10362- ⇒ [page 144](#)
- ◆ Thrust piece - T40008-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Hot air blower - V.A.G 1416-

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



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- ◆ Socket - T10107 A-



- ◆ Sealing paste - AMV 188 200 03-

Dismantling gearbox

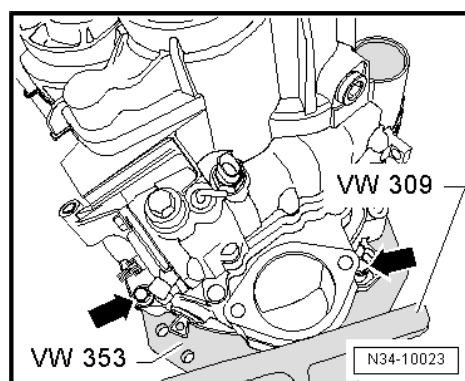
- Secure gearbox to assembly stand with bolts -arrows-.



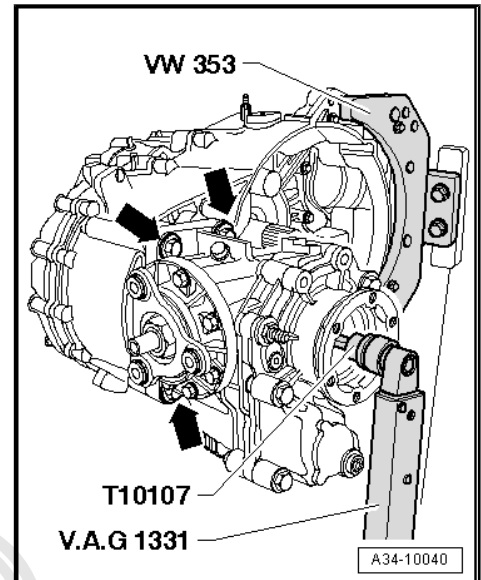
Note

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

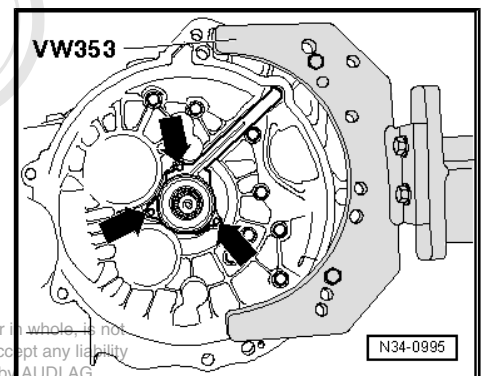
- Turn the gearbox in the assembly stand so that the oil drain plug faces downwards.
- Place used oil collection and extraction unit - VAS 6622A- underneath.
- Drain off gear oil.



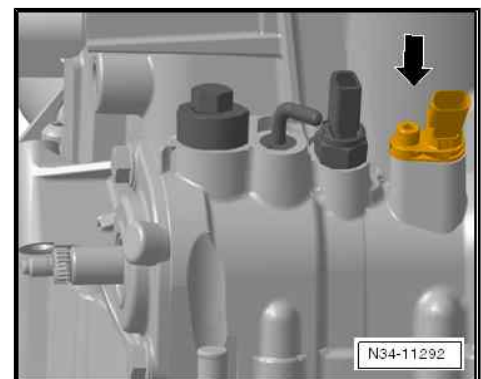
- Remove countersunk bolt for flange shaft (right-side) with socket and extended bit - T10107- or -T10107 A- .
- Remove 4 bolts -arrows- securing bevel box to gearbox (illustration only shows 3 bolts).
- Carefully push bevel box away from gearbox, making sure it does not fall down.



- Remove clutch slave cylinder with release bearing -arrows-.

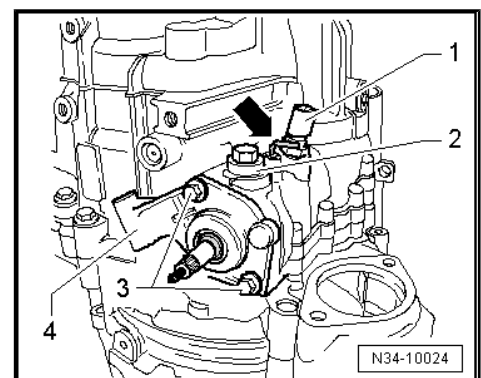


- Remove gearbox neutral position sender - G701- -arrow-.

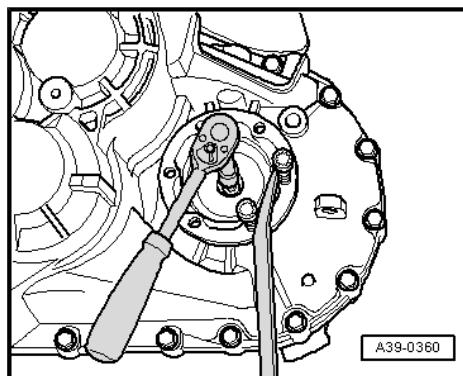


Make sure that the selector shaft is not locked in position by the angled rod -arrow- while carrying out the following steps.

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



- Remove bolt securing flange shaft (left-side). To do so, screw two bolts into flange and counterhold flange shaft with suitable lever.
- Pull out flange shafts and spring.



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



Note

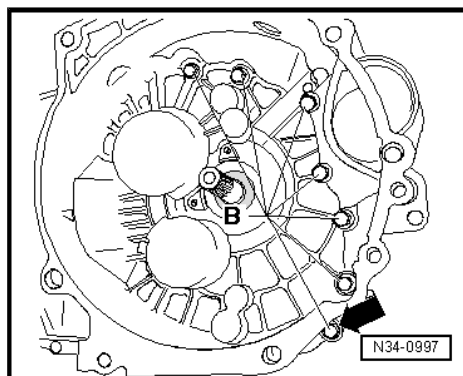
One of the bolts -arrow- is outside the joint flange.

- Secure input shaft as follows:

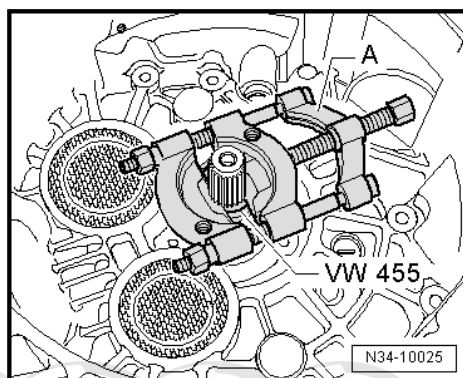


Note

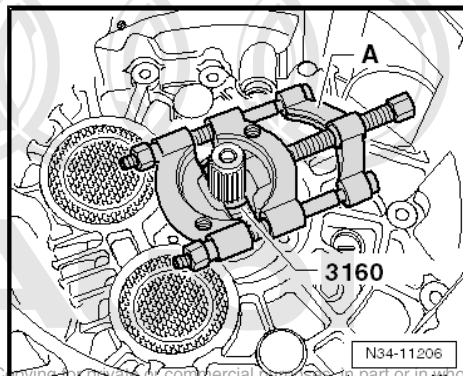
The input shaft splines are of different length, depending on the gearbox version.



- Either fit installing sleeve - VW 455- over input shaft and against clutch housing.



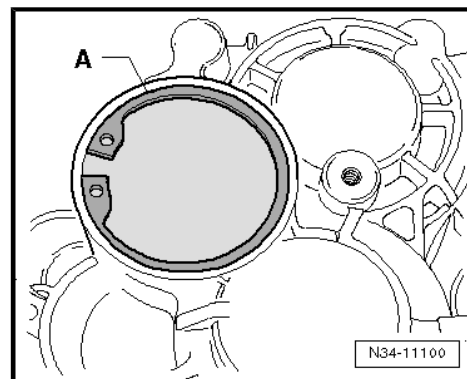
- Or fit sleeve - 3160- over input shaft and against clutch housing.
- Then tighten splitter -A-, e.g. -Kukko 17/0- behind splines on input shaft.
- The rear side of the splitter must be in contact with installing sleeve - VW 455- or sleeve - 3160- (zero play).



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Metal sealing cap

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



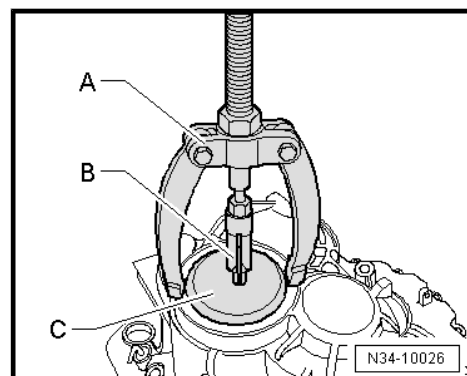
- Pierce rubber in centre of sealing cap -C- with a screwdriver .

- Pull sealing cap out of gearbox housing.

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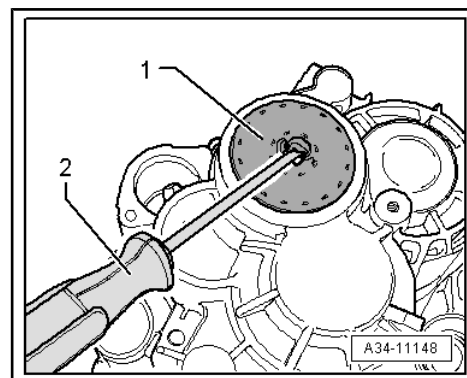
- A - Counter-support , e.g. -Kukko 22/1-

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



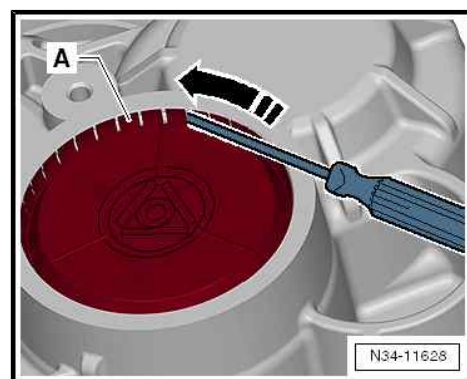
Note

- ♦ To remove sealing cap -1-, rubber in centre of sealing cap may also be pierced with a screwdriver.
- ♦ Carefully lever sealing cap off gearbox housing with a screwdriver -2-.

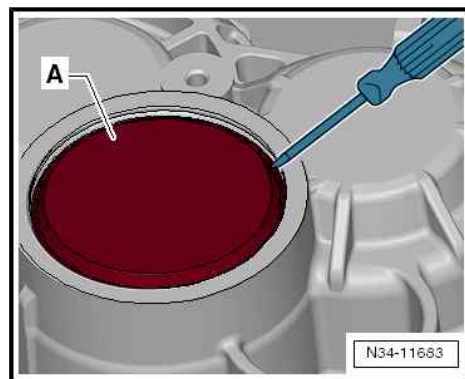


Plastic sealing cap

Carefully remove all tabs -A-. Take care not to damage gearbox housing.



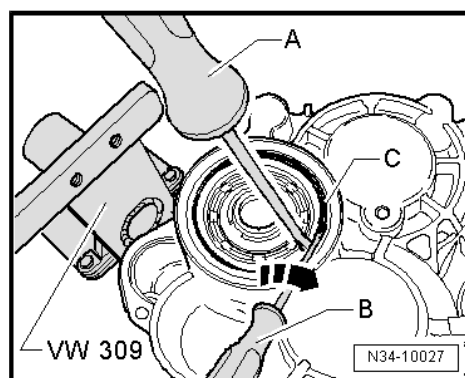
- Lever out sealing cap -A-.
- Make sure that all parts of the sealing cap are completely removed.



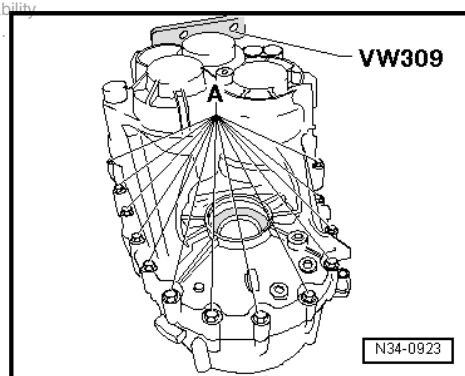
Continued for all vehicles:

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

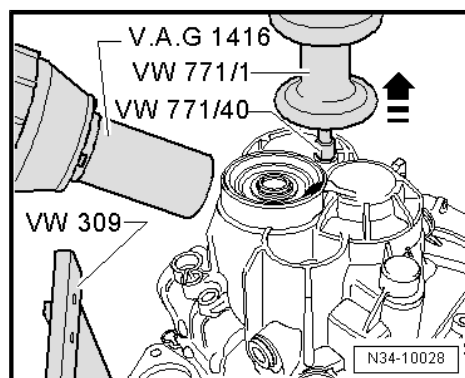
- Hold one end of circlip with screwdriver -A-.
- Lever other end of circlip out of slot in grooved ball bearing in direction of -arrow- with 2nd screwdriver -B-.
- Lever circlip out further by repositioning screwdriver -B-.



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



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

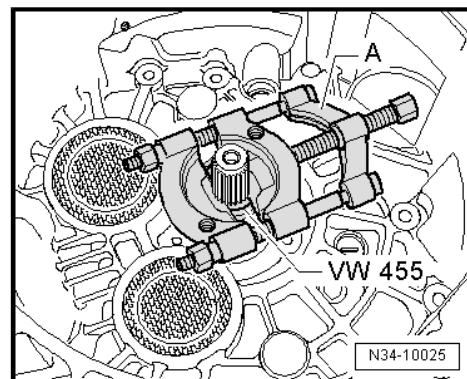


Note

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

- Remove splitter -A- and installing sleeve VW 455 or sleeve -3160- from input shaft.

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

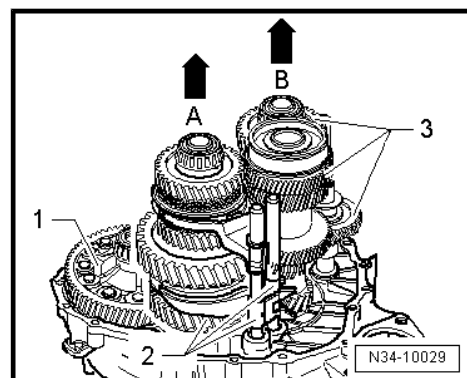


- Lift up differential -1- with your left hand. With your right hand, lift 1st - 4th gear output shaft together with selector rods -2- -arrow A-.
- At the same time, the second mechanic must lift the input shaft, reverse shaft and 5th/6th gear output shaft -3- out of the clutch housing together with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



Note

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



- Remove input shaft oil seal.

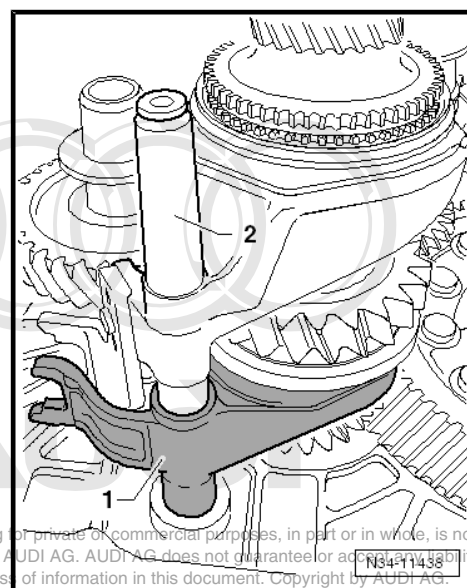


Note

*Always renew grooved ball bearing on input shaft
⇒ [Item 4 \(page 149\)](#) .*

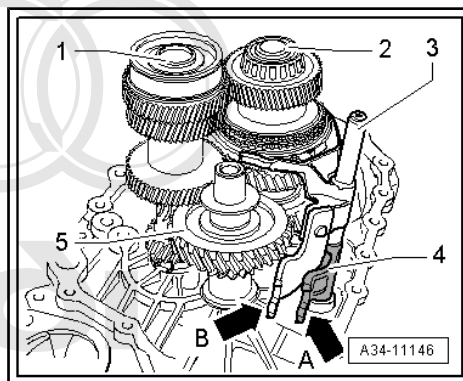
Assembling gearbox

- A new grooved ball bearing has been pressed onto the input shaft ⇒ [Item 4 \(page 149\)](#) .
- Reverse gear selector fork -1- is fitted on selector rod for 5th/6th gear -2- in fitting location ⇒ [page 130](#) .



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- Insert input shaft -1-, output shaft for 5th and 6th gear -2- together with selector rod for 5th and 6th gear -3-, reverse gear selector fork -4- and reverse shaft -5-.
- Selector jaw -arrow A- of reverse gear selector fork faces outside of gearbox. Selector jaw -arrow B- of selector rod for 5th and 6th gear must face inside of gearbox.



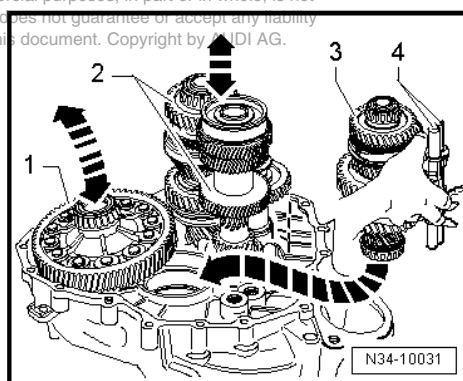
- Then install differential -1-.



Note

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

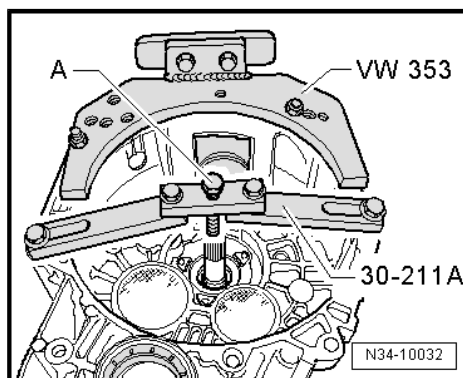
- Take 1st - 4th gear output shaft -3- with selector rods -4- in your right hand as illustrated.
- Lift up differential slightly with your left hand.
- At the same time, have the second mechanic lift the input shaft and output shaft for 5th and 6th gear -2- slightly, together with the reverse shaft.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



Note

Illustration shows clutch housing turned through 180° for clarity.

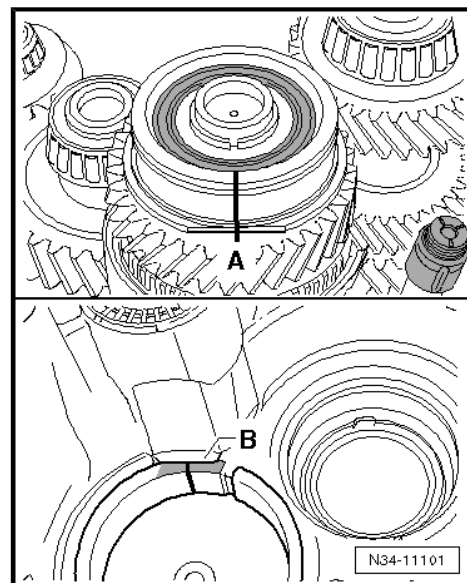
- Screw in bolt -A- until input shaft lifts slightly.



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

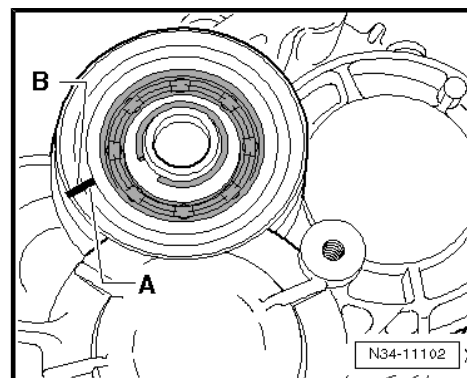
The grooved ball bearing and the bearing mounting are flattened on one side.

- Flattened sides -A- on grooved ball bearing and bearing mounting -B- in gearbox housing must be aligned.
- Mark flattened sides with paint.
- Transfer markings onto top area of grooved ball bearing and top area of bearing mounting on gearbox housing (⇒ next illustration).
- Using hot air blower - V.A.G 1416- , heat area around seat of grooved ball bearing for input shaft in gearbox housing for approx. 10 minutes to approx. 100°C.

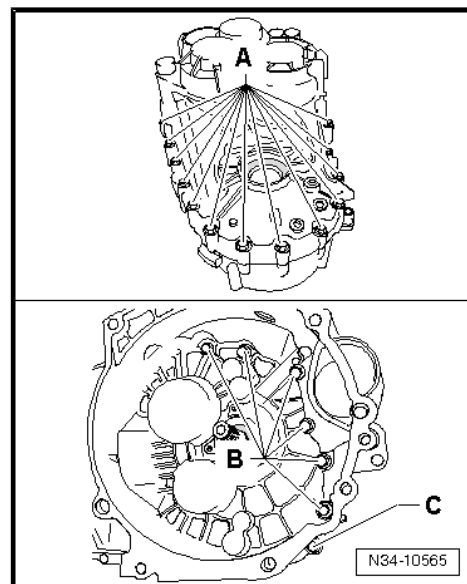


Note

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

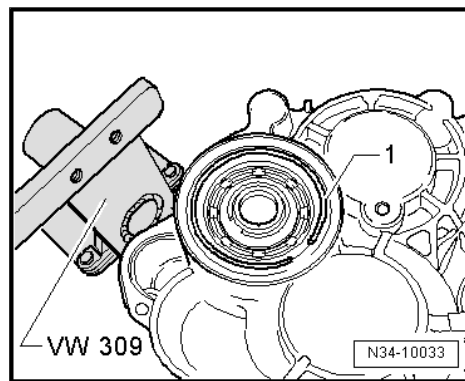


- Fit gearbox housing and tighten new bolts -A-, -B- and -C- to specified torque.



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- Install circlip -1- for input shaft grooved ball bearing.
- Attach support bridge - 30 - 211 A- for input shaft.
- If stop sleeve for selector shaft has been removed, drive it in now ⇒ [page 144](#) (drive in until tool reaches stop).

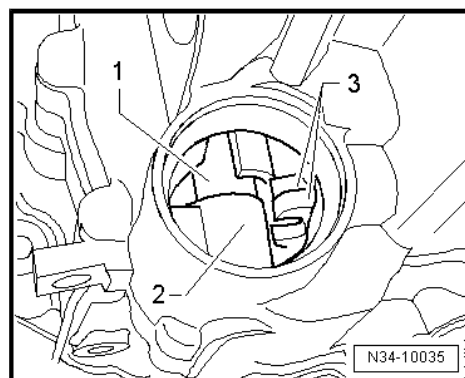


- Turn gearbox on assembly stand so that opening for selector shaft faces up.
- Insert selector shaft -1- into bottom mounting -2- and into selector forks -3-.



Note

The sealing cap ⇒ [Item 2 \(page 136\)](#) is removed to give a better illustration.

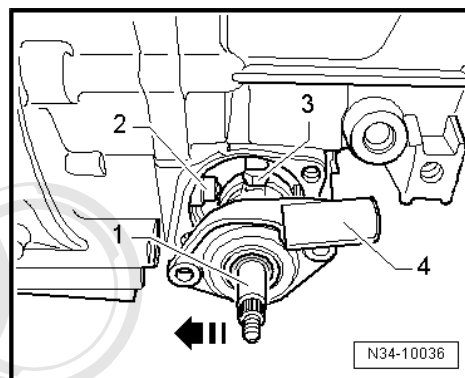


- Now push selector shaft -1- against stop sleeve -2- in direction of -arrow- and run selector finger -3- down through selector forks and onto stop.
- Selector mechanism cover -4- should be parallel to joint surface on gearbox housing.
- Selector shaft should move up and down easily (gate selector movement).



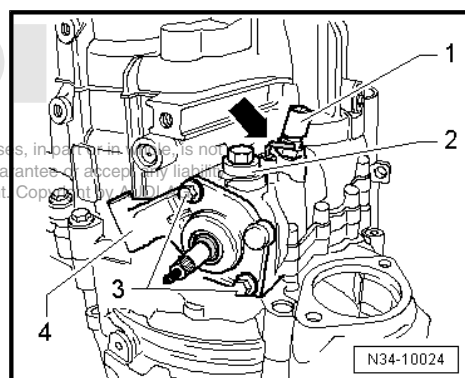
Note

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

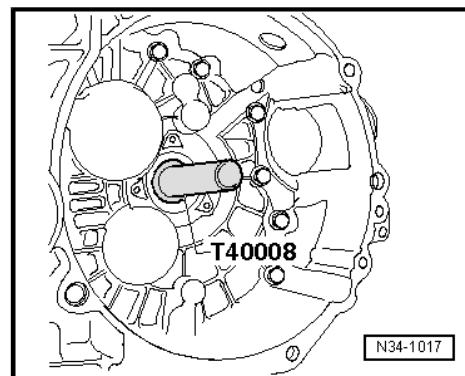


- Tighten bolts -3- for selector mechanism cover -4-.
- Screw in locking bolt -2-; angled rod -arrow- must be released.
- Install reversing light switch - F4- -1-.

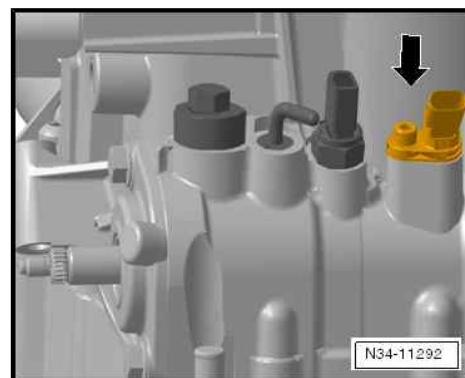
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- Drive in input shaft oil seal until flush.

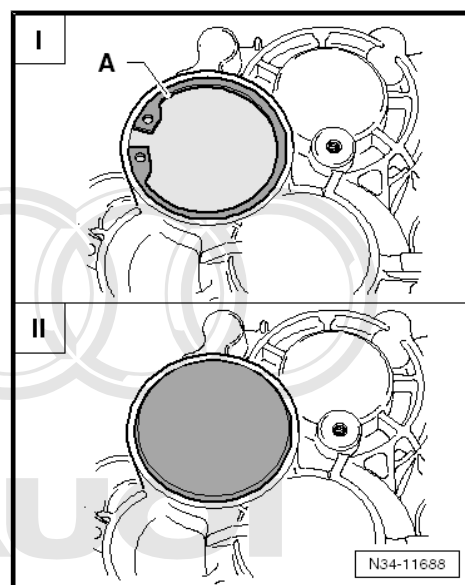


- Install gearbox neutral position sender - G701- -arrow-
⇒ [Item 10 \(page 112\)](#) .
- Install clutch slave cylinder with release bearing ⇒ [page 19](#) .
- Select all gears.
- Install sealing cap as follows:



Identification of sealing caps

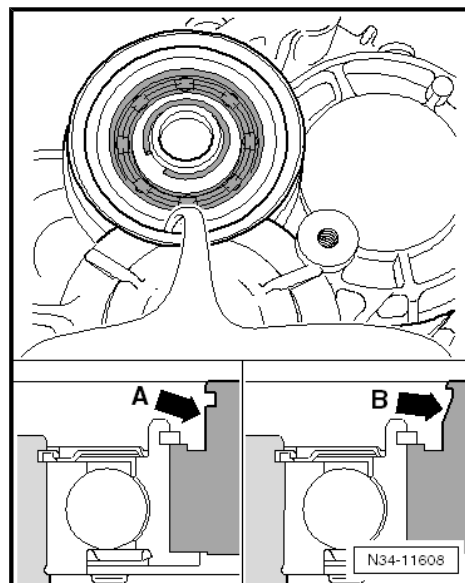
- I- = Sheet metal sealing cap: secured with circlip -A-
- II- = Plastic sealing cap without circlip



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Allocation

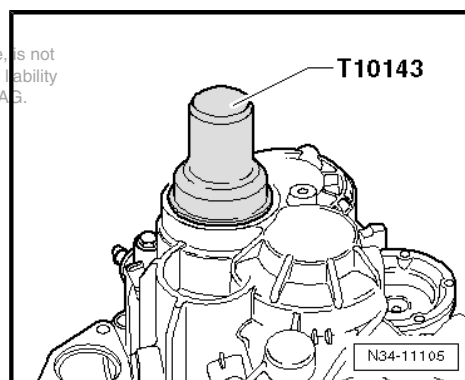
Seat for sealing cap	Filler cap	Installing
-Arrow A- = vertical	Made of metal	⇒ page 134
-Arrow B- = tapered	Made of plastic	⇒ page 134



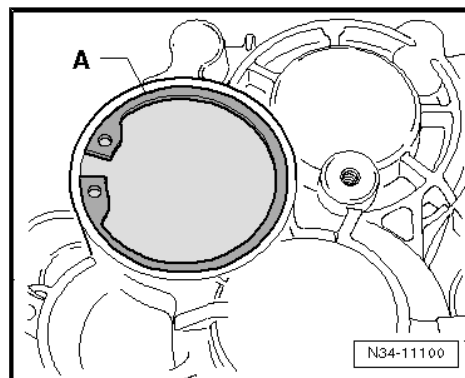
Metal sealing cap

- Drive sealing cap into gearbox housing onto stop.

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- Secure sealing cap with circlip -A-.

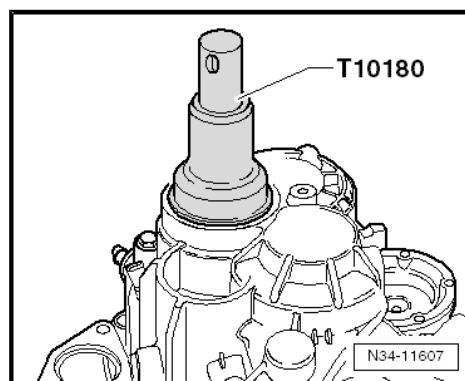


Plastic sealing cap

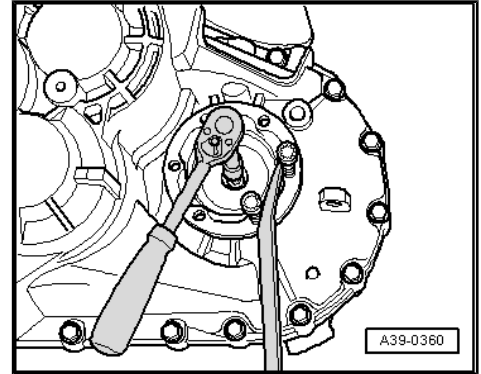
- Drive sealing cap into gearbox housing onto stop.

Continued for all vehicles:

- It is important to use the correct type of sealing cap
⇒ [page 134](#) .
- Incorrect installation can cause leakage.
- Select correct sealing cap from ⇒ Electronic parts catalogue .



- Install flange shaft (left-side) together with spring, thrust washer and tapered ring.



Attach bevel box to gearbox as follows:

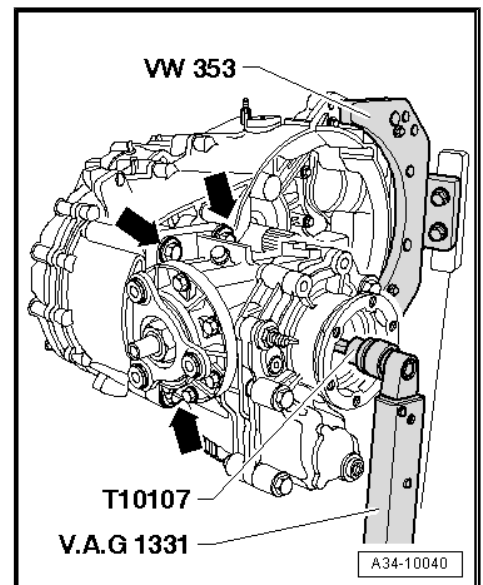
- Grease splines on differential in gearbox with grease for clutch plate splines - G 000 100- .
- Push bevel box fully onto gearbox, ensuring that splines of bevel box input shaft and differential are centred when brought together.
- Also align the teeth of the flange shaft (right-side) and the differential pinion; if necessary turn the flange shaft.
- If the teeth are correctly positioned and the components are located centrally, the bevel box will slide against the gearbox onto the stop.



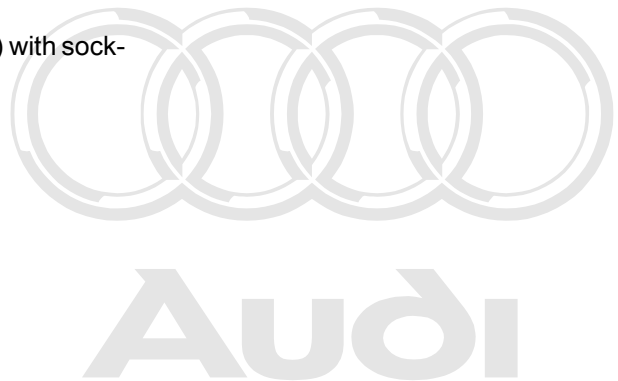
Caution

Risk of irreparable damage to bevel box housing.

- ◆ ***Do not use the securing bolts to pull the bevel box onto the gearbox. This could cause the bevel box to tilt and the securing eyes could break off.***



- Fit 4 bolts -arrows- securing bevel box to gearbox (illustration only shows 3 bolts) and tighten bolts.
- Tighten countersunk bolt for flange shaft (right-side) with socket and extended bit - T10107- or -T10107 A- .



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9 Gearbox housing, clutch housing

⇒ "9.1 Exploded view - gearbox housing", page 136

⇒ "9.2 Exploded view - clutch housing", page 138

⇒ "9.3 Servicing gearbox housing", page 139

⇒ "9.4 Servicing clutch housing", page 146

9.1 Exploded view - gearbox housing

1 - Gearbox housing

- ☐ If renewed: Adjust output shafts and differential ⇒ [page 216](#)
- ☐ Note shape of housing in area of mounting for sealing cap ⇒ [page 134](#)
- ☐ Select correct components from ⇒ Electronic parts catalogue

2 - Filler cap

- ☐ Removing ⇒ [page 142](#)
- ☐ Driving in ⇒ [page 142](#)

3 - Oil drain plug

- ☐ 35 Nm

4 - Oil filler plug

- ☐ 35 Nm

5 - Angled rod

- ☐ For adjusting selector mechanism ⇒ [page 67](#)
- ☐ Can be renewed without dismantling gearbox
- ☐ Removing ⇒ [page 142](#)
- ☐ Installation position ⇒ [page 143](#)
- ☐ Driving in ⇒ [page 143](#)

6 - Bearing bush

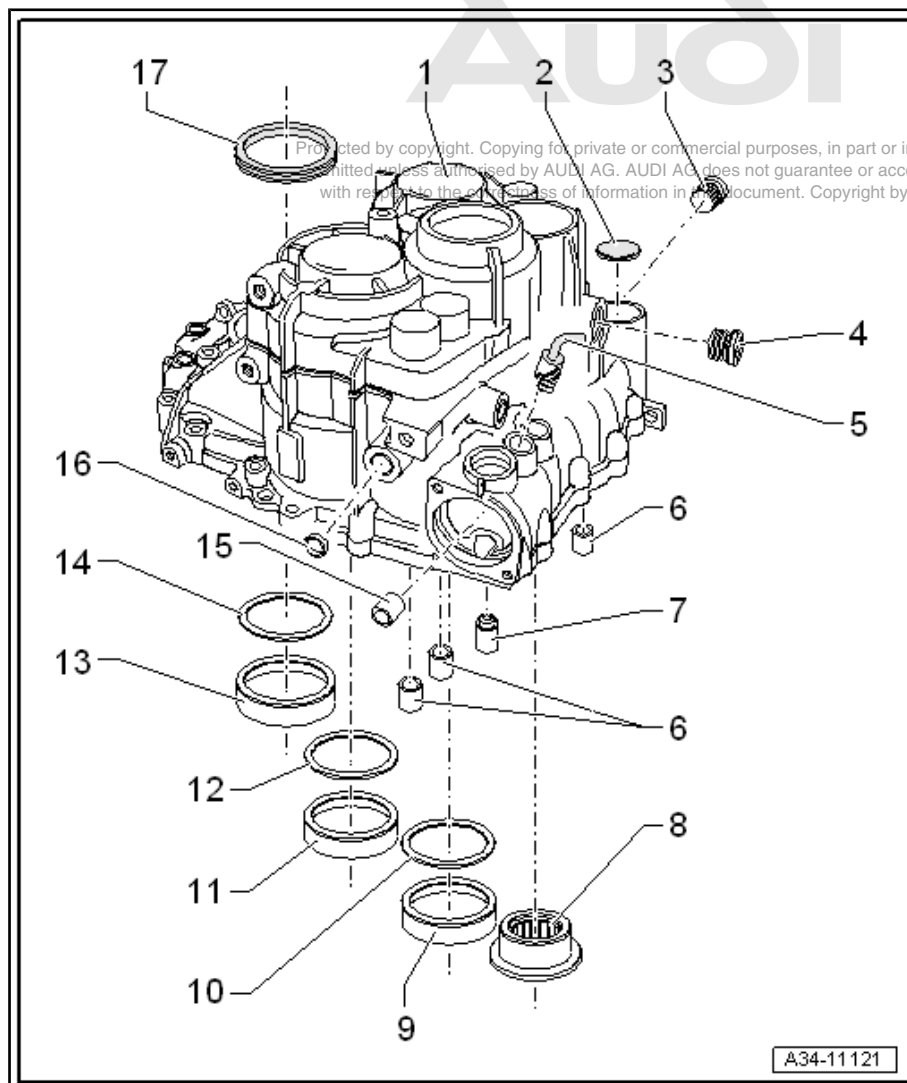
- ☐ For selector rods
- ☐ Pulling out ⇒ [page 143](#)
- ☐ Driving in ⇒ [page 143](#)

7 - Stop sleeve

- ☐ Pressing out (gearbox dismantled) ⇒ [page 144](#)
- ☐ Driving out (gearbox not dismantled) ⇒ [page 144](#)
- ☐ Identification of different types of stop sleeve ⇒ [page 144](#)
- ☐ Driving in stop sleeve with shoulder ⇒ [page 144](#)
- ☐ Driving in stop sleeve without shoulder ⇒ [page 145](#)

8 - Needle bearing

- ☐ For reverse shaft
- ☐ Always renew after removing
- ☐ Pulling out ⇒ [page 145](#)
- ☐ Pressing in ⇒ [page 145](#)



9 - Tapered roller bearing outer race

- ☐ For 5th/6th and reverse gear output shaft
- ☐ Removing and installing ⇒ [page 172](#)
- ☐ If renewed: Adjust 5th/6th and reverse gear output shaft ⇒ [page 185](#)

10 - Shim

- ☐ For 5th/6th and reverse gear output shaft
- ☐ Table of adjustments ⇒ [page 216](#)

11 - Tapered roller bearing outer race

- ☐ For 1st - 4th gear output shaft
- ☐ Removing and installing ⇒ [page 155](#)
- ☐ If renewed: Adjust 1st - 4th gear output shaft ⇒ [page 181](#)

12 - Shim

- ☐ For 1st - 4th gear output shaft
- ☐ Table of adjustments ⇒ [page 216](#)

13 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Removing and installing ⇒ [page 194](#)
- ☐ If renewed: adjust differential ⇒ [page 204](#)

14 - Shim

- ☐ For differential
- ☐ Table of adjustments ⇒ [page 216](#)

15 - Bearing bush

- ☐ For selector shaft
- ☐ Pulling out ⇒ [page 145](#)
- ☐ Driving in ⇒ [page 146](#)

16 - Sealing plug

- ☐ Driving out ⇒ [page 146](#)
- ☐ Driving in ⇒ [page 146](#)

17 - Oil seal

- ☐ For flange shaft (left-side)
- ☐ Renewing ⇒ [page 191](#)

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9.2 Exploded view - clutch housing

1 - Bearing bush

- ☐ For selector rods
- ☐ Always renew after re-
moving
- ☐ Pulling out ⇒ [page 147](#)
- ☐ Driving in ⇒ [page 148](#)

2 - Needle bearing

- ☐ For reverse shaft
- ☐ Always renew after re-
moving
- ☐ Pulling out ⇒ [page 148](#)
- ☐ Pressing in
⇒ [page 148](#)

3 - Dowel sleeve

- ☐ 2x

4 - Clutch housing

- ☐ If renewed: Adjust out-
put shafts and differen-
tial ⇒ [page 216](#)

5 - Oil seal

- ☐ For input shaft
- ☐ Renewing ⇒ [page 54](#)

6 - Oil seal

- ☐ In gearbox, fitted be-
tween gearbox and bev-
el box
- ☐ Renewing with gearbox
removed ⇒ [page 192](#)

7 - Shim

- ☐ With shoulder
- ☐ For differential
- ☐ Installation position: Shoulder on inside diameter faces towards oil seal ⇒ [Item 6 \(page 138\)](#)

8 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Removing and installing ⇒ [page 194](#)
- ☐ If renewed: adjust differential ⇒ [page 204](#)

9 - Oil deflector plate

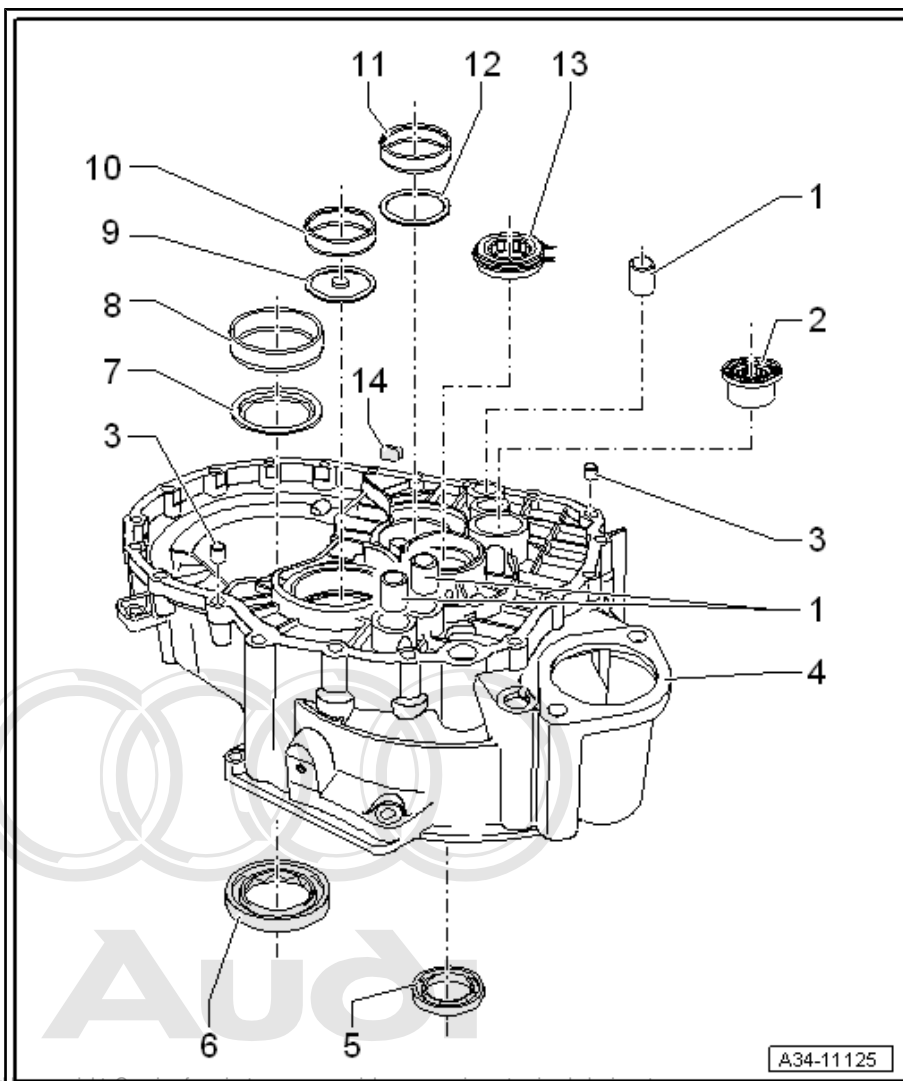
- ☐ Installation position: Shoulder on drilling faces towards output shaft

10 - Tapered roller bearing outer race

- ☐ For 1st - 4th gear output shaft
- ☐ Removing and installing ⇒ [page 155](#)
- ☐ If renewed: Adjust 1st - 4th gear output shaft ⇒ [page 181](#)

11 - Tapered roller bearing outer race

- ☐ For 5th/6th and reverse gear output shaft
- ☐ Removing and installing ⇒ [page 172](#)
- ☐ If renewed: Adjust 5th/6th and reverse gear output shaft ⇒ [page 185](#)



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12 - Shim

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

13 - Roller bearing

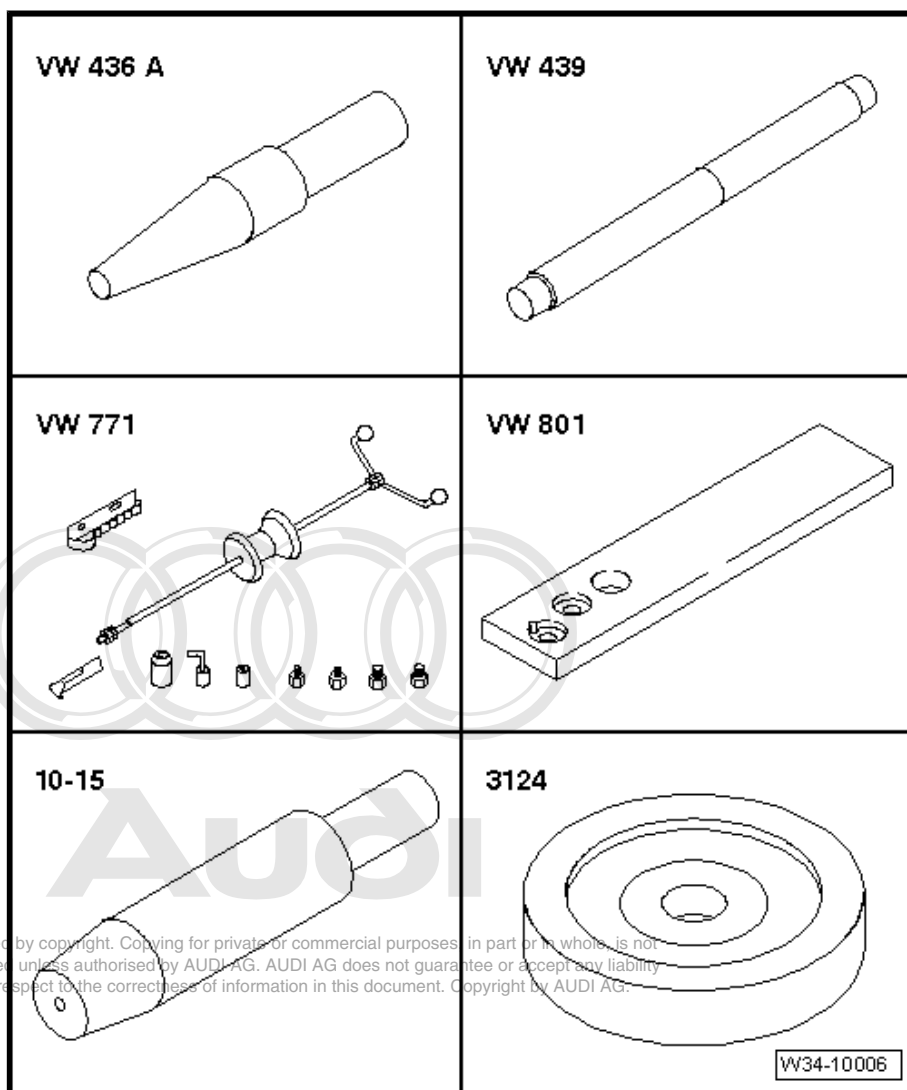
- ☐ For input shaft
- ☐ Removing and installing ⇒ [page 149](#)

14 - Magnet

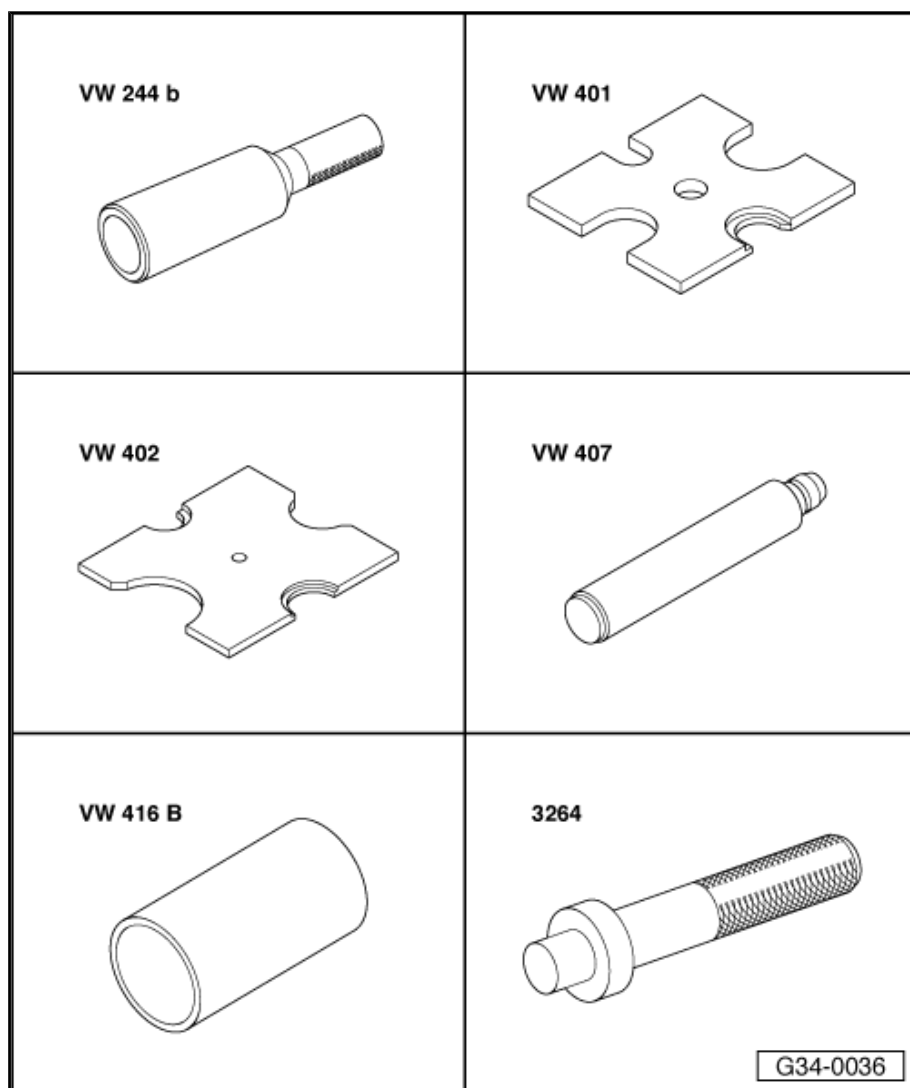
- ☐ Held in place by joint surface of housing

9.3 Servicing gearbox housing

Special tools and workshop equipment required



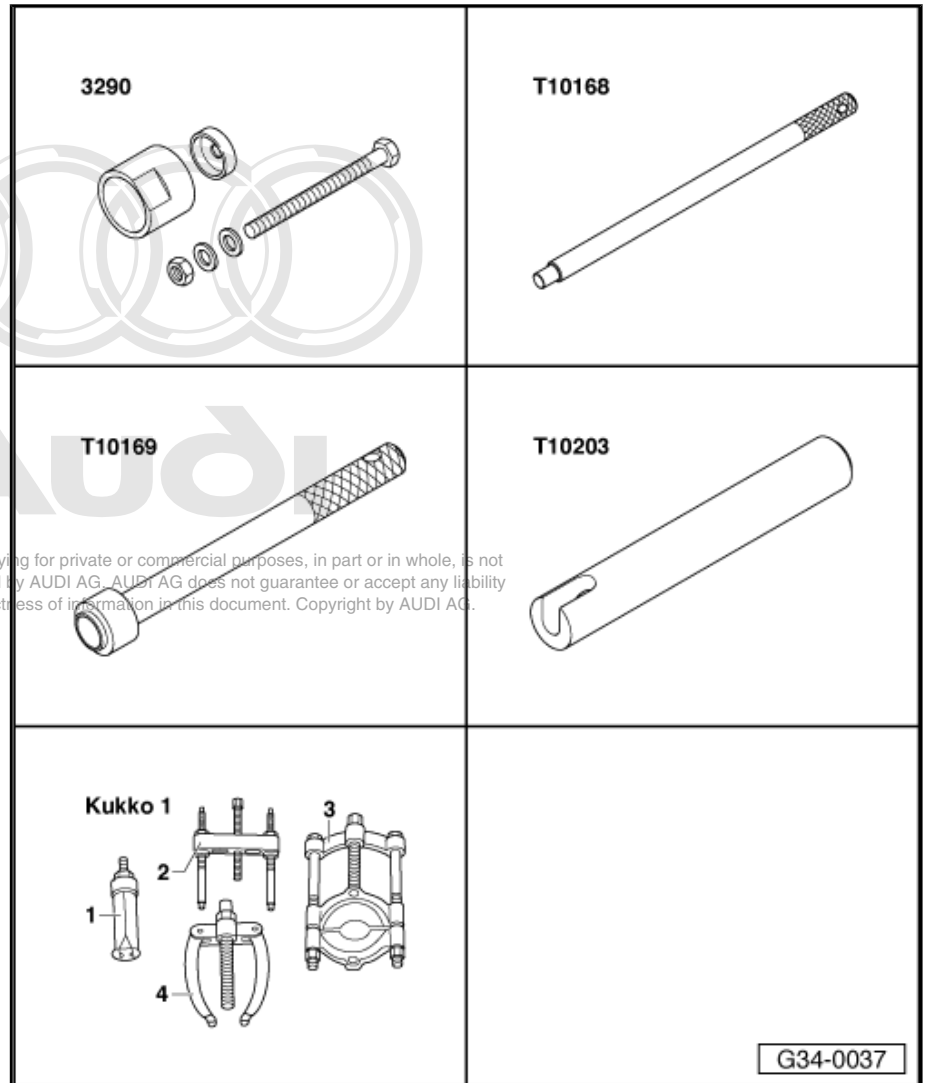
- ◆ Guide pin - VW 436A-
- ◆ Guide pin - VW 439-
- ◆ Multi-purpose tool - VW 771-
- ◆ Retaining plate - VW 801-
- ◆ Guide pin - 10-15-
- ◆ Thrust piece - 3124-



- ◆ Drift sleeve - VW 244B-
- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Tube - VW 416 B-
- ◆ Thrust piece - 3264-



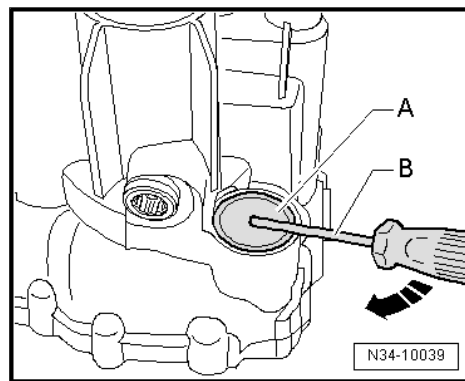
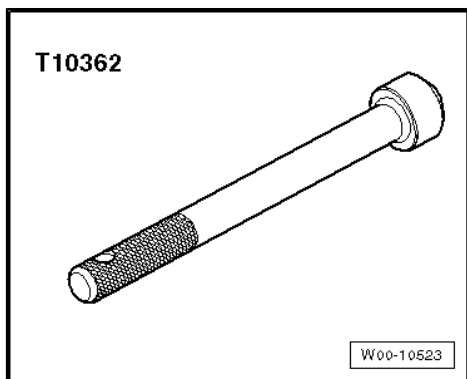
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- ◆ Assembly tool - 3290-
- ◆ Punch - T10168-
- ◆ Punch - T10169-
- ◆ Thrust piece - T10203-
- ◆ -1- Internal puller - Kukko 21/2-
- ◆ -1- Internal puller - Kukko 21/4-
- ◆ -4- Counter-support - Kukko 22/2-
- ◆ Thread adapter of counter-support - Kukko 22/1-

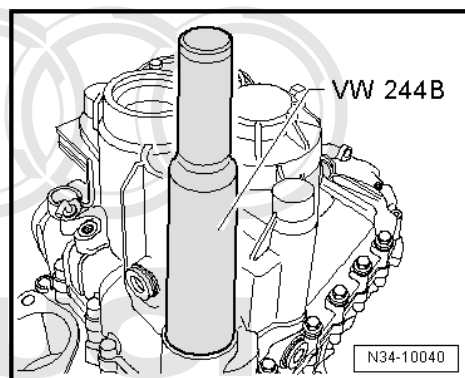
- ◆ Drift - T10362-
⇒ [page 144](#)



Removing sealing cap -A-

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

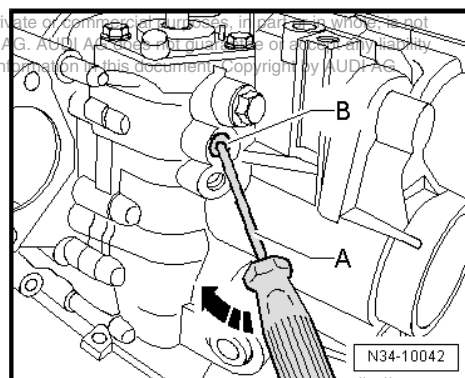
Driving in sealing cap onto stop



Removing angled rod for selector shaft

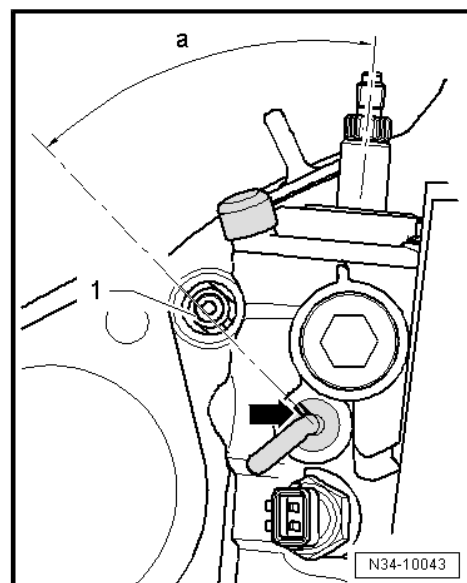
- Shear off rod in released position.
- Insert screwdriver -A- in bore for angled rod -B-.
- Lever out angled rod in direction of -arrow-.

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Installation position of angled rod

- Marking on angled rod -arrow- must face towards connection on clutch slave cylinder -1-.
- Dimension -a- must be approx. 45°.

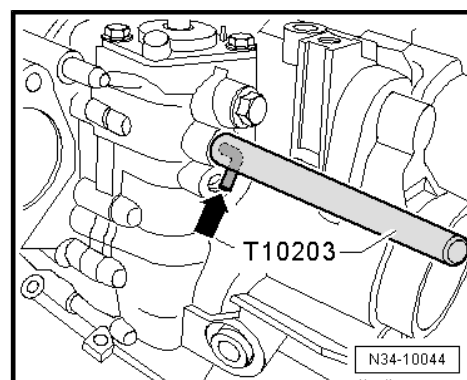


Driving in angled rod -arrow- for selector shaft as far as tool stop



Note

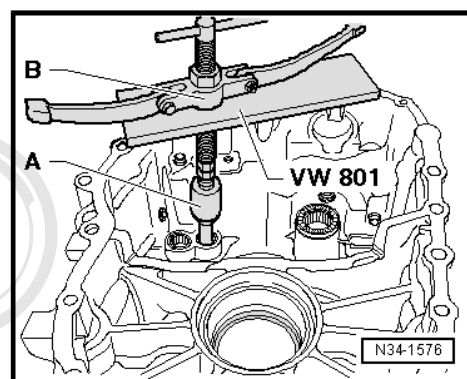
Angled rod must be in released position when driving in.



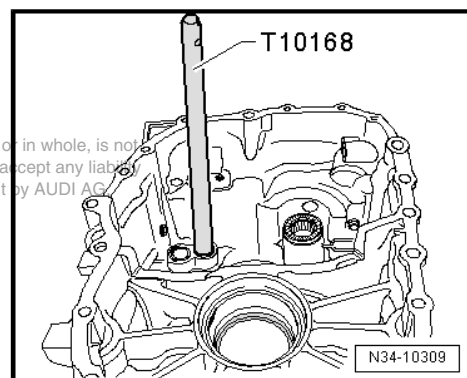
Pulling out bearing bush for selector rod

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

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



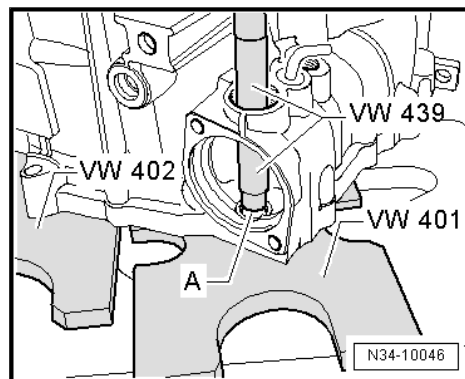
Driving in bearing bush for selector rod (drive in until tool contacts stop)



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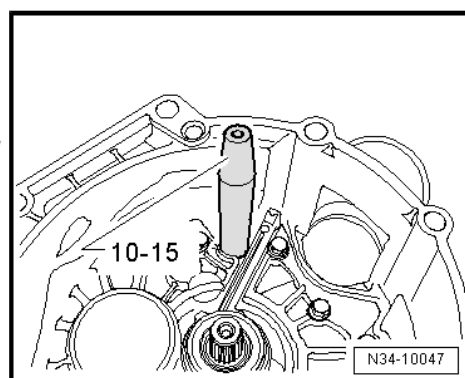
Pressing stop sleeve -A- out of gearbox housing

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



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

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



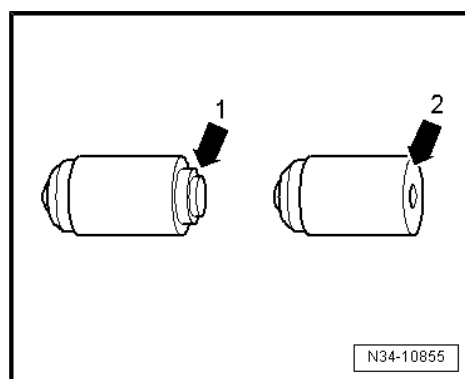
Identification of different types of stop sleeve

The following stop sleeves can be installed:

Stop sleeve with shoulder -arrow 1- ⇒ [page 144](#)

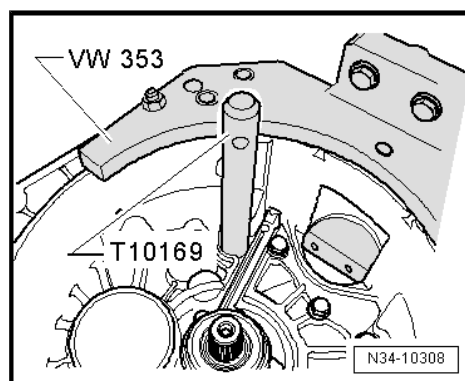
Stop sleeve without shoulder -arrow 2- ⇒ [page 145](#)

Select correct components from ⇒ Electronic parts catalogue .



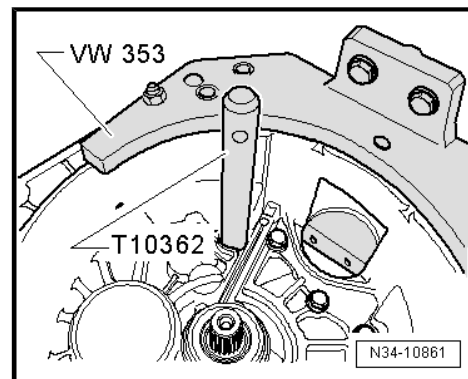
Driving in stop sleeve with shoulder as far as tool stop

- Gearbox housing bolted to clutch housing



Driving in stop sleeve without shoulder as far as tool stop

- Gearbox housing bolted to clutch housing



Pulling needle bearing for reverse shaft out of gearbox housing

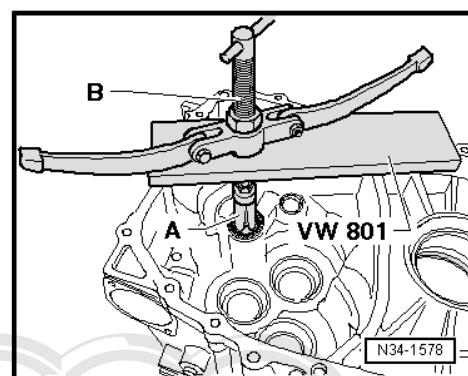
A - Internal puller 23.5 ... 30 mm , e.g. -Kukko 21/4-

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



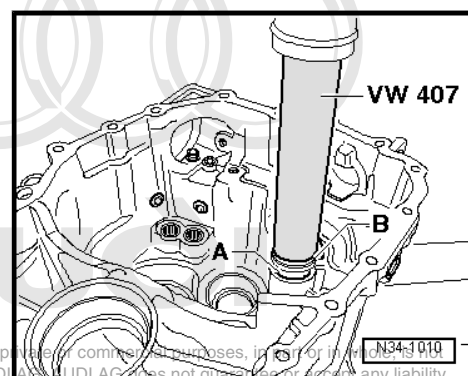
Note

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



Pressing needle bearing -A- into gearbox housing

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

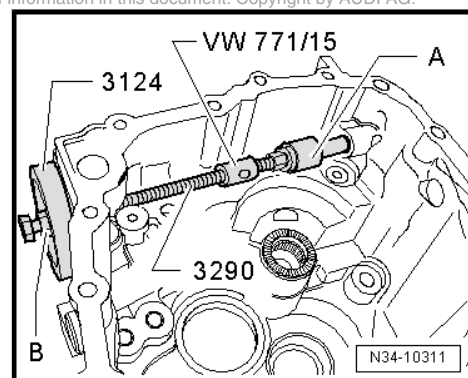


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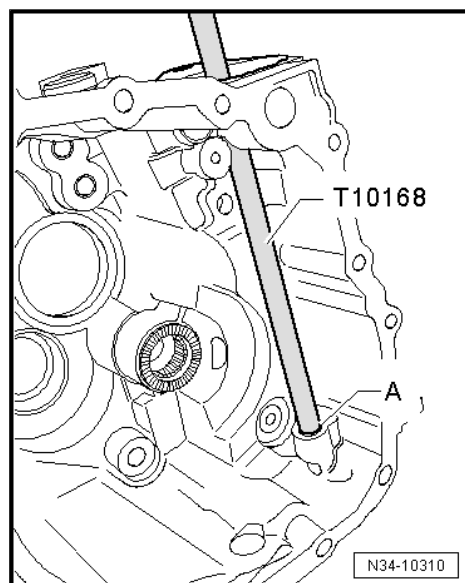
Pulling out selector shaft bearing bush

- Use thread adapter of counter-support - Kukko 22/1- -arrow-.
- Hold spindle of assembly tool - 3290- tight and turn nut -B-.

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

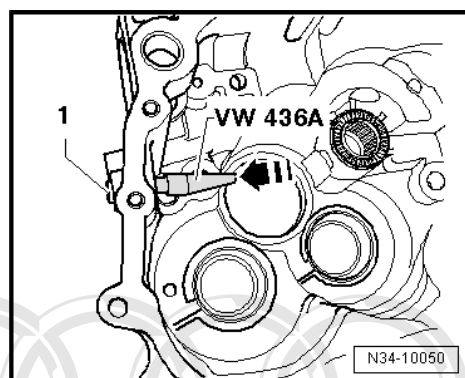


Driving in bearing bush -A- for selector shaft as far as tool stop



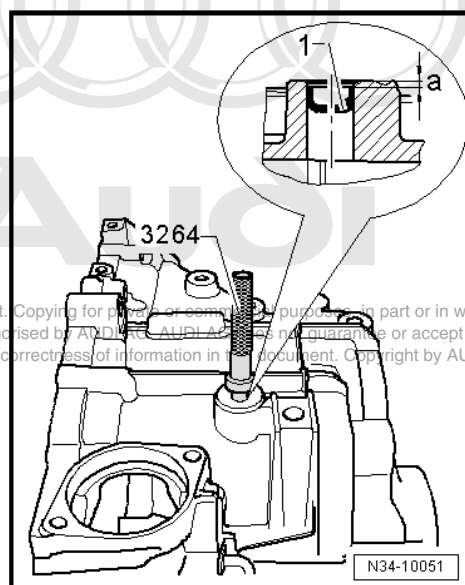
Driving out sealing plug -1-

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



Driving in sealing plug -1-

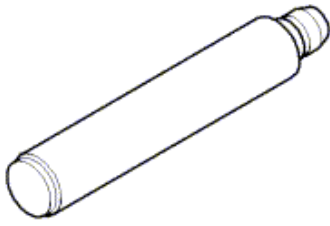
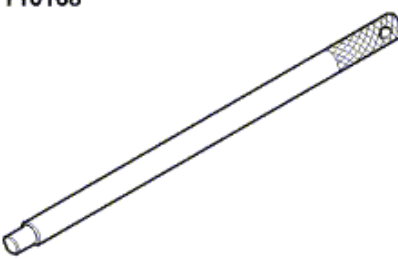
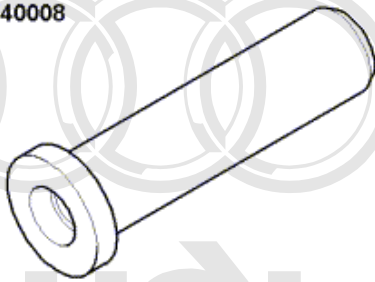
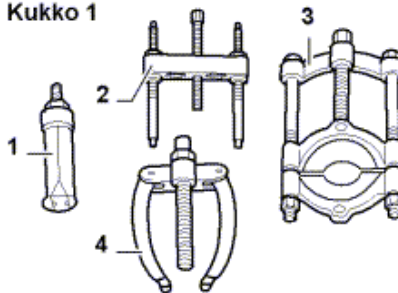
- Use punch - 3264- to drive in sealing plug to dimension -a- = approx. 3 mm below top edge of housing.



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9.4 Servicing clutch housing

Special tools and workshop equipment required

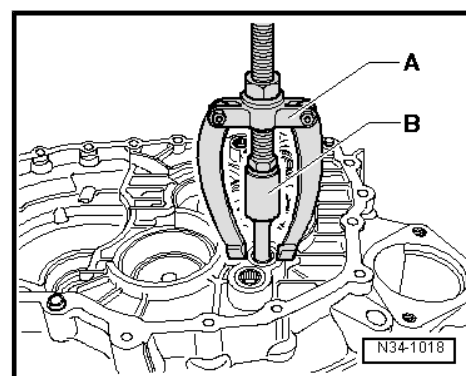
VW 407 	T10168 
T40008 	Kukko 1 
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- ◆ Press tool - VW 407-
- ◆ Punch - T10168-
- ◆ Thrust piece - T40008-
- ◆ -1- Internal puller - Kukko 21/2-
- ◆ -1- Internal puller - Kukko 21/4-
- ◆ -4- Counter-support - Kukko 22/1-
- ◆ -4- Counter-support - Kukko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

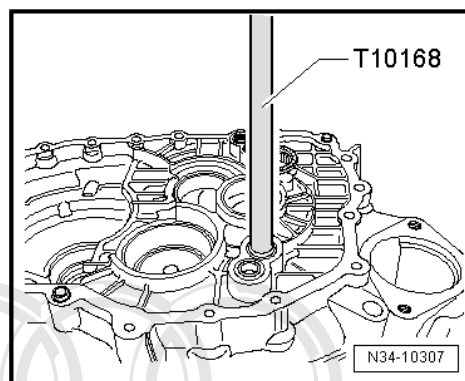
Pulling out bearing bush for selector rod

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

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



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



Pulling needle bearing out of clutch housing

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

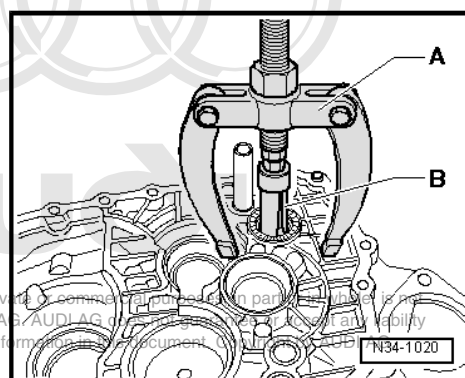
B - Internal puller 23.5 ... 30 mm , e.g. -Kukko 21/4-



Note

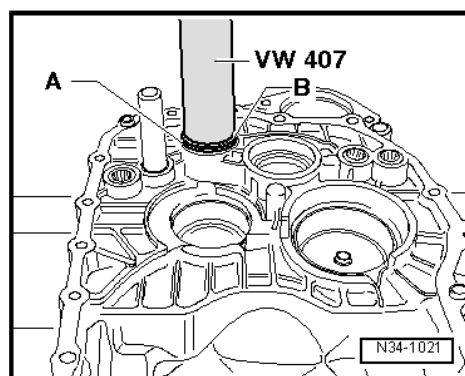
The needle bearing is destroyed during removal and must be renewed.

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Pressing needle bearing -A- into clutch housing

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



35 – Gears, shafts

1 Input shaft

⇒ [“1.1 Exploded view - input shaft”, page 149](#)

⇒ [“1.2 Dismantling and assembling input shaft”, page 150](#)

1.1 Exploded view - input shaft



Note

- ◆ Before installing, heat gear wheels to approx. 100 °C using inductive heater - VAS 6414- . Wear protective gloves.
- ◆ Lubricate all bearings on input shaft with gear oil before installing.
- ◆ Always renew grooved ball bearing ⇒ [Item 4 \(page 149\)](#) .

1 - Circlip

- ☐ For grooved ball bearing on input shaft
⇒ [Item 4 \(page 149\)](#)
- ☐ Removing and installing
⇒ [page 121](#)

2 - Gearbox housing

3 - Circlip

- ☐ When grooved ball bearing
⇒ [Item 4 \(page 149\)](#) or
input shaft
⇒ [Item 6 \(page 149\)](#) are
renewed: determine
thickness of required
circlip ⇒ [page 154](#)

4 - Grooved ball bearing

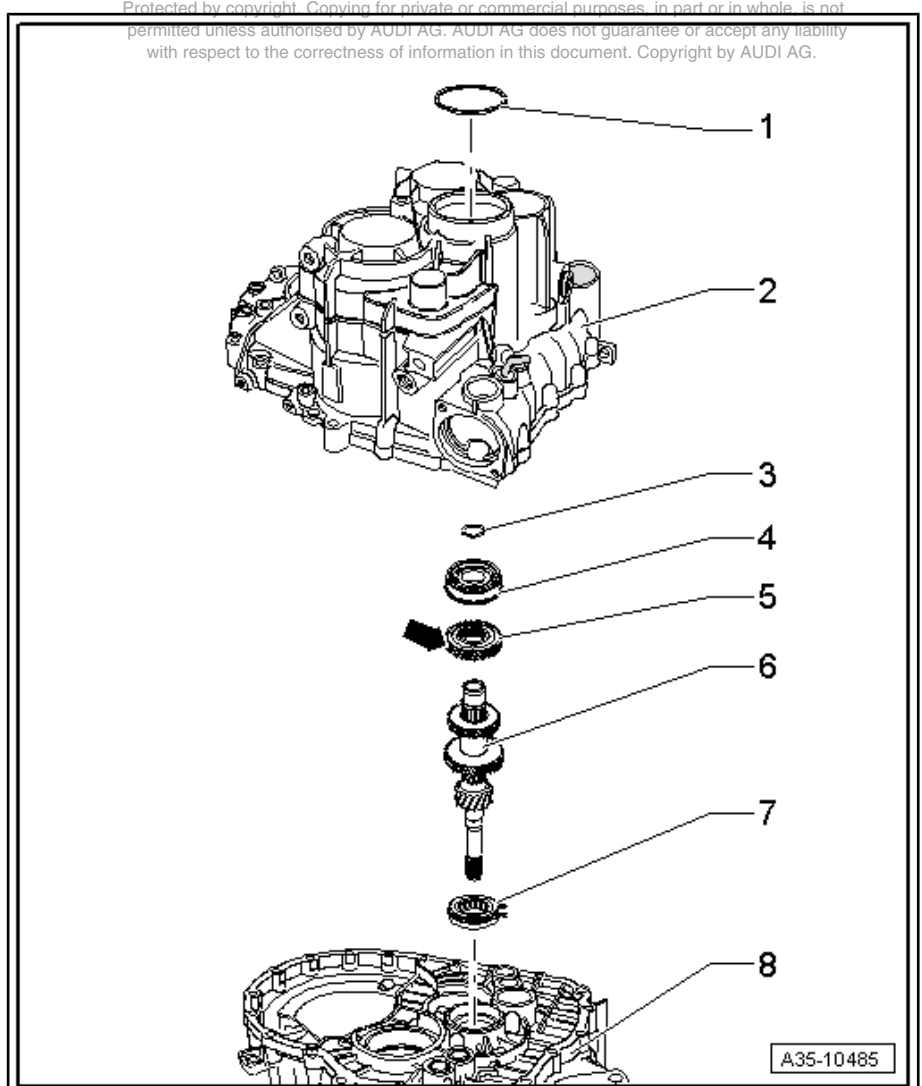
- ☐ Always renew
- ☐ Pulling off ⇒ [page 152](#)
- ☐ Installation position
⇒ [page 153](#)
- ☐ Pressing on
⇒ [page 153](#)

5 - 5th gear wheel

- ☐ Supplied together with
input shaft as replace-
ment part
- ☐ Pressing off
⇒ [page 152](#)
- ☐ Installation position: Cir-
cular slot -arrow- faces
towards grooved ball
bearing
⇒ [Item 4 \(page 149\)](#)
- ☐ Pressing on ⇒ [page 153](#)

6 - Input shaft

- ☐ With 3rd/4th and 6th gear wheels



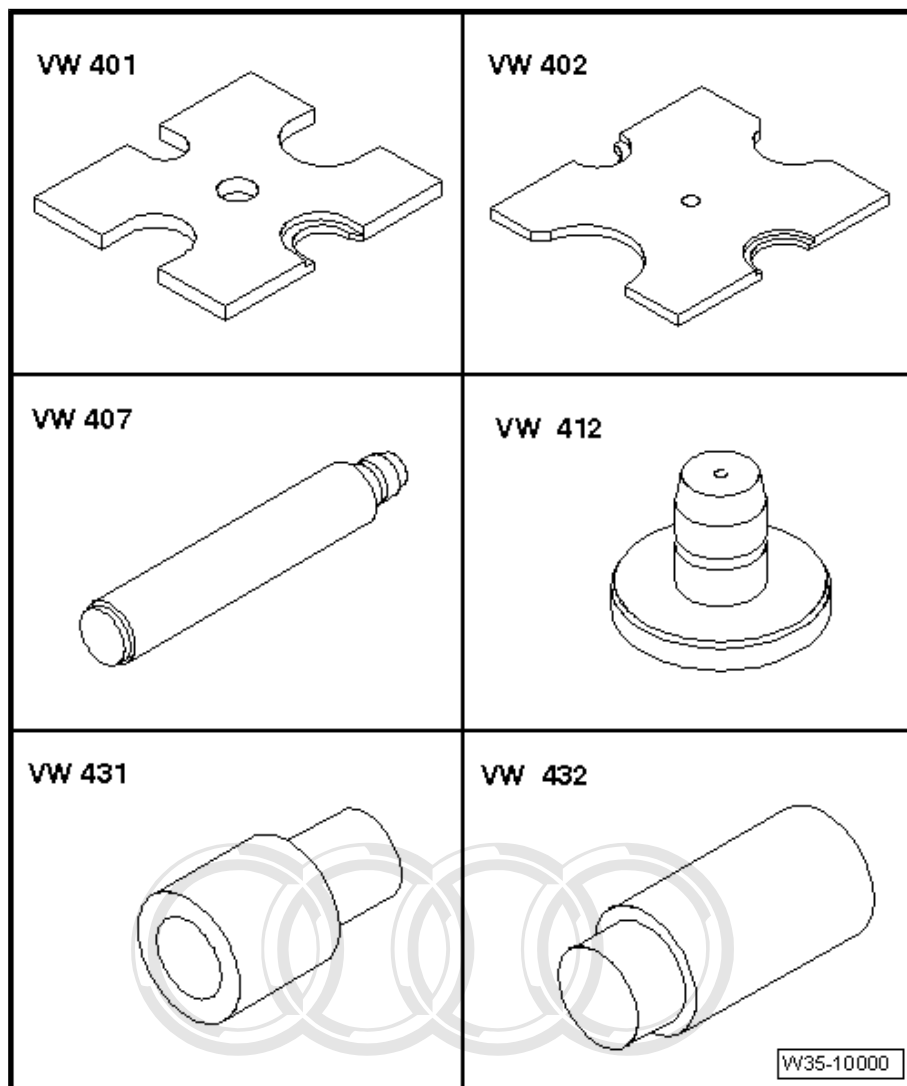
7 - Roller bearing

- ☐ With circlip
- ☐ Pulling out ⇒ [page 154](#)
- ☐ Pressing in ⇒ [page 154](#)
- ☐ Installation position: Circlip in bearing faces towards input shaft

8 - Clutch housing

1.2 Dismantling and assembling input shaft

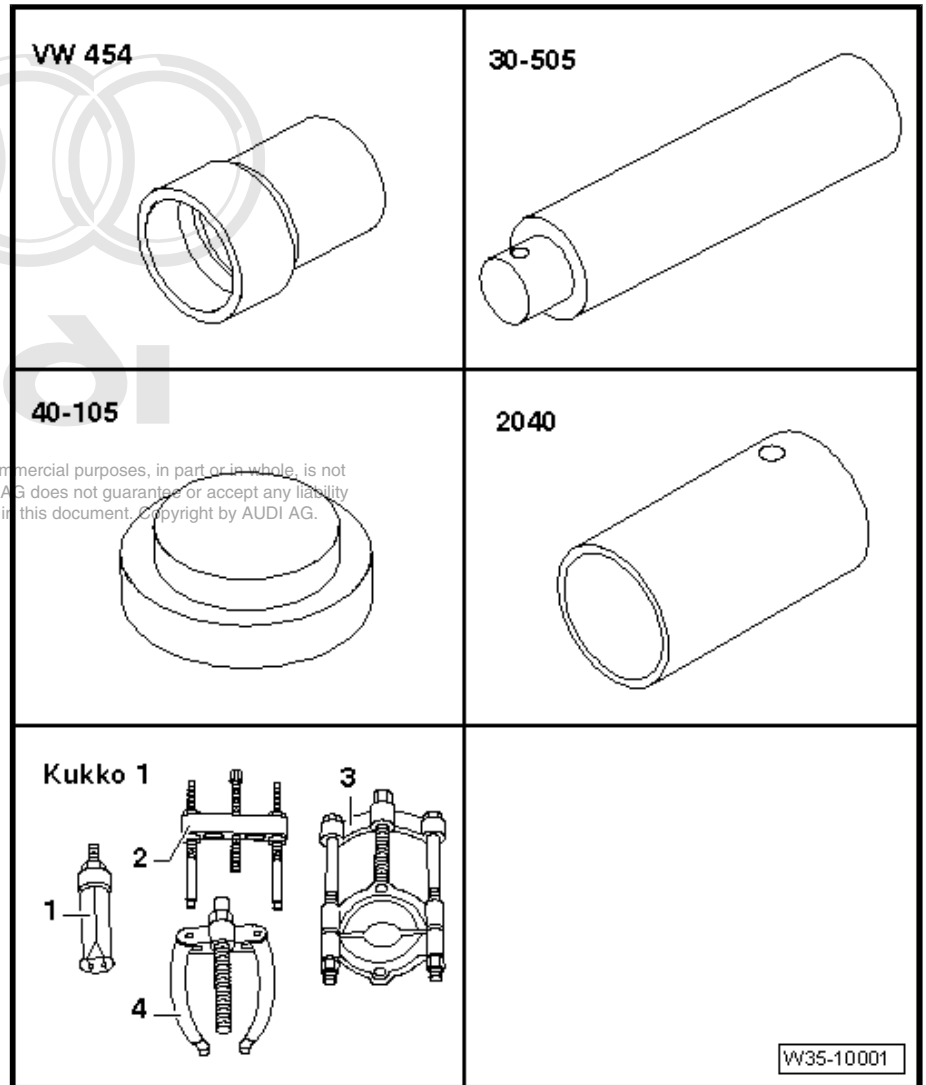
Special tools and workshop equipment required



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

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- ◆ Thrust piece - VW 454-
- ◆ Mandrel - 30 - 505-
- ◆ Tube - 2040-
- ◆ -1- Internal puller - Kukko 21/5-
- ◆ -3- Splitter - Kukko 17/1-
- ◆ -3- Splitter - Kukko 17/2-
- ◆ -4- Counter-support - Kukko 22/2-

◆ Inductive heater - VAS 6414-



◆ Feeler gauge

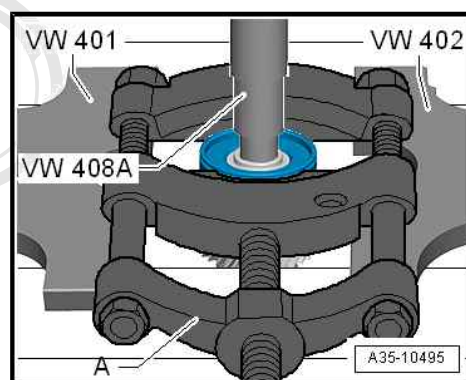
Dismantling input shaft

- Remove circlip for grooved ball bearing from input shaft.

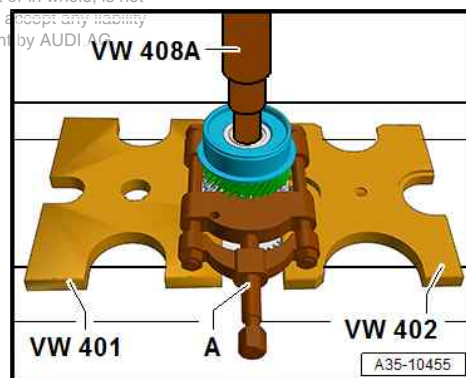
Pressing off grooved ball bearing

- Apply splitter -A- at annular groove for circlip in grooved ball bearing.

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



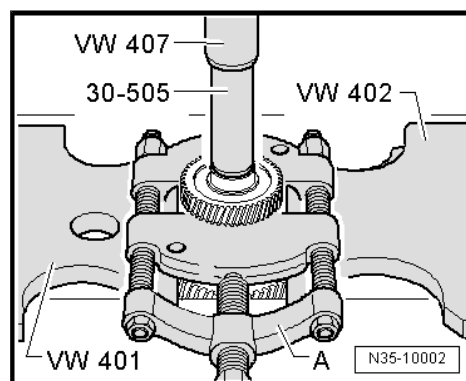
- Grooved ball bearing and 5th gear wheel can be pressed off together; to do so, place splitter -A- under 5th gear wheel.



Pressing off 5th gear wheel

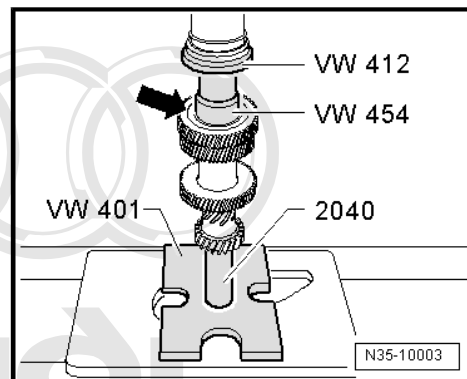
A - Splitter 22...115 mm , e.g. -Kukko 17/2-

Assembling input shaft



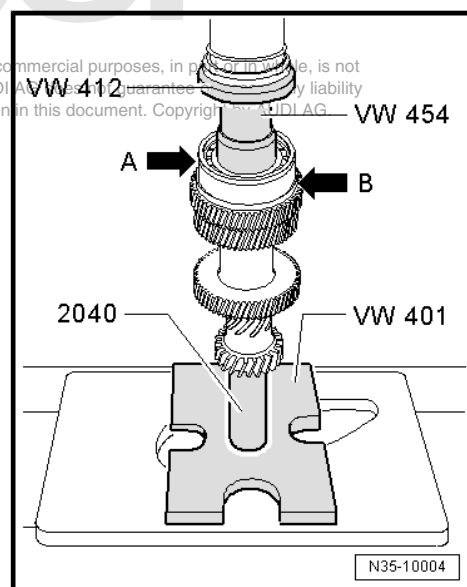
Heating 5th gear wheel and pressing on

- Slot -arrow- on gear wheel must face upwards.



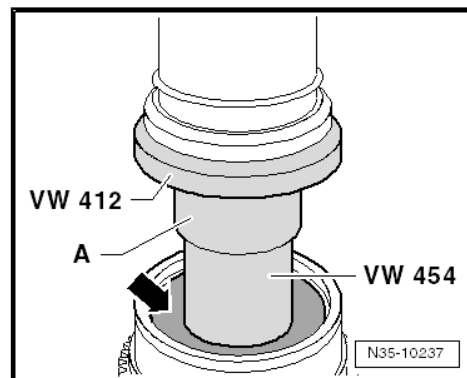
Installation position of grooved ball bearing

- Installation position of grooved ball bearing: Slot for circlip faces upwards -arrow A- and shoulder -arrow B- must face towards 5th gear wheel.



Pressing on grooved ball bearing

- If grooved ball bearing is fitted with a rubber ring -arrow-, press tool - VW 454- must be applied so that shoulder -A- faces towards press tool - VW 412- .
- Then determine thickness of circlip for grooved ball bearing on input shaft → [page 154](#) and fit circlip.

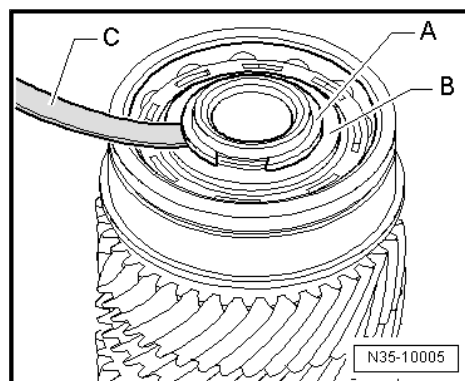


Determining thickness of circlip for grooved ball bearing on input shaft

- Install a 1.86 mm thick circlip -A- in slot on input shaft and press circlip upwards.
- Measure gap between grooved ball bearing -B- and fitted circlip -A- using feeler gauge -C-.
- Remove circlip fitted for measurement.
- Select circlip from table; refer to ⇒ Electronic parts catalogue for part number.

The following circlips are available:

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

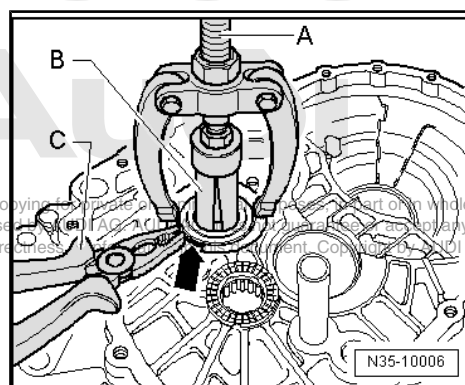


Pulling roller bearing out of clutch housing

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

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

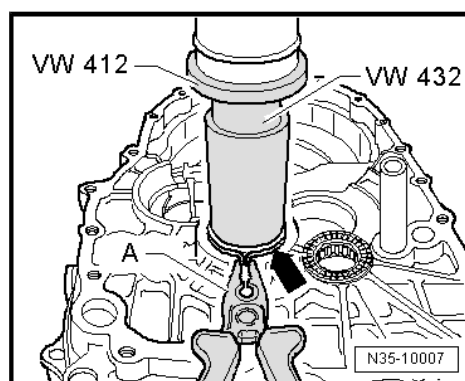
B - Internal puller 30 ... 37 mm , e.g. -Kukko 21/5-



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Pressing roller bearing into clutch housing

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



2 Output shaft

⇒ [“2.1 Exploded view - output shaft”, page 155](#)

⇒ [“2.2 Dismantling and assembling output shaft”, page 160](#)

⇒ [“2.3 Adjusting output shaft”, page 181](#)

2.1 Exploded view - output shaft

⇒ [“2.1.1 Exploded view - output shaft for 1st - 4th gear”, page 155](#)

⇒ [“2.1.2 Exploded view - output shaft for 5th, 6th and reverse gear”, page 158](#)

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



Note

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- ◆ *Before installing, heat tapered roller bearing inner races and synchro-hubs to approx. 100 °C using inductive heater - VAS 6414- . Wear protective gloves.*
- ◆ *Carry out output shaft adjustment ⇒ [page 181](#) if the output shaft or tapered roller bearings have been renewed.*
- ◆ *Always renew both tapered roller bearings together.*

1 - Clutch housing

2 - Oil deflector plate

3 - Dished washer

- ☐ Pulling out ⇒ [page 164](#)
- ☐ Pressing in ⇒ [page 164](#)

4 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 165](#)
- ☐ Pressing in ⇒ [page 165](#)

5 - Tapered roller bearing inner race

- ☐ Pressing off ⇒ [page 166](#)
- ☐ Pressing on ⇒ [page 167](#)

6 - Output shaft

- ☐ For 1st to 4th gear
- ☐ Adjusting ⇒ [page 181](#)

7 - Needle bearing

- ☐ For 2nd gear

8 - 2nd speed selector gear

9 - Inner ring for 2nd gear

- ☐ Renew if scored
- ☐ Installation position ⇒ [page 168](#)

10 - Outer ring for 2nd gear

- ☐ Check inner contact surface for wear ⇒ [page 167](#)
- ☐ Check outer contact surface for wear ⇒ [page 167](#)
- ☐ Installation position ⇒ [page 168](#)

11 - 2nd gear synchro-ring

- ☐ Check inner friction surface for grooves or radial scoring
- ☐ Installation position ⇒ [page 168](#)

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

- ☐ Press off together with 2nd speed selector gear after removing circlip ⇒ [Item 13 \(page 156\)](#) ⇒ [page 166](#)
- ☐ Dismantling ⇒ [page 168](#)
- ☐ Assembling locking collar/synchro-hub ⇒ [page 168](#) and ⇒ [page 168](#)
- ☐ Installation position ⇒ [page 169](#)
- ☐ Pressing on ⇒ [page 169](#)

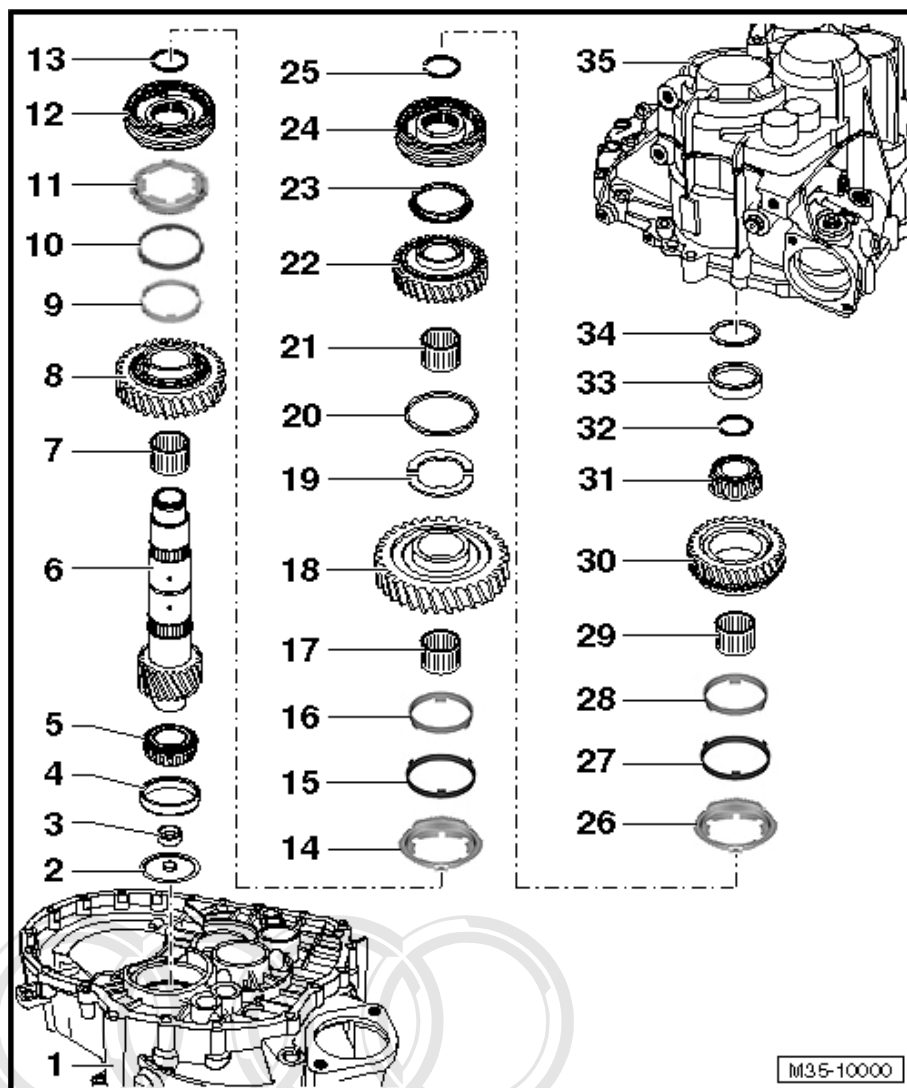
13 - Circlip

14 - 1st gear synchro-ring

- ☐ Check inner friction surface for grooves or radial scoring
- ☐ Installation position ⇒ [page 169](#)

15 - Outer ring for 1st gear

- ☐ Check inner contact surface for wear ⇒ [page 167](#)
- ☐ Check outer contact surface for wear ⇒ [page 167](#)



- ☐ Installation position [⇒ page 169](#)

16 - Inner ring for 1st gear

- ☐ Renew if scored
- ☐ Installation position [⇒ page 169](#)

17 - Needle bearing

- ☐ For 1st gear

18 - 1st speed selector gear

- ☐ Fit onto output shaft [⇒ page 170](#)

19 - Thrust washers

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

20 - Circlip

- ☐ Holds thrust washers [⇒ Item 19 \(page 157\)](#) in position on output shaft

21 - Needle bearing

- ☐ For 4th gear

22 - 4th speed selector gear

23 - 4th gear synchro-ring

- ☐ Brass or sheet steel
- ☐ Checking for wear [⇒ page 170](#)

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

- ☐ Pull off together with 4th speed selector gear after removing circlip [⇒ Item 25 \(page 157\)](#) [⇒ page 166](#)
- ☐ Dismantling [⇒ page 168](#)
- ☐ Assembling locking collar/synchro-hub [⇒ page 168](#) and [⇒ page 168](#)
- ☐ Installation position: Locking collar/synchro-hub [⇒ page 170](#)
- ☐ Pressing on [⇒ page 171](#)

25 - Circlip

26 - 3rd gear synchro-ring

- ☐ Check inner friction surface for grooves or radial scoring
- ☐ Installation position [⇒ page 171](#)

27 - Outer ring for 3rd gear

- ☐ Check inner contact surface for wear [⇒ page 167](#)
- ☐ Check outer contact surface for wear [⇒ page 167](#)
- ☐ Installation position [⇒ page 171](#)

28 - Inner ring for 3rd gear

- ☐ Renew if scored
- ☐ Installation position [⇒ page 171](#)

29 - Needle bearing

- ☐ For 3rd gear

30 - 3rd speed selector gear

- ☐ Fit onto output shaft [⇒ page 171](#)

31 - Tapered roller bearing inner race

- ☐ Pulling off [⇒ page 166](#)
- ☐ Pressing on [⇒ page 171](#)

32 - Circlip

- ☐ When tapered roller bearing [⇒ Item 31 \(page 157\)](#) or output shaft [⇒ Item 6 \(page 156\)](#) are renewed: determine thickness of required circlip [⇒ page 172](#)

33 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 165](#)
- ☐ Pressing in ⇒ [page 165](#)

34 - Shim

- ☐ Determining thickness ⇒ [page 181](#)

35 - Gearbox housing

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



Note

- ◆ *Secure gearbox to assembly stand ⇒ [page 109](#).*
- ◆ *Before installing, heat tapered roller bearing inner races and synchro-hubs to approx. 100 °C using inductive heater - VAS 6414- . Wear protective gloves.*
- ◆ *Carry out output shaft adjustment ⇒ [page 185](#) if the output shaft or tapered roller bearings have been renewed.*
- ◆ *Always renew both tapered roller bearings together.*

1 - Clutch housing

2 - Shim

- ☐ Always 0.65 mm thick

3 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 176](#)
- ☐ Pressing in ⇒ [page 177](#)

4 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 178](#)
- ☐ Pressing on ⇒ [page 181](#)

5 - Output shaft

- ☐ For 5th, 6th and reverse gear
- ☐ Adjusting ⇒ [page 185](#)

6 - Reverse gear synchro-hub

- ☐ Pressing off ⇒ [page 178](#)
- ☐ Installation position ⇒ [page 179](#)
- ☐ Pressing on ⇒ [page 179](#)

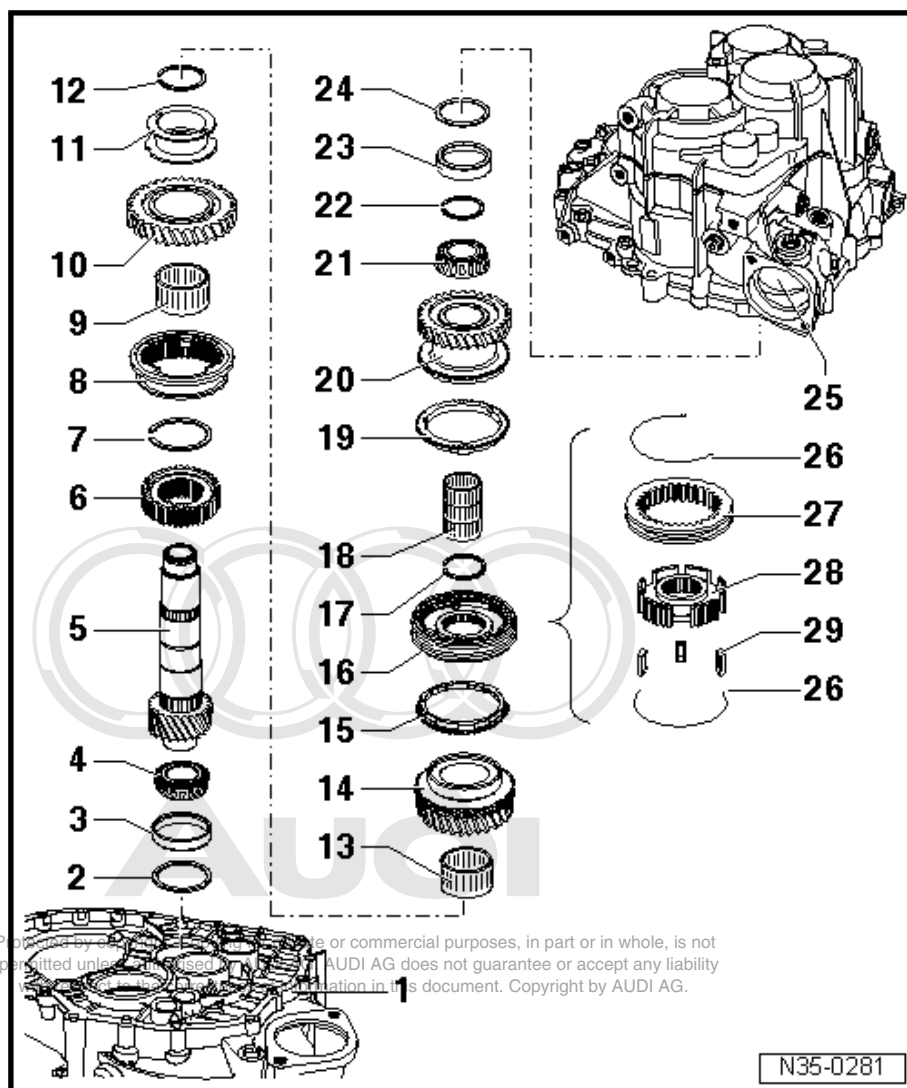
7 - Circlip

8 - Reverse gear locking collar

- ☐ With synchro-ring

9 - Needle bearing

- ☐ For reverse selector gear



N35-0281

10 - Reverse selector gear

11 - Sleeve

- ☐ Press off with reverse selector gear [⇒ page 178](#)
- ☐ Installation position: Wide shoulder of sleeve faces towards reverse selector gear
- ☐ Pressing on [⇒ page 179](#)

12 - Circlip

13 - Needle bearing

- ☐ For 6th gear

14 - 6th speed selector gear

15 - 6th gear synchro-ring

- ☐ Checking for wear [⇒ page 179](#)

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

- ☐ Press off together with 6th speed selector gear after removing circlip [⇒ Item 17 \(page 159\)](#)
[⇒ page 178](#)
- ☐ Dismantling [⇒ page 180](#)
- ☐ Assembling locking collar/synchro-hub [⇒ page 180](#) and [⇒ page 180](#)
- ☐ Pressing on [⇒ page 180](#)

17 - Circlip

18 - Needle bearing

- ☐ For 5th gear

19 - 5th gear synchro-ring

- ☐ Checking for wear [⇒ page 179](#)

20 - 5th speed selector gear

21 - Tapered roller bearing inner race

- ☐ Pulling off [⇒ page 177](#)
- ☐ Pressing on [⇒ page 180](#)

22 - Circlip

- ☐ When tapered roller bearing [⇒ Item 21 \(page 159\)](#) or output shaft [⇒ Item 5 \(page 158\)](#) are renewed:
determine thickness of required circlip [⇒ page 181](#)

23 - Tapered roller bearing outer race

- ☐ Pulling out [⇒ page 177](#)
- ☐ Pressing in [⇒ page 177](#)

24 - Shim

- ☐ Determining thickness [⇒ page 185](#)

25 - Gearbox housing

26 - Spring

- ☐ Installation position [⇒ page 180](#)

27 - Locking collar

28 - Synchro-hub

29 - Locking pieces

- ☐ 3x
- ☐ Installation position [⇒ page 180](#)

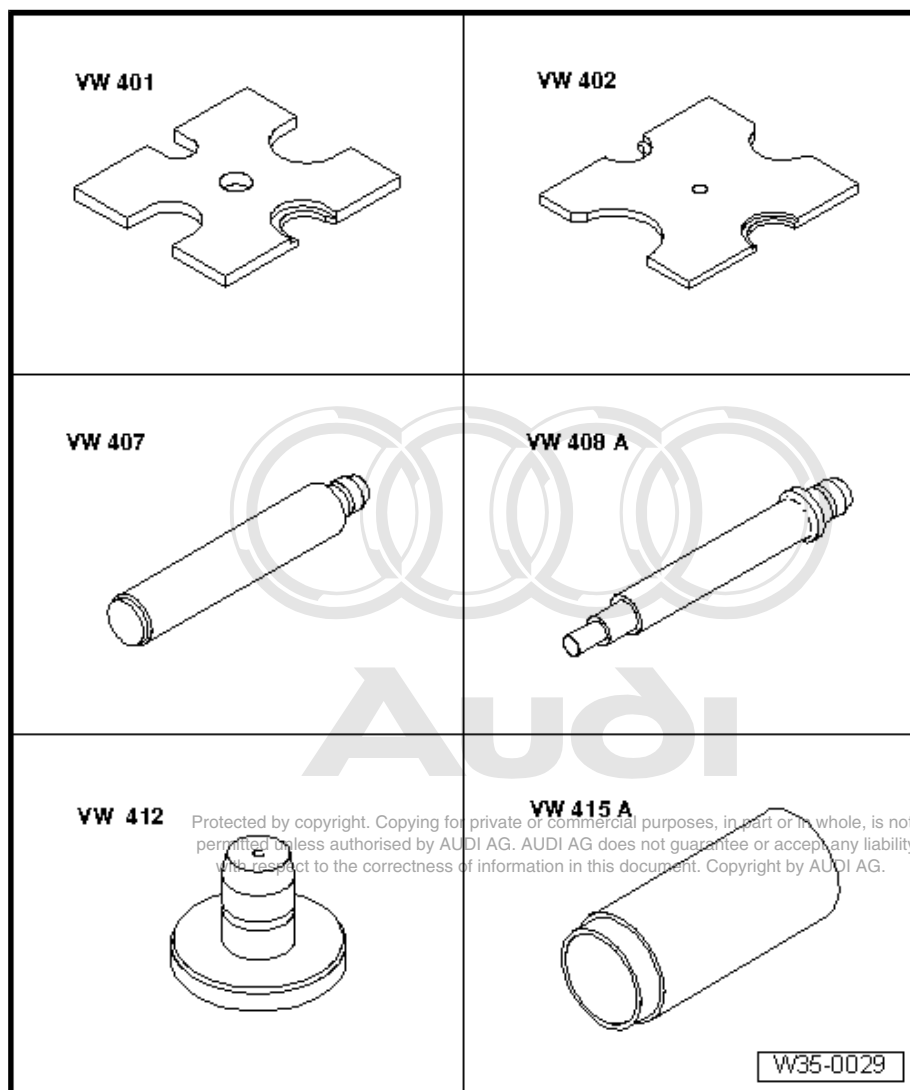
2.2 Dismantling and assembling output shaft

⇒ ["2.2.1 Dismantling and assembling output shaft for 1st - 4th gear", page 160](#)

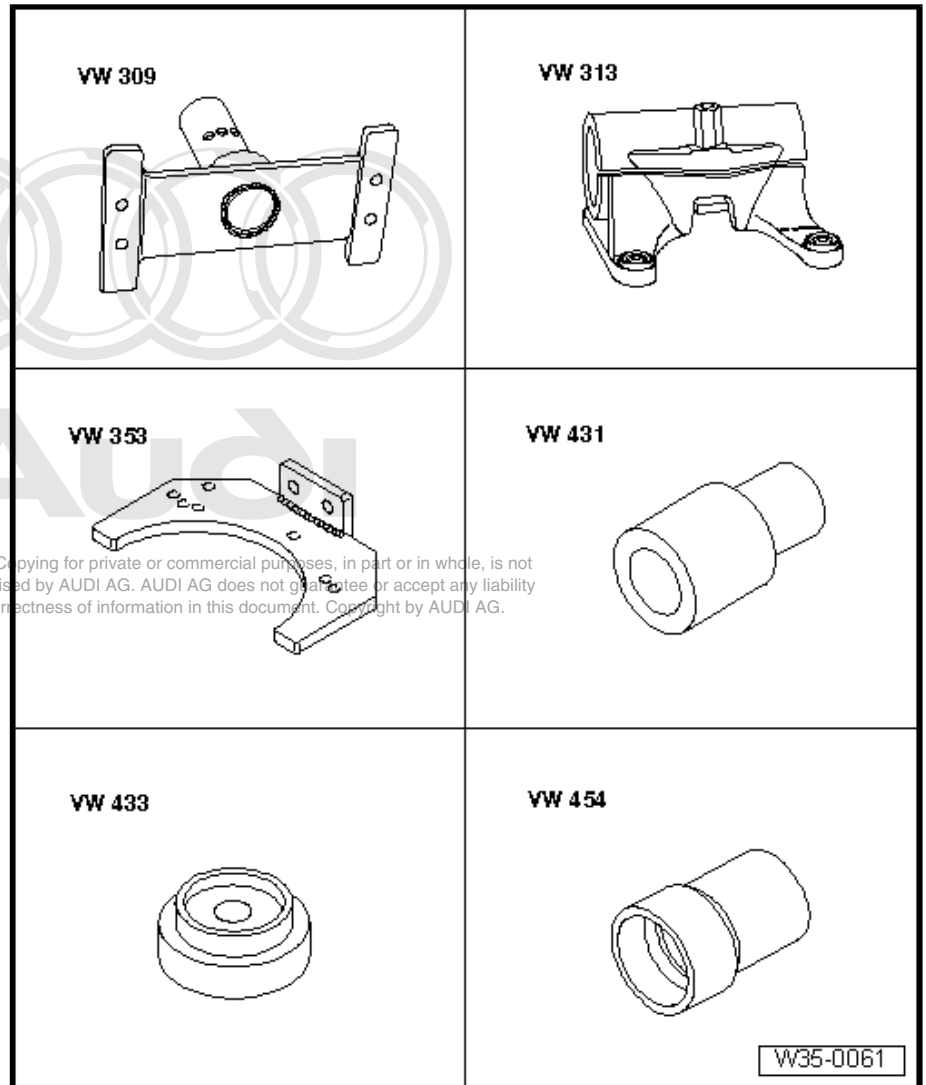
⇒ ["2.2.2 Dismantling and assembling output shaft for 5th, 6th and reverse gear", page 172](#)

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

Special tools and workshop equipment required

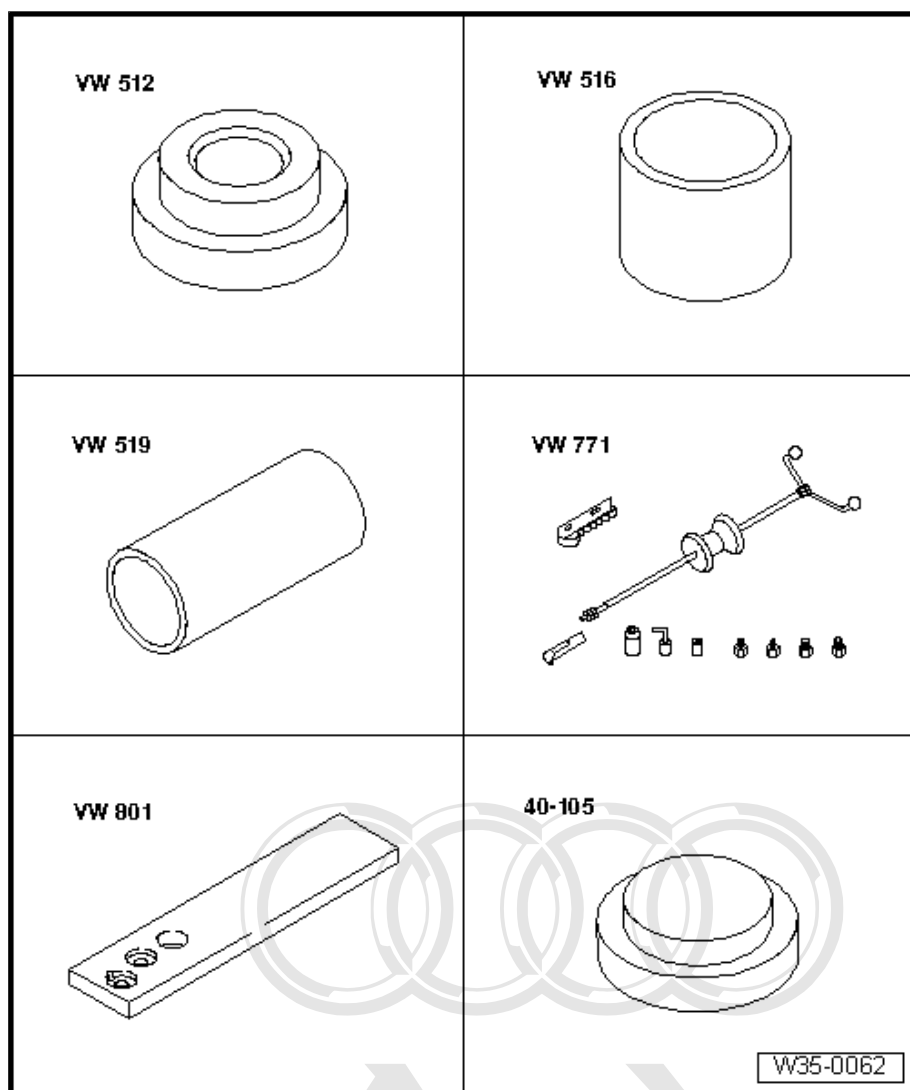


- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 415 A-



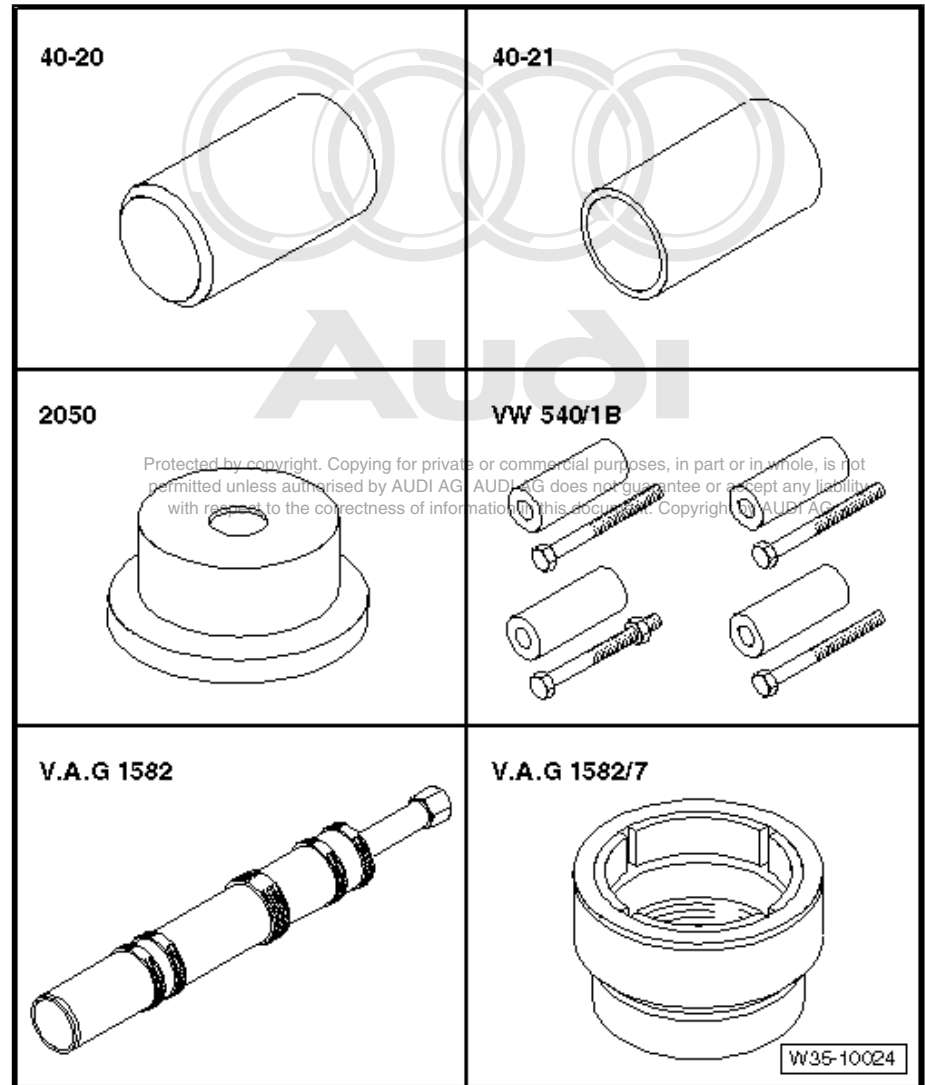
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- ◆ Retaining plate - VW 309-
- ◆ Support clamp - VW 313-
- ◆ Gearbox support - VW 353-
- ◆ Thrust piece - VW 431-
- ◆ Thrust piece - VW 433-
- ◆ Thrust piece - VW 454-



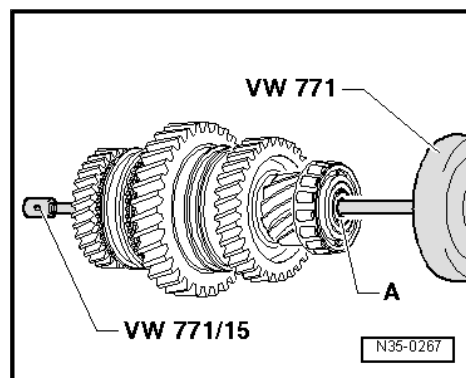
- ◆ Thrust piece - VW 512-
- ◆ Tube - VW 516-
- ◆ Tube - VW 519-
- ◆ Multi-purpose tool - VW 771-
- ◆ Retaining plate - VW 801-
- ◆ Thrust plate - 40 - 105-

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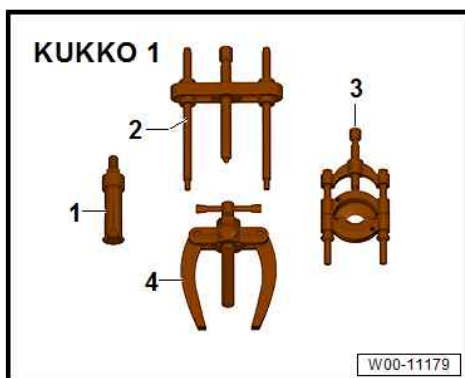


- ◆ Drift sleeve - 40 - 20-
- ◆ Drift sleeve - 40 - 21-
- ◆ Thrust piece - 2050-
- ◆ Engine and gearbox support supplement - VW 540/1 B-
- ◆ Tapered roller bearing puller - V.A.G 1582-
- ◆ Adapter - V.A.G 1582/7-

- ◆ Inductive heater - VAS 6414-



- ◆ -1- Internal puller - Kukko 21/7-

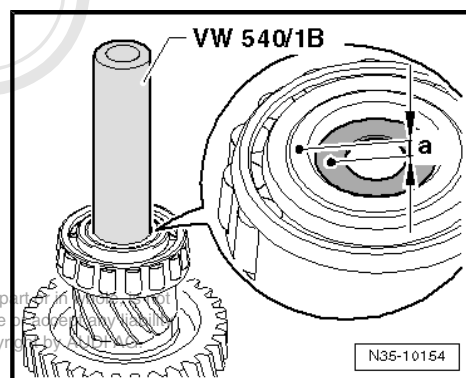


- ◆ -1- Internal puller - Kukko 21/8-
- ◆ -2- Puller - Kukko 18/2-
- ◆ -3- Splitter - Kukko 17/2-
- ◆ -4- Counter-support - Kukko 22/2-

Pulling dished washer -A- out of output shaft

Pressing dished washer into output shaft

- Dimension -a- = 2 mm

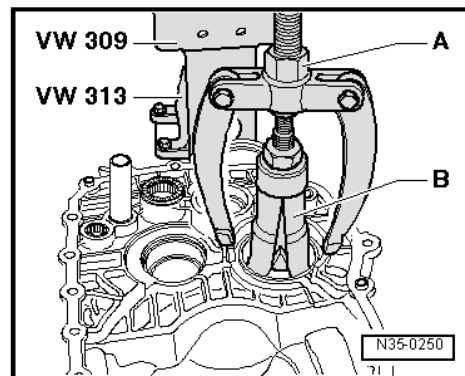


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Pulling tapered roller bearing outer race out of clutch housing

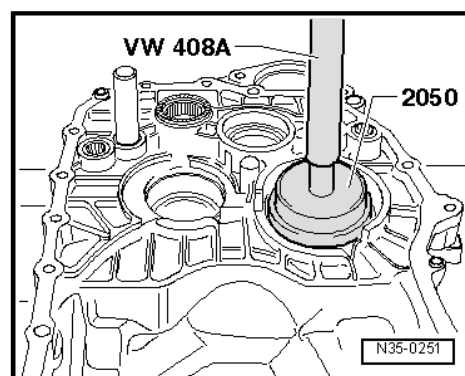
A - Counter-support , e.g. -Kukko 22/2-

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



Pressing tapered roller bearing outer race into clutch housing

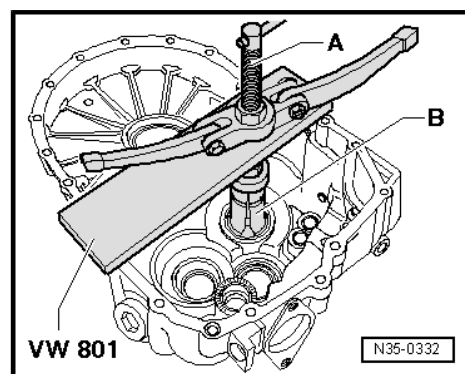
- Support clutch housing with drift sleeve - 40-20- directly below bearing mounting.



Pulling tapered roller bearing outer race out of gearbox housing

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

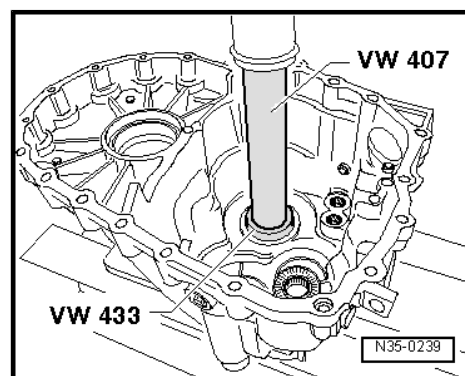
B - Internal puller 46 ... 58 mm , e.g. -Kukko 21/7-



Pressing tapered roller bearing outer race into gearbox housing

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

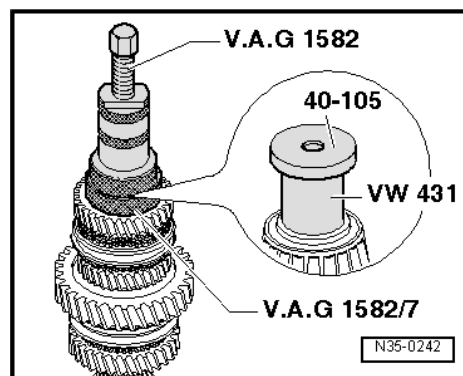
Dismantling output shaft



Pulling off tapered roller bearing inner race on gearbox housing end

Before applying bearing puller :

- Remove circlip for tapered roller bearing inner race on gearbox housing end.
- Insert thrust piece - VW 431- in output shaft and place thrust plate - 40-105- on it.

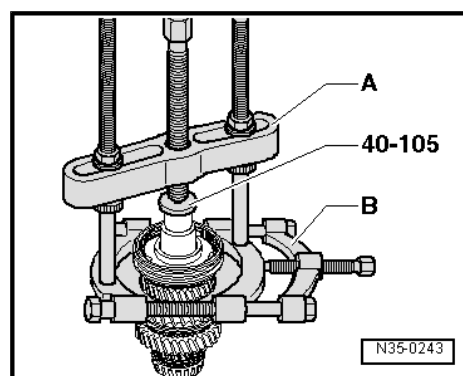


Pulling off 3rd and 4th gear synchro-hub/locking collar with 4th speed selector gear

- Remove circlip before pulling off.

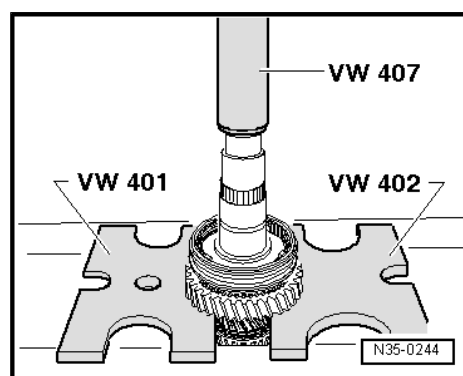
A - Puller , e.g. -Kukko 18/2-

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



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

- Remove circlip.
- Press off selector gear and locking collar/synchro-hub together.



Pressing off tapered roller bearing inner race on clutch housing end

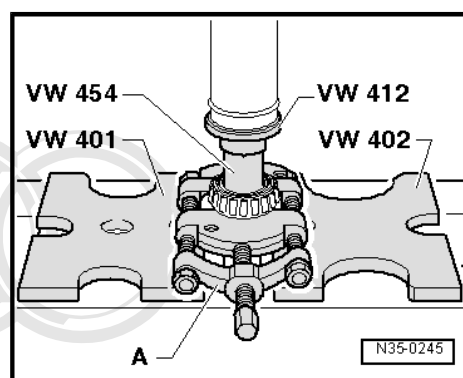
A - Splitter 22...115 mm , e.g. -Kukko 17/2-

Assembling output shaft

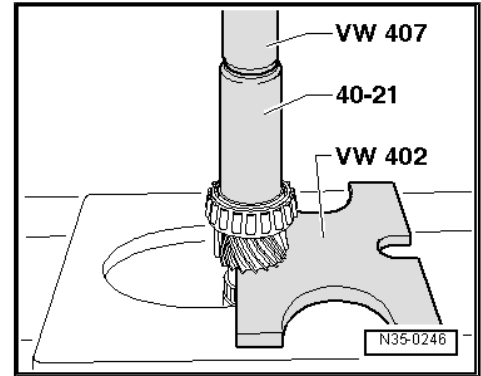


Note

Use inductive heater - VAS 6414- to heat inner races of tapered roller bearings and synchro-hubs to approx. 100°C before installing. Press home onto stop when installing so there is no axial clearance.



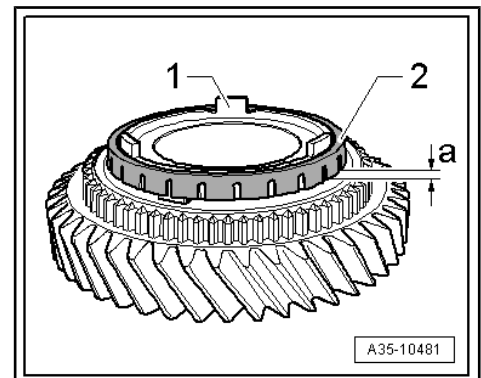
Pressing on tapered roller bearing inner race on clutch housing end



Checking wear on inner friction surface of 1st, 2nd and 3rd gear outer ring

- Place inner ring -1- onto cone of selector gear.
- Press outer ring -2- against cone of inner ring. Measure gap -a- with feeler gauge at 3 points spaced 120° apart.
- Note down mean value.

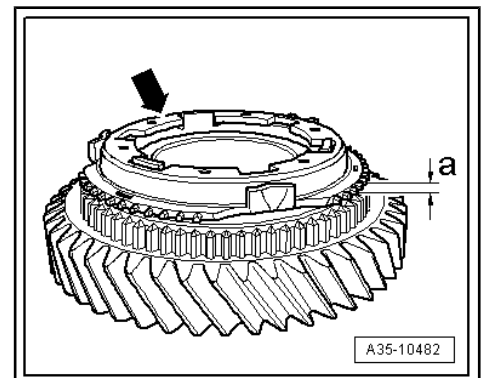
Wear limit: dimension -a-	
1st, 2nd and 3rd gear	0.4 mm



Checking wear on outer friction surface of 1st, 2nd and 3rd gear outer ring

- Check inner friction surface of synchro-ring -arrow- for grooves or radial scoring and renew if necessary.
- Place inner ring, outer ring and synchro-ring onto cone of inner ring.
- Press down and simultaneously rotate synchro-ring with outer ring to achieve proper seating.
- Measure gap -a- with feeler gauge at 3 points spaced 120° apart.
- Note down mean value.

Wear limit: dimension -a-	
1st, 2nd and 3rd gear	0.8 mm



- Install 2nd speed selector gear with needle bearing.

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

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

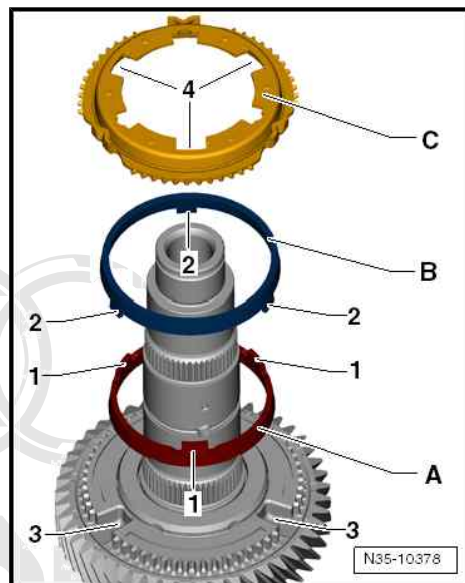
Lugs -1- face away from selector gear.

- Fit outer ring -B-.

Lugs -2- engage in slots -3- in selector gear.

- Fit synchro-ring -C-.

Larger recesses -4- engage on lugs -1- on inner ring -A-.



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

- Take off springs -1- before dismantling.

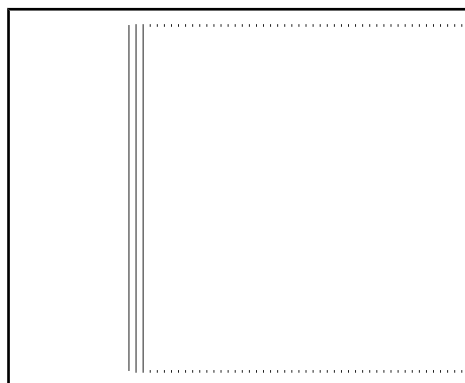
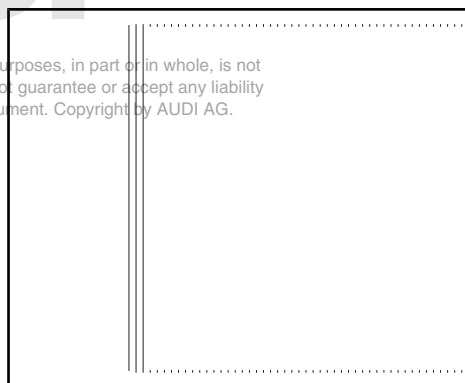
- 1 - Spring
- 2 - Locking piece
- 3 - Locking collar
- 4 - Synchro-hub

- To assemble, slide locking collar over synchro-hub.

- On 3rd and 4th gear the wider collar of the synchro-hub and the shoulder on the locking collar face in the same direction.
- Installation position: Narrower recesses in synchro-hub align with recesses in locking collar

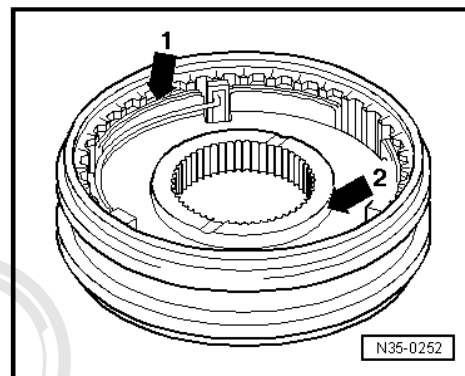
Assembling 1st/2nd gear and 3rd/4th gear locking collar/synchro-hub

- Locking collar is pushed over synchro-hub.
- Insert locking pieces and install springs offset at 120°.
- Angled end of spring must locate in hollow locking piece.



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

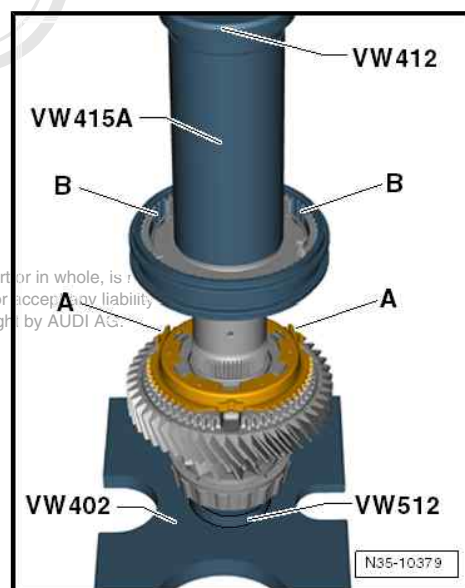
- Identification groove -arrow 1- and narrow shoulder -arrow 2- on synchro-hub point towards 1st gear.



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

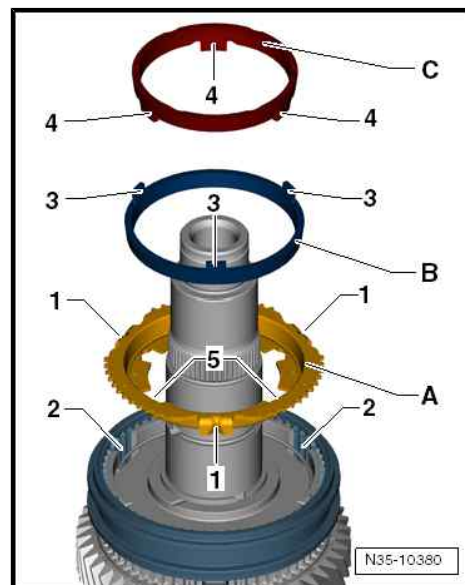
Lugs -A- on synchro-ring engage in recesses -B- in synchro-hub.

- Fit circlip.



Installing synchro-ring, outer ring and inner ring for 1st gear

- Fit synchro-ring -A- in 1st and 2nd gear synchro-hub.
- Lugs -1- engage in slots -2- in synchro-hub.
- Fit outer ring -B- in synchro-ring.
- Lugs -3- face away from synchro-ring.
- Fit inner ring -C- in outer ring.
- Lugs -4- engage in larger recesses -5- on synchro-ring -A-.



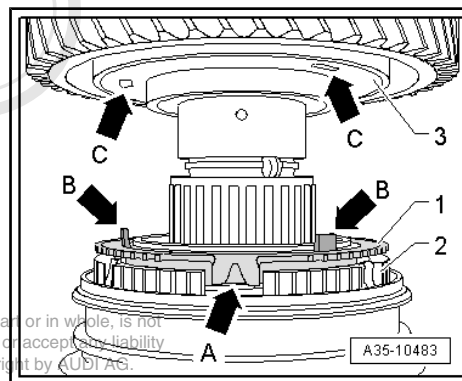
Installing 1st speed selector gear with needle bearing

- Lugs -arrow A- on synchro-ring -1- are located in recesses in synchro-hub -2-.

Lugs -arrows B- on outer ring engage in recesses -arrows C- in selector gear -3-.

- Fit thrust washers for 1st and 4th gear in output flange
⇒ [Item 19 \(page 157\)](#) and ⇒ [Item 20 \(page 157\)](#) .
- Install 4th speed selector gear with needle bearing.

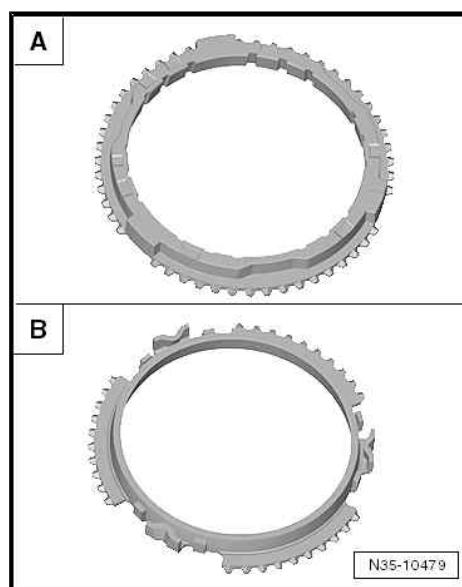
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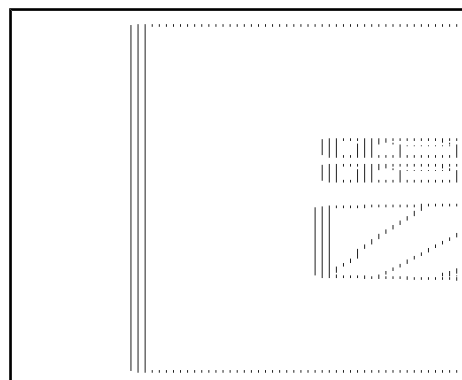
Checking 4th gear synchro-ring for wear

-A- = Brass synchro-ring		
Gap -a-	Installation depth	Wear limit
4th gear	1.0 ... 1.7 mm	0.5 mm

-B- = Sheet steel synchro-ring		
Gap -a-	Installation depth	Wear limit
4th gear	1.3 ... 2.4 mm	0.8 mm

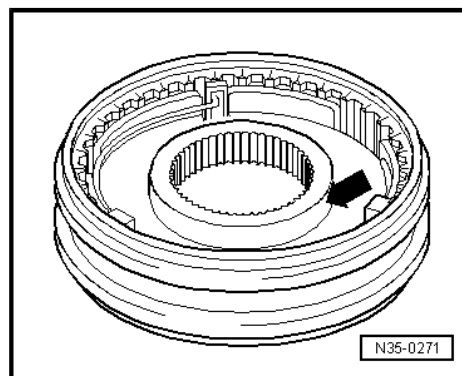


- Press synchro-ring onto cone of selector gear and measure gap dimension -a- with feeler gauge.



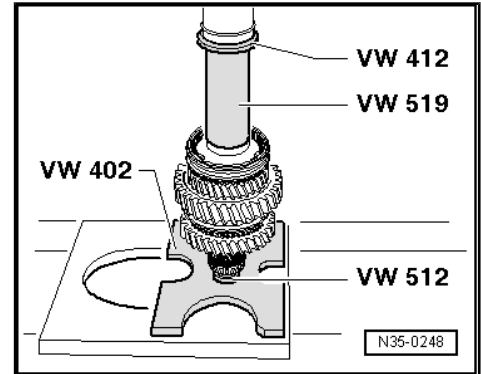
Installation position of 3rd and 4th gear locking collar and synchro-hub

- The wider shoulder on the synchro-hub -arrow- faces towards 3rd gear.
- Fit 4th gear synchro-ring on 4th speed selector gear.



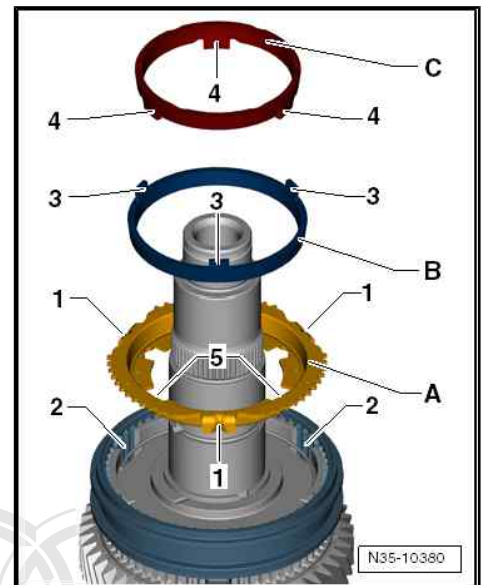
Heat and press on 3rd and 4th gear synchro-hub with locking collar

- Turn 4th gear synchro-ring so that grooves align with locking pieces.
- Fit circlip.



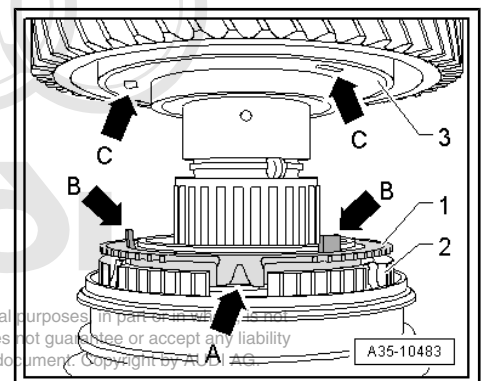
Installing synchro-ring, outer ring and inner ring for 3rd gear

- Fit synchro-ring -A- in 3rd and 4th gear synchro-hub.
- Lugs -1- engage in slots -2- in synchro-hub.
- Fit outer ring -B- in synchro-ring.
- Lugs -3- face away from synchro-ring.
- Fit inner ring -C- in outer ring.
- Lugs -4- engage in larger recesses -5- on synchro-ring -A-.



Installing 3rd speed selector gear with needle bearing

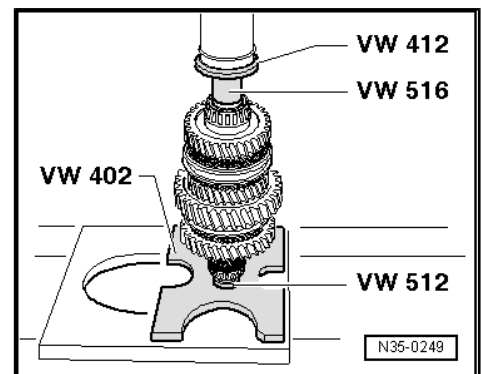
- Lugs -arrow A- on synchro-ring -1- are located in recesses in synchro-hub -2-.
- Lugs -arrows B- on outer ring engage in recesses -arrows C- in selector gear -3-.
- Install 3rd speed selector gear with needle bearing.



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Pressing on tapered roller bearing inner race on gearbox housing end

- Determine thickness of required circlip ⇒ [page 172](#) and install circlip.

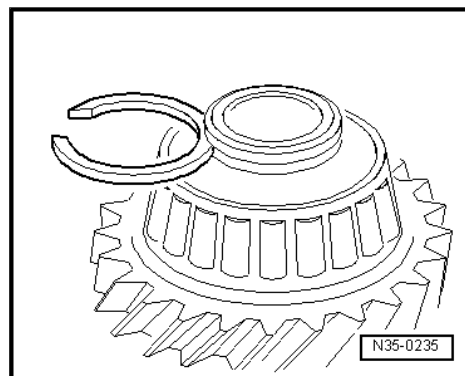


Determining thickness of circlip

- Determine the thickest circlip that will just fit and install it. For part number refer to ⇒ Electronic parts catalogue .

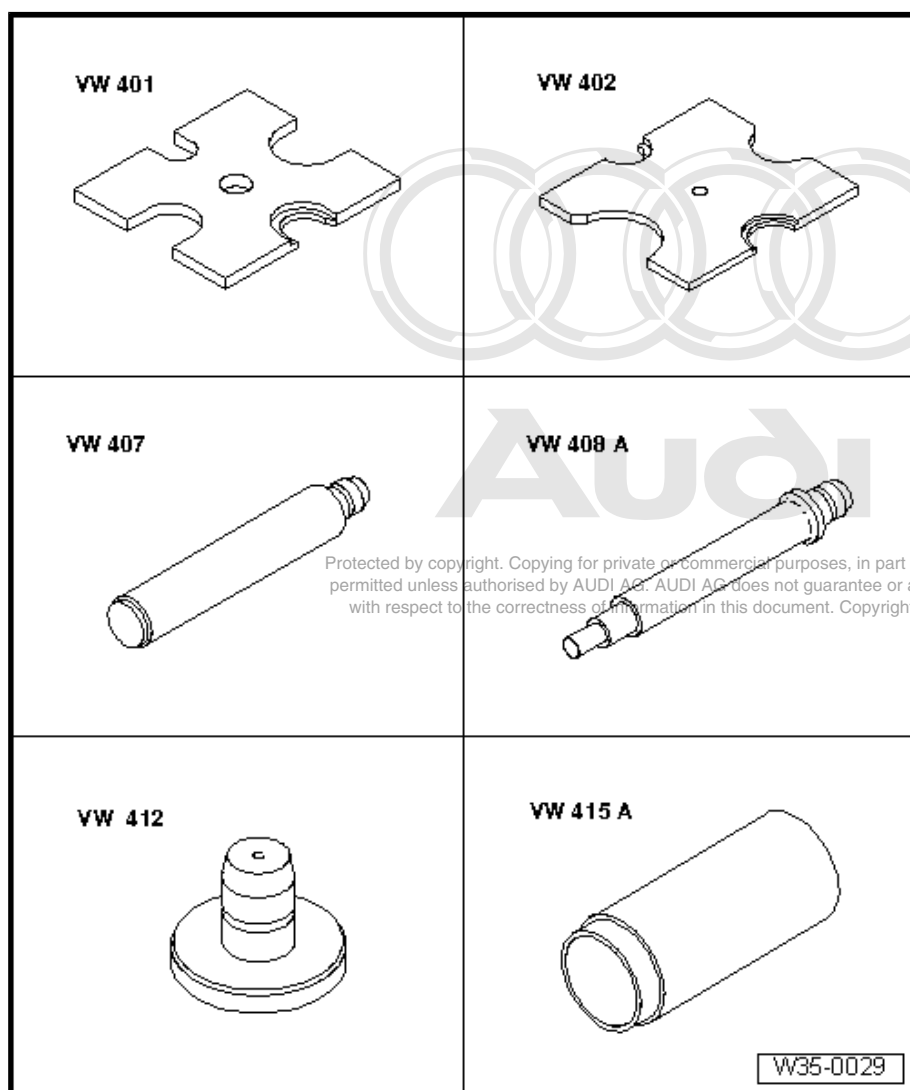
The following circlips are available:

Circlip thickness (mm)		
1.79	1.83	1.86
1.89	1.92	1.95
1.98		



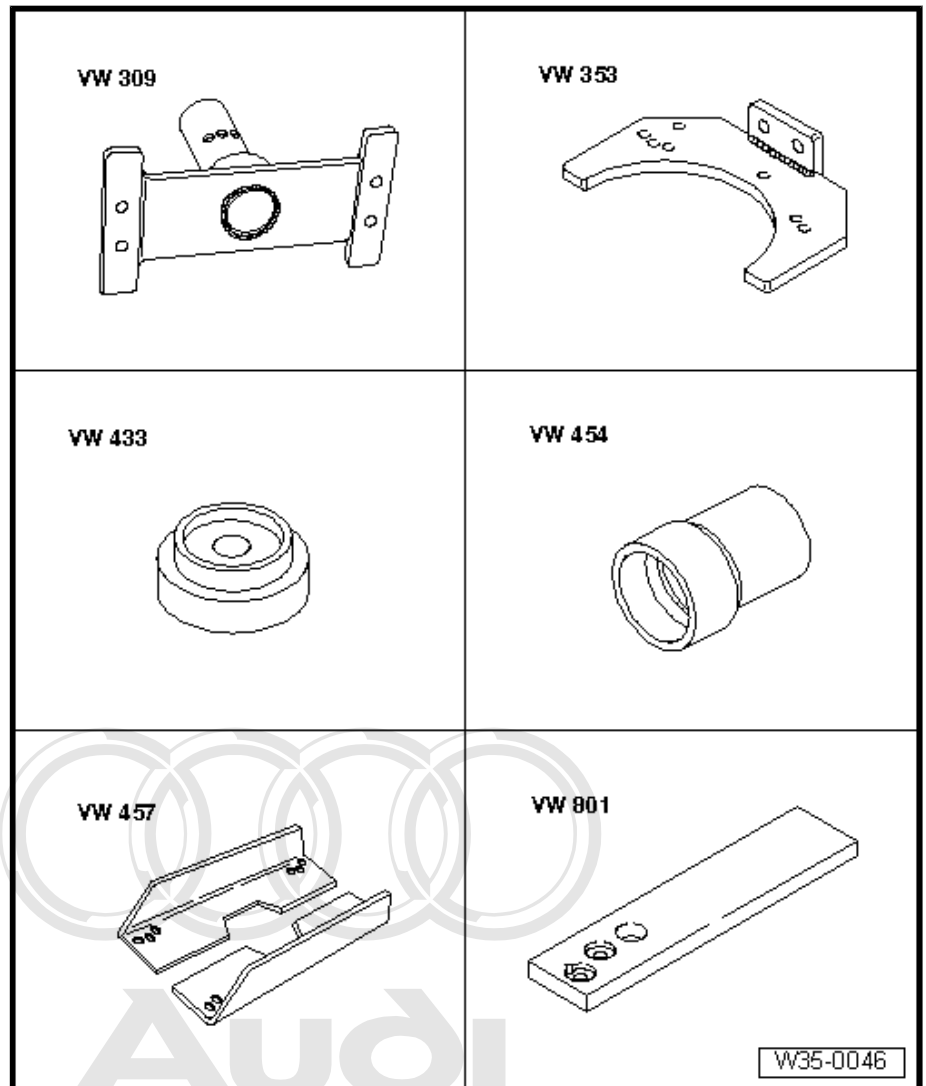
2.2.2 Dismantling and assembling output shaft for 5th, 6th and reverse gear

Special tools and workshop equipment required

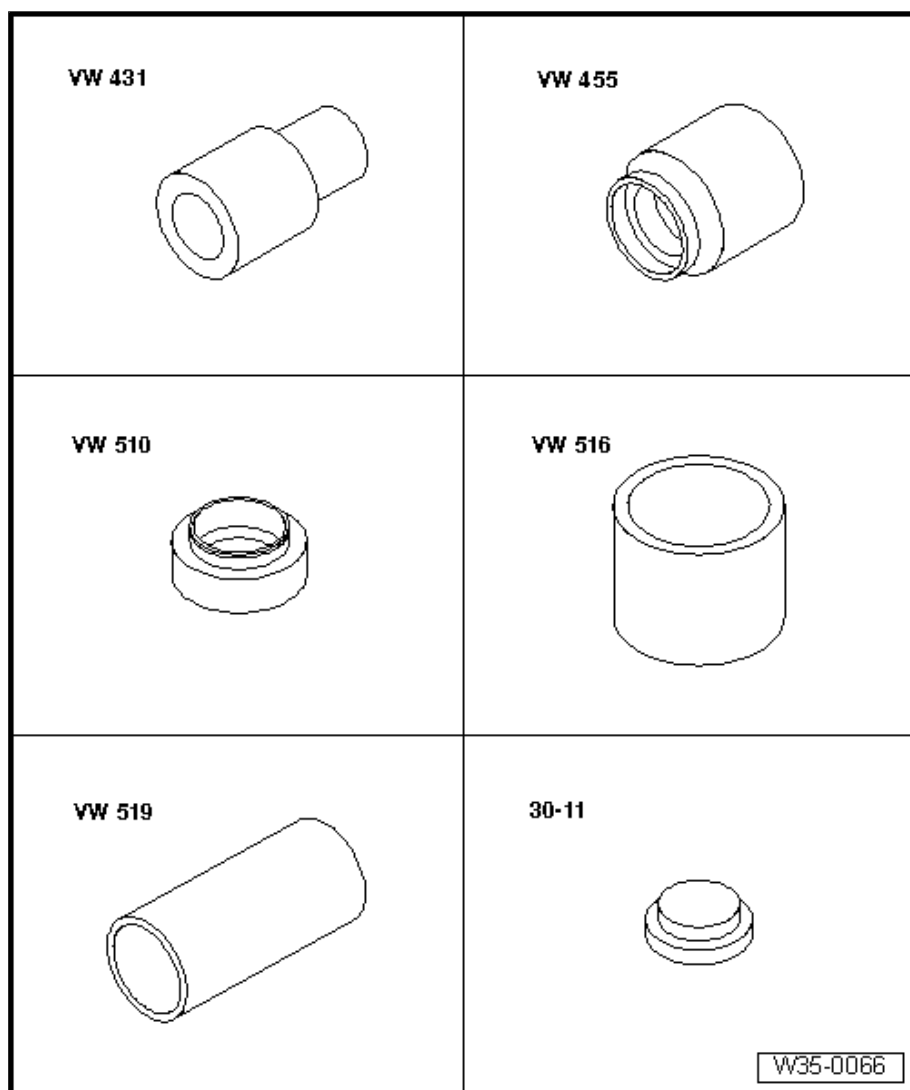


- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 412-

◆ Tube - VW 415 A-



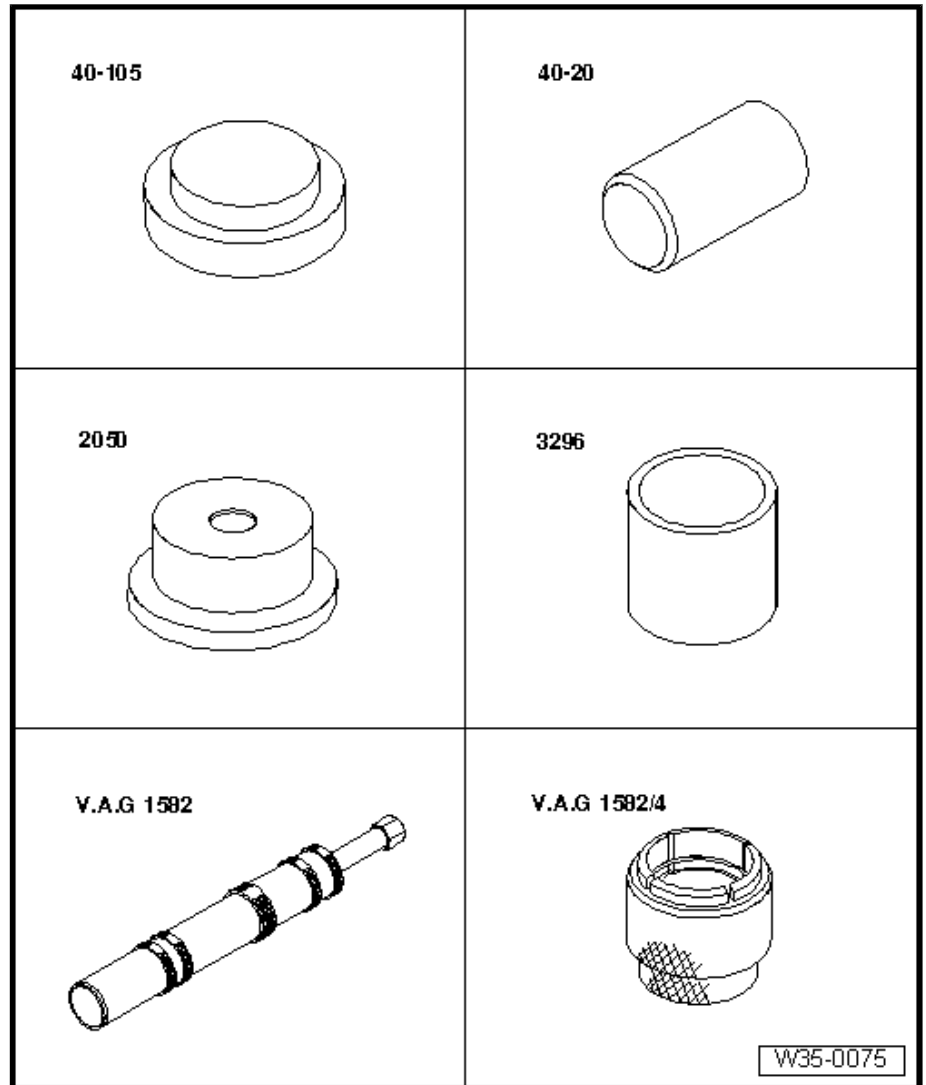
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- ◆ Retaining plate - VW 309-
 - ◆ Gearbox support - VW 353-
 - ◆ Thrust piece - VW 433-
 - ◆ Thrust piece - VW 454-
 - ◆ Support rails - VW 457-
 - ◆ Retaining plate - VW 801-



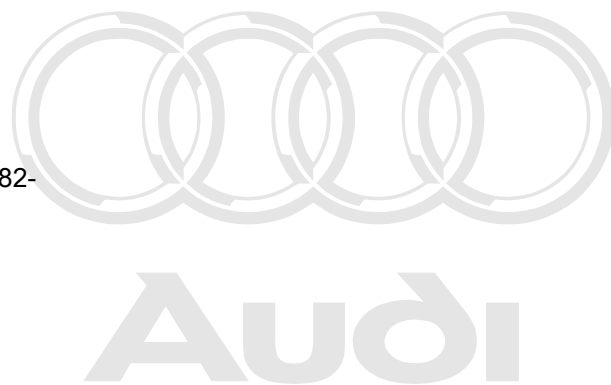
- ◆ Thrust piece - VW 431-
- ◆ Installing sleeve - VW 455-
- ◆ Press tool - VW 510-
- ◆ Tube - VW 516-
- ◆ Tube - VW 519-
- ◆ Thrust plate - 30 - 11-



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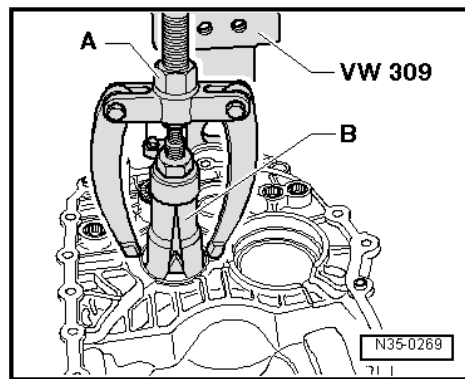


- ◆ Thrust plate - 40 - 105-
- ◆ Drift sleeve - 40 - 20-
- ◆ Thrust piece - 2050-
- ◆ Tube - 3296-
- ◆ Tapered roller bearing puller - V.A.G 1582-
- ◆ Adapter - V.A.G 1582/4-



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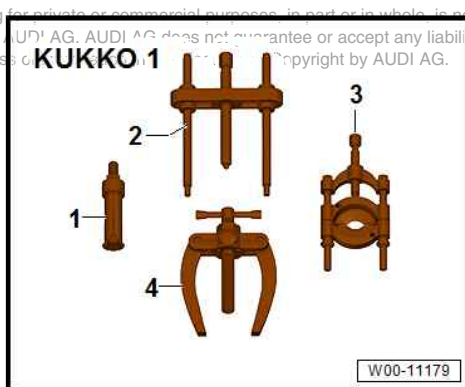
- ◆ Adapter - V.A.G 1582/7-



- ◆ Inductive heater - VAS 6414-



- ◆ 1- Internal puller - Kukko 21/7-



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

Pulling tapered roller bearing outer race out of clutch housing

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

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

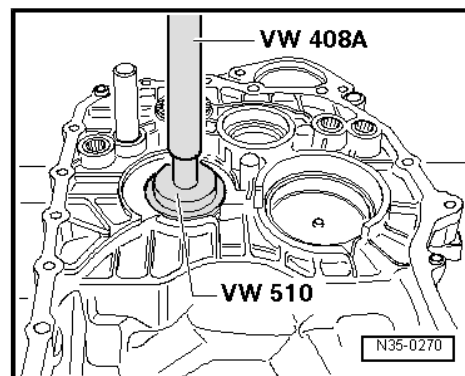


Note

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

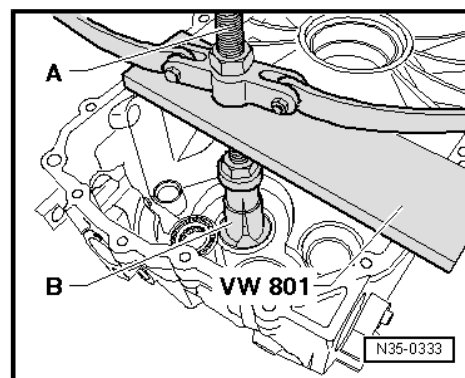
Pressing tapered roller bearing outer race into clutch housing

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



Pulling tapered roller bearing outer race out of gearbox housing

- A - Counter-support , e.g. -Kukko 22/2-
- B - Internal puller 46 ... 58 mm , e.g. -Kukko 21/7-

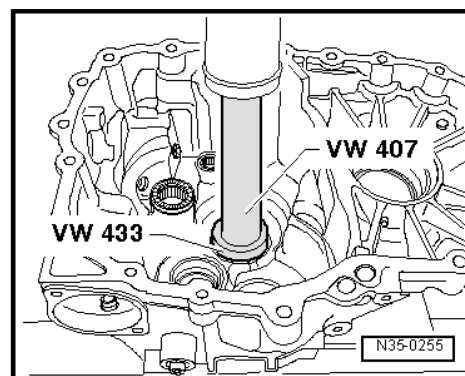


Pressing tapered roller bearing outer race into gearbox housing

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

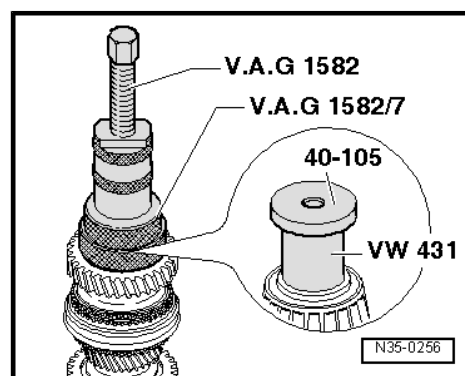
Dismantling output shaft

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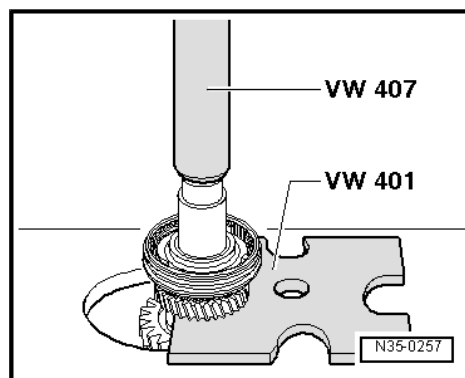
Pulling off tapered roller bearing inner race on gearbox housing end

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



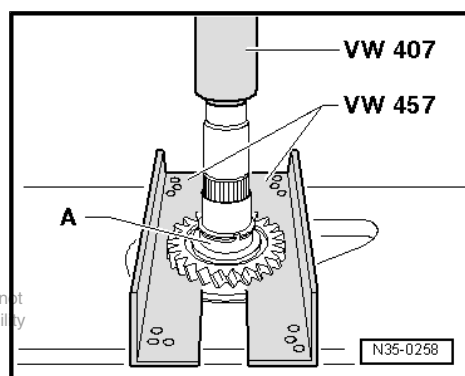
Pressing off 5th and 6th gear synchro-hub/locking collar with 6th speed selector gear

- Remove circlip before pressing off.



Pressing off sleeve -A- together with reverse selector gear

- Remove circlip before pressing off.

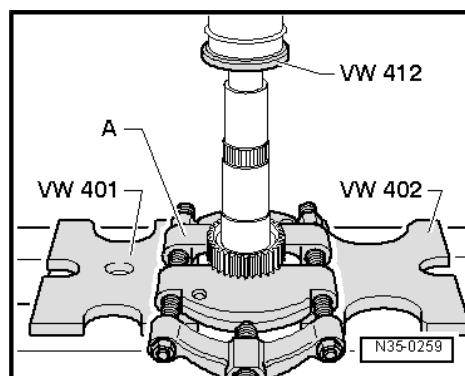


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Pressing off reverse gear synchro-hub

- Remove circlip before pressing off.

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



Pulling off tapered roller bearing inner race on clutch housing end

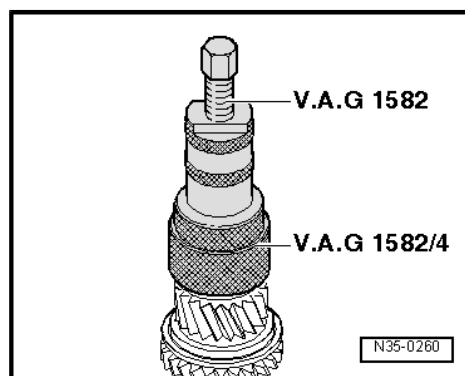
- Before applying puller, place thrust plate - 30 - 11- on output shaft.

Assembling output shaft



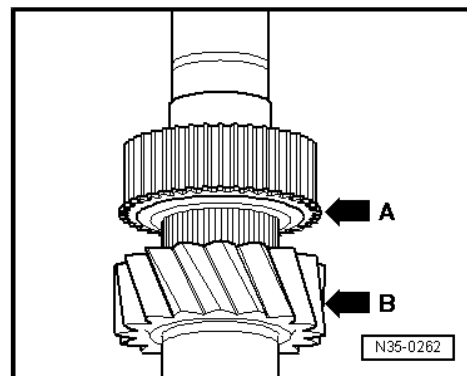
Note

Use inductive heater - VAS 6414- to heat inner races of tapered roller bearings and synchro-hubs to approx. 100°C before installing. Press home onto stop when installing so there is no axial clearance.



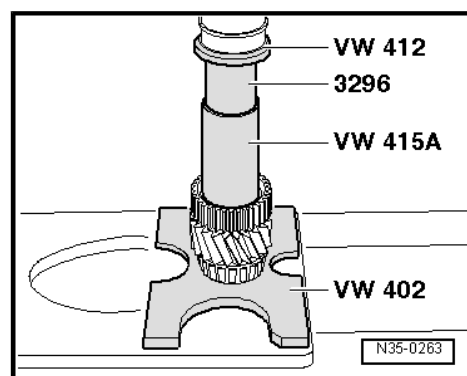
Installation position of reverse gear synchro-hub

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



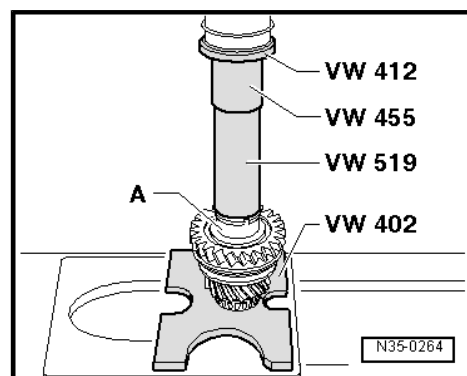
Heating and pressing on reverse gear synchro-hub

- Fit circlip.
- Fit reverse gear locking collar on reverse gear synchro-hub.
- Install reverse selector gear with needle bearing.



Pressing on sleeve -A-

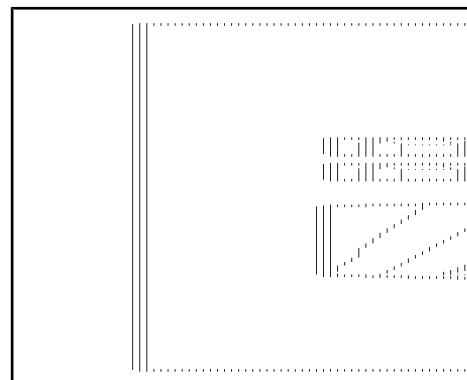
- Installation position: Wide shoulder faces towards reverse selector gear
- Then install circlip.



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

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

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

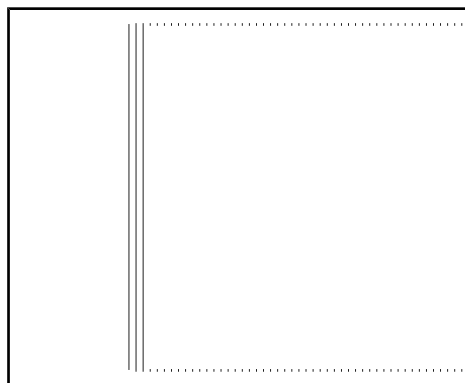




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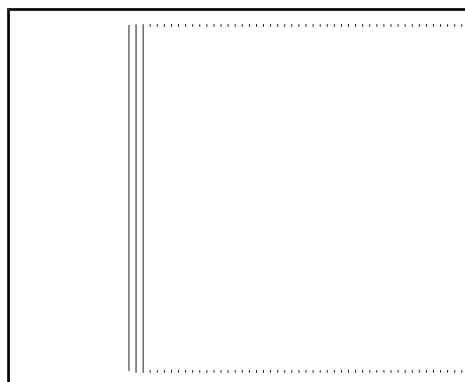
Dismantling and assembling 5th and 6th gear locking collar/synchro-hub

- Take off springs -1- before dismantling.
- 1 - Spring
- 2 - Locking piece
- 3 - Locking collar
- 4 - Synchro-hub
- To assemble, slide locking collar over synchro-hub.
- Installation position: Narrower recesses for locking pieces in synchro-hub align with recesses in locking collar



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

- Locking collar is pushed over synchro-hub.
- Insert locking pieces and install springs offset at 120°.
- Angled end of spring must locate in hollow locking piece.
- Install 6th speed selector gear with needle bearing.
- Fit 6th gear synchro-ring.

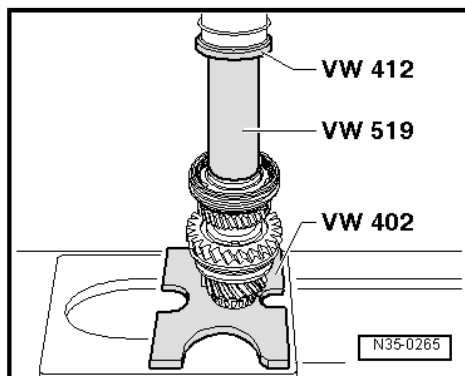


Heating 5th and 6th gear locking collar/synchro-hub and pressing on

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

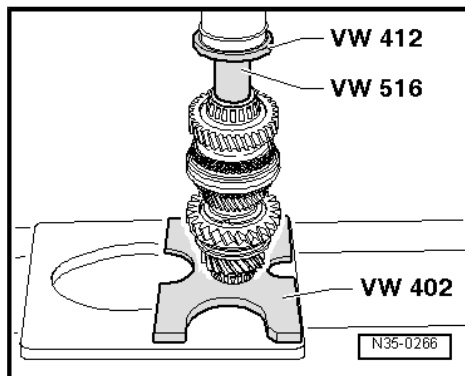
Installation position: Chamfer on outer diameter of locking collar faces towards 5th speed selector gear.

- Turn 6th gear synchro-ring so that grooves align with locking pieces.
- Fit circlip.
- Fit 5th gear synchro-ring.
- Install 5th speed selector gear with needle bearing.



Pressing on tapered roller bearing inner race on gearbox housing end

- Then determine thickness of required circlip ⇒ [page 181](#) and install circlip.

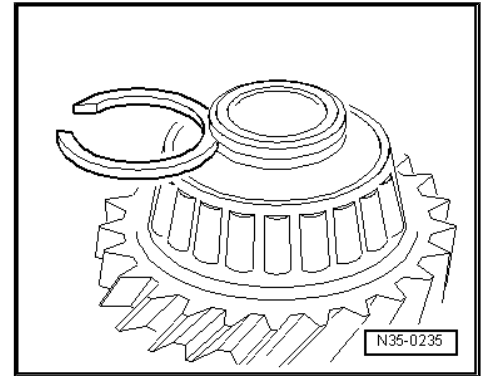


Determining thickness of circlip

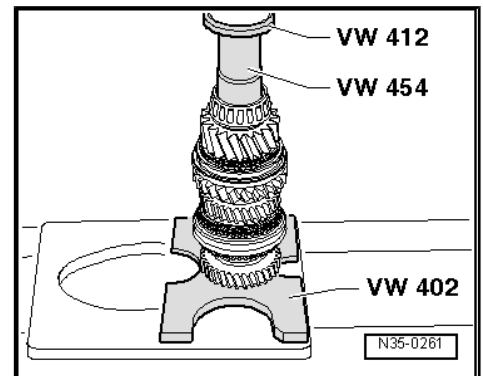
- Determine the thickest circlip that will just fit and install it. For part numbers refer to ⇒ Electronic parts catalogue .

The following circlips are available:

Circlip thickness (mm)		
1.79	1.83	1.86
1.89	1.92	1.95
1.98		



Pressing on tapered roller bearing inner race on clutch housing end



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2.3 Adjusting output shaft

⇒ [“2.3.1 Adjusting output shaft for 1st - 4th gear”, page 181](#)

⇒ [“2.3.2 Adjusting output shaft for 5th, 6th and reverse gear”, page 185](#)

2.3.1 Adjusting output shaft for 1st - 4th gear

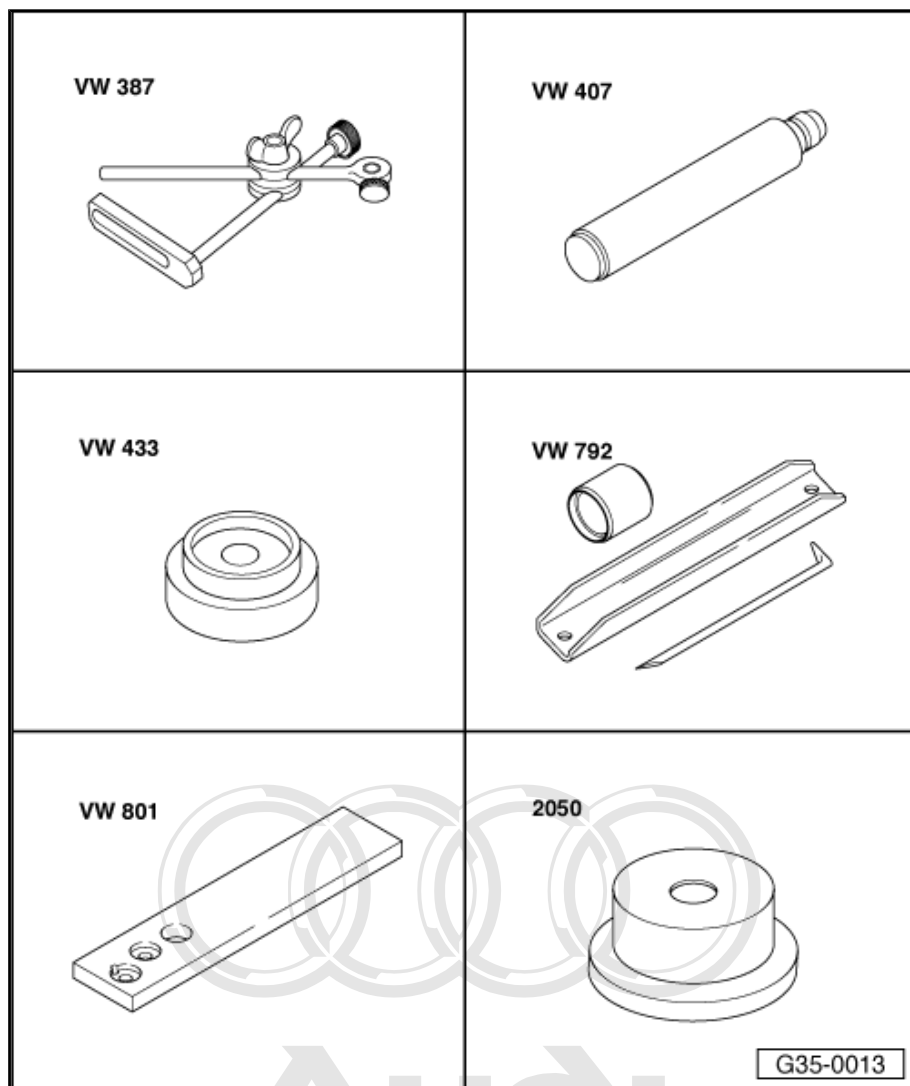
(Determining thickness of output shaft shim)

Re-adjustment of the output shaft is required if the following components have been renewed:

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

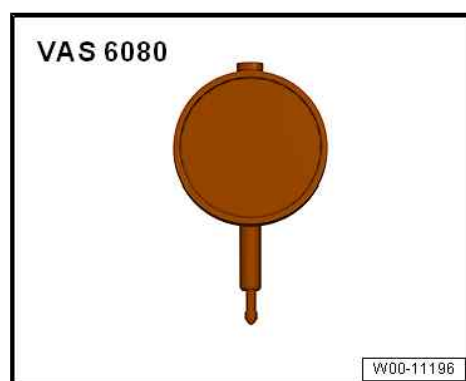
Table of adjustments ⇒ [page 216](#)

Special tools and workshop equipment required

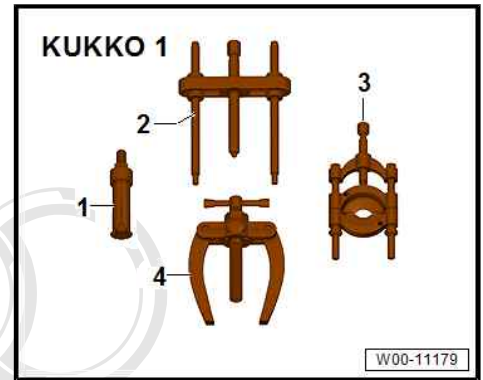


- ◆ Universal dial gauge bracket - VW 387-
- ◆ Press tool - VW 407-
- ◆ Thrust piece - VW 433-
- ◆ Assembly tool - VW 792-
- ◆ Retaining plate - VW 801-
- ◆ Thrust piece - 2050-
- ◆ Dial gauge - VAS 6080-

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◆ -1- Internal puller - Kukko 21/7-

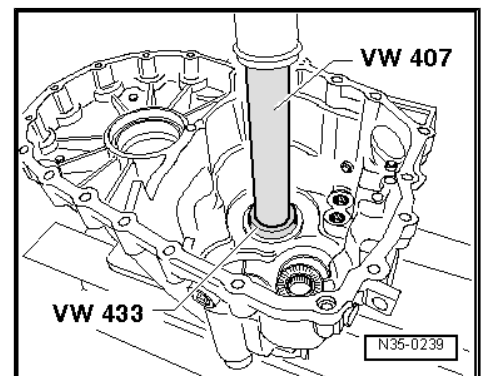


◆ -4- Counter-support - Kukko 22/2-

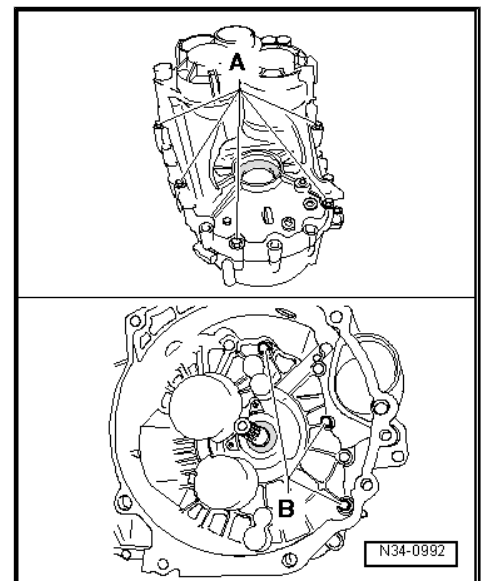
Requirements:

- Secure gearbox to assembly stand ⇒ [page 109](#) .
- Sealing surfaces of clutch and gearbox housings must be free of sealant.
- When taking measurements, install only the output shaft that is to be measured.
- Press tapered roller bearing outer race with shim (thickness 1.70 mm) into gearbox housing. Support gearbox housing with thrust piece - 2050- directly below bearing mounting.
- Fit complete 1st to 4th gear output shaft into clutch housing.

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- Fit gearbox housing and tighten bolts -A- and -B- diagonally to correct torque ⇒ [Item 13 \(page 112\)](#) .



- Attach measuring tools and secure with bolt -arrow- to clutch housing.
- Set dial gauge e.g. -VAS 6080- (3 mm measuring range) to “0” with 1 mm preload.
- Loosen clutch housing/gearbox housing securing bolts diagonally until output shaft is free to move in gearbox housing.
- Read off play on gauge and note reading (example: 0.14 mm).



Note

- ◆ If no reading is shown when clutch housing/gearbox housing securing bolts are loosened:
- ◆ Install 1.95 mm shim or, if necessary, 2.20 mm shim in place of 1.70 mm shim for measurement.
- ◆ Select correct shims from ⇒ *Electronic parts catalogue*.

Determining thickness of shim

The specified bearing preload is obtained as follows:

The measured value (0.14 mm) is subtracted from the thickness of the shim previously installed (1.70 mm).

A constant preload value (0.20 mm) is added to the result.

Example:

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

Select shim of required thickness from table; for part numbers, refer to ⇒ *Electronic parts catalogue*.

The following shims are available:

Thickness of shims in mm			
1.45	1.70	1.95	2.20
1.50	1.75	2.00	2.25
1.55	1.80	2.05	
1.60	1.85	2.10	
1.65	1.90	2.15	

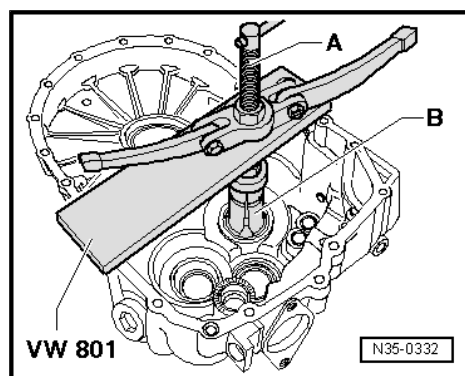
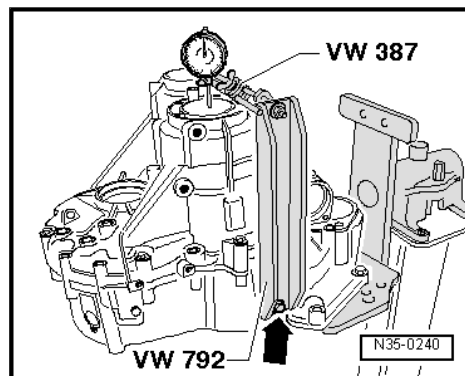
Tolerance variations make it possible to obtain the exact shim thickness required.

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

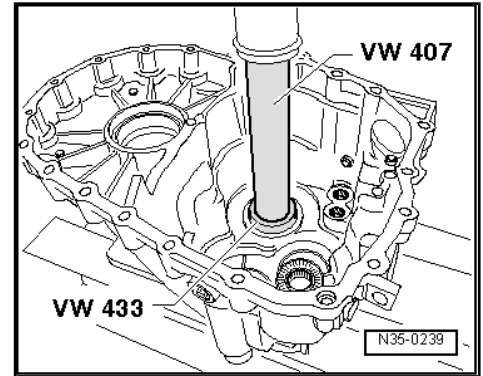
A - Counter-support , e.g. -Kukko 22/2-

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

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

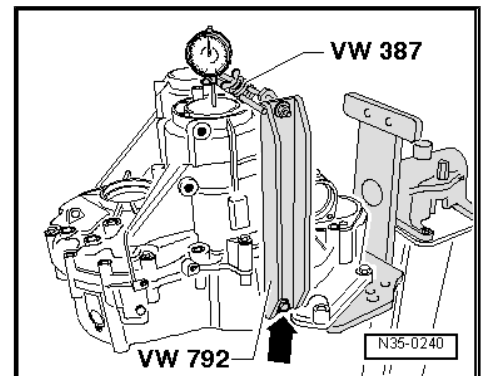


- Press in tapered roller bearing outer race together with the correct shim (in example 1.75 mm). Support gearbox housing with thrust piece - 2050- directly below bearing mounting.



Checking adjustment

- Required shim installed (thickness as determined above)
- Attach measuring tools and secure with bolt -arrow- to clutch housing.
- Set dial gauge e.g. -VAS 6080- (3 mm measuring range) to "0" with 1 mm preload.
- Loosen clutch housing/gearbox housing securing bolts diagonally until output shaft is free to move in gearbox housing.
- If the correct shim has been selected, the dial gauge should now indicate a value of 0.15 ... 0.25 mm.



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

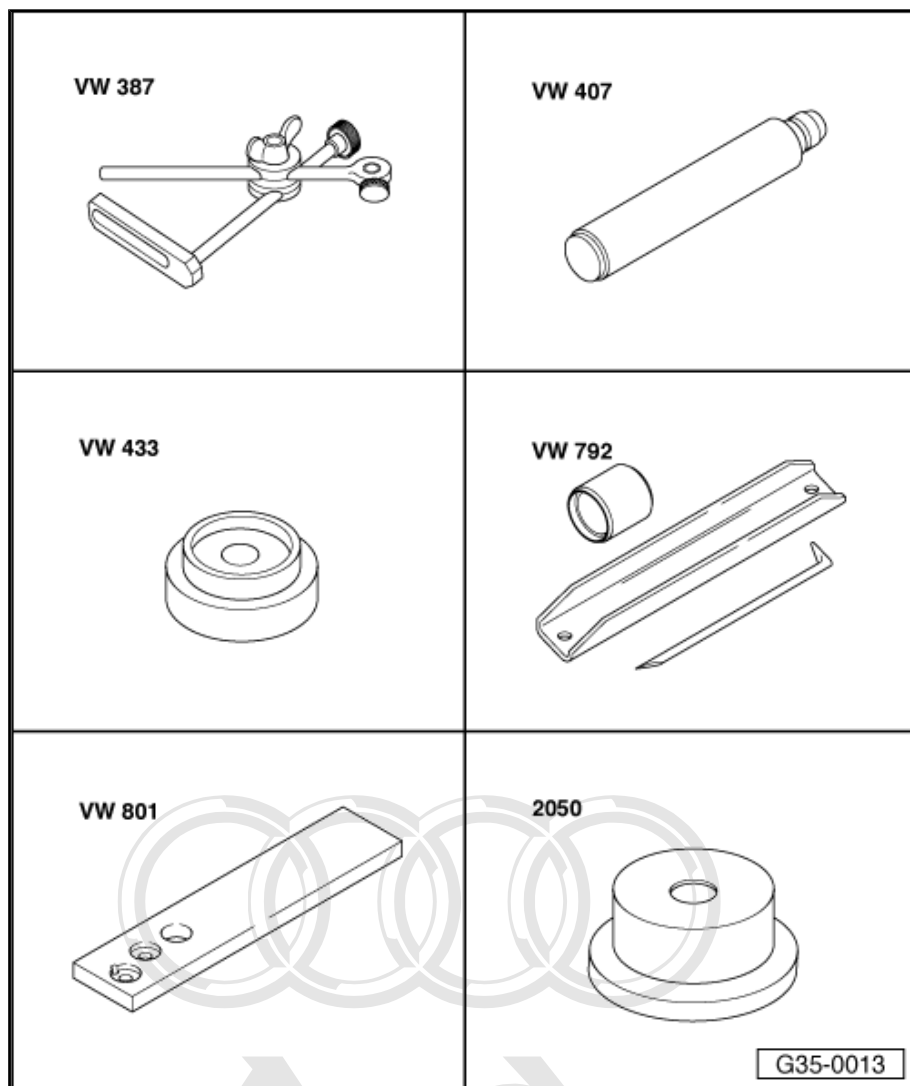
The output shaft must be re-adjusted when the following components are renewed:

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

Table of adjustments ⇒ [page 216](#)

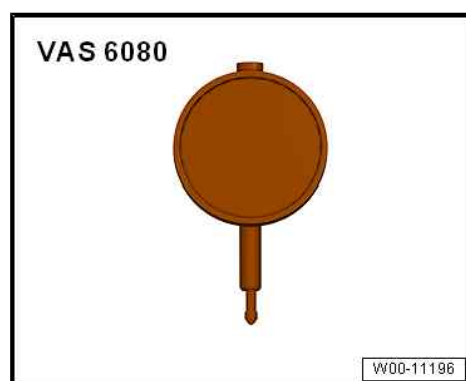
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Special tools and workshop equipment required

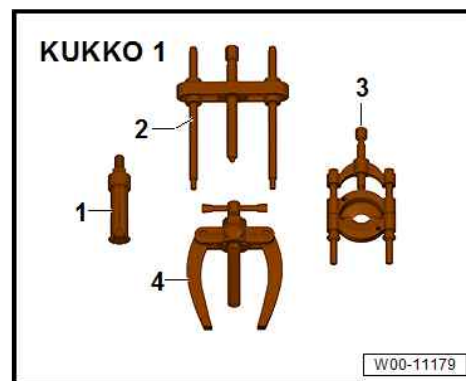


- ◆ Universal dial gauge bracket - VW 387-
- ◆ Press tool - VW 407-
- ◆ Thrust piece - VW 433-
- ◆ Assembly tool - VW 792-
- ◆ Retaining plate - VW 801-
- ◆ Thrust piece - 2050-
- ◆ Dial gauge - VAS 6080-

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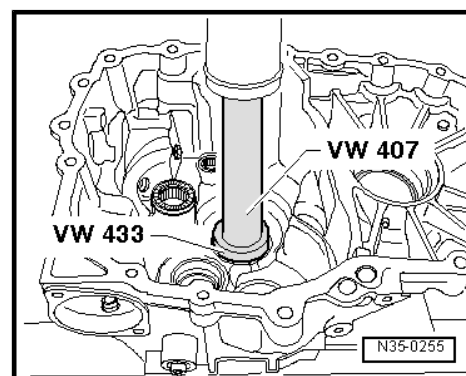
◆ -1- Internal puller - Kukko 21/7-



◆ -4- Counter-support - Kukko 22/2-

Requirements:

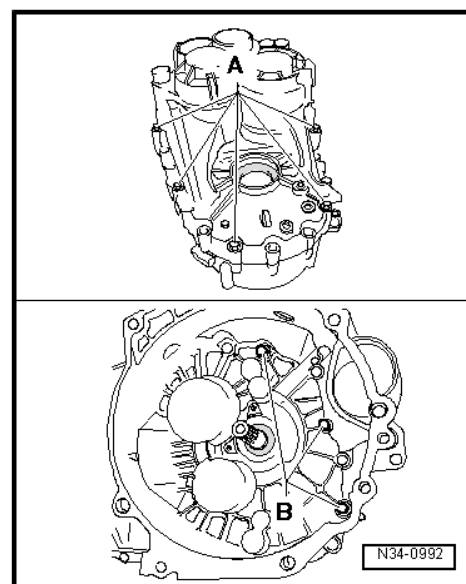
- Secure gearbox to assembly stand ⇒ [page 109](#) .
- Sealing surfaces of clutch and gearbox housings must be free of sealant.
- When taking measurements, install only the output shaft that is to be measured.
- Press tapered roller bearing outer race with shim (thickness 1.70 mm) into gearbox housing. Support gearbox housing with thrust piece - 2050- directly below bearing mounting.
- Insert complete 5th, 6th and reverse gear output shaft in clutch housing.



- Fit gearbox housing and tighten bolts -A- and -B- diagonally to correct torque ⇒ [Item 13 \(page 112\)](#) .



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



Note

- ♦ If no reading is shown when clutch housing/gearbox housing securing bolts are loosened:
- ♦ Install 1.95 mm shim or, if necessary, 2.20 mm shim in place of 1.70 mm shim for measurement.
- ♦ Select correct shims from ⇒ Electronic parts catalogue .

Determining thickness of shim

The specified bearing preload is obtained as follows:

The measured value (0.25 mm) is subtracted from the thickness of the shim previously installed (1.70 mm).

A constant preload value (0.20 mm) is added to the result.

Example:

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

- Select shim of required thickness from table; for part numbers, refer to ⇒ Electronic parts catalogue .

The following shims are available:

Thickness of shims in mm			
1.50	1.70	1.90	2.10
1.55	1.75	1.95	2.15
1.60	1.80	2.00	2.20
1.65	1.85	2.05	2.25

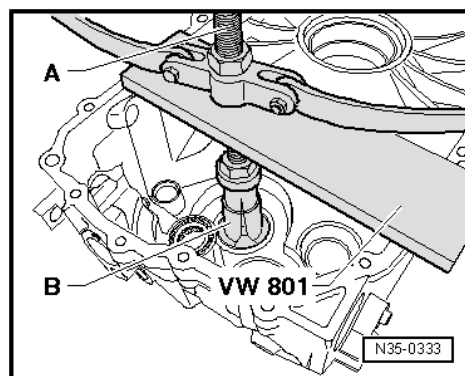
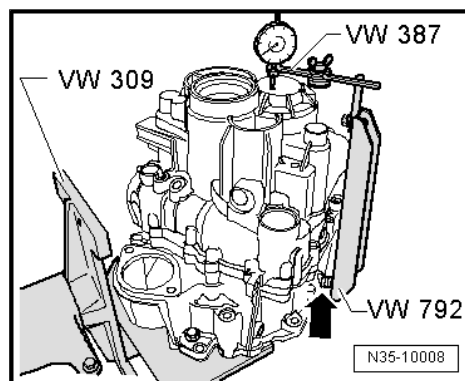
Tolerance variations make it possible to obtain the exact shim thickness required.

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

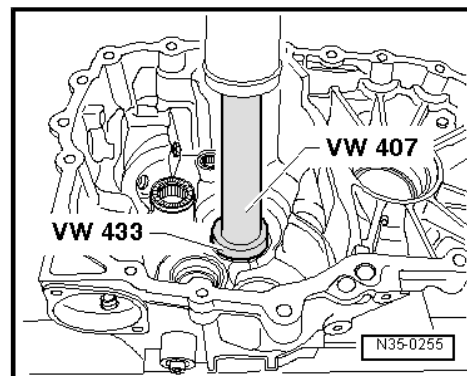
A - Counter-support , e.g. -Kukko 22/2-

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

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

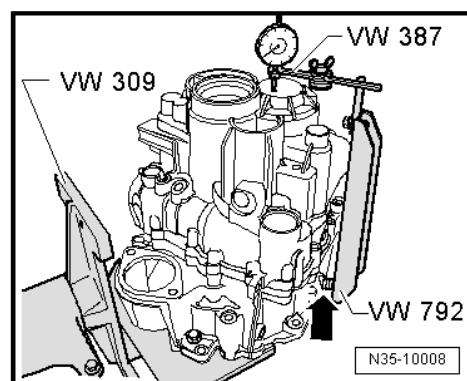


- Press in tapered roller bearing outer race together with the correct shim (in example 1.65 mm). Support gearbox housing with thrust piece - 2050- directly below bearing mounting.



Checking adjustment

- Required shim installed (thickness as determined above)
- Set up measuring tools.
- Put washers of a total thickness of 8 mm on bolt -arrow- securing assembly device - VW 792- to clutch housing.
- Set dial gauge e.g. -VAS 6080- (3 mm measuring range) to »0« with 1 mm preload.
- Loosen clutch housing/gearbox housing securing bolts diagonally until output shaft is free to move in gearbox housing.
- If the correct shim has been selected, the dial gauge should now indicate a value of 0.15 ... 0.25 mm.



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39 – Final drive - front differential

1 Oil seals

⇒ "1.1 Overview of fitting locations - oil seals", page 190

⇒ "1.2 Renewing oil seal (left-side)", page 191

⇒ "1.3 Renewing oil seal (right-side)", page 192

1.1 Overview of fitting locations - oil seals

1 - Final drive

2 - Input shaft oil seal

- ☐ Renewing ⇒ [page 54](#)

3 - Oil seal between gearbox and bevel box

- ☐ Installed in gearbox
- ☐ Renewing with gearbox removed ⇒ [page 192](#)

4 - Oil seal for selector shaft

- ☐ Renewing ⇒ [page 69](#)

5 - Oil seal for flange shaft (right-side)

- ☐ Renewing with gearbox removed ⇒ [page 223](#)

6 - Oil seal

- ☐ Renew after removing
- ☐ Insert in annular groove in flange shaft (right-side)
- ☐ Remove needle bearings (polygon bearings) -item 8- in order to renew oil seal
⇒ [page 197](#)

7 - Flange shaft (right-side)

- ☐ Removing and installing
⇒ [page 209](#)

8 - Needle bearing (polygon bearing)

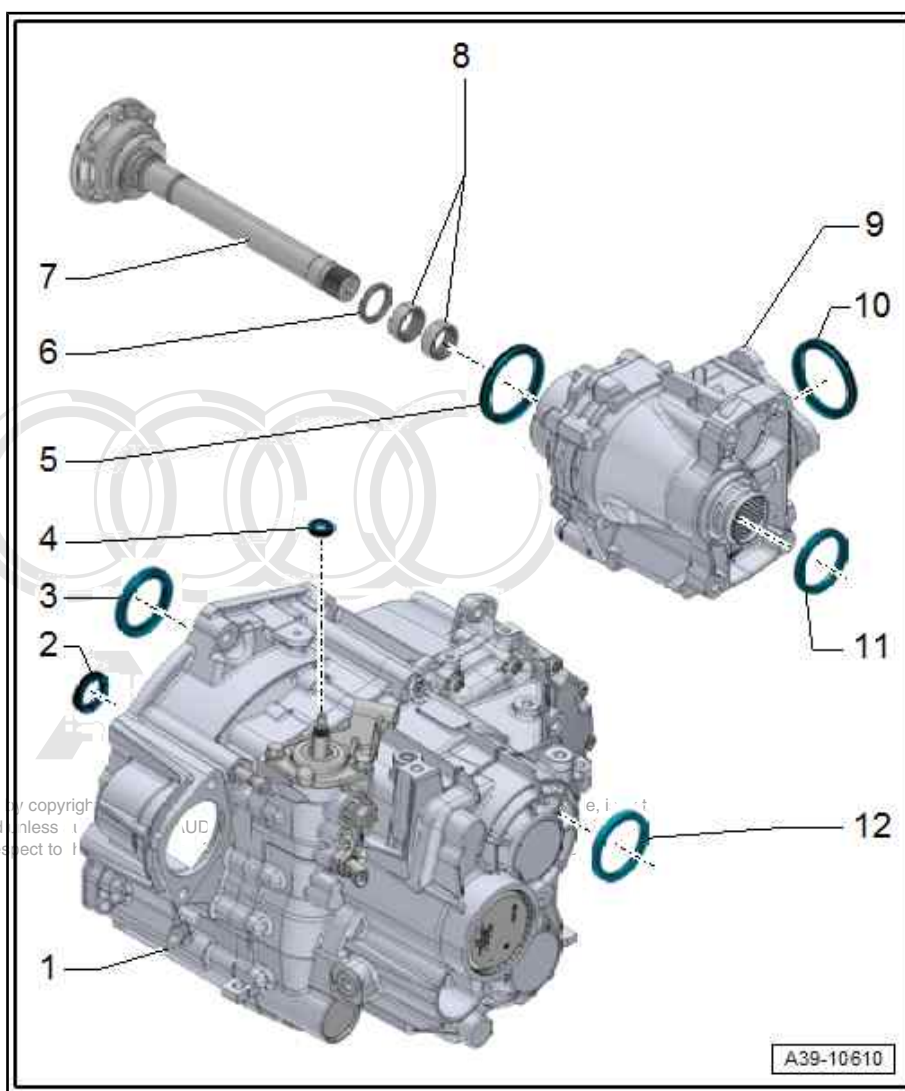
- ☐ Does not turn easily when flange shaft is removed; this does not indicate a fault
- ☐ Acoustic check can only be performed when installed
- ☐ Check for damage such as cracking in outer race
- ☐ Renewing ⇒ [page 197](#)

9 - Bevel box

- ☐ Renewing oil seals ⇒ [page 223](#)

10 - Oil seal

- ☐ For output flange
- ☐ Renewing (with bevel box installed) ⇒ [page 225](#)



- ☐ Renewing (with bevel box removed) ⇒ [page 229](#)

11 - Oil seal

- ☐ On bevel box between gearbox and bevel box
- ☐ Renewing ⇒ [page 224](#)

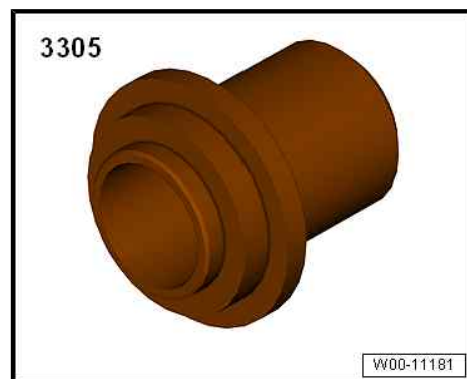
12 - Flange shaft oil seal (left-side)

- ☐ Renewing ⇒ [page 191](#)

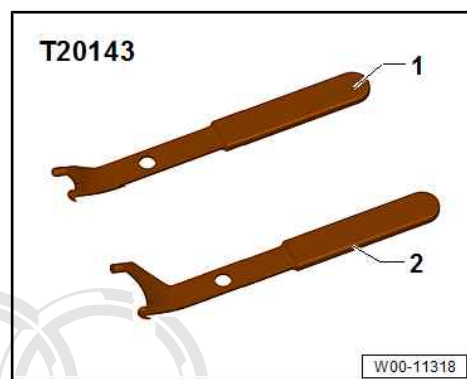
1.2 Renewing oil seal (left-side)

Special tools and workshop equipment required

- ◆ Thrust piece - 3305-



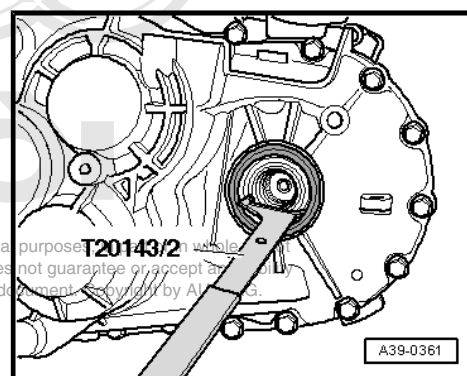
- ◆ Extractor tool - T20143/2-



- ◆ Sealing grease - G 052 128 A1-

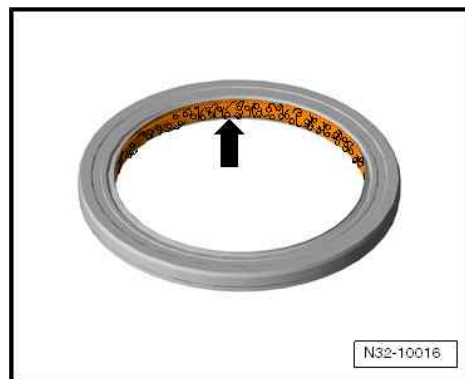
Procedure

- Gearbox in vehicle
- Remove flange shaft (left-side) ⇒ [page 207](#) .
- Use extractor tool - T20143/2- to pull out flange shaft oil seal (left-side).

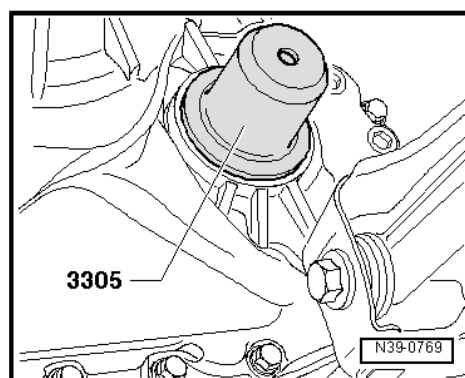


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- Lightly oil outer circumference of new oil seal.
- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .



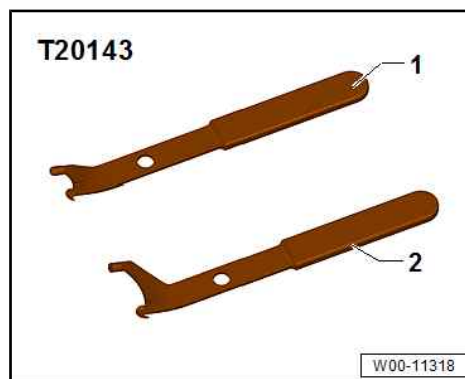
- Drive in oil seal onto stop using thrust piece - 3305- . Take care to keep seal straight when installing.
- Install flange shaft (left-side) ⇒ [page 207](#) .
- Check oil level in gearbox and top up with gear oil if necessary ⇒ [page 95](#) .



1.3 Renewing oil seal (right-side)

Special tools and workshop equipment required

- ◆ Extractor tool - T20143/2-



- ◆ Thrust piece - T10243-

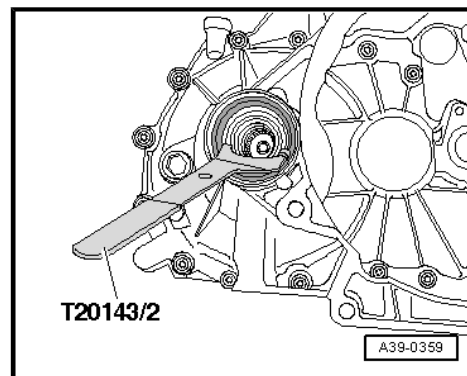


- ◆ Sealing grease - G 052 128 A1-

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Procedure

- Bevel box removed ⇒ [page 97](#) .
- Pull out oil seal for bevel box using extractor tool - T20143/2- .

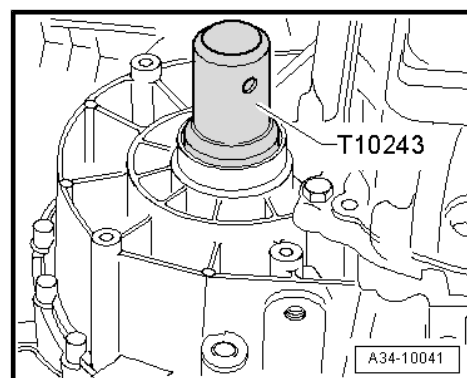


- Lubricate outer circumference of new oil seal with gear oil.
- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .



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- Drive in oil seal until seal reaches stop (take care to keep seal straight).
- Attach bevel box to gearbox and engine ⇒ [page 97](#) .
- Install gearbox with engine ⇒ Rep. gr. 10 ; Removing and installing engine; Installing engine .
- Check gear oil level in manual gearbox and top up as required ⇒ [page 95](#) .



2 Differential

⇒ [“2.1 Exploded view - differential”, page 194](#)

⇒ [“2.2 Renewing needle bearings and flange shaft oil seal \(right-side\)”, page 197](#)

⇒ [“2.3 Dismantling and assembling differential”, page 199](#)

⇒ [“2.4 Adjusting differential”, page 204](#)

⇒ [“2.5 Removing and installing flange shaft \(left-side\)”, page 207](#)

⇒ [“2.6 Removing and installing flange shaft \(right-side\)”, page 209](#)

2.1 Exploded view - differential



Note

- ◆ *Secure gearbox to assembly stand ⇒ [page 109](#).*
- ◆ *Use inductive heater - VAS 6414- to heat tapered roller bearing inner race to 100 °C before installing.*
- ◆ *Always renew both tapered roller bearings together.*
- ◆ *Adjust differential if tapered roller bearings, differential cage, gearbox housing or clutch housing are renewed ⇒ [page 204](#).*



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1 - Gearbox housing

2 - Shim

- ☐ For differential
- ☐ Determining thickness
⇒ [page 204](#)

3 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 203](#)
- ☐ Pressing in
⇒ [page 203](#)

4 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 202](#)
- ☐ Pressing on
⇒ [page 202](#)

5 - Differential cage

- ☐ With riveted final drive gear

6 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 202](#)
- ☐ Pressing on
⇒ [page 203](#)

7 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 201](#)
- ☐ Pressing in
⇒ [page 202](#)

8 - Shim

- ☐ 0.65 mm thick
- ☐ Installation position:
Shoulder on inside diameter faces towards bevel box ⇒ [Item 18 \(page 196\)](#)

9 - Clutch housing

10 - Oil seal

- ☐ In gearbox, fitted between gearbox and bevel box
- ☐ Renewing with gearbox removed ⇒ [page 192](#)

11 - Oil seal

- ☐ For flange shaft (right-side)
- ☐ Different diameters for left and right
- ☐ Renewing with gearbox removed ⇒ [page 223](#)

12 - Bolt

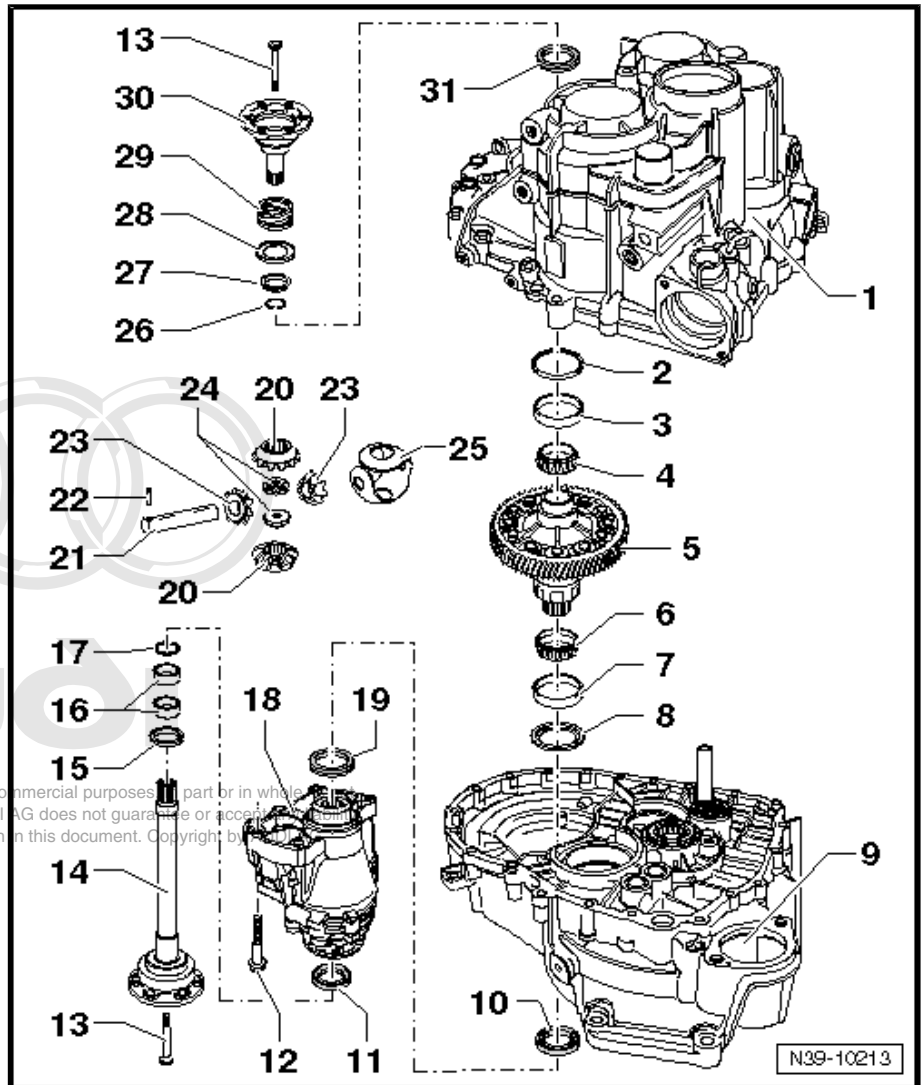
- ☐ 40 Nm and turn 90° further
- ☐ 4x
- ☐ Renew

13 - Countersunk bolt

- ☐ 33 Nm
- ☐ Screws into threaded piece ⇒ [Item 24 \(page 196\)](#)

14 - Flange shaft (right-side)

- ☐ Removing and installing ⇒ [page 209](#)



15 - Oil seal

- ☐ Insert in annular groove in flange shaft (right-side)
- ☐ Remove needle bearings (polygon bearings ⇒ [Item 16 \(page 196\)](#)) in order to renew

16 - Needle bearing (polygon bearing)

- ☐ Renewing ⇒ [page 197](#)

17 - Circlip

- ☐ Renew

18 - Bevel box

- ☐ Removing and installing ⇒ [page 97](#)
- ☐ ⇒ ["5.2 Renewing oil seals for bevel box", page 223](#)

19 - Oil seal between bevel box and gearbox

- ☐ Installed in bevel box
- ☐ Renewing (with bevel box removed) ⇒ [page 224](#)

20 - Sun wheel

- ☐ Installing ⇒ [page 204](#)

21 - Differential pinion pin

- ☐ Removing ⇒ [page 203](#)
- ☐ Installing ⇒ [page 204](#)

22 - Clamping sleeve

- ☐ Secures differential pinion pin
- ☐ Removing ⇒ [page 203](#)
- ☐ Drive new spring pin in flush ⇒ [page 204](#)

23 - Planet pinion

- ☐ Removing and installing ⇒ [page 204](#)

24 - Threaded piece

- ☐ Installing ⇒ [page 204](#)

25 - One-piece thrust washer

- ☐ Lubricate with gear oil before installing

26 - Circlip

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

27 - Tapered ring

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

28 - Thrust washer

- ☐ Installation position: Shoulder towards spring, lugs towards tapered ring

29 - Spring for flange shaft (left-side)

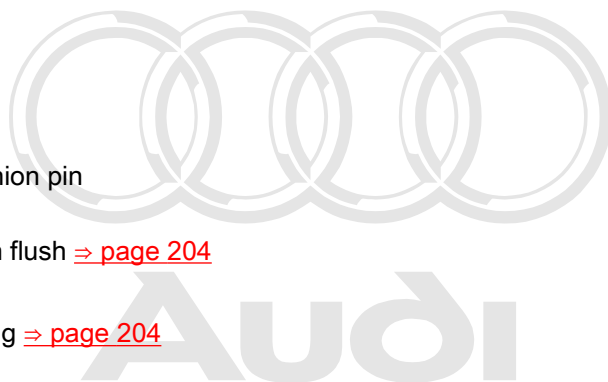
- ☐ Installed behind flange shaft (left-side)

30 - Flange shaft (left-side)

- ☐ Removing and installing ⇒ [page 207](#)

31 - Oil seal

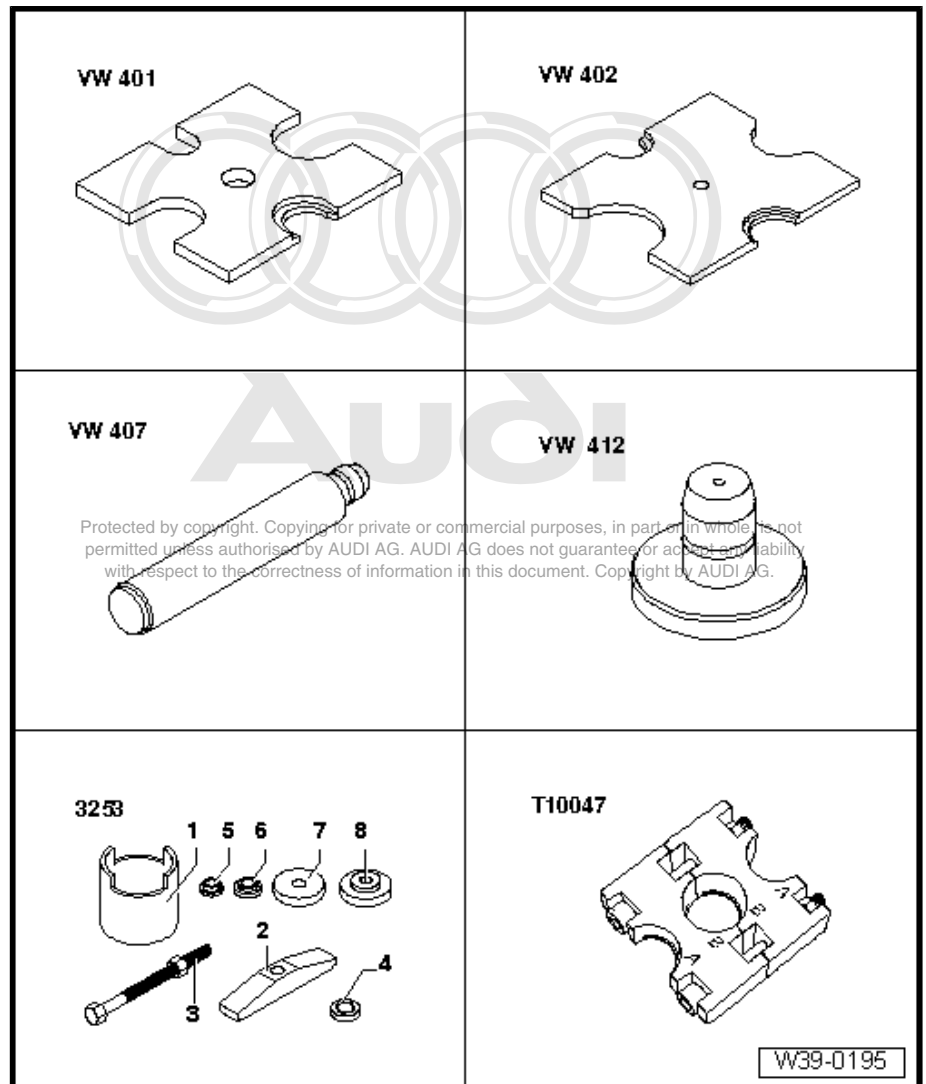
- ☐ For flange shaft (left-side)
- ☐ Different diameters for left and right
- ☐ Renewing with gearbox installed ⇒ [page 191](#)



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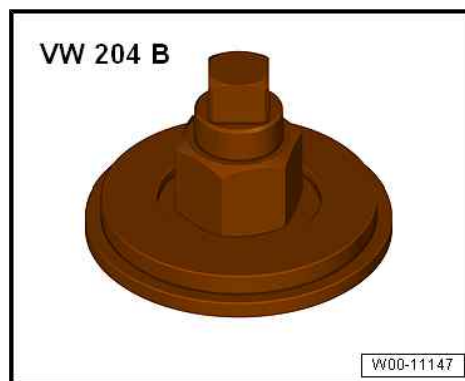
2.2 Renewing needle bearings and flange shaft oil seal (right-side)

Special tools and workshop equipment required



- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 412-
- ◆ Assembly tool - VAS 3253-
- ◆ Tensioning device - T10047-

◆ Crankshaft seal fitting tool - VW 204 B-

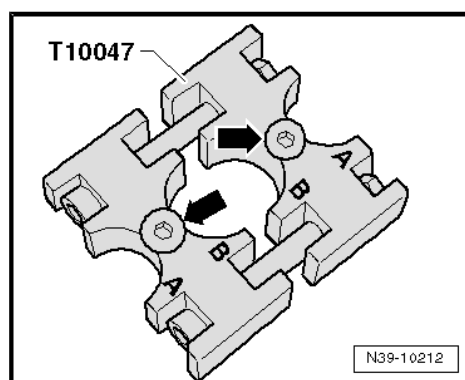


Procedure

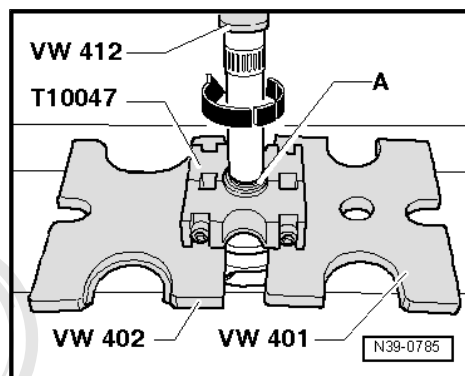
- Remove flange shaft (right-side) ⇒ [page 209](#) .

Attach clamp - T10047- to flange shaft as follows:

- Marks “B” on both parts of tool face each other.
- The stepped shoulders -arrows- must then be below the bearing.
- Screw parts together as far as stop.



- Remove circlip -A- for needle bearings.
- To prevent damage to contact surface of needle bearings on shaft, rotate shaft -arrow- when pressing on.

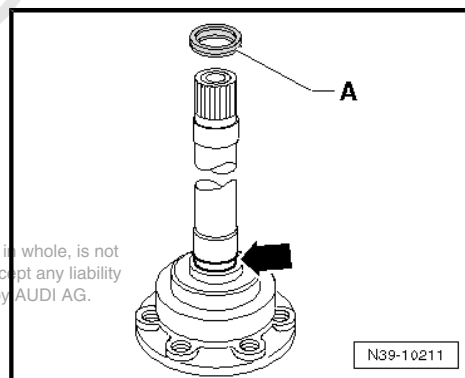


- Remove old oil seal -A- from groove -arrow-.
- Lubricate new oil seal -A- lightly with gear oil and install.

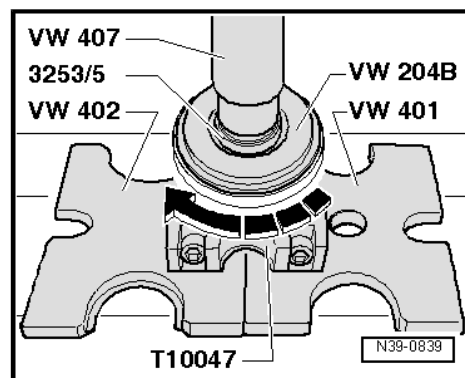
***i** Note*

Make sure that seal is not twisted.

- Attach clamp - T10047- to flange shaft ⇒ [page 198](#) .

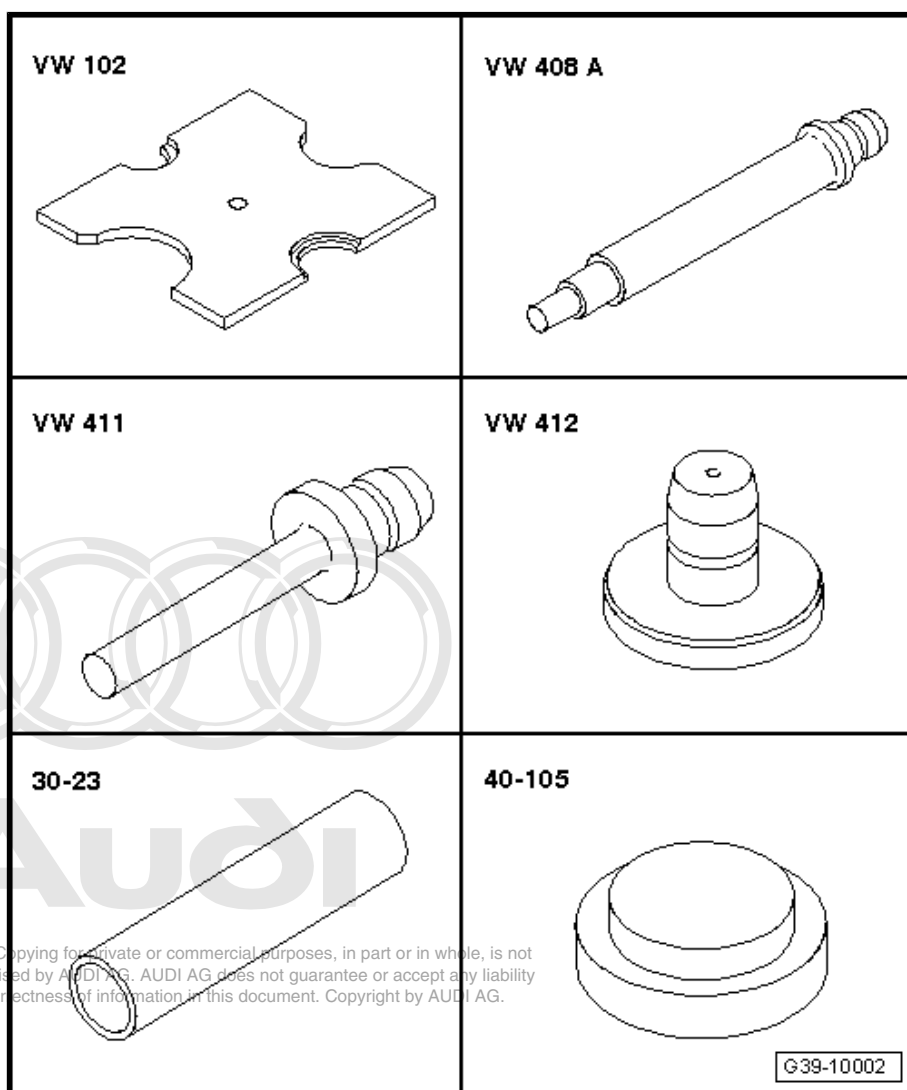


- To prevent damage to contact surface of needle bearings on shaft, rotate shaft -arrow- when pressing off.
- Secure needle bearings on flange shaft with a new circlip.
- Install flange shaft (right-side) ⇒ [page 212](#).



2.3 Dismantling and assembling differential

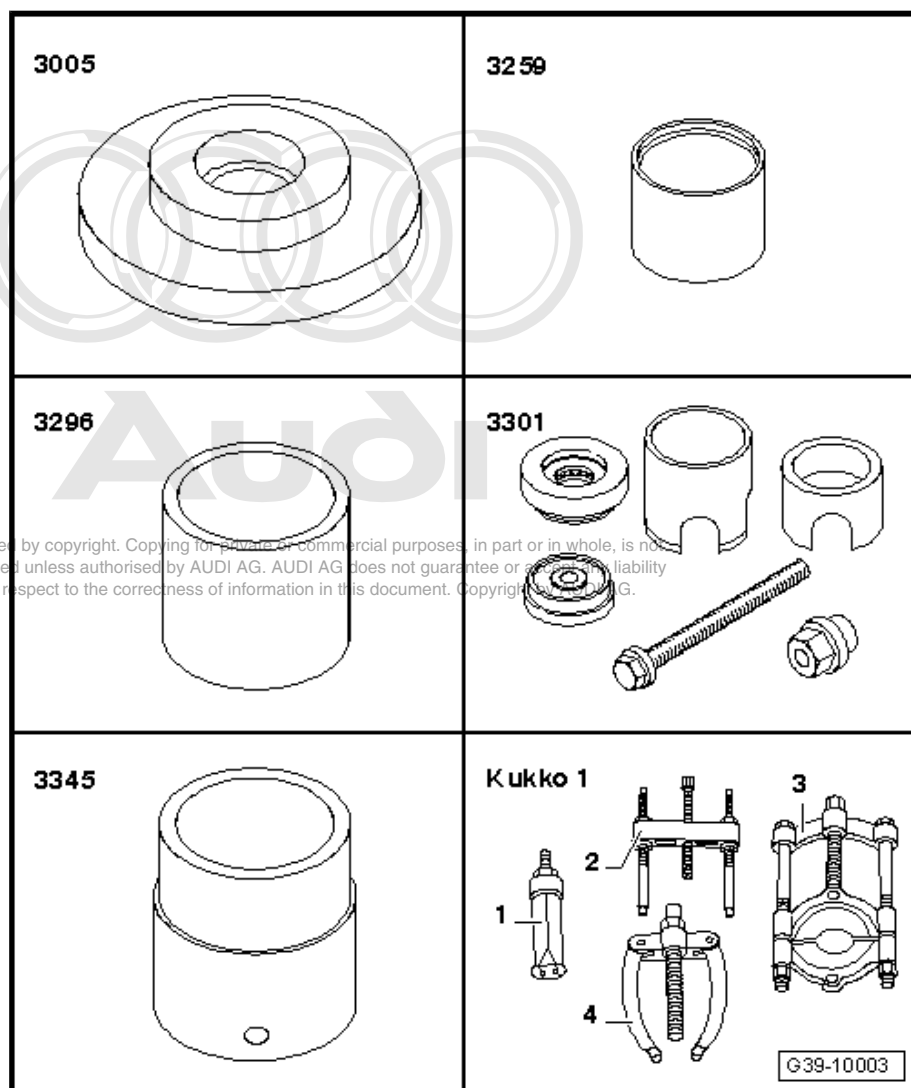
Special tools and workshop equipment required



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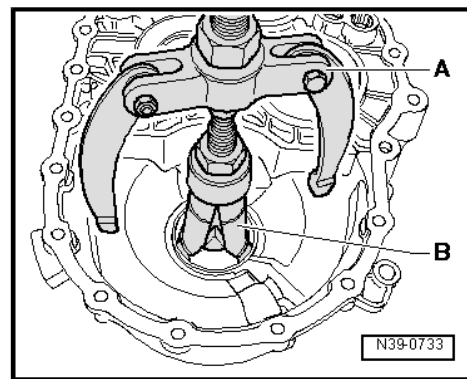
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 411-
- ◆ Press tool - VW 412-
- ◆ Extension - 30 - 23-

◆ Thrust plate - 40 - 105-

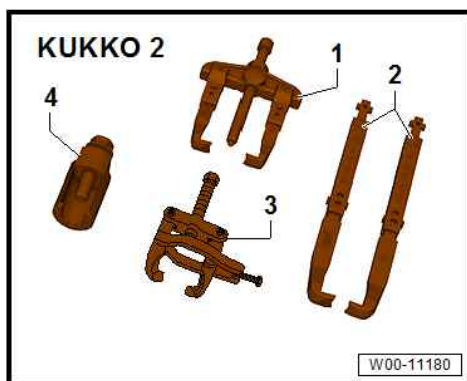


- ◆ Thrust plate - 3005-
- ◆ Tube - 3259-
- ◆ Tube - 3296-
- ◆ Assembly tool - 3301-
- ◆ Tube - 3345-
- ◆ -1- Internal puller - Kukko 21/7-
- ◆ -2- Puller - Kukko 18/1-
- ◆ -3- Splitter - Kukko 17/1-
- ◆ -4- Counter-support - Kukko 22/2-

- ◆ Inductive heater - VAS 6414-



- ◆ -3- Puller - Kukko 204/2-



Pulling tapered roller bearing outer race out of gearbox housing

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

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

- Clamp internal puller -B- firmly between tapered roller bearing outer race and shim.



Note

*After pulling out, check shim
⇒ **Item 8 (page 195)** for damage and renew if necessary.*



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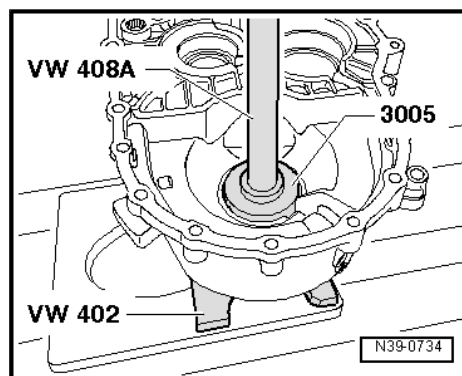
Pressing tapered roller bearing outer race into clutch housing

- First install shim ⇒ [Item 8 \(page 195\)](#) .



Note

- ◆ Note installation position of shim.
- ◆ Shoulder on inside diameter faces oil seal in clutch housing.



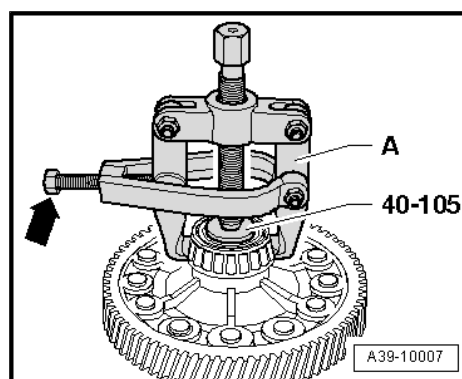
Pulling off tapered roller bearing inner race

- Fit thrust plate - 40 - 105- onto differential cage.
- Clamp jaws of puller (e.g. -Kukko 204/2-) under tapered roller bearing inner race on flat surfaces of differential cage.



Note

When pulling off the inner race ensure that the hooks do not bend outwards, if necessary tighten bolt -arrow-.



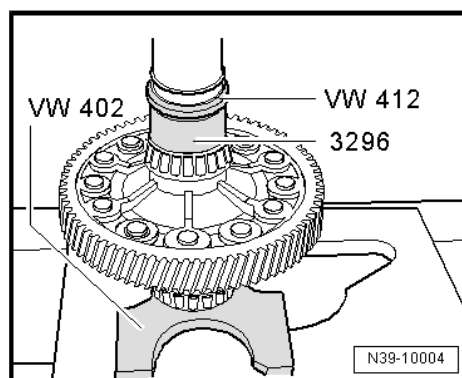
Heating and pressing on tapered roller bearing inner race



WARNING

Wear protective gloves.

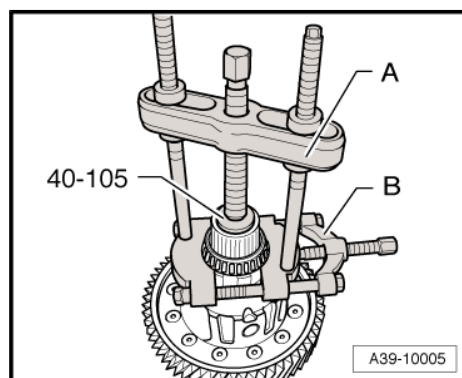
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Pulling off tapered roller bearing inner race

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

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



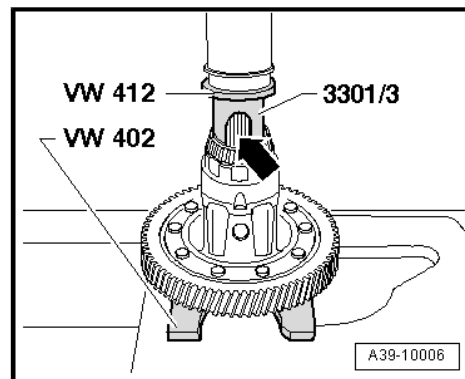
Heating and pressing on tapered roller bearing inner race



WARNING

Wear protective gloves.

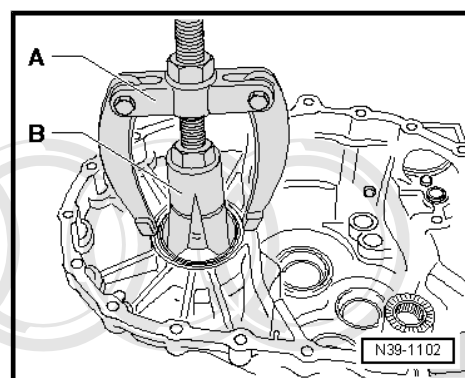
- Fit sleeve -3301/3- of assembly device - 3301- onto tapered roller bearing inner race with recess -arrow- (larger inner diameter) facing downwards.



Pulling tapered roller bearing outer race out of gearbox housing

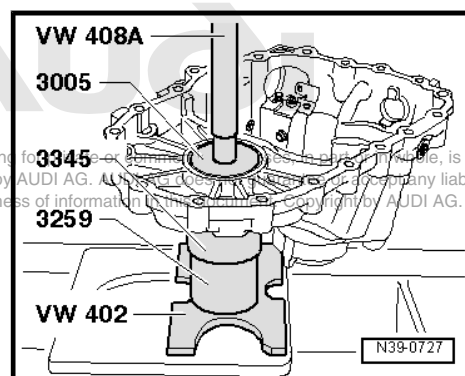
A - Counter-support , e.g. -Kukko 22/2-

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



Pressing tapered roller bearing outer race into gearbox housing

- Support gearbox housing with tube - 3345- directly below bearing mounting.



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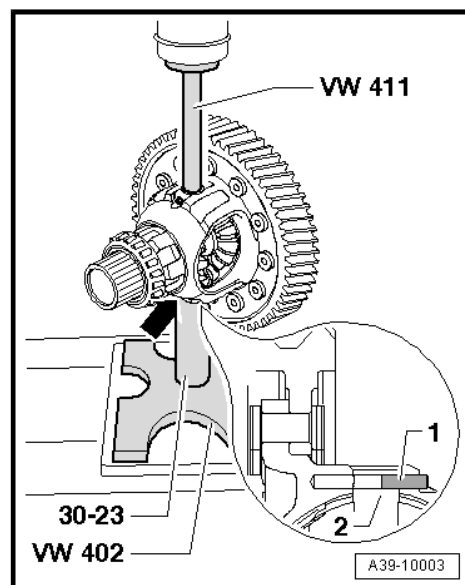
Removing differential pinion pin and spring pin for differential pinion pin

- First drive spring pin -1- into differential pinion pin -2- so it is flush.
- Fit differential under press, with spring pin -arrow- facing towards extension - 30 - 23- .
- Now press out differential pinion pin.



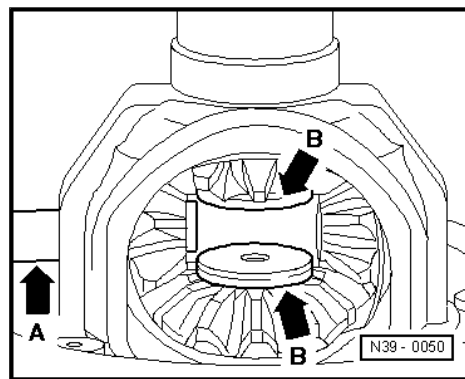
Note

Remove any sheared off parts of the spring pin from the differential cage and differential pinion pin.



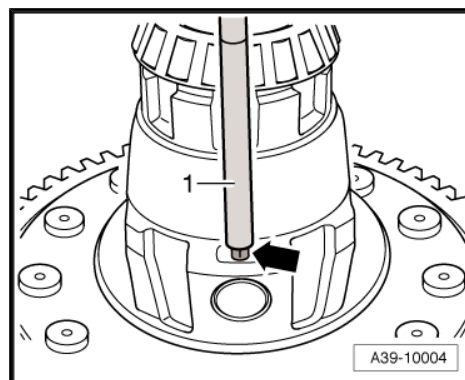
Installing differential bevel gears

- Lubricate one-piece thrust washer with gear oil and install.
- Install both sun wheels and secure (e.g. with flange shaft).
- Fit planet pinions (180° apart) and pivot into position.
- Push differential pinion pin -arrow A- in as far as first planet pinion.
- Fit threaded pieces -arrows B- in sun wheels.
- Installation position: Stepped shoulder towards sun wheel
- Drive differential pinion pin into final position and secure with spring pin => [page 204](#) .



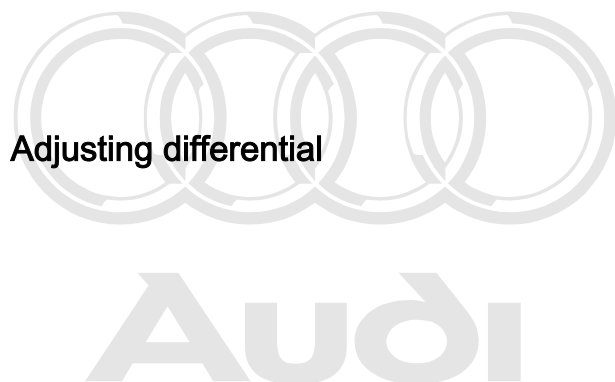
Installing spring pin

- Use a punch -1- to drive new spring pin -arrow- in flush with differential cage.



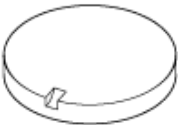
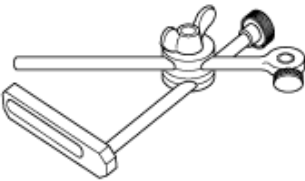
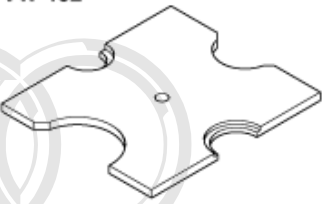
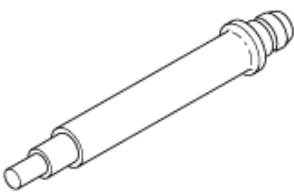
2.4

Adjusting differential



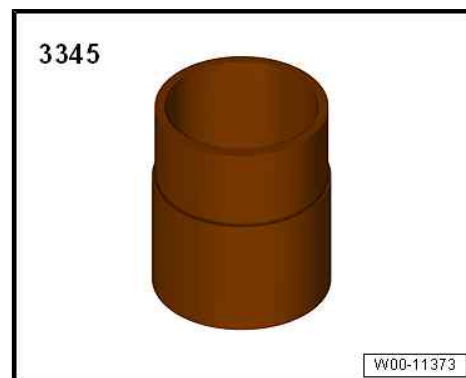
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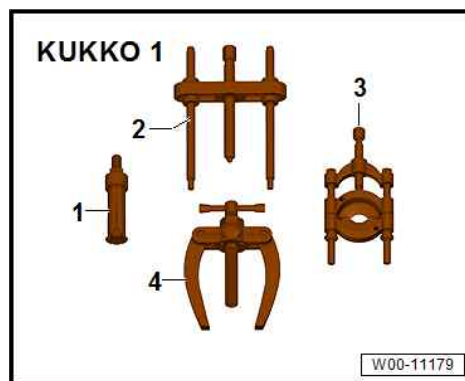
Special tools and workshop equipment required

VW 385/17 	VW 387 
VW 402 	VW 408 A 
3005 	3259  G39-0109

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- ◆ End measuring plate - VW 385/17-
- ◆ Universal dial gauge bracket - VW 387-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 408 A-
- ◆ Thrust plate - 3005-
- ◆ Tube - 3259-





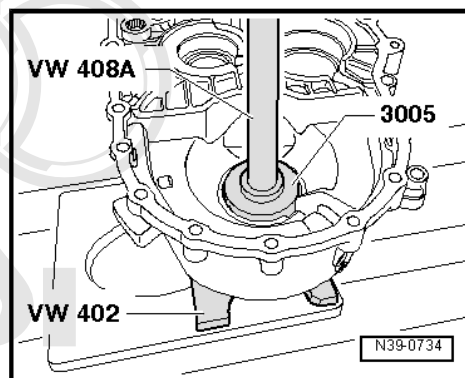
- ◆ Wheel bearing tube - 3345-
- ◆ -1- Internal puller 46 ... 58 mm - Kukko 21/7-
- ◆ -4- Counter-support - Kukko 22/2-
- ◆ Dial gauge - VAS 6080-
- ◆ Dial gauge extension, 30 mm

The differential has to be readjusted when the following components are renewed:

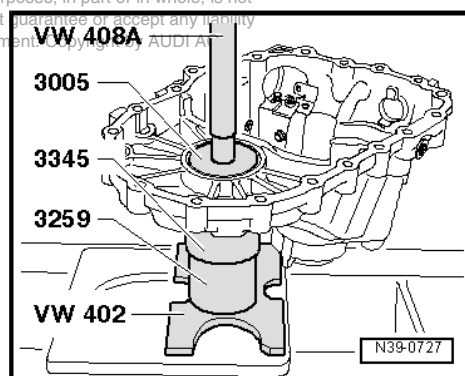
- ◆ Gearbox housing
- ◆ Clutch housing
- ◆ Differential cage, or
- ◆ Tapered roller bearing for differential

Table of adjustments ⇒ [page 216](#)

- Press tapered roller bearing outer race with shim into clutch housing ⇒ [Item 8 \(page 195\)](#) .
- Installation position of shim: Shoulder on inside diameter faces towards oil seal.



- Press tapered roller bearing outer race without shim into the gearbox housing
- Install differential in clutch housing.
- Fit gearbox housing and tighten 5 bolts to specified torque ⇒ [Item 13 \(page 112\)](#) .
- Press differential towards clutch housing; hold in this position and turn eight times.
- Press differential towards gearbox housing; hold in this position and turn eight times.



- Attach dial gauge e.g. -VAS 6080- to gearbox housing and set to "0" with 1 mm preload.

A - Dial gauge extension, 30 mm

- Move differential up and down and note play indicated on dial gauge (in this example: 0.70 mm).

Determining thickness of shim

The specified bearing preload is obtained by adding a constant figure (0.25 mm) to the reading indicated.

Example:

Measured value	0.70 mm
+ Preload (constant value)	0.25 mm
Thickness of shim =	0.95 mm

- Take off gearbox housing.
- Pull tapered roller bearing outer race out of gearbox housing.

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

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

- Select shim of required thickness from table; for part numbers, refer to ⇒ Electronic parts catalogue .
- Insert shim of correct thickness.

The following shims are available:

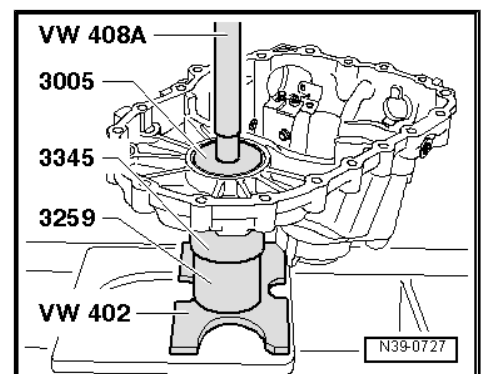
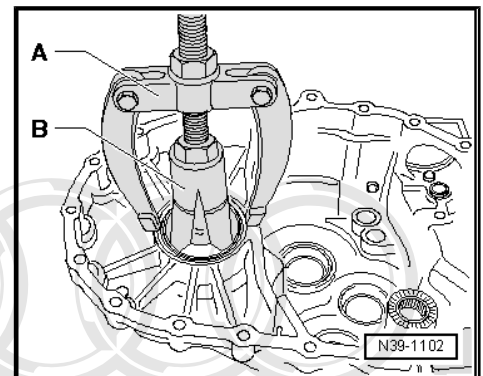
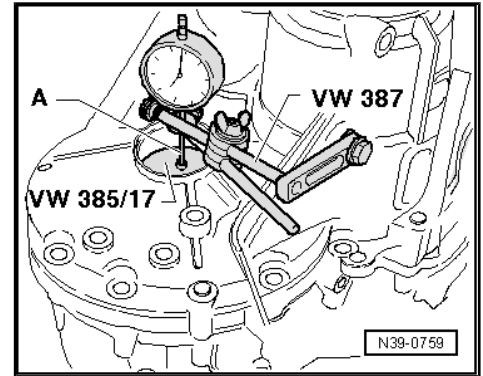
Shim thickness (mm)			
0.65	0.85	1.05	1.25
0.70	0.90	1.10	
0.75	0.95	1.15	
0.80	1.00	1.20	

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

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

- Press outer race in again and tighten gearbox housing bolts to specified torque ⇒ [Item 13 \(page 112\)](#) .



2.5 Removing and installing flange shaft (left-side)

Special tools and workshop equipment required

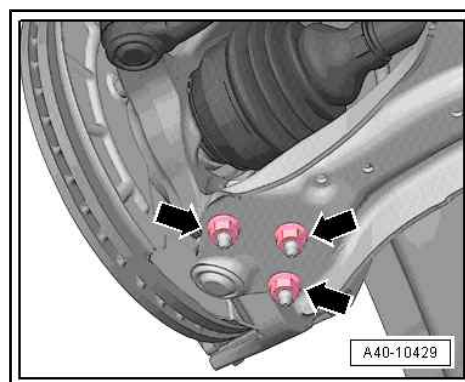
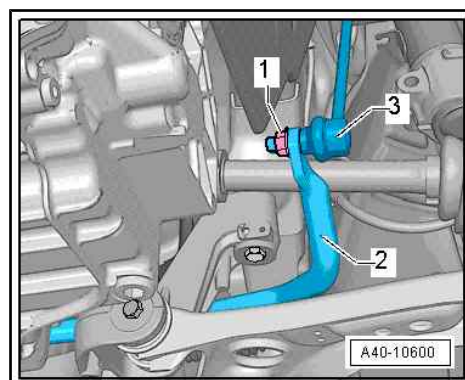
◆ Hook -2024 A /1-



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Removing

- Gearbox in vehicle
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove front wheel (left-side) ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Unbolt drive shaft (left-side) from flange shaft of gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Unscrew nut -1- from coupling rod -3- (left-side) ⇒ Running gear, axles steering; Rep. gr. 40 ; Subframe; Removing and installing coupling rod .
- Pull coupling rod -3- out of anti-roll bar -2- on left side.
- Remove nuts -arrows- securing swivel joint (left-side).
- Disengage swivel joint (left-side) from suspension link.



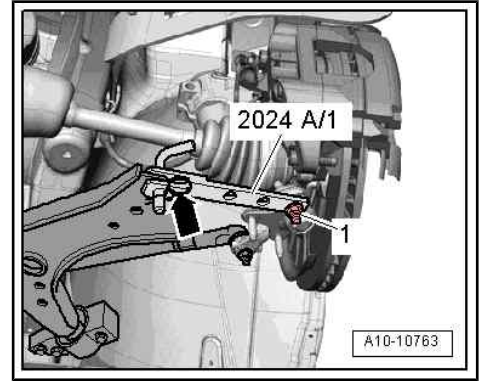
- Swivel suspension strut (left-side) outwards and support with hook -2024 A /1- as shown in illustration.



WARNING

Risk of accident if parts of support are not properly secured.

- ◆ *Secure locking pin and swivel joint with retaining clip -arrow- and nut -1-.*



- Tie up drive shaft (left-side).



Note

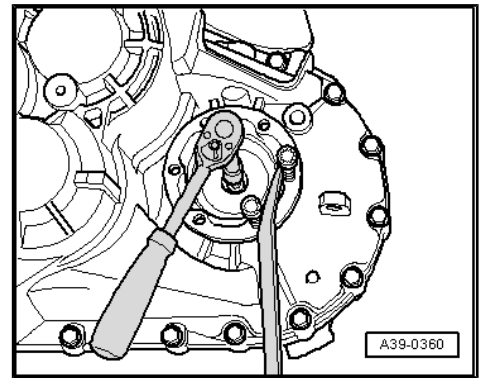
Make sure you do not damage surface coating on drive shaft.

- Remove bolt 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 order; note the following:

- Push flange shaft in against spring pressure and secure with bolt (tighten to specified torque ⇒ [Item 13 \(page 195\)](#)).
- Secure swivel joint (left-side) to suspension link and coupling rod to anti-roll bar ⇒ Running gear, axles steering; Rep. gr. 40 ; Subframe; Exploded view - subframe .
- Secure drive shaft (left-side) to flange shaft in gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .
- Fit front wheel (left-side) ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



2.6 Removing and installing flange shaft (right-side)

⇒ [“2.6.1 Removing and installing flange shaft \(right-side\), Audi A1 quattro”, page 209](#)

⇒ [“2.6.2 Removing and installing flange shaft \(right-side\), Audi S1”, page 213](#)

2.6.1 Removing and installing flange shaft (right-side), Audi A1 quattro

Special tools and workshop equipment required

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◆ Socket (8 mm) - 3247-



◆ Puller - T10037-

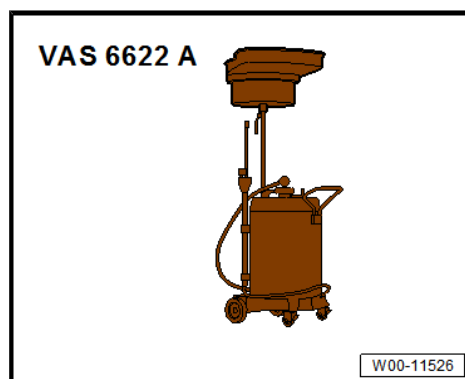


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◆ Socket - T10107 A-



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

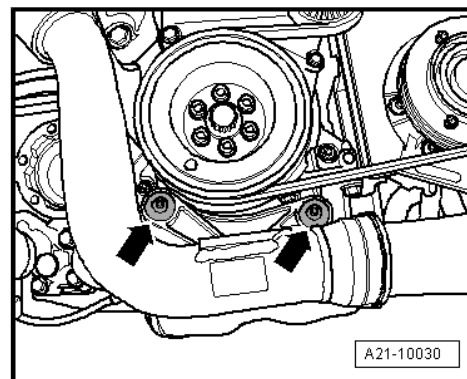


◆ Grease for clutch plate splines - G 000 100-

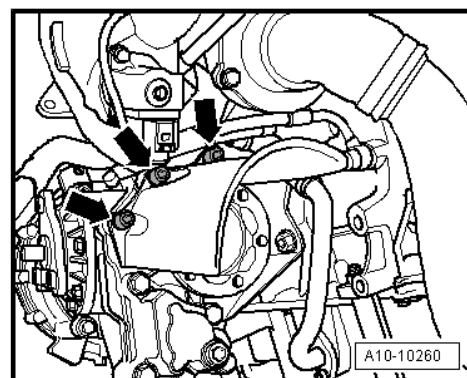
Removing

- Bevel box must be removed together with gearbox and engine
⇒ Rep. gr. 10 ; Removing and installing engine; Removing engine .

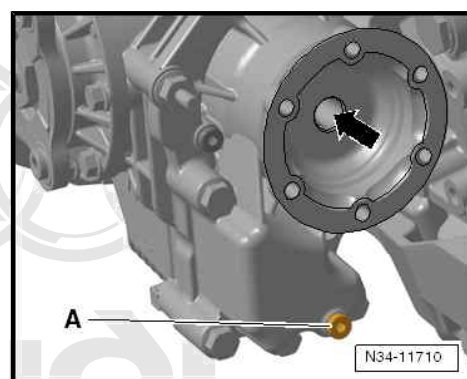
- Remove bolts -arrows- and detach air pipe from turbocharger.



- Detach heat shield for drive shaft (right-side) from bevel box -arrows- using hexagon key extension, 8 mm - 3247- .
- Place used oil collection and extraction unit - VAS 6622A- underneath.



- Remove plug -A- and drain oil from bevel box.
- Then screw in new plug and tighten to 20 Nm.
- Using socket and extended bit - T10107 A- , remove counter-sunk bolt -arrow- securing flange shaft (right-side). To do so, screw two bolts into flange and counterhold flange shaft with suitable lever.



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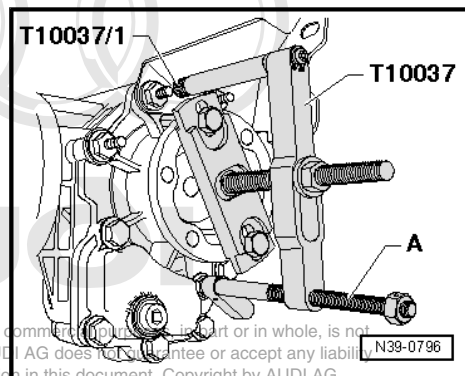
- Attach puller - T10037- to flange shaft (right-side).



Note

Use the puller - T10037- to remove the flange shaft (right-side) to avoid damaging the bearings of the flange shaft.

- Place a spacer (e.g. press tool - T10037/1-) between gearbox carrier and knurled nut - VW 434- .
- Use spindle -A- to align puller parallel with flange.
- Pull out flange shaft (right-side).



Installing

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

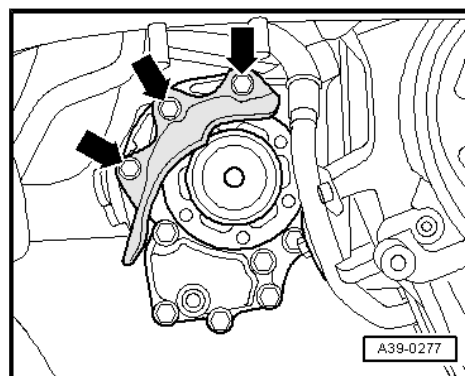
- Bevel box must be attached to gearbox.
- Gearbox carrier between engine and bevel box must be installed.



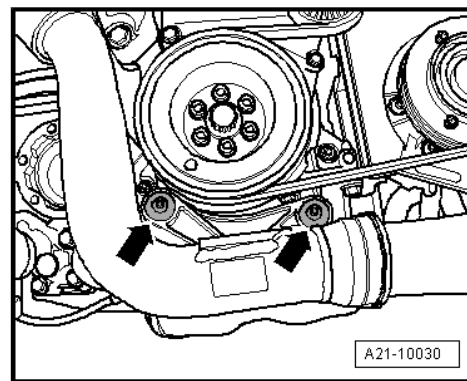
Note

Clean contact surface and sealing surface before installing flange shaft.

- Carefully drive in flange shaft (right-side). At the same time, turn flange shaft to avoid damage to bearings.
- Tighten countersunk bolt for flange shaft (right-side) with socket and extended bit - T10107 A- ; tightening torque [⇒ Item 13 \(page 195\)](#) .
- Fill up bevel box with 0.9 litres of gear oil [⇒ page 218](#) .
- Check gear oil level in bevel box after installing bevel box in vehicle [⇒ page 217](#) .
- Attach heat shield for drive shaft (right-side) to bevel box, tightening the 2 nuts -arrows- to 20 Nm.



- Attach air pipe (right-side) to turbocharger, tightening bolts
-arrows- to specified torque ⇒ Rep. gr. 21 ; Charge air system;
Exploded view - charge air system .



2.6.2 Removing and installing flange shaft (right-side), Audi S1

Special tools and workshop equipment required

- ◆ Socket (8 mm) - 3247-



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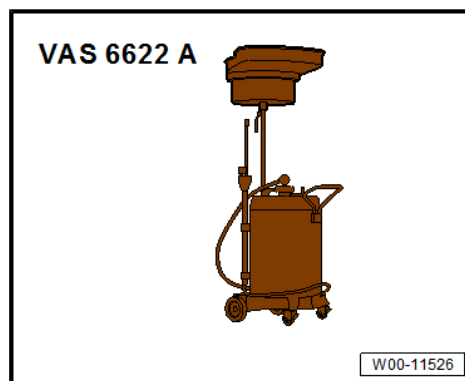
- ◆ Puller - T10037-



- ◆ Socket - T10107 A-



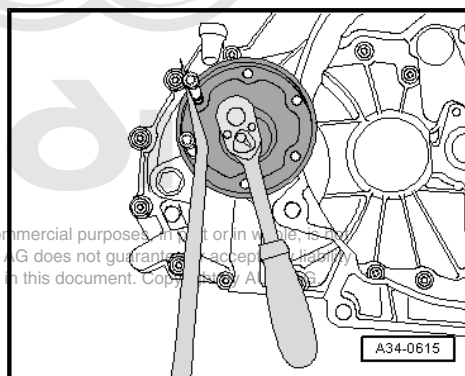
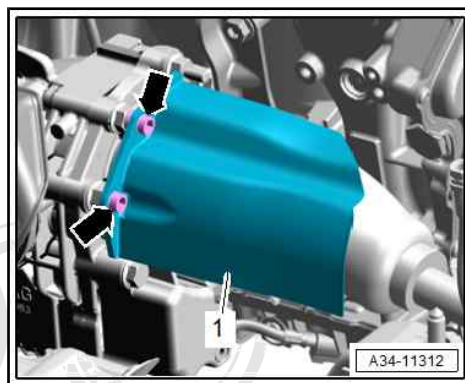
- ◆ Used oil collection and extraction unit - VAS 6622A-



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

Removing

- Gearbox in vehicle
- Remove nuts -arrows- and detach heat shield -1- for drive shaft (right-side).
- Remove drive shaft (right-side) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Using socket and extended bit - T10107- , remove bolt securing flange shaft (right-side). To do so, screw two bolts into flange and counterhold flange shaft with suitable lever.



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- Place used oil collection and extraction unit - VAS 6622A- underneath.
- Bolt puller - T10037- onto flange shaft (right-side) as shown in illustration.
- Use knurled nut -T10037/1- and spindle -A- to align puller so that it is parallel with flange.
- Pull out flange shaft.

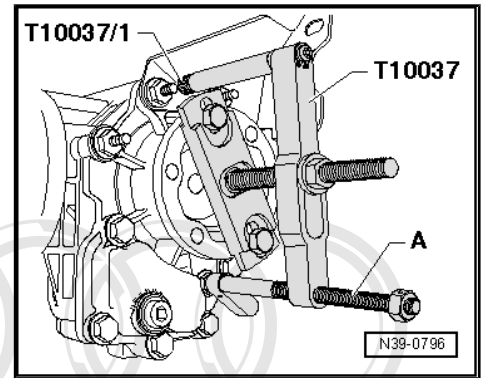
Installing

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

- Carefully drive in flange shaft; when doing so, turn flange shaft to avoid damage to bearings.
- Secure flange shaft.
- Check gear oil level ⇒ [page 217](#) .

Tightening torques

- ◆ ⇒ ["2.1 Exploded view - differential", page 194](#)
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40; Drive shaft;
Exploded view - drive shaft



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3 Table of adjustments



Note

If repairs have been carried out on the gearbox, it is only necessary to adjust the output shaft for 1st - 4th gear, the output shaft for 5th, 6th and reverse gear or the differential if components have been renewed which have a direct effect on the adjustment of the gearbox. Refer to the following table to avoid unnecessary adjustment work:

Components renewed:	Components requiring adjustment:		
	Output shaft for 1st - 4th gear ⇒ page 181	Output shaft for 5th, 6th and reverse gear ⇒ page 185	Differential ⇒ page 204
Gearbox housing	x	x	x
Clutch housing	x	x	x
Output shaft for 1st - 4th gear	x		
Output shaft for 5th, 6th and reverse gear		x	
Differential cage			x
Tapered roller bearing for 1st - 4th gear output shaft	x		
Tapered roller bearing for 5th/6th and reverse gear output shaft		x	
Tapered roller bearing for differential			x

4 Gear oil

⇒ ["4.1 Checking gear oil level", page 217](#)

⇒ ["4.2 Draining and filling gear oil", page 218](#)

4.1 Checking gear oil level

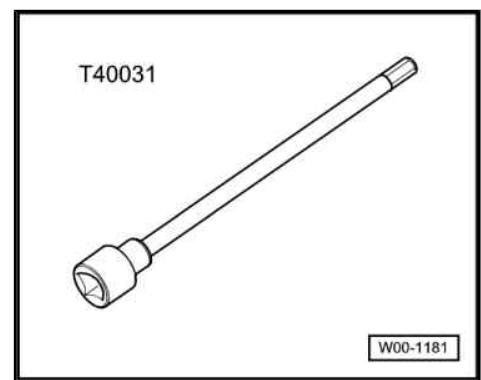


Note

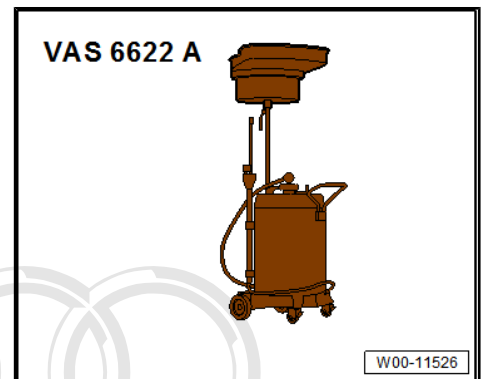
- ◆ *The bevel box is secured to the side of the gearbox and has a separate oil filling.*
- ◆ *For gear oil specifications, refer to ⇒ Electronic parts catalogue .*

Special tools and workshop equipment required

- ◆ Socket - T40031-



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



Procedure



Note

Renew oil filler plug.

- Drive vehicle onto a four-pillar lifting platform or over an inspection pit so it is standing horizontal.
- Remove noise insulation ⇒ **General body repairs, exterior, Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .**

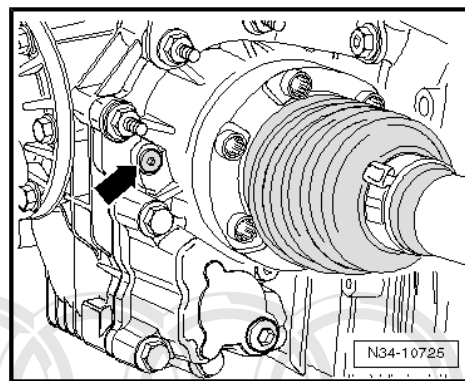
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- Place used oil collection and extraction unit - VAS 6622A- below bevel box.



Note

- ◆ *Illustration shows bevel box without heat shield for drive shaft (right-side).*
- ◆ *A1 quattro: The heat shield for drive shaft (right-side) can only be detached from the bevel box when the engine and gearbox are removed, as the 3 securing nuts are difficult to access.*
- ◆ *Place a cloth below the oil filler plug -arrow- to catch escaping gear oil.*
- Remove oil filler plug -arrow- in bevel box, e.g. with socket and key - T40031- .
- Specification: oil level up to bottom lip of filler hole
- Top up gear oil as necessary ⇒ [page 218](#) .



Note

Carefully remove any traces of escaped oil on bevel box.

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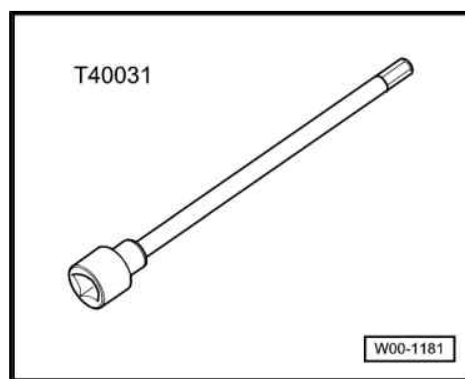
Tightening torques

- ◆ ⇒ [Item 5 \(page 221\)](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

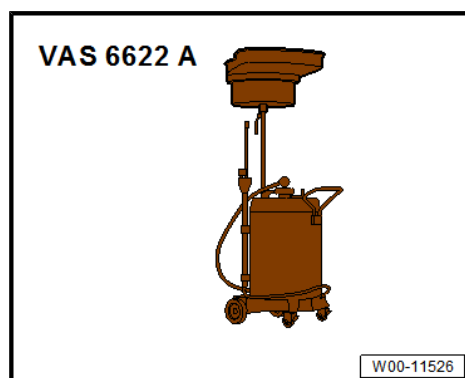
4.2 Draining and filling gear oil

Special tools and workshop equipment required

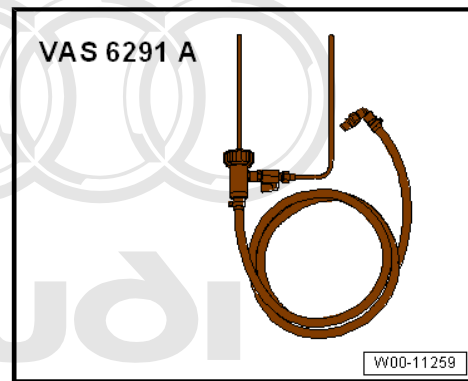
- ◆ Socket - T40031-



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



- ◆ Charging device for Haldex coupling 2 - VAS 6291 A-



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Draining



Note

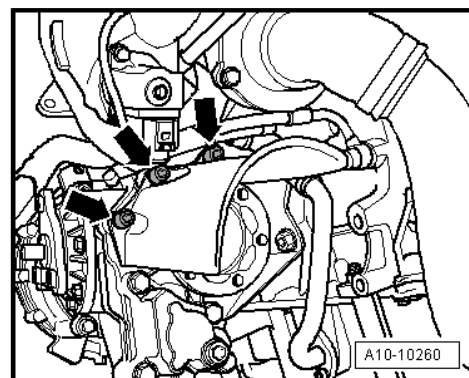
Renew oil drain plug and oil filler plug.

- Drive vehicle onto a four-pillar lifting platform or over an inspection pit so it is standing horizontal.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



Note

- ◆ *A1 quattro: The heat shield for drive shaft (right-side) can only be detached from the bevel box when the engine and gearbox are removed, as the 3 securing nuts -arrows- are difficult to access.*
- ◆ *Place a cloth below the oil filler plug -arrow- to catch escaping gear oil.*
- Place used oil collection and extraction unit - VAS 6622A- below bevel box.
- Unscrew oil drain plug ⇒ [Item 3 \(page 221\)](#) and allow gear oil to drain.
- Fit and tighten new oil drain plug.



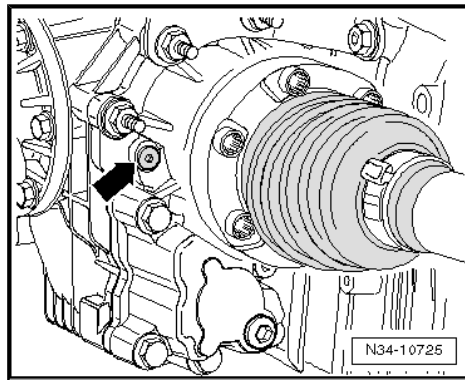
Filling

- Remove oil filler plug -arrow- in bevel box, e.g. with socket and key - T40031- .
- Fill bevel box with gear oil e.g. using charging device for Haldex coupling2 - VAS 6291 A- until gear oil emerges at bottom lip of oil filler hole.
- Fit new oil filler plug and tighten.



Note

Carefully remove any traces of escaped oil on bevel box.



Tightening torques

- ◆ ⇒ [Item 3 \(page 221\)](#) , ⇒ [Item 5 \(page 221\)](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



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5 Bevel box

⇒ ["5.1 Exploded view - bevel box", page 221](#)

⇒ ["5.2 Renewing oil seals for bevel box", page 223](#)

5.1 Exploded view - bevel box

1 - Oil seal between bevel box and gearbox

- ☐ Installed in bevel box
- ☐ Renewing (with bevel box removed)
⇒ [page 224](#)

2 - Bevel box

- ☐ Removing and installing (with gearbox removed)
⇒ [page 97](#)

3 - Oil drain plug

- ☐ 20 Nm
- ☐ Always renew
- ☐ With captive seal

4 - Oil seal

- ☐ For flange shaft (right-side)
- ☐ Renewing (gearbox with bevel box removed)
⇒ [page 223](#)

5 - Oil filler plug

- ☐ 20 Nm
- ☐ Always renew
- ☐ With captive seal

6 - Breather pipe

- ☐ For bevel box breather
- ☐ Press in onto stop

7 - Cap

- ☐ For bevel box breather

8 - Centre hex stud

- ☐ 30 Nm
- ☐ 2x
- ☐ Centre hex studs secure heat shield for propshaft

9 - Flange shaft (right-side)

- ☐ Removing and installing ⇒ [page 209](#)

10 - Oil seal

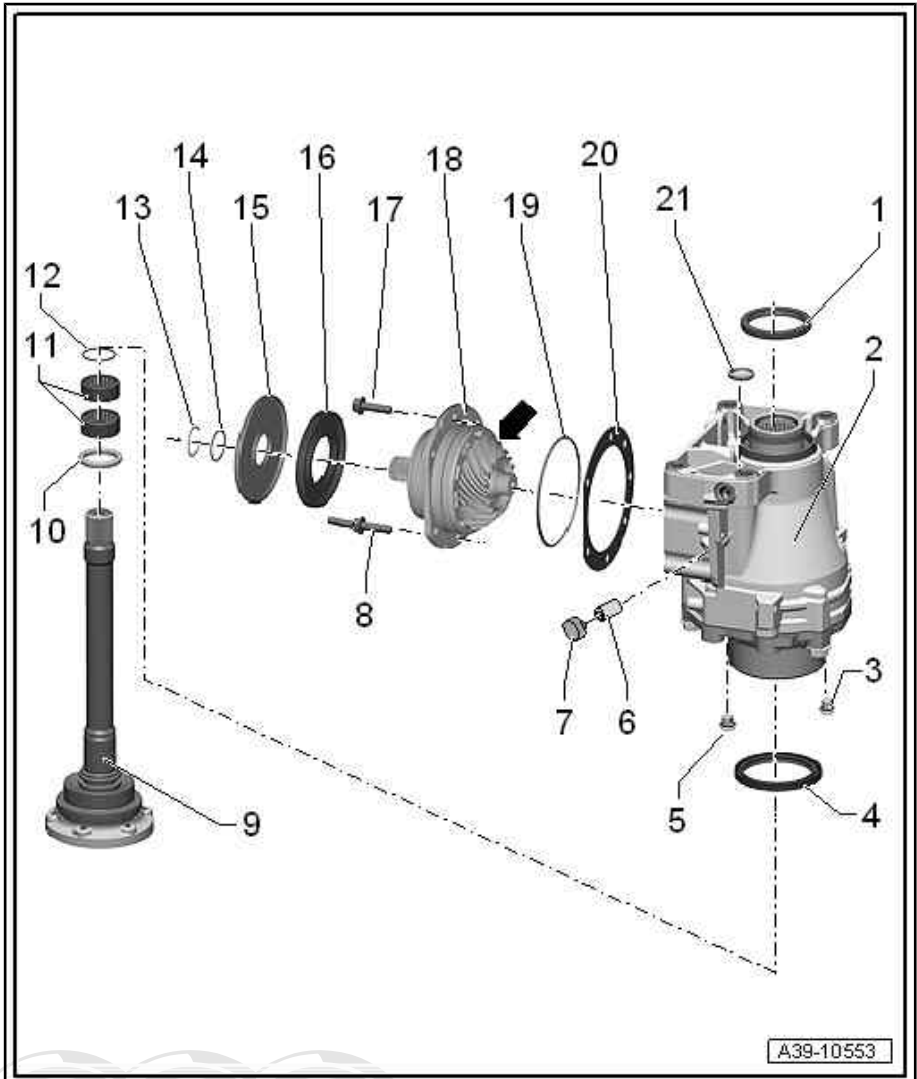
- ☐ Insert in annular groove in flange shaft (right-side)
- ☐ Remove needle bearings (polygon bearings ⇒ [Item 11 \(page 221\)](#)) in order to renew

11 - Needle bearing (polygon bearing)

- ☐ Renewing ⇒ [page 197](#)

12 - Circlip

- ☐ Always renew



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13 - Circlip

- ☐ Always renew ⇒ [page 222](#)
- ☐ Fit in rear annular groove in rear splined shaft ⇒ [page 222](#)

14 - O-ring

- ☐ Always renew
- ☐ Fit in front annular groove in rear splined shaft ⇒ [page 222](#)

15 - Heat shield

- ☐ For oil seal ⇒ [Item 16 \(page 222\)](#)
- ☐ Prise off pinion housing using a screwdriver

16 - Oil seal

- ☐ For rear splined shaft
 - ☐ Renewing (with bevel box removed) ⇒ [page 229](#)
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17 - Bolt

- ☐ 38 Nm
- ☐ 5x

18 - Pinion housing

- ☐ With rear splined shaft bevel gear -arrow- and inner bearing races
- ☐ Components are not available as replacement parts
- ☐ Carefully prise off and drive in on alternate sides ⇒ [page 232](#)
- ☐ Observe bolt holes; pinion housing fits only in one position

19 - O-ring

- ☐ Renewing ⇒ [page 232](#)

20 - Shim

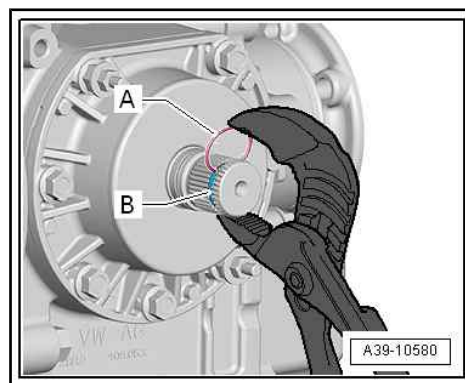
- ☐ Component is not available as a replacement part
- ☐ Observe bolt holes on bevel box; shim can only be fitted in one position

21 - Filler cap

- ☐ Drive in as far as stop using spacer tube - VW 540/1 B- .

Renewing circlip on rear splined shaft

- Circlip must always be renewed after detaching propshaft.
- Use new circlip -A- to press old circlip -B- out of groove in rear splined shaft.



5.2 Renewing oil seals for bevel box

⇒ ["5.2.1 Renewing flange shaft oil seal \(right-side\) on bevel box", page 223](#)

⇒ ["5.2.2 Renewing oil seal between gearbox and bevel box \(on bevel box\)", page 224](#)

⇒ ["5.2.3 Renewing oil seal for rear splined shaft, bevel box installed", page 225](#)

⇒ ["5.2.4 Renewing oil seal for rear splined shaft, bevel box removed", page 229](#)

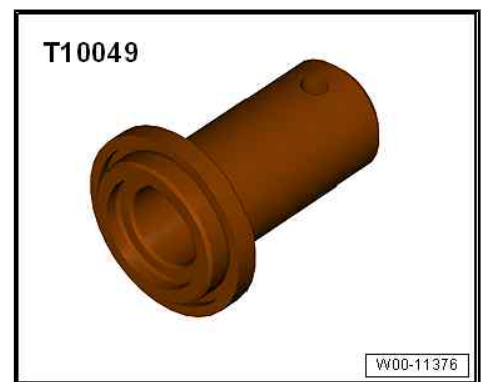
⇒ ["5.2.5 Renewing O-ring for pinion housing", page 232](#)

5.2.1 Renewing flange shaft oil seal (right-side) on bevel box

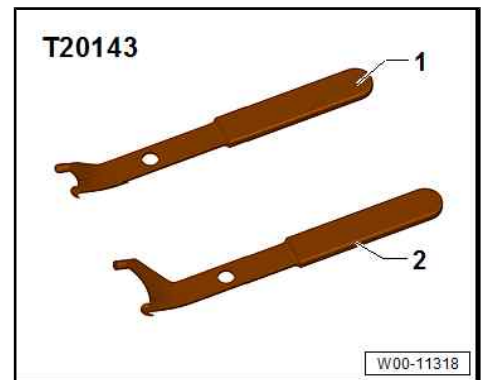
Special tools and workshop equipment required

- ◆ Thrust piece - T10049-

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- ◆ Extractor tool - T20143/2-

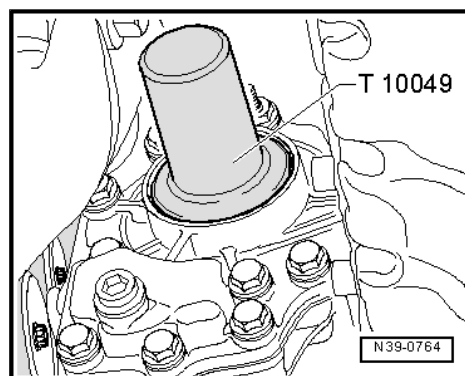


- ◆ Sealing grease - G 052 128 A1-

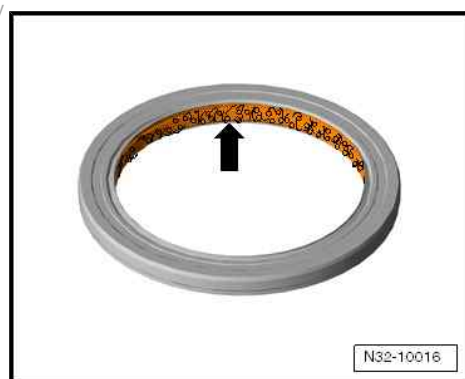
Procedure

- Remove flange shaft (right-side) ⇒ [page 209](#) .
- Use extractor tool - T20143/2- to pull out flange shaft oil seal.
- Clean contact surface and sealing surface.
- Lightly oil outer circumference of new oil seal.

- Drive in oil seal onto stop using thrust piece - T10049- . Take care to keep seal straight when installing.



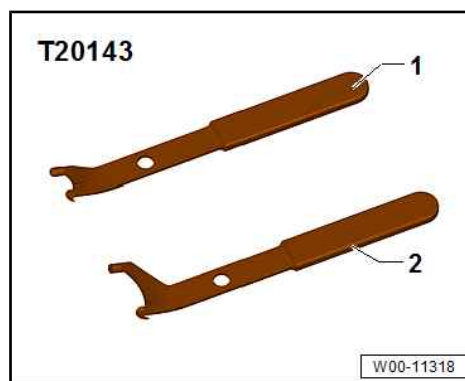
- Pack space between sealing lip and dust lip arrow, half full with sealing grease - G 052 128 A1- .
- Install flange shaft (right-side) ⇒ [page 212](#) .



5.2.2 Renewing oil seal between gearbox and bevel box (on bevel box)

Special tools and workshop equipment required

- ◆ Extractor tool - T20143-

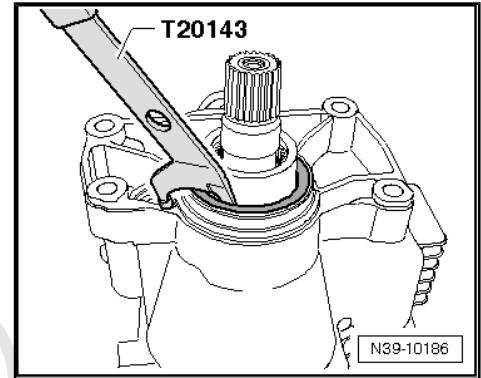


- ◆ Thrust piece - T10298-



Procedure

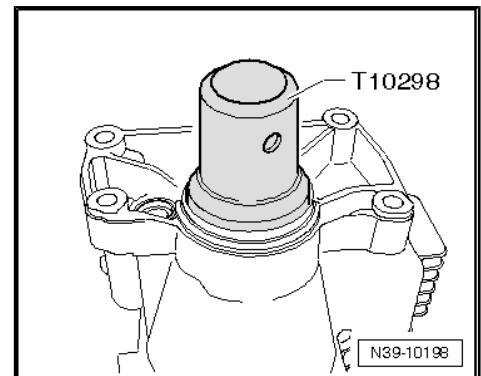
- Bevel box removed ⇒ [page 98](#) .
- Remove oil seal using extractor tool - T20143/1- or extractor tool - T20143/2- .



- Lubricate outer circumference of new oil seal with gear oil.
- 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 - T10298- . Take care to keep seal straight when installing.
- Attach bevel box to gearbox ⇒ [page 97](#) .

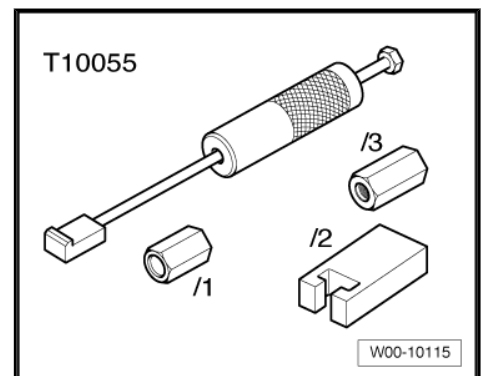


5.2.3 Renewing oil seal for rear splined shaft, bevel box installed

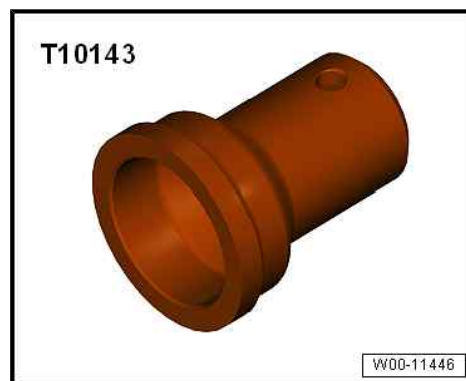
Renewing oil seal for rear splined shaft at bevel box (bevel box removed) ⇒ [page 229](#)

Special tools and workshop equipment required

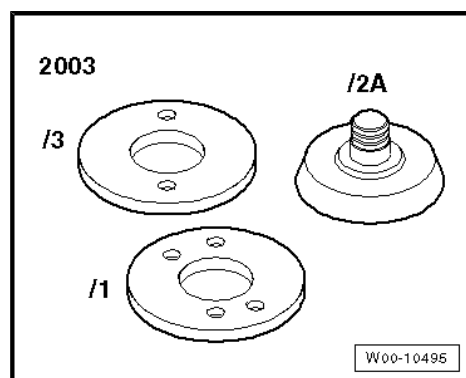
- ◆ Puller - T10055- with adapter - T10055/2-



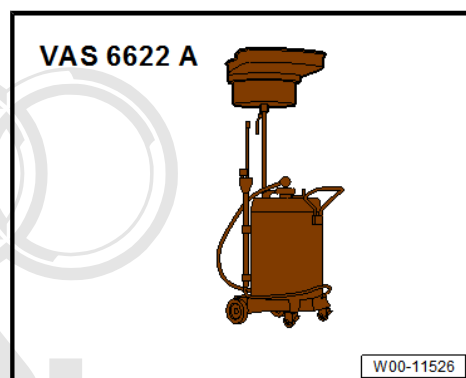
- ◆ Thrust piece - T10143-



- ◆ Fitting tool - 2003/1-



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



- ◆ Sealing grease - G 052 128 A1-

- ◆ Self-tapping screw (approx. 4 mm Ø)

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Procedure

- Bevel box must be installed.
- Remove noise insulation ⇒ General body repairs, exterior;
Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

Audi A1 quattro:

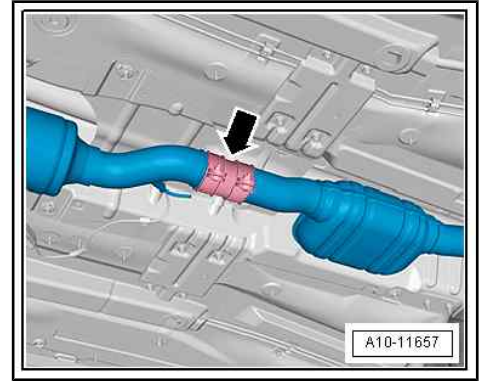


Caution

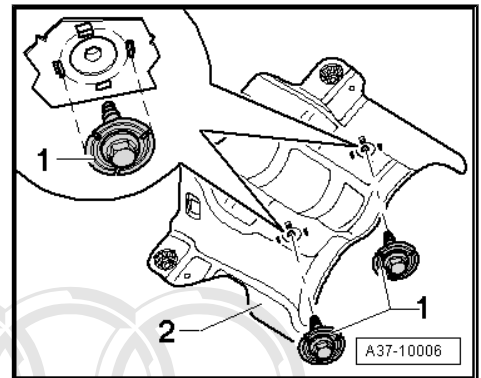
Risk of damage to flexible joint.

- ◆ The flexible joint must not be bent further than 10°.
- ◆ Do not subject flexible joint to tensile load.
- ◆ Take care not to damage wire mesh on flexible joint.

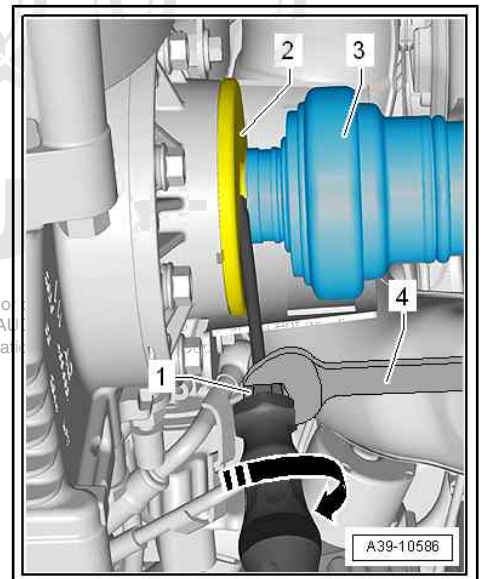
- Remove nuts for clamp -arrow-.
- Detach exhaust system at clamp and tie up front exhaust pipe.
- Remove subframe with steering rack (fix position of subframe when removing) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe with steering rack .



- Loosen but do not remove bolts with washers -1- securing centre bearing of propshaft to body, and push propshaft as far as possible towards rear.
- If necessary, detach heat shield -2- from body so that centre bearing of propshaft on body can be moved.



- Apply a suitable plain slot screwdriver with hexagonal shaft -1- between heat shield -2- and propshaft -3-.
- Press propshaft off bevel box by turning screwdriver 90° (in direction of arrow) with an open-end spanner -4-.
- Push engine/gearbox assembly forward slightly, and at the same time detach propshaft from rear splined shaft of bevel box.
- Tie propshaft to side.

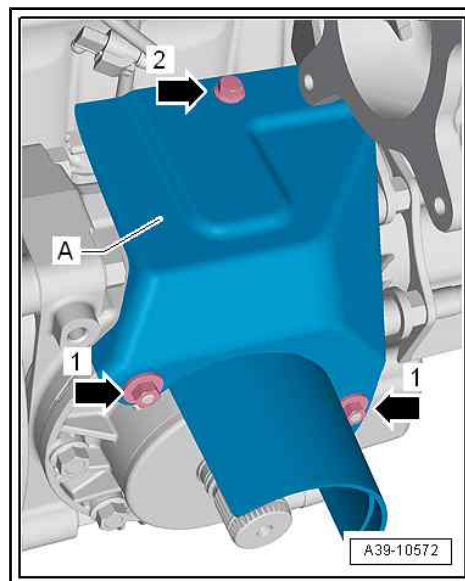


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Note

- ◆ The heat shield -A- for the propshaft is not shown in the following illustrations. The securing bolt -arrow 2- can only be removed if the front exhaust pipe has been removed.
- ◆ The oil seal for the rear splined shaft of bevel box can be renewed with the heat shield -A- installed.



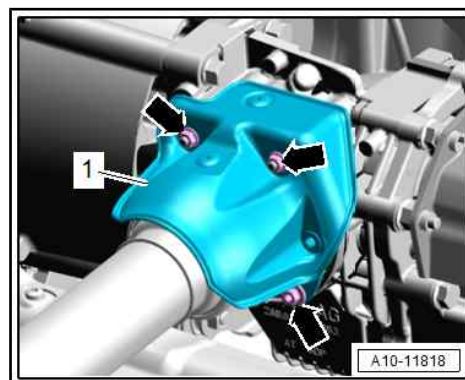
Audi S1:

- Remove nuts -arrows- and detach heat shield -1-.
- Press propshaft off bevel box and tie up ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .



Note

Make sure you do not damage surface coating on propshaft.



Continued for all vehicles:

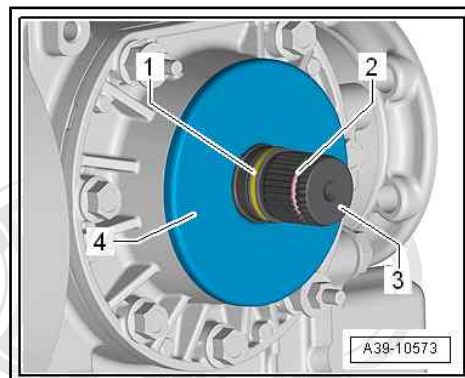
- Pry heat shield -4- for oil seal off bevel box.



Note

Items -1 ... 3- can be disregarded.

- Place used oil collection and extraction unit - VAS 6622A- below bevel box.

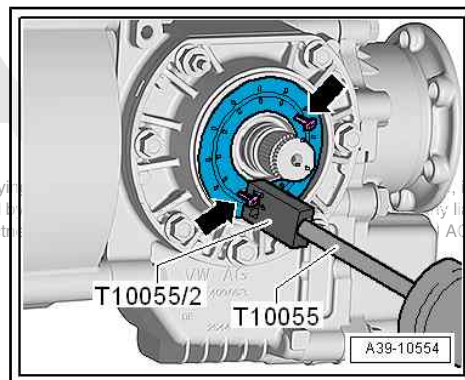


- In order to screw self-tapping screw -arrow- into oil seal, first pierce a hole in oil seal e.g. using a punch.
- Screw in self-tapping screw (4 mm diameter) -bottom arrow-.
- Pull out oil seal.



Note

- ◆ To avoid damaging the bearing behind, do not screw in the self-tapping screw too far.
- ◆ If the oil seal is fitted very tightly, screw in a second self-tapping screw -top arrow- opposite the first and pull out the oil seal.



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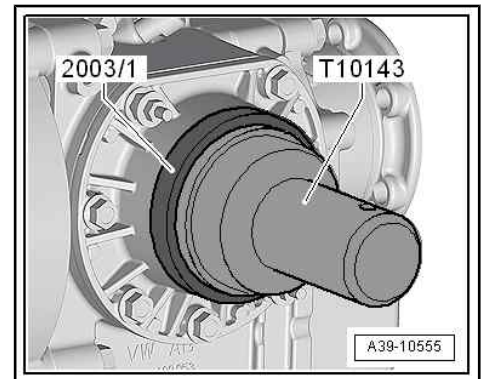
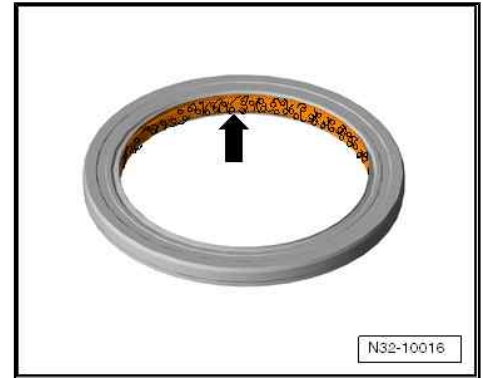
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A/S

- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .
- Push new oil seal onto seat in bevel box.

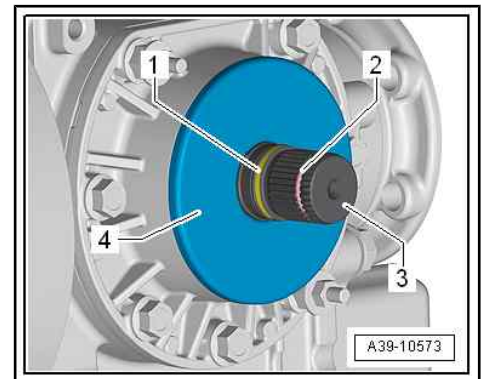
 Note

To prevent the sealing lip of the new oil seal from being damaged during installation, carefully guide the oil seal over the chamfered surface of the rear splined shaft while turning the oil seal.

- Apply installing tool - 2003/1- with smooth side towards oil seal.
- Drive in oil seal until flush using thrust piece - T10143- and installing tool - 2003/1- . Take care to keep oil seal straight when installing.



- Drive heat shield -4- for oil seal at bevel box onto stop using thrust piece - T10143- .
- Fit new O-ring -1- and new circlip -2- onto rear splined shaft -3- ⇒ [page 222](#) .
- Lubricate splines of rear splined shaft with grease for clutch plate splines - G 000 100- .
- Fit propshaft onto rear splined shaft of bevel box and hold propshaft in this position.
- Have a second mechanic push engine/gearbox assembly towards rear until circlip on rear splined shaft engages on propshaft.
- **Propshaft must be locked in place; it should not be possible to pull it off bevel box by hand.**



Audi A1 quattro:

- Install subframe with steering rack ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe with steering rack .
- Connect exhaust system at clamp ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers .

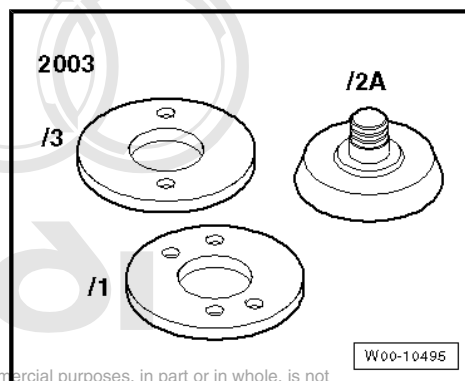
Continued for all vehicles:

- Check gear oil level in bevel box and top up if necessary ⇒ [page 217](#) .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

5.2.4 Renewing oil seal for rear splined shaft, bevel box removed

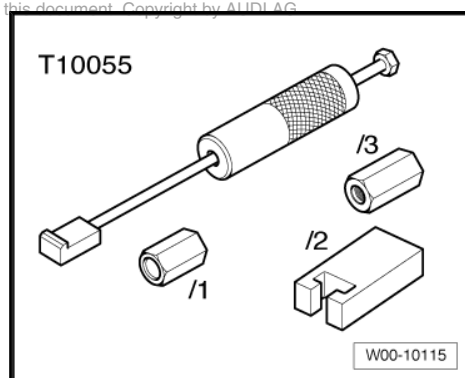
Special tools and workshop equipment required

◆ Fitting tool - 2003-

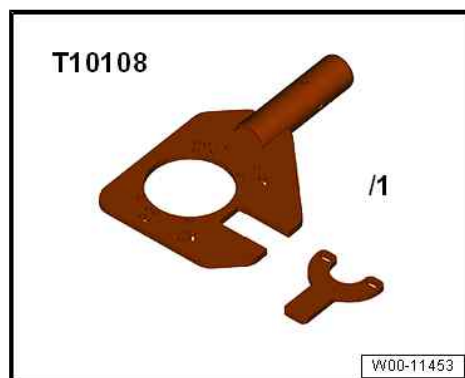


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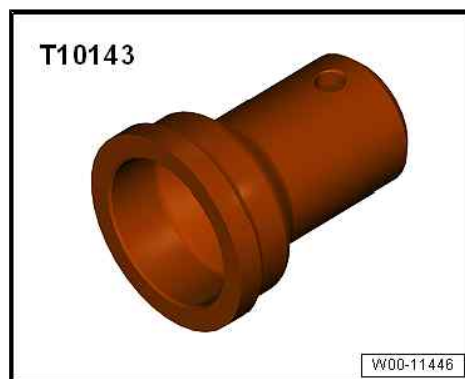
◆ Puller - T10055- with adapter - T10055/2-



◆ Gearbox support - T10108-



◆ Thrust piece - T10143-

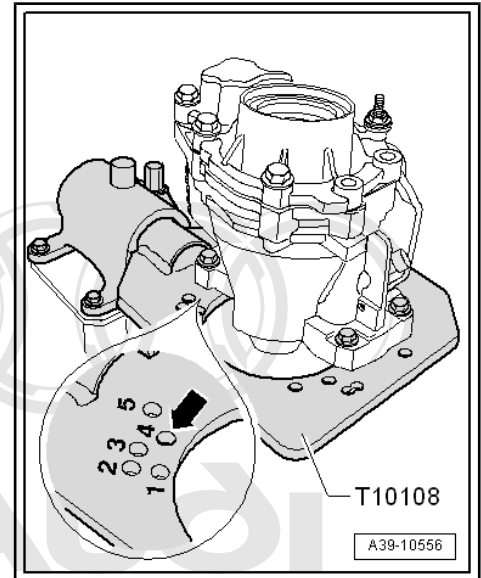


◆ Sealing grease - G 052 128 A1-

◆ Self-tapping screw (approx. 4 mm Ø)

Procedure

- Bevel box removed ⇒ [page 98](#) .
- Locate bevel box on hole marked -4- -arrow- in gearbox support - T10108- .
- Then align the bevel box with the three remaining holes and secure.



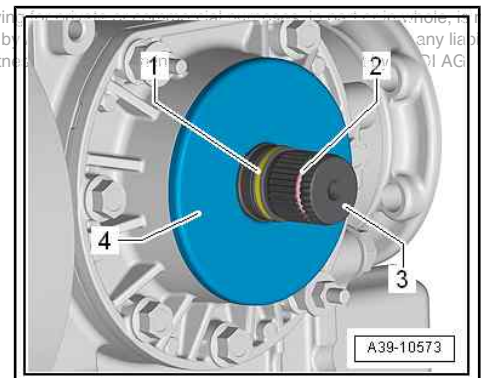
- Pry heat shield -4- for oil seal off bevel box.



Note

Items -1 ... 3- can be disregarded.

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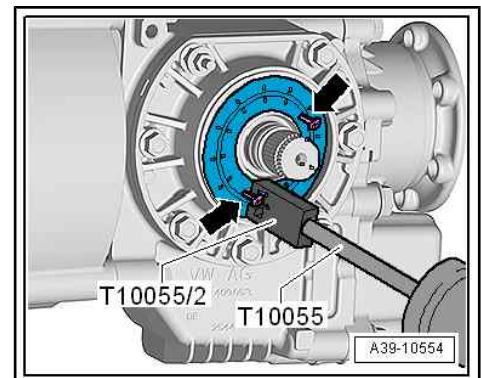


- In order to screw self-tapping screw -arrow- into oil seal, first pierce a hole in oil seal e.g. using a punch.
- Screw in self-tapping screw (4 mm diameter) -bottom arrow-.
- Pull out oil seal.



Note

- ◆ To avoid damaging the bearing behind, do not screw in the self-tapping screw too far.
- ◆ If the oil seal is fitted very tightly, screw in a second self-tapping screw -top arrow- opposite the first and pull out the oil seal.

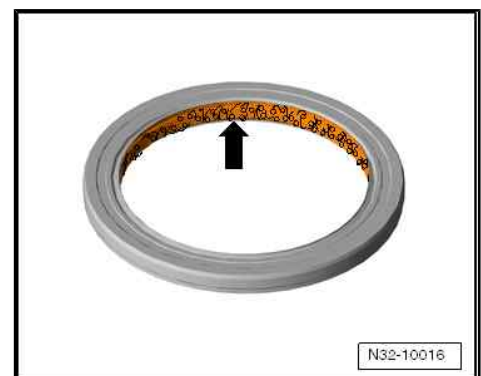


- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .
- Push new oil seal onto seat in bevel box.

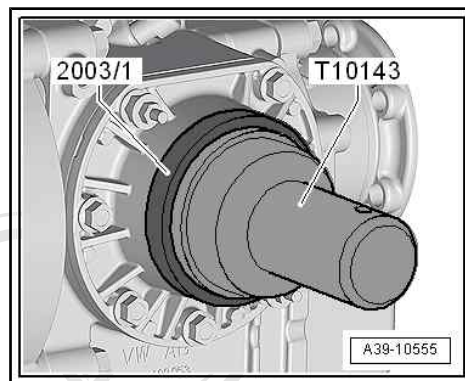


Note

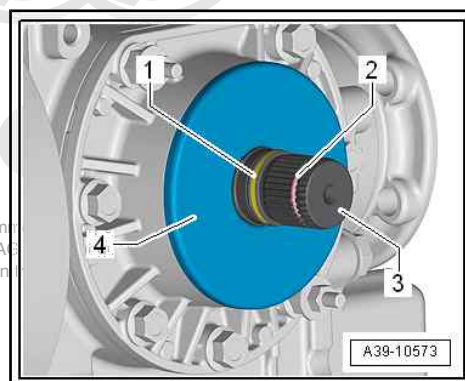
To prevent the sealing lip of the new oil seal from being damaged during installation, carefully guide the oil seal over the chamfered surface of the rear splined shaft while turning the oil seal.



- Apply installing tool - 2003/1- with smooth side towards oil seal.
- Drive in oil seal until flush using thrust piece - T10143- and installing tool - 2003/1- . Take care to keep oil seal straight when installing.



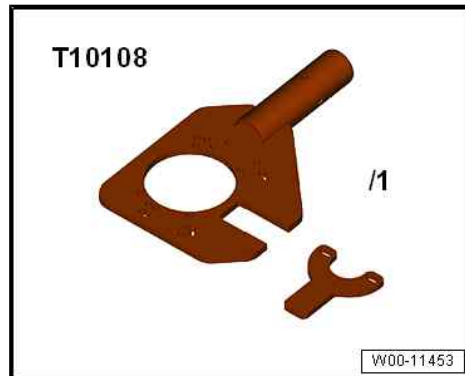
- Drive heat shield -4- for oil seal at bevel box onto stop using thrust piece - T10143- .
- Fit new O-ring -1- and new circlip -2- onto rear splined shaft -3- ⇒ [page 222](#) .
- Lubricate splines of rear splined shaft with grease for clutch plate splines - G 000 100- .
- Attach bevel box to gearbox ⇒ [page 104](#) .



5.2.5 Renewing O-ring for pinion housing

Special tools and workshop equipment required

- ◆ Gearbox support - T10108-

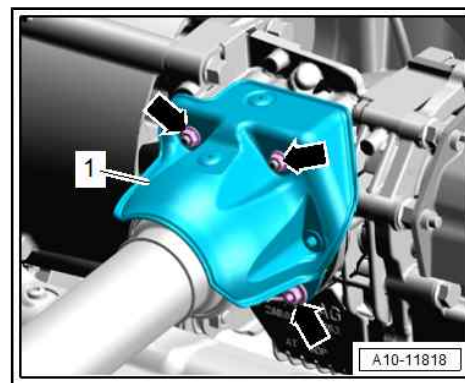


- ◆ Guide pin M8 - T10273-



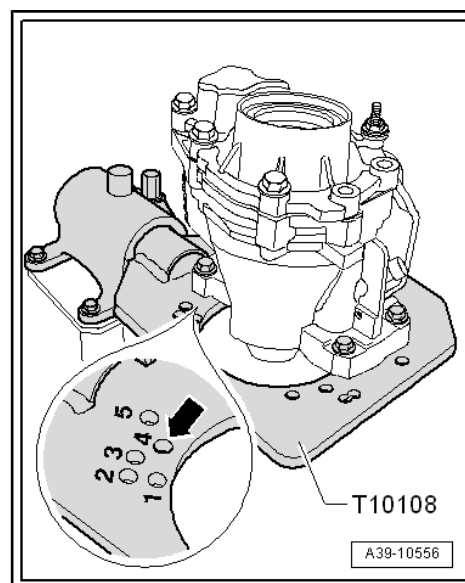
Procedure

- Remove nuts -arrows- and detach heat shield -1-.
- Press propshaft off bevel box and tie up ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .



Bevel box removed:

- Locate bevel box on hole marked -4- -arrow- in gearbox support - T10108- .
- Then align the bevel box with the three remaining holes and secure.
- Turn bevel box so that pinion housing faces upwards.



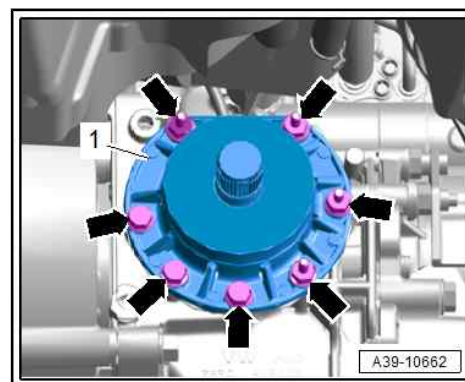
Bevel box installed or removed:



Note

Note position of securing bolts for pinion housing; if necessary, mark accordingly before removing.

- Remove bolts -arrows- for pinion housing -1-.



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- Carefully pry pinion housing -2- off bevel box housing at the recesses provided.



Note

The rear splined shaft bevel gear and the oil seal remain installed in the pinion housing.

- Remove old O-ring -1- from pinion housing.
- Screw studs M8 x 30 mm = -A- or guide pins M8 - T10273- into bevel box housing.
- Lightly lubricate new O-ring -1- with oil and fit onto pinion housing -2-.

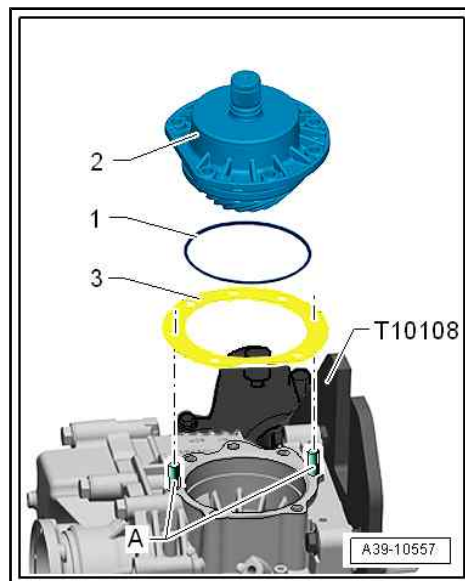
Pinion housing -2- and shim -3- can only be fitted in one position.

- Insert old shim -3-.
- Carefully drive in pinion housing in a diagonal sequence as far as stop using a drift.

A small gap remains between pinion housing and housing for bevel box.

The gap closes when bolts for pinion housing are tightened.

- Tighten bolts securing pinion housing in a diagonal sequence to specified torque ⇒ [Item 8 \(page 221\)](#) and ⇒ [Item 17 \(page 222\)](#) .
- Attach bevel box to gearbox ⇒ [page 104](#) .



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