

Workshop Manual Audi A3 2004 ➤

6-speed manual gearbox 0AG

Edition 05.2017

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List of Workshop Manual Repair Groups

Repair Group

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



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

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00 – Technical data

1 Gearbox identification

(ARL005271; Edition 05.2017)

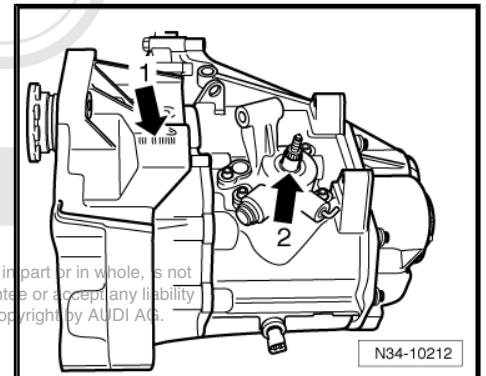
The 6-speed manual gearbox 0AG is fitted in conjunction with 4-cylinder injection engines in the Audi A3 2004 >.

Allocation ⇒ [page 2](#) .

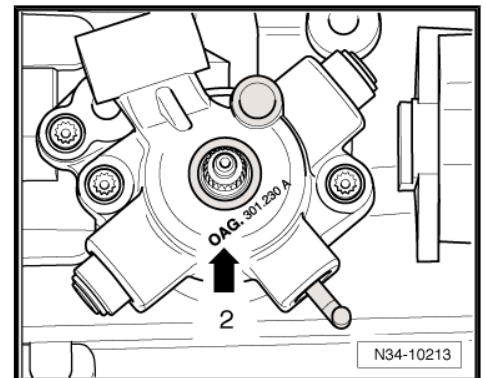
Location on gearbox

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

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Manual gearbox 0AG -arrow 2-



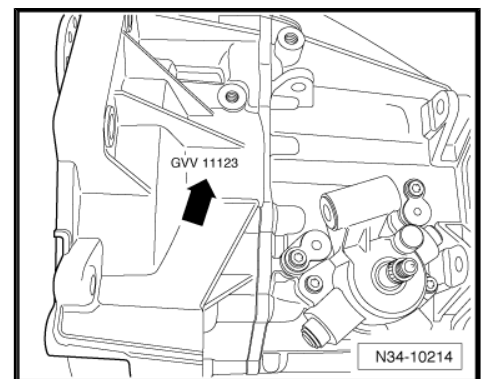
Code letters and date of manufacture of gearbox -arrow-

Example:	GVV	11	12	3
	Code letters	Day	Month	Year (2003) of manufacture

Additional data identify the factory where the unit was built.



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





2 Code letters, allocation, capacities

Manual gearbox		6-speed 0AG		
Code letters		GAJ	GMW	GVV
Manufactured	from	08.03	08.03	08.03
	to			06.04
Allocation	Model	Audi A3 2004 ►	Audi A3 2004 ►	Audi A3 2004 ►
	Engine	1.6 ltr. - 85 kW	1.6 ltr. - 85 kW	1.6 ltr. - 85 kW
Ratio Z1 : Z2	Final drive	68 : 15 = 4.533	68 : 15 = 4.533	68 : 15 = 4.533
Capacity of manual gearbox		2.1 ltr.		

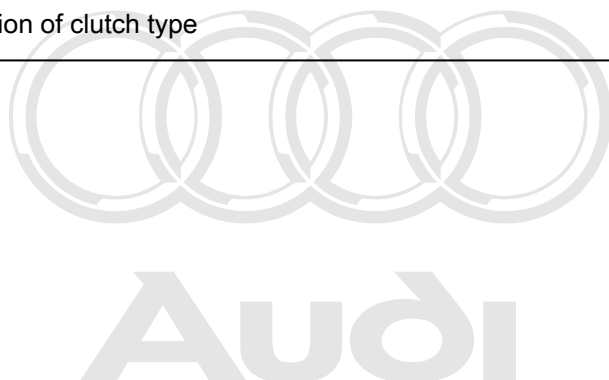
The following data can be found in the ⇒ Electronic parts catalogue

- ◆ Individual gear ratios
- ◆ Gear oil specification
- ◆ Allocation of drive shaft flanges
- ◆ Allocation of clutch type

Manual gearbox		6-speed 0AG		
Code letters		HBM	JHY	
Manufactured	from	06.04	11.06	
	to	11.06		
Allocation	Model	Audi A3 2004 ►	Audi A3 2004 ►	
	Engine	1.6 ltr. - 85 kW	1.6 ltr. - 85 kW	
Ratio Z1 : Z2	Final drive	68 : 15 = 4.533	68 : 15 = 4.533	
Capacity of manual gearbox		2.1 ltr.		

The following data can be found in the ⇒ Electronic parts catalogue

- ◆ Individual gear ratios
- ◆ Gear oil specification
- ◆ Allocation of drive shaft flanges
- ◆ Allocation of clutch type



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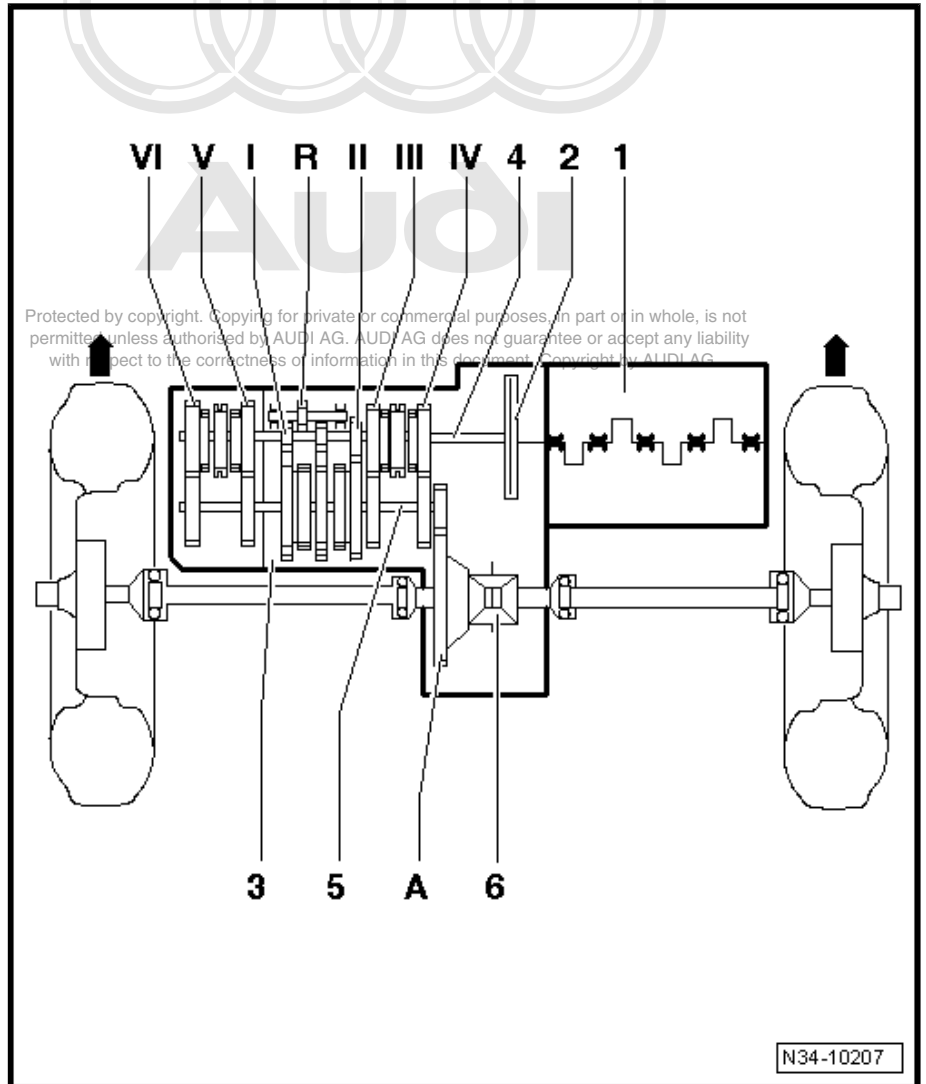
3 Transmission layout



Note

-Arrows- point in direction of travel.

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



3.1 Calculating ratio "i"

Example:

	6th gear	Final drive
Driving gear	$ZG_1 = 51$	$ZA_1 = 15$
Driven gear	$ZG_2 = 36$	$ZA_2 = 68$

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

$$i_G = \text{gear ratio} = ZG_2 : ZG_1 = 36 : 51 = 0.706$$

$$i_A = \text{axle ratio} = ZA_2 : ZA_1 = 68 : 15 = 4.533$$



$$i_{ov} = \text{overall ratio} = i_G \times i_A = 0.706 \times 4.533 = 3.200$$

1) Z_1 = number of teeth on driving gear, Z_2 = number of teeth on driven gear



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4 General repair instructions

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

A number of generally applicable instructions for the various repair procedures 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

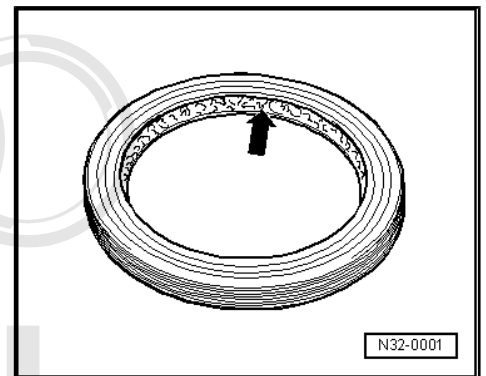
- ◆ Allocate bolts and other components according to ⇒ Electronic parts catalogue .
- ◆ Clean contact surfaces when assembling mounting brackets and waxed components. The contact surfaces must be free of wax and grease.
- ◆ Thoroughly clean all joints and connections and the surrounding areas before disconnecting.
- ◆ When installing the gearbox, ensure that the dowel sleeves between the engine and the gearbox are correctly located.
- ◆ When installing a replacement gearbox, check the gear oil level and top up as required ⇒ [page 89](#) : capacities ⇒ [page 2](#) ; specification ⇒ Electronic parts catalogue .

Sealant

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

Oil seals, seals, O-rings and gaskets

- ◆ Always renew seals, oil seals, O-rings and gaskets.
- ◆ After removing gaskets and seals, always inspect the contact surface on the housing or shaft for burrs resulting from removal or for other signs of damage.
- ◆ Before installing oil seals, lightly oil the outer circumference of the seal and fill the space between the sealing lips -arrow- about half full with grease - G 052 128 A1- .
- ◆ The open side of the oil seal should face the side containing the fluid.
- ◆ When installing a new oil seal, position the seal in the housing so that the sealing lip does not contact the shaft in the same place as the old seal (make use of installation depth tolerances).
- ◆ Lightly lubricate O-rings with oil before installation to prevent them being trapped during assembly
- ◆ Check oil level after installing new gaskets, O-rings and oil seals ⇒ [page 89](#) .



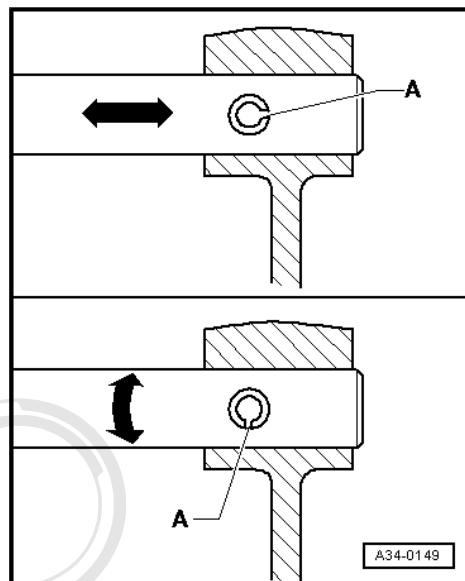
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Locking elements

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

Nuts, bolts

- ◆ Loosen the nuts and bolts in reverse sequence to the specified tightening sequence.
- ◆ Bolts and nuts which secure covers and housings should be loosened and tightened in diagonal sequence and in stages if no tightening sequence is specified.
- ◆ Parts which are particularly sensitive (e.g. clutch pressure plate) must be kept straight. Loosen and tighten bolts and nuts in stages and in diagonal sequence.
- ◆ Always renew self-locking nuts and bolts.
- ◆ The tightening torques stated apply to non-oiled nuts and bolts.
- ◆ Threaded holes which take self-locking bolts or bolts coated with locking fluid must be cleaned (using a tap or similar). Otherwise there is a danger of the bolts shearing off the next time they are removed.
- ◆ For all threaded connections, ensure that (where applicable) the contact surfaces and the nuts and bolts are not coated with wax until after assembly is completed.



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Bearings

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

Shims

- ◆ Use a micrometer to measure the shims at several points. Different shim thicknesses make it possible to obtain the exact thickness required.
- ◆ Check for burrs and damage. Install only shims which are in perfect condition.
- ◆ Install only shims which are in perfect condition.

Synchro-rings

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

Gear wheels

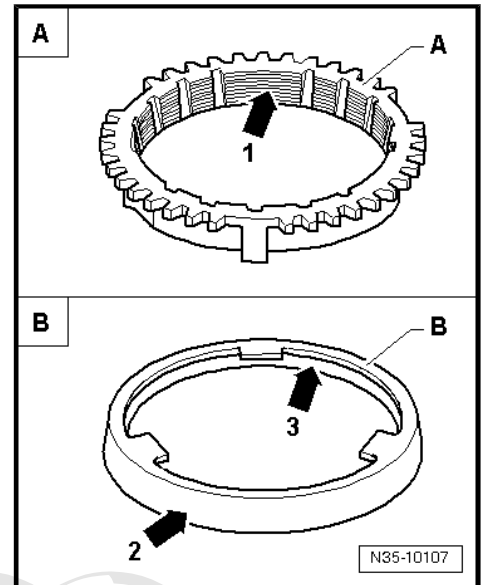
- ◆ Clean before pressing on.
- ◆ Use inductive heater - VAS 6414- to heat to approx. 100°C before installing. Press home onto stop when installing so there is no axial clearance.

Selector gears and locking collars

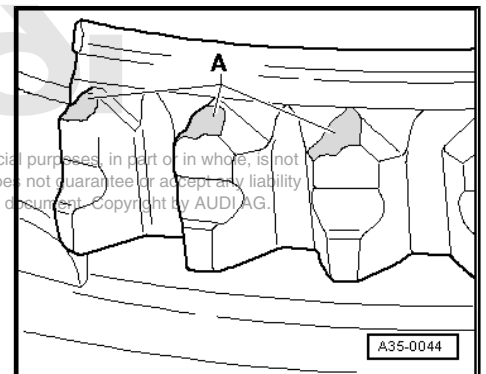
- ◆ After installing, check 1st to 5th selector gears for minimal axial play and freedom of movement.

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

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

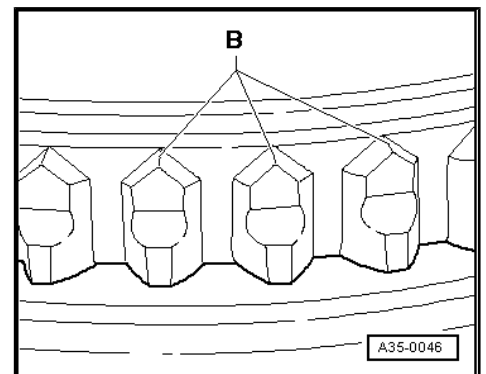


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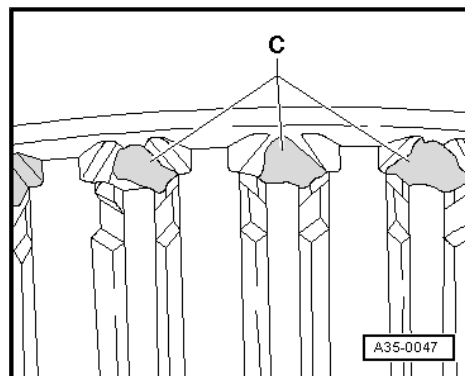
- ◆ In comparison: intact synchro-ring or selector gear:

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



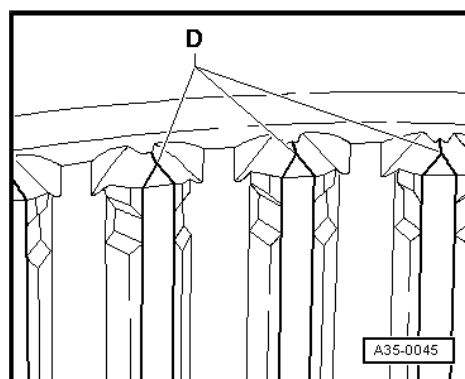
- ◆ Abnormal wear on locking collar:

C - Worn chamfer on internal splines of locking collar.



- ◆ In comparison: intact locking collar:

D - Intact chamfer on internal splines of locking collar.



Clutch mechanism

- ◆ When removing gearbox, remove clutch slave cylinder without disconnecting pipes.
- ◆ Do not depress the clutch pedal after removing the clutch slave cylinder if the hydraulic pipe is still connected. Otherwise the piston will be pressed out of the clutch slave cylinder.
- ◆ If the clutch pedal does not return to its initial position after releasing it (clutch pedal in rest position), you must bleed the clutch system (further measures ⇒ [page 9](#)).
- ◆ Ensure that the pressure plate is kept straight: loosen and tighten bolts in a diagonal sequence and in several gradual stages.
- ◆ If the clutch has burnt out, thoroughly clean the bell housing, flywheel and parts of the engine facing the gearbox in order to prevent odours.
- ◆ Only blow out dual-mass flywheel with compressed air.

4.1 Contact corrosion

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

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

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

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

Please note:

- ◆ Use only genuine spare parts: these have been fully tested and are compatible with aluminium.
- ◆ We recommend the use of accessories approved by Audi.
- ◆ Damage caused by contact corrosion is not covered by warranty.

30 – Clutch

1 Overview - clutch mechanism



If you suspect a defective clutch master cylinder or clutch slave cylinder, pay attention to

⇒ [“1.1 Notes on removing and installing clutch master cylinder and slave cylinder”, page 9](#) and perform
⇒ [“1.2 Function check for clutch master cylinder and slave cylinder”, page 10](#) prior to renewing.

I -

⇒ [“2 Exploded view - pedal cluster, clutch master cylinder”, page 12](#)

- ❑ ⇒ [“2.1 Removing and installing over-centre spring”, page 13](#)
- ❑ ⇒ [“2.2 Removing and installing clutch pedal”, page 15](#)
- ❑ ⇒ [“2.3 Removing and installing mounting bracket”, page 18](#)
- ❑ ⇒ [“2.4 Removing and installing clutch position sender G476”, page 21](#)
- ❑ ⇒ [“2.5 Removing and installing clutch master cylinder”, page 21](#)

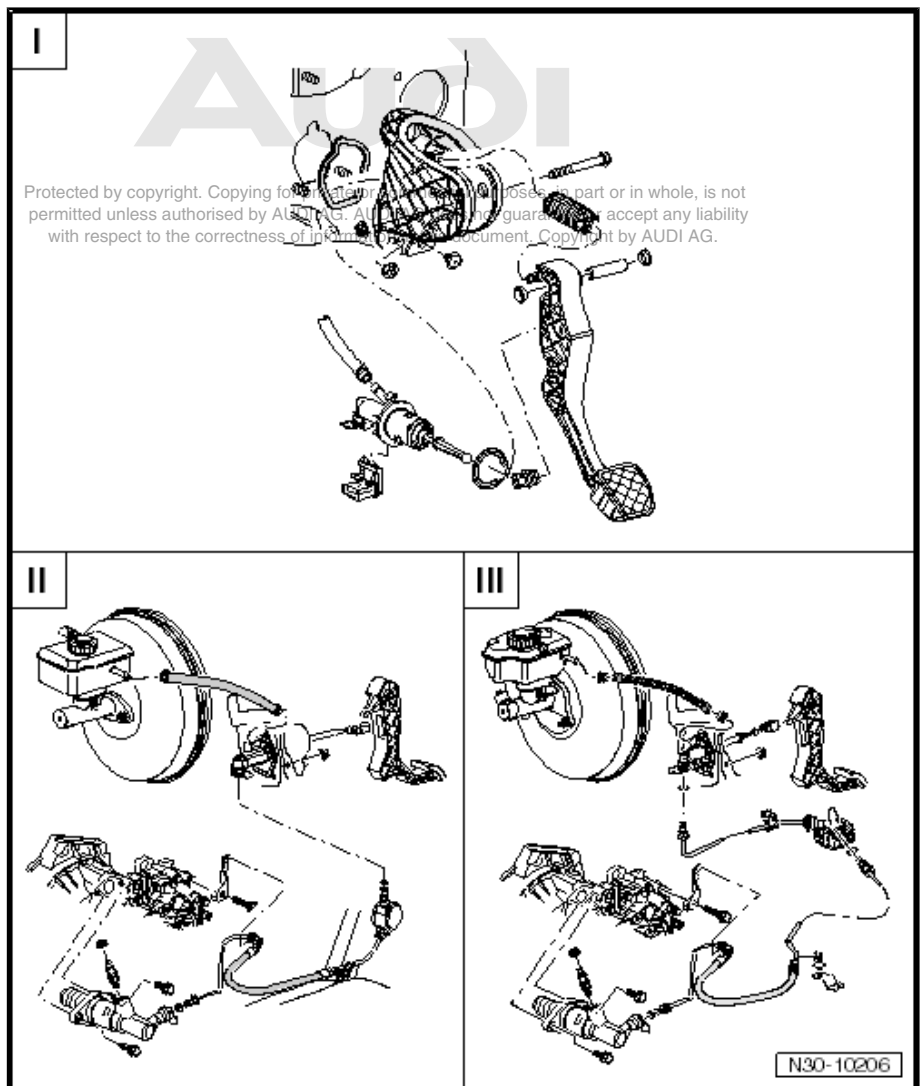
II -

⇒ [“3 Exploded view - hydraulic system, LHD vehicles”, page 24](#)

- ❑ ⇒ [“3.1 Removing and installing clutch slave cylinder”, page 26](#)
- ❑ ⇒ [“3.2 Removing and installing pipe/hose assembly or plastic pipe”, page 28](#)
- ❑ ⇒ [“3.3 Bleeding clutch system”, page 30](#)

III -

⇒ [“4 Exploded view - hydraulic system, RHD vehicles”, page 32](#)



1.1 Notes on removing and installing clutch master cylinder and slave cylinder

- ◆ Before renewing the clutch master cylinder or slave cylinder on the assumption that it is defective you must first carry out a function check

⇒ ["1.2 Function check for clutch master cylinder and slave cylinder", page 10](#) .

- ◆ If the slave cylinder is removed from gearbox with the pipe/hose assembly still attached, make sure you do not press the clutch pedal. Otherwise, the piston will be pressed out of the slave cylinder and be destroyed.
- ◆ After installing the slave cylinder, carefully press the clutch pedal. If you feel an unusually strong point of resistance when pressing the clutch pedal, you must not press it down further. The plunger of the slave cylinder is likely to have been guided past the clutch release lever. The slave cylinder would then be destroyed once pedal force exceeds approx. 300 N.

1.2 Function check for clutch master cylinder and slave cylinder

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

Noises when operating the clutch:

- ◆ First check the over-centre spring / clutch pedal switch for noise.
- ◆ If you hear a noise, remove over-centre spring and repeat check.
- ◆ Renew relevant component.

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

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

Check the complete hydraulic system for leaks.

- ◆ Check brake fluid level in brake fluid reservoir.
- ◆ Check clutch master cylinder and slave cylinder as well as the pipe/hose assembly including connections for external leaks (visual inspection).
- ◆ If you identify any leaks you must renew the leaking component.
- ◆ Bleed clutch system ⇒ [page 30](#) .

Pedal forces:

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

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High pedal force:

- ◆ Mechanically defective pressure plate/clutch plate
⇒ [page 36](#) .

Clutch does not disengage or does not disengage fully:

- ◆ Air in hydraulic system: bleed clutch system ⇒ [page 30](#) and check hydraulic system for external and internal leaks.
- ◆ Clutch plate does not move smoothly on input shaft splines (due to corrosion or dirt, etc.)
- ◆ Foreign body in clutch system
- ◆ Mechanically defective pressure plate/clutch plate
⇒ [page 36](#) .
- ◆ Wrong components used or components forgotten when carrying out repair work (e.g. intermediate plate or dowel sleeves).



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2 Exploded view - pedal cluster, clutch master cylinder



Note

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

1 - Pipe/hose assembly or plastic pipe

- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Disconnecting from clutch master cylinder and clutch slave cylinder ⇒ [page 26](#)
- ☐ Removing and installing ⇒ [page 28](#)

2 - Seal or O-ring

- ☐ Matched to type of connection ⇒ [page 25](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew damaged seals or O-rings
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing

3 - Clip

4 - Supply hose

- ☐ To brake fluid reservoir
- ☐ Made of rubber or plastic, depending on version
- ☐ Plastic supply hose with additional seals ⇒ [page 25](#)

5 - Nut

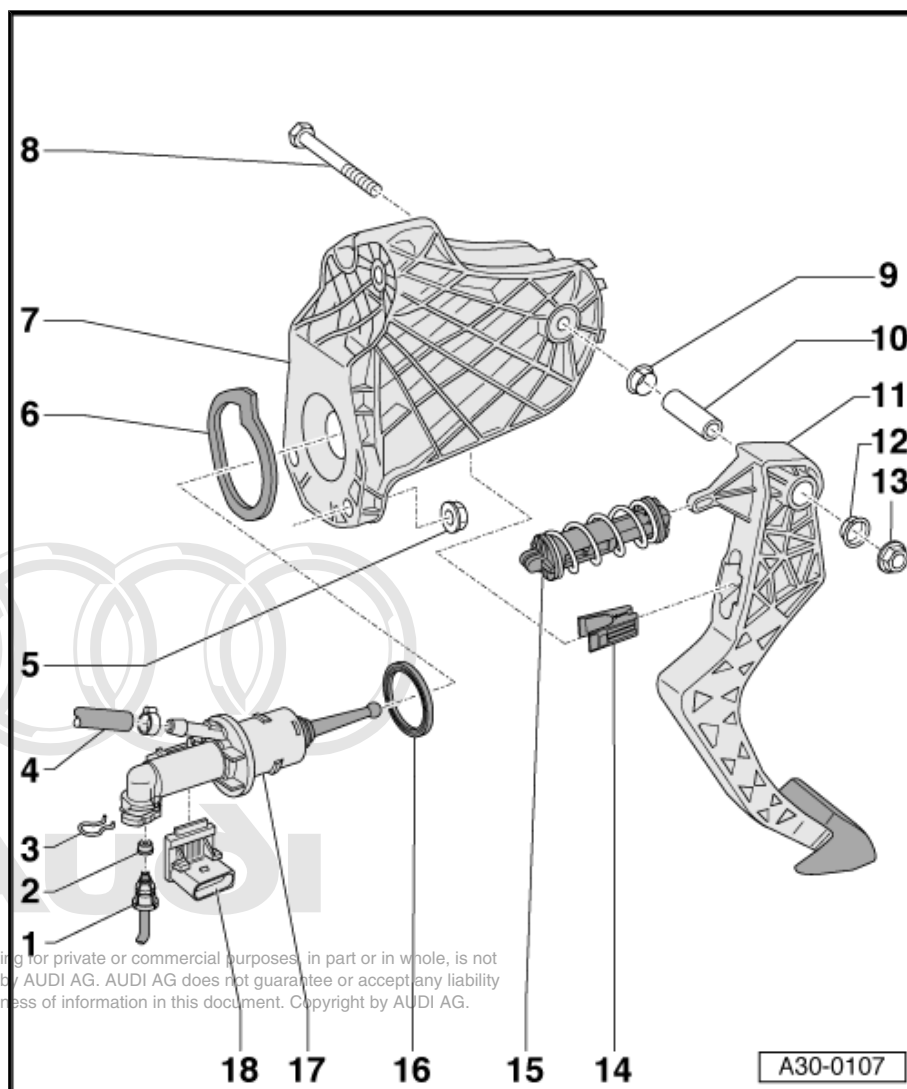
- ☐ 3x
- ☐ Self-locking
- ☐ Renew
- ☐ 25 Nm

6 - Gasket

- ☐ Renew

7 - Mounting bracket

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



8 - Bolt

9 - Bearing bush

10 - Pivot pin

11 - Clutch pedal

- ☐ Removing and installing ⇒ [page 15](#)

12 - Bearing bush

13 - Nut

- ☐ Self-locking
- ☐ Renew
- ☐ 25 Nm

14 - Retaining clip

- ☐ For operating rod on clutch master cylinder

15 - Over-centre spring

- ☐ Removing and installing ⇒ [page 13](#)

16 - Seal

- ☐ Renew

17 - Clutch master cylinder

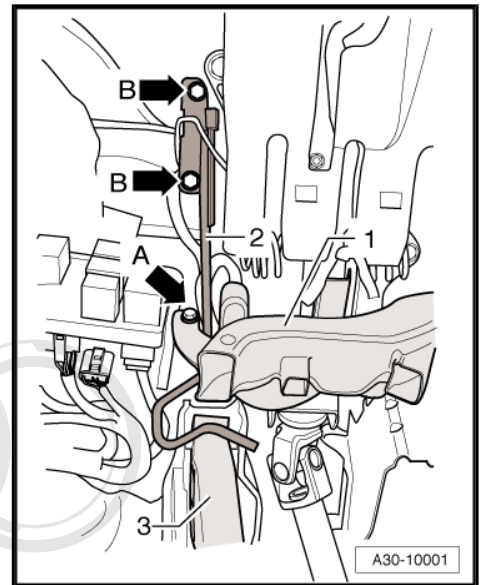
- ☐ Removing and installing ⇒ [page 21](#)

18 - Clutch position sender - G476-

- ☐ Removing and installing ⇒ [page 21](#)
- ☐ Checking in "Guided Fault Finding" ⇒ Vehicle diagnostic tester

Crash bar - tightening torque

- Fit crash bar -2- and tighten 1 or 2 bolts (depending on version)
–arrows B-.
- M6 10 Nm
- M8 20 Nm

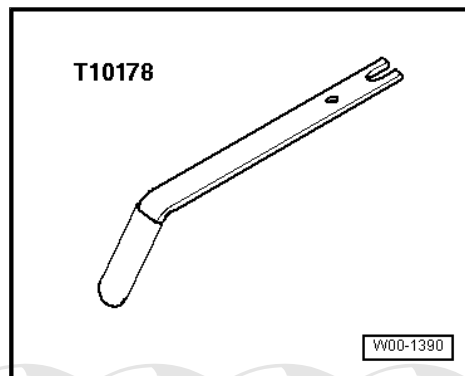


2.1 Removing and installing over-centre spring

Special tools and workshop equipment required

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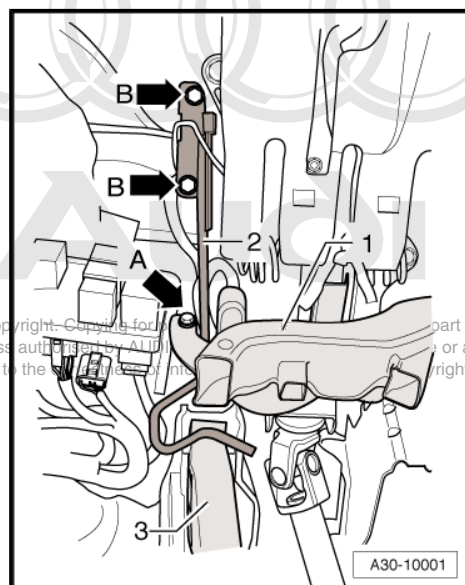
◆ Assembly tool - T10178-



◆ Grease - G 000 450 02-

Removing

- Clutch pedal mounting bracket fitted in vehicle
- Move driver's seat away from pedals.
- Remove storage compartment on driver's side ⇒ Rep. gr. 68 .
- Unscrew bolt -arrow A- and remove footwell vent (front left) -1-.
- Unclip wiring harness at rear of footwell vent -1- and move clear to one side.
- Unbolt crash bar -2- (secured by one or two bolts -arrows B- depending on version).



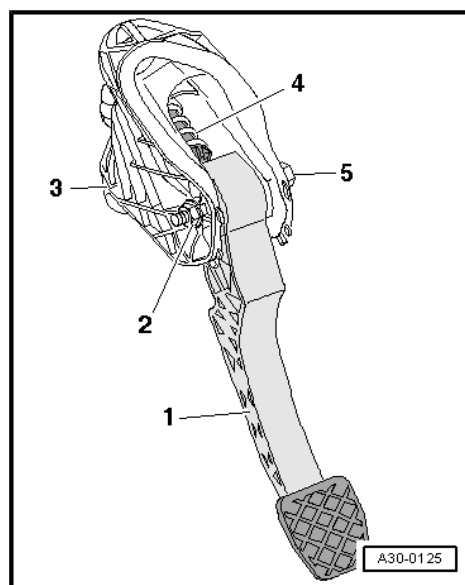
- Unbolt clutch pedal -1- from mounting bracket -3-. To do this, remove nut -2- and pull out bolt -5-.



Note

The clutch pedal does not have to be detached from the operating rod on the clutch master cylinder.

- Pivot clutch pedal down slightly and take over-centre spring -4- out of mounting bracket.

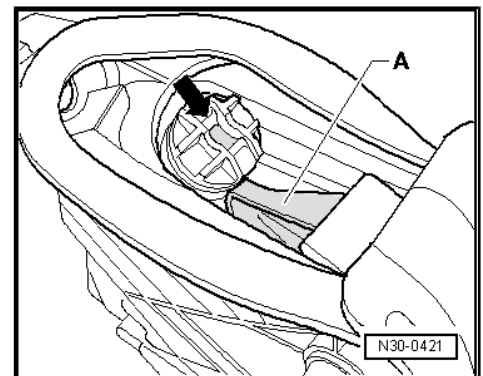
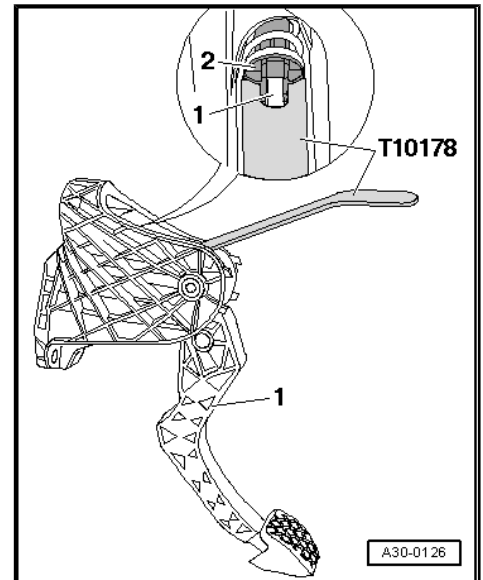


Installing

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

Note

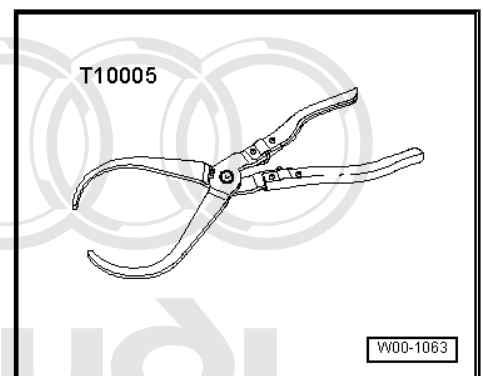
- ◆ *Renew self-locking nut.*
- ◆ *Lubricate all bearings and contact surfaces with grease - G 000 450 02- .*
- Fit over-centre spring -2- into mounting bracket from above while holding end of spring in correct position with assembly tool - T10178- .
- Socket -arrow- of over-centre spring must be in vertical position.
- Fit actuator on clutch pedal -A- into corresponding socket in over-centre spring -arrow-.
- Press clutch pedal slightly, push bolt through and tighten self-locking nut. Tightening torque ⇒ [Item 13 \(page 13\)](#)
- Install crash bar ⇒ [page 13](#) .
- Install footwell vent (front left) ⇒ Rep. gr. 80 .
- Install storage compartment on driver's side ⇒ Rep. gr. 68 .



2.2 Removing and installing clutch pedal

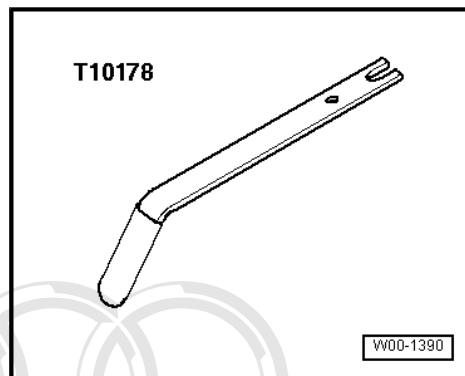
Special tools and workshop equipment required

- ◆ Pliers - T10005-



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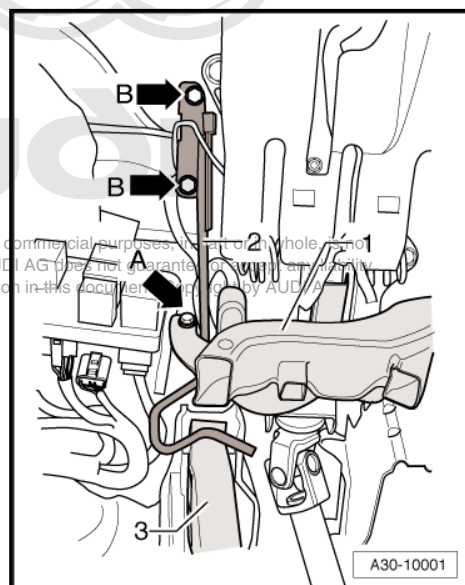
◆ Assembly lever - T10178-



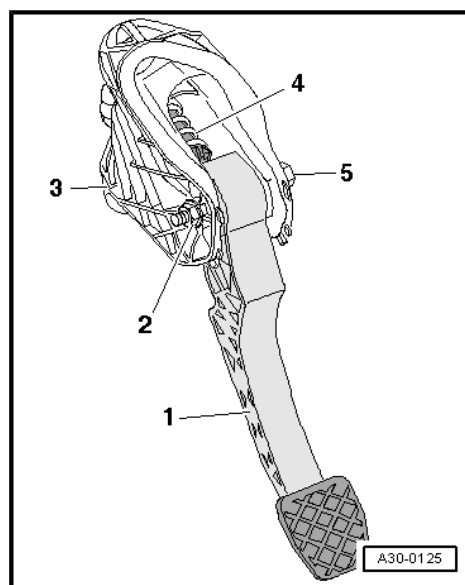
◆ Grease - G 000 450 02-

Removing

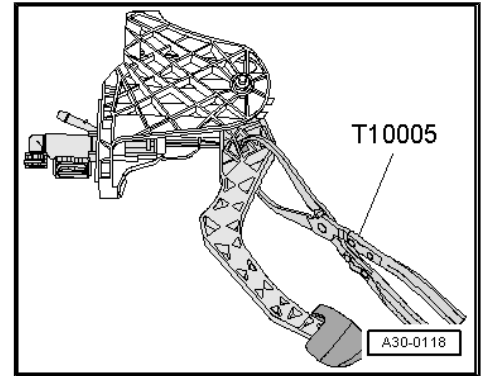
- Clutch pedal mounting bracket fitted in vehicle
- Move driver's seat away from pedals.
- Remove storage compartment on driver's side ⇒ Rep. gr. 68 .
- Unscrew bolt -arrow A- and remove footwell vent (front left) -1-.
- Unclip wiring harness at rear of footwell vent -1- and move clear to one side.
- Unbolt crash bar -2- (secured by one or two bolts -arrows B-, depending on version).



- Unbolt clutch pedal -1- from mounting bracket -3-. To do this, remove nut -2- and pull out bolt -5-.
- Pivot clutch pedal down slightly and take over-centre spring -4- out of mounting bracket.



- Release retaining clip for operating rod on clutch master cylinder using pliers - T10005- .
- Remove clutch pedal.

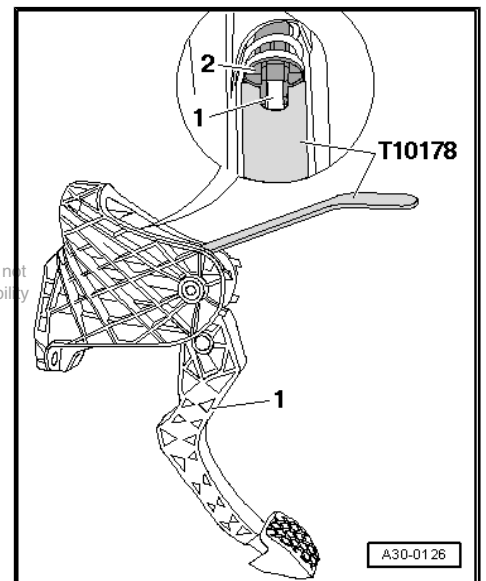
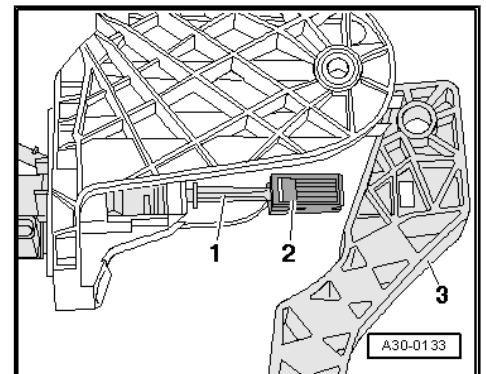


Installing

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

Note

- ◆ *Renew self-locking nut.*
- ◆ *Lubricate all bearings and contact surfaces with grease - G 000 450 02- .*
- Install retaining clip -2- on operating rod -1- for clutch master cylinder.
- Press retaining clip into mounting on clutch pedal so that it snaps into place.
- Fit over-centre spring -2- into mounting bracket from above while holding end of spring in correct position with assembly tool - T10178- .



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- Socket -arrow- of over-centre spring must be in vertical position.
- Fit actuator on clutch pedal -A- into corresponding socket in over-centre spring -arrow-.
- Press top of clutch pedal forwards against spring pressure of over-centre spring, push through bolt and tighten self-locking nut. Tightening torque ⇒ [Item 13 \(page 13\)](#)



Note

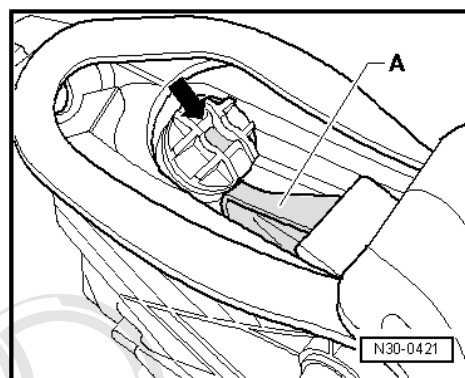
It is easier to press the pedal against the spring if you pull back the bottom of the pedal carefully as you bring the top of the pedal into position.

- Install crash bar ⇒ [page 13](#) .
- Install footwell vent (front left) ⇒ Rep. gr. 80 .
- Install storage compartment on driver's side ⇒ Rep. gr. 68 .

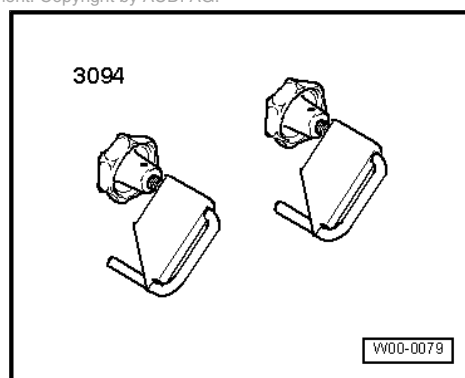
2.3 Removing and installing mounting bracket

Special tools and workshop equipment required

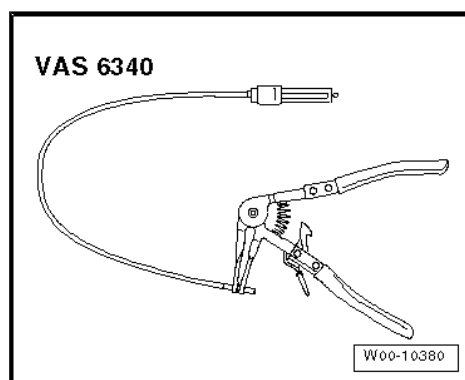
- ◆ Hose clamps, up to 25 mm - 3094-



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- ◆ Hose clip pliers - VAS 6340-



Removing

- Move driver's seat away from pedals.

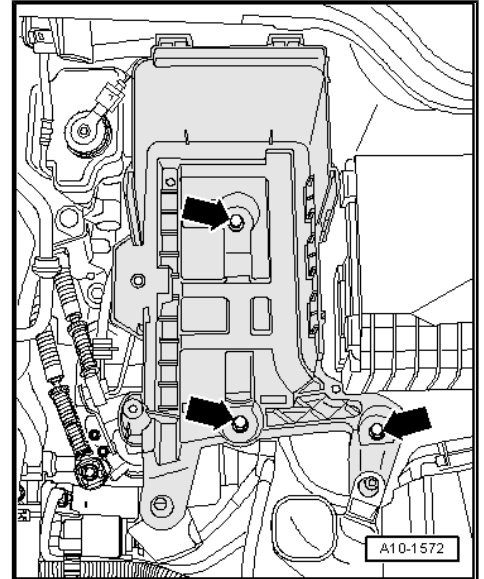


Caution

When disconnecting the battery there is a risk of irreparable damage to electronic components.

- ◆ *Observe notes on procedure for disconnecting the battery.*

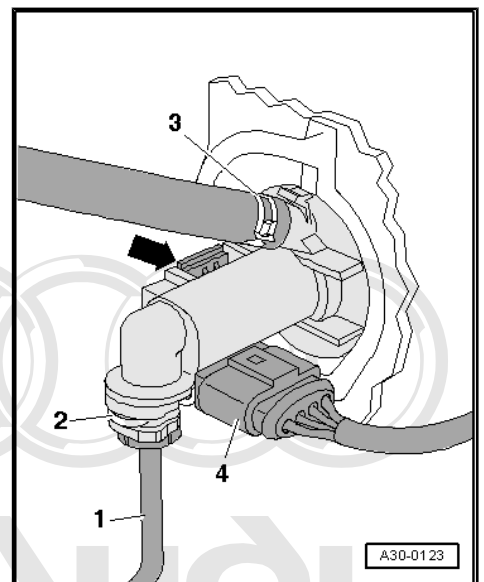
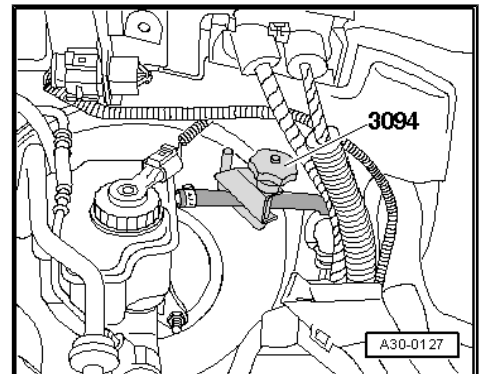
- Remove battery ⇒ Rep. gr. 27 .
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).



Note

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

- Use hose clamp -3094- to clamp off supply hose to clutch master cylinder.
- Disconnect supply hose at clutch master cylinder (if necessary, release spring-type clip -3- using hose clip pliers - VAS 6340-).
- Release clip -2- with a screwdriver and disconnect pipe/hose assembly -1- or plastic pipe from connection.
- Unclip and detach clutch position sender - G476- from clutch master cylinder -arrow-. Electrical connector -4- can remain connected.



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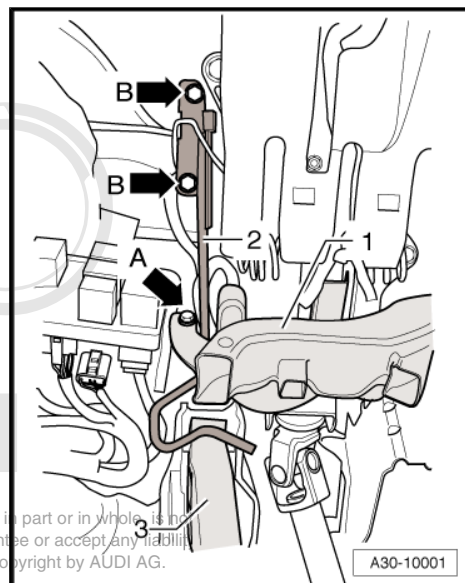
- Remove storage compartment on driver's side ⇒ Rep. gr. 68 .
- Unscrew bolt -arrow A- and remove footwell vent (front left) -1-.
- Unclip wiring harness at rear of footwell vent -1- and move clear to one side.
- Unbolt crash bar -2- (secured by one or two bolts -arrows B-, depending on version).



Note

When performing work in the footwell, put cloths on the carpet to protect it from possible brake fluid spills.

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- Remove nuts -2-.
- Take out mounting bracket -1-.

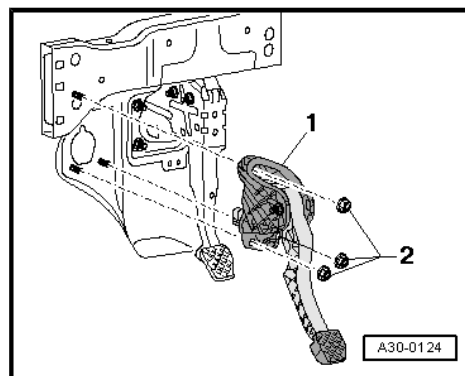
Installing

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

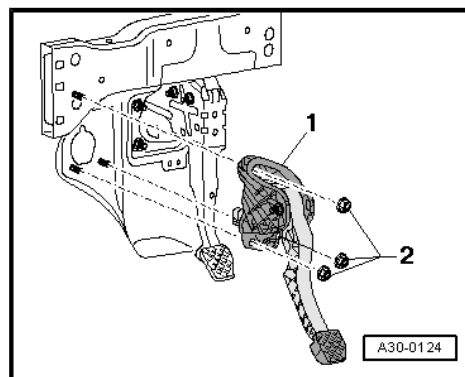


Note

- ◆ Renew self-locking nuts.
- ◆ Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ *Electronic parts catalogue* .



- Fit mounting bracket -1- and tighten nuts -2-. Tightening torque ⇒ [Item 5 \(page 12\)](#)
- Connect pipe/hose assembly or plastic pipe ⇒ [page 26](#) .
- Bleed clutch system ⇒ [page 30](#) .
- Install crash bar ⇒ [page 13](#) .
- Install footwell vent (front left) ⇒ Rep. gr. 80 .
- Install storage compartment on driver's side ⇒ Rep. gr. 68 .
- Install battery tray and battery ⇒ Rep. gr. 27 .



2.4 Removing and installing clutch position sender - G476-

Removing

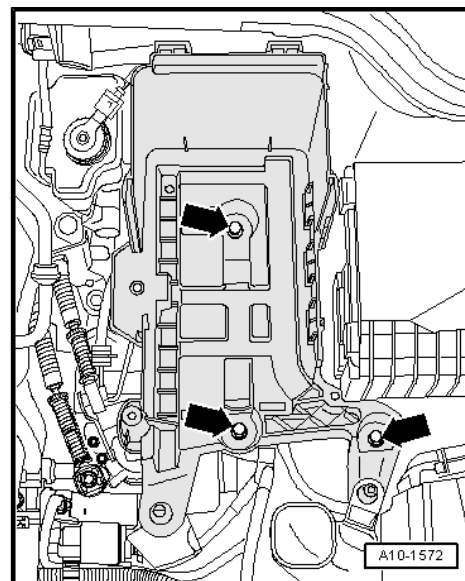


Caution

When disconnecting the battery there is a risk of irreparable damage to electronic components.

◆ *Observe notes on procedure for disconnecting the battery.*

- Remove battery ⇒ Rep. gr. 27 .
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).



- Unplug electrical connector -4-, and unclip and detach clutch position sender -G476- from master cylinder -arrow-.



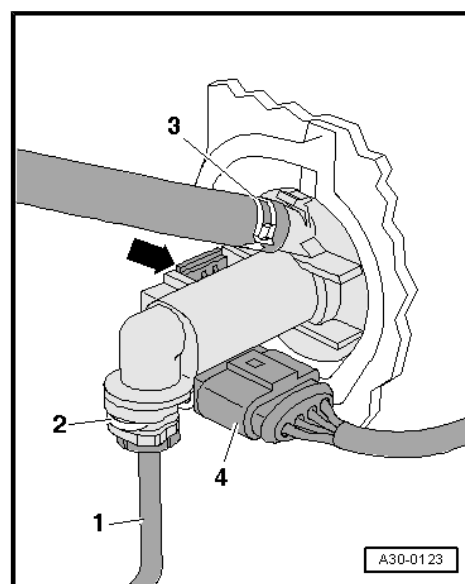
Note

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

Installing

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted without the prior written consent of Audi AG. Copyright by Audi AG. Installation is carried out in reverse sequence; note the following:

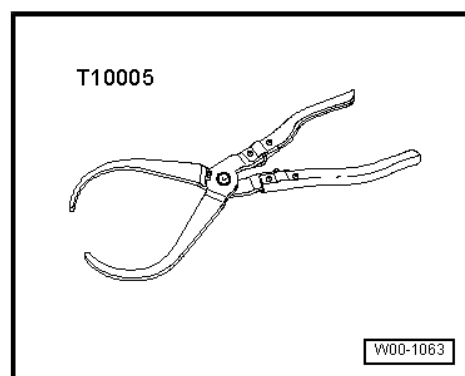
- Install battery tray and battery ⇒ Rep. gr. 27 .



2.5 Removing and installing clutch master cylinder

Special tools and workshop equipment required

- ◆ Pliers - T10005-



Removing

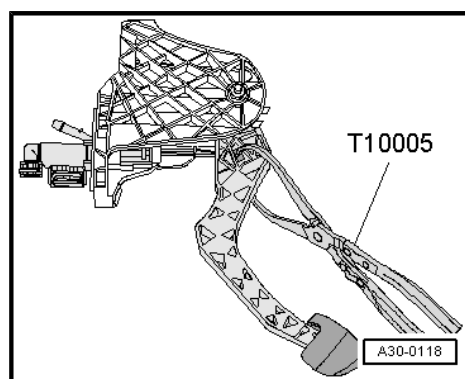


Note

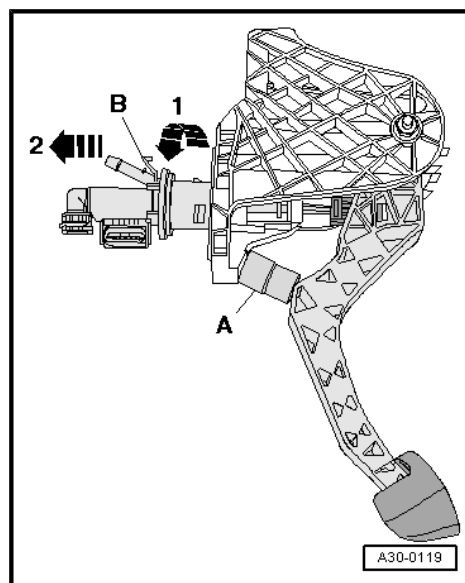
- ◆ If you suspect a defective clutch master cylinder, perform function test prior to renewing
⇒ "1.1 Notes on removing and installing clutch master cylinder and slave cylinder", page 9.
- ◆ When performing work in the footwell, put cloths on the carpet to protect it from possible brake fluid spills.

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- Remove mounting bracket → page 18.
- Release retaining clip for operating rod on clutch master cylinder using pliers - T10005-.

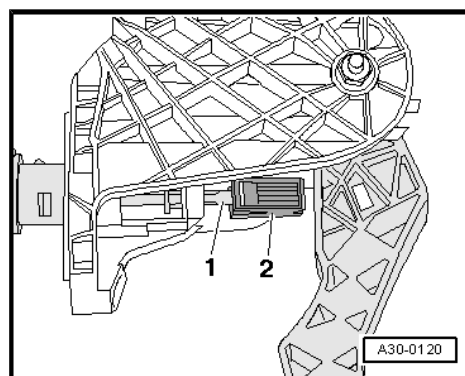


- Insert a spacer -A- between clutch pedal and stop, and press clutch pedal forward.
- ◆ Length of spacer = approx. 40 mm (e.g. 1/2" socket).
- Release retaining clip -B-, turn clutch master cylinder in direction of -arrow 1- as far as stop and pull it out of mounting bracket -arrow 2-.

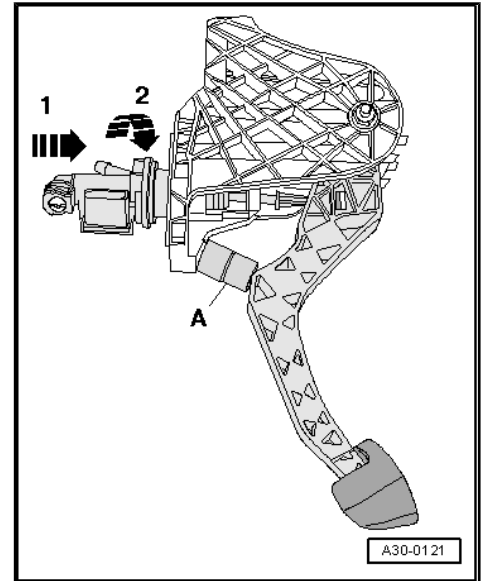


Installing

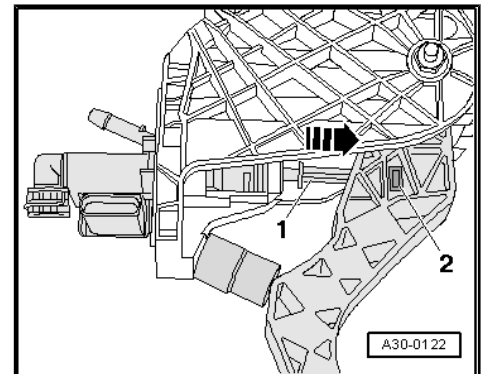
- Clutch pedal in "released" position.
- Install retaining clip -2- on operating rod -1- for clutch master cylinder.



- Insert a spacer -A- between clutch pedal and stop, and press clutch pedal forward.
- ◆ Length of spacer = approx. 40 mm (e.g. 1/2" socket).
- Secure clutch master cylinder on mounting bracket -arrows 1 and 2-.



- Press operating rod -1- for clutch master cylinder in direction indicated (arrow) so that retaining clip -2- snaps into place in clutch pedal.
- Install mounting bracket ⇒ [page 18](#) .



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3 Exploded view - hydraulic system, LHD vehicles

1 - Brake fluid reservoir

2 - Hose clip (spring-type clip)

- ☐ Not fitted on all versions

3 - Supply hose

- ☐ Made of rubber or plastic, depending on version
- ☐ Plastic supply hose with additional seals
⇒ [page 25](#)

4 - Clutch master cylinder

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

5 - Clip

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

6 - Retaining clip

- ☐ For operating rod on clutch master cylinder
- ☐ To remove and install retaining clip first detach clutch master cylinder from clutch pedal
⇒ [page 15](#)

7 - Clutch pedal

- ☐ Removing and installing
⇒ [page 15](#)

8 - Nut

- ☐ Secures mounting bracket to body
- ☐ Renew
- ☐ Tightening torque ⇒ [Item 5 \(page 12\)](#)

9 - O-ring

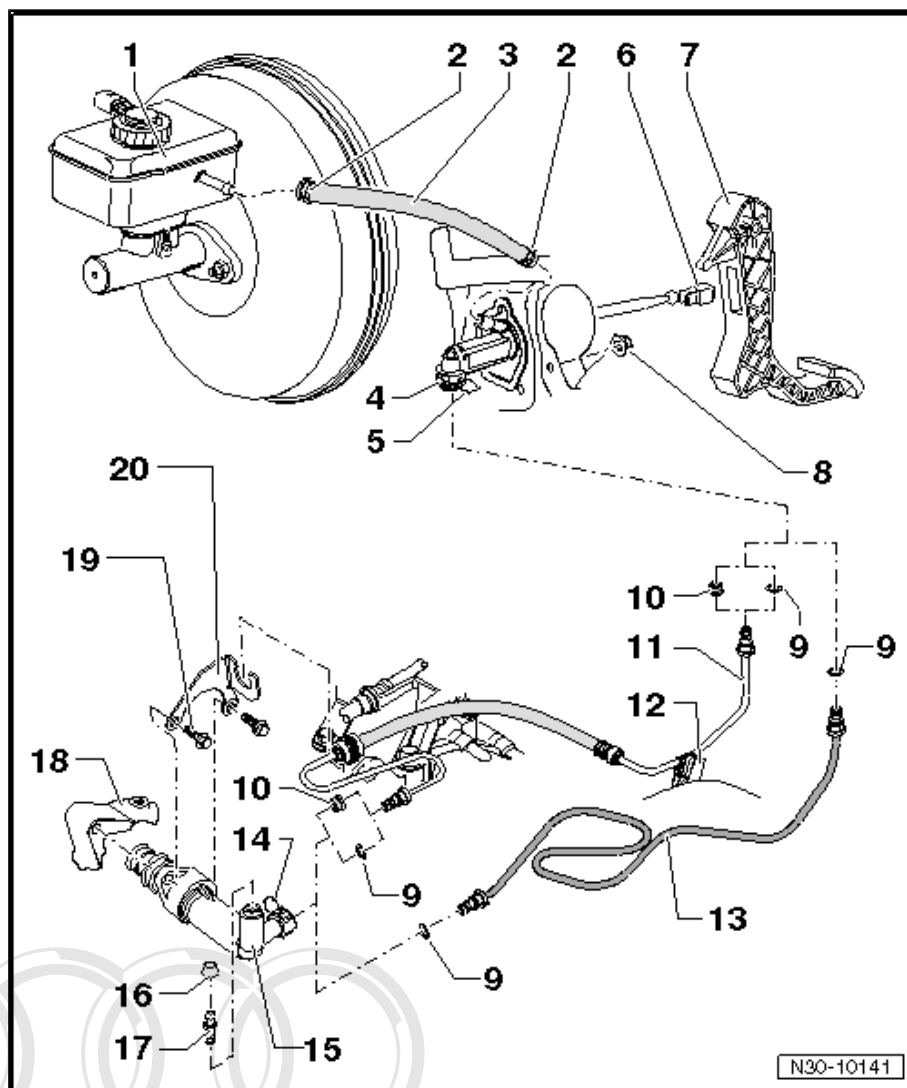
- ☐ Matched to type of connection ⇒ [page 25](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew damaged O-rings
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing

10 - Seal

- ☐ Matched to type of connection ⇒ [page 25](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew damaged seals
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing

11 - Pipe/hose assembly

- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 28](#)
- ☐ Disconnecting from clutch master cylinder and clutch slave cylinder ⇒ [page 26](#)



12 - Bracket

- ☐ For pipe/hose assembly ⇒ [Item 11 \(page 24\)](#)
- ☐ Secured on body

13 - Plastic pipe

- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 28](#)
- ☐ Disconnecting from clutch master cylinder and clutch slave cylinder ⇒ [page 26](#)

14 - Clip

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

15 - Clutch slave cylinder

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

16 - Dust cap

17 - Bleeder screw

- ☐ Bleeding clutch system ⇒ [page 30](#)
- ☐ 6 Nm

18 - Gearbox

19 - Bolt

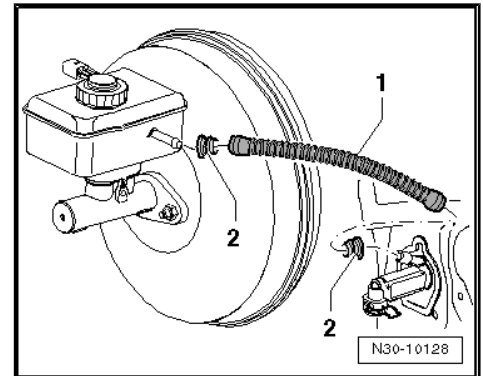
- ☐ 2x
- ☐ 20 Nm

20 - Bracket

- ☐ For pipe/hose assembly

Vehicles with plastic supply hose -1-

- Seals -2- must be fitted in supply hose.



Seals or O-rings for pipe/hose assembly or plastic pipe

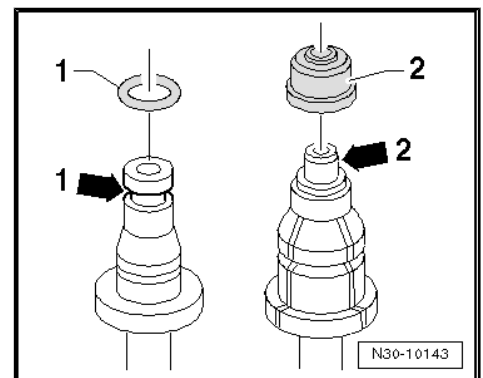
1 - O-ring

- ◆ Connection with annular groove -arrow 1-
- ◆ Check O-ring for damage and renew if necessary

2 - Seal

- ◆ Connection with shoulder -arrow 2-

- ◆ Position seal 2 onto connection -arrow 2- before fitting
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Disconnecting and connecting hose/pipe assembly or plastic pipe at clutch master cylinder or clutch slave cylinder

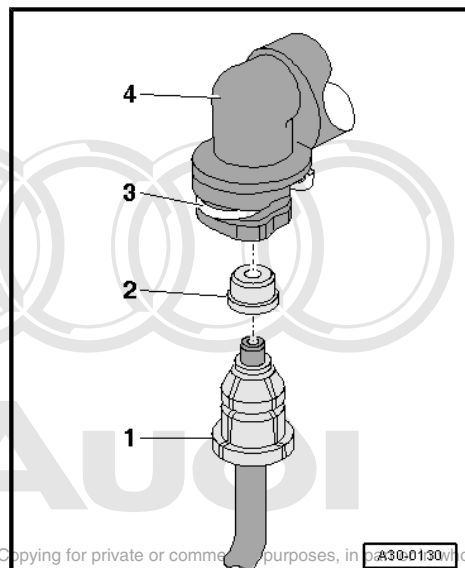
- Release clip -3- with a screwdriver and disconnect pipe/hose assembly -1- or plastic pipe from connection -4-.

Installing



Note

- ◆ Observe distinction between seals -2- and O-rings
⇒ [page 25](#).
- ◆ Renew damaged seals or O-rings.
- Press pipe/hose assembly or plastic pipe -1- onto connection on clutch slave cylinder and clutch master cylinder -4- so that clip -3- snaps into place.
- Pull on pipe to check that it is secure.

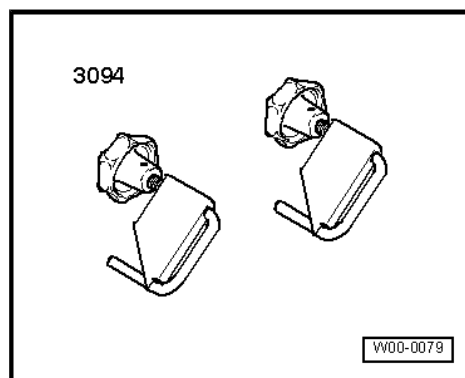


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3.1 Removing and installing clutch slave cylinder

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



Removing



Note

- ◆ If you suspect a defective clutch slave cylinder, perform function test prior to renewing
⇒ [“1.1 Notes on removing and installing clutch master cylinder and slave cylinder”, page 9](#).
- ◆ If the slave cylinder is removed from gearbox with the pipe/hose assembly still attached, make sure you do not press the clutch pedal. Otherwise, the piston will be pressed out of the slave cylinder and be destroyed.

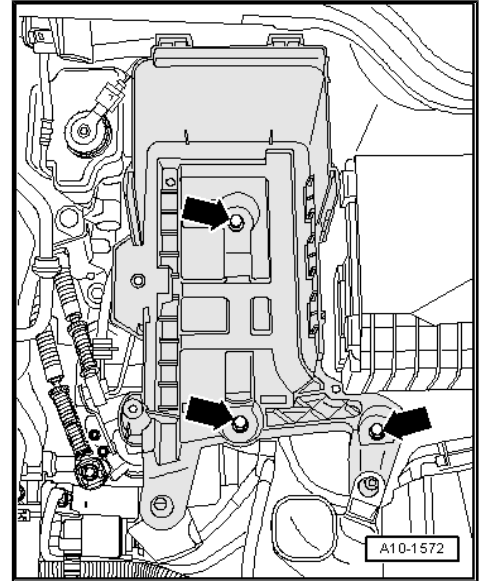


Caution

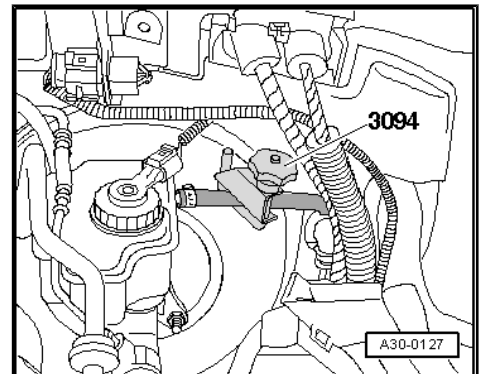
When disconnecting the battery there is a risk of irreparable damage to electronic components.

◆ *Observe notes on procedure for disconnecting the battery.*

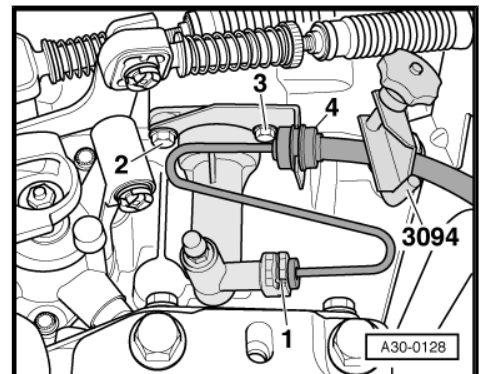
- Remove battery ⇒ Rep. gr. 27 .
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).



- If a plastic pipe is installed between clutch master cylinder and slave cylinder, clamp off supply hose to clutch master cylinder using hose clamp -3094- .



- If a pipe/hose assembly is installed between clutch master cylinder and slave cylinder, clamp off hose using hose clamp -3094- .



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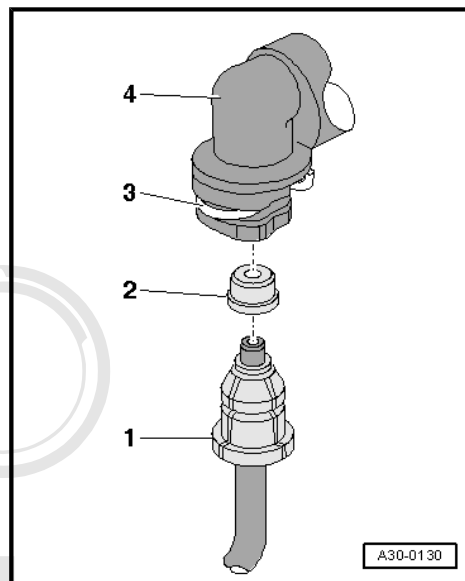


Note

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

◆ Place a cloth underneath to catch escaping brake fluid.

- Release clip -3- with a screwdriver and disconnect pipe/hose assembly -1- or plastic pipe from connection -4-.
- Detach pipe/hose assembly from bracket and move clear to the side.



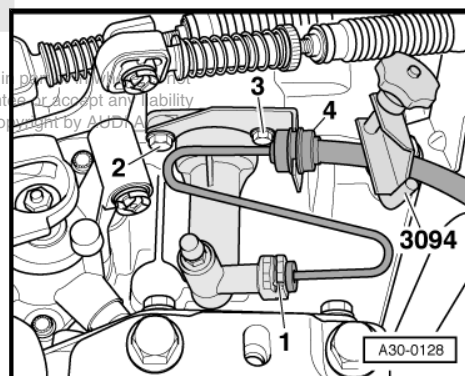
– Remove bolts -2- and -3-.

– Remove slave cylinder.



Caution

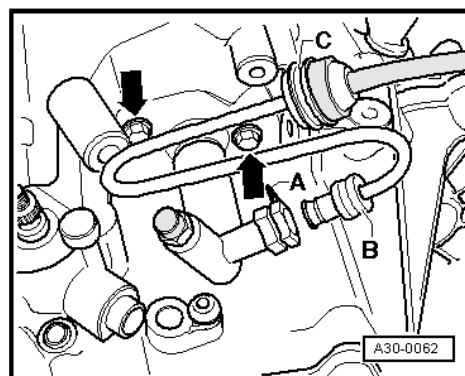
Do not operate clutch pedal after removing clutch slave cylinder.



Installing

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

- Connect pipe/hose assembly or plastic pipe -B- to clutch slave cylinder -A- ⇒ [page 26](#) .
- Lubricate end of plunger with MoS₂ grease.
- Install clutch slave cylinder and tighten bolts -arrows-. Tightening torque ⇒ [Item 19 \(page 25\)](#)
- Engage pipe/hose assembly in bracket -C-.
- Bleed clutch system ⇒ [page 30](#) .
- Install battery tray and battery ⇒ Rep. gr. 27 .



3.2 Removing and installing pipe/hose assembly or plastic pipe

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-

Removing



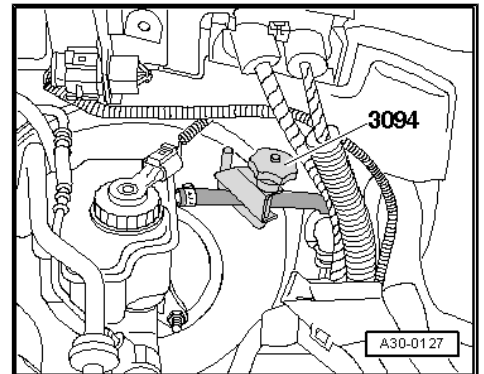
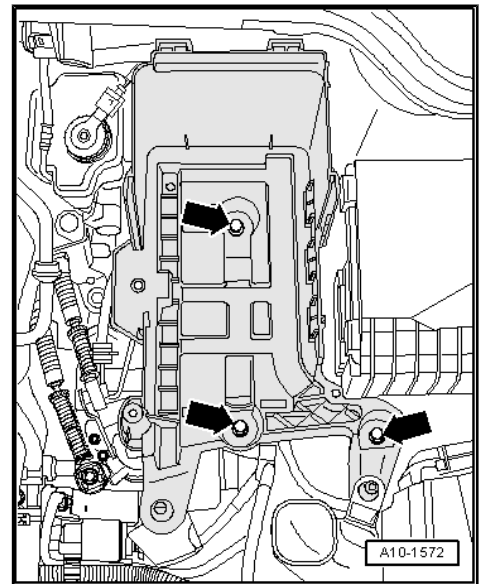
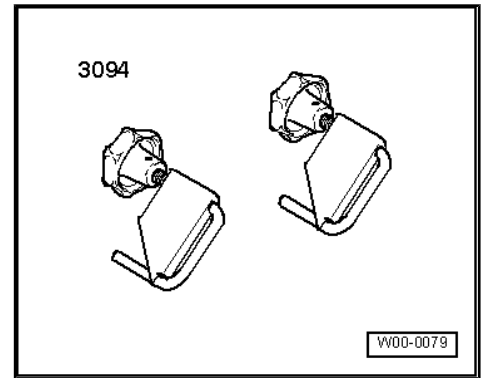
Caution

When disconnecting the battery there is a risk of irreparable damage to electronic components.

- ◆ *Observe notes on procedure for disconnecting the battery.*

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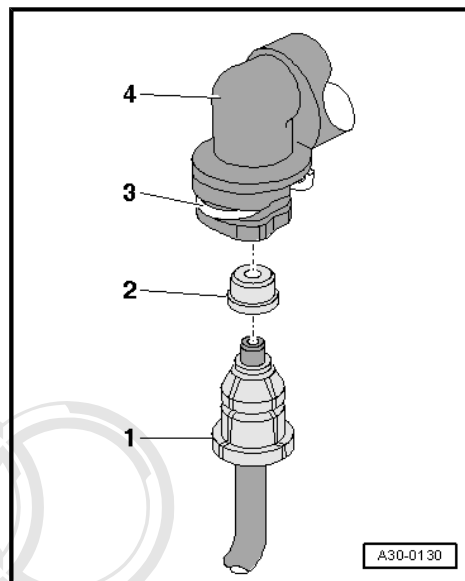
- Remove battery → Rep. gr. 27
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).
- Use hose clamp -3094- to clamp off supply hose to clutch master cylinder.





Note

- ◆ *In the following steps make sure that no brake fluid escapes onto the longitudinal member or onto the gearbox below. If this does happen, clean the affected area thoroughly.*
- ◆ *Place a cloth underneath to catch escaping brake fluid.*
- Release clip -3- at clutch master cylinder with a screwdriver and disconnect pipe/hose assembly -1- or plastic pipe from connection -4-.



- Disengage pipe/hose assembly from bracket -C-.
- Release clip -A- at clutch slave cylinder with a screwdriver and disconnect pipe/hose assembly -B- or plastic pipe from connection.

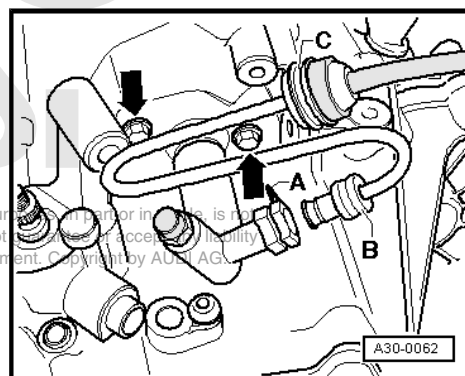
Installing

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



Note

- ◆ *Observe distinction between seals -2- and O-rings*
⇒ [page 25](#).
- ◆ *Renew damaged seals or O-rings.*
- Connect pipe/hose assembly or plastic pipe to clutch slave cylinder and master cylinder ⇒ [page 26](#).
- Clip pipe/hose assembly into bracket.
- Bleed clutch system ⇒ [page 30](#).
- Install battery tray and battery ⇒ Rep. gr. 27.



3.3 Bleeding clutch system

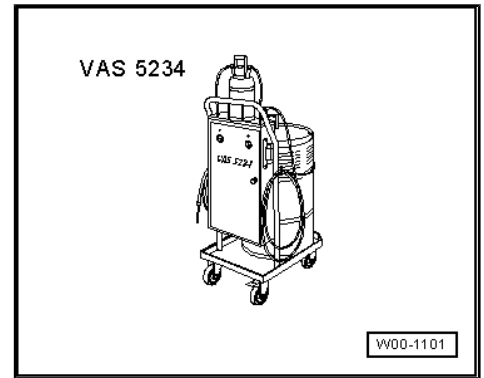


Note

- ◆ *The clutch system must be bled after performing work on the hydraulic clutch mechanism.*
- ◆ *In the following steps make sure that no brake fluid escapes onto the longitudinal member or onto the gearbox below.*

Special tools and workshop equipment required

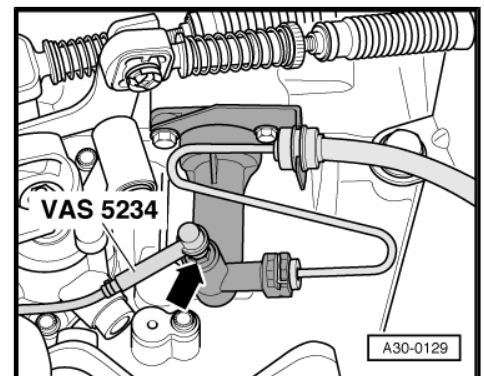
◆ Brake filling and bleeding equipment - VAS 5234-



◆ Brake fluid specification ⇒ Rep. gr. 47 .

Procedure

- Pull clutch pedal back to its initial position.
- Connect brake filling and bleeding equipment - VAS 5234- to brake fluid reservoir.
- Remove protective cap from bleeder screw -arrow- on slave cylinder and connect hose from bleeder bottle to bleeder screw.
- Switch on bleeding equipment.
- Operating pressure 2.0 bar
- Now open bleeder screw approx $\frac{1}{4}$ turn and allow 100 cm³ of brake fluid to run out.
- Close bleeder screw.
- Rapidly operate pedal from stop to stop 15 times.
- Bleed off an additional 50 cm³ of brake fluid.
- Close bleeder screw.
- Switch off brake filling and bleeding equipment - VAS 5234- and release operating pressure (2.0 bar).
- Press clutch pedal slowly down with your foot 10 times and check that clutch system is functioning properly.
- Bleed system once again if necessary.
- Detach brake filling and bleeding equipment - VAS 5234- from brake fluid reservoir.



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4 Exploded view - hydraulic system, RHD vehicles

1 - Brake fluid reservoir

2 - Seal

- ☐ For plastic supply hose
- ☐ Seals must be fitted in supply hose

3 - Supply hose

- ☐ Made of rubber or plastic, depending on version
- ☐ Plastic supply hose with additional seals
⇒ [Item 2 \(page 32\)](#)

4 - Clutch master cylinder

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

5 - Clip

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

6 - Seal or O-ring

- ☐ Matched to type of connection ⇒ [page 25](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew damaged seals or O-rings
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing

7 - Retaining clip

- ☐ To remove and install retaining clip first detach clutch master cylinder from clutch pedal ⇒ [page 15](#)

8 - Clutch pedal

9 - Nut

- ☐ For securing mounting bracket to bulkhead
- ☐ 25 Nm

10 - Bracket

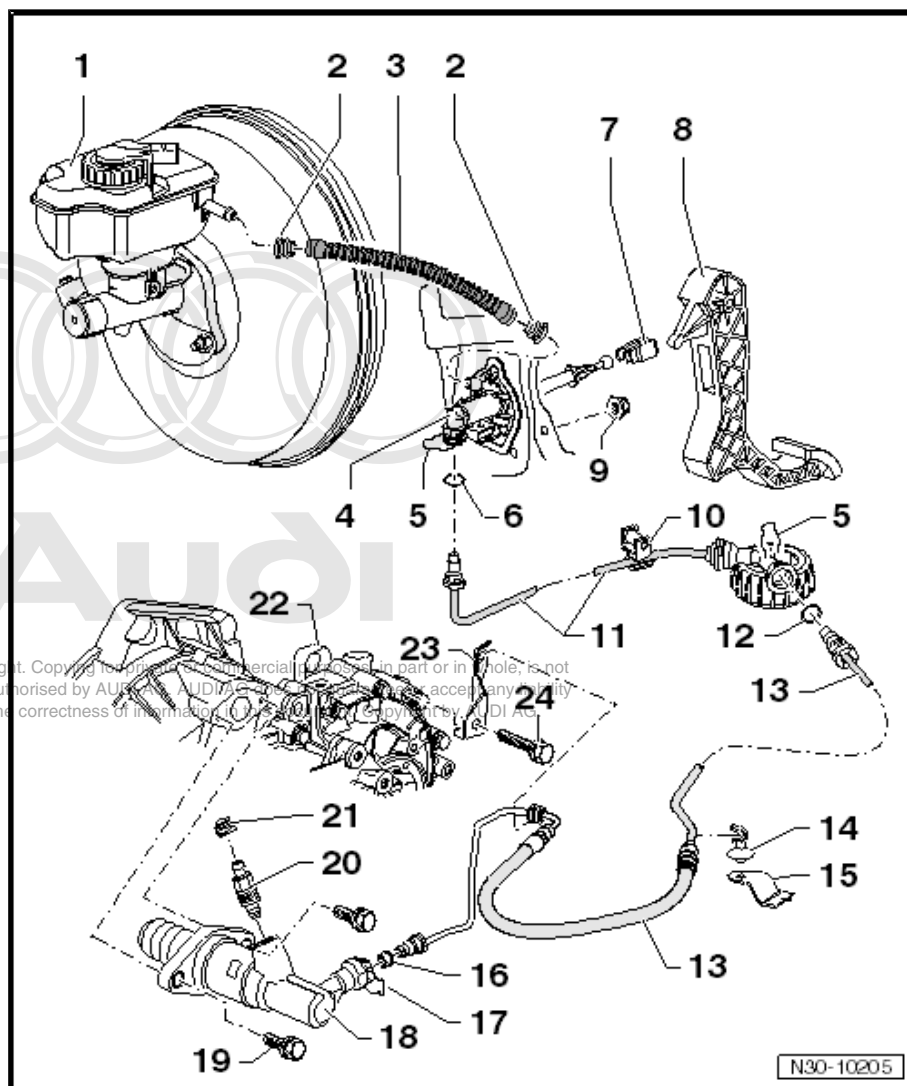
- ☐ Secured on body

11 - Pipe

- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Prior to removal, remove battery and battery tray ⇒ Rep. gr. 27

12 - Seal or O-ring

- ☐ Matched to type of connection ⇒ [page 25](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew damaged seals or O-rings
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing



13 - Pipe/hose assembly

- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Prior to removal, remove battery and battery tray ⇒ Rep. gr. 27

14 - Bracket

- ☐ Secured to bracket for ABS/EDL

15 - Bracket

- ☐ For ABS/EDL

16 - Seal or O-ring

- ☐ Matched to type of connection ⇒ [page 25](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew damaged seals or O-rings
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing

17 - Clip

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

18 - Clutch slave cylinder

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

19 - Bolt

- ☐ 2x
- ☐ 20 Nm

20 - Bleeder screw

- ☐ Bleeding clutch system ⇒ [page 30](#)
- ☐ 6 Nm

21 - Dust cap

22 - Gearbox

23 - Bracket

24 - Bolt

- ☐ 20 Nm



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5 Exploded view - clutch release mechanism

1 - Release bearing

- ☐ Remove and install together with release lever ⇒ [Item 3 \(page 34\)](#) and guide sleeve ⇒ [Item 5 \(page 34\)](#) ⇒ [page 35](#)
- ☐ Do not wash out bearing; wipe clean only
- ☐ Renew bearing if noisy
- ☐ Lubricate surfaces which contact release lever with MoS₂ grease

2 - Bolt

- ☐ Renew
- ☐ 5 Nm +90°

3 - Clutch release lever

- ☐ Remove and install together with release bearing ⇒ [Item 1 \(page 34\)](#) and guide sleeve ⇒ [Item 5 \(page 34\)](#) ⇒ [page 35](#)
- ☐ Remove existing grease
- ☐ Lubricate surface which contacts ball-head pin with MoS₂ grease

4 - Retaining spring

- ☐ Secure to clutch release lever

5 - Guide sleeve

- ☐ Remove and install together with release bearing ⇒ [Item 1 \(page 34\)](#) and release lever ⇒ [Item 3 \(page 34\)](#) ⇒ [page 35](#)

6 - Input shaft oil seal

- ☐ Renewing ⇒ [page 153](#)

7 - Ball-head pin

- ☐ Remove existing grease from contact surface of release lever
- ☐ Lubricate with grease -G 000 100-
- ☐ 20 Nm

8 - Gearbox

9 - Bolt

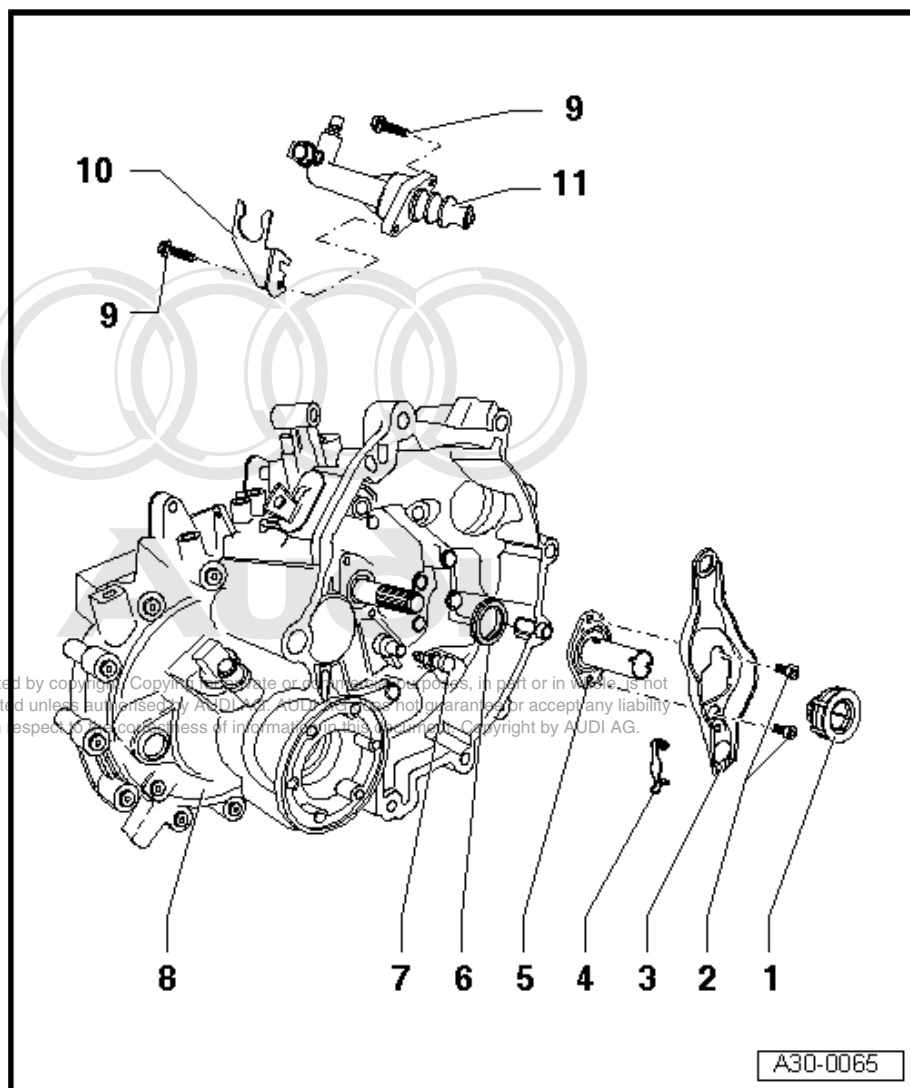
- ☐ Tightening torque ⇒ [Item 19 \(page 25\)](#)

10 - Bracket

- ☐ For pipe/hose assembly

11 - Clutch slave cylinder

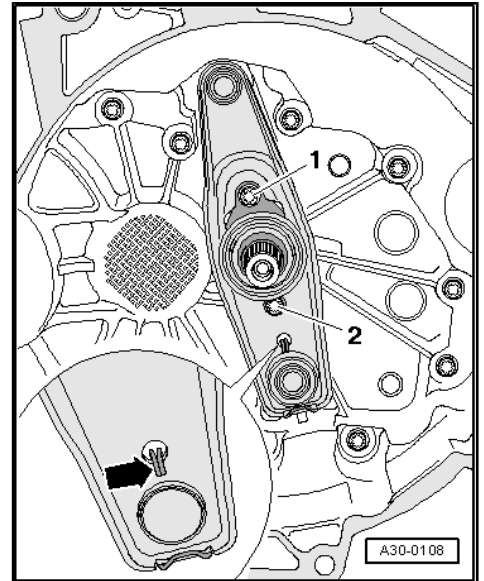
- ☐ Removing and installing ⇒ [page 26](#)



5.1 Removing and installing clutch release bearing with release lever and guide sleeve

Removing

- Gearbox removed
- Unhook spring -arrow- from clutch release lever.
- Remove bolts -1- and -2-.
- Remove release lever with release bearing and guide sleeve.



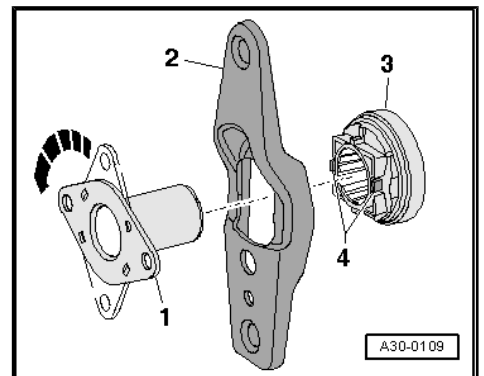
- Rotate guide sleeve -1- approx. 90° -arrow-.
- Press down the two retainer tabs -4- and pull release bearing -3- off release lever -2-.

Installing

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



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



Tightening torque ➔ [page 34](#)



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6 Exploded view - clutch unit

1 - Flywheel

- ☐ Removing and installing
⇒ Rep. gr. 13
- ☐ Ensure that dowel pins
fit tightly
- ☐ Contact surface for
clutch lining must be
free of grooves, oil and
grease

2 - Clutch plate

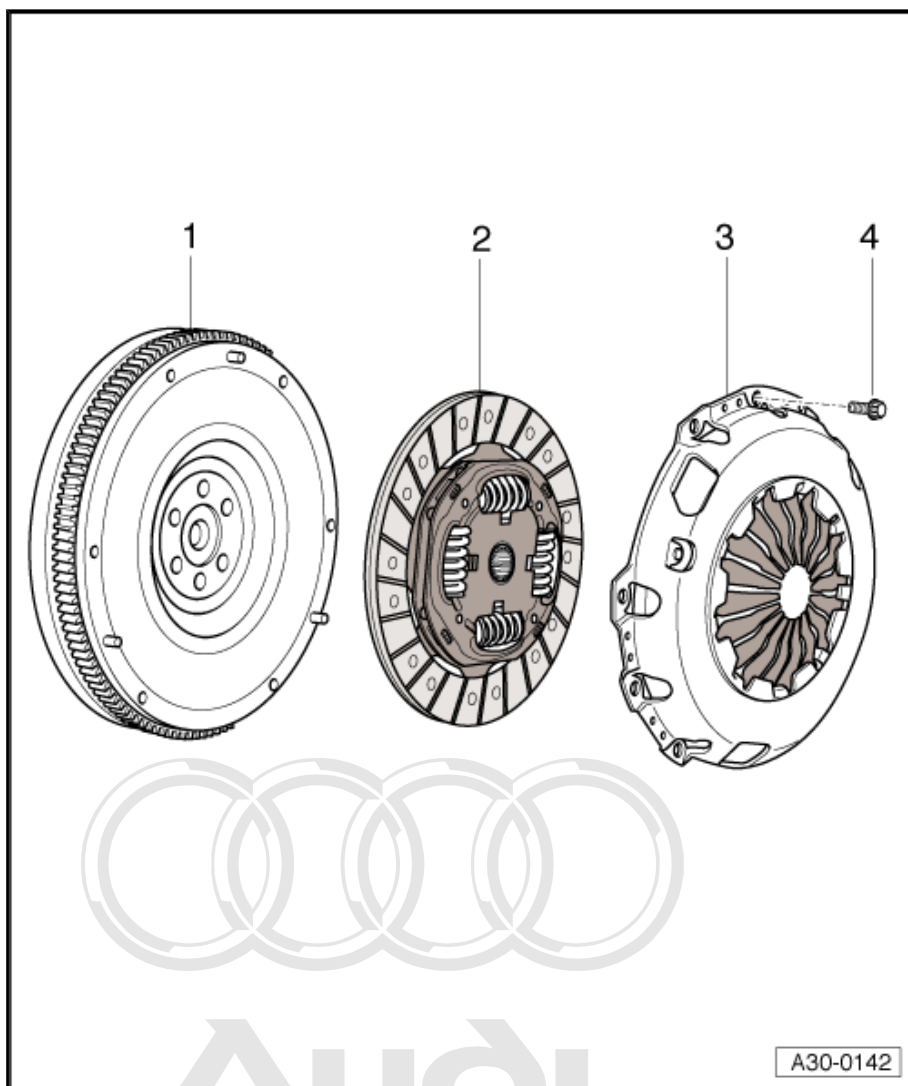
- ☐ For correct version, re-
fer to ⇒ Electronic parts
catalogue
- ☐ Removing and installing
⇒ [page 37](#)
- ☐ Installation position:
marking
"Getriebeseite" (gear-
box side) faces towards
pressure plate

3 - Pressure plate

- ☐ Removing and installing
⇒ [page 37](#)
- ☐ Checking ends of dia-
phragm spring
⇒ [page 36](#)
- ☐ Checking spring con-
nection and rivets
⇒ [page 37](#)

4 - Bolt

- ☐ M6 - 13 Nm
- ☐ M7 - 20 Nm
- ☐ Loosen and tighten
gradually in diagonal se-
quence and in small steps



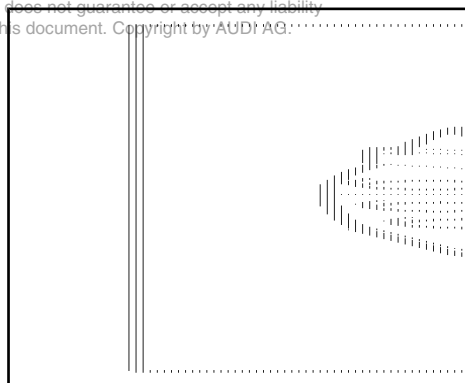
Checking ends of diaphragm spring

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



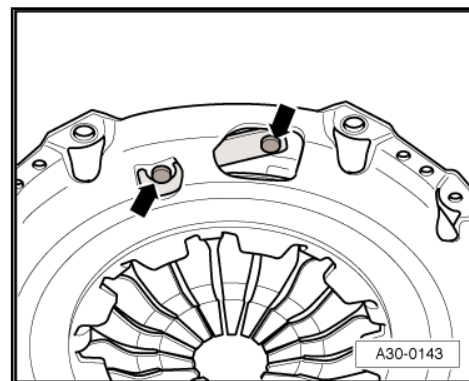
Note

When performing repairs always match up clutch pressure plate and clutch plate by checking engine code ⇒ Electronic parts catalogue .



Checking spring connection and rivets

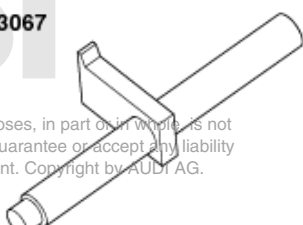
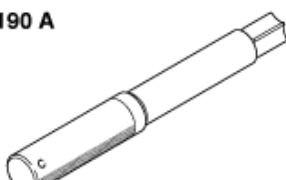
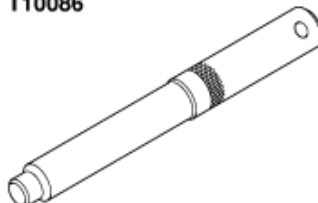
- Check spring connection between pressure plate and cover for cracks and make sure riveted fastenings are seated tightly.
- Renew pressure plate if springs are damaged or rivets are loose -arrows-.



6.1 Removing and installing clutch

Special tools and workshop equipment required

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3067 	3190 A 
V.A.G 1331 	T10086 
	W30-0027

- ◆ Counterhold tool - 3067-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Centring mandrel - 3190 A-
- ◆ For engines with smaller-diameter crankshaft or engines with needle bearing in crankshaft ⇒ [page 39](#) : centring mandrel - T10086-

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

Removing

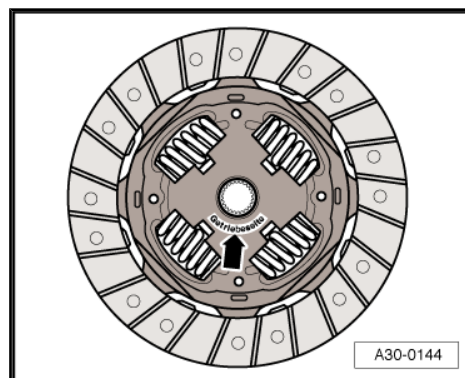
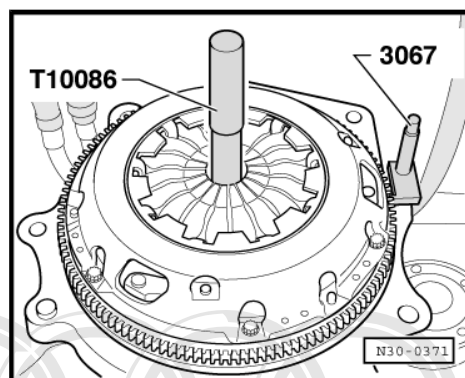
- Gearbox removed
- Apply counter-hold tool - 3067- in order to loosen bolts.
- Loosen bolts in small steps and in diagonal sequence.
- Take off pressure plate and clutch plate.

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



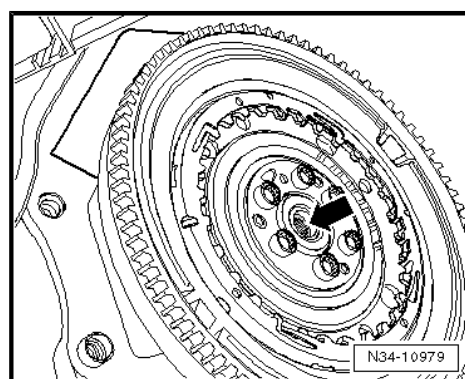
Note

- ◆ *Renew clutch plate and pressure plate if riveted joints are damaged or loose.*
- ◆ *If the clutch has burnt out, thoroughly clean the bell housing, flywheel and parts of the engine facing the gearbox in order to prevent odours.*
- ◆ *Select the correct clutch plate and pressure plate according to the engine code ⇒ Electronic parts catalogue .*
- ◆ *Clean input shaft splines and (in the case of used clutch plates) the hub splines. Remove corrosion and apply only a very thin coating of grease for clutch plate splines - G 000 100- to the splines. Then move clutch plate backwards and forwards on input shaft until hub moves freely on shaft. It is important to remove excess grease.*
- ◆ *Pressure plates have an anti-corrosion coating and are greased. Only the contact surface may be cleaned, otherwise the service life of the clutch will be considerably reduced.*
- ◆ *Pressure plate contact surface and clutch plate lining must make full contact with flywheel. Only then insert bolts.*
- Installation position of clutch plate: marking "Getriebeseite" (gearbox side) faces towards pressure plate

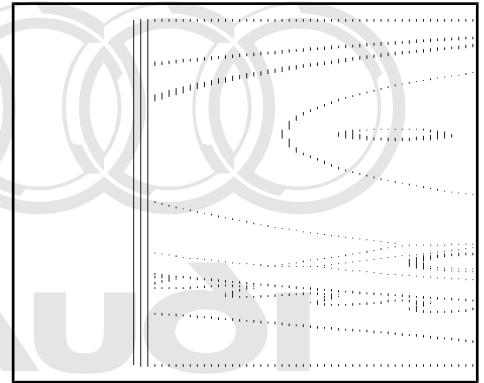


Engines with different diameters or with needle bearing -arrow- in crankshaft

- Large diameter: Use centring mandrel - 3190 A-
- Small diameter or needle bearing: Use centring mandrel - T10086-



- Reverse position of counter-hold tool - 3067- when installing.
- Use centring mandrel - 3190 A- to centralise clutch plate.
- Tighten bolts in small steps and in diagonal sequence to avoid damaging centring holes in pressure plate and dowel pins on flywheel. Tightening torque ⇒ [page 36](#)

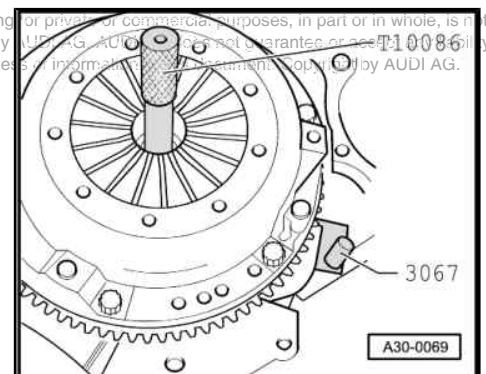


Centralising clutch plate on engines with smaller-diameter crankshaft or engines with needle bearing -arrow- in crankshaft

- Use centring mandrel - T10086- to centralise clutch plate.
- Tighten bolts in small steps and in diagonal sequence to avoid damaging centring holes in pressure plate and dowel pins on flywheel. Tightening torque ⇒ [page 36](#)

All vehicles (continued)

- Install gearbox ⇒ [page 75](#) .



34 – Controls, housing

1 Overview - selector mechanism

Gear selection movement -black arrow-

Gate selection movement -white arrow-

A - Gear selector cable (gear selection movement)

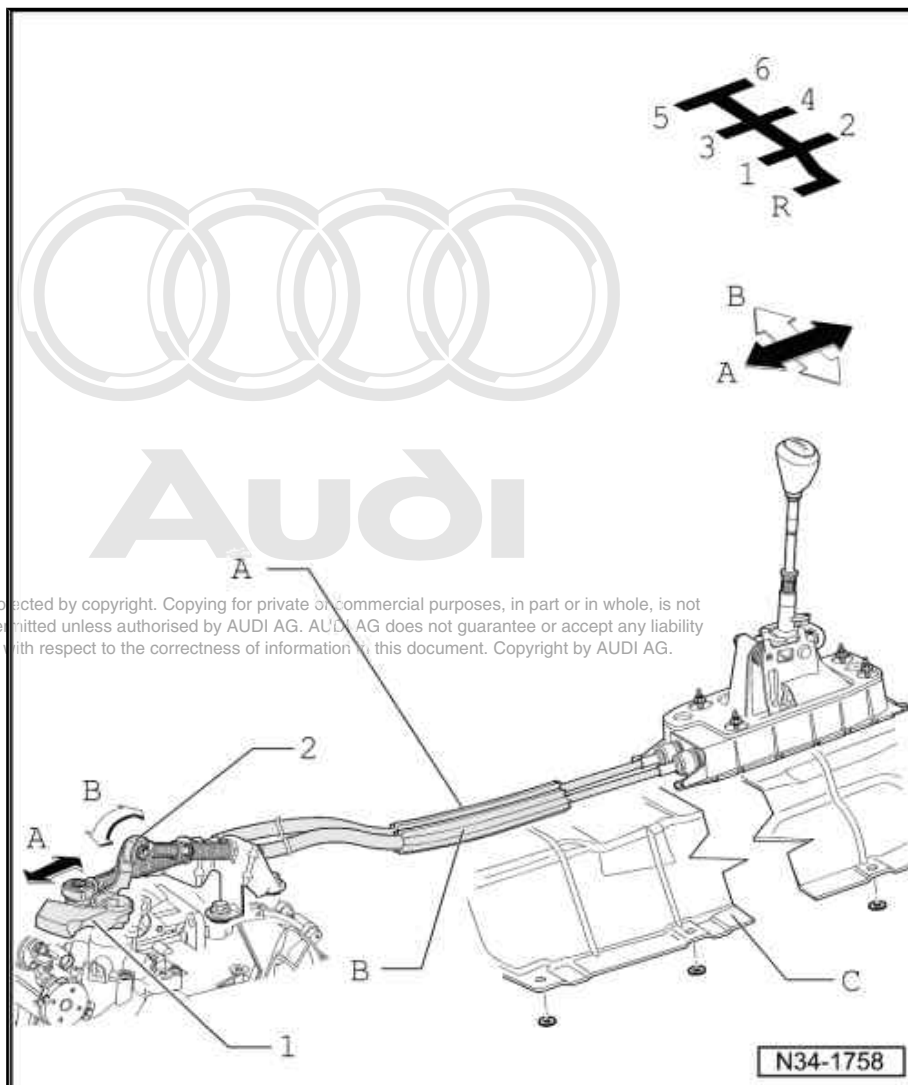
B - Gate selector cable (gate selection movement)

C - Heat shield

- ☐ Remove before removing selector mechanism

1 - Gearbox selector lever

2 - Gate relay lever



1.1 Exploded view - gear knob and gear lever boot

1 - Gear lever

2 - Noise insulation cover (lower)

3 - Noise insulation cover (upper)

4 - Gear knob

- ☐ Remove and install together with gear lever boot ⇒ [page 41](#)

5 - Gear lever boot

- ☐ Remove and install together with gear knob ⇒ [page 41](#)

6 - Cover for centre console

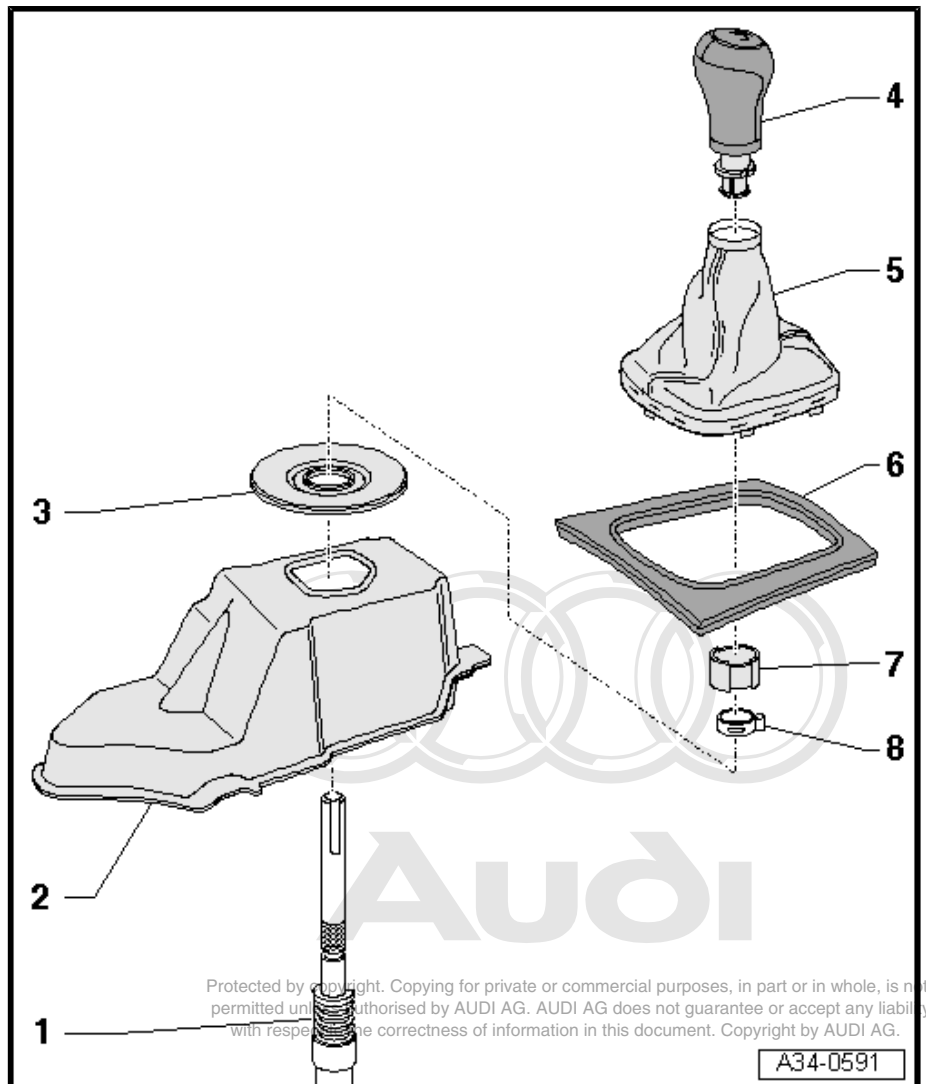
- ☐ Remove and install together with gear knob and gear lever boot ⇒ [page 41](#)

7 - Connecting piece

- ☐ Connects gear lever boot and gear knob

8 - Clip

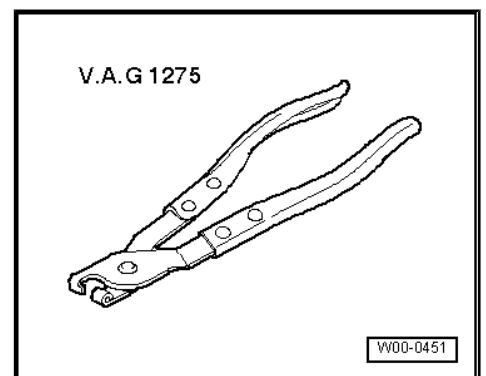
- ☐ Secures gear knob to gear lever
- ☐ Secure with hose clip pliers - V.A.G 1275-



1.2 Removing and installing gear knob with gear lever boot

Special tools and workshop equipment required

- ◆ Hose clip pliers - V.A.G 1275-

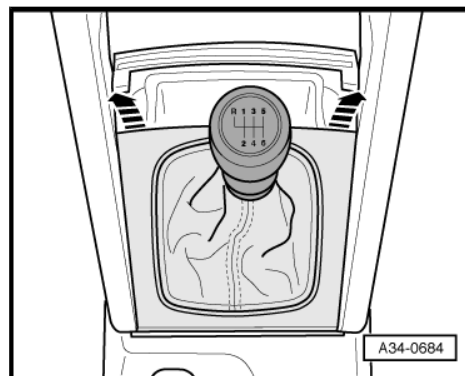


Removing



The gear knob is removed together with the gear lever boot and the cover for the centre console.

- Open ashtray (if fitted).
- Carefully pry gear lever boot off centre console -arrows-.
- Pull boot up and over gear knob.

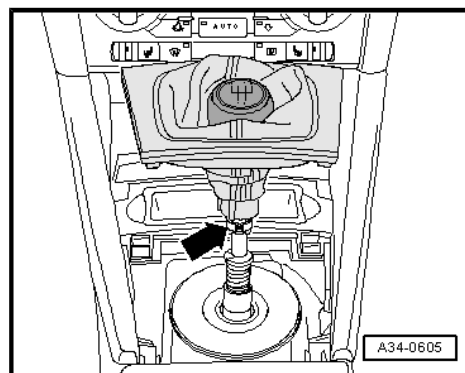


- Open clip -arrow- and pull off gear knob together with boot.

Installing

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

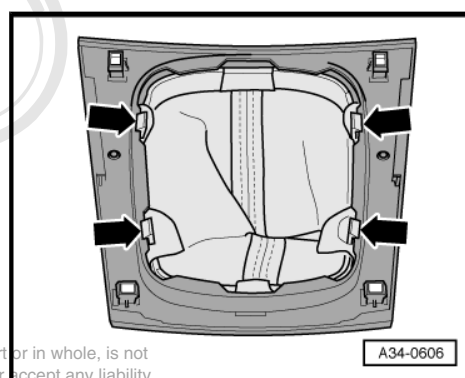
- Push gear knob together with boot onto gear lever until it contacts stop.
- Secure gear knob to gear lever with clip -arrow-, using hose clip pliers - V.A.G 1275- .



1.3 Separating gear lever boot from gear knob

Separating

- Remove gear knob together with boot ⇒ [page 41](#) .
- Unclip frame of gear lever boot from centre console cover -arrows-.



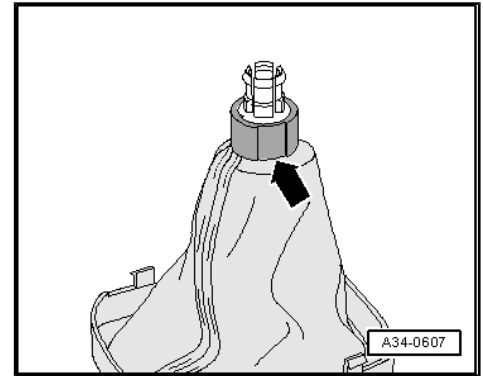
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- Cut through the connecting piece with a sharp knife at the point marked -arrow-. Take care not to damage gear lever boot.
- Then bend out the connecting piece, open it apart and remove.

Assembling

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

- Fit gear lever boot on gear knob, using a new connecting piece -arrow-.
- Install gear knob together with boot ⇒ [page 41](#).



1.4 Exploded view - gear lever and selector housing on vehicles up to model year 2007



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

1 - Floor plate

- ☐ Bend tabs open to remove
- ☐ Renew

2 - Gasket

- ☐ Renew if damaged

3 - Gear lever

4 - O-ring

- ☐ Renew if damaged

5 - Retaining clip

- ☐ Renew

6 - Gate selector cable

- ☐ Removing and installing ⇒ [page 64](#)
- ☐ Adjusting ⇒ [page 65](#)

7 - Gear selector cable

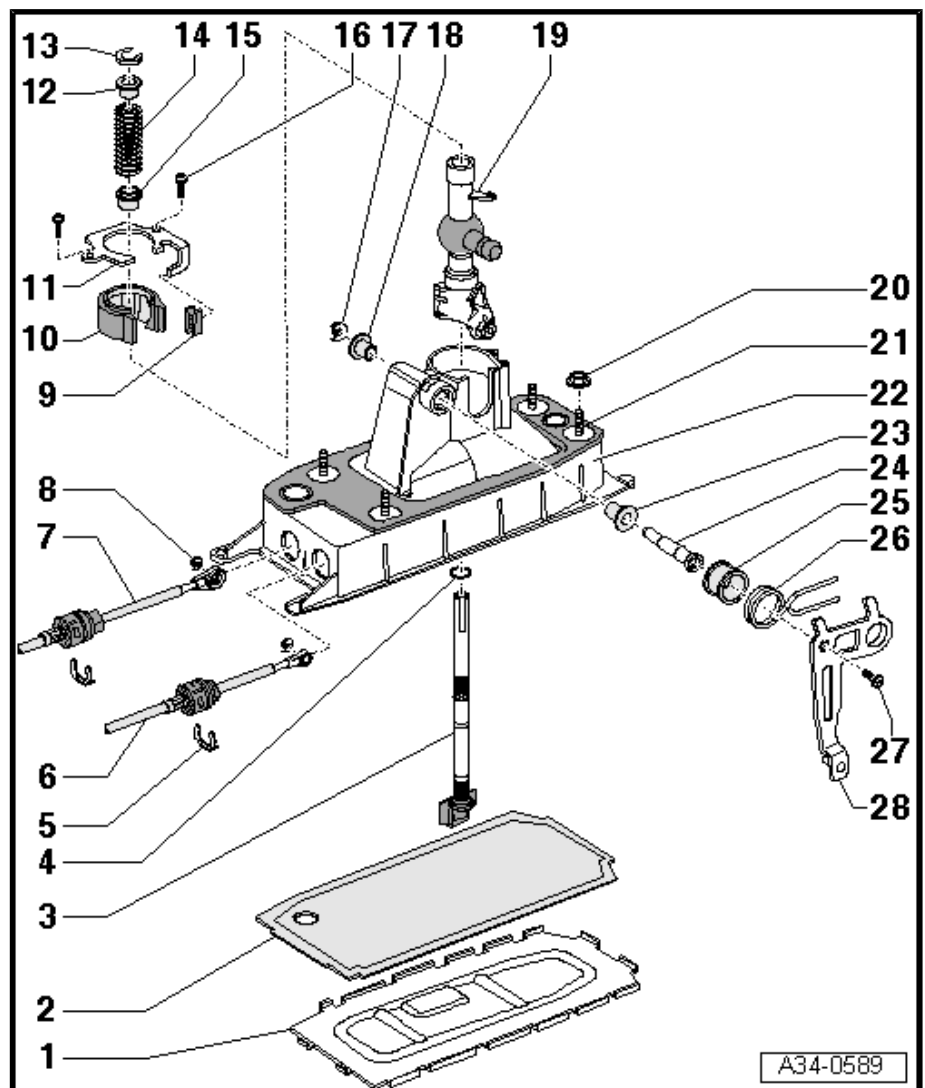
- ☐ Removing and installing ⇒ [page 64](#)
- ☐ Adjusting ⇒ [page 65](#)

8 - Securing clip

- ☐ Renew

9 - Guide

- ☐ For spring



⇒ [Item 26 \(page 44\)](#)

10 - Bearing shell with damper

11 - Lid

12 - Bush

13 - Securing clip

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

14 - Spring

15 - Bush

16 - Bolt

- ❑ 6 Nm

17 - Securing clip

18 - Bearing bush

19 - Gear lever guide

20 - Nut

- ❑ 10 Nm

21 - Gasket

- ❑ Between selector housing and floor
- ❑ Self-adhesive

22 - Selector housing

23 - Bearing bush

24 - Pivot pin

25 - Guide bush

- ❑ Press onto selector housing

26 - Spring

- ❑ Installing ⇒ [page 45](#)

27 - Bolt

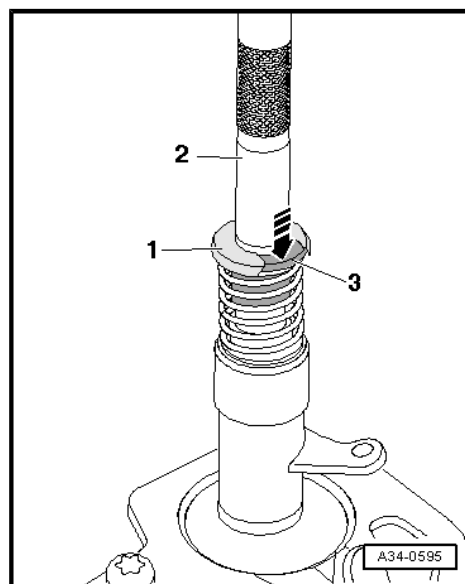
- ❑ 5 Nm

28 - Gate selector lever

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Removing and installing securing clip

- Hold gear lever -2- in position.
- Press spacer bush -3- in direction indicated (arrow).
- Take off securing clip -1-.



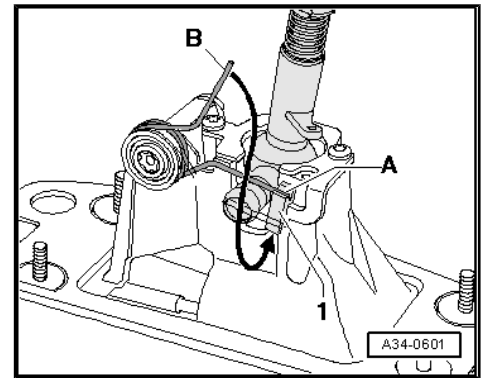
Installing spring

- Insert arm -A- of spring in guide -1- from above.
- Pull down arm -B- of spring and insert it in the guide from below.



Note

The gate selector lever is removed to give a better illustration.



1.5 Exploded view - selector mechanism, vehicles from model year 2008 onwards



Note

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

1 - Floor plate

- ☐ Bend tabs open to remove
- ☐ Always renew

2 - Gasket

- ☐ Renew

3 - Gearbox selector lever

- ☐ Can be removed and installed without removing gear lever guide
⇒ [Item 15 \(page 46\)](#)

4 - Damping washer

- ☐ Push onto gear lever as far as stop -arrow-

5 - Retaining clip

- ☐ Renew

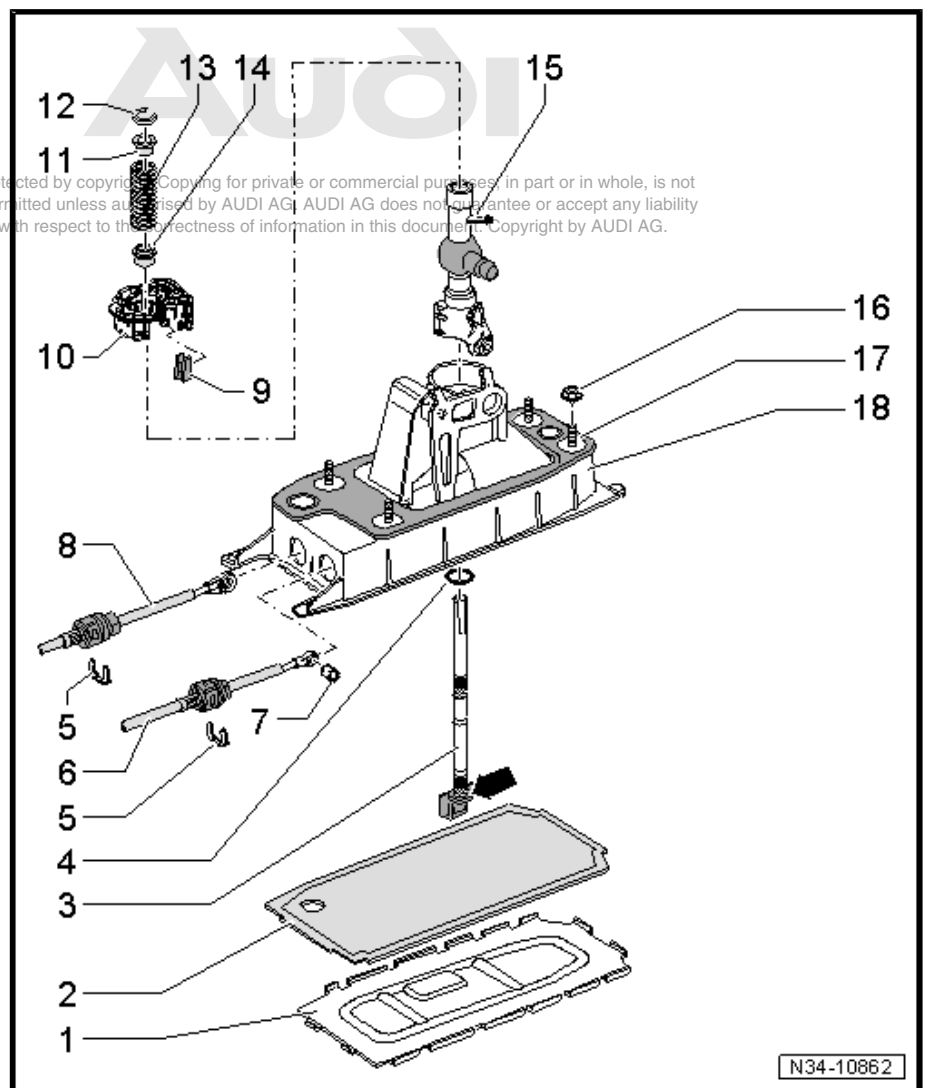
6 - Gate selector cable

- ☐ Lever off gate selector lever
- ☐ Press onto gate selector lever inside selector mechanism
- ☐ Installation position
⇒ [page 40](#)

7 - Bush

8 - Gear selector cable

- ☐ Lever off gear lever guide
- ☐ Press onto gear lever guide inside selector mechanism
- ☐ Installation position
⇒ [page 40](#)



9 - Damper**10 - Ball socket**

- ☐ Will be damaged during removal
- ☐ Renew

11 - Bush**12 - Securing clip**

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

13 - Spring**14 - Bush****15 - Gear lever guide****16 - Nut**

- M6 - 8 Nm
- M8 - 25 Nm
- ☐ 4x

17 - Gasket

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

18 - Selector housing

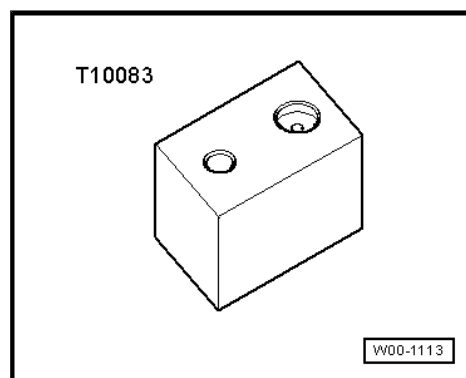
- ☐ With spring and gate selector lever
- ☐ Spring and gate selector lever cannot be removed

1.6 Dismantling and assembling selector mechanism on vehicles from model year 2008 onwards

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Special tools and workshop equipment required

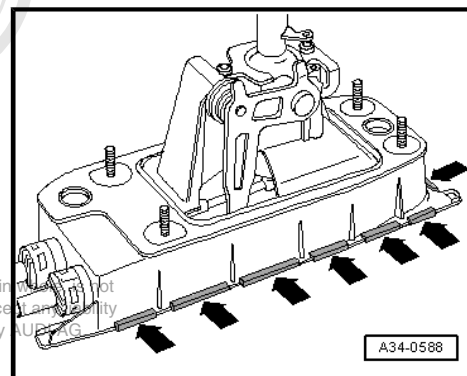
- ◆ Thrust block - T10083-



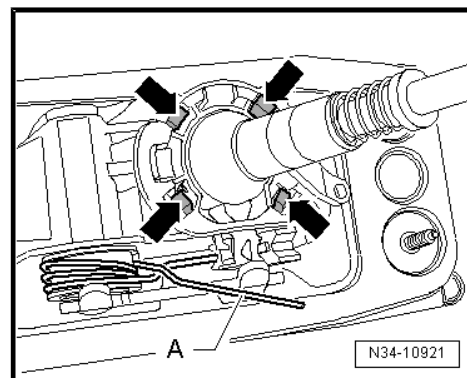
Dismantling

- Remove selector mechanism ⇒ [page 51](#)
- Using a screwdriver, bend open tabs -arrows- on all sides of floor plate and remove floor plate.
- Remove gasket from selector housing.
- Remove gear selector cable and gate selector cable from selector housing ⇒ [page 45](#).

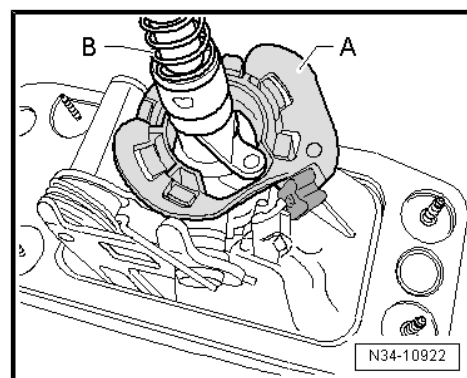
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- Lift top spring arm -A- over tab on gate selector lever.
- Using a screwdriver, press lugs -arrows- on ball socket towards ball on gear lever guide; if necessary, break off lugs.



- Prise ball socket -A- out of selector housing together with gear lever guide and gear lever -B-.
- Then press ball socket -A- off ball on gear lever guide and remove.





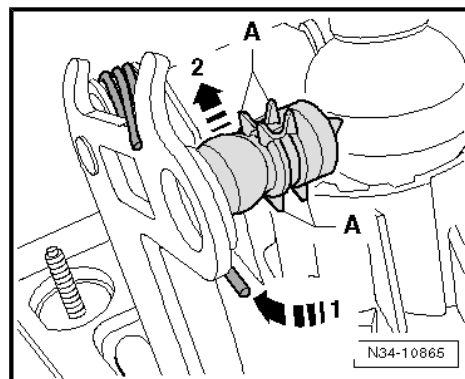
Note

- ◆ Note guides -A- when performing the following steps.
- ◆ They must not break off.
- Swivel bottom spring arm -arrow 1- onto stop on shoulder of gate selector lever.



Caution

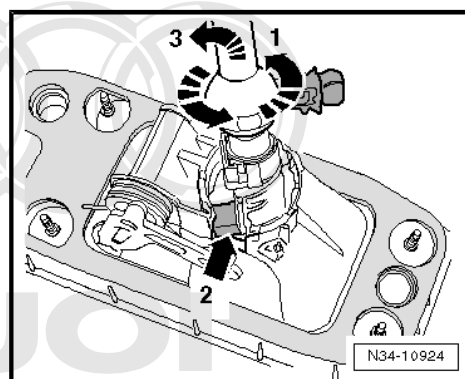
During the following steps, the bottom spring arm (-arrow 1-) can become dislodged and snap downwards off the shoulder of the gate selector lever.



- Pull gear lever guide upwards as far as stop and at the same time pull ball-head pin -arrow 2- out of gate selector lever.
- Press spring -arrow 1- carefully off the shoulder of the gate selector lever.

The spring arms will then compress “diagonally”.

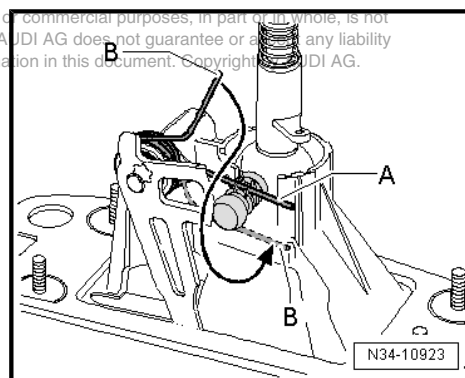
- Then turn gear lever guide in direction of -arrow 1-.
- The pin -arrow 2- should be positioned in the recess on the selector housing.
- Next, swivel gear lever guide out in direction of -arrow 3- together with gear lever.



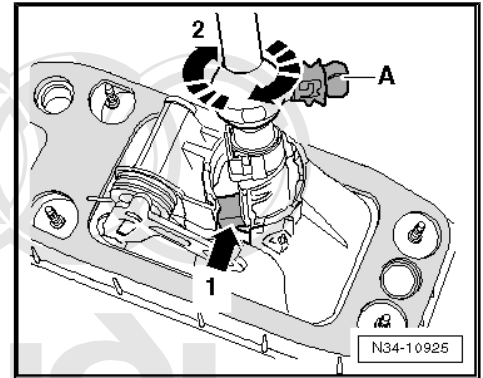
Assembling selector mechanism

- Release spring arms -A- and -B-.
- Spring arms -A- and -B- must point in opposite directions. (Shown here with gear lever guide installed.)

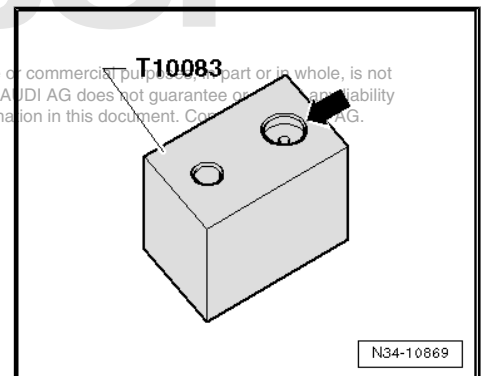
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- Insert gear lever guide into selector housing together with gear lever.
- Pin -arrow 1- should be positioned just inside recess on selector housing.
- Turn gear lever guide in direction of -arrow 2- until ball-head pin -A- is above recess on selector housing.



- Position selector housing with gear lever guide onto thrust block - T10083- .
- The gear lever guide rests in the larger recess -arrow in the thrust block - T10083- .
- The gear lever guide should protrude out of the selector housing as far as the stop.



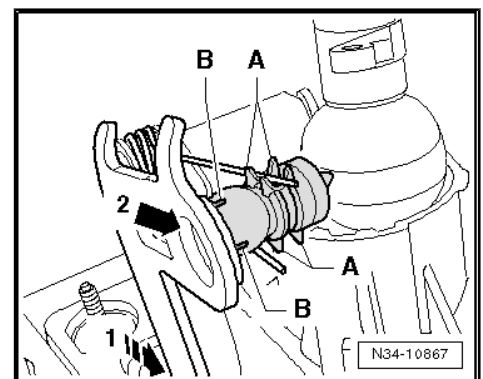
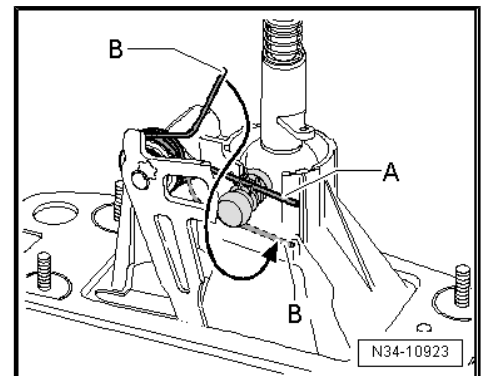
- Insert arm -A- of spring in guide from above.
- Pull arm -B- of spring downwards and insert it next to the guide (towards ball head).



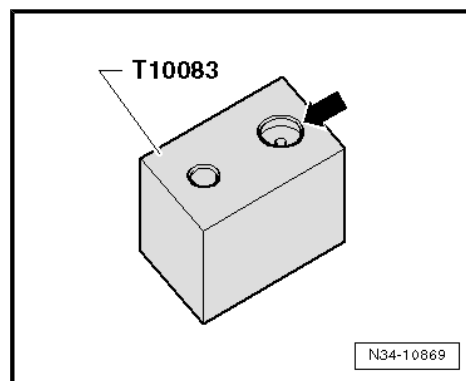
Note

For illustration purposes, only part of the gate selector lever is shown.

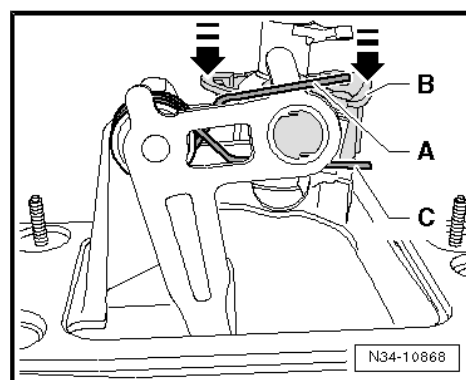
- Carefully take selector housing off thrust block - T10083- together with gear lever guide.
- Move gate selector lever rearwards as far as stop in direction of -arrow 1-.
- Grease ball-head pin.
- Press ball-head pin into hole in gate selector lever -arrow 2-.
- Guides -A- and tabs -B- must not be damaged.



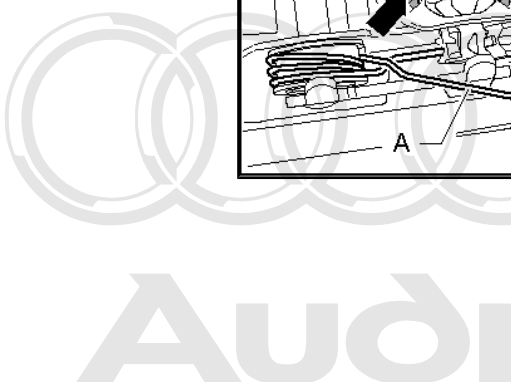
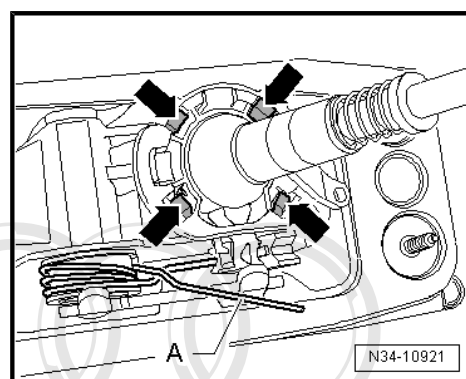
- Now insert gear lever guide (which is now fitted in selector housing) into larger recess -arrow- in thrust block - T10083- again.
- The gear lever guide should now protrude out of the selector housing as far as the stop.



- Lift top spring arm -A- over pin on gate selector lever.
- Use a new ball socket -B-.
- Grease ball socket and ball of gear lever guide.
- Press ball socket onto ball of gear lever guide as far as stop.
- Remove selector housing from thrust block - T10083- .
- Press ball socket into selector housing in direction of -arrows-.



- All four lugs -arrows- must engage.
- Lift top spring arm -A- over pin on gate selector lever into guide.
- Insert bottom spring arm into guide.
- Fit gear lever, gear selector cable, gate selector cable and floor plate.
- Install selector mechanism ⇒ [page 54](#) .

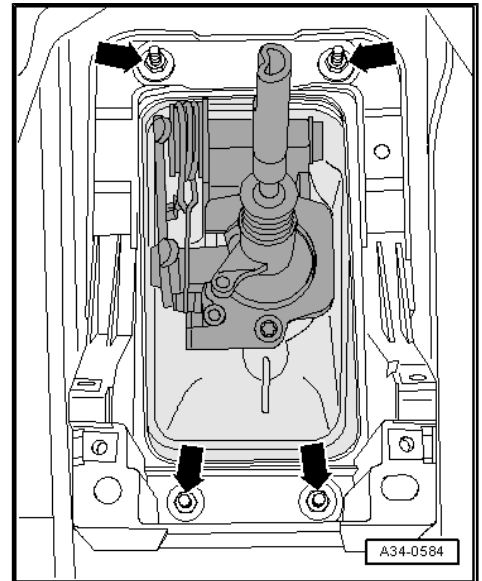


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1.7 Removing and installing selector mechanism

Removing

- Remove gear knob together with boot ➔ [page 41](#) .
- Remove ashtray or storage compartment in front centre console ➔ Rep. gr. 68 .
- Lift out noise insulation sections above selector mechanism.
- Remove nuts -arrows-.

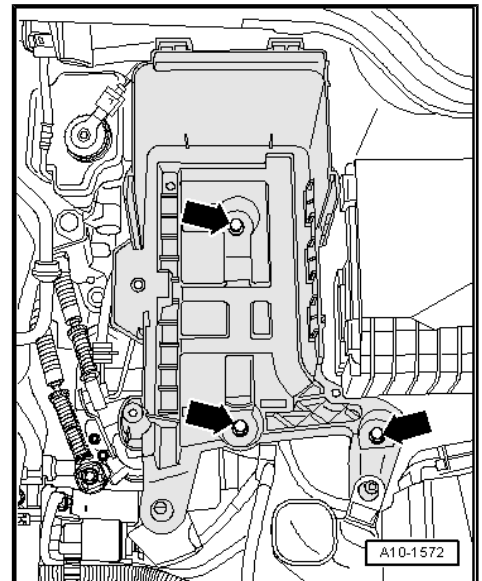


Caution

When disconnecting the battery there is a risk of irreparable damage to electronic components.

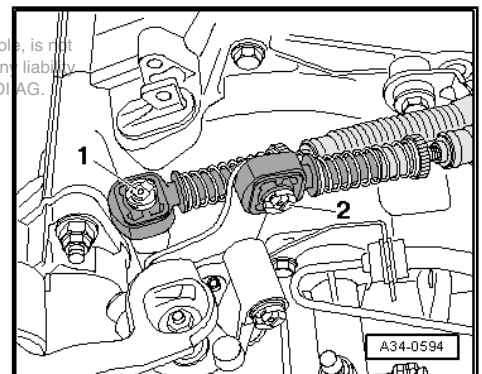
♦ *Observe notes on procedure for disconnecting the battery.*

- Remove battery ➔ Rep. gr. 27 .
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).



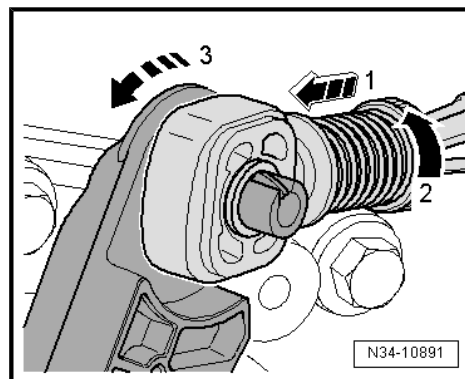
Metal gate relay lever:

- Detach securing clips 1 and 2 on both cables
- Detach cable end-pieces from gearbox selector lever and gate relay lever.



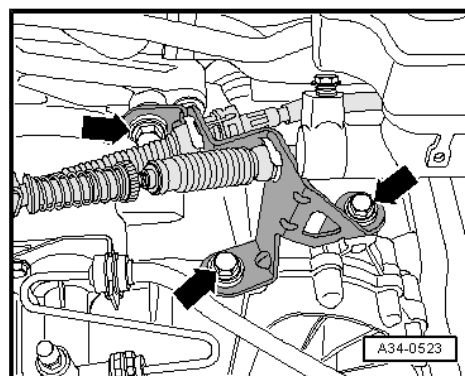
Plastic gate relay lever:

- To prevent damage to gate selector cable, cable end-piece must be detached from gate selector cable before removing relay lever.
- Pull locking mechanism forwards in direction of -arrow 1- onto stop and then turn to left in direction of -arrow 2- to lock.
- Then press gate relay lever forwards (in direction of -arrow 3-).
- Do not detach cable end-piece from gate relay lever until gate relay lever has been removed ⇒ [page 63](#) .

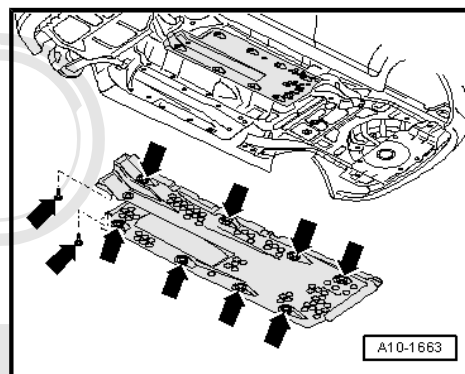


Continued for all vehicles:

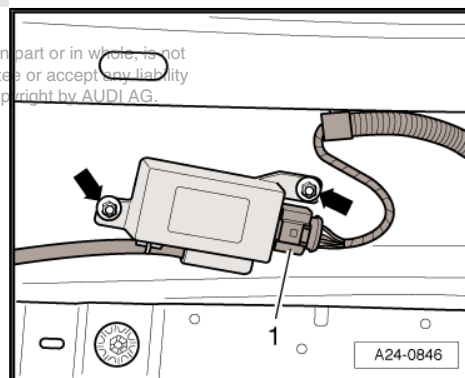
- Detach cable support bracket from gearbox -arrows-.



- Remove covers on vehicle underside -arrows- (left and right).



- Unplug electrical connector -1-.
- Unbolt NOx sensor control unit - J583- -arrows-.
- Move clear the electrical wiring to NOx sender - G295- .

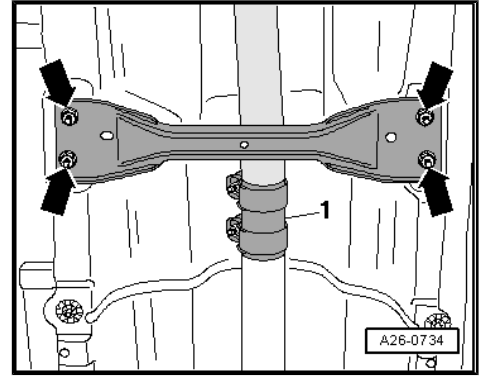


- Remove front cross member on underbody -arrows-.

 Note

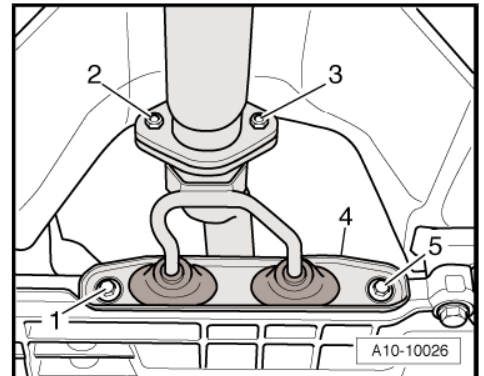
To avoid damage, the flexible joints in the front exhaust pipe must not be bent more than 30°.

- Disconnect exhaust system at clamp -1-.



- Unscrew bolts -1- and -5- of bracket -4- for exhaust system.

- Remove nuts -2- and -3- from exhaust system flange.
- Detach exhaust system at flange and remove exhaust pipe with main catalytic converter.

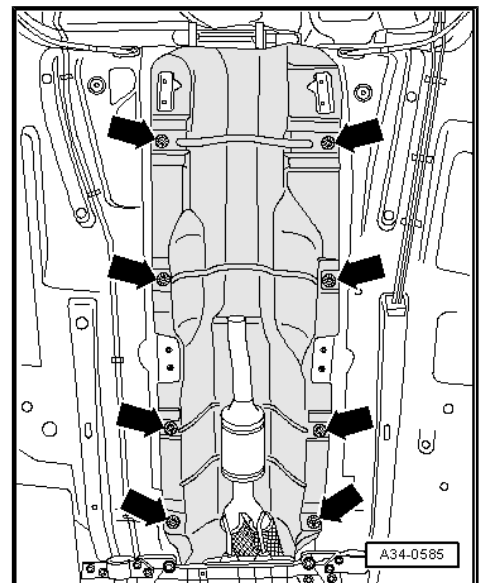
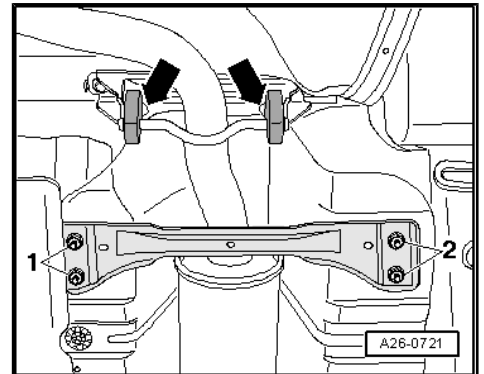


- Remove rear cross member on underbody -nuts 1 and 2-.

 Note

A second mechanic is required for removing the rear section of the exhaust system.

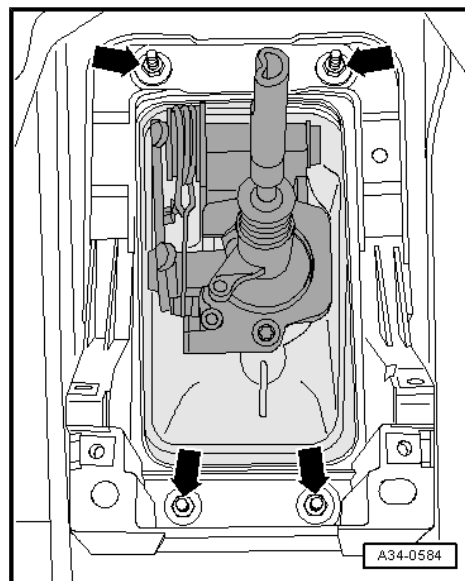
- Detach exhaust system at rubber mountings -arrows-.
- Detach rear silencer at rubber mountings and remove rear section of exhaust system.
- Loosen clips -arrows- and remove heat shield together with selector mechanism.



Installing

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

- Install selector mechanism and tighten nuts -arrows-. Tightening torque ⇒ [Item 20 \(page 44\)](#)

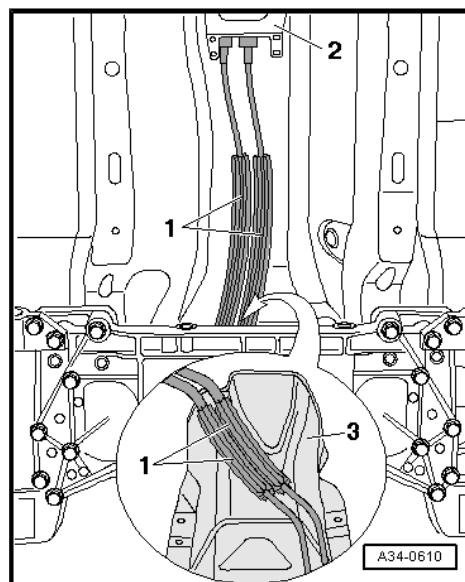


- Route cables -1- from selector mechanism -2- to gearbox as follows:
 - The cables must run parallel and must not be crossed.
 - The cables must be routed in the slot provided in heat shield -3-.

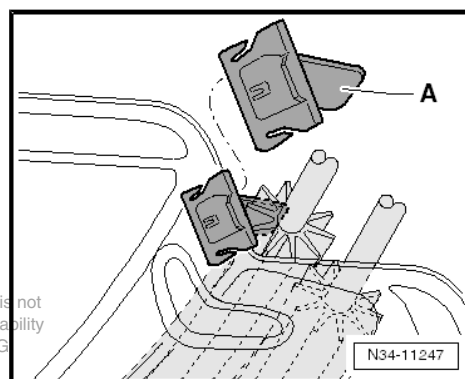


Note

The enlargement shows the heat shield from above.



The cables and heat shield are held in the correct positions by clip -A-.



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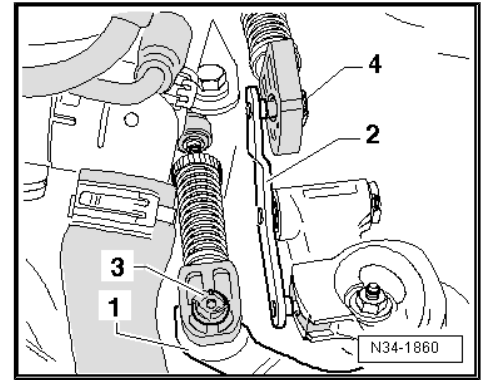
- Apply a small quantity of grease - G 000 450 02- to pins -arrow- of gearbox selector lever -1-.
- Push gear selector cable onto pin and secure with securing clip -3-.

Metal gate relay lever -2-:

- Apply a small quantity of grease - G 000 450 02- to pin of gate relay lever -2-.
- Push gate selector cable onto pin and secure with securing clip -4-.

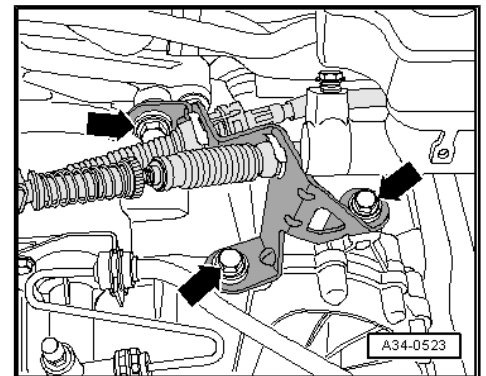
Plastic gate relay lever -2-:

- Insert gate selector cable in cable end-piece.



Continued for all vehicles:

- Attach cable support bracket to gearbox -arrows-. Tightening torque ⇒ [Item 6 \(page 56\)](#) or ⇒ [Item 16 \(page 60\)](#) .
- Adjust selector mechanism ⇒ [page 65](#) .
- Install noise insulation above selector mechanism.
- Install ashtray in front section of centre console ⇒ Rep. gr. 68 .
- Install gear knob together with boot ⇒ [page 41](#) .
- Install exhaust system and perform stress-free alignment ⇒ Rep. gr. 26 .
- Secure both tunnel cross-pieces on vehicle underside ⇒ Rep. gr. 26 .
- Install battery tray and battery ⇒ Rep. gr. 27 .



1.8 Exploded view - gear selector cable and gate selector cable, vehicles up to model year 2007



Note

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

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1 - Gear selector cable

- ☐ Removing and installing
⇒ [page 64](#)
- ☐ Adjusting ⇒ [page 65](#)

2 - Gate selector cable

- ☐ Removing and installing
⇒ [page 64](#)
- ☐ Adjusting ⇒ [page 65](#)

3 - Retaining clips

- ☐ Renew

4 - Selector housing
5 - Retaining clips

- ☐ Renew

6 - Bolt

- ☐ 20 Nm

7 - Cable support bracket
8 - Grommet
9 - Spacer
10 - Cable end-piece

- ☐ Secures gate selector cable to gate relay lever
- ☐ Release to adjust selector mechanism
⇒ [page 64](#)

11 - Cable end-piece

- ☐ Secures gear selector cable to gearbox selector lever
- ☐ Release to adjust selector mechanism
⇒ [page 64](#)

12 - Securing clip

- ☐ Renew

13 - Securing clip

- ☐ Renew

14 - Bush
15 - Gate relay lever

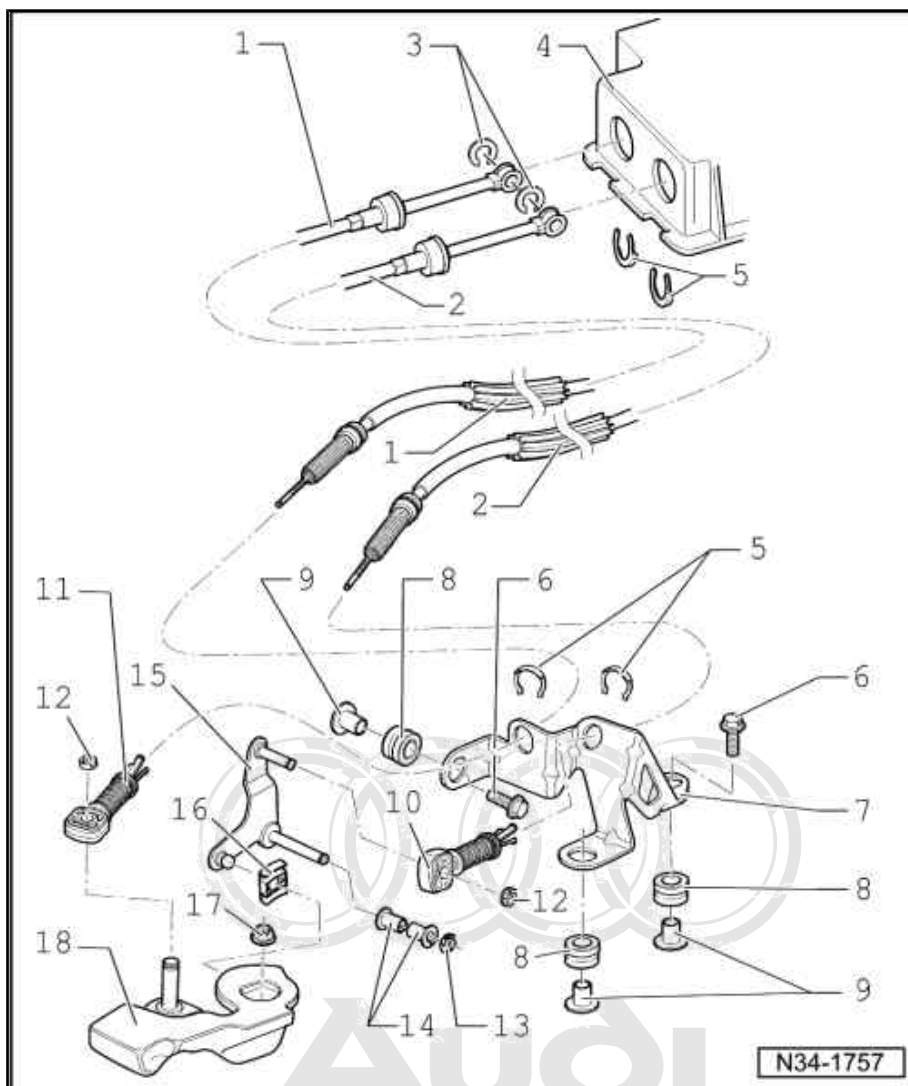
- ☐ Installation position ⇒ [page 58](#)
- ☐ After installing, adjust selector mechanism ⇒ [page 65](#)

16 - Slide block
17 - Nut

- ☐ Self-locking
- ☐ Renew
- ☐ 23 Nm

18 - Gearbox selector lever

- ☐ Installing ⇒ [page 57](#)

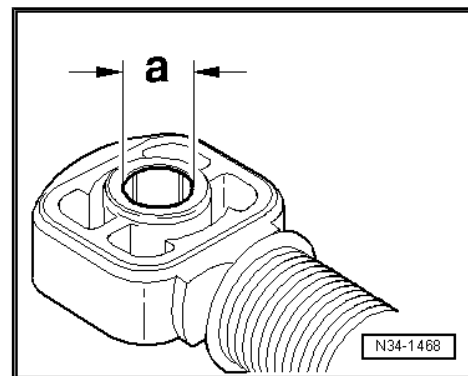


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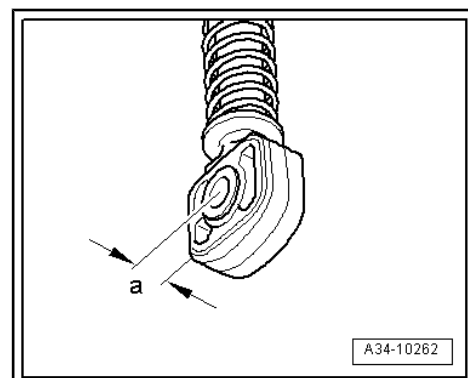
Identification of cable end-pieces

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

Cable end-piece for:	Dimension "a"
Gear selector cable to gearbox selector lever	10 mm
Gate selector cable to gate relay lever	8 mm

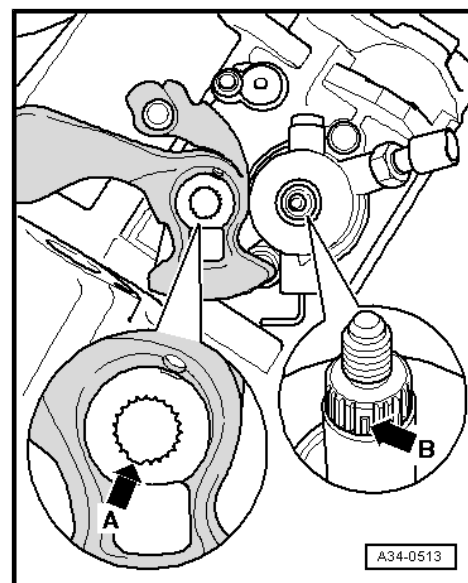


Cable end-piece for:	Dimension "a"
Gear selector cable to gearbox selector lever	20 mm
Gate selector cable to gate relay lever	18.5 mm



Installing gearbox selector lever

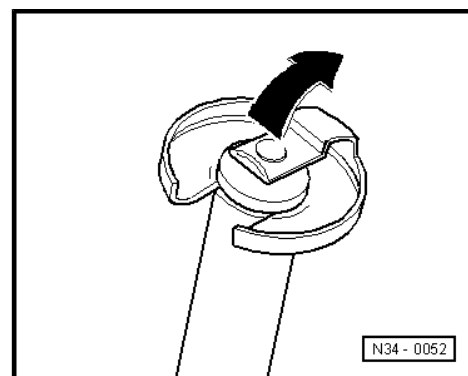
- When installing gearbox selector lever, make sure that the gap in the splines -arrow A- aligns with the wider spline -arrow B- on the selector shaft.



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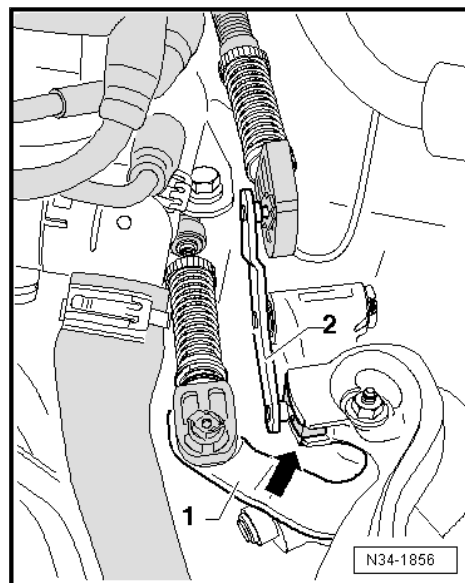
Removing securing clip from gate relay lever

- Pull up clip -arrow- and detach securing clip.



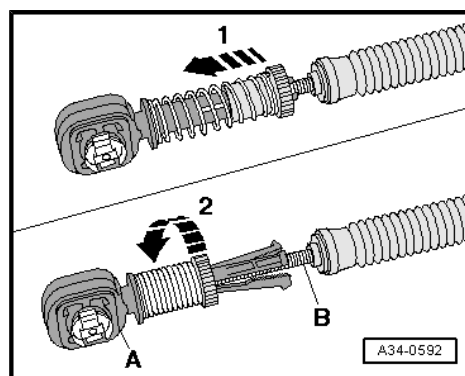
Installation position: gearbox selector lever/gate relay lever

- 1 - Gearbox selector lever with damper weight
- 2 - Gate relay lever locates in guide rail of gearbox selector lever via slide block -arrow-.



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

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



Detaching and securing gear selector cable and gate selector cable

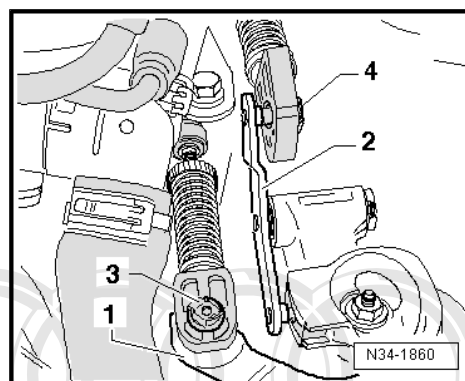
Detaching

- Lift up tab on securing clip -3- for gear selector cable and detach securing clip from gearbox selector lever -1-. Then pull selector cable off pin.
- Lift up tab on securing clip -4- for gate selector cable and detach securing clip from gate relay lever -2-. Then pull selector cable off pin.

Securing

Note

- ◆ *Renew securing clips.*
- ◆ *Apply a small quantity of grease - G 000 450 02- to the pin.*
- Push gear selector cable onto gearbox selector lever -1- and secure with securing clip -3-.
- Push gate selector cable onto gate relay lever -2- and secure with securing clip -4-.



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1.9 Exploded view - gear selector cable and gate selector cable, vehicles from model year 2008 onwards



Note

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

1 - Selector mechanism cover

2 - Slide block

3 - Gate relay lever

- ☐ Made of plastic
- ☐ Different versions available; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Installation position ⇒ [page 61](#)
- ☐ Detaching and securing gate relay lever (with detent catch) at gearbox selector lever ⇒ [page 62](#)
- ☐ Detaching and securing gate relay lever (with clip) at gearbox selector lever ⇒ [page 63](#)

4 - Cable end-piece

- ☐ Secures gate selector cable to gate relay lever
- ☐ Allocation ⇒ [page 60](#)
- ☐ Detaching from gate selector cable ⇒ [page 61](#)

5 - Gearbox selector lever

- ☐ With damper weight
- ☐ Fitting ⇒ [page 61](#)
- ☐ Installation position ⇒ [page 61](#)
- ☐ After installing, adjust selector mechanism ⇒ [page 65](#)

6 - Nut

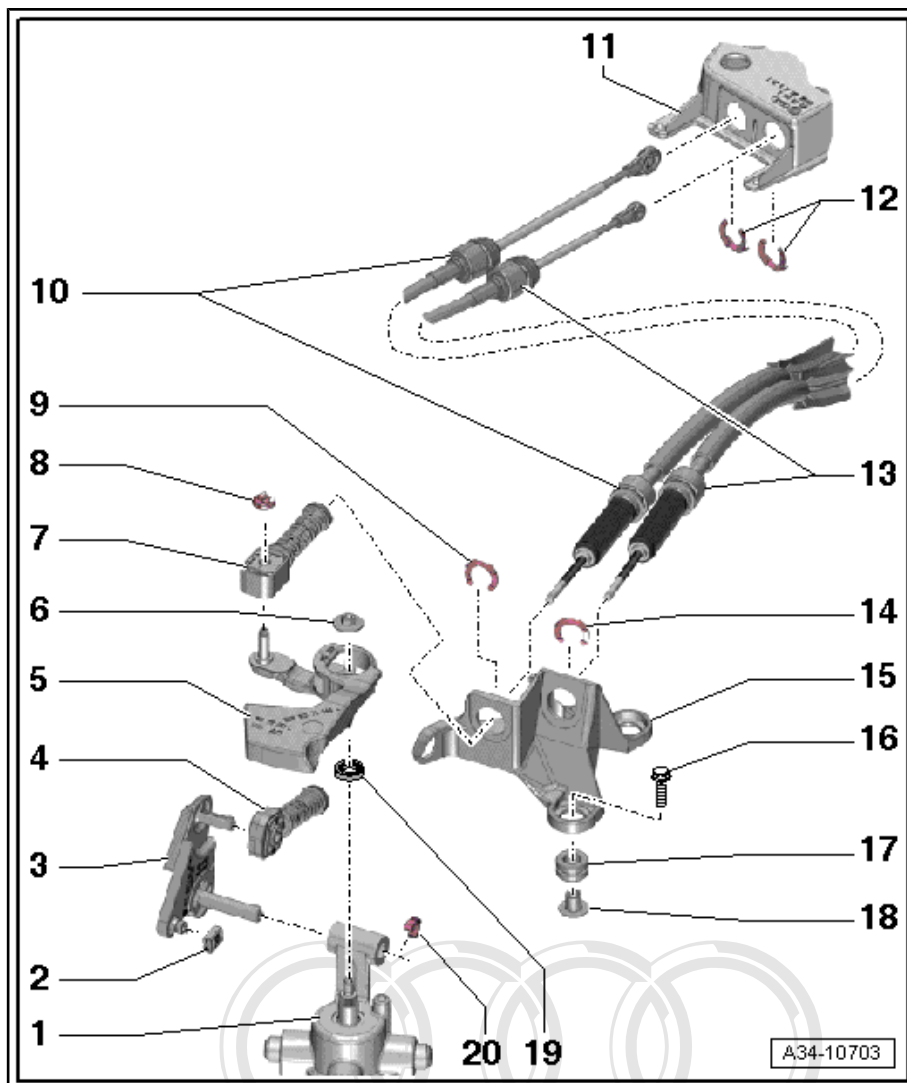
- ☐ Self-locking
- ☐ Renew
- ☐ 23 Nm

7 - Cable end-piece

- ☐ Secures gear selector cable to gearbox selector lever
- ☐ Allocation ⇒ [page 60](#)
- ☐ Detaching from gear selector cable ⇒ [page 61](#)

8 - Securing clip

- ☐ Removing ⇒ [page 62](#)
- ☐ Renew



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9 - Retaining clip

- ☐ Renew

10 - Gear selector cable

- ☐ Detaching and securing at gearbox selector lever ⇒ [page 62](#)
- ☐ Removing and installing ⇒ [page 64](#)
- ☐ Adjusting ⇒ [page 65](#)

11 - Selector housing

12 - Retaining clips

- ☐ Renew

13 - Gate selector cable

- ☐ Removing and installing ⇒ [page 64](#)
- ☐ Adjusting ⇒ [page 65](#)

14 - Retaining clip

- ☐ Renew

15 - Cable support bracket

16 - Bolt

- ☐ 20 Nm

17 - Grommet

18 - Bush

19 - Oil seal

- ☐ Renewing ⇒ [page 120](#)

20 - Clip

- ☐ For gate relay lever (only from 08.2008 onwards)

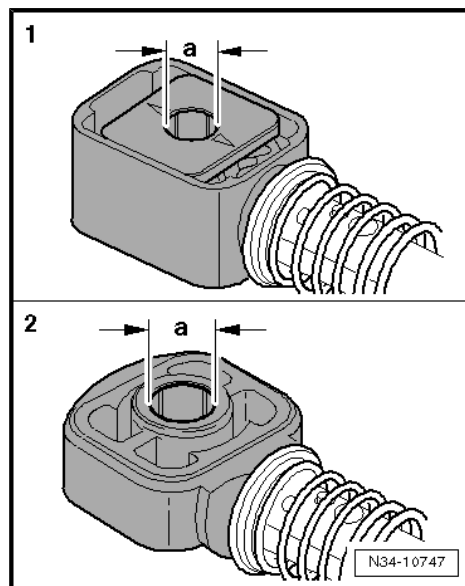


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Identification of cable end-pieces

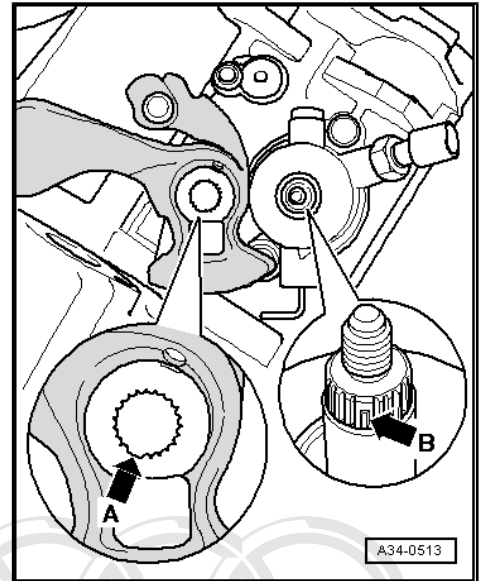
The holes in the cable end-pieces have different diameters.

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



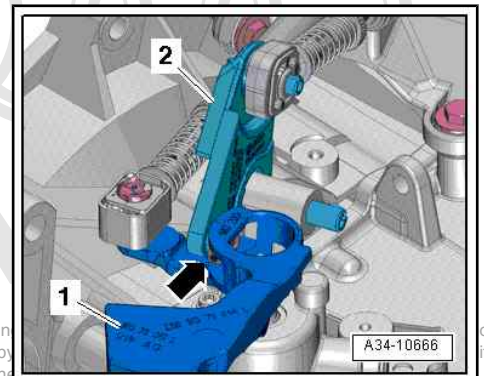
Installing gearbox selector lever

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



Installation position: gearbox selector lever/gate relay lever

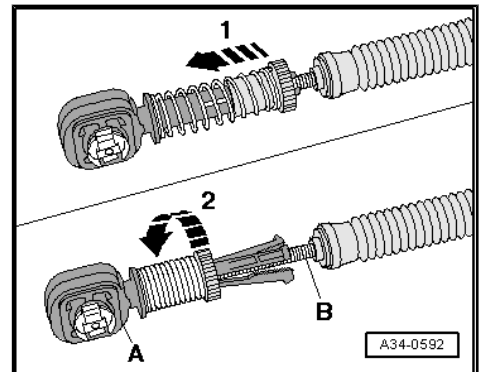
- 1 - Gearbox selector lever with damper weight
- 2 - Gate relay lever locates in guide rail of gearbox selector lever via slide block -arrow-.



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

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



Detaching and securing gear selector cable at gearbox selector lever

Detaching

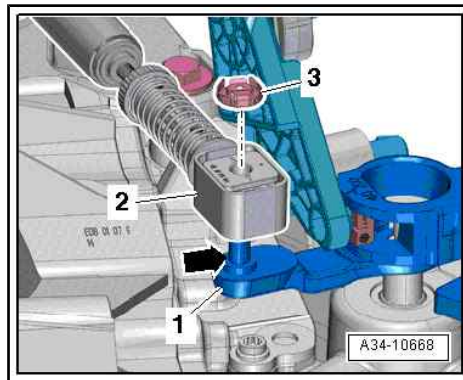
- Lift up tab and detach securing clip -3- for gear selector cable from gearbox selector lever -1-.
- Pull gear selector cable -2- off pin -arrow-.

Securing



Note

- ◆ Renew securing clip for gear selector cable.
- ◆ Apply a small amount of grease - G 000 450 02- to pin -arrow-.
- Push gear selector cable -2- onto gearbox selector lever -1- and secure with securing clip -3-.



Detaching and securing gate relay lever (with detent catch) at gearbox selector lever

Detaching

- Press detent -arrow 1- down onto stop and remove gate relay lever together with cable end-piece. Move gate relay lever in normal direction of operation.



Note

-Arrow 2- can be disregarded.

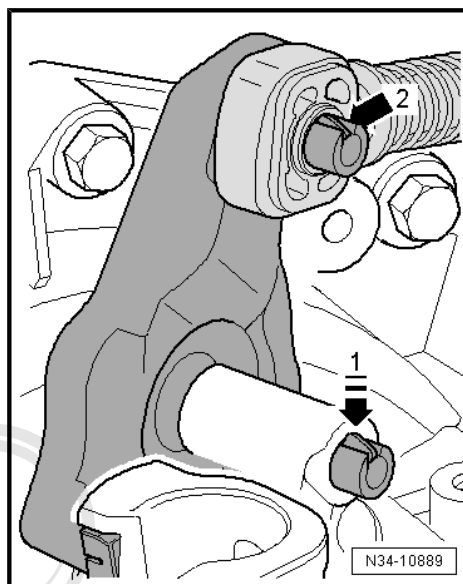
Securing



Note

To install, lubricate bearings and moving surfaces with grease - G 000 450 02- .

- Press cable end-piece onto gate relay lever ⇒ [page 63](#) .
- Insert gate relay lever with cable end-piece as far as stop.
- Gate relay lever is secured by detent -arrow 1-.
- Cable end-piece is secured by detent -arrow 2-.
- Ensure that components engage securely.



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Detaching and securing gate relay lever (with clip) at gearbox selector lever

Detaching

- Remove clip -arrow 1- and take off gate relay lever together with cable end-piece.

Securing



Note

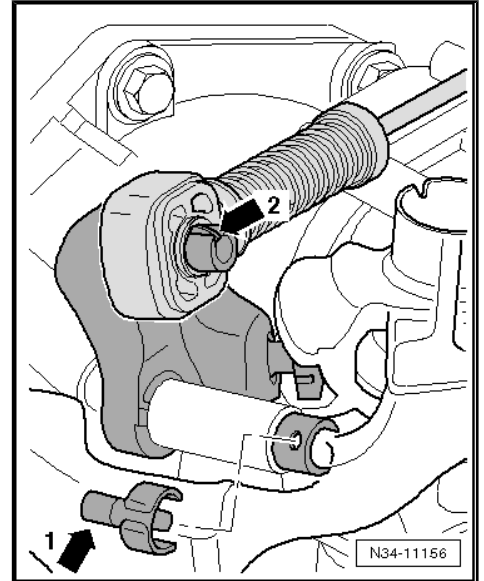
Lubricate all bearings and moving surfaces with grease - G 000 450 02- .

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



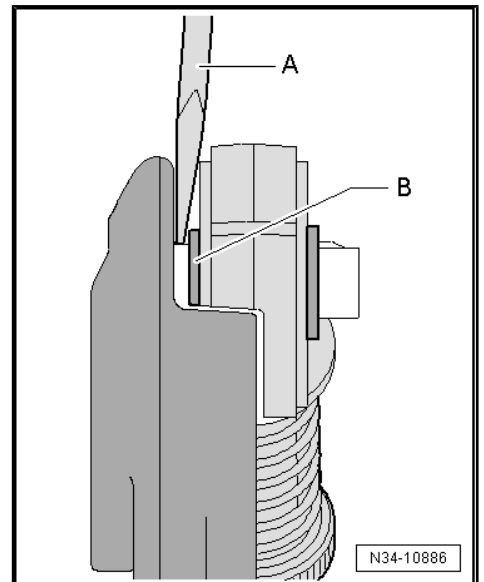
Note

-Arrow 2- can be disregarded.



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

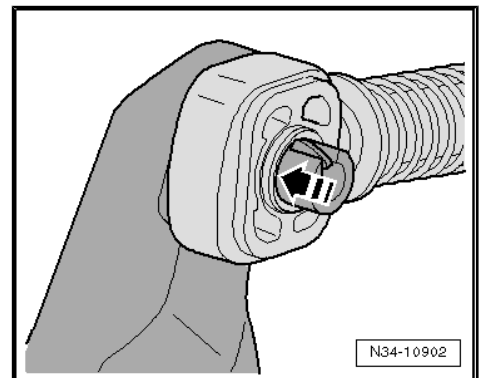
- Gate relay lever removed
- Apply plain slot screwdriver -A- between bush -B- and gate relay lever.



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

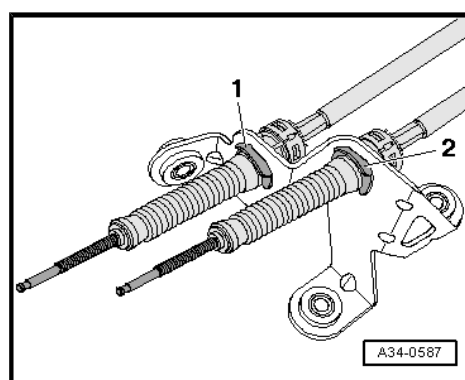
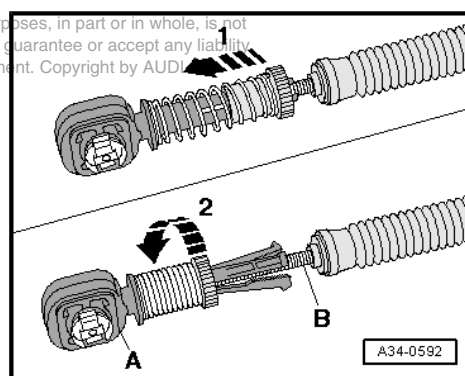
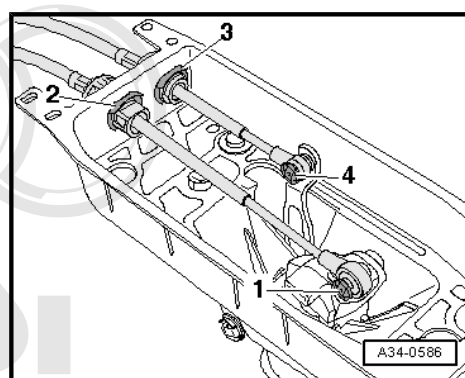
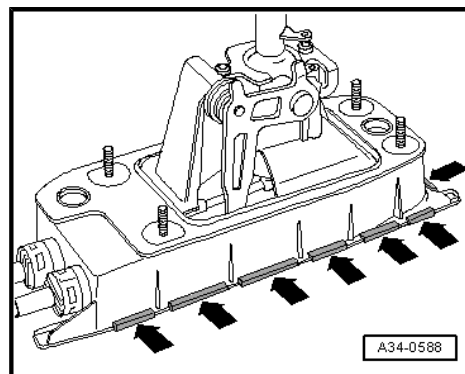
- Gate relay lever removed
- Press on cable end-piece only at bush -arrow-.
- Cable end-piece must move freely on gate relay lever.
- Cable end-piece must be behind detent.
- Ensure that components engage securely.



1.10 Removing and installing gear selector cable and gate selector cable

Removing

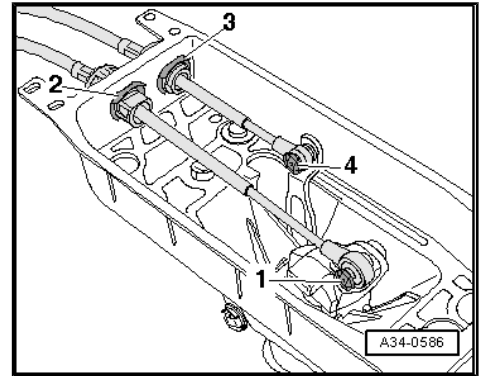
- Remove selector mechanism ⇒ [page 51](#)
- Using a screwdriver, bend open tabs -arrows- for selector mechanism on floor plate and remove floor plate.
- Remove gasket.
- Take off securing clips -1 ... 4- and detach gear selector cable and gate selector cable from selector housing.
- Release cable end-pieces **A**- for gate selector cable and gear selector cable **B**- as follows.
- Push locking sleeve forwards as far as stop -arrow 1-.
- Turn locking sleeve clockwise as far as stop -arrow 2- so that it engages.
- Detach cable end-pieces from cables.
- Pull off securing clips -1- and -2-.
- Detach cable support bracket from cables.



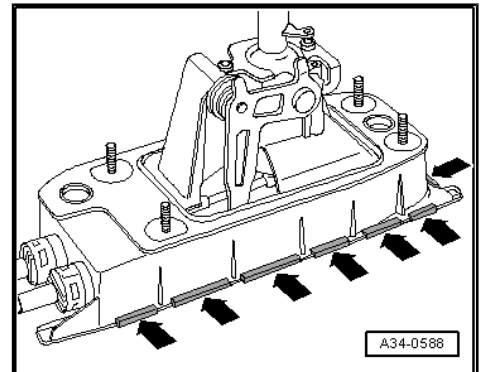
Installing

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

- Secure gear selector cable and gate selector cable to selector housing with securing clips -1 ... 4-.



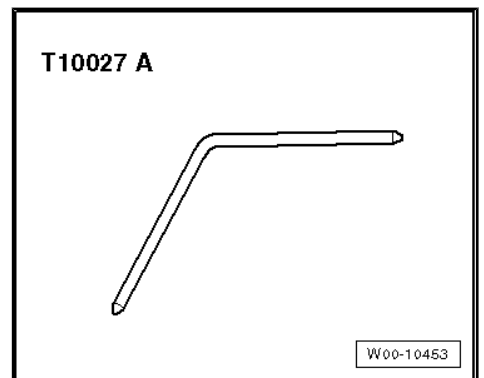
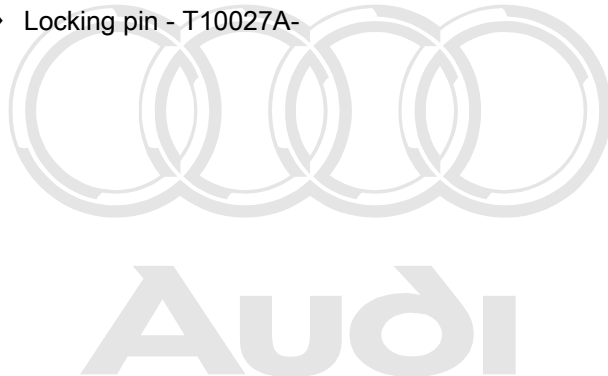
- Fit gasket and secure floor plate to selector mechanism by bending over tabs -arrows-.
- Install selector mechanism ⇒ [page 54](#) .
- Adjust selector mechanism ⇒ [page 65](#) .



1.11 Adjusting selector mechanism

Special tools and workshop equipment required

- ◆ Locking pin - T10027A-



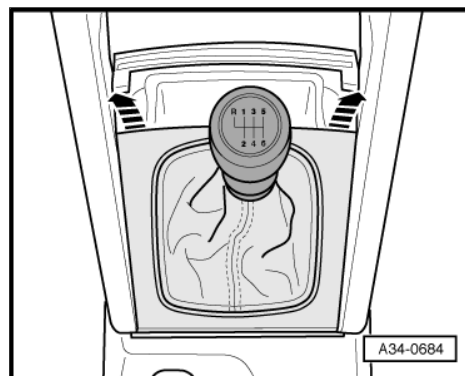
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Adjustment conditions

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

Adjusting

- Open ashtray (if fitted).
- Carefully pry gear lever boot off centre console -arrows-.
- Pull boot up and over gear knob.
- With gearbox in neutral, guide gear lever to the left into 1st/2nd gear gate.

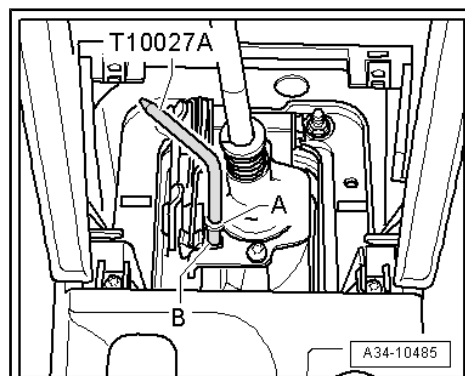


- Pull noise insulation slightly to one side.
- Lock gear lever in position with locking pin - T10027A- .



Note

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



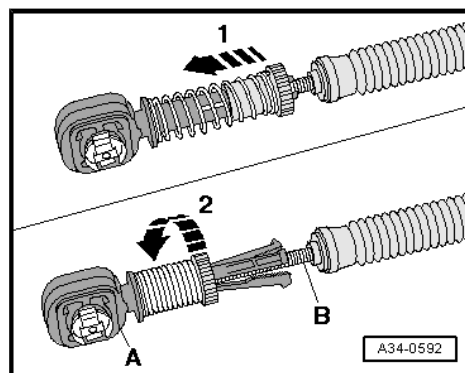
Release cable end-pieces for gate selector cable and gear selector cable as follows:

- Push locking sleeve forwards as far as stop -arrow 1-.
- Turn locking sleeve clockwise as far as stop -arrow 2- so that it engages.



Note

It should now be possible to move the cables in the cable end-pieces.

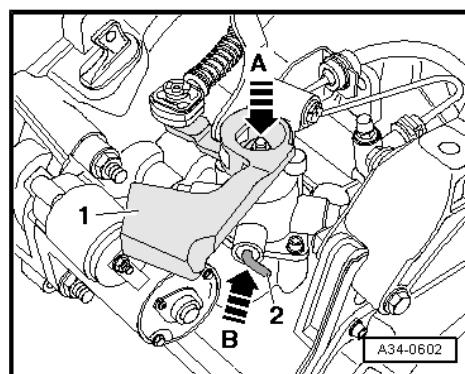


- Gearbox in neutral.

Lock selector shaft as follows:

- Press gearbox selector lever -1- down -arrow A- into 1st/2nd gear gate, and at the same time press locking pin -2- into gearbox -arrow B- until it locks.

The selector shaft is then locked and can no longer be moved.



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- Check that gate selector cable and gear selector cable -B- are located in cable end-pieces -A- without tension.
- Release locking sleeve -arrow 1-.
- Allow locking sleeve to slide onto stop -arrow 2-.

 Note

Cable adjustment is now complete.

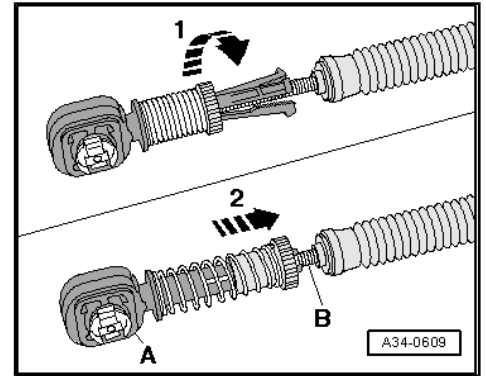
- Pull locking pin just far enough out of gearbox to release selector mechanism.
- Pull locking pin - T10027A- out of selector mechanism.

Check gear lever setting as follows:

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

If the gear lever sticks or baulks repeatedly when engaging a gear, perform the adjustment procedure again.

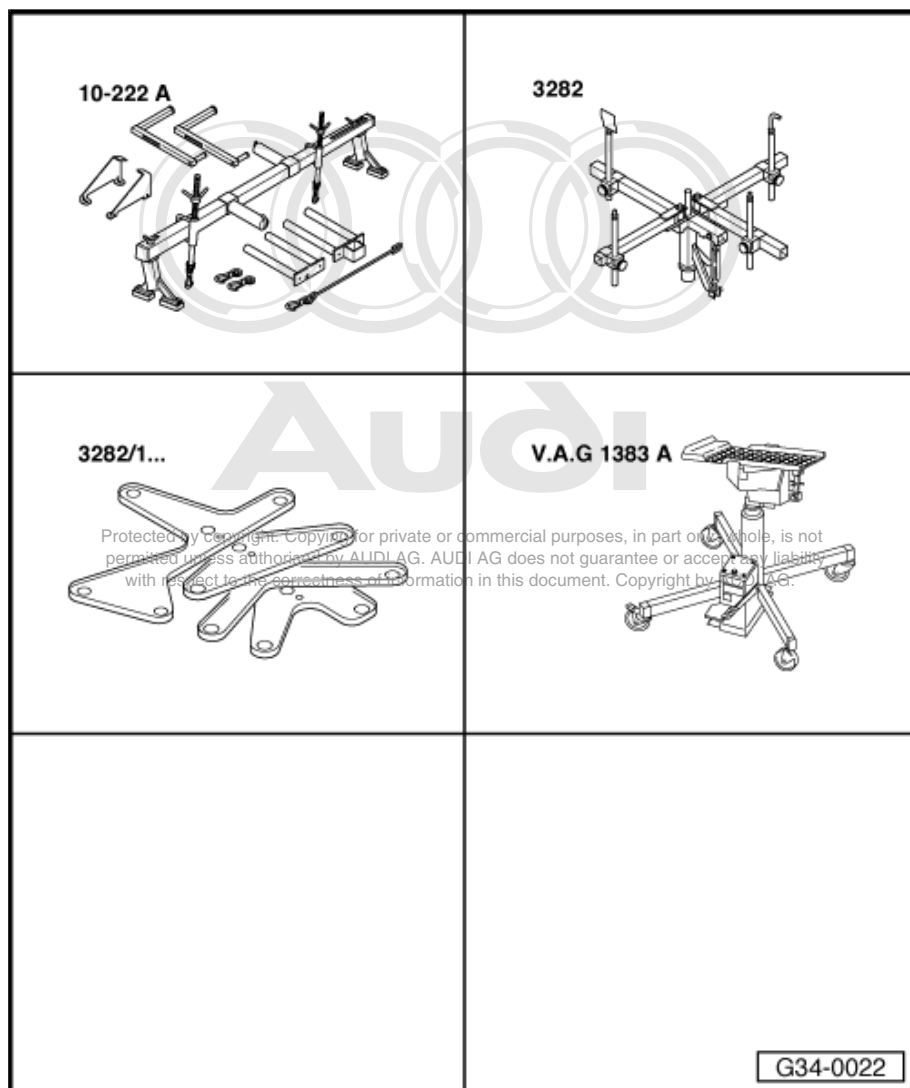
- Fit gear lever boot.



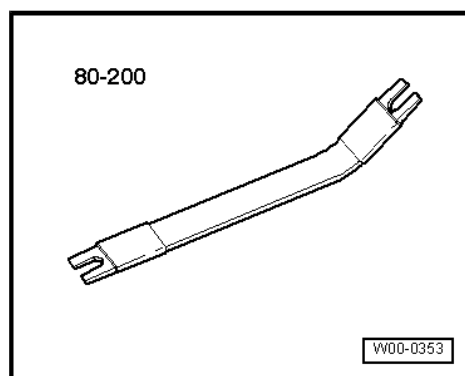
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2 Removing gearbox

Special tools and workshop equipment required



- ◆ Support bracket - 10 - 222 A-
- ◆ Gearbox support - 3282-
- ◆ Adjustment plate - 3282/31-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Removal lever - 80 - 200- for vehicles from 06.2008 onwards



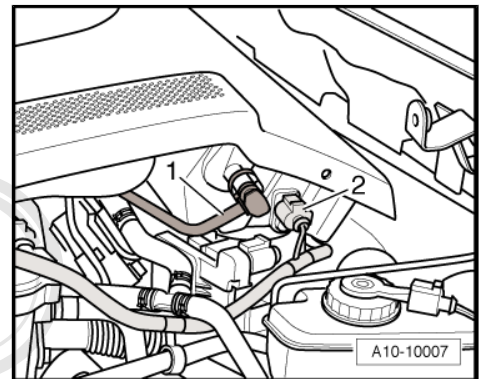
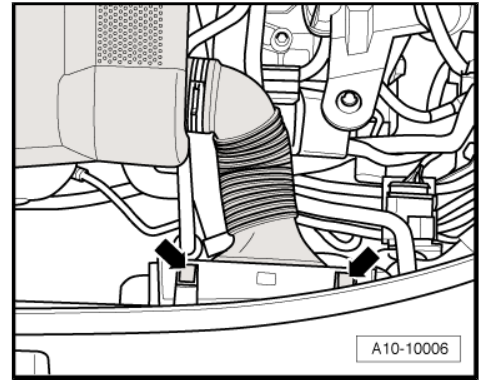
Procedure



Note

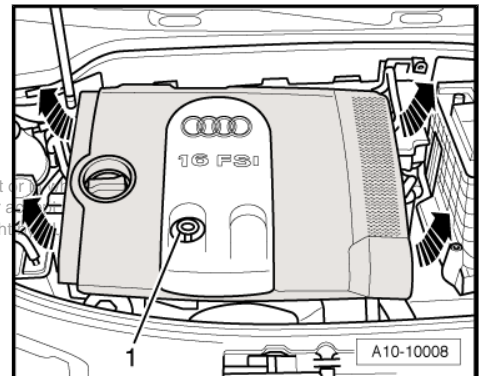
Re-attach all cable ties at the same locations when re-installing.

- Unclip air intake hose from air duct -arrows-.
- Unplug electrical connector at intake air temperature sender 2 - G299- .
- Detach vacuum hose -1- from actuator for intake air preheater.



- Pull oil dipstick -1- out of guide tube.
- Remove engine cover panel with air cleaner housing -arrows-.
- Insert dipstick back into guide tube.

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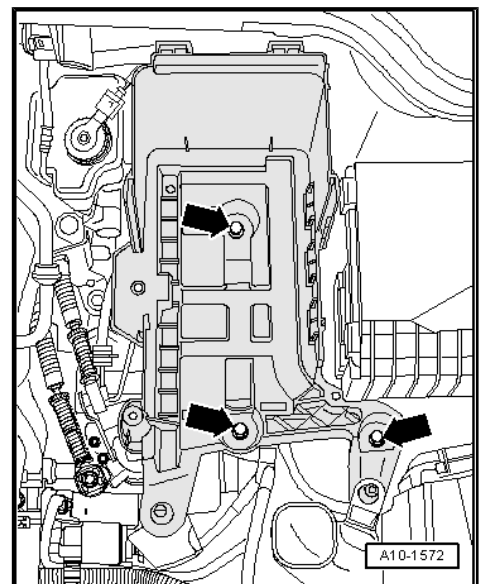


Caution

When disconnecting the battery there is a risk of irreparable damage to electronic components.

◆ ***Observe notes on procedure for disconnecting the battery.***

- Remove battery ⇒ Rep. gr. 27 .
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).



Metal gate relay lever:

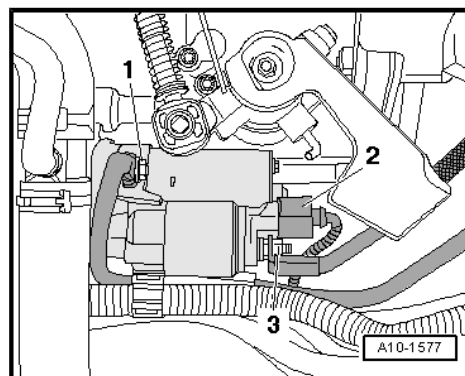
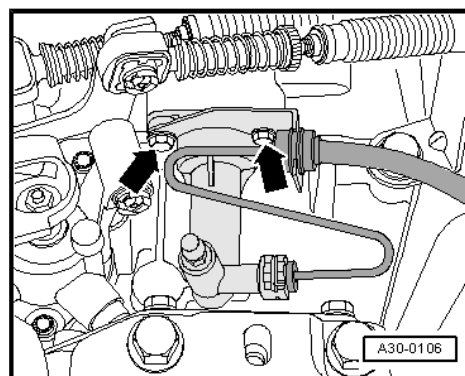
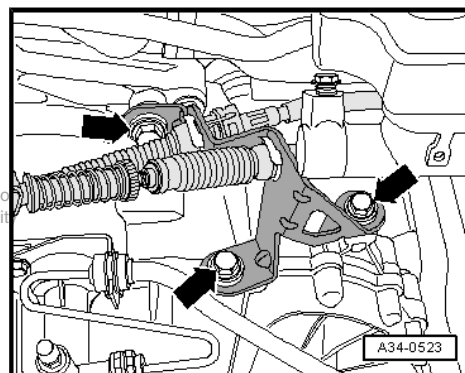
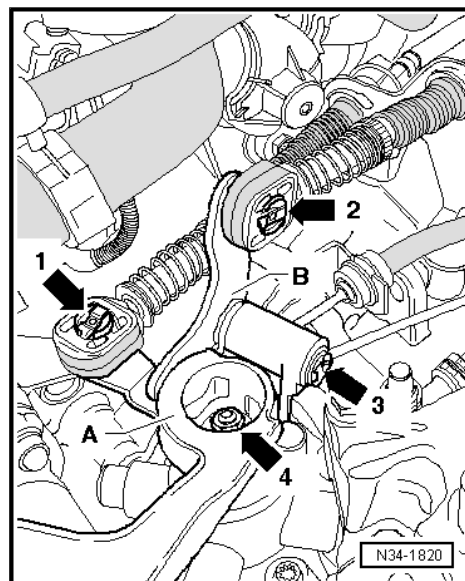
- Detach securing clip -arrow 1- for gear selector cable from gearbox selector lever -A-.
- Detach securing clip -arrow 2- for gate selector cable from gate relay lever -B-.
- Pull gate selector cable and gear selector cable off joint pins.
- Pull securing clip -arrow 3- off gate relay lever -B- and remove gate relay lever.

Plastic gate relay lever:

- Detach gate relay lever (with detent catch) / gate relay lever (with clip) from gearbox selector lever ⇒ [page 62](#) / ⇒ [page 63](#).

Continued for all vehicles:

- Remove nut -arrow 4- and detach gearbox selector lever -A-.
- Detach cable support bracket from gearbox -arrows- and place to one side.



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- Remove clutch slave cylinder -arrows- and place to one side; do not disconnect pipe.

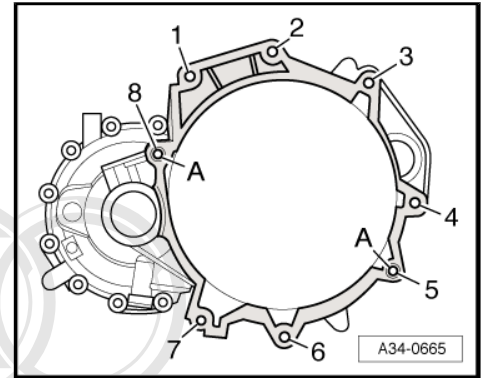


Caution

Do not operate clutch pedal after removing clutch slave cylinder.

- Unscrew earth wire -1-.
- Disconnect electrical wires -2- and -3- at starter and move them clear.

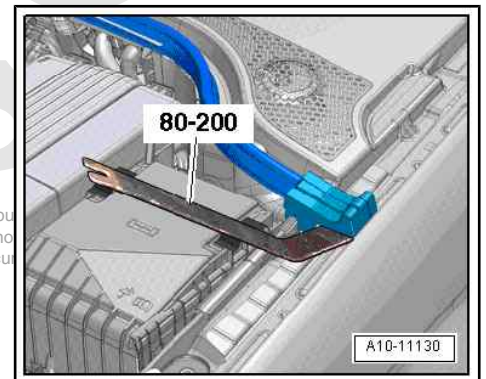
- Remove bolts -1 ... 3- from engine/gearbox flange.



Vehicles from 06.2008 onwards:

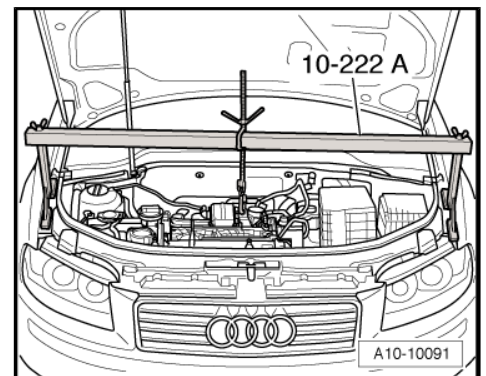
- Lever clip off sealing element using removal lever - 80 - 200- and fold up sealing element.

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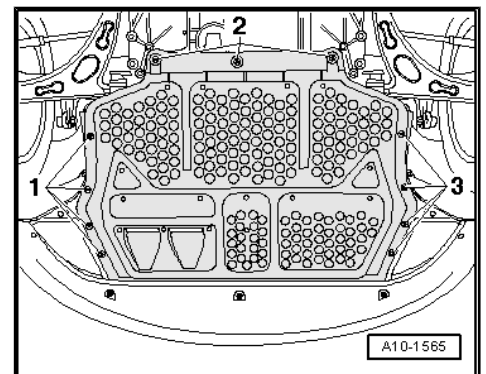


Continued for all vehicles:

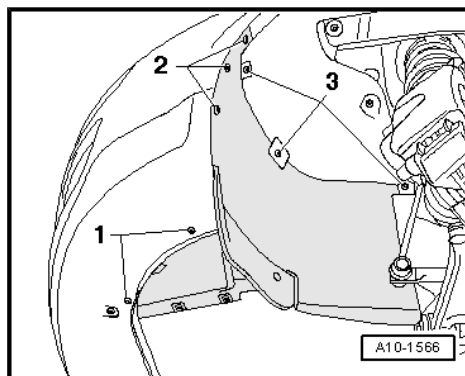
- Set up support bracket - 10 - 222 A- on wing mounting flanges (vehicles up to 05.2008) or on body flanges (vehicles from 06.2008 onwards).
- Hook spindle of support bracket into engine lifting eye (left-side).
- Take up weight of engine with spindle; do not lift.



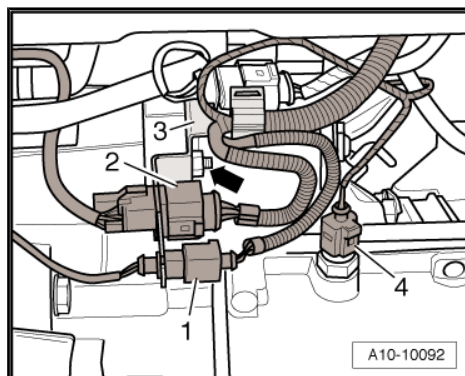
- Remove front left wheel.
- Remove centre noise insulation -fasteners 1 ... 3-.



- Remove noise insulation (left-side) -fasteners 1 ... 3-.



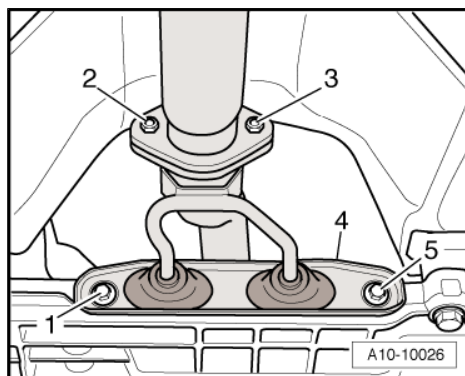
- Unplug electrical connector -4- for reversing light switch - F4- .
- Unplug electrical connector -2- for Lambda probe - G39- and electrical connector -1- for exhaust gas temperature sender 1 - G235- and unhook from bracket.
- Remove nut -arrow- and detach bracket -3- from stud together with electrical wiring.
- Tie bracket and electrical wiring to the front.
- Unbolt drive shafts (left and right) from gearbox flanges.
- Tie up drive shafts.



Note

To avoid damage, the flexible joints in the front exhaust pipe must not be bent more than 30°.

- Remove nuts -2- and -3- from exhaust system flange.
- Detach exhaust system at flange.
- Unscrew bolts -1- and -5- of bracket -4- for exhaust system.

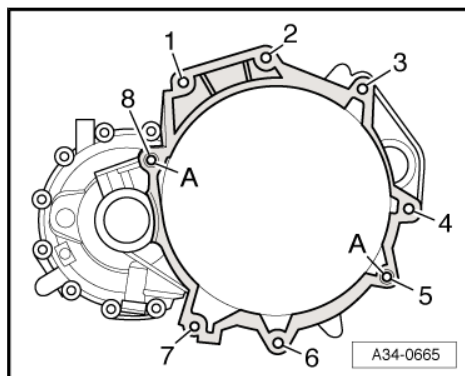


- Remove bolts -4- and -6 ... 8- from engine/gearbox flange.
- Slacken bolt -5- and leave it in position only finger-tight.
- Remove starter.

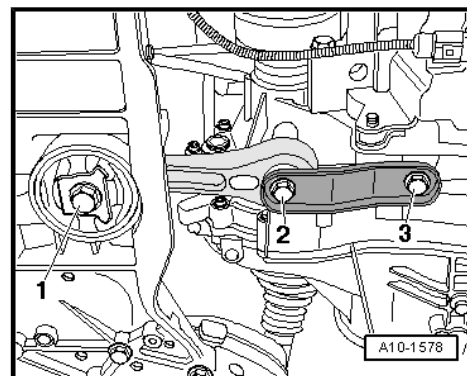


Note

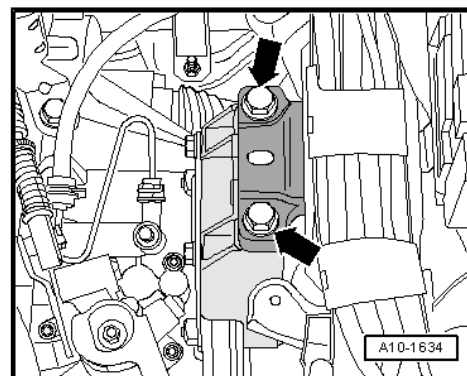
The two lower bolts on engine/gearbox flange -6- and -7- remain in place on engine.



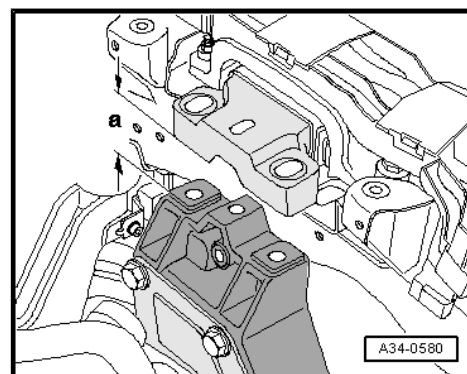
- Remove bolts -1 ... 3- and detach pendulum support.



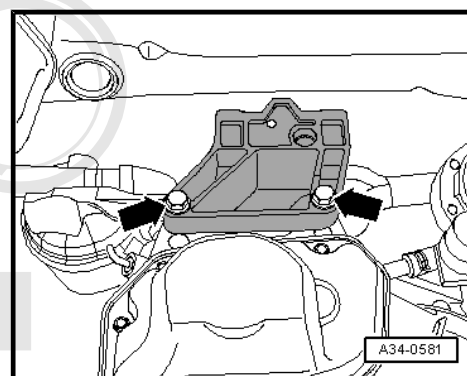
- Remove bolts -arrows- from gearbox mounting.



- By adjusting spindle on support bracket - 10-222 A- , lower gearbox by distance -a-.
- Distance a = 60 mm

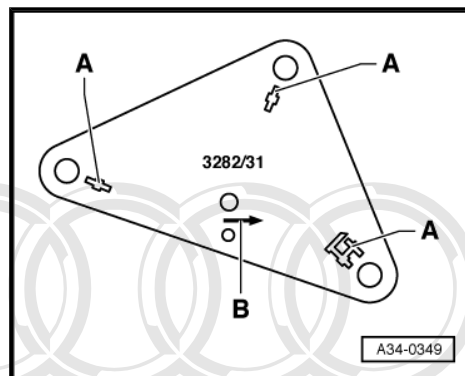


- Unbolt gearbox support from gearbox -arrows-.

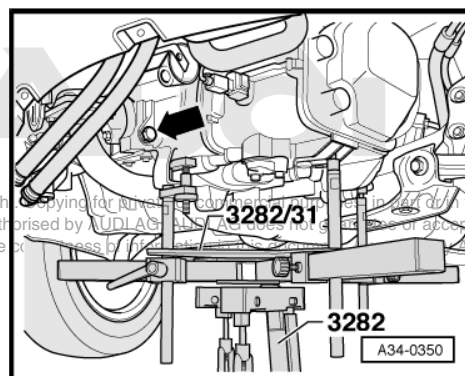


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- Set up gearbox support - 3282- on engine and gearbox jack - V.A.G 1383 A- .
- Place adjustment plate - 3282/31- on gearbox support - 3282- (adjustment plate only fits in one position).
- Align arms of gearbox support to coincide with holes in adjustment plate.
- Screw in support elements -A- as shown on adjustment plate.
- Run engine/gearbox jack - V.A.G 1383 A- under vehicle; arrow symbol -B- points in direction of travel.

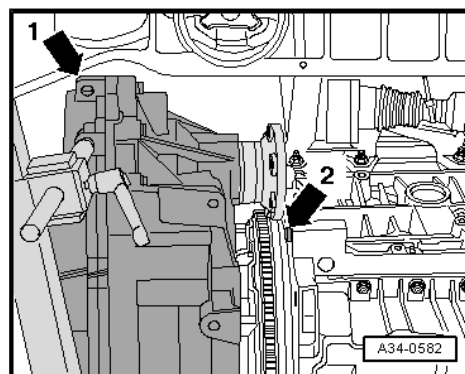


- Align adjustment plate - 3282/31- parallel to gearbox and lock safety support on gearbox as illustrated.
- Remove the last engine/gearbox securing bolt -arrow-.



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- Pull gearbox off dowel sleeves and about 60 mm away from engine.
- Move the gearbox into the position shown.
- Flange shaft must clear dowel sleeve on engine -arrow 2- when gearbox is lowered.
- Gearbox housing must clear subframe -arrow 1- when gearbox is lowered.



3 Installing gearbox

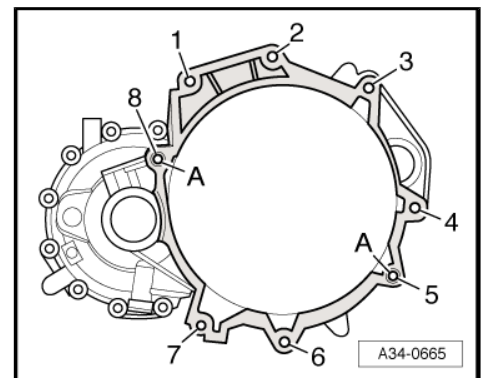
Procedure

Note

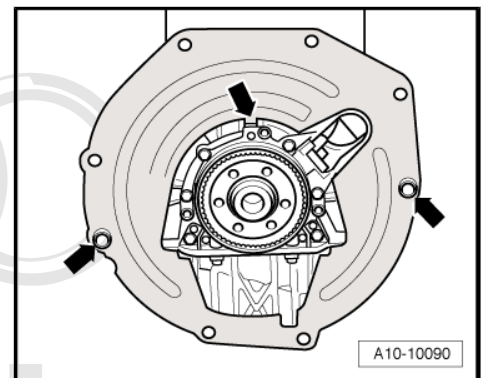
- ◆ *Renew self-locking nuts and bolts when performing assembly work.*
 - ◆ *Renew oil seals and gaskets, and bolts which are tightened by turning through a specified angle.*
 - ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*
 - ◆ *Re-attach all cable ties at the same locations when re-installing.*
 - ◆ *Clean input shaft splines and (in the case of used clutch plates) the hub splines. Remove corrosion and apply only a very thin coating of grease for clutch plate splines - G 000 100- to the splines. Then move clutch plate backwards and forwards on input shaft until hub moves freely on shaft. It is important to remove excess grease.*
- Check that dowel sleeves -A- for centralising engine/gearbox are in the cylinder block; install any missing dowel sleeves.

Note

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

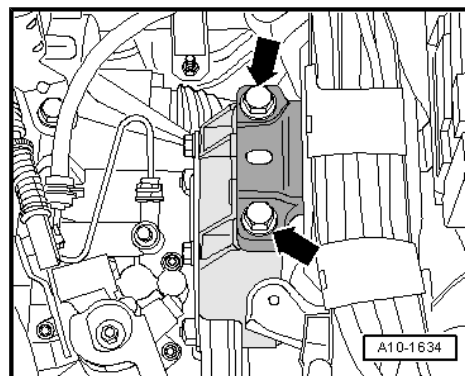


- Make sure that the intermediate plate is engaged on the sealing flange and fitted on the dowel sleeves -arrows-.
- Check clutch release bearing for wear and renew if necessary.
- Lubricate surface which contacts ball-head pin with MoS₂ grease.
- Raise gearbox carefully and move to installation position using gearbox support - 3282- .
- Bolt gearbox onto engine.

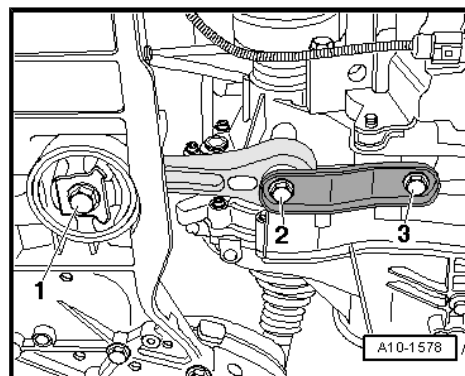


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- Tighten bolts -arrows- on gearbox mounting finger-tight to start with.
- Use new bolts.



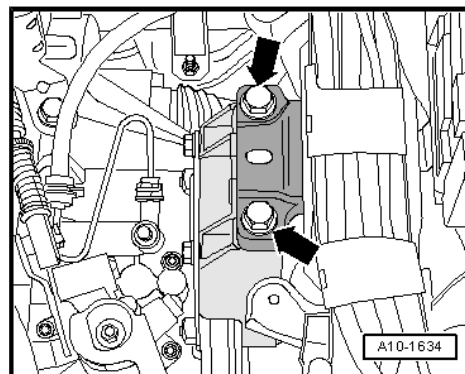
- Bolt pendulum support onto gearbox first, and then secure to subframe -bolts 1 ... 3- ⇒ [page 80](#) .
- Bolt drive shafts to flange shafts ⇒ Rep. gr. 40. .
- Install exhaust system and perform stress-free alignment ⇒ Rep. gr. 26 .
- Check mountings of engine/gearbox assembly for correct adjustment, and re-adjust if necessary ⇒ Rep. gr. 10. .



- Tighten bolts -arrows- on gearbox mounting ⇒ [page 80](#) .

Remaining installation steps are carried out in reverse sequence; note the following:

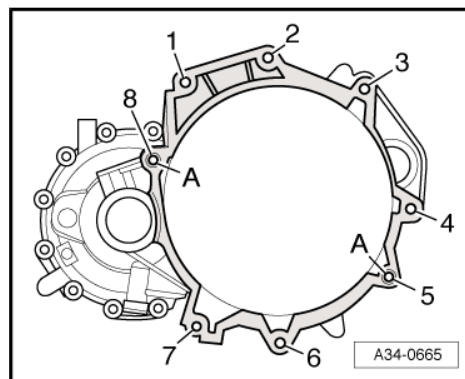
- Install clutch slave cylinder ⇒ [page 26](#) .
- Attach and adjust selector cables at gearbox ⇒ [page 65](#) .
- Fill up oil in gearbox and check oil level ⇒ [page 89](#) .
- Install battery tray and battery ⇒ Rep. gr. 27 .



Tightening torques

Item	Bolt	Nm
1, 2, 5	M12×65	80
3 ²⁾	M12×135	80
4 ²⁾	M12×150	80
6, 7	M10×60	40
8	M12×80	80
A	Dowel sleeves for centralising	

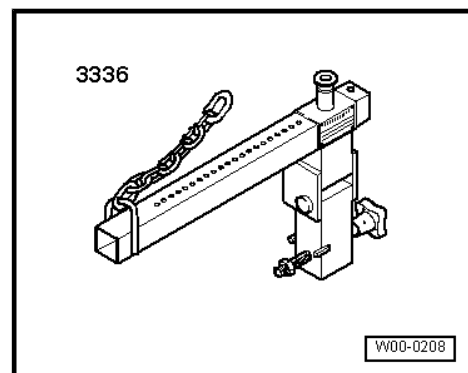
2) Bolt with stud M8



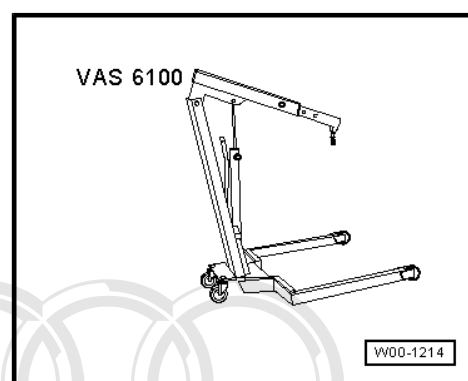
4 Transporting gearbox

Special tools and workshop equipment required

- ◆ Gearbox lifting tackle - 3336-

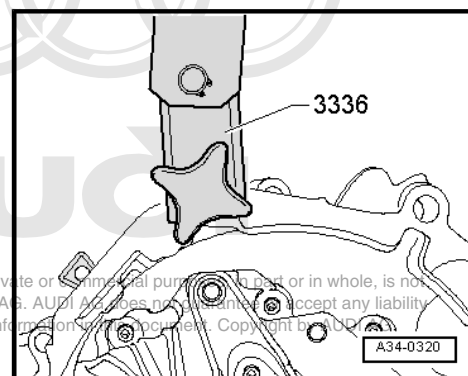


- ◆ Workshop hoist - VAS 6100-



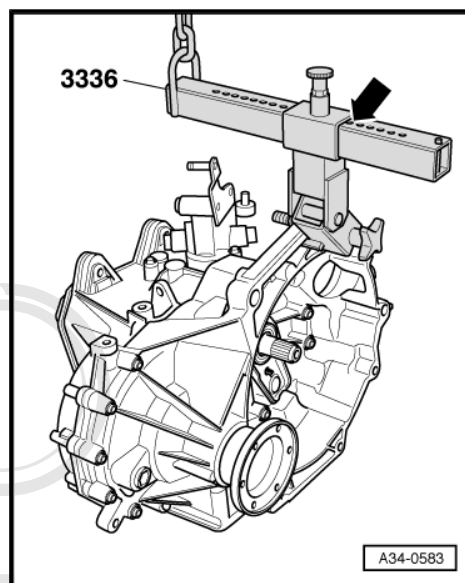
Procedure

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



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- Set support arm on sliding bracket by means of locking pin -arrow-.
- Number of holes visible = 6
- Lift gearbox with workshop hoist - VAS 6100- and gearbox lifting tackle - 3336- .

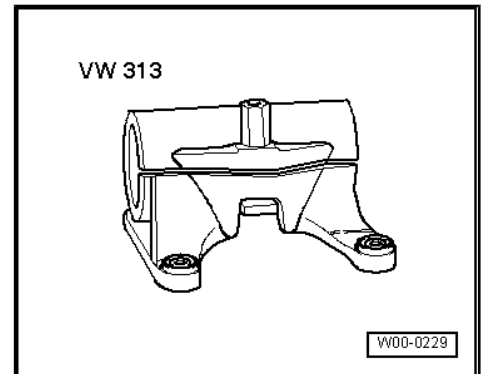


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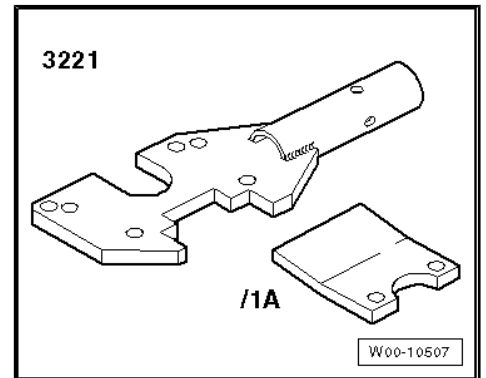
5 Securing gearbox to assembly stand

Special tools and workshop equipment required

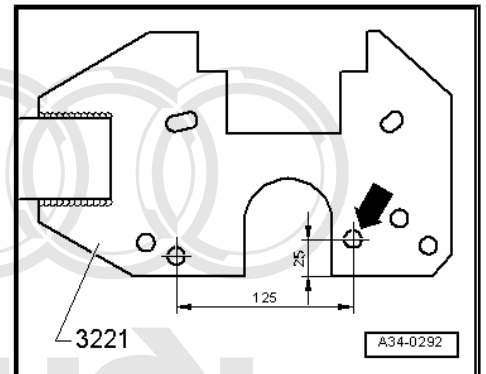
- ◆ Support clamp - VW 313-



- ◆ Gearbox support - 3221-



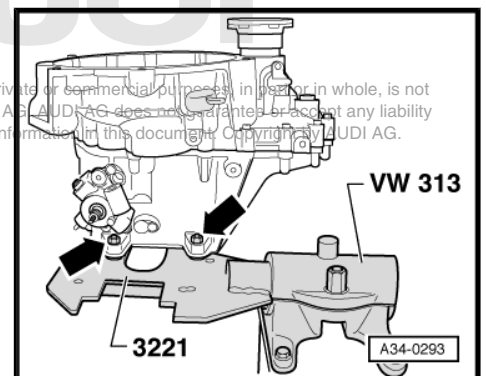
- Make an additional 11 mm $\varnothing$ drilling -arrow- in gearbox support - 3221- according to the dimensions shown (dimensions in mm).



Procedure

- Bolt gearbox housing to gearbox support - 3221- as illustrated -arrows-.

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6 Exploded view - assembly mountings

1 - Bolt

- ☐ Renew
- ☐ Tightening sequence
⇒ [page 81](#)
- ☐ 50 Nm +90°

2 - Pendulum support

- ☐ Removing and installing
⇒ [page 84](#)

3 - Engine mounting

- ☐ Removing and installing
⇒ Rep. gr. 10

4 - Bolt

- ☐ Tightening torque ⇒
Rep. gr. 10

5 - Connecting bracket

- ☐ Removing and installing
⇒ Rep. gr. 10

6 - Bolt

- ☐ Tightening torque ⇒
Rep. gr. 10

7 - Bolt

- ☐ Tightening torque ⇒
Rep. gr. 10

8 - Bolt

- ☐ Tightening torque ⇒
Rep. gr. 10

9 - Bolt

- ☐ Tightening torque ⇒
Rep. gr. 10

10 - Bolt

- ☐ Renew
- ☐ Tightening sequence ⇒ [page 81](#)
- ☐ 60 Nm +90°

11 - Bolt

- ☐ Tightening sequence ⇒ [page 81](#)
- ☐ Renew
- ☐ 40 Nm +90°

12 - Gearbox mounting

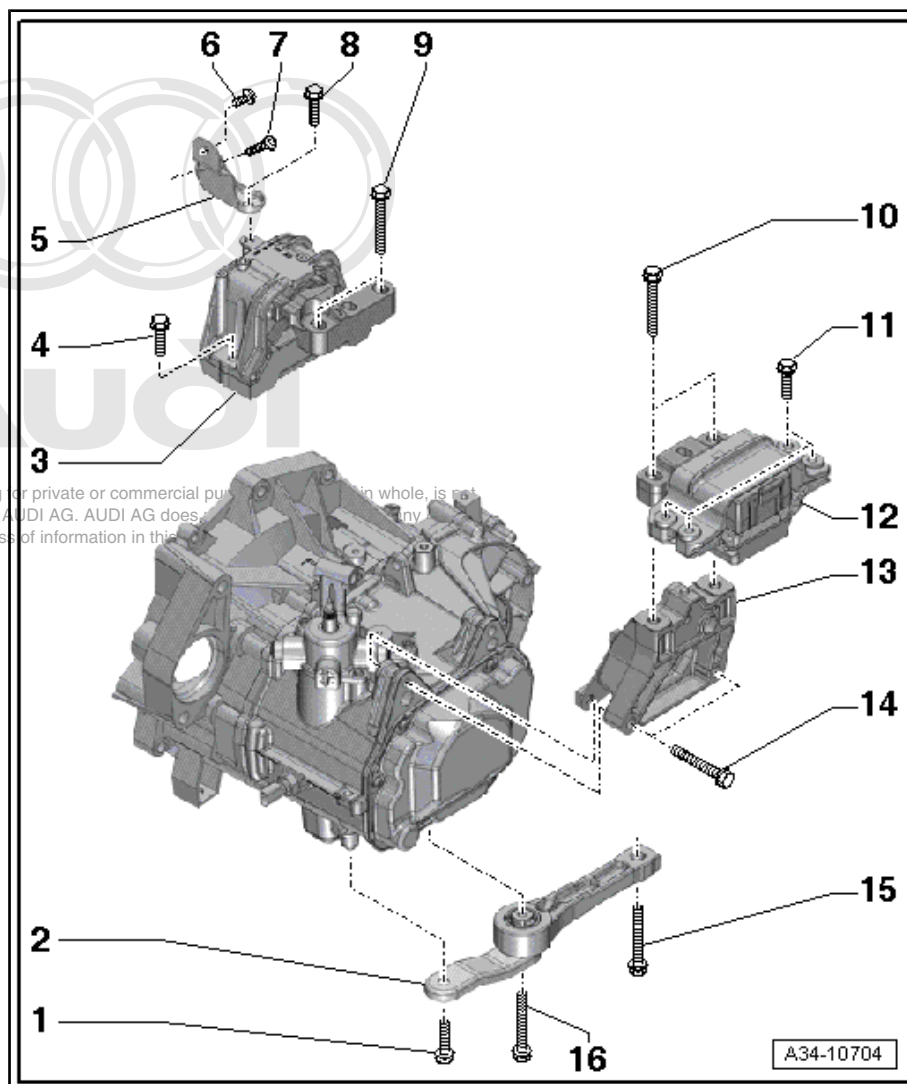
- ☐ Removing and installing ⇒ [page 81](#)
- ☐ Secure to gearbox support

13 - Gearbox support

- ☐ Removing and installing ⇒ [page 84](#)

14 - Bolt

- ☐ Renew
- ☐ 40 Nm +90°



15 - Bolt

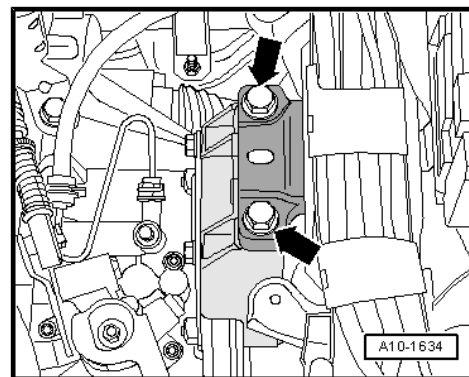
- ☐ Renew
- ☐ Tightening sequence ➔ [page 81](#)
- ☐ 100 Nm +90°

16 - Bolt

- ☐ Renew
- ☐ Tightening sequence ➔ [page 81](#)
- ☐ 50 Nm +90°

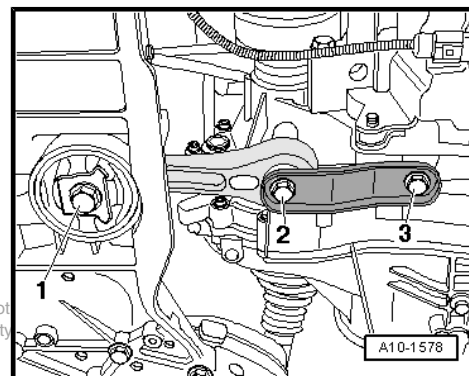
Attaching gearbox mounting to gearbox support

- Renew bolts.
- Tighten all bolts hand-tight.
- Tighten bolts to specified torque.



Installing pendulum support

- Renew bolts.
- First secure pendulum support to gearbox (-2- and -3-), then on subframe -1-.

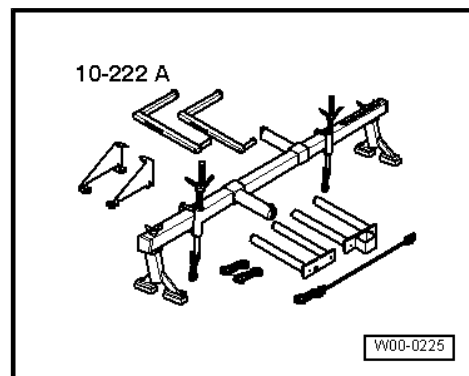


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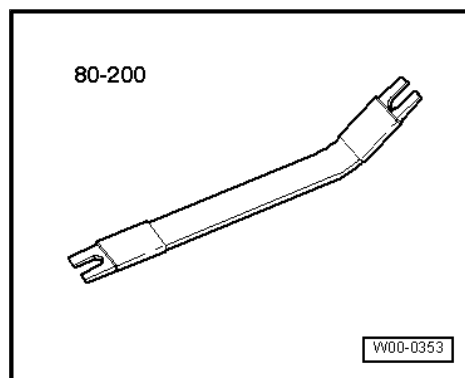
6.1 Removing and installing gearbox mounting

Special tools and workshop equipment required

- ◆ Support bracket - 10 - 222 A-



- ◆ Removal lever - 80 - 200- for vehicles from 06.2008 onwards



Removing

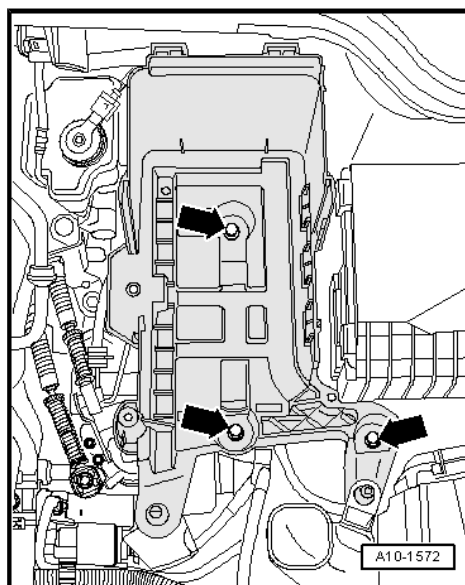


Caution

When disconnecting the battery there is a risk of irreparable damage to electronic components.

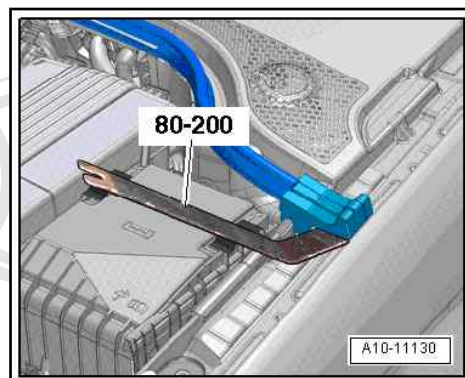
- ◆ Observe notes on procedure for disconnecting the battery.

- Remove battery ⇒ Rep. gr. 27 .
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).



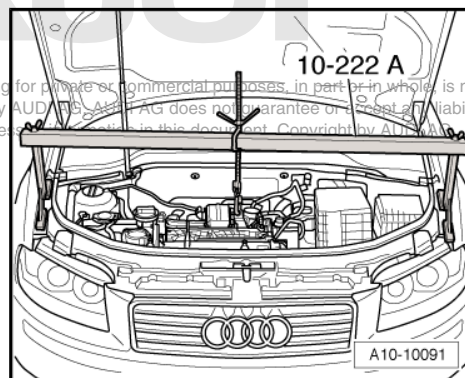
Vehicles from 06.2008 onwards:

- Lever clip off sealing element using removal lever - 80 - 200- and fold up sealing element.



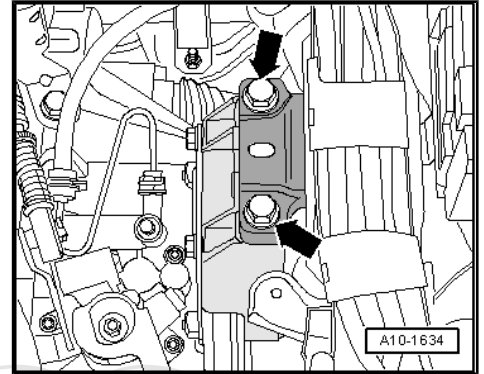
Continued for all vehicles:

- Set up support bracket - 10 - 222 A- on wing mounting flanges (vehicles up to 05.2008) or on body flanges (vehicles from 06.2008 onwards).

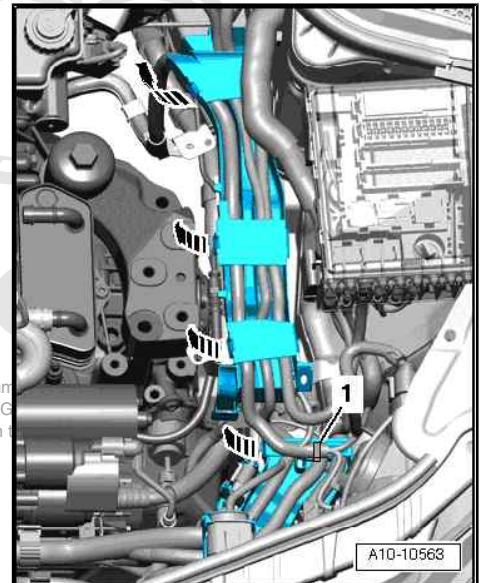


Continued for all vehicles:

- Remove bolts -arrows-.



- Open retainers for wiring duct -arrows-.
- Cut open cable tie -1- and push electrical wiring to one side.
- Unclip wiring duct.

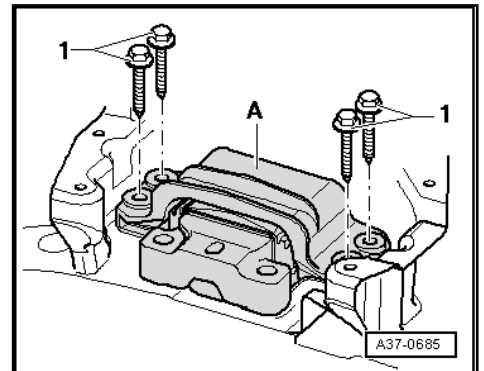


- Remove bolts -1- and detach gearbox mounting -A-.

Installing

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

- Fit gearbox mounting -A- with new bolts -1- to longitudinal member. Tightening torque ⇒ [Item 11 \(page 80\)](#)

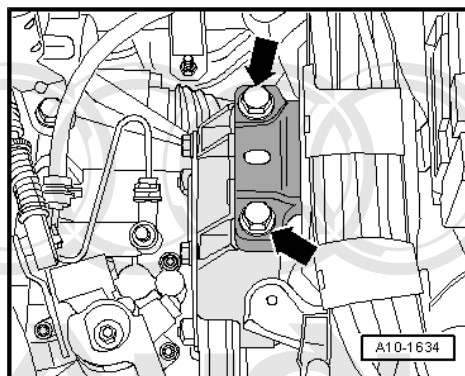




Caution

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

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



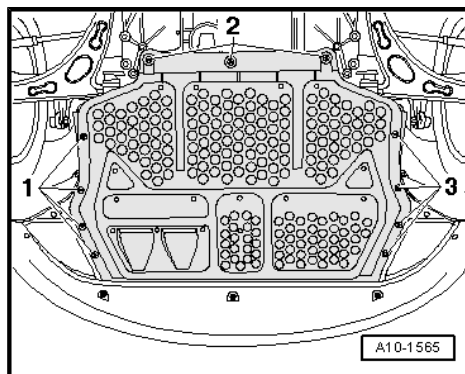
- Pull gearbox up with spindle on support bracket until gearbox support contacts support arm of gearbox mounting.
- Bolt support arm of gearbox mounting onto gearbox support using new bolts -arrows-. Tightening torque
⇒ [Item 10 \(page 80\)](#)
- Adjust assembly mountings ⇒ Rep. gr. 10 .
- Detach support bracket - 10 - 222 A- from engine.
- Install battery tray and battery ⇒ Rep. gr. 27 .

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6.2 Removing and installing pendulum support

Removing

- Remove centre noise insulation -fasteners 1 ... 3-.



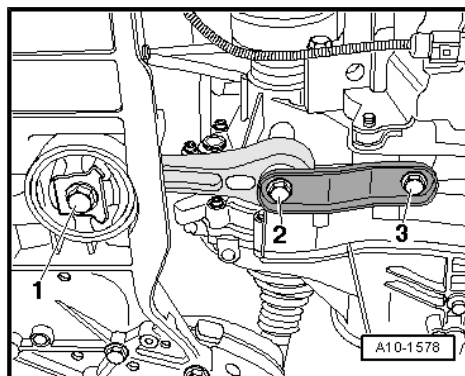
- Unscrew bolts -1 ... 3- and remove pendulum support.

Installing

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

- Install noise insulation.

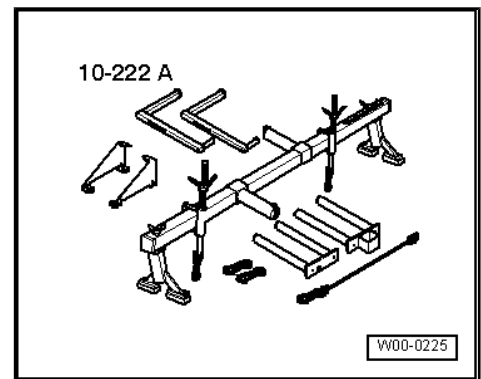
Tightening torques ⇒ [page 80](#)



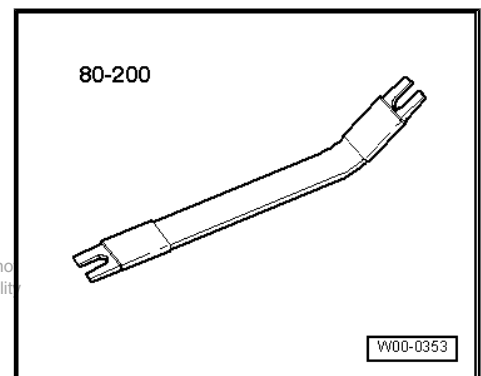
6.3 Removing and installing gearbox support

Special tools and workshop equipment required

◆ Support bracket - 10 - 222 A-



◆ Removal lever - 80 - 200- for vehicles from 06.2008 onwards



Removing

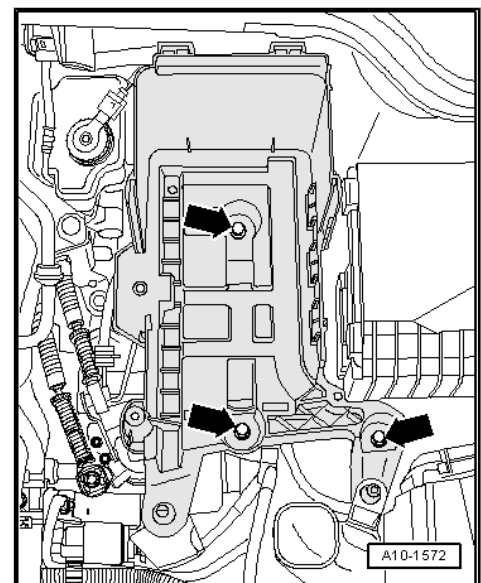


Caution

When disconnecting the battery there is a risk of irreparable damage to electronic components.

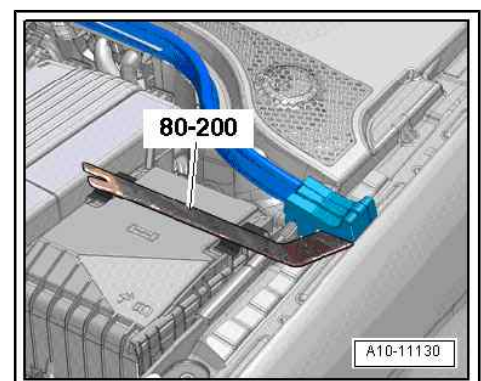
◆ *Observe notes on procedure for disconnecting the battery.*

- Remove battery ⇒ Rep. gr. 27 .
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).



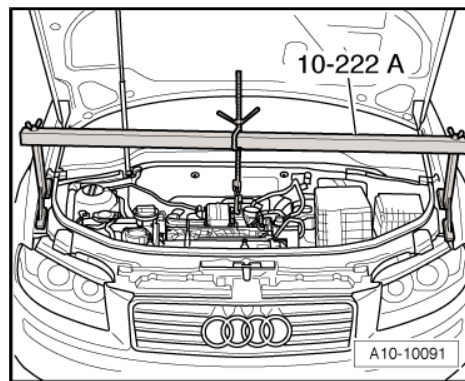
Vehicles from 06.2008 onwards:

- Lever clip off sealing element using removal lever - 80 - 200- and fold up sealing element.



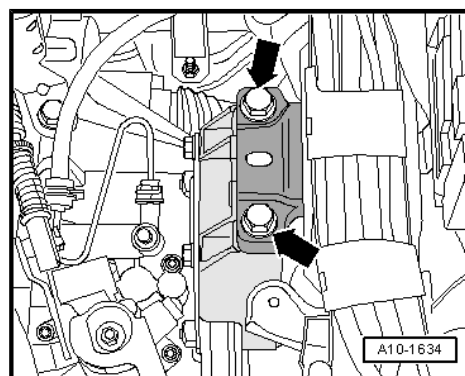
Continued for all vehicles:

- Set up support bracket - 10 - 222 A- on wing mounting flanges (vehicles up to 05.2008) or on body flanges (vehicles from 06.2008 onwards).

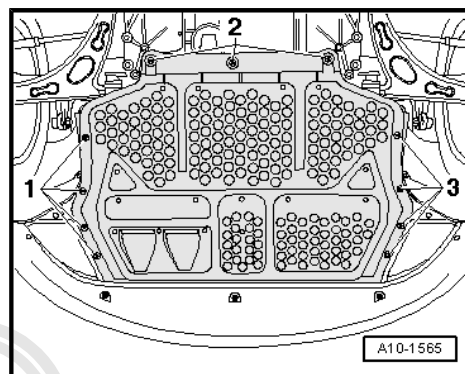


Continued for all vehicles:

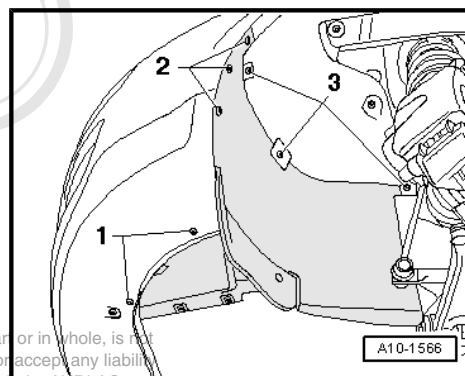
- Remove bolts -arrows-.
- Remove front left wheel.
- Turn steering to the left.



- Remove centre noise insulation -fasteners 1 ... 3-.

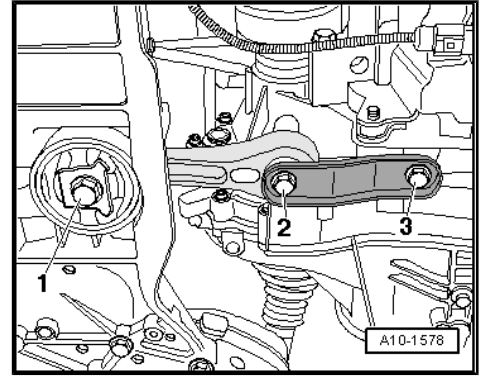


- Remove front section of wheel housing liner (left-side) ⇒ Rep. gr. 66 .

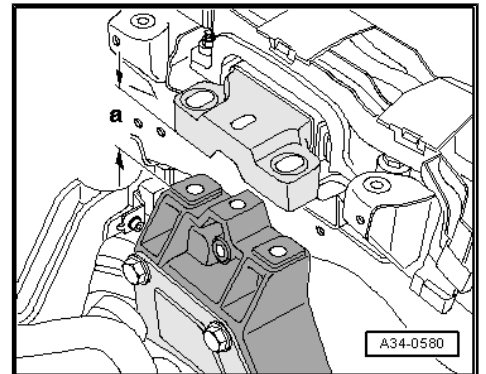


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- Unscrew bolts -1 ... 3- and remove pendulum support.



- Adjust spindles of support bracket - 10 - 222 A- to lower gear-box by distance -a-.
- ◆ Dimension -a- = 50 mm

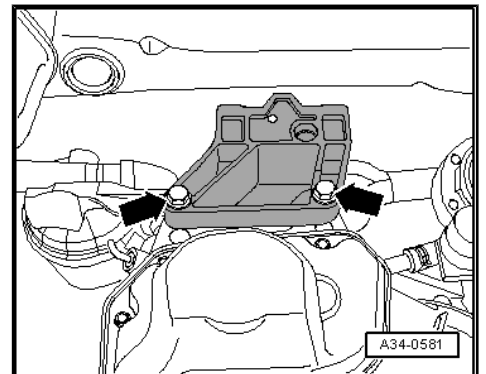


- Unbolt gearbox support from gearbox -arrows- and detach.

Installing

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

- Install gearbox support with new bolts -arrows-. Tightening torque ⇒ [Item 14 \(page 80\)](#)



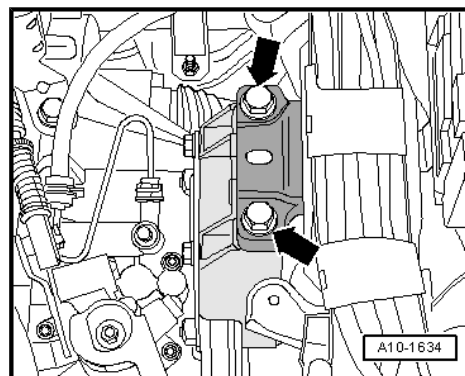


Caution

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

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

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

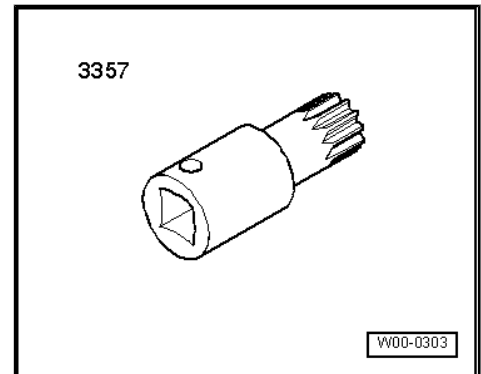


- Pull gearbox up with spindle on support bracket until gearbox support contacts support arm of gearbox mounting.
- Bolt support arm of gearbox mounting onto gearbox support using new bolts -arrows-. Tightening torque
⇒ [Item 10 \(page 80\)](#)
- Adjust assembly mountings ⇒ Rep. gr. 10 .
- Detach support bracket - 10 - 222 A- from engine.
- Install pendulum support ⇒ [page 84](#) .
- Install front left wheel.
- Install battery tray and battery ⇒ Rep. gr. 27 .

7 Checking oil level in manual gearbox

Special tools and workshop equipment required

- ◆ Socket - 3357-

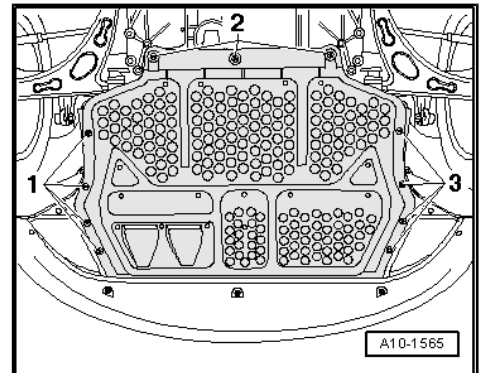


Or

- ◆ 17 mm socket (hexagon key)

Procedure

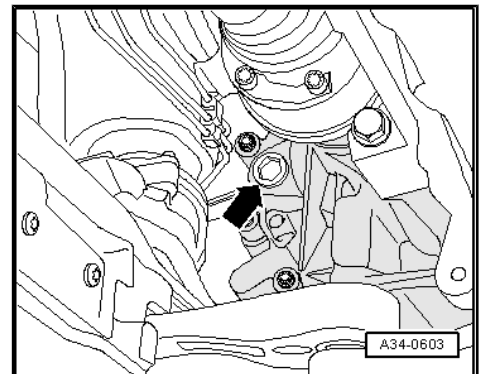
- Drive vehicle onto a four-column lifting platform or over an inspection pit (vehicle must be horizontal).
- Remove centre noise insulation -fasteners 1 ... 3-.



- Remove oil filler plug -arrow-.
- Specification: oil level up to bottom lip of filler hole
- Top up gear oil if necessary. For gear oil specification, refer to ⇒ Electronic parts catalogue .
- Tighten oil filler plug to specified torque.
- Install noise insulation.

Note the following when filling with new oil:

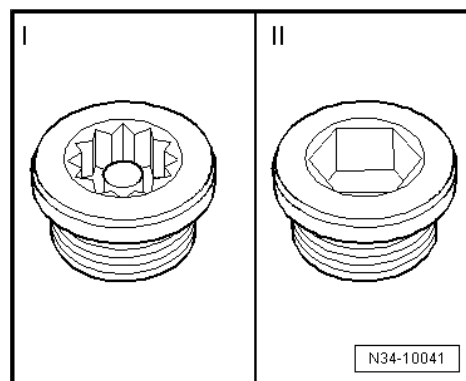
- Fill up gear oil to bottom lip of filler hole.
- Screw in oil filler plug.
- Start engine, engage a gear and allow gearbox to turn for approx. 2 minutes.
- Switch off engine and remove oil filler plug.
- Top up gear oil again to bottom lip of filler hole.
- Tighten oil filler plug to specified torque.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





Tightening torque

Component	Nm
I - Oil filler/ oil drain plug with multi-point socket	25
II - Oil filler/oil drain plug with hexagon socket	30



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8 Dismantling and assembling gearbox

⇒ ["8.1 General layout of gearbox", page 91](#)

⇒ ["8.2 Exploded view - dismantling and assembling gearbox", page 92](#)

⇒ ["8.3 Exploded view - gearbox housing cover and 5th/6th gear", page 93](#)

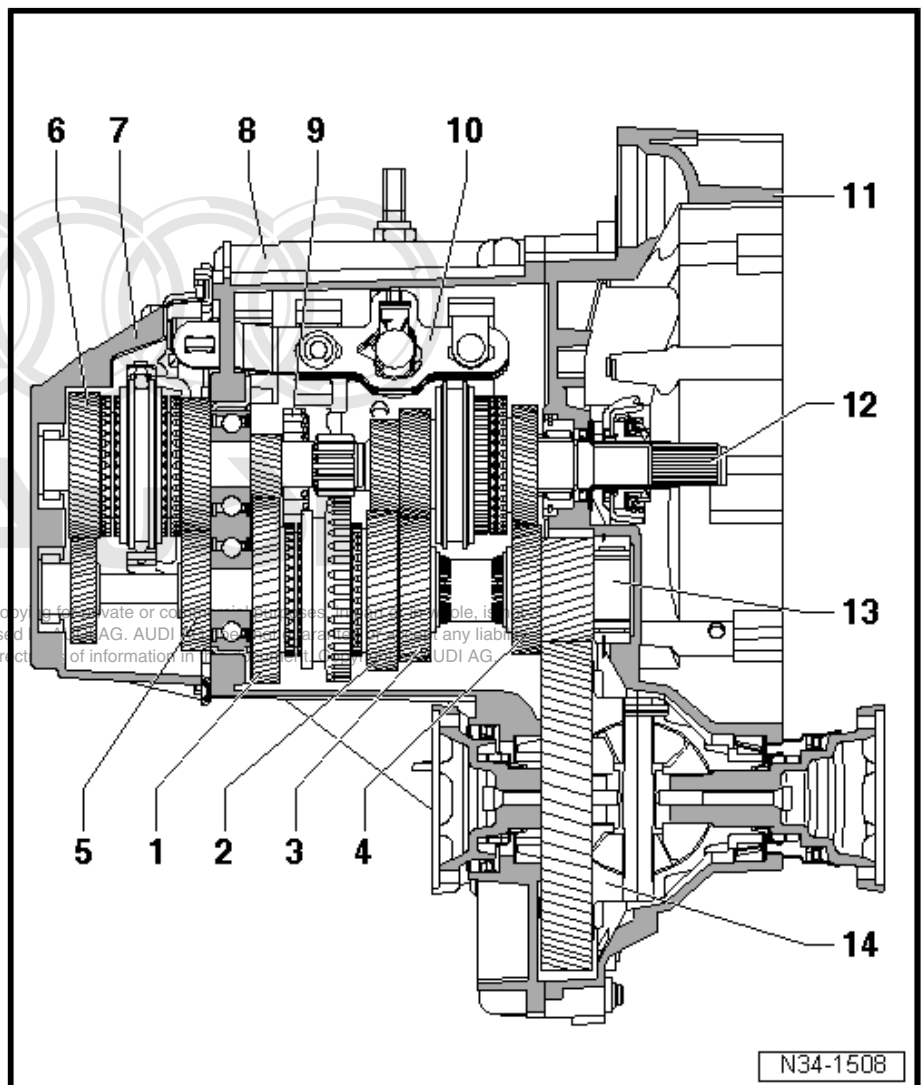
⇒ ["8.4 Exploded view - clutch housing", page 95](#)

⇒ ["8.5 Exploded view - input shaft, output shaft, differential, selector mechanism and selector forks", page 96](#)

⇒ ["8.6 Assembly sequence - dismantling and assembling gearbox", page 98](#)

8.1 General layout of gearbox

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



N34-1508

8.2 Exploded view - dismantling and assembling gearbox

I - Gearbox housing cover and 5th/6th gear

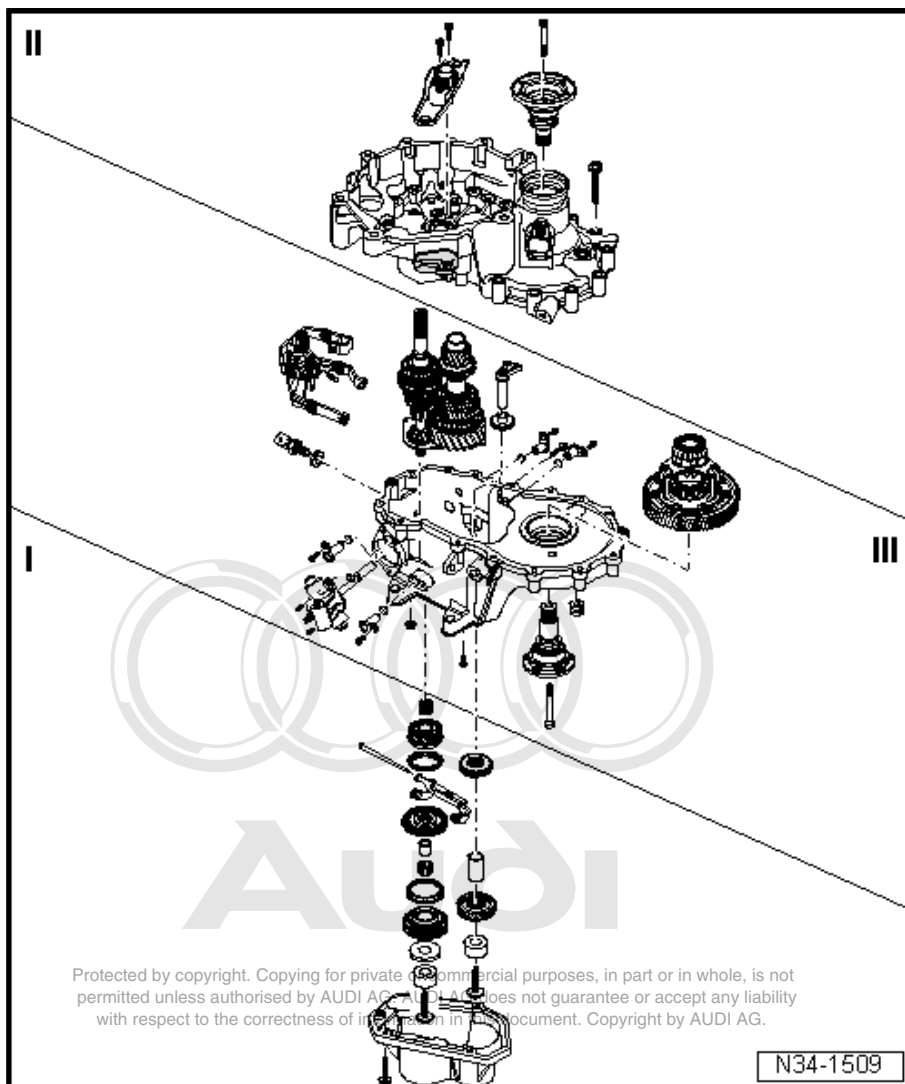
- ☐ Exploded view
⇒ [page 93](#)
- ☐ Removing and installing
⇒ [page 98](#)

II - Removing and installing clutch housing ⇒ [page 95](#)

- ☐ Exploded view
⇒ [page 95](#)
- ☐ Removing and installing
⇒ [page 98](#)

III - Input shaft, output shaft, differential, selector mechanism and selector forks

- ☐ Exploded view
⇒ [page 96](#)
- ☐ Removing and installing
⇒ [page 98](#)



8.3 Exploded view - gearbox housing cover and 5th/6th gear

1 - Gearbox housing

- ☐ Servicing ⇒ [page 113](#)

2 - 5th gear wheel

- ☐ Installation position
⇒ [page 108](#)

3 - Sleeve

4 - 6th gear wheel

- ☐ Installation position
⇒ [page 109](#)

5 - Roller bearing inner race

- ☐ For output shaft
- ☐ Mark before removing
- ☐ Do not interchange with roller bearing inner race for input shaft
- ☐ Can be renewed individually

6 - Bolt

- ☐ M8: 30 Nm and turn 90° further
- ☐ M10: 75 Nm and turn 45° further
- ☐ For output shaft
- ☐ Self-locking
- ☐ Renew

7 - Gearbox housing cover

- ☐ With roller bearings for input and output shafts

8 - Bolt

- ☐ Renew
- ☐ 5 Nm +90°

9 - Bolt

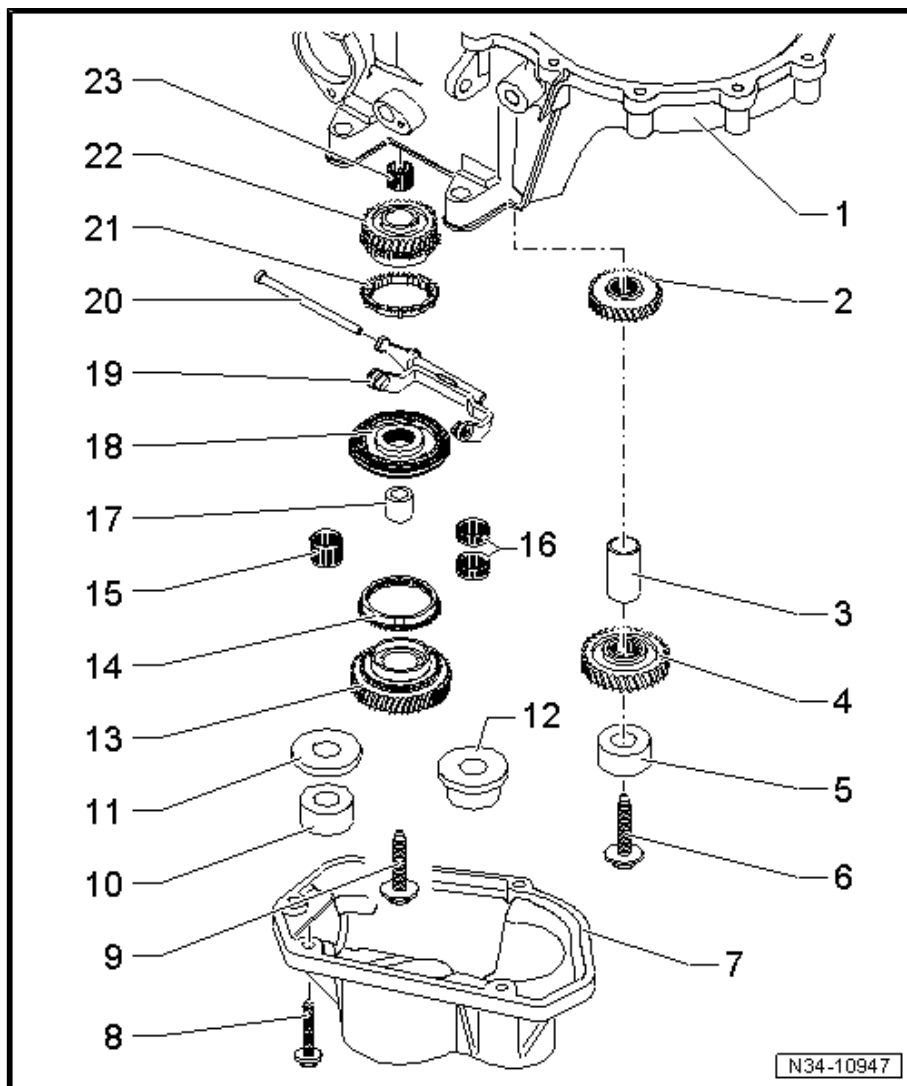
- ☐ M8: 30 Nm and turn 90° further
- ☐ M10: 75 Nm and turn 45° further
- ☐ For input shaft
- ☐ Self-locking
- ☐ Renew

10 - Roller bearing inner race

- ☐ For input shaft
- ☐ Separate on some versions
- ☐ For correct version, refer to ⇒ [Electronic parts catalogue](#)
- ☐ Mark before removing
- ☐ Do not interchange with roller bearing inner race for output shaft
- ☐ Can be renewed individually

11 - Thrust washer

- ☐ Separate on some versions
- ☐ For correct version, refer to ⇒ [Electronic parts catalogue](#)



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12 - Roller bearing inner race with thrust washer

- ☐ Combined as one unit on some versions
- ☐ For correct version, refer to ⇒ Electronic parts catalogue

13 - 6th speed selector gear**14 - 6th gear synchro-ring****15 - Needle bearing**

- ☐ For 6th gear
- ☐ Combined as one unit on some versions
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew together with ⇒ [Item 17 \(page 94\)](#)

16 - Needle bearing

- ☐ For 6th gear
- ☐ Two-piece on some versions
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew together with ⇒ [Item 17 \(page 94\)](#)

17 - Sleeve

- ☐ For 6th gear needle bearing
- ☐ Renew together with needle bearing

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

- ☐ Dismantling and assembling ⇒ [page 128](#)

19 - 5th/6th gear selector fork**20 - Pivot pin**

- ☐ For 5th gear selector fork

21 - 5th gear synchro-ring

- ☐ Will be damaged when removed from input shaft
- ☐ Renew

22 - 5th speed selector gear**23 - Needle bearing**

- ☐ For 5th gear

8.4 Exploded view - clutch housing

1 - Countersunk bolt

- ☐ 25 Nm

2 - Flange shaft with spring

- ☐ Removing and installing
⇒ [page 35](#)
- ☐ Assembling
⇒ [page 155](#)

3 - Bolt

- ☐ Renew
- ☐ 5 Nm +90°

4 - Clutch housing

- ☐ Servicing ⇒ [page 113](#)

5 - Gearbox housing

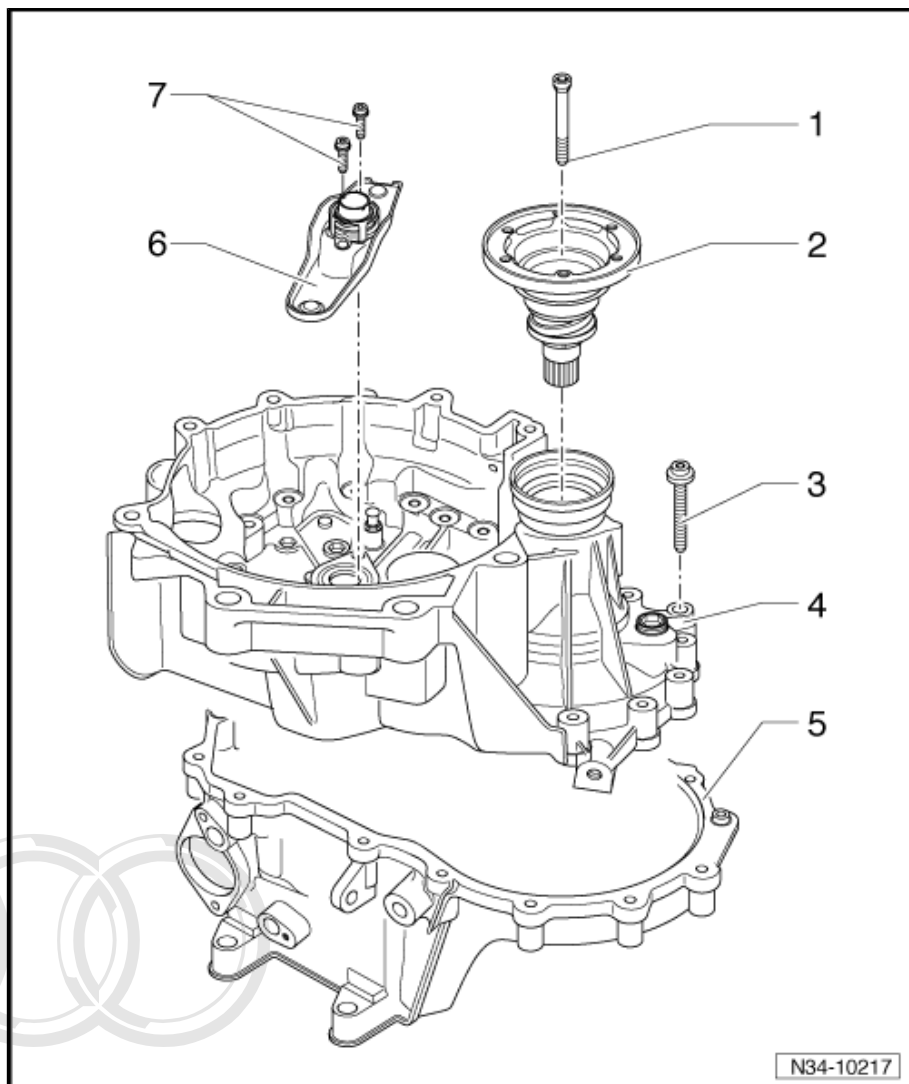
- ☐ Servicing ⇒ [page 113](#)

6 - Clutch release lever

- ☐ With guide sleeve and
release bearing
- ☐ Removing and installing
⇒ [page 35](#)

7 - Bolt

- ☐ Tightening torque
⇒ [Item 2 \(page 34\)](#)



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8.5 Exploded view - input shaft, output shaft, differential, selector mechanism and selector forks

1 - Differential

- ☐ Removing and installing ⇒ [page 98](#)
- ☐ Dismantling and assembling ⇒ [page 157](#)

2 - Gearbox housing

- ☐ Servicing ⇒ [page 113](#)
- ☐ Shim S₁ for tapered roller bearing outer race for differential was discontinued as of gearbox manufacturing date 04 12 6 ⇒ [page 113](#)

3 - Bolt

- ☐ For oil drain hole
- ☐ Tightening torque ⇒ [page 113](#)

4 - Flange shaft with spring

- ☐ Removing and installing ⇒ [page 151](#)
- ☐ Assembling ⇒ [page 155](#)

5 - Countersunk bolt

- ☐ 25 Nm

6 - Bolt

- ☐ Secures bearing mounting with grooved ball bearings for input and output shafts ⇒ [Item 16 \(page 97\)](#)
- ☐ Self-locking
- ☐ Renew
- ☐ 5 Nm +90°

7 - Hexagon flange nut

- ☐ For selector mechanism ⇒ [Item 15 \(page 97\)](#)
- ☐ Self-locking
- ☐ Renew
- ☐ 23 Nm

8 - O-ring

- ☐ Renew

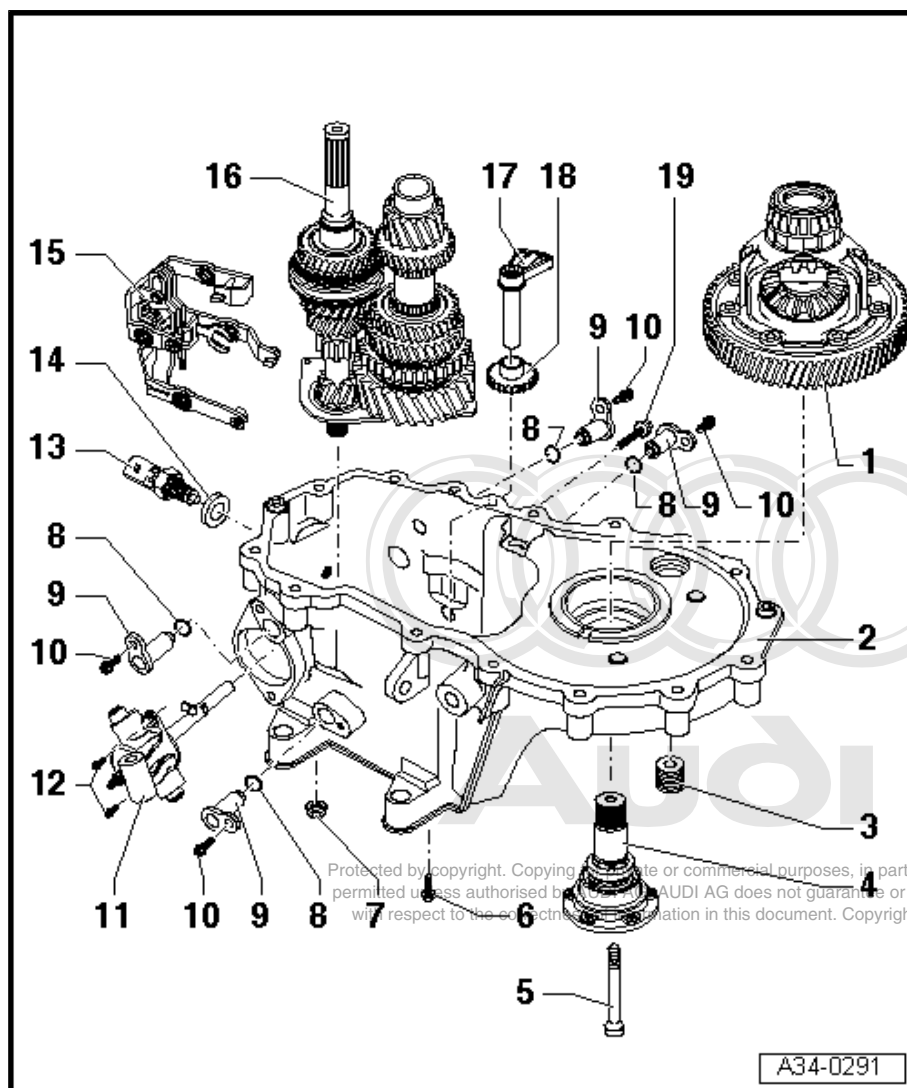
9 - Pivot pin

10 - Bolt

- ☐ Renew
- ☐ 5 Nm +90°

11 - Selector shaft with selector mechanism cover

- ☐ Selector unit
- ☐ Dismantling and assembling ⇒ [page 119](#)



12 - Bolt

- ☐ Renew
- ☐ 5 Nm +90°

13 - Reversing light switch - F4-

- ☐ If a captive seal is fitted on the switch, this seal does not need to be replaced.
- ☐ 20 Nm

14 - Seal

- ☐ Renew
- ☐ Not fitted on all versions

15 - Selector mechanism

- ☐ Selector forks
- ☐ Dismantling and assembling ⇒ [page 124](#)

16 - Input and output shafts with bearing mounting for grooved ball bearings

- ☐ If bearing mounting is separated from gearbox housing, it must always be renewed
- ☐ Pressing bearing mounting on and off: Dismantling and assembling input shaft ⇒ [Item 14 \(page 129\)](#)
- ☐ Dismantling and assembling input shaft ⇒ [page 131](#)
- ☐ Dismantling and assembling output shaft ⇒ [page 142](#)

17 - Reverse gear shaft

18 - Reverse gear wheel

19 - Bolt

- ☐ For reverse gear shaft
- ☐ Renew
- ☐ 25 Nm +45°

8.6 Assembly sequence - dismantling and assembling gearbox

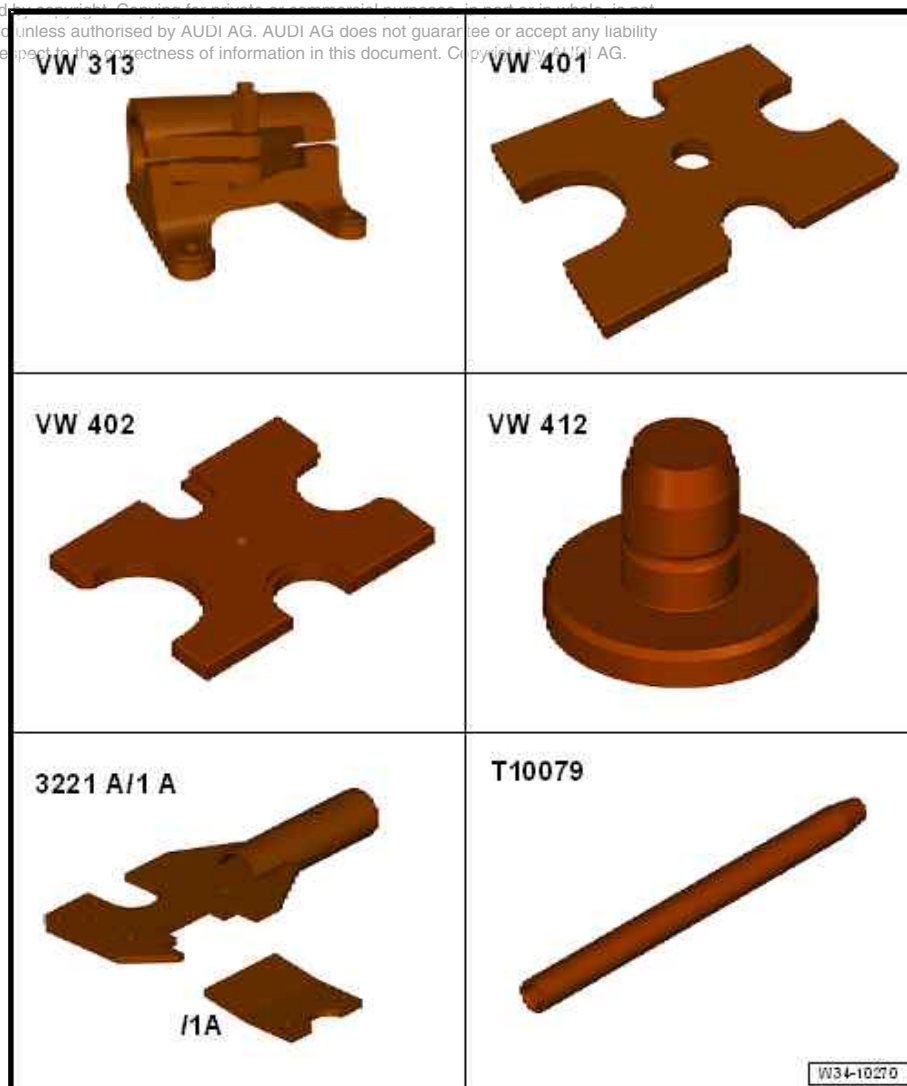
⇒ ["8.6.1 Dismantling gearbox", page 98](#)

⇒ ["8.6.2 Assembling gearbox", page 105](#)

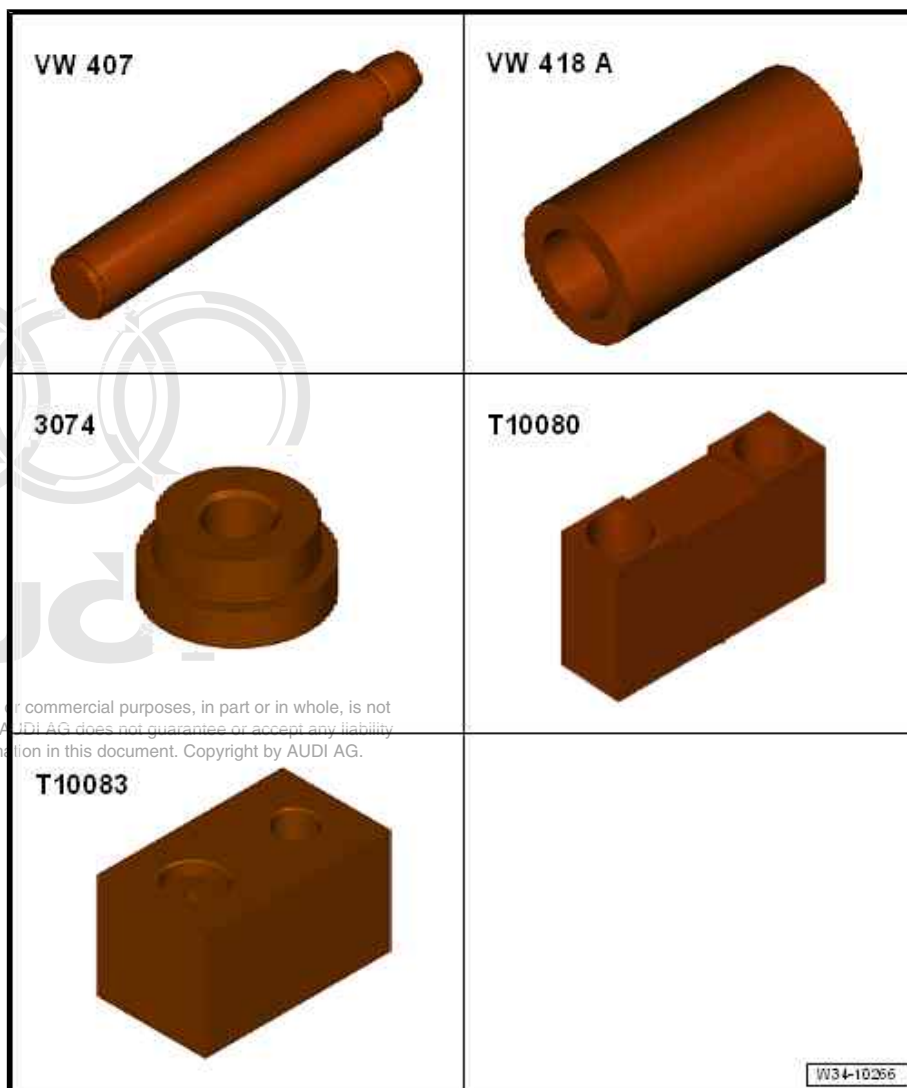
8.6.1 Dismantling gearbox

Special tools and workshop equipment required

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- ◆ Support clamp - VW 313-
- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 412-
- ◆ Gearbox support - 3221A-
- ◆ Gearbox support - 3221-
- ◆ Guide pin - T10079-



- ◆ Press tool - VW 407-
- ◆ Tube - VW 418 A-
- ◆ Thrust plate - 3074-
- ◆ Thrust piece - T10080-
- ◆ Thrust block - T10083-
- ◆ Shim - T10083/1-
- ◆ Drip tray - V.A.G 1306-

◆ Puller - T10309A-



◆ Adapter - T10309/4-

◆ If pulling off is not possible using shell half listed above:

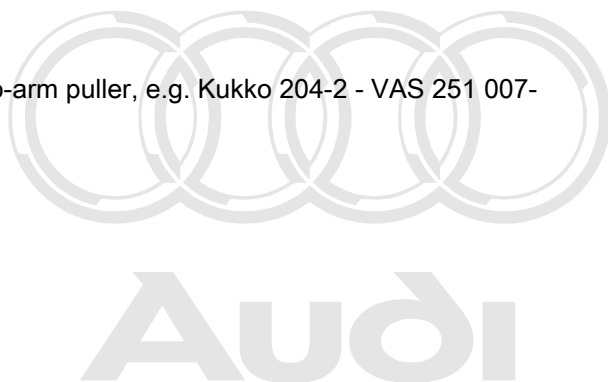
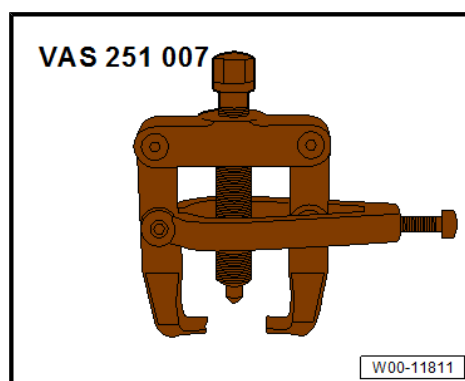
◆ Adapter - T10309/4A-

◆ Thrust piece - T10309/5-

◆ Three-arm puller, e.g. Kukko 30-1 - VAS 251 203-



◆ Two-arm puller, e.g. Kukko 204-2 - VAS 251 007-



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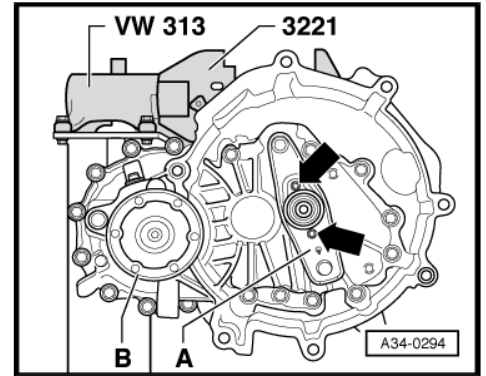
◆ Hexagon socket head bolt - M 8 X 15-

◆ Sealant - AMV 188 200 03-

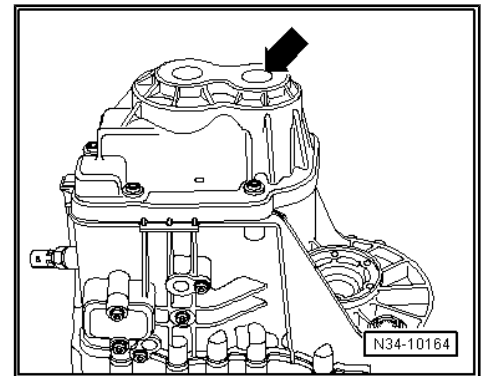
Dismantling gearbox

- Gearbox removed
- Secure gearbox to assembly stand ⇒ [page 79](#) .
- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.
- Drain off gear oil.

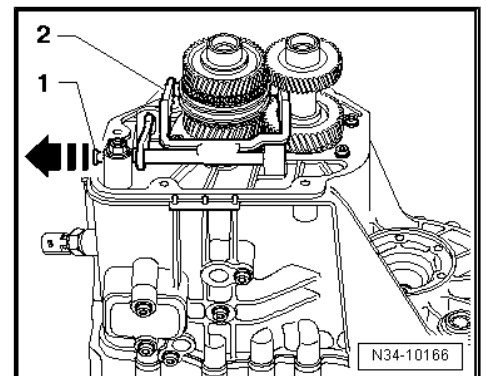
- Remove clutch release lever -A- together with clutch release bearing and guide sleeve -arrows-.
- Remove securing bolt for flange shaft (right-side) -B-.



- Unbolt gearbox housing cover -arrow- and pull off carefully.



- Pull out pivot pin -1- for 5th/6th gear selector fork -2- and remove selector fork.

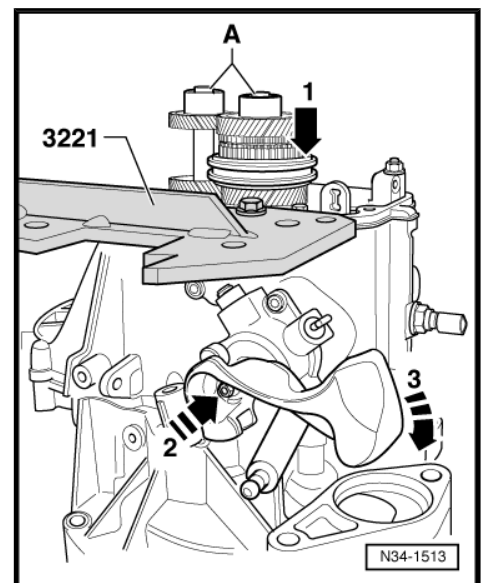


- Remove bolts -A- for inner bearing races on input and output shafts. To do this, engage 5th gear -arrow 1- and 1st gear -arrows 2 and 3-.
- The input and output shafts are both locked when these two gears are engaged. The two bolts can now be loosened.



Note

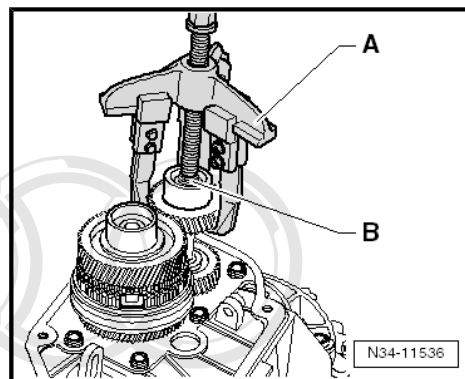
If the shafts are not being renewed, carefully clean residual locking compound out of tapped holes using a thread tap.



- Pull off 6th gear wheel and roller bearing inner race for output shaft.

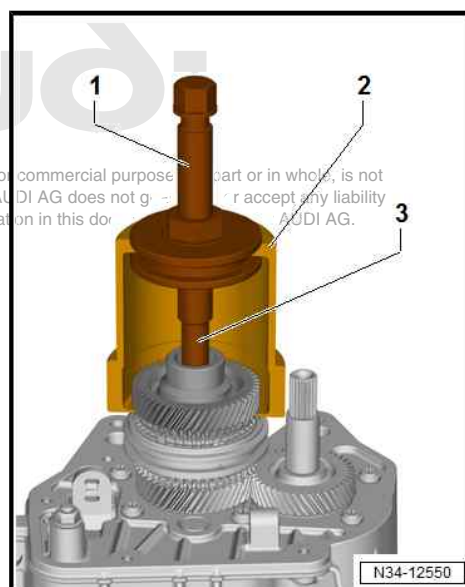
A - Three-arm puller, e.g. Kukko 30-1 - VAS 251 203-

B - Hexagon socket head bolt - M8 x 15-

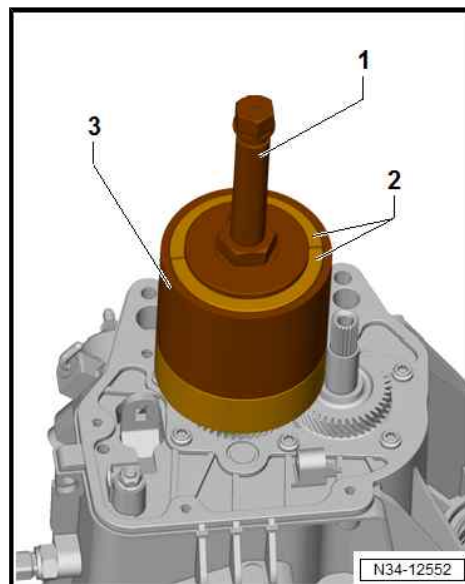


Detach 6th speed selector gear together with roller bearing inner race.

- First insert shell half - T10309/4- or shell half - T10309/4A-2-.
- Shell half must be positioned underneath 6th speed selector gear.
- If necessary, press shell half into end position.
- Fit adapter - T10309/5- -3-.
- Introduce thread insert - T10309/3- -1- into shell half and tighten slightly.

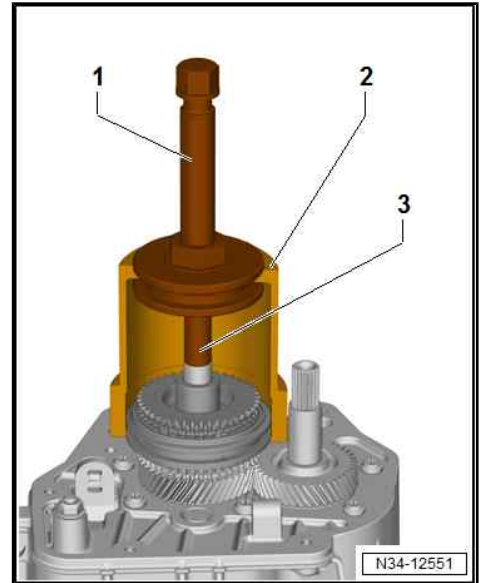


- Now fit second shell half - T10309/4- or shell half - T10309/4A-2- and slide tube - T10309/2- -3- onto tool.
- Pull off 6th speed selector gear.
- Remove 6th gear synchro-ring.



Detach 5th/6th gear synchro-hub with inner race for 6th gear needle bearing.

- First insert shell half - T10309/4- or shell half - T10309/4A-2-.
- Shell half must be positioned underneath 5th gear synchro-ring.
- If necessary, press shell half into end position.
- Fit adapter - T10309/5- -3-.
- Introduce thread insert - T10309/3- -1- into shell half and tighten slightly.

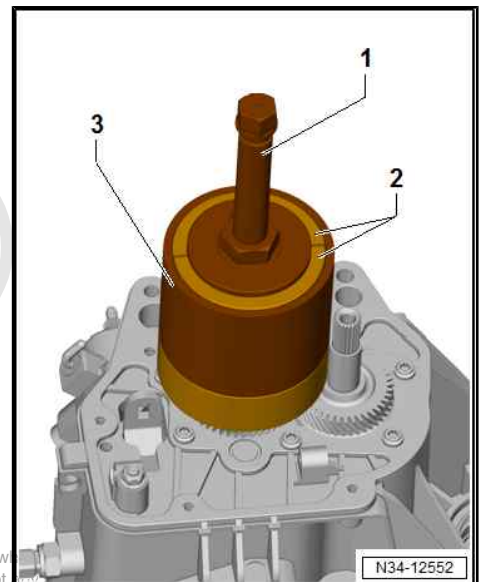


- Now fit second shell half - T10309/4- or shell half - T10309/4A-2- and slide tube - T10309/2- -3- onto tool.
- Pull off 5th and 6th gear locking collar/synchro-hub.

Note

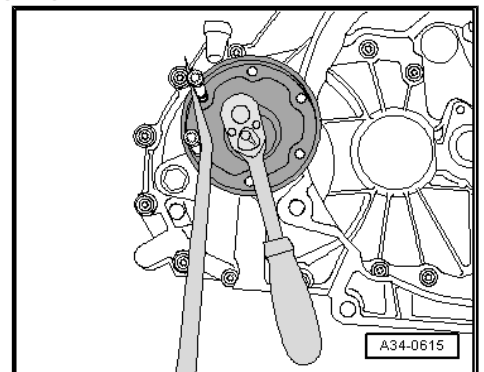
The 5th gear synchro-ring must always be renewed after removal.

- Remove 5th speed selector gear.

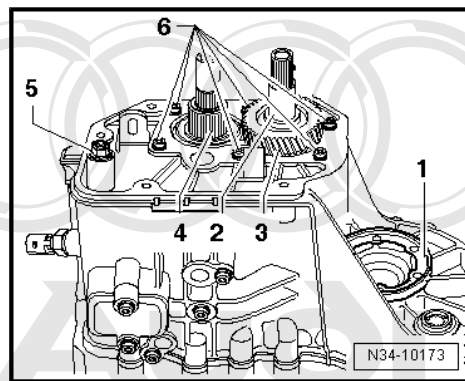


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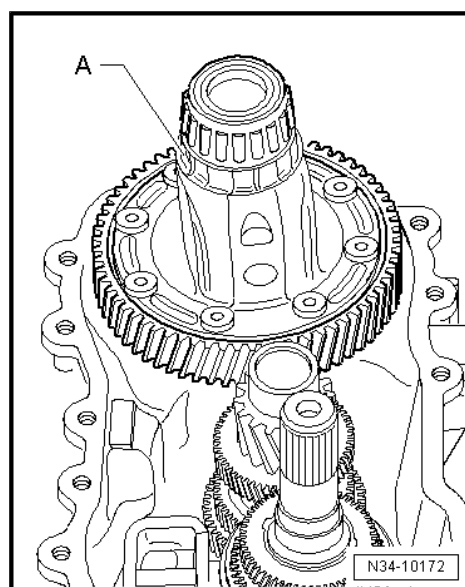
- Remove flange shaft securing bolt. To do this, screw two bolts into flange and counterhold flange shaft with tyre iron or other suitable lever.



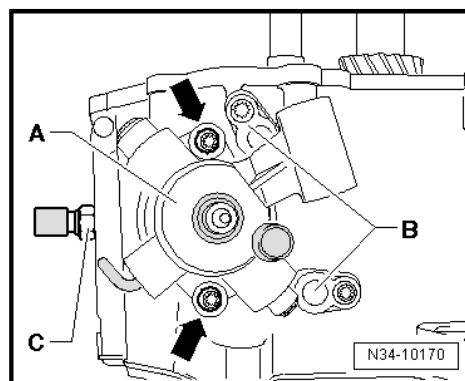
- Remove flange shaft -1- with spring.
- Remove sleeve -2-, 5th speed gear wheel -3- and 5th speed selector gear with needle bearing -4-.
- Unscrew hexagon flange nut -5- for selector mechanism (reverse gear wheel mounting).
- Unscrew securing bolts -6- for bearing mounting for input and output shafts.
- Turn gearbox in assembly stand so that clutch housing faces upwards.
- Remove bolts securing gearbox housing from inside clutch housing.
- Carefully remove clutch housing by levering alternately at the protruding webs on the housing, taking care not to damage the sealing surfaces.
- Make sure you keep clutch housing straight to avoid damaging roller bearings and bearing seat on input and output shafts.
- Remove differential -A- from gearbox housing.



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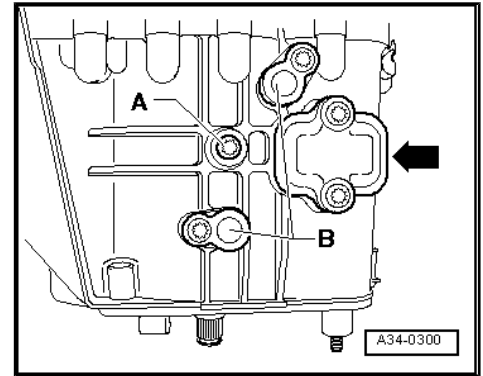
- Remove selector shaft with selector mechanism cover -A-. To do so, move selector shaft into neutral position. Then remove bolts -arrows- and pull selector shaft out of gearbox housing.
- Remove pivot pins -B- from top of gearbox.
- Remove reversing light switch -F4- -C-.



- Remove bolt -A- for securing reverse gear shaft.
- Remove pivot pins -B- from gearbox underside.

 Note

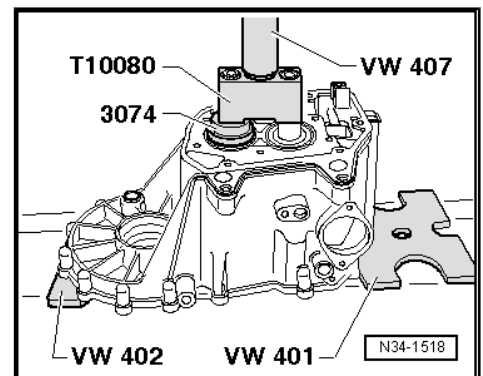
Do not remove cover plate -arrow- when dismantling gearbox.



- Press out input and output shafts together with bearing mounting, selector mechanism (selector forks) and reverse gear wheel.

 Note

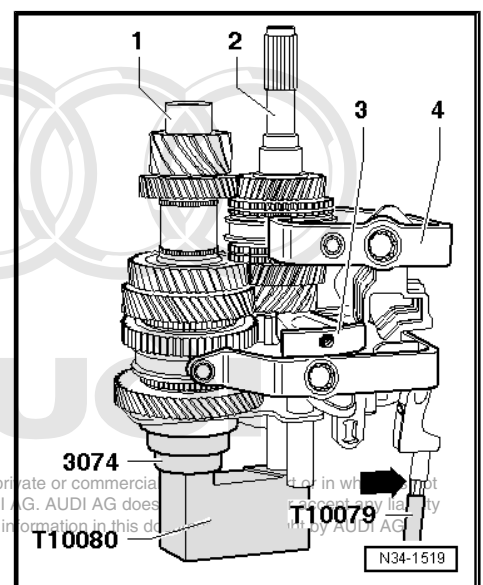
- ◆ *Set gearbox housing down in such a way that dowel sleeves in gearbox housing do not become damaged.*
- ◆ *Make sure components do not drop out when being removed (get help from a second person if necessary).*
- Press input and output shaft out of bearing mounting and grooved ball bearings.



8.6.2 Assembling gearbox

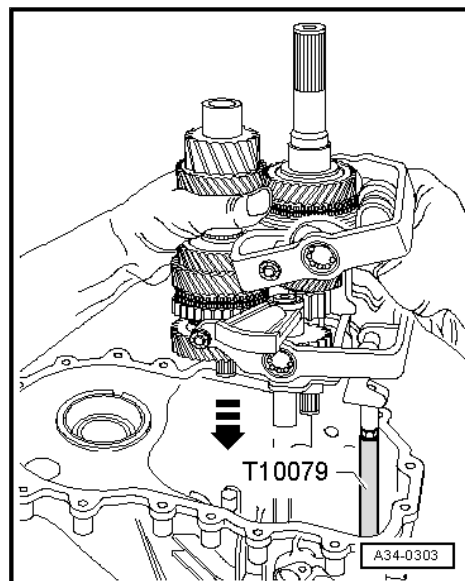
 Note

- ◆ *Pressing bearing mounting with grooved ball bearings onto input and output shafts ⇒ [page 137](#).*
- ◆ *Pressing sleeve for 5th speed selector gear needle bearing onto input shaft ⇒ [page 138](#).*
- Place the input shaft -2- and output shaft -1- with bearing mounting/grooved ball bearings in thrust piece - T10080- .
- Insert selector mechanism (selector forks) -4- in locking collars on shafts.
- Fit reverse gear shaft -3- with reverse gear wheel.
- Screw guide pin - T10079- onto threaded pin (reverse gear mounting) -arrow-.



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- Insert assembled components into gearbox housing, running guide pin - T10079- into gearbox housing through hole for selector mechanism mounting.
- Unscrew guide pin - T10079- .
- Check that selector forks engage correctly in locking collars before pressing in bearing mounting.



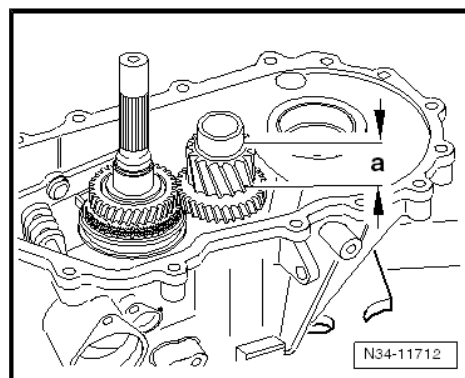
Before installation note the following:

- ◆ Selector forks must engage correctly in locking collars.
- ◆ Check dimension -a- on splines of output shaft.



Note

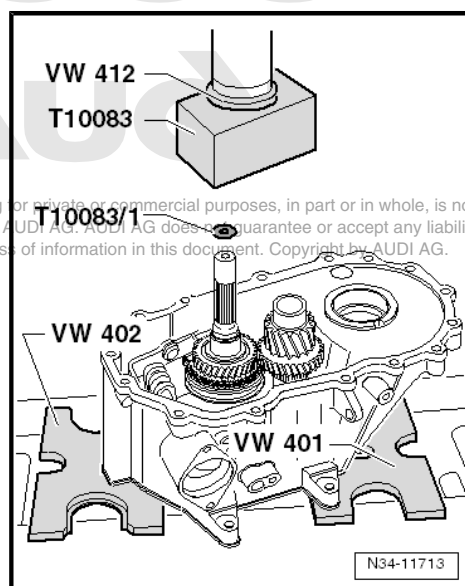
- ◆ Due to differences in the height of the teeth (dimension -a-), the output shafts of different gearboxes differ in length.
- ◆ It may be necessary to fit a shim - T10083/1- (3 mm thick) on the input shaft so that output shaft and input shaft can be pressed in evenly.
- ◆ Dimension -a- on teeth of output shaft must therefore be measured.



Dimension -a- = 30.6 mm

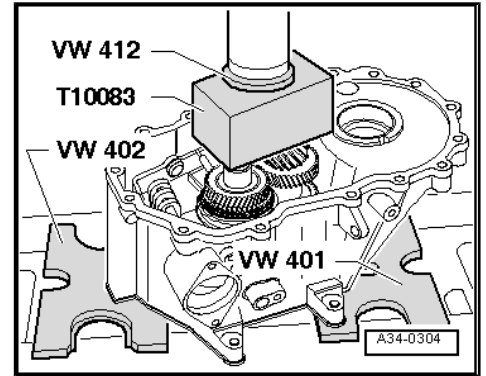
Place shim - T10083/1- on input shaft ⇒ next illustration.

Placing shim - T10083/1- on input shaft, and carefully pressing in bearing mounting together with input and output shafts as far as stop

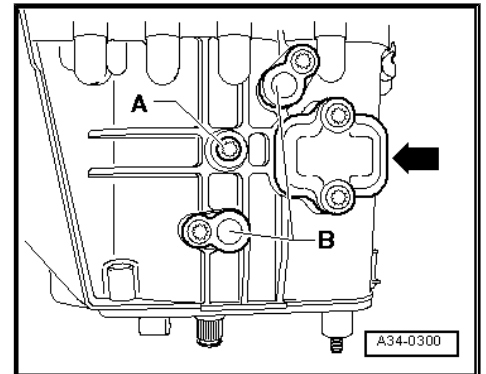


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- Carefully press in bearing mounting together with input and output shafts as far as the stop.

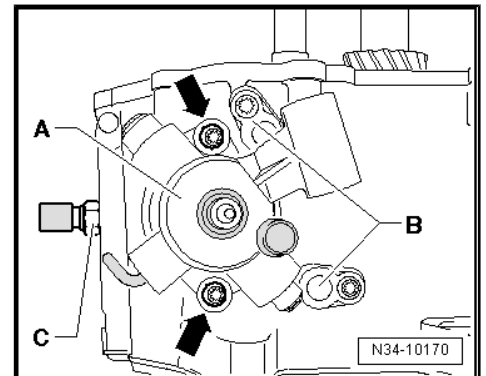


- Screw in bolt -A- for reverse gear shaft.
- Install pivot pins -B- on underside of gearbox.



- Install reversing light switch - F4- -C-.
- Install pivot pins -B- on top of gearbox.
- Set selector plates in neutral position.
- Apply sealant - AMV 188 200 03- evenly to sealing surface of selector mechanism cover.
- Install selector shaft with selector mechanism cover -A-. Then tighten bolts -arrows-.

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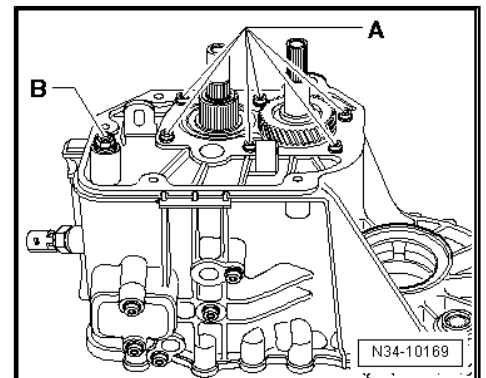
- Using new bolts -A-, secure bearing mounting for input and output shafts.



Note

Tighten the bolts in stages to the specified torque in diagonal sequence, starting in the centre.

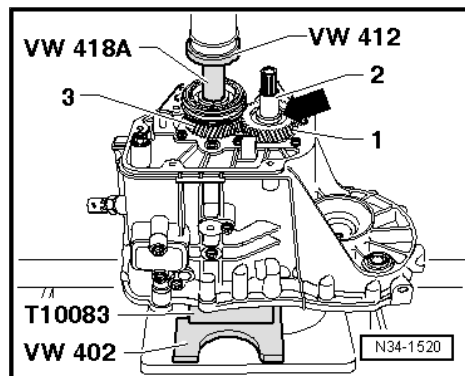
- Tighten hexagon flange nut -B- for selector mechanism (selector forks).
- Fit input and output shafts together with gearbox housing in thrust block - T10083- .
- Fit 5th gear wheel -1- and sleeve -2-.



Installation position of 5th gear wheel

The high collar -arrow- points to the gearbox housing cover.

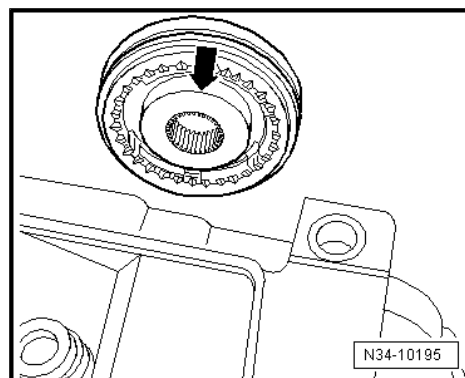
- Install 5th speed selector gear -3- with needle bearing.
- Fit 5th gear synchro-ring on selector gear.



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

The high collar -arrow- points to 5th gear and to gearbox housing.

- Press on 5th and 6th gear locking collar/synchro-hub
⇒ [page 108](#).



- Heat inner race for 6th speed needle bearing to 100°C (maximum) and press on.

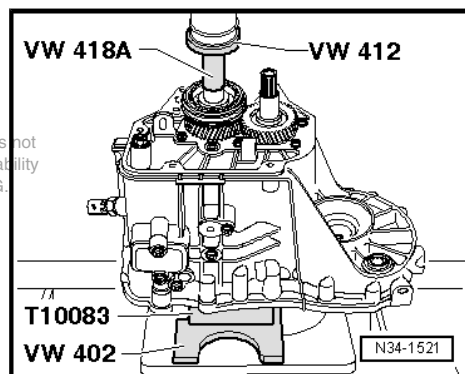


WARNING

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Wear protective gloves.

- Install 6th speed selector gear with needle bearing and synchro-ring.

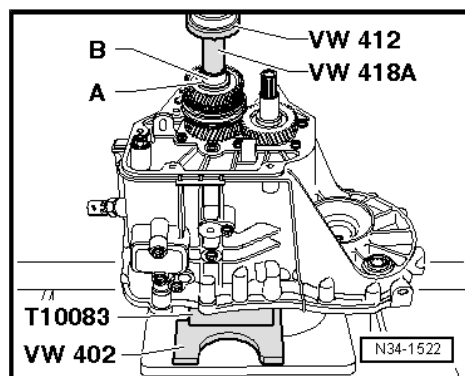


- Fit thrust washer -A-.



Note

- ◆ Do not interchange roller bearing inner races of input and output shafts.
- ◆ The thrust washer -A- and the roller bearing inner race -B- are combined as one component on some gearbox versions.
- Heat roller bearing inner race -B- to 100°C (maximum) and press onto input shaft.



WARNING

Wear protective gloves.

Installation position of 6th gear wheel:

Large collar points towards sleeve.

- Set locking collar -A- for 5th/6th gear to neutral position to allow 6th speed selector gear to turn while pressing on 6th gear wheel.
- Heat 6th gear wheel to 100°C (maximum).



WARNING

Wear protective gloves.

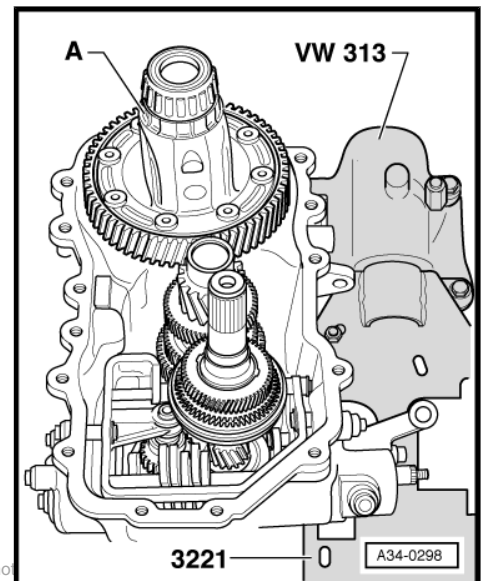
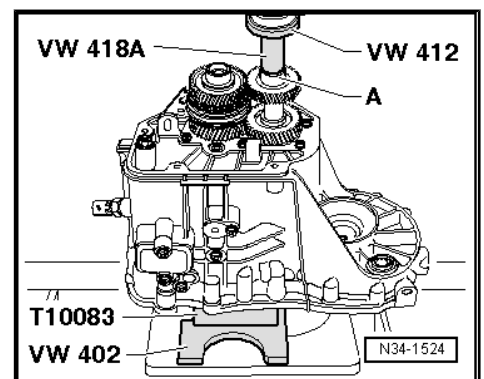
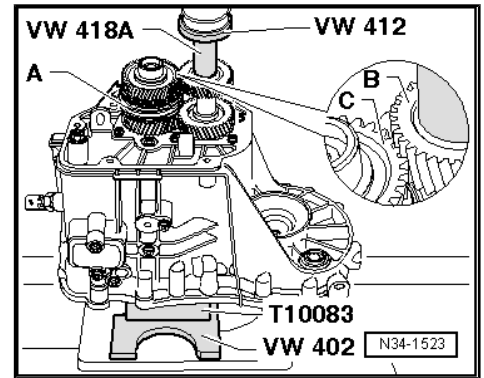
- Press on 6th gear wheel -B-, making sure that it meshes properly with 6th speed selector gear -C-.
- Heat roller bearing inner race -A- to 100°C (maximum) and press onto output shaft.



WARNING

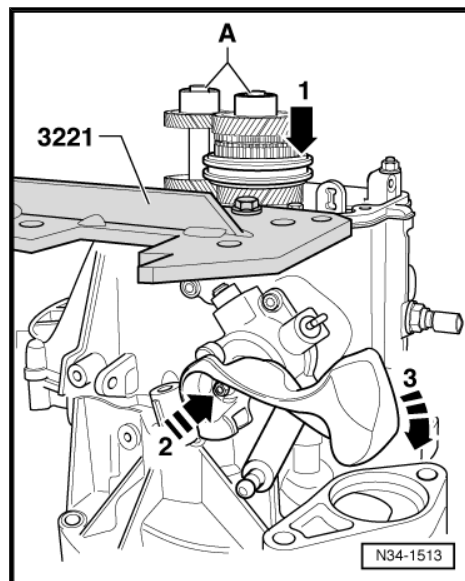
Wear protective gloves.

- Insert magnet in gearbox housing.
- Install differential -A-.
- Apply sealant - AMV 188 200 03- evenly to sealing surface.
- Bolt clutch housing to gearbox housing.
- Turn the gearbox in the assembly stand so that the gearbox housing faces upwards.

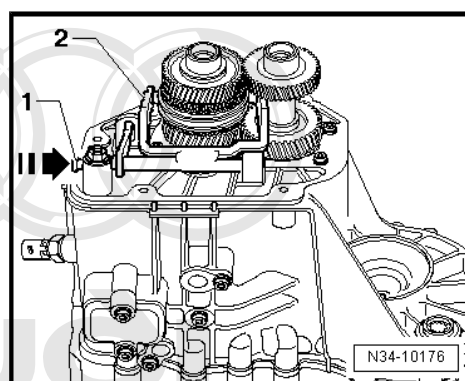


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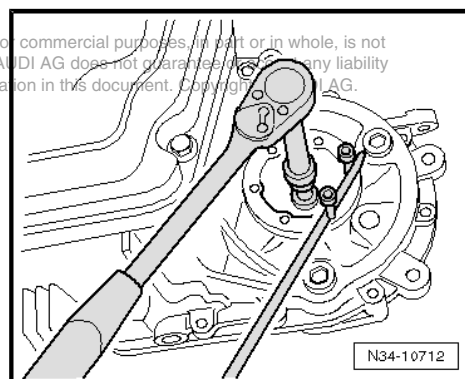
- Engage 2 gears -arrows 1- to -3- before tightening securing bolts -A-.



- Fit 5th/6th gear selector fork -2- and slide pivot pin -1- in onto stop in direction of -arrow-.
- Apply sealant - AMV 188 200 03- evenly to sealing surface.
- Bolt on gearbox housing cover.



- Install both flange shafts with springs, thrust washers and tapered rings.
- Install clutch release lever together with release bearing and guide sleeve ⇒ [page 35](#) .



9 Exploded view - gearbox housing and clutch housing

1 - Sleeve

- ☐ For selector shaft
- ☐ Driving out ⇒ [page 116](#)
- ☐ Driving in ⇒ [page 117](#)

2 - Dowel sleeve

3 - Magnet

- ☐ Held in place by joint surface of housing

4 - Filler cap

- ☐ Before tightening apply sealant - AMV 188 200 03- to sealing surface

5 - Circlip

- ☐ Fit in groove on roller bearing

6 - Circlip

- ☐ Fit in groove on roller bearing

7 - Roller bearing

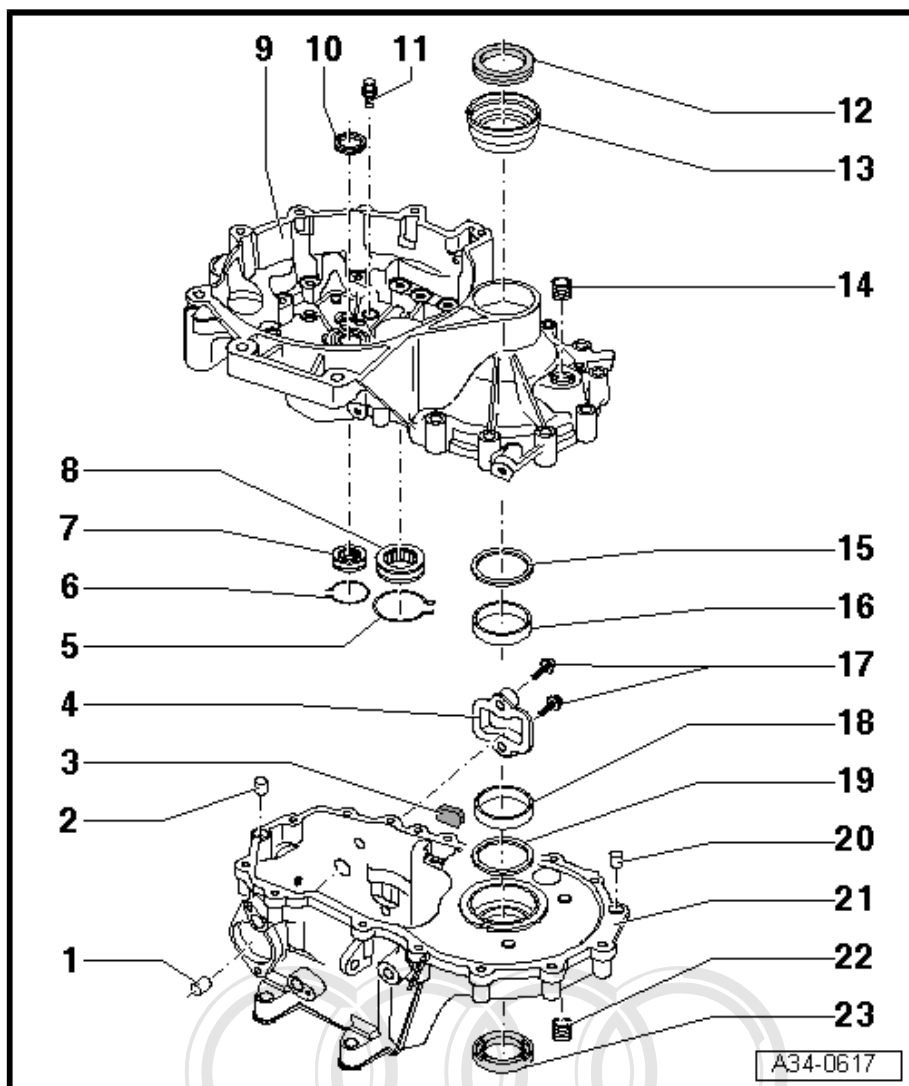
- ☐ For input shaft
- ☐ Pulling out and pressing in ⇒ [page 128](#)

8 - Roller bearing

- ☐ For output shaft
- ☐ Pulling out and pressing in ⇒ [page 139](#)

9 - Clutch housing

- ☐ If renewed: adjust differ-



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ential ⇒ [page 163](#)

10 - Input shaft oil seal

- ☐ Lever out with screwdriver
- ☐ Driving in ⇒ [page 116](#)

11 - Ball-head pin

- ☐ Lubricate with MoS₂ grease
- ☐ 20 Nm

12 - Oil seal for flange shaft (right-side)

- ☐ Can be renewed with gearbox in vehicle ⇒ [page 151](#)

13 - Sleeve

- ☐ For oil seal
- ☐ Removing ⇒ [page 116](#)
- ☐ Installing ⇒ [page 116](#)

14 - Bolt

- ☐ For oil filler hole
- ☐ Tightening torque ⇒ [page 113](#)

15 - Shim S₁

- ☐ For differential
- ☐ Always 1 mm thick
- ☐ Discontinued as of gearbox manufacturing date 04 12 6; bearing seat for tapered roller bearing outer race has been adapted ⇒ [page 113](#)

16 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Pressing in and out of clutch housing ⇒ [page 155](#)
- ☐ If renewed: adjust differential ⇒ [page 163](#)

17 - Bolt

- ☐ Renew
- ☐ 5 Nm +90°

18 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Pulling out of and pressing into gearbox housing ⇒ [page 155](#)
- ☐ If renewed: adjust differential

19 - Shim S₂

- ☐ For differential
- ☐ Determining thickness ⇒ [page 163](#)

20 - Dowel sleeve

21 - Gearbox housing

- ☐ If renewed: adjust differential ⇒ [page 163](#)

22 - Bolt

- ☐ For oil drain hole
- ☐ Tightening torque ⇒ [page 113](#)

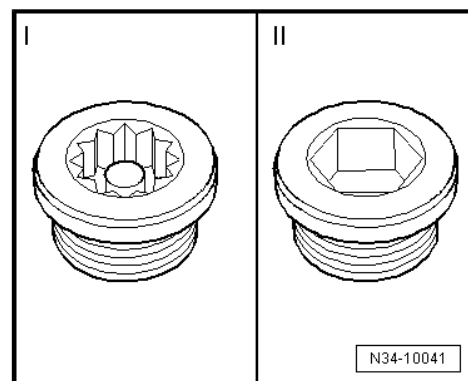
23 - Oil seal for flange shaft (left-side)

- ☐ Can be renewed with gearbox in vehicle ⇒ [page 148](#)

Different versions of oil filler/oil drain plug

I - Oil filler/oil drain plug with multi-point socket - 25 Nm

II - Oil filler/oil drain plug with hexagon socket - 30 Nm

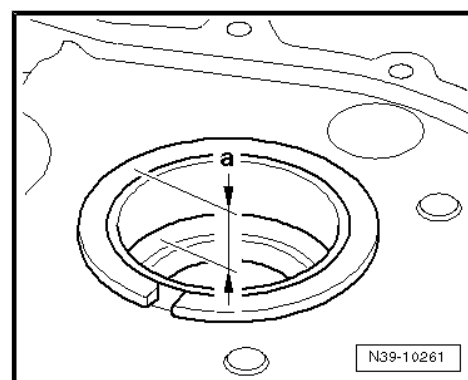


Bearing seat for tapered roller bearing outer race

Shim S₁ for tapered roller bearing outer race was discontinued as of gearbox manufacturing date 04 12 6.

Bearing seat for tapered roller bearing outer race has been adapted

- Depth of seat for tapered roller bearing outer race with shim S₁: dimension -a- = 16.2 mm
- Depth of seat for tapered roller bearing outer race without shim S₁: dimension -a- = 15.2 mm

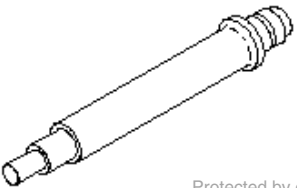
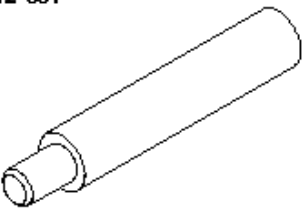
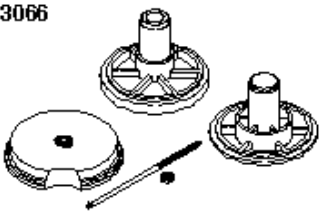
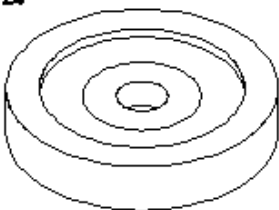


9.1 Servicing gearbox housing and clutch housing

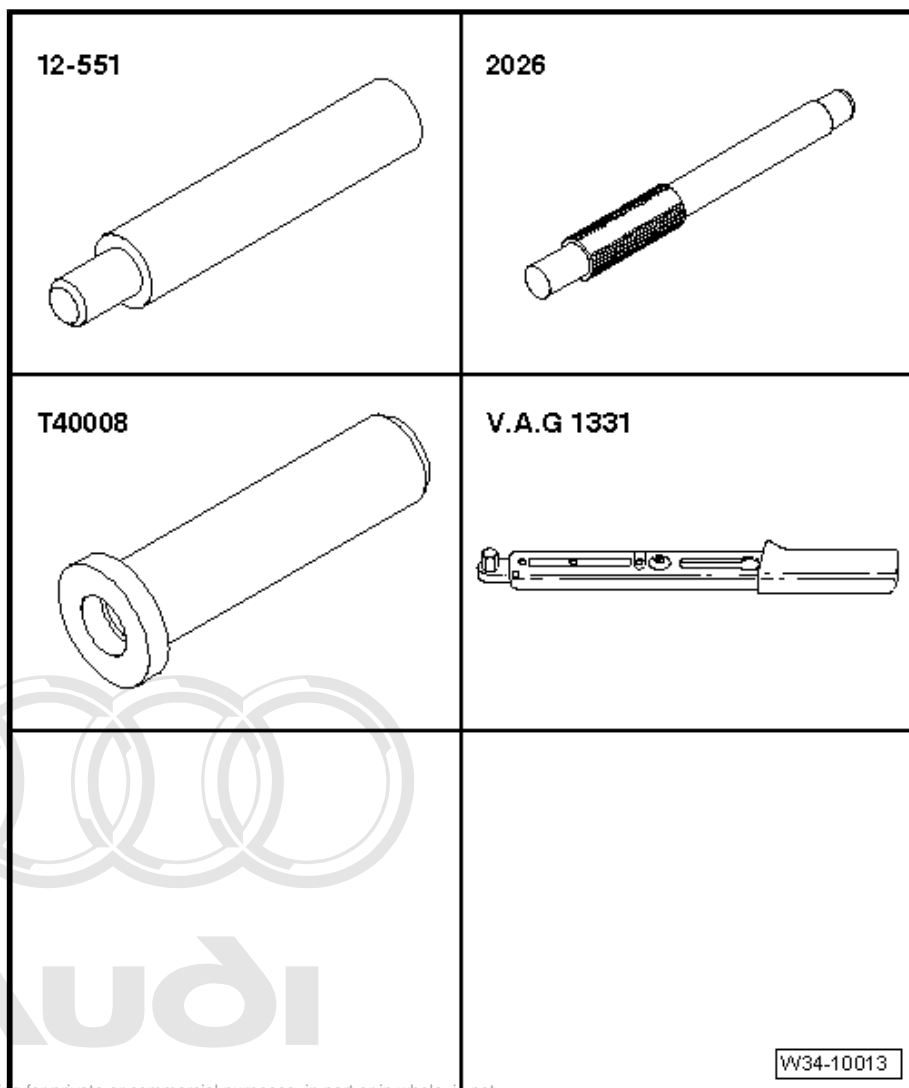


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Special tools and workshop equipment required

VW 408 A 	VW 472/2 
12-551 	30-555 
3066 	3124  G34-0009

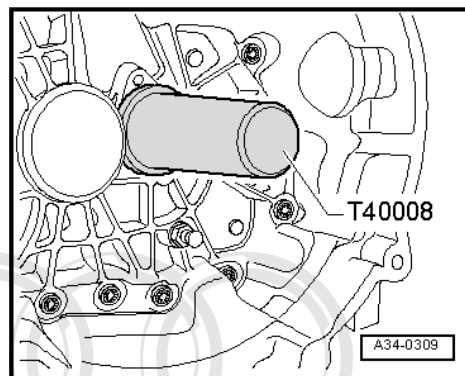
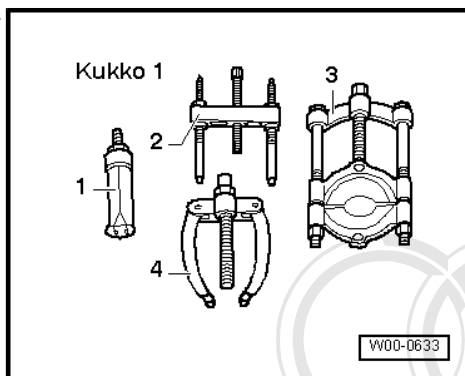
- ◆ Spacer sleeve - VW 472/2-
- ◆ Centring mandrel - 12 - 551-
- ◆ Thrust piece - 30 - 555-
- ◆ Threaded rod from assembly device - 3066-
- ◆ Thrust piece - 3124-



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- ◆ Centring mandrel - 12 - 551-
- ◆ Punch - 2026-
- ◆ Thrust piece - T40008-
- ◆ Torque wrench - V.A.G 1331-

◆ -2- Kukko 18/1 puller



◆ -3- Kukko 17/1 splitter

Driving in input shaft oil seal until flush

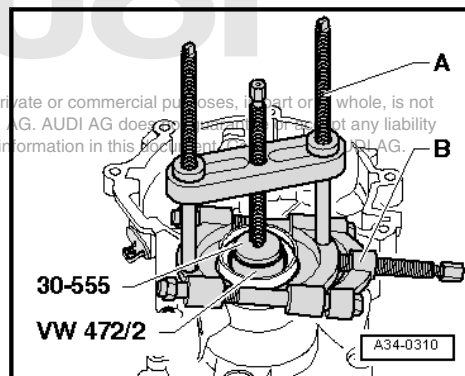
Pulling out oil seal sleeve

- Apply spacer sleeve - VW 472/2- and press tool - 30 - 555- to differential.

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

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

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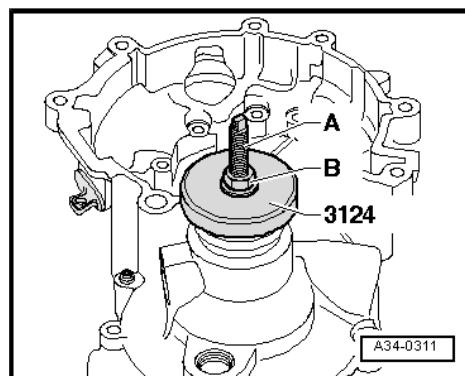


Drawing in oil seal sleeve

A - Screw threaded rod from assembly device - 3066- into threaded piece in differential.

B - M12 nut with washer

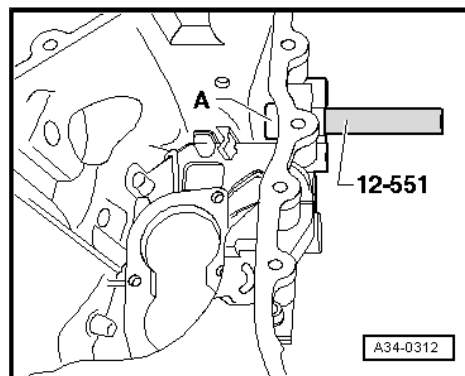
- Turn nut -B- and pull sleeve in onto stop with thrust piece - 3124- .



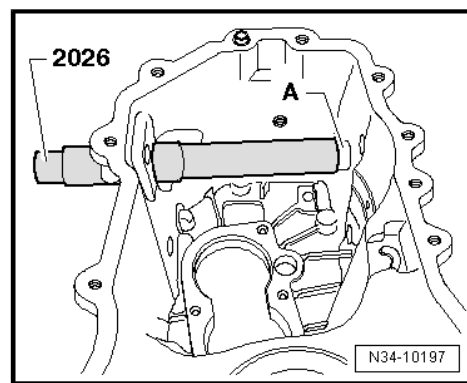
Note

If gearbox has been dismantled, press in sleeve onto stop using thrust piece - 3124- .

Driving out selector shaft sleeve -A-



Driving in selector shaft sleeve -A- to stop



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10 Exploded view - gearbox housing cover

1 - Bolt

- ☐ Tighten diagonally
- ☐ 2 Nm

2 - Base plate

- ☐ For roller bearings
- ☐ Not available separately

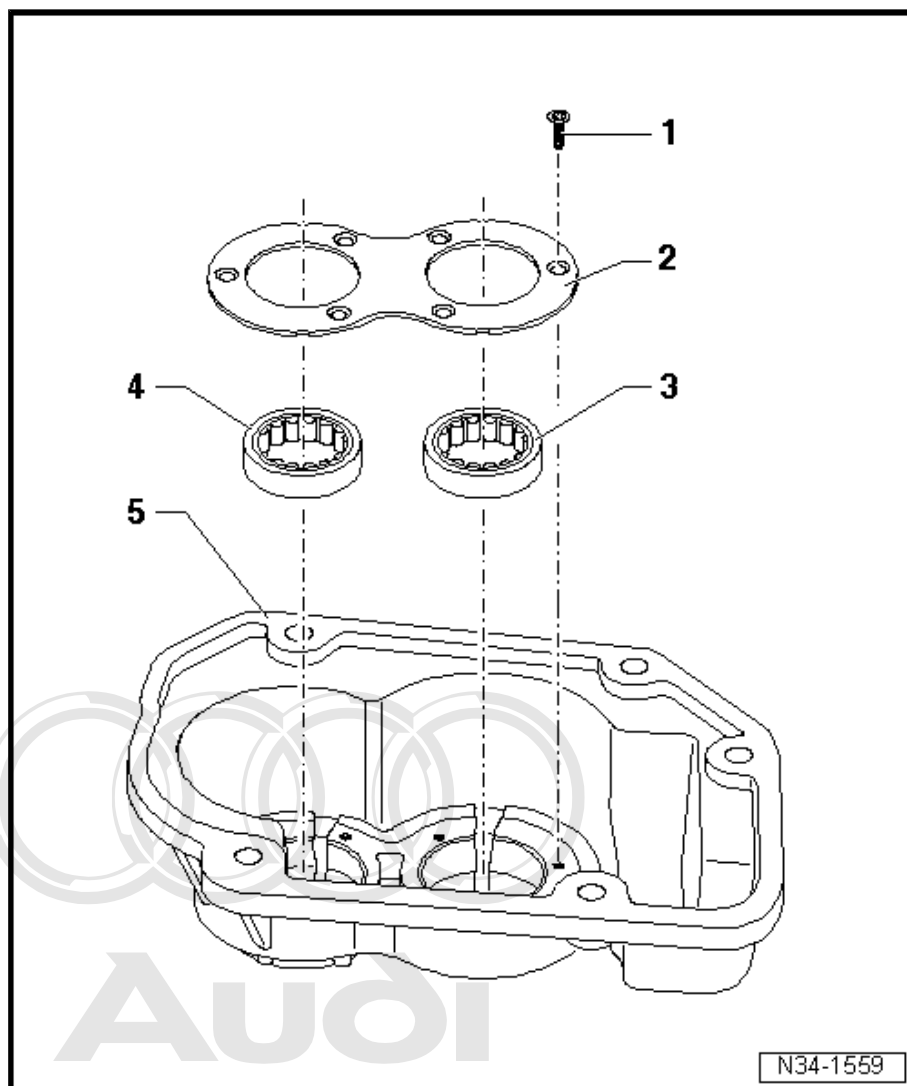
3 - Roller bearing

- ☐ For input shaft
- ☐ Not available separately

4 - Roller bearing

- ☐ For output shaft
- ☐ Not available separately

5 - Gearbox housing cover



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11 Exploded view - selector mechanism in gearbox

1 - Sleeve

- ☐ For selector shaft
- ☐ Driving out ⇒ [page 116](#)
- ☐ Driving in ⇒ [page 117](#)

2 - Locking pin

- ☐ For adjusting selector mechanism ⇒ [page 65](#)
- ☐ Removing and installing ⇒ [page 119](#)

3 - Selector shaft with selector mechanism cover

- ☐ Selector unit
- ☐ Renew together

4 - Bolt

- ☐ Renew
- ☐ 5 Nm +90°

5 - Oil seal

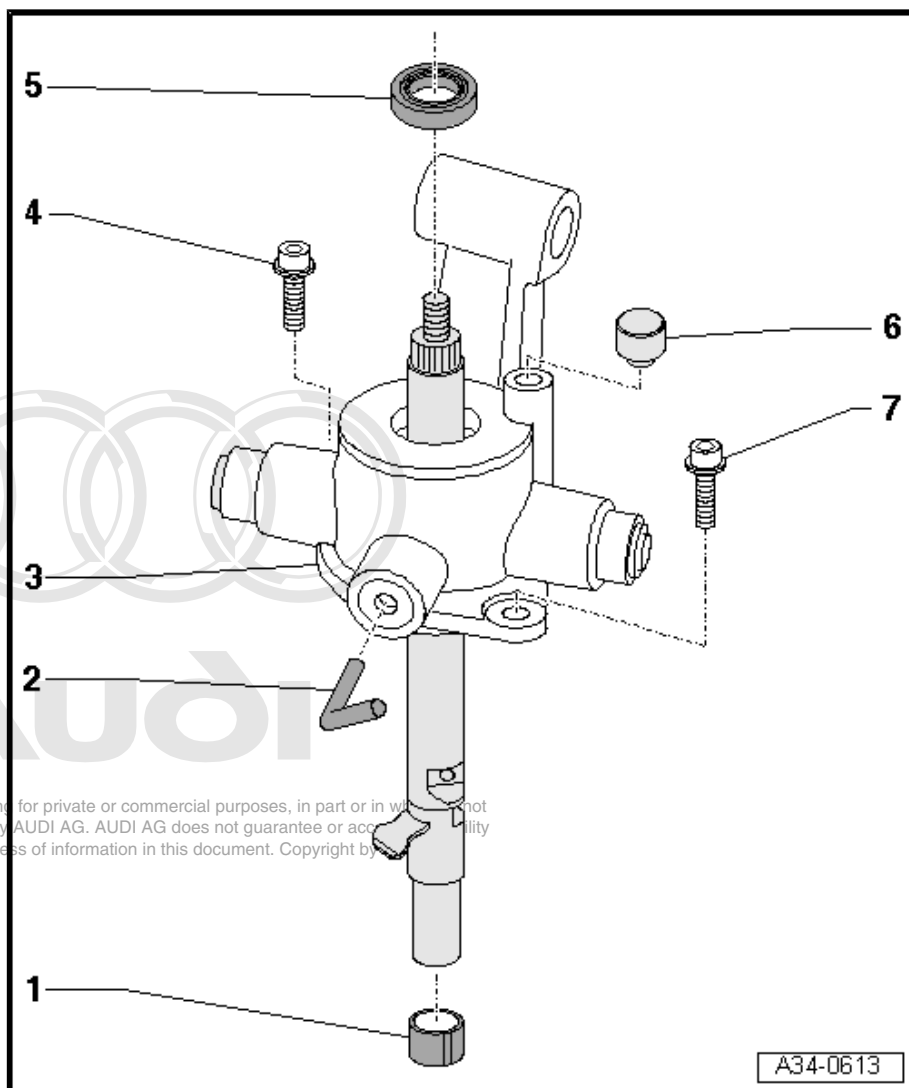
- ☐ Renewing ⇒ [page 120](#)

6 - Cap

- ☐ For gearbox breather

7 - Bolt

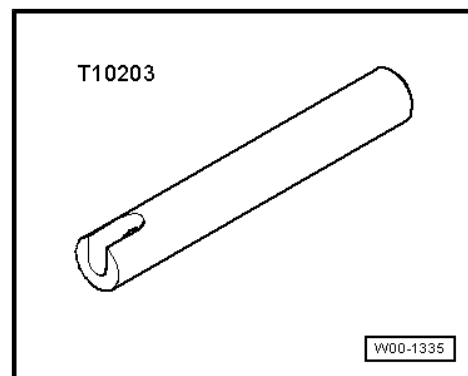
- ☐ Renew
- ☐ 5 Nm +90°



11.1 Removing and installing locking pin

Special tools and workshop equipment required

- ◆ Tube - T10203-



Removing

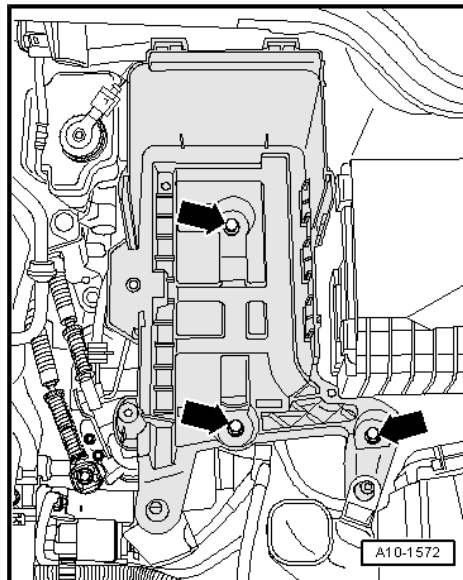


Caution

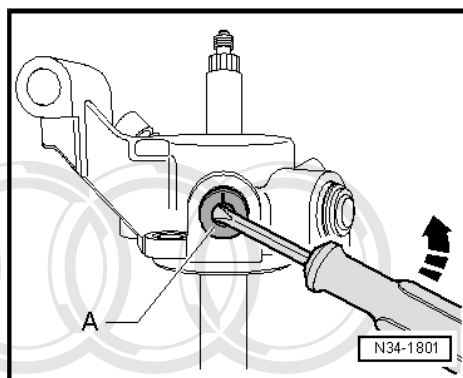
When disconnecting the battery there is a risk of irreparable damage to electronic components.

◆ *Observe notes on procedure for disconnecting the battery.*

- Remove battery ⇒ Rep. gr. 27 .
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).



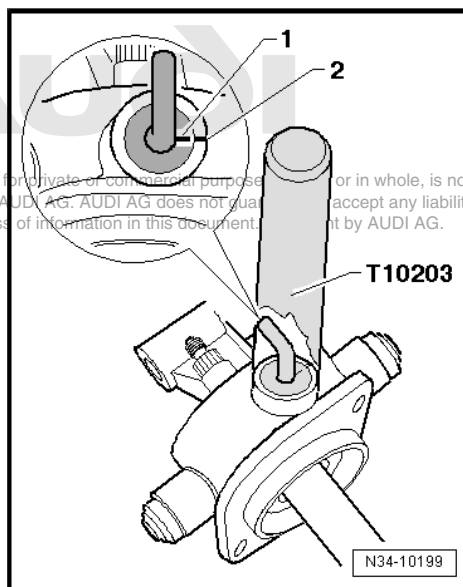
- Remove outer part of locking pin -A-.
- Carefully lever out locking pin with a screwdriver -arrow-.



Installing

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

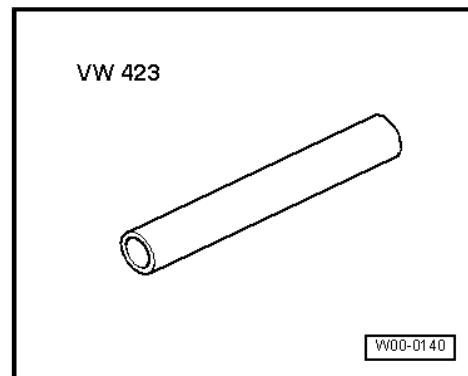
- Drive locking pin into selector mechanism cover with tube -T10203- .
- Installation position: Marking -1- should coincide with marking -2- on selector mechanism cover.
- Install battery tray and battery ⇒ Rep. gr. 27 .



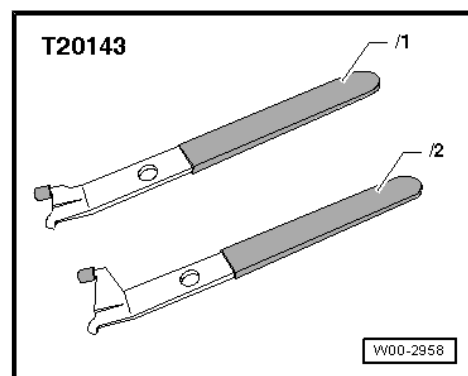
11.2 Renewing oil seal for selector mechanism in gearbox

Special tools and workshop equipment required

◆ Tube - VW 423-



◆ Extractor lever - T20143/1-



Procedure

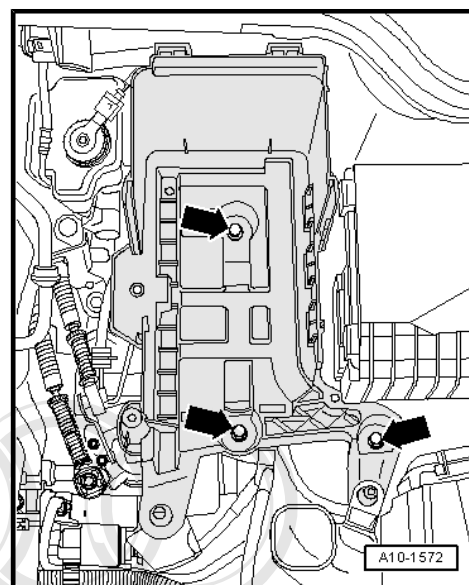


Caution

When disconnecting the battery there is a risk of irreparable damage to electronic components.

◆ *Observe notes on procedure for disconnecting the battery.*

- Remove battery ⇒ Rep. gr. 27 .
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).



Metal gate relay lever:

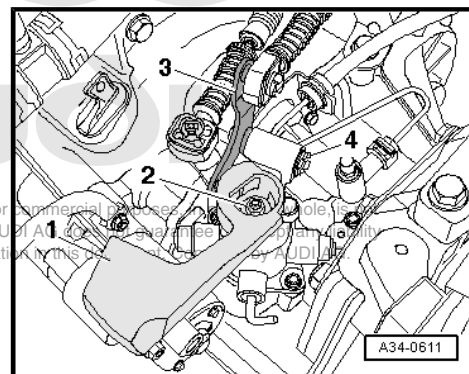
- Detach circlip -4- and push gate relay lever -3- sideways out of bearing.

Plastic gate relay lever:

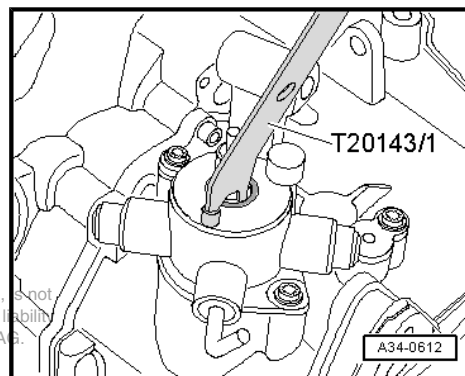
- Detach gate relay lever (with detent catch) / gate relay lever (with clip) from gearbox selector lever ⇒ [page 62](#) / [page 63](#) .

Continued for all vehicles:

- Remove nut -2- and take out gearbox selector lever -1-.



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



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

Remaining installation steps are carried out in reverse sequence; note the following:

- Install gearbox selector lever and gate relay lever ⇒ [page 55](#) / ⇒ [page 59](#) .

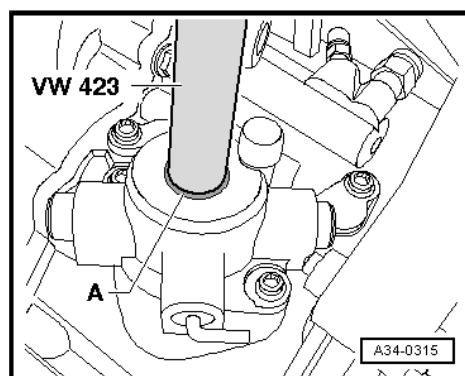


Note

The gearbox selector lever can only be installed in one position.

- Install battery tray and battery ⇒ Rep. gr. 27 .

Tightening torque ⇒ [page 55](#) or ⇒ [page 59](#)



12 Exploded view - selector forks



Note

The selector fork cluster (⇒ [Item 1 \(page 123\)](#)) does not have to be dismantled in order to remove and install the detent segments, clamping washers and angular contact ball bearings.

1 - Selector fork cluster with selector plates

2 - 3rd/4th gear detent segment

- ☐ Identification ⇒ [page 125](#)
- ☐ Detent segment should turn freely after installation.

3 - Angular contact ball bearing

- ☐ 4x
- ☐ Removing ⇒ [page 126](#)
- ☐ Pressing inner race into outer race ⇒ [page 127](#)
- ☐ Installing ⇒ [page 127](#)

4 - Clamping washer

- ☐ Renew
- ☐ Removing ⇒ [page 126](#)
- ☐ Installing ⇒ [page 126](#)

5 - 1st/2nd gear detent segment

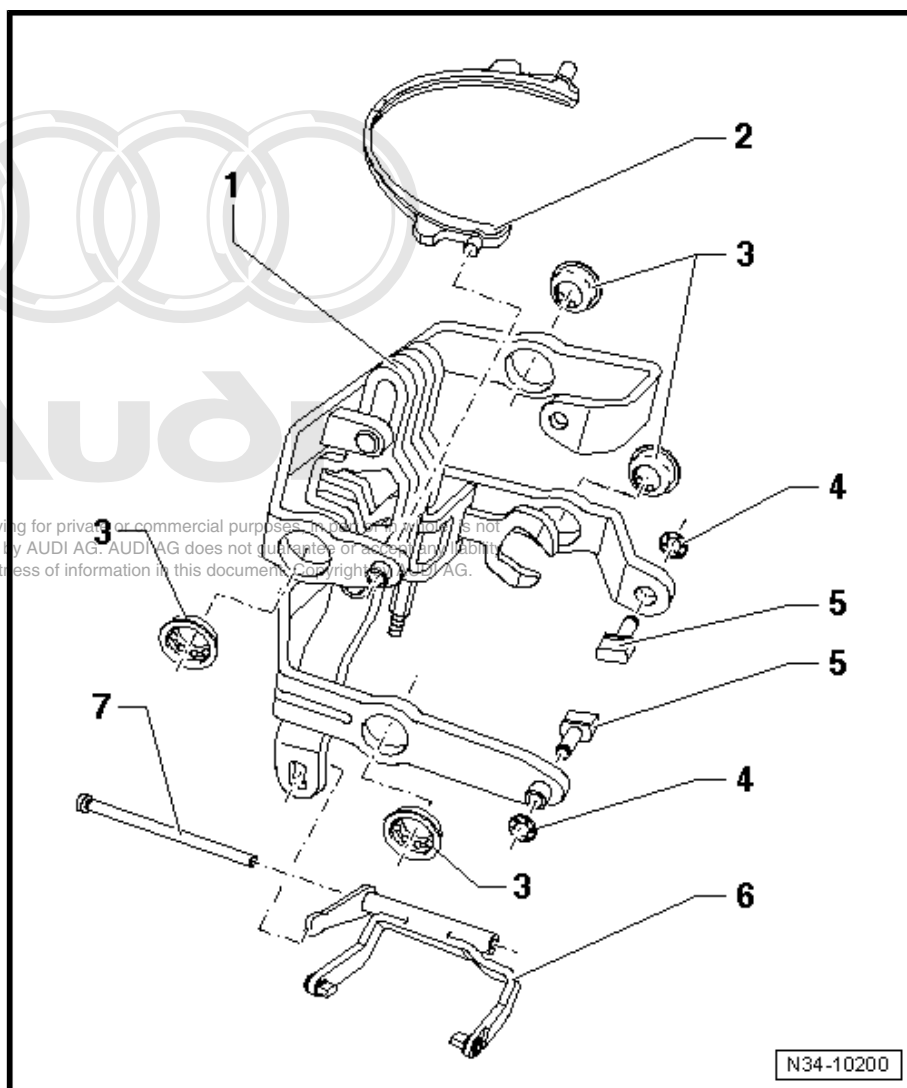
- ☐ Identification ⇒ [page 125](#)
- ☐ The segment must rotate freely after installing the lock washer
- ☐ Selector fork with detent segment ⇒ [page 126](#)

6 - 5th/6th gear selector fork with detent segments

- ☐ Detent segments are inseparably joined with selector fork
- ☐ Identification ⇒ [page 125](#)

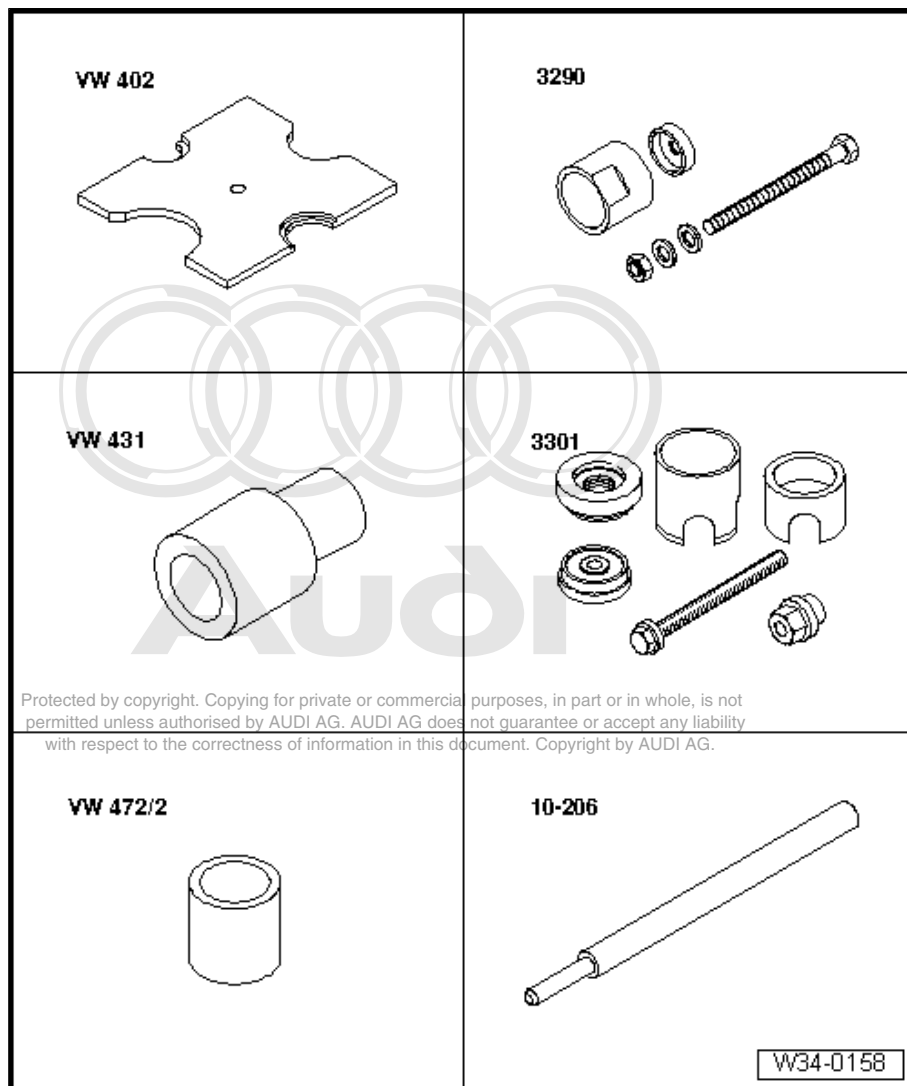
7 - Pivot pin

- ☐ for 5th/6th gear selector fork



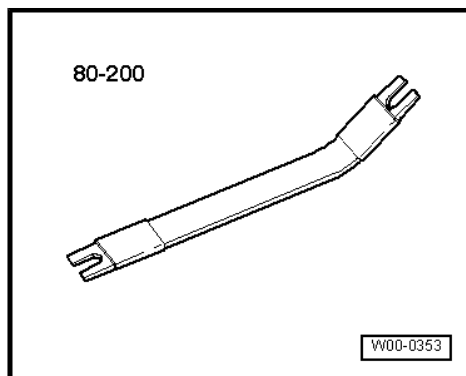
12.1 Dismantling and assembling selector forks

Special tools and workshop equipment required

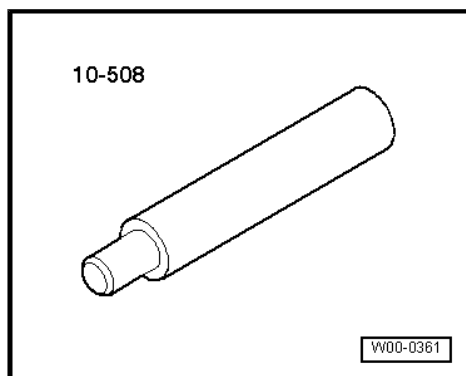


- ◆ Thrust plate - VW 402-
- ◆ Thrust piece -3290/1- from assembly tool - 3290-
- ◆ Assembly tool - 3301-
- ◆ Thrust piece - VW 431-
- ◆ Spacer sleeve - VW 472/2-
- ◆ Drift - 10 - 206-

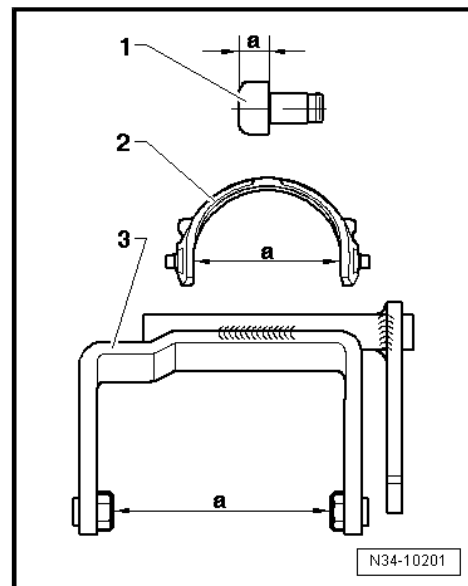
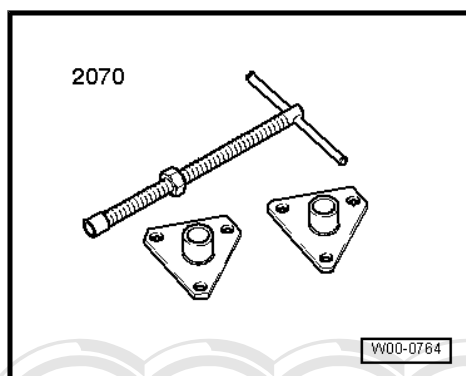
- ◆ Removal lever - 80 - 200-



- ◆ Assembly mandrel - 10 - 508-



- ◆ Tensioning device - 2070-



Identification of detent segments and 5th/6th gear selector fork with detent segments

Dimension -a-

1 - Detent segments 1st/2nd gear = 10.2 mm

2 - Detent segment 3rd/4th gear = 78.6 mm

3 - 5th/6th gear selector fork with detent segments = 79.5 mm

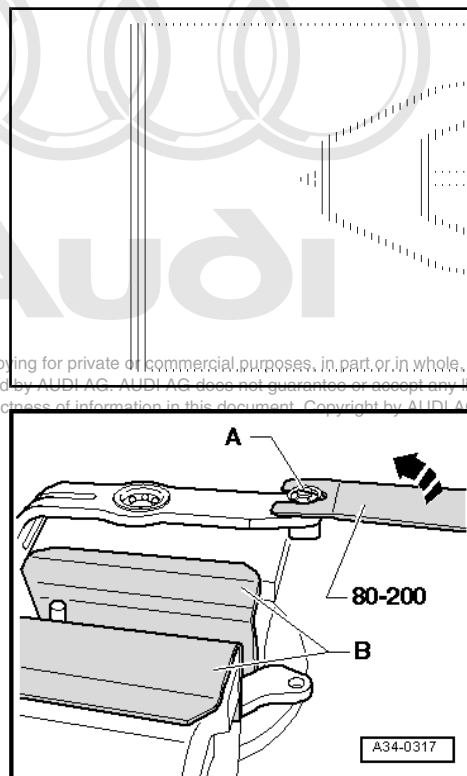
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1st/2nd gear selector fork with detent segments

Distance -a- = 75 mm

Removing lock washer

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



Installing lock washer

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

A - Socket (10 mm)

B - Protective jaw covers



Note

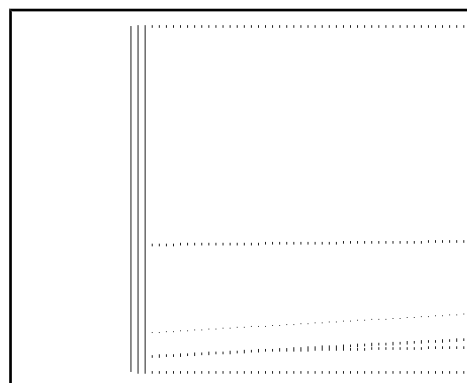
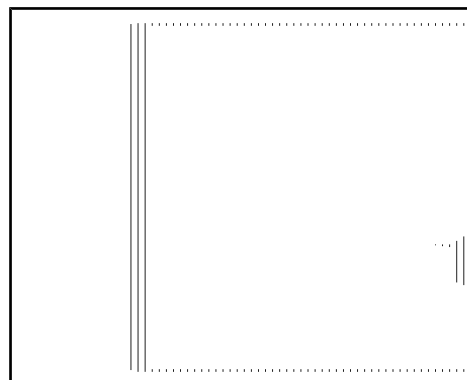
Detent segment should turn freely after lock washer is installed.

Removing angular contact ball bearing



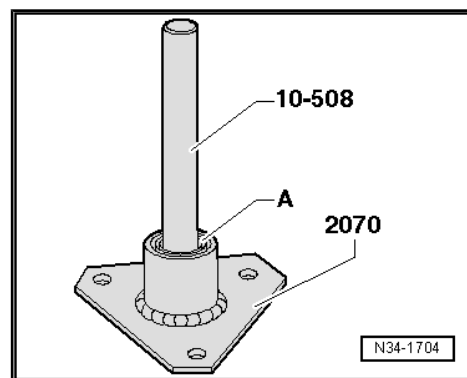
Note

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



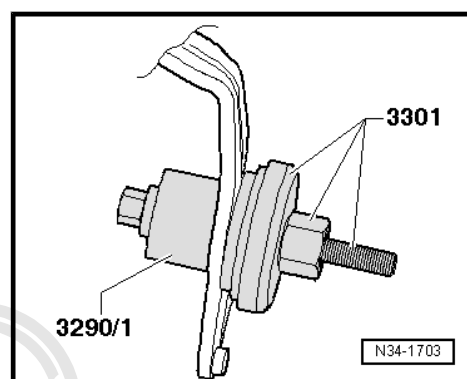
Pressing inner race -A- of angular contact ball bearing into outer race

Inner race must engage positively in outer race.



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

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



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35 – Gears, shafts

1 Exploded view - input shaft



Note

- ◆ Securing gearbox to assembly stand ⇒ [page 79](#).
- ◆ When fitting new gear wheels or input shaft refer to technical data ⇒ [page 2](#) and ⇒ Electronic parts catalogue.
- ◆ Lubricate all bearings, selector gears and synchro-rings on input shaft with gear oil before installing.
- ◆ Do not interchange synchro-rings. When re-using synchro-rings, always fit on the same selector gear.

1 - Bolt

- Tightening torque
⇒ [Item 9 \(page 93\)](#)

2 - Roller bearing inner race

- Combined as one unit with thrust washer
⇒ [Item 3 \(page 128\)](#) on some versions
⇒ [page 93](#)
- For correct version, refer to ⇒ Electronic parts catalogue
- Mark before removing
- Do not interchange with roller bearing inner race for output shaft
- Can be renewed individually
- Removing and installing
⇒ [page 98](#)

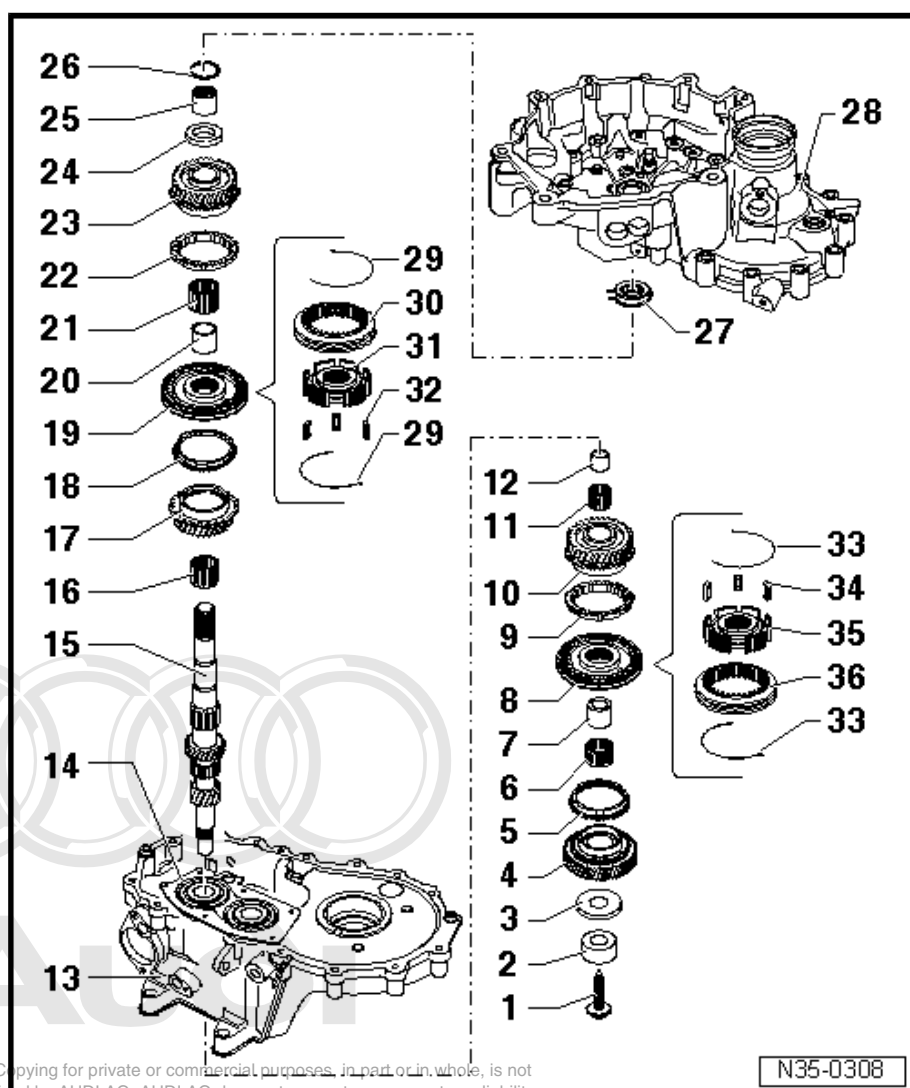
3 - Thrust washer

- Combined as one unit with roller bearing inner race
⇒ [Item 2 \(page 128\)](#) on some versions
⇒ [page 93](#)
- For correct version, refer to ⇒ Electronic parts catalogue

4 - 6th speed selector gear

5 - 6th gear synchro-ring

- Checking for wear



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⇒ [page 135](#)

6 - Needle bearing

- ☐ For 6th gear
- ☐ One or two-piece, depending on version ⇒ [page 93](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew together with ⇒ [Item 11 \(page 129\)](#)

7 - Sleeve

- ☐ For 6th gear needle bearing
- ☐ Renew together with ⇒ [Item 6 \(page 129\)](#)
- ☐ Removing and installing ⇒ [page 98](#)

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

- ☐ Removing and installing ⇒ [page 98](#)
- ☐ Dismantling ⇒ [page 138](#)
- ☐ Assembling 5th/6th gear locking collar/synchro-hub ⇒ [page 138](#) and ⇒ [page 138](#)
- ☐ Installation position ⇒ [page 138](#)

9 - 5th gear synchro-ring

- ☐ Will be damaged when removed from input shaft
- ☐ Renew
- ☐ Checking for wear ⇒ [page 135](#)

10 - 5th speed selector gear

11 - Needle bearing

- ☐ For 5th gear
- ☐ Renew together with ⇒ [Item 12 \(page 129\)](#)

12 - Sleeve

- ☐ For 5th gear needle bearing
- ☐ Renew together with ⇒ [Item 11 \(page 129\)](#) .
- ☐ Press off with bearing mounting/grooved ball bearing ⇒ [page 134](#) .
- ☐ Pressing on ⇒ [page 138](#)

13 - Gearbox housing

- ☐ Servicing ⇒ [page 113](#)

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14 - Bearing mounting with grooved ball bearings

- ☐ If bearing mounting is separated from gearbox housing, it must always be renewed
- ☐ Pressing off ⇒ [page 134](#)
- ☐ Pressing on ⇒ [page 137](#)

15 - Input shaft

- ☐ Clean residual locking compound out of tapped hole in input shaft using a thread tap.

16 - Needle bearing

- ☐ For 3rd gear

17 - 3rd speed selector gear

18 - 3rd gear synchro-ring

- ☐ Checking for wear ⇒ [page 135](#)

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

- ☐ Press off with 3rd speed selector gear ⇒ [page 134](#)
- ☐ Dismantling ⇒ [page 135](#)
- ☐ Installation position: Locking collar/synchro-hub ⇒ [page 135](#)
- ☐ Assembling ⇒ [page 135](#)
- ☐ Pressing on ⇒ [page 136](#)

20 - Sleeve

- ☐ For 4th gear needle bearing
- ☐ Renew together with ⇒ [Item 21 \(page 130\)](#)
- ☐ Press off with 3rd speed selector gear ⇒ [page 134](#)
- ☐ Pressing on ⇒ [page 136](#)

21 - Needle bearing

- ☐ For 4th gear
- ☐ Renew together with ⇒ [Item 20 \(page 130\)](#)

22 - 4th gear synchro-ring

- ☐ Checking for wear ⇒ [page 135](#)

23 - 4th speed selector gear**24 - Thrust washer****25 - Roller bearing inner race**

- ☐ Pressing off ⇒ [page 134](#)
- ☐ Pressing on ⇒ [page 136](#)

26 - Circlip

- ☐ Renew
- ☐ Determining thickness ⇒ [page 137](#)

27 - Roller bearing

- ☐ With circlip
- ☐ Pulling out ⇒ [page 134](#)
- ☐ Pressing in ⇒ [page 134](#)
- ☐ Installation position: Circlip in bearing faces towards input shaft

28 - Clutch housing

- ☐ Servicing ⇒ [page 113](#)

29 - Spring

- ☐ Installation position ⇒ [page 135](#)

30 - Locking collar for 3rd and 4th gear**31 - Synchro-hub for 3rd and 4th gear****32 - Locking pieces (3x)****33 - Spring**

- ☐ Installation position ⇒ [page 138](#)

34 - Locking pieces

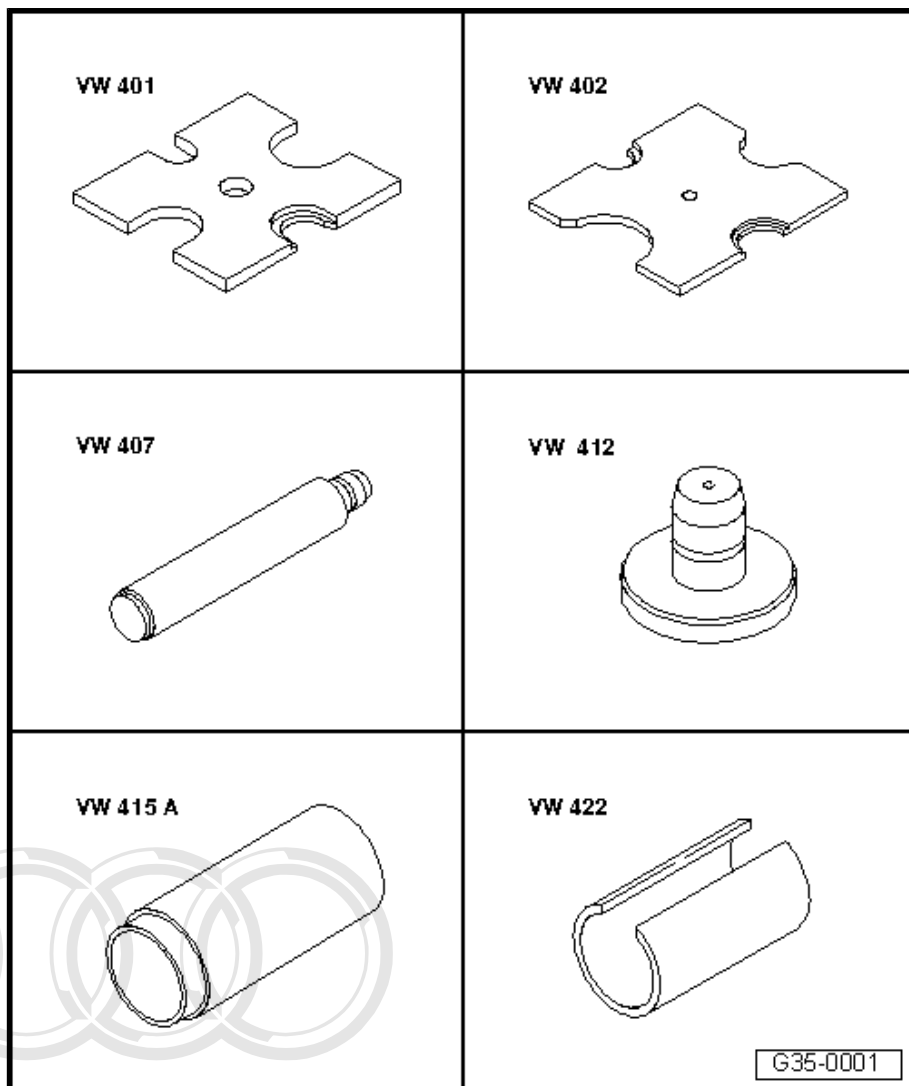
- ☐ 3x

35 - Synchro-hub for 5th and 6th gear**36 - Locking collar for 5th and 6th gear**

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1.1 Dismantling and assembling input shaft

Special tools and workshop equipment required



◆ Thrust plate - VW 401-

◆ Thrust plate - VW 402-

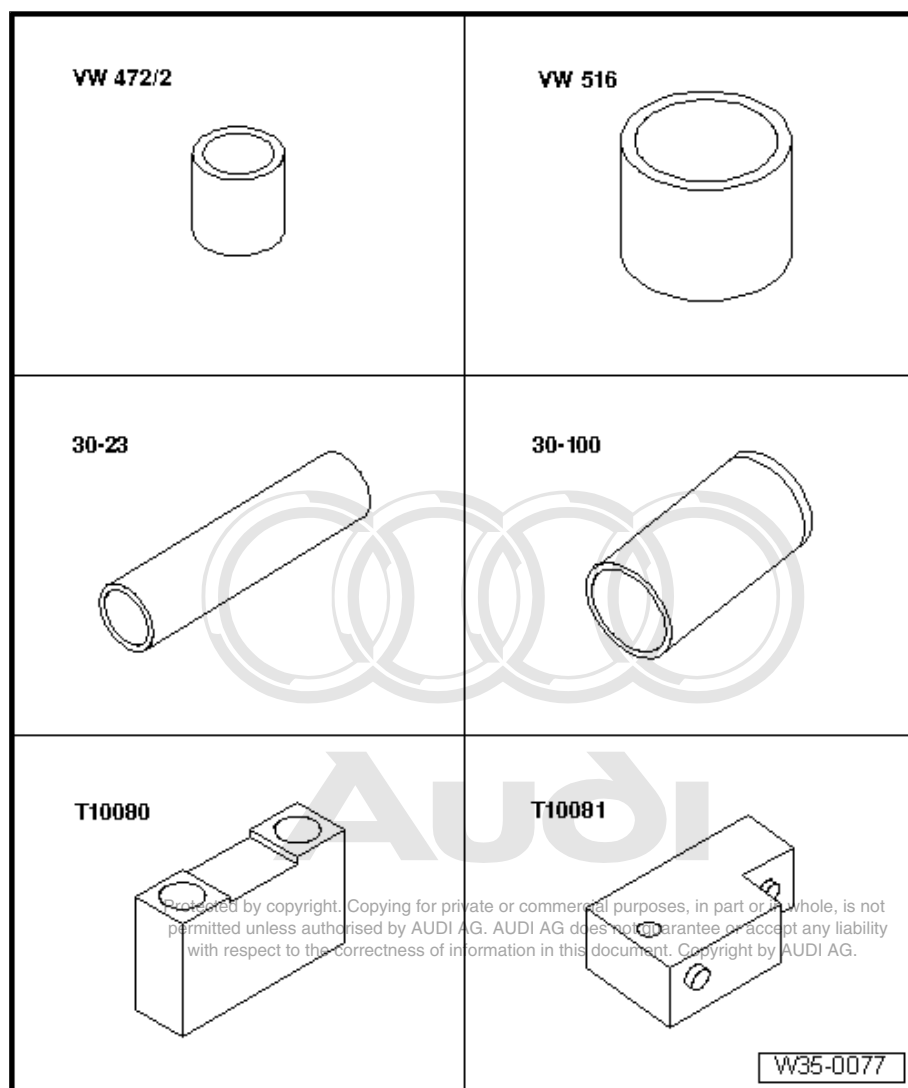
◆ Press tool - VW 407-

◆ Press tool - VW 412-

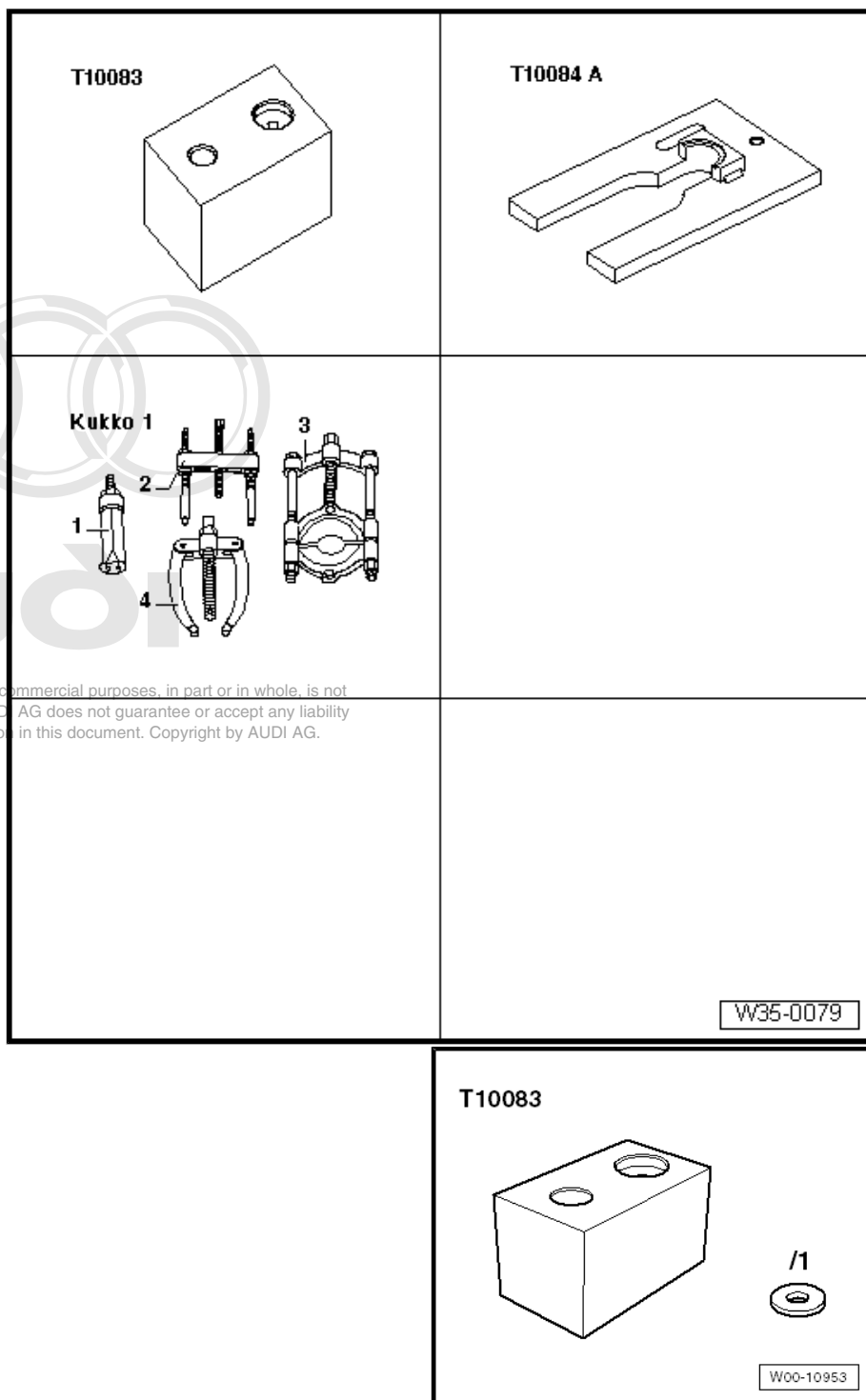
◆ Tube - VW 415 A-

◆ Tube - VW 422-

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- ◆ Spacer sleeve - VW 472/2-
- ◆ Tube - VW 516-
- ◆ Extension - 30 - 23-
- ◆ Drift sleeve - 30 - 100-
- ◆ Thrust piece - T10080-
- ◆ Thrust piece - T10081-



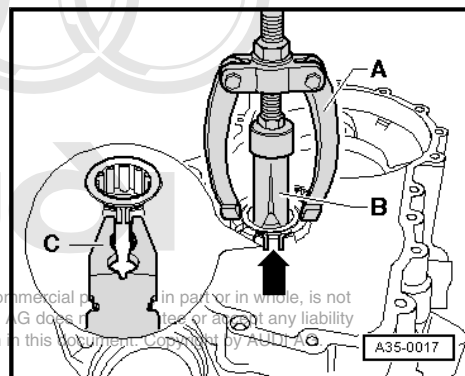
- ◆ Thrust block - T10083-
- ◆ Thrust plate - T10084 A-
- ◆ -1- Internal puller - Kukko 21/5-
- ◆ -4- Counter-support - Kukko 22/2-
- ◆ Shim - T10083/1-

Pulling roller bearing out of clutch housing

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

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

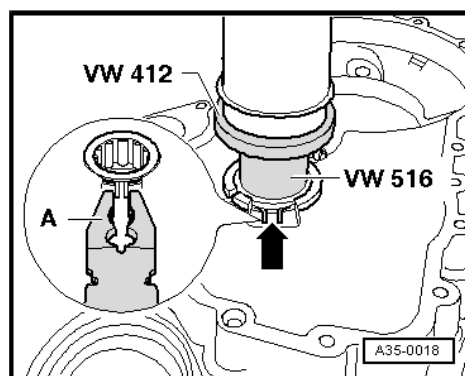
B - Internal puller 30 ... 37 mm , e.g. -Kukko 21/5-



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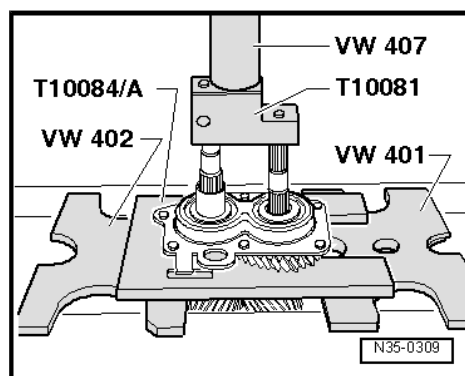
Pressing roller bearing into clutch housing

- Support clutch housing using tube - VW 415 A- (not visible in illustration) directly under bearing mounting.
- When pressing in, compress circlip -arrow- for roller bearing using pliers -A-.
- Remove the pliers before the roller bearing is in its final position. The circlip must engage in the groove in the clutch housing.



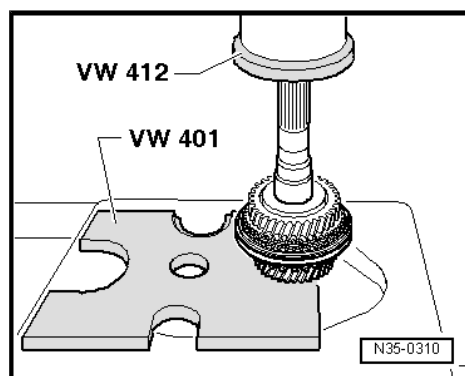
Pressing off bearing mounting and grooved ball bearings

- Slide locking collar for 1st and 2nd gear onto 2nd gear.
- Slide in thrust plate - T10084 A- from the side until it contacts input shaft.
- Remove circlip.



Pressing off roller bearing inner race

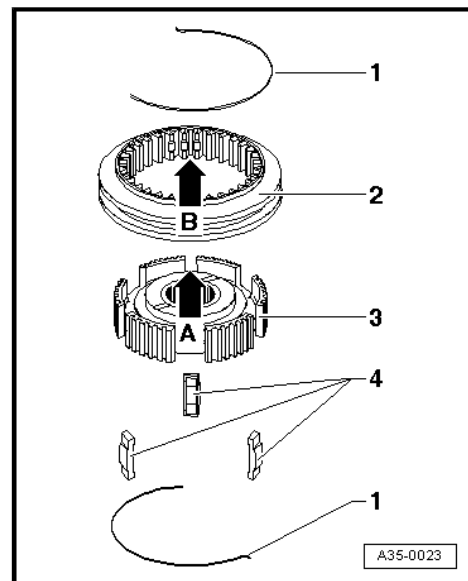
- Press off roller bearing inner race together with: thrust washer, 4th speed selector gear with needle bearing, locking collar and synchro-hub for 3rd and 4th gear and 3rd speed selector gear.



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

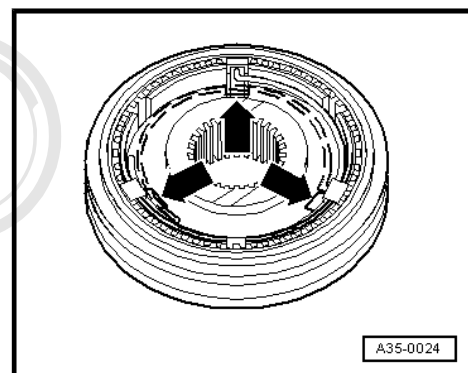
- 1 - Spring
- 2 - Locking collar
- 3 - Synchro-hub
- 4 - Locking piece
- Slide locking collar over synchro-hub.

The deeper recesses -arrow A- for the locking pieces in the synchro-hub must align with the recesses -arrow B- in the locking collar.



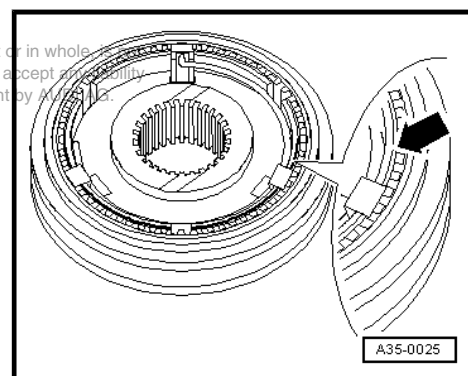
Assembling locking collar with synchro-hub for 3rd and 4th gears

- Locking collar is pushed over synchro-hub.
- Insert locking pieces in the deeper slots -arrows- and install springs off-set by 120°. Angled end of spring must locate in hollow locking piece.



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

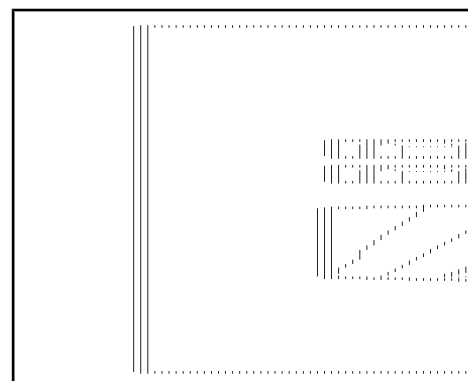
The groove on the top -arrow- points towards 4th gear.



Checking synchro-ring for wear

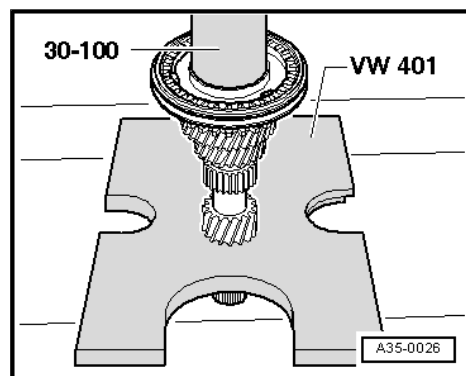
- Press synchro-ring onto cone on selector gear and measure gap -a- with a feeler gauge.

Gap -a-	Installation depth	Wear limit
3rd, 4th, 5th and 6th gear	1.1 ... 1.7 mm	0.5 mm



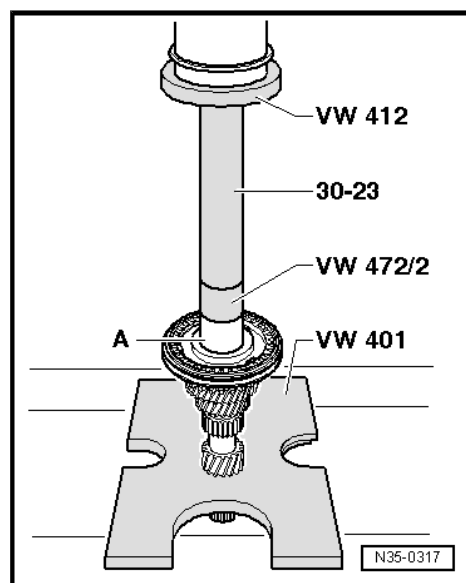
Pressing on 3rd and 4th gear synchro-hub with locking collar

Installation position: Wide shoulder faces 3rd speed selector gear.

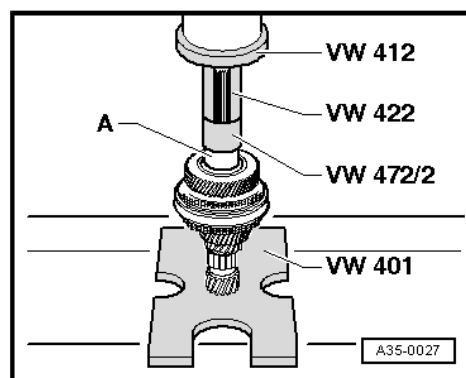


Pressing on sleeve -A- for 4th gear needle bearing

- After pressing on sleeve -A-, install 4th gear needle bearing with 4th speed selector gear and thrust washer.



Pressing on roller bearing inner race -A-



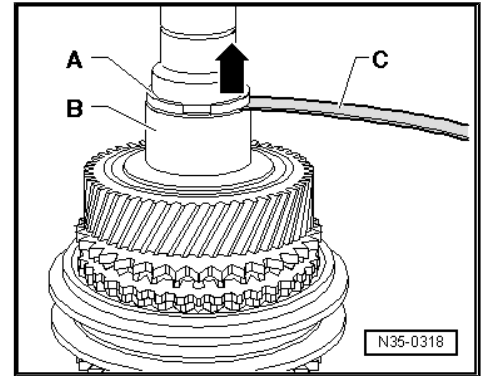
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Determining thickness of circlip

- Insert a 2.0 mm thick circlip -A- in groove on input shaft and press upwards -arrow-.
- Measure gap between inner race -B- and fitted circlip -A- using feeler gauge -C-.
- Remove circlip fitted for measurement.
- Select required circlip from table and install. For Part Nos. refer to ⇒ Electronic parts catalogue .

The following circlips are available:

Measured value (mm)	Circlip thickness (mm)	Axial clearance (mm)
0.05 ... 0.10	2.0	0.05 ... 0.15
0.15 ... 0.20	2.1	0.05 ... 0.15
0.25 ... 0.30	2.2	0.05 ... 0.15
0.35 ... 0.40	2.3	0.05 ... 0.15
0.45 ... 0.50	2.4	0.05 ... 0.10



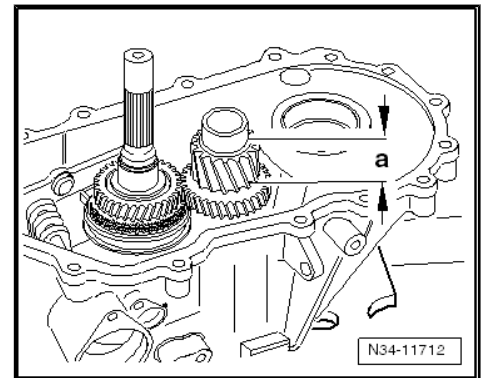
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Pressing on bearing mounting with grooved ball bearing



Note

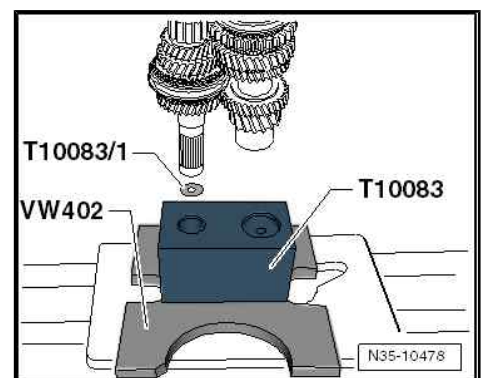
- ◆ Due to differences in the height of the teeth (dimension -a-), the output shafts of different gearboxes differ in length (shown here with shafts installed).
- ◆ The bearing mounting must be kept straight when it is pressed onto the shafts. To do so, insert shafts evenly in thrust block - T10083- .
- ◆ It may be necessary to place a shim - T10083/1- (3 mm thick) between the input shaft and the thrust block .
- ◆ Dimension -a- on teeth of output shaft must therefore be measured.



Dimension -a- = 30.6 mm

Place shim - T10083/1- on input shaft ⇒ next illustration.

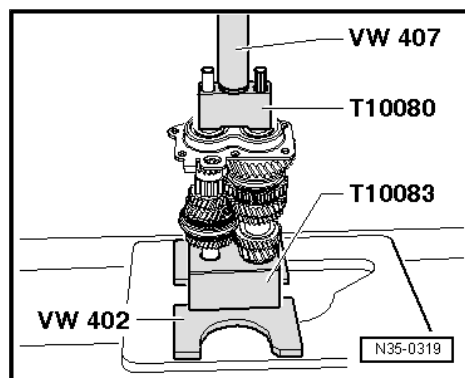
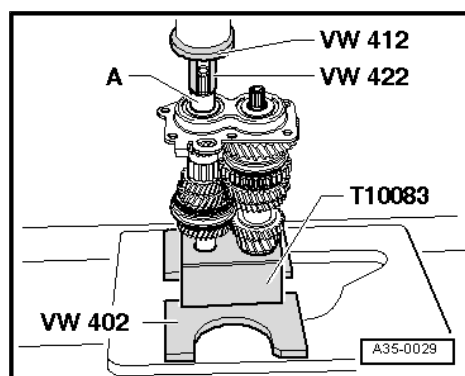
Inserting shim - T10083/1- (if necessary)



- Heat bearing mounting to 100°C (maximum) before pressing on.

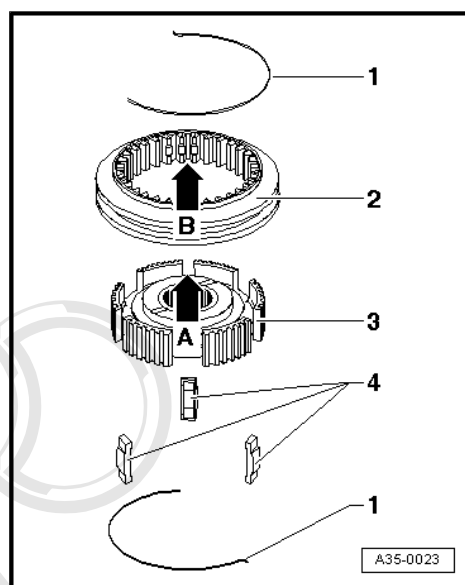

WARNING

Wear protective gloves.

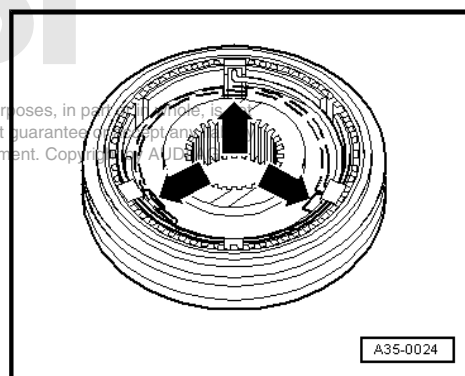

Pressing on sleeve -A- for 5th gear needle bearing

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

- 1 - Spring
 - 2 - Locking collar
 - 3 - Synchro-hub
 - 4 - Locking piece
- Slide locking collar over synchro-hub.

The deeper recesses -arrow A- for the locking pieces in the synchro-hub must align with the recesses -arrow B- in the locking collar.


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

- Locking collar is pushed over synchro-hub.
- Insert locking pieces in the deeper recesses -arrows- and install springs 120° off-set.
- Angled end of spring must locate in hollow locking piece.



2 Exploded view - output shaft



Note

- ◆ Securing gearbox to assembly stand ⇒ [page 79](#).
- ◆ When fitting new gear wheels or input shaft refer to technical data ⇒ [page 2](#) and ⇒ *Electronic parts catalogue*.
- ◆ Lubricate all bearings, selector gears and synchro-rings on input shaft with gear oil before installing.
- ◆ Do not interchange synchro-rings. When re-using synchro-rings, always fit on the same selector gear.

1 - Clutch housing

- ❑ Servicing ⇒ [page 111](#)

2 - Roller bearing

- ❑ With circlip
- ❑ Pulling out ⇒ [page 143](#)
- ❑ Pressing in ⇒ [page 143](#)
- ❑ Installation position: the circlip in the bearing faces the output shaft

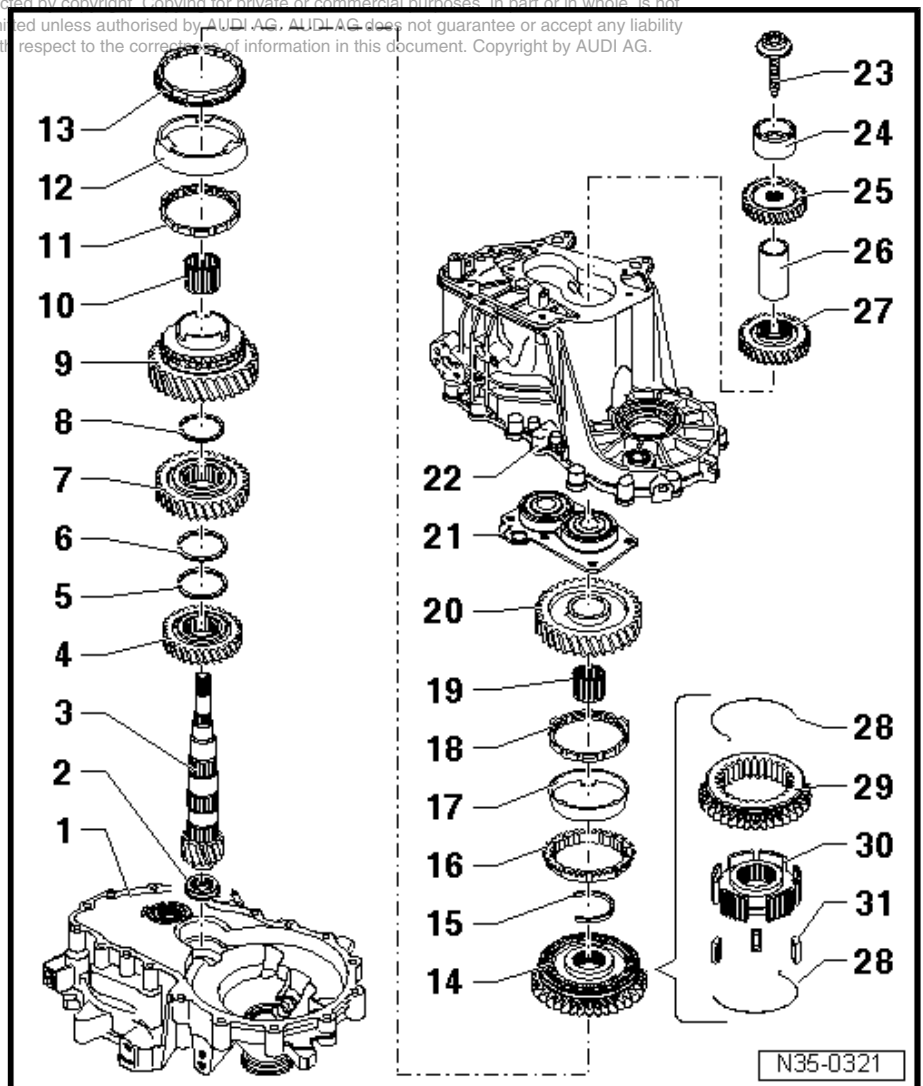
3 - Output shaft

- ❑ With inner race for roller bearing (depending on version)
- ❑ Inner race cannot be removed from output shaft
- ❑ Check bearing seat / bearing inner race for scoring or other damage
- ❑ If you detect scoring or other damage to the bearing seat / inner race, renew both output shaft and roller bearing

4 - 4th gear wheel

- ❑ Installation position: Collar faces 3rd gear

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⇒ [page 144](#)

5 - Circlip

- ☐ Renew

6 - Circlip

- ☐ Renew

7 - 3rd gear wheel

- ☐ Installation position: Collar faces 4th gear ⇒ [page 144](#)

8 - Circlip

- ☐ Renew

9 - 2nd speed selector gear

10 - Needle bearing

- ☐ For 2nd gear

11 - Inner ring for 2nd gear

- ☐ Checking for wear ⇒ [page 144](#)
- ☐ Installation position ⇒ [page 145](#)

12 - Outer ring for 2nd gear

- ☐ Fit on inner ring ⇒ [Item 11 \(page 140\)](#) .
- ☐ Renew if scored or if there are visible traces of wear
- ☐ Installation position ⇒ [page 145](#)

13 - 2nd gear synchro-ring

- ☐ Checking for wear ⇒ [page 144](#)
- ☐ Installation position ⇒ [page 145](#)

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

- ☐ Press off together with 2nd speed selector gear after removing circlip ⇒ [Item 15 \(page 140\)](#) ⇒ [page 144](#)
- ☐ Dismantling ⇒ [page 145](#)
- ☐ Assembling locking collar/synchro-hub ⇒ [page 145](#) and ⇒ [page 145](#)
- ☐ Installation position ⇒ [page 145](#)
- ☐ Pressing on ⇒ [page 146](#)

15 - Circlip

- ☐ Pressing out ⇒ [page 143](#)
- ☐ Fitting ⇒ [page 146](#)

16 - 1st gear synchro-ring

- ☐ Checking for wear ⇒ [page 144](#)
- ☐ Assemble so that the recesses engage on the locking pieces on the locking collar ⇒ [Item 14 \(page 140\)](#)

17 - Outer ring for 1st gear

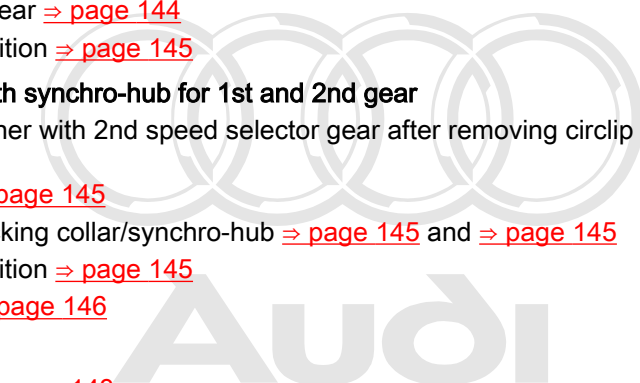
- ☐ Insert in synchro-ring ⇒ [Item 16 \(page 140\)](#)
- ☐ Installation position
- ☐ Renew if scored or if there are visible traces of wear

18 - Inner ring for 1st gear

- ☐ Checking for wear ⇒ [page 144](#)
- ☐ Check lugs for scoring
- ☐ Installation position ⇒ [page 146](#)

19 - Needle bearing

- ☐ For 1st gear



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20 - 1st speed selector gear

- ☐ Installation position ⇒ [page 147](#)

21 - Bearing mounting with grooved ball bearings

- ☐ If bearing mounting is separated from gearbox housing, it must always be renewed
- ☐ Pressing off ⇒ [page 134](#)
- ☐ Pressing on ⇒ [page 137](#)

22 - Gearbox housing

- ☐ Servicing ⇒ [page 111](#)

23 - Multi-point socket head bolt

- ☐ Tightening torque ⇒ [Item 6 \(page 93\)](#)

24 - Roller bearing inner race

- ☐ Mark before removing
- ☐ Do not interchange with roller bearing inner race for input shaft
- ☐ Can be renewed individually
- ☐ Removing and installing ⇒ [page 98](#)

25 - 6th gear wheel

- ☐ Installation position: Collar faces sleeve
- ☐ Removing and installing ⇒ [page 98](#)

26 - Sleeve

- ☐ Removing and installing ⇒ [page 98](#)

27 - 5th gear wheel

- ☐ Installation position: Collar faces gearbox housing cover ⇒ [page 108](#)
- ☐ Removing and installing ⇒ [page 98](#)

28 - Spring

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

29 - Locking collar

30 - Synchro-hub

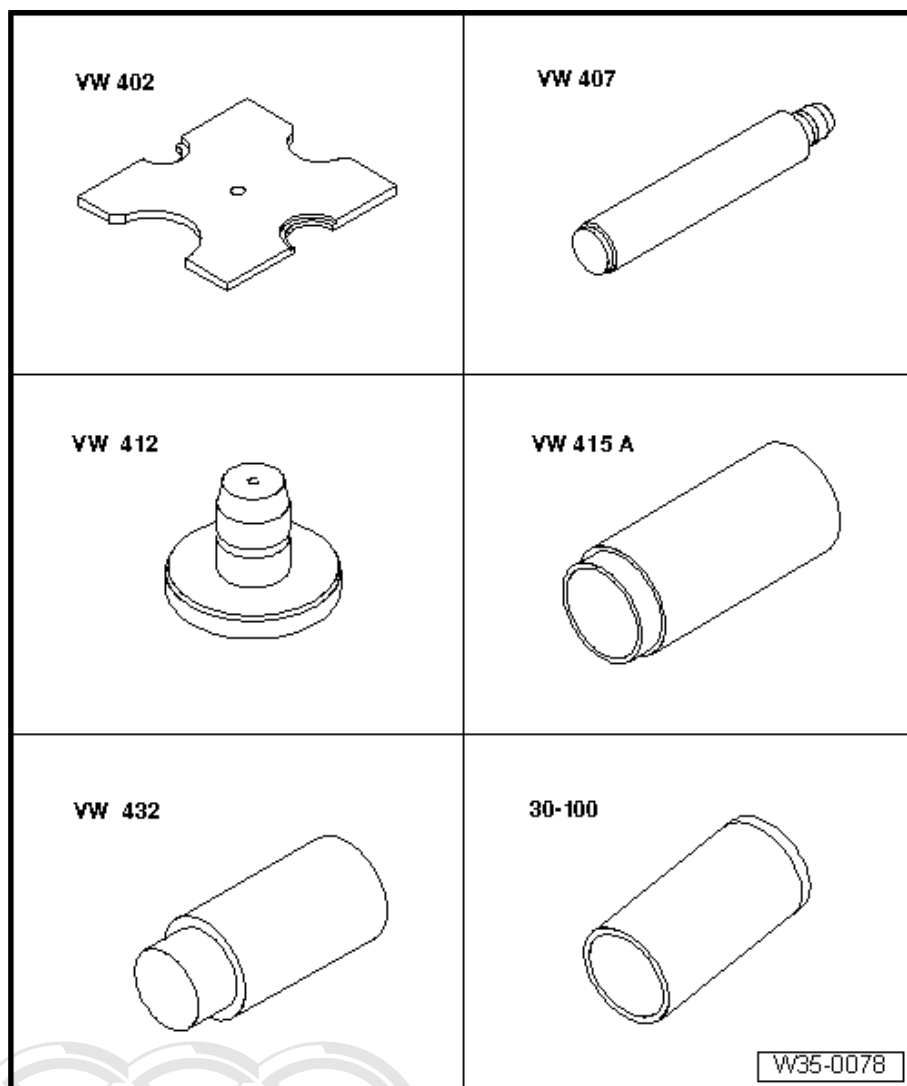
31 - Locking pieces

- ☐ 3x

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2.1 Dismantling and assembling output shaft

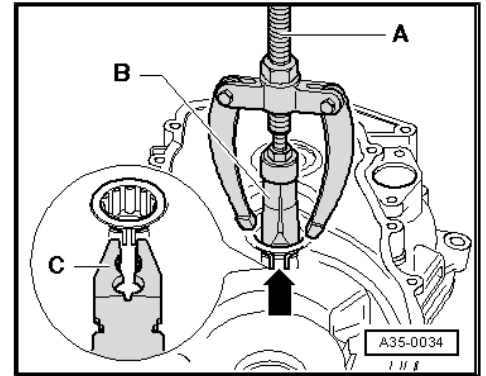
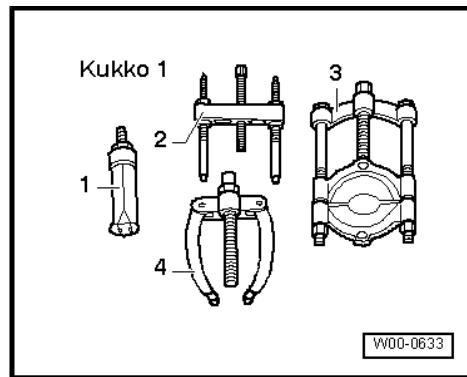
Special tools and workshop equipment required



- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Tube - VW 412-
- ◆ Thrust piece - VW 415 A-
- ◆ Drift sleeve - 30 - 100-

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- ◆ -1- Internal puller - Kukko 21/5-



- ◆ -4- Counter-support - Kukko 22/1-

Pulling roller bearing out of clutch housing

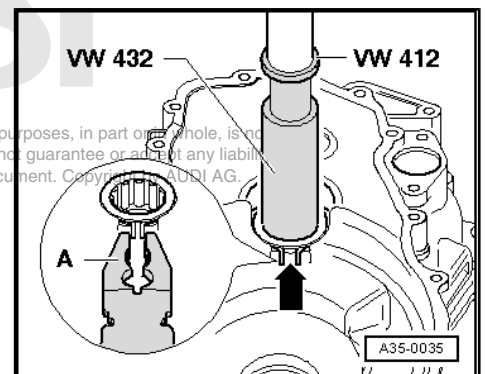
- When pulling out, compress circlip -arrow- for roller bearing using pliers -C-.

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

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

Pressing roller bearing into clutch housing

- Support clutch housing using tube - VW 415 A- (not visible in diagram) directly under bearing mounting.
- When pressing in, compress circlip -arrow- for roller bearing using pliers -A-.
- Remove the pliers before the roller bearing is in its final position. The circlip must engage in the groove in the clutch housing.



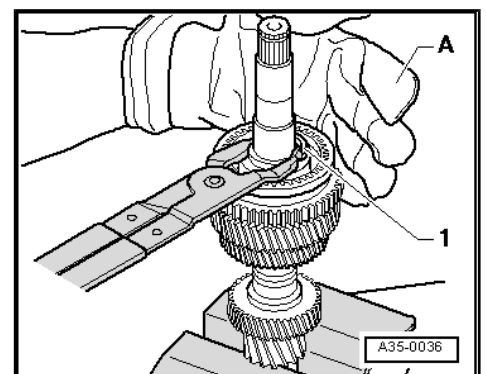
Removing circlip -1- from groove

A - Protective glove



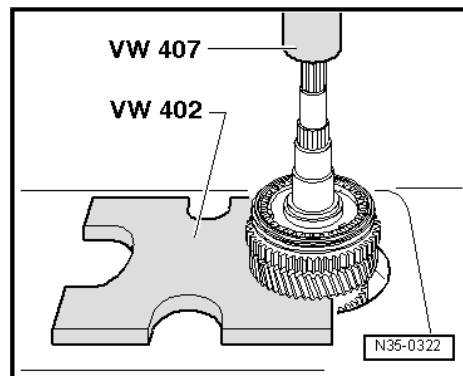
WARNING

Prevent circlip from springing off suddenly.



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

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



Installation position of 3rd and 4th gear wheel

- Fit 4th gear wheel -A- onto output shaft.

Installation position:

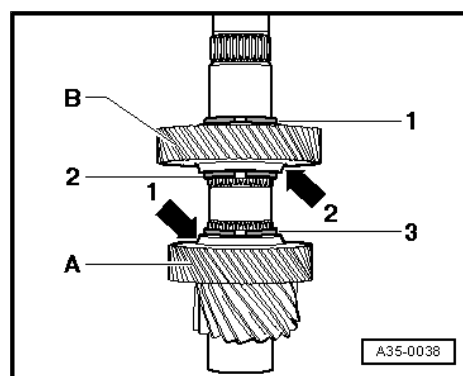
Collar -arrow 1- faces 3rd gear wheel -B-.

- Fit circlips -2- and -3-.
- Fit 3rd gear wheel -B- onto output shaft.

Installation position:

Collar -arrow 2- faces 4th gear wheel -A-.

- Fit circlip -1-.



Checking 1st and 2nd gear inner ring for wear

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

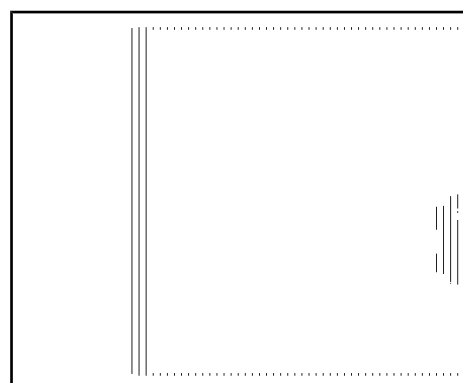
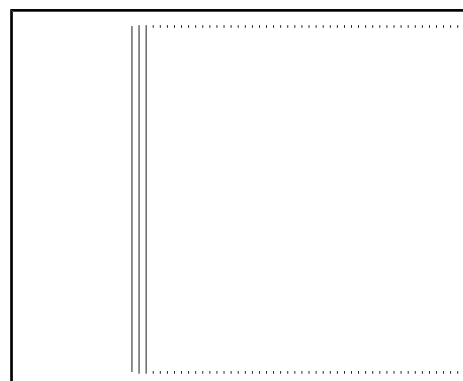
Gap "a"	Installation depth	Wear limit
1st and 2nd gear	0.75 ... 1.25 mm	0.3 mm

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Checking 1st and 2nd gear synchro-ring for wear

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

Gap "a"	Installation depth	Wear limit
1st and 2nd gear	1.2 ... 1.8 mm	0.5 mm



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

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

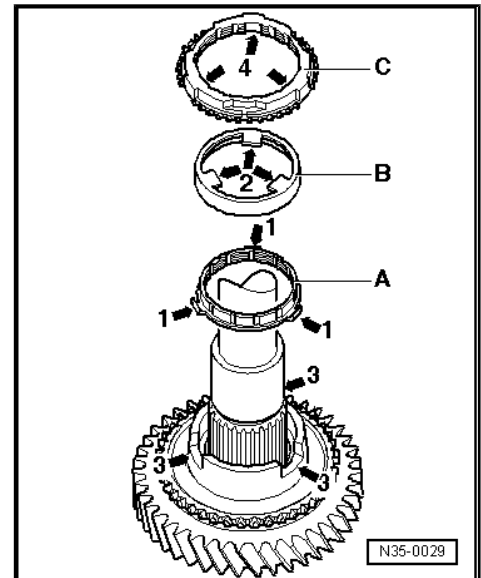
The angled tabs -arrows 1- point towards the outer ring -B-.

- Fit outer ring -B-.

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

- Fit synchro-ring -C-.

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



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

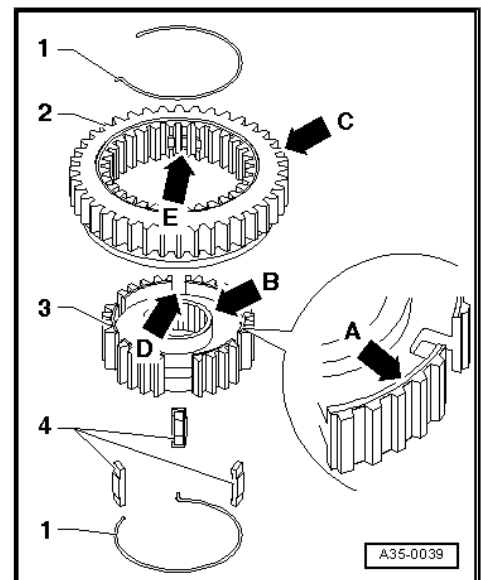
- 1 - Spring
- 2 - Locking collar
- 3 - Synchro-hub
- 4 - Locking piece

- Slide locking collar over synchro-hub.

Installation position:

After assembly, the groove on the top -arrow A- and the higher shoulder -arrow B- on the synchro-hub will face towards the external splines on the locking collar -arrow C-.

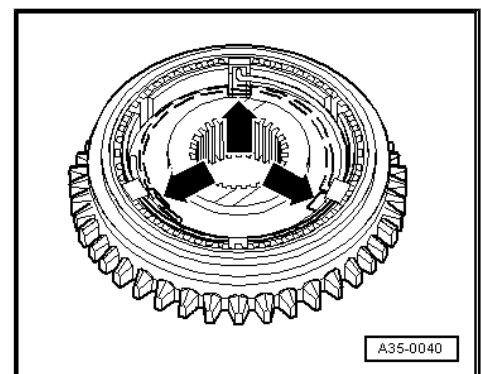
The deeper recesses -arrow D- for the locking pieces in the synchro-hub must align with the recesses -arrow E- in the locking collar.



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

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- Locking collar is pushed over synchro-hub.
- Insert locking pieces in deeper recesses -arrows- and install springs so they are offset 120°. Angled end of spring must locate in hollow locking piece.

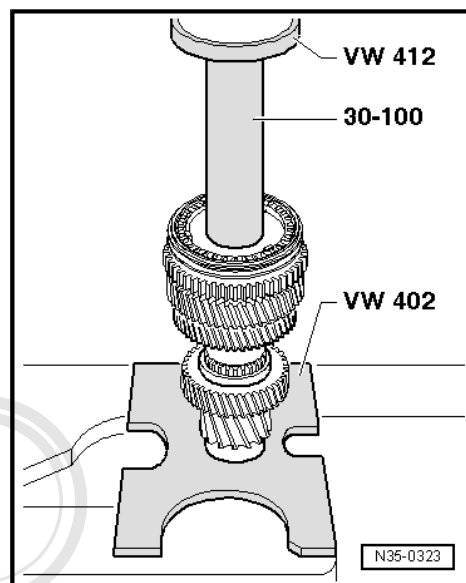


Pressing on 1st and 2nd gear locking collar/synchro-hub

Installation position:

Groove for selector fork in locking collar points towards 1st gear; reverse gear splines point towards 2nd gear.

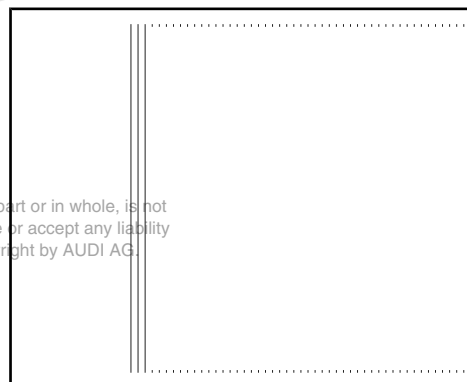
- Turn synchro-ring so that grooves align with locking pieces.



Inserting circlip

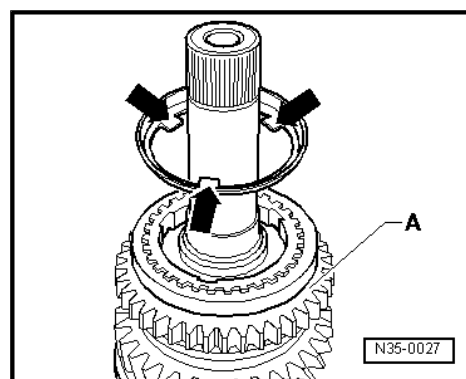
- Fit 1st gear synchro-ring in locking collar/synchro-hub.

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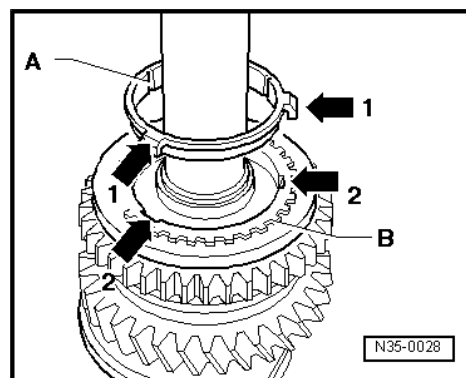
Installation position of outer ring for 1st gear

The lugs -arrows- face the gear teeth of the reverse gear



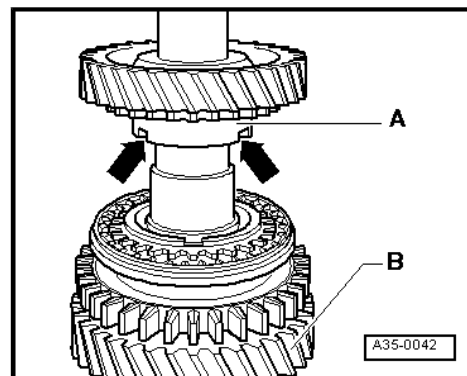
Installation position of 1st gear inner ring -A-

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



Installation position of 1st speed selector gear

The higher shoulder -A- faces towards 2nd gear -B-. The recesses in the shoulder -arrows- engage on the lugs on the outer ring
⇒ [page 146](#).



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39 – Final drive - differential

1 Oil seals

⇒ [“1.1 Overview of fitting locations - oil seals”, page 148](#)

⇒ [“1.2 Renewing oil seal for flange shaft \(left-side\)”, page 148](#)

⇒ [“1.3 Renewing oil seal for flange shaft \(right-side\)”, page 151](#)

⇒ [“1.4 Renewing input shaft oil seal”, page 153](#)

1.1 Overview of fitting locations - oil seals

1 - Oil seal

- ☐ For input shaft
- ☐ Renewing ⇒ [page 153](#)

2 - Oil seal

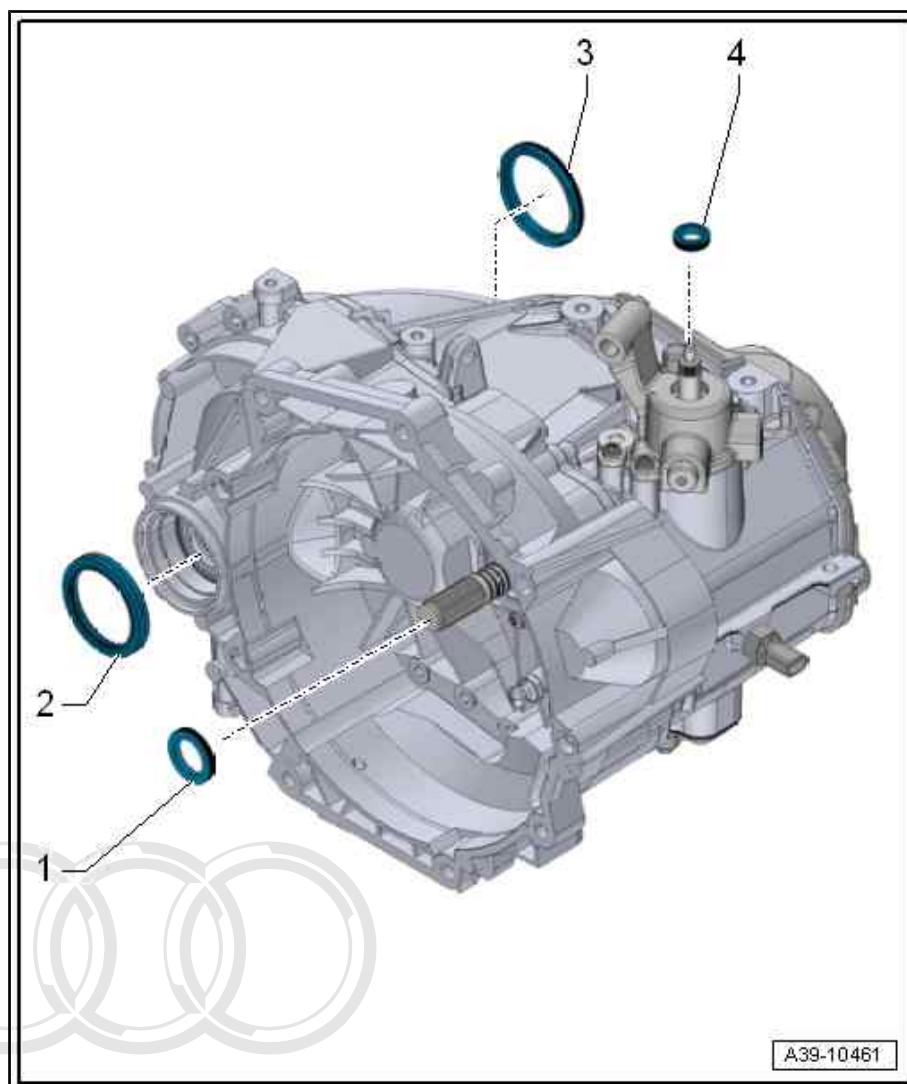
- ☐ For flange shaft (right-side)
- ☐ Renewing ⇒ [page 151](#)

3 - Oil seal

- ☐ For flange shaft (left-side)
- ☐ Renewing ⇒ [page 148](#)

4 - Oil seal

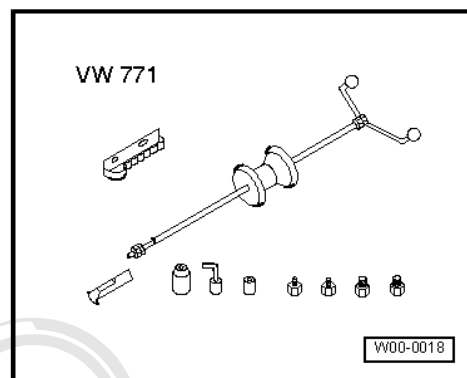
- ☐ For selector shaft
- ☐ Renewing ⇒ [page 120](#)



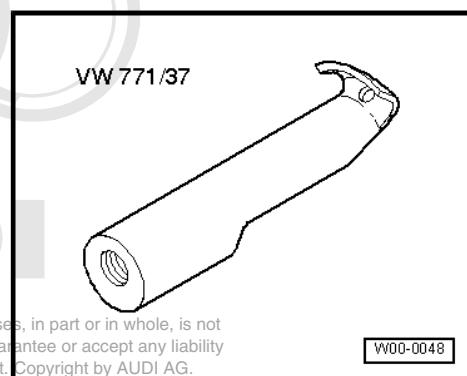
1.2 Renewing oil seal for flange shaft (left-side)

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◆ Multi-purpose tool - VW 771-

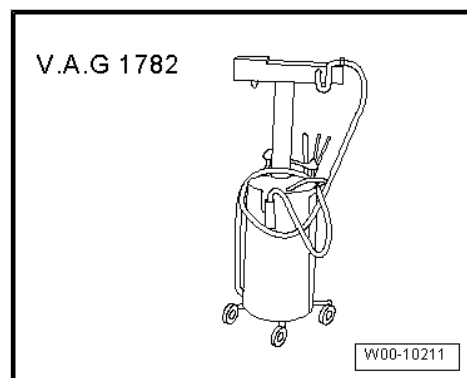


◆ Extractor tool - VW 771/37-

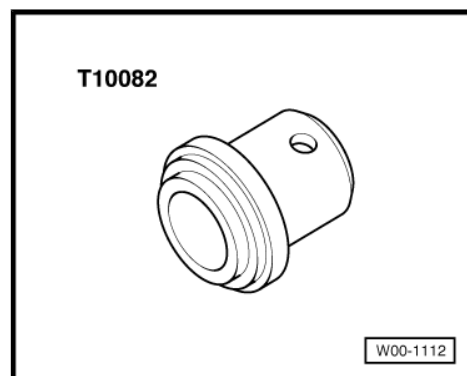


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◆ Used oil collection and extraction unit - V.A.G 1782-



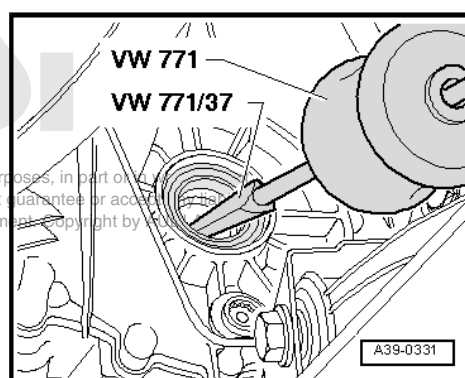
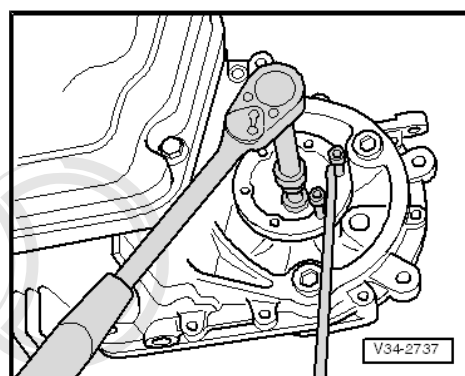
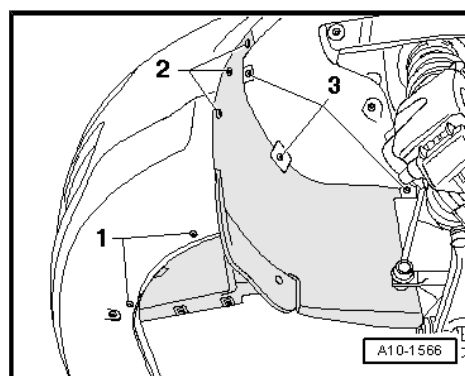
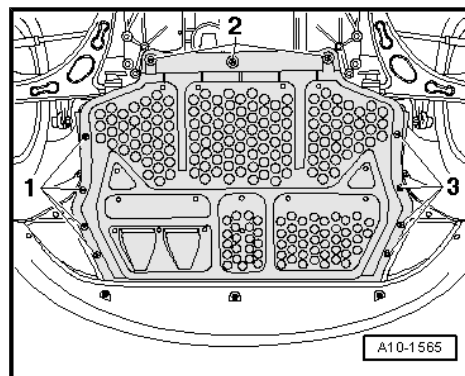
◆ Thrust piece - T10082-



◆ Sealing grease - G 052 128 A1-

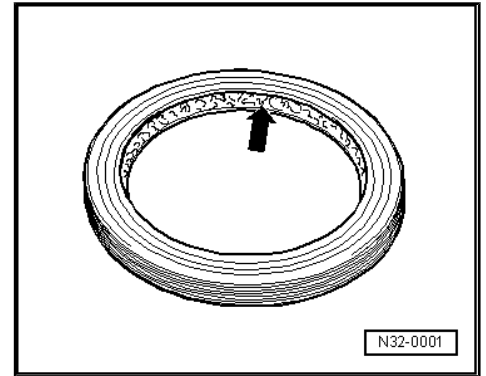
Procedure

- Gearbox in vehicle
- Remove front left wheel.
- Remove centre noise insulation -fasteners 1 ... 3-.
- Remove noise insulation (left-side) -fasteners 1 ... 3-.
- Turn steering to the left.
- Unbolt drive shaft from gearbox flange.
- Tie up drive shaft as high as possible. Do not damage paint on drive shaft.
- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.
- Remove flange shaft securing bolt. To do this, screw two bolts into flange and counterhold flange shaft with tyre iron or other suitable lever.
- Pull out flange shaft together with spring, thrust washer and tapered ring.
- Pull out flange shaft oil seal using multi-purpose tool - VW 771- and puller hook - VW 771/37- .



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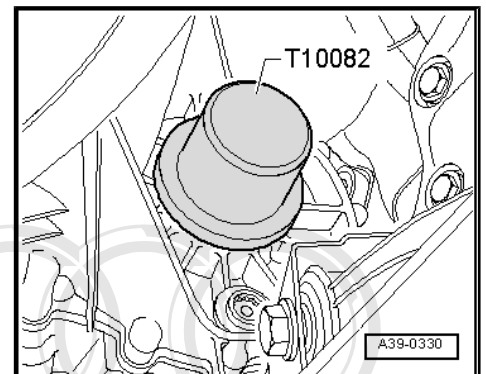
- Lightly oil outer circumference of new oil seal.
- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .



- Drive in new oil seal onto stop (take care to keep oil seal straight).

Remaining installation steps are carried out in reverse sequence; note the following:

- Install flange shaft.
- Bolt drive shaft to flange shaft ⇒ Rep. gr. 40.
- Fill up oil in gearbox and check oil level ⇒ [page 89](#) .
- Install noise insulation.
- Install wheel and tighten wheel bolts ⇒ Rep. gr. 44 .



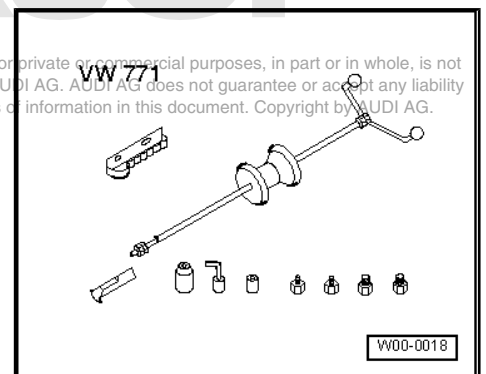
Tightening torque ⇒ [page 155](#)

1.3 Renewing oil seal for flange shaft (right-side)

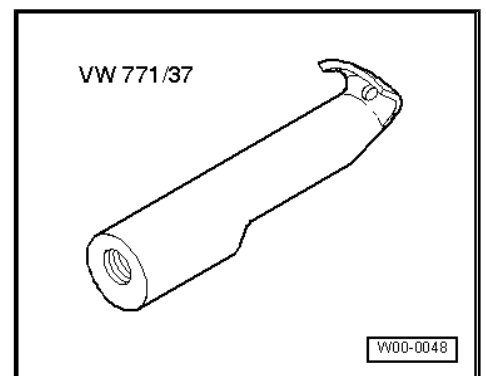
Special tools and workshop equipment required

- ◆ Multi-purpose tool - VW 771-

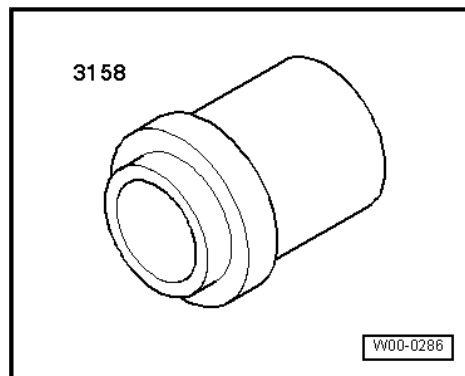
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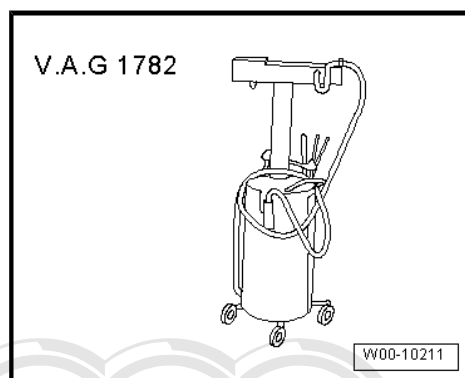
- ◆ Extractor tool - VW 771/37-



◆ Drift sleeve - 3158-



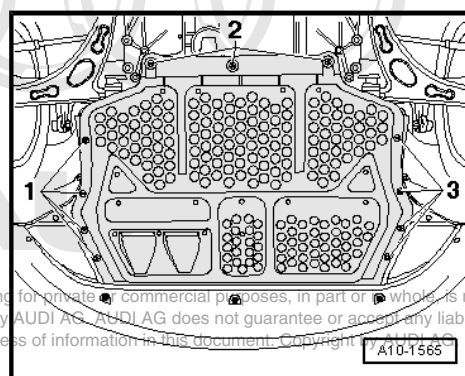
◆ Used oil collection and extraction unit - V.A.G 1782-



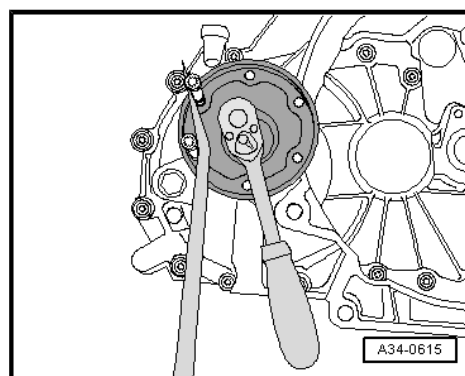
◆ Sealing grease - G 052 128 A1-

Procedure

- Remove centre noise insulation -fasteners 1 ... 3-.
- Unbolt drive shaft from flange shaft.
- Tie up drive shaft as high as possible. Do not damage paint on drive shaft.

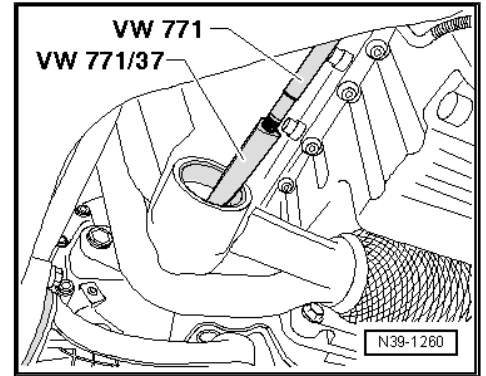


- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.
- Remove right flange shaft securing bolt; to do so, screw two bolts into flange and counterhold flange shaft with tyre iron or other suitable lever.
- Pull out flange shaft together with spring, thrust washer and tapered ring.

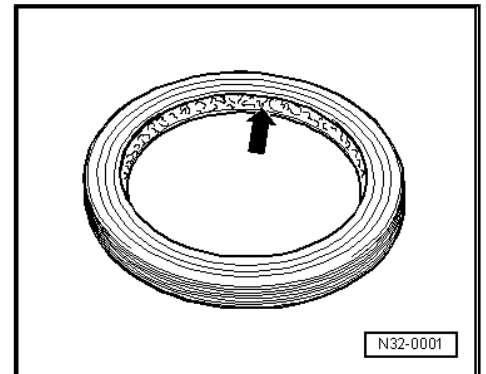


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- Pull out flange shaft oil seal using multi-purpose tool - VW 771- and puller hook - VW 771/37- .

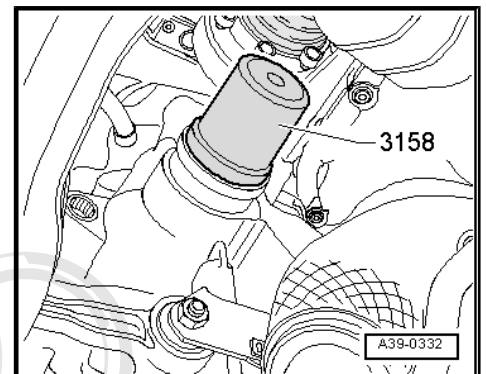


- Lightly oil outer circumference of new oil seal.
- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .



- Drive in new oil seal onto stop (take care to keep oil seal straight).
- Install flange shaft.
- Bolt drive shaft to flange shaft ⇒ Rep. gr. 40.
- Fill up oil in gearbox and check oil level ⇒ [page 89](#) .
- Install noise insulation.

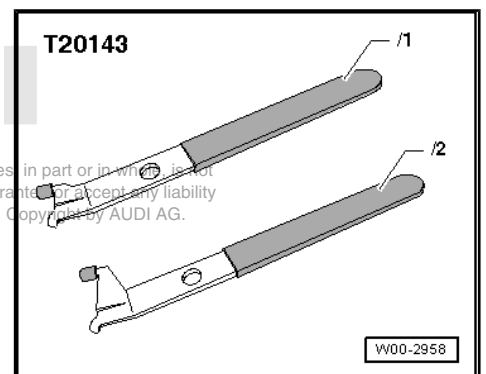
Tightening torque ⇒ [page 155](#)



1.4 Renewing input shaft oil seal

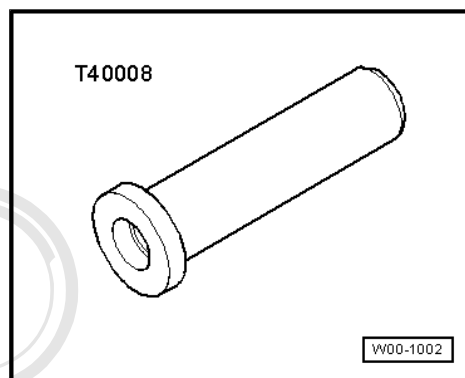
Special tools and workshop equipment required

- ◆ Extractor lever - T20143/1-



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◆ Thrust piece - T40008-



◆ Sealing grease - G 052 128 A1-

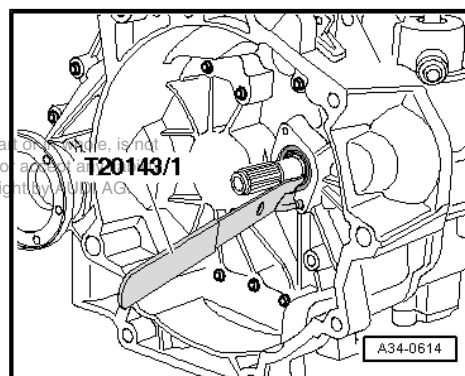
Procedure

- Gearbox removed
- Remove release bearing ⇒ [page 35](#) .
- Pry out oil seal using extractor lever - T20143/1 - .

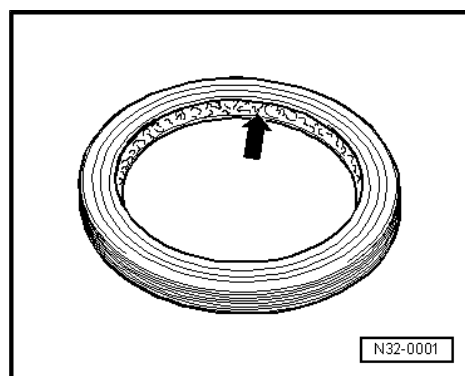


Note

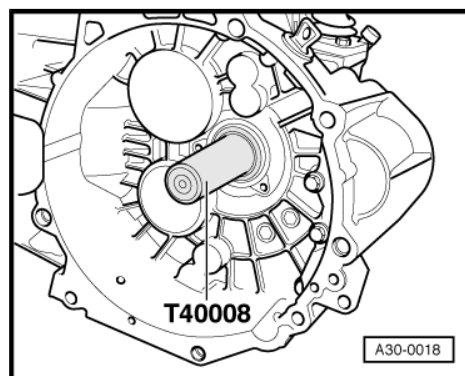
Take care not to damage contact surface for oil seal on input shaft.



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



- Drive in new oil seal onto stop (take care to keep oil seal straight).
- Install release bearing ⇒ [page 35](#) .



2 Exploded view - differential



Note

- ◆ Securing gearbox to assembly stand ⇒ [page 79](#).
- ◆ Always renew both tapered roller bearings together.
- ◆ Adjust differential if tapered roller bearings, differential cage, gearbox housing or clutch housing are renewed ⇒ [page 163](#).

1 - Countersunk bolt

- ☐ Screws into threaded piece
⇒ [Item 8 \(page 155\)](#)
- ☐ 25 Nm

2 - Flange shaft (right-side)

- ☐ Do not interchange; left and right flange shafts are different
- ☐ For correct version, refer to ⇒ Electronic parts catalogue

3 - Spring for flange shaft

- ☐ Installed behind flange shafts

4 - Thrust washer

- ☐ Installation position: lip faces spring

5 - Tapered ring

- ☐ Installation position: Taper towards differential cage

6 - Circlip

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

7 - Sun wheel

- ☐ Installing ⇒ [page 163](#)

8 - Threaded piece

- ☐ Installing ⇒ [page 163](#)

9 - Differential pinion pin

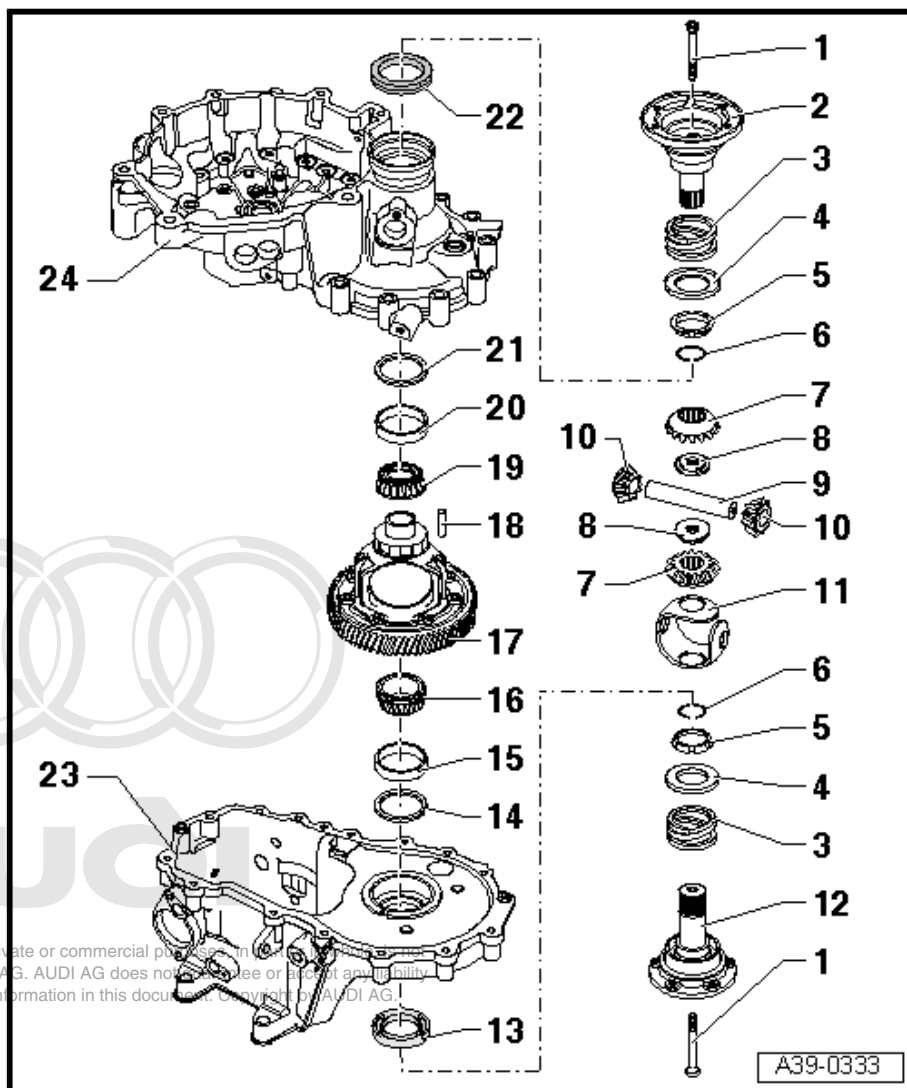
- ☐ To remove, shear off spring pin ⇒ [Item 18 \(page 156\)](#) ⇒ [page 162](#)
- ☐ Installing ⇒ [page 163](#)

10 - Planet pinion

- ☐ Installing ⇒ [page 163](#)

11 - One-piece thrust washer

- ☐ Lubricate with gear oil before installing





12 - Flange shaft (left-side)

13 - Oil seal for flange shaft (left-side)

- ☐ Can be renewed with gearbox in vehicle ⇒ [page 148](#)

14 - Shim S₁

- ☐ For differential
- ☐ Always 1 mm thick
- ☐ Discontinued as of gearbox manufacturing date 04 12 6; bearing seat for tapered roller bearing outer race has been adapted ⇒ [page 113](#)

15 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 160](#)
- ☐ Pressing in ⇒ [page 161](#)

16 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 161](#)
- ☐ Pressing on ⇒ [page 161](#)

17 - Differential cage

- ☐ With riveted final drive gear

18 - Clamping sleeve

- ☐ For securing differential pinion pin
- ☐ Is sheared off on removal ⇒ [page 162](#)
- ☐ Installing ⇒ [page 163](#)

19 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 162](#)
- ☐ Pressing on ⇒ [page 162](#)

20 - Tapered roller bearing outer race

- ☐ Pressing out ⇒ [page 161](#)
- ☐ Pressing in ⇒ [page 162](#)

21 - Shim S₂

- ☐ For differential
- ☐ Determining thickness ⇒ [page 163](#)

22 - Oil seal for flange shaft (right-side)

- ☐ Can be renewed with gearbox in vehicle ⇒ [page 151](#)

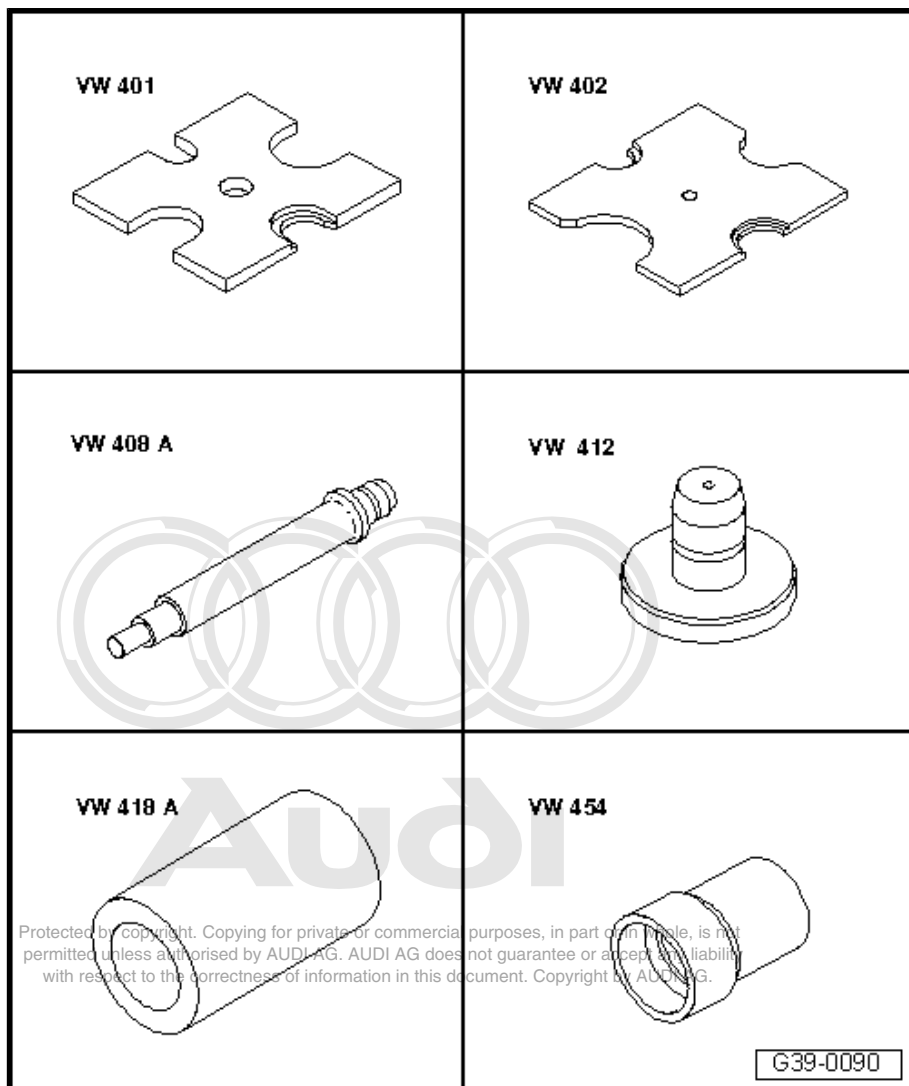
23 - Gearbox housing

- ☐ Servicing ⇒ [page 113](#)
- ☐ Shim S₁ for tapered roller bearing outer race was discontinued as of gearbox manufacturing date 04 12 6. Bearing seat for tapered roller bearing outer race has been adapted ⇒ [page 113](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue

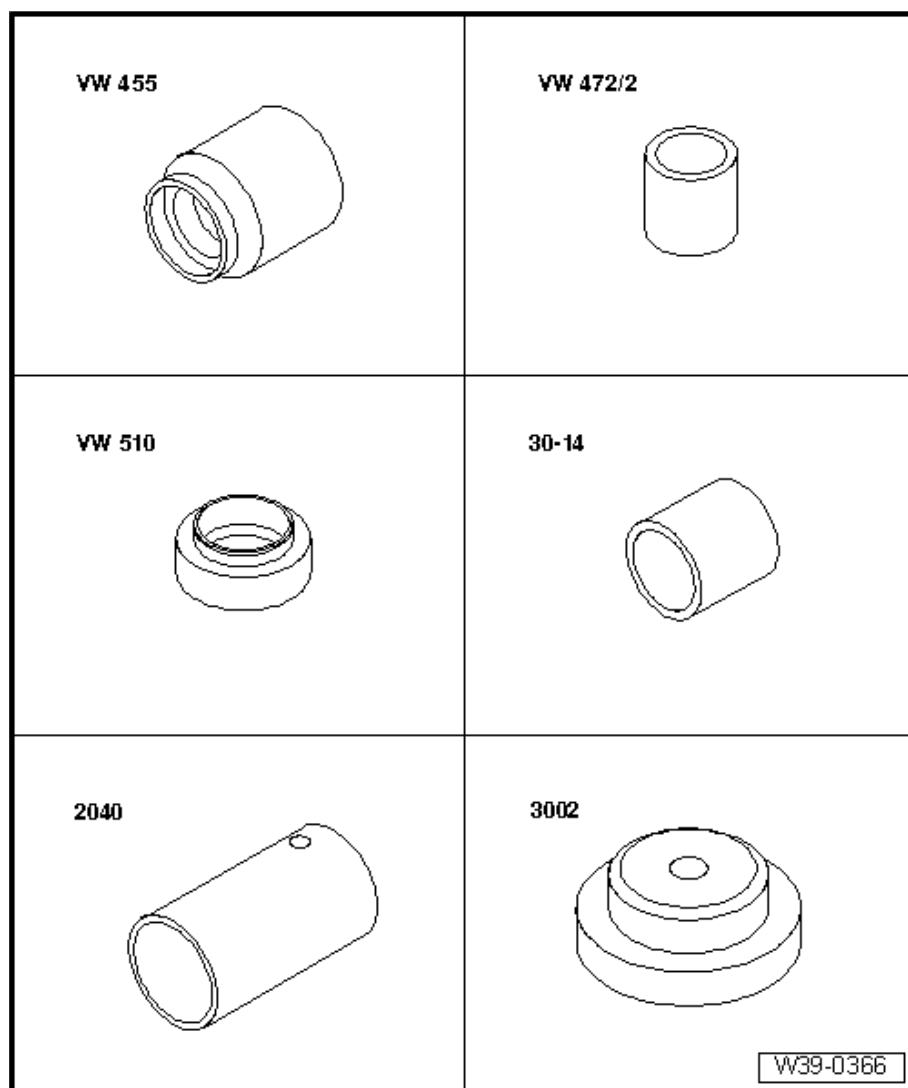
24 - Clutch housing

2.1 Dismantling and assembling differential

Special tools and workshop equipment required



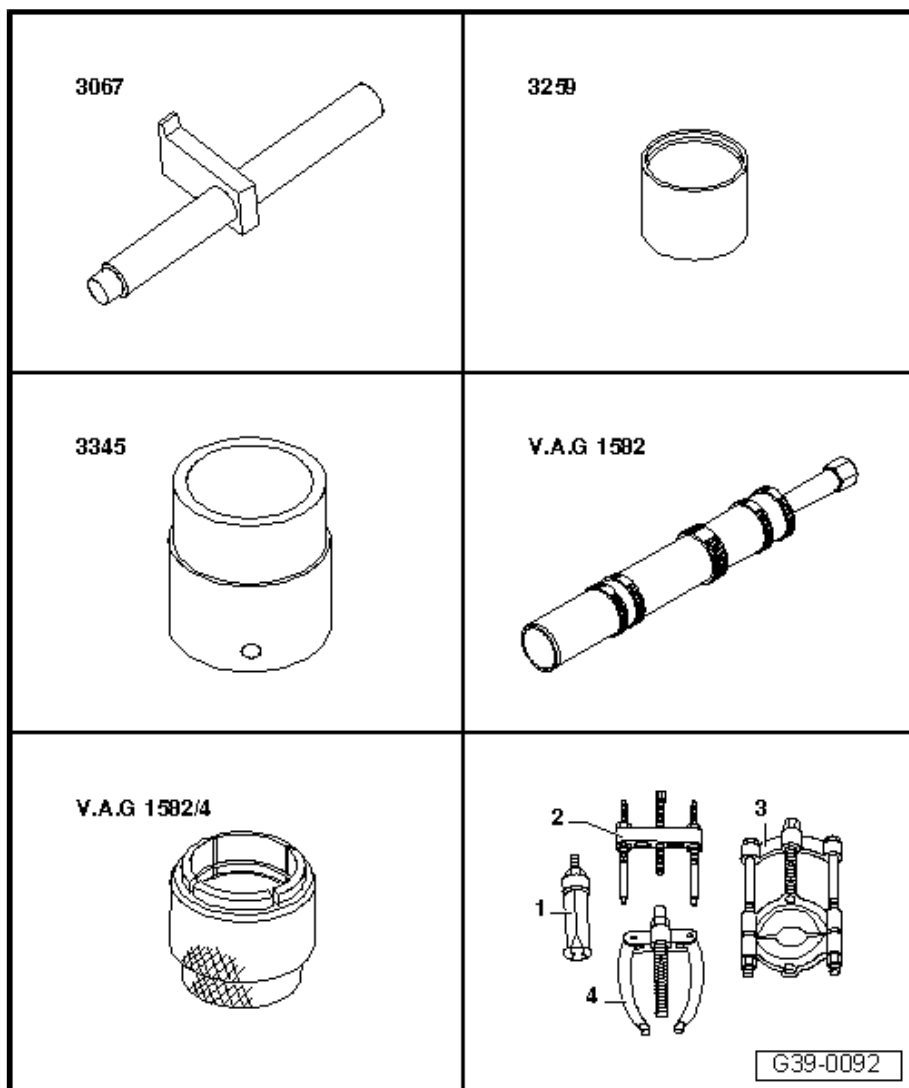
- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 418 A-
- ◆ Thrust piece - VW 454-



- ◆ Installing sleeve - VW 455-
- ◆ Spacer sleeve - VW 472/2-
- ◆ Thrust pad - VW 510-
- ◆ Tube - 30 - 14-
- ◆ Tube - 2040-
- ◆ Thrust piece - 3002-

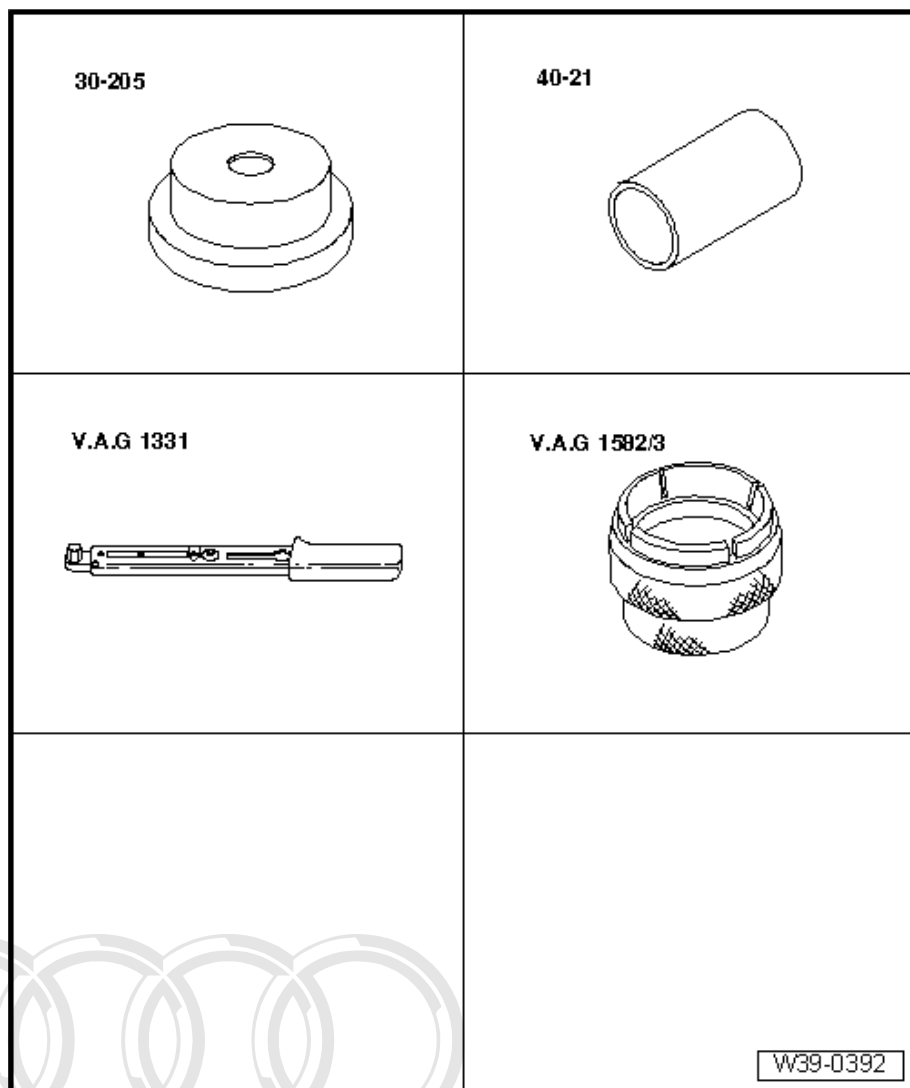


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- ◆ Counterhold tool - 3067-
- ◆ Tube - 3259-
- ◆ Wheel bearing tube - 3345-
- ◆ Tapered roller bearing puller - V.A.G 1582-
- ◆ Adapter - V.A.G 1582/4-
- ◆ -1- Kukko 21/7 internal puller
- ◆ -4- Kukko 22/2 counter-support

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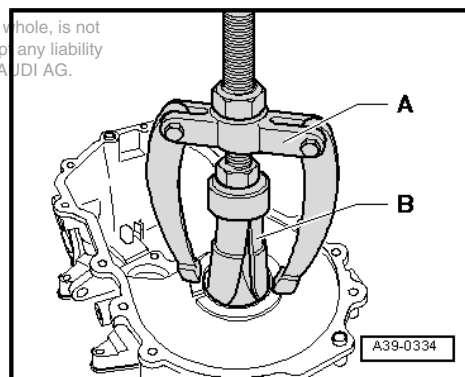


- ◆ Thrust plate - 30 - 205-
- ◆ Drift sleeve - 40 - 21-
- ◆ Torque wrench - V.A.G 1331- (5 ... 50 Nm)
- ◆ Adapter - V.A.G 1582/3-

Pulling tapered roller bearing outer race out of gearbox housing

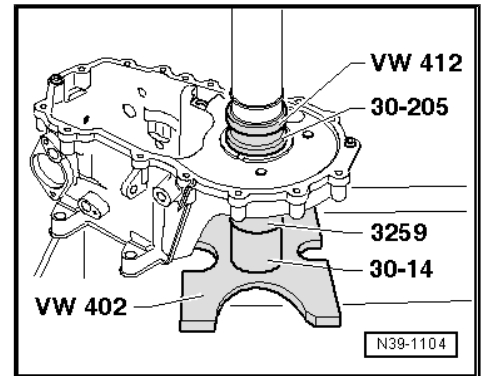
A - Counter-support, e.g. -Kukko 22/2-

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



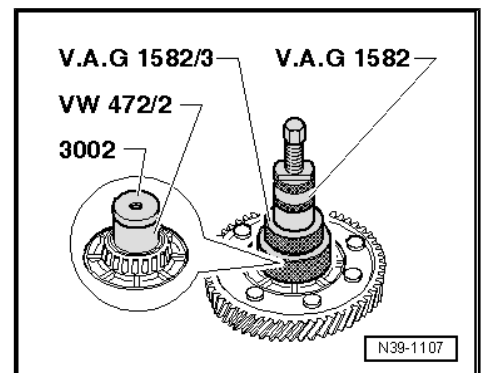
Pressing tapered roller bearing outer race into gearbox housing

- Check whether a shim S₁ must be inserted underneath outer race ⇒ [page 113](#) .
- If necessary, fit shim S₁ (always 1 mm thick) under outer race.
- Support gearbox housing with tube - 3259- directly below bearing mounting.



Pulling off tapered roller bearing inner race

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



Pressing on tapered roller bearing inner race

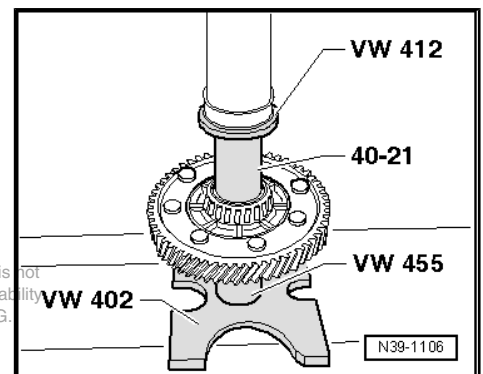


WARNING

Wear protective gloves.

- Heat tapered roller bearing inner race to approx. 100°C before pressing on.
- Support opposite side of inner race using installing sleeve - VW 455- .

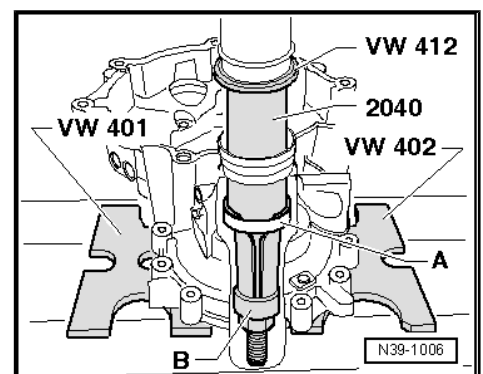
Shoulder of installing sleeve - VW 455- points to differential cage.



Pressing tapered roller bearing outer race -A- out of clutch housing

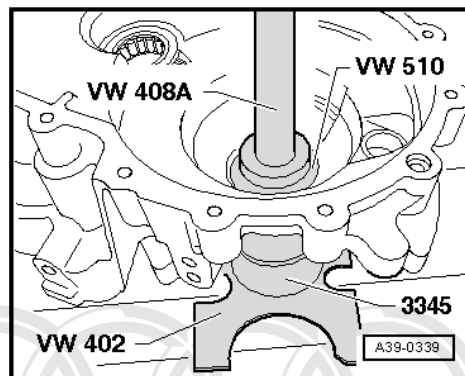
B - Internal puller 46 ... 58 mm , e.g. -Kukko 21/7-

- Clamp internal puller firmly under tapered roller bearing outer race.



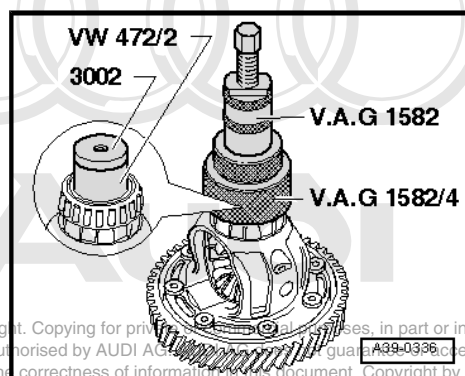
Pressing tapered roller bearing outer race into clutch housing

- Support clutch housing with tube for wheel bearing - 3345- directly below bearing mounting.



Pulling off tapered roller bearing inner race

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



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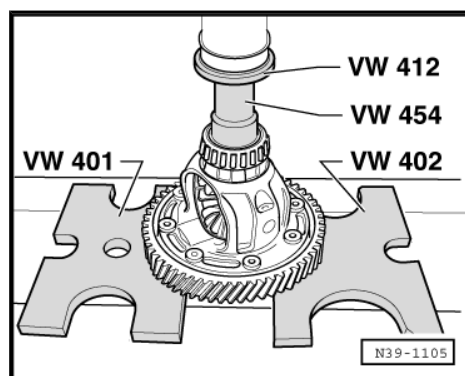
Pressing on tapered roller bearing inner race



WARNING

Wear protective gloves.

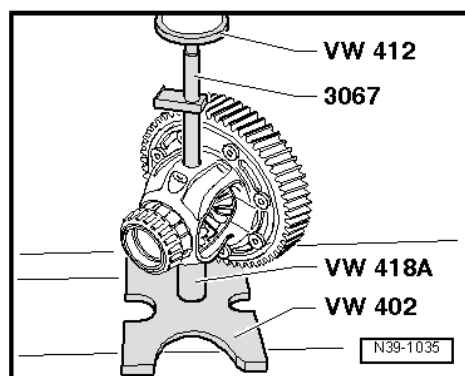
- Heat tapered roller bearing inner race to approx. 100°C before pressing on.



Pressing out differential pinion pin

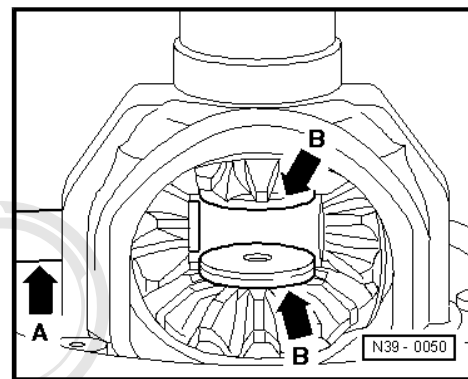
The spring pin is sheared off when it is pressed out.

- Drive the remaining part of the spring pin out of the differential cage.



Installing differential bevel gears

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



2.2 Adjusting differential

The differential has to be readjusted when the following components are renewed:

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

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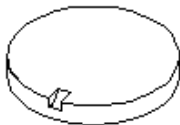
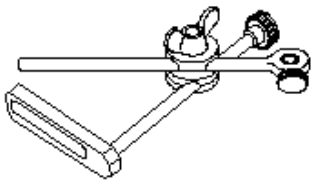
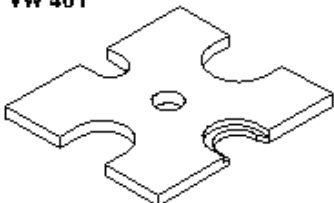
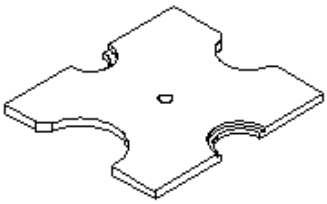
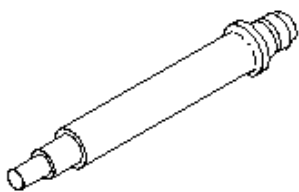
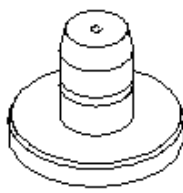
- ◆ Tapered roller bearings for differential



Note

Shim S₁ for tapered roller bearing outer race was discontinued as of gearbox manufacturing date 04 12 6. Bearing seat for tapered roller bearing outer race has been adapted ⇒ [page 113](#).

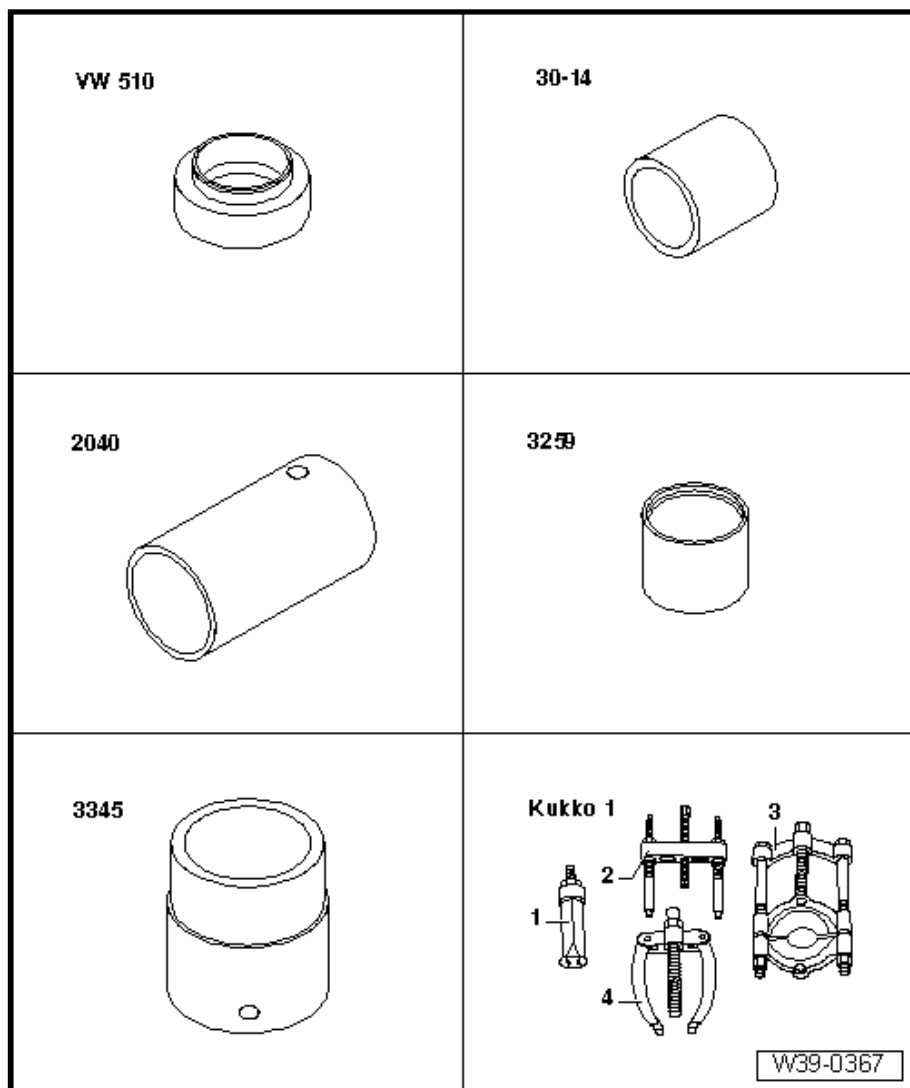
Special tools and workshop equipment required

VW 385/17 	VW 387 
VW 401 	VW 402 
VW 408 A 	VW 412  G39-0093

- ◆ End measuring plate - VW 385/17-
- ◆ Universal dial gauge bracket - VW 387-
- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 412-



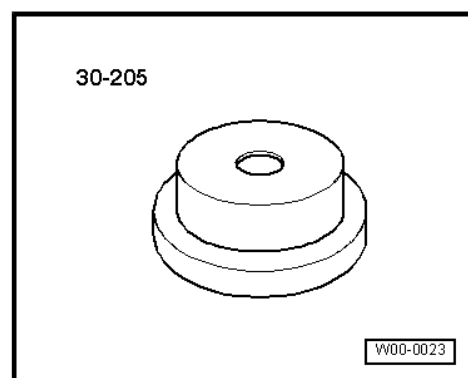
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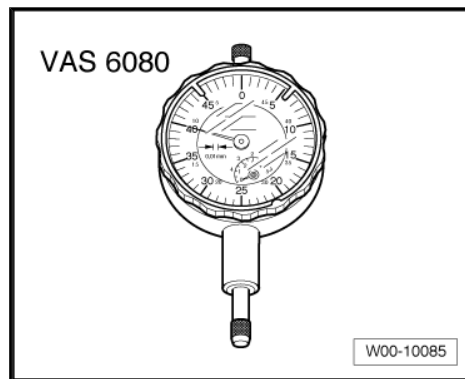
- ◆ Thrust pad - VW 510-
- ◆ Tube - 30 - 14-
- ◆ Tube - 2040-
- ◆ Tube - 3259-
- ◆ Wheel bearing tube - 3345-
- ◆ -1- Kukko 21/7 internal puller
- ◆ Thrust plate - 30 - 205-

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◆ Dial gauge - VAS 6080-



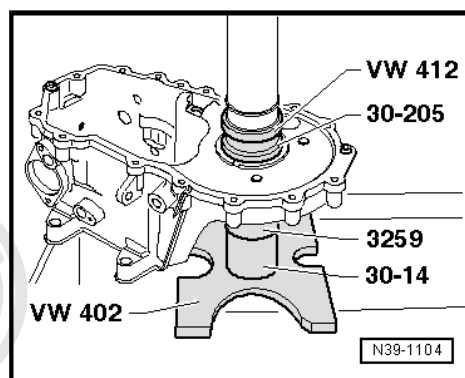
◆ Dial gauge extension, 30 mm

- Press tapered roller bearing outer race (on side adjacent to final drive gear) with shim S₁ (always 1 mm thick) into gearbox housing.



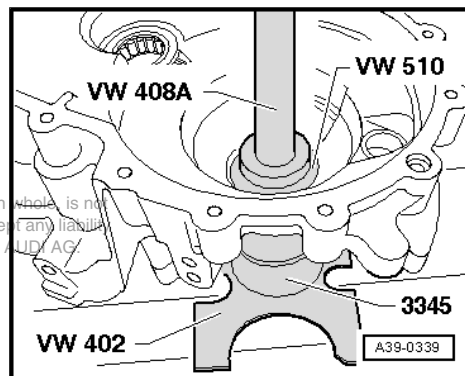
Note

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



- Press tapered roller bearing outer race (on side opposite final drive gear) without shim into clutch housing.
- Install differential in gearbox housing.
- Fit clutch housing in place and tighten 5 bolts to torque
⇒ [page 95](#) .

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- Attach dial gauge and set to “0” with a preload of 1 mm.

A - Dial gauge extension, 30 mm

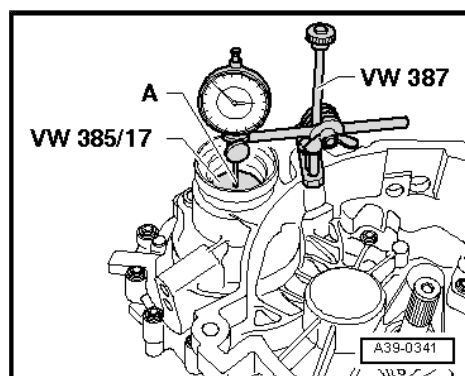
- Preload dial gauge to 1 mm and set to “0”.
- Move differential up and down and read off and note play indicated on dial gauge. (1.50 mm in this example.)

Determining thickness of shim S₂

The specified bearing preload is achieved by adding a constant value (0.35 mm) to the measured value to obtain the required thickness for S₂.

Example:

Measured value	1.50 mm
+ Preload (constant value)	0.35 mm
Thickness of shim S ₂ =	1.85 mm

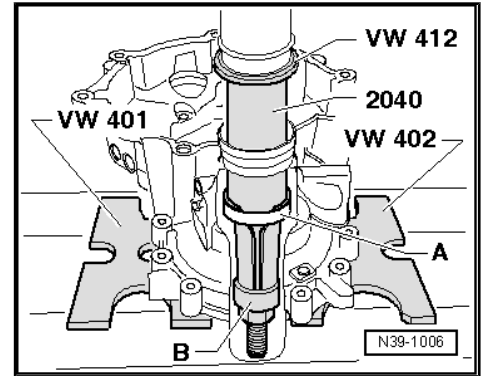


- Remove clutch housing and press out tapered roller bearing outer race -A-.

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

Different shim thicknesses make it possible to obtain the exact shim thickness required; if necessary, fit 2 shims.

- Fit shim S₂ of the required thickness as determined above (1.85 mm in example). For Part Nos. refer to ⇒ Electronic parts catalogue .
- Press tapered roller bearing outer race into clutch housing again.
- Fit clutch housing in place and tighten bolts to torque
⇒ [page 95](#) .



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