

Workshop Manual

Audi A4 2008 ➤ ,
Audi A5 Cabriolet 2009 ➤ ,
Audi A5 Coupé 2008 ➤ ,
Audi Q5 2008 ➤ , Audi Q5 China 2010 ➤

Servicing 6-speed manual gearbox 0B2, four-wheel drive

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Edition 02.2014

List of Workshop Manual Repair Groups

Repair Group

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



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

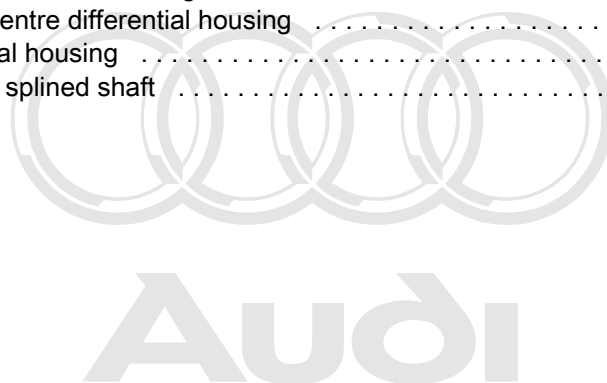
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00 – Technical data

1 Identification

(ARL003661; Edition 02.2014)

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

1.1 Gearbox identification

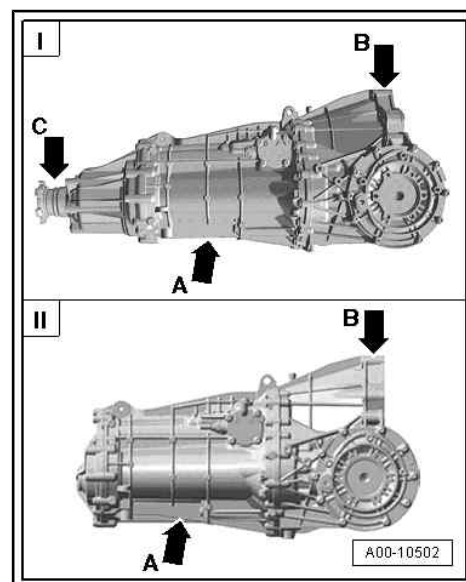
-I- Four-wheel drive (manual gearbox 0B2)

- ◆ -Arrow A- Manual gearbox 0B1 or 0B2 ⇒ [page 1](#)
- ◆ -Arrow B- Code letters and production date ⇒ [page 1](#)
- ◆ -Arrow C- Rear flange shaft for four-wheel drive

-II- Front-wheel drive (manual gearbox 0B1)

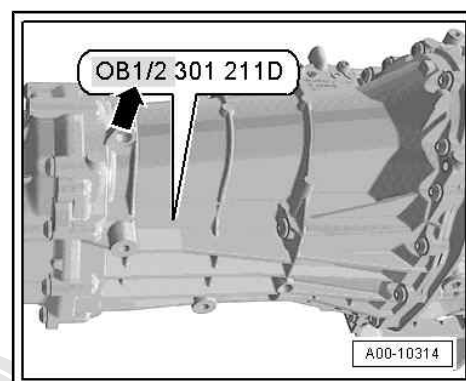
- ◆ -Arrow A- Manual gearbox 0B1/2 ⇒ [page 1](#)
- ◆ -Arrow B- Code letters and production date ⇒ [page 1](#)

For detailed information on code letters, gearbox allocation, transmission ratios and capacities please refer to the Workshop Manual ⇒ 6-speed manual gearbox 0B2; Rep. gr. 00 ; Technical data .



Manual gearbox 0B1 or 0B2 -arrow-

- ◆ 0B1 - gearbox version for front-wheel drive
- ◆ 0B2 - gearbox version for four-wheel drive



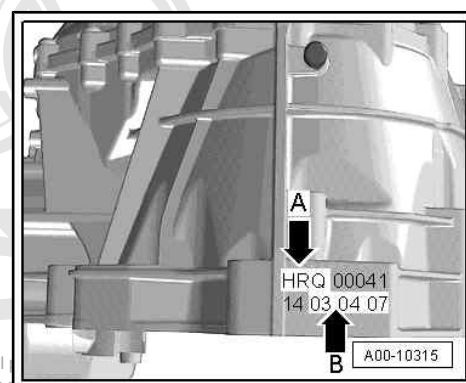
Code letters -arrow A- and production date of gearbox -arrow B-

Example:	HRQ	03 04 07
	Code letters	Production date:
		03.04.07

Note

- ◆ Additional data are manufacture-related.
- ◆ The code letters for the gearbox are also given on the vehicle data stickers.

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2 Repair instructions

⇒ "2.1 General repair instructions", page 2

2.1 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.

To avoid repetition, a number of generally applicable instructions for the various repair procedures are summarised here. They apply to the work described in this Manual.

Special tools

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

Gearbox

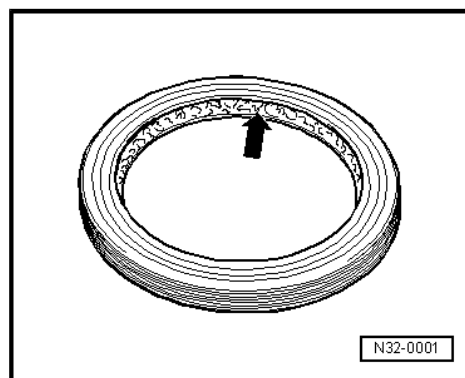
- ◆ Allocate bolts and other components according to gearbox code letters, refer to ⇒ Electronic parts catalogue .
- ◆ Thoroughly clean all joints and connections and the surrounding areas before dismantling.
- ◆ When exchanging or repairing the manual gearbox, check the oil level and fill up with oil if necessary ⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Gear oil; Checking gear oil level .
- ◆ Determine capacities and specifications according to the gearbox code letters ⇒ 6-speed manual gearbox 0B2; Rep. gr. 00 ; Technical data; Capacities .

Sealant

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

O-rings, oil seals and gaskets

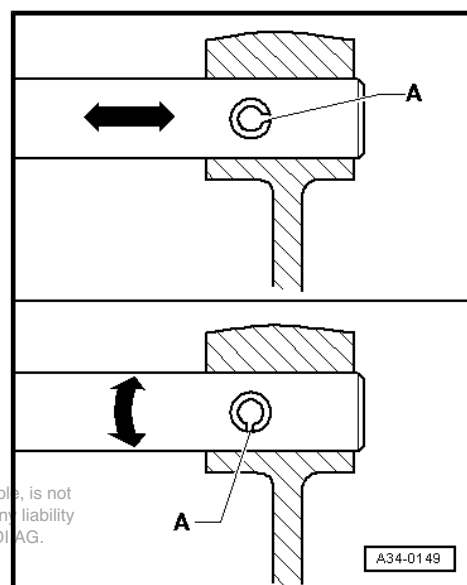
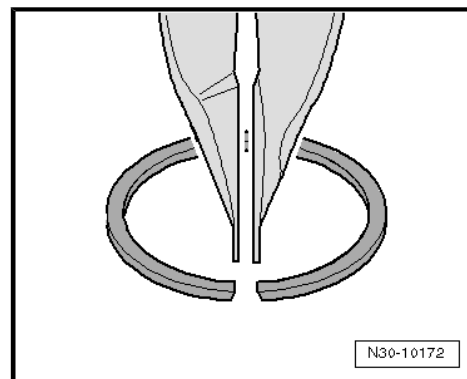
- ◆ Always renew O-rings, oil seals and gaskets.
- ◆ After removing gaskets and oil seals, always inspect the contact surface on the housing or shaft for burrs resulting from removal or for other signs of damage.
- ◆ Thoroughly clean housing joint surfaces before assembling.
- ◆ Before installing oil seals, lightly oil the outer circumference of the seal and fill the space between the sealing lips -arrow- about half full with grease - G 052 128 A1- .
- ◆ The open side of the oil 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 before installation to prevent them from being trapped and damaged during assembly.
- ◆ After renewing oil seals and gaskets, check and, if necessary, top up oil level in gearbox ⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Gear oil; Checking gear oil level .



Locking elements

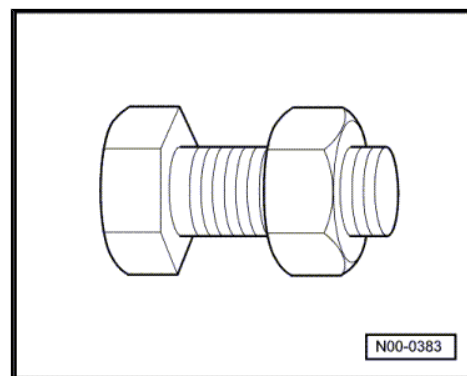
- ◆ Do not over-stretch circlips.
- ◆ Always renew circlips which have been damaged or over-stretched.
- ◆ Installation position for some circlips: the circlip is fitted so that the narrow part of the gap is at the top. This also gives the pliers a better grip when removing and installing.
- ◆ Circlips must be properly seated in the base of the groove.
- ◆ Renew spring pins. Position: the slit -A- should be in line with the line of force -arrow-.

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Bolts and nuts

- ◆ 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.
- ◆ Loosen and tighten particularly sensitive parts in diagonal sequence and in stages, taking care to keep them straight.
- ◆ The tightening torques stated apply to non-oiled nuts and bolts.
- ◆ Always renew self-locking bolts and nuts.
- ◆ Use a wire brush to clean the threads of bolts which are secured with locking fluid. Then apply locking fluid - AMV 185 101 A1- to bolt threads before installing.
- ◆ Threaded holes which take self-locking bolts or bolts coated with locking fluid must be cleaned (using a thread tap or similar). Otherwise there is a danger of the bolts shearing off the next time they are removed.

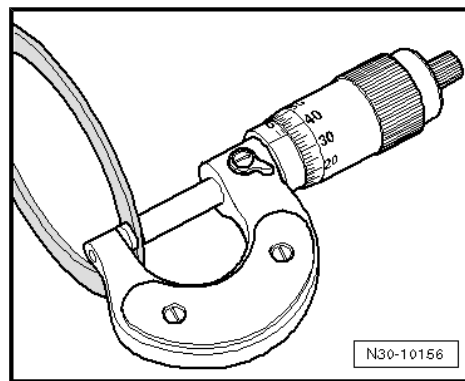


Shims

- ◆ 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.
- ◆ Do not install shims which are damaged or not in perfect condition.

Bearings

- ◆ Install needle bearings, ball sleeves and roller bearings so the lettering (side with thicker metal) faces towards the installing tool.
- ◆ Lubricate all bearings in gearbox with gear oil when installing.
- ◆ 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.
- ◆ Heat inner races of needle bearings and roller bearings to max. 130 °C.
- ◆ 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.



Gear wheels, synchro-hubs, inner races for selector gears

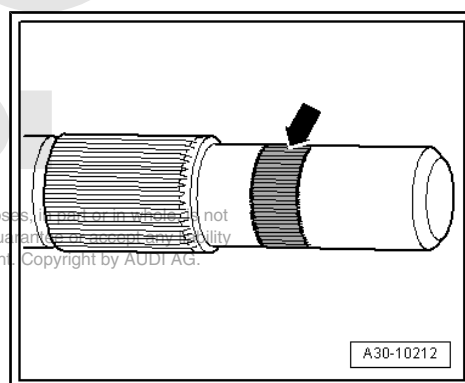
- ◆ Before installing, heat inner races for selector gears to approx. 100° C using inductive heater - VAS 6414- .
- ◆ Use inductive heater - VAS 6414- to heat gear wheels and synchro-hubs to approx. 100°C before installing. Press home onto stop when installing so there is no axial clearance.
- ◆ Note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

Selector gears

- ◆ After installing, check that 1st to 6th speed selector gears have an axial clearance of 0.15 ... 0.50 mm and check that they rotate freely.

Input shaft

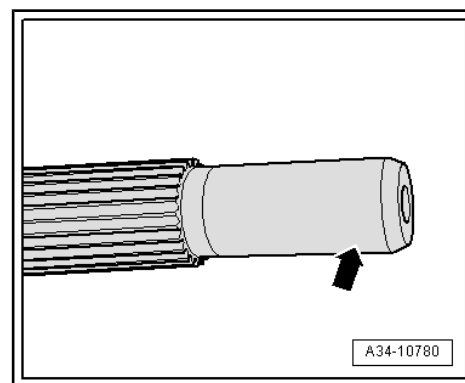
- If there is visible damage on the surface of the input shaft in the vicinity of the needle bearing for the dual-mass flywheel -arrow-, both the input shaft and the needle bearing in the dual-mass flywheel must be renewed.
- Renewing input shaft
⇒ ["3.7 Dismantling and assembling gearbox", page 55](#)
- Renewing needle bearing in dual-mass flywheel
⇒ ["2.6 Renewing needle bearing/ball bearing for dual-mass flywheel", page 37](#)



- ◆ Check input shaft for scoring around bearing in drive plate -arrow-. Renew needle bearing in drive plate if necessary ⇒ Rep. gr. 13 ; Cylinder block (gearbox end); Renewing needle bearing in drive plate .

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 molybdenum-coated synchro-rings -I- and carbon-coated synchro-rings -II-

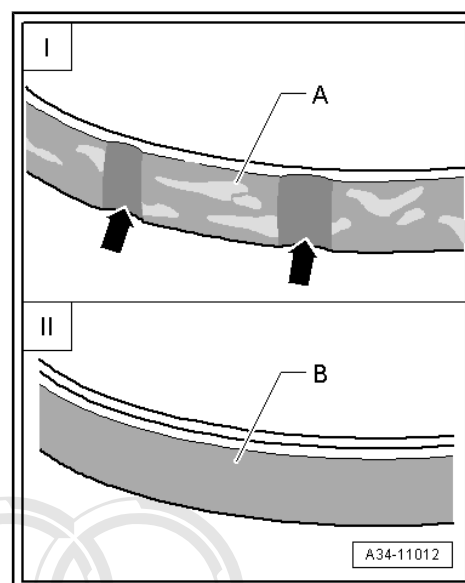
- ◆ Clean synchro-ring; the friction surface must be free of oil.

I - Molybdenum-coated synchro-ring

- ◆ The friction surface of an intact molybdenum coated synchro-ring has a graphite-grey, slightly porous appearance.
- ◆ The synchro-ring must be renewed if very shiny areas -A- have formed on the friction surface or if the brass-coloured metal underneath is already visible.

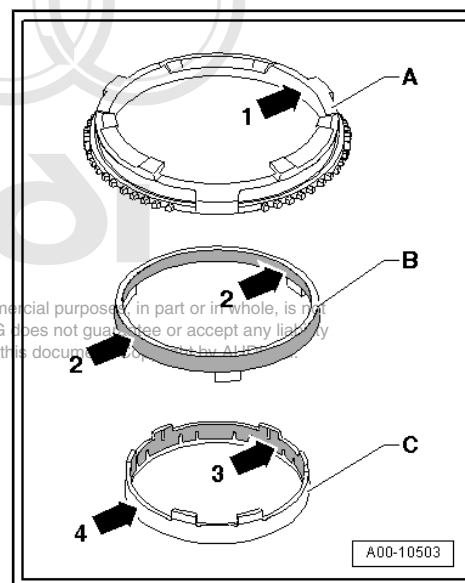
II - Carbon-coated synchro-ring

- ◆ Check friction surfaces -B- of carbon-coated synchro-rings for damage (flattened sections or particles of carbon coating broken away). Renew if necessary.



Checking synchro-rings for 1st and 2nd gear

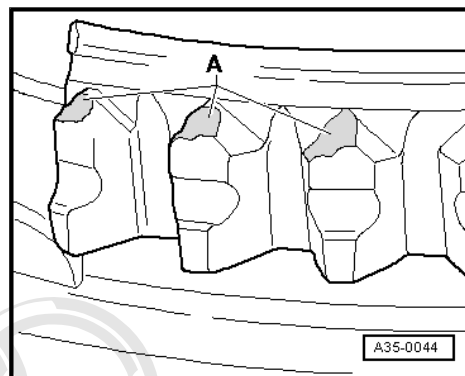
- ◆ Check coated contact surfaces -arrows 2- on intermediate ring -B- for damage (flattened sections or particles of carbon coating broken away).
- ◆ Check inner contact surface -arrow 1- on synchro-ring -A- and outer contact surface -arrow 4- on inner ring -C- for grooves or scoring.
- ◆ Check for damage to coating on inner rings -C- with coated contact surface -arrow 3- (particles of carbon coating broken away).



Abnormal wear on selector gears and locking collars

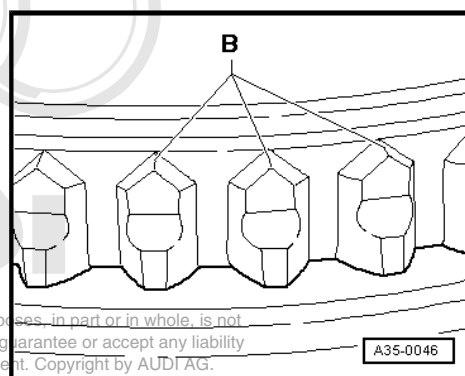
- ◆ Abnormal wear on synchro-ring or selector gear:

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



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

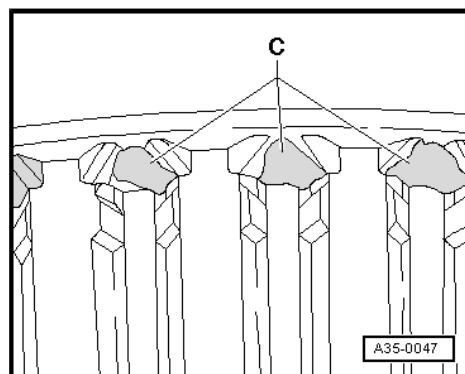
B - Undamaged chamfer on dog teeth of synchro-ring or selector gear



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- ◆ Abnormal wear on locking collar:

C - Worn chamfer on internal splines of locking collar



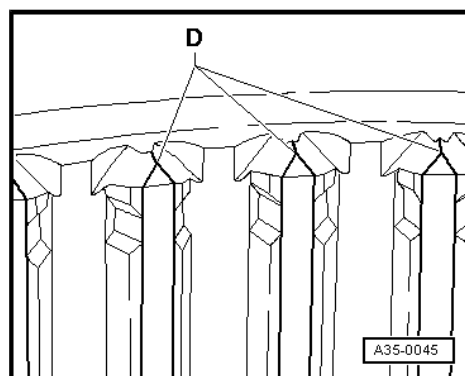
- ◆ In comparison: intact locking collar:

D - Intact chamfer on internal splines of locking collar

- ◆ Always renew synchro-rings with carbon coating together with locking collar. Renew selector gears also if there are traces of wear.

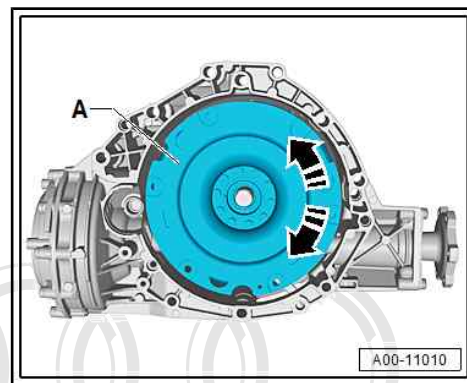
Clutch mechanism; clutch

- ◆ 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.
- ◆ Blow out clutch module with compressed air only.



Rattling sound in LuK version dual-mass flywheel with centrifugal pendulum absorber

- ◆ Depending on version, clutch modules -A- with or without centrifugal pendulum absorbers may be fitted.
- ◆ When clutch module with centrifugal pendulum absorbers is turned by hand, a rattling sound can be heard at intervals of approx. 90°.
- ◆ This is caused by a centrifugal pendulum absorber in the dual-mass flywheel and is not a fault.



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30 – Clutch

1 Clutch mechanism

⇒ [“1.1 Exploded view - clutch release mechanism”, page 8](#)

⇒ [“1.2 Servicing clutch release mechanism”, page 11](#)

1.1 Exploded view - clutch release mechanism

1 - Ball-head pin

□ 25 Nm

- Coat bearing surface for clutch release lever -arrow A- with grease - G 000 100-

2 - Intermediate piece

- Renew if damaged

3 - Retaining spring

- Engage on clutch release lever

4 - Release bearing

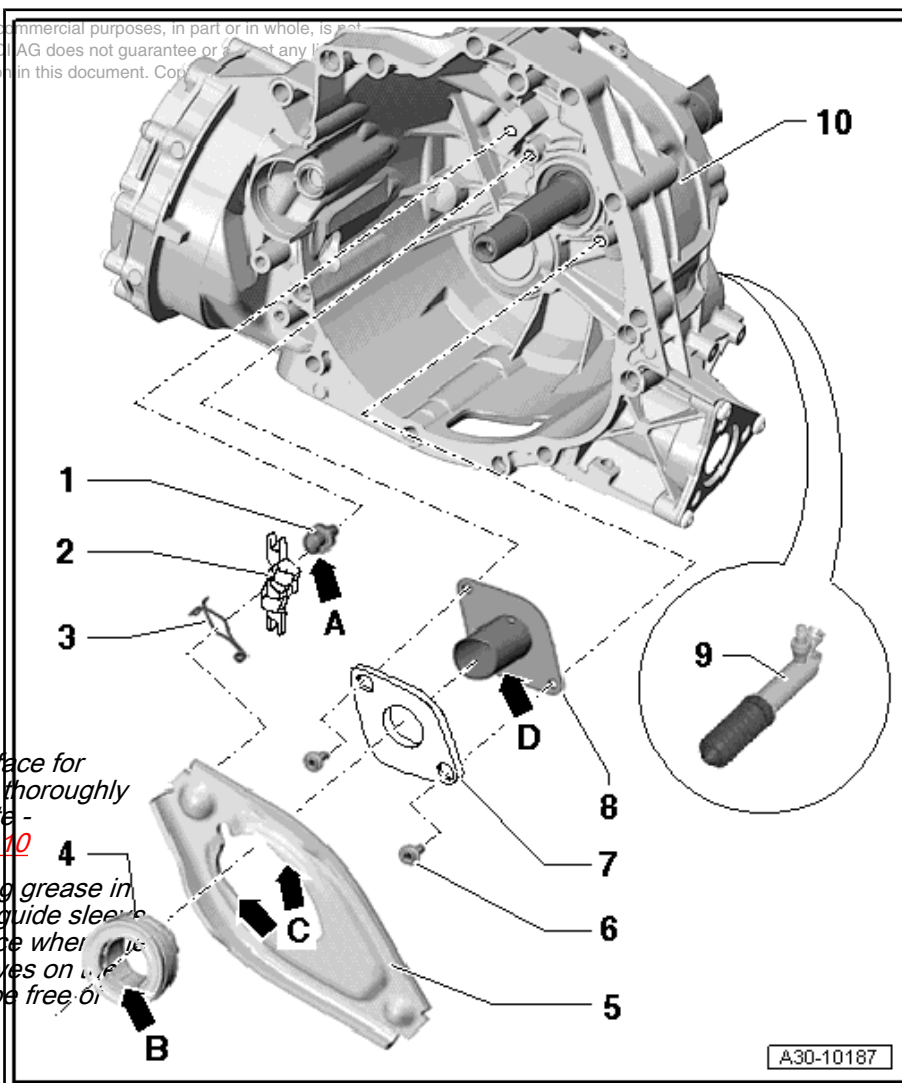
- Different versions
- For correct version, refer to ⇒ Electronic parts catalogue
- Do not wash out; wipe clean only
- Renew bearing if noisy



Note

- ◆ Grease bearing surface for clutch release lever thoroughly with lubricating paste - G 000 150- ⇒ [page 10](#)
- ◆ Remove any existing grease in bearing surface for guide sleeve -arrow B-: the surface where the release bearing moves on the guide sleeve must be free of grease

- Retainer lugs on release bearing must engage in release lever
- Removing and installing ⇒ [page 11](#)



Release bearing up to 02.2008

- Inner diameter -arrow B-: 34 mm
- Checking release bearing ⇒ [page 10](#)

Clutch release bearing with tumbler ring - from 02.2008 onwards

- Inner diameter -arrow B-: 36 mm
- Checking release bearing with tumbler ring ⇒ [page 10](#)

5 - Clutch release lever

- ☐ Different versions
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Remove existing grease from release lever
- ☐ Re-grease bearing surface for release bearing -arrows C- with lubricating paste - G 000 150-
- ☐ Removing and installing ⇒ [page 11](#)

6 - Bolt

- ☐ 8 Nm
- ☐ Different bolt length
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ 2x
- ☐ Apply locking fluid - AMV 185 101 A1- when fitting

7 - Retaining piece

- ☐ For guide sleeve



Note

- ◆ *Discontinued as of 02.2008*
- ◆ *Is also omitted when new guide sleeve is installed*
⇒ [Item 8 \(page 9\)](#)
- ◆ *For correct version, refer to ⇒ Electronic parts catalogue*

8 - Guide sleeve

- ☐ Different versions
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Remove grease from guide sleeve -arrow D- – clutch release bearing must be fitted free of grease on guide sleeve

Guide sleeve up to 02.2008

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- Diameter -arrow D-: 34 mm
- If renewed, install without retaining piece ⇒ [Item 7 \(page 9\)](#)

Guide sleeve from 02.2008 onwards

- Fitted on clutch release bearing with tumbler ring ⇒ [page 10](#)
- Diameter -arrow D-: 36 mm
- Is installed without retaining piece ⇒ [Item 7 \(page 9\)](#)

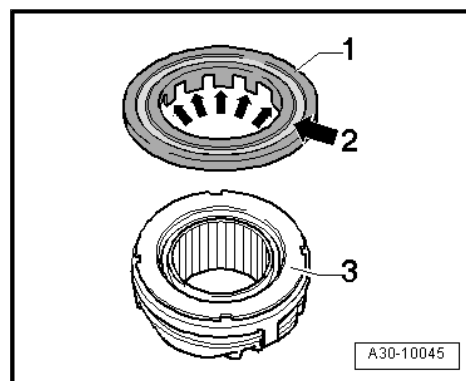
9 - Clutch slave cylinder

- ☐ Removing and installing ⇒ 6-speed manual gearbox 0B2; Rep. gr. 30 ; Clutch mechanism; Removing and installing clutch slave cylinder
- ☐ Do not operate clutch pedal after slave cylinder has been removed
- ☐ Observe correct sequence when bleeding ⇒ 6-speed manual gearbox 0B2; Rep. gr. 30 ; Clutch mechanism; Bleeding clutch mechanism
- ☐ When installing, push in until the securing bolt can be fitted.

10 - Gearbox

Checking release bearing (up to 02.2008)

- The release bearing must be renewed if the plastic ring -1- has come loose.
- The release bearing -3- must be renewed if the groove -arrow 2- worn on the plastic ring -1- is deeper than 0.8 mm.



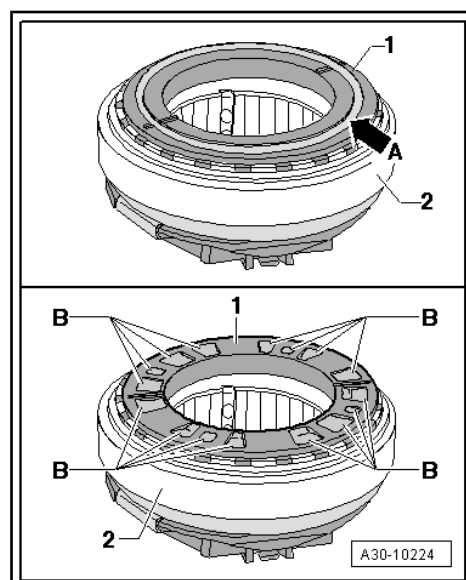
Checking clutch release bearing with tumbler ring -1- - from 02.2008 onwards

Different versions:

- ◆ Tumbler ring -1- with annular groove -arrow A-
- ◆ Tumbler ring -1- without groove (when new)
- ◆ Tumbler ring -1- with indentations -B- (used release bearing)

Check:

- Axial and radial clearance is permissible on the tumbler ring -1- of the release bearing.
- The tumbler ring (swash plate) -1- should be able to tilt to all sides in the release bearing -2-.
- The tumbler ring is a relatively loose fit when the release bearing is not in contact with the clutch.
- The release bearing must be renewed if the groove -arrow A- or the indentations -B- are deeper than 0.8 mm.



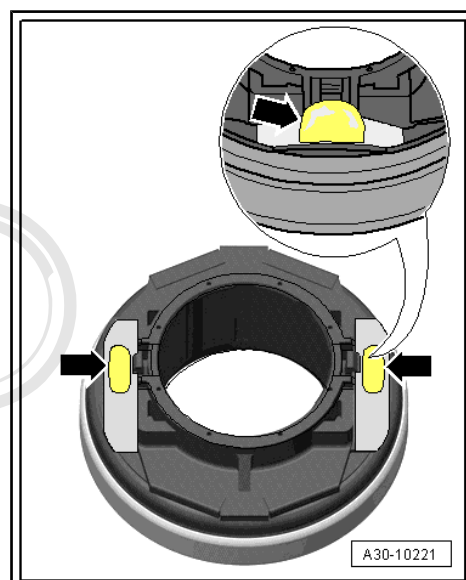
Greasing release bearing



Caution

Grating/creaking noises can occur when clutch is operated.

- **Lack of grease at the bearings -arrows- on the release bearing assembly can cause creaking/grating noises when the clutch is operated.**
- **Grease bearings -arrows- on release bearing assembly thoroughly with lubricating paste - G 000 150- . A thin coating of grease is not sufficient.**
- **Remove grease in bearing surface for guide sleeve: bearing of release bearing on guide sleeve must be free of grease.**



1.2 Servicing clutch release mechanism

Removing

- Remove clutch release lever -1- together with release bearing -2- and retaining spring -3-.
- Remove bolts -4- and detach retaining piece -5- (if fitted) with guide sleeve -6-.
- Remove any existing grease on clutch release lever -1-, release bearing -2- and guide sleeve -6-.

Installing

- Clean guide sleeve -6- and install together with retaining piece -5- (if previously fitted).



Note

The retaining piece -5- is omitted if a new guide sleeve -6- is installed.

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- Clean threads of bolts -4- with wire brush. Then apply locking fluid - AMV 185 101 A1- to bolts and tighten. Tightening torque
⇒ [Item 6 \(page 9\)](#)

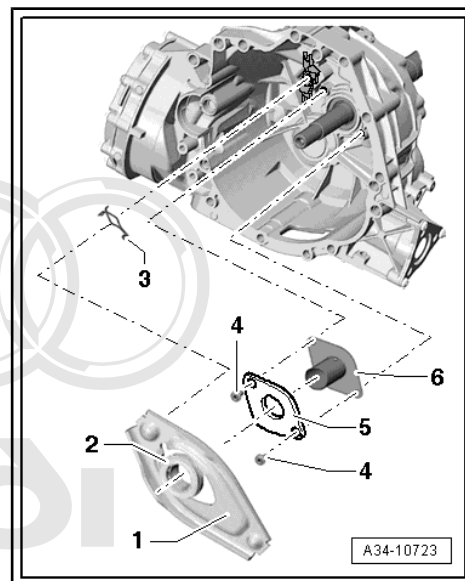


Caution

Grating/creaking noises can occur when clutch is operated.

- *Grease bearing surfaces for clutch release lever with lubricating paste - G 000 150- ⇒ [Item 5 \(page 9\)](#).*

- Engage release bearing -2- and retaining spring -3- in release lever -1- and install complete assembly.



2 Clutch

⇒ ["2.1 General notes on clutch", page 12](#)

⇒ ["2.2 Exploded view - clutch unit", page 16](#)

⇒ ["2.3 Removing and installing clutch module", page 25](#)

⇒ ["2.4 Removing and installing clutch", page 28](#)

⇒ ["2.5 Resetting adjuster ring in pressure plate, LuK version", page 35](#)

⇒ ["2.6 Renewing needle bearing/ball bearing for dual-mass fly-wheel", page 37](#)

2.1 General notes on clutch

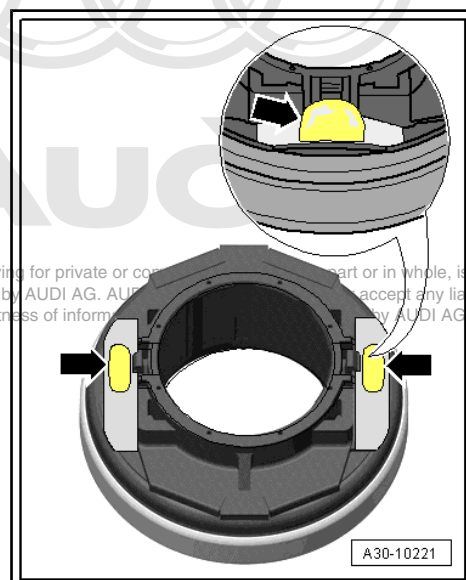


Note

- ◆ Refer to general repair instructions ⇒ [page 2](#) .
- ◆ Servicing clutch mechanism and clutch hydraulics ⇒ 6-speed manual gearbox 0B2; Rep. gr. 30 ; Clutch mechanism .
- ◆ The gearbox must be removed before working on the clutch
⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Removing and installing gearbox; Removing gearbox .
- ◆ 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.
- ◆ Blow out clutch module with compressed air only.

Release bearing

- ◆ Lack of grease at the bearings -arrows- on the release bearing assembly can cause creaking/grating noises when the clutch is operated.
- ◆ Grease bearings -arrows- on release bearing assembly thoroughly with lubricating paste - G 000 150- .



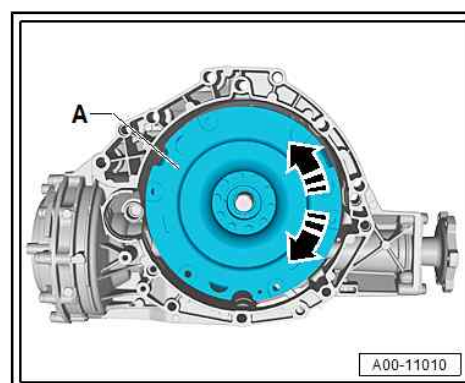
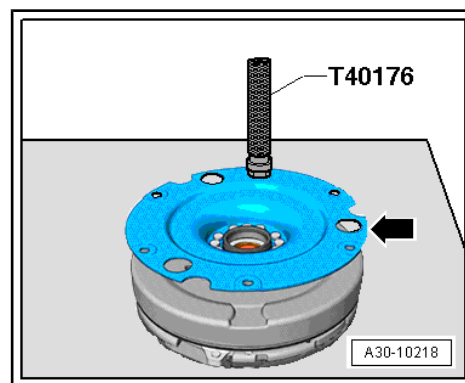
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Clutch module

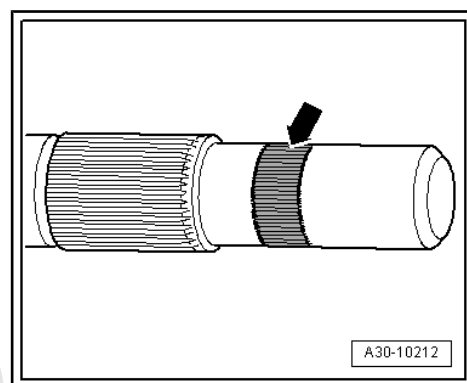
Do not put down clutch module with flange -arrow- for drive plate facing downwards.

This could bend the flange -arrow- for the drive plate, which would cause problems with clutch operation.

- ◆ Rattling sound (can be disregarded) in the clutch module -A- for the LuK version dual-mass flywheel with centrifugal pendulum absorber.
- ◆ Depending on version, clutch modules -A- with or without centrifugal pendulum absorbers may be fitted.
- ◆ When clutch module with centrifugal pendulum absorbers is turned by hand, a rattling sound can be heard at intervals of approx. 90°.
- ◆ This is caused by a centrifugal pendulum absorber in the dual-mass flywheel and is not a fault.



Input shaft



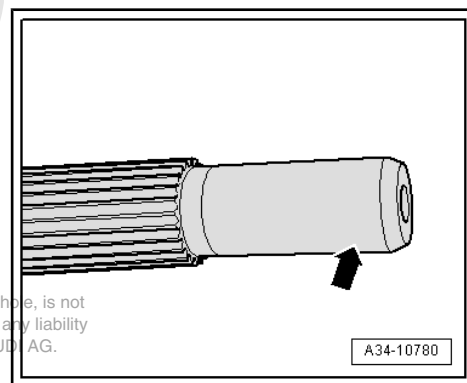
- ◆ If there is visible damage on the surface of the input shaft in the vicinity of the needle bearing for the dual-mass flywheel -arrow-, both the input shaft and the needle bearing in the dual-mass flywheel must be renewed
⇒ ["2.6 Renewing needle bearing/ball bearing for dual-mass flywheel", page 37](#) .

- ◆ Renewing input shaft
⇒ ["3.7 Dismantling and assembling gearbox", page 55](#)

- ◆ Check input shaft for scoring around bearing in drive plate -arrow-. **Renew needle bearing in drive plate if necessary** ⇒ Rep. gr. 13; **Cylinder block (gearbox end); Renewing needle bearing in drive plate** .

- ◆ 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.

- ◆ Remove grease from input shaft bearing journal as far as splines.

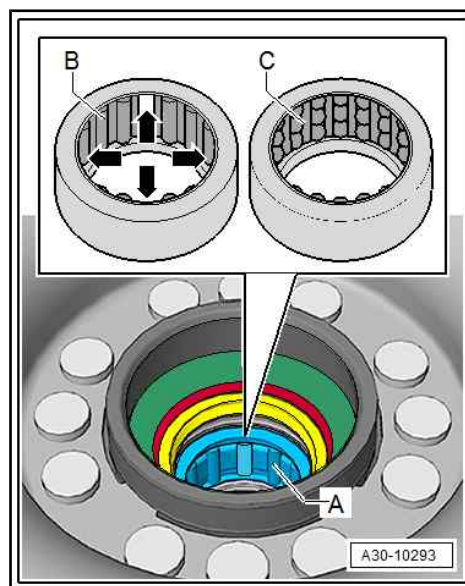
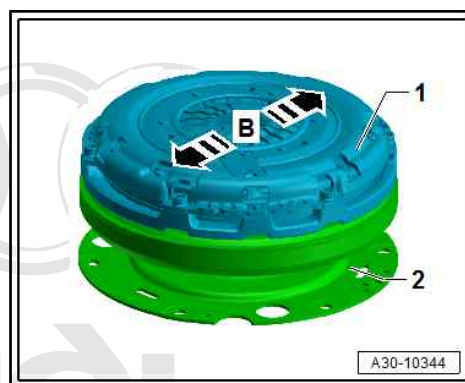
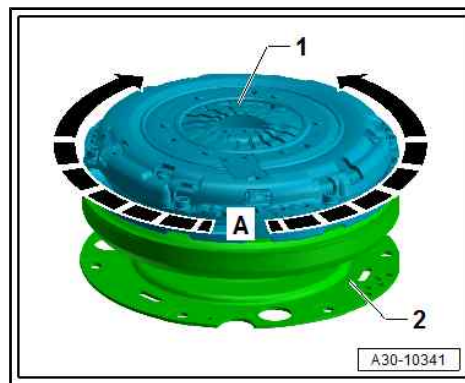


Dual-mass flywheel



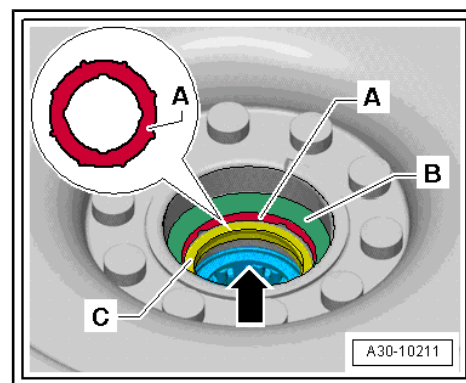
Caution

- ◆ When the dual-mass flywheel is removed, the two weights may turn, shift and tilt towards one another slightly; this is not a defect, but rather part of the technological design.
- ◆ The dual-mass flywheel does not settle until it is fitted in the gearbox and secured to the engine.

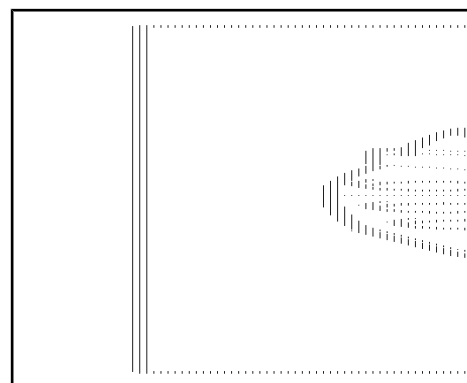


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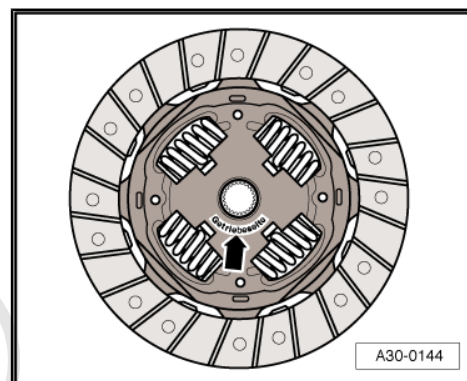
- ◆ When turning secondary inertia weight -1- against primary inertia weight -2- in direction of -arrows A-, turn smoothly as far as stop in each direction, applying even pressure.
- ◆ The stop mechanisms on both sides are spring-loaded.
- ◆ Secondary inertia weight -1- can be moved horizontally in direction of -arrows B- opposite primary inertia weight -2-.
- ◆ Secondary weight -1- has a tilting clearance to primary weight -2- (direction of -arrows C-).
- ◆ Check version of needle bearing in dual-mass flywheel -A, B, C- and renew needle bearing if necessary
⇒ [page 19](#) .
- ◆ Check for wear on plastic washer -A- in "Sachs" version dual-mass flywheel ⇒ [page 18](#) .



Clutch plate, clutch pressure plate



- ◆ To avoid damaging clutch pressure plate when removing and installing, observe assembly instructions
⇒ ["2.4.1 Removing and installing Sachs version clutch"](#), [page 28](#) or
⇒ ["2.4.2 Removing and installing LuK version clutch"](#), [page 32](#) .
- ◆ On clutch pressure plate (LuK version) an adjuster ring has to be reset when only the clutch plate is renewed ⇒ [page 35](#) .
- ◆ Checking pressure plate for distortion ⇒ [page 20](#) and
⇒ [page 24](#) .
- ◆ 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.
- ◆ Renew clutch plate and pressure plate if riveted fastening is damaged or loose.
- ◆ Installation position of clutch plate: damper assembly (coil springs) or marking "Getriebeseite" (gearbox side) -arrow- in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.
- ◆ Select the correct clutch plate and pressure plate according to engine code ⇒ Electronic parts catalogue .



2.2 Exploded view - clutch unit

⇒ [“2.2.1 Exploded view - Sachs version clutch”, page 16](#)

⇒ [“2.2.2 Exploded view - LuK version clutch”, page 21](#)

2.2.1 Exploded view - Sachs version clutch



Caution

On this type of clutch the clutch pressure plate and clutch plate can only be renewed together.

- ◆ Observe notes on clutch ⇒ [page 12](#) .
- ◆ Identification ⇒ [page 18](#)

1 - Clutch module

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

2 - Oil seal

- ❑ For dual-mass flywheel
- ❑ Pulling out ⇒ [page 39](#)
- ❑ Driving in ⇒ [page 40](#)

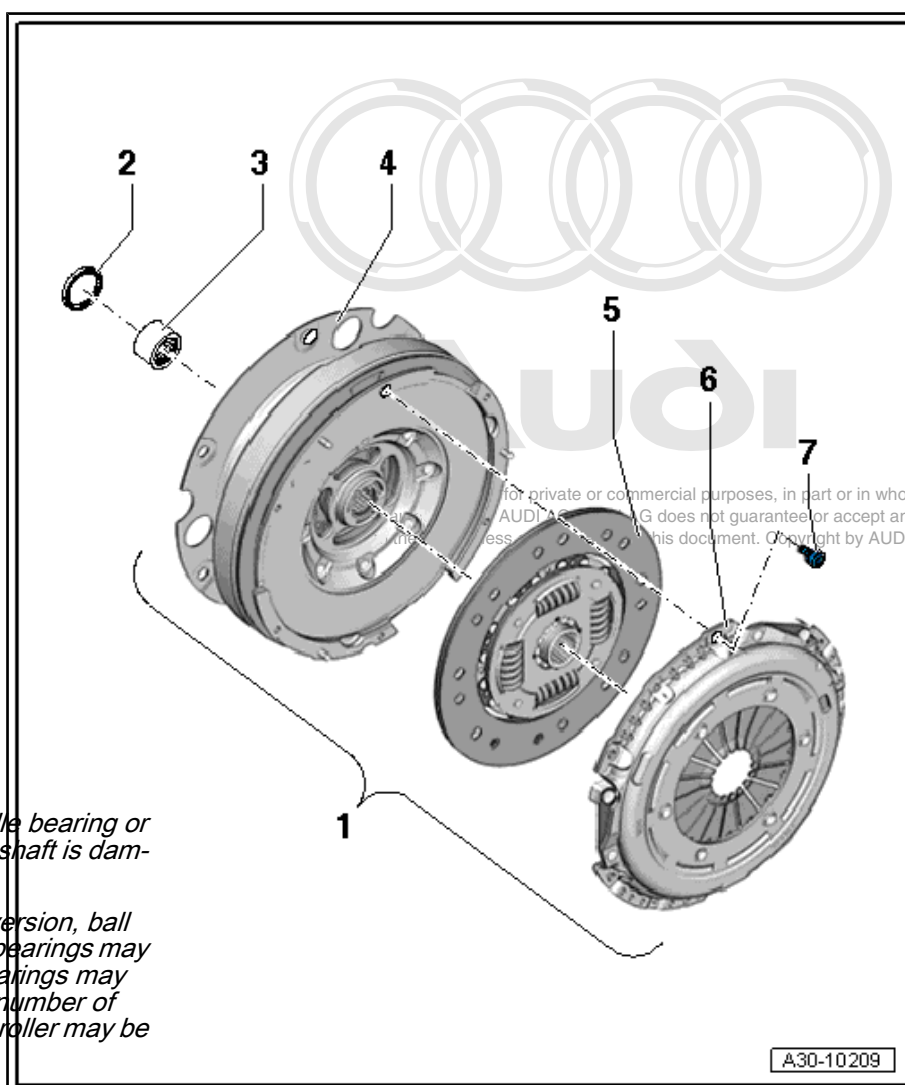
3 - Needle bearing or ball bearing

- ❑ For dual-mass flywheel
- ❑ Different versions
⇒ [page 19](#)
- ❑ For correct version, refer to ⇒ Electronic parts catalogue
- ❑ Check and renew if necessary ⇒ [page 19](#)
- ❑ Pressing out
⇒ [page 39](#)
- ❑ Pressing in
⇒ [page 39](#)



Note

- ◆ Always renew needle bearing or ball bearing if input shaft is damaged ⇒ [page 38](#) .
- ◆ Depending on the version, ball bearings or needle bearings may be fitted; needle bearings may have either the full number of rollers, or every 4th roller may be missing.
- ◆ The needle bearing of the type where every 4th roller is missing must always be renewed on vehicles with 4-cylinder TDI engine (except 125 kW TDI)
⇒ [page 37](#) .



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- ◆ *On all other vehicles the missing needle rollers do not mean that the needle bearing is defective. Do not renew the needle bearing.*

4 - Dual-mass flywheel

- ☐ With flange for drive plate
- ☐ Ensure that dowel pins fit tightly
- ☐ Contact surface for clutch lining must be free of grooves, oil and grease
- ☐ Removing and installing ⇒ ["2.4.1 Removing and installing Sachs version clutch", page 28](#)
- ☐ Checking plastic washer in dual-mass flywheel ⇒ [page 18](#)
- ☐ Measuring degree of wear on plastic washer ⇒ [page 18](#)
- ☐ Checking for damage ⇒ [page 19](#)

5 - Clutch plate

- ☐ Removing and installing ⇒ [page 28](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Installation position: marking "Getriebeseite" (gearbox side) faces towards pressure plate
- ☐ If fitted, coil springs (damper assembly) face towards pressure plate

6 - Pressure plate

- ☐ Self-adjusting
- ☐ Identification ⇒ [page 18](#)
- ☐ Pressure plate and clutch plate can only be renewed together
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 28](#)
- ☐ Checking pressure plate for distortion ⇒ [page 20](#)
- ☐ Checking ends of diaphragm spring ⇒ [page 20](#)
- ☐ Checking springs and riveting ⇒ [page 20](#)
- ☐ Checking metal ring ⇒ [page 21](#)
- ☐ Contact surface for clutch lining must be free of grooves, oil and grease

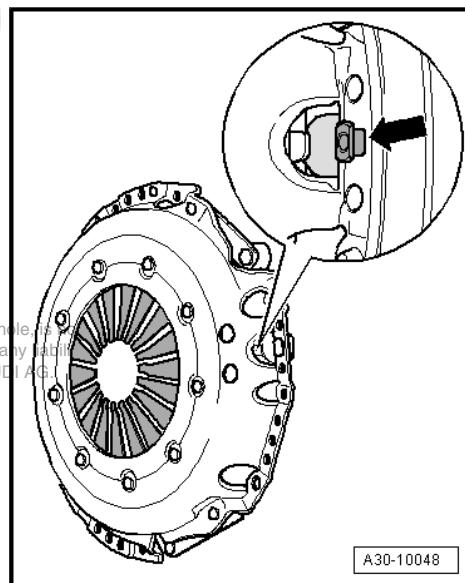
7 - Bolt

- ☐ 22 Nm and then turn 90° further
- ☐ Always renew
- ☐ Secures pressure plate to dual-mass flywheel
- ☐ Observe assembly instructions ⇒ [page 28](#) for loosening or tightening

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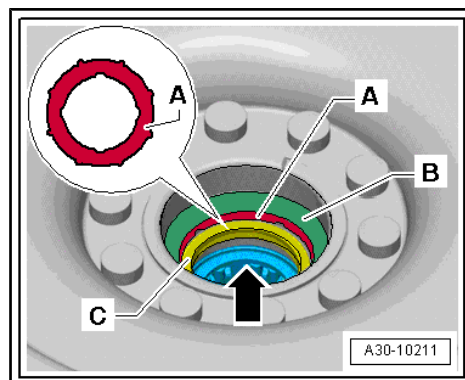
Identification of "Sachs" version

Pressure plate with position sender -arrow- or "Sachs" lettering



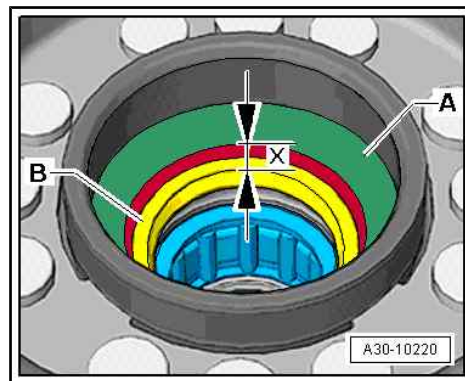
Checking plastic washer -A- in "Sachs" version dual-mass flywheel

- There must be a white plastic washer -A- in the dual-mass flywheel. It should be located under the copper-coloured bearing washer -B- and above the oil seal -C-.
- If the white plastic washer -A- is missing, the dual-mass flywheel must be renewed.
- Measuring degree of wear on plastic washer -A-
⇒ [page 18](#)



Measuring degree of wear on plastic washer in "Sachs" version dual-mass flywheel

- Clean copper-coloured bearing washer -A- and oil seal -B- at points to be measured.
- Press bearing washer -A- towards oil seal -B-.
- Maintain pressure and measure distance -x- from top surface of copper-coloured bearing washer -A- to top surface of oil seal -B- at outer edge using a depth gauge .
- Distance -x- = 2.5 mm (minimum)
- The dual-mass flywheel must be renewed if distance -x- is less than 2.5 mm.



Checking needle bearing in dual-mass flywheel on vehicles with 4-cylinder TDI engine (except 125 kW TDI)



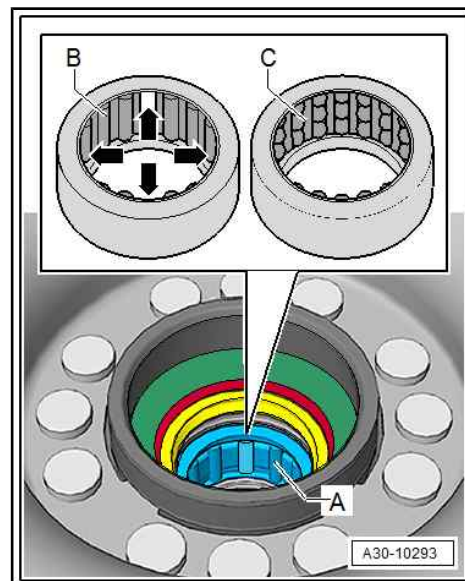
Caution

Check version of needle bearing in dual-mass flywheel.

- ◆ Depending on the version, ball bearings or needle bearings may be fitted; needle bearings may have either the full number of rollers, or every 4th roller may be missing.
- ◆ The needle bearings -B- of the type where every 4th roller is missing -arrows- must always be renewed on vehicles with 4-cylinder TDI engine (except 125 kW TDI)
⇒ [page 37](#).
- ◆ On all other vehicles the missing needle rollers do not mean that the needle bearing is defective. Do not renew the needle bearing.
- ◆ Depending on the manufacturer, the new needle bearings are fitted with the full number of either rollers -A- or balls -C-.

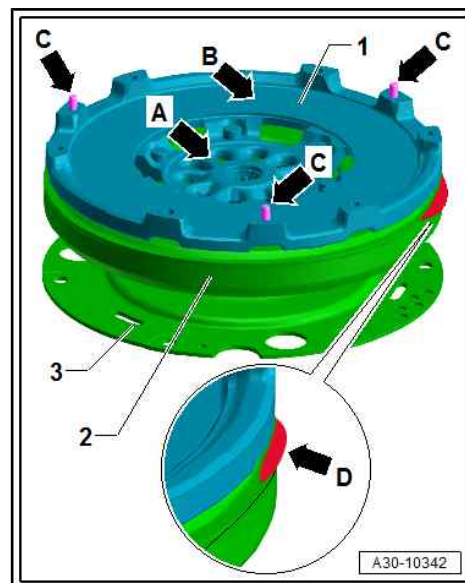
Depending on the make, the following bearings are fitted on vehicles with 4-cylinder TDI engines (except 125 kW TDI):

- ◆ »LuK« dual-mass flywheel: Needle bearing -A- fitted with the full number of rollers
- ◆ »Sachs« dual-mass flywheel: Ball bearing -C-
- ◆ For correct version, refer to ⇒ *Electronic parts catalogue*



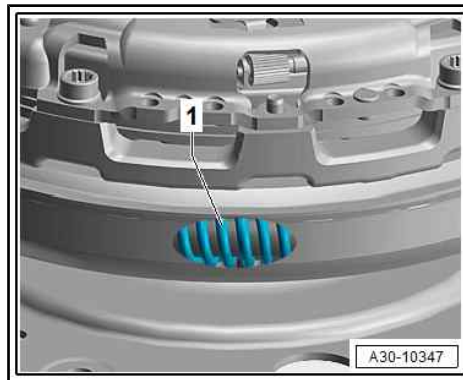
Checking dual-mass flywheel for damage

- Check projections -arrow A- and friction surface -arrow B- for cracks.
- Ensure that dowel pins -arrows C- are seated securely in dual-mass flywheel.
- Surface -2- must not be warped -arrow D-.
- Drive plate -3- must not be bent.



Damage to wall of dual-mass flywheel housing

- ◆ Damage to housing wall is caused by a defective bow spring -1- or bow spring mounting.

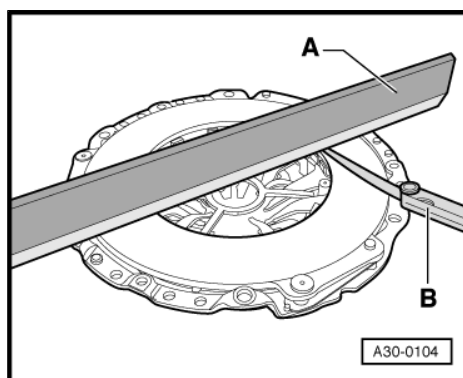


Checking pressure plate for distortion, cracks and burning

A - Straightedge

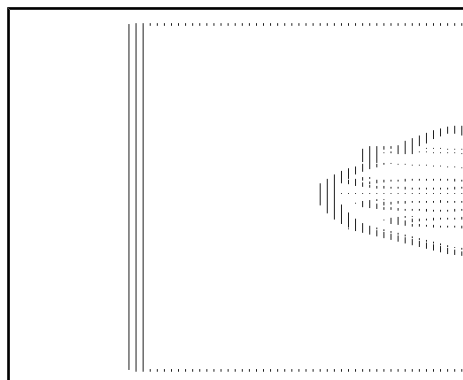
B - Feeler gauge

- Pressure plate distortion up to 0.8 mm is permissible.



Checking ends of diaphragm spring

- Wear up to 0.3 mm (maximum) is permissible.



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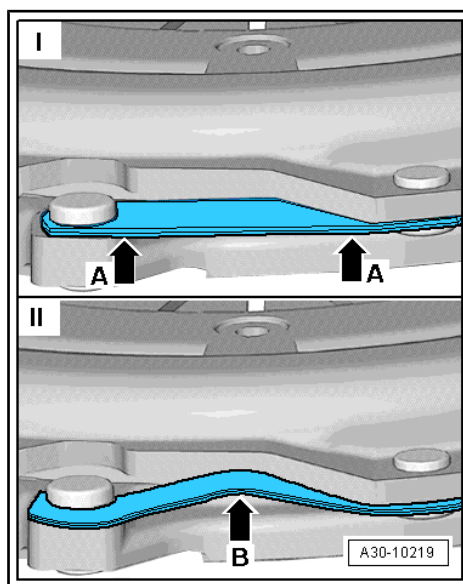
Checking springs and riveting

I - Springs OK

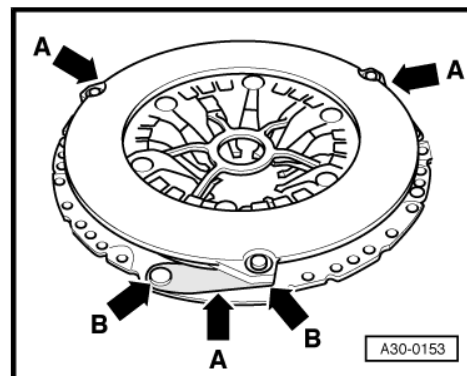
- Slight kinking on the outside -arrows A- is normal on production parts.

II - Springs damaged

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

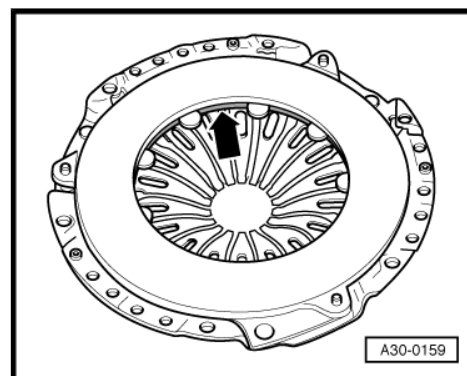


- Check that rivets -arrows B- are secure at all springs -arrows A-.
- Renew pressure plate if rivets -arrows B- are loose.



Checking metal ring

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



2.2.2 Exploded view - LuK version clutch



Note

- ◆ "SAC" stands for "Self-Adjusting Clutch".
- ◆ Observe notes on clutch ⇒ [page 12](#).



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1 - Clutch module

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

2 - Oil seal

- ☐ For dual-mass flywheel
- ☐ Pulling out ⇒ [page 39](#)
- ☐ Driving in ⇒ [page 40](#)

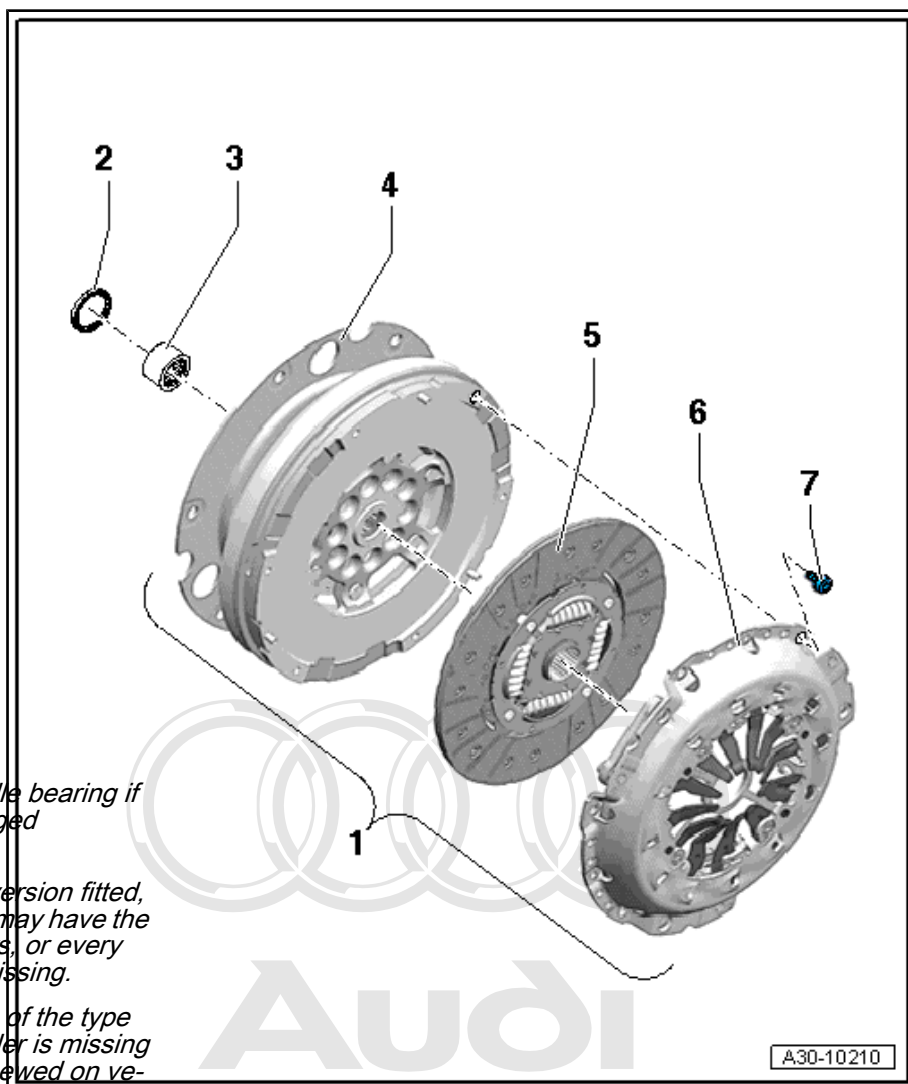
3 - Needle bearing

- ☐ For dual-mass flywheel
- ☐ Different versions
⇒ [page 23](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Check and renew if necessary ⇒ [page 23](#)
- ☐ Pressing out
⇒ [page 39](#)
- ☐ Pressing in
⇒ [page 39](#)



Note

- ◆ Always renew needle bearing if input shaft is damaged
⇒ [page 38](#)
- ◆ Depending on the version fitted, the needle bearing may have the full number of rollers, or every 4th roller may be missing.
- ◆ The needle bearing of the type where every 4th roller is missing must always be renewed on vehicles with 4-cylinder TDI engine (except 125 kW TDI)
⇒ [page 37](#).
- ◆ On all other vehicles the missing needle rollers do not mean that the needle bearing is defective. Do not renew the needle bearing.



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4 - Dual-mass flywheel

- ☐ With flange for drive plate
- ☐ Ensure that dowel pins fit tightly
- ☐ Contact surface for clutch lining must be free of grooves, oil and grease
- ☐ Different versions with or without centrifugal pendulum absorber ⇒ [page 23](#)
- ☐ Checking for damage ⇒ [page 24](#)
- ☐ Removing and installing ⇒ ["2.4.2 Removing and installing LuK version clutch", page 32](#)

5 - Clutch plate

- ☐ Removing and installing ⇒ [page 32](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Installation position: marking "Getriebeseite" (gearbox side) faces towards pressure plate
- ☐ If fitted, coil springs (damper assembly) face towards pressure plate

6 - SAC pressure plate

- ☐ For correct version, refer to ➔ Electronic parts catalogue
- ☐ Removing and installing ➔ [page 32](#)
- ☐ Resetting adjuster ring ➔ [page 35](#)
- ☐ Checking ends of diaphragm spring ➔ [page 24](#)
- ☐ Checking pressure plate for distortion ➔ [page 24](#)
- ☐ Checking springs and riveting ➔ [page 25](#)
- ☐ Contact surface for clutch lining must be free of grooves, oil and grease

7 - Bolt

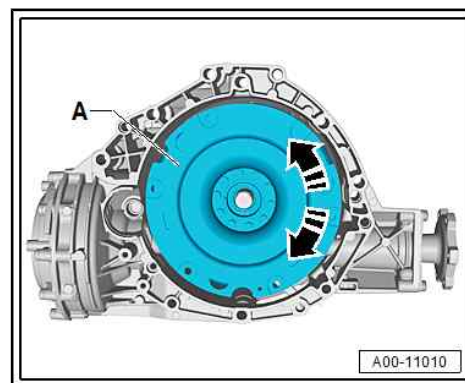
- ☐ 22 Nm and then turn 90° further
- ☐ Always renew
- ☐ Secures pressure plate to dual-mass flywheel
- ☐ Observe assembly instructions ➔ [page 32](#) for loosening or tightening

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Rattling sound in LuK version dual-mass flywheel with centrifugal pendulum absorber

When the clutch module -A- is turned, a rattling sound can be heard at intervals of approx. 90°.

This is caused by moving pendulum masses in the dual-mass flywheel and is not a fault.



Checking needle bearing in dual-mass flywheel on vehicles with 4-cylinder TDI engine (except 125 kW TDI)



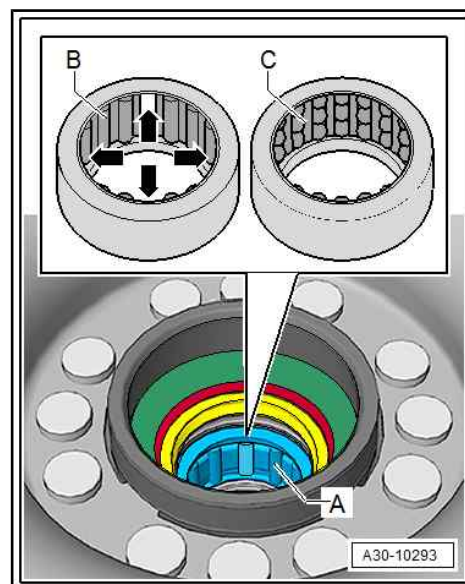
Caution

Check version of needle bearing in dual-mass flywheel.

- ◆ Depending on the version, ball bearings or needle bearings may be fitted; needle bearings may have either the full number of rollers, or every 4th roller may be missing.
- ◆ The needle bearings -B- of the type where every 4th roller is missing -arrows- must always be renewed on vehicles with 4-cylinder TDI engine (except 125 kW TDI) ➔ [page 37](#).
- ◆ On all other vehicles the missing needle rollers do not mean that the needle bearing is defective. Do not renew the needle bearing.
- ◆ Depending on the manufacturer, the new needle bearings are fitted with the full number of either rollers -A- or balls -C-.

Depending on the make, the following bearings are fitted on vehicles with 4-cylinder TDI engines (except 125 kW TDI):

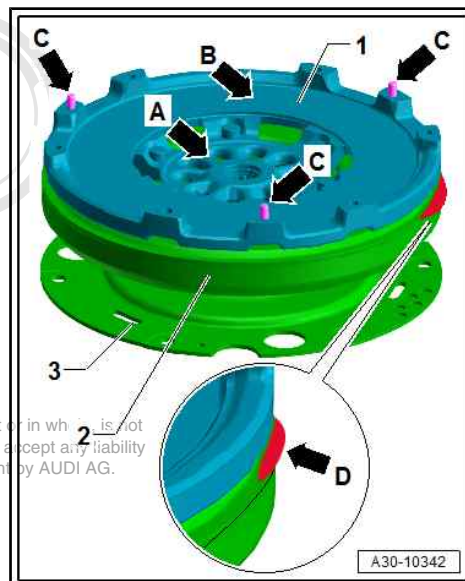
- ◆ »LuK« dual-mass flywheel: Needle bearing -A- fitted with the full number of rollers
- ◆ »Sachs« dual-mass flywheel: Ball bearing -C-
- ◆ For correct version, refer to ➔ Electronic parts catalogue



Checking dual-mass flywheel for damage

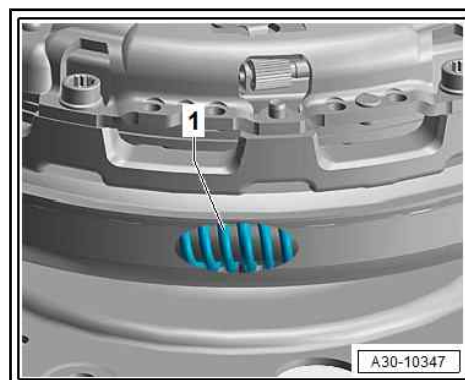
- Check projections -arrow A- and friction surface -arrow B- for cracks.
- Ensure that dowel pins -arrows C- are seated securely in dual-mass flywheel.
- Surface -2- must not be warped -arrow D-.
- Drive plate -3- must not be bent.

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Damage to wall of dual-mass flywheel housing

- ◆ Damage to housing wall is caused by a defective bow spring -1- or bow spring mounting.

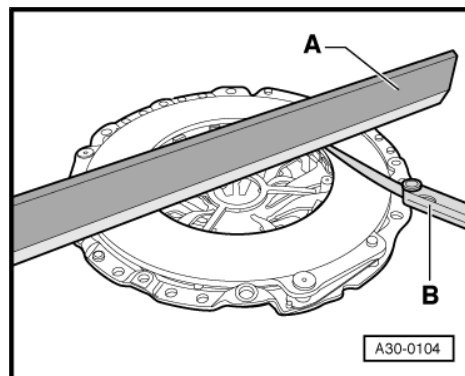


Checking pressure plate for distortion, cracks and burning

A - Straightedge

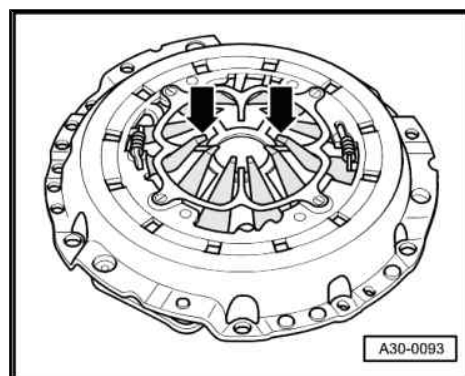
B - Feeler gauge

- Pressure plate distortion up to 0.8 mm is permissible.



Checking ends of diaphragm spring

- Wear up to 0.3 mm (maximum) is permissible.



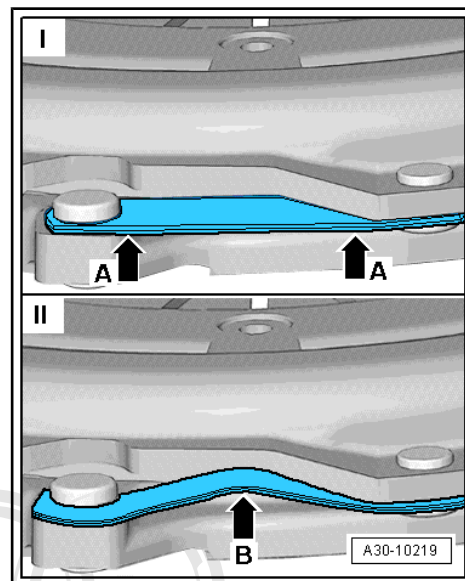
Checking springs and riveting

I - Springs OK

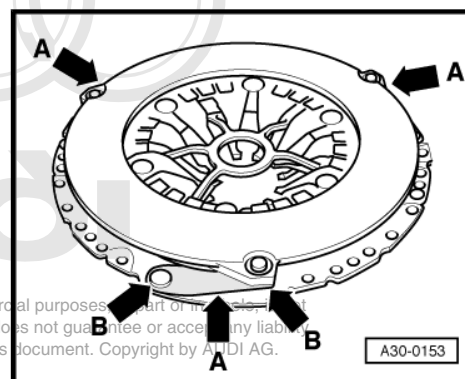
- Slight kinking on the outside -arrows A- is normal on production parts.

II - Springs damaged

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



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

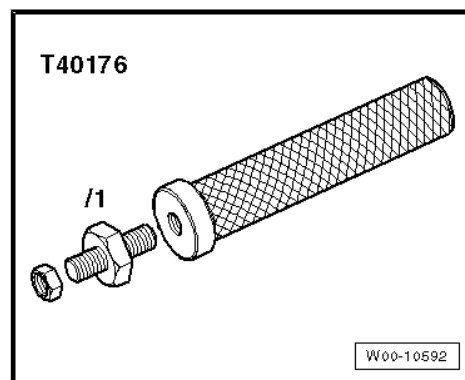


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2.3 Removing and installing clutch module

Special tools and workshop equipment required

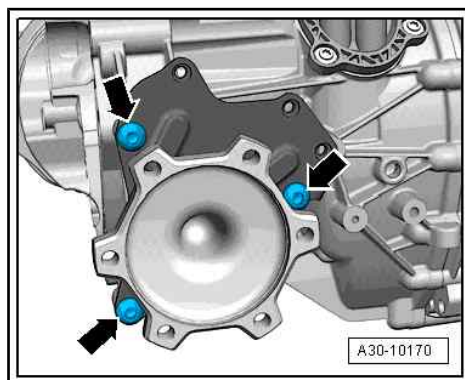
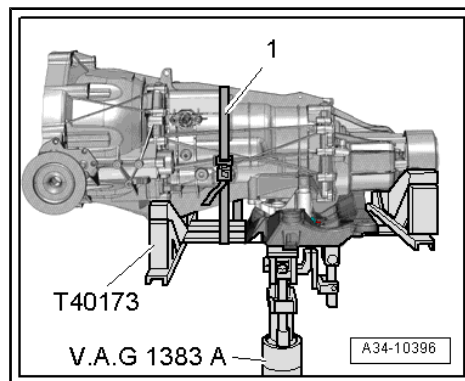
- ◆ Extractor - T40176-



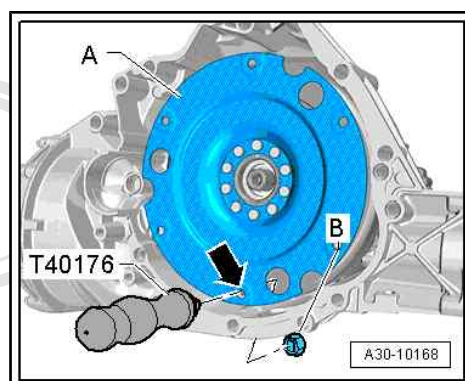
- ◆ Grease for clutch plate splines - G 000 100-

Removing

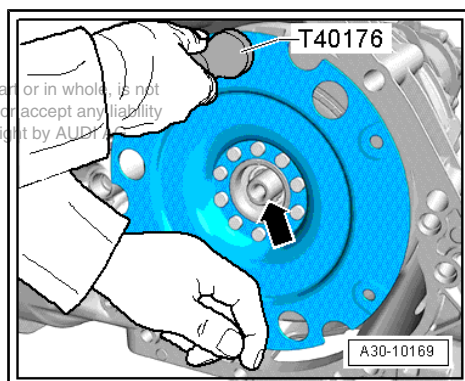
- Remove gearbox and secure to gearbox support - T40173- using tensioning strap -1- ➔ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Removing and installing gearbox; Removing gearbox .
- Gearbox removed ➔ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Removing and installing gearbox; Removing gearbox
- Gearbox is secured to gearbox support - T40173- with tensioning strap -1-.
- Tilt gearbox to rear with gearbox support - T40173- to prevent gear oil from escaping.
- Remove flange shaft (left-side) ➔ [page 137](#) .



- Attach extractor - T40176- to clutch module -A- using nut -B- -arrow-.



- Turn extractor - T40176- upwards.



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Risk of damage to oil seals and needle bearing in dual-mass flywheel.

- ◆ The clutch module weighs approx. 20 kg.
- ◆ Keep firm hold of the bottom of the clutch module, as shown in the illustration, to prevent the clutch module from tilting over.
- ◆ When removing and installing the clutch module, take care not to damage the oil seals and needle bearing in the dual-mass flywheel -arrow-.
- ◆ Renew oil seals or needle bearing if damaged ➔ [page 37](#) .

- Pull clutch module off input shaft -arrow- keeping clutch module straight.

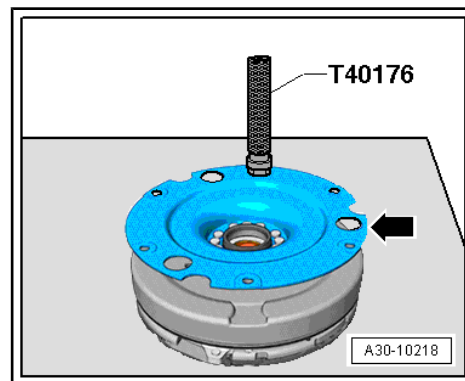


Caution

Take care not to damage flange for drive plate on dual-mass flywheel.

- ◆ **Do not put down clutch module with flange -arrow- for drive plate facing downwards.**
- ◆ **This could bend the flange -arrow- for the drive plate, which would cause problems with clutch operation.**

- Put clutch module down carefully, e.g. on work bench, with pressure plate facing downwards.



Vehicles with 4-cylinder TDI engine (except 125 kW TDI)



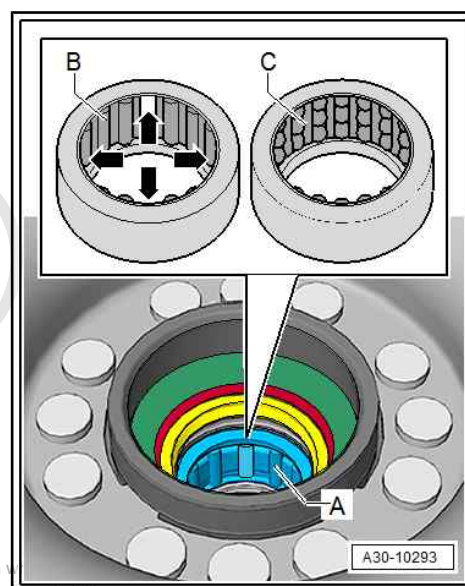
Caution

Check version of needle bearing in dual-mass flywheel.

- ◆ **Depending on the version, ball bearings or needle bearings may be fitted; needle bearings may have the full number of rollers, or every 4th roller may be missing.**
- ◆ **The needle bearings -B- of the type where every 4th roller is missing -arrows- must always be renewed on vehicles with 4-cylinder TDI engine (except 125 kW TDI) ⇒ [page 37](#).**
- ◆ **On all other vehicles the missing needle rollers do not mean that the needle bearing is defective. Do not renew the needle bearing.**
- ◆ **Depending on the manufacturer, the new needle bearings are fitted with the full number of either rollers -A- or balls -C-.**

Depending on the make, the following bearings are fitted on vehicles with 4-cylinder TDI engines (except 125 kW TDI):

- ◆ **»LuK« dual-mass flywheel: Needle bearing -A- fitted with the full number of rollers**
- ◆ **»Sachs« dual-mass flywheel: Ball bearing -C-**
- ◆ **For correct version, refer to ⇒ *Electronic parts catalogue***



Installing clutch module

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

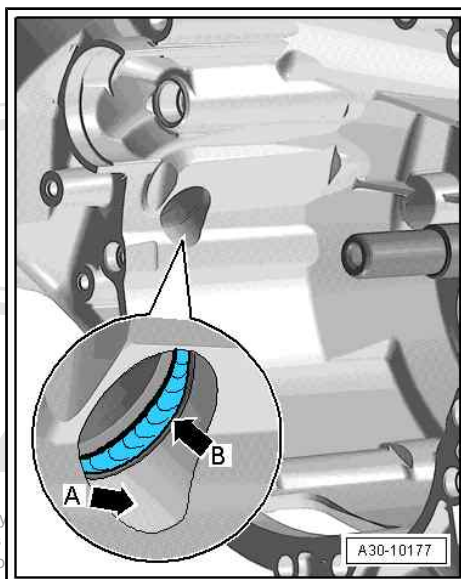
- Thoroughly clean flange shaft (left-side), area of gearbox housing leading to differential -arrow A- and oil seal -arrow B-.



Note

If oil seal between differential and gearbox housing -arrow B- is damaged, it must be renewed ➔ [page 139](#) .

- Pack space between sealing lip and dust lip -arrow B- half full with sealing grease - G 052 128 A1- .



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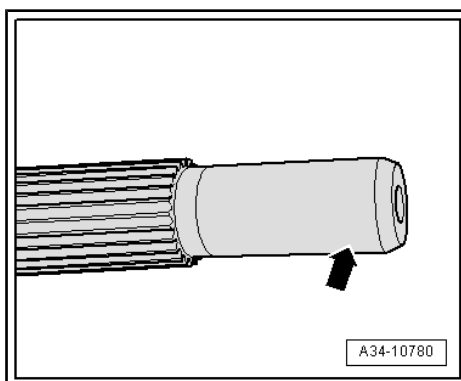
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cept any liability
y AUDI AG.

- Grease clutch release bearing according to specifications ➔ [page 10](#) .
- Clean splines and bearing journal of input shaft -arrow-.
- Apply a thin coating of grease for clutch plate splines - G 000 100- to splines on input shaft.

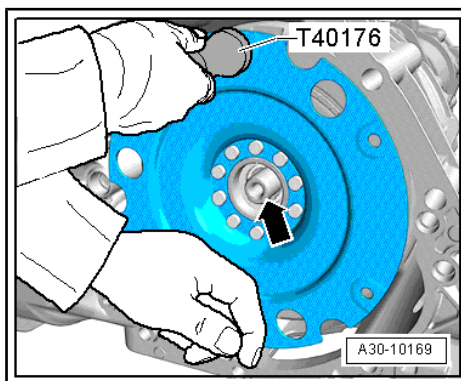


Caution

Before installing clutch module, remove grease from input shaft bearing journal -arrow- as far as splines.



- Carefully slide clutch module onto input shaft -arrow-, taking care to keep clutch module straight.
- Detach extractor - T40176- from clutch module.
- Install flange shaft (left-side) ➔ [page 153](#) .



2.4 Removing and installing clutch

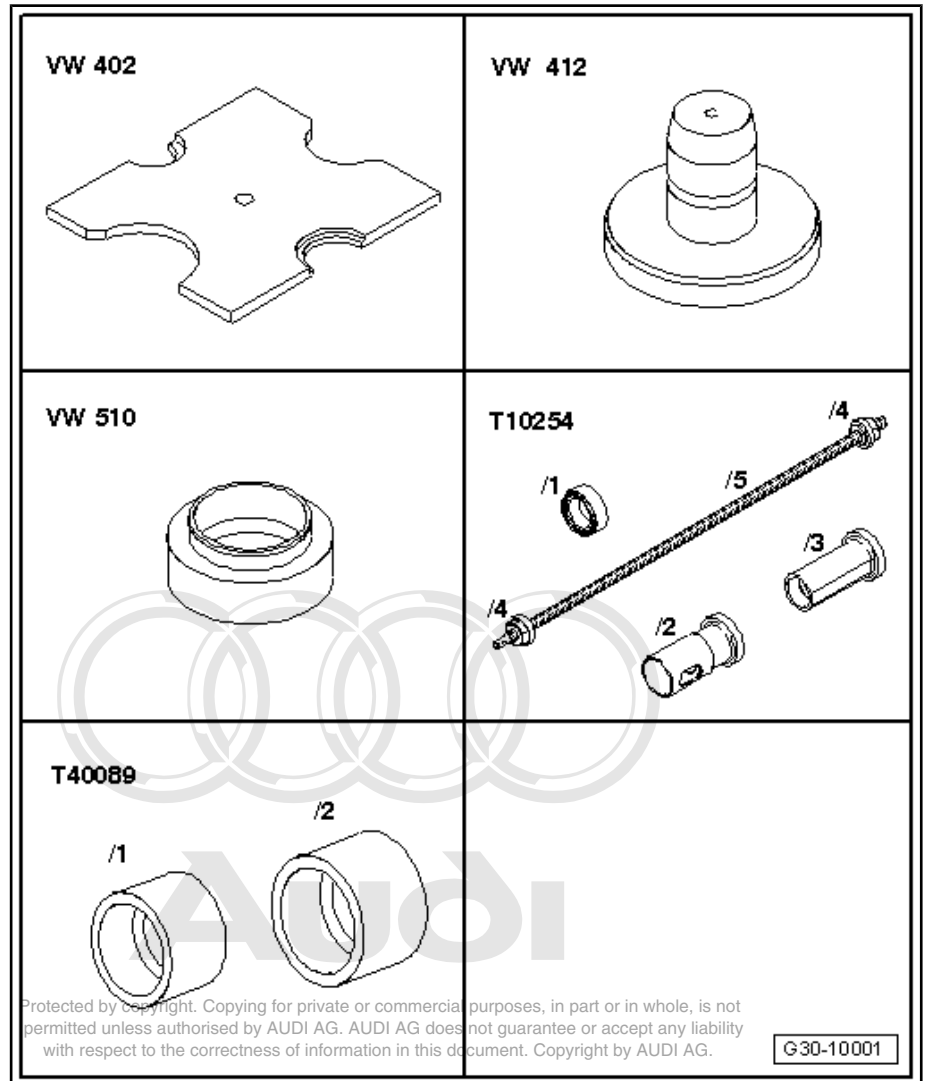
➔ ["2.4.1 Removing and installing Sachs version clutch", page 28](#)

➔ ["2.4.2 Removing and installing LuK version clutch", page 32](#)

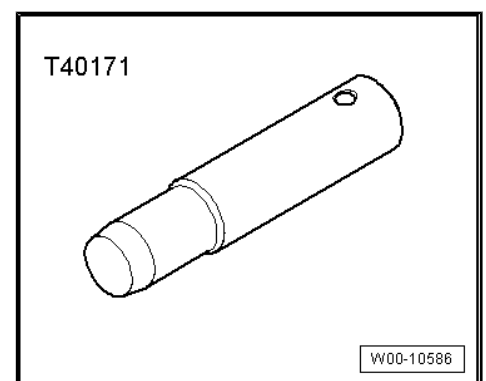
2.4.1 Removing and installing Sachs version clutch

Special tools and workshop equipment required

- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 412-
- ◆ Thrust pad - VW 510-
- ◆ Assembly tool - T10254-
- ◆ Thrust piece - T40089-



- ◆ Centring mandrel - T40171-



Removing

- Remove clutch module ➤ [page 25](#) .

3 - Pressure plate



Caution

Take care not to damage pressure plate and dual-mass flywheel.
Pressure plate -3- must be compressed before removing or installing.

If the pressure plate is not compressed, it will become distorted when the bolts -2- are slackened or tightened (causes clutch grab when driving off).

The dual-mass flywheel must rest only on the bearing washer -arrow A- when compressing the pressure plate -3- in the hydraulic press.

If the dual-mass flywheel is supported on the flange for drive plate -1- the flange will become distorted and the flywheel will thus be damaged. In this case, the dual-mass flywheel will have to be renewed.

- Position the clutch module so that the thrust pad - VW 510 - makes contact with the bearing washer -arrow A- in the dual-mass flywheel.

- Place the assembly tool - T10254/3 - on the spring tongues in the diaphragm of the pressure plate -3- and apply the press.

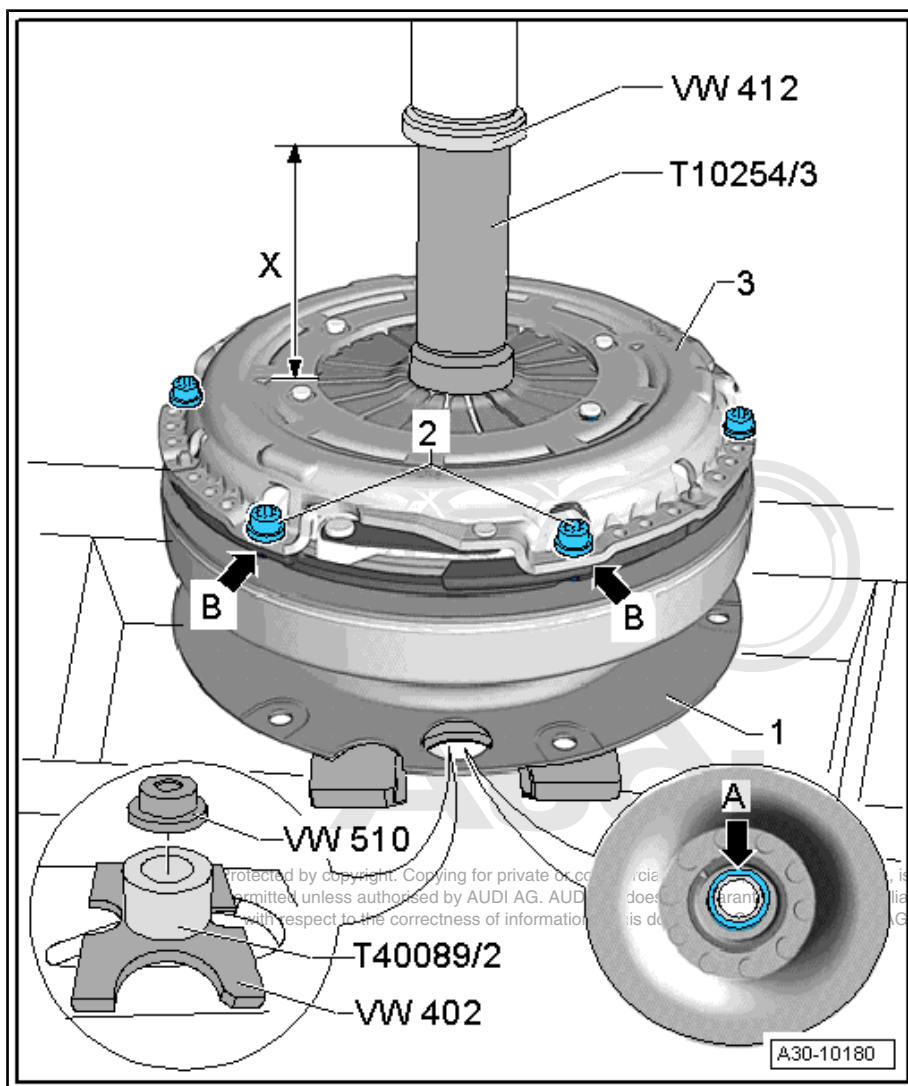
- Distance of travel: dimension -x- = 8 to 9 mm



Note

A second mechanic is required for the next step.

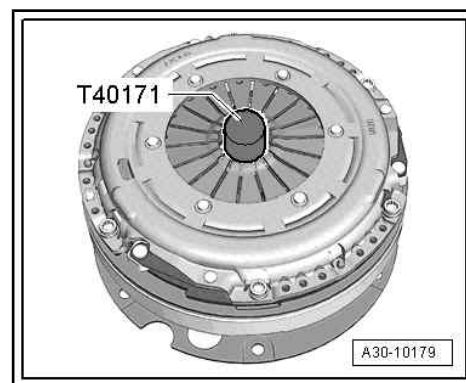
- Remove all 6 bolts -2- and release press.
- Remove pressure plate -3- and clutch plate.



Installing

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

- Tightening torque ➤ [Item 7 \(page 17\)](#)
- Check that pressure plate is not distorted ➤ [page 20](#).
- Use centring mandrel - T40171- to centralise clutch plate.
- Position pressure plate on centring pins.
- Installation position of clutch plate: damper assembly (coil springs) or marking “Getriebeseite” (gearbox side) point towards pressure plate.
- Position the clutch module so that the thrust pad - VW 510- makes contact with the bearing washer -arrow A- in the dual-mass flywheel.



1 - Pressure plate



Caution

Take care not to damage dual-mass flywheel.
The dual-mass flywheel -3- must rest only on the bearing washer -arrow A- when compressing the pressure plate -1- in the hydraulic press.

the dual-mass flywheel is supported on the flange for drive plate -arrow B- the flange will become distorted and the flywheel will thus be damaged. In this case, the dual-mass flywheel will have to be renewed.

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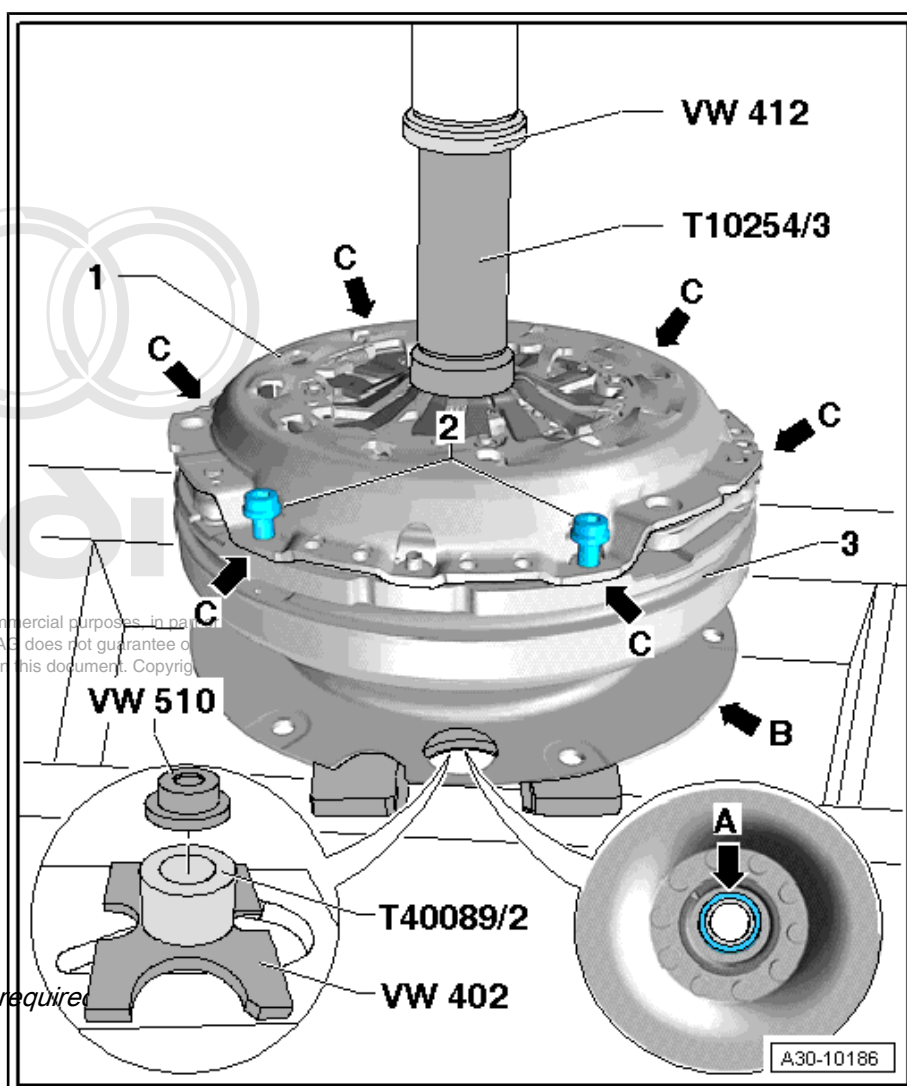
- Place assembly tool - T10254/3- over centring mandrel - T40171- .
- Apply press until pressure plate -1- just makes contact with dual-mass flywheel -3- -arrows C-.



Note

A second mechanic is required for the next step.

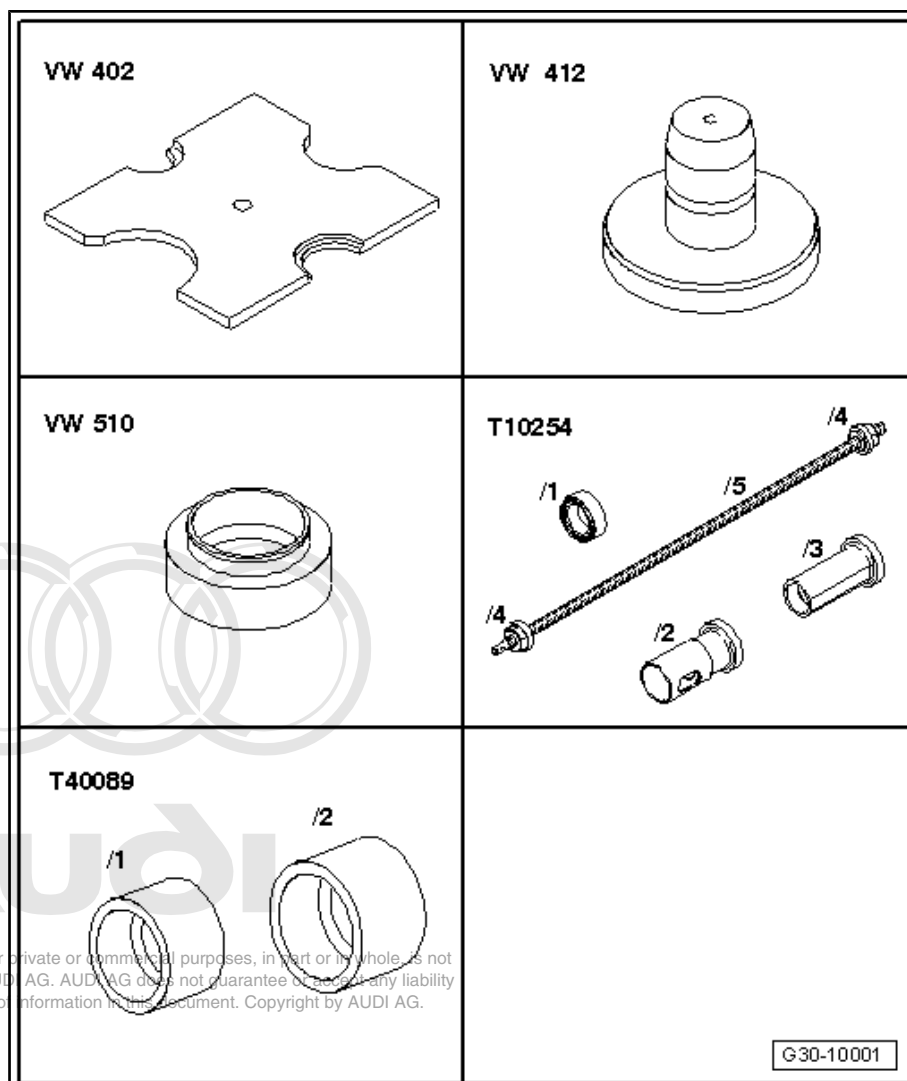
- Screw in each of the 6 bolts -2- in succession and tighten to final torque.
- Release press.
- Install clutch module ➤ [page 25](#) .



2.4.2 Removing and installing LuK version clutch

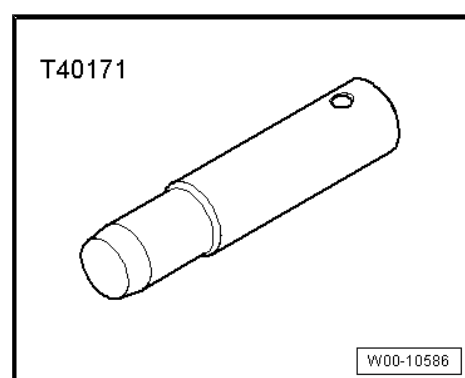
Special tools and workshop equipment required

- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 412-
- ◆ Thrust pad - VW 510-
- ◆ Assembly tool - T10254-
- ◆ Thrust piece - T40089-



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- ◆ Centring mandrel - T40171-



Removing

- Remove clutch module ➔ [page 25](#) .

1 - Pressure plate



Caution

Take care not to damage pressure plate and dual-mass flywheel.

Pressure plate -1- must be compressed before removing or installing.

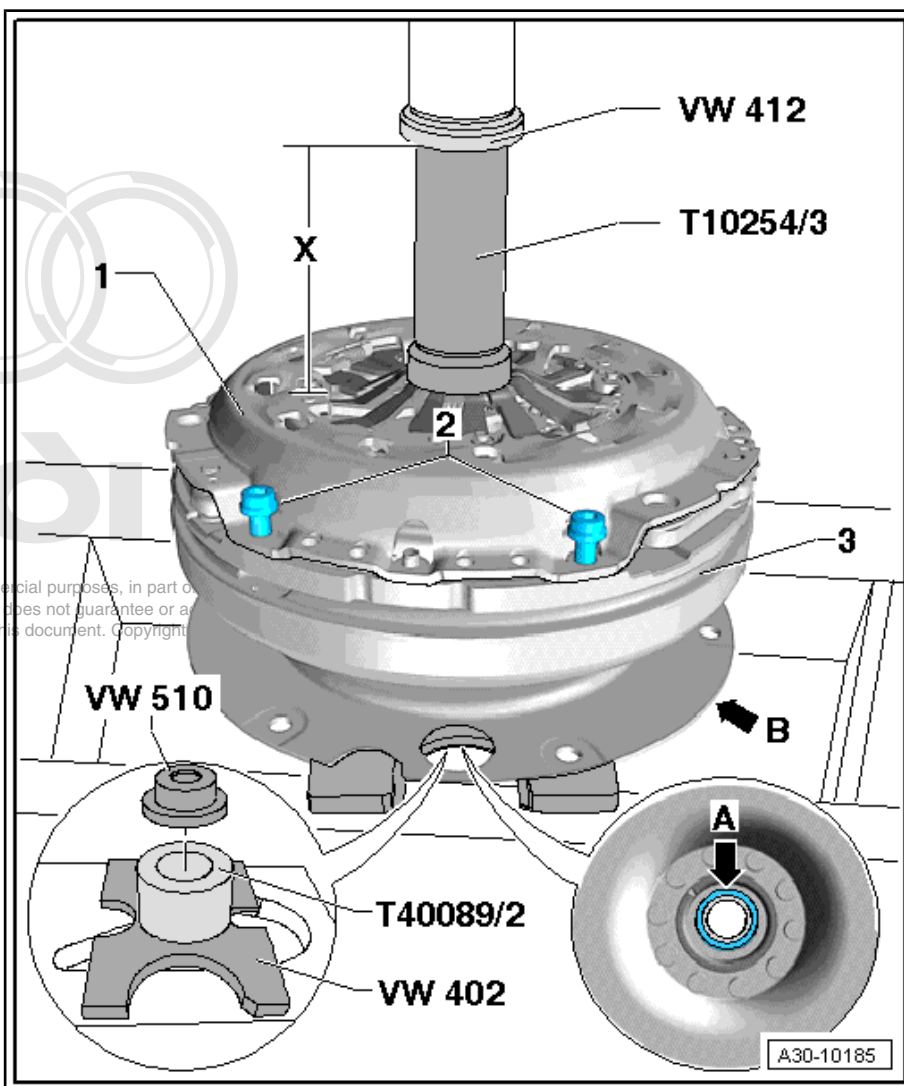
If the pressure plate is not compressed, it will become distorted when the bolts -2- are slackened or tightened (causes clutch grab when driving off).

The dual-mass flywheel -3- must rest only on the bearing washer

-arrow A- when compressing the pressure plate -1- in the hydraulic press.

If the dual-mass flywheel is supported on the flange for drive plate -arrow B- the flange will become distorted and the flywheel will thus be damaged. In this case, the dual-mass flywheel will have to be renewed.

- Position the clutch module so that the thrust pad - VW 510- makes contact with the bearing washer -arrow A- in the dual-mass flywheel.



- Place the assembly tool - T10254/3- on the spring tongues in the diaphragm of the pressure plate -1- and apply the press.
- Distance of travel: dimension -x- = 8 to 9 mm



Note

A second mechanic is required for the next step.

- Remove all 6 bolts -2- and release press.
- Remove pressure plate -1- and clutch plate.

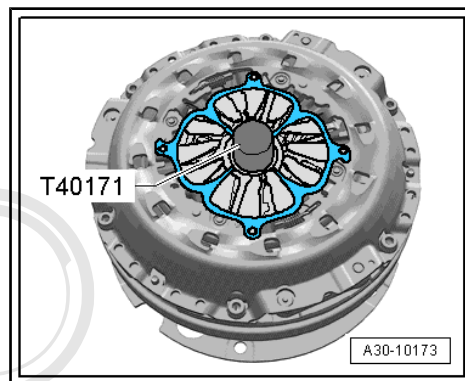
Installing

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



Note

- ◆ Check that pressure plate is not distorted ➔ [page 24](#).
- ◆ When only the clutch plate is being renewed, the adjuster ring in the pressure plate has to be reset before assembly ➔ [page 35](#).
- Use centring mandrel - T40171- to centralise clutch plate.
- Installation position of clutch plate: damper assembly (coil springs) or marking “Getriebeseite” (gearbox side) point towards pressure plate.
- Position pressure plate on centring pins.
- Position the clutch module so that the thrust pad - VW 510- makes contact with the bearing washer - arrow A- in the dual-mass flywheel.



1 - Pressure plate



Caution

Take care not to damage dual-mass flywheel. The dual-mass flywheel -3- must rest only on the bearing washer -arrow A- when compressing the pressure plate -1- in the hydraulic press.

If the dual-mass flywheel is supported on the flange for drive plate -arrow B- the flange will become distorted and the flywheel will thus be damaged. In this case, the dual-mass flywheel will have to be renewed.

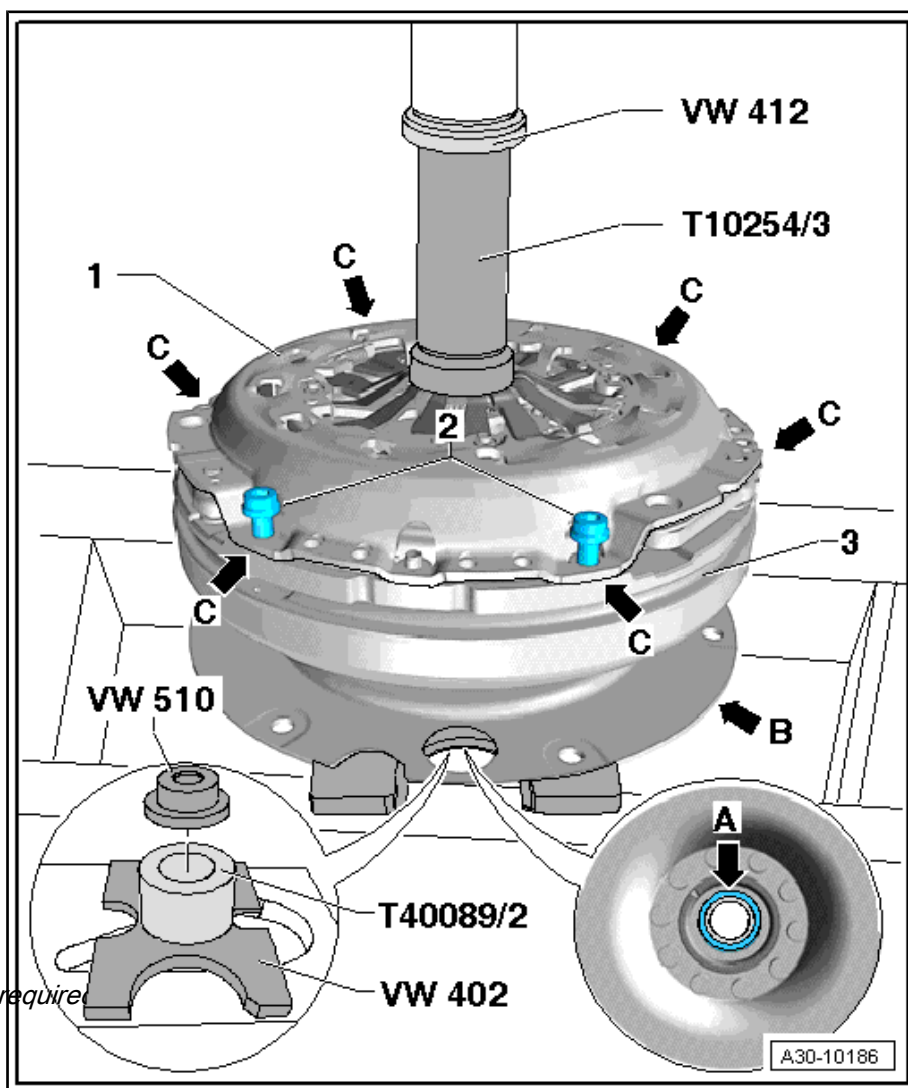
- Place assembly tool - T10254/3- over centring mandrel - T40171-.
- Apply press until pressure plate -1- just makes contact with dual-mass flywheel -3- -arrows C-.



Note

A second mechanic is required for the next step.

- Screw in each of the 6 bolts -2- in succession and tighten to final torque.
- Release press.



- Install clutch module ➔ [page 25](#) .

2.5 Resetting adjuster ring in pressure plate, LuK version



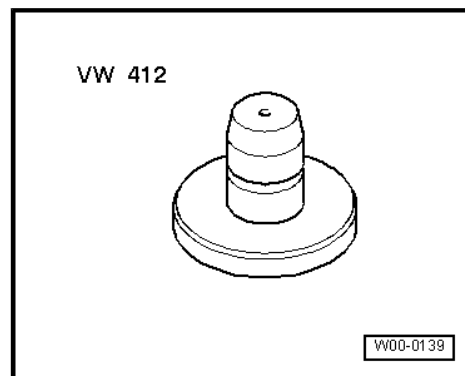
Note

- ◆ *When fitting a new clutch plate in conjunction with a used pressure plate, the adjuster ring in the pressure plate has to be reset by turning it back as far as it will go. If you do not reset the adjuster ring in the pressure plate, the pressure plate will operate with reduced clamping force, which will cause excessive wear, especially of the clutch plate (clutch will then slip).*
- ◆ *If the clutch plate is not renewed, it is not necessary to reset the adjuster ring.*
- ◆ *New pressure plates are pre-set accordingly, and do not have to be reset.*

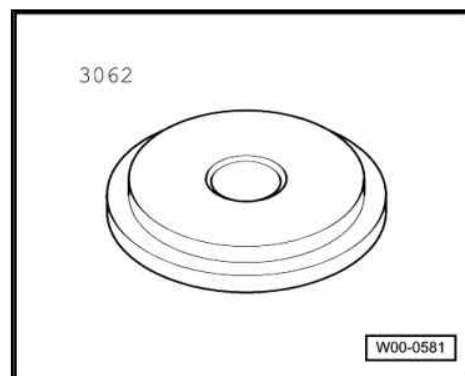
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Special tools and workshop equipment required

- ◆ Press tool - VW 412-

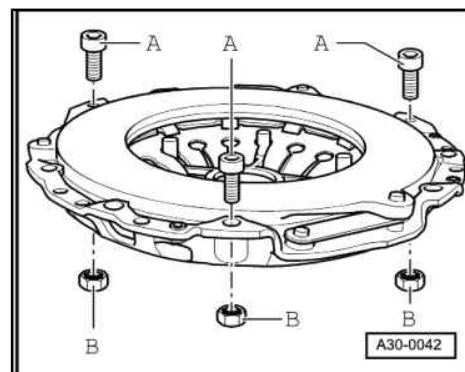


- ◆ Thrust pad - 3062-

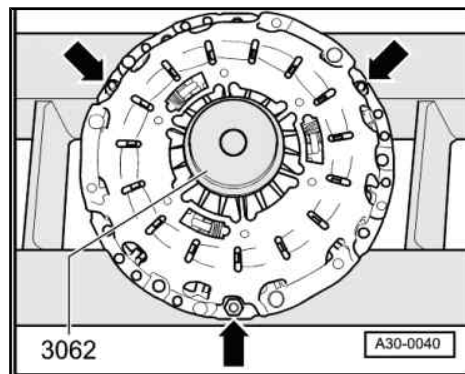


Procedure

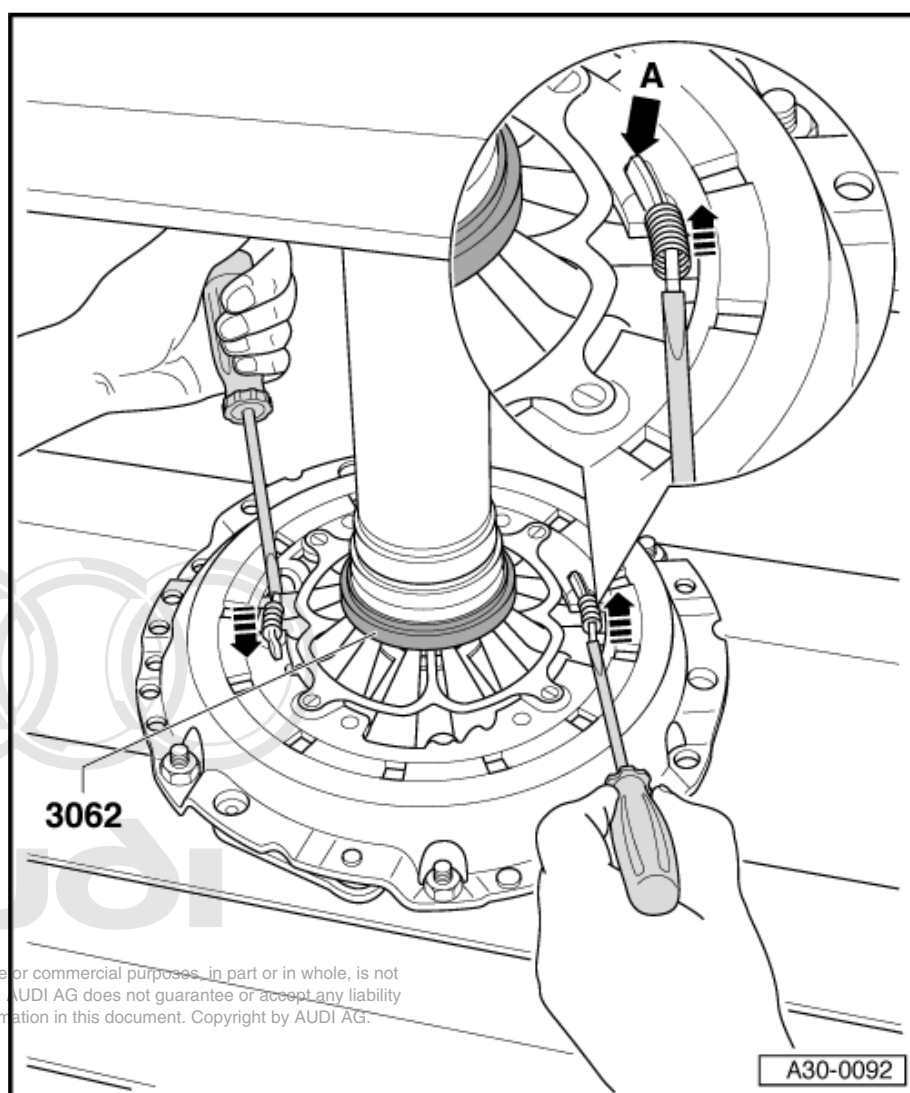
- Insert 3 bolts for securing pressure plate -A- into the mounting holes on the pressure plate located at 120° (1/3 turn) intervals, as shown in the illustration.
- Screw 3 nuts -B- (M8) onto bolts -A- and tighten nuts lightly.



- Place the pressure plate onto the press so that only the 3 bolt heads -arrows- make contact.
- Position thrust pad - 3062- in the centre of the pressure plate.



Do not use force when performing the following steps, as this could cause the forks on the adjuster ring to break off.



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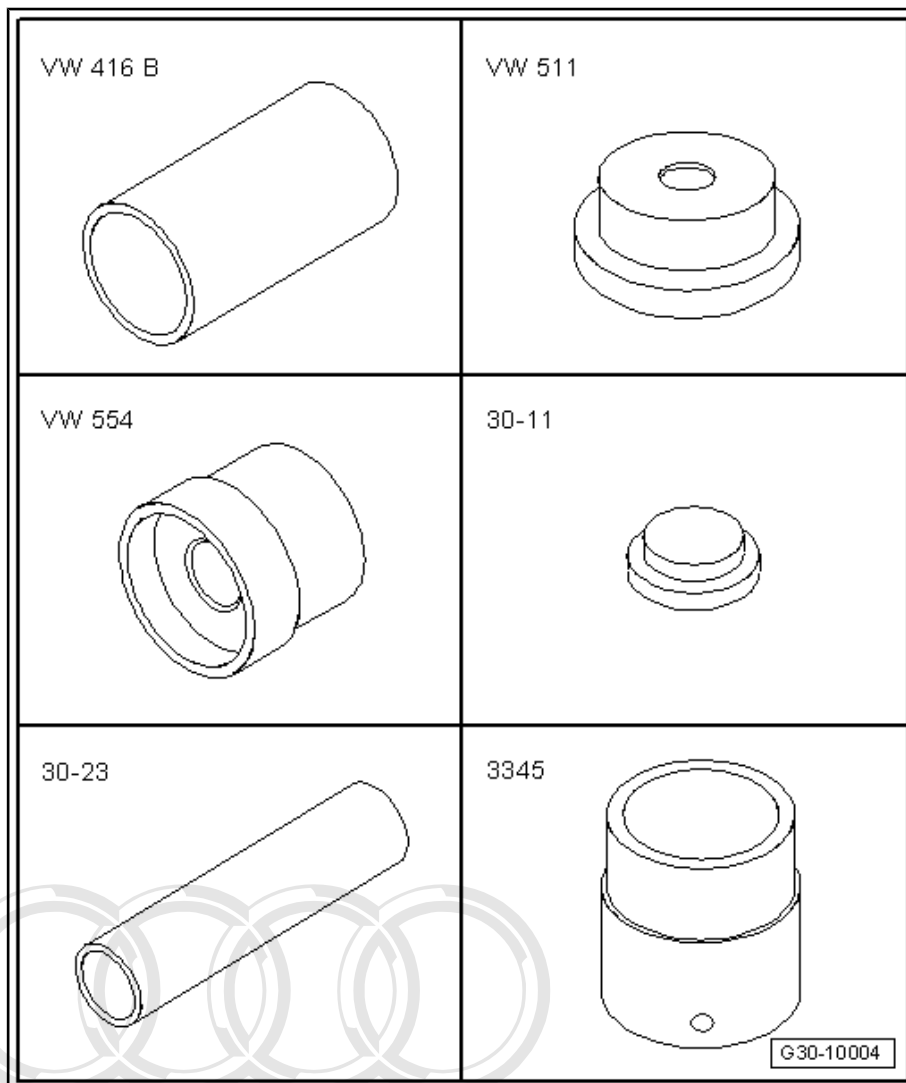
- Apply two screwdrivers to the forks on the adjuster ring. Use the press to apply pressure to the pressure plate until it is just possible to move the adjuster ring.
- Using the two screwdrivers, turn back the adjuster ring evenly in the direction of the -arrows- until it reaches the stop -arrow A-.

- Hold the adjuster ring against the stop and relieve the pressure applied by the press so that the adjuster ring is held in this position.

2.6 Renewing needle bearing/ball bearing for dual-mass flywheel

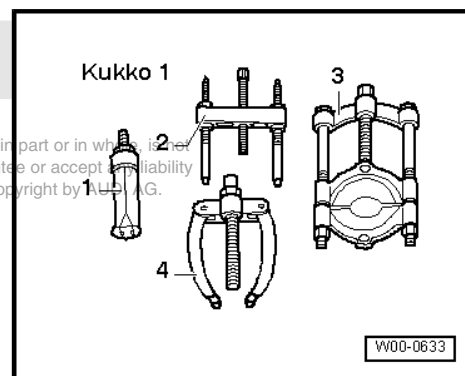
Special tools and workshop equipment required

- ◆ Tube - VW 416B-
- ◆ Thrust pad - VW 511-
- ◆ Press tool - VW 554-
- ◆ Thrust plate - 30-11-
- ◆ Extension - 30-23-
- ◆ Wheel bearing tube - 3345-

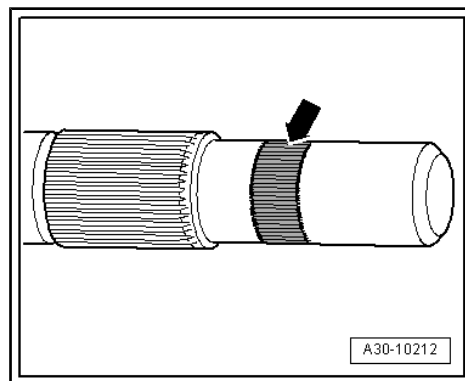


- ◆ -1- Internal puller - Kukko 21/4-

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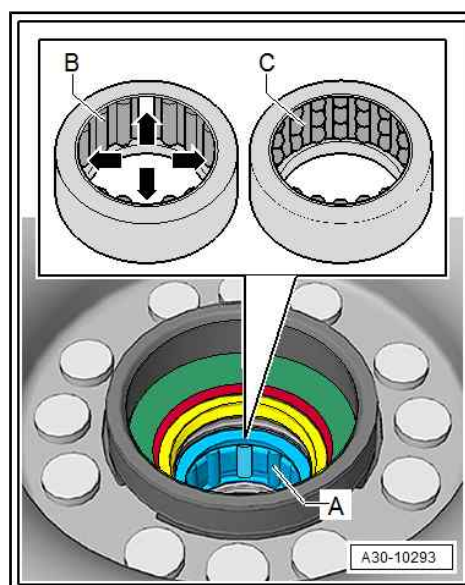


- ◆ -1- Internal puller - Kukko 21/5-



Note

- ◆ The procedure for renewing the needle bearing or ball bearing and the oil seal on the "Sachs" and "LuK" version clutches is identical.
- ◆ If there is visible damage on the surface of the input shaft in the vicinity of the needle bearing for the dual-mass flywheel -arrow-, both the input shaft and the needle bearing or ball bearing in the dual-mass flywheel must be renewed.
- ◆ Depending on the version, ball bearings or needle bearings may be fitted; needle bearings may have either the full number of rollers, or every 4th roller may be missing.
- ◆ The needle bearings -B- of the type where every 4th roller is missing -arrows- must always be renewed on vehicles with 4-cylinder TDI engine (except 125 kW TDI) ➔ [page 37](#) .
- ◆ On all other vehicles the missing needle rollers do not mean that the needle bearing is defective. Do not renew the needle bearing.
- ◆ The new needle bearings are fitted with the full number of rollers -A- or balls -C-.



Depending on the make, the following bearings are fitted on vehicles with 4-cylinder TDI engines (except 125 kW TDI):

- ◆ »LuK« dual-mass flywheel: Needle bearing -A- fitted with the full number of rollers
- ◆ »Sachs« dual-mass flywheel: Ball bearing -C-
- ◆ For correct version, refer to ➔ Electronic parts catalogue

Removing

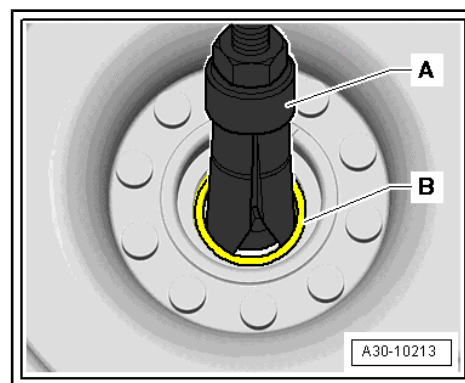
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- Pressure plate with clutch plate has been removed from dual-mass flywheel ➔ [page 28](#) or ➔ [page 32](#) .

Removing oil seal from dual-mass flywheel

- Clamp internal puller -A- behind sealing lip of oil seal -B- and pry out oil seal.

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



Pressing needle bearing out of dual-mass flywheel



Caution

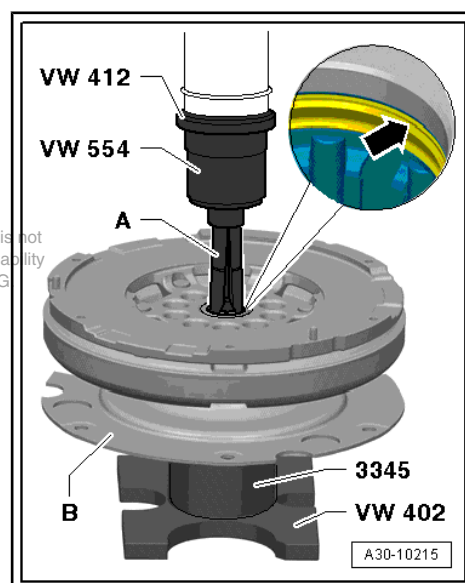
Take care not to damage dual-mass flywheel.

- ◆ *If the dual-mass flywheel is supported on the flange for drive plate -B-, the flange will become distorted and the flywheel will thus be damaged. In this case, the dual-mass flywheel will have to be renewed.*

- Always renew the needle bearing when it has been removed from the dual-mass flywheel.
- Remove oil seal from dual-mass flywheel ➔ [page 39](#) .
- Apply internal puller -A- in area of seal -arrow- in needle bearing and tighten puller.

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

- Then apply press tool -VW 554- to internal puller and press out needle bearing.



Pressing in needle bearing for dual-mass flywheel



Caution

Take care not to damage dual-mass flywheel.

- ◆ *The centring pins on the dual-mass flywheel can be damaged when pressing in the needle bearing.*
- ◆ *The dual-mass flywheel must always be supported centrally under the bearing mounting for the needle bearing -arrow-.*

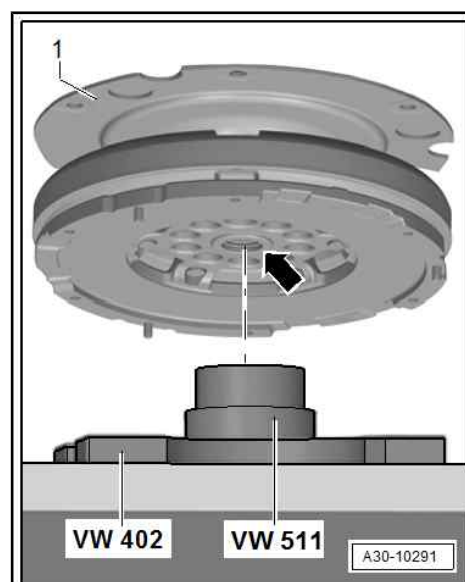
- Remove remaining grease in bore for needle bearing in dual-mass flywheel using a dry cleaning cloth.



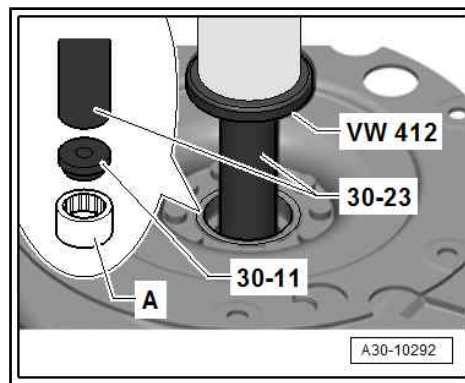
Note

Do not use solvent for cleaning bore.

- Support dual-mass flywheel -1- with thrust pad -VW 511- directly below bearing mounting -arrow-.

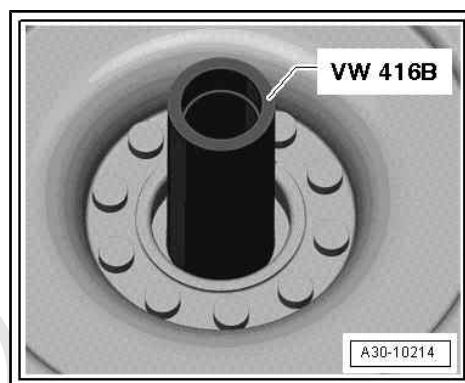


- Insert smaller diameter of thrust plate - 30-11- in needle bearing -A-. Lettering on needle bearing (thicker metal) must face towards thrust plate .
- Carefully press in needle bearing as far as stop.



Driving oil seal into dual-mass flywheel

- Needle bearing is installed in dual-mass flywheel.
- Open side of oil seal faces towards needle bearing.
- Carefully drive in oil seal onto stop.
- Installing pressure plate with clutch plate on dual-mass flywheel ➔ [page 28](#) or ➔ [page 32](#)



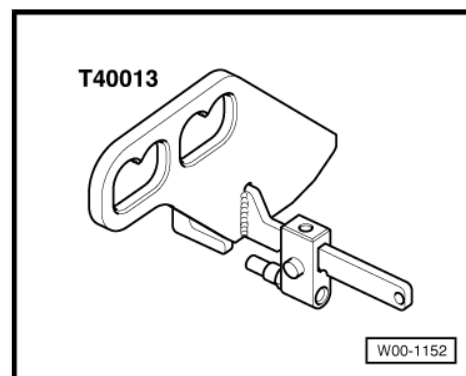
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34 – Controls, housing

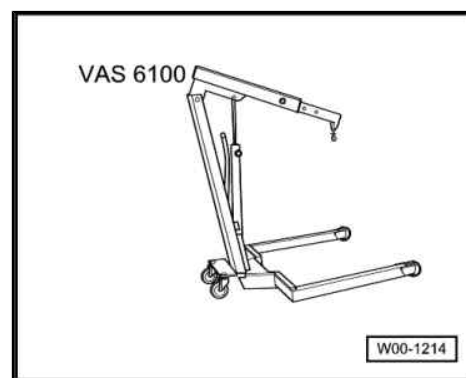
1 Transporting gearbox

Special tools and workshop equipment required

- ◆ Lifting aid - T40013-



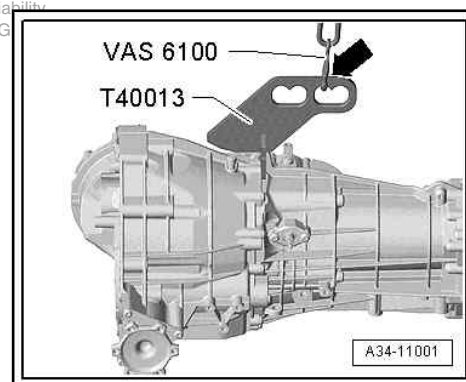
- ◆ Workshop hoist - VAS 6100-



Procedure

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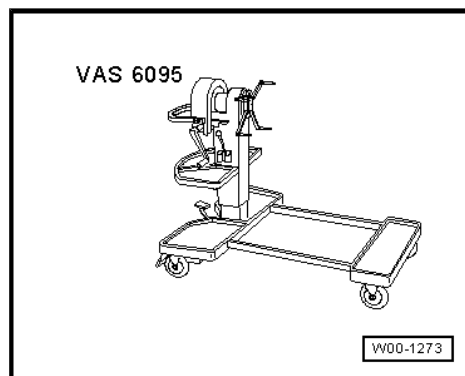
- Insert lifting aid - T40013- in lifting eye on gearbox and secure
- Engage hook of workshop hoist - VAS 6100- in 3rd notch -arrow- on lifting aid .
- Lift gearbox with workshop hoist - VAS 6100- and lifting aid - T40013- .



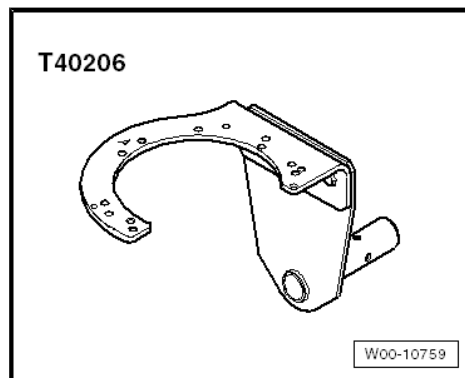
2 Securing to engine and gearbox support

Special tools and workshop equipment required

- ◆ Engine and gearbox support - VAS 6095-



- ◆ Gearbox support - T40206- with -T40206/1-



Procedure

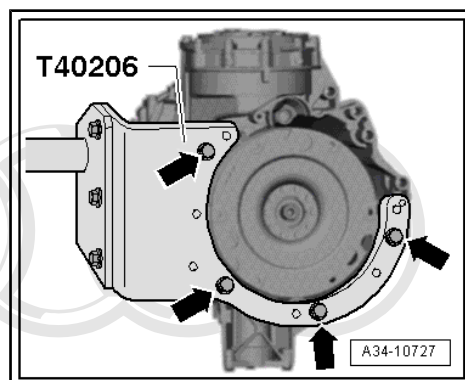


Caution

Risk of breaking gearbox housing

- ◆ *The gearbox must be secured to the gearbox support with four bolts -arrows- as the gearbox housing could break when pressing out the gear cluster.*

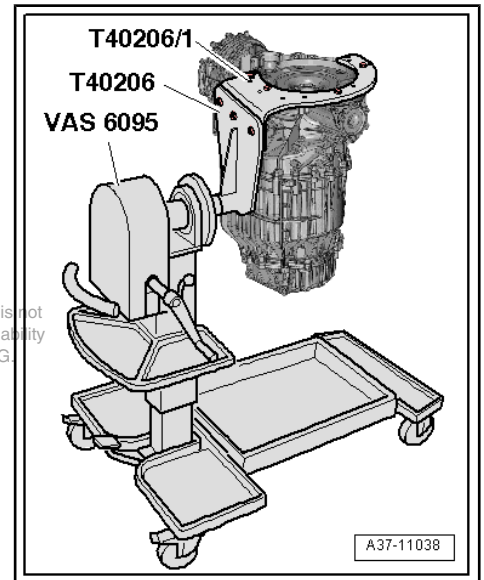
- Secure gearbox support - T40206- with -T40206/1- to gearbox -arrows-.



- Lift gearbox with workshop hoist - VAS 6100- ➔ [page 41](#) .
- Attach gearbox with gearbox support - T40206- to engine and gearbox support - VAS 6095- .

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3 Dismantling and assembling gearbox

⇒ "3.1 Schematic overview - gearbox", page 44

⇒ "3.2 Exploded view - gearbox", page 45

⇒ "3.3 Exploded view - centre differential housing and centre differential", page 46

⇒ "3.4 Exploded view - gearbox cover, selector shaft", page 47

⇒ "3.5 Exploded view - gear cluster, reverse gear wheel, selector mechanism", page 51

⇒ "3.6 Exploded view - selector forks", page 53

⇒ "3.7 Dismantling and assembling gearbox", page 55

3.1 Schematic overview - gearbox

1 - Clutch module

- ❑ Consists of pressure plate, clutch plate and dual-mass flywheel with flange for drive plate

2 - Gearbox housing

3 - Cover for final drive

4 - Flange shaft (right-side)

5 - Differential

- ❑ With crown wheel

6 - Final drive gear set

- ❑ Pinion shaft with crown wheel/ differential

7 - Pinion shaft

8 - Reverse gear

9 - 1st gear

10 - 2nd gear

11 - Gearbox cover

12 - Side shaft

- ❑ With spur gear

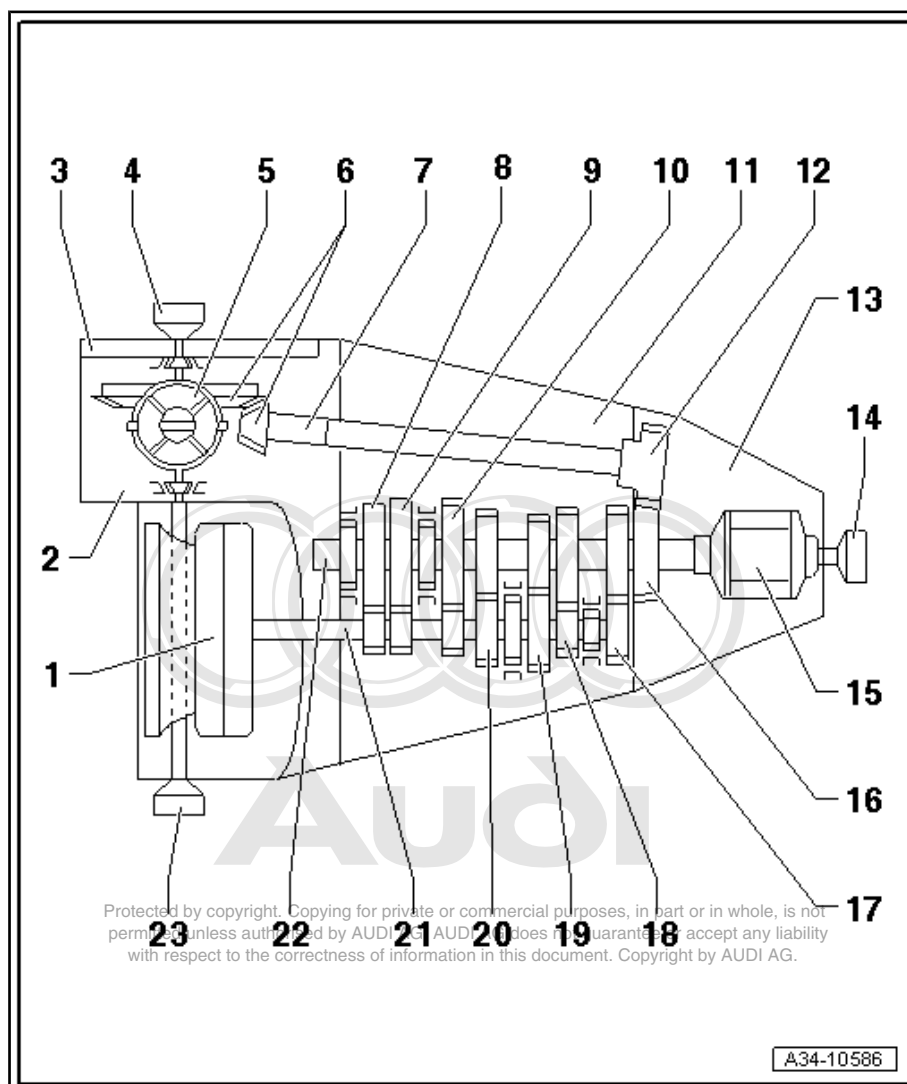
13 - Centre differential housing

14 - Flange shaft (rear)

15 - Centre differential

16 - Spur gear

- ❑ Drive gear for side shaft (spur gearing)



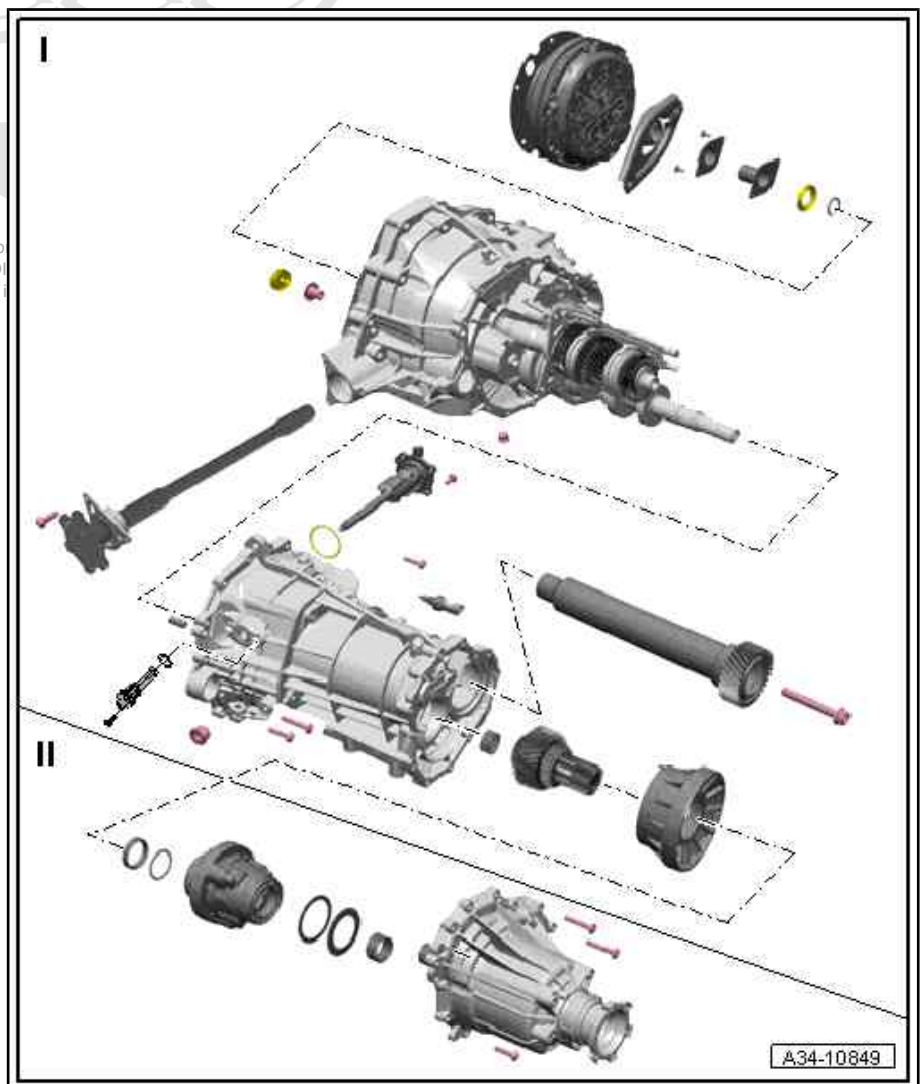
- 17 - 4th gear
- 18 - 3rd gear
- 19 - 6th gear
- 20 - 5th gear
- 21 - Input shaft
- 22 - Output shaft
- 23 - Flange shaft (left-side)

3.2 Exploded view - gearbox

I - Exploded view - gearbox
cover, selector shaft
⇒ [page 47](#)

II - Exploded view - centre dif-
ferential housing and centre
differential ⇒ [page 46](#)

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3.3 Exploded view - centre differential housing and centre differential



Note

The centre differential housing can also be removed and installed with the gearbox installed in the vehicle ⇒ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Centre differential .

1 - Centre differential housing

- ☐ Different versions

- ◆ With or without vibration damper

- ◆ With flange shaft or rear splined shaft

- ☐ ⇒ ["4.2 Removing and installing centre differential housing", page 197](#)

- ☐ ⇒ ["4.3 Servicing centre differential housing", page 202](#)

2 - Bolt

- ☐ 10 Nm and then turn 90° further
- ☐ Aluminium bolts (M8; 35 mm long)
- ☐ 9 or 11x
- ☐ Always renew

3 - Bolt

Aluminium bolts

- ☐ 10 Nm and then turn 90° further
- ☐ 2x
- ☐ Always renew

or

Steel studs (38 mm long, some versions M8)

- ☐ 15 Nm and then turn 90° further
- ☐ 2x

4 - Bolt

- ☐ 15 Nm and then turn 90° further
- ☐ Steel bolts (M8; 55 mm long)
- ☐ 2x

5 - Spring

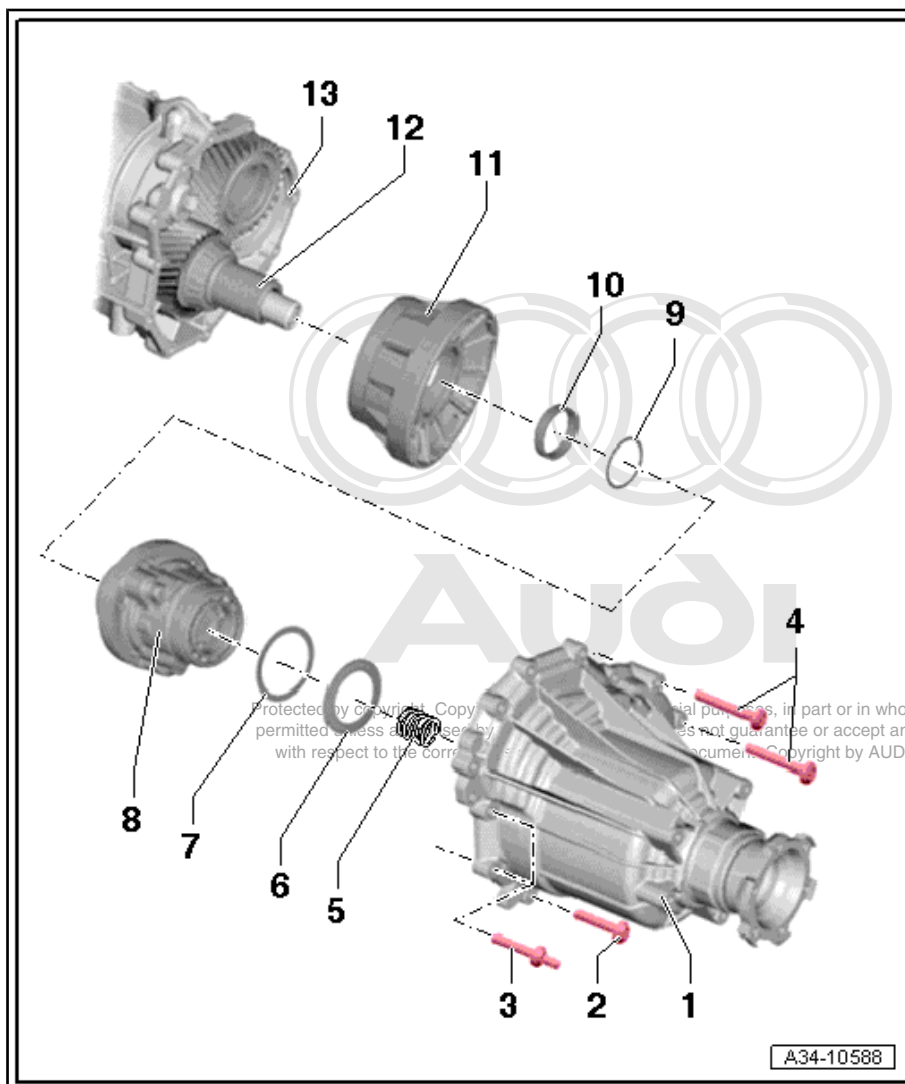
6 - Dished spring

- ☐ Installation position: Inner diameter (convex side) faces centre differential housing

7 - Shim

8 - Centre differential

- ☐ Cannot be serviced
- ☐ Removing and installing ⇒ ["4.2 Removing and installing centre differential housing", page 197](#)



- ☐ Servicing bearings for centre differential ➔ [page 99](#)

9 - Shim

- ☐ Sets position of centre differential
- ☐ Determining thickness ➔ [page 109](#)

10 - Spacer sleeve

11 - Bearing plate

- ☐ Note correct installation position in relation to gearbox cover ➔ [page 68](#)

12 - Spur gear

- ☐ Drive gear for side shaft / pinion shaft (spur gearing)

13 - Gearbox cover / gearbox

3.4 Exploded view - gearbox cover, selector shaft

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➔ ["3.5 Exploded view - gear cluster, reverse gear wheel, selector mechanism", page 51](#)

➔ ["3.7 Dismantling and assembling gearbox", page 55](#)

1 - Clutch module

- ☐ Removing and installing ➔ [page 25](#)
- ☐ Servicing with "Sachs" version clutch ➔ [page 16](#)
- ☐ Servicing with "LuK" version clutch ➔ [page 21](#)

2 - Clutch release lever with release bearing and retaining spring

- ☐ Removing and installing ➔ [page 11](#)
- ☐ Dismantling and assembling ➔ [page 8](#)

3 - Bolt

- ☐ 8 Nm
- ☐ 2x
- ☐ Apply locking fluid - AMV 185 101 A1- when fitting

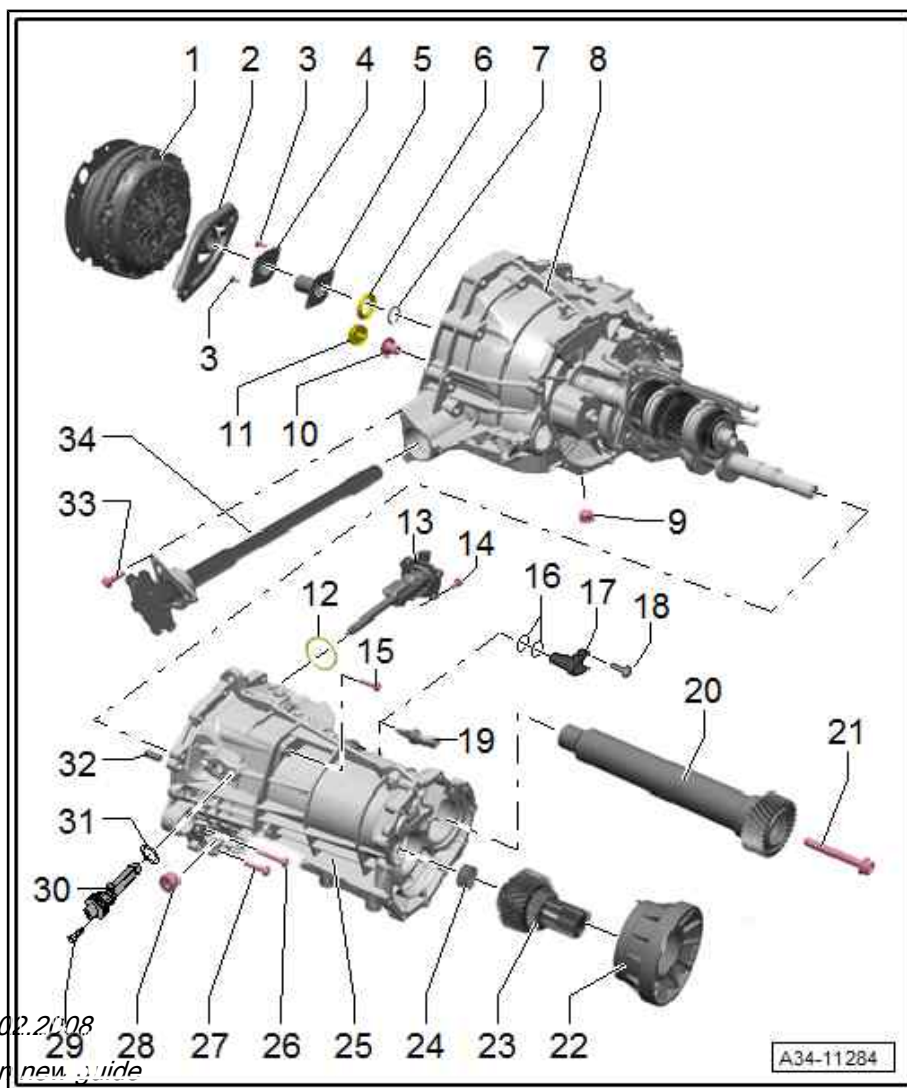
4 - Retaining piece

- ☐ Not fitted on all versions
- ☐ Installation position: recess for bolts ➔ [Item 3 \(page 47\)](#) faces towards clutch module



Note

- ◆ Discontinued as of 02.2008
- ◆ Is also omitted when sleeve is installed ➔ [Item 8 \(page 9\)](#)



5 - Guide sleeve

- ☐ Remove any existing grease from guide sleeve

6 - Input shaft oil seal

- ☐ Removing and installing ⇒ [page 143](#)

7 - Circlip

- ☐ Determining thickness ⇒ [page 66](#)
- ☐ Insert in circumferential groove in input shaft

8 - Gearbox housing

- ☐ With gear cluster (input and output shafts) and selector fork cluster
- ☐ Removing and installing gear cluster (input and output shafts), reverse gear wheel and selector fork cluster ⇒ [page 51](#)
- ☐ Servicing gearbox housing ⇒ [page 76](#)
- ☐ Removing and installing differential ⇒ [page 162](#)

9 - Oil drain plug

- ☐ 45 Nm

10 - Bolt

- ☐ 200 Nm
- ☐ For output shaft
- ☐ Apply locking fluid - AMV 185 101 A1- when fitting

11 - Sealing cap

- ☐ With oil guide
- ☐ For output shaft
- ☐ Always renew

12 - O-ring

- ☐ Always renew

13 - Selector shaft with selector mechanism cover

- ☐ Different versions may be fitted
- ☐ Removing and installing ⇒ [page 71](#)
- ☐ Select correct version according to gearbox code letters ⇒ Electronic parts catalogue

14 - Bolt

- ☐ 10 Nm and then turn 45° further
- ☐ Aluminium bolts (M8; 22 mm long)
- ☐ 4x
- ☐ Always renew

15 - Bolt

- ☐ 20 Nm and then turn 30° further
- ☐ Steel bolts (M8; 30 mm long)
- ☐ 3x
- ☐ Secures bearing mounting to gearbox cover
- ☐ Apply locking fluid - AMV 185 101 A1- when fitting

16 - O-ring

- ☐ 2x
- ☐ Always renew

17 - Gear detection sensor - G604-

- ☐ Fitted from model year 2012 onwards
- ☐ Installation position ⇒ [page 51](#)
- ☐ Please refer to installation instructions ⇒ [page 51](#)



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- ☐ Can be removed and installed with gearbox installed in vehicle ⇒ 6-speed manual gearbox 0B2; Rep. gr. 00 ; Electrical components
- ☐ Replaces gear detector switch - F208- and gearbox neutral position sender - G701-

18 - Bolt

- ☐ 10 Nm and then turn 45° further
- ☐ Always renew

19 - Gear detector switch - F208-

- ☐ 20 Nm
- ☐ Fitted up to model year 2011
- ☐ Can be removed and installed with gearbox installed in vehicle ⇒ 6-speed manual gearbox 0B2; Rep. gr. 00 ; Electrical components

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20 - Side shaft

- ☐ With spur gear
- ☐ Only renew together with spur gear ⇒ [Item 23 \(page 49\)](#)

21 - Bolt

- ☐ 150 Nm and then turn 90° further
- ☐ Secures side shaft to pinion shaft
- ☐ Always renew
- ☐ Bolt head: twelve-point, 21 mm across flats

22 - Bearing plate

- ☐ Note correct installation position in relation to gearbox cover ⇒ [page 55](#)

23 - Spur gear

- ☐ Drive gear for side shaft / pinion shaft (spur gearing)
- ☐ Only renew together with side shaft ⇒ [Item 20 \(page 49\)](#)

24 - Needle bearing

- ☐ For spur gear ⇒ [Item 23 \(page 49\)](#)
- ☐ Fit onto output shaft

25 - Gearbox cover

- ☐ Servicing ⇒ [page 74](#)

26 - Bolt

- ☐ 15 Nm and then turn 90° further
- ☐ Steel bolt (M8; 50 mm long)
- ☐ 1x

27 - Bolt

- ☐ 10 Nm and then turn 90° further
- ☐ Aluminium bolts (M8; 35 mm long)
- ☐ 16x
- ☐ Always renew

28 - Oil filler plug

- ☐ 45 Nm

29 - Bolt

- ☐ 10 Nm and then turn 45° further
- ☐ Aluminium bolt (M8; 22 mm long)
- ☐ Secures gearbox neutral position sender - G701- or sealing plug and sealing cap-selector shaft to gearbox cover
- ☐ Not fitted on all versions
- ☐ Always renew

30 - Gearbox neutral position sender - G701- or sealing plug

- ☐ Gearbox neutral position sender for vehicles with start/stop system
- ☐ Installation position ⇒ [page 50](#)
- ☐ Sealing plug is fitted in place of gearbox neutral position sender - G701-



Note

If a sealing plug is fitted in place of the gearbox neutral position sender - G701- , it does not have to be removed when dismantling and assembling the gearbox.

- ☐ Gearbox neutral position sender - G701- was discontinued from model year 2012 onwards. It has been replaced by gear detection sensor - G604- ⇒ [Item 17 \(page 48\)](#)
- ☐ Select correct version according to gearbox code letters ⇒ Electronic parts catalogue
- ☐ Can be removed and installed with gearbox installed in vehicle ⇒ 6-speed manual gearbox 0B2; Rep. gr. 00 ; Electrical components

31 - O-ring

- ☐ Always renew
- ☐ Installed in gearboxes with gearbox neutral position sender - G701- or sealing plug

32 - Dowel sleeve

- ☐ 2x

33 - Bolt

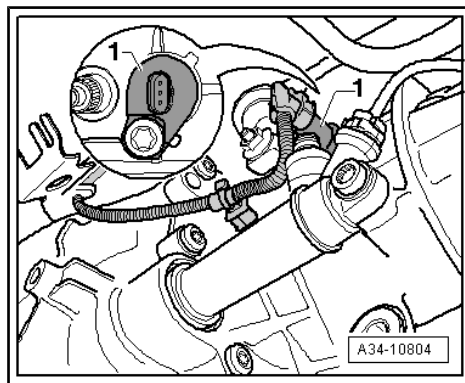
- ☐ 15 Nm and then turn 45° further
- ☐ Steel bolts (M8; 25 mm long)
- ☐ 3x

34 - Flange shaft (left-side)

- ☐ With mounting bracket
- ☐ Removing and installing ⇒ [page 151](#)
- ☐ Renewing mounting bracket and ball bearing ⇒ [page 160](#)

Installation position of gearbox neutral position sender - G701- -1-.

- ◆ Only in vehicles with start/stop system
- ◆ Not fitted on gearbox with gear detection sensor - G604- ⇒ [page 51](#)



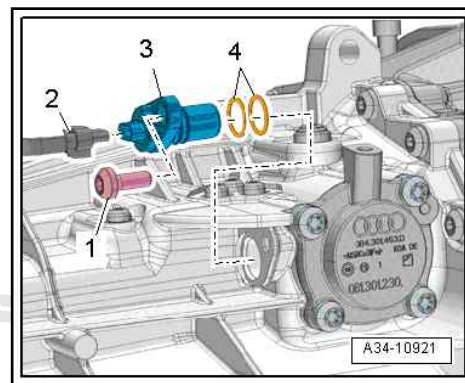
Installation position of gear detection sensor - G604-

- 1 - Bolt
- 2 - Connector
- 3 - Gear detection sensor
- 4 - O-rings



Note

The gear detection sensor - G604- can also be removed and installed with the gearbox installed in the vehicle ➔ 6-speed manual gearbox 0B2; Rep. gr. 00; Electrical components.



Caution

Take care when installing gear detection sensor - G604- : risk of breakage or sensor malfunction

- ***Gear detection sensor - G604- -3- must not be knocked into the gearbox or pulled in by tightening bolt -1-.***
- ***O-rings -4- and bore in gearbox cover must be lubricated with gear oil.***
- ***Gear detection sensor - G604- -3- can be pushed in carefully using a suitable tool, such as a hammer handle.***

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3.5 Exploded view - gear cluster, reverse gear wheel, selector mechanism

1 - Gearbox housing

- ☐ With differential and pinion shaft
- ☐ Different versions
- ☐ For correct version, refer to ➤ Electronic parts catalogue

2 - Magnet

- ☐ Clean

3 - Sealing plug

- ☐ 2x
- ☐ Fitted from model year 2012 onwards, depending on version
- ☐ Installation position ➤ [page 53](#)
- ☐ Not fitted on gearbox with heat exchanger ➤ [Item 4 \(page 52\)](#)

4 - Heat exchanger

- ☐ For gear oil heating
- ☐ Fitted from model year 2012 onwards, depending on version
- ☐ Removing and installing ➤ [page 55](#)

5 - O-ring

- ☐ 2x
- ☐ For heat exchanger or sealing plug
- ☐ Always renew
- ☐ Fit in front groove of sealing plug or heat exchanger

6 - O-ring

- ☐ 2x
- ☐ For gear oil heating or sealing plug
- ☐ Always renew
- ☐ Fit in rear groove of sealing plug or heat exchanger

7 - Oil collector

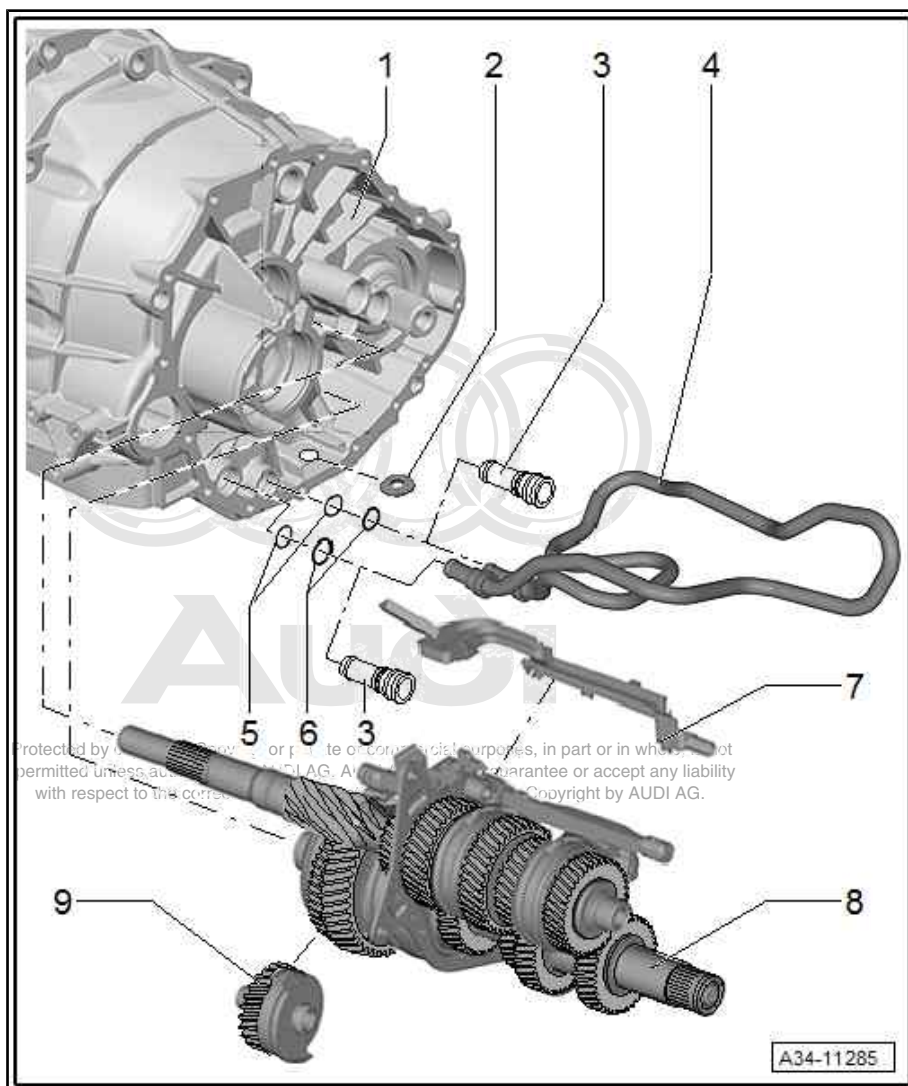
- ☐ Is clipped into bearing mounting and selector plate / selector fork for 3rd/4th gear

8 - Gear cluster

- ☐ Consists of input and output shafts with selector fork cluster
- ☐ Dismantling and assembling ➤ [page 90](#)

9 - Reverse gear wheel

- ☐ With support for reverse shaft
- ☐ Exploded view - reverse gear wheel ➤ [page 53](#)

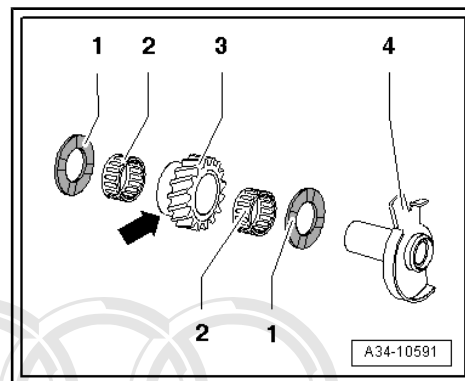


Exploded view - reverse gear wheel

- 1 - Thrust washer
- 2 - Needle bearing
- 3 - Reverse gear wheel

Installation position: collar points -arrow- towards gearbox housing

- 4 - Reverse shaft support



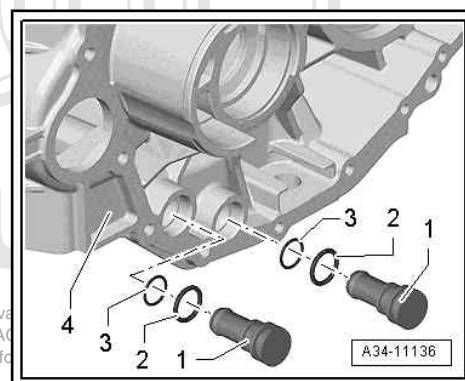
Gearbox housing with sealing plug in place of heat exchanger



Note

- ◆ On gearbox housings fitted for gear oil heating, sealing plugs -1- may be installed in gearbox housing -4- instead of heat exchanger.
- ◆ O-rings -2 ... 3- must always be renewed.

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3.6 Exploded view - selector forks



Note

- ◆ Installation position of selector plates / selector forks in gearbox ⇒ [page 54](#)
- ◆ Detaching selector fork cluster from bearing mounting for input shaft and output shaft ⇒ [page 90](#)

1 - Selector plate / selector fork for reverse gear

2 - Selector plate / selector fork for 1st and 2nd gear

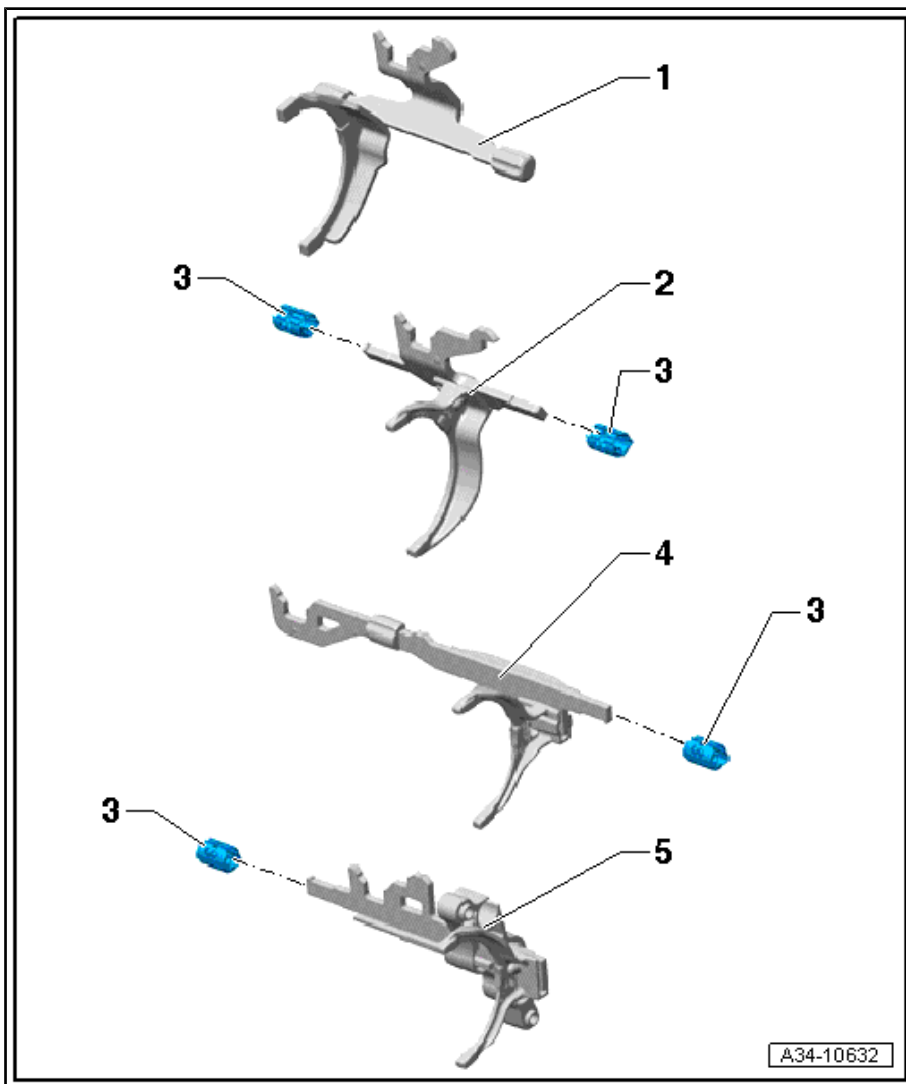
3 - Ball sleeve

- ❑ To attach/detach from selector plate / selector fork, use external circlip pliers or similar

4 - Selector plate / selector fork for 3rd and 4th gear

5 - Selector plate / selector fork for 5th and 6th gear

- ❑ With support for bearings of selector plates / selector forks
- ❑ Selector fork cannot be separated from support



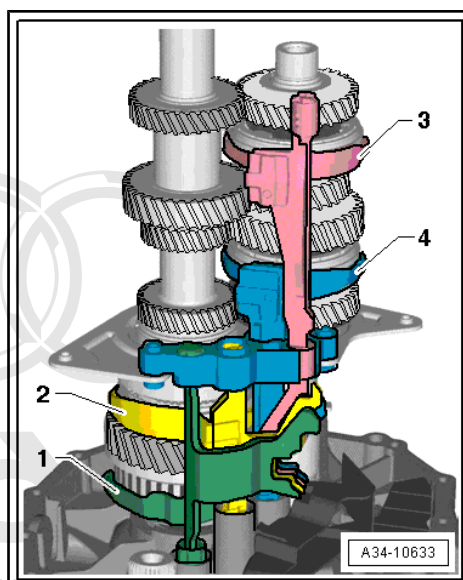
Installation position of selector plates / selector forks in gearbox

1 - Selector plate / selector fork for reverse gear

2 - Selector plate / selector fork for 1st and 2nd gear

3 - Selector plate / selector fork for 3rd and 4th gear

4 - Selector plate / selector fork for 5th and 6th gear



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3.7 Dismantling and assembling gearbox

The housing for centre differential, centre differential, side shaft, gearbox cover, input shaft and output shaft are removed and installed together with the internal gearbox selector mechanism



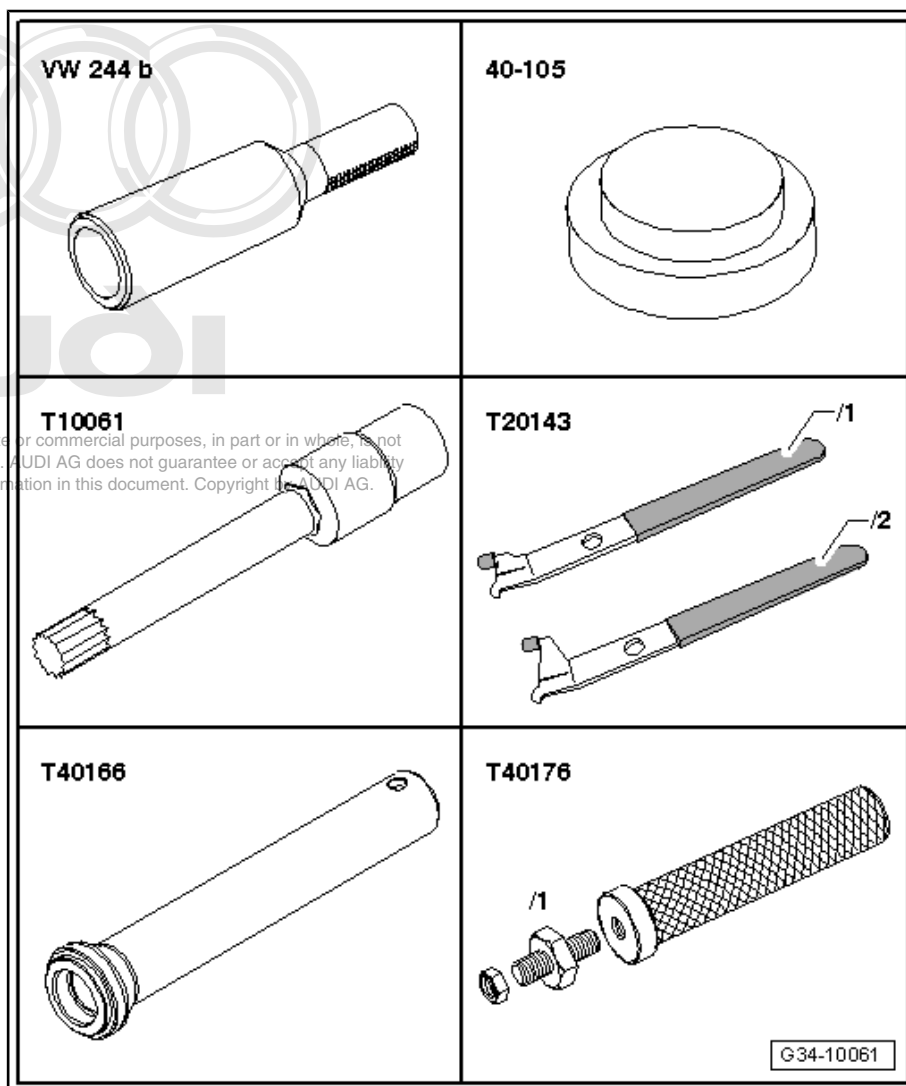
Note

- ◆ The differential does not have to be removed in order to remove the above-mentioned components.
- ◆ Refer to general repair instructions ➔ [page 2](#).

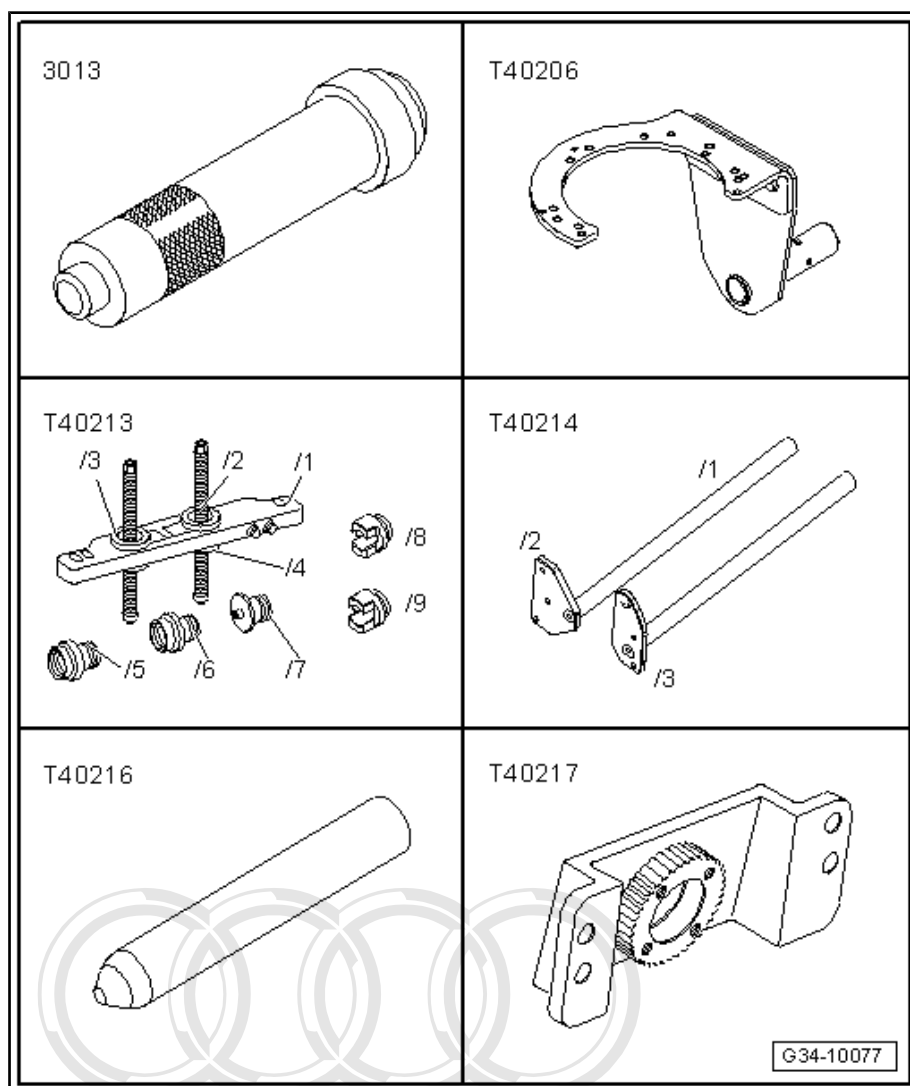
Special tools and workshop equipment required

- ◆ Drift sleeve - VW 244 B-
- ◆ Thrust plate - 40 -105-
- ◆ Socket, multi-point bit - T10061-
- ◆ Extractor tool - T20143-
- ◆ Thrust piece - T40166-
- ◆ Grip - T40176-

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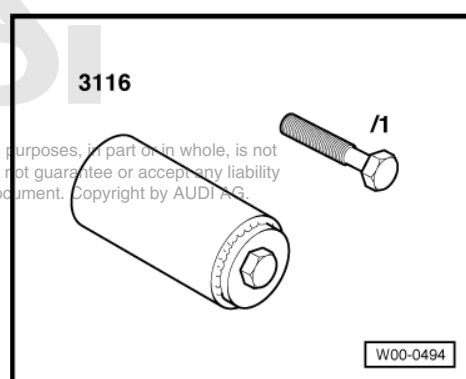


- ◆ Punch - 3013-
- ◆ Gearbox support - T40206-
- ◆ Separating tool - T40213-
- ◆ Support tool - T40214-
- ◆ Guide pin - T40216-
- ◆ Counterhold tool - T40217-



- ◆ Clamping sleeve - 3116-

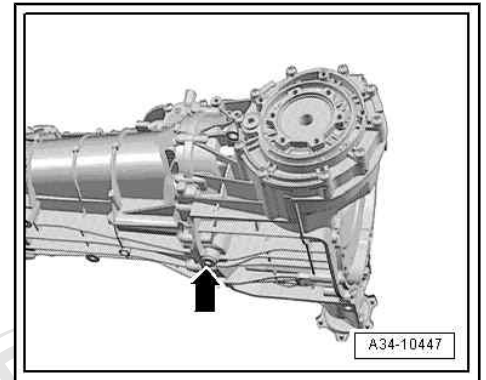
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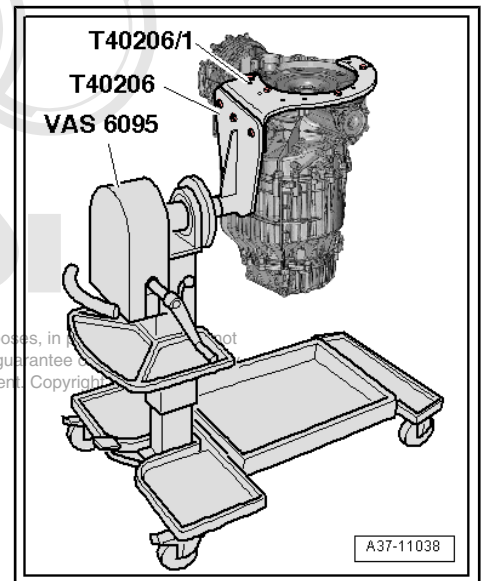
- ◆ Counterhold tool - T40215-
- ◆ Locking fluid - AMV 185 101 A1-
- ◆ Sealing paste - AMV 188 001 02-
- ◆ Grease for clutch plate splines - G 000 100-
- ◆ Lubricating paste - G 000 150-
- ◆ Sealing grease - G 052 128 A1-

Dismantling gearbox

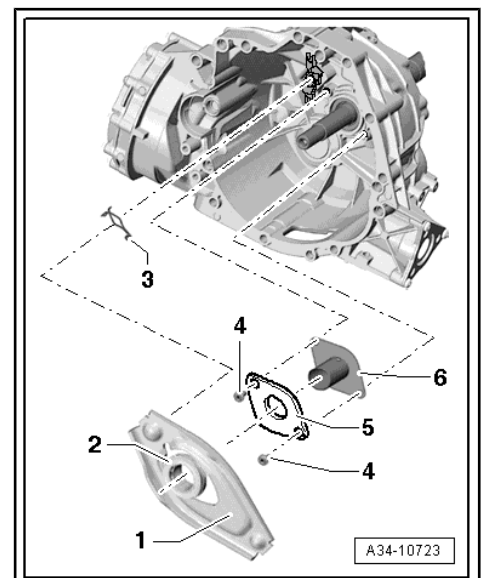
- Place drip tray underneath.
- Unscrew plug -arrow- and drain off gear oil.



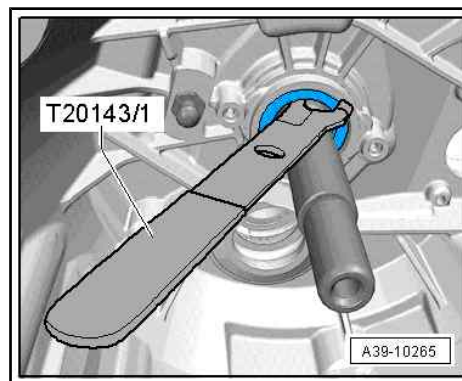
- Secure gearbox to engine and gearbox support ➤ [page 42](#) .
- Remove clutch module ➤ [page 25](#) .
- Put clutch module down carefully, e.g. on work bench.



- Remove clutch release lever -1- together with release bearing -2- and retaining spring -3-.
- Remove bolts -4- and detach retaining piece -5- (if fitted) with guide sleeve -6-.



- Prise out input shaft oil seal.

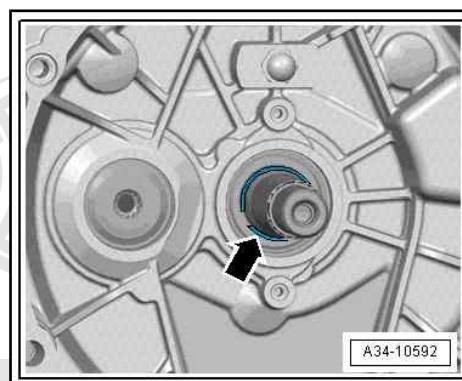


- Then remove circlip -arrow- in front of ball bearing for input shaft.



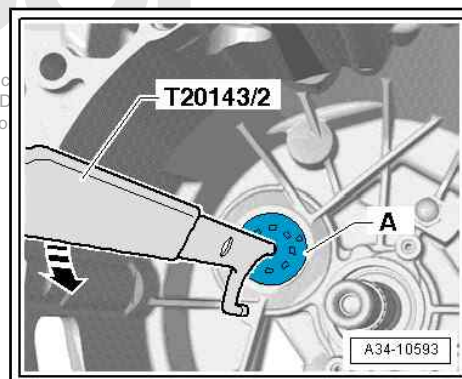
Note

If this circlip cannot be removed, detach the gearbox cover first and knock the input shaft forwards using a rubber-headed hammer.

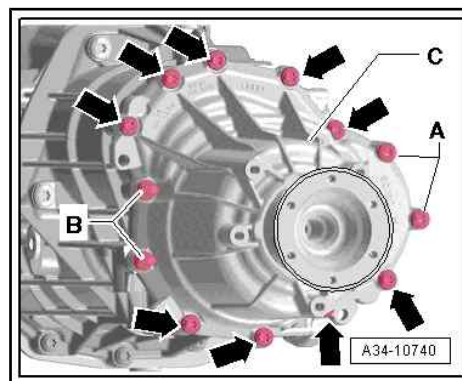


- Pierce through centre of sealing cap -A- for output shaft and prise out in direction of -arrow-.

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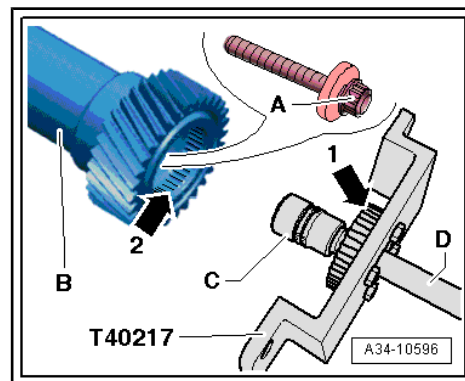


- Detach centre differential housing -C- ➔ ["4.2 Removing and installing centre differential housing", page 197](#).



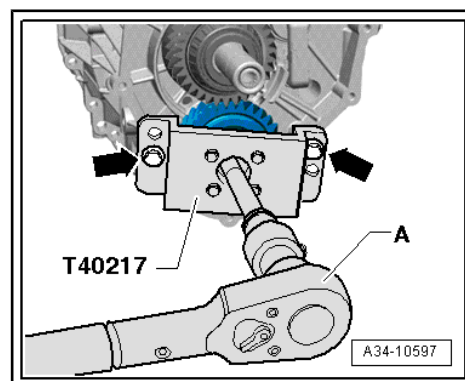
Loosen twelve-point bolt -A- securing side shaft -B- to pinion shaft as follows:

- Apply twelve-point socket -C- (21 mm) with extension -D- to twelve-point bolt -A-.
- Engage external teeth -arrow 1- of counterhold tool - T40217- in internal splines -arrow 2- of side shaft.



- Secure counterhold tool - T40217- to gearbox cover with M8 bolts -arrows-.
- Loosen and unscrew twelve-point bolt securing side shaft to pinion.

-A- Torque wrench

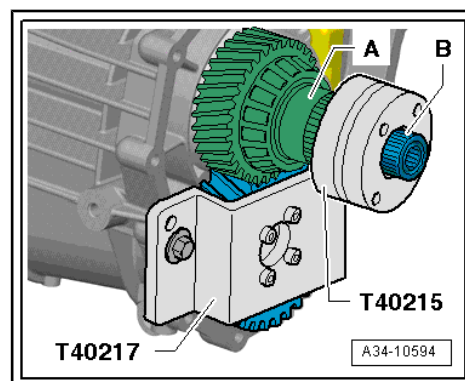


- Fit counterhold tool - T40215- all the way onto spur gear -A- for side shaft and output shaft -B-.



Note

- ◆ Counterhold tool - T40217- remains in position on the gearbox cover.
- ◆ When the special tools are attached, the output shaft is locked and will not turn.

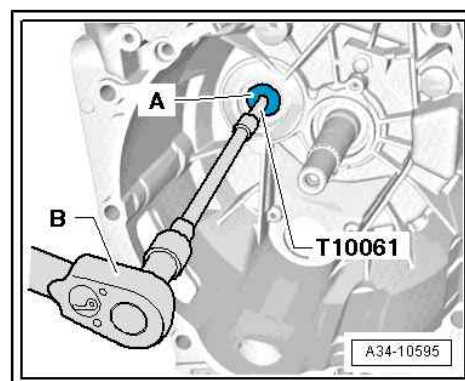


- Now loosen bolt -A- on output shaft using socket - T10061- .



Note

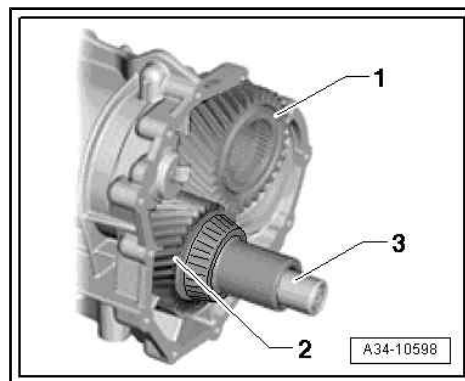
- ◆ Bolt -A- has a very high release torque (approx. 300 - 350 Nm).
- ◆ If necessary, heat bolt to approx. 80 °C using hot air blower - VAG 1416-. This will reduce the torque required to release the bolt. After dismantling the gearbox, check the seal of the ball bearing in the gearbox housing for damage. Renew ball bearing if necessary.



B - Torque wrench

- Remove counterhold tools - T40215- and -T40217- .

- Pull side shaft -1- out of gearbox cover.
- Detach spur gear -2- for side shaft with needle bearing from output shaft -3-.

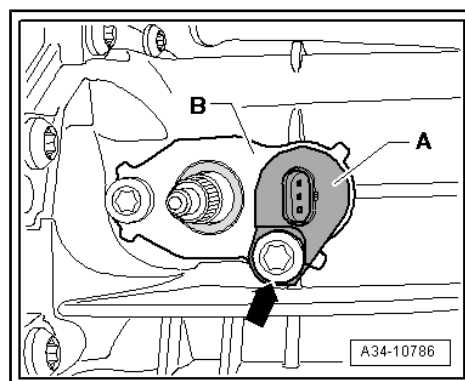


- If fitted, remove gearbox neutral position sender - G701- -A-.
- To do this, remove bolt -arrow- and pull sender out of sealing cap -B- for selector shaft.

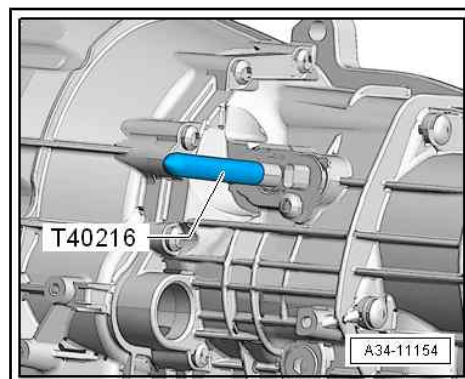


Note

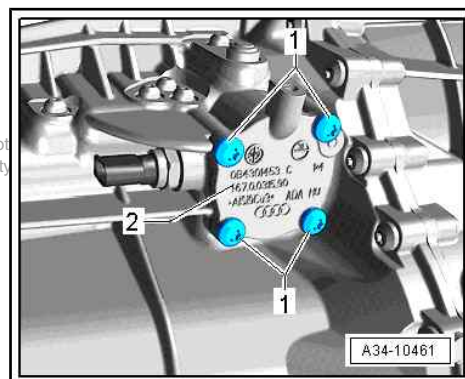
- ♦ Sealing cap -B- remains fitted.
- ♦ If a sealing plug is fitted in place of the gearbox neutral position sender - G701- , it does not have to be removed when dismantling and assembling the gearbox.



- Screw guide pin - T40216- onto selector shaft.

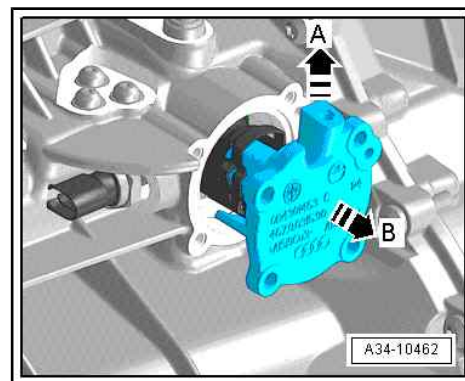


- Remove bolts -1- and carefully lever off selector shaft cover -2-.



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- Lift selector shaft slightly -arrow A- and pull it out -arrow B-.



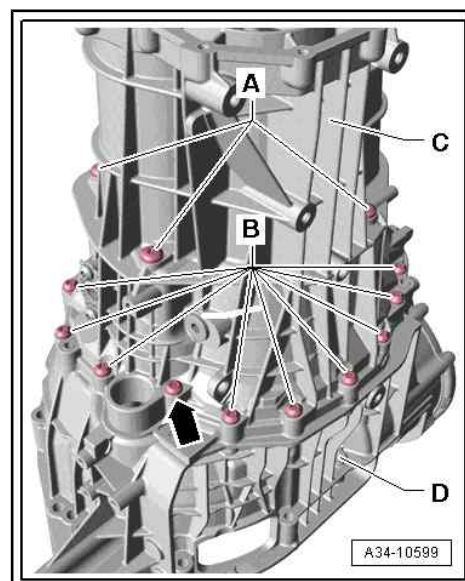
- Then turn gearbox in assembly stand so that gearbox cover -C- faces upwards.
- Remove bolts -A- securing bearing mounting and bolts -B- securing gearbox cover -C- to gearbox housing -D-.



Note

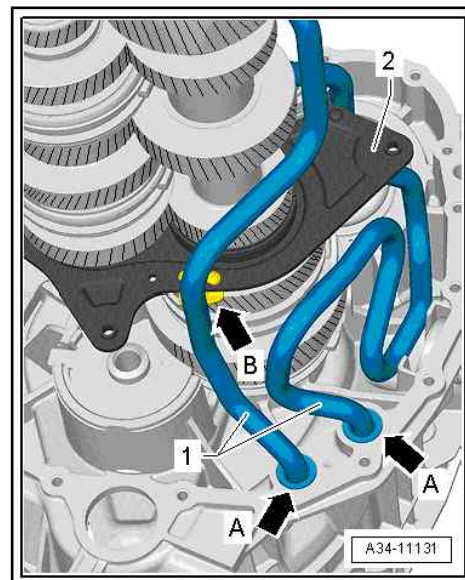
For subsequent installation of the gearbox cover, note that the bolt marked with the -arrow- is a steel bolt, 50 mm long.

- Take off gearbox cover -C-.



Gearbox with gear oil heating

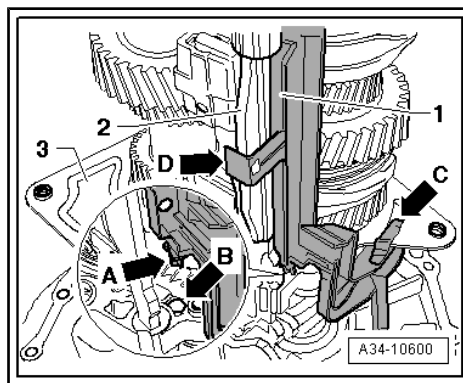
- Carefully pull heat exchanger -1- out of holes in gearbox housing -arrows A-. When doing so, pay attention to guides -arrow B- of bearing mounting -2-.



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Continued for all vehicles:

- Detach oil collector -1- from selector plate / selector fork for 3rd/4th gear -2- and from bearing mounting -3-
-arrows A...D-.

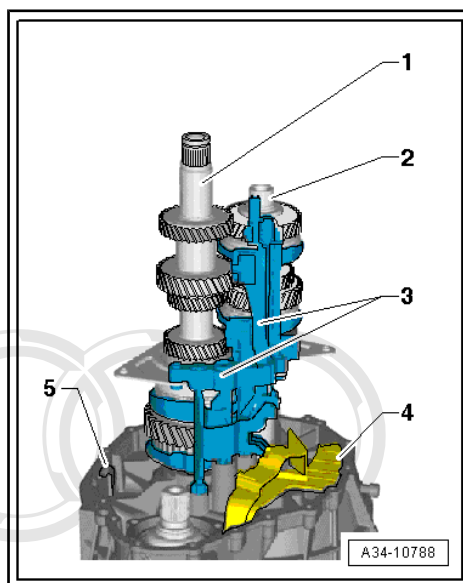


- Remove magnet -5- from gearbox housing and clean magnet.



Note

-Items 1 ... 4- can be disregarded.

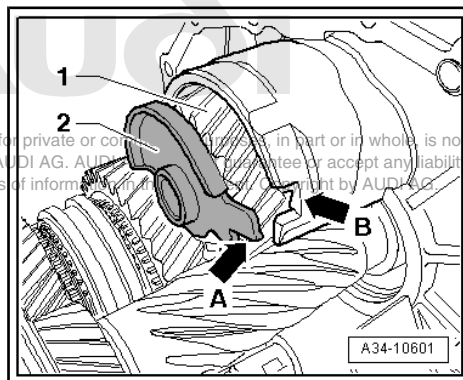


- Turn gearbox into a horizontal position on assembly stand or engine and gearbox support - VAS 6095- . Reverse gear wheel -1- with support for reverse shaft -2- then faces upwards.



Note

-Arrow A- and -arrow B- can be disregarded.



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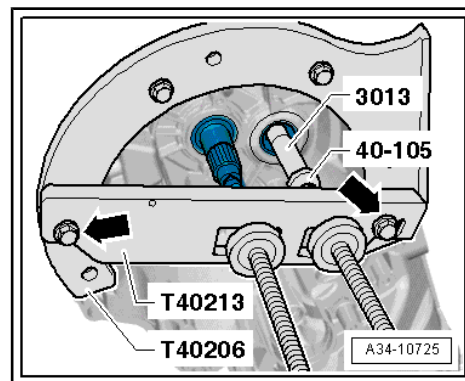
- Attach separating tool - T40213- to gearbox support - T40206- with bolts -arrows-.



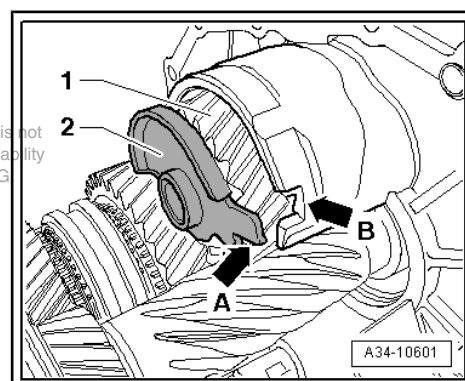
Caution

Risk of damage to gears, shafts and bearings.

- ◆ **The input shaft and output shaft must be pressed out together.**
- ◆ **It is permissible to turn the spindles alternately not more than one turn at a time when pressing out the shafts.**



- By turning spindles of separating tool - T40213- alternately one turn at a time, press input shaft and output shaft out of ball bearings in gearbox housing.
- At the same time, guide support for reverse shaft -2- out of retainer in gearbox housing -arrow B-.
- Then detach reverse gear wheel -1- with support for reverse shaft -2- from input shaft.



- Detach input shaft -1- and output shaft -2- together with selector fork cluster -3- from gearbox housing.
- Remove oil collector -4-.

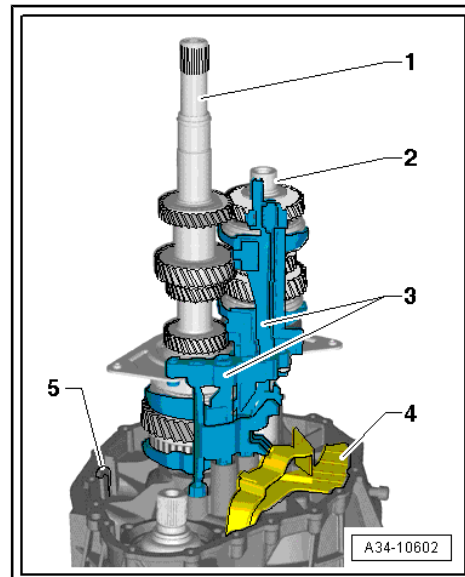
Detach separating tool - T40213- from gearbox support - T40206- .

Assembling gearbox



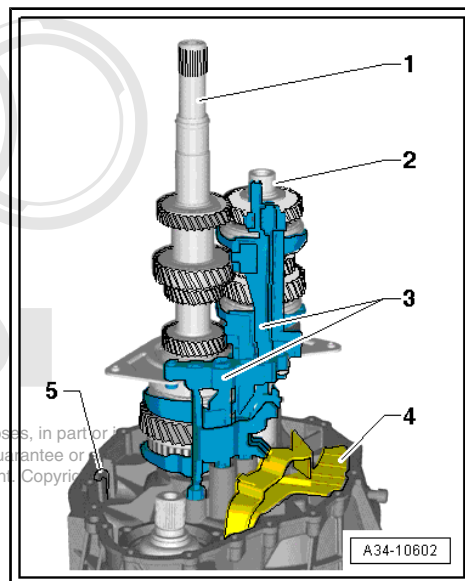
Note

If you are renewing the gearbox cover, spur gear, tapered roller bearings for spur gear, bearing plate, or housing for centre differential, you must first determine the thickness of the required shim for the preload of the tapered roller bearings for the spur gear ⇒ [page 107](#) .

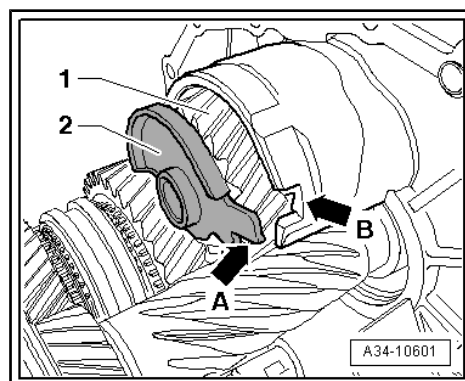


- The reverse gear wheel with support for reverse shaft must be installed ⇒ [page 64](#) before the input shaft -1- and output shaft -2- are seated in the ball bearings.
- Install oil collector -4- and magnet -5- in gearbox housing.
- Install input shaft -1- and output shaft -2- together with selector fork cluster -3- in gearbox housing.

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- Install reverse gear wheel -1- with support for reverse shaft -2-. When doing this, fit lug -arrow A- into slot -arrow B- in gearbox housing.



- Secure supports - T40214/1- and -T40214/2- to gearbox housing, as shown in illustration, with bolts -1- and -2-.
- Attach plate - T40213/1- to supports - T40214/1 and T40214/2- and -- .
- Fit thrust plate - 40-105- on input shaft and clamping sleeve - 3116- on output shaft.

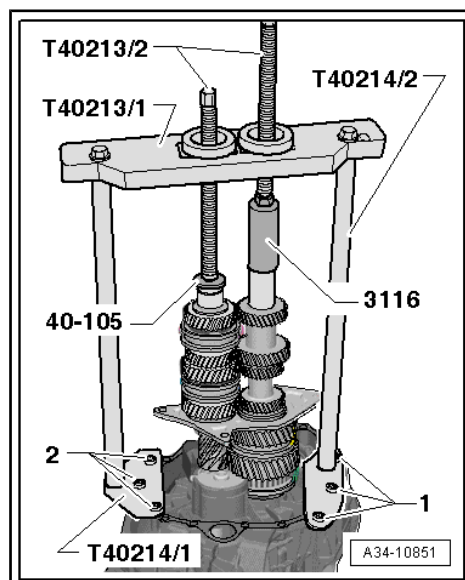


Caution

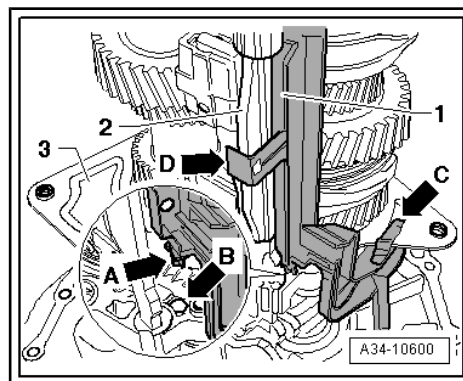
Risk of damage to gears, shafts and bearings.

- ◆ *The input shaft and output shaft must be pressed in together.*
- ◆ *It is permissible to turn the spindles alternately not more than one turn at a time when pressing in the shafts.*

- Then, by turning spindles - T40213/2- alternately one turn at a time, press in input shaft and output shaft until they are seated in ball bearings.
- Detach separating tool - T40213- and supports - T40214- .

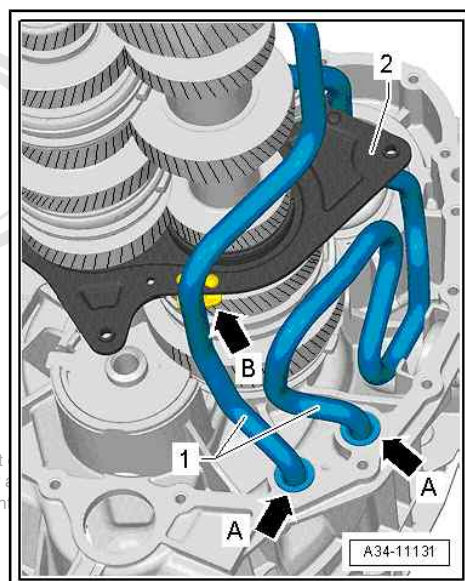


- Fit lug -arrow A- on oil collector -1- into hole -arrow B- in bearing mounting -3- and then clip oil collector onto bearing mounting -arrow C- and selector plate / selector fork for 3rd/4th gear -2- -arrow D-.



Gearbox with gear oil heating

- Renew O-rings on heat exchanger.
- Carefully press heat exchanger -1- into holes in gearbox housing -arrows A-. When doing so, lock it into guide -arrow B- of bearing mounting -2-.



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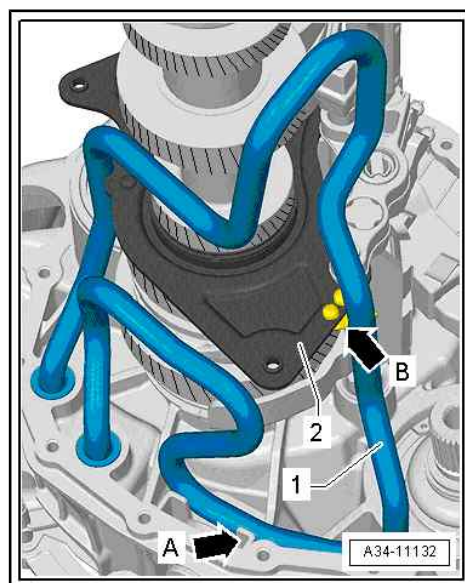


Note

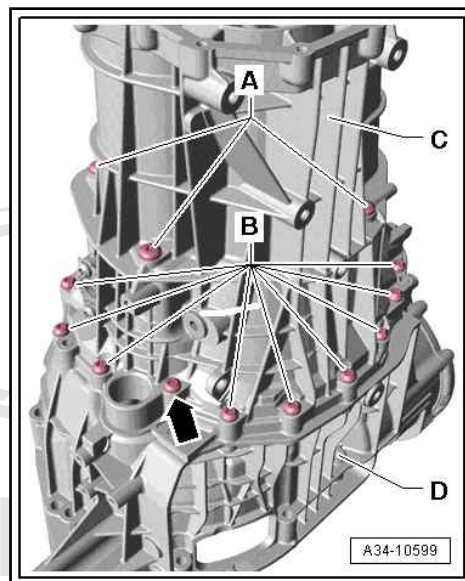
When installing, guide the heat exchanger -1- past the housing rib for the magnet -arrow A- and lock into the bearing mounting guide -arrow B-.

Continued for all vehicles:

- Check that 2 dowel sleeves for centring gearbox cover and gearbox housing are fitted in gearbox housing.
- Apply sealing paste - AMV 188 001 02- evenly and not too thickly onto contact surfaces between gearbox housing and gearbox cover.



- Fit gearbox cover -C- onto gearbox housing -D-.
- Clean threads of bolts -A- with a wire brush. Then apply locking fluid - AMV 185 101 A1- and screw bolts hand-tight into bearing mounting.
- Tighten new aluminium bolts -B- (16x; 35 mm long) to specified torque.
- Tighten steel bolt -arrow- (50 mm long) below aperture for slave cylinder to specified torque.
- Then tighten bolts -A- to specified torque.



Determine thickness of circlip -arrow- for input shaft as follows:

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

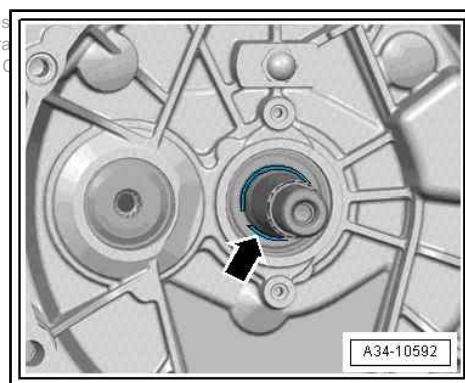


Note

Start with the thickest circlip.

The following circlips are available:

Circlip thickness (mm)		
3.44	3.47	3.50



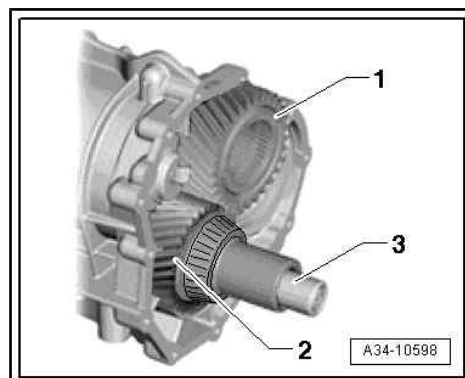
- Fit spur gear -2- with needle bearing ➤ [Item 24 \(page 49\)](#) on output shaft -3-.



Note

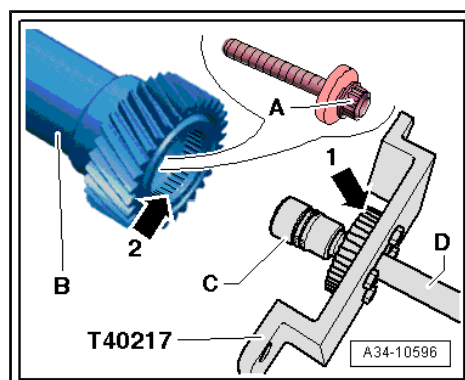
If you are renewing the gearbox cover, spur gear, tapered roller bearings for spur gear or the spacer sleeve, you must first determine the thickness of the shim required for setting the position of the centre differential ➤ [page 109](#) .

- Insert side shaft -1- all the way into gearbox cover.

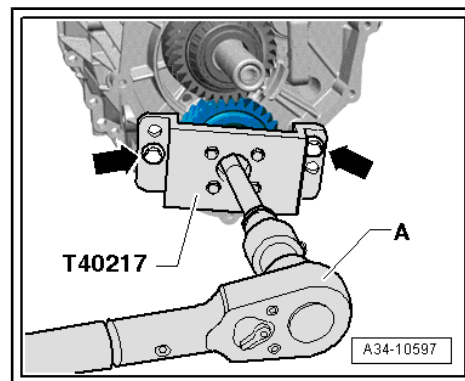


Tighten twelve-point bolt -A- securing side shaft -B- to pinion shaft as follows:

- Apply twelve-point socket -C- (21 mm) with extension -D- to twelve-point bolt -A-.
- Engage external teeth -arrow 1- of counterhold tool - T40217- in internal splines -arrow 2- of side shaft.



- Secure counterhold tool - T40217- to gearbox cover with M8 bolts -arrows-.
- Tighten twelve-point bolt securing side shaft / pinion to specified torque.
- A- Torque wrench

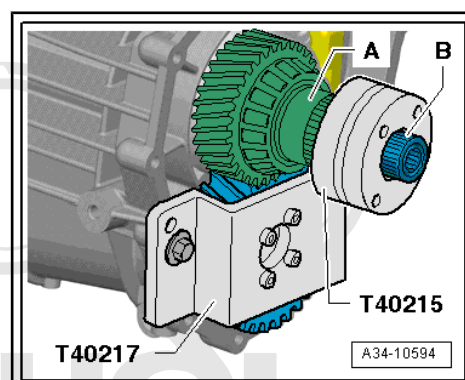


- Fit counterhold tool - T40215- all the way onto spur gear -A- for side shaft and output shaft -B-.



Note

- ◆ Counterhold tool - T40217- remains in position on the gearbox cover.
- ◆ When the special tools are attached, the output shaft is locked and will not turn.

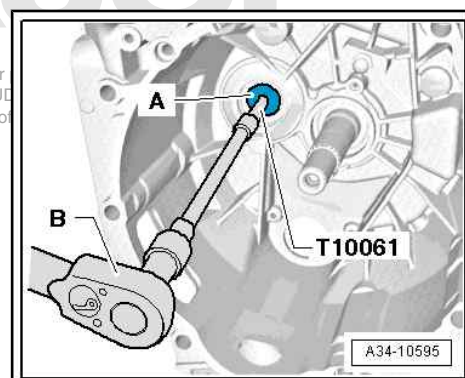


- Clean thread of bolt -A- for output shaft with a wire brush. Then install bolt with locking fluid - AMV 185 101 A1- and tighten to specified torque.

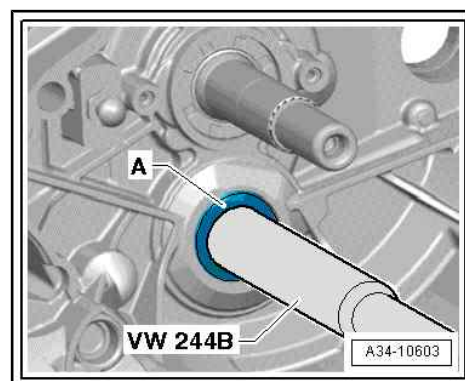
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with respect to the correctness of

B - Torque wrench

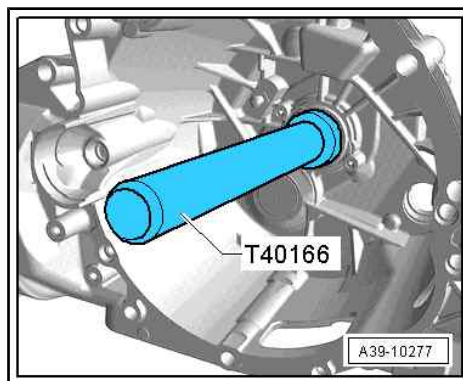
- Remove counterhold tools - T40215- and -T40217- .



- Before installation, lightly oil outside circumference of new sealing cap -A- for output shaft, and drive in until flush.

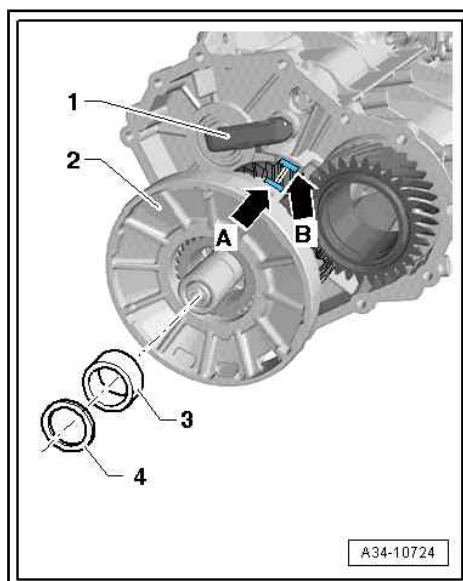


- Lightly oil outer circumference of new oil seal for input shaft.
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .
- Drive in new oil seal until flush (take care to keep seal straight).

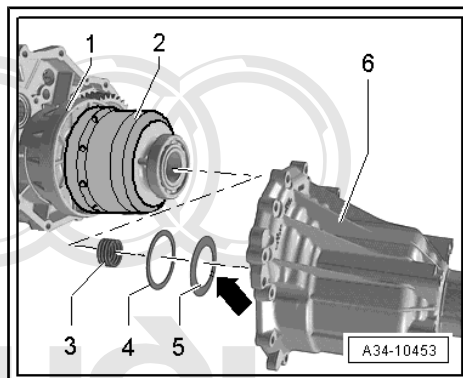


Install bearing plate on gearbox cover as follows:

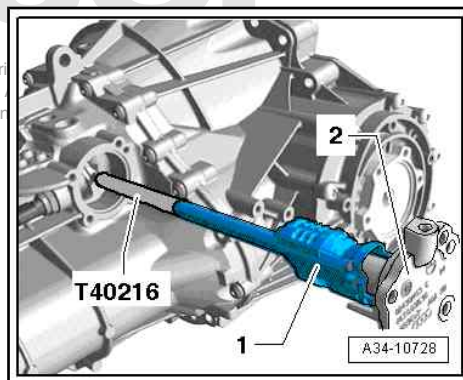
- Installation position: lug -arrow A- on bearing plate -2- must engage in recess -arrow B- in gearbox cover.
- Install oil collector -1-.
- Fit spacer sleeve -3- and shim -4- (sets position of centre differential) on output shaft.



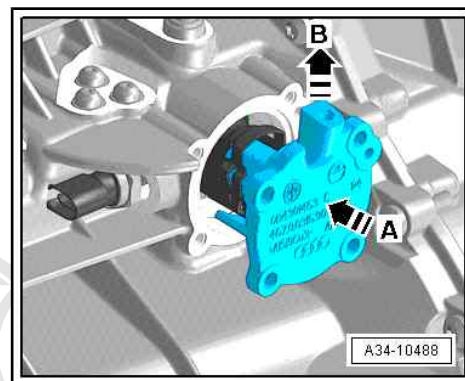
- Install centre differential -2- and centre differential housing -6-
⇒ ["4.2 Removing and installing centre differential housing", page 197](#) .



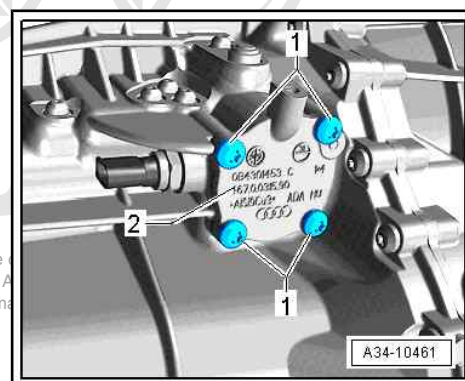
- Fit new O-ring on selector shaft cover -2-.
- Screw guide pin - T40216- onto selector shaft -1-.



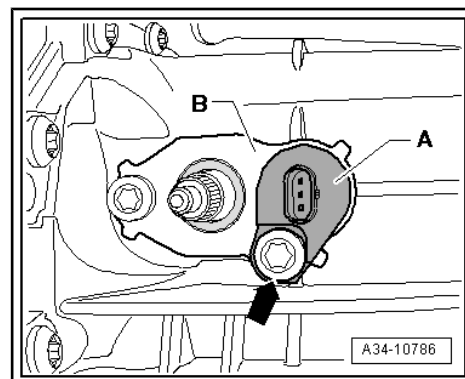
- Lift selector shaft slightly -arrow B- and install it in gearbox -arrow A-.



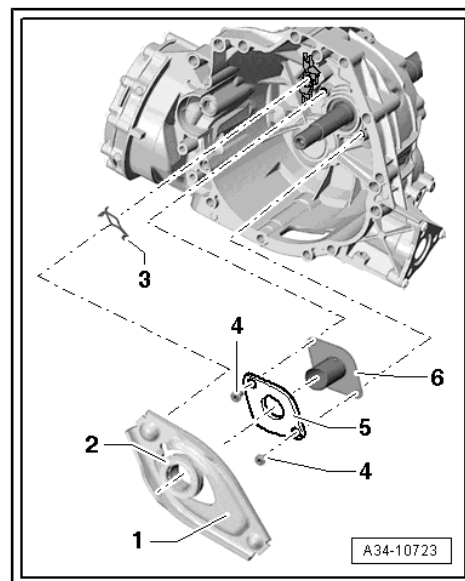
- Selector shaft cover -2- must make contact with gearbox housing.
- Tighten new bolts -1- to specified torque.
- Unscrew guide pin - T40216- .



- If previously fitted, insert gearbox neutral position sender - G701- -A- with new O-ring in sealing cap -B- for selector shaft.
- Tighten new bolt -arrow- to specified torque.



- Fit guide sleeve -6- and retaining piece -5-, if applicable.
- Clean threads of bolts -4- with wire brush. Then install bolts with locking fluid - AMV 185 101 A1- and tighten to specified torque ➔ [Item 6 \(page 9\)](#) .



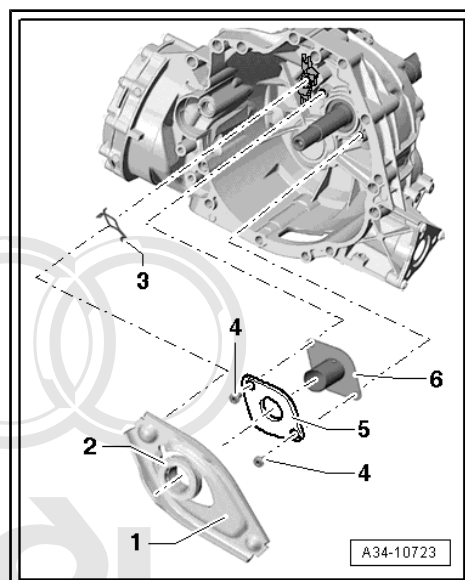
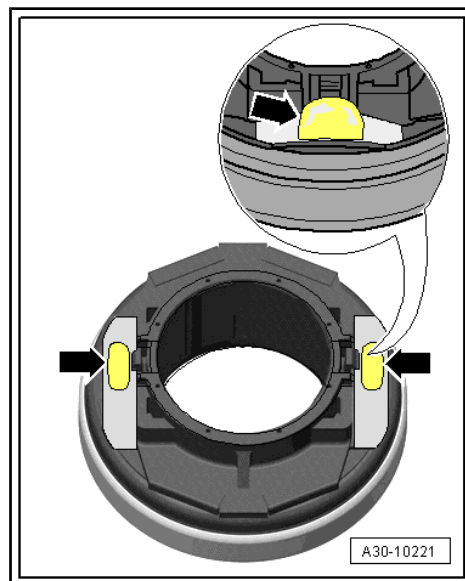


Caution

Grating/creaking noises can occur when clutch is operated.

- *Lack of grease at the bearings -arrows- on the release bearing assembly can cause creaking/grating noises when the clutch is operated.*
- *Grease bearings -arrows- on release bearing assembly thoroughly with lubricating paste - G 000 150- ➔ [page 8](#) .*
- *Grease bearing surfaces for clutch release bearing on release lever with lubricating paste - G 000 150-*
- *Remove grease in bearing surface for guide sleeve: bearing of release bearing on guide sleeve must be free of grease.*

- Install release lever -1- together with release bearing -2- and retaining spring -3- ➔ [page 8](#) .



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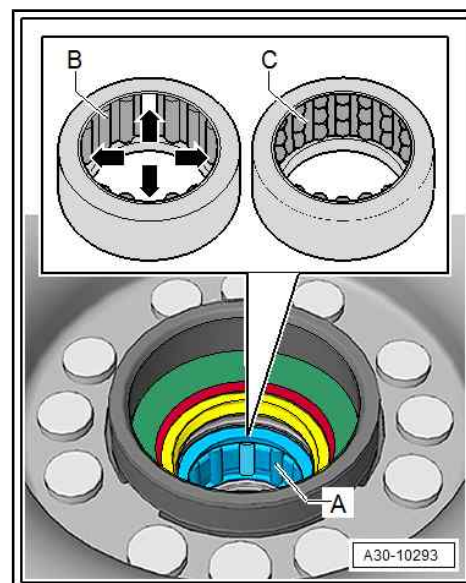
Caution

Check version of needle bearing in dual-mass flywheel.

- ◆ Depending on the version, ball bearings or needle bearings may be fitted; needle bearings may have the full number of rollers, or every 4th roller may be missing.
- ◆ The needle bearings -B- of the type where every 4th roller is missing -arrows- must always be renewed on vehicles with 4-cylinder TDI engine (except 125 kW TDI) ⇒ [page 37](#).
- ◆ On all other vehicles the missing needle rollers do not mean that the needle bearing is defective. Do not renew the needle bearing.
- ◆ Depending on the manufacturer, the new needle bearings are fitted with the full number of either rollers -A- or balls -C-.

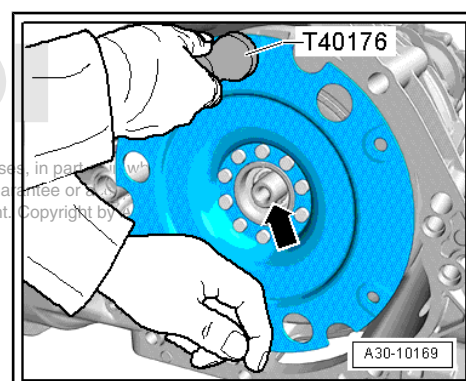
Depending on the make, the following bearings are fitted on vehicles with 4-cylinder TDI engines (except 125 kW TDI):

- ◆ »LuK« dual-mass flywheel: Needle bearing -A- fitted with the full number of rollers
- ◆ »Sachs« dual-mass flywheel: Ball bearing -C-
- ◆ For correct version, refer to ⇒ *Electronic parts catalogue*

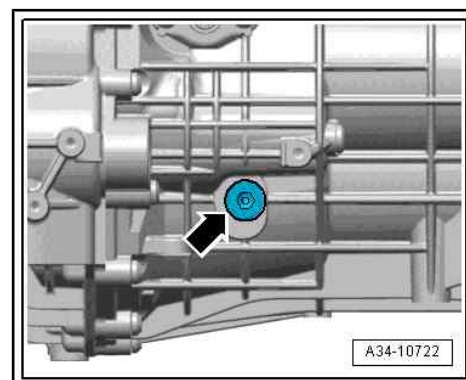


- Install clutch module and flange shaft (left-side) ⇒ [page 28](#).

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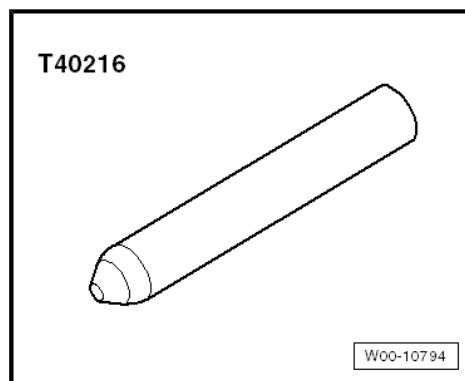
- Unscrew oil filler plug -arrow-, fill up gear oil in gearbox and check oil level ⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Gear oil; Checking gear oil level .



3.8 Removing and installing selector shaft

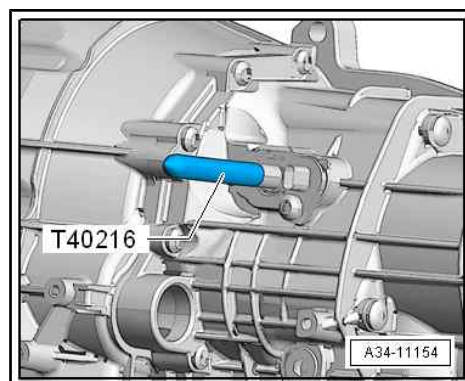
Special tools and workshop equipment required

◆ Guide pin - T40216-

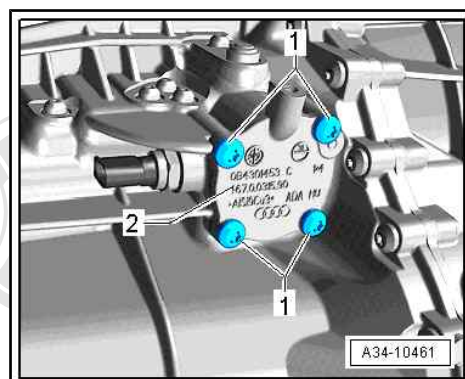


Removing

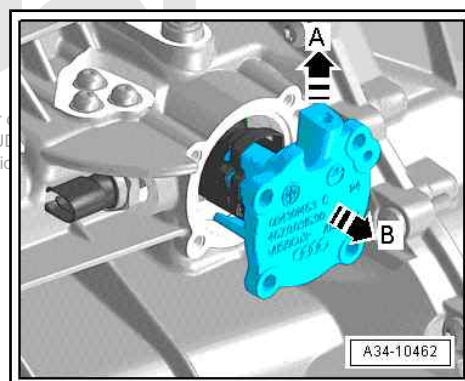
- Screw guide pin - T40216- onto selector shaft.



- Remove bolts -1- and carefully lever off selector shaft cover -2-.



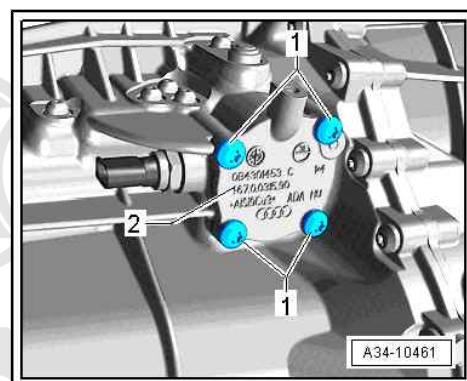
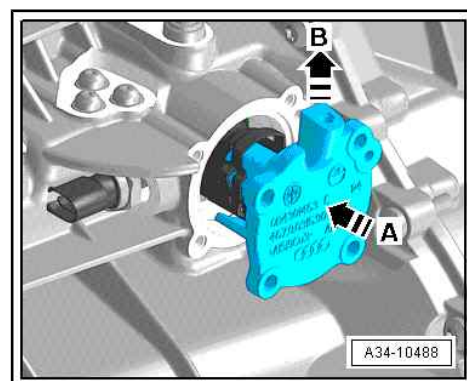
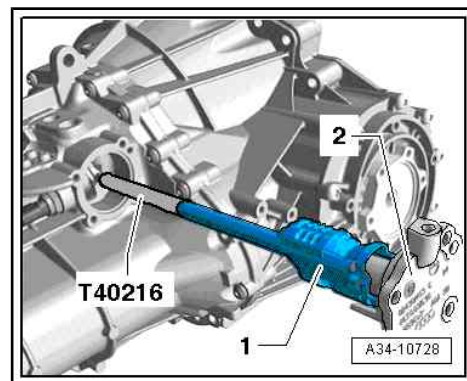
- Lift selector shaft slightly -arrow A- and pull it out -arrow B-.



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Installing

- Fit new O-ring on selector shaft cover -2-.
 - Screw guide pin - T40216- onto selector shaft -1-.
-
- Lift selector shaft slightly -arrow B- and install it in gearbox -arrow A-.
-
- Selector shaft cover -2- must make contact with gearbox housing.
 - Fit new bolts -1- and tighten to specified torque
⇒ [Item 14 \(page 48\)](#) .
 - Unscrew guide pin - T40216- .



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4 Gearbox housing, clutch housing

⇒ "4.1 Exploded view - gearbox cover", page 74

⇒ "4.2 Exploded view - gearbox housing", page 76

⇒ "4.3 Servicing gearbox cover", page 78

⇒ "4.4 Servicing gearbox housing", page 86

4.1 Exploded view - gearbox cover

1 - Large locking bush

- ☐ For selector shaft
- ☐ Removing and installing
⇒ page 82
- ☐ Installation depth
⇒ page 82

2 - Locking bush

- ☐ For selector plate / selector fork
- ☐ Removing ⇒ page 82
- ☐ Pressing in
⇒ page 82

3 - Needle bearing

- ☐ Bearing for side shaft
- ☐ Drive out of gearbox cover using drift - 3138-
- ☐ Always renew
- ☐ Driving in ⇒ page 83
- ☐ Peen to secure after installing ⇒ page 83

4 - Oil collector

- ☐ Fit in holes in gearbox cover and roller bearing
⇒ Item 6 (page 74)

5 - Tapered roller bearing outer race

- ☐ Bearing for spur gear in gearbox cover
- ☐ Pressing out
⇒ page 83
- ☐ Pressing in
⇒ page 83

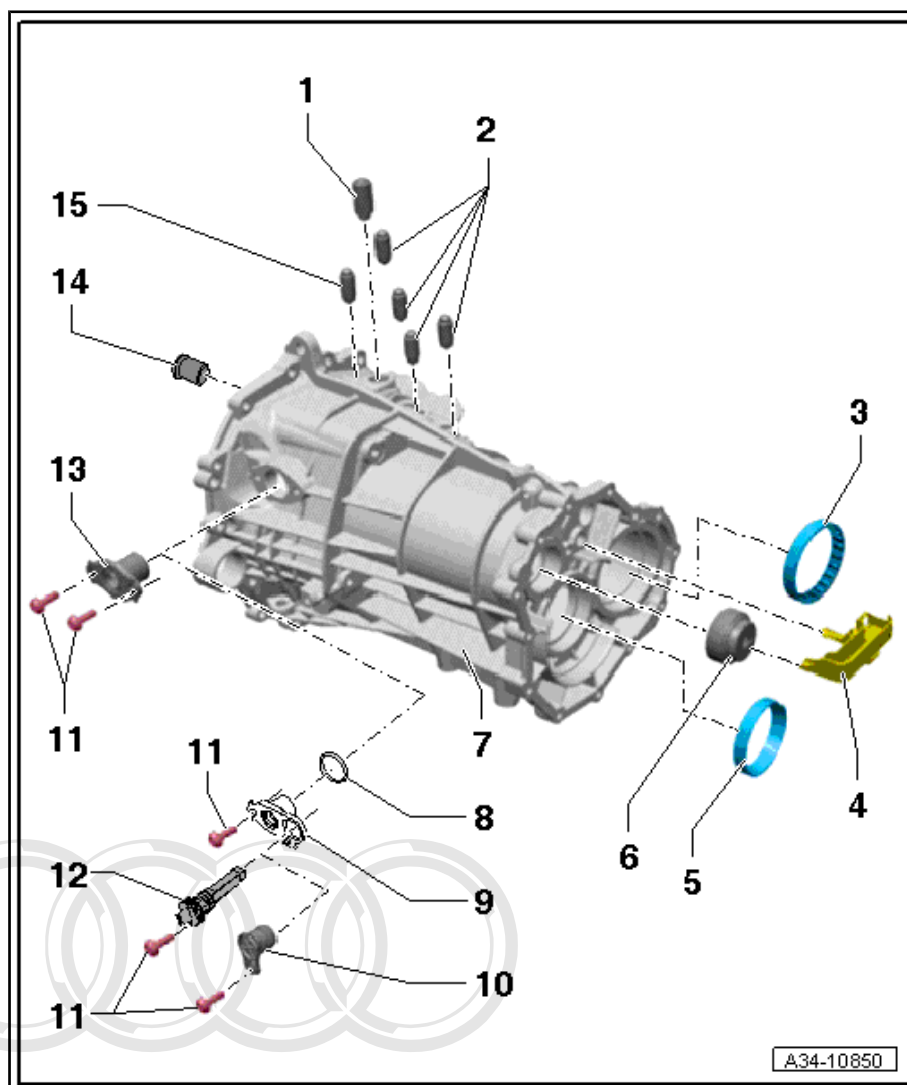
6 - Roller bearing

- ☐ Bearing for input shaft
- ☐ Pressing out ⇒ page 84
- ☐ Pressing in ⇒ page 84

7 - Gearbox cover

8 - O-ring

- ☐ Only installed in gearboxes with sealing cap/selector shaft in conjunction with gearbox neutral position sender - G701- or sealing plug
- ☐ Always renew



9 - Sealing cap

- ☐ For selector shaft in conjunction with gearbox neutral position sender - G701- or sealing plug
- ☐ Not fitted on all versions
- ☐ Select correct version according to gearbox code letters ⇒ Electronic parts catalogue
- ☐ Exploded view ⇒ [page 85](#)
- ☐ Removing and installing oil seal for selector shaft ⇒ [page 85](#)
- ☐ Removing ball sleeve for selector shaft ⇒ [page 85](#)
- ☐ Installing ball sleeve for selector shaft ⇒ [page 86](#)

10 - Sealing plug

- ☐ Not fitted on all versions
- ☐ Select correct version according to gearbox code letters ⇒ Electronic parts catalogue
- ☐ Renew O-ring on sealing plug; select correct version according to gearbox code letters ⇒ Electronic parts catalogue

11 - Bolt

- ☐ 10 Nm and then turn 45° further
- ☐ Aluminium bolts (M8; 22 mm long)
- ☐ Always renew

12 - Gearbox neutral position sender - G701-

- ☐ For vehicles with start/stop system
- ☐ Installation position ⇒ [page 50](#)
- ☐ Gearbox neutral position sender - G701- was discontinued from model year 2012 onwards. It has been replaced by gear detection sensor - G604- ⇒ [Item 4 \(page 52\)](#) ⇒ [page 51](#)
- ☐ Sealing plug is fitted in place of gearbox neutral position sender - G701-
- ☐ Select correct version according to gearbox code letters ⇒ Electronic parts catalogue
- ☐ Renew O-ring on gearbox neutral position sender - G701- ; select correct version according to gearbox code letters ⇒ Electronic parts catalogue
- ☐ Can be removed and installed with gearbox installed in vehicle ⇒ 6-speed manual gearbox 0B2; Rep. gr. 00 ; Electrical components

13 - Sealing cap

- ☐ For selector shaft without gearbox neutral position sender - G701- or sealing plug
- ☐ Not fitted on all versions
- ☐ Select correct version according to gearbox code letters ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 84](#)
- ☐ Exploded view ⇒ [page 84](#)
- ☐ Removing and installing oil seal for selector shaft ⇒ [page 85](#)
- ☐ Removing ball sleeve for selector shaft ⇒ [page 85](#)
- ☐ Installing ball sleeve for selector shaft ⇒ [page 85](#)

14 - Bearing bush

- ☐ For 3rd/4th gear selector plate / selector fork
- ☐ Pressing out ⇒ [page 86](#)
- ☐ Pressing in ⇒ [page 86](#)

15 - Small locking bush

- ☐ For selector shaft
- ☐ Not fitted on all versions

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4.2 Exploded view - gearbox housing



Note

At present there is no provision for removing and installing the pinion shaft.

1 - Intermediate piece

- ☐ Renew if damaged

2 - Ball-head pin

- ☐ 25 Nm
- ☐ Grease bearing surface for clutch release lever with lubricating paste - G 000 150-

3 - Cap

- ☐ For gearbox breather

4 - Breather pipe

- ☐ Installation depth
⇒ [page 87](#)
- ☐ Clip in cap for gearbox breather

5 - Oil seal

- ☐ For flange shaft (left-side)
- ☐ Removing and installing
⇒ [page 139](#)

6 - Differential

- ☐ Renewing tapered roller bearings for differential
⇒ [page 147](#)



Note

Differential bevel gears cannot be removed and installed

7 - O-ring

- ☐ Always renew
- ☐ Lubricate with gear oil

8 - Cover for final drive

- ☐ Renewing ⇒ [page 164](#)

9 - Bolt

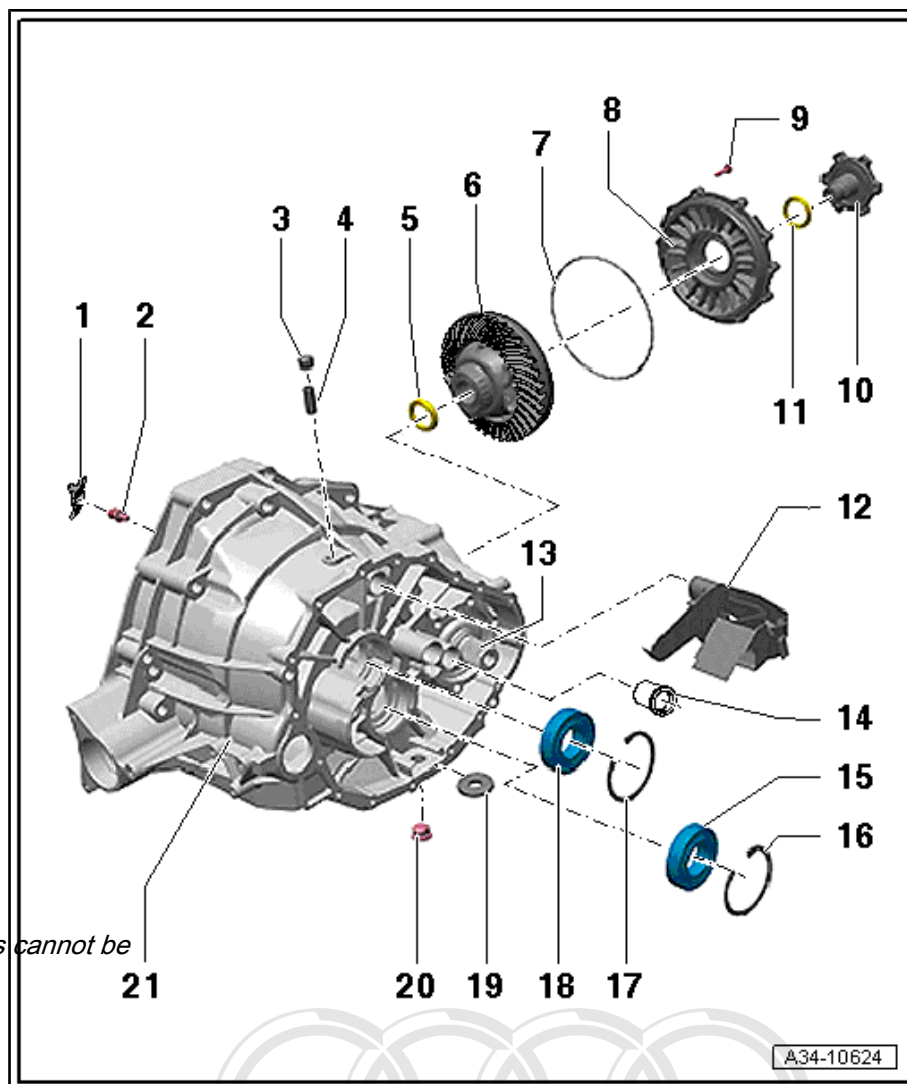
- ☐ 20 Nm and then turn 90° further
- ☐ Steel bolts (M8; 38 mm long)
- ☐ 10x

10 - Flange shaft (right-side)

- ☐ With circlip
- ☐ Removing and installing ⇒ [page 149](#)

11 - Oil seal

- ☐ For flange shaft (right-side)
- ☐ Removing and installing ⇒ [page 137](#)



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12 - Oil collector

13 - Pinion shaft

- ☐ Cannot be renewed at present

14 - Bearing bush

- ☐ For selector plate / selector fork
- ☐ 3x
- ☐ Removing ⇒ [page 88](#)
- ☐ Installing ⇒ [page 88](#)

15 - Ball bearing

- ☐ For output shaft
- ☐ Driving out ⇒ [page 88](#)
- ☐ Driving in ⇒ [page 88](#)

16 - Circlip

- ☐ Installation position ⇒ [page 89](#)

17 - Circlip

- ☐ Installation position ⇒ [page 89](#)

18 - Ball bearing

- ☐ For input shaft
- ☐ Driving out ⇒ [page 89](#)
- ☐ Driving in ⇒ [page 89](#)

19 - Magnet

- ☐ Clean

20 - Oil drain plug

- ☐ 45 Nm

21 - Gearbox housing

- ☐ Cannot be renewed at present
- ☐ Different versions
- ☐ Sealing plugs are fitted in some gearboxes instead of gear oil heater ⇒ [page 89](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue

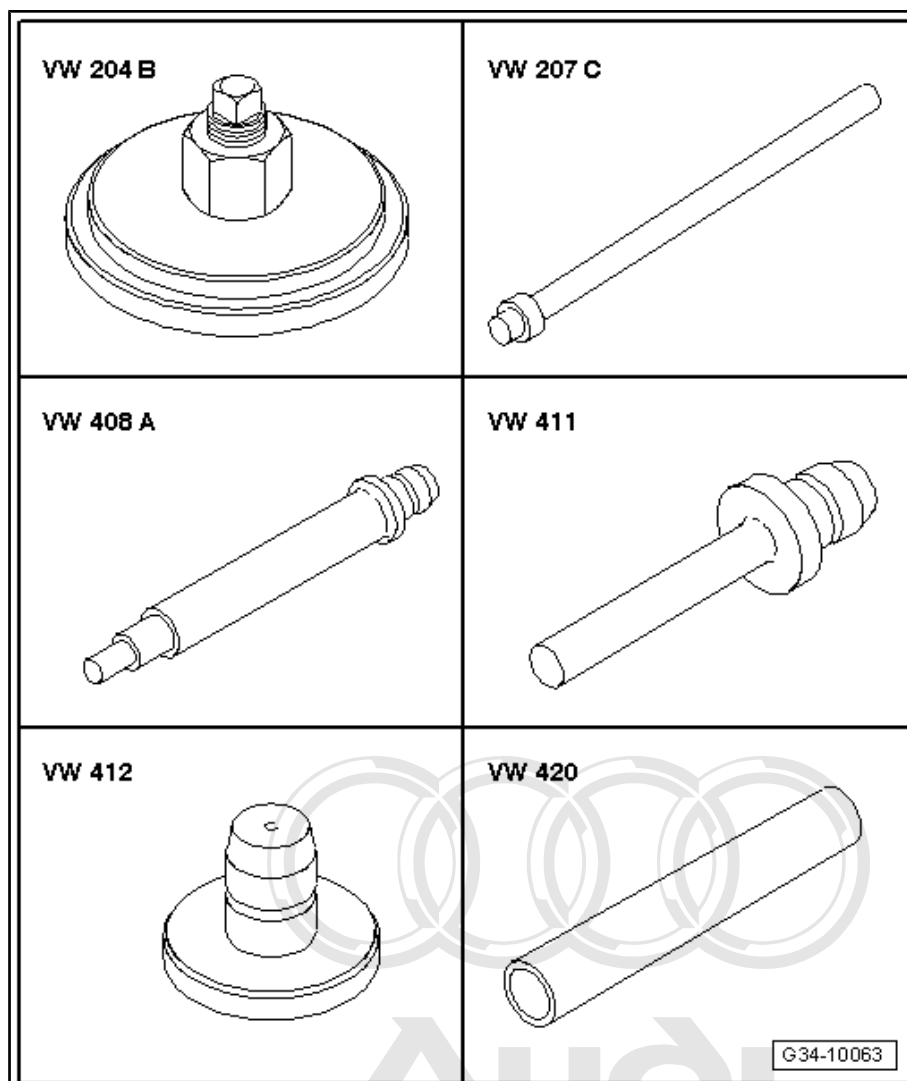


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4.3 Servicing gearbox cover

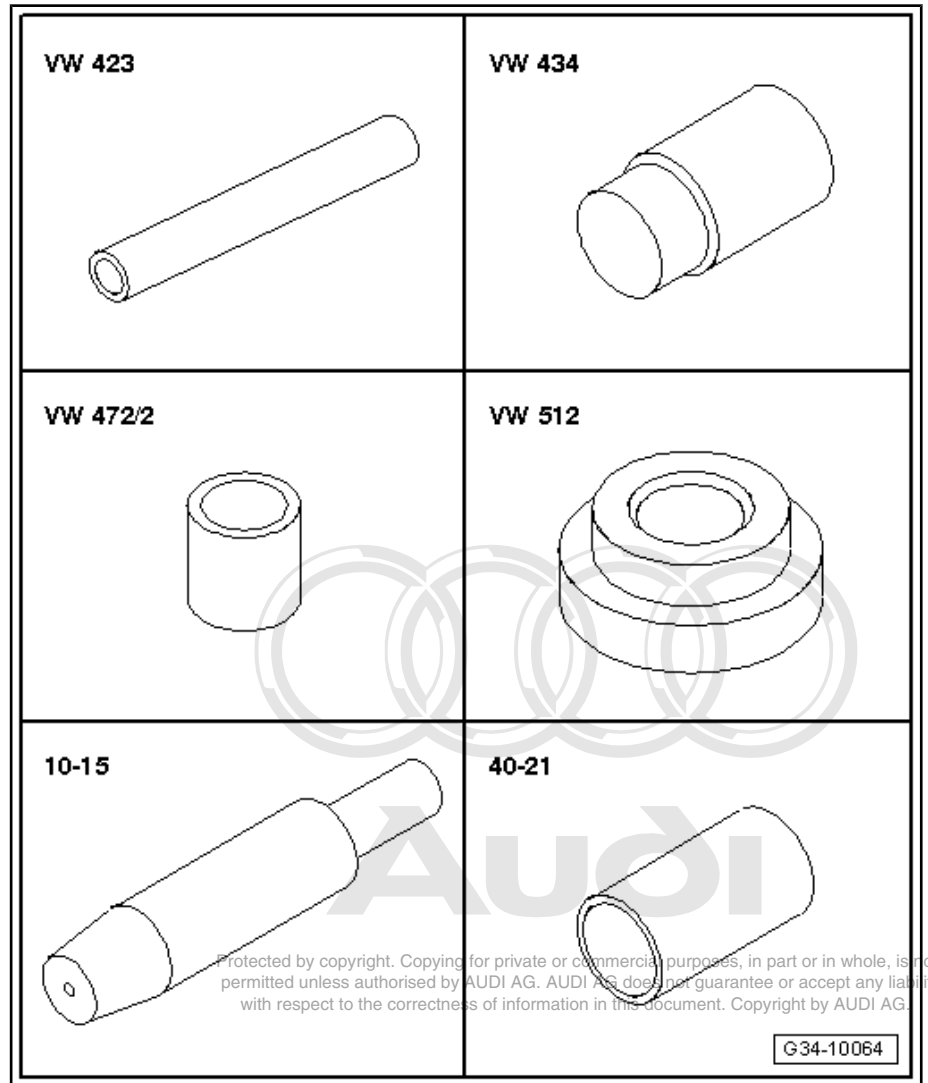
Special tools and workshop equipment required

- ◆ Crankshaft seal installing tool - VW 204 B-
- ◆ Drift - VW 207 C-
- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 411-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 420-

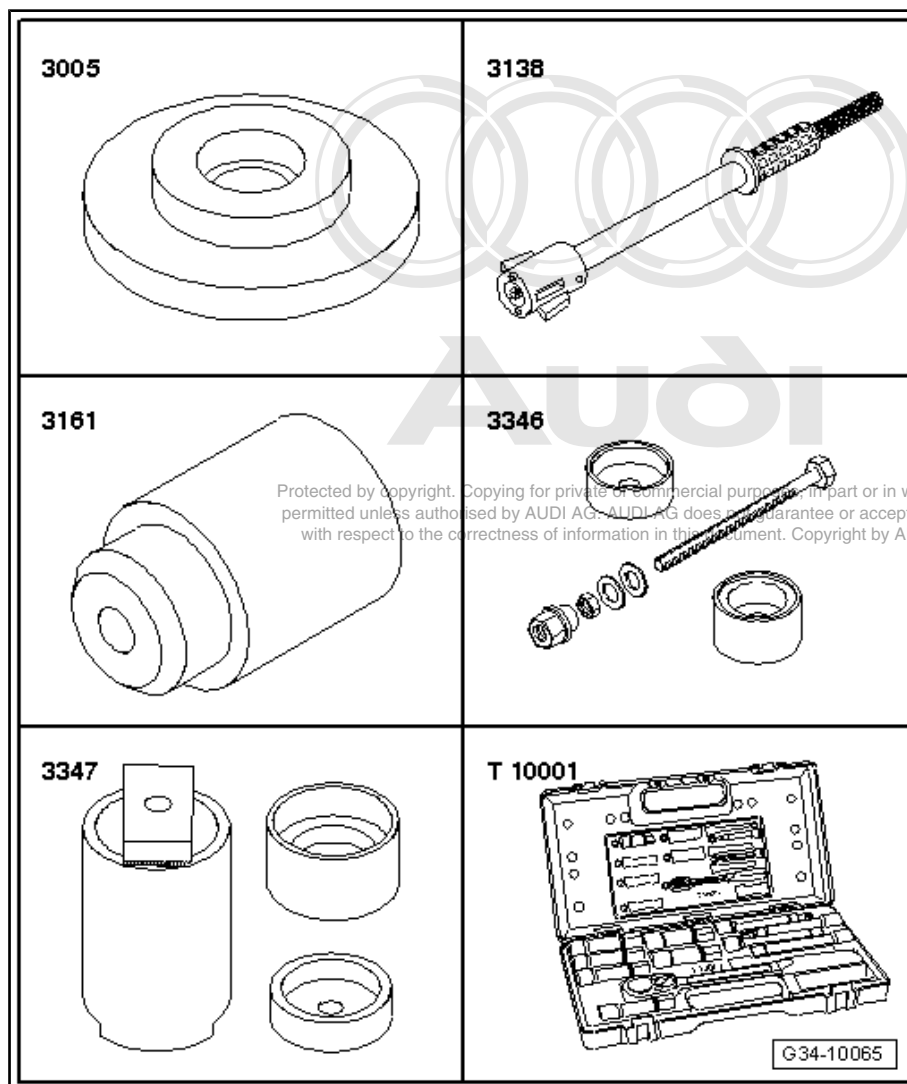


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- ◆ Tube - VW 423-
- ◆ Press tool - VW 434-
- ◆ Distance sleeve - VW 472/2-
- ◆ Thrust pad - VW 512-
- ◆ Guide pin - 10 - 15-
- ◆ Press tool - 40 - 21-

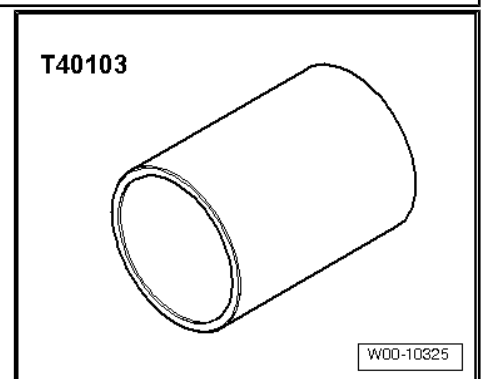
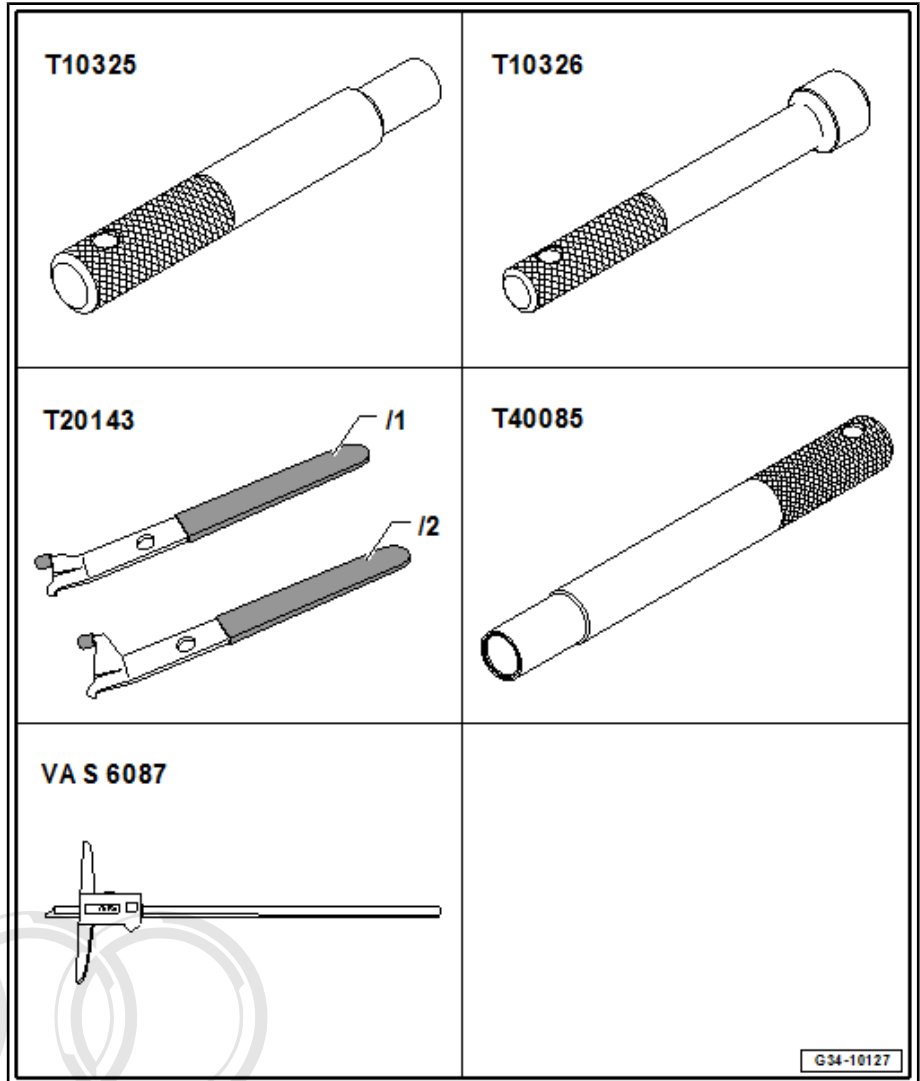


- ◆ Thrust plate - 3005-
- ◆ Drift - 3138-
- ◆ Extension - 3161-
- ◆ Assembly tool - 3346-
- ◆ Assembly tool - 3347-
- ◆ Shock absorber set - T10001-



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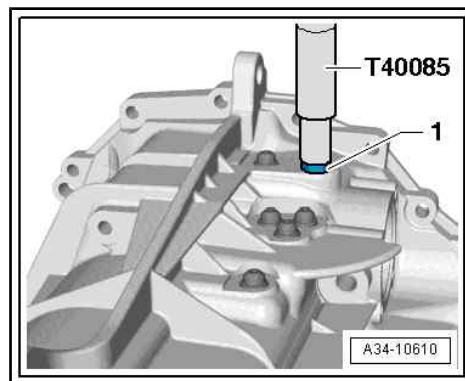
◆ Pressure sleeve - T40103-



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Removing and installing large locking bush -1- for selector shaft

- The selector shaft must be removed.
- If the gearbox has not been dismantled, put a cloth in the aperture for the selector shaft to stop the locking bush from dropping into the gearbox.
- Drive out large locking bush inwards (i.e. into gearbox cover) using drift - T40085- .
- Use drift - T40085- to press in locking bush to correct installation depth ⇒ [page 82](#) .



Installation depth of large locking bush -1- in gearbox cover

- Apply digital depth gauge - VAS 6087- to first shoulder -arrow- of locking bush and check installation depth -a-.

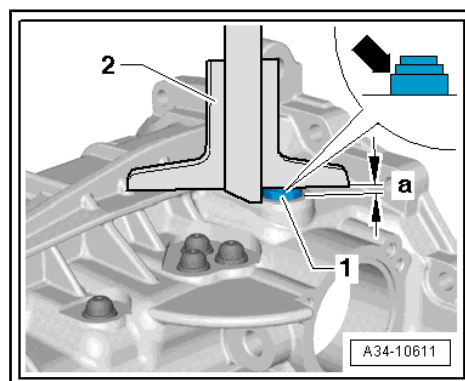
Installation depth -a-:

Gearbox with gear detector switch - F208- up to model year 2012

- 5.0 ± 0.2 mm

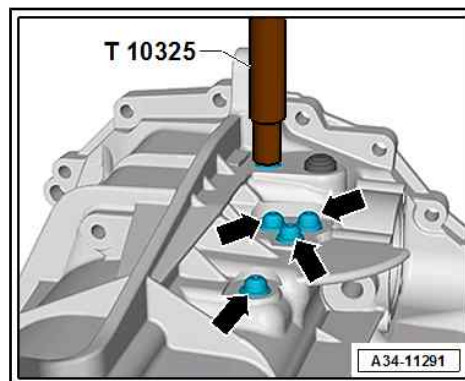
Gearbox with gear detection sensor - G604- from model year 2013 onwards

- 6.5 ± 0.2 mm



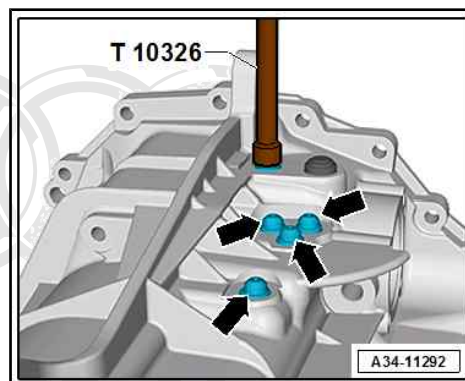
Removing locking bushes for selector plates/selector forks

- The gearbox cover must be removed.
- Drive out locking bushes for selector plates/selector forks -arrows- with drift - T10325- .



Pressing in locking bushes for selector plates/selector forks

- Press in locking bushes for selector plates/selector forks -arrows- with drift - T10326- (press in until drift contacts stop).



Driving in needle bearing onto stop in gearbox cover

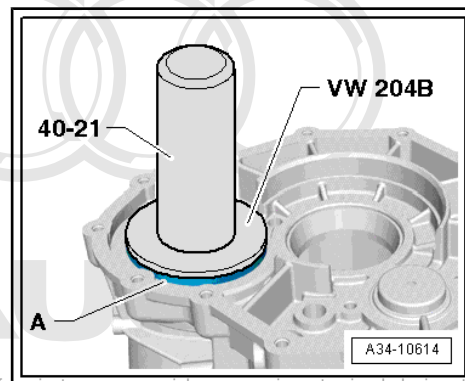


Note

Eliminate peening depressions if necessary.

Install the needle bearing so the lettering (side with thicker metal) faces towards the installing tool - VW 204 B- .

- Secure needle bearing after pressing in by peening into gearbox cover ⇒ [page 83](#) .

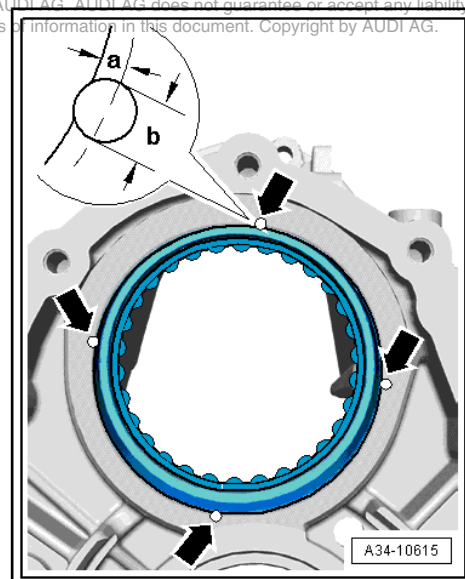


Securing needle bearing in gearbox cover by peening

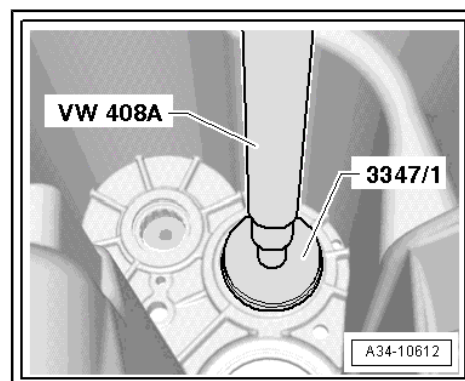
- Use blunt punch with ball-shaped end (ball Ø approx. 5 mm) to peen in position.
- The needle bearing is secured with 4 peening marks spaced 90° apart around the circumference -arrows-.

Observe position and diameter of peening marks:

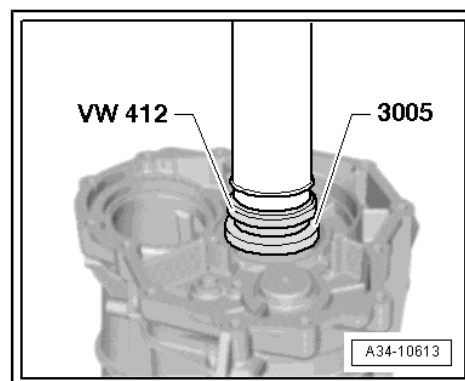
- ◆ Dimension -a- = 2 mm
- ◆ Dimension -b- = 3 mm



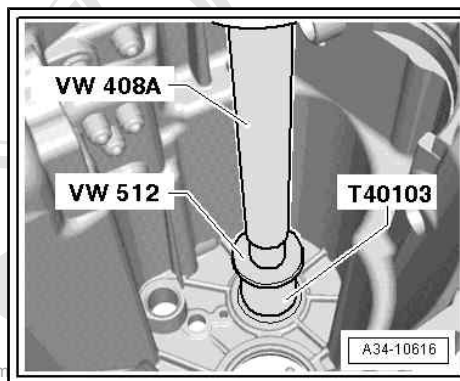
Pressing tapered roller bearing outer race out of gearbox cover



Pressing tapered roller bearing outer race into gearbox cover (press onto stop)

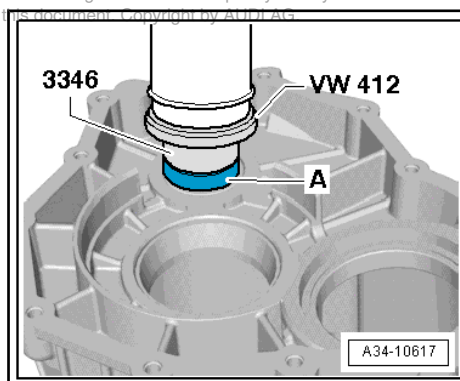


Pressing roller bearing for input shaft out of gearbox cover



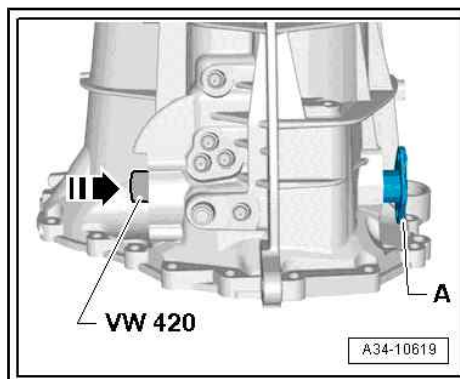
Pressing roller bearing -A- for input shaft into gearbox cover (press onto stop)

- Install with the shoulder of the roller bearing facing towards the open side of thrust piece - 3346- .



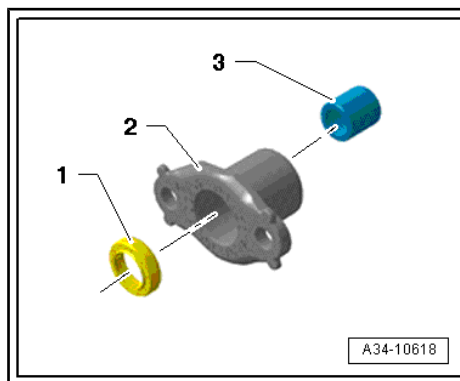
Removing and installing sealing cap -A- for selector shaft

- Selector shaft is removed.
- Remove bolts securing sealing cap -A- to gearbox cover.
- Carefully knock out sealing cap in direction of -arrow- using tube - VW 420- .
- Clean sealing surfaces of sealing cap and gearbox cover.
- Apply sealing paste - AMV 188 001 02- evenly and secure sealing cap with new bolts ➔ [Item 11 \(page 75\)](#) .



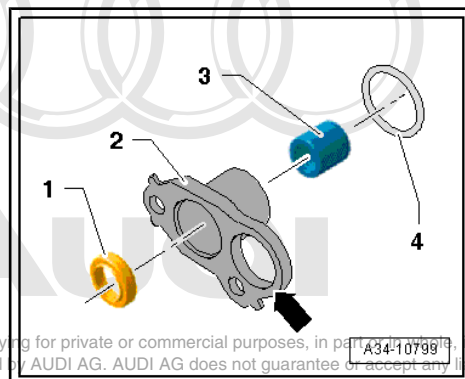
Exploded view - sealing cap for selector shaft

- 1 - Oil seal for selector shaft; removing and installing ➔ [page 85](#)
- 2 - Sealing cap
- 3 - Ball sleeve for selector shaft; removing ➔ [page 85](#) , installing ➔ [page 85](#)



Exploded view - sealing cap for selector shaft with aperture -arrow- for gearbox neutral position sender - G701- or sealing plug

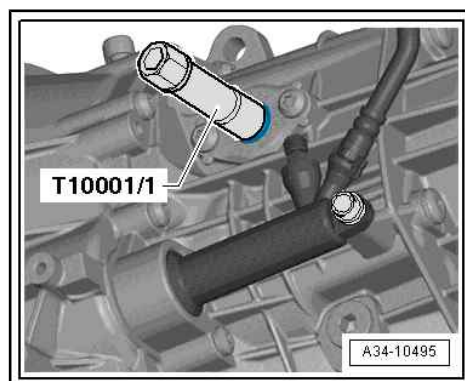
- 1 - Oil seal for selector shaft; removing and installing ➔ [page 85](#)
- 2 - Sealing cap
- 3 - Ball sleeve for selector shaft; removing ➔ [page 85](#) , installing ➔ [page 86](#)
- 4 - O-ring



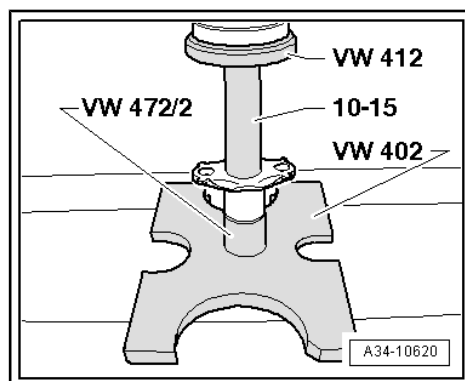
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Removing and installing oil seal for selector shaft

- Prise out oil seal with extractor tool - T20143/1- .
- Lightly oil outer circumference of oil seal.
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .
- Drive in oil seal using -T10001/1- or tube - VW 423- .
- Installation depth: 2 mm below top edge of sealing cap

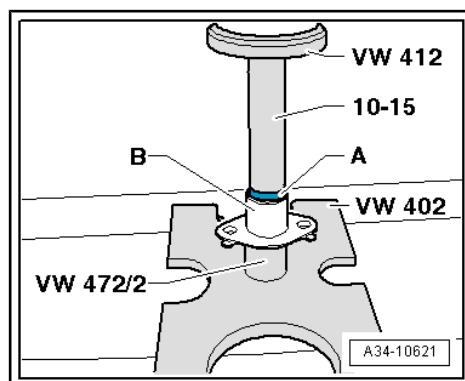


Pressing ball sleeve for selector shaft out of sealing cap



Pressing ball sleeve -A- for selector shaft into sealing cap -B- (press in until flush)

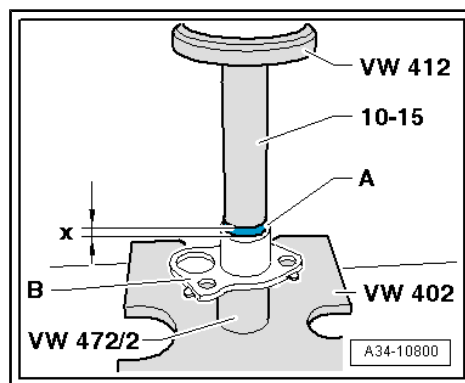
Fit ball sleeve so that side with lettering (thicker metal) faces guide pin - 10 - 15- .



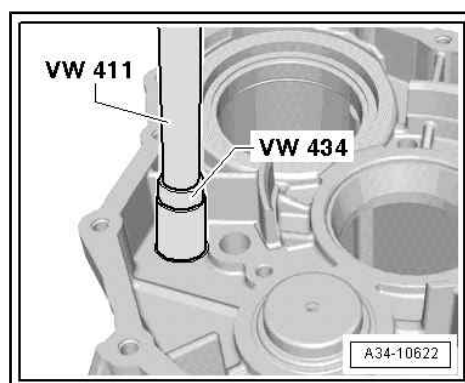
Pressing ball sleeve -A- for selector shaft into sealing cap -B- (press in to dimension -x-)

Fit ball sleeve so that side with lettering (thicker metal) faces guide pin - 10 - 15- .

- Installation depth -x- = 2.5 ± 0.5 mm

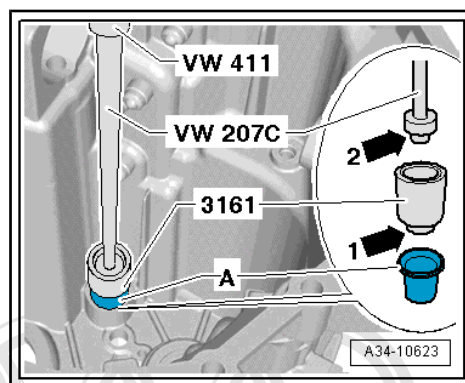


Pressing bearing bush for 3rd/4th gear selector plate / selector fork out of gearbox cover



Pressing bearing bush -A- for 3rd/4th gear selector plate / selector fork into gearbox cover (press onto stop)

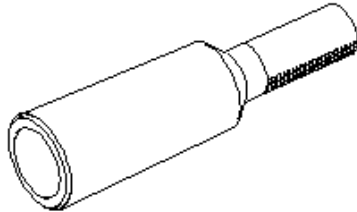
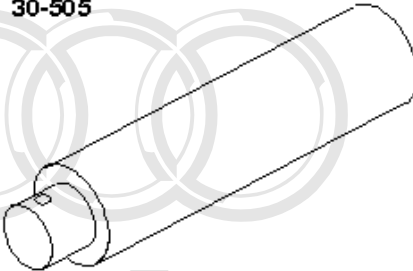
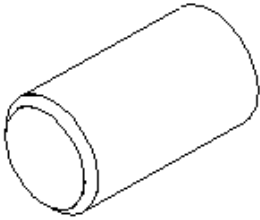
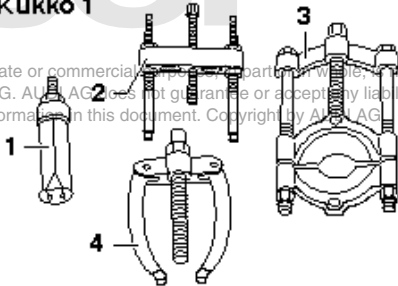
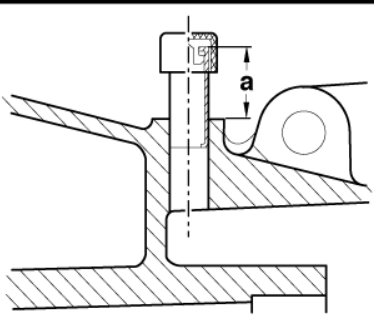
- Insert shoulder -arrow 1- of extension - 3161- into bearing bush -A-.
- Insert shoulder -arrow 2- of drift - VW 207 C- in extension - 3161- and press in bearing bush onto stop.



4.4 Servicing gearbox housing

Special tools and workshop equipment required

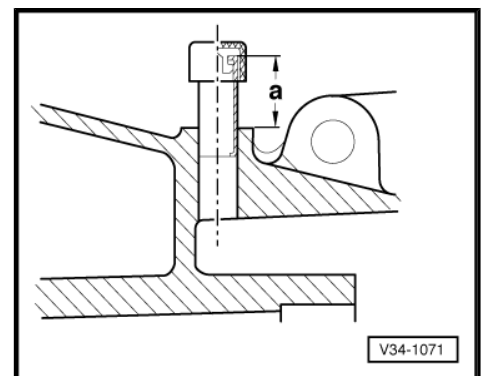
- ◆ Drift sleeve - VW 244 B-
- ◆ Multi-purpose tool - VW 771-
- ◆ Mandrel - 30 - 505-
- ◆ Drift sleeve - 40 - 20-
- ◆ -1- Internal puller - Kukko 21/3-
- ◆ Lubricating paste - G 000 150-

VW 244 b 	00000
30-505 	40-20 
Kukko 1 	 G34-10066

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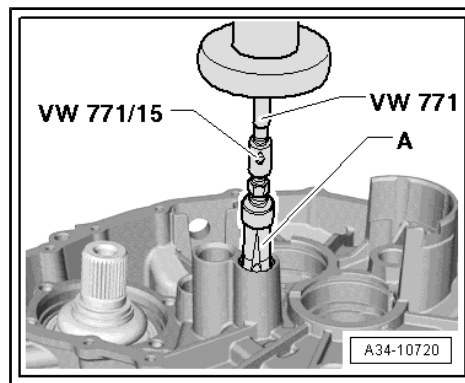
Installation dimension of breather pipe

Dimension -a- = 21.5 mm



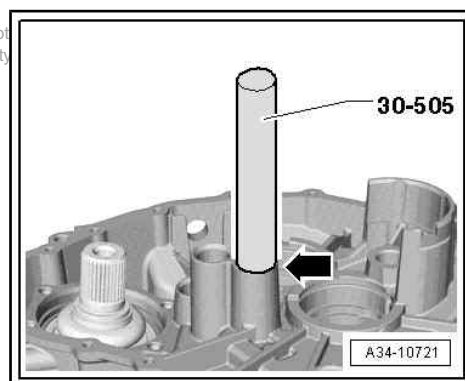
Pulling out bearing bush for selector plate / selector fork

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



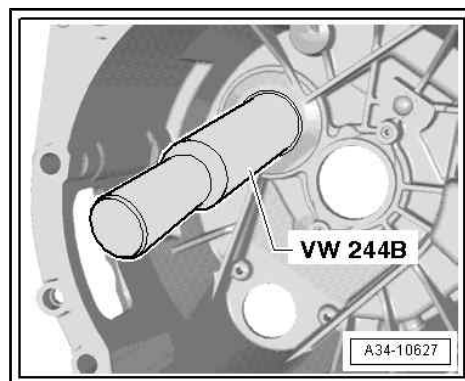
Driving in bearing bush -arrow- for selector plate / selector fork (drive in onto stop)

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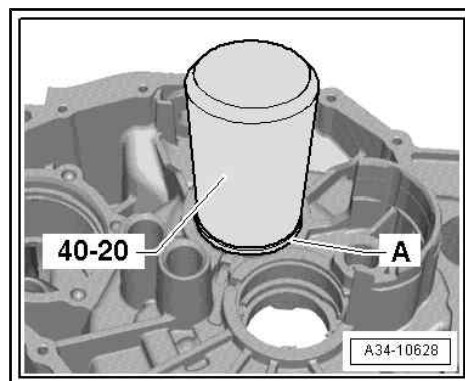
Driving output shaft ball bearing out of gearbox housing

- First remove circlip for ball bearing.



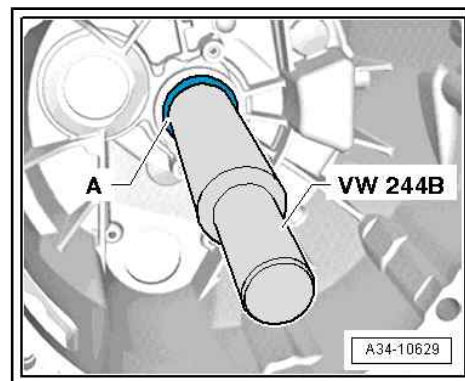
Driving output shaft ball bearing -A- into gearbox housing (drive in onto stop)

- Then fit circlip for ball bearing; note correct installation position of circlip ➔ [page 89](#) .



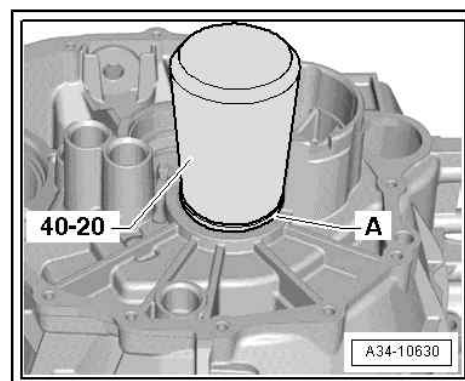
Driving input shaft ball bearing -A- out of gearbox housing

- First remove circlip for ball bearing.



Driving input shaft ball bearing -A- into gearbox housing (drive in onto stop)

- Then fit circlip for ball bearing; note correct installation position of circlip ➔ [page 89](#) .



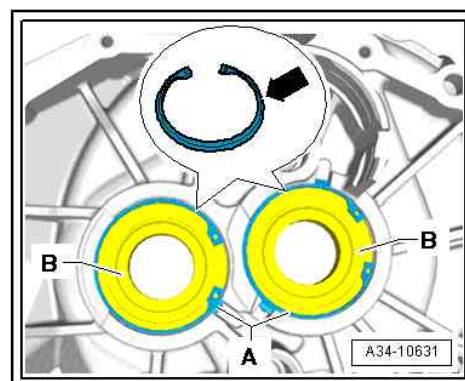
Installation position of circlips -A- for ball bearings -B-

- The chamfer -arrow- on circlip -A- faces away from ball bearings -B-.



Note

The circlips and ball bearings for the input shaft and output shaft are identical.



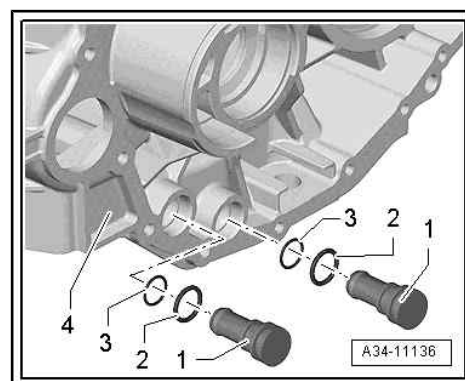
Gearbox housing with sealing plugs in place of gear oil heater



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- ◆ On gearbox housings fitted for gear oil heating ➔ [Item 4 \(page 52\)](#) , sealing plugs -1- may be installed in gearbox housing -4- instead of gear oil heater.
- ◆ O-rings -2 ... 3- must always be renewed.



35 – Gears, shafts

1 Dismantling and assembling gears and shafts

⇒ "1.1 Exploded view - gear cluster", page 90

⇒ "1.2 Dismantling and assembling gear cluster", page 92

⇒ "1.3 Exploded view - bearings for spur gear and centre differential", page 99

⇒ "1.4 Servicing bearings for spur gear and centre differential", page 101

⇒ "1.5 Determining preload of tapered roller bearings for spur gear", page 107

⇒ "1.6 Determining thickness of new shim S6 for adjusting position of centre differential", page 109

1.1 Exploded view - gear cluster

1 - Bolt

- ☐ 20 Nm and then turn 45° further
- ☐ Secures selector fork cluster
⇒ Item 2 (page 90) to bearing mounting
⇒ Item 3 (page 90)

☐ 2x

2 - Selector fork cluster

- ☐ Dismantling and assembling ⇒ page 53

3 - Bearing mounting

- ☐ Carries bearings for input shaft and output shaft in gearbox cover
- ☐ Clean locking fluid out of tapped holes (using thread tap or similar)

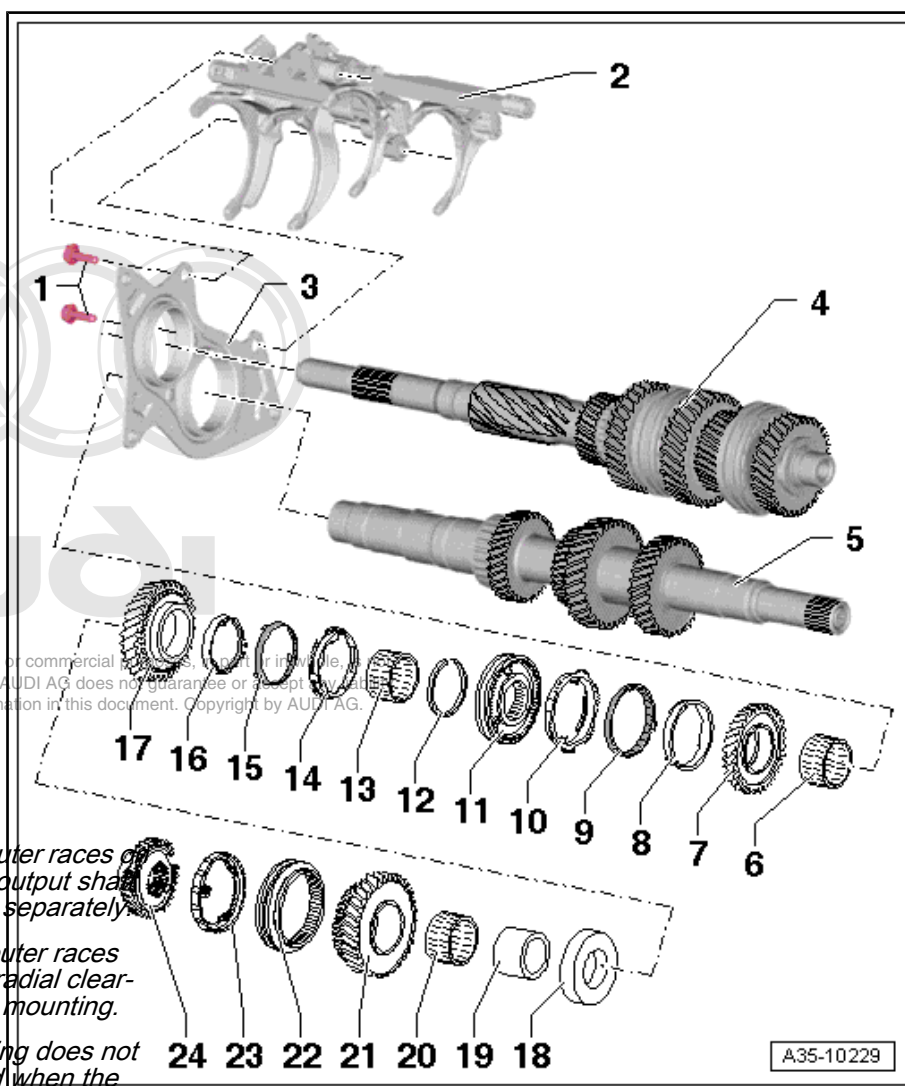
☐ Different versions

- ☐ For correct version refer to ⇒ Electronic parts catalogue



Note

- ◆ The roller bearing outer races of the input shaft and output shaft cannot be renewed separately.
- ◆ The roller bearing outer races must not have any radial clearance in the bearing mounting.
- ◆ The bearing mounting does not have to be renewed when the roller bearings on the input shaft or output shaft are renewed, e.g. when installing a new input shaft.



4 - Input shaft

- ☐ Dismantling and assembling ⇒ [page 111](#)

5 - Output shaft

- ☐ With 3rd and 4th gear wheels
- ☐ Removing and installing 1st, 2nd and reverse gear ⇒ [page 92](#)
- ☐ Dismantling and assembling ⇒ [page 130](#)

6 - Needle bearing

- ☐ For 2nd gear

7 - 2nd speed selector gear

8 - Inner ring for 2nd gear

- ☐ Installation position ⇒ [page 96](#)
- ☐ Distinguishing inner rings for 1st and 2nd gear ⇒ [page 129](#)

9 - Intermediate ring for 2nd gear

- ☐ Installation position ⇒ [page 96](#)

10 - Synchro-ring for 2nd gear

- ☐ Installation position ⇒ [page 96](#)

11 - Locking collar/synchro-hub for 1st and 2nd gear

- ☐ Pulling off ⇒ [page 95](#)
- ☐ Installation position: high inside collar faces 2nd speed selector gear ⇒ [page 130](#)
- ☐ Pressing on ⇒ [page 97](#)

12 - Circlip

- ☐ Determining thickness ⇒ [page 97](#)

13 - Needle bearing

- ☐ For 1st gear

14 - Synchro-ring for 1st gear

- ☐ Installation position ⇒ [page 96](#)

15 - Intermediate ring for 1st gear

- ☐ Installation position ⇒ [page 96](#)

16 - Inner ring for 1st gear

- ☐ Installation position ⇒ [page 96](#)
- ☐ Distinguishing inner rings for 1st and 2nd gear ⇒ [page 129](#)

17 - 1st speed selector gear

18 - Thrust washer

- ☐ For 1st speed and reverse selector gears

19 - Needle bearing inner race

- ☐ For reverse gear
- ☐ Pulling off ⇒ [page 95](#)
- ☐ Pressing on ⇒ [page 98](#)

20 - Needle bearing

- ☐ For reverse gear

21 - Reverse selector gear

22 - Reverse gear locking collar

- ☐ Installation position ⇒ [page 129](#)

23 - Synchro-ring for reverse gear

- ☐ Checking for wear ⇒ [page 129](#)

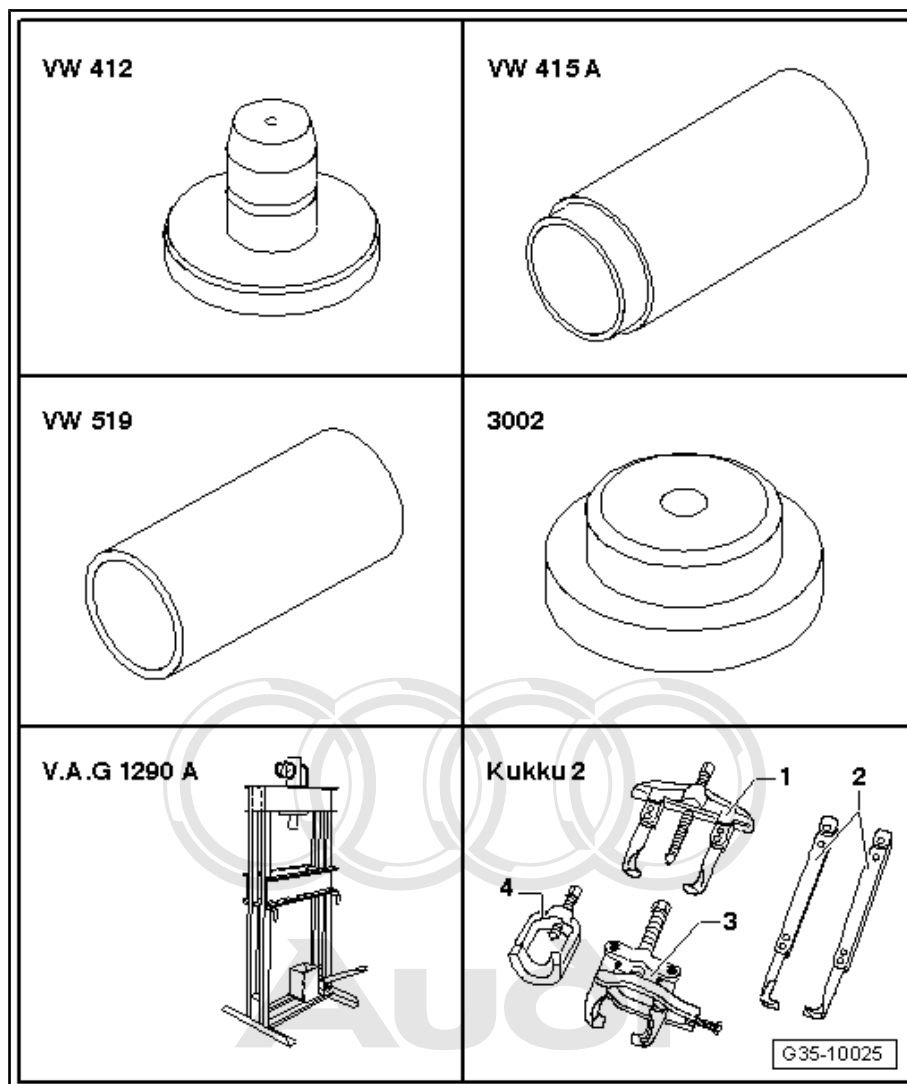
24 - Reverse gear synchro-hub

- ☐ With synchro-spring
- ☐ Pulling off ➤ [page 95](#)
- ☐ Pressing on ➤ [page 98](#)

1.2 Dismantling and assembling gear cluster

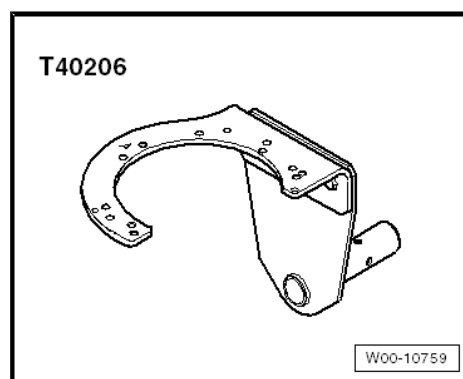
Special tools and workshop equipment required

- ◆ Press tool - VW 412-
- ◆ Tube - VW 415 A-
- ◆ Tube - VW 519-
- ◆ Thrust piece - 3002-
- ◆ Workshop press - V.A.G 1290A-
- ◆ -1- Two-arm puller - Kukku 20/10-
- ◆ -1- Two-arm puller - Kukku 20-20- with 300 mm hooks

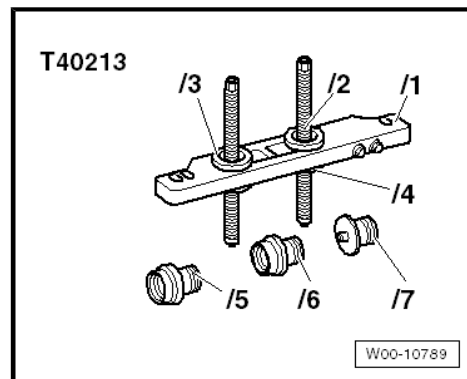


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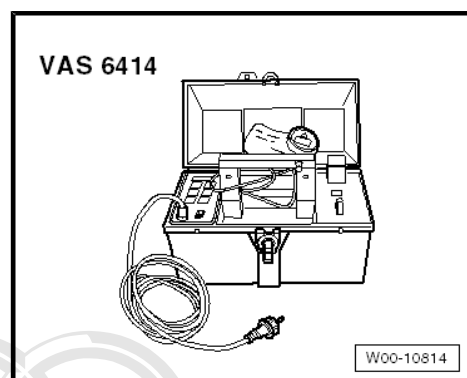
- ◆ Gearbox support - T40206-



◆ Separating tool - T40213-



◆ Inductive heater - VAS 6414-



◆ Hot air blower - V.A.G 1416-



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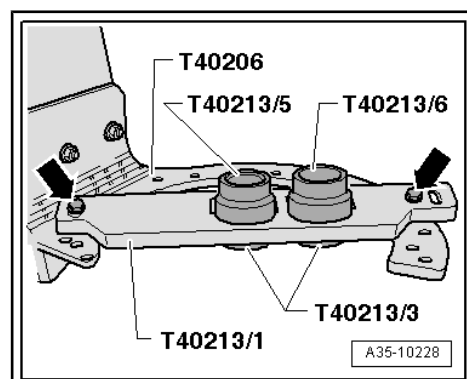
Dismantling

- Attach plate - T40213/1- to gearbox support - T40206- with bolts -arrows-.
- Fit adapters - T40213/5- and -T40213/6- in plate - T40213/1- .

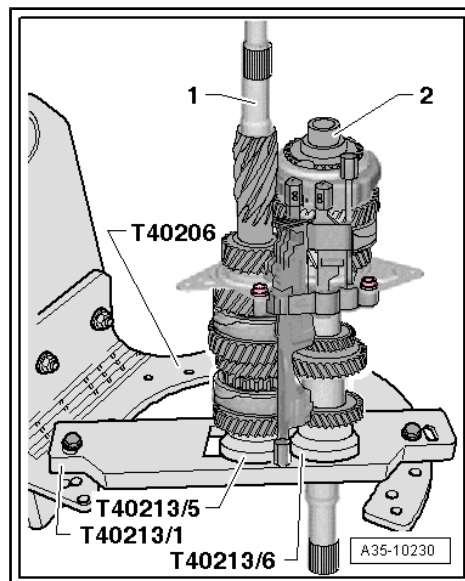


Note

*Secure adapters - T40213/5- and -T40213/6- with knurled screws
- T40213/3- after inserting shafts.*



- Insert input shaft -1- together with output shaft -2- and selector fork cluster in adapters - T40213/5- and -T40213/6- .

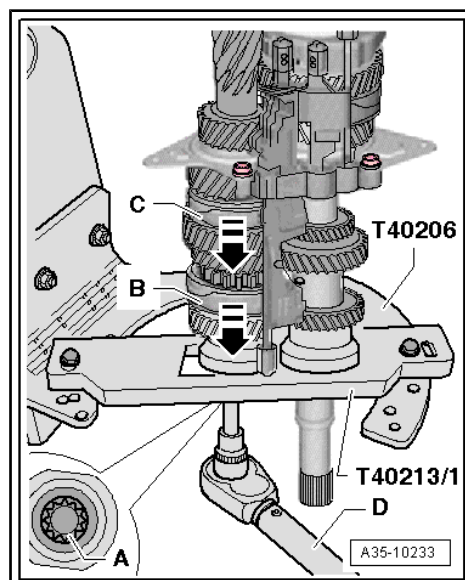


- If you have to dismantle the input shaft, now loosen and unscrew the multi-point socket head bolt -A- in the input shaft using torque wrench -D- or similar.
- To do this, engage 2 gears by moving locking collars -B- and -C- in direction of -arrow-.
- The shafts must be vertical, as shown in illustration.
- Then move locking collars back to neutral position.

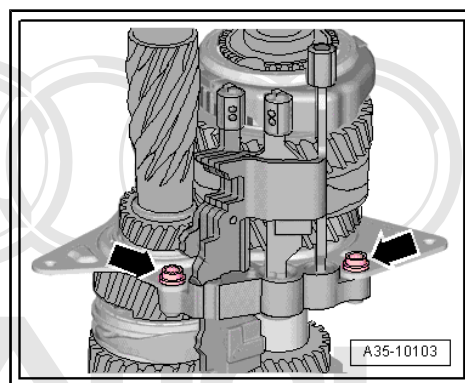


Note

In order to move the locking collars -B- and -C- back into the centre position, turn the output shaft slightly in a clockwise direction. To turn the output shaft, screw the bolt ➔ [Item 2 \(page 126\)](#) into the output shaft.



- Remove bolts -arrows- and detach selector fork cluster from bearing mounting.



- Pull off 1st speed selector gear -C- together with reverse gear synchro-hub -B- and inner race for reverse selector gear.
- Heat synchro-hub -B- to approx. 80 °C using hot air blower - V.A.G 1416- (or similar) and detach it using two-arm puller .

A - Two-arm puller , e.g. -Kukko 20/10- or -Kukko 20-20-

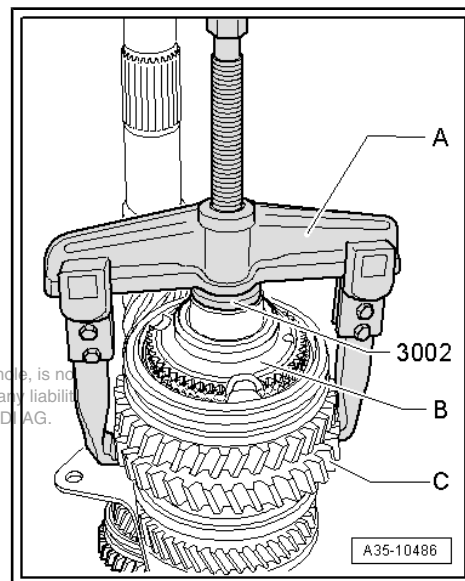


Caution

Risk of damage to dog teeth on 1st speed selector gear -C-

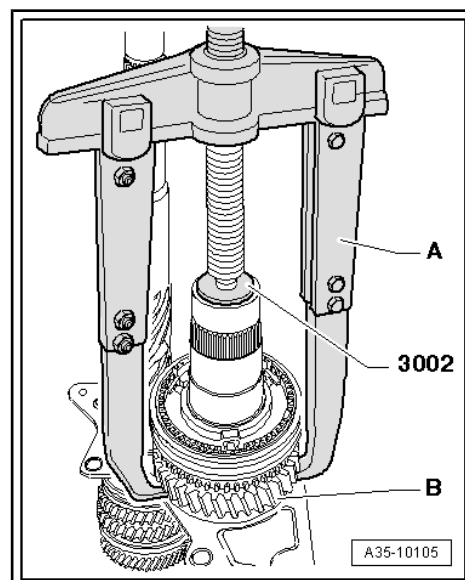
- **Hooks of two-arm puller must not come into contact with dog teeth of 1st speed selector gear during removal.**

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- Detach circlip for 1st/2nd gear synchro-hub.
- Pull off 2nd speed selector gear -B- together with synchro-hub and locking collar for 1st/2nd gear.

A - Two-arm puller , e.g. -Kukko 20-20- with 300 mm hooks



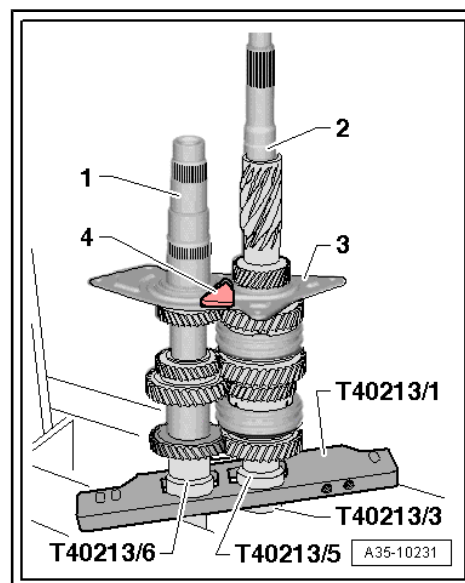
- Detach bearing mounting -3- from input shaft and output shaft.



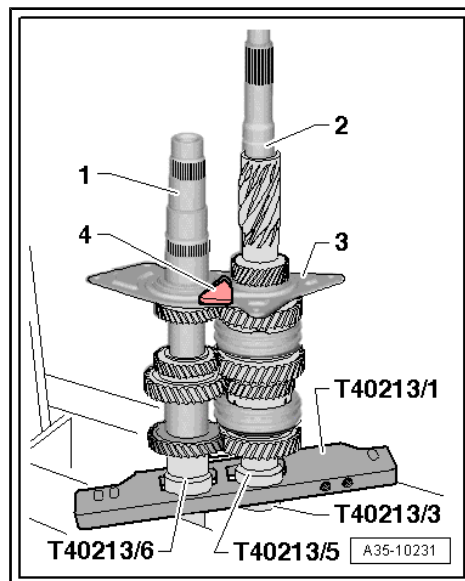
Note

- ◆ *Dismantling and assembling output shaft -1- ➔ [page 130](#)*
- ◆ *Dismantling and assembling input shaft -2- ➔ [page 115](#)*

Assembling



- Place plate - T40213/1- with adapters - T40213/5- and - T40213/6- on work table of workshop press - V.A.G 1290A- .
- Insert output shaft -1- and input shaft -2- in adapters - T40213/5- and -T40213/6- .
- Fit bearing mounting -3- in correct position over the two shafts, with plastic piece -4- facing upwards.



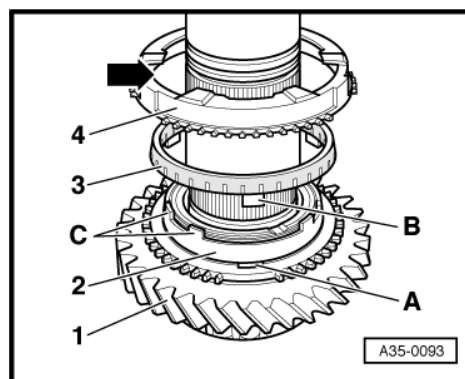
Installation position of synchro-rings for 1st and 2nd gear



Note

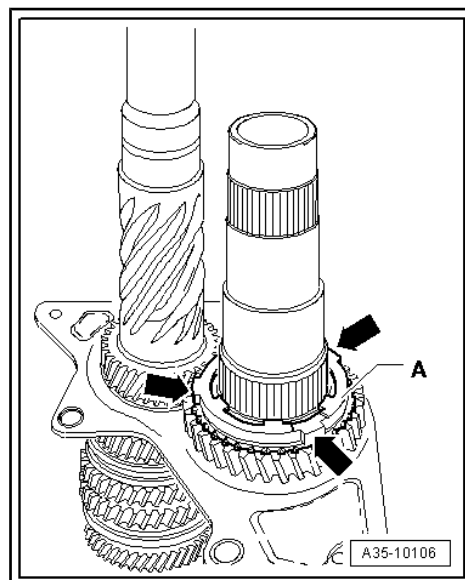
If components are not being renewed, make sure they are re-installed on the same gear.

- Fit inner ring -2- onto selector gear -1-.
- Fit intermediate ring -3-. Lug -B- must be inserted into recess -A-.
- Fit synchro-ring -4-. Guide lugs -C- through recess -arrow-.
- Fit 2nd speed selector gear together with needle bearing and synchro-rings -A-; note position of synchro-rings ➔ [page 96](#) .



Note

The stop lugs -arrows- on the synchro-ring must engage in the slots in the 1st/2nd gear synchro-hub when the synchro-hub is pressed on (next step).



Pressing on 1st/2nd gear synchro-hub

- Heat synchro-hub to approx. 100°C.
- Installation position of synchro-hub: high inside collar faces 2nd speed selector gear

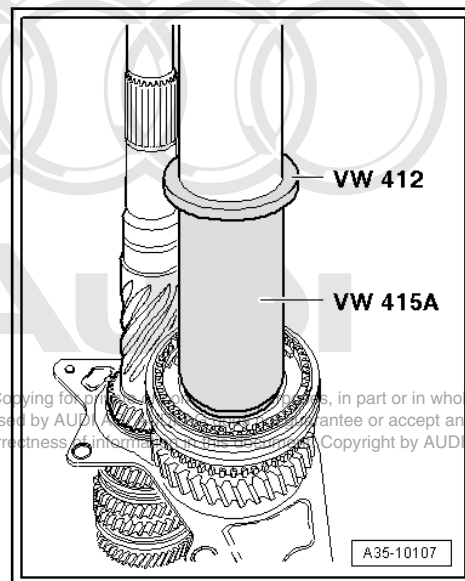


Note

When pressing on the synchro-hub, lift the 2nd speed selector gear slightly so that the stop lugs on the synchro-ring engage in the slots in the hub.

- Install circlip for 1st/2nd gear synchro-hub.

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- When renewing synchro-hub or output shaft:

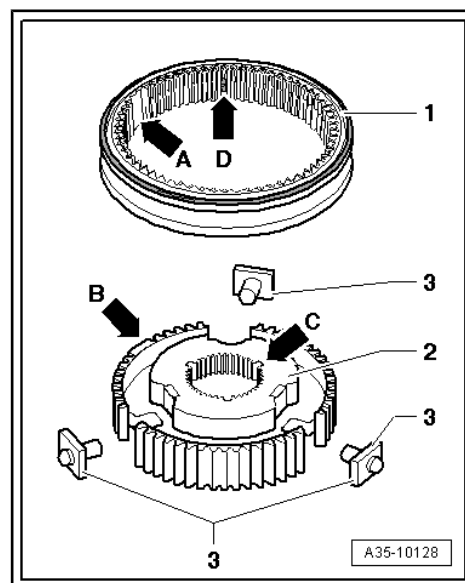
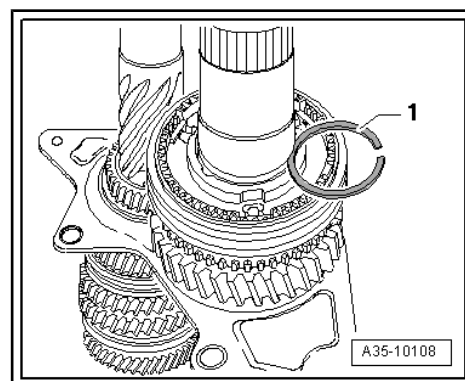
Determine thickness of new circlip -1- for 1st/2nd gear synchro-hub.

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

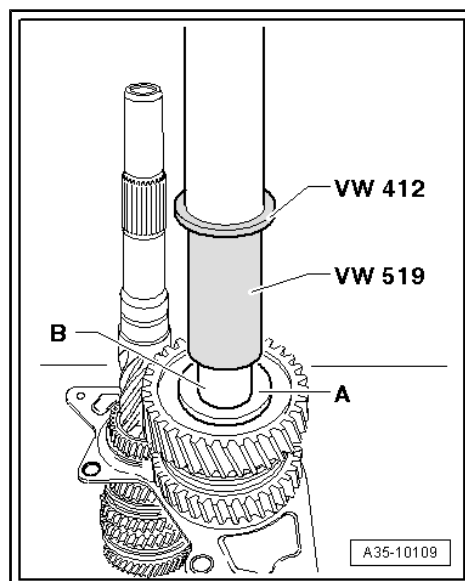
The following circlips are available:

Circlip thickness (mm)		
2.44	2.47	2.50

- Install circlip for 1st/2nd gear synchro-hub.
- Fit locking collar -1- onto pressed-on synchro-hub -2- so that wide teeth of locking collar -arrow A- and synchro-hub -arrow B- coincide.
- Then fit thrust blocks -3- in synchro-hub and press them into recesses -arrows D- in locking collar.
- Install 1st speed selector gear with synchro-rings and needle bearing on output shaft.



- Fit thrust washer -A- and pre-heated inner race -B- for reverse gear needle bearing.
- Fit reverse gear needle bearing together with selector gear and locking collar for reverse gear; note correct position ➔ [page 129](#) .
- Fit synchro-ring for reverse gear in locking collar.
- Heat synchro-hub for reverse gear to approx. 100°C.

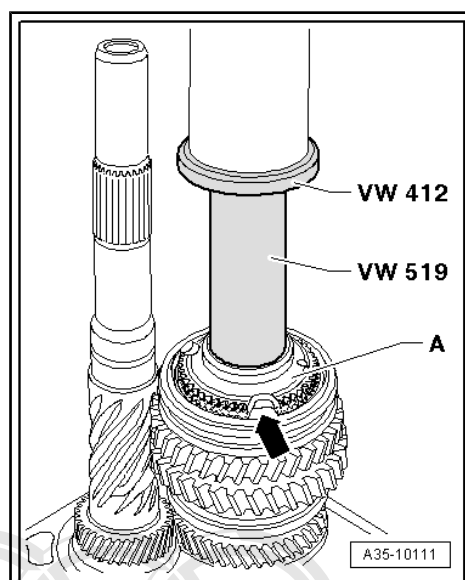


- Press on synchro-hub for reverse gear -A- with installed synchro-spring ➔ [Item 7 \(page 126\)](#) .

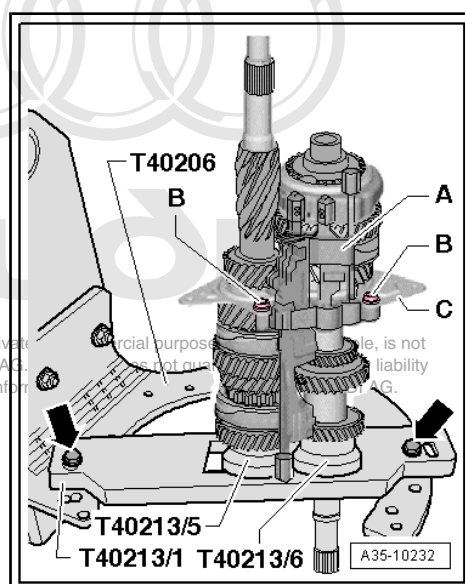


Note

When the synchro-hub for reverse gear is pressed on, the lugs -arrow- on the synchro-ring must engage in the slots in the hub.



- Attach plate - T40213/1- to gearbox support - T40206- with bolts -arrows-.
- Secure selector fork cluster -A- to bearing mounting -C- with bolts -C-. Tightening torque ➔ [Item 1 \(page 90\)](#)



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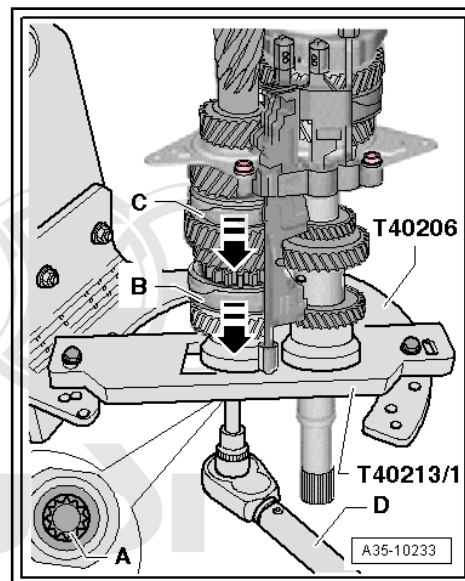
- If you have dismantled and assembled the input shaft, now tighten the multi-point socket head bolt -A- in the input shaft to the specified torque ➔ [Item 36 \(page 114\)](#) using torque wrench -D-. Before installing the bolt, clean the thread with a wire brush and then apply locking fluid - AMV 185 101 A1- .
- To do this, engage 2 gears by moving locking collars -B- and -C- in direction of -arrow-.
- The shafts must be vertical, as shown in illustration.
- Then move locking collars back to neutral position.



Note

In order to move the locking collars -B- and -C- back into the centre position, turn the input shaft slightly anti-clockwise via bolt -A-.

- Remove input shaft together with output shaft and selector fork cluster from plate - T40213/1- .



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1.3 Exploded view - bearings for spur gear and centre differential

1 - Output shaft

2 - Gearbox cover

3 - Tapered roller bearing outer race

- ☐ Removing and installing ➔ [Item 5 \(page 74\)](#)

4 - Tapered roller bearing inner race

- ☐ Goes towards gearbox cover
- ☐ Pressing off ➔ [page 104](#)
- ☐ Pressing on ➔ [page 104](#)

5 - Needle bearing

- ☐ Bearing for spur gear on output shaft

6 - Spur gear

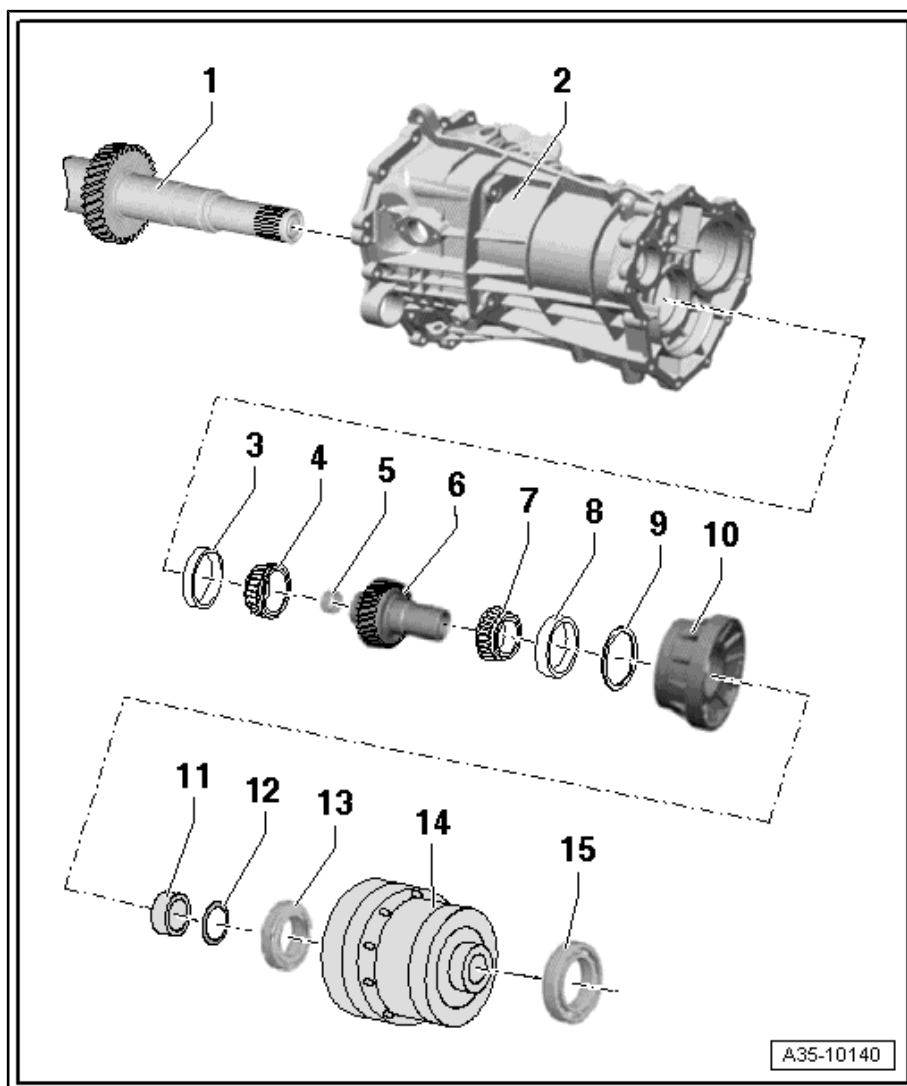
- ☐ Drive gear for side shaft (spur gearing)

7 - Tapered roller bearing inner race

- ☐ Goes towards bearing plate
- ☐ Pressing off ➔ [page 104](#)
- ☐ Pressing on ➔ [page 104](#)

8 - Tapered roller bearing outer race

- ☐ Pressing out ➔ [page 105](#)
- ☐ Pressing in ➔ [page 105](#)





9 - Shim

- ☐ Adjusts preload of tapered roller bearings for spur gear ⇒ [Item 6 \(page 99\)](#)
- ☐ Determining thickness ⇒ [page 107](#)

10 - Bearing plate

11 - Spacer sleeve

12 - Shim

- ☐ Sets position of centre differential
- ☐ Determining thickness ⇒ [page 109](#)

13 - Ball bearing, small

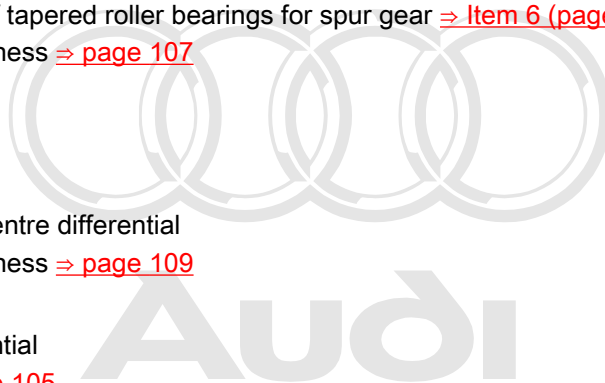
- ☐ For centre differential
- ☐ Pulling out ⇒ [page 105](#)
- ☐ Pressing in ⇒ [page 106](#)

14 - Centre differential

- ☐ Removing and installing ⇒ [page 197](#)
- ☐ Can only be serviced by manufacturer

15 - Ball bearing, large

- ☐ For centre differential
- ☐ Pulling off ⇒ [page 106](#)
- ☐ Pressing on ⇒ [page 106](#)



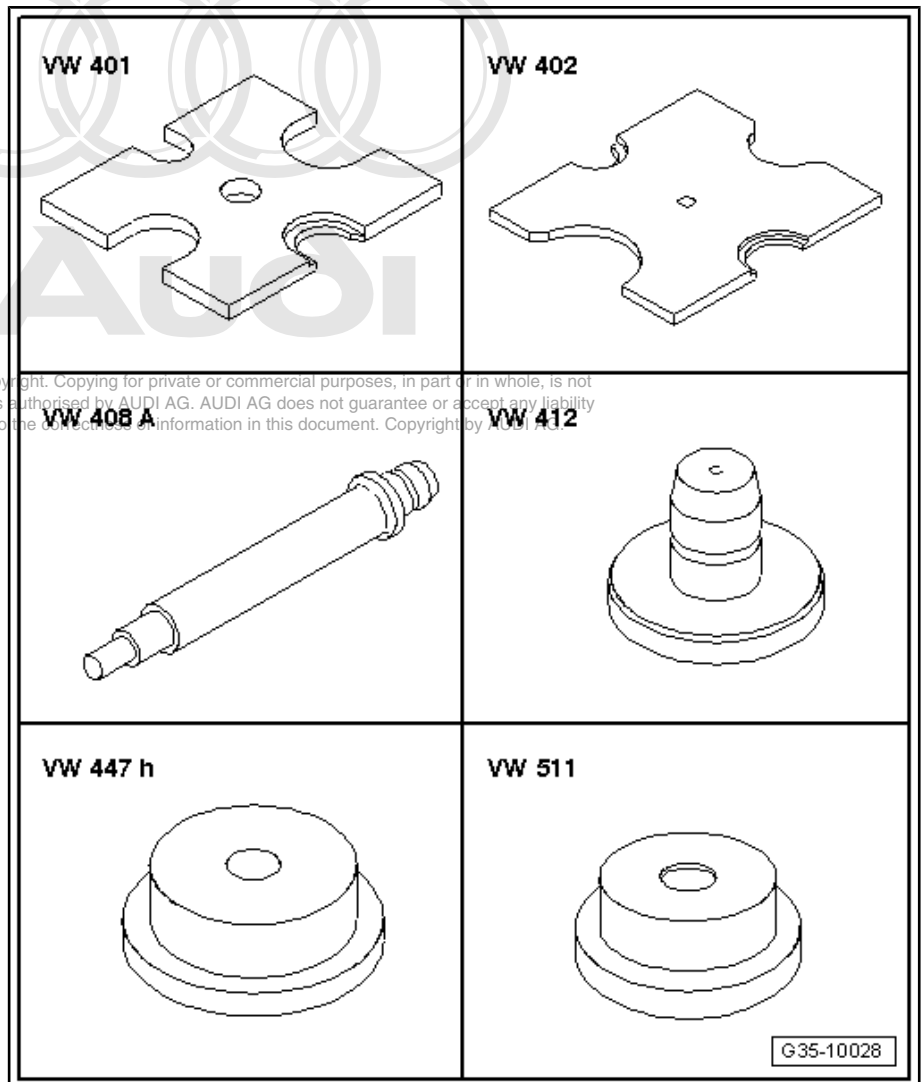
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1.4 Servicing bearings for spur gear and centre differential

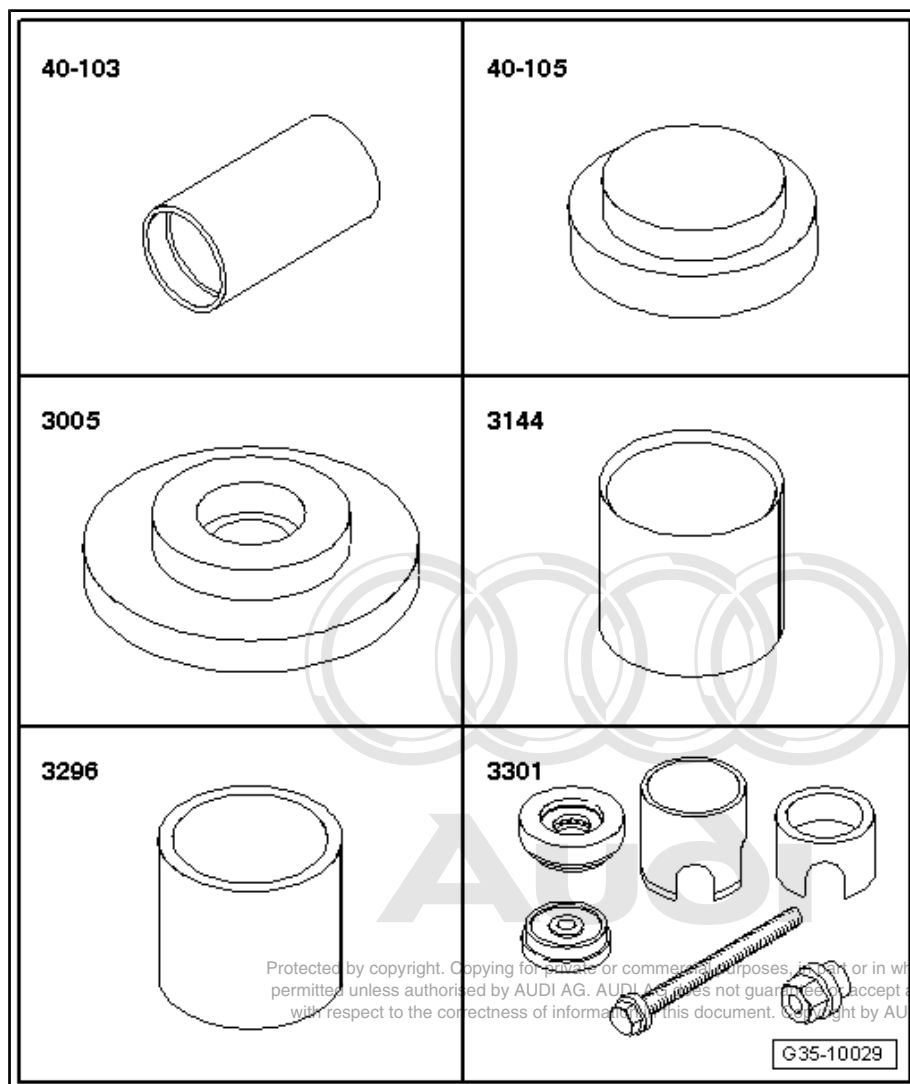
Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 412-
- ◆ Thrust plate - VW 447 H-
- ◆ Thrust pad - VW 511-

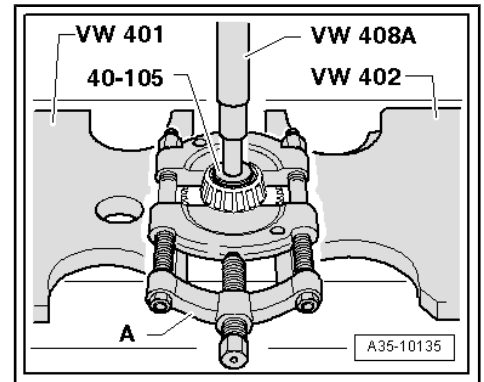
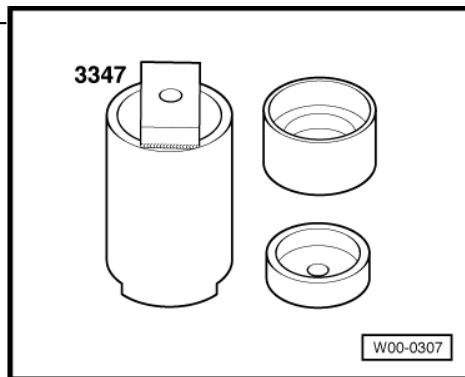
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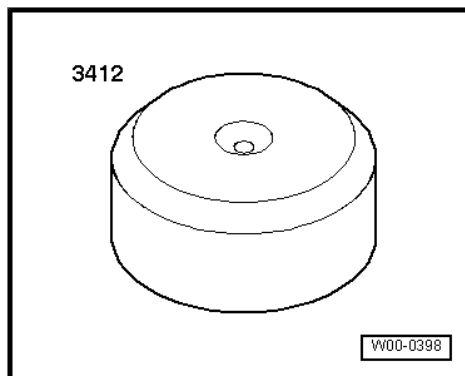
- ◆ Support - 40 - 103-
- ◆ Thrust plate - 40 - 105-
- ◆ Thrust plate - 3005-
- ◆ Sleeve - 3144-
- ◆ Tube - 3296-
- ◆ Assembly tool - 3301-



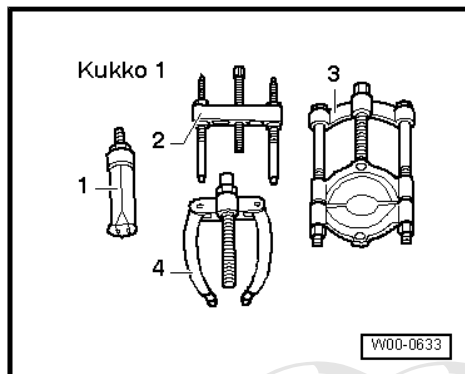
- ◆ Assembly tool - 3347-



- ◆ Thrust piece - 3412-



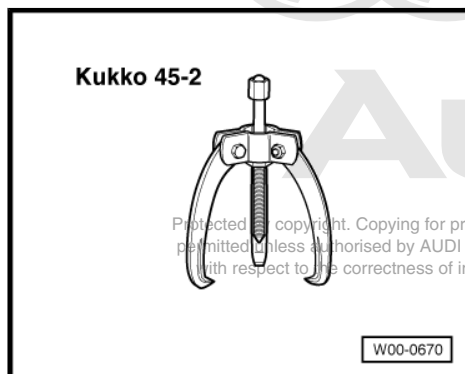
- ◆ -1- Internal puller -
Kukko 21/7-



- ◆ -3- Splitter - Kukko
17/2-

- ◆ -4- Counter-support -
Kukko 22/2-

- ◆ Three-arm puller -
Kukko 45-2-



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Pressing tapered roller bearing inner race off spur gear

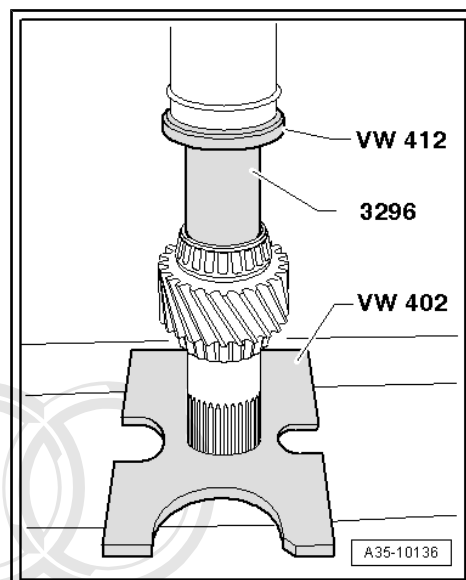
A - Splitter 22...115 mm ,
e.g. -Kukko 17/2-



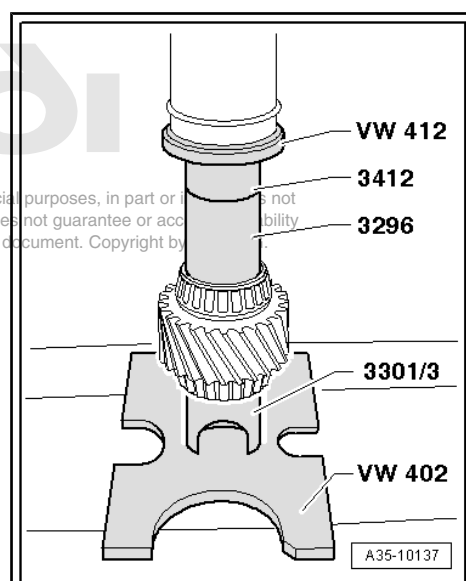
Note

- ◆ The method of pressing off the tapered roller bearing inner races for the spur gear is the same for both bearings.
- ◆ The tapered roller bearing inner and outer races are paired. Do not interchange.

Pressing tapered roller bearing inner race onto spur gear (gear-box cover side)

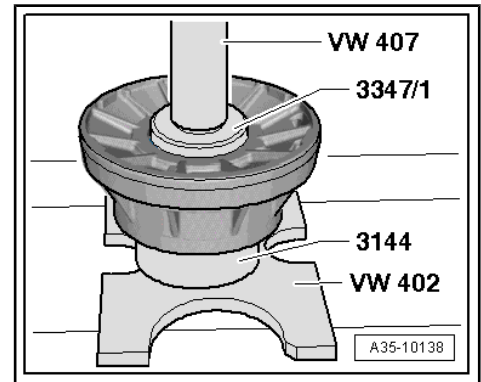


Pressing tapered roller bearing inner race onto spur gear (bearing plate side)

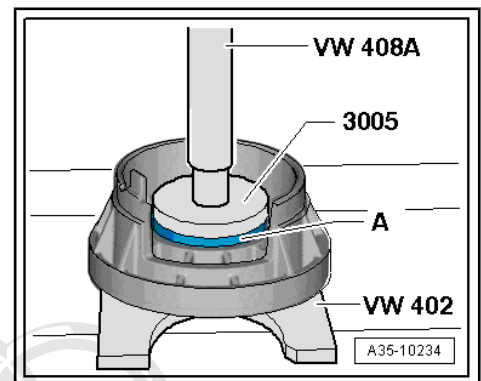


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Pressing tapered roller bearing outer race out of bearing plate



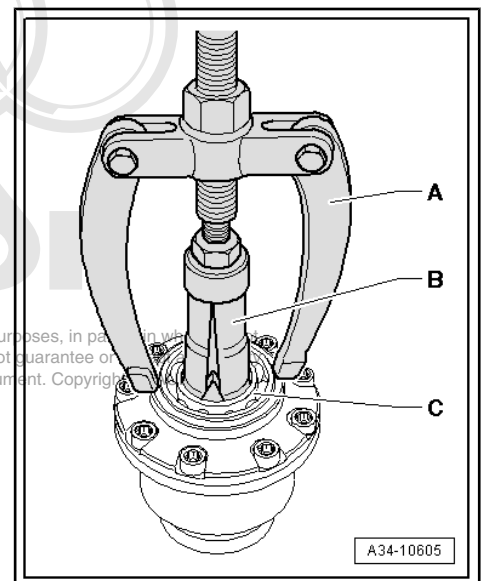
Pressing tapered roller bearing outer race -A- into bearing plate



Pulling small ball bearing -C- out of centre differential

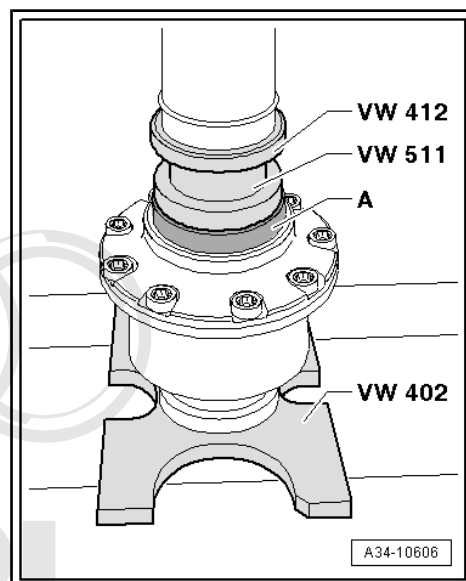
A - Counter-support , e.g. -Kukko 22/2-

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



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Pressing small ball bearing -A- into centre differential

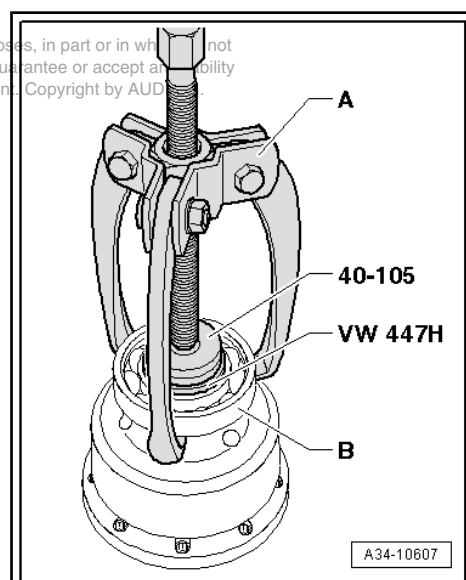


Pulling large ball bearing -B- off centre differential

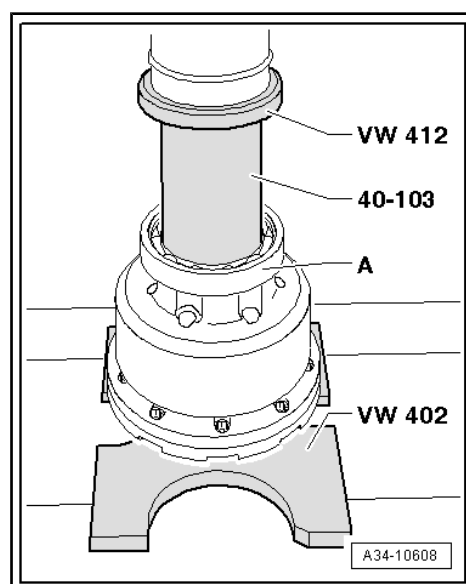
- Insert smaller diameter of thrust plate - VW 447 H- in centre differential

- Then apply thrust plate - 40 - 105- .

A - Three-arm puller , e.g. -Kukko 45-2-



Pressing large ball bearing -A- onto centre differential



1.5 Determining preload of tapered roller bearings for spur gear

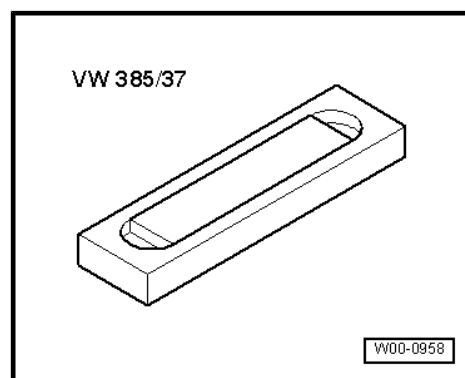
Determining thickness of shim "S₅"

This adjustment is necessary when the following components are renewed:

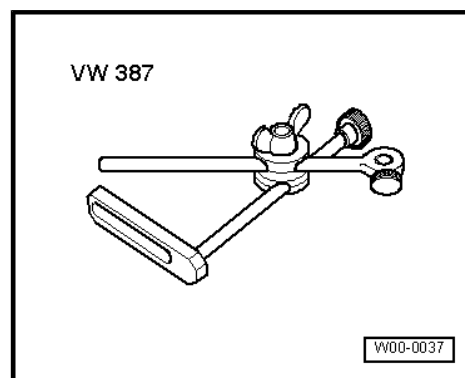
- ◆ Gearbox cover
- ◆ Centre differential housing
- ◆ Bearing plate
- ◆ Spur gear
- ◆ Tapered roller bearings on spur gear

Special tools and workshop equipment required

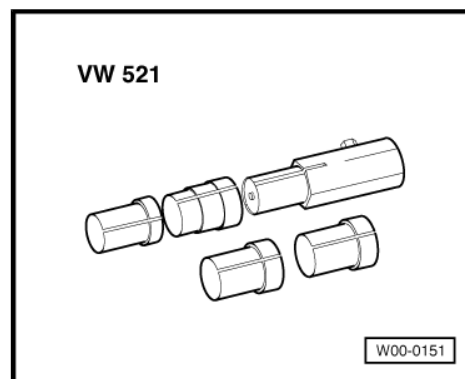
- ◆ Measuring plate - VW 385/17- from universal measuring tool - VW 385-



- ◆ Universal dial gauge bracket - VW 387-

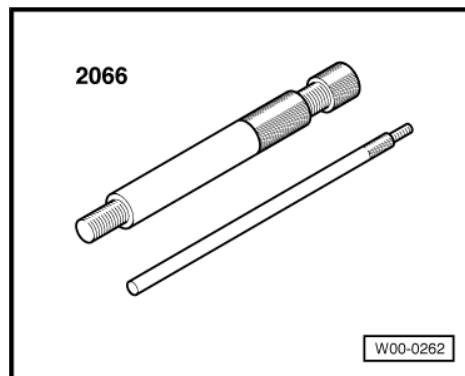


- ◆ Crown wheel adjusting tool - VW 521-



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- ◆ Dial gauge extension from dial gauge adapter - 2066-



- Tapered roller bearing outer race for spur gear is installed in gearbox cover.
- Tapered roller bearing outer race with shim for spur gear is installed in bearing plate. For measurement purposes use a 0.85 mm thick shim "S5*" (Part No. 012 409 387 ED).



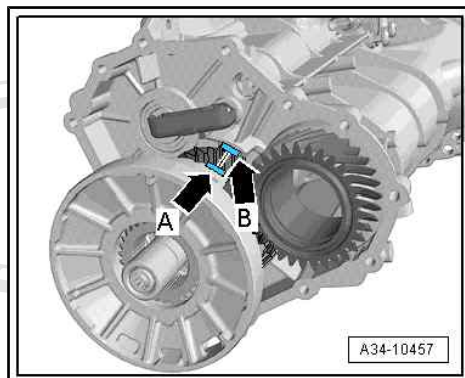
Note

For measurement purposes a 0.85 mm thick shim "S5" is inserted provisionally. This is referred to in the following as "S5*". "S5*" is replaced with the final shim "S5" after determining the bearing preload.

- Install spur gear in gearbox cover.

Install bearing plate on gearbox cover as follows:

- Installation position: lug -arrow A- on bearing plate must engage in slot -arrow B- in gearbox cover.



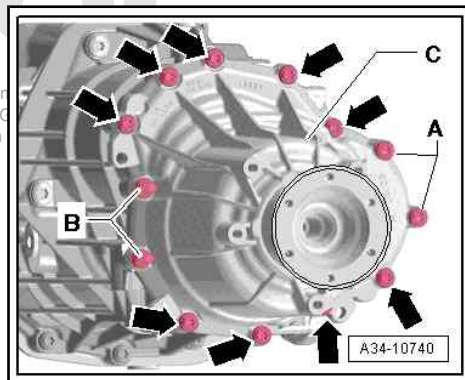
- Then secure housing for centre differential -C- to gearbox cover with bolts -A-, -B- and -arrows- (5x).



Note

The centre hex studs -B- are not fitted on all versions, for allocation refer to ⇒ Electronic parts catalogue .

- Then rotate gearbox cover with housing for centre differential attached so it is vertical, with housing for centre differential facing downwards.



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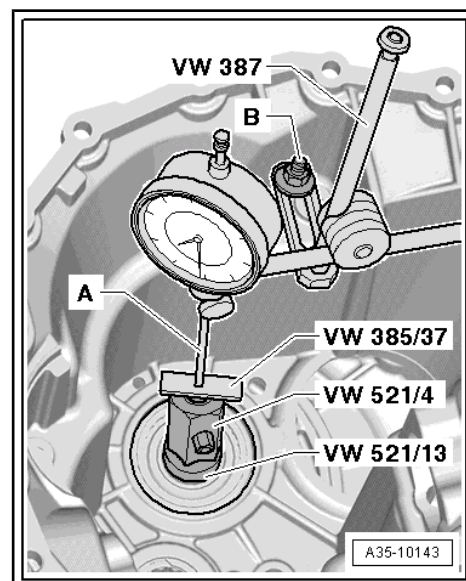
- Attach measuring equipment.
- Secure universal dial gauge bracket - VW 387- to threaded hole in gearbox cover with bolt -B- and nut.
- Apply dial gauge extension to centre of measuring plate - VW 385/37- .
- Set dial gauge (3 mm measuring range) to »0« with 2 mm preload.
- A- Dial gauge extension from dial gauge adapter - 2066-
- Move spur gear up and down using crown wheel adjusting tool - VW 521- .
- Read off play from dial gauge

Example:

0.26 mm

Example:

Shim S ₅ * fitted	0.85 mm
Measurement result (example)	+ 0.26 mm
Preload (constant value)	+ 0.10 mm
Thickness of shim S ₅	= 1.21 mm



Note

Select correct shims from ⇒ *Electronic parts catalogue* .

- The shim thickness "S₅" in this example is 1.21 mm.

1.6 Determining thickness of new shim "S₆" for adjusting position of centre differential

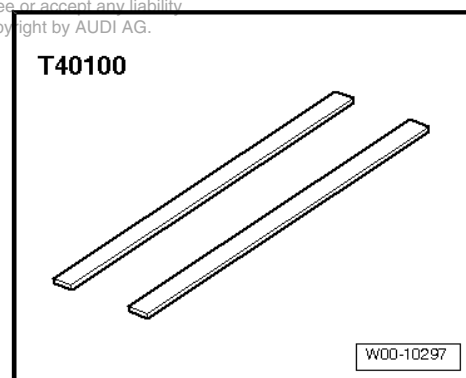
This adjustment is necessary when the following components are renewed:

- ◆ Gearbox cover
- ◆ Spacer sleeve
- ◆ Spur gear
- ◆ Tapered roller bearings on spur gear

Special tools and workshop equipment required

- ◆ Straightedge - T 40100-

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- ◆ Digital depth gauge (e.g. -VAS 6087-)

- Tapered roller bearing outer race for spur gear is installed in gearbox cover.
- Spur gear and spacer sleeve -1- are installed.
- Position straightedge - T40100- onto cleaned joint surface of gearbox cover.
- Using digital depth gauge -2- (e.g. digital depth gauge - VAS 6087-), measure depth between spacer sleeve -1- and straightedge . When taking measurement, press spur gear downwards towards gearbox cover, in direction of -arrow-.
- Add the height of straightedge - T 40100- to this measurement.

Example:

Depth as measured with digital depth gauge (measurement -a-)	5.13 mm
+ Height of straightedge - T 40100-	39.70 mm
= Measuring range (overall dimension)	44.83 mm

Select required shim from table ⇒ [page 110](#) .

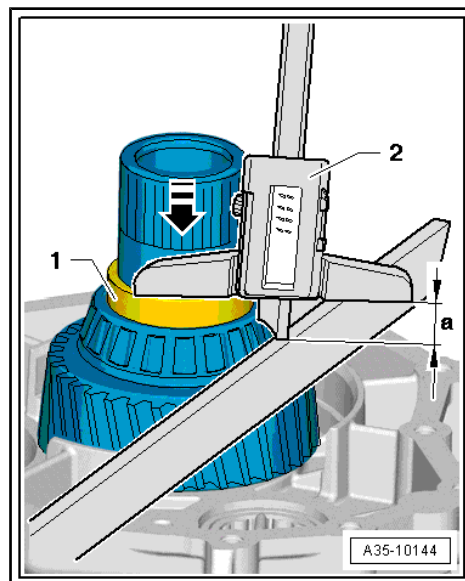
Measuring range (overall dimension)	Shim "S ₆ "
Measured value (mm)	Thickness (mm)
44.30...44.40	1.41
44.40...44.50	1.31
44.50...44.60	1.21
44.60...44.70	1.11
44.70...44.80	1.01
44.80...44.90	0.91
44.90...45.00	0.81
45.00...45.10	0.71



Note

Select correct shims from ⇒ *Electronic parts catalogue* .

- The shim thickness "S₆" in this example is 0.91 mm.



2 Input shaft

⇒ [“2.1 Exploded view - input shaft”, page 111](#)

⇒ [“2.2 Dismantling and assembling input shaft”, page 115](#)

⇒ [“2.3 Allocation of 3rd - 6th gear synchro-rings to locking collars”, page 124](#)

⇒ [“2.4 Checking 3rd - 6th gear synchro-rings for wear”, page 125](#)

2.1 Exploded view - input shaft

Detaching input shaft from output shaft and bearing mounting

⇒ [page 90](#)

Dismantling and assembling input shaft ⇒ [page 115](#)



Note

- ◆ *Refer to technical data when installing new gears or a new input shaft ⇒ 6-speed manual gearbox 0B2; Rep. gr. 00; Technical data; Allocation of gearbox to engine .*
- ◆ *Lubricate all bearings and synchro-rings on input shaft with gear oil before installing.*
- ◆ *The circlip ⇒ [Item 10 \(page 113\)](#) should only be detached when renewing the roller bearing ⇒ [Item 7 \(page 112\)](#) .*
- ◆ *3rd to 6th speed selector gears should have an axial play of 0.15 ... 0.50 mm after installation.*
- ◆ *Note allocation of synchro-rings to locking collars ⇒ [page 124](#) .*



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- ☐ Installation position ➔ [page 120](#)

10 - Circlip

- ☐ Mark
 - ☐ Do not interchange with other circlip ➔ [Item 16 \(page 113\)](#)
 - ☐ Installation position ➔ [page 120](#)
 - ☐ Always renew after detaching
- It should not be possible to turn circlip in annular groove on input shaft by hand
 - In installation position, circlip must not come into contact with 5th speed selector gear when gear is rotated ➔ [page 120](#)

11 - 5th speed selector gear

- When rotated, gear must not come into contact with circlip ➔ [Item 10 \(page 113\)](#) ➔ [page 120](#)

12 - Synchro-spring

- ☐ Fit in 5th speed selector gear ➔ [page 120](#)

13 - 5th gear synchro-ring

- ☐ Checking for wear ➔ [page 125](#)
- ☐ ➔ ["2.3 Allocation of 3rd - 6th gear synchro-rings to locking collars", page 124](#)

14 - Synchro-hub for 5th and 6th gear

- ☐ Installation position ➔ [page 121](#)

15 - Locking collar for 5th and 6th gear

- ☐ Installation position ➔ [page 121](#)
- ☐ Do not interchange with locking collar for 3rd/4th gear. Mark locking collars accordingly.
- ☐ ➔ ["2.3 Allocation of 3rd - 6th gear synchro-rings to locking collars", page 124](#)

16 - Circlip

- ☐ Mark
- ☐ Do not interchange with other circlip ➔ [Item 10 \(page 113\)](#)
- ☐ Determining thickness ➔ [page 122](#)

17 - Needle bearing

- ☐ For 6th gear

18 - 6th gear synchro-ring

- ☐ Checking for wear ➔ [page 125](#)
- ☐ ➔ ["2.3 Allocation of 3rd - 6th gear synchro-rings to locking collars", page 124](#)

19 - Synchro-spring

- ☐ Fit in 6th speed selector gear ➔ [page 120](#)

20 - 6th speed selector gear

21 - Thrust washer

- ☐ For 3rd speed and 6th speed selector gears

22 - Needle bearing inner race

- ☐ For 3rd gear

23 - Needle bearing

- ☐ For 3rd gear

24 - 3rd speed selector gear

25 - Synchro-spring

- ☐ Insert in 3rd speed selector gear ➔ [page 120](#)

26 - 3rd gear synchro-ring

- ☐ Checking for wear ➔ [page 125](#)
- ☐ ➔ ["2.3 Allocation of 3rd - 6th gear synchro-rings to locking collars", page 124](#)



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27 - Synchro-hub for 3rd and 4th gear

- ☐ Installation position: lower inside collar faces 4th gear ➤ [page 122](#)

28 - Locking collar for 3rd and 4th gear

- ☐ Installation position ➤ [page 122](#)
- ☐ Do not interchange with locking collar for 5th/6th gear. Mark locking collars accordingly.
- ☐ ➤ ["2.3 Allocation of 3rd - 6th gear synchro-rings to locking collars", page 124](#)

29 - Needle bearing inner race

- ☐ For 4th gear

30 - Needle bearing

- ☐ For 4th gear

31 - 4th gear synchro-ring

- ☐ Checking for wear ➤ [page 125](#)
- ☐ ➤ ["2.3 Allocation of 3rd - 6th gear synchro-rings to locking collars", page 124](#)

32 - Synchro-spring

- ☐ Fit in 4th speed selector gear ➤ [page 120](#)

33 - 4th speed selector gear

34 - Thrust washer

- ☐ For 4th speed selector gear

35 - Inner race

- ☐ For roller bearing ➤ [Item 37 \(page 114\)](#) in gearbox cover

36 - Multi-point socket head bolt

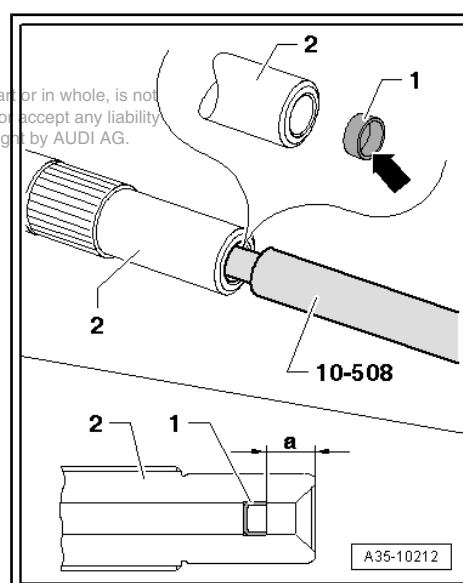
- ☐ 200 Nm
- ☐ Apply locking fluid - AMV 185 101 A1- when fitting
- ☐ Loosen and tighten with socket for multi-point socket head bolt XZN 12

37 - Roller bearing

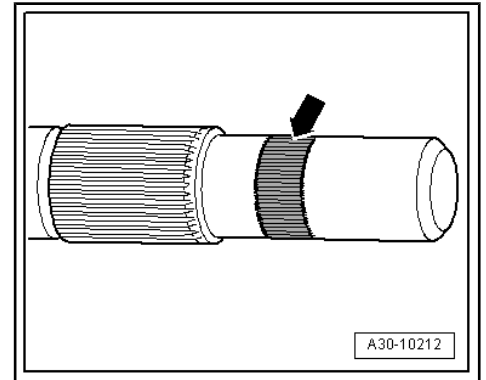
- ☐ Is fitted in gearbox cover
- ☐ Removing and installing ➤ [Item 6 \(page 74\)](#)

Installing sealing plug -1- in input shaft

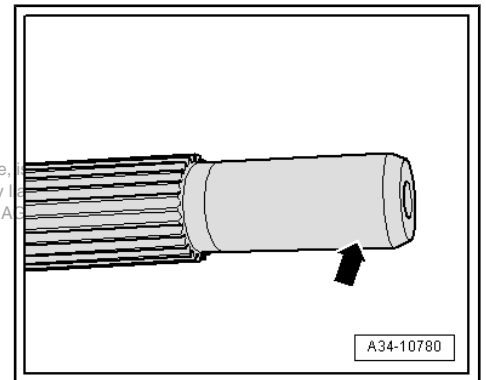
- Drive sealing plug -1- into input shaft -2- to dimension -a-.
- Dimension -a- = 12.5 mm
- Open end of sealing plug -arrow- faces towards assembly mandrel - 10-508- .



Checking input shaft for wear



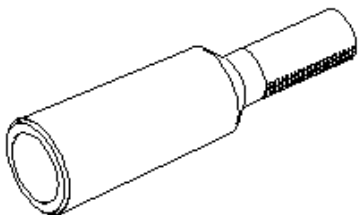
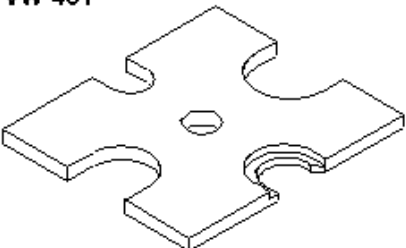
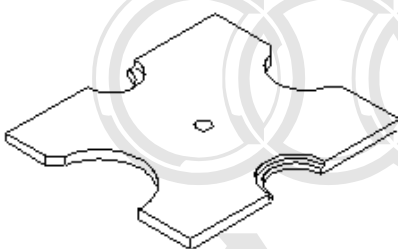
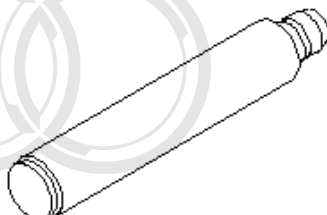
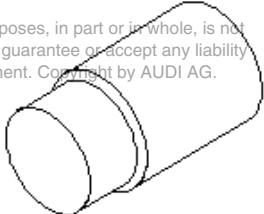
- If damage can be felt on the surface of the input shaft in the vicinity of the needle bearing for the dual-mass flywheel -arrow-, both the input shaft and the needle bearing in the dual-mass flywheel must be renewed ➔ [page 37](#) .
- Check input shaft for scoring around bearing in drive plate -arrow-. Renew needle bearing in drive plate if necessary ➔ Rep. gr. 13 : Cylinder block (gearbox end); Renewing needle bearing in drive plate .



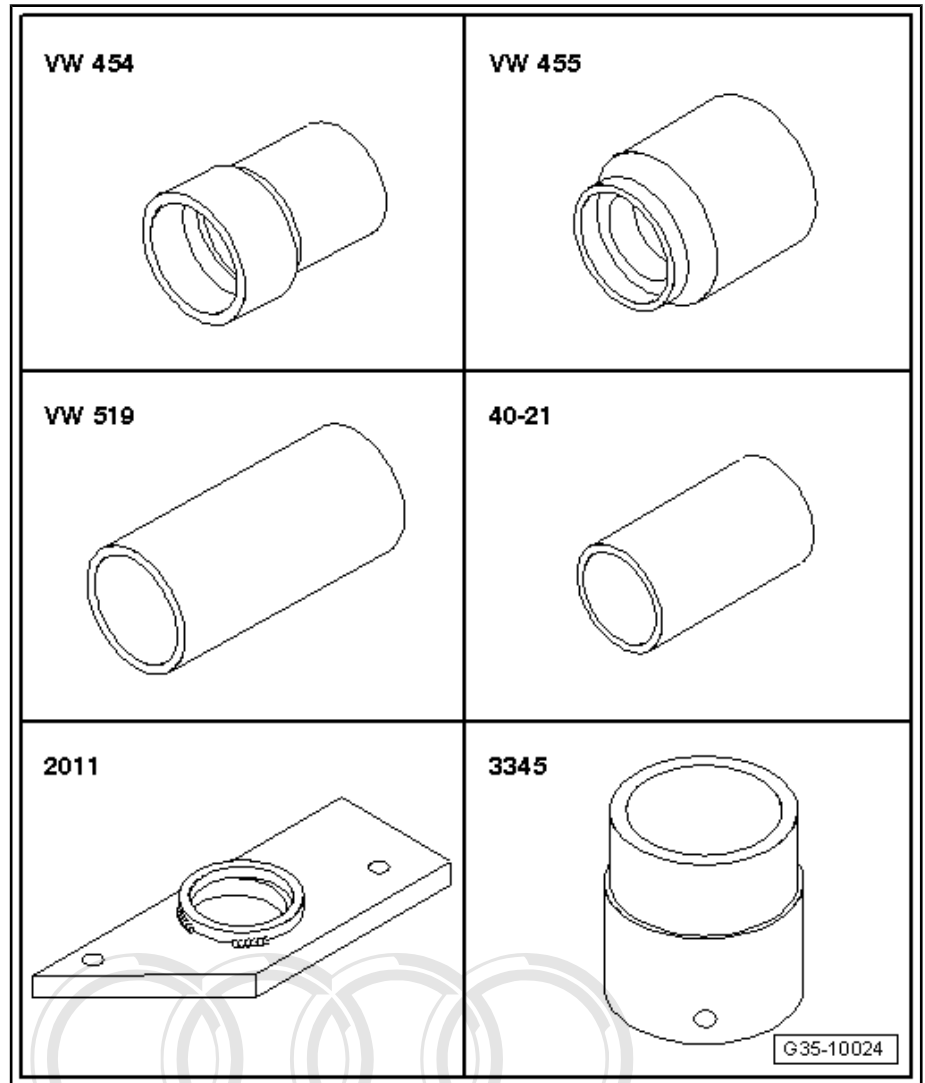
2.2 Dismantling and assembling input shaft

Special tools and workshop equipment required

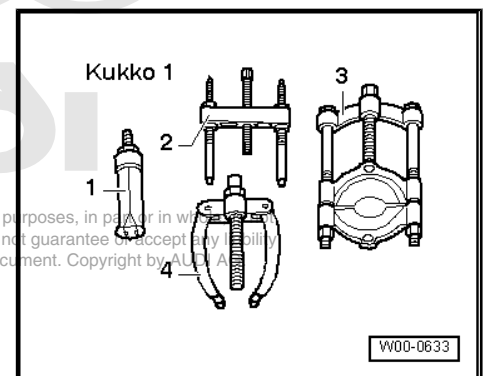
- ◆ Drift sleeve - VW 244 B-
- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 412-
- ◆ Press tool - VW 434-

VW 244 b 	VW 401 
VW 402 	VW 407 
VW 412  Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.	VW 434  G35-10023

- ◆ Press tool - VW 454-
- ◆ Installing sleeve - VW 455-
- ◆ Tube - VW 519-
- ◆ Press tool - 40 - 21-
- ◆ Support bridge - 2011-
- ◆ Wheel bearing tube - 3345-

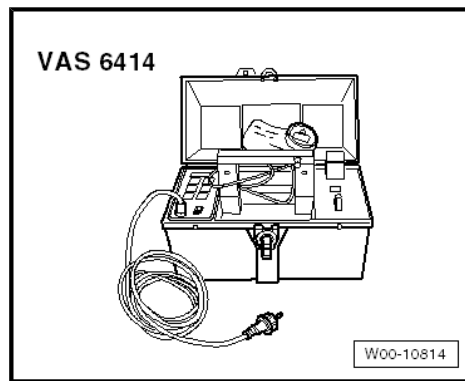


- ◆ -3- Splitter - Kukko 17/2-



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◆ Inductive heater - VAS 6414-



◆ Depth gauge

Dismantling input shaft

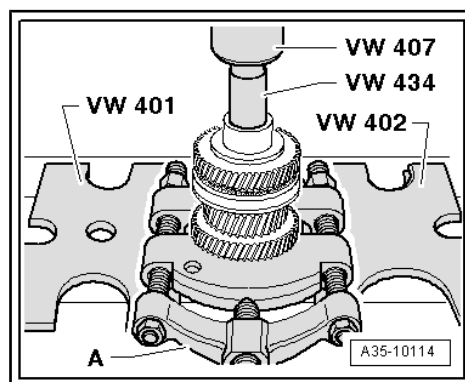
- Input shaft has been detached from output shaft and bearing mounting ➔ [page 90](#) .
- Bolt in input shaft has been loosened and removed ➔ [page 94](#) .
- If synchro-rings are not being renewed, make sure they are re-installed on the same gear.
- Do not confuse locking collar for 3rd/4th gear with locking collar for 5th/6th gear. Mark locking collars accordingly.
- Press off 3rd speed, 4th speed and 6th speed selector gears together with synchro-hub for 3rd/4th gear and needle bearing inner races.

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

i Note

Support splitter -A- against 6th speed selector gear so that 5th/6th gear locking collar is not pulled off at the same time.

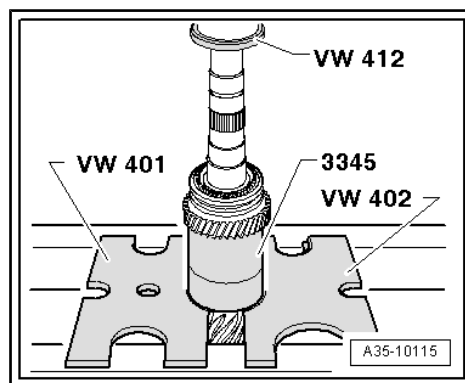
- Detach circlip for 5th /6th gear synchro-hub from input shaft.



i Note

Mark this circlip so that it is not interchanged with the circlip below the 5th /6th gear synchro-hub.

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



- Open out needle bearing -2- for 5th gear and guide it carefully over circlip -1- and teeth -3- for 5th/6th gear synchro-hub.

i Note

- ◆ *The circlip -1- below teeth -3- for the 5th/6th gear synchro-hub should only be removed from the input shaft if the roller bearing is being renewed (next step).*
- ◆ *Always renew the circlip if it has been removed.*
- Remove circlip -1-.

- Press roller bearing off input shaft.

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

i

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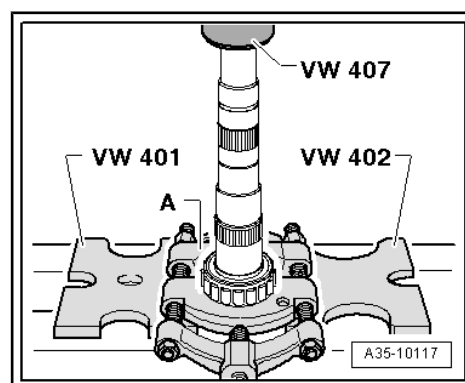
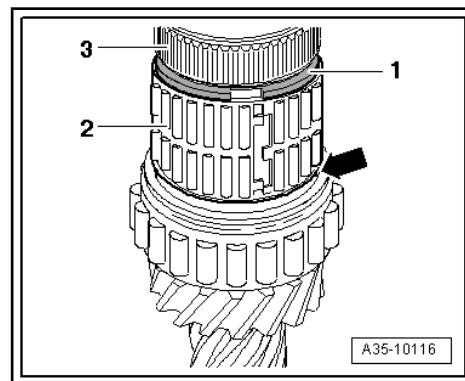
- ◆ *The roller bearing will be damaged when it is pressed off and must therefore always be renewed.*
- ◆ *If the input shaft is being renewed, the roller bearing does not have to be pressed off the shaft.*
- ◆ *To press off the roller bearing, you can also break open the cage of the bearing using a screwdriver or similar and then apply the splitter to the inner race.*
- Clean thread for multi-point socket head bolt in input shaft to remove any remaining locking fluid.

Assembling input shaft

i

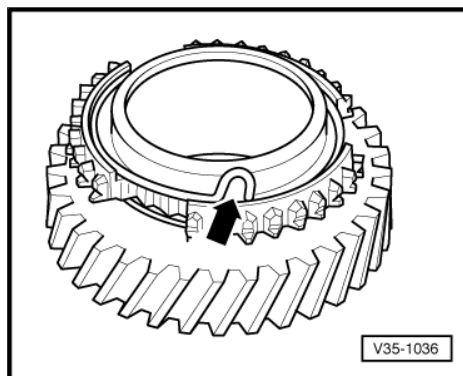
Note

- ◆ *Lubricate all needle bearings and synchro-rings with gear oil before fitting.*
- ◆ *Checking synchro-rings for wear ⇒ [page 125](#) .*
- ◆ *Note allocation of synchro-rings to locking collars ⇒ [page 124](#) .*
- ◆ *Using inductive heater - VAS 6414- or similar, heat needle bearing inner races to 130 °C (max.) before pressing on (wear protective gloves).*
- ◆ *Using inductive heater - VAS 6414- or similar, heat synchro-hub to 100 °C (max.) before pressing on (wear protective gloves).*
- ◆ *Always press on roller bearing, needle bearing inner races and synchro-hubs as far as stop to make sure the axial clearance of the selector gears meets the specification.*



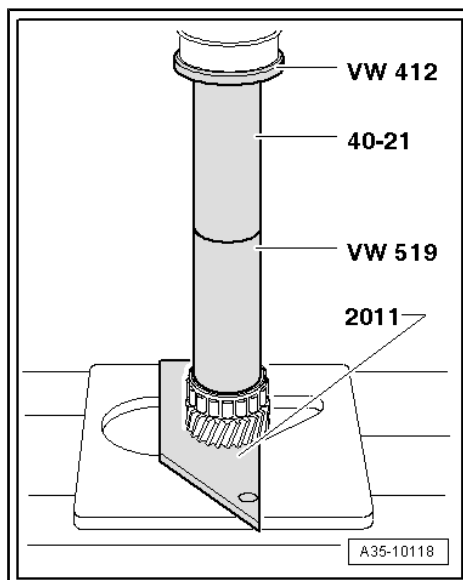
Inserting synchro-spring in selector gear

The bent end of the synchro-spring -arrow- must be hooked into the hole in the selector gear.



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- Press roller bearing onto input shaft as far as stop.



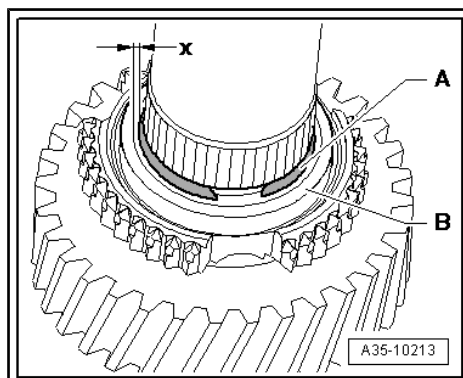
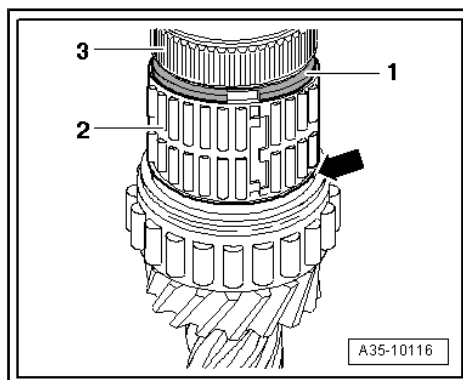
- Open out needle bearing -2- for 5th speed selector gear and guide it carefully over splines for 5th/6th gear synchro-hub -3-; do not seat needle bearing on shoulder -arrow- of input shaft.



Note

If the circlip -1- has not been removed, the needle bearing -2- must also be guided carefully over this circlip.

- If previously removed, carefully open out new circlip -1- and guide it over splines for 5th/6th gear synchro-hub -3-.
- It should not be possible to turn the circlip in the annular groove on the input shaft by hand
- Install 5th speed selector gear -B-.
- When rotated, selector gear -B- must not come into contact with circlip -A-.
- There must be a uniform clearance -x- between selector gear and circlip all round.



Installation position of 5th/6th gear synchro-hub and locking collar



Note

Depending on version, synchro-hubs -1- with or without groove -arrow B- may be fitted.

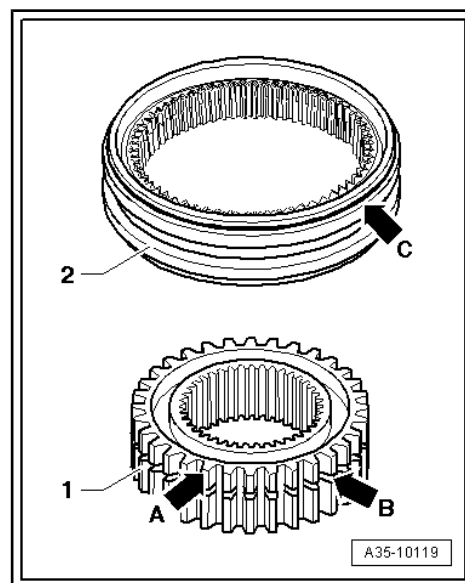
Installation position of synchro-hub with groove -arrow B-:

- The shorter teeth -arrow A- above the annular groove -arrow B- of synchro-hub -1- must face towards 6th speed selector gear.



Note

- ◆ Depending on version, locking collars -2- with or without groove -arrow C- may be fitted.
- ◆ If there is a groove -arrow C- on the locking collar, this may face towards 5th or 6th gear.

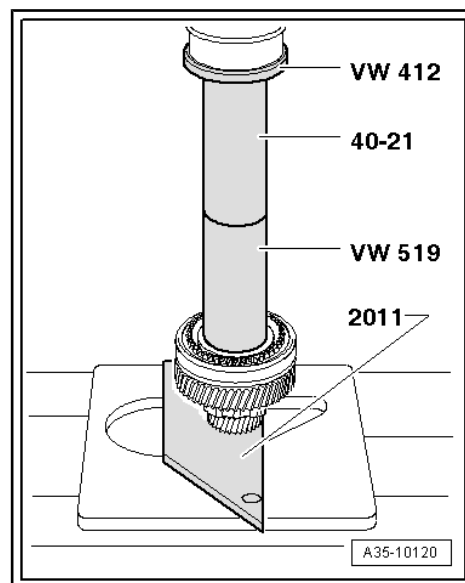


Note the following when performing the following steps:

- Fit input shaft in drilling of support bridge - 2011- .
- Position drift sleeves on centre of heated components (synchro-hub and needle bearing inner races).
- First press on components just briefly, then stop exerting pressure and check whether drift sleeves are still positioned properly and press on as far as stop.

Press on synchro-hub for 5th and 6th gear as follows:

- Fit 5th gear synchro-ring.
- Press on pre-heated synchro-hub as far as stop.
- Slide locking collar over synchro-hub.



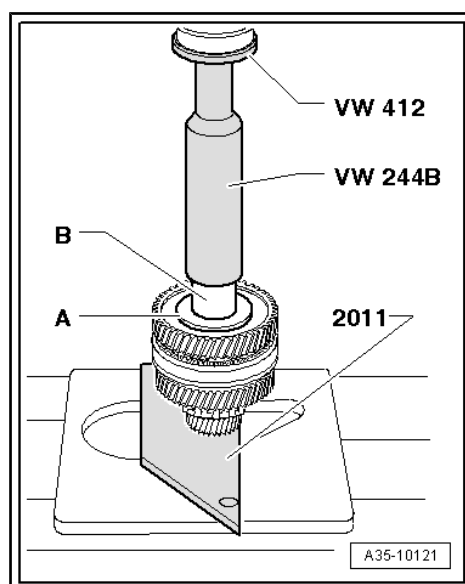
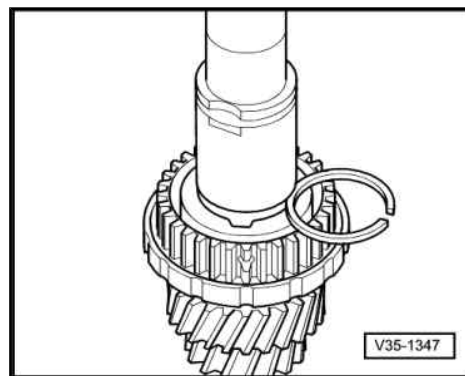
Determining thickness of circlip for synchro-hub for 5th and 6th gear

- Synchro-hub is pressed on as far as stop.
- 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)		
2.44	2.47	2.50

- Install 6th speed selector gear with needle bearing and synchro-ring.
- Fit thrust washer -A-.
- Press on pre-heated needle bearing inner race -B- for 3rd speed selector gear.
- Install 3rd speed selector gear with needle bearing and synchro-ring.



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

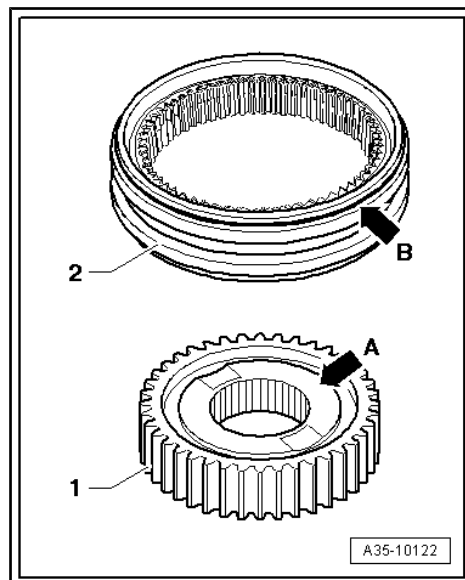
- The lower inside collar -arrow A- of the synchro-hub -1- faces 4th gear.



Note

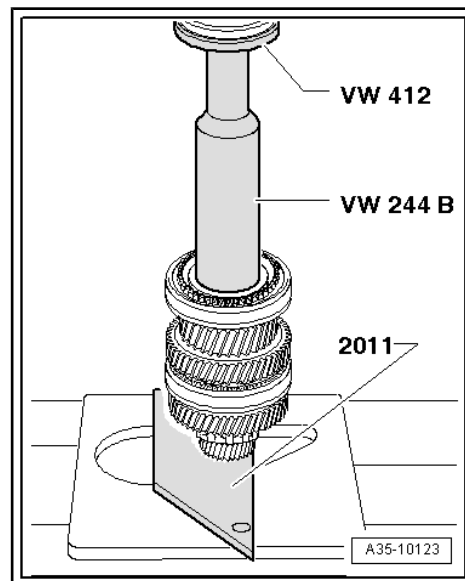
- ◆ Depending on version, locking collars -2- with or without groove -arrow B- may be fitted.
- ◆ If there is a groove -arrow B- on the locking collar -2-, this may face towards 3rd or 4th gear.

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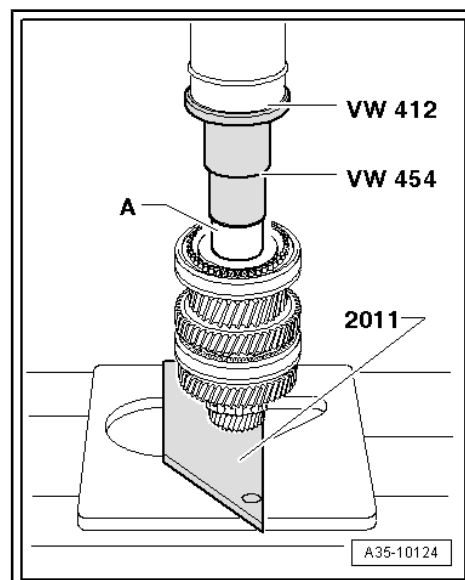
Pressing on pre-heated 3rd/4th gear synchro-hub

- Fit locking collar for 3rd/4th gear on synchro-hub.



Pressing on pre-heated needle bearing inner race -A- for 4th speed selector gear

- Install 4th speed selector gear together with needle bearing and synchro-ring.

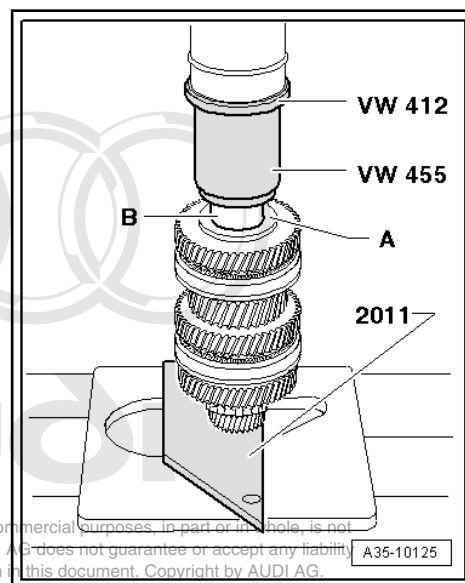


- Fit thrust washer -A-.
- Press on pre-heated inner race -B- for roller bearing.
- Then check all selector gears for freedom of movement and axial play.
- The axial play of the selector gears must be at least 0.15 mm.



Note

Tighten bolt securing input shaft to specified torque ➔ [page 99](#).



2.3 Allocation of 3rd - 6th gear synchro-rings to locking collars



Note

- Depending on the version, the synchro-rings for 3rd/4th gear can have a molybdenum or carbon coating.
- The synchro-rings for 5th/6th gear always have a molybdenum coating.
- Please note correct allocation of synchro-rings to locking collars.

Different types of synchro-rings

I -

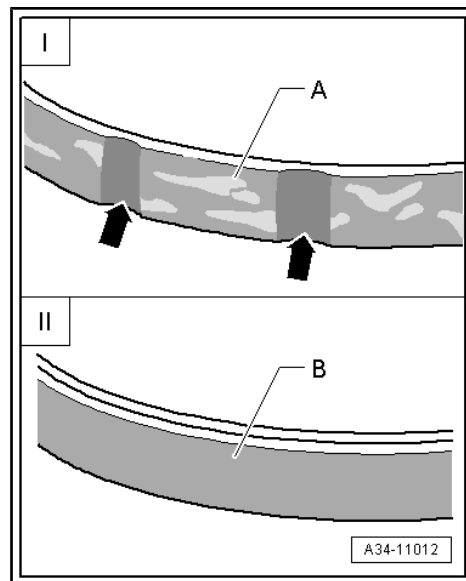
Molybdenum-coated synchro-ring

- Distinguishing features: synchro-ring has oil recesses -arrows-, and friction surface -A- is graphite-grey with a slightly porous appearance.

II -

Carbon-coated synchro-ring

- Distinguishing features: friction surface -B- is black with a porous appearance; upper part is not coated.



Locking collars for molybdenum-coated synchro-rings

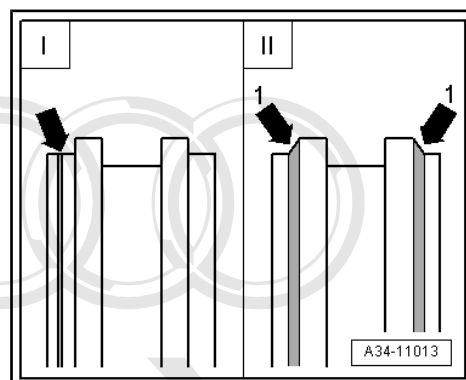
⇒ [page 124](#)

I - Locking collar with one groove -arrow- and no chamfers

- Locking collar -I- – old version, no longer installed

II - Locking collar with chamfers -arrows 1- on both sides of selector fork slot

- Locking collar -II- – new version, currently installed



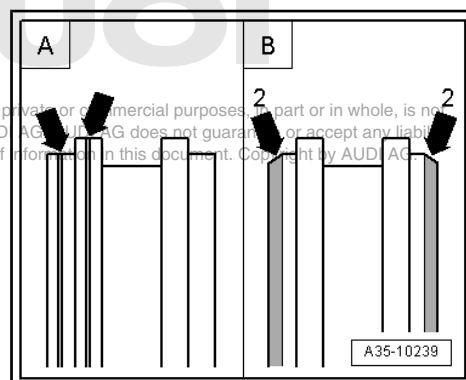
Locking collars for carbon-coated synchro-rings ⇒ [page 124](#)

A - Locking collar with two grooves -arrows- and no chamfers

- Locking collar -A- – old version, no longer installed

B - Locking collar with chamfers on outer sides -arrows 2-

- Locking collar -B- – new version, currently installed

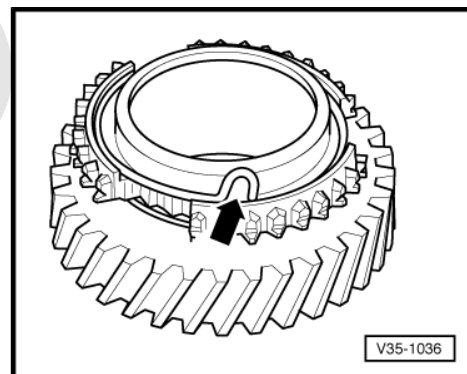


2.4 Checking 3rd - 6th gear synchro-rings for wear



Note

- ◆ If the synchromesh of one of the gears makes a grinding noise when engaging the gear, check the synchro-ring, the dog teeth of the locking collar/synchro-ring and the selector gear ⇒ [page 6](#) and the synchro-spring -arrow- in the selector gear for damage. Renew damaged parts.
- ◆ The clutch and clutch actuator mechanism must be OK and the selector mechanism must be correctly adjusted.



Checking synchro-rings with molybdenum coating and carbon coating

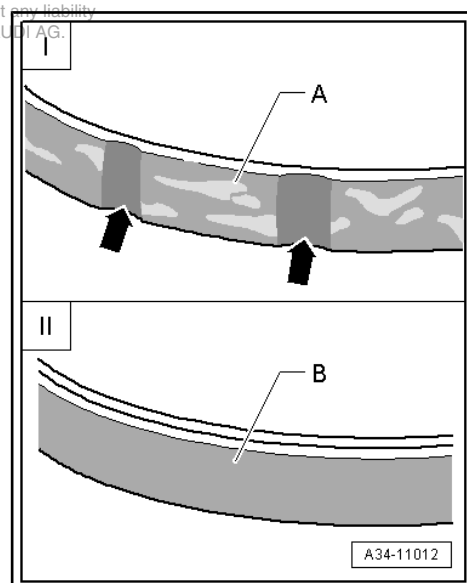
Clean synchro-ring; the friction surface must be free of oil.

I - Molybdenum-coated synchro-ring

- ◆ The friction surface of an intact molybdenum coated synchro-ring has a graphite-grey, slightly porous appearance.
- ◆ The synchro-ring must be renewed if very shiny areas -A- have formed on the friction surface or if the brass-coloured metal underneath is already visible.

II - Carbon-coated synchro-ring

- ◆ Check the friction surfaces -B- of carbon-coated synchro-rings for damage (flattened sections or particles of carbon coating broken away). Renew if necessary.



3 Output shaft

⇒ "3.1 Exploded view - output shaft", page 126

⇒ "3.2 Dismantling and assembling output shaft", page 130

3.1 Exploded view - output shaft

Detaching output shaft from input shaft and bearing mounting

⇒ page 90

Dismantling and assembling output shaft ⇒ page 130



Note

- ♦ Refer to technical data when installing new gears or a new output shaft ⇒ 6-speed manual gearbox 0B2; Rep. gr. 00; Technical data; Allocation of gearbox to engine.
- ♦ Lubricate all needle bearings and synchro-rings with gear oil before installing.
- ♦ When renewing synchro-rings, renew inner ring, intermediate ring and synchro-ring for the corresponding gear together.
- ♦ If synchro-rings are not being renewed, make sure they are re-installed on the same gear.

1 - Sealing cap

- ☐ With oil guide
- ☐ For output shaft
- ☐ Removing and installing
⇒ page 55

2 - Bolt

- ☐ 200 Nm
- ☐ For output shaft
- ☐ Apply locking fluid -
AMV 185 101 A1- when
fitting
- ☐ To loosen, heat bolt to
approx. 80 °C if neces-
sary using hot air blower
- V.A.G 1416-

3 - Gearbox housing

4 - Ball bearing

- ☐ For output shaft
- ☐ Removing and installing
⇒ Item 15 (page 77)

5 - Circlip

- ☐ Note installation posi-
tion ⇒ page 89

6 - Reverse gear synchro-hub

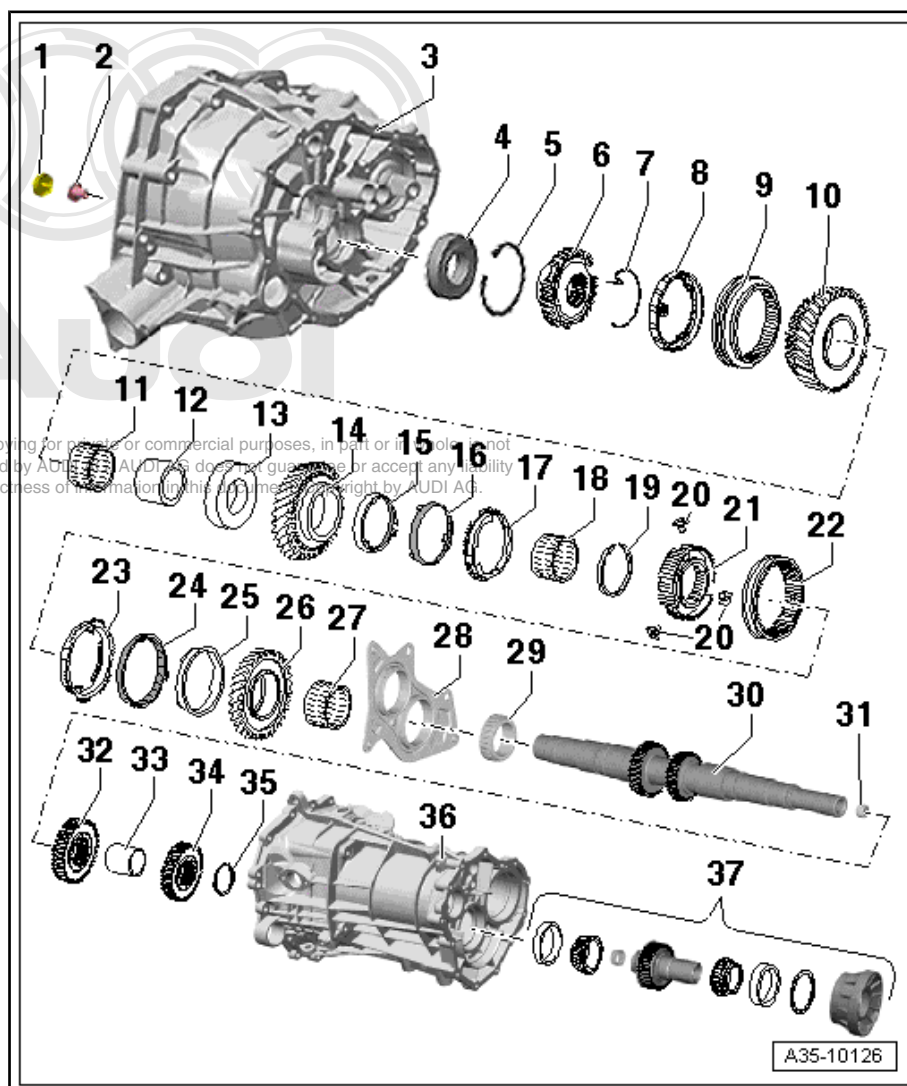
- ☐ Removing and installing
⇒ page 92

7 - Synchro-spring

- ☐ Insert in drilling in re-
verse gear synchro-hub

8 - Synchro-ring for reverse gear

- ☐ Checking for wear ⇒ page 129



9 - Reverse gear locking collar

- ☐ Installation position ➔ [page 129](#)

10 - Reverse selector gear

- ☐ Installation position ➔ [page 129](#)

11 - Needle bearing

- ☐ For reverse gear

12 - Needle bearing inner race

- ☐ For reverse gear
- ☐ Removing and installing ➔ [page 92](#)

13 - Thrust washer

- ☐ For 1st speed and reverse selector gears

14 - 1st speed selector gear

15 - Inner ring for 1st gear

- ☐ Installation position ➔ [page 96](#)
- ☐ Distinguishing inner rings for 1st and 2nd gear ➔ [page 129](#)
- ☐ Checking for wear ➔ [page 130](#)
- ☐ Renew if scored or if there are visible traces of wear

16 - Intermediate ring for 1st gear

- ☐ Installation position ➔ [page 96](#)
- ☐ Checking for wear ➔ [page 130](#)

17 - Synchro-ring for 1st gear

- ☐ Installation position ➔ [page 96](#)
- ☐ Checking for wear ➔ [page 130](#)
- ☐ Renew if scored or if there are visible traces of wear

18 - Needle bearing

- ☐ For 1st gear

19 - Circlip

- ☐ Determining thickness ➔ [page 97](#)

20 - Thrust block

- ☐ 3x
- ☐ Installing ➔ [page 130](#)

21 - Synchro-hub for 1st and 2nd gear

- ☐ Installation position ➔ [page 130](#)

22 - Locking collar for 1st and 2nd gear

- ☐ Installation position ➔ [page 130](#)

23 - Synchro-ring for 2nd gear

- ☐ Installation position ➔ [page 96](#)
- ☐ Checking for wear ➔ [page 130](#)
- ☐ Renew if scored or if there are visible traces of wear

24 - Intermediate ring for 2nd gear

- ☐ Installation position ➔ [page 96](#)
- ☐ Checking for wear ➔ [page 130](#)

25 - Inner ring for 2nd gear

- ☐ Installation position ➔ [page 96](#)
- ☐ Distinguishing inner rings for 1st and 2nd gear ➔ [page 129](#)
- ☐ Renew if scored or if there are visible traces of wear

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26 - 2nd speed selector gear

27 - Needle bearing

- ☐ For 2nd gear

28 - Bearing mounting

- ☐ Carries bearings for input shaft and output shaft in gearbox cover
- ☐ ⇒ [Item 3 \(page 90\)](#)

29 - Roller bearing

- ☐ For output shaft
- ☐ Pressing off ⇒ [page 133](#)
- ☐ Pressing on ⇒ [page 133](#)
- ☐ Always renew

30 - Output shaft

- ☐ With splines for 5th and 6th gear

31 - Needle bearing or bearing bush

- ☐ Bearing for rear flange shaft in output shaft
- ☐ Whether needle bearing or bearing bush is fitted depends on version
- ☐ Allocate according to gearbox code letters ⇒ Electronic parts catalogue
- ☐ Pulling out ⇒ [page 135](#)
- ☐ Driving in ⇒ [page 135](#)

32 - 3rd gear wheel

- ☐ Pressing off ⇒ [page 133](#)
- ☐ Installation position: high inside collar faces 4th gear
- ☐ Pressing on ⇒ [page 134](#)

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33 - Spacer sleeve

34 - 4th gear wheel

- ☐ Pressing off ⇒ [page 133](#)
- ☐ Installation position: high inside collar faces spur gear ⇒ [Item 37 \(page 128\)](#)
- ☐ Pressing on ⇒ [page 134](#)

35 - Circlip

- ☐ Determining thickness ⇒ [page 134](#)

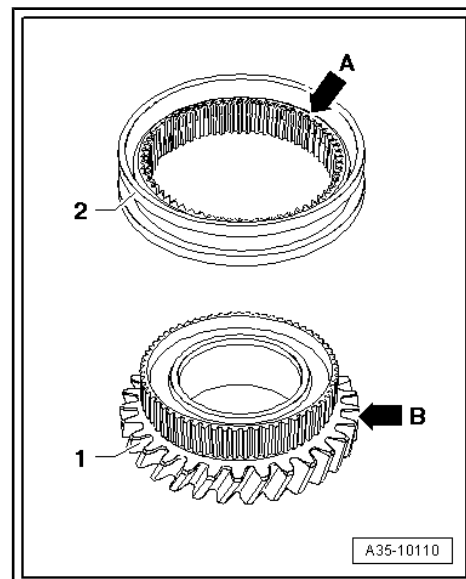
36 - Gearbox cover

37 - Spur gear

- ☐ With tapered roller bearing and bearing plate
- ☐ Servicing bearings for spur gear ⇒ [page 99](#)

Installation position of locking collar -2- and selector gear -1- for reverse gear

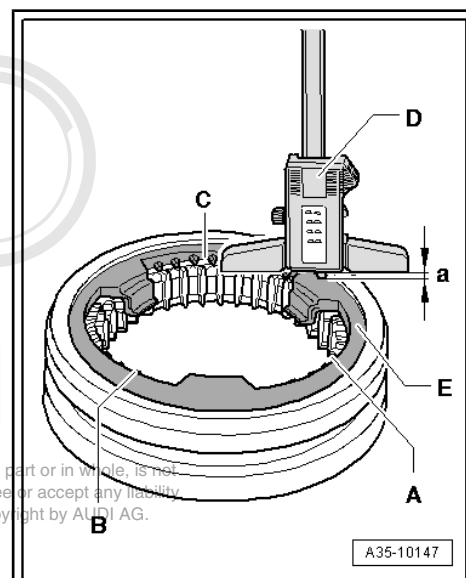
- The pointed teeth -arrow A- of the locking collar -2- point away from the driving teeth -arrow B- of the reverse selector gear -1-.



Checking synchro-ring for wear

- Press synchro-ring -E- into locking collar and measure gap -a- at positions -A-, -B- and -C- using depth gauge -D-.
- Add the measured values and divide by 3.

The determined value should not exceed 0.5 mm.

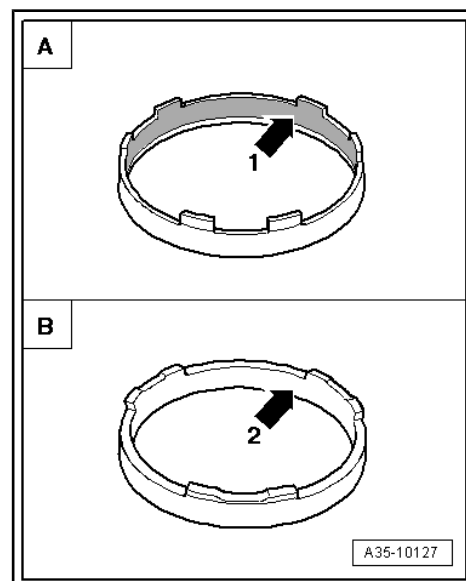


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Distinguishing inner rings for 1st gear -A- and 2nd gear -B-

-A- The inner ring for 1st gear has a coated friction surface on the inside -arrow 1- and is conical.

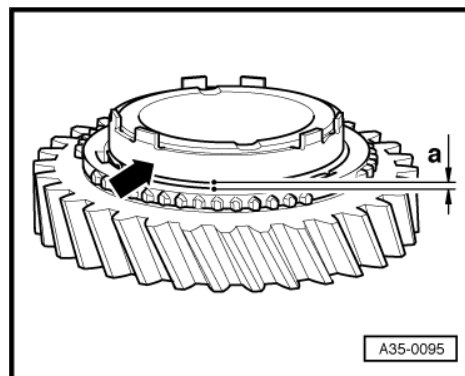
-A- The inner ring for 2nd gear has no friction surface on the inside -arrow 2- and is cylindrical.



Checking 1st gear inner ring for wear

- Check outer contact surface -arrow- for scoring or visible traces of wear and renew if necessary.
- Press inner ring onto chamfer on selector gear and measure gap -a- using a feeler gauge .

Gap -a-	Wear limit
Inner ring for 1st gear	0.6 mm



Checking 1st and 2nd gear intermediate ring for wear

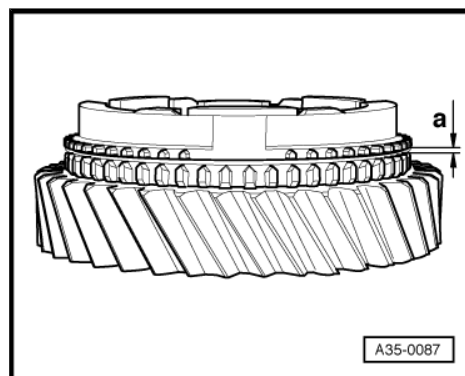
- Check inner friction surface of synchro-ring for grooves or scoring and renew if necessary.
- Fit inner ring, intermediate ring and synchro-ring on selector gear and rotate rings until they are »seated«.

Note

To achieve proper seating, rotate synchro-rings approx. one turn while pressing down rings simultaneously.

- Then measure gap -a- using a feeler gauge .

Gap -a-	Wear limit
1st and 2nd gear	0.7 mm

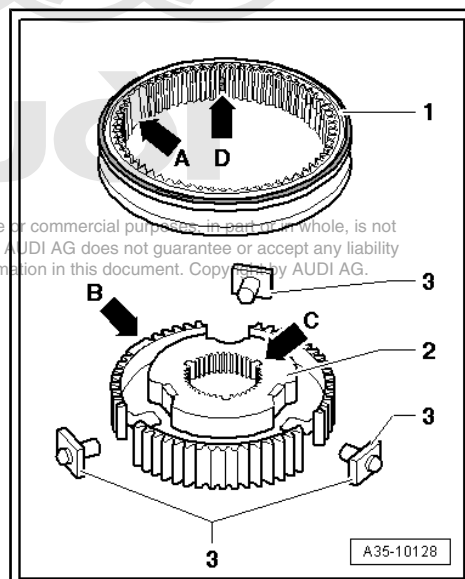


Note

Renew inner ring, intermediate ring and synchro-ring for the corresponding gear together.

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

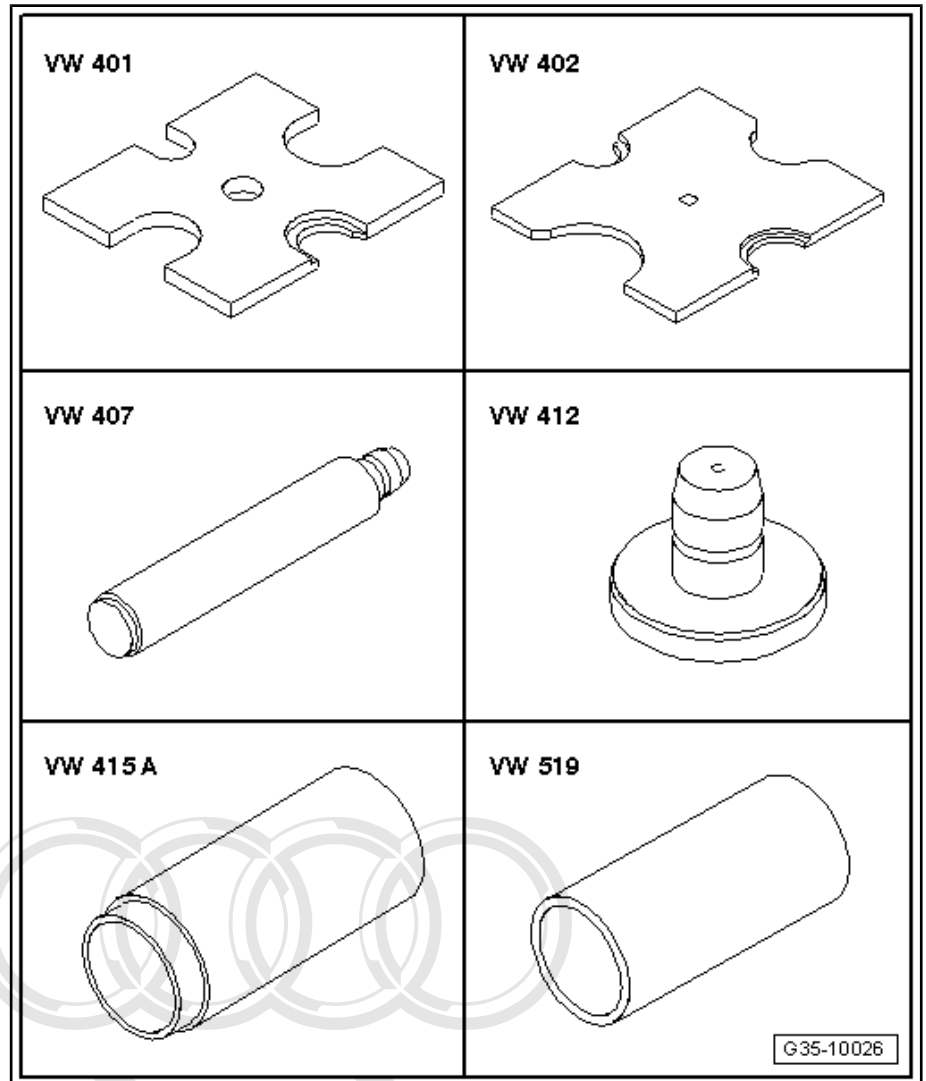
- Fit locking collar -1- onto synchro-hub -2- so that wide teeth of locking collar -arrow A- and synchro-hub -arrow B- coincide.
- Installation position of synchro-hub: high inside collar -arrow C- faces 2nd speed selector gear.
- Then fit thrust blocks -3- in synchro-hub and press them into recesses -arrows D- in locking collar.



3.2 Dismantling and assembling output shaft

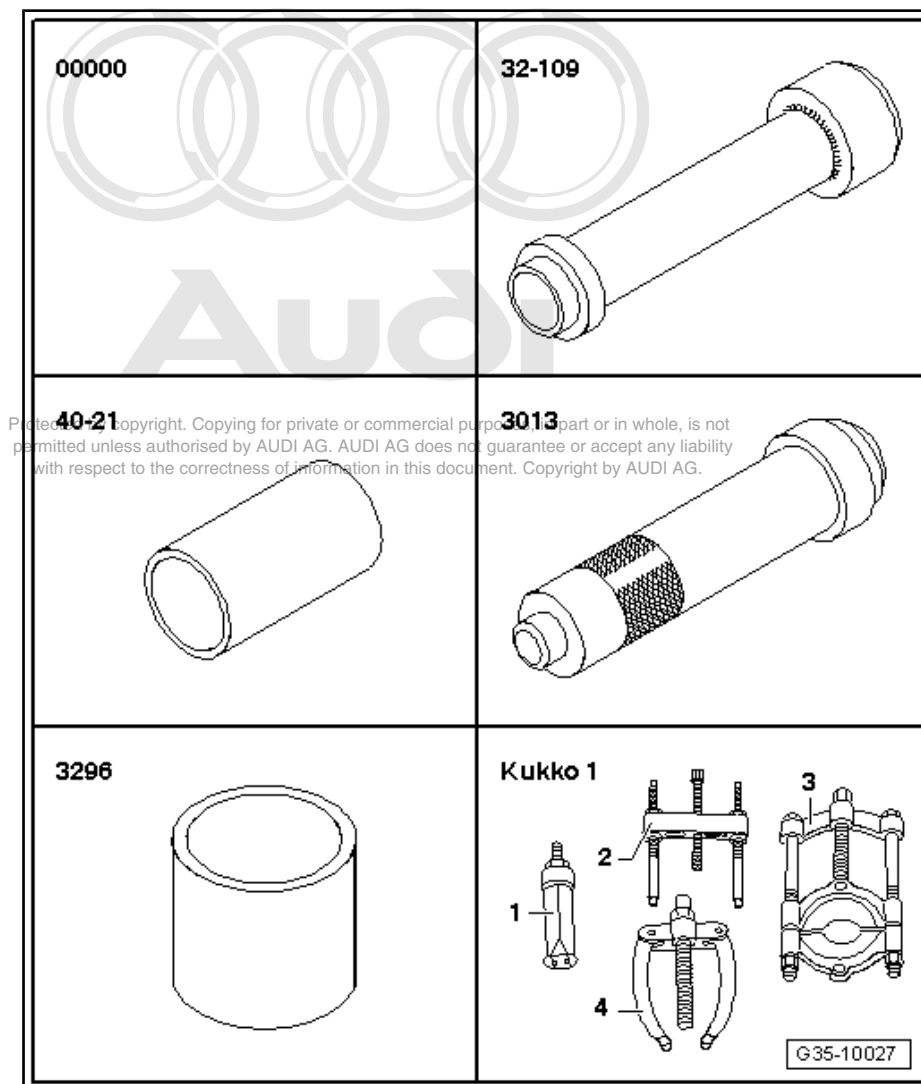
Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 415 A-
- ◆ Tube - VW 519-

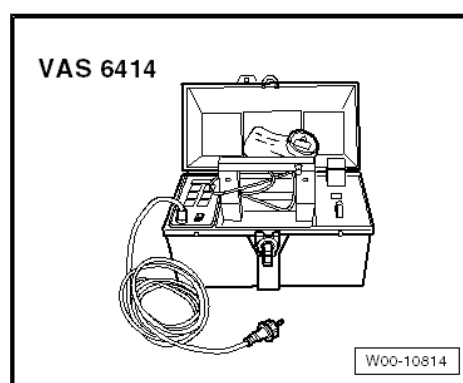


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- ◆ Multi-purpose tool - VW 771-
- ◆ Tube - 32 - 109-
- ◆ Press tool - 40 - 21-
- ◆ Punch - 3013-
- ◆ Tube - 3296-
- ◆ -1- Internal puller - Kukko 21/1-
- ◆ -3- Splitter - Kukko 17/2-



- ◆ Inductive heater - VAS 6414-

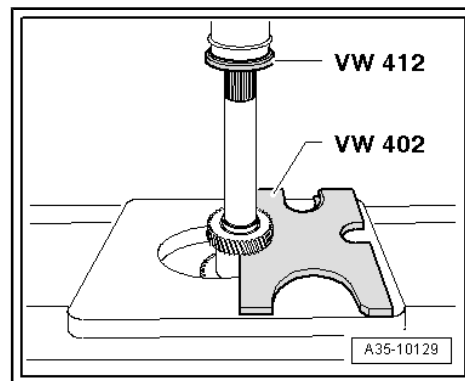


Note

Removing and installing 1st, 2nd and reverse gears is described under
⇒ ["1.2 Dismantling and assembling gear cluster", page 92](#).

Remove circlip and press off 4th gear wheel

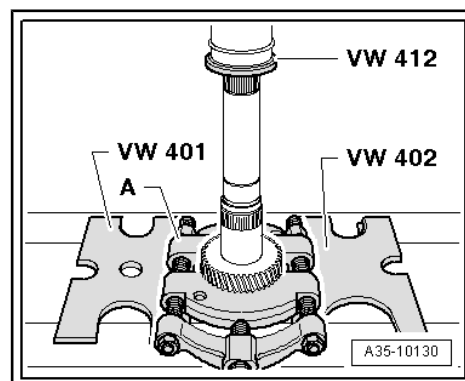
- Detach spacer sleeve ➔ [Item 33 \(page 128\)](#) from output shaft by hand.



Pressing off 3rd gear wheel

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

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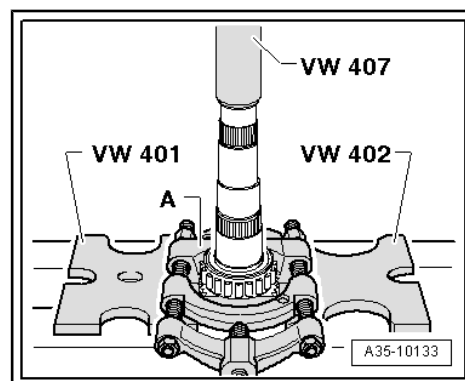
Pressing roller bearing off output shaft

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

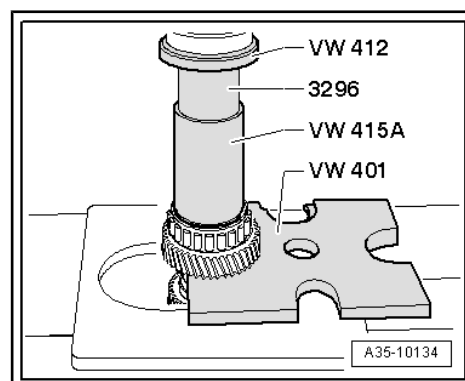


Note

- ◆ The roller bearing will be damaged when it is pressed off and must therefore always be renewed.
- ◆ If the output shaft is being renewed, the roller bearing does not have to be pressed off the shaft.
- ◆ To press off the roller bearing, you can also break open the cage of the bearing using a screwdriver or similar and then apply the splitter to the inner race.



Pressing roller bearing onto output shaft

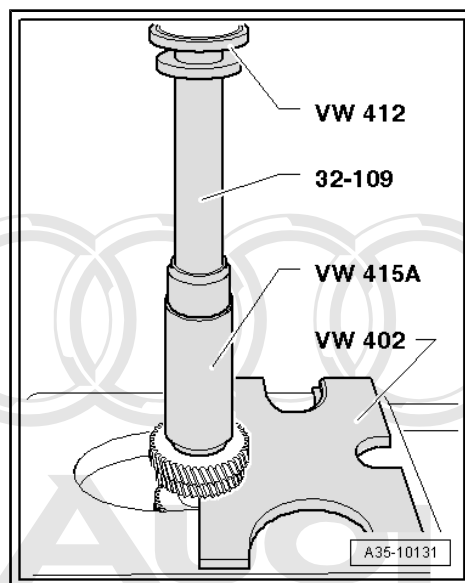


Pressing on 3rd gear wheel

◆ Installation position:

Higher inside collar faces 4th gear.

- Fit spacer sleeve ➔ [Item 33 \(page 128\)](#) onto output shaft by hand.



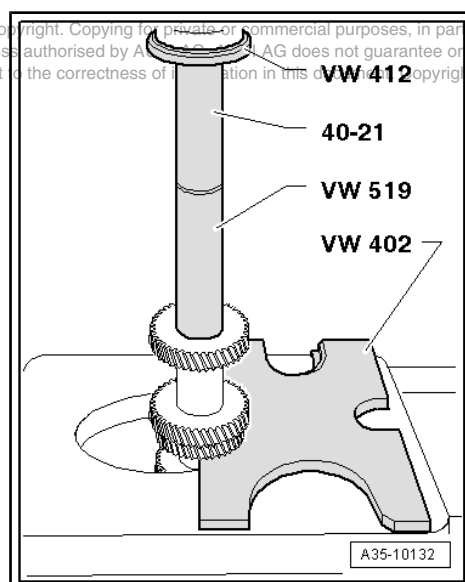
Pressing on 4th gear wheel

◆ Installation position:

Higher inside collar faces upwards towards circlip groove.

- Fit circlip for 4th gear wheel.
- If the output shaft, spacer sleeve or 3rd or 4th gear wheels are being renewed:

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Determine thickness of new circlip for 4th gear wheel.

- Gear wheel is pressed on as far as stop.



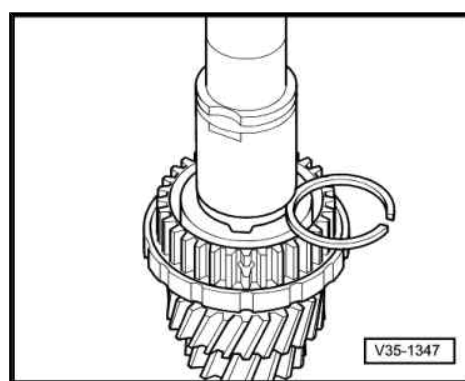
Note

The thickness of the circlip for the 4th gear wheel is determined as shown for the synchro-hub.

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

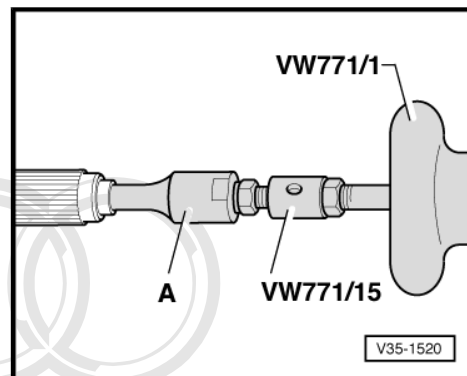
The following circlips are available:

Circlip thickness (mm)		
2.35	2.41	2.47
2.38	2.44	2.50



Pulling out needle bearing or bearing bush for rear flange shaft in output shaft

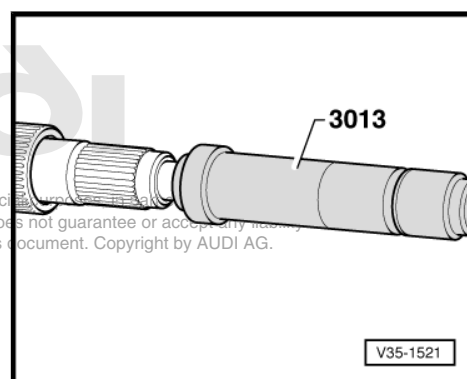
A - Internal puller 12 ... 14.5 mm , e.g. -Kukko 21/1-



Driving in needle bearing or bearing bush for rear flange shaft in output shaft

Gearbox with needle bearing

- The large $\varnothing$ on the punch - 3013- faces towards the needle bearing.
- Install needle bearing so the lettering (side with thicker metal) faces towards the punch - 3013.
- Make sure needle bearing is flush after being driven into output shaft.



Gearbox with bearing bush

- The small $\varnothing$ on the punch - 3013- faces towards the bearing bush.
- Drive bearing bush into output shaft as far as stop.

39 – Final drive - differential

1 Oil seals

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

⇒ [“1.2 Renewing oil seal \(right-side\)”, page 137](#)

⇒ [“1.3 Renewing oil seal \(left-side\)”, page 139](#)

⇒ [“1.4 Renewing input shaft oil seal”, page 143](#)

1.1 Overview of fitting locations - oil seals

The oil seals -C-, -D- and -E- can also be renewed with the gearbox installed in the vehicle ⇒ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Oil seals; Overview of fitting locations - oil seals .

A - Oil seal

- ☐ For input shaft
- ☐ ⇒ [“1.4 Renewing input shaft oil seal”, page 143](#)

B - Oil seal

- ☐ For flange shaft (left-side)
- ☐ ⇒ [“1.3 Renewing oil seal \(left-side\)”, page 139](#)

C - Oil seal

- ☐ For flange shaft (right-side)
- ☐ ⇒ [“1.2 Renewing oil seal \(right-side\)”, page 137](#)
- ☐ Renewing with gearbox installed ⇒ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Oil seals; Renewing oil seal (right-side)

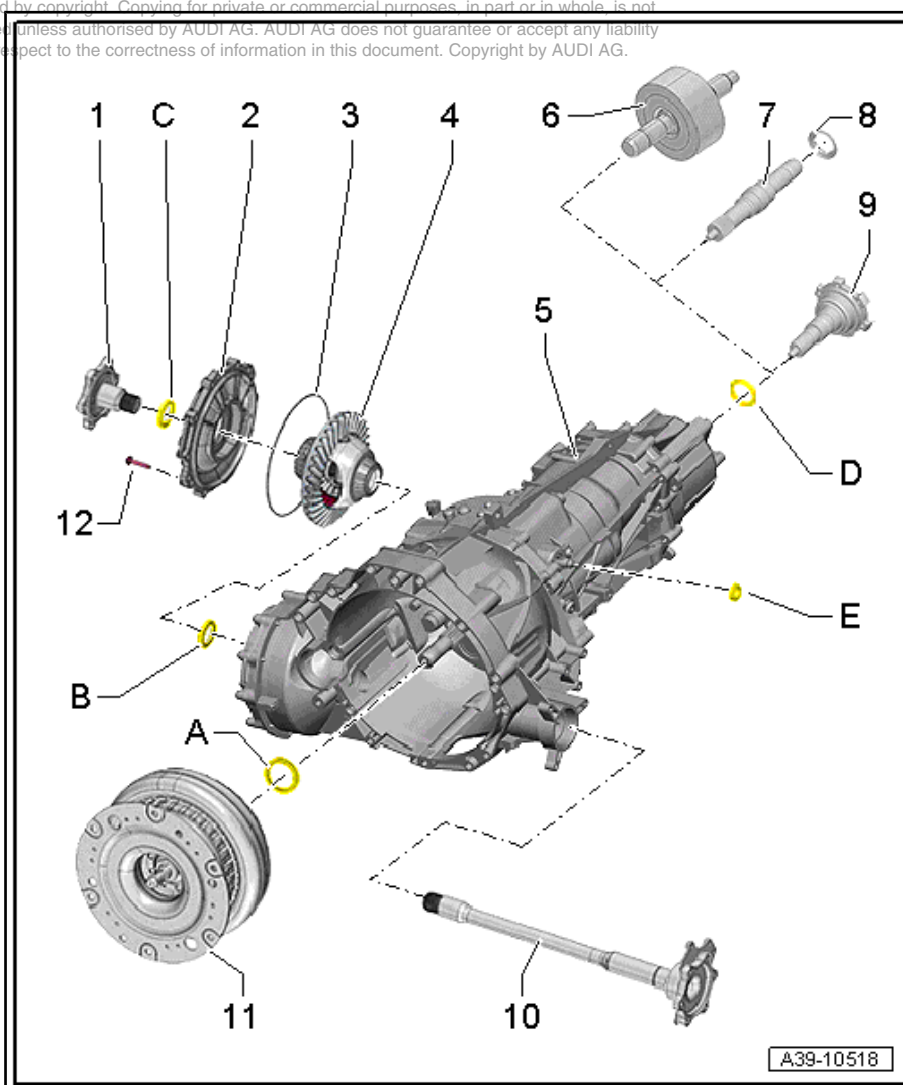
D - Oil seal

- ☐ For rear flange shaft or rear splined shaft
- ☐ Removing and installing ⇒ [page 202](#)

E - Oil seal

- ☐ For selector shaft
- ☐ ⇒ [Fig. ““Removing and installing oil seal for selector shaft””, page 85](#)
- ☐ Renewing with gearbox installed ⇒ 6-speed

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manual gearbox 0B2;
Rep. gr. 34 ; Selector mechanism; Renewing selector shaft oil seal

1 - Flange shaft (right-side)

- ☐ ⇒ [“3.2 Removing and installing flange shaft \(right-side\)”, page 149](#)
- ☐ Renewing with gearbox installed ⇒ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Oil seals; Renewing oil seal (right-side)

2 - Cover for final drive

- ☐ ⇒ [“3.7 Renewing cover for final drive”, page 164](#)

3 - O-ring

- ☐ On cover for final drive
- ☐ Renewing ⇒ [page 164](#)

4 - Differential

- ☐ ⇒ [“3.1 Exploded view - differential”, page 147](#)
- ☐ ⇒ [“3.6 Removing and installing differential”, page 162](#)

5 - Gearbox

- ☐ Removing and installing ⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Removing and installing gearbox

6 - Rear splined shaft

- ☐ With vibration damper; for correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew oil seal -D- when renewing rear splined shaft
- ☐ Removing and installing ⇒ [page 205](#)

7 - Rear splined shaft

- ☐ Without vibration damper; for correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew oil seal -D- when renewing rear splined shaft
- ☐ Removing and installing ⇒ [page 205](#)

8 - Dust ring

- ☐ Renew if removed

9 - Flange shaft (rear)

- ☐ With or without vibration damper; for correct version, refer to ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 202](#)

10 - Flange shaft (left-side)

- ☐ ⇒ [“3.3 Removing and installing flange shaft \(left-side\)”, page 151](#)

11 - Clutch module

- ☐ Removing and installing ⇒ [“2.3 Removing and installing clutch module”, page 25](#)

12 - Bolt

- ☐ Tightening torque ⇒ [Item 8 \(page 146\)](#)
- ☐ 10x

1.2 Renewing oil seal (right-side)

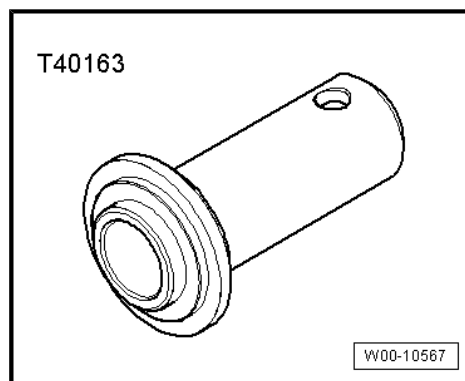


Note

The flange shaft oil seal (right-side) can also be renewed with the gearbox installed in the vehicle ⇒ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Oil seals; Renewing oil seal (right-side) .

Special tools and workshop equipment required

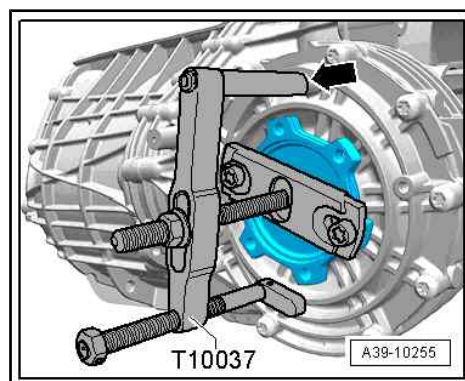
◆ Thrust piece - T40163-



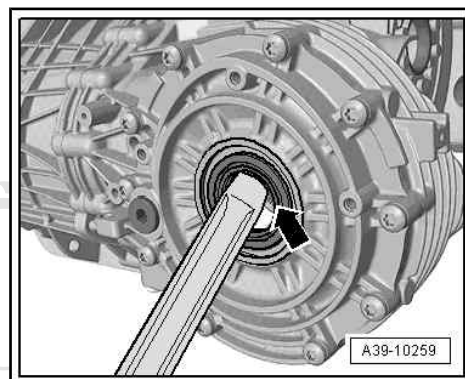
◆ Sealing grease - G 052 128 A1-

Removing

- Remove flange shaft (right-side) ➔ [page 149](#) .



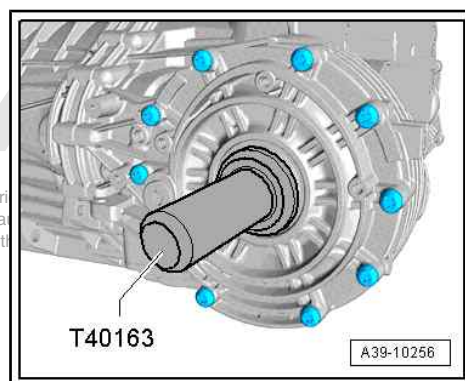
- Lever out flange shaft oil seal using an assembly lever.



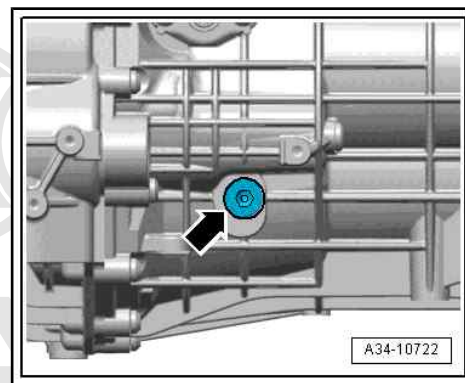
Installing

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

- Lightly oil outer circumference of new oil seal.
- Drive in new flange shaft oil seal (right-side) as far as stop; keep seal straight when installing.
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .
- Install flange shaft (right-side) ➔ [page 150](#) .



- Unscrew oil filler plug -arrow-, fill up gear oil in gearbox and check oil level ⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Gear oil; Checking gear oil level .

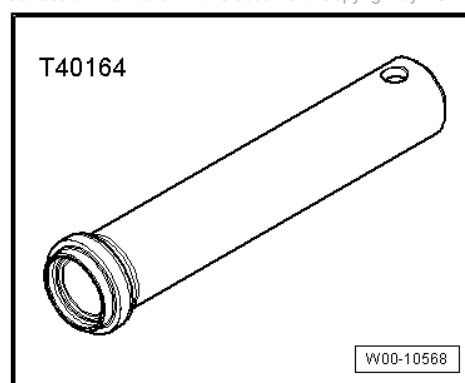


1.3 Renewing oil seal (left-side)

Special tools and workshop equipment required

- ◆ Thrust piece - T40164-

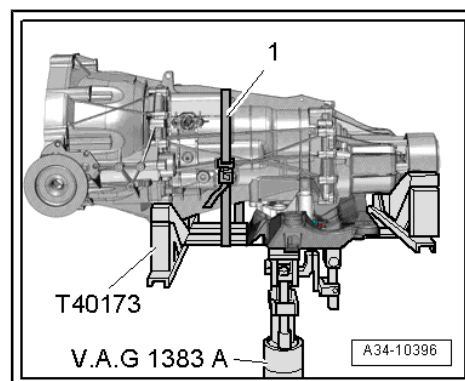
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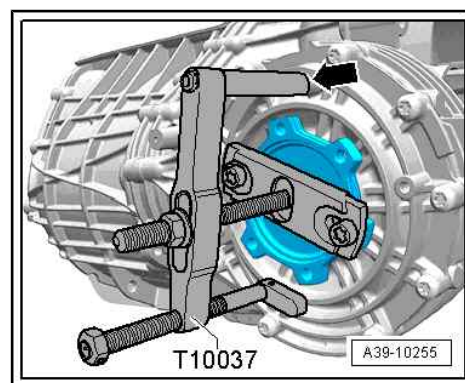
- ◆ Sealing grease - G 052 128 A1-

Removing

- Gearbox removed ⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Removing and installing gearbox; Removing gearbox
- Gearbox is secured to gearbox support - T40173- with tensioning strap -1-.
- Tilt gearbox towards rear and slightly to left with gearbox support - T40173- to prevent gear oil from escaping.



- Remove flange shaft (right-side) ⇒ [page 149](#) .



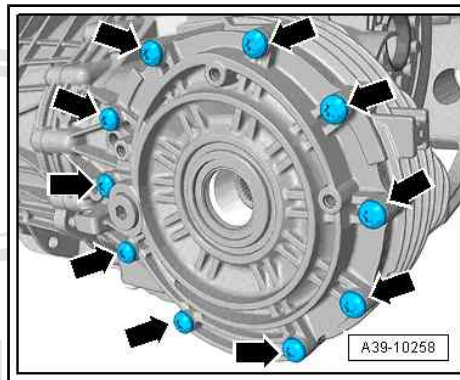
- Unscrew bolts -arrows- and detach cover for final drive.



Caution

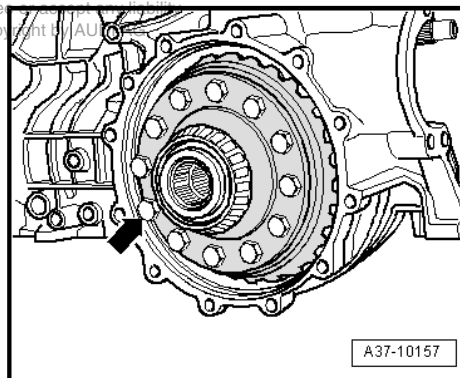
Risk of damage to the differential.

- ◆ **Detach cover for front final drive slowly and carefully from gearbox housing. The differential may otherwise fall out of the gearbox.**
- ◆ **The differential must not be re-installed if it is damaged. Renew the gearbox if the differential is damaged.**

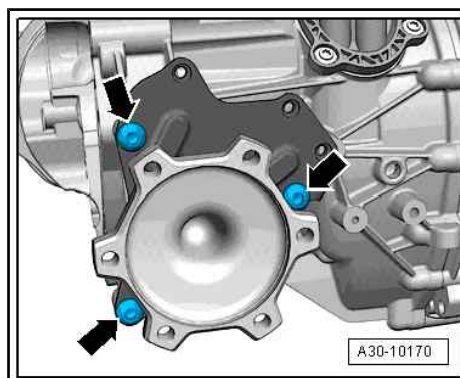


- Carefully detach cover for front final drive (some remaining gear oil will drain off).

- Carefully remove differential -arrow- and set it down on a soft surface.



- Remove flange shaft (left-side) ➤ [page 151](#) .



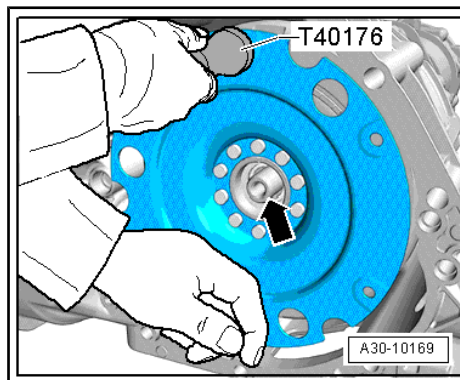
- Remove clutch module ➤ [page 25](#) .



Caution

Risk of damaging clutch module when removing and installing

- **Refer to Workshop Manual**
➤ "2.3 Removing and installing clutch module", page 25



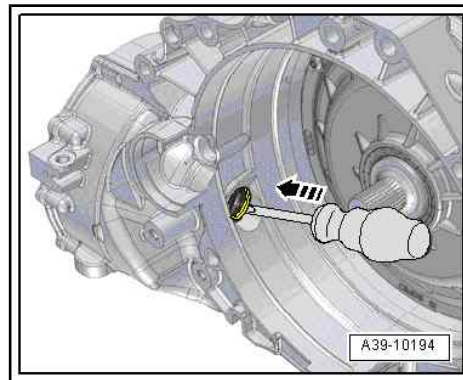
- Press out oil seal with a screwdriver.



Caution

Risk of damage to fitting surface in gearbox housing.

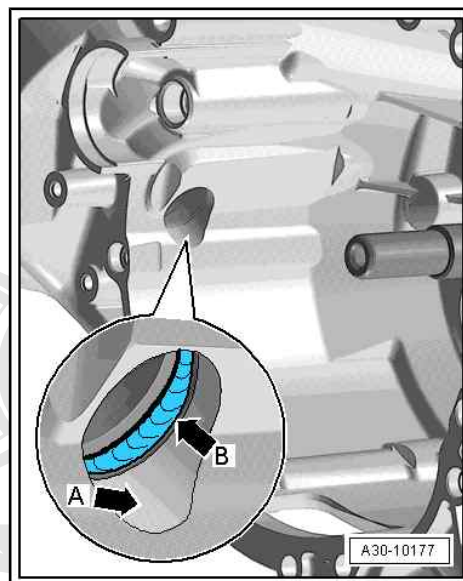
- ◆ *Apply screwdriver with care.*



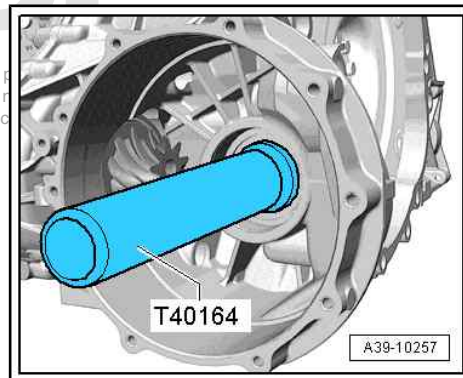
Installing

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

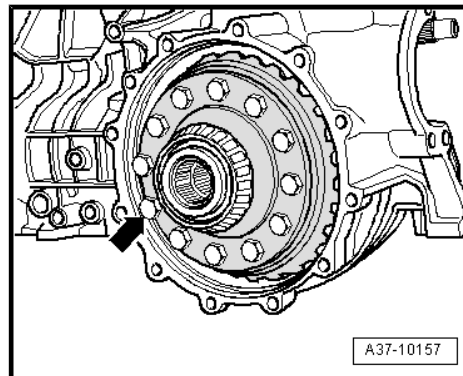
- Thoroughly clean area of gearbox housing leading to differential -arrow A-, and seat for oil seal -arrow B-.



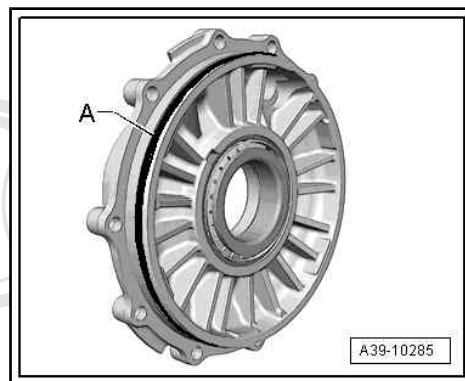
- Lightly oil outer circumference of new oil seal and slide onto thrust piece - T40164- .
- Open side of oil seal faces towards thrust piece - T40164- .
- Drive in oil seal onto stop (take care to keep seal straight).
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .



- Fit differential -arrow-.

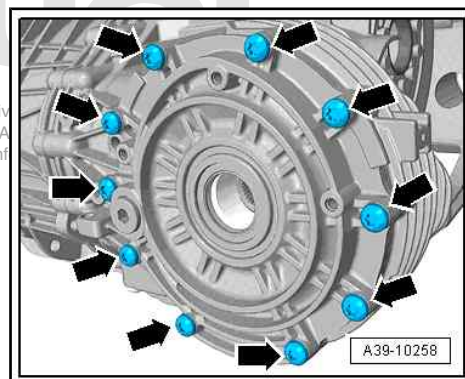


- Renew O-ring -A- on cover for front final drive and lubricate lightly with gear oil.

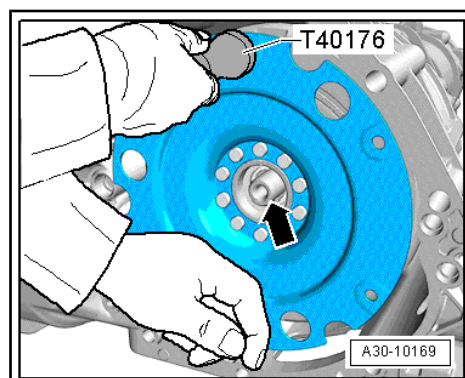


- Install cover for final drive and tighten bolts -arrows-. Tightening torque ➔ [Item 8 \(page 146\)](#)
- Install flange shaft (right-side) ➔ [page 150](#).

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- Install clutch module ➔ [page 25](#).



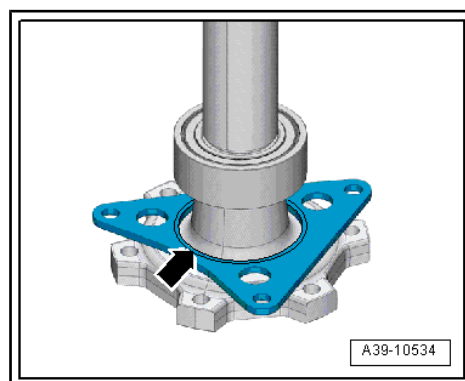
- Thoroughly clean flange shaft (left-side).

Vehicles with vehicle ID No. up to 8K0BA088680 or 8FXBN009589:

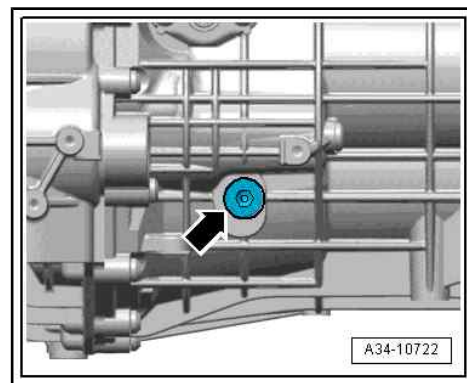
- Check preload of ball bearing for flange shaft (left-side) according to wear pattern on mounting bracket -arrow- ➔ [page 155](#).
- ◆ Depending on wear pattern, optimise preload of ball bearing for flange shaft (left-side) as required ➔ [page 156](#).
- ◆ Depending on wear pattern, adjust preload of ball bearing for flange shaft (left-side) as required ➔ [page 157](#).

Continued for all vehicles:

- Install flange shaft (left-side) ➔ [page 153](#).



- After installing gearbox, unscrew oil filler plug -arrow-, fill up gear oil in gearbox and check oil level ⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Gear oil; Checking gear oil level .



1.4 Renewing input shaft oil seal

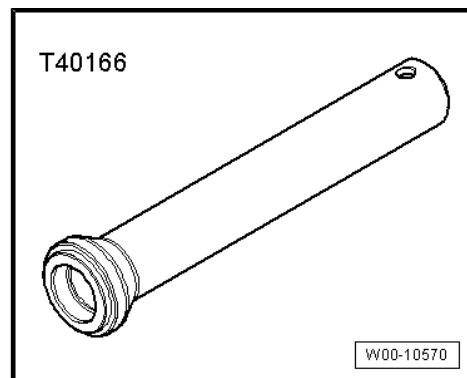
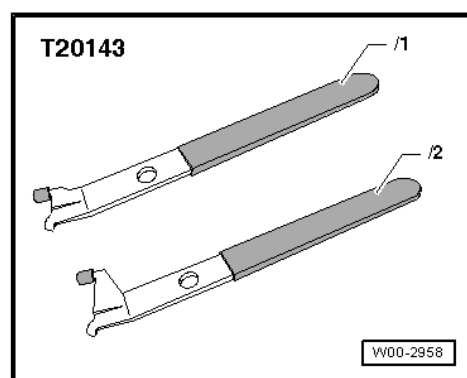
Special tools and workshop equipment required

- ◆ Extractor tool - T20143/1-

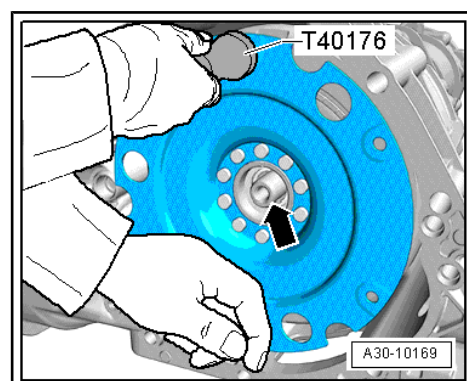


- ◆ Thrust piece - T40166-

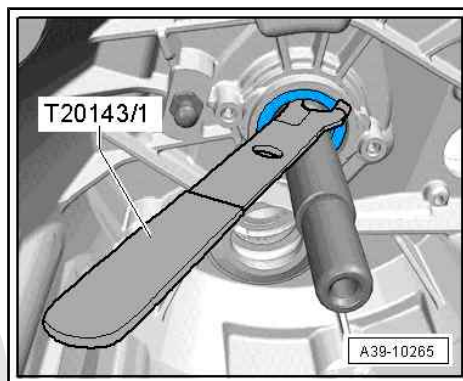
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- ◆ Sealing grease - G 052 128 A1-
- Gearbox removed ⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Removing and installing gearbox; Removing gearbox .
- Remove clutch module ⇒ [page 25](#) .

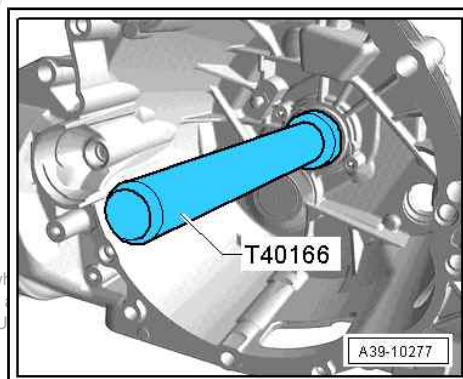


- Remove clutch release lever, release bearing and guide sleeve ➤ [page 11](#) .
- Prise out input shaft oil seal.



- Lightly oil outer circumference of new oil seal for input shaft.
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .
- Drive in new oil seal onto stop (take care to keep seal straight).
- Install guide sleeve, clutch release lever and release bearing ➤ [page 11](#) .
- Install clutch module ➤ [page 28](#) .

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2 Final drive

⇒ **"2.1 Exploded view - final drive", page 145**

2.1 Exploded view - final drive



Note

- ◆ The differential can be removed and installed without removing the selector mechanism, input shaft, output shaft, side shaft / pinion shaft or gearbox cover.
- ◆ If you are renewing the cover for the final drive -7-, you must adjust the preload of the tapered roller bearings for the differential ⇒ [page 164](#).
- ◆ If you are renewing the tapered roller bearings of the differential, you must adjust the differential ⇒ [page 184](#).

1 - Bolt

- ☐ 15 Nm and then turn 45° further
- ☐ Steel bolts (M8; 25 mm long)
- ☐ 3x
- ☐ Renew

2 - Flange shaft (left-side)

- ☐ With mounting bracket and ball bearing
- ☐ Removing and installing
⇒ ["3.3 Removing and installing flange shaft \(left-side\)", page 151](#)
- ☐ Checking and adjusting preload of ball bearing for flange shaft (left-side) ⇒ [page 155](#)
- ☐ Renewing ball bearing or mounting bracket
⇒ [page 160](#)

3 - Gearbox housing

4 - Oil seal

- ☐ For flange shaft (left-side)
- ☐ ⇒ ["1.3 Renewing oil seal \(left-side\)", page 139](#)

5 - Differential with crown wheel

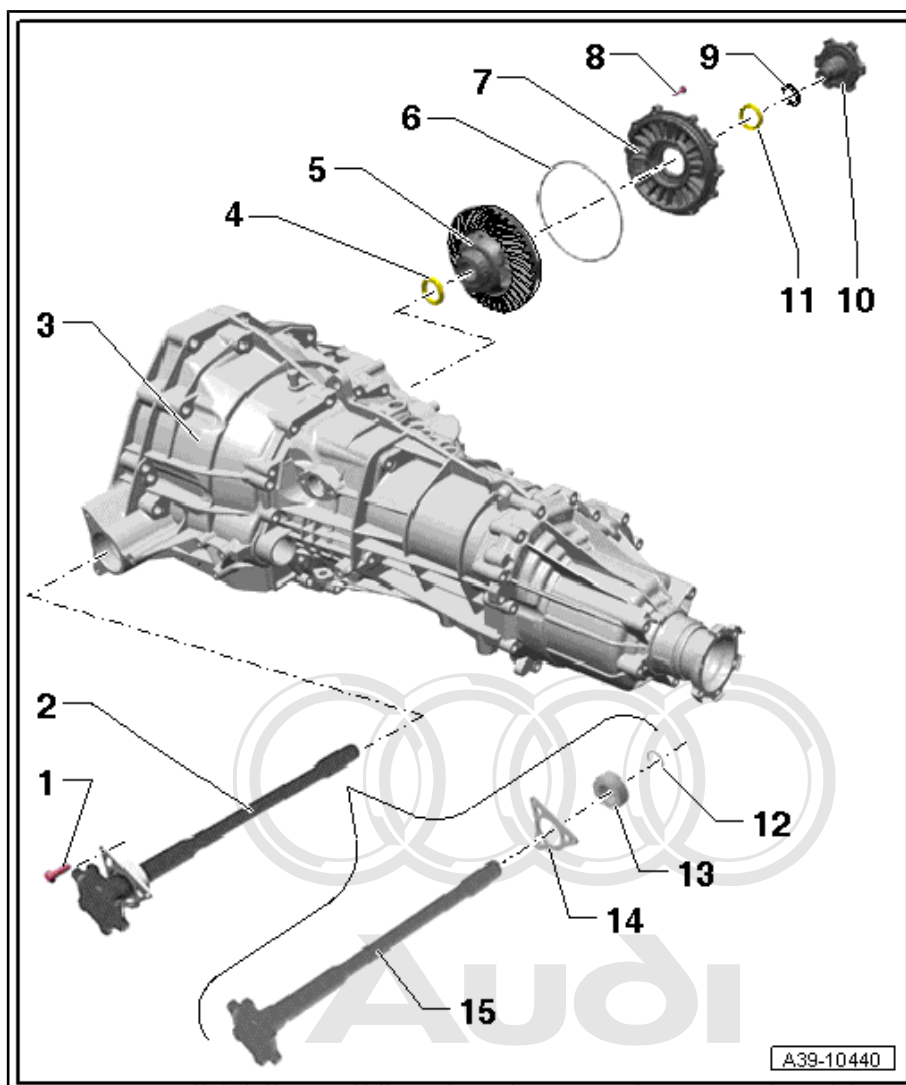
- ☐ ⇒ ["3.6 Removing and installing differential", page 162](#)
- ☐ ⇒ ["3.1 Exploded view - differential", page 147](#)

6 - O-ring

- ☐ Always renew
- ☐ Lubricate with gear oil

7 - Cover for final drive

- ☐ Renewing ⇒ [page 164](#)



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8 - Bolt

- ☐ 20 Nm and then turn 90° further
- ☐ Steel bolts (M8; 38 mm long)
- ☐ 10x

9 - Circlip

- ☐ Always renew
- ☐ Removing and installing ⇒ [page 150](#)

10 - Flange shaft (right-side)

- ☐ ⇒ [“3.2 Removing and installing flange shaft \(right-side\)”, page 149](#)
- ☐ Drive in with drift - VW 295-

11 - Oil seal

- ☐ For flange shaft (right-side)
- ☐ ⇒ [“1.2 Renewing oil seal \(right-side\)”, page 137](#)

12 - Circlip

- ☐ Renew

13 - Ball bearing

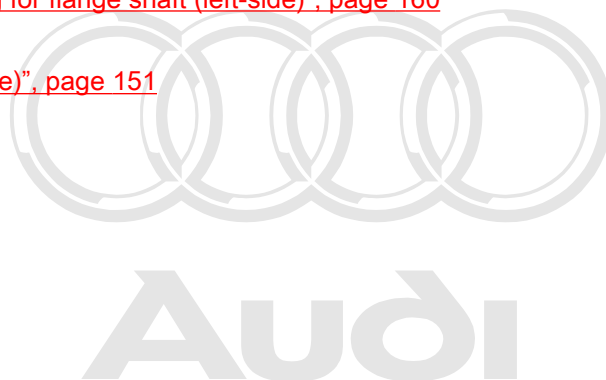
- ☐ For flange shaft (left-side)
- ☐ Checking and adjusting preload of ball bearing for flange shaft (left-side) ⇒ [page 155](#)
- ☐ Renewing ⇒ [page 160](#)

14 - Mounting bracket

- ☐ For flange shaft (left-side)
- ☐ ⇒ [“3.5 Renewing mounting bracket and ball bearing for flange shaft \(left-side\)”, page 160](#)

15 - Flange shaft (left-side)

- ☐ ⇒ [“3.3 Removing and installing flange shaft \(left-side\)”, page 151](#)



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3 Differential

⇒ [“3.1 Exploded view - differential”, page 147](#)

⇒ [“3.2 Removing and installing flange shaft \(right-side\)”, page 149](#)

⇒ [“3.3 Removing and installing flange shaft \(left-side\)”, page 151](#)

⇒ [“3.4 Checking and adjusting preload of ball bearing for flange shaft \(left-side\)”, page 155](#)

⇒ [“3.5 Renewing mounting bracket and ball bearing for flange shaft \(left-side\)”, page 160](#)

⇒ [“3.6 Removing and installing differential”, page 162](#)

⇒ [“3.7 Renewing cover for final drive”, page 164](#)

⇒ [“3.8 Dismantling and assembling differential”, page 176](#)

⇒ [“3.9 Adjusting differential”, page 184](#)

3.1 Exploded view - differential



Note

- ◆ *Always renew both bearings for differential together.*
- ◆ *Adjustment work is required when renewing the parts marked with ¹⁾. The bearing system for the differential consists of 2 tapered roller bearings (standard bearings); this version is fitted up to gearbox manufacturing date 14 08 11.*
- ◆ *Adjustment work is required when renewing the parts marked with ²⁾. The bearing system of the differential consists of 1 tapered roller bearing and 1 angular contact ball bearing (high-efficiency bearings); this version is fitted from gearbox manufacturing date 15 08 11 onwards.*
- ◆ *With the exception of the tapered roller bearings/angular contact ball bearings, no components of the differential can be renewed at present. Select correct bearings and shims from ⇒ Electronic parts catalogue .*

1 - Gearbox housing

2 - Shim "S₂"

- ☐ Note thickness
- ☐ If tapered roller bearings of differential are renewed, thickness of required shim must be determined ➤ [page 184](#)

3 - Tapered roller bearing outer race (left-side) ¹⁾

- ☐ Pulling out ➤ [page 180](#)
- ☐ Driving in ➤ [page 180](#)

4 - Tapered roller bearing inner race (left-side) ¹⁾

- ♦ Standard bearing; roller cage is made of metal
- ☐ Pulling off ➤ [page 181](#)
- ☐ Pressing on ➤ [page 181](#)

5 - Differential with crown wheel

- ☐ Crown wheel cannot be removed from differential
- ☐ Differential bevel gears cannot be renewed

6 - Tapered roller bearing inner race (right-side) ¹⁾

- ☐ Pulling off ➤ [page 182](#)
- ☐ Pressing on ➤ [page 182](#)

7 - Tapered roller bearing outer race (right-side) ¹⁾

- ☐ Pulling out ➤ [page 183](#)
- ☐ Pressing in ➤ [page 183](#)

8 - Shim "S₁"

- ☐ Note thickness
- ☐ If tapered roller bearings of differential or cover for final drive are renewed ➤ [Item 9 \(page 148\)](#) , thickness of required shim must be determined ➤ [page 184](#)

9 - Cover for final drive ¹⁾

- ☐ If renewed, re-determine thickness of shim "S₁" ➤ [Item 8 \(page 148\)](#) , ➤ [page 164](#)

10 - Cover for final drive ²⁾

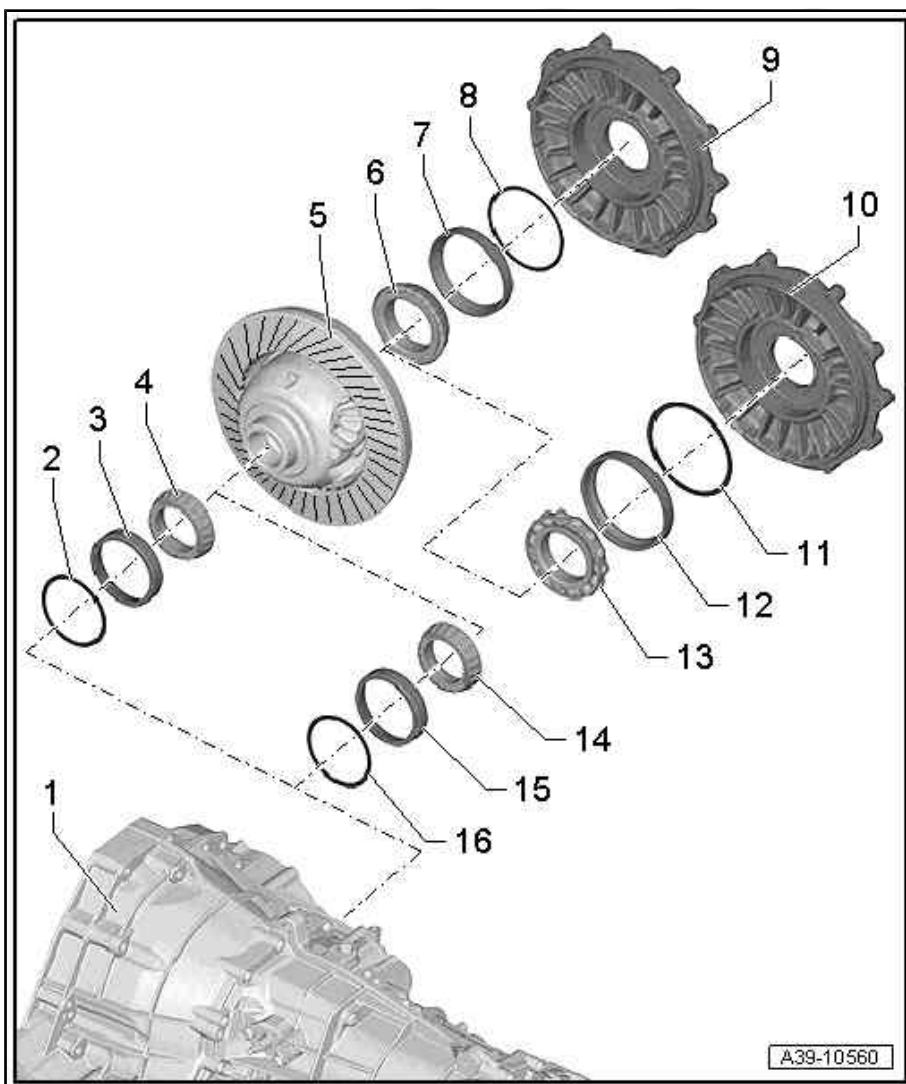
- ☐ Houses bearing for differential with high-efficiency bearings
- ☐ If renewed, re-determine thickness of shim "S₁" ➤ [Item 11 \(page 148\)](#) , ➤ [page 164](#)

11 - Shim "S₁"

- ☐ Note thickness
- ☐ If bearings for differential or cover for final drive are renewed ➤ [Item 10 \(page 148\)](#) , thickness of required shim must be determined ➤ [page 184](#)

12 - Outer race for angular contact ball bearing ²⁾

- ☐ Removing ➤ [page 183](#)
- ☐ Pressing in ➤ [page 184](#)



hole, is not
any liability
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13 - Inner race for angular contact ball bearing ²⁾

High-efficiency bearings:

- From gearbox manufacturing date 15 08 11 onwards
 - ☐ Pulling off ⇒ [page 182](#)
 - ☐ Pressing on ⇒ [page 182](#)

14 - Tapered roller bearing inner race ²⁾

High-efficiency bearings:

- Roller cage is made of plastic
- From gearbox manufacturing date 15 08 11 onwards
 - ☐ Pulling off ⇒ [page 181](#)
 - ☐ Pressing on ⇒ [page 181](#)

15 - Tapered roller bearing outer race ²⁾

- ☐ Pulling out ⇒ [page 180](#)
- ☐ Driving in ⇒ [page 180](#)

16 - Shim "S2"

- ☐ Note thickness
- ☐ If bearings for differential are renewed, thickness of required shim must be determined ⇒ [page 184](#)

3.2 Removing and installing flange shaft (right-side)

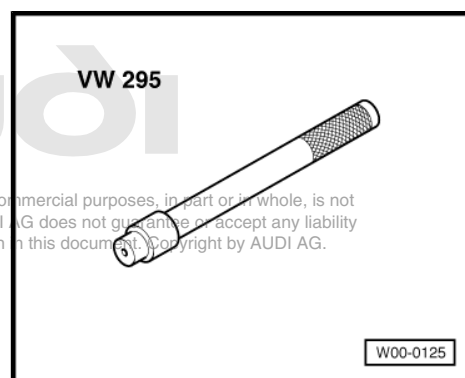


Note

The flange shaft (right-side) can also be removed and installed with the gearbox installed in the vehicle ⇒ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Oil seals; Renewing oil seal (right-side) .

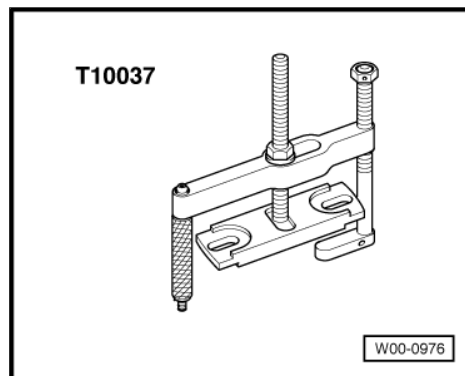
Special tools and workshop equipment required

- ◆ Drift - VW 295-



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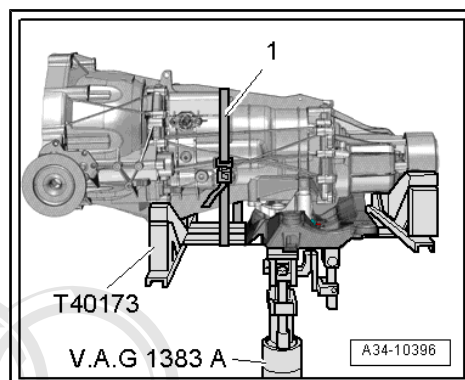
◆ Puller - T10037-



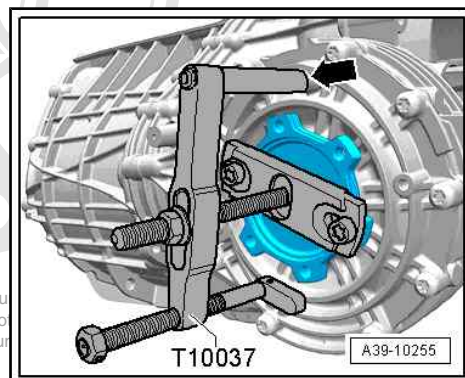
◆ Sealing grease - G 052 128 A1-

Removing

- Gearbox removed
- Gearbox is secured to gearbox support - T40173- with tensioning strap -1-.
- Tilt gearbox to rear with gearbox support - T40173- to prevent gear oil from escaping.



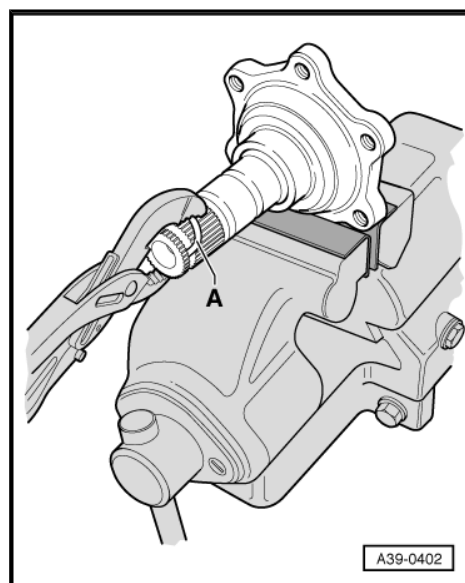
- Remove flange shaft (right-side); to do so, secure puller - T10037- to gearbox housing -arrow-.



Installing flange shaft (right-side).

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

- Always renew circlip for flange shaft -A-.
- Clamp flange shaft in vice, using jaw protectors. Use new circlip -A- to press old circlip out of groove in flange shaft.

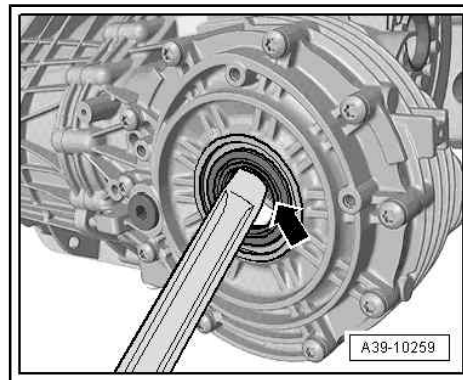


- Check flange shaft oil seal (right-side) -arrow- for damage and renew if necessary ➤ [page 137](#) .
- Clean space between sealing lip and dust lip then fill it half full again with sealing grease - G 052 128 A1- .
- Knock flange shaft in with drift - VW 295- .



Note

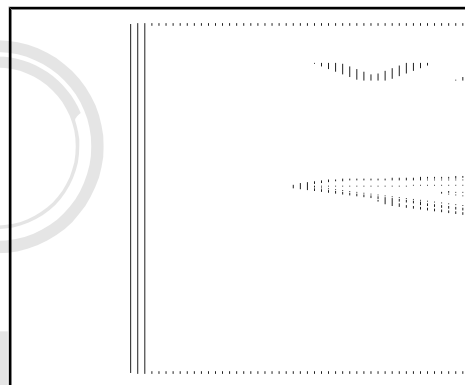
If gear oil has escaped, gearbox must be topped up with gear oil after it has been installed; checking oil level ➤ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Gear oil; Checking gear oil level .



3.3 Removing and installing flange shaft (left-side)

Special tools and workshop equipment required

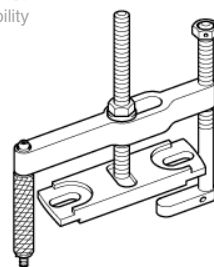
- ◆ Drip tray for workshop hoist - VAS 6208-



- ◆ Puller - T10037-

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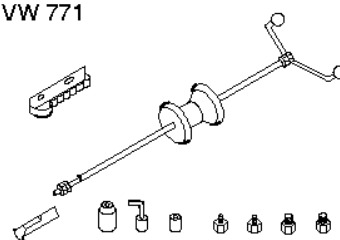
T10037



W00-0976

- ◆ Multi-purpose tool - VW 771/1-

VW 771

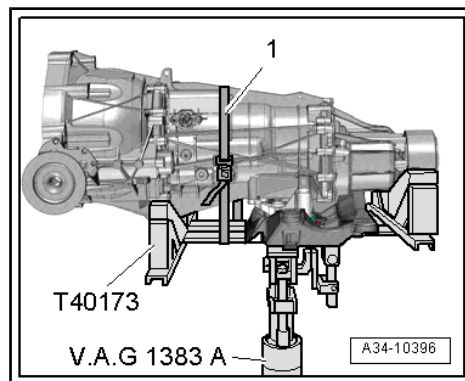


W00-0018

- ◆ Sealing grease - G 052 128 A1-

Removing

- Gearbox removed
- Gearbox is secured to gearbox support - T40173- with tensioning strap -1-.
- Tilt gearbox towards rear and slightly to left with gearbox support - T40173- to prevent gear oil from escaping.



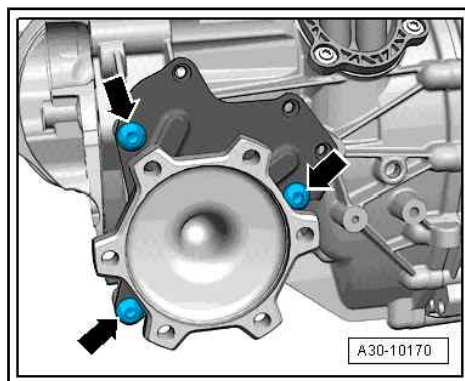
- Unscrew bolts -arrows- on mounting bracket for flange shaft (left-side).



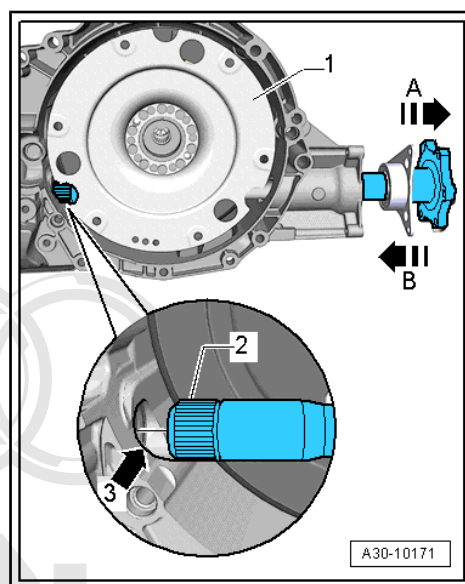
Caution

Risk of damage to oil seal.

- ◆ If you do not keep the shaft centred when pulling it out further, the splines of the shaft -2- will fall against the inner oil seal -arrow 3- between the differential and the gearbox housing.
- ◆ If oil seal is damaged, it must be renewed ➔ [page 139](#).

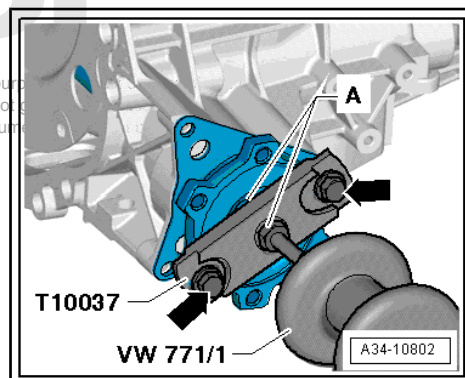


- Remove flange shaft (left-side) from gearbox in direction of -arrow A-.



Note

- ◆ If the flange shaft (left-side) cannot be removed by hand, pull it out carefully using multi-purpose tool - VW 771-.
- ◆ To do this, secure plate of puller - T10037- to flange shaft -arrows- and attach plate to spindle of multi-purpose tool - VW 771- (nuts -A-).



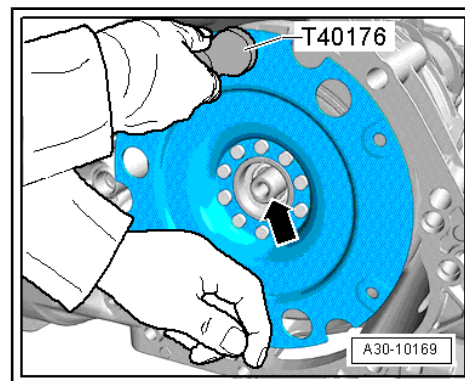
- Remove clutch module ➔ [page 25](#) .



Caution

Risk of damaging clutch module when removing and installing

- Refer to Workshop Manual
➔ *"2.3 Removing and installing clutch module", page 25*



Installing flange shaft (left-side)

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

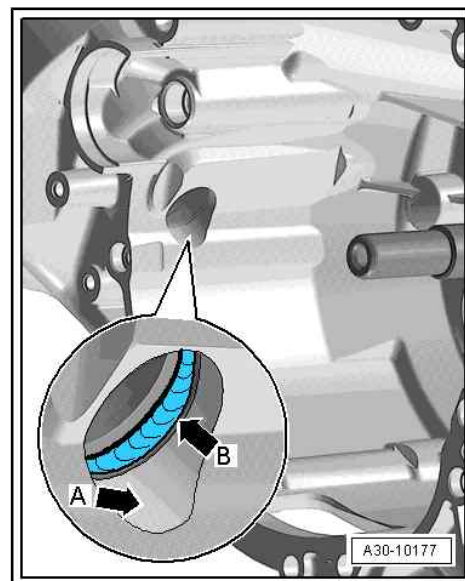
- Thoroughly clean area of gearbox housing leading to differential -arrow A-, and oil seal -arrow B-.



Note

*If oil seal for flange shaft (left-side) between differential and gearbox housing -arrow B- is damaged, it must be renewed
➔ [page 139](#) .*

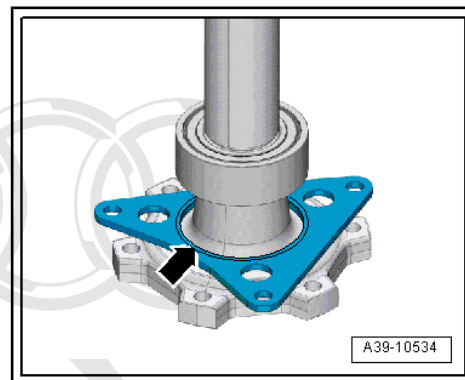
- Clean space between sealing lip and dust lip then fill it half full with sealing grease - G 052 128 A1- .



- Thoroughly clean flange shaft (left-side).

Vehicles with vehicle ID No. up to 8K0BA088680 or 8FXBN009589K:

- Check preload of ball bearing for flange shaft (left-side) according to wear pattern on mounting bracket -arrow- ➔ [page 155](#) .
- ◆ Depending on wear pattern, optimise preload of ball bearing for flange shaft (left-side) as required ➔ [page 156](#) .
- ◆ Depending on wear pattern, adjust preload of ball bearing for flange shaft (left-side) as required ➔ [page 157](#) .



Continued for all vehicles:

- Install clutch module -1- ➔ [page 25](#) .
- Turn clutch module -1- so that you can see opening to differential -arrow 3-.
- Slide flange-shaft (left-side) -2- into gearbox in direction of -arrow B- (keep end of shaft centred while guiding it into oil seal on front final drive -arrow 3-).



Caution

Risk of damage to oil seal. Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted without the written permission of AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

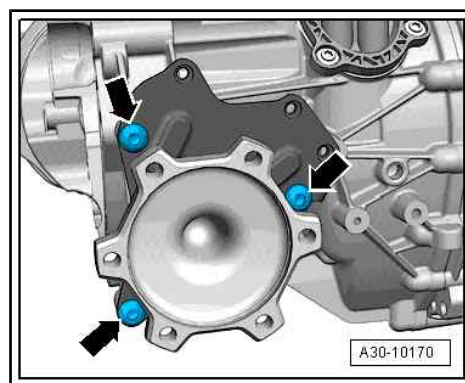
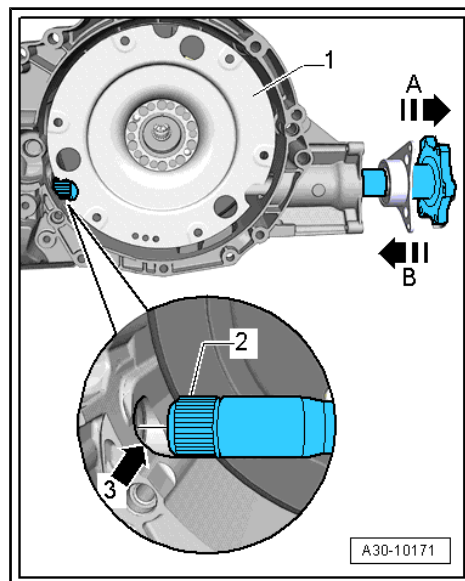
- ♦ **If you do not keep the shaft centred, the splines of the shaft -2- will damage the oil seal -arrow 3- between the differential and the gearbox housing.**
- ♦ **If oil seal is damaged, it must be renewed ➔ [page 139](#) .**

- Tighten flange shaft mounting bracket -arrows-. Tightening torque ➔ [Item 1 \(page 145\)](#)



Note

If gear oil has escaped, gearbox must be topped up with gear oil after it has been installed; checking oil level ➔ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Gear oil; Checking gear oil level .



3.4 Checking and adjusting preload of ball bearing for flange shaft (left-side)

⇒ [“3.4.1 Checking preload of ball bearing for flange shaft \(left-side\) - vehicles with vehicle ID No. up to 8K0BA088680 or 8FXBN009589”, page 155](#)

⇒ [“3.4.2 Optimising preload of ball bearing for flange shaft \(left-side\) - vehicles with vehicle ID No. up to 8K0BA088680 or 8FXBN009589”, page 156](#)

⇒ [“3.4.3 Adjusting preload of ball bearing for flange shaft \(left-side\) - vehicles with vehicle ID No. up to 8K0BA088680 or 8FXBN009589”, page 157](#)

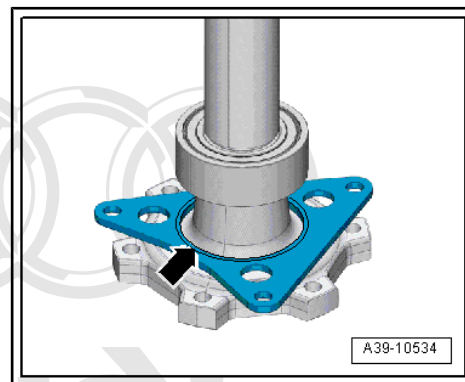
3.4.1 Checking preload of ball bearing for flange shaft (left-side) - vehicles with vehicle ID No. up to 8K0BA088680 or 8FXBN009589

Check preload of ball bearing according to wear pattern on mounting bracket -arrow-.



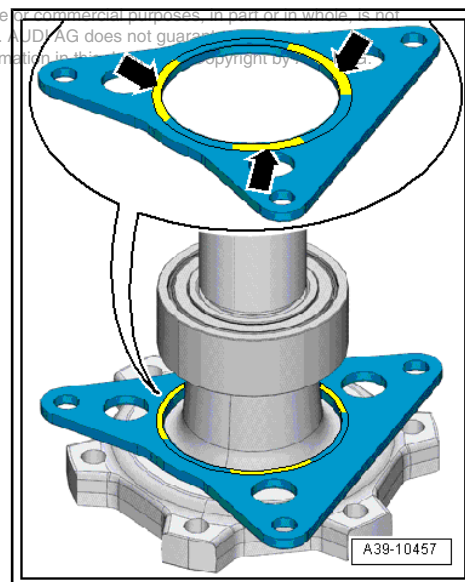
Note

- ◆ It is only necessary to check preload of ball bearing for flange shaft (left-side) on vehicles up to the following ID Nos.:
 - ◆ Audi A4 up to vehicle ID No. WAUZZZ8K0BA088680
 - ◆ Audi A5 up to vehicle ID No. WAUZZZ8FXBN009589
 - ◆ This measure is not required on later vehicles because of a design change.
- Flange shaft (left-side) must be removed ⇒ [page 151](#) .



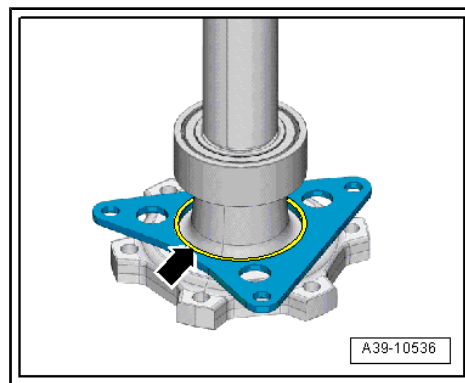
Wear pattern “A”

- Slight impressions in vicinity of hole in mounting bracket -arrows-.
- No trace of scoring or material worn down around circumference.
- Optimise preload of ball bearing for flange shaft (left-side) ⇒ [page 156](#) .



Wear pattern "B"

- Scoring and possibly material worn down around circumference of hole in mounting bracket -arrow-.
- Adjust preload of bearing for flange shaft (left-side)
⇒ [page 157](#) .
- Renew mounting bracket, ball bearing and circlip
⇒ [page 160](#) .

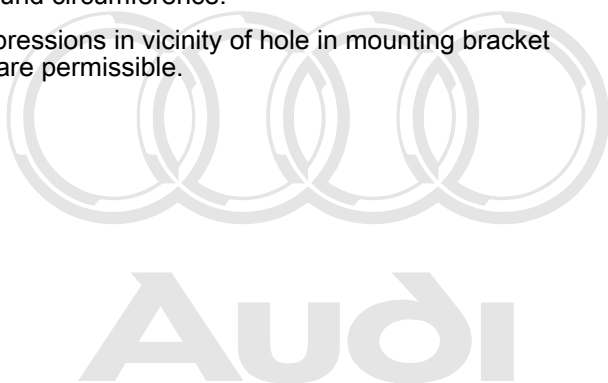


3.4.2 Optimising preload of ball bearing for flange shaft (left-side) - vehicles with vehicle ID No. up to 8K0BA088680 or 8FXBN009589

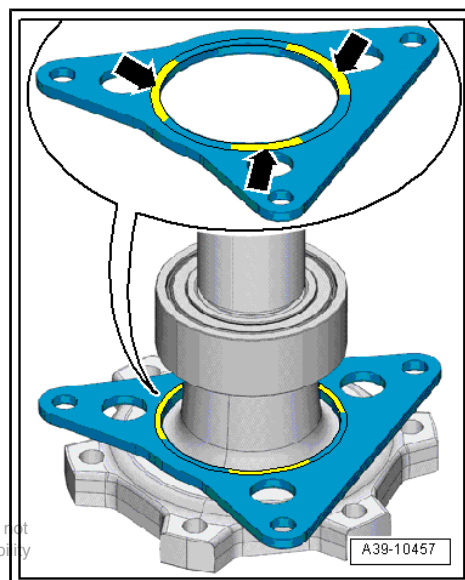
- Flange shaft (left-side) must be removed ⇒ [page 151](#) .

Requirements for optimising:

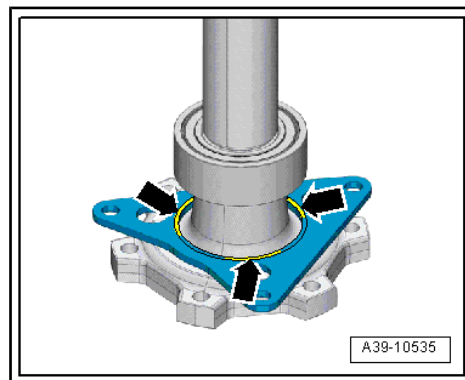
- Mounting bracket shows no trace of scoring or material worn down around circumference.
- Slight impressions in vicinity of hole in mounting bracket -arrows- are permissible.



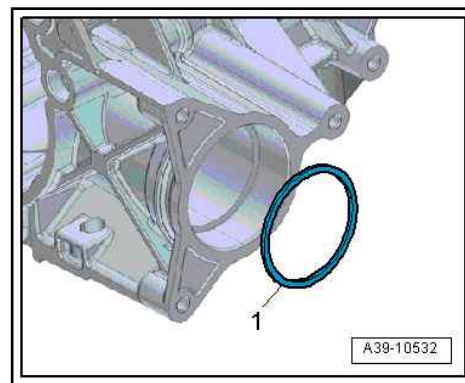
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- Mounting bracket with wear pattern "A" ⇒ [page 155](#) (mounting bracket has no traces of scoring or material worn down around circumference).
- A shim is inserted in the bearing seat in the gearbox to optimise the preload of the ball bearing.

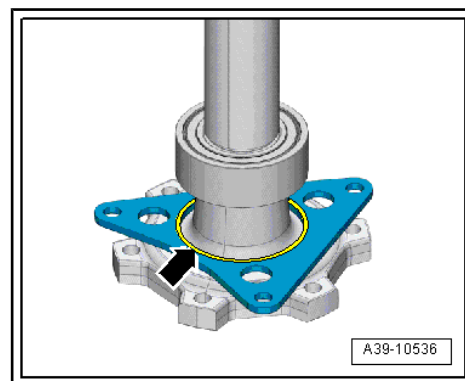


- Before installing flange shaft , insert shim - 0B4 409 227 - item 1- in bearing seat in gearbox to optimise preload of ball bearing.
- Install flange shaft (left-side) ⇒ [page 153](#) .



3.4.3 Adjusting preload of ball bearing for flange shaft (left-side) - vehicles with vehicle ID No. up to 8K0BA088680 or 8FXBN009589

- Flange shaft (left-side) must be removed ⇒ [page 151](#) .
- Mounting bracket with wear pattern “B” ⇒ [page 156](#) (scoring and possibly material worn down around circumference of hole).
- Mounting bracket and ball bearing must be renewed ⇒ [page 160](#) .



Procedure

- Attach emery cloth (grain size 150) to sanding block and clean coarse dirt and corrosion off contact surface -arrow-.



Note

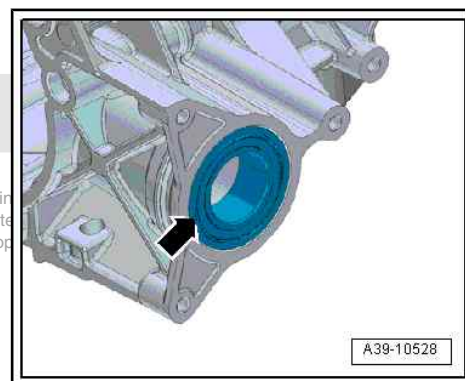
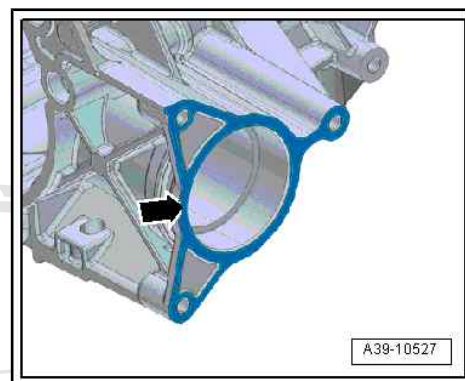
The contact surface does not have to be sanded down to bare metal; it is sufficient to remove coarse dirt and corrosion.

- Clean contact surface and bearing seat.
- Fit new ball bearing -arrow- for flange shaft (left-side) in bearing seat.

Continued procedure:

- ◆ If bearing protrudes slightly outside contact surface ⇒ [page 158](#)
- ◆ If bearing is below contact surface ⇒ [page 159](#)

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Procedure if bearing protrudes outside contact surface

- Apply straight edge (500 mm) - VAS 6075- across bearing and measure distance to contact surface on gearbox housing on both sides using feeler gauge.
- Note down measured value.
- Re-apply straight edge at an angle of 90° across bearing and measure distance to contact surface on gearbox housing on both sides using feeler gauge.
- Note down measured value.

Determining shim(s):



Note

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The smallest of the 4 measured values is used to determine the shim(s).

- Specification: bearing should protrude by 0.5 ... 0.8 mm

	Smallest amount of bearing protrusion (0.1 mm in this example)
+	Thickness of shim(s), (thickness 0.3 mm)
=	Bearing preload (specification 0.5 ... 0.8 mm)

Example:

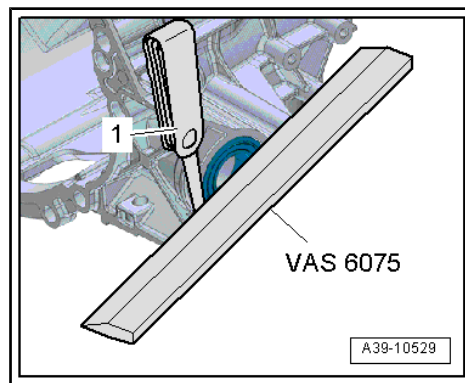
1 shim:

$0.1 \text{ mm} + 0.3 \text{ mm} = 0.4 \text{ mm}$, "bearing preload insufficient"

2 shims:

$0.1 \text{ mm} + 0.3 \text{ mm} + 0.3 \text{ mm} = 0.7 \text{ mm}$ "bearing preload in specified range"

- Result: Inserting 2 shims of 0.3 mm thickness gives a bearing preload of 0.7 mm (inside tolerance range of 0.5 ... 0.8 mm)



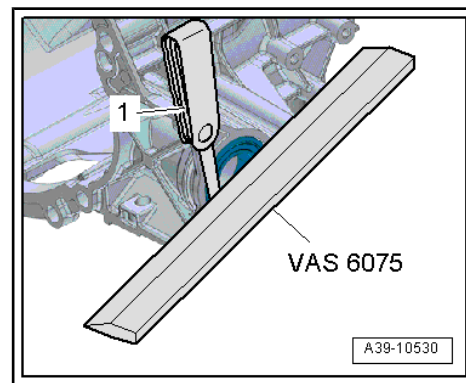
Procedure if bearing is below contact surface



Note

Use only the method described here to measure the distance below the contact surface.

- Apply straight edge (500 mm) - VAS 6075- across contact surface on gearbox housing and measure distance to bearing on both sides using feeler gauge.
- Note down measured value.
- Re-apply straight edge at an angle of 90° across contact surface on gearbox housing and measure distance to bearing on both sides using feeler gauge.
- Note down measured value.



Determining shim(s):



Note

- ◆ *The largest of the 4 measured values is used to determine the shim(s).*

- ◆ *The measured distance below the contact surface is taken as a minus value ("–") for the calculation.*

- Specification: bearing should protrude by 0.5 ... 0.8 mm

–	Largest distance below surface (–0.15 mm in this example)
+	Thickness of shim(s), (thickness 0.3 mm)
=	Bearing preload (specification 0.5 ... 0.8 mm)

Example:

1 shim:

$$-0.15 \text{ mm} + 0.3 \text{ mm} = 0.15 \text{ mm, "bearing preload insufficient"}$$

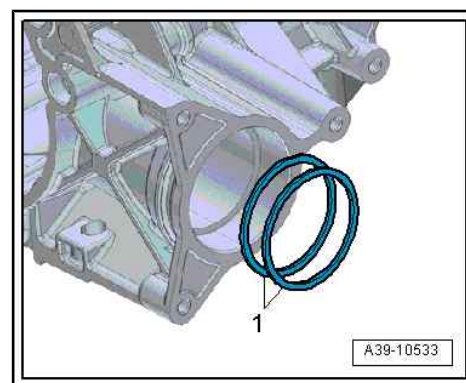
3 shims:

$$-0.15 \text{ mm} + 0.3 \text{ mm} + 0.3 \text{ mm} + 0.3 \text{ mm} = 0.75 \text{ mm, "bearing preload in specified range"}$$

- Result: Inserting 3 shims of 0.3 mm thickness gives a bearing preload of 0.75 mm (inside tolerance range of 0.5 ... 0.8 mm)

Continued for all vehicles:

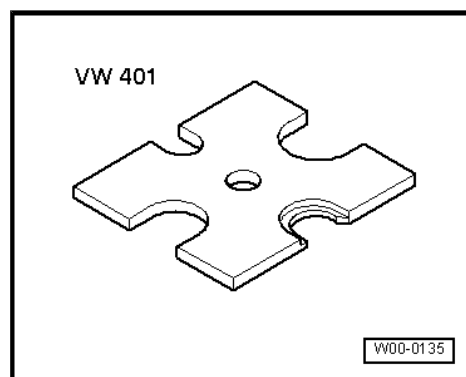
- Renew mounting bracket, ball bearing and circlip
⇒ [page 160](#) .
- Before installing flange shaft fit calculated number of shims
-0B4 409 227- -item 1- in bearing seat in gearbox.
- Install flange shaft (left-side) ⇒ [page 153](#) .



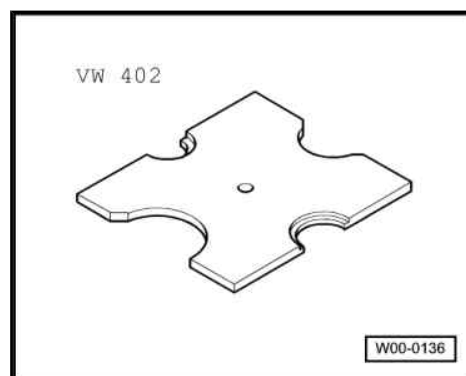
3.5 Renewing mounting bracket and ball bearing for flange shaft (left-side)

Special tools and workshop equipment required

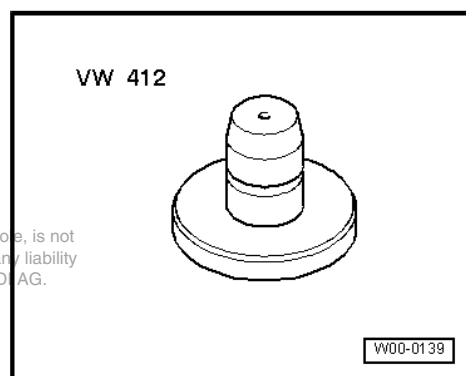
- ◆ Thrust plate - VW 401-



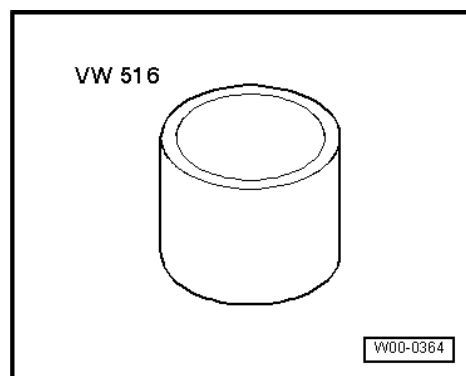
- ◆ Thrust plate - VW 402-



- ◆ Press tool - VW 412-

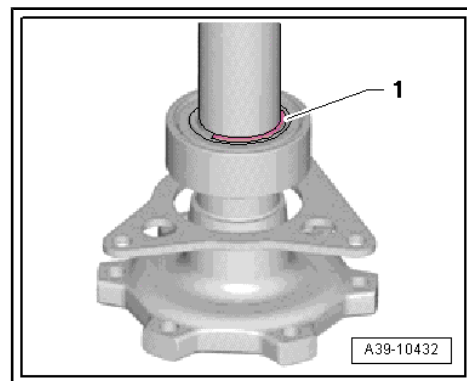


- ◆ Tube - VW 516-

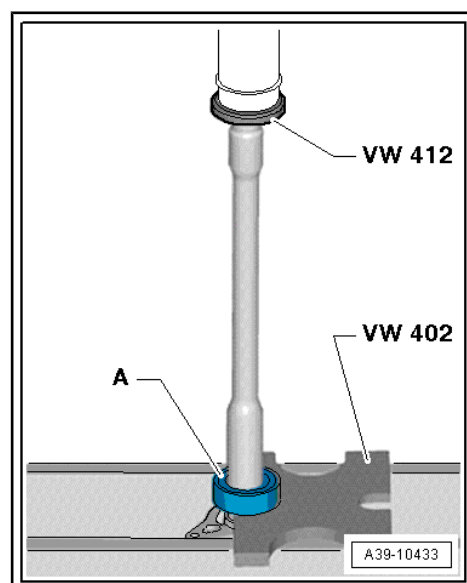


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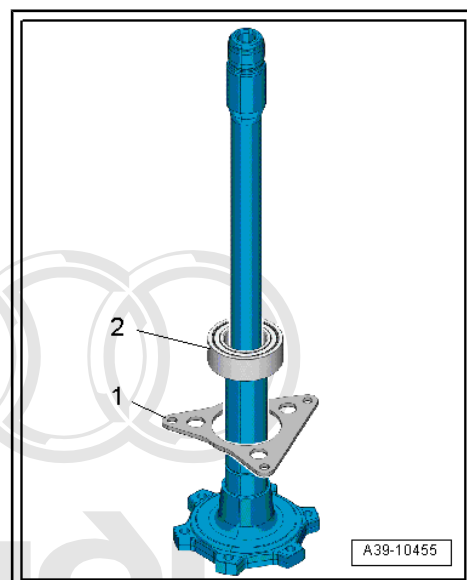
- Remove flange shaft (left-side) ➔ [page 151](#) .
- Remove circlip -1- from flange shaft.



- Press ball bearing -A- off flange shaft.

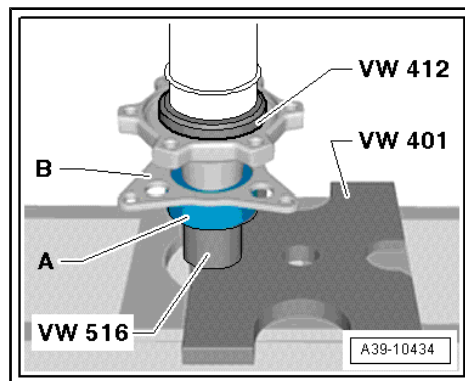


- Fit new mounting bracket -1-.
- Installation position: side with lettering faces towards flange for drive shaft.
- Fit new ball bearing -2-.

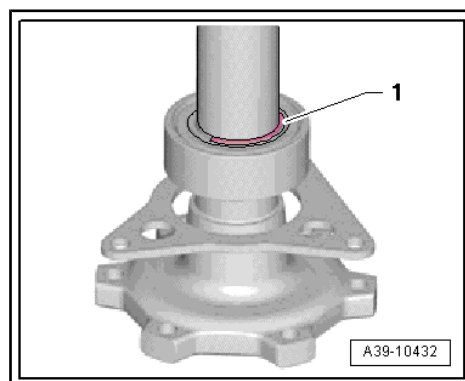


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- With mounting bracket -B- installed, press on ball bearing -A- as far as stop.



- Fit circlip -1- in annular groove on flange shaft.

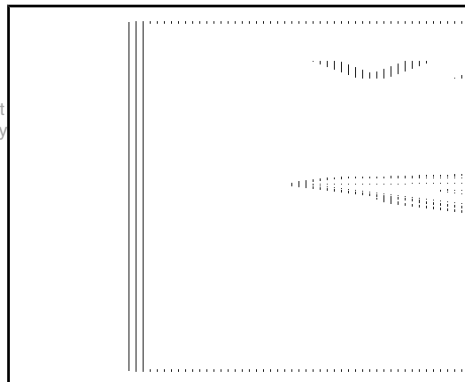


3.6 Removing and installing differential

Special tools and workshop equipment required

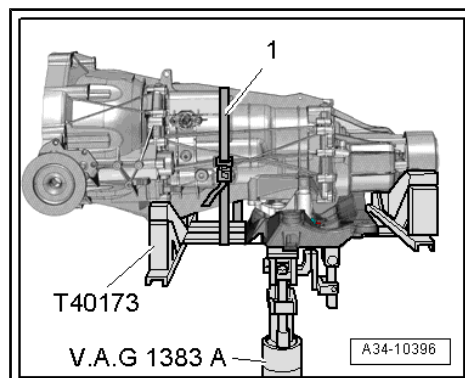
- ♦ Drip tray for workshop hoist - VAS 6208-

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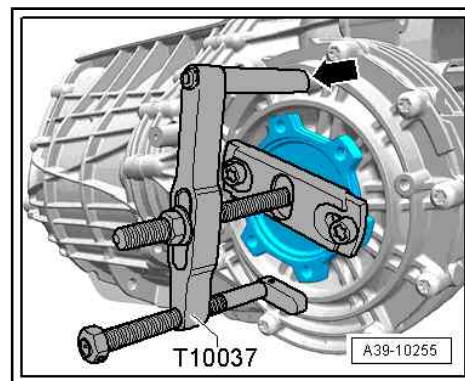


Removing

- Gearbox removed ⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Removing and installing gearbox; Removing gearbox .
- Gearbox is secured to gearbox support - T40173- with tensioning strap -1-.
- Tilt gearbox towards rear and slightly to left with gearbox support - T40173- to prevent gear oil from escaping.
- Place drip tray - VAS 6208- under the gearbox.



- Remove flange shaft (right-side) ➔ [page 149](#) .



Unscrew bolts -arrows- and detach cover for final drive.

- Carefully detach cover for final drive (remaining gear oil will drain off).

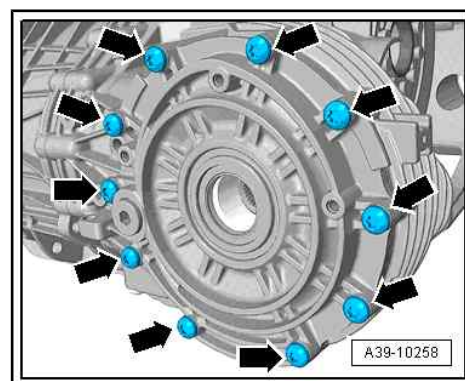


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Risk of damage to the differential.

- ◆ *Detach cover for final drive from gearbox housing slowly and carefully. The differential may otherwise fall out of the gearbox.*
- ◆ *If the crown wheel or the differential cage have been damaged due to a fall, the differential must not be re-installed. If the differential has been damaged, the gearbox housing together with the installed final drive gear set must be renewed. Tapered roller bearings on differential can be renewed.*

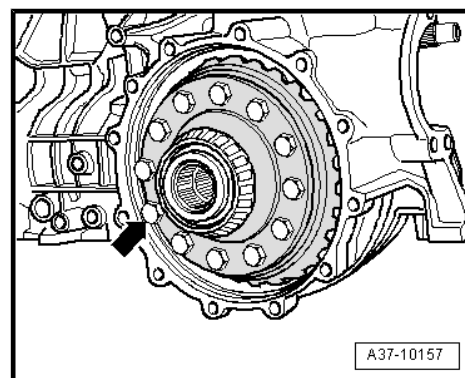


- Carefully remove differential -arrow- and set it down on a soft surface.



Note

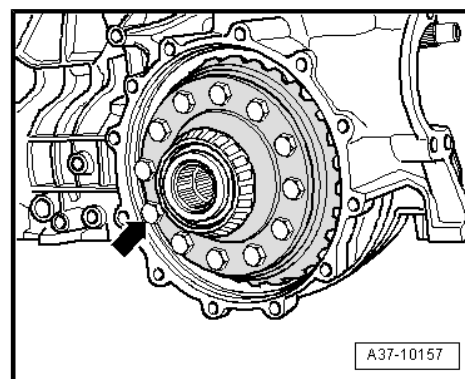
If tapered roller bearing outer race (left-side) of differential requires renewal, first remove flange shaft (left-side) ➔ [page 151](#) .



Installing

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

- Fit differential -arrow-.

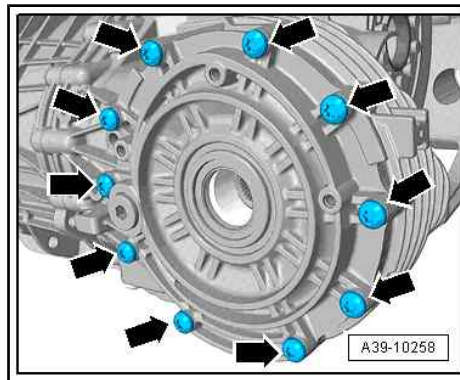


- Install cover for final drive with new O-ring and tighten bolts -arrows-. Tightening torque ➔ [Item 8 \(page 146\)](#)
- Install flange shaft (right-side) ➔ [page 150](#) .

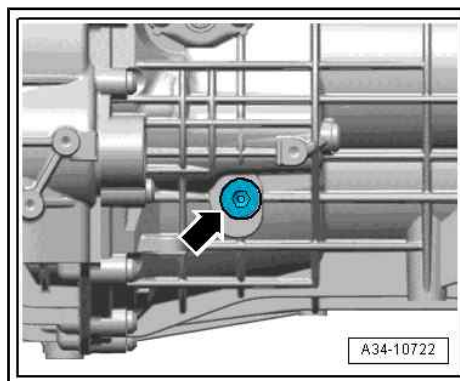


Note

If previously removed, install flange shaft (left-side) ➔ [page 151](#) .



- After installing gearbox, unscrew oil filler plug -arrow-, fill up gear oil in gearbox and check oil level ➔ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Gear oil; Checking gear oil level .



3.7 Renewing cover for final drive

➔ ["3.7.1 Renewing cover for final drive, version with tapered roller bearings up to gearbox manufacturing date 14 08 11", page 164](#)

➔ ["3.7.2 Renewing cover for final drive, version with angular contact ball bearing \(high-efficiency bearing\) from gearbox manufacturing date 15 08 11 onwards", page 171](#)

3.7.1 Renewing cover for final drive, version with tapered roller bearings up to gearbox manufacturing date 14 08 11



Note

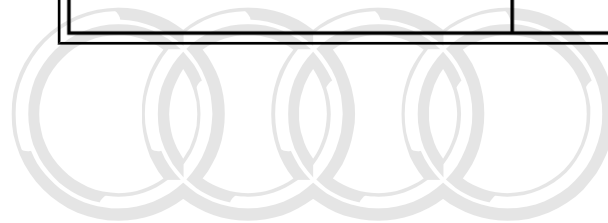
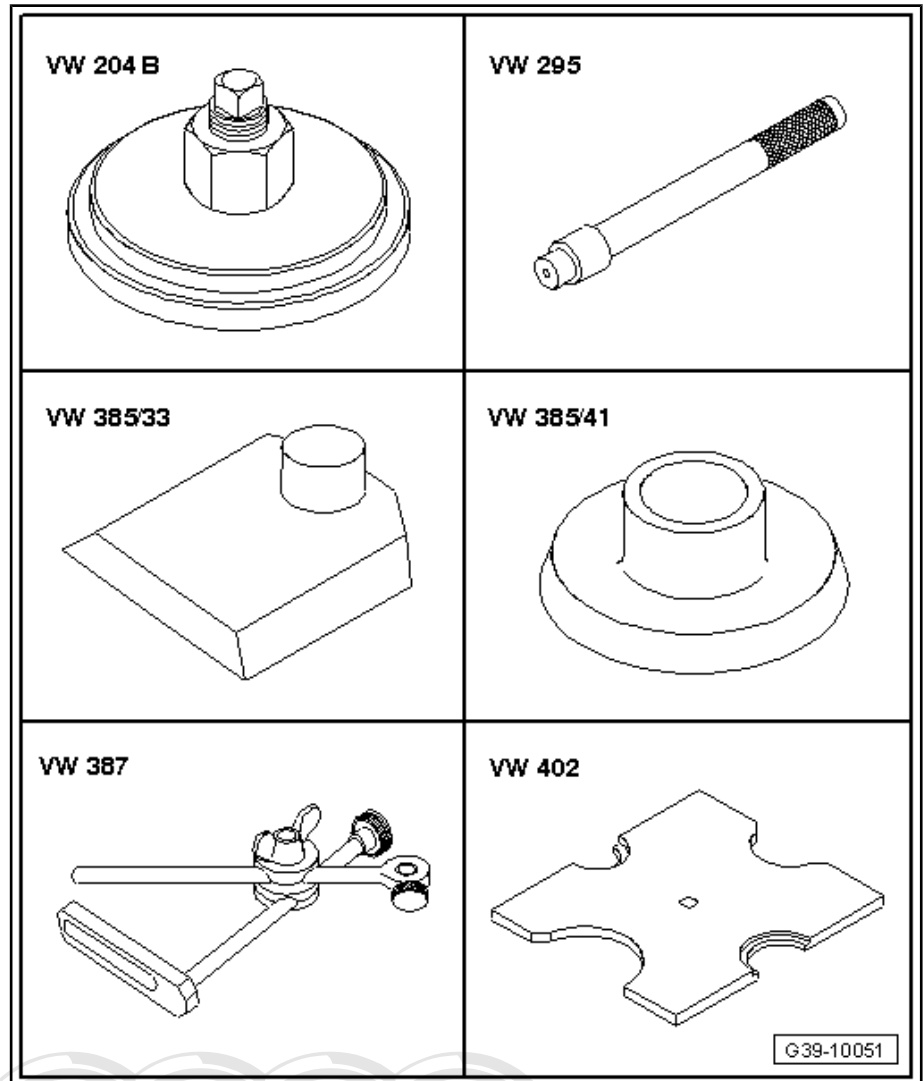
- ◆ Different versions of the cover for final drive are installed depending on the version.
- ◆ When renewing cover for final drive, determine thickness of new shim to adjust preload of bearings for differential.
- ◆ This shim is located behind the outer race in the cover for the final drive.

Old version (standard bearings) up to gearbox manufacturing date 14 08 11:

- Differential with 2 tapered roller bearings

Special tools and workshop equipment required

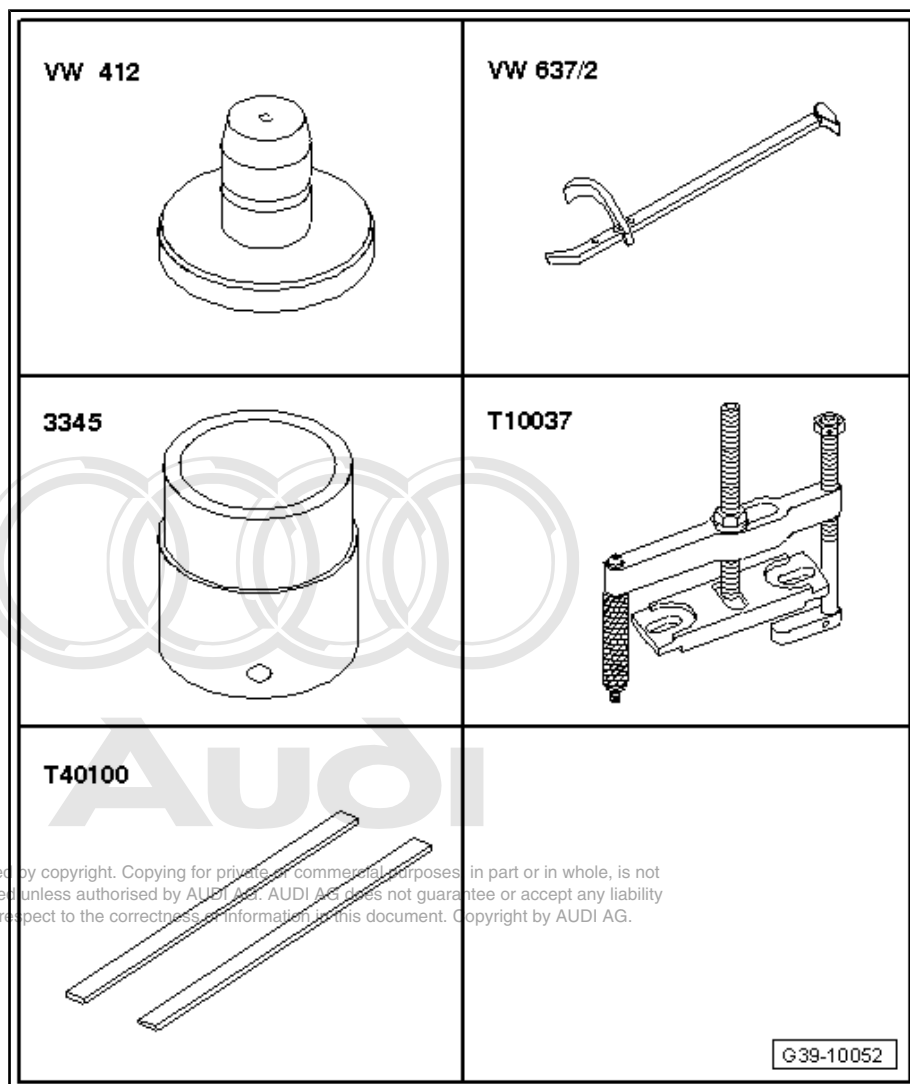
- ◆ Crankshaft seal installing tool - VW 204 B-
- ◆ Drift - VW 295-
- ◆ Measuring plate - VW 385/33-
- ◆ Centring disc - VW 385/41- for cover with tapered roller bearing outer race
- ◆ Universal dial gauge bracket - VW 387-
- ◆ Thrust plate - VW 402-



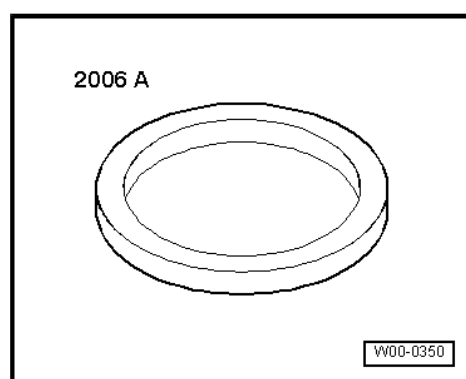
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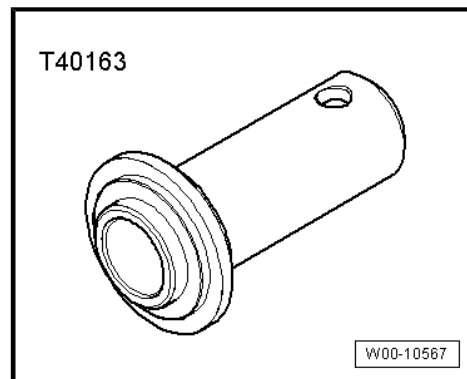
- ◆ Press tool - VW 412-
- ◆ Hub grease cap puller - VW 637/2-
- ◆ Wheel bearing tube - 3345-
- ◆ Puller - T10037-
- ◆ Ruler - T40100-



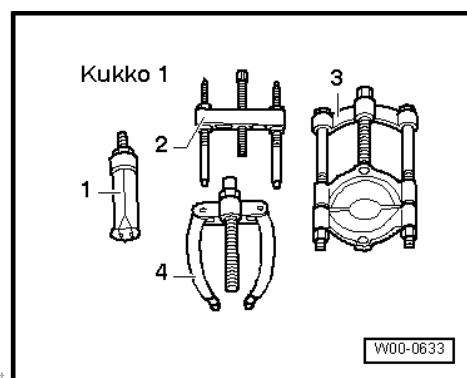
- ◆ Thrust ring - 2006 A-



- ◆ Thrust piece - T40163-

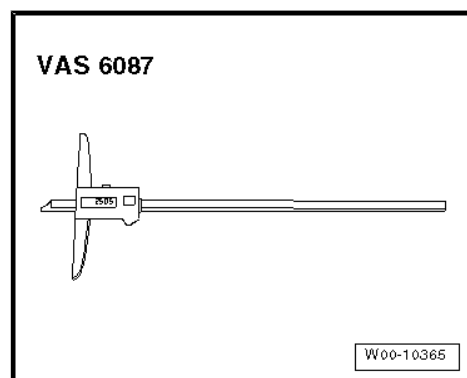


- ◆ -1- Internal puller - Kukko 21/89-

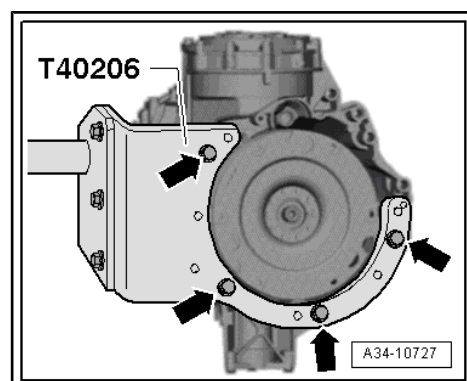


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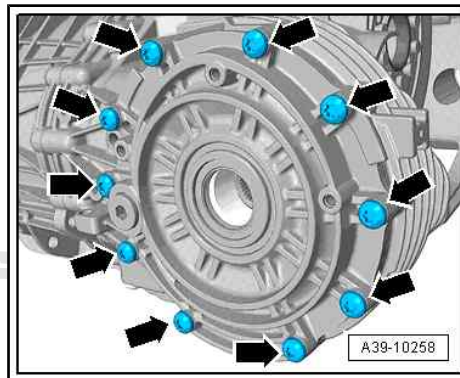
- ◆ -4- Counter-support - Kukko 22/4-
- ◆ Digital depth gauge - VAS 6087-



- ◆ Dial gauge , e.g. -VAS 6080-
- ◆ Sealing grease - G 052 128 A1-
- Gearbox removed ⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Removing and installing gearbox; Removing gearbox .
- Secure gearbox to gearbox support ⇒ [page 42](#) .
- Turn gearbox so that cover for final drive points upwards.
- Remove flange shaft (right-side) ⇒ [page 149](#) .



- Unscrew bolts -arrows- and detach cover for final drive.

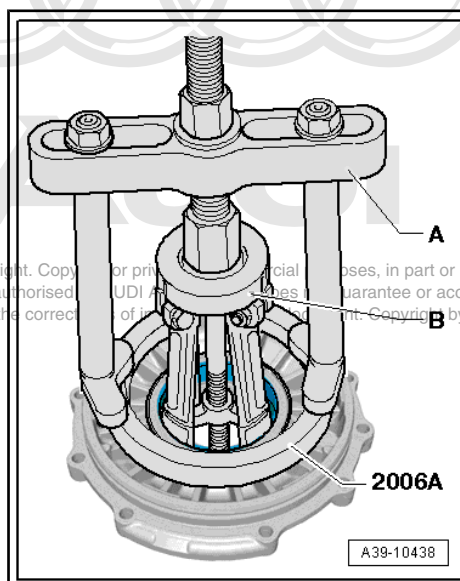


- Pull out outer race using internal puller - Kukko 21/89- -B- and counter support - Kukko 22/4- -A-.

A - Counter-support , e.g. -Kukko 22/4-

B - Internal puller 56 ... 110 mm , e.g. -Kukko 21/89-

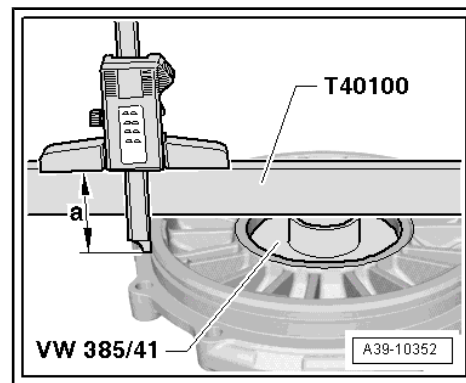
- Remove existing shim.



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Determining thickness of shim

- Measure dimension -a- on old cover and new cover as follows:
 - Inert old shim in cover so that centring disc - VW 385/41- is positioned exactly during following procedure.
- Insert centring disc - VW 385/41- in bearing seat for tapered roller bearing outer race.
- Using digital depth gauge (e.g. digital depth gauge - VAS 6087-), measure down to joint flange.



Example:

Dimension -a- on old cover for final drive	68.40 mm
Dimension -a- on new cover for final drive	68.65 mm
Difference	= 0.25 mm

- Install thicker shim if dimension -a- is smaller on new cover.
- Install thinner shim if dimension -a- is greater on new cover.

Example:

Existing shim	1.50 mm
Difference	– 0.25 mm
New shim	= 1.25 mm



Note

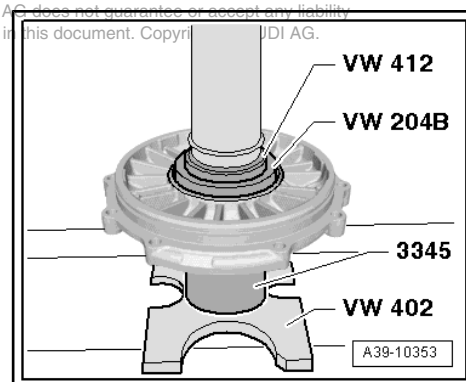
Select correct shim from ⇒ *Electronic parts catalogue* .

- The shim thickness in this example is 1.25 mm.
- Install new shim of required thickness in new cover for final drive.
- Press in tapered roller bearing outer race as far as stop: smaller Ø of -VW 204 B- goes towards outer race.



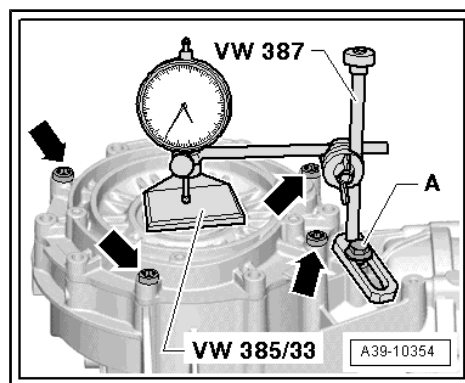
Note

Support cover for final drive with -3345- directly below bearing seat.



Check adjustment of preload of tapered roller bearings for differential as follows:

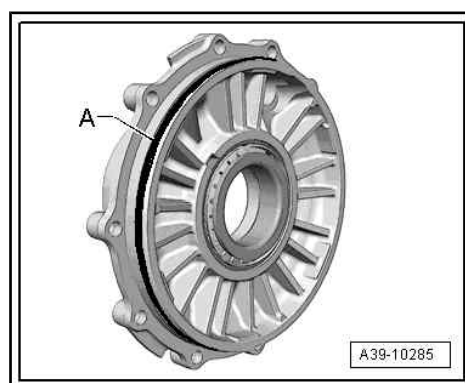
- Fit cover for final drive without O-ring and tighten 4 bolts -arrows-.
- Attach measuring equipment to gearbox housing.
- Secure universal dial gauge bracket - VW 387- to threaded hole in gearbox housing with bolt -A-.
- Apply dial gauge extension to centre of measuring plate - VW 385/33- .
- Set dial gauge , e.g. -VAS 6080- to »0« with 1 mm preload.
- Slacken 4 bolts -arrows- by one turn in diagonal sequence.
- Check reading on dial gauge.
- It should be 0.10 ... 0.15 mm for bearings with low mileage.



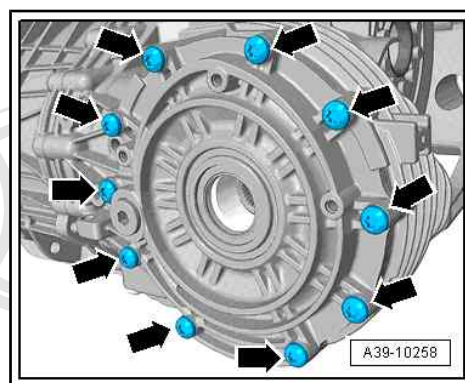
Note

For bearings with high mileage, measured value must be at least 0.05 ... 0.10 mm.

- Renew O-ring -A-.



- Install cover for final drive and tighten bolts -arrows-; tightening torque ➔ [Item 12 \(page 137\)](#) .
- Install new flange shaft oil seal (right-side) ➔ [page 138](#) .
- Install flange shaft (right-side) ➔ [page 150](#) .
- If gear oil has been drained off, fill up gearbox with gear oil and check oil level ➔ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Gear oil; Checking gear oil level .



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3.7.2 Renewing cover for final drive, version with angular contact ball bearing (high-efficiency bearing) from gearbox manufacturing date 15 08 11 onwards



Note

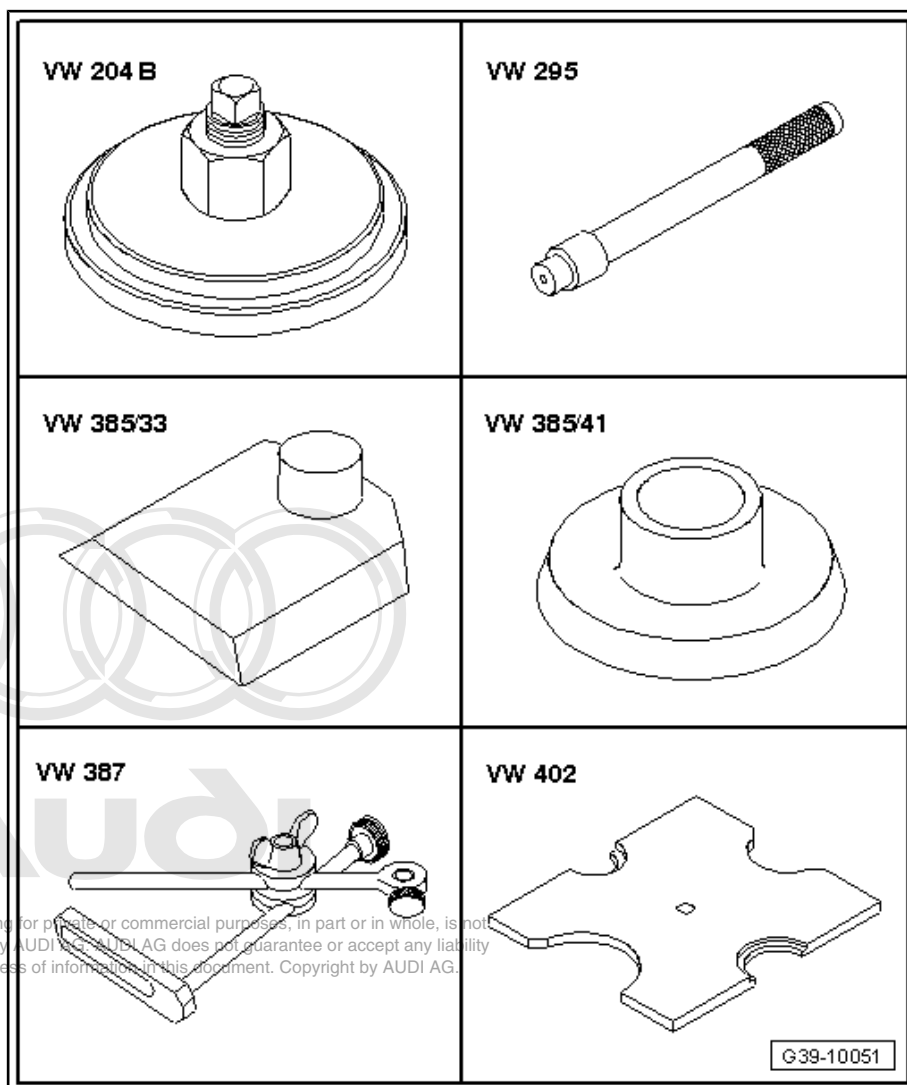
- ◆ Different versions of the cover for final drive are installed depending on the version.
- ◆ When renewing cover for final drive, determine thickness of new shim to adjust preload of bearings for differential.
- ◆ This shim is located behind the outer race in the cover for the final drive.

New version (high-efficiency bearings) from gearbox manufacturing date 15 08 11 onwards:

- Differential with tapered roller bearing on left and angular contact ball bearing on right

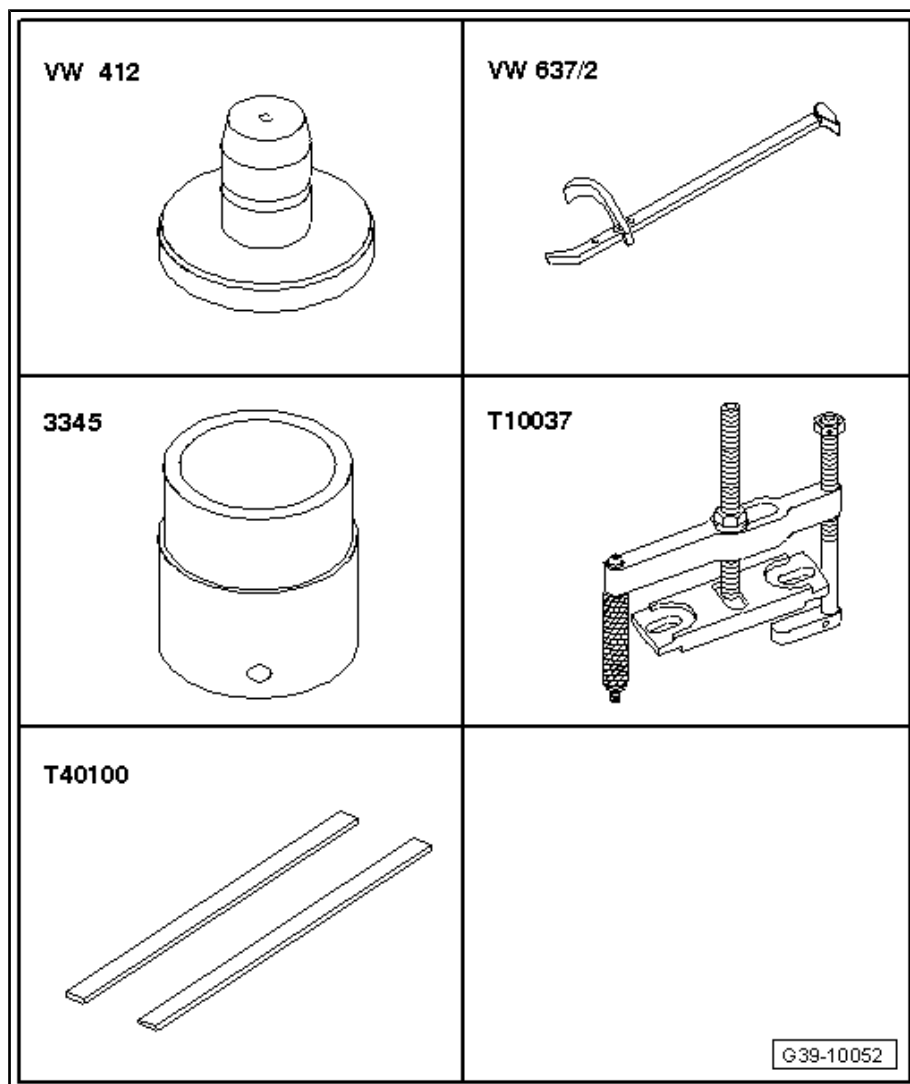
Special tools and workshop equipment required

- ◆ Crankshaft seal installing tool - VW 204 B-
- ◆ Drift - VW 295-
- ◆ Measuring plate - VW 385/33-
- ◆ Centring disc - VW 385/41- for cover with tapered roller bearing outer race
- ◆ Universal dial gauge bracket - VW 387-
- ◆ Thrust plate - VW 402-

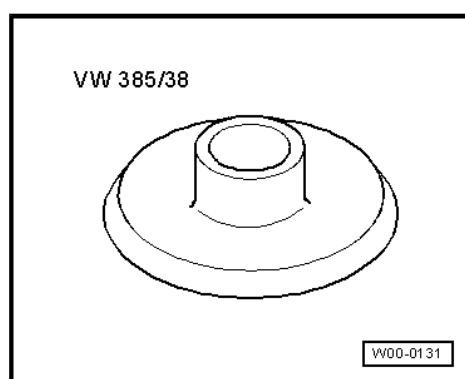


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- ◆ Press tool - VW 412-
- ◆ Hub grease cap puller - VW 637/2-
- ◆ Wheel bearing tube - 3345-
- ◆ Puller - T10037-
- ◆ Ruler - T40100-

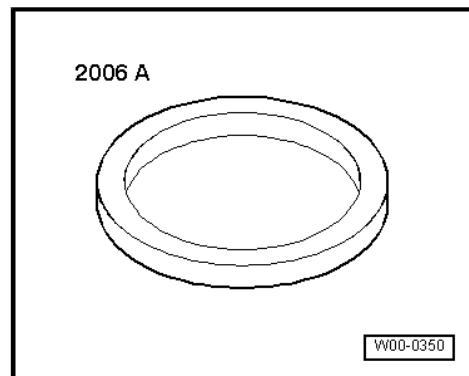


- ◆ Centring disc - VW 385/38- for cover with outer race for angular contact ball bearing

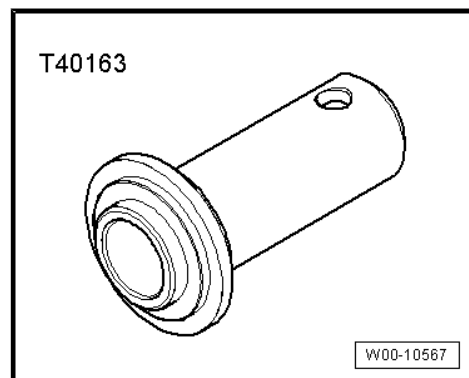


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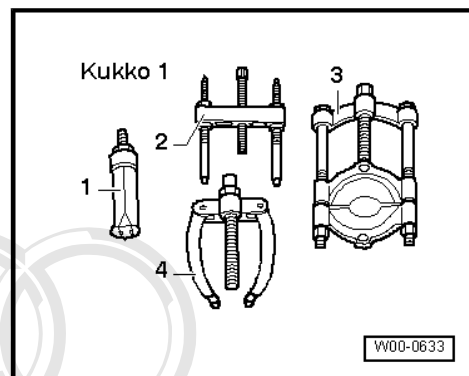
◆ Thrust ring - 2006 A-



◆ Thrust piece - T40163-

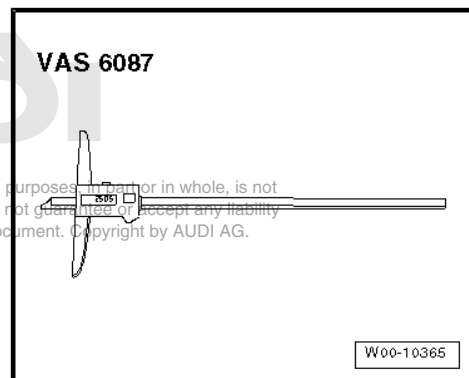


◆ -1- Internal puller - Kukko 21/89-



◆ -4- Counter-support - Kukko 22/4-

◆ Digital depth gauge - VAS 6087-



◆ Dial gauge , e.g. -VAS 6080-

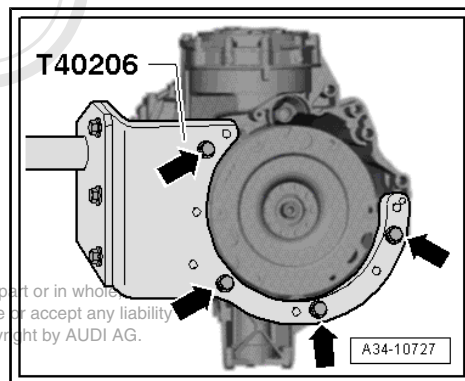
◆ Sealing grease - G 052 128 A1-

- Gearbox removed ⇒ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Removing and installing gearbox; Removing gearbox .

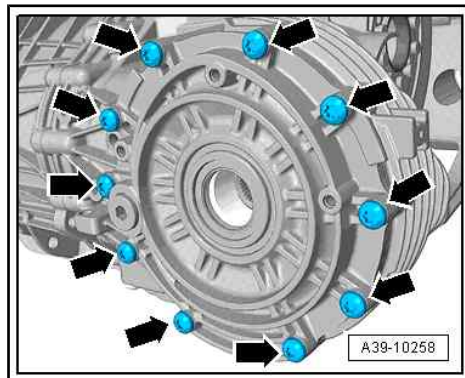
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- Secure gearbox to gearbox support ➤ [page 42](#) .
- Turn gearbox so that cover for final drive points upwards.
- Remove flange shaft (right-side) ➤ [page 149](#) .

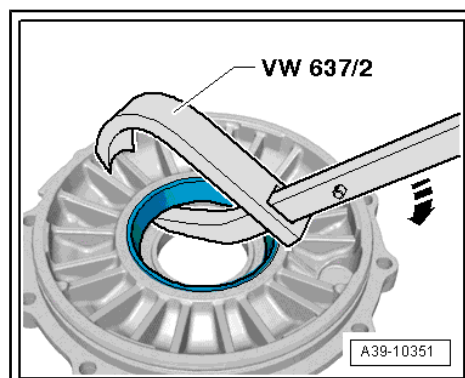
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- Unscrew bolts -arrows- and detach cover for final drive.



- First press outer race for angular contact ball bearing slightly off bearing seat by applying hub grease cap puller - VW 637/2- continuously in small stages and pressing in direction of -arrow-.

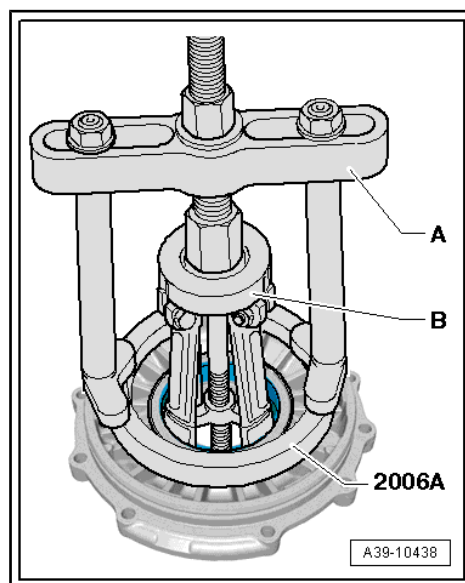


- Then pull out outer race using internal puller - Kukko 21/89- -B- and counter support - Kukko 22/4- -A-.

A - Counter-support , e.g. -Kukko 22/4-

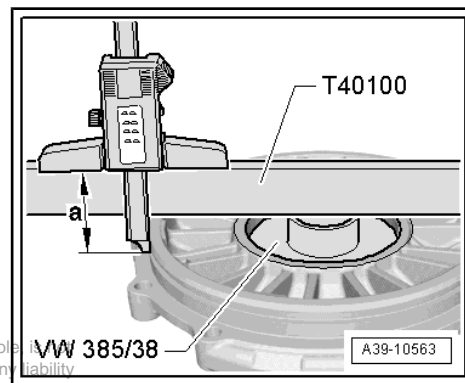
B - Internal puller 56 ... 110 mm , e.g. -Kukko 21/89-

- Remove existing shim.



Determining thickness of shim

- Measure dimension -a- on old cover and new cover as follows:
 - Inert old shim in cover so that centring disc - VW 385/38- is positioned exactly during following procedure.
- Insert centring disc - VW 385/38- in bearing seat for outer race for angular contact ball bearing.
- Using digital depth gauge (e.g. digital depth gauge - VAS 6087-), measure down to joint flange.



Example:

Dimension -a- on old cover for final drive	67.45 mm
Dimension -a- on new cover for final drive	67.60 mm
Difference	= 0.15 mm

- Install thicker shim if dimension -a- is smaller on new cover.
- Install thinner shim if dimension -a- is greater on new cover.

Example:

Existing shim	1.30 mm
Difference	– 0.15 mm
New shim	= 1.15 mm



Note

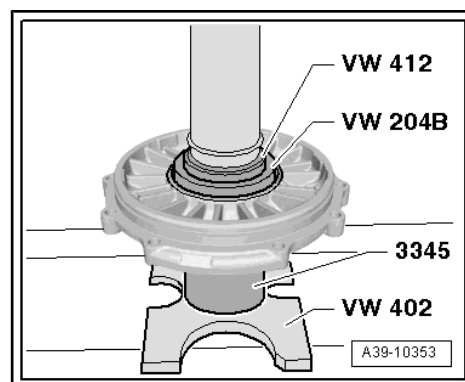
Select correct shim from ⇒ *Electronic parts catalogue* .

- The shim thickness in this example is 1.15 mm.
- Install new shim of required thickness in new cover for final drive.
- Press in outer race for angular contact ball bearing onto stop; larger Ø of -VW 204 B- faces towards outer race.



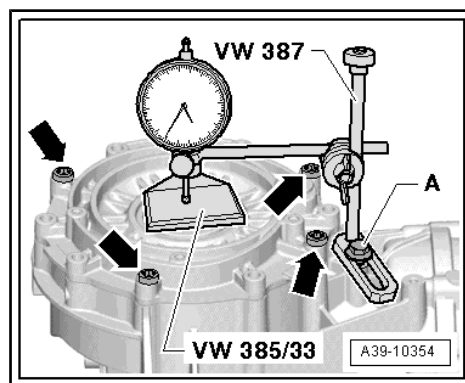
Note

Support cover for final drive with -3345- directly below bearing seat.



Check adjustment of preload of bearings for differential as follows:

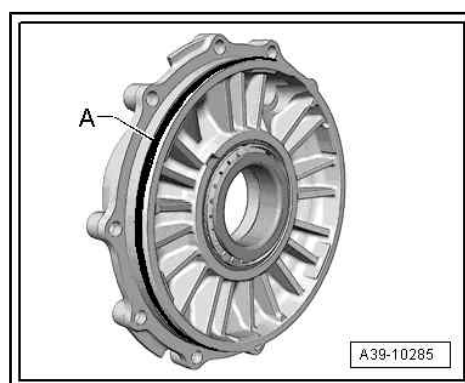
- Fit cover for final drive without O-ring and tighten 4 bolts -arrows-.
- Attach measuring equipment to gearbox housing.
- Secure universal dial gauge bracket - VW 387- to threaded hole in gearbox housing with bolt -A-.
- Apply dial gauge extension to centre of measuring plate - VW 385/33- .
- Set dial gauge , e.g. -VAS 6080- to »0« with 1 mm preload.
- Slacken 4 bolts -arrows- by one turn in diagonal sequence.
- Check reading on dial gauge.
- It should be 0.25 ... 0.30 mm for bearings with low mileage.



Note

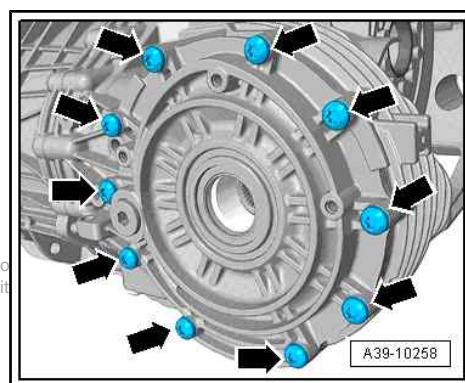
For bearings with high mileage, measured value must be at least 0.05 mm.

- Renew O-ring -A-.



- Install cover for final drive and tighten bolts -arrows-; tightening torque ➔ [Item 12 \(page 137\)](#) .
- Install new flange shaft oil seal (right-side) ➔ [page 138](#) .
- Install flange shaft (right-side) ➔ [page 150](#) .
- If gear oil has been drained off, fill up gearbox with gear oil and check oil level ➔ 6-speed manual gearbox 0B2; Rep. gr. 34 ; Gear oil; Checking gear oil level .

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3.8 Dismantling and assembling differential

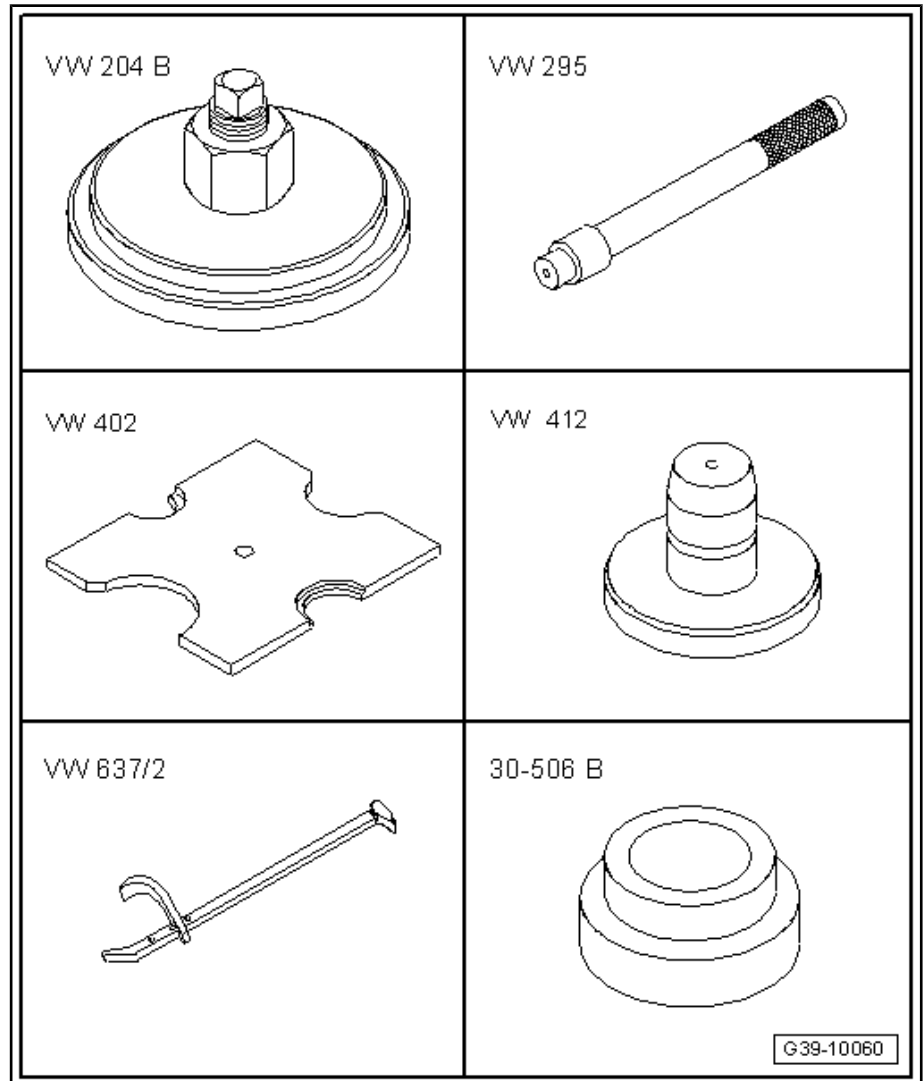


Note

- ♦ Observe the general repair instructions for tapered roller bearings and shims ➔ [page 2](#) .
- ♦ Before carrying out assembly work on differential, drain off gearbox oil and secure gearbox to assembly stand ➔ [page 42](#) .

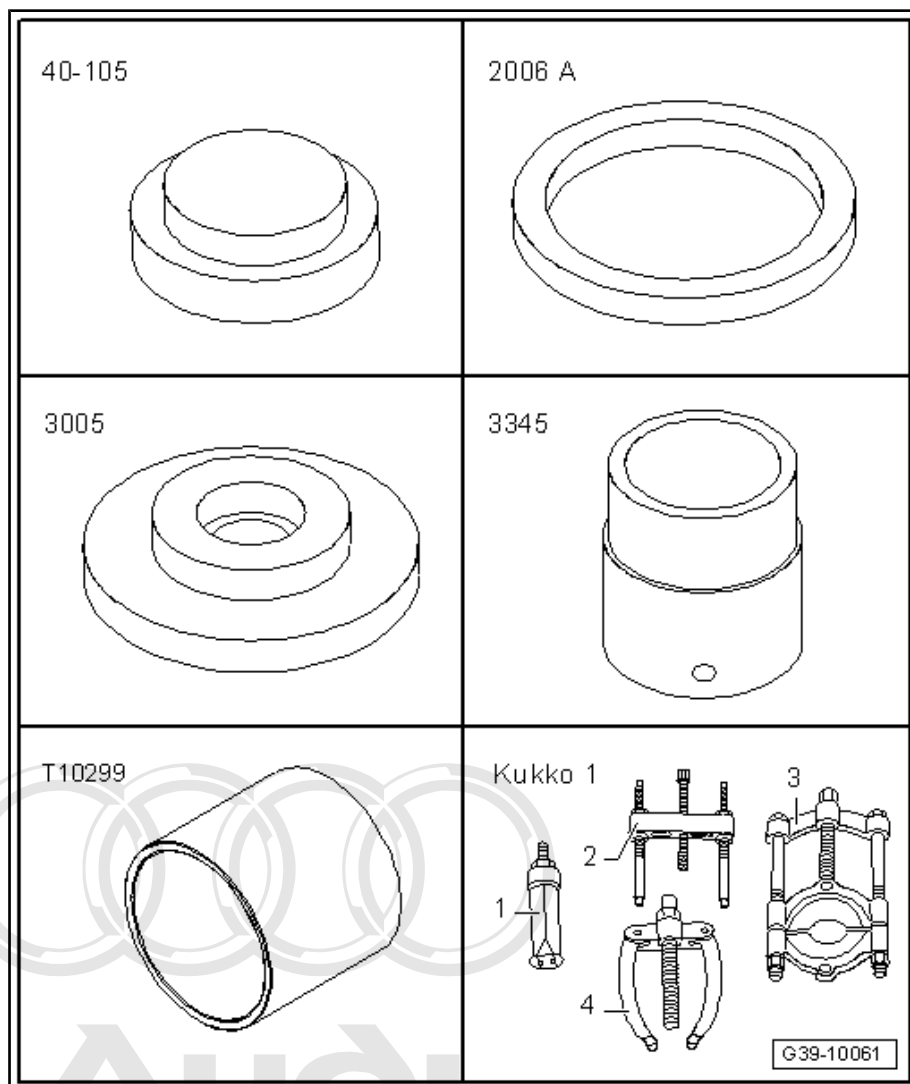
Special tools and workshop equipment required

- ◆ Crankshaft seal installing tool - VW 204 B-
- ◆ Drift - VW 295-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 412-
- ◆ Press tool - VW 408 A-
- ◆ Hub grease cap puller - VW 637/2-
- ◆ Press tool - 30 - 506 B-

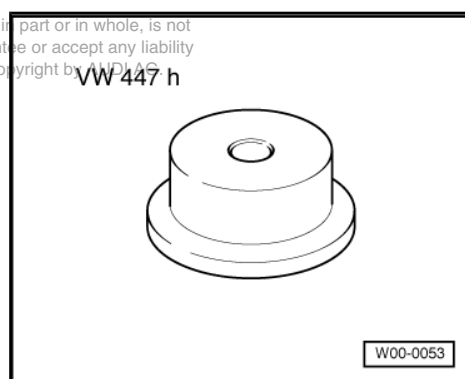


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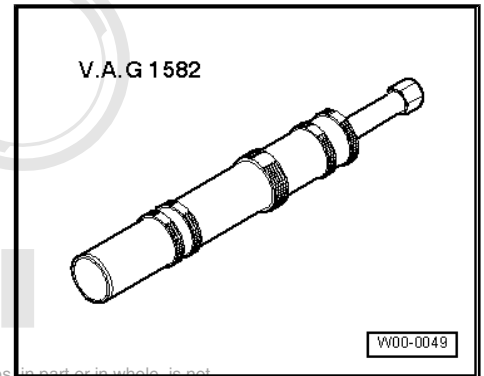
- ◆ Thrust plate - 40 - 105-
- ◆ Thrust ring - 2006 A-
- ◆ Thrust plate - 3005-
- ◆ Wheel bearing tube - 3345-
- ◆ Pressure sleeve - T10299-
- ◆ -1- Internal puller - Kukko 21/89-
- ◆ -1- Internal puller 56 ... 70 mm - VAS 6775-
- ◆ -4- Counter-support -Kukko 22/2-
- ◆ -4- Counter-support -Kukko 22/4-



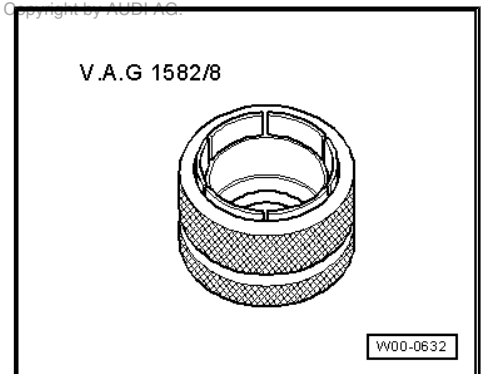
- ◆ Thrust plate - VW 447 H-



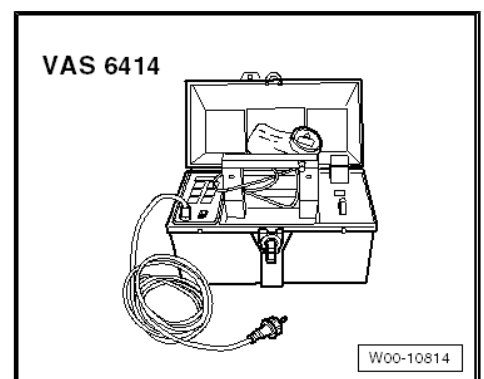
- ◆ Tapered roller bearing puller - V.A.G 1582-



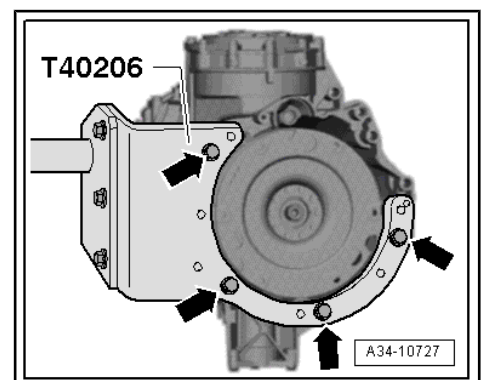
- ◆ Adapter - V.A.G 1582/8-



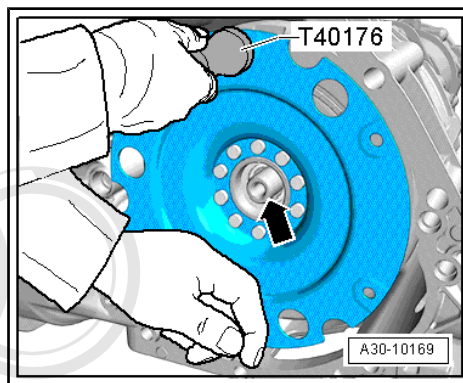
- ◆ Adapter - VAS 1582/15-
- ◆ Inductive heater - VAS 6414-



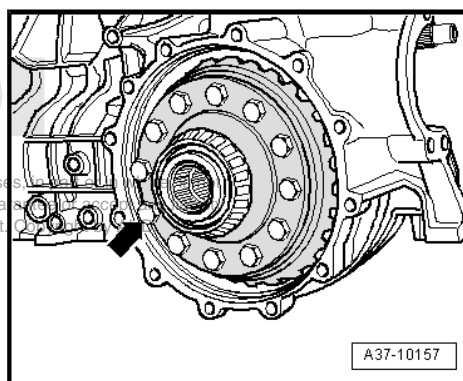
- Secure gearbox to gearbox support ⇒ [page 42](#) and drain off gearbox oil.



- Remove clutch module ➔ [page 25](#) .



- Remove differential ➔ [page 162](#) .

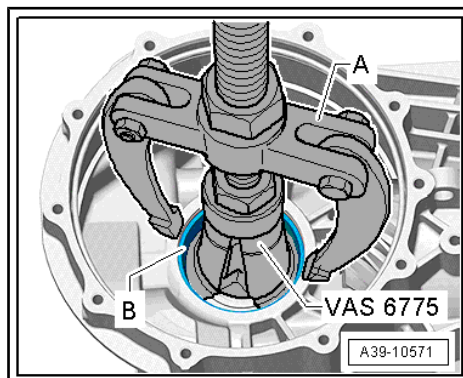


Pulling -B- tapered roller bearing outer race (left-side) out of gear-box housing

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

To pull outer race out, apply internal puller - VAS 6775- beneath outer race -B-.

- After removing, check shim for damage.

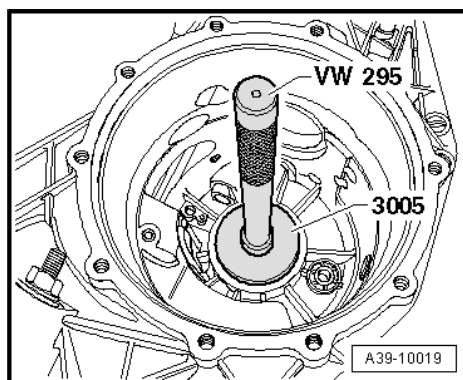


Driving tapered roller bearing outer race (left-side) into gearbox housing



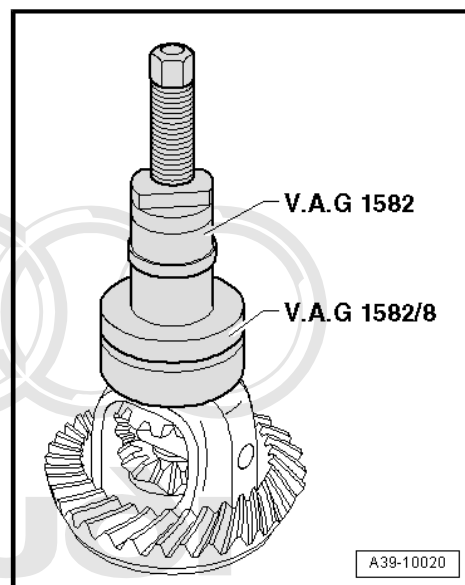
Note

First insert shim in gearbox housing.



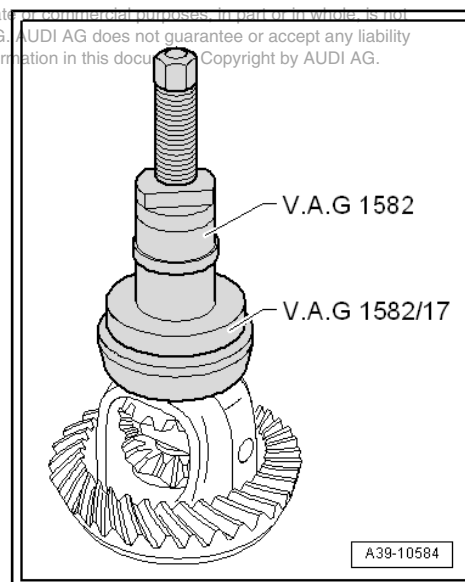
Pulling off tapered roller bearing inner race (left-side) - standard bearings

- Before setting up the puller, place thrust plate - 40 - 105- on differential cage.



Pulling off tapered roller bearing inner race (left-side) - high-efficiency bearings

- Before setting up the puller, place thrust plate - 40 - 105- on differential cage.



Pressing on tapered roller bearing inner race (left-side) - standard and high-efficiency bearings



WARNING

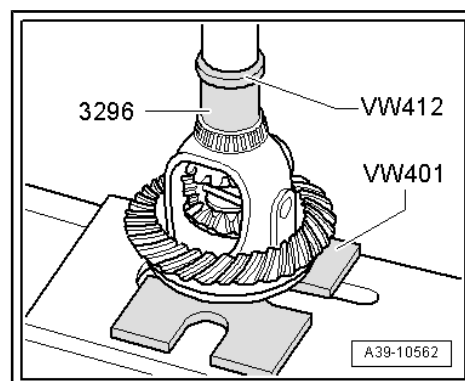
Wear protective gloves.



Note

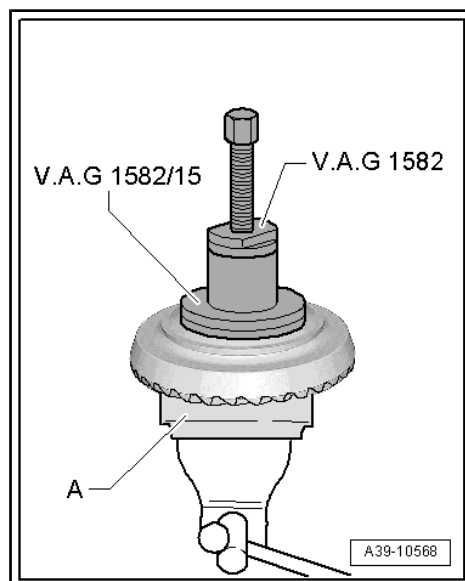
Support bottom of differential with press tool - 30 - 506 B- (do not apply to inner race).

- Heat inner race to approx. 100 °C, fit in position and press home.



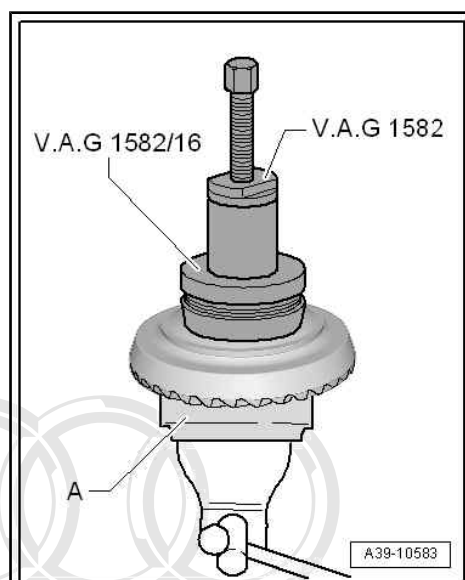
Pulling off tapered roller bearing inner race (right-side) - standard bearings

- Carefully secure differential in a vice with soft jaws -A-.
- Before setting up puller, place thrust pad - VW 447 H- on differential cage.



Pulling off inner race for angular contact ball bearing (right-side) - high-efficiency bearings

- Carefully secure differential in a vice with soft jaws -A-.
- Detach bearing cage and balls from from inner race.
- Before setting up puller, place thrust pad - VW 447 H- on differential cage.



Pressing on tapered roller bearing inner race (right-side) or inner race for angular contact ball bearing



WARNING

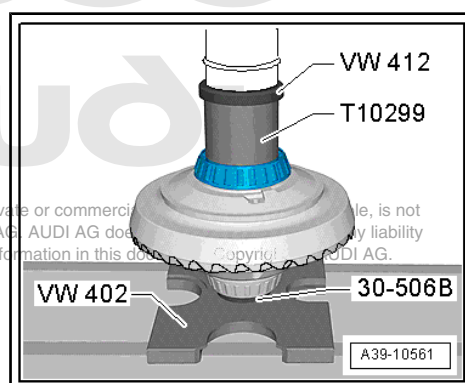
Wear protective gloves.



Note

Support bottom of differential with press tool - 30 - 506 B- (do not apply to inner race).

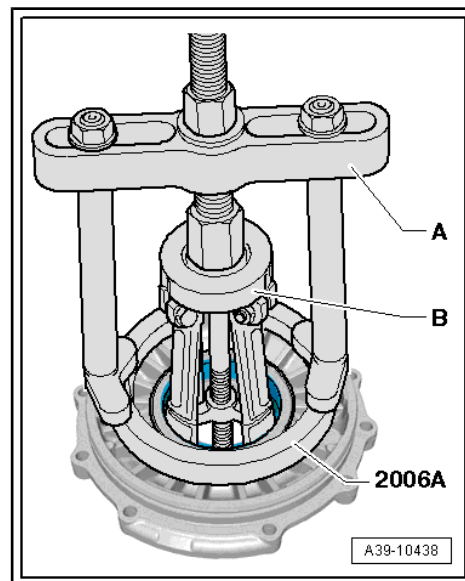
- Heat inner race to approx. 100 °C, fit in position and press home.



Pulling tapered roller bearing outer race out of cover for final drive

A - Counter-support , e.g. -Kukko 22/4-

B - Internal puller 56 ... 110 mm , e.g. -Kukko 21/89-



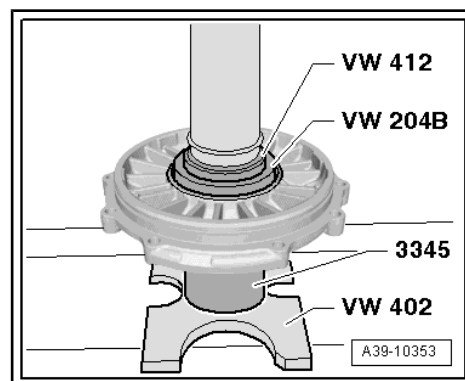
Pressing tapered roller bearing outer race (right-side) into final drive cover

- First install shim in cover for final drive.
- Press in tapered roller bearing outer race as far as stop; smaller Ø of -VW 204 B- goes towards outer race.



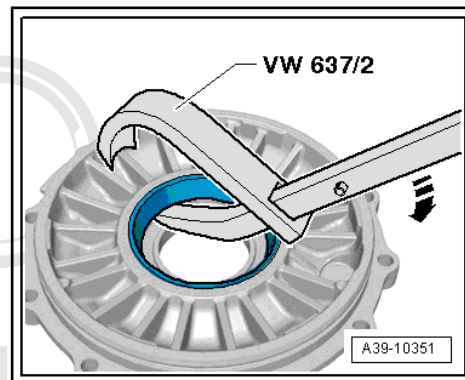
Note

Support cover for final drive with -3345- directly below bearing seat.



Removing outer race for angular contact ball bearing from final drive cover

- First press outer race for angular contact ball bearing slightly off bearing seat by applying hub grease cap puller - VW 637/2- continuously in small stages and pressing in direction of -arrow-.

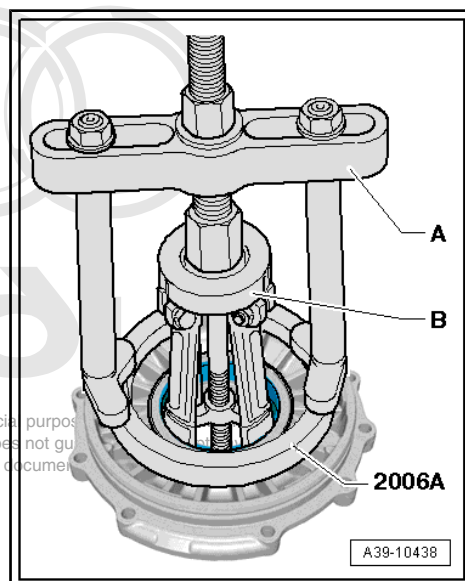


- Then pull out outer race using internal puller - Kukko 21/89-B- and counter support - Kukko 22/4- -A-.

A - Counter-support , e.g. -Kukko 22/4-

B - Internal puller 56 ... 110 mm , e.g. -Kukko 21/89-

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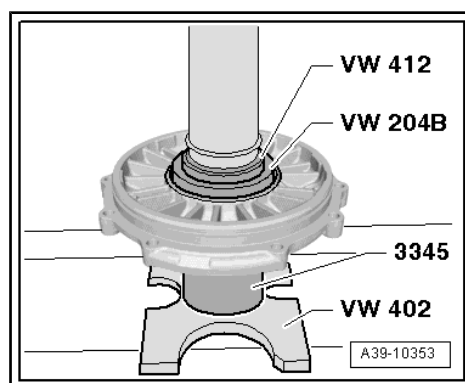
Pressing outer race for angular contact ball bearing into final drive cover

- First install shim in cover for final drive.
- Press in outer race for angular contact ball bearing; larger Ø of -VW 204 B- faces towards outer race.



Note

Support cover for final drive with -3345- directly below bearing seat.



3.9 Adjusting differential



Note

Careful adjustment of the differential is essential to ensure that the final drive gives long service and runs silently.

- The crown wheel must be adjusted when the tapered roller bearings of the differential have been renewed.
- The pinion shaft remains installed; for which reason backlash must always be present during adjustment process. Otherwise the gear set will be damaged.
- The gearbox must be secured to the assembly stand, and the clutch module with the flange shaft (right-side) must be removed.

Different versions of the bearings for the differential may be fitted.

- New bearings (high-efficiency bearings) were introduced from gearbox manufacturing date 15 08 11 onwards.

Old version (standard bearings) up to gearbox manufacturing date 14 08 11:

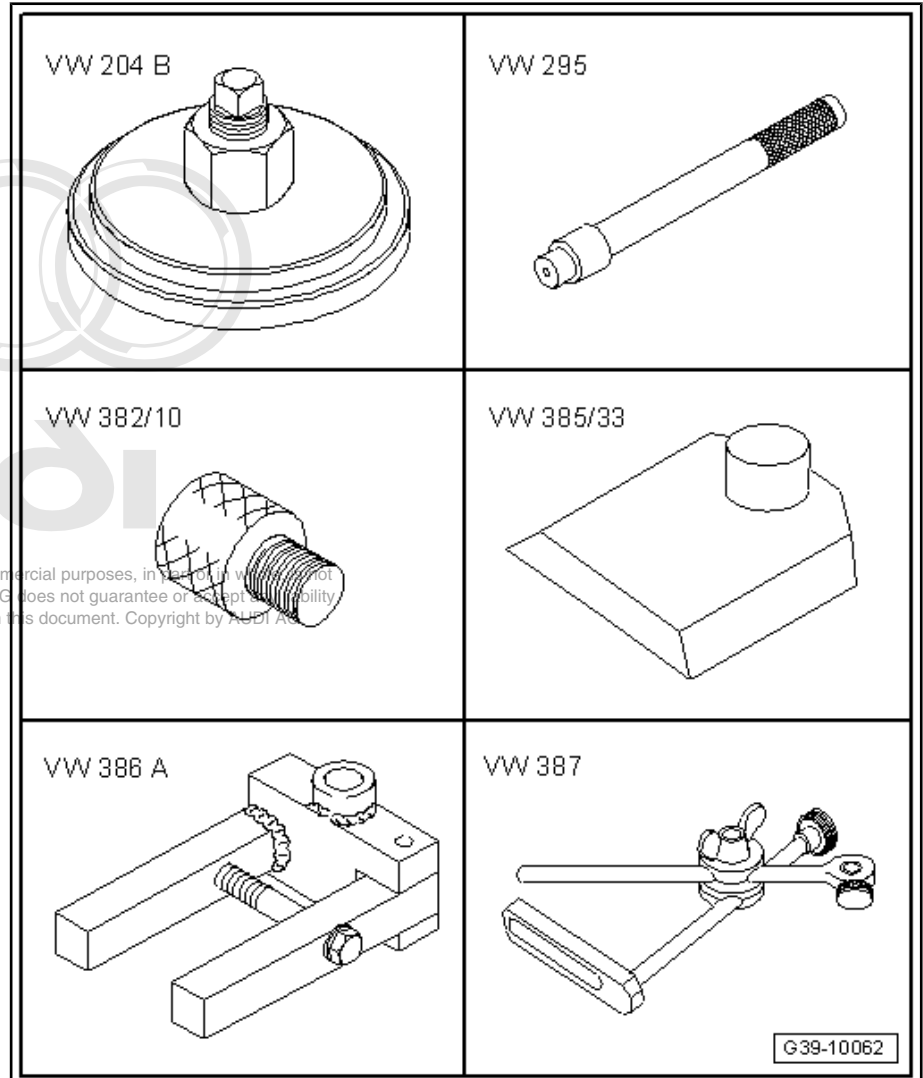
- Differential with 2 tapered roller bearings
- The process for adjusting the differential is described in this section.

New version (high-efficiency bearings) from gearbox manufacturing date 15 08 11 onwards:

- Differential with tapered roller bearing on left and angular contact ball bearing on right

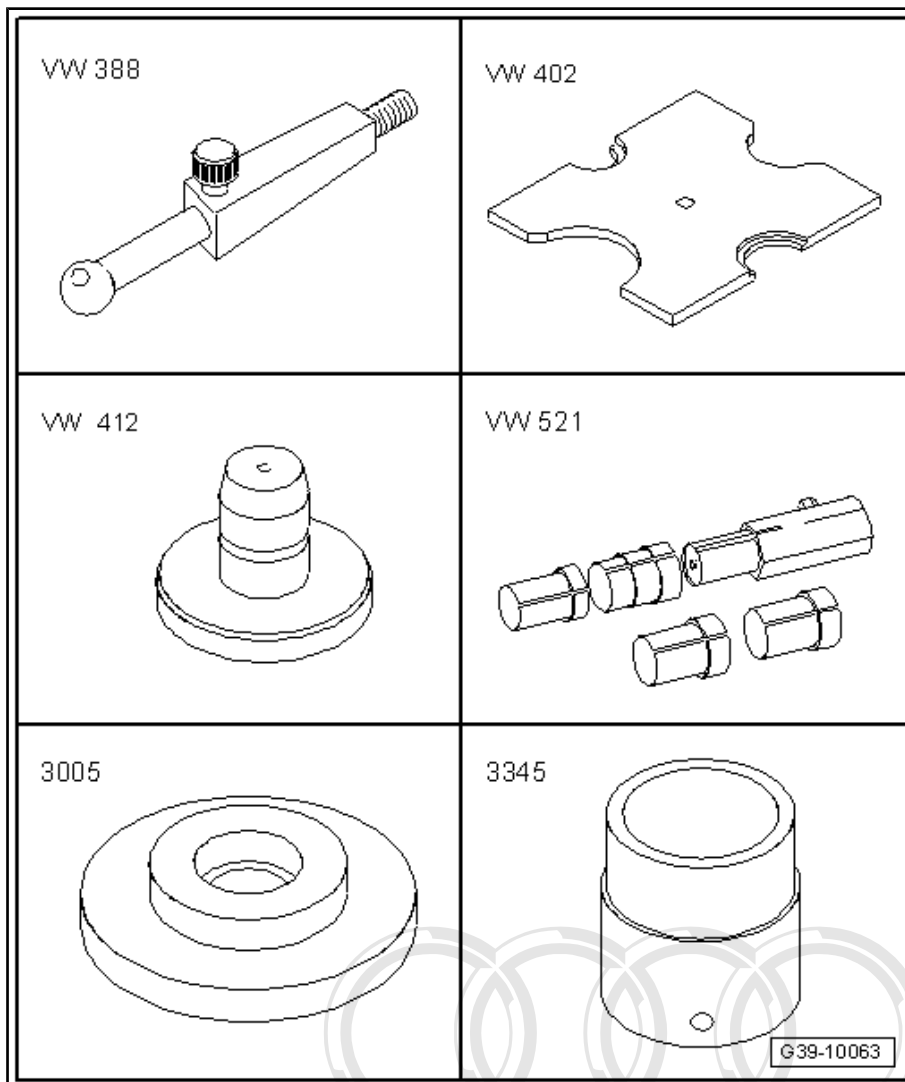
Special tools and workshop equipment required

- ◆ Crankshaft seal installing tool - VW 204 B-
- ◆ Drift - VW 295-
- ◆ Dial gauge extension - VW 382/10-
- ◆ Measuring plate - VW 385/33-
- ◆ Drive pinion clamp - VW 386 A-
- ◆ Universal dial gauge bracket - VW 387-

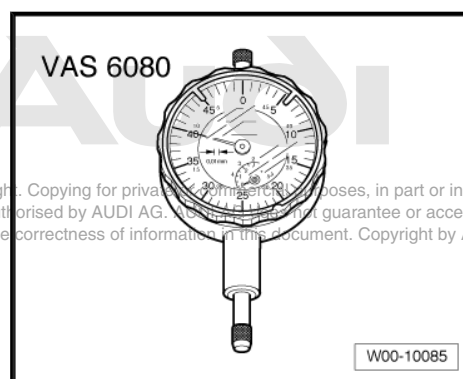


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- ◆ Adjustable measuring lever - VW 388-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 412-
- ◆ Crown wheel adjusting tool - VW 521-
- ◆ Thrust plate - 3005-
- ◆ Wheel bearing tube - 3345-



- ◆ Dial gauge , e.g. -VAS 6080-



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Determining total shim thickness " S_{total} " for shims " S_1 " + " S_2 "

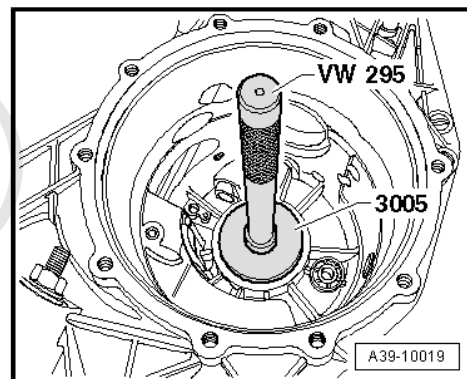
- Pull tapered roller bearing outer race (left-side) out of gearbox housing ➔ [page 180](#) .

- Drive new tapered roller bearing outer race (left-side) with old shim “S₁” (1.30 mm in example given) into gearbox housing.



Note

The old shim “S₁” (1.30 mm thick in the example given) is inserted for measurement purposes. This is referred to in the following as “S₁”. “S₁*” is exchanged with the final shim “S₁” after determining backlash.*



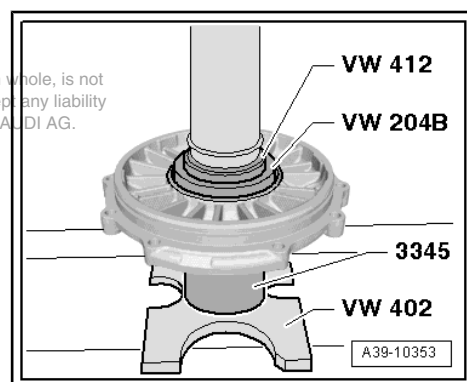
Gearbox with tapered roller bearing (right-side) on differential

- Pull tapered roller bearing outer race out of cover for final drive
⇒ [page 183](#)
- Press new tapered roller bearing outer race (right-side) with old shim “S₂” (0.87 mm thick in example given) into cover for final drive. When doing so, smaller Ø of -VW 204 B- faces outer race.



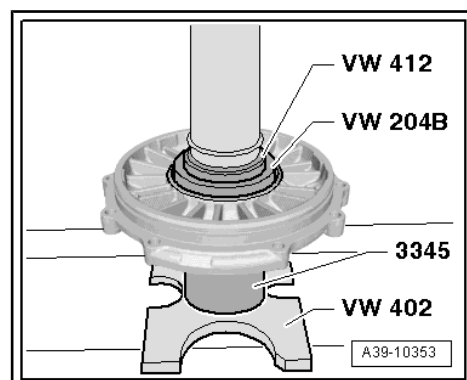
Note

- ◆ *The old shim “S₂” (0.87 mm thick in the example given) is inserted for measurement purposes. This is referred to in the following as “S₂*”. “S₂*” is exchanged with the final shim “S₂” after determining backlash.*
- ◆ *The total thickness of the shims “S₁*” and “S₂*” is 2.17 mm in this example.*
- ◆ *A shim must always be inserted before installing outer races.*



Gearbox with angular contact ball bearing (right-side) on differential

- Press new outer race for angular contact ball bearing (right-side) with old shim “S₂” into cover for final drive. When doing so, larger Ø of -VW 204 B- faces outer race.



Continued for all vehicles:

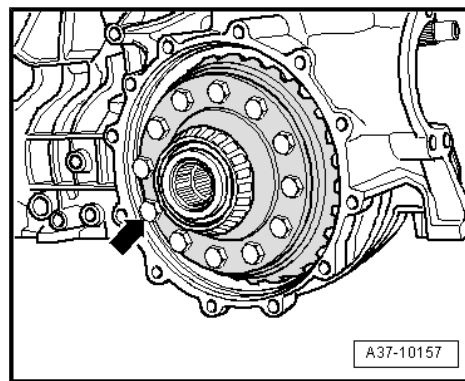
- Install differential -arrow- in gearbox housing.



Caution

Risk of damage to the gear set

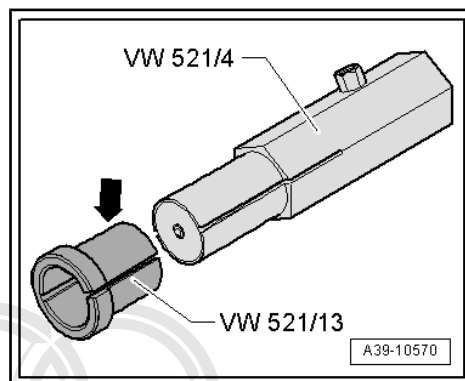
- *Check backlash when tightening cover for final drive. There must always be a certain amount of play.*
- *If gearbox is dismantled, check play at pinion shaft by turning it back and forth.*
- *If gearbox is not dismantled, insert crown wheel adjusting tool - VW 521- and check play.*



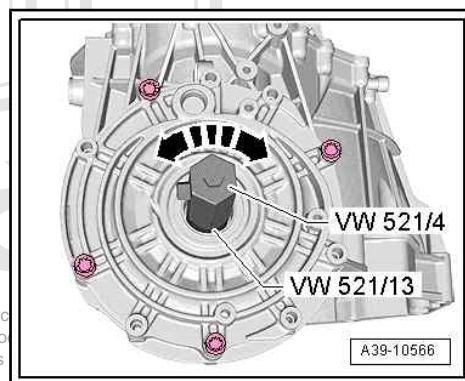
- Carefully secure cover for final drive with 4 bolts (tighten to 20 Nm in diagonal sequence).

Assemble crown wheel adjusting tool - VW 521- as follows:

- Fit sleeve - VW 521/13- with smaller outer diameter -arrow- onto mandrel - VW 521/4- .

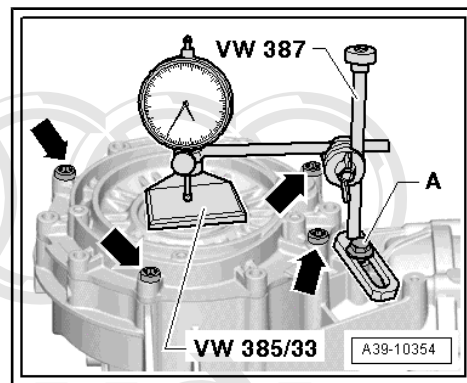


- Insert crown wheel adjusting tool - VW 521- and turn differential 5 turns in both directions to settle tapered roller bearings.



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- Remove crown wheel adjusting tool - VW 521- and attach measuring tools to gearbox housing as follows:
- Secure universal dial gauge bracket - VW 387- to threaded hole in gearbox housing with bolt -A-.
- Apply dial gauge extension to centre of measuring plate - VW 385/33- .
- Set dial gauge , e.g. -VAS 6080- to »0« with 1 mm preload.
- Slacken 4 bolts -arrows- by one turn in diagonal sequence.
- Check reading on dial gauge.
- Specification: 0.10 ... 0.15 mm for differential with tapered roller bearings on both sides.
- Specification: 0.25 ... 0.30 mm for differential with tapered roller bearing on left side and angular contact ball bearing (high-efficiency bearing) on right side.



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Note

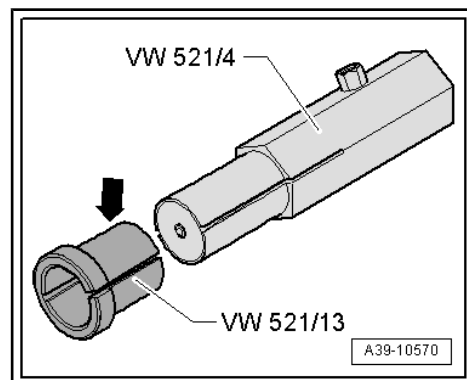
- ◆ *If specified measured value is not achieved, or if no backlash is discernible, correct thickness of shims "S₁" and "S₂".*
- ◆ *Select correct shims from ⇒ Electronic parts catalogue .*

Measuring backlash

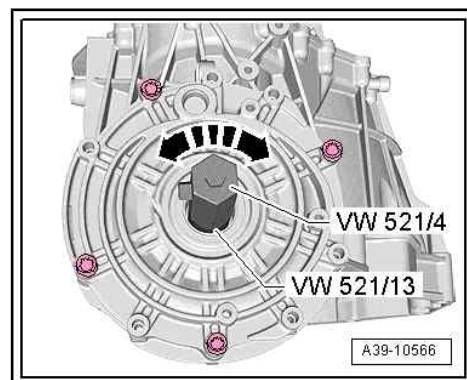
- Differential fitted with shims "S₁" and "S₂".
- Install differential with crown wheel: S₁ is fitted on cover side, S₂ in gearbox housing.
- Fit cover for final drive and tighten bolts to 20 Nm.

Assemble crown wheel adjusting tool - VW 521- as follows:

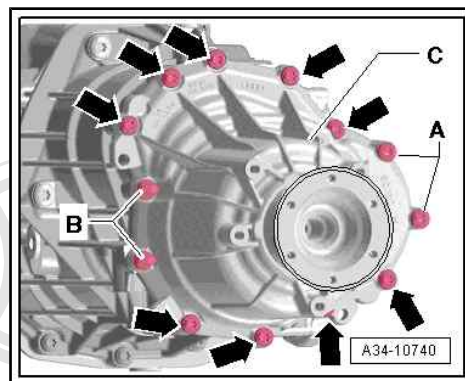
- Fit sleeve - VW 521/13- with smaller outer diameter -arrow- onto mandrel - VW 521/4- .



- Insert crown wheel adjusting tool - VW 521/4- in differential.
- Turn differential 5 turns in both directions to settle tapered roller bearings.



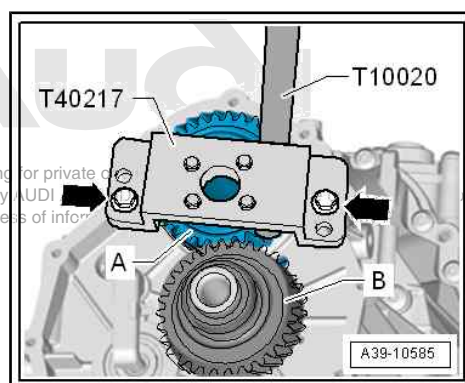
- Remove bolts -A-, -B- and -arrows- and detach centre differential housing -C-.



Locking side shaft in place

Block side shaft during measuring procedure to keep it from turning.

- To do so, engage counterhold tool - T40217- in side shaft and bolt loosely to gearbox cover with M8 bolts -arrows-.
- Insert pin wrench - T10020- between side shaft -A- and counterhold tool - T40217- .



Note

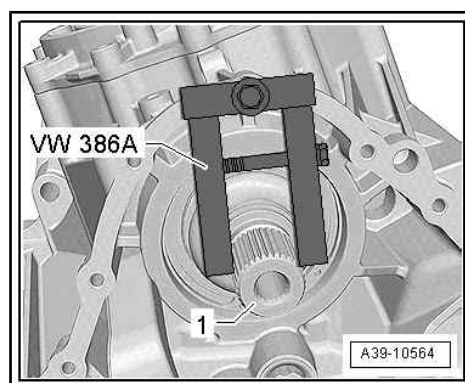
Do not slide on pin wrench - T10020- as far as spur gear -B-.

- Tighten bolts -arrows- to 5 Nm.

Locking pinion shaft in place with gearbox cover detached:

- To prevent pinion shaft -1- from turning during measurement, lock it in place using drive pinion clamp - VW 386 A- .

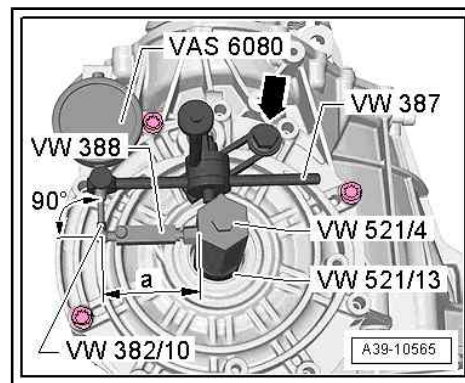
Continued for all vehicles:



- Secure universal dial gauge bracket - VW 387- to cover for final drive -arrow-.
- Insert dial gauge , e.g. -VAS 6080- with dial gauge extension - VW 382/10- (6 mm, flat).
- Set measuring lever - VW 388- to dimension “a” = 54.5 mm.

Measure play between teeth faces (backlash) as follows:

- Turn crown wheel until it makes contact with the face of one tooth (end of backlash travel).
- Preload dial gauge to 2 mm and set to “0”.
- Turn back crown wheel until it makes contact with opposite tooth face (backlash).
- Take backlash reading and note down measured value.
- Turn crown wheel through 90° and repeat measurement another 3 times. Unlock to turn further ➔ [page 190](#) .



Determining average backlash

- Add the four measured values together and divide by four.

Example:

1st measured value	0.28 mm
+ 2nd measured value	0.30 mm
+ 3rd measured value	0.30 mm
+ 4th measured value	0.28 mm
= Sum of measured values	1.16 mm

- Result: the average backlash is 1.16 mm : 4 = 0.29 mm

Determining thickness of shim “S₂”

Formula: “S₂” = “S₂*” - measured backlash + specified backlash

Example:

Previous shim “S ₂ *”	1.30 mm
- Measured average backlash	0.29 mm
+ Specified backlash (desired average value for backlash)	0.20 mm
= Thickness of shim “S ₂ ”	1.21 mm

Select correct shims from ➔ Electronic parts catalogue .

Determining thickness of shim “S₁”

Formula: “S₁” = “S_{total}” – “S₂”

Example:

Total shim thickness “S _{total} ” for “S ₁ ” + “S ₂ ”	2.17 mm
- Thickness of shim “S ₂ ”	1.21 mm
= Thickness of shim “S ₁ ”	0.96 mm

- Remove old shims “S₁*” and “S₂*” and fit new determined shims ➔ [page 147](#) .

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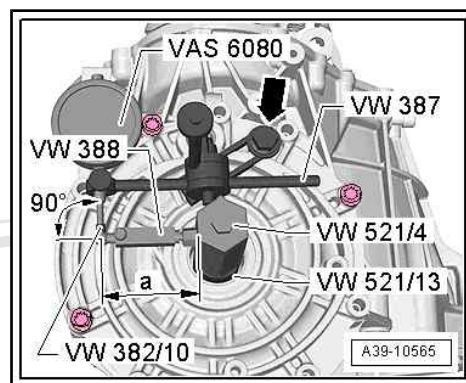
Checking adjustment

- After installing shims “S₁” and “S₂”, turn differential 5 turns in both directions so that the tapered roller bearings settle.
- Measure backlash four times on circumference.
- ◆ Specification: 0.12 ... 0.28 mm for differential with tapered roller bearings on both sides.
- ◆ Specification: 0.12 ... 0.18 mm for differential with tapered roller bearing on left side and angular contact ball bearing (high-efficiency bearing) on right side.



Note

Adjustment must be repeated if backlash is outside tolerance. The total shim thickness “S_{total}” must remain unchanged.



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4 Centre differential

⇒ [“4.1 Exploded view - centre differential housing”, page 193](#)

⇒ [“4.2 Removing and installing centre differential housing”, page 197](#)

⇒ [“4.3 Servicing centre differential housing”, page 202](#)

⇒ [“4.4 Renewing oil seal for rear splined shaft”, page 210](#)

4.1 Exploded view - centre differential housing

⇒ [“4.1.1 Exploded view - centre differential housing with flange shaft \(bolted propshaft\)”, page 193](#)

⇒ [“4.1.2 Exploded view - centre differential housing with rear splined shaft \(propshaft with splines on gearbox end\)”, page 195](#)

4.1.1 Exploded view - centre differential housing with flange shaft (bolted propshaft)

Removing and installing centre differential housing with gearbox installed ⇒ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Centre differential .

1 - Centre differential

- ☐ Removing and installing
⇒ [“4.2.1 Removing and installing centre differential housing - bolted propshaft”, page 197](#)
- ☐ Renewing ball bearing
⇒ [page 99](#)

2 - Spring

3 - Shim

4 - Dished spring

- ☐ Installation position: Inner diameter (convex side) faces rear flange shaft

5 - Spacer sleeve

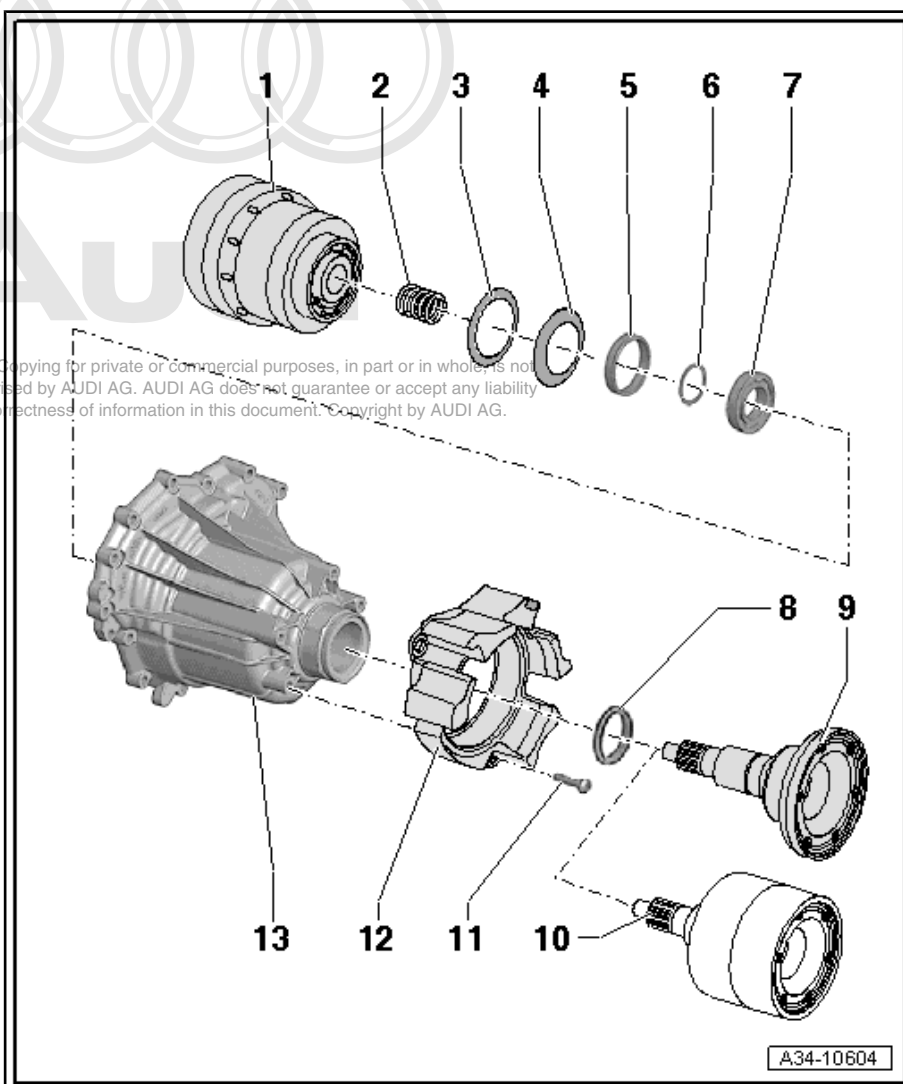
- ☐ Pressing out and pressing in
⇒ [“4.3.1 Removing and installing rear flange shaft, oil seal and ball bearing”, page 202](#)

6 - Circlip

- ☐ For flange shaft
- ☐ Removing and installing
⇒ [“4.3.1 Removing and installing rear flange shaft, oil seal and ball bearing”, page 202](#)

7 - Ball bearing

- ☐ For flange shaft
- ☐ ⇒ [“4.3.1 Removing and installing rear flange](#)





[shaft, oil seal and ball bearing", page 202](#)

8 - Oil seal

- ☐ ⇒ ["4.3.1 Removing and installing rear flange shaft, oil seal and ball bearing", page 202](#)

9 - Flange shaft (rear)

- ☐ Without vibration damper
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Pressing out and pressing in
⇒ ["4.3.1 Removing and installing rear flange shaft, oil seal and ball bearing", page 202](#)

10 - Flange shaft (rear)

- ☐ With vibration damper
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Pressing out and pressing in
⇒ ["4.3.1 Removing and installing rear flange shaft, oil seal and ball bearing", page 202](#)

11 - Bolt

- ☐ 24 Nm
- ☐ For vibration damper
- ☐ 3x
- ☐ Apply locking fluid - AMV 185 101 A1- when fitting

12 - Vibration damper

- ☐ Not fitted on all versions
- ☐ Select correct version according to gearbox code letters ⇒ Electronic parts catalogue

13 - Centre differential housing

- ☐ ⇒ ["4.2.1 Removing and installing centre differential housing - bolted propshaft", page 197](#)
- ☐ Removing and installing with gearbox installed in vehicle ⇒ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Centre differential



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4.1.2 Exploded view - centre differential housing with rear splined shaft (propshaft with splines on gearbox end)

Removing and installing centre differential housing with gearbox installed ➔ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Centre differential .

1 - Bolt

- ☐ 24 Nm
- ☐ For vibration damper
- ☐ 3x
- ☐ Apply locking fluid - AMV 185 101 A1- when fitting

2 - Bolt

- ☐ Aluminium bolts
- ☐ 11x
- ☐ Renew
- ☐ Tightening torque
➔ [Item 2 \(page 46\)](#)

3 - Housing

- ☐ For centre differential
- ☐ ➔ [“4.2.2 Removing and installing centre differential housing - propshaft with splines”, page 200](#)
- ☐ Removing and installing with gearbox installed in vehicle ➔ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Centre differential

4 - Bearing plate

- ☐ Installation position: shoulder must engage in recess in intermediate gearbox housing

5 - Centre differential

- ☐ ➔ [“4.2.2 Removing and installing centre differential housing - propshaft with splines”, page 200](#)

6 - Spring

7 - Assembly sleeve

- ☐ Does not have to be re-installed

8 - Circlip

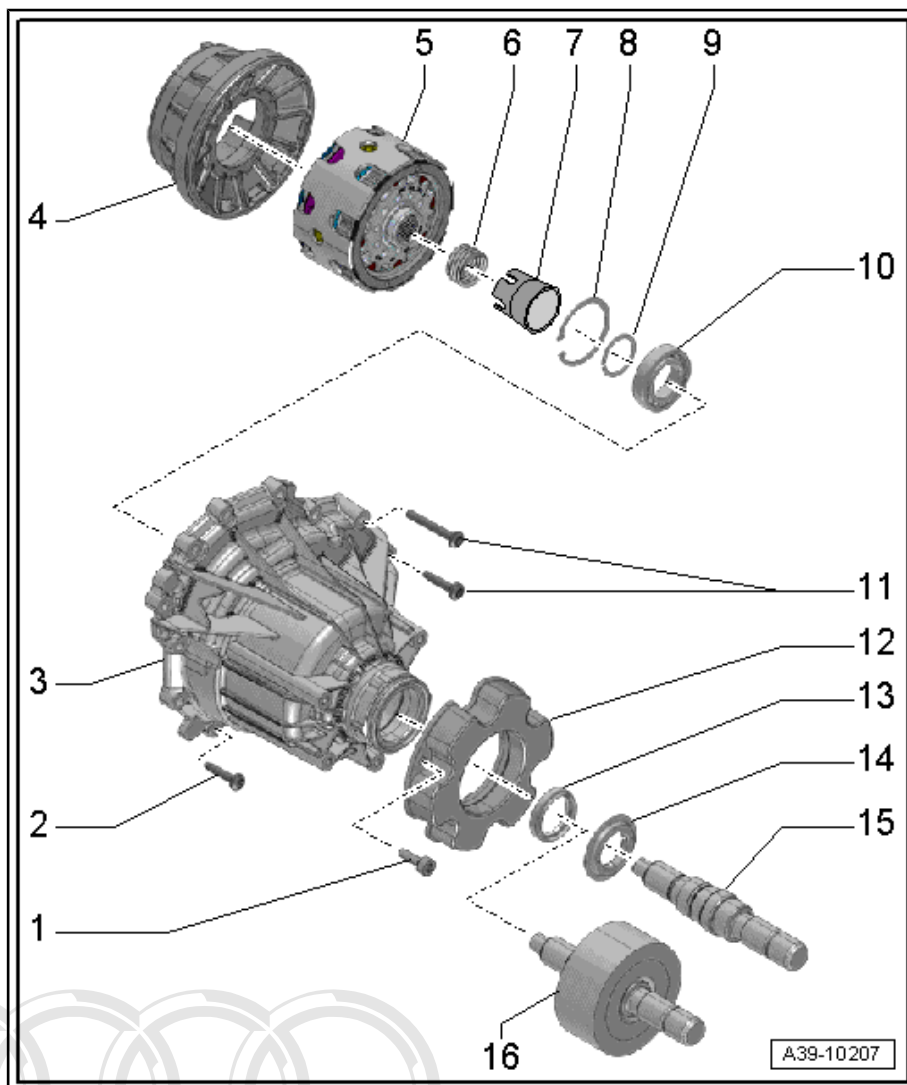
- ☐ For ball bearing for rear splined shaft
- ☐ Removing and installing
➔ [“4.3.2 Removing and installing rear splined shaft, oil seal and ball bearing”, page 205](#)

9 - Circlip

- ☐ For rear splined shaft
- ☐ Removing and installing
➔ [“4.3.2 Removing and installing rear splined shaft, oil seal and ball bearing”, page 205](#)

10 - Ball bearing

- ☐ For rear splined shaft



- ☐ ⇒ [“4.3.2 Removing and installing rear splined shaft, oil seal and ball bearing”, page 205](#)

11 - Bolt

- ☐ Steel bolts
- ☐ 2x
- ☐ Renew
- ☐ Tightening torque ⇒ [Item 4 \(page 46\)](#)

12 - Damper weight

- ☐ Depending on version

13 - Oil seal

- ☐ For rear splined shaft

Renewing on rear splined shaft with vibration damper

- ☐ ⇒ [“4.3.2 Removing and installing rear splined shaft, oil seal and ball bearing”, page 205](#)

Renewing on rear splined shaft without vibration damper

◆ Gearbox removed

- ☐ ⇒ [“4.4.1 Renewing oil seal for rear splined shaft - rear splined shaft without vibration damper”, page 210](#)

◆ Gearbox installed

- ☐ ⇒ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Centre differential; Renewing oil seal for rear splined shaft

14 - Dust ring

- ☐ Renew if removed

15 - Rear splined shaft without vibration damper

- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Pressing out and pressing in
⇒ [“4.3.2 Removing and installing rear splined shaft, oil seal and ball bearing”, page 205](#)

16 - Rear splined shaft with vibration damper

- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Pressing out and pressing in
⇒ [“4.3.2 Removing and installing rear splined shaft, oil seal and ball bearing”, page 205](#)
- ☐ ⇒ [“4.3.3 Pressing vibration damper onto rear splined shaft”, page 209](#)



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4.2 Removing and installing centre differential housing

⇒ [“4.2.1 Removing and installing centre differential housing - bolted propshaft”, page 197](#)

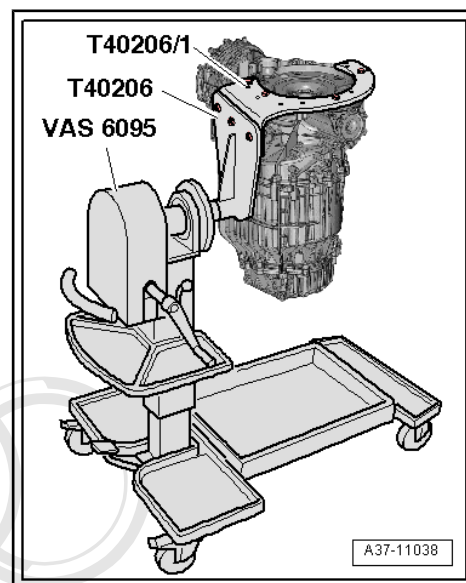
⇒ [“4.2.2 Removing and installing centre differential housing - propshaft with splines”, page 200](#)

4.2.1 Removing and installing centre differential housing - bolted propshaft

The centre differential housing can also be removed and installed with the gearbox installed in the vehicle ⇒ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Centre differential .

Removing

- Secure gearbox to engine and gearbox support ⇒ [page 42](#) .



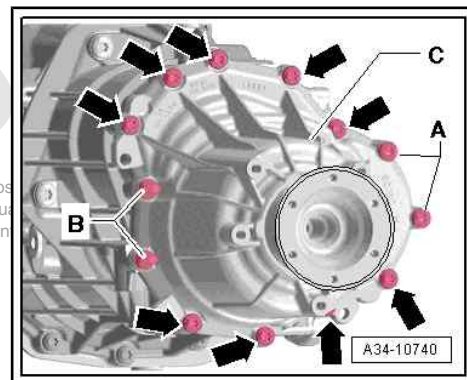
- Place used oil collection and extraction unit - VAS 6622A- below gearbox.
- Remove bolts -A-, -B- and -arrows-.



Note

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The centre hex studs -B- are not fitted on all versions.

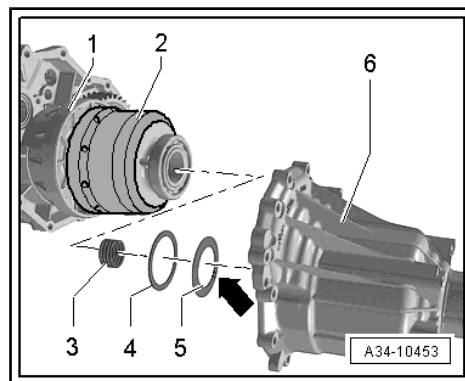


Caution

Risk of damage to the centre differential.

- ◆ ***Pull the centre differential housing -C- slowly and carefully towards the rear off the gearbox. The centre differential may otherwise fall out of the gearbox.***
- ◆ ***A centre differential which has fallen to the ground can no longer be installed. It must be renewed.***

- Carefully pull off centre differential housing -6-, together with spring -3-, shim -4- and dished spring -5-.
- Detach centre differential -2- and bearing plate -1-.



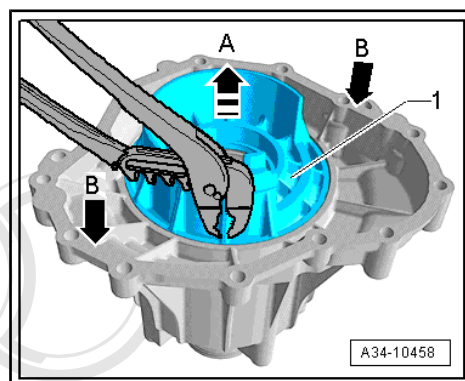
If bearing plate -1- remains behind in centre differential housing, proceed as follows:



Caution

Risk of damage to the sealing surface of the centre differential housing.

- ♦ **Carefully tap the housing in several places with a hammer.**



- Grip one of side ribs on bearing plate -1- with pliers and pull off in direction of -arrow A-.
- While doing so, carefully tap alternate sides of housing -arrows B- with a rubber-headed hammer .
- Remove centre differential, spring, shim and dished spring from centre differential housing.

Installing centre differential housing

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

Tightening torques

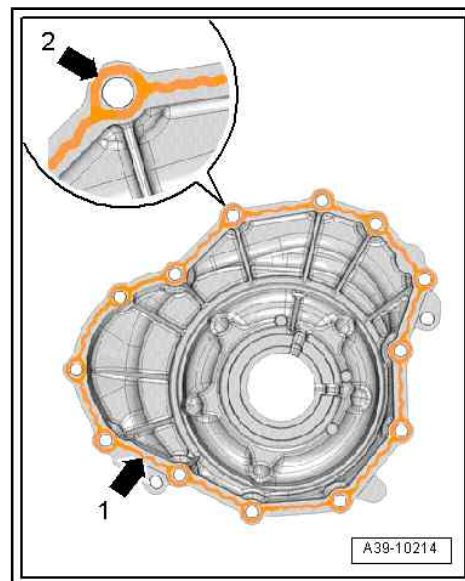
- ♦ ⇒ ["3.3 Exploded view - centre differential housing and centre differential", page 46](#)



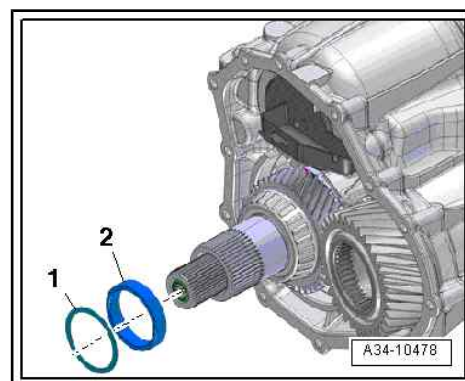
Note

Renew the aluminium bolts for the centre differential housing.

- In housing, lightly lubricate fitting surfaces for bearing plate with gear oil.
- Thoroughly clean both housing joint surfaces; they must be free from oil and grease.
- Apply bead of sealant -arrow 1- evenly and not too thick on housing joint surface; use sealing paste - AMV 188 001 02- .
- To avoid contact corrosion, apply a ring of sealant around each bolt hole -arrow 2-.

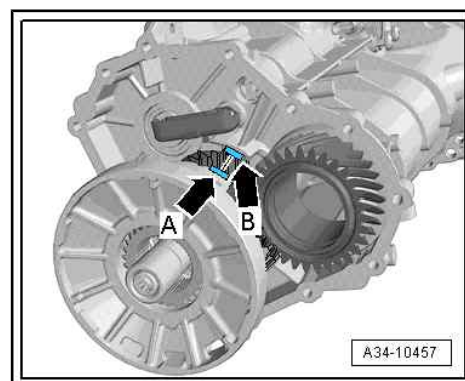


- Check that spacer sleeve -2- and shim -1- are fitted on output shaft.

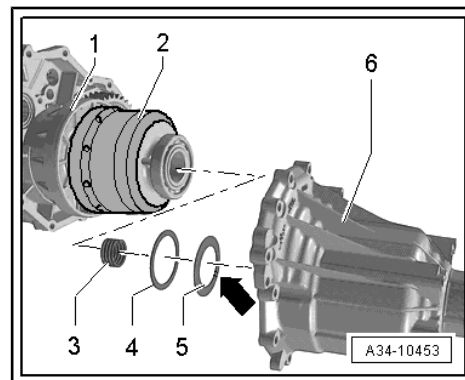


Install bearing plate on gearbox as follows:

- Lightly lubricate surfaces of both races on outside of bearing plate with a small quantity of gear oil.
- Insert bearing plate.
- **Installation position: lug on bearing plate -arrow A- must engage in slot in gearbox cover -arrow B-.**



- Slide on centre differential -2- towards bearing plate -1- as far as stop.
- Insert dished spring -5-, shim(s) -4- and spring -3- into centre differential housing -6-.
- Installation position of dished spring -5-: inner diameter (convex side) -arrow- faces centre differential housing -6-.
- Fit centre differential housing -6- onto gearbox.

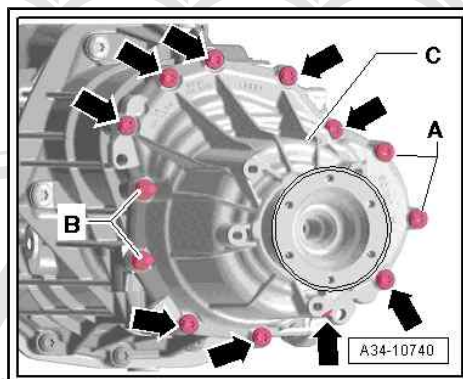


- Press centre differential housing -C- fully onto gearbox cover and hold in place.
- Fit and tighten bolts -A-, -B- and -arrows-.



Note

- ◆ The centre hex studs -B- are not fitted on all versions.
- ◆ In this case, aluminium bolts ➔ [Item 2 \(page 46\)](#) are fitted in place of the centre hex studs.



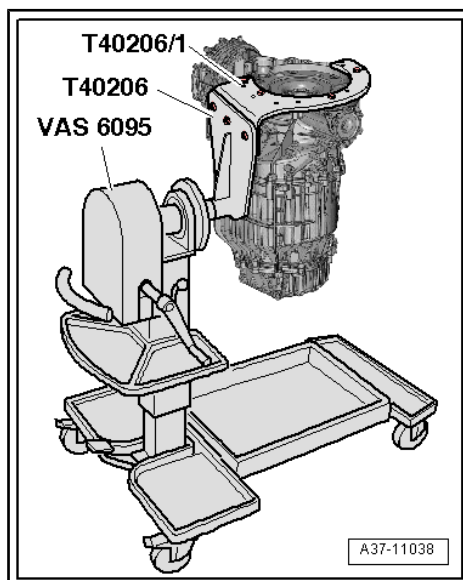
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4.2.2 Removing and installing centre differential housing - propshaft with splines

The centre differential housing can also be removed and installed with the gearbox installed in the vehicle ➔ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Centre differential .

Removing

- Secure gearbox to engine and gearbox support ➔ [page 42](#) .



- Remove bolts -5- (13x).

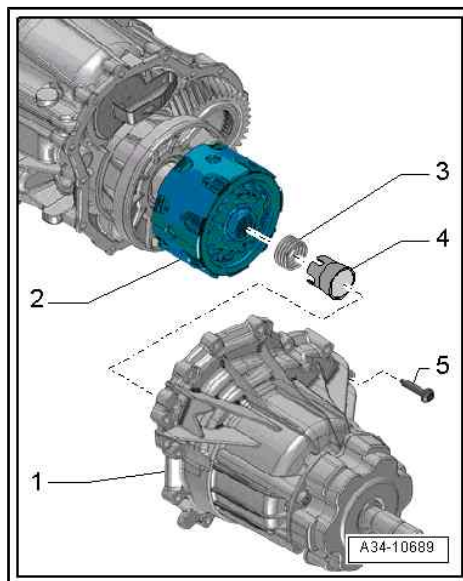


Caution

Risk of damage to the centre differential.

- ◆ Pull the centre differential housing -1- slowly and carefully towards the rear off the gearbox. The centre differential -2- may otherwise fall out of the gearbox.
- ◆ A centre differential which has fallen to the ground can no longer be installed.

- Carefully pull off centre differential housing -1-.
- Remove assembly sleeve -4-, spring -3- and centre differential -2-.



If bearing plate -1- and centre differential remain behind in centre differential housing, proceed as follows:

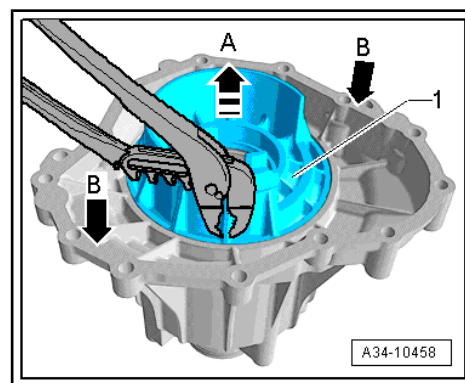


Caution

Risk of damage to the sealing surface of the centre differential housing.

◆ ***Carefully tap the housing in several places with a hammer.***

- Grip one of side ribs on bearing plate -1- with pliers and pull off in direction of -arrow A-.
- While doing so, carefully tap alternate sides of housing -arrows B- with a rubber-headed hammer .
- Remove centre differential, assembly sleeve and spring from centre differential housing.



Installing centre differential housing

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

Tightening torques

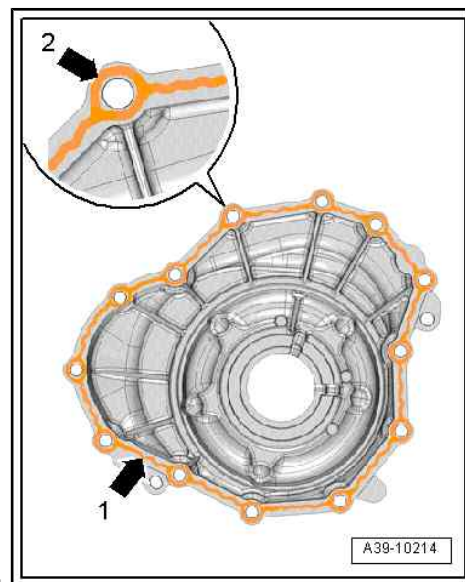
- ◆ ⇒ [“3.3 Exploded view - centre differential housing and centre differential”, page 46](#)



Note

Renew the aluminium bolts for the centre differential housing.

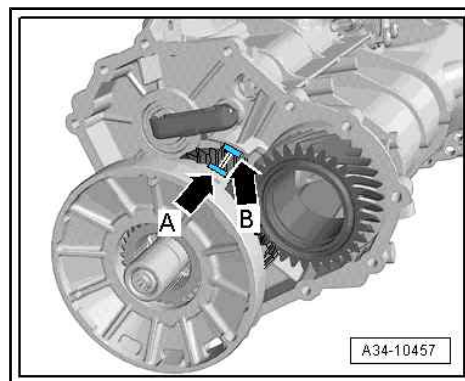
- In housing, lightly lubricate fitting surfaces for bearing plate with gear oil.
- Thoroughly clean both housing joint surfaces; they must be free from oil and grease.
- Apply bead of sealant -arrow 1- evenly and not too thick on housing joint surface; use sealing paste - AMV 188 001 02- .
- To avoid contact corrosion, apply a ring of sealant around each bolt hole -arrow 2-.



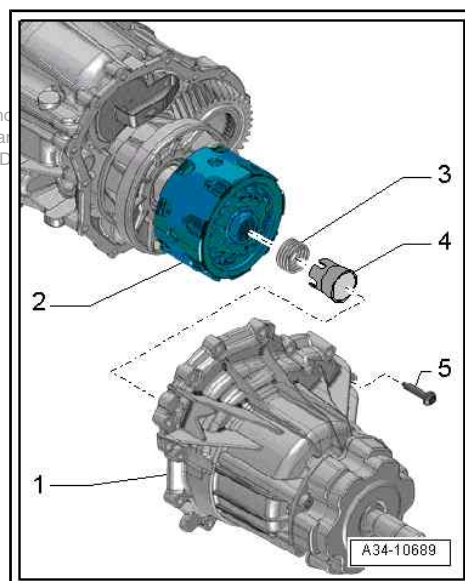
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Install bearing plate on gearbox as follows:

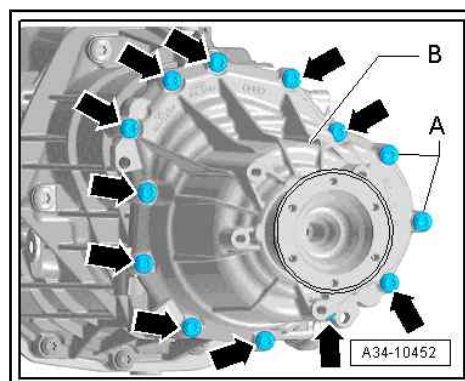
- Lightly lubricate surfaces of both races on outside of bearing plate with a small quantity of gear oil.
- Insert bearing plate.
- Installation position: lug on bearing plate -arrow A- must engage in slot in gearbox cover -arrow B-.



- Fit centre differential -2- onto gearbox.
 - Insert spring -3- in centre differential.
 - Fit assembly sleeve -4- on centre differential.
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- Press centre differential housing -B- fully onto gearbox housing, keeping it centred, and hold in place.
- Fit steel bolts -A- and new aluminium bolts -arrows- and tighten to secure centre differential housing.



4.3 Servicing centre differential housing

⇒ [“4.3.1 Removing and installing rear flange shaft, oil seal and ball bearing”, page 202](#)

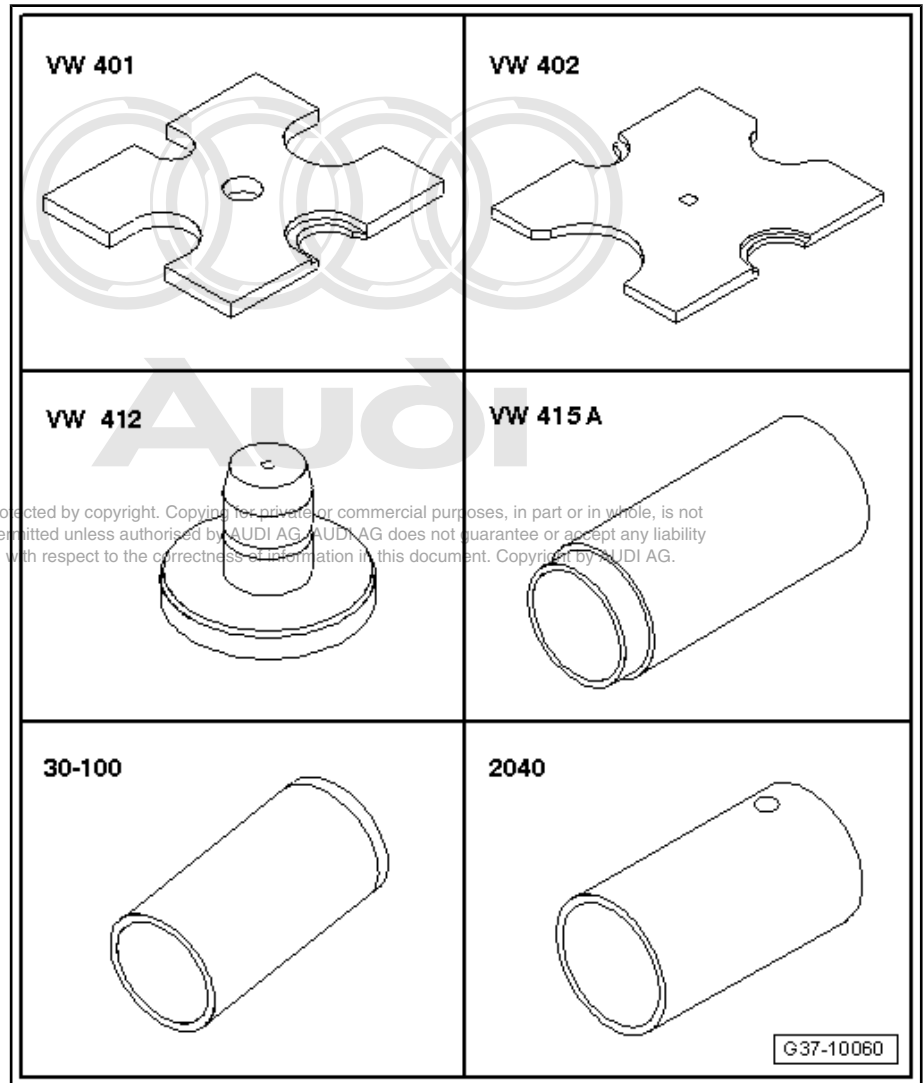
⇒ [“4.3.2 Removing and installing rear splined shaft, oil seal and ball bearing”, page 205](#)

⇒ [“4.3.3 Pressing vibration damper onto rear splined shaft”, page 209](#)

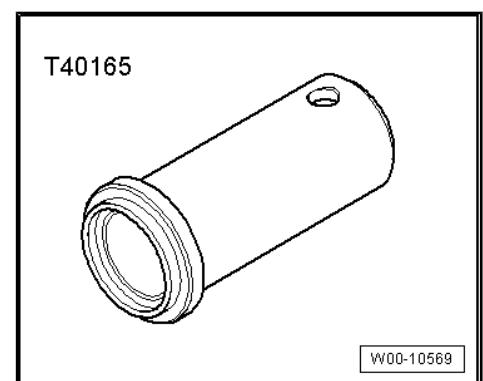
4.3.1 Removing and installing rear flange shaft, oil seal and ball bearing

Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 415 A-
- ◆ Drift sleeve - 30 - 100-
- ◆ Tube - 2040-



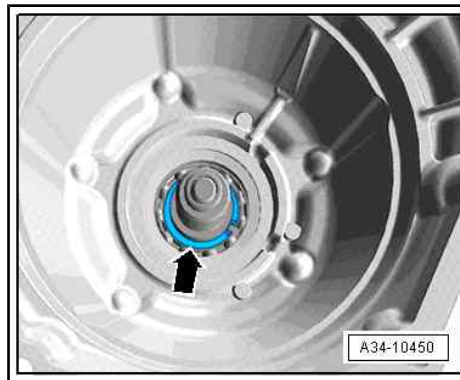
- ◆ Thrust piece - T40165-



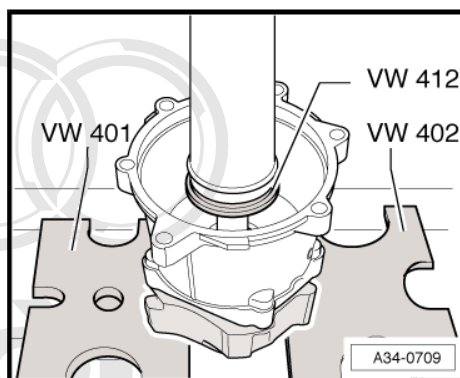
- ◆ Sealing grease - G 052 128 A1-

Procedure

- Remove centre differential housing
⇒ [“4.2.1 Removing and installing centre differential housing - bolted propshaft”, page 197](#) .
- Remove circlip -arrow-.



- Press out flange shaft (position centre differential housing in such a way that the flange shaft does not make contact with thrust plates -VW 401- and -VW 402- when it is pressed out).



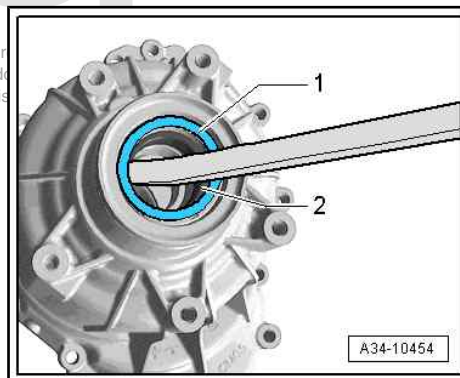
- Lever out oil seal -1-.



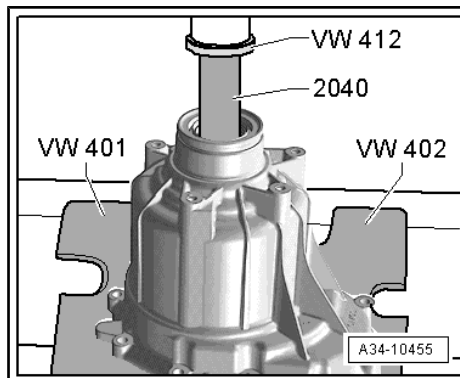
Note

-Item 2- can be disregarded.

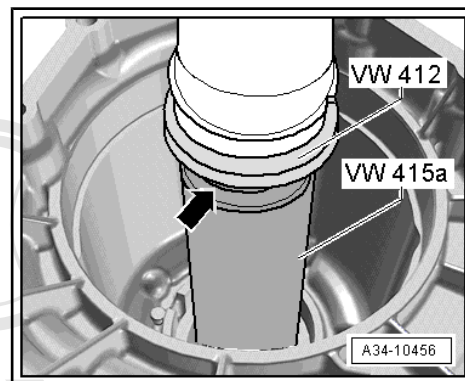
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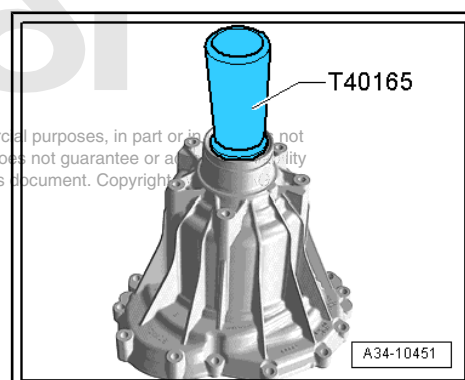
- If necessary, press out ball bearing for flange shaft and spacer sleeve.



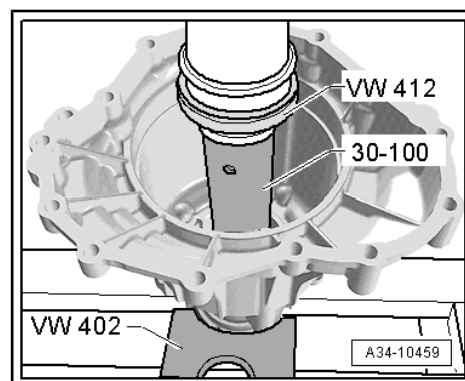
- Press in ball bearing for flange shaft.
- Collar of tube - VW 415 A- -arrow- faces press tool - VW 412- .
- Now press in spacer sleeve ➔ [Item 5 \(page 193\)](#) using tube - VW 415 A- .



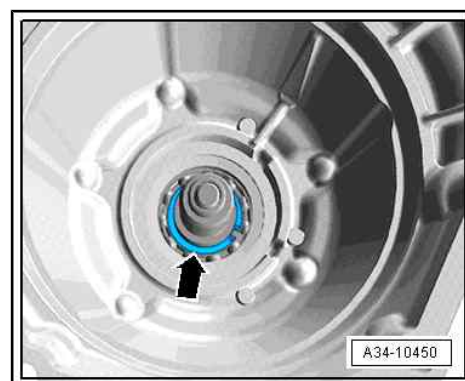
- Lightly oil outer circumference of oil seal and drive in onto stop using thrust piece - T40165- .
- Installation position: open side of oil seal points towards gear-box
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .



- Press in flange shaft.
- Insert flange shaft into centre differential housing from below.
- Place housing with flange shaft on thrust plate - VW 402- under workshop press.
- Press inner bearing race onto flange shaft using drift sleeve - 30 - 100- .



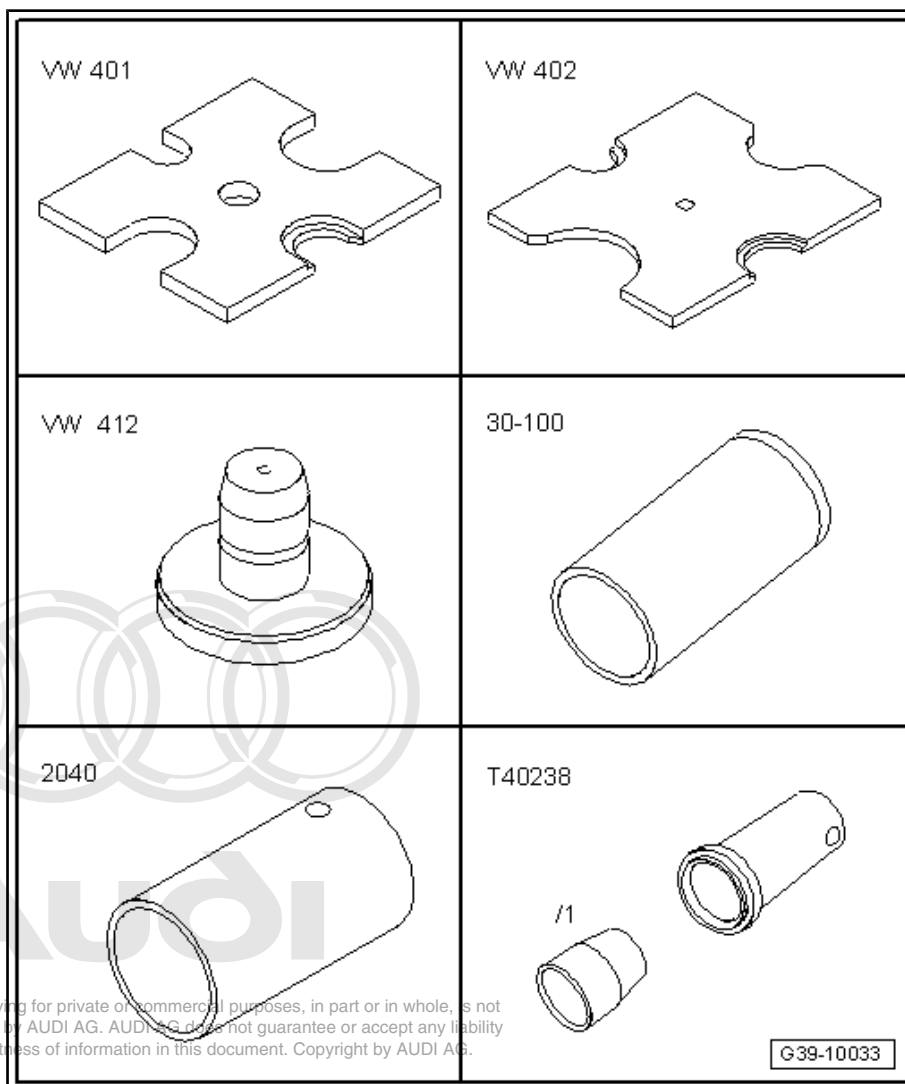
- Fit new circlip -arrow- onto flange shaft.
- Install centre differential housing ➔ [“4.2.1 Removing and installing centre differential housing - bolted propshaft”, page 197](#) .



4.3.2 Removing and installing rear splined shaft, oil seal and ball bearing

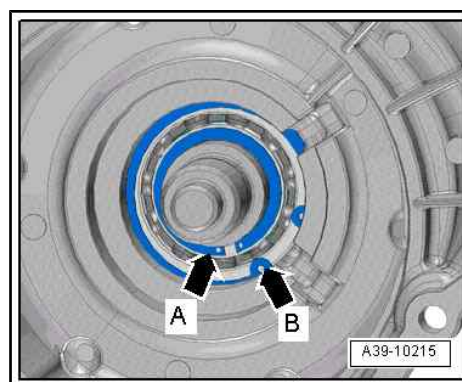
Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 412-
- ◆ Drift sleeve - 30 - 100-
- ◆ Tube - 2040-
- ◆ Assembly tool - T40238-
- ◆ Sealing grease - G 052 128 A1-



Procedure

- Remove centre differential housing
⇒ ["4.2.2 Removing and installing centre differential housing - propshaft with splines"](#), page 200 .
- Remove circlip -arrow A-
- Additionally remove circlip -arrow B- if ball bearing is also being removed.



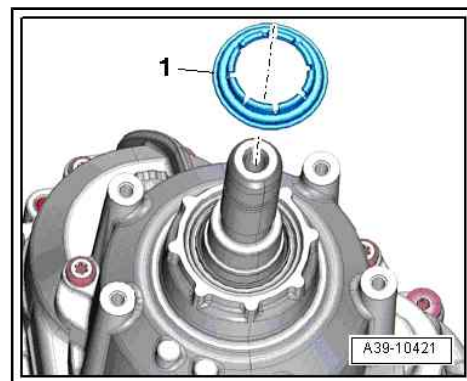
Rear splined shaft without vibration damper:

- Pry off dust ring -1-.



Note

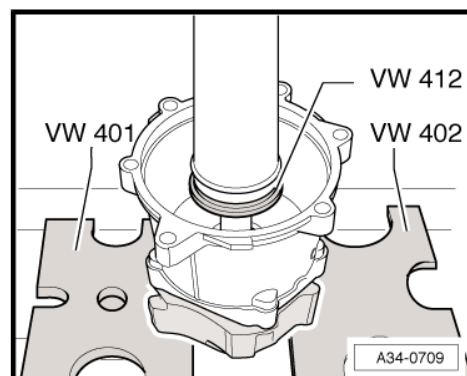
The dust ring cannot be removed without being damaged.



- Press out rear splined shaft (position centre differential housing in such a way that the shaft does not make contact with thrust plates -VW 401- and -VW 402- when it is pressed out).

Rear splined shaft with vibration damper:

- Press out rear splined shaft (position centre differential housing in such a way that the vibration damper does not make contact with thrust plates -VW 401- and -VW 402- when the shaft is pressed out).



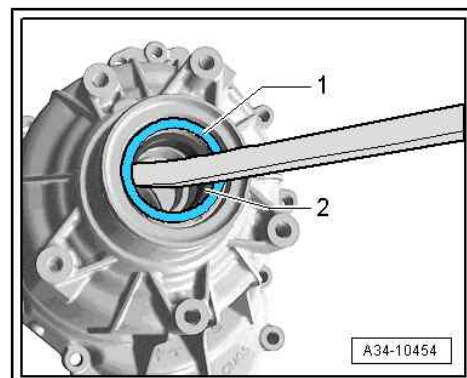
All versions:

- Lever out oil seal -1-.

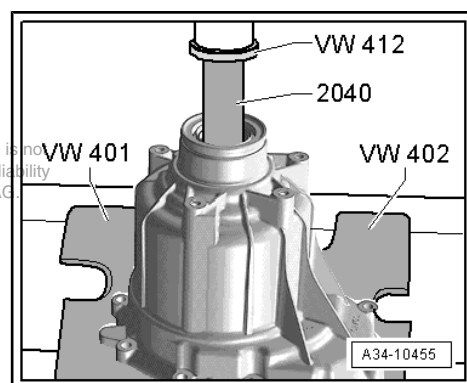


Note

-Item 2- can be disregarded.

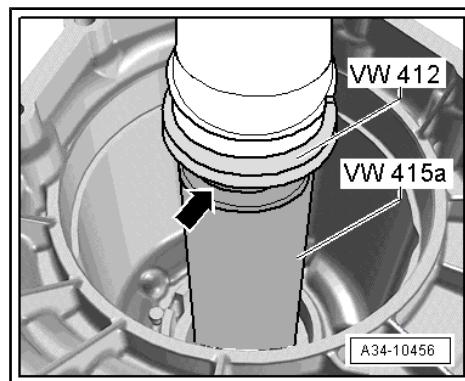


- If necessary, press out ball bearing for rear splined shaft.

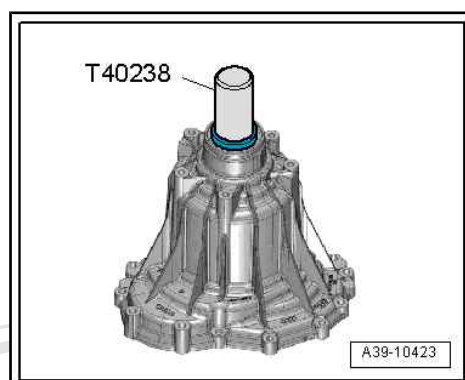


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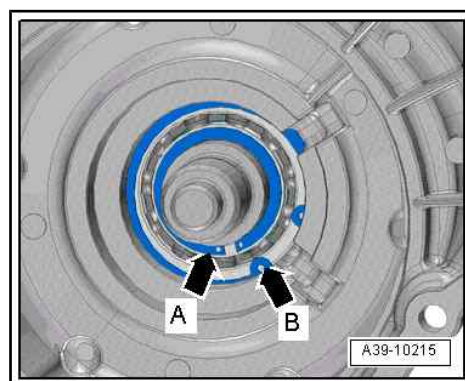
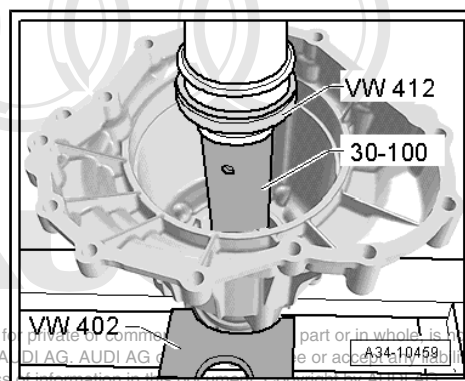
- Press in ball bearing for rear splined shaft.
- Collar of tube - VW 415 A- -arrow- faces press tool - VW 412- .



- Lightly oil outer circumference of oil seal and drive in onto stop using assembly tool - T40238- .
- Installation position: open side of oil seal points towards gear-box
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .



- Press rear splined shaft into centre differential housing as follows:
- If originally fitted, secure vibration damper to centre differential housing. Tightening torque ➔ [Item 1 \(page 195\)](#)
- Insert rear splined shaft into centre differential housing from below.
- Place housing with rear splined shaft on thrust plate - VW 402- under workshop press.
- Position drift sleeve - 30 - 100- on inner race of ball bearing.
- Press in rear splined shaft.
- Fit circlip for rear splined shaft -arrow A- and for ball bearing -arrow B-.

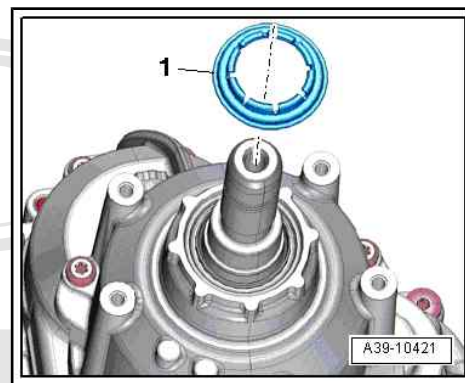


Rear splined shaft without vibration damper:

- Clip on new dust ring -1-.

All versions:

- Install centre differential housing ⇒ [page 200](#) .



4.3.3 Pressing vibration damper onto rear splined shaft

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Special tools and workshop equipment required

- ◆ Tube - VW 284/1- from assembly tool for spring clips - VW 284-
- ◆ Installing sleeve - VW 455-
- ◆ Tube - T40104/2- from removal and assembly tools - T40104-
- ◆ Thrust plate - VW 402-

Requirements

If the rear splined shaft with vibration damper must be renewed, the rear splined shaft -A- and vibration damper -B- may be delivered as separate parts if ordered via ⇒ Electronic parts catalogue .

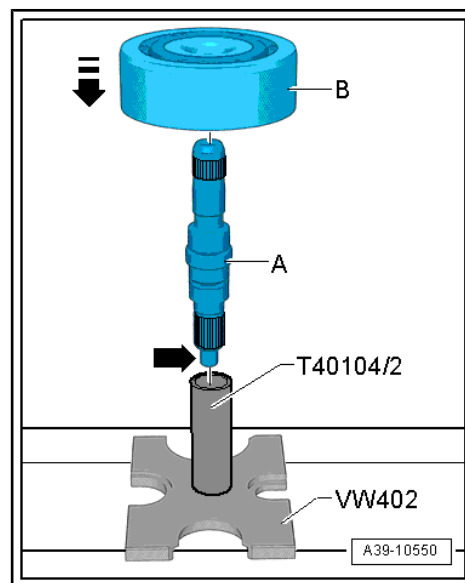
Only then is it necessary to press vibration damper onto rear splined shaft.



Caution

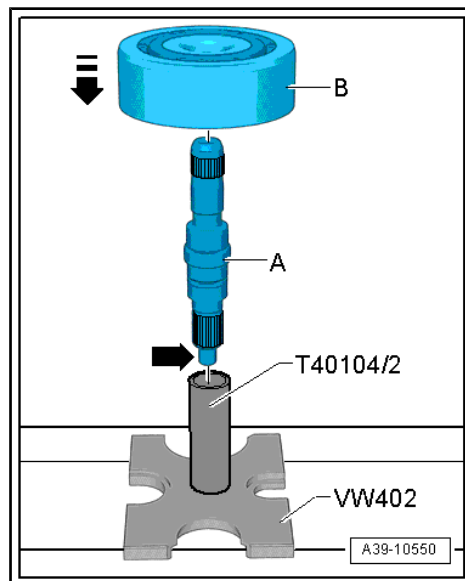
Risk of damage to components.

- *The vibration damper must not be reused after it is pressed off the rear splined shaft, otherwise a secure fit of the vibration damper on the rear splined shaft is no longer assured. The vibration damper can become detached from the rear splined shaft and cause damage to the gearbox and other components.*



Procedure

- Place tube - T40104/2- onto thrust plate - VW 402- with opening facing upwards.
- Insert new rear splined shaft -A- into tube - T40104/2- with narrow end -arrow- pointing downwards.
- Fit new vibration damper -B-.

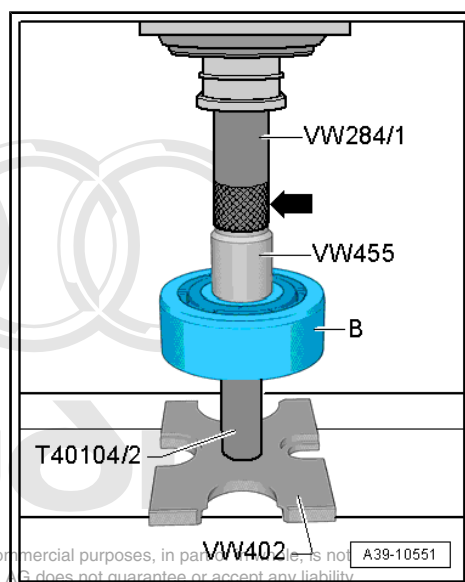


- Using installing sleeve - VW 455- and tube - VW 284/1- , press vibration damper -B- on to stop.



Note

Installation location of tube - VW 284/1- : fluted section -arrow- points downwards.



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4.4 Renewing oil seal for rear splined shaft

⇒ [“4.4.1 Renewing oil seal for rear splined shaft - rear splined shaft without vibration damper”, page 210](#)

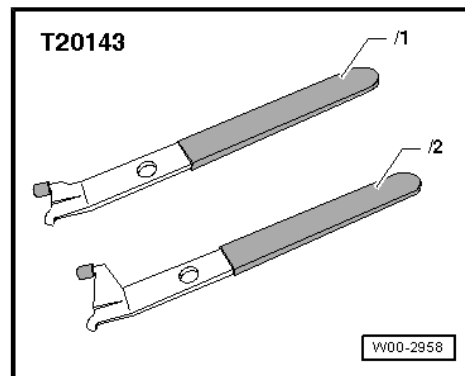
⇒ [“4.4.2 Renewing oil seal for rear splined shaft - rear splined shaft with vibration damper”, page 212](#)

4.4.1 Renewing oil seal for rear splined shaft - rear splined shaft without vibration damper

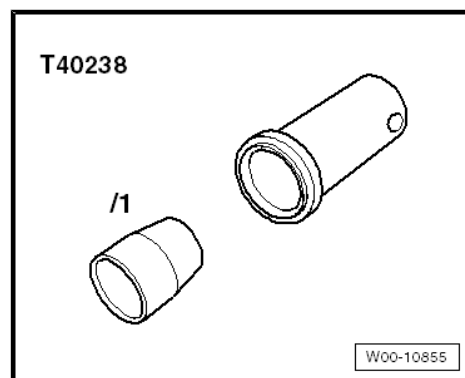
Oil seal for rear splined shaft can also be renewed with gearbox installed in vehicle ⇒ 6-speed manual gearbox 0B2; Rep. gr. 39 ; Centre differential; Renewing oil seal for rear splined shaft .

Special tools and workshop equipment required

◆ Extractor tool -T20143/1-



◆ Assembly tool - T40238-



◆ Sealing grease - G 052 128 A1-

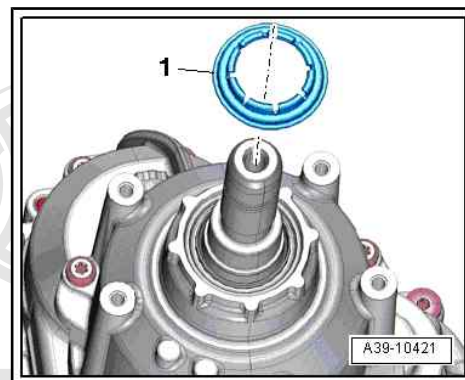
Procedure

- Pry off dust ring -1-.

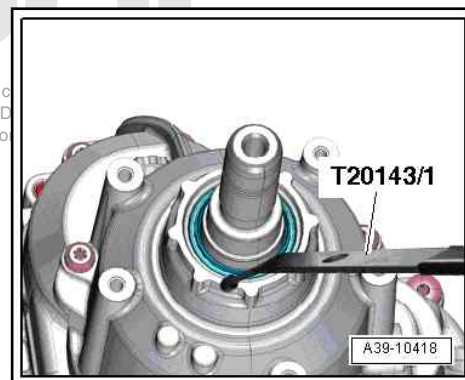


Note

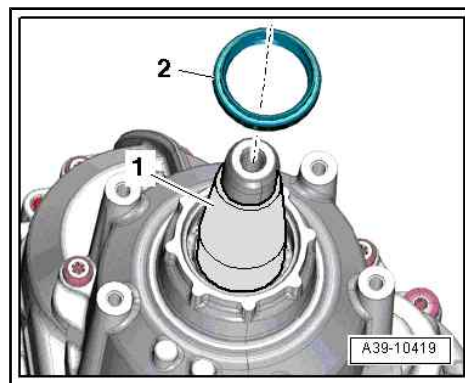
The dust ring cannot be removed without being damaged.



- Pull out oil seal for rear splined shaft.
- Clean contact surface and sealing surface.
- Lightly lubricate outer circumference of oil seal with gear oil.



- Fit guide sleeve - T40238/1- -item 1- onto rear splined shaft.
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .
- Push oil seal -2- onto guide sleeve -item 1-.
- Installation position: the open side of the seal should face the gearbox housing.

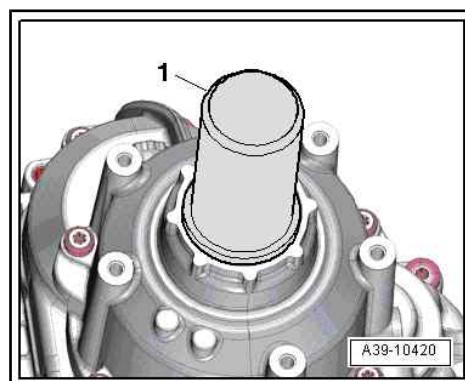


- Drive in oil seal as far as stop using thrust piece - T40238-item 1-. Make sure oil seal remains straight.

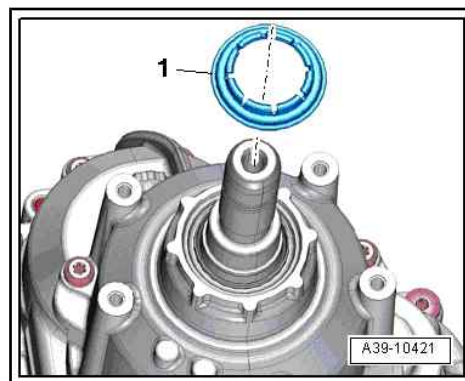


Note

Pull guide sleeve - T40238/1- carefully out of oil seal so that sealing lip is not rolled back.



- Clip on new dust ring -1-.



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4.4.2 Renewing oil seal for rear splined shaft - rear splined shaft with vibration damper

On vehicles with vibration damper the rear splined shaft must be removed in order to renew the oil seal for the rear splined shaft.

⇒ **"4.3.2 Removing and installing rear splined shaft, oil seal and ball bearing", page 205 .**