

Workshop Manual Audi A3 2004 ➤

5-speed manual gearbox 0AF

Edition 08.2015



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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

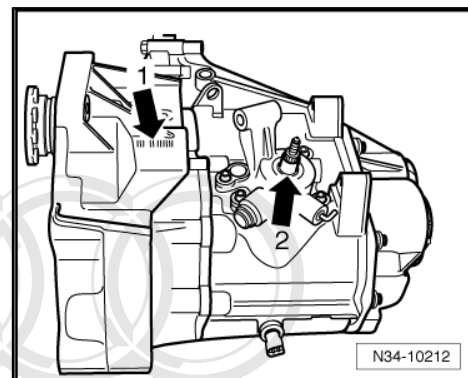
1 Gearbox identification

(ARL004392; Edition 08.2015)

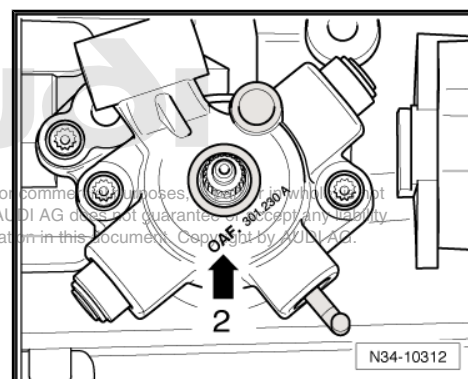
The 5-speed manual gearbox 0AF is installed in the Audi A3 2004
> in conjunction with the 1.6 ltr. 75 kW engine. Allocation
⇒ [page 2](#).

Location on gearbox

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



Manual gearbox 0AF -arrow 2-



Code letters and production date of gearbox -arrow-

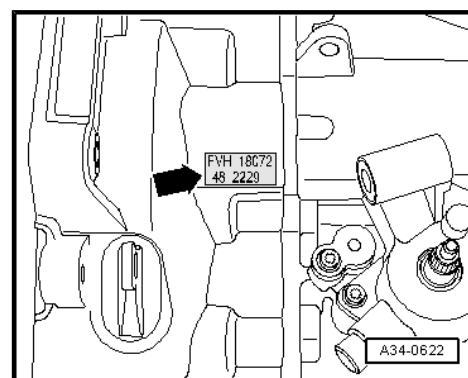
Example:	FVH	18	07	2
	Code letters	Day	Month	Year of manufacture (2002)

Additional data are manufacture-related.



Note

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





2 Code letters, allocation, transmission ratios, capacities

Manual gearbox		5-speed 0AF		
Code letters		FVH	JHT	LVN
Manufactured	from	02.03	11.06	05.09
	to	10.06	05.09	03.13
Allocation	Model	Audi A3 2004 ▶	Audi A3 2004 ▶	Audi A3 2004 ▶
	Engine	1.6 ltr. - 75 kW	1.6 ltr. - 75 kW	1.6 ltr. - 75 kW
Ratio Z1 : Z2	Final drive	68 : 15 = 4.533	68 : 15 = 4.533	68 : 15 = 4.533
Capacity of manual gearbox		2.0 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				

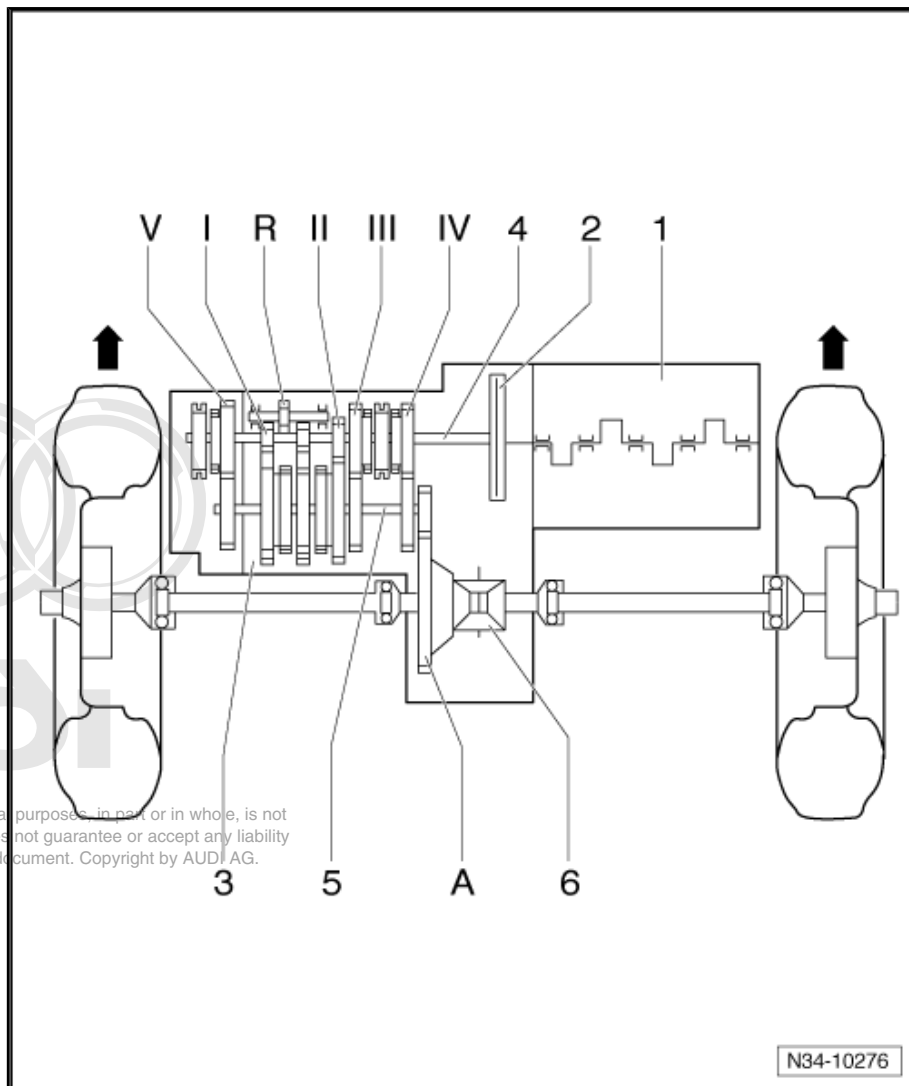
Manual gearbox		5-speed 0AF		
Code letters		NVT		
Manufactured from to		03.12 03.13		
Allocation Model		Audi A3 2004 ►		
Engine		1.6 ltr. - 75 kW		
Ratio Z1 : Z2		64 : 14 = 4.571		
Capacity of manual gearbox		2.0 ltr.		
The following data can be found in the ⇒ Electronic parts catalogue				
◆ Individual gear ratios				
◆ Gear oil specification				
◆ Allocation of drive shaft flanges				
◆ Allocation of clutch type				

3 Transmission layout

Identification

-Arrows- point in direction of travel.

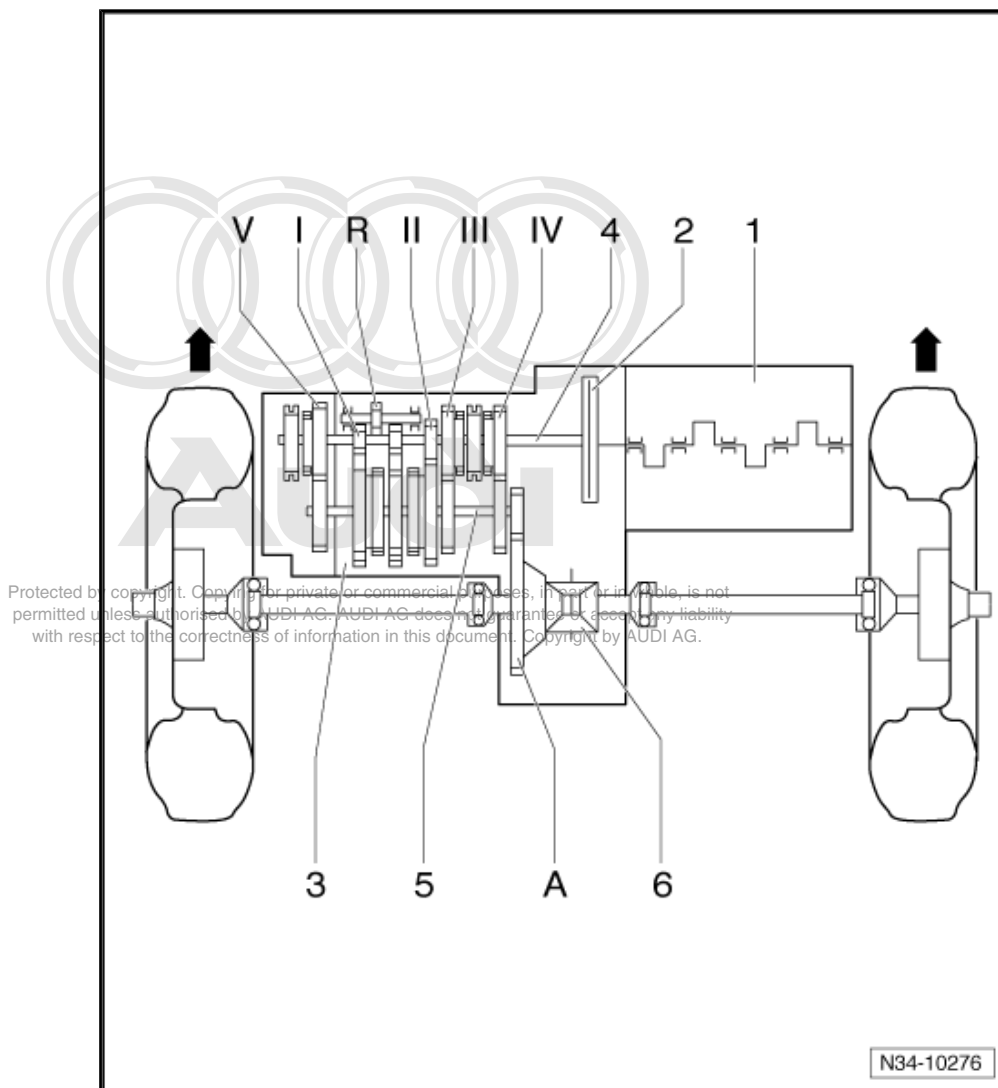
- 1 - Engine
- 2 - Clutch
- 3 - Manual gearbox
- 4 - Input shaft (main shaft)
- 5 - Output shaft
- 6 - Differential



Ratio

-Arrows- point in direction of travel

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



3.1 Calculating ratio "i"

Example:

	5th gear	Final drive
Driving gear	$ZG_1 = 48$	$ZA_1 = 15$
Driven gear	$ZG_2 = 39$	$ZA_2 = 68$

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

$$i_G = \text{gear ratio} = ZG_2 : ZG_1 = 39 : 48 = 0.813$$

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

i_{ov} = overall ratio

$$i_{ov} = i_G \times i_A = 0.813 \times 4.533 = 3.683$$

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

4 Safety precautions

⇒ **"4.1 Safety precautions when working on vehicles with start/stop system", page 5**

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



WARNING

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

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

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5 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

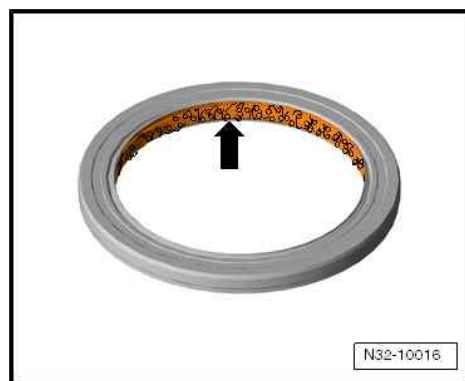
- ◆ Allocate bolts and other components according to ⇒ Electronic parts catalogue .
- ◆ Clean contact surfaces when assembling mounting brackets and waxed components. The contact surfaces must be free of wax and grease.
- ◆ Thoroughly clean all joints and connections and the surrounding areas before dismantling.
- ◆ 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 98](#) : 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.

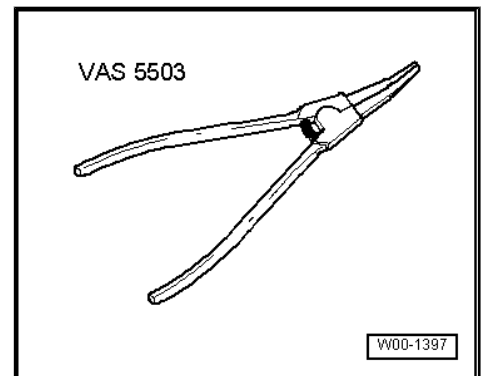
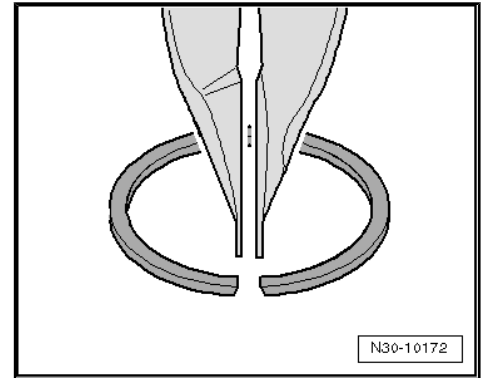
Oil seals, seals, O-rings and gaskets

- ◆ Always renew 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 98](#) .

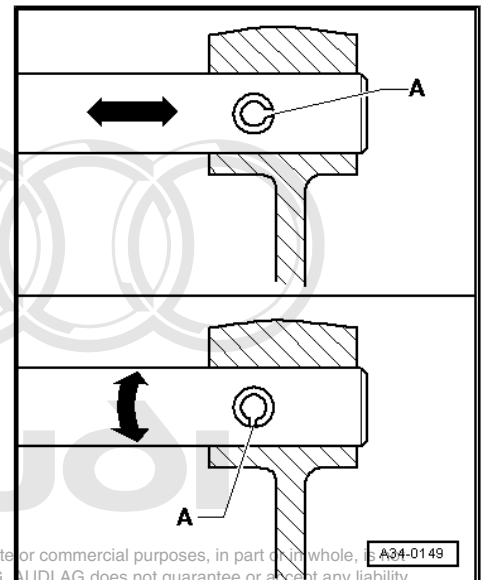


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Locking elements



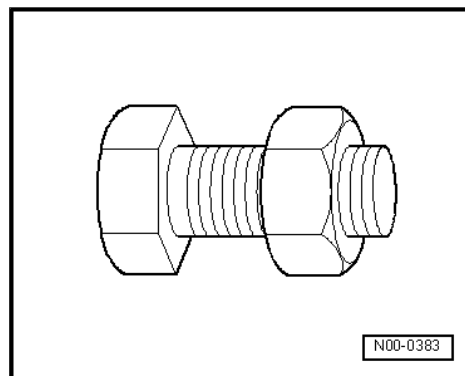
- ◆ Installation position for some circlips: the circlip is fitted so that the narrow part of the gap is at the top. This also gives the pliers a better grip when removing and installing.
- ◆ To facilitate assembly, use circlip pliers - VAS 5503A- .
- ◆ Do not over-stretch circlips.
- ◆ Always renew 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-.



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Nuts, bolts

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



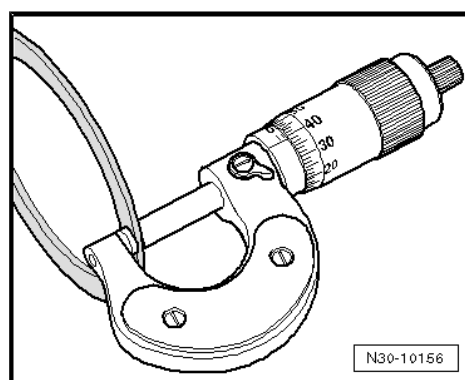
Bearings

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

Shims

- ◆ Use a micrometer to measure the shims at several points. 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

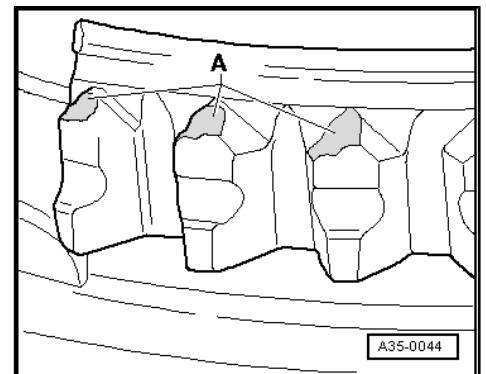
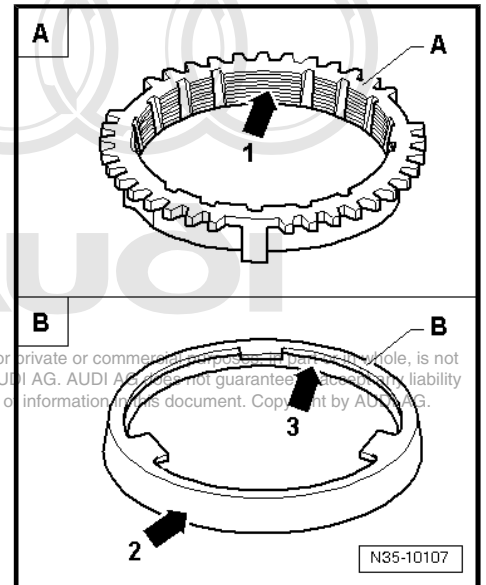
- ◆ Clean before pressing on.
- ◆ Use inductive heater - VAS 6414- to heat to approx. 100°C before installing. Press home onto stop when installing so there is no axial clearance.

Selector gears and locking collars

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

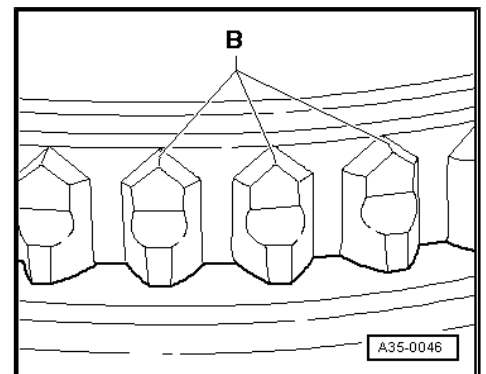
- ◆ Abnormal wear on synchro-ring or selector gear:

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



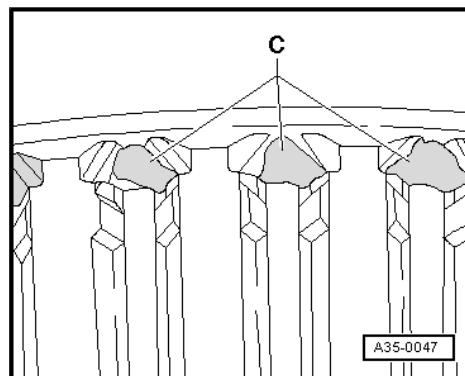
- ◆ In comparison: intact synchro-ring or selector gear:

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.

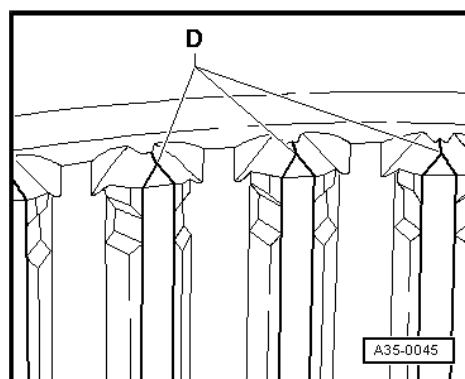


- ◆ In comparison: intact locking collar:

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 12](#)).
- ◆ Ensure that the pressure plate is kept straight: loosen and tighten bolts in a diagonal sequence and in several gradual stages.
- ◆ If the clutch has burnt out, thoroughly clean the clutch housing, flywheel and parts of the engine facing the gearbox in order to prevent odour.
- ◆ Only blow out dual-mass flywheel with compressed air.



5.1 Contact corrosion!

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

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

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

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

Please note:

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

6 Electrical components

⇒ ["6.1 Overview of fitting locations - electrical components", page 11](#)

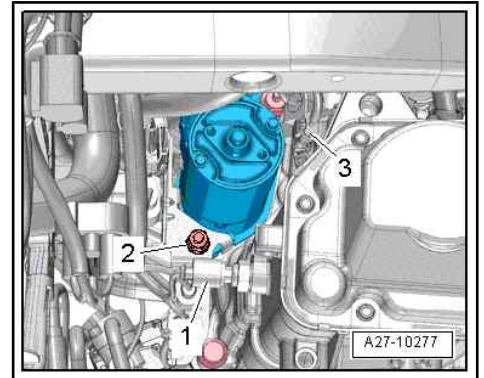
6.1 Overview of fitting locations - electrical components

Reversing light switch - F4- -1-

Fitting location:

The reversing light switch - F4- is located under the starter on the gearbox.

- Removing and installing ⇒ [Item 14 \(page 107\)](#)



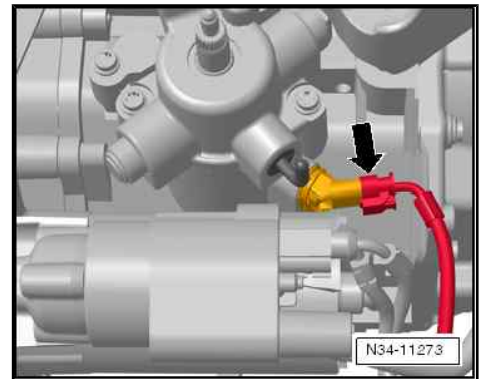
Gearbox neutral position sender - G701- -arrow-

- Only in vehicles with start/stop system

Fitting location:

The gearbox neutral position sender - G701- is located behind the starter on the gearbox.

- Removing and installing ⇒ [Item 14 \(page 107\)](#)

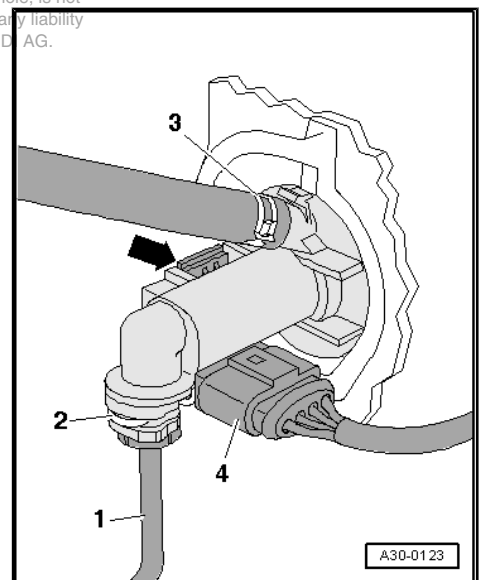


Clutch position sender - G476- -arrow-

Fitting location:

Clutch position sender - G476- is located on clutch master cylinder.

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



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30 – Clutch

1 Overview - clutch mechanism



Note

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 12 and perform

⇒ "1.2 Function check for clutch master cylinder and slave cylinder", page 13 prior to renewing.

I -

⇒ "2 Exploded view - pedal cluster, clutch master cylinder", page 15

- ⇒ "2.1 Removing and installing over-centre spring", page 16
- ⇒ "2.2 Removing and installing clutch pedal", page 18
- ⇒ "2.3 Removing and installing mounting bracket", page 21
- ⇒ "2.4 Removing and installing clutch position sender G476", page 24
- ⇒ "2.5 Removing and installing clutch master cylinder", page 25

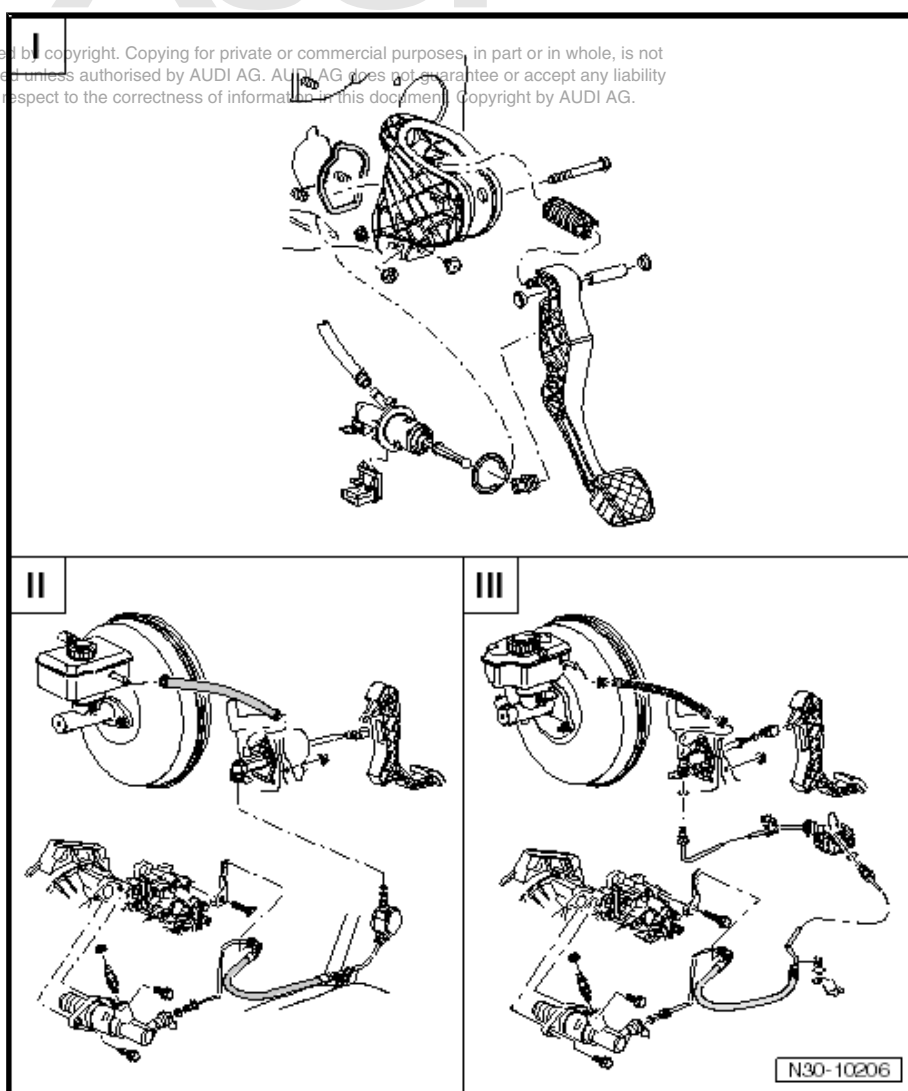
II -

⇒ "3 Exploded view - hydraulic system (LHD vehicles)", page 28

- ⇒ "3.1 Removing and installing clutch slave cylinder", page 30
- ⇒ "3.2 Removing and installing pipe/hose assembly or plastic pipe", page 32
- ⇒ "3.3 Bleeding clutch system", page 35

III -

⇒ "4 Exploded view - hydraulic system (RHD vehicles)", page 37



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 13 .

- ◆ 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 depressing the clutch pedal, you must not press it down further. The plunger of the slave cylinder is likely to have been guided past the clutch release lever. The slave cylinder would then be destroyed once pedal force exceeds approx. 300 N.

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 depressed / does not return to its initial position.

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

Check the complete hydraulic system for leaks.

- ◆ Check brake fluid level in brake fluid reservoir.
- ◆ Check clutch master cylinder and slave cylinder as well as the pipe/hose assembly including connections for external leaks (visual inspection).
- ◆ If you identify any leaks you must renew the leaking component.
- ◆ Bleed clutch system ⇒ page 35 .

Pedal forces:

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



High pedal force:

- ◆ Mechanically defective pressure plate/clutch plate
⇒ [page 42](#) .

Clutch does not disengage or does not disengage fully:

- ◆ Air in hydraulic system: bleed clutch system ⇒ [page 35](#) 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 42](#) .
- ◆ 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

- ☐ With frequency modulator on some versions
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Disconnecting from clutch master cylinder and clutch slave cylinder ⇒ [page 30](#)
- ☐ Removing and installing ⇒ [page 32](#)

2 - Seal or O-ring

- ☐ Matched to type of connection ⇒ [page 29](#)
- ☐ 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 29](#)

5 - Nut

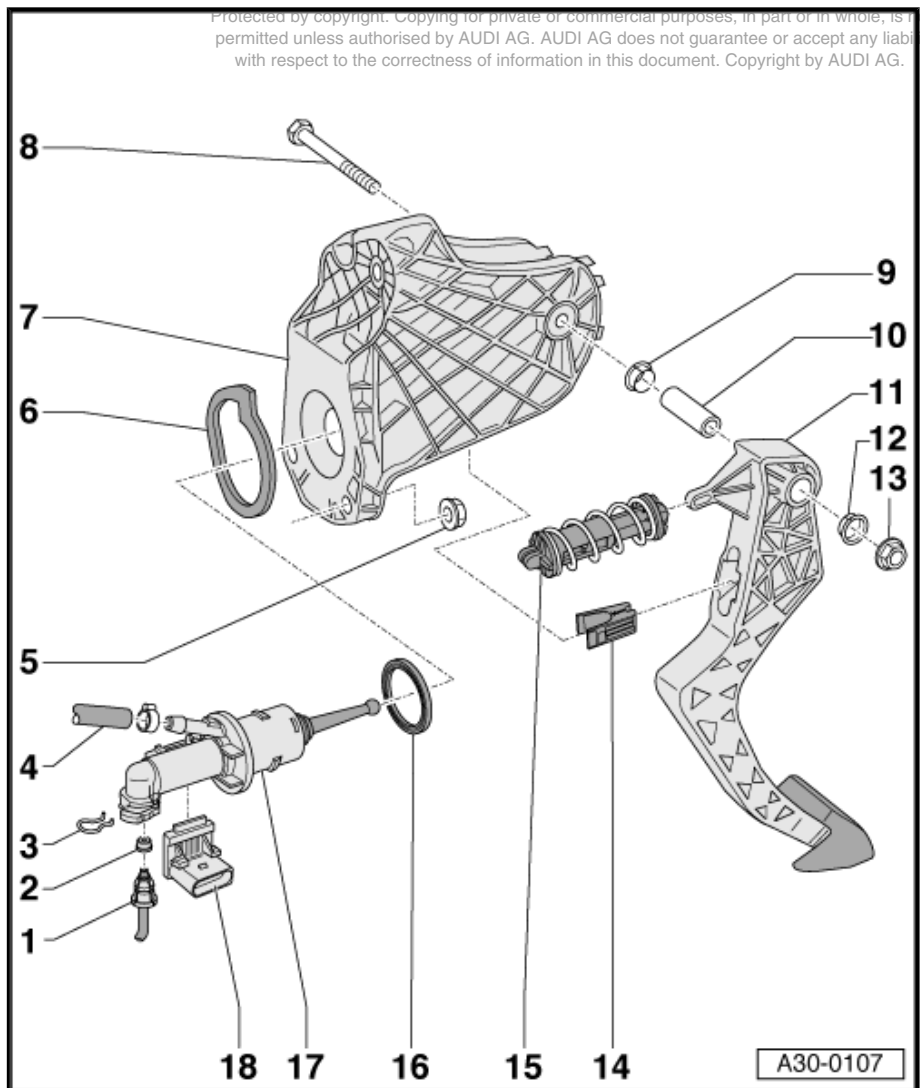
- ☐ 3x
- ☐ Self-locking
- ☐ Renew
- ☐ 20 Nm

6 - Gasket

- ☐ Renew

7 - Mounting bracket

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



8 - Bolt**9 - Bearing bush****10 - Pivot pin****11 - Clutch pedal**

- ❑ Removing and installing ⇒ [page 18](#)

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 16](#)

16 - Seal

- ❑ Renew

17 - Clutch master cylinder

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

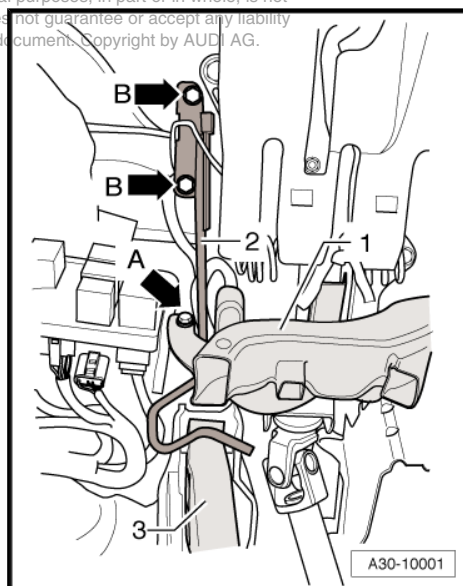
18 - Clutch position sender - G476-

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

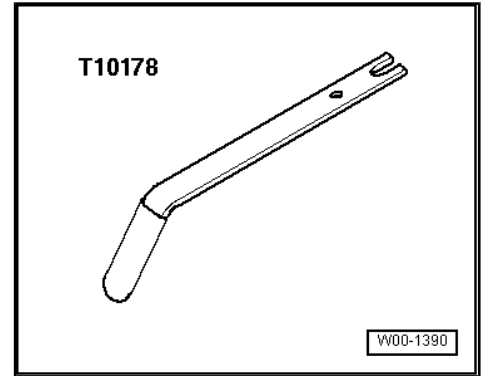
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2.1 Removing and installing over-centre spring

Special tools and workshop equipment required

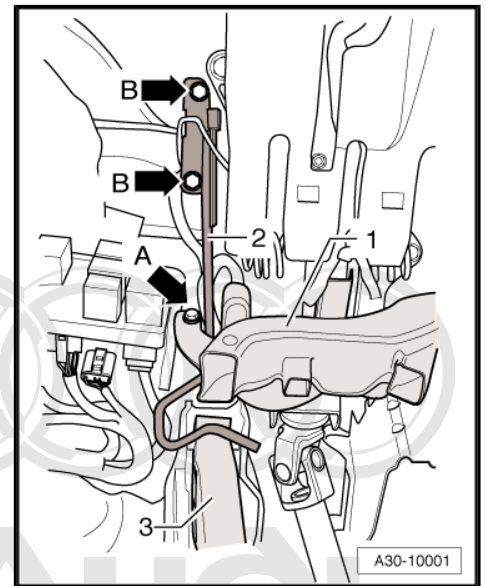
◆ Assembly tool - T10178-



◆ 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).



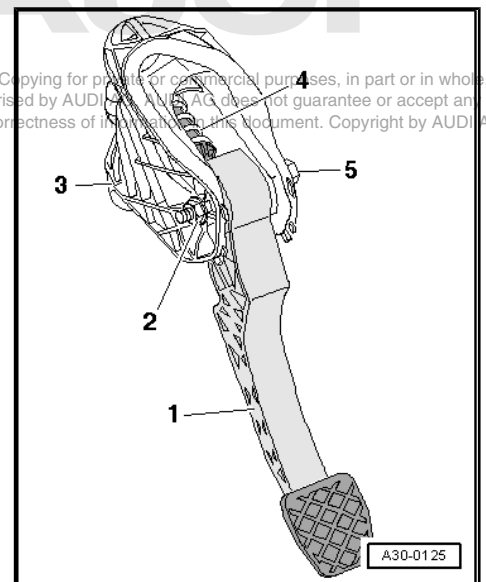
- Unbolt clutch pedal -1- from mounting bracket -3-. To do this, remove nut -2- and pull out bolt -5-.



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.



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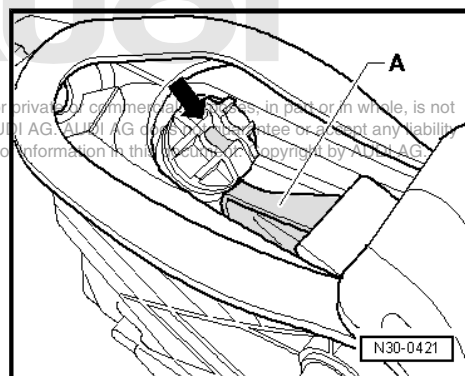
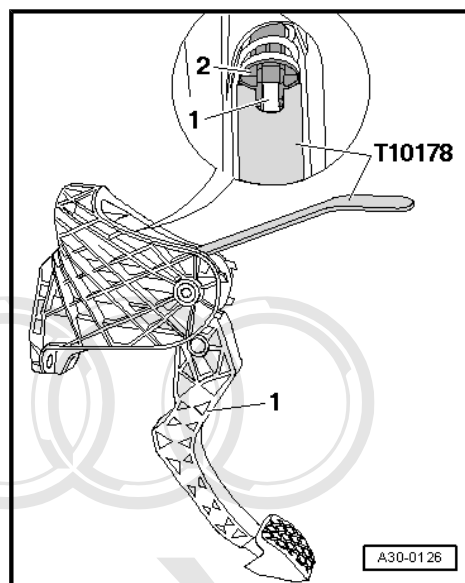
Installing

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



Note

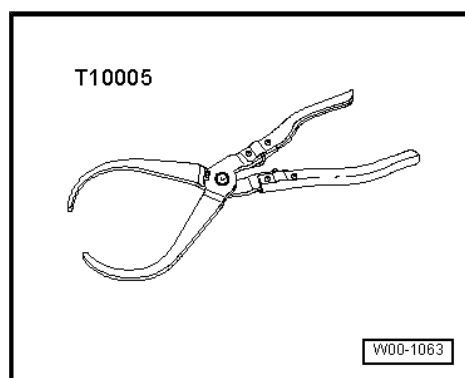
- ◆ *Renew self-locking nut.*
- ◆ *Lubricate all bearings and contact surfaces with grease - G 000 450 02- .*
- Fit over-centre spring -2- into mounting bracket from above while holding end of spring in correct position with assembly tool - T10178- .
- Socket -arrow- of over-centre spring must be in 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 \(page 16\)](#)
- Install crash bar ⇒ [page 16](#) .
- Install footwell vent (front left) ⇒ Rep. gr. 80 .
- Install storage compartment on driver's side ⇒ Rep. gr. 68 .



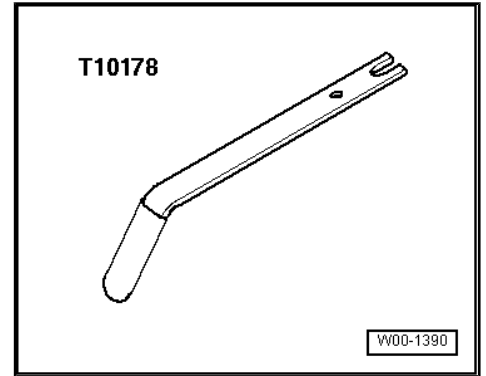
2.2 Removing and installing clutch pedal

Special tools and workshop equipment required

- ◆ Pliers - T10005-



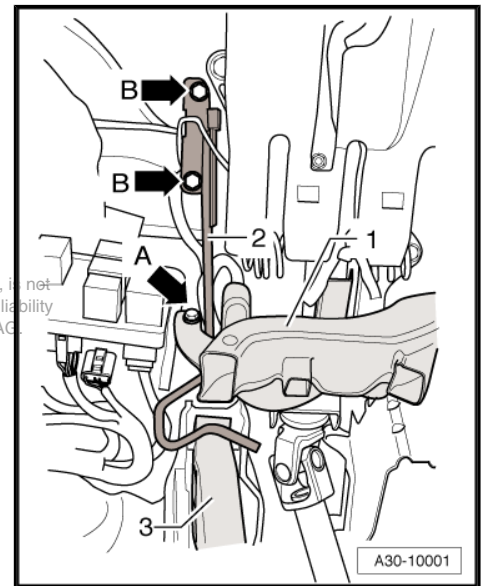
◆ Assembly tool - T10178-



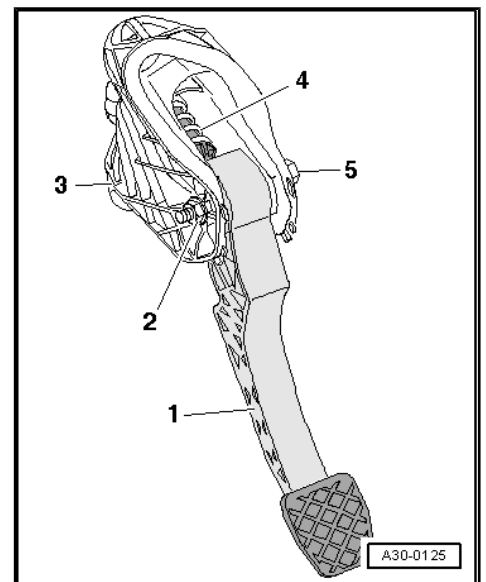
◆ Grease - G 000 450 02-

Removing

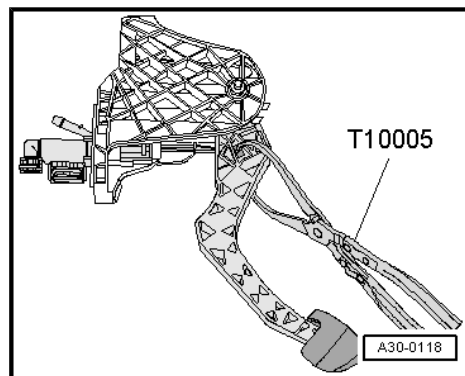
- Clutch pedal mounting bracket fitted in vehicle
- Move driver's seat away from pedals.
- Remove storage compartment on driver's side ⇒ Rep. gr. 68 .
- Unscrew bolt -arrow A- and remove footwell vent (front left) -1-.
- Unclip wiring harness at rear of footwell vent -1- and move clear to one side.
- 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-.
- 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.



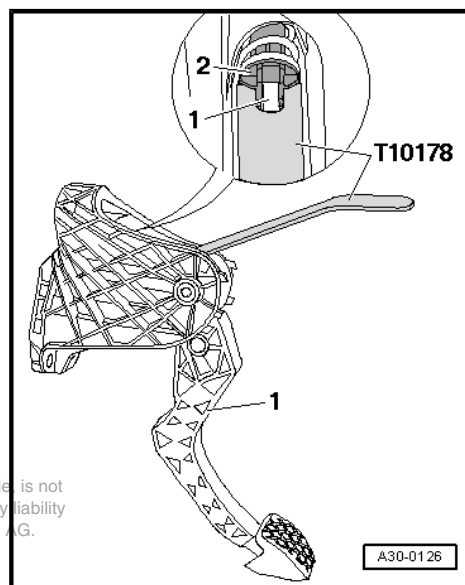
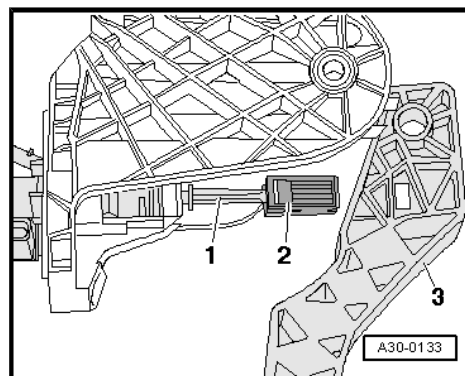
Installing

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- .



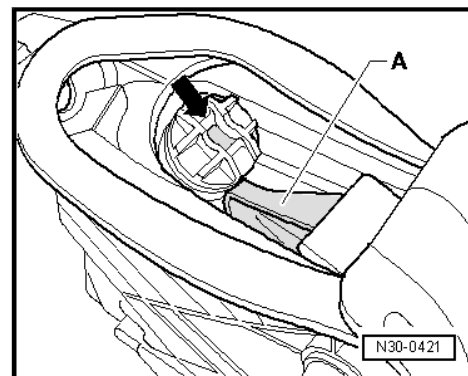
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- Socket -arrow- of over-centre spring must be in vertical position.
- Fit actuator on clutch pedal -A- into corresponding socket in over-centre spring -arrow-.
- Press top of clutch pedal forwards against spring pressure of over-centre spring, push through bolt and tighten self-locking nut. Tightening torque ⇒ [Item 13 \(page 16\)](#)



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.

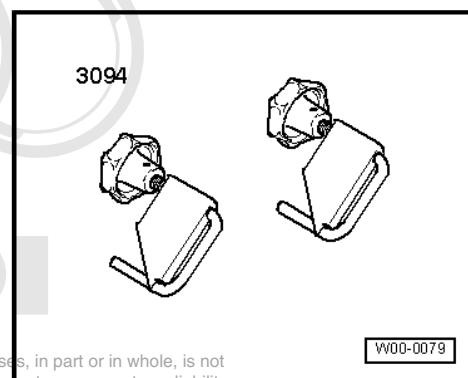


- Install crash bar ⇒ [page 16](#) .
- Install footwell vent (front left) ⇒ Rep. gr. 80 .
- Install storage compartment on driver's side ⇒ Rep. gr. 68 .

2.3 Removing and installing mounting bracket

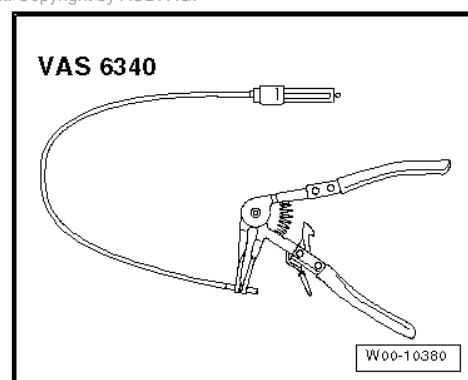
Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



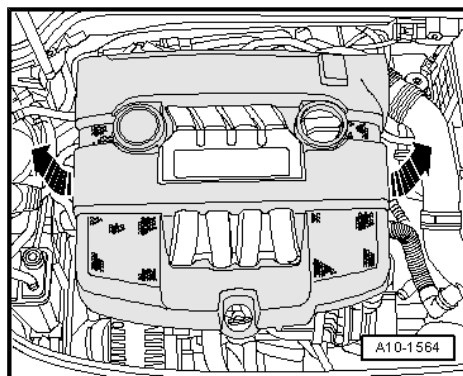
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- ◆ Hose clip pliers - VAS 6340-

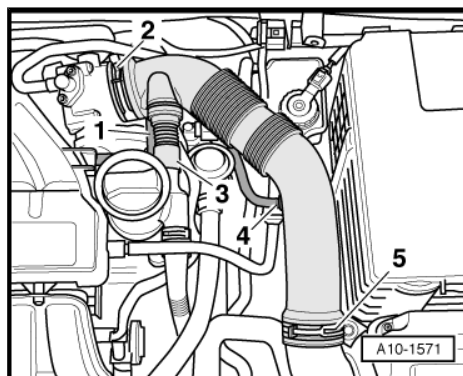


Removing

- Move driver's seat away from pedals.
- Remove engine cover panel -arrows-.

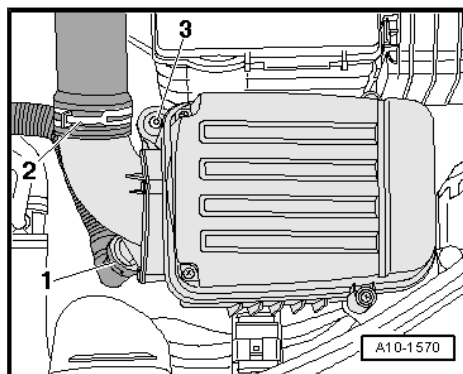


- Disconnect hoses -1-, -3- and -4-.
- Release spring clips -2- and -5-, and remove air intake hose.



- Remove complete air cleaner housing ⇒ Rep. gr. 24 .

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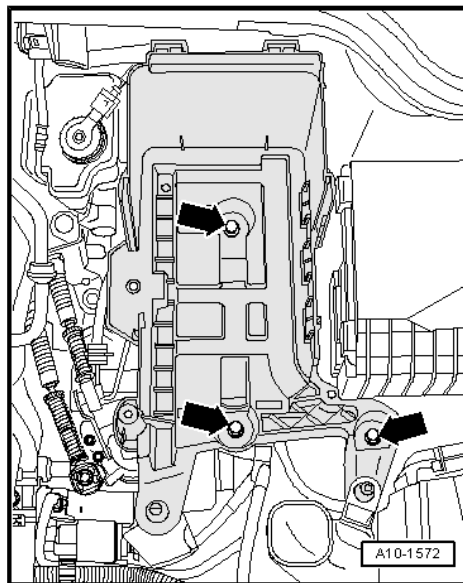


Caution

When disconnecting the battery there is a risk of serious damage to electronic components:

- ◆ **Observe the correct procedure for disconnecting the battery.**

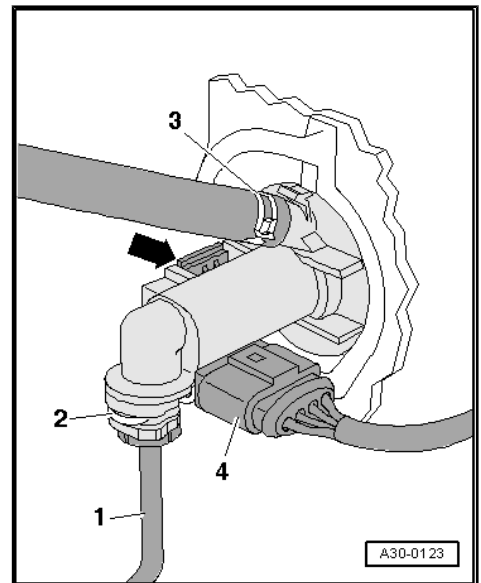
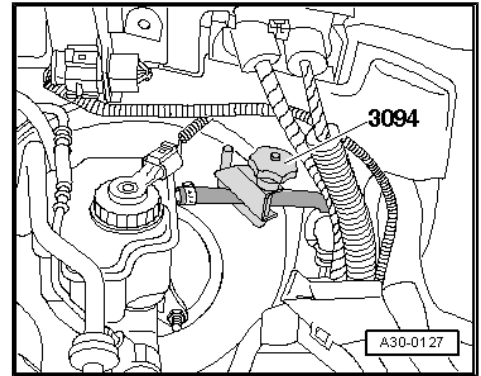
- Remove battery ⇒ Rep. gr. 27 .
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).



 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.

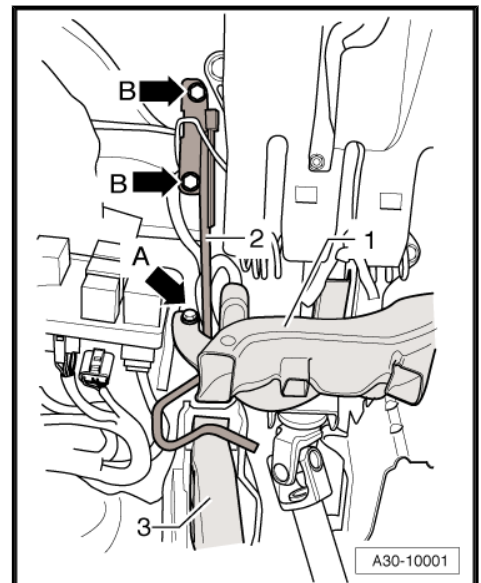
- Use hose clamp -3094- to clamp off supply hose to clutch master cylinder.
- Disconnect supply hose at clutch master cylinder (if necessary, release spring-type clip -3- using hose clip pliers - VAS 6340-).
- Release clip -2- with a screwdriver and disconnect pipe/hose assembly -1- or plastic pipe from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



- 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.



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

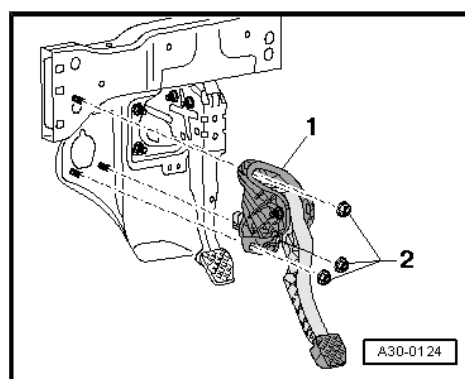
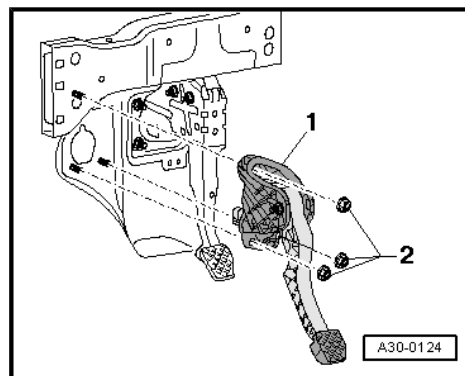
Installing

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



Note

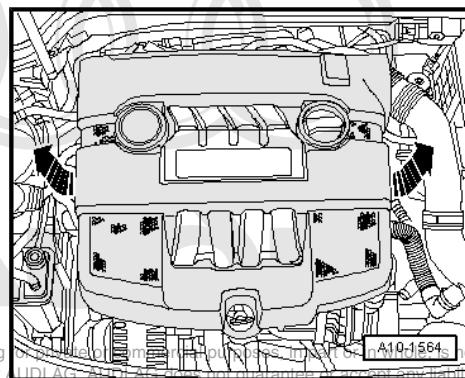
- ◆ *Renew self-locking nuts.*
- ◆ *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ [Electronic parts catalogue](#) .*
- Fit mounting bracket -1- and tighten nuts -2-. Tightening torque ⇒ [Item 5 \(page 15\)](#)
- Connect pipe/hose assembly or plastic pipe ⇒ [page 30](#) .
- Bleed clutch system ⇒ [page 35](#) .
- Install crash bar ⇒ [page 16](#) .
- 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 .
- Install air cleaner housing ⇒ Rep. gr. 24 .



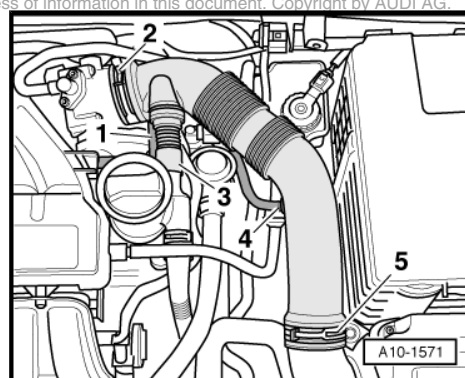
2.4 Removing and installing clutch position sender - G476-

Removing

- Remove engine cover panel -arrows-.

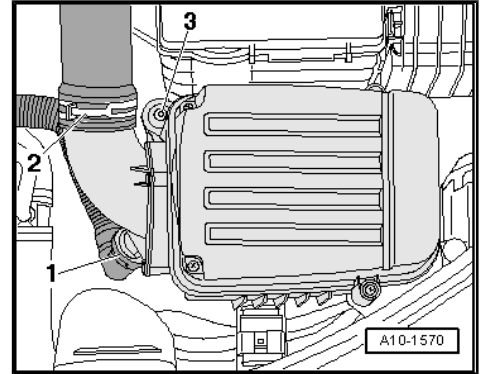


- Disconnect hoses -1-, -3- and -4-.
- Release spring clips -2- and -5-, and remove air intake hose.



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- Remove complete air cleaner housing ⇒ Rep. gr. 24 .

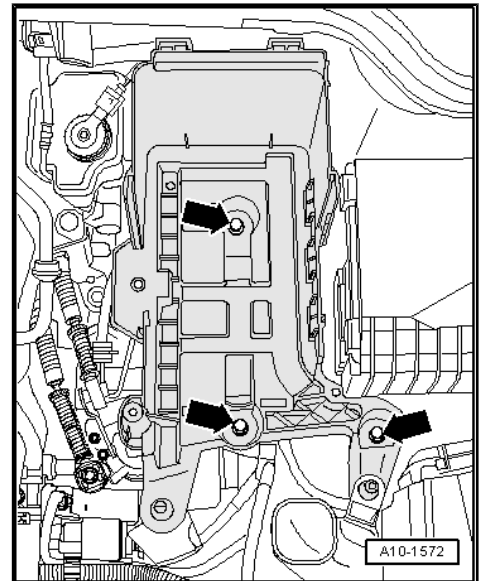


Caution

When disconnecting the battery there is a risk of serious damage to electronic components:

- ◆ *Observe the correct 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-.



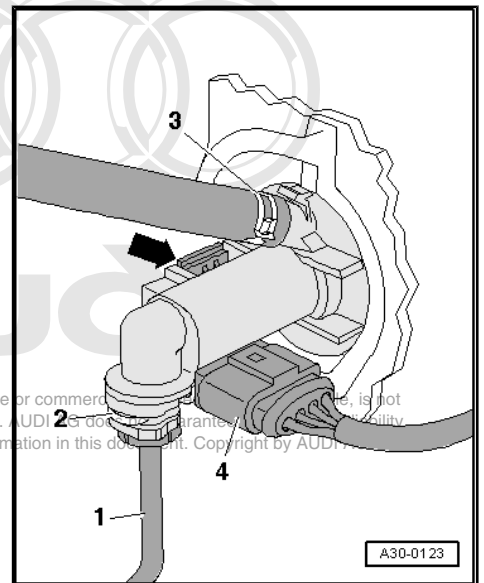
Note

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

Installing

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

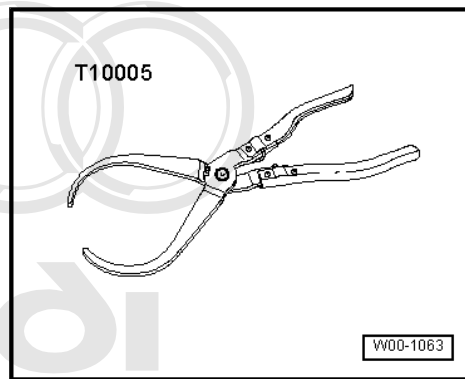
- Install battery tray and battery ⇒ Rep. gr. 27 .
- Install air cleaner housing ⇒ Rep. gr. 24 .



2.5 Removing and installing clutch master cylinder

Special tools and workshop equipment required

Pliers - T10005-



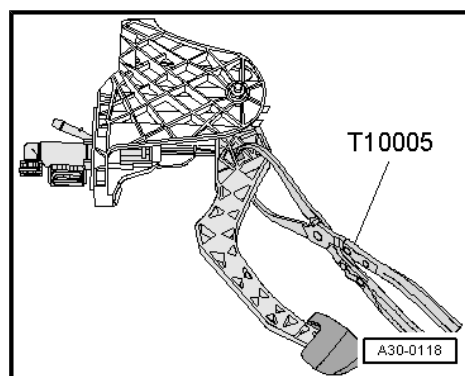
Removing

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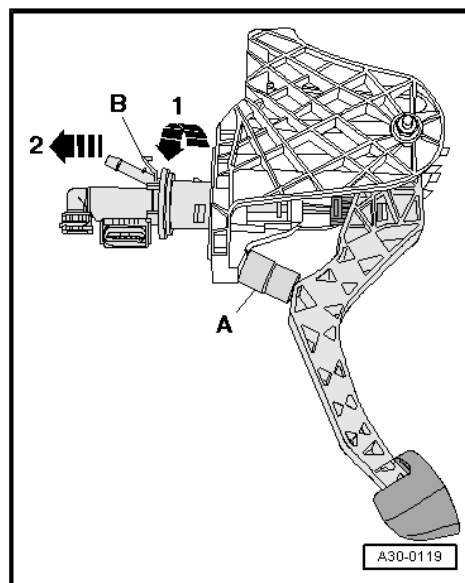


Note

- ◆ 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 12.
- ◆ When performing work in the footwell, put cloths on the carpet to protect it from possible brake fluid spills.
- Remove mounting bracket ⇒ page 21.
- Release retaining clip for operating rod on clutch master cylinder using pliers - T10005-.

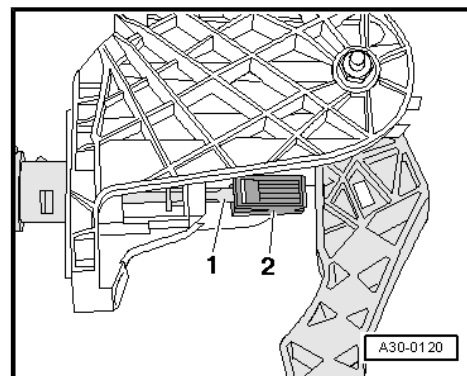


- Insert a spacer -A- between clutch pedal and stop, and press clutch pedal forward.
- ◆ Length of spacer = approx. 40 mm (e.g. 1/2" socket)
- Release retainer clip -B- and pull clutch master cylinder out of mounting bracket -arrows 1 and 2-.

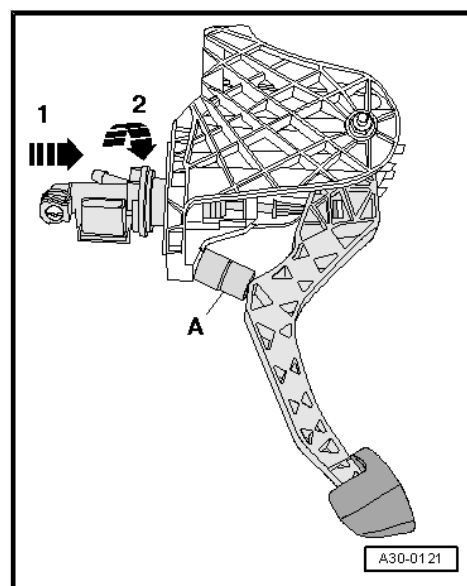


Installing

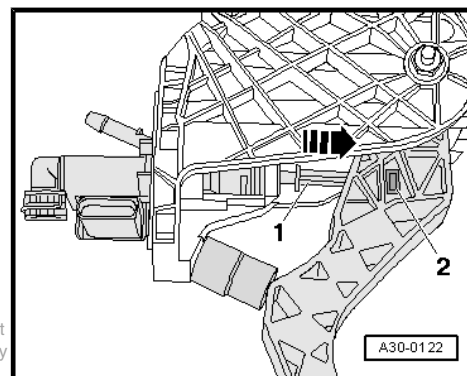
- Clutch pedal in “released” position.
- Install retaining clip -2- on operating rod -1- for clutch master cylinder.



- 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 21](#) .



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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 29](#)

4 - Clutch master cylinder

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

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 18](#)

7 - Clutch pedal

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

8 - Nut

- ☐ Secures mounting bracket to body
- ☐ Renew
- ☐ Tightening torque ⇒ [Item 5 \(page 15\)](#)

9 - O-ring

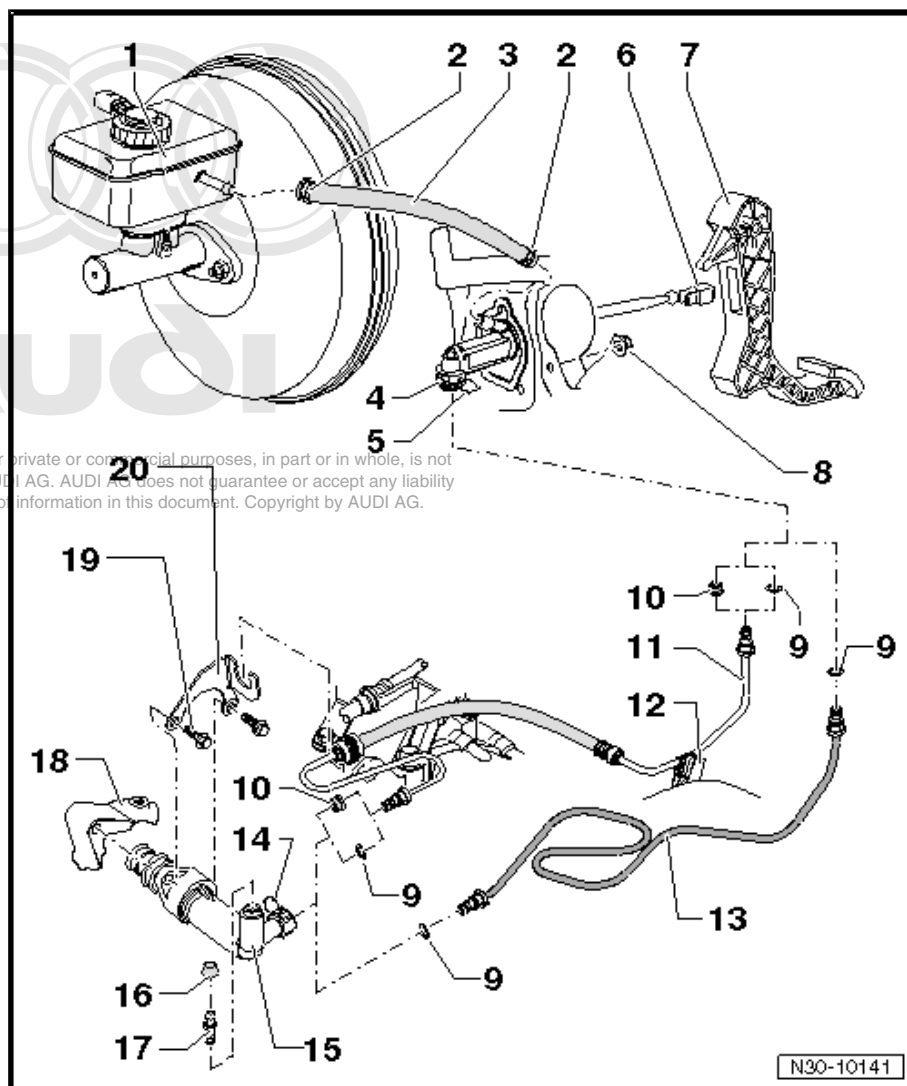
- ☐ Matched to type of connection ⇒ [page 29](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Renew damaged O-rings
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing

10 - Seal

- ☐ Matched to type of connection ⇒ [page 29](#)
- ☐ 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

- ☐ With frequency modulator on some versions
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 32](#)



- ☐ Disconnecting from clutch master cylinder and clutch slave cylinder ⇒ [page 30](#)

12 - Retainer

- ☐ For pipe/hose assembly ⇒ [Item 11 \(page 28\)](#)
- ☐ Secured on body

13 - Plastic pipe

- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 32](#)
- ☐ Disconnecting from clutch master cylinder and clutch slave cylinder ⇒ [page 30](#)

14 - Clip

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

15 - Clutch slave cylinder

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

16 - Dust cap

17 - Bleeder screw

- ☐ Bleeding clutch system ⇒ [page 35](#)
- ☐ 6 Nm

18 - Gearbox

19 - Bolt

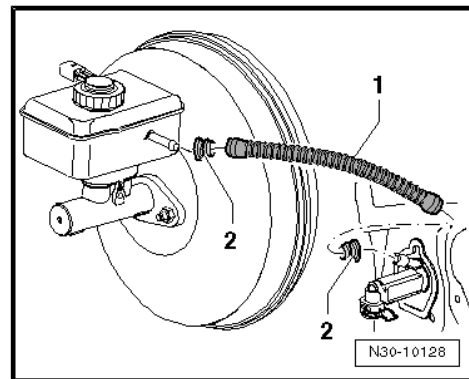
- ☐ 2x
- ☐ 20 Nm

20 - Retainer

- ☐ For pipe/hose assembly

Vehicles with plastic supply hose -1-

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



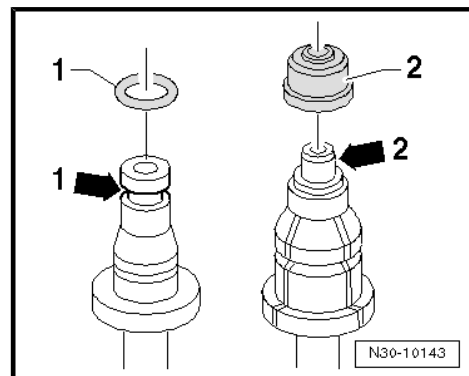
Seals or O-rings for pipe/hose assembly or plastic pipe

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



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-.

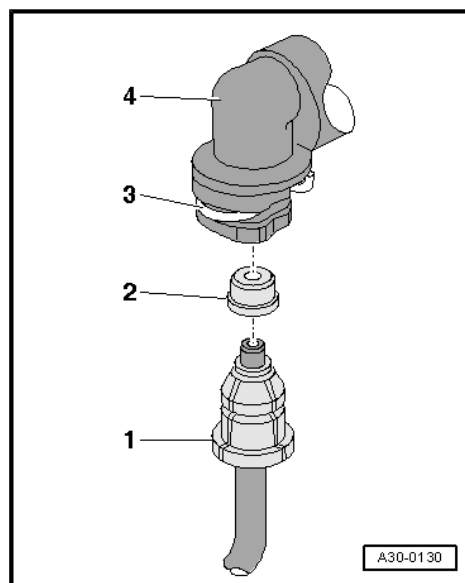
Installing



Note

- ♦ *Observe distinction between seals -2- and O-rings
⇒ [page 29](#)*
- ♦ *Renew damaged seals or O-rings.*

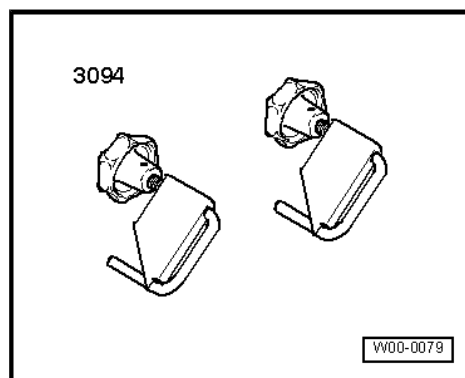
- Press pipe/hose assembly or plastic pipe -1- onto connection on clutch slave cylinder and clutch master cylinder -4- so that clip -3- snaps into place.
- Pull on pipe to check that it is secure.



3.1 Removing and installing clutch slave cylinder

Special tools and workshop equipment required

- ♦ Hose clamps, up to 25 mm - 3094-



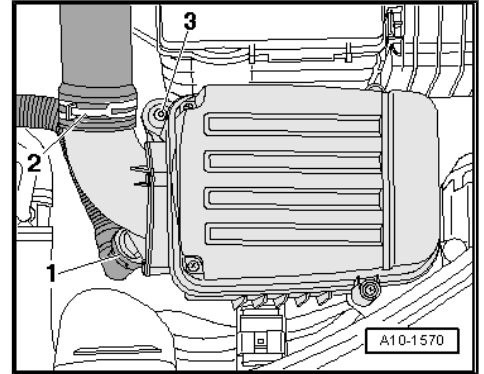
Removing



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 12](#).*
- ♦ *If the slave cylinder is removed from gearbox with the pipe/hose assembly still attached, make sure you do not press the clutch pedal. Otherwise, the piston will be pressed out of the slave cylinder and be destroyed.*

- Remove complete air cleaner housing ⇒ Rep. gr. 24 .

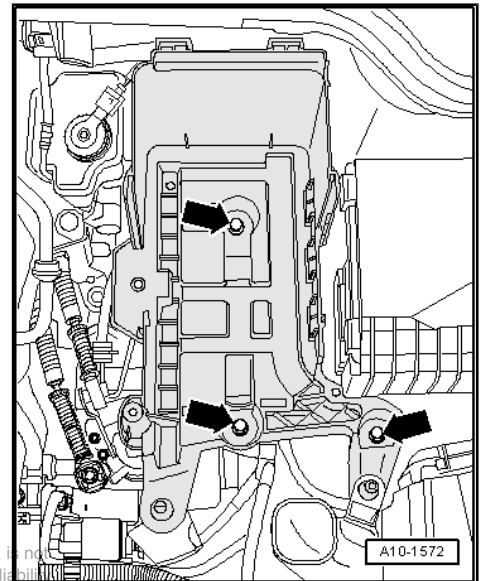


Caution

When disconnecting the battery there is a risk of serious damage to electronic components:

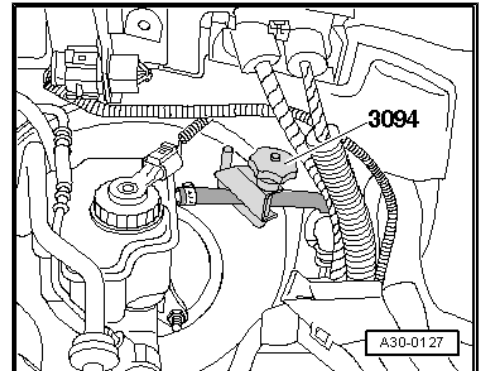
- ◆ *Observe the correct procedure for disconnecting the battery.*

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

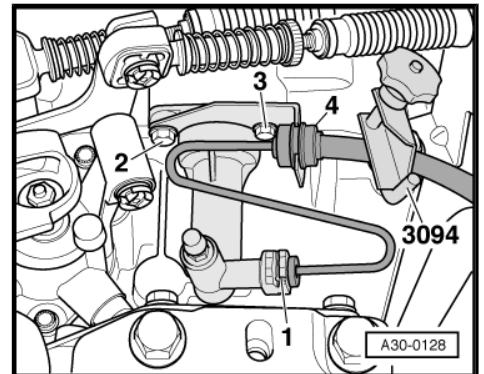


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- If a plastic pipe is installed between clutch master cylinder and slave cylinder, clamp off supply hose to clutch master cylinder using hose clamp -3094- .



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





Note

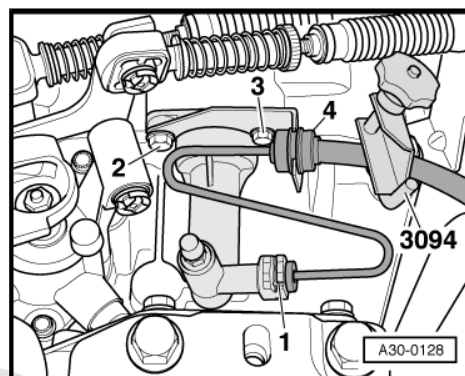
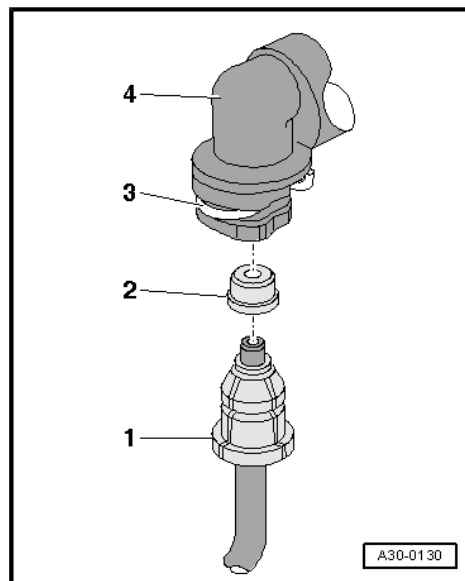
- ◆ *In the following steps make sure that no brake fluid escapes onto the longitudinal member or onto the gearbox below. If this does happen, clean the affected area thoroughly.*
- ◆ *Place a cloth underneath to catch escaping brake fluid.*
- Release clip -3- with a screwdriver and disconnect pipe/hose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

- Detach pipe/hose assembly -4- from bracket and move clear to the side.
- Remove bolts -2- and -3-.
- Remove slave cylinder.



Caution

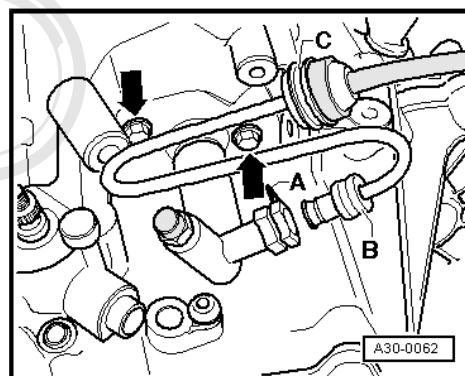
Do not operate clutch pedal after removing clutch slave cylinder.



Installing

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

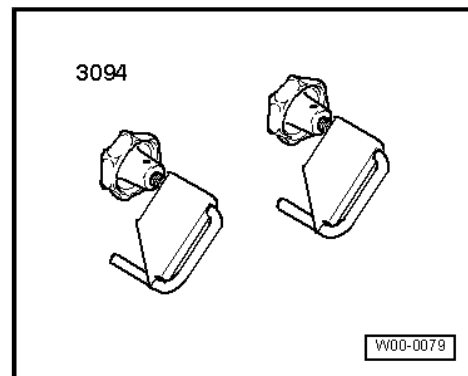
- Connect pipe/hose assembly or plastic pipe -B- to clutch slave cylinder -A- ⇒ [page 30](#).
- Lubricate end of plunger with MoS₂ grease.
- Install clutch slave cylinder and tighten bolts -arrows-. Tightening torque ⇒ [Item 19 \(page 29\)](#)
- Engage pipe/hose assembly in bracket -C-.
- Bleed clutch system ⇒ [page 35](#).
- Install battery tray and battery ⇒ [Rep. gr. 27](#)
- Install air cleaner housing ⇒ [Rep. gr. 24](#).



3.2 Removing and installing pipe/hose assembly or plastic pipe

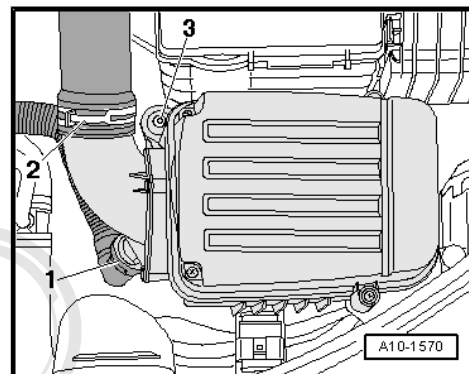
Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



Removing

- Remove complete air cleaner housing ⇒ Rep. gr. 24 .



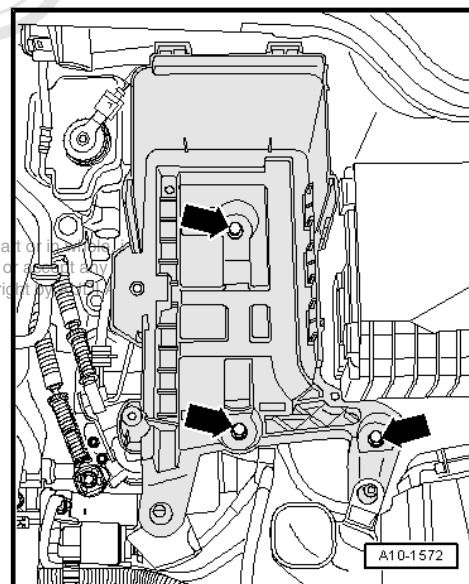
Caution

When disconnecting the battery there is a risk of serious damage to electronic components:

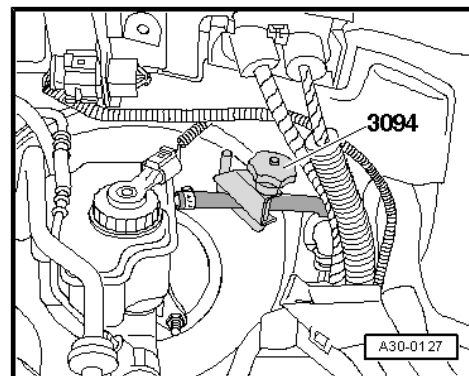
- ◆ *Observe the correct procedure for disconnecting the battery.*

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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.



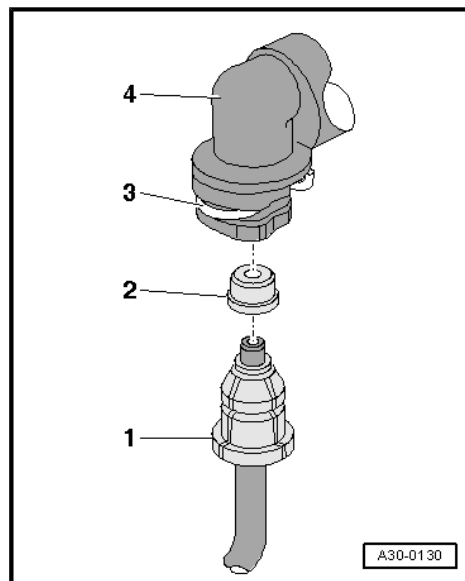


Note

◆ *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-.

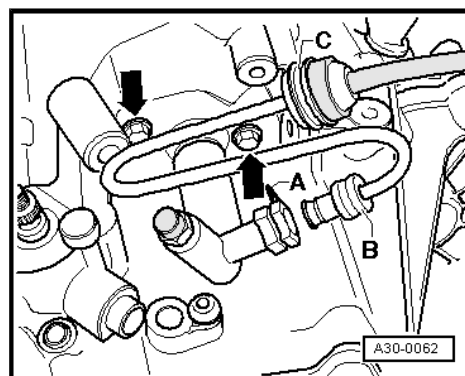


- Disengage pipe/hose assembly from bracket -C-.
- Release clip -A- at clutch slave cylinder with a screwdriver and disconnect pipe/hose assembly -B- or plastic pipe from connection.



Note

-Arrows- can be disregarded.



Installing

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



Note

◆ *Observe distinction between seals -2- and O-rings*

⇒ [page 29](#)

◆ *Renew damaged seals or O-rings.*

- Connect pipe/hose assembly or plastic pipe to clutch slave cylinder and master cylinder ⇒ [page 30](#) .
- Clip pipe/hose assembly into bracket.
- Bleed clutch system ⇒ [page 35](#) .
- Install battery tray and battery ⇒ Rep. gr. 27 .
- Install air cleaner housing ⇒ Rep. gr. 24 .



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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.*
- ◆ *Before bleeding clutch system, top up brake fluid reservoir to "max." marking with brake fluid.*

Special tools and workshop equipment required

- ◆ Brake filling and bleeding equipment - VAS 5234-

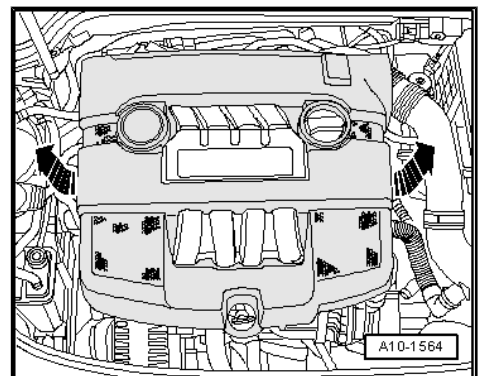
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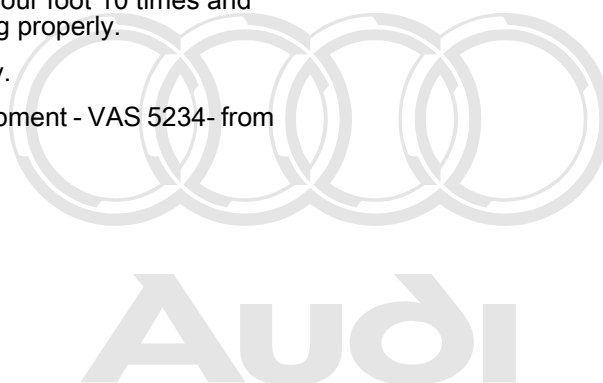
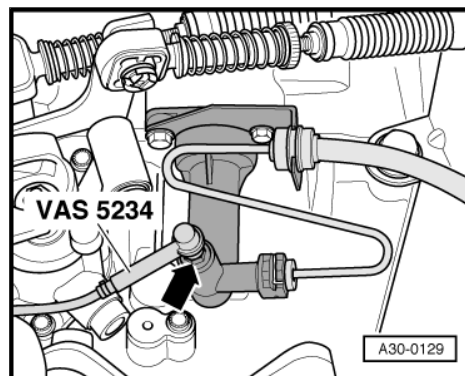
- ◆ Brake fluid specification ⇒ Rep. gr. 47 .

Procedure

- Pull clutch pedal back to its normal rest position.
- Remove engine cover panel -arrows-.



- 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 \(page 37\)](#)

4 - Clutch master cylinder

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

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 29](#)
- ☐ 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 18](#)

8 - Clutch pedal

9 - Nut

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

10 - Retainer

- ☐ Secured on body

11 - Pipe/hose assembly

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

12 - Bracket

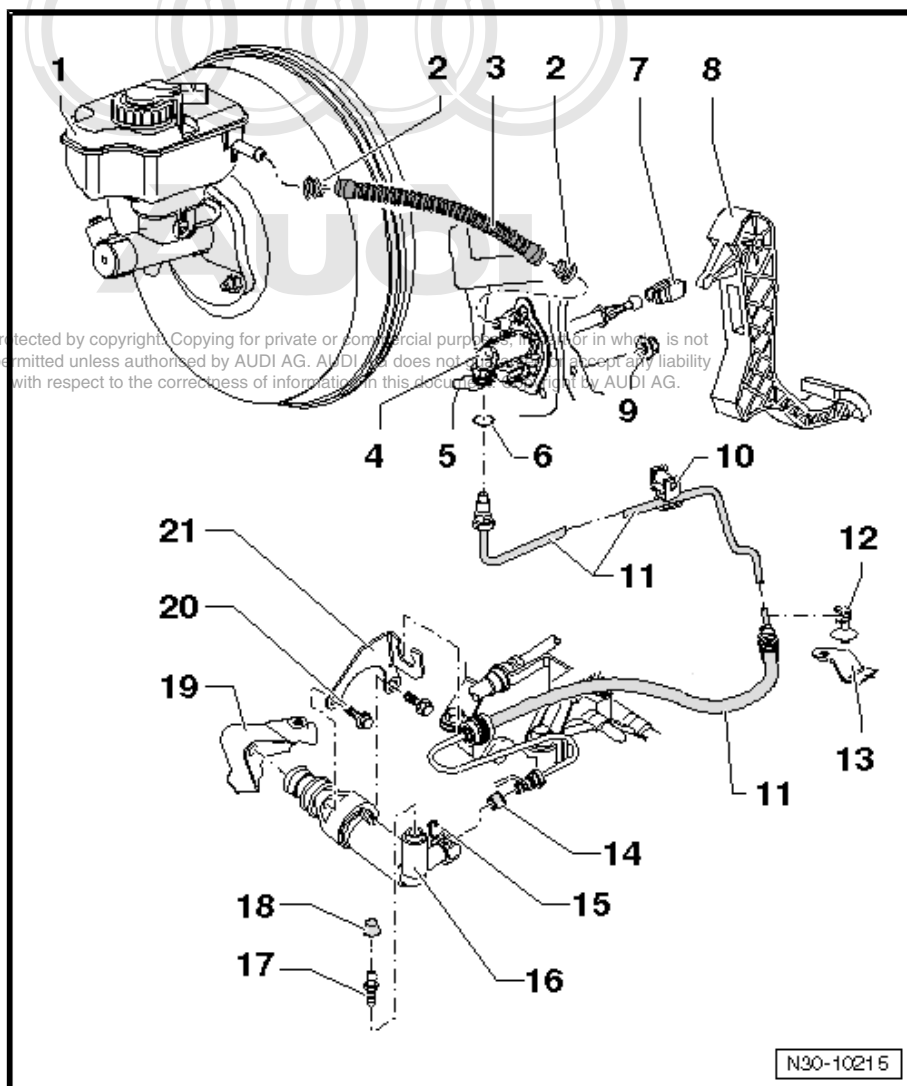
- ☐ Secured to bracket for ABS/EDL

13 - Bracket

- ☐ For ABS/EDL

14 - Seal or O-ring

- ☐ Matched to type of connection ⇒ [page 29](#)





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

15 - Clip

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

16 - Clutch slave cylinder

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

17 - Bleeder screw

- ☐ Bleeding clutch system ⇒ [page 35](#)
- ☐ 6 Nm

18 - Dust cap

19 - Gearbox

20 - Bolt

- ☐ 2x
- ☐ 20 Nm

21 - Bracket



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5 Exploded view - clutch release mechanism

1 - Release bearing

- ☐ Remove and install together with release lever ➔ [Item 3 \(page 39\)](#) and guide sleeve ➔ [Item 5 \(page 39\)](#) ➔ [page 40](#)
- ☐ 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 \(page 39\)](#) and guide sleeve ➔ [Item 5 \(page 39\)](#) ➔ [page 40](#)
- ☐ 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 \(page 39\)](#) and release lever ➔ [Item 3 \(page 39\)](#) ➔ [page 40](#)

6 - Input shaft oil seal

- ☐ Renewing ➔ [page 40](#)

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

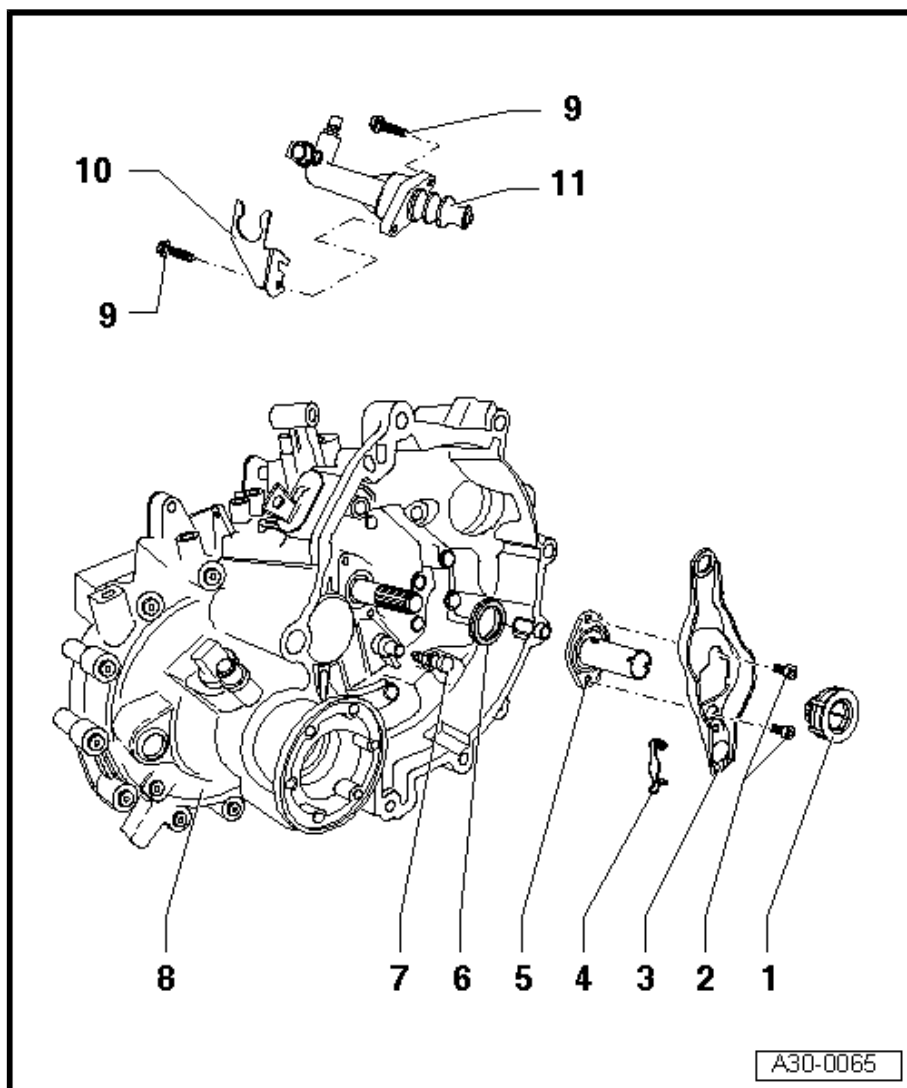
- ☐ Tightening torque ➔ [Item 19 \(page 29\)](#)

10 - Bracket

- ☐ For pipe/hose assembly

11 - Clutch slave cylinder

- ☐ Removing and installing ➔ [page 30](#)

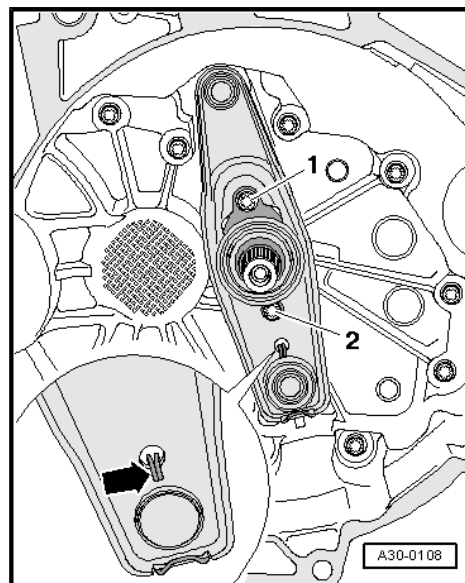


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5.1 Removing and installing clutch release bearing with release lever and guide sleeve

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-.

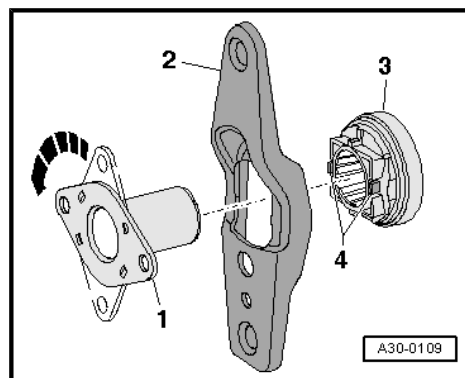
Installing

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



Note

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

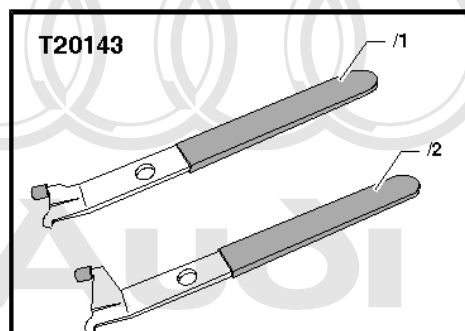


Tightening torque ⇒ [page 39](#)

5.2 Renewing input shaft oil seal

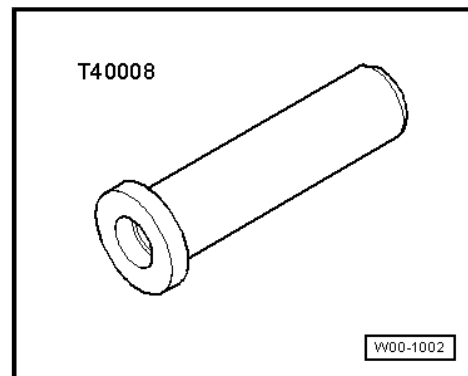
Special tools and workshop equipment required

- ♦ Extractor tool - T20143/1-



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◆ Thrust piece - T40008-



◆ Sealing grease - G 052 128 A1-

Procedure

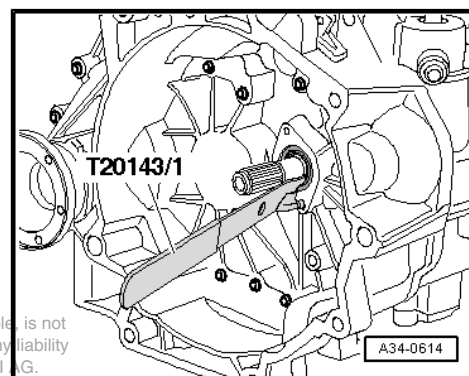
- Gearbox removed
- Remove release bearing ⇒ [page 40](#) .
- Pry out oil seal using extractor tool - T20143/1- .



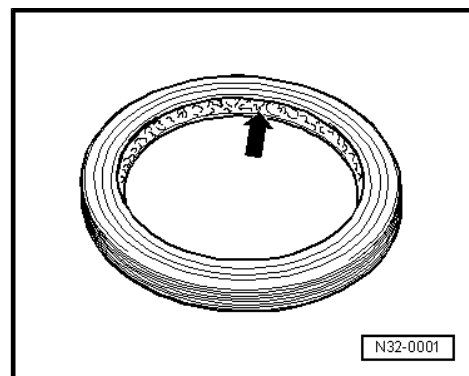
Note

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

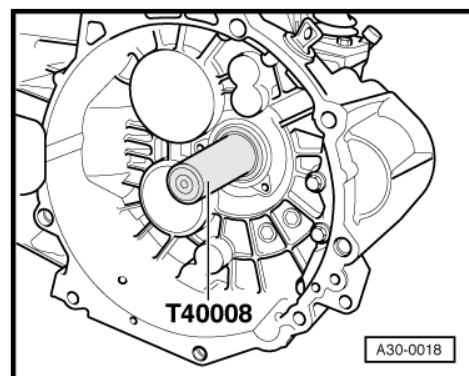
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- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .



- Drive in new oil seal onto stop (take care to keep oil seal straight).
- Install release bearing ⇒ [page 40](#) .



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

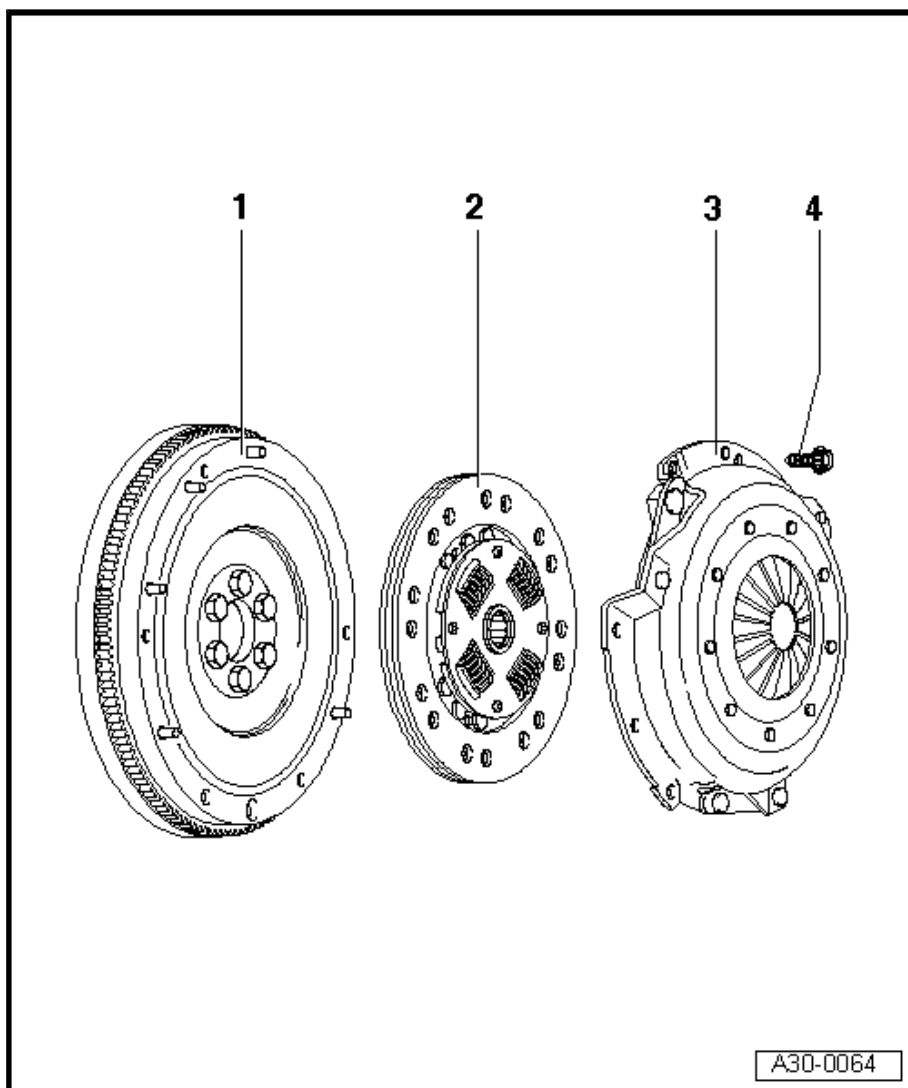
- ☐ For correct version, re-
fer to ⇒ Electronic parts
catalogue
- ☐ Removing and installing
⇒ [page 43](#)

3 - Pressure plate

- ☐ Removing and installing
⇒ [page 43](#)
- ☐ Checking ends of dia-
phragm spring
⇒ [page 42](#)
- ☐ Checking spring con-
nection and rivets
⇒ [page 43](#)

4 - Bolt

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



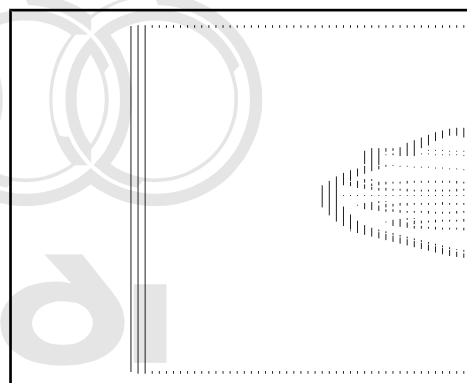
Checking ends of diaphragm spring

- Wear up to half the thickness of the diaphragm spring is per-
missible.



Note

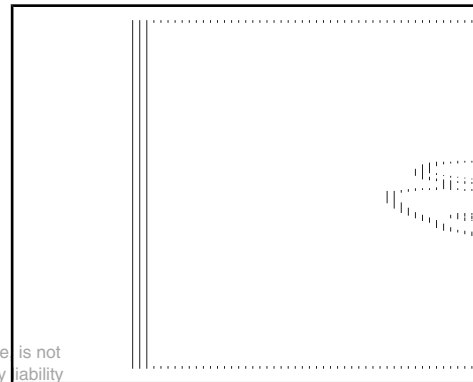
*When performing repairs always match up clutch pressure plate
and clutch plate by checking engine code ⇒ Electronic parts
catalogue .*



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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-.

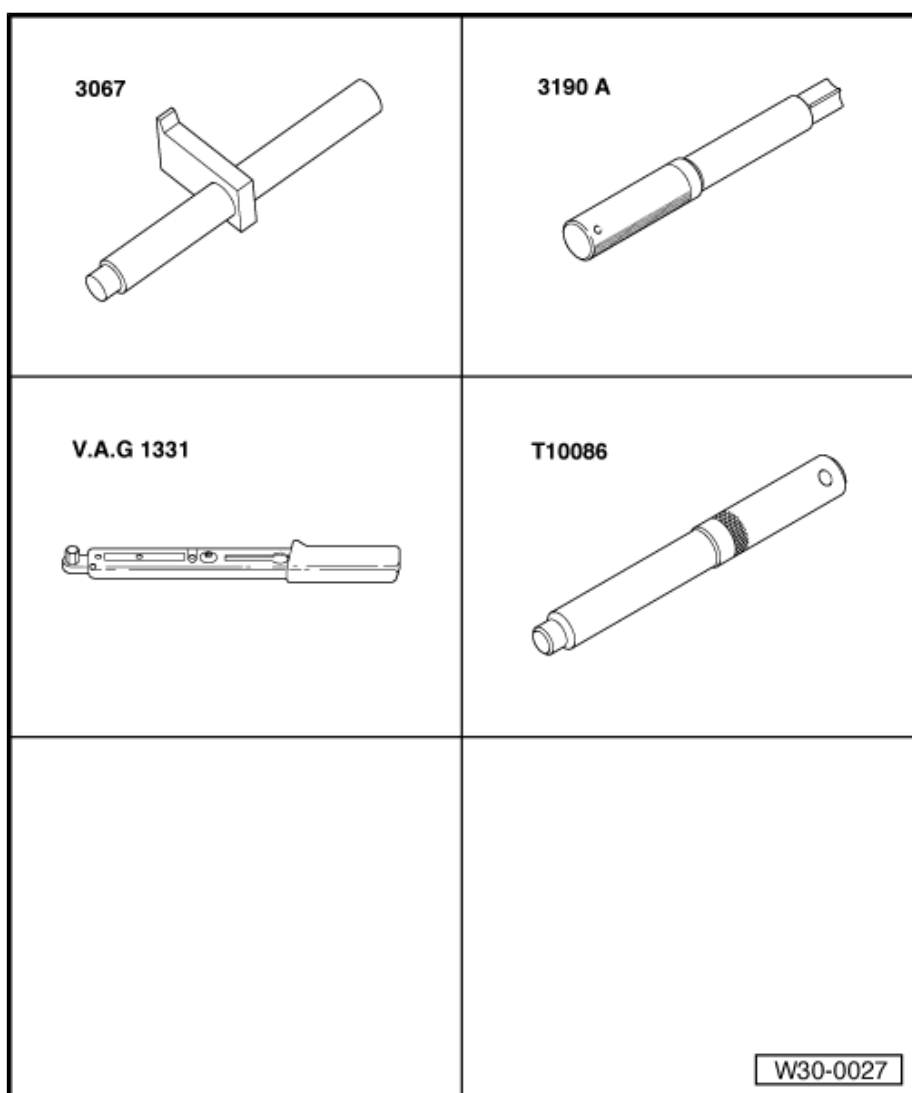


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6.1 Removing and installing clutch

Special tools and workshop equipment required

- ◆ 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 45](#) : 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.

Installing

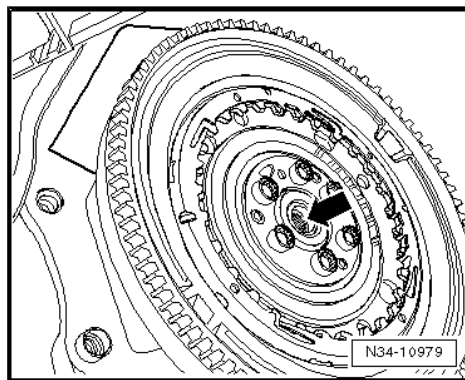
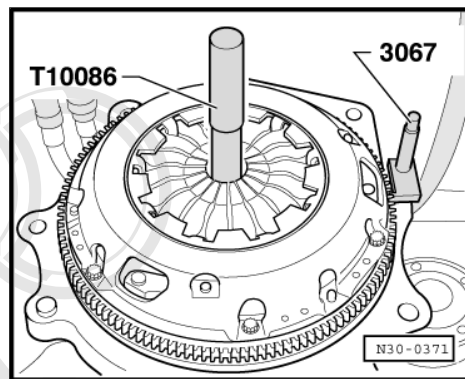
Installation is carried out in reverse sequence; note the following:



Note

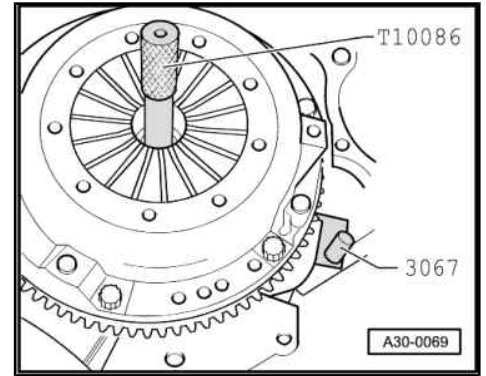
- ◆ *Renew clutch plate and pressure plate if riveted joints are damaged or loose.*
- ◆ *If the clutch has burnt out, thoroughly clean the clutch housing, flywheel and parts of the engine facing the gearbox in order to reduce the smell of burnt linings.*
- ◆ *Select the correct clutch plate and pressure plate according to engine code ⇒ Electronic parts catalogue .*
- ◆ *Clean input shaft splines and (in the case of used clutch plates) the hub splines. Remove corrosion and apply only a very thin coating of grease for clutch plate splines - G 000 100- to the splines. Then move clutch plate backwards and forwards on input shaft until hub moves freely on shaft. It is important to remove excess grease.*
- ◆ *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: spring cage faces pressure plate.*

For engines with smaller-diameter crankshaft -arrow- or engines with needle bearing -arrow- in crankshaft



Centralising clutch plate and removing and installing pressure plate on engines with smaller-diameter crankshaft or engines with needle bearing in crankshaft -arrow-

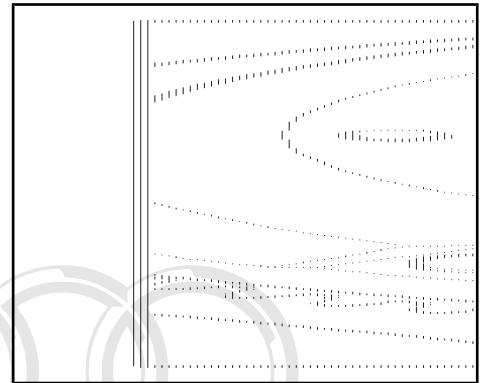
- Reverse position of counter-hold tool - 3067- when installing.
- Use centring mandrel - T10086- to centralise clutch plate.
- Tighten bolts in small steps and in diagonal sequence to avoid damaging centring holes in pressure plate and dowel pins on flywheel.



Engines without needle bearing or with larger-diameter crankshaft

- 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 ⇒ [Item 4 \(page 42\)](#)



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34 – Controls, housing

1 Overview - selector mechanism

Gear selection movement -black arrow-

Gate selection movement -white arrow-

1 - Gearbox selector lever

□ With damper weight

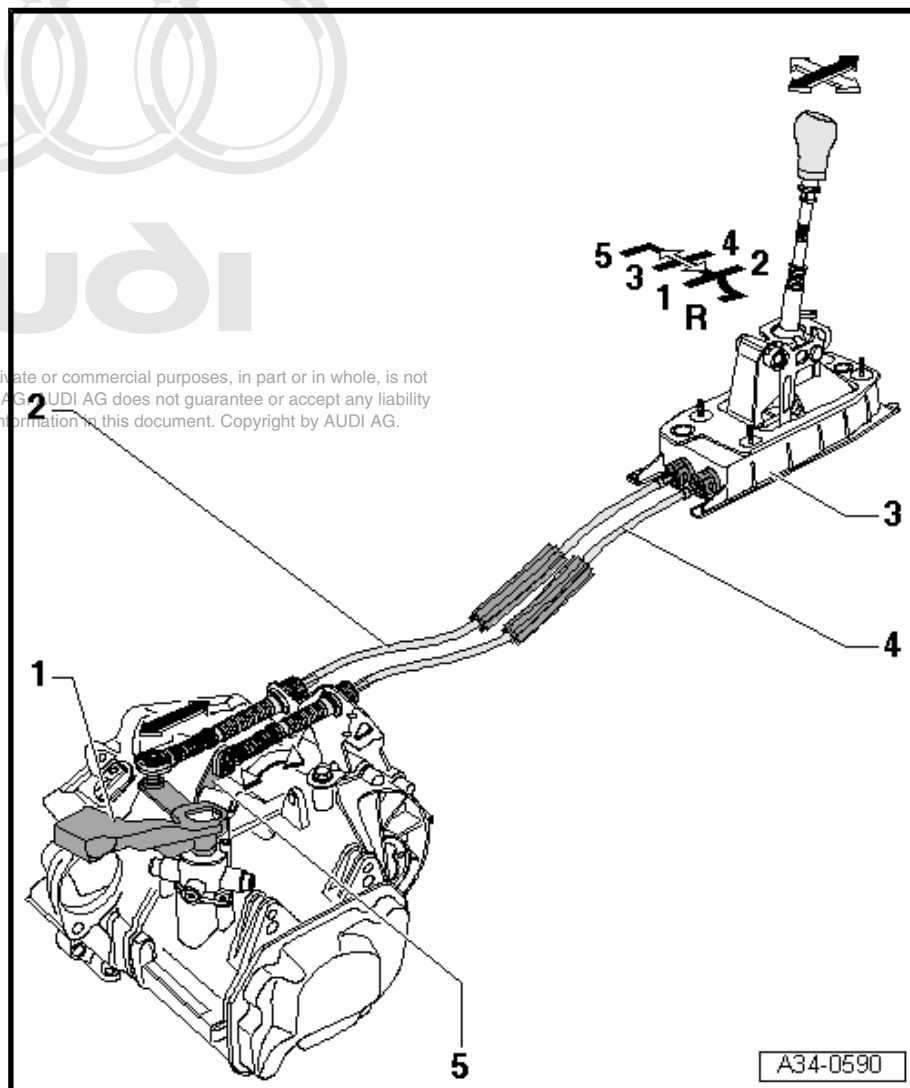
2 - Gear selector cable

3 - Selector mechanism

4 - Gate selector cable

5 - Gate relay lever

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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 47](#)

5 - Gear lever boot

- ☐ Remove and install together with gear knob ⇒ [page 47](#)

6 - Cover for centre console

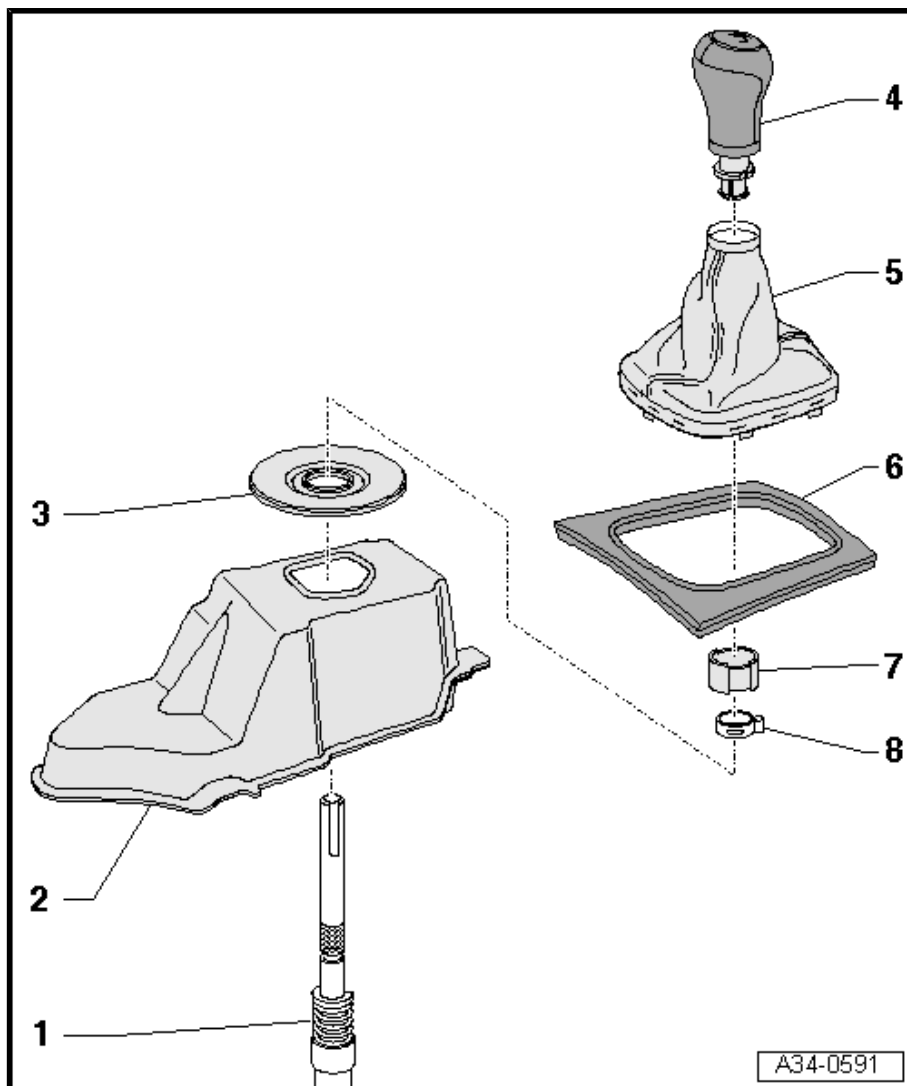
- ☐ Remove and install together with gear knob and gear lever boot ⇒ [page 47](#)

7 - Connecting piece

- ☐ Connects gear lever boot and gear knob

8 - Clip

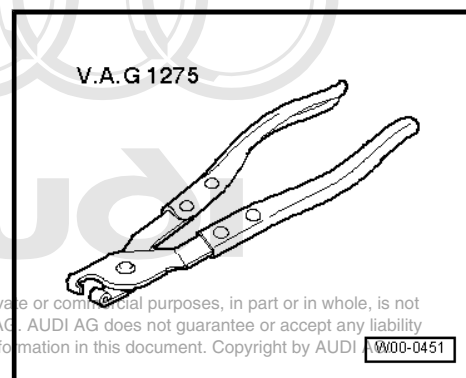
- ☐ Secures gear knob to gear lever
- ☐ Secure with hose clip pliers - V.A.G 1275-



1.2 Removing and installing gear knob with gear lever boot

Special tools and workshop equipment required

- ◆ Hose clip pliers - V.A.G 1275-



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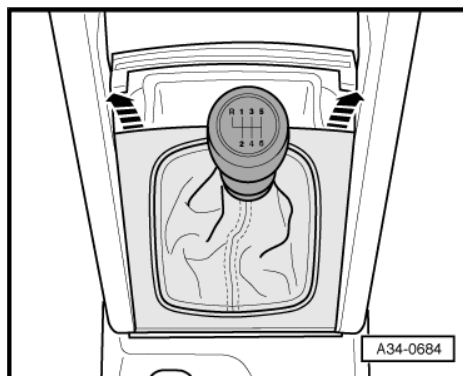
Removing



Note

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

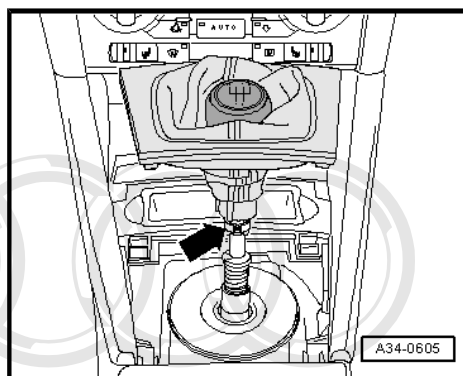
- Open ashtray (if fitted).
- Carefully pry gear lever boot off centre console -arrows-.
- Pull boot up and over gear knob.
- Open clip -arrow- and pull off gear knob together with boot.



Installing

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

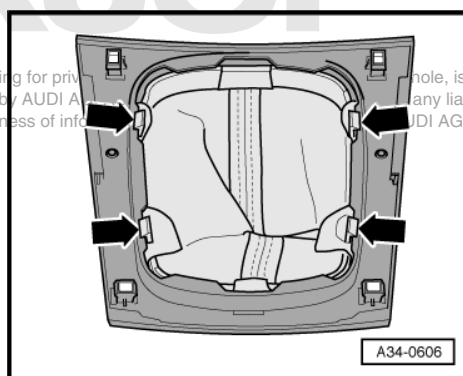
- Push gear knob together with boot onto gear lever as far as stop.
- Secure gear knob to gear lever with clip -arrow-, using hose clip pliers - V.A.G 1275- .



1.3 Separating gear lever boot from gear knob

Separating

- Remove gear knob together with gear lever boot ⇒ [page 47](#).
- Unclip frame of gear lever boot from centre console cover -arrows-.

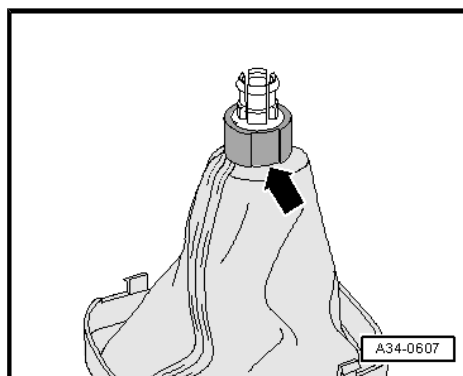


- Cut through the connecting piece with a sharp knife at the point marked -arrow-. Take care not to damage gear lever boot.
- Then bend out the connecting piece, open it apart and remove.

Assembling

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

- Fit gear lever boot on gear knob, using a new connecting piece -arrow-.
- Install gear knob together with boot ⇒ [page 47](#) .



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

-
- 13 14 15 16 17 18 19
- 12
- 11 10 9
- 8 7
- 6 5 4 3 2 1
- 20 21 22 23 24 25 26
- 27 28
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- A34-0589

⇒ [Item 26 \(page 50\)](#)

10 - Ball socket with damper

11 - Cover

12 - Bush

13 - Securing clip

- ☐ Removing and installing ⇒ [page 50](#)

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 51](#)

27 - Bolt

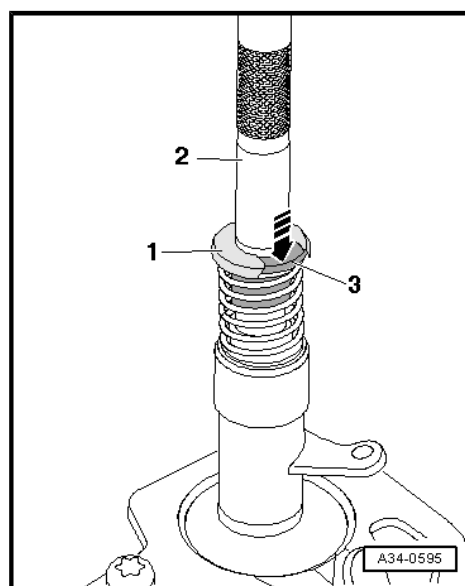
- ☐ 5 Nm

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-.



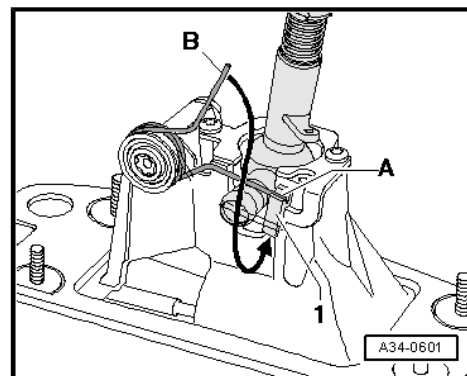
Installing spring

- 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 on 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 - Gear lever

- ☐ Can be removed and installed without removing gear lever guide
⇒ [Item 15 \(page 52\)](#)

4 - Damping washer

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

5 - Retaining clip

- ☐ Renew

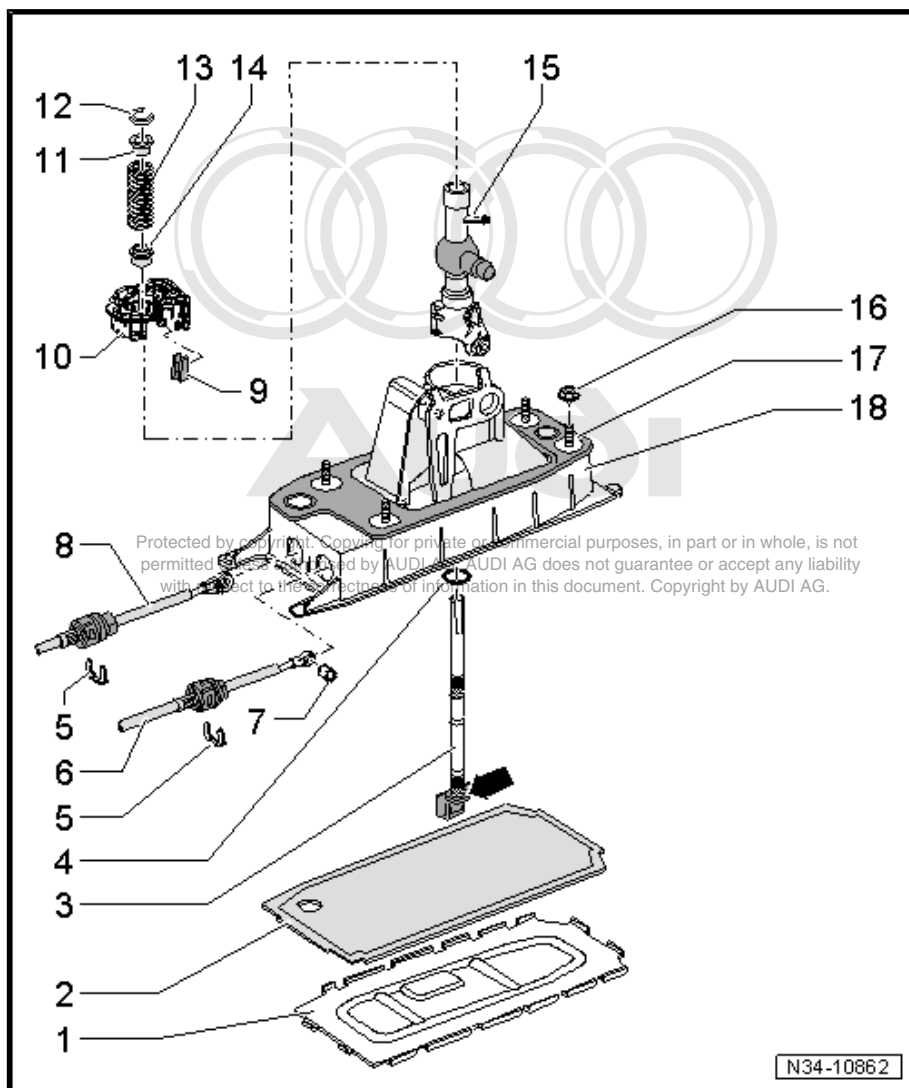
6 - Gate selector cable

- ☐ Lever off gate selector lever
- ☐ Press onto gate selector lever inside selector mechanism
- ☐ Installation position
⇒ [page 46](#)

7 - Bush

8 - Gear selector cable

- ☐ Lever off gear lever guide
- ☐ Press onto gear lever guide inside selector mechanism
- ☐ Installation position
⇒ [page 46](#)



9 - Damper**10 - Ball socket**

- ☐ Will be damaged during removal
- ☐ Renew

11 - Bush**12 - Securing clip**

- ☐ Removing and installing ⇒ [page 50](#)

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

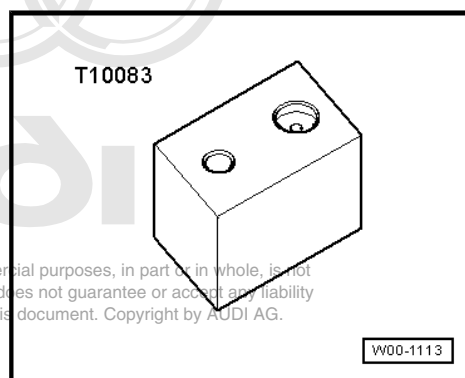
18 - Selector housing

- ☐ 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

Special tools and workshop equipment required

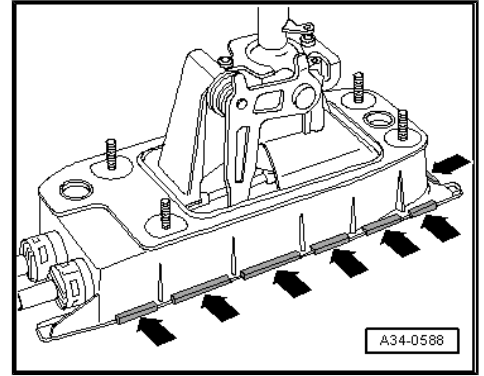
- ◆ Thrust block - T10083-



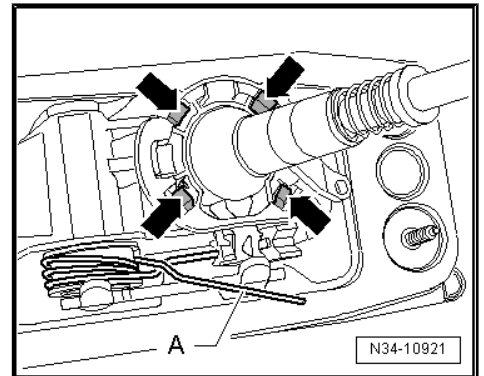
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Dismantling

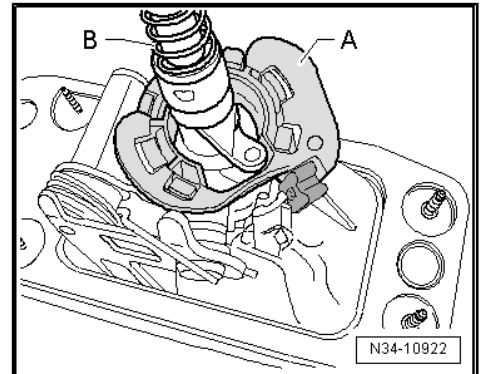
- Remove selector mechanism ⇒ [page 57](#)
- Using a screwdriver, bend open tabs -arrows- on all sides of floor plate and remove floor plate.
- Remove gasket from selector housing.
- Remove gear selector cable and gate selector cable from selector housing ⇒ [page 51](#).



- 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.



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Note

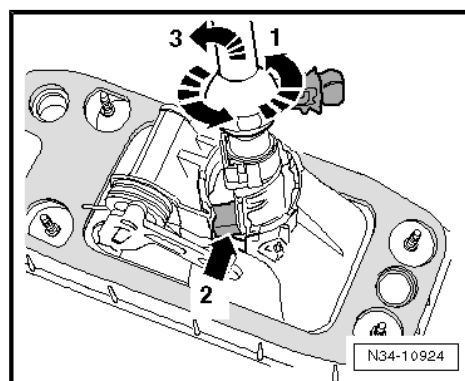
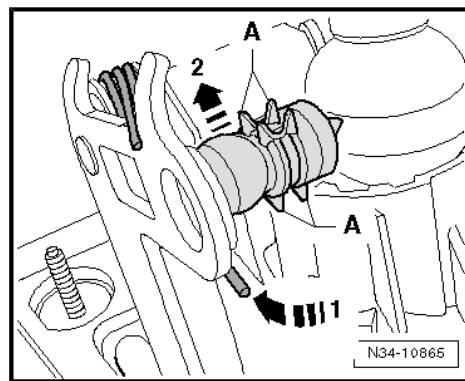
- ◆ Note guides -A- when performing the following steps.
- ◆ They must not break off.
- Swivel bottom spring arm -arrow 1- onto stop on shoulder of gate selector lever.



Caution

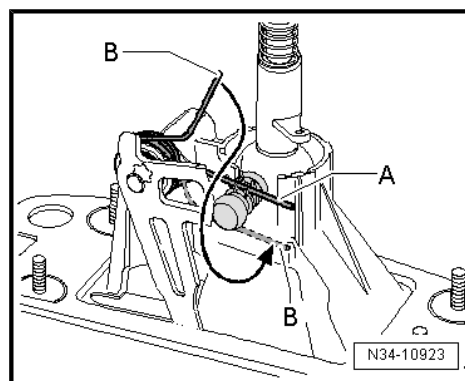
During the following steps, the bottom spring arm (-arrow 1-) can become dislodged and snap downwards off the shoulder of the gate selector lever.

- 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.

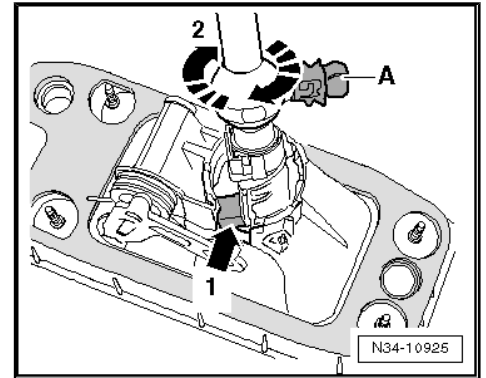


Assembling selector mechanism

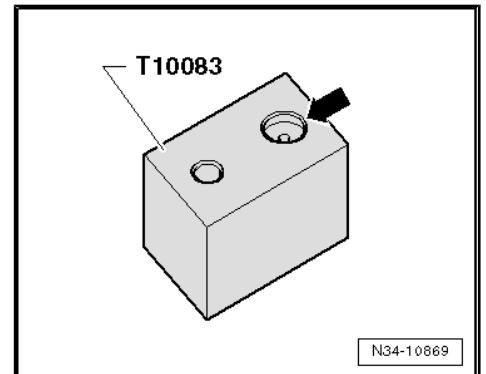
- Release spring arms -A- and -B-.
- Spring arms -A- and -B- must point in opposite directions. (Shown here with gear lever guide installed.)



- 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.



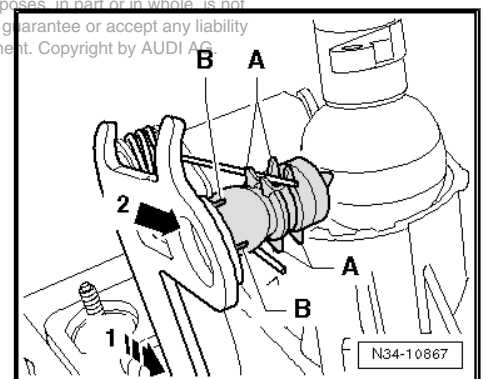
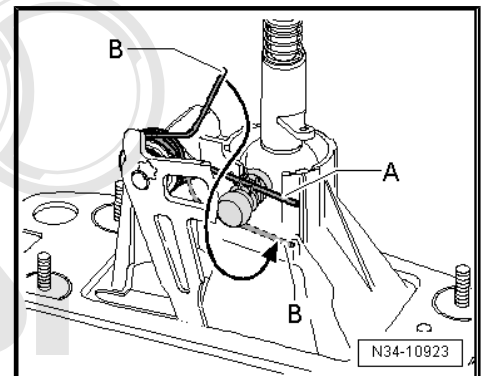
- Insert arm -A- of spring in guide from above.
- Pull arm -B- of spring downwards and insert it next to the guide (towards ball head).



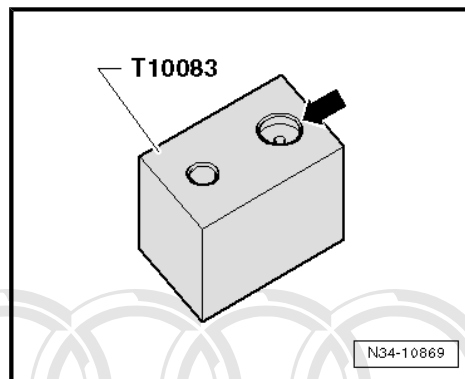
Note

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

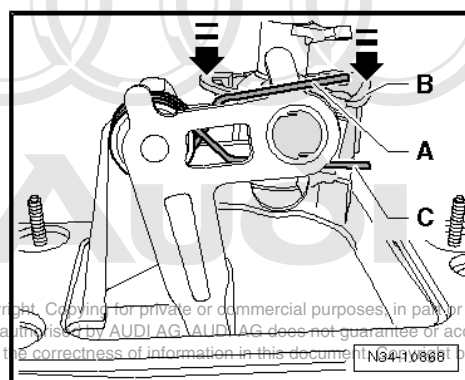
- Carefully take selector housing off thrust block - T10083- together with gear lever guide.
- Move gate selector lever rearwards as far as stop in direction of -arrow 1-.
- Grease ball-head pin.
- Press ball-head pin into hole in gate selector lever -arrow 2-.
- Guides -A- and tabs -B- must not be damaged.



- 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.

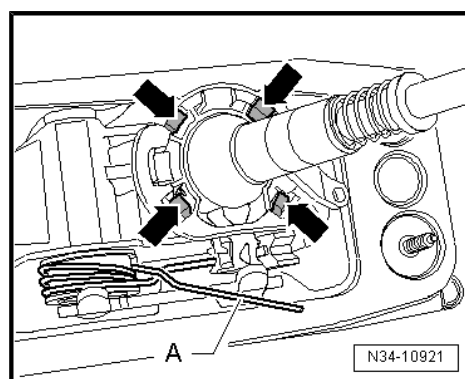


- Lift top spring arm -A- over pin on gate selector lever.
- Use a new ball socket -B-.
- Grease ball socket and ball of gear lever guide.
- Press ball socket onto ball of gear lever guide as far as stop.
- Remove selector housing from thrust block - T10083- .
- Press ball socket into selector housing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



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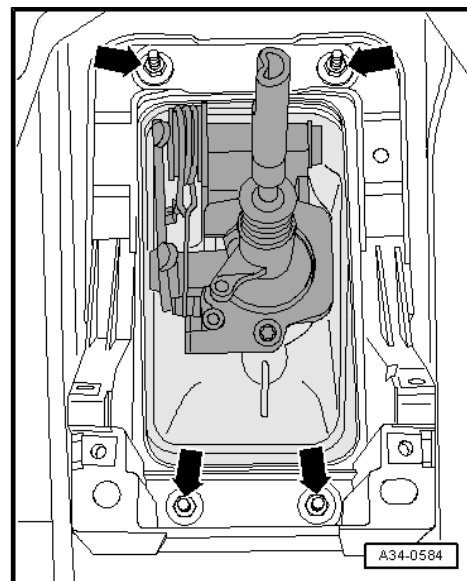
- All four lugs -arrows- must engage.
- Lift top spring arm -A- over pin on gate selector lever into guide.
- Insert bottom spring arm into guide.
- Fit gear lever, gear selector cable, gate selector cable and floor plate.
- Install selector mechanism ⇒ [page 61](#) .



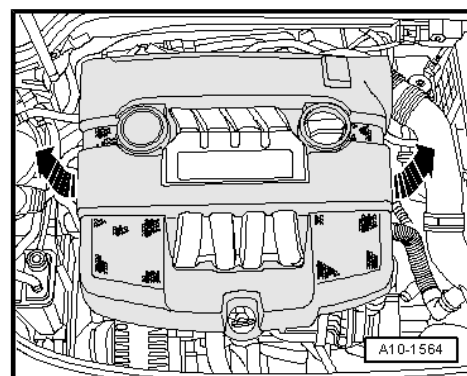
1.7 Removing and installing selector mechanism

Removing

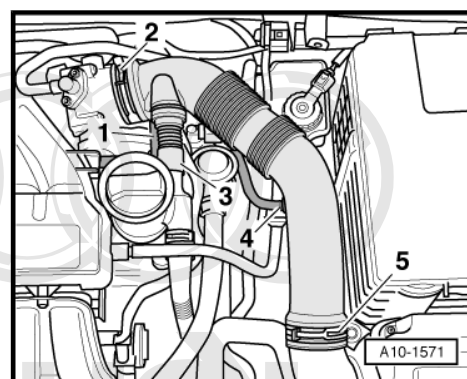
- Remove gear knob together with gear lever boot ⇒ [page 47](#) .
- Remove ashtray or storage compartment in front centre console ⇒ Rep. gr. 68 .
- Lift out noise insulation above selector mechanism.
- Remove nuts -arrows-.



- Remove engine cover panel -arrows-.



- Disconnect hoses -1-, -3- and -4-.
- Release spring clips -2- and -5-, and remove air intake hose.



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- Remove air cleaner housing completely ⇒ Rep. gr. 24 .



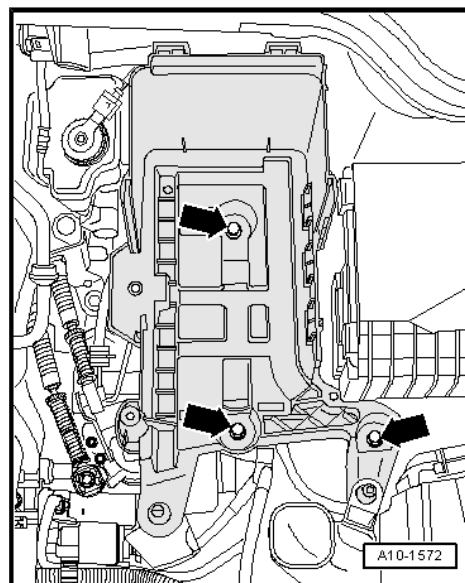
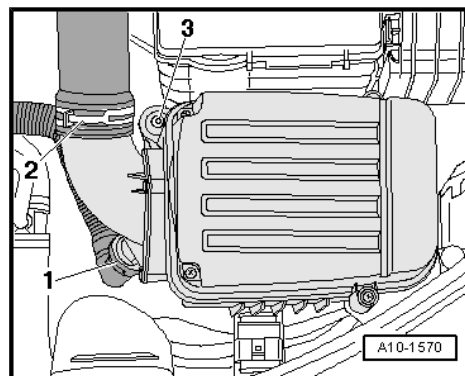
Caution

When disconnecting the battery there is a risk of serious damage to electronic components:

- ◆ *Observe the correct procedure for disconnecting the battery.*

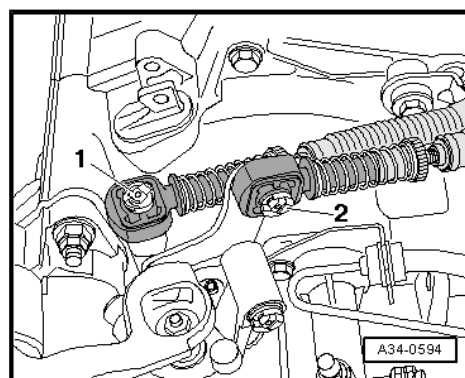
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- Remove battery ⇒ Rep. gr. 27 .
- Remove battery tray -arrows- (detach front of battery tray from air duct if applicable).



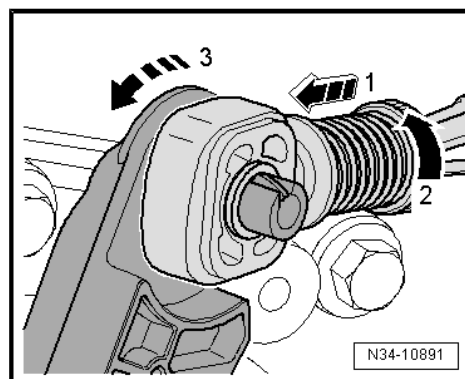
Metal gate relay lever:

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



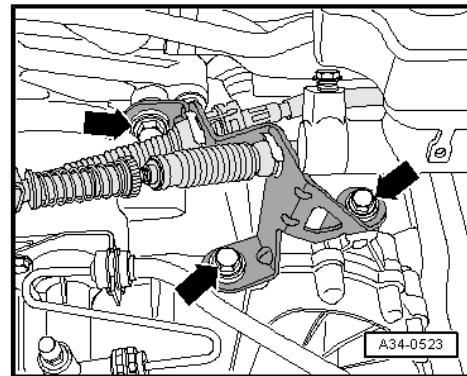
Plastic gate relay lever:

- 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 70](#) .

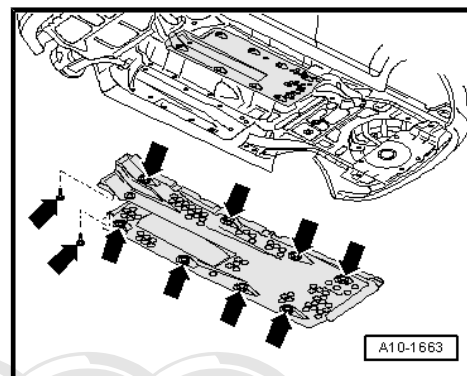


Continued for all vehicles:

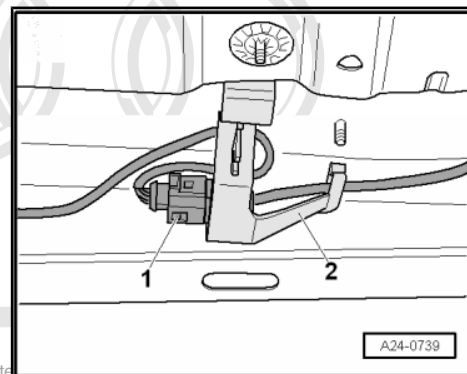
- Detach cable support bracket from gearbox -arrows-.



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



- Detach electrical connector -1-.
- Detach plug connector from bracket -2- and move clear wiring to Lambda probe after catalytic converter - G130- .



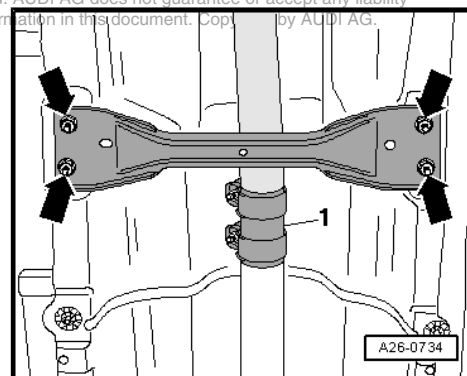
- Remove front cross member on underbody -arrows-.



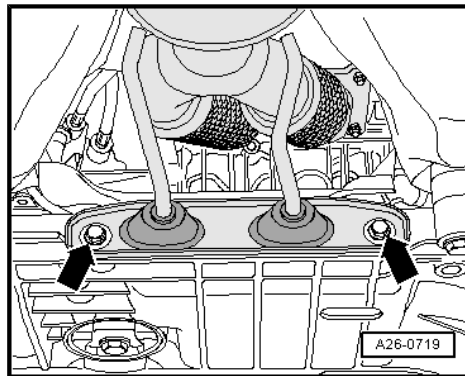
Note

To prevent damage, the flexible couplings in the front exhaust pipe must not be bent further than 10°.

- Disconnect exhaust system at clamp -1-.



- Unbolt support bracket for exhaust system -arrows-.
- Tie up front exhaust pipe on underbody.



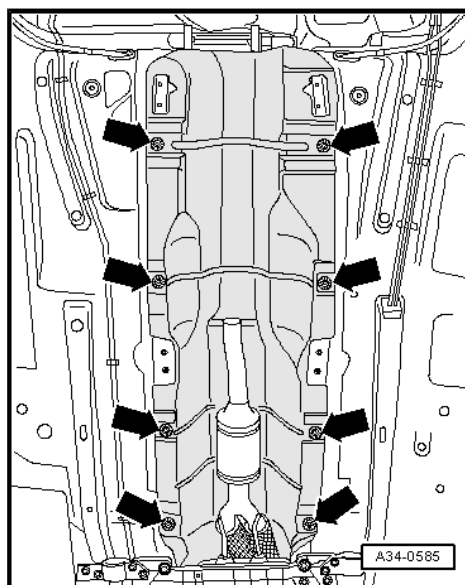
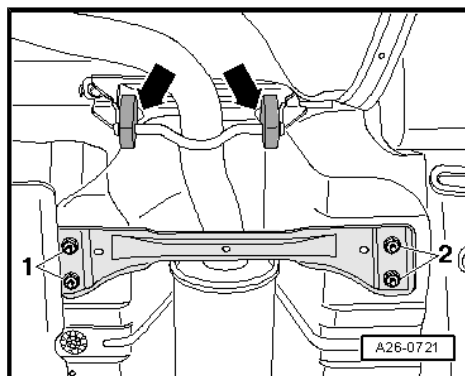
- Remove rear cross member on underbody -nuts 1 and 2-.



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.

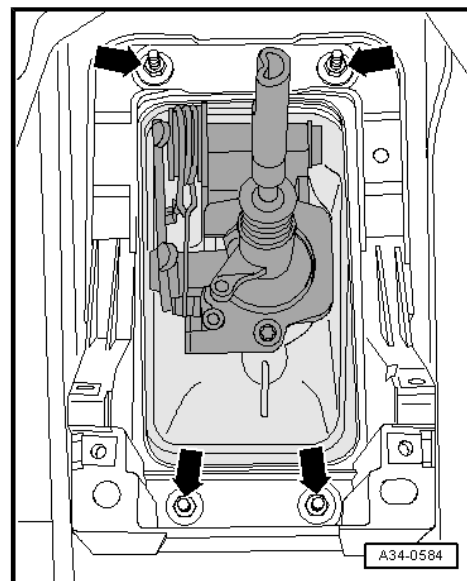


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Installing

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

- Install selector mechanism and tighten nuts -arrows-. Tightening torque [⇒ Item 20 \(page 50\)](#)

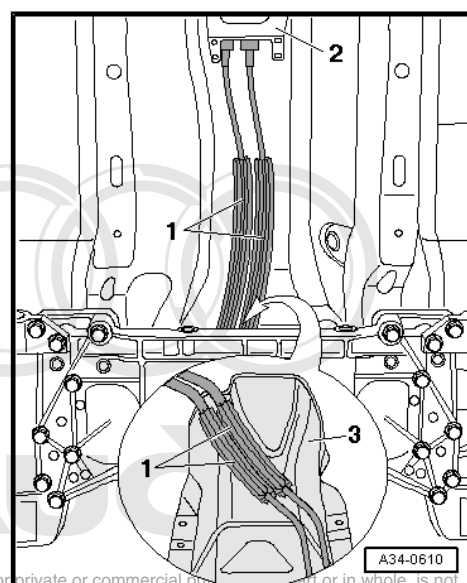


- Route cables -1- from selector mechanism -2- to gearbox as follows:
 - The cables must run parallel and must not be crossed.
 - The cables must be routed in the slot provided in heat shield -3-.



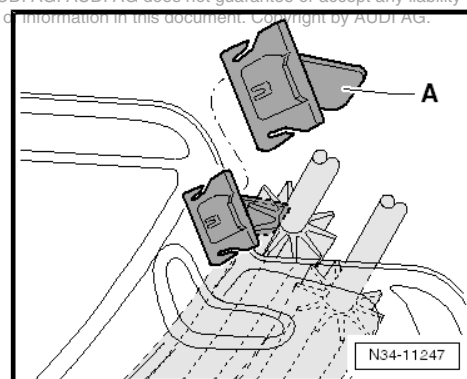
Note

The enlargement shows the heat shield from above.



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



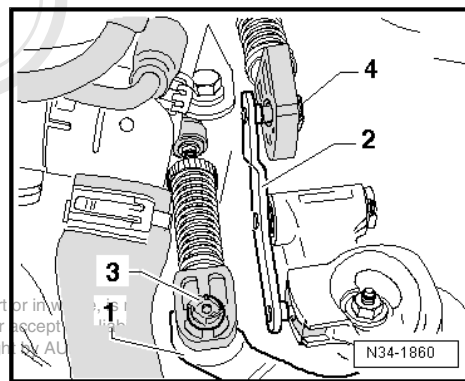
- Apply a small quantity of grease - G 000 450 02- to pins -arrow- of gearbox selector lever -1-.
- Push gear selector cable onto pin and secure with securing clip -3-.

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-.

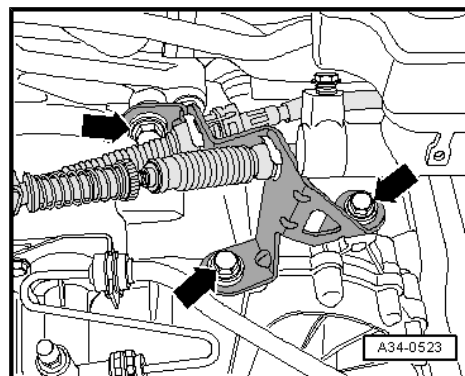
Plastic gate relay lever -2-:

- Insert gate selector cable in cable end-piece.



Continued for all vehicles:

- Attach cable support bracket to gearbox -arrows-. Tightening torque ⇒ [Item 6 \(page 63\)](#) or ⇒ [Item 16 \(page 67\)](#) .
- Adjust selector mechanism ⇒ [page 72](#) .
- Install noise insulation above selector mechanism.
- Install ashtray in front section of centre console ⇒ Rep. gr. 68 .
- Install gear knob together with boot ⇒ [page 47](#) .
- 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 .
- Install air cleaner housing ⇒ Rep. gr. 24 .



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



Note

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

1 - Gear selector cable

- ☐ Removing and installing
⇒ [page 71](#)
- ☐ Adjusting ⇒ [page 72](#)

2 - Gate selector cable

- ☐ Removing and installing
⇒ [page 71](#)
- ☐ Adjusting ⇒ [page 72](#)

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 71](#)

11 - Cable end-piece

- ☐ Secures gear selector cable to gearbox selector lever
- ☐ Release to adjust selector mechanism
⇒ [page 71](#)

12 - Securing clip

- ☐ Renew

13 - Securing clip

- ☐ Renew

14 - Bush

15 - Gate relay lever

- ☐ Installation position ⇒ [page 65](#)
- ☐ After installing, adjust selector mechanism ⇒ [page 72](#)

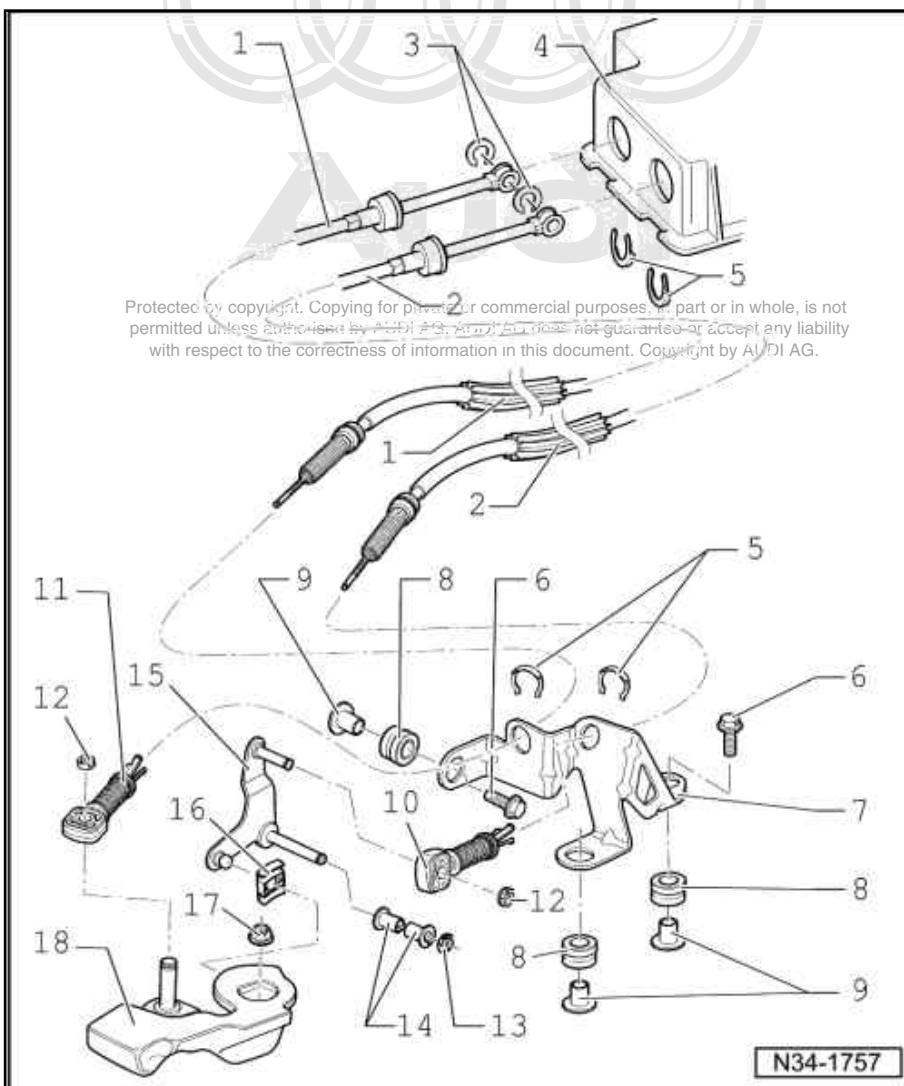
16 - Slide block

17 - Nut

- ☐ Self-locking
- ☐ Renew
- ☐ 23 Nm

18 - Gearbox selector lever

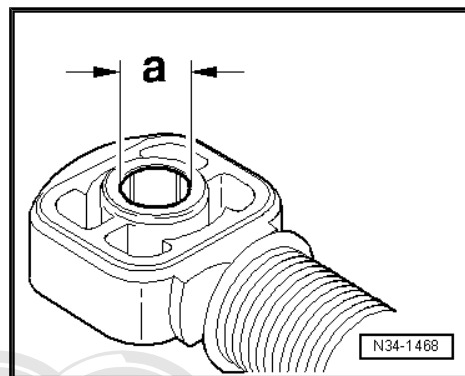
- ☐ Installing ⇒ [page 64](#)



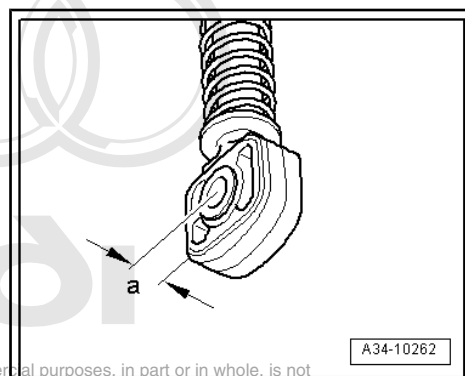
Identification of cable end-pieces

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



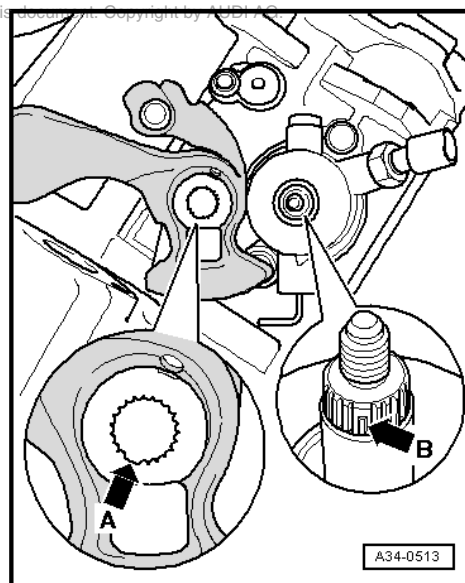
Cable end-piece for:	Dimension "a"
Gear selector cable to gearbox selector lever	20 mm
Gate selector cable to gate relay lever	18.5 mm



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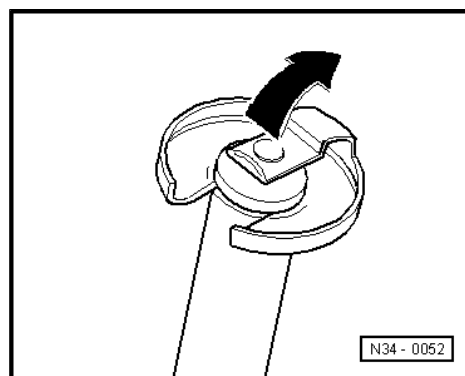
Installing gearbox selector lever

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



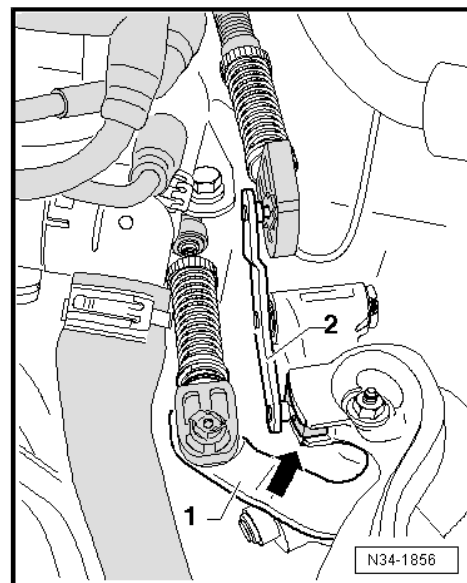
Removing securing clip from gate relay lever

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



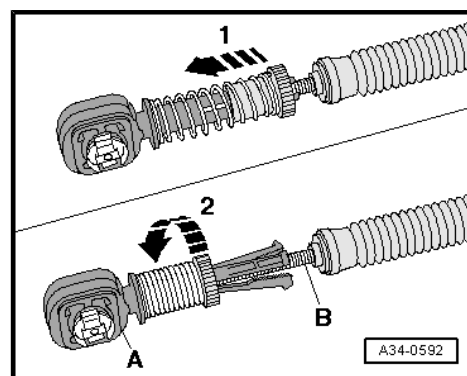
Installation position: gearbox selector lever/gate relay lever

- 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



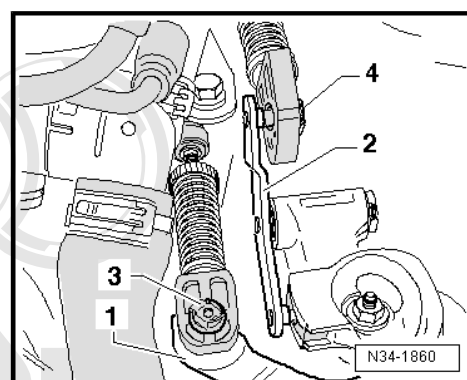
Note

- ◆ *Renew securing clips.*

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- ◆ *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-.



1.9 Exploded view - gear selector cable and gate selector cable 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 68](#)
- ☐ Detaching and securing gate relay lever (with detent catch) at gearbox selector lever ⇒ [page 69](#)
- ☐ Detaching and securing gate relay lever (with clip) at gearbox selector lever ⇒ [page 70](#)

4 - Cable end-piece

- ☐ Secures gate selector cable to gate relay lever
- ☐ Allocation ⇒ [page 67](#)
- ☐ Detaching from gate selector cable ⇒ [page 68](#)

5 - Gearbox selector lever

- ☐ With damper weight
- ☐ Fitting ⇒ [page 68](#)
- ☐ Installation position ⇒ [page 68](#)
- ☐ After installing, adjust selector mechanism ⇒ [page 72](#)

6 - Nut

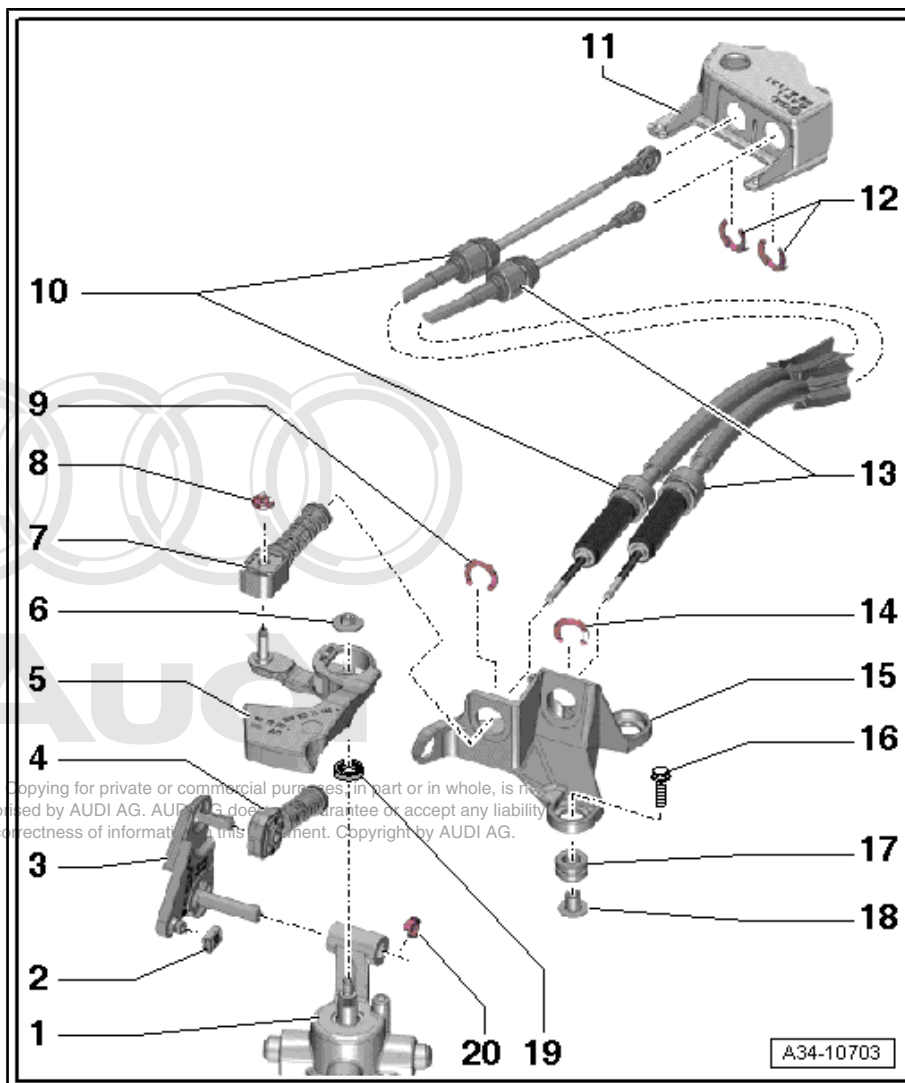
- ☐ Self-locking
- ☐ Renew
- ☐ 23 Nm

7 - Cable end-piece

- ☐ Secures gear selector cable to gearbox selector lever
- ☐ Allocation ⇒ [page 67](#)
- ☐ Detaching from gear selector cable ⇒ [page 68](#)

8 - Securing clip

- ☐ Removing ⇒ [page 69](#)
- ☐ Renew



9 - Retaining clip

- ☐ Renew

10 - Gear selector cable

- ☐ Detaching and securing at gearbox selector lever ➔ [page 69](#)
- ☐ Removing and installing ➔ [page 71](#)
- ☐ Adjusting ➔ [page 72](#)

11 - Selector housing

12 - Retaining clips

- ☐ Renew

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13 - Gate selector cable

- ☐ Removing and installing ➔ [page 71](#)
- ☐ Adjusting ➔ [page 72](#)

14 - Retaining clip

- ☐ Renew

15 - Cable support bracket

16 - Bolt

- ☐ 20 Nm

17 - Grommet

18 - Bush

19 - Oil seal

- ☐ Renewing ➔ [page 127](#)

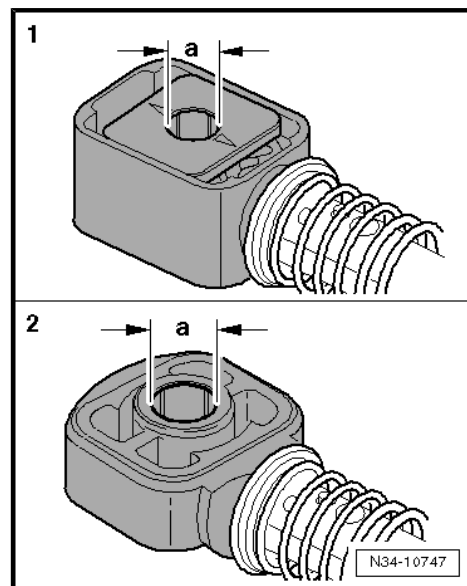
20 - Clip

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

Identification of cable end-pieces

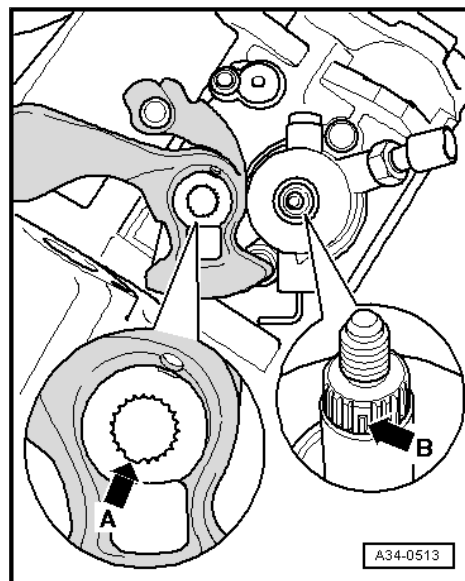
The holes in the cable end-pieces have different diameters.

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



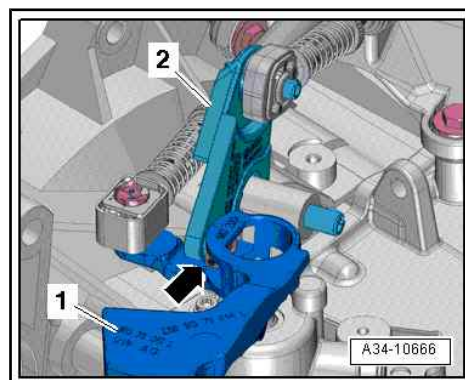
Installing gearbox selector lever

- 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.



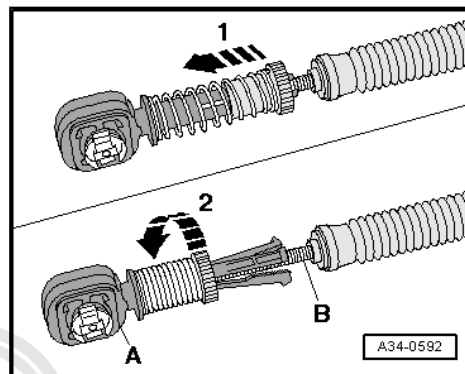
Installation position: gearbox selector lever/gate relay lever

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



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

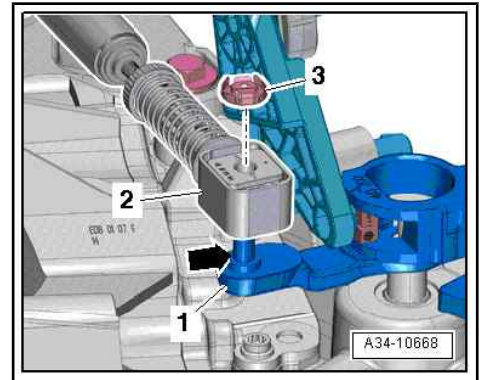
- Lift up tab and detach securing clip -3- for gear selector cable from gearbox selector lever -1-.
- Pull gear selector cable -2- off pin -arrow-.

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.

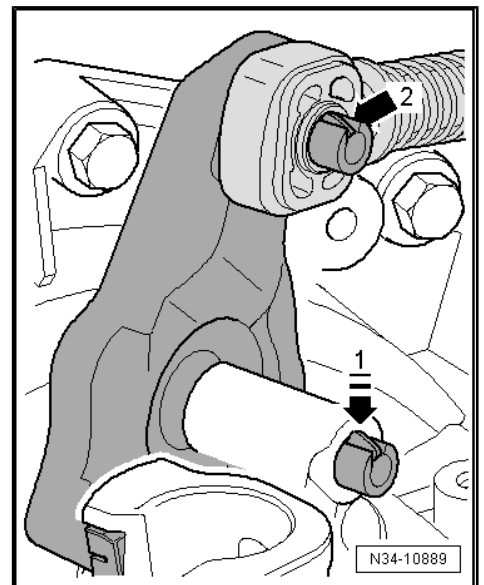
Securing



Note

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

- Press cable end-piece onto gate relay lever ⇒ [page 70](#) .
- 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.



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

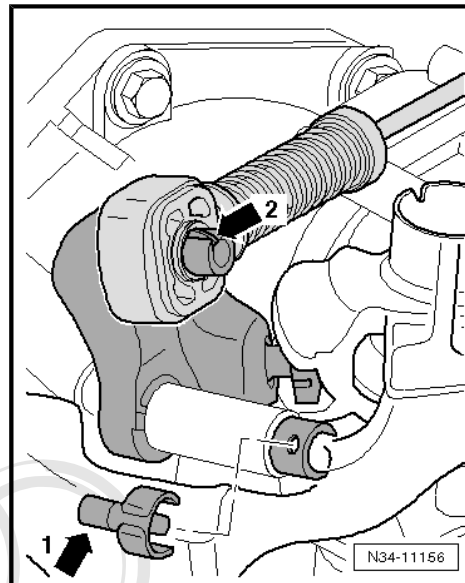
Lubricate all bearings and moving surfaces with grease - G 000 450 02- .

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



Note

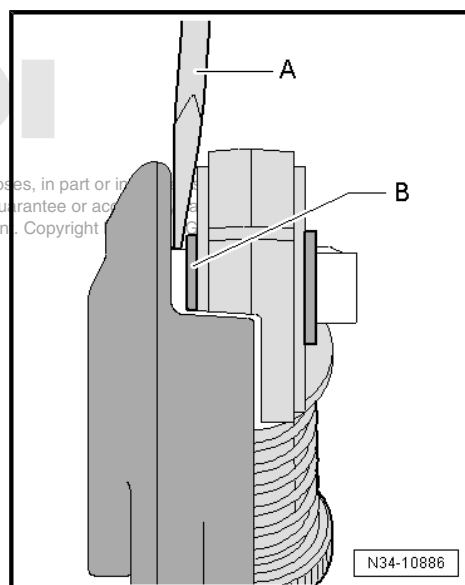
-Arrow 2- can be disregarded.



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

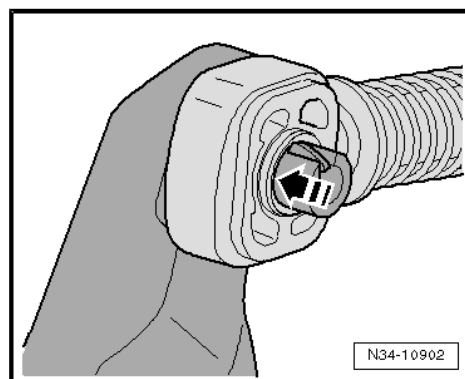
- Gate relay lever removed
- Apply plain slot screwdriver -A- between bush -B- and gate relay lever.

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

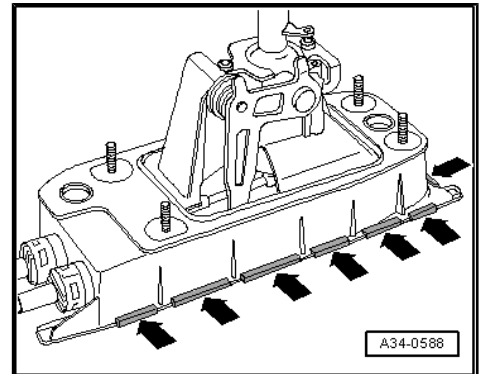
- Gate relay lever removed
- Press on cable end-piece only at bush -arrow-.
- Cable end-piece must move freely on gate relay lever.
- Cable end-piece must be behind detent.
- Ensure that components engage securely.



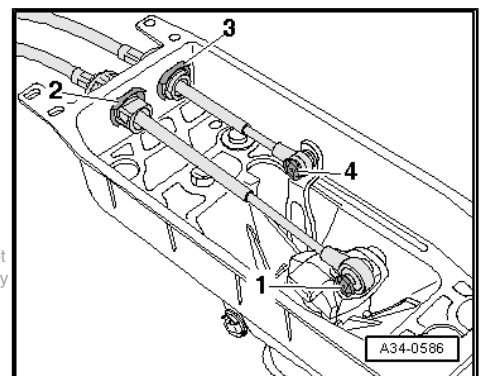
1.10 Removing and installing gear selector cable and gate selector cable

Removing

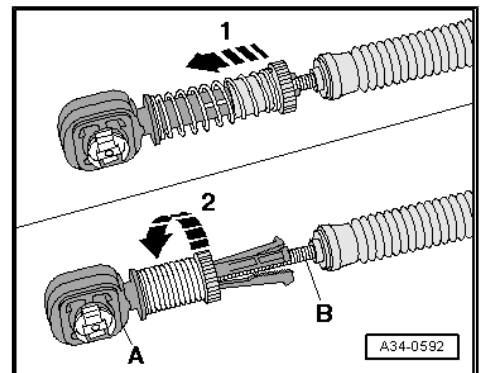
- Remove selector mechanism ➔ [page 57](#)
- Using a screwdriver, bend open tabs -arrows- for selector mechanism on floor plate and remove floor plate.
- Remove gasket.



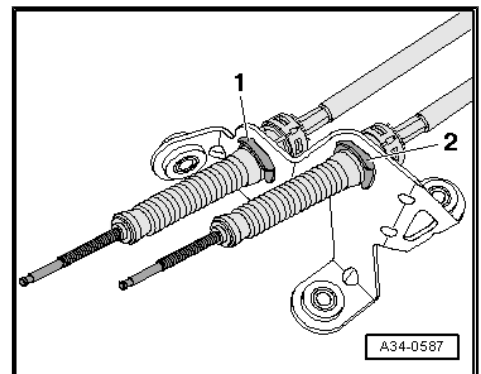
- Take off securing clips -1 ... 4- and detach gear selector cable and gate selector cable from selector housing.



- 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.

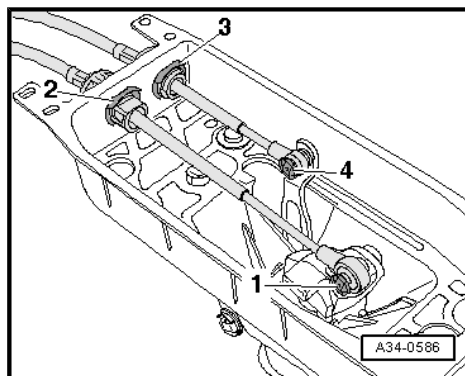


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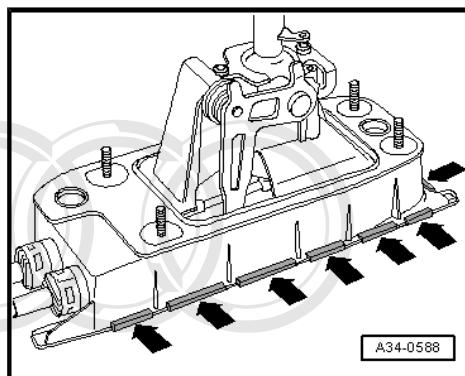
Installing

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 61](#) .
- Adjust selector mechanism ⇒ [page 72](#) .



1.11 Adjusting selector mechanism

Special tools and workshop equipment required

- ◆ Locking pin - T10027A-

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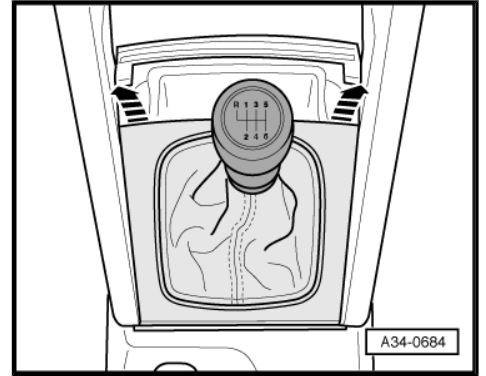


Requirements for adjustment

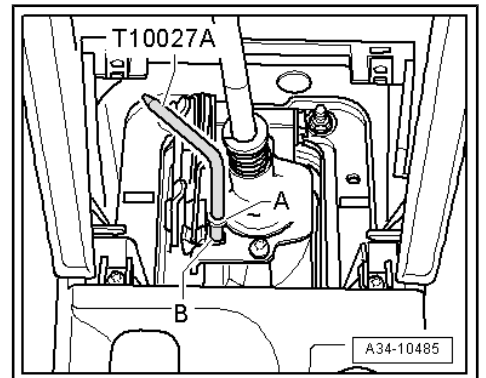
- Gear selector linkage must be in proper condition and undamaged.
- Selector mechanism must move freely.
- Gearbox, clutch and clutch mechanism must be in proper condition.
- Gearbox in neutral.

Adjusting

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



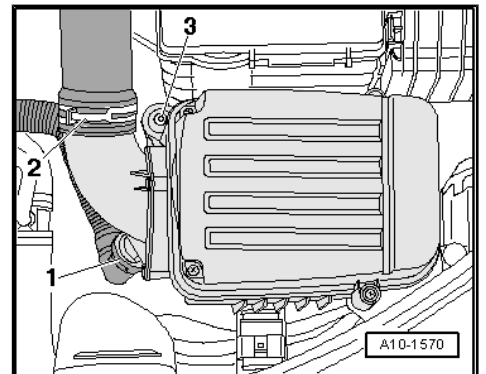
- Pull noise insulation slightly to one side.
- Lock gear lever in position with locking pin - T10027A- .



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

- Remove air cleaner housing completely ⇒ Rep. gr. 24 .

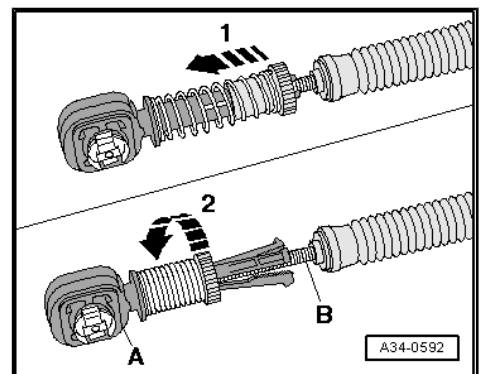


Release cable end-pieces for gate selector cable and gear selector cable as follows:

- 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.

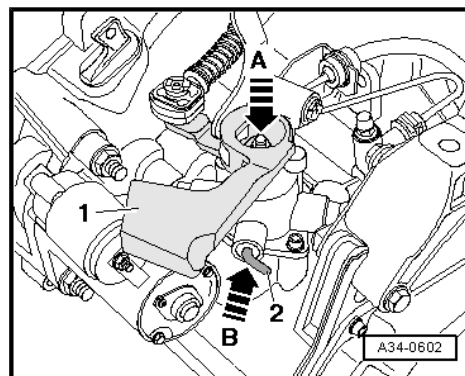


- Gearbox in neutral.

Lock the 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.



- 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:

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

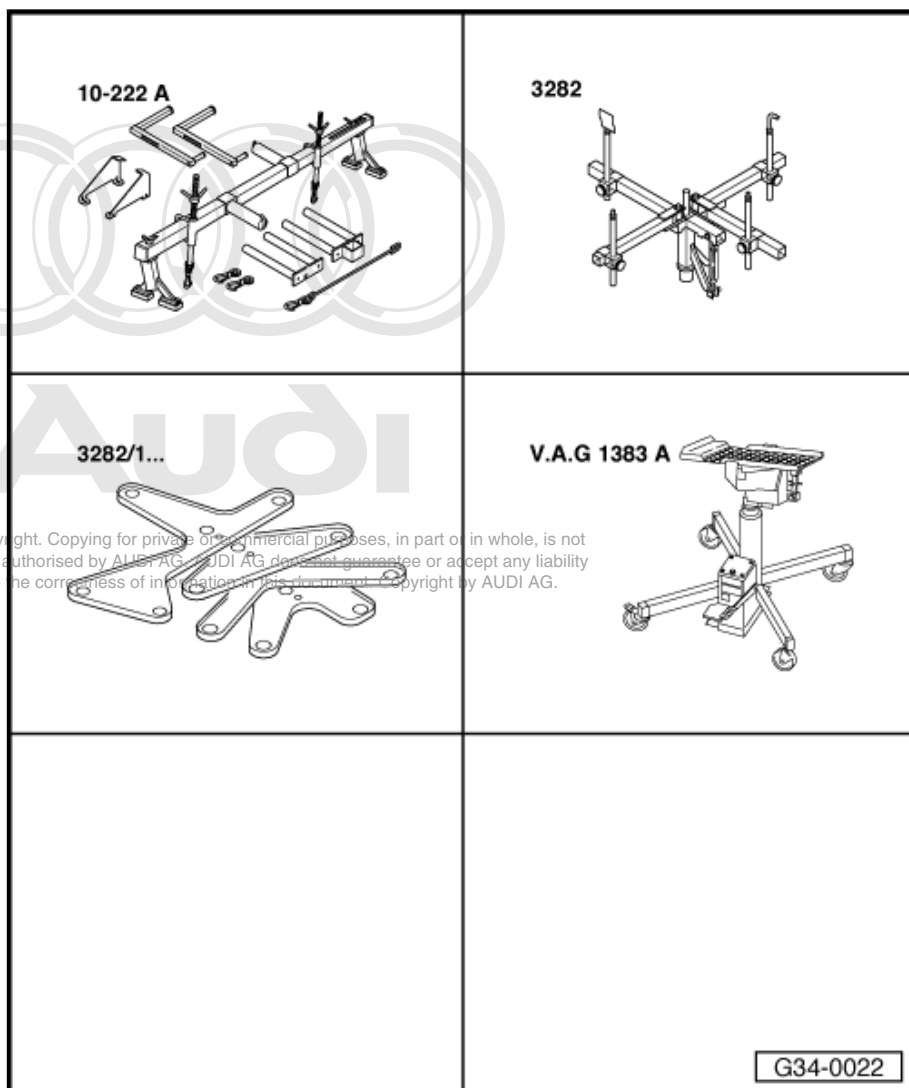
- Install air cleaner housing ⇒ Rep. gr. 24

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2 Removing gearbox

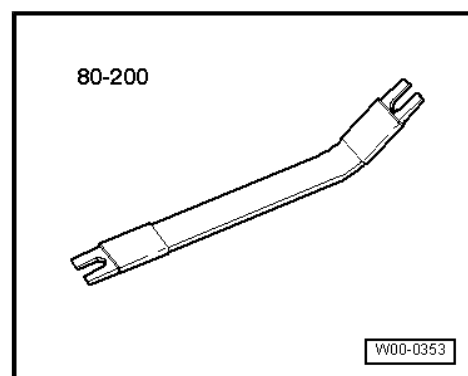
Special tools and workshop equipment required

- ◆ Support bracket - 10 - 222 A-
- ◆ Gearbox support - 3282-
- ◆ Adjustment plate - 3282/31-
- ◆ Engine and gearbox jack - V.A.G 1383 A-



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



Procedure



Note

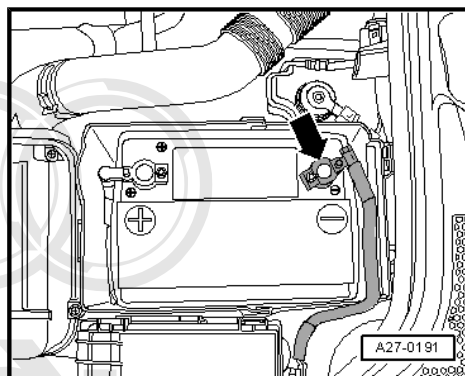
Re-attach all cable ties at the same locations when re-installing.



Caution

When disconnecting the battery there is a risk of serious damage to electronic components:

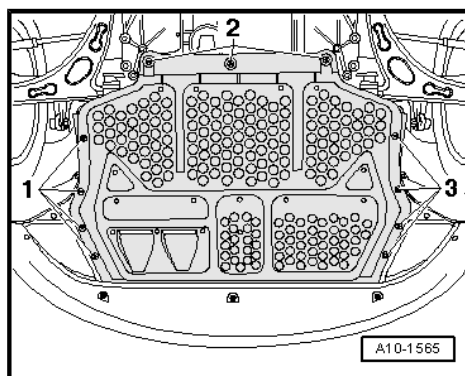
- ◆ Observe the correct procedure for disconnecting the battery.



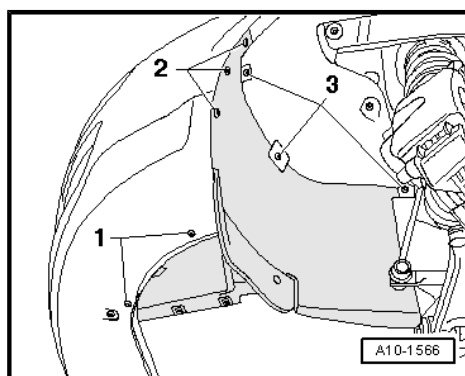
- With ignition switched off, disconnect battery earth strap -arrow- ⇒ Rep. gr. 27 .

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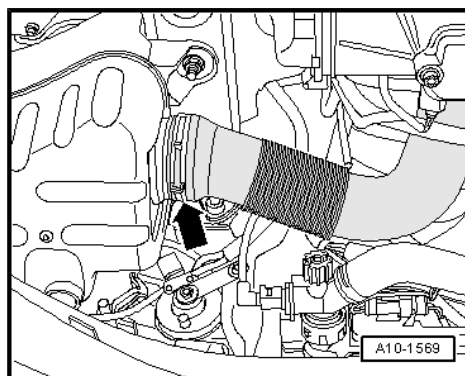
- Remove front left wheel.
- Remove noise insulation (centre) by releasing fasteners -1 ... 3-.



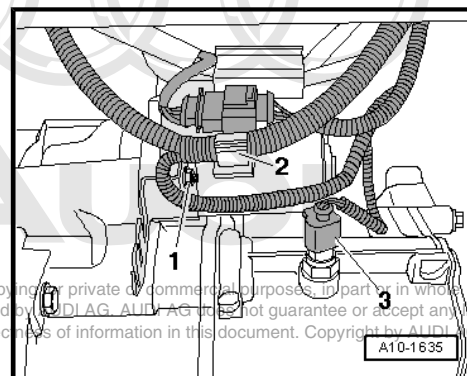
- Remove noise insulation (left-side) -fasteners 1 ... 3-.



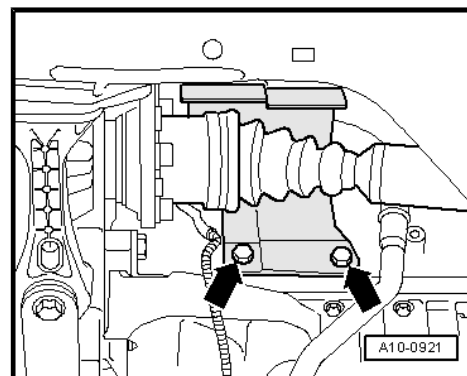
- Detach air hose -arrow- at bottom of resonator.



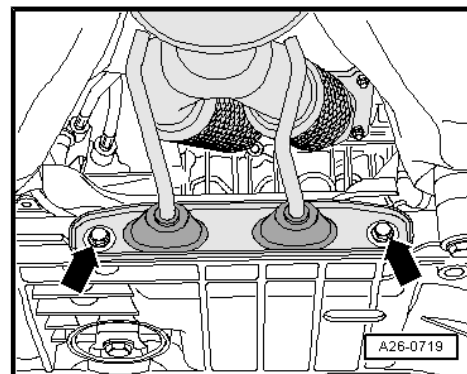
- Unplug electrical connector -3- at reversing light switch.
- Remove nut -1- and detach bracket -2- from stud together with electrical wiring.
- Move bracket and wiring clear to the side.



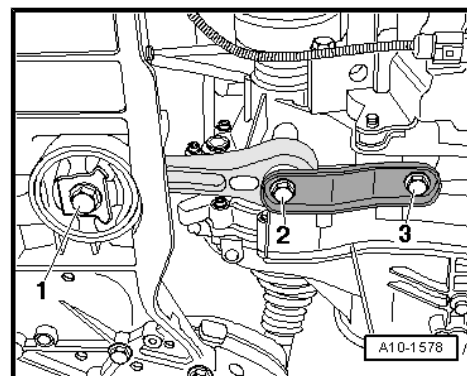
- Unbolt heat shield for right-side drive shaft -arrows-.
- Unbolt drive shafts (left and right) from gearbox flanges.
- Tie up drive shafts.



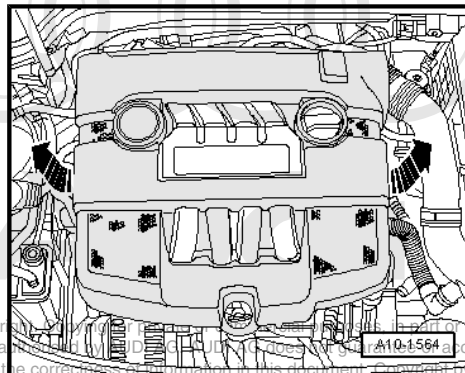
- Unbolt support bracket for exhaust system -arrows-.



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

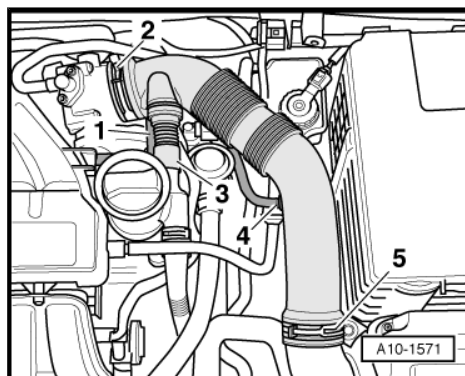


- Remove engine cover panel -arrows-.

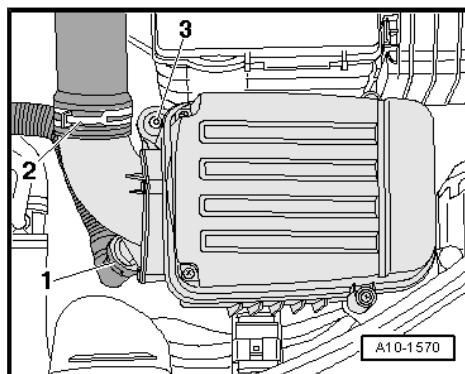


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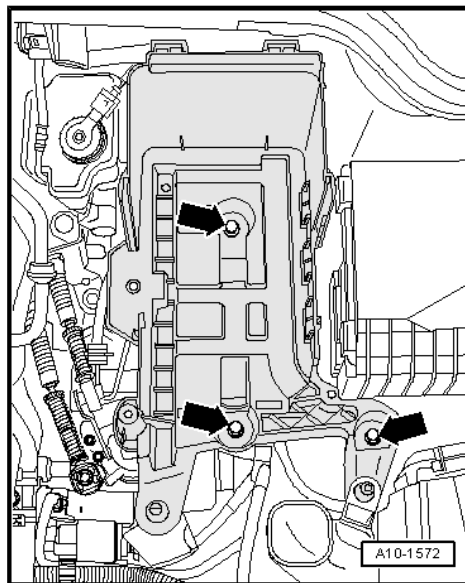
- Disconnect hoses -1-, -3- and -4-.
- Release spring clips -2- and -5-, and remove air intake hose.



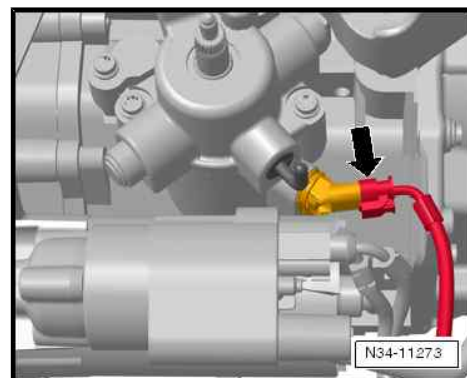
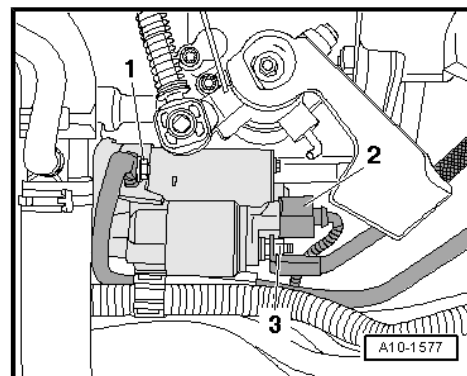
- Remove air cleaner housing completely ⇒ Rep. gr. 24 .
- Disconnect air hose (going to resonator) at lock carrier and remove.



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

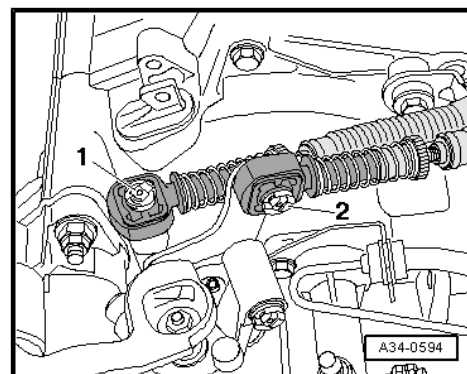


- Unscrew earth wire -1-.
- Disconnect electrical wires -2- and -3- at starter and move them clear.
- Move wiring clear.
- If fitted, unplug connector from gearbox neutral position sender - G701- -arrow-.



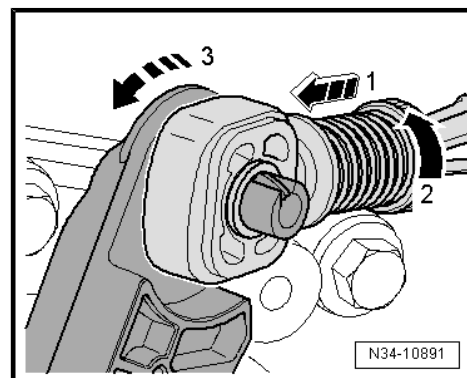
Metal gate relay lever:

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



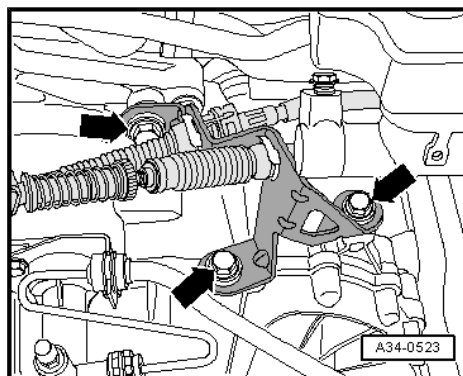
Plastic gate relay lever:

- 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 70](#) .

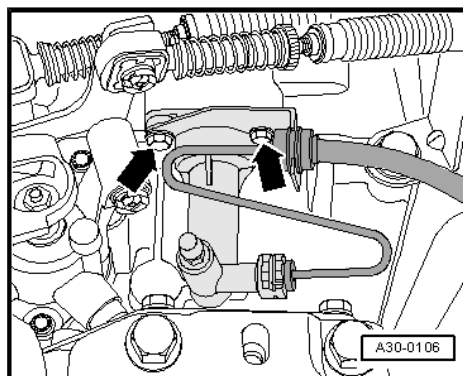


Continued for all vehicles:

- Detach cable support bracket from gearbox -arrows- and place to one side.



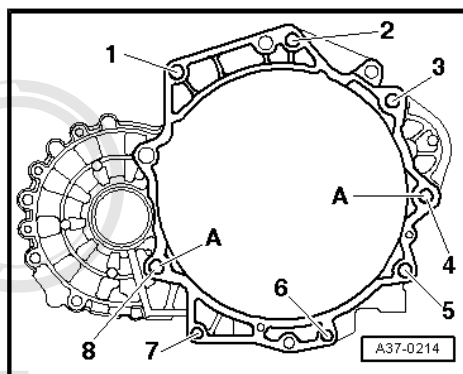
- Remove clutch slave cylinder -arrows- and place to one side; do not disconnect pipe.



Caution

Do not operate clutch pedal after removing clutch slave cylinder.

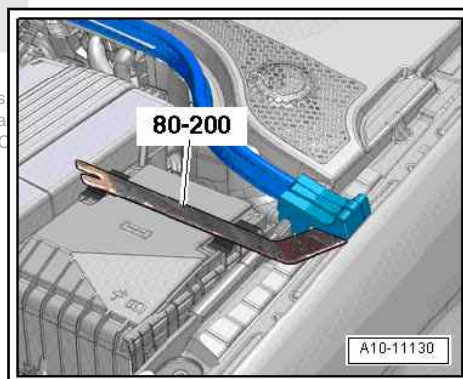
- Remove bolts -1 ... 3- from engine/gearbox flange.



Vehicles from 06.2008 onwards:

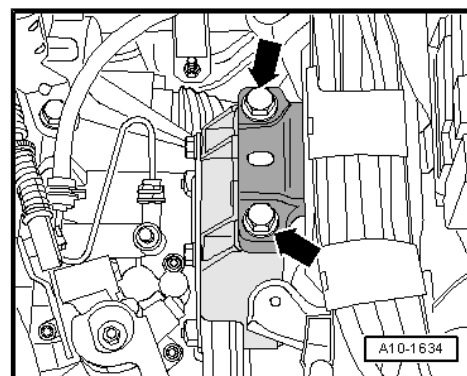
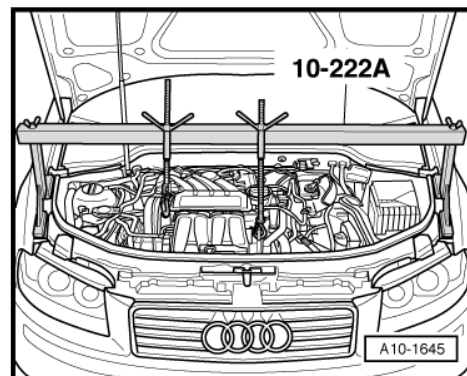
- Lever clip off sealing element using removal lever - 80 - 200- and fold up sealing element.

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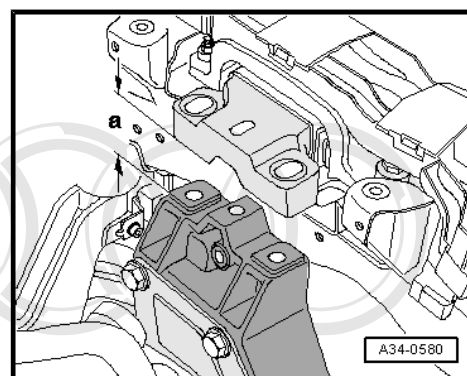


Continued for all vehicles:

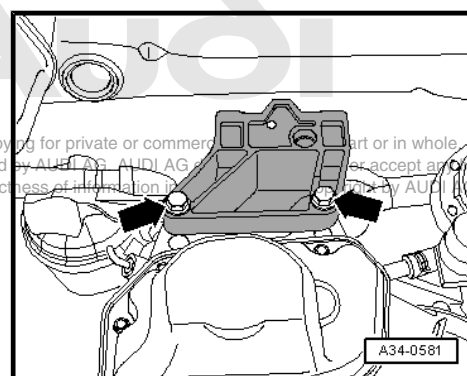
- Set up support bracket - 10 - 222 A- on wing mounting flanges (vehicles up to 05.2008) or on body flanges (vehicles from 06.2008 onwards).
- Spindles face to the front.
- Disconnect crankcase breather hose from cylinder head cover.
- Engage spring hooks of spindles on lifting eyes.
- Take up weight of engine evenly with both spindles; do not lift.
- Remove bolts -arrows- from gearbox mounting.



- By adjusting spindles on support bracket - 10 - 222 A- , lower gearbox by distance -a-.
- Distance a = 70 mm



- Unbolt gearbox support from gearbox -arrows-.

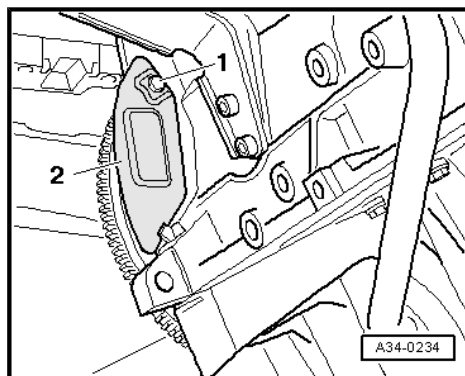


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- Remove bolt -1- with gearbox fitted.
- Lift out cover plate -2-.


Note

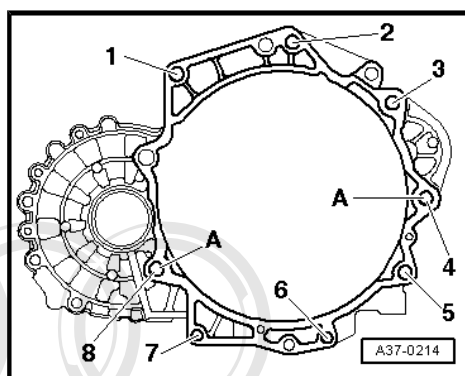
Shown in illustration with gearbox removed.



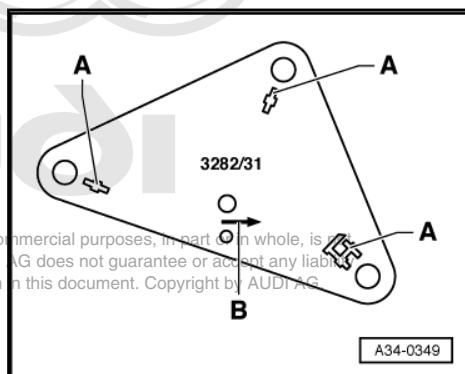
- Remove bolts -4- and -6 ... 8- from engine/gearbox flange.
- Remove starter.


Note

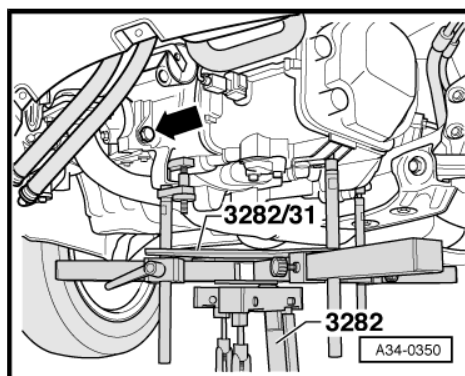
Slacken bolt -item 5- and leave it in position only finger-tight.



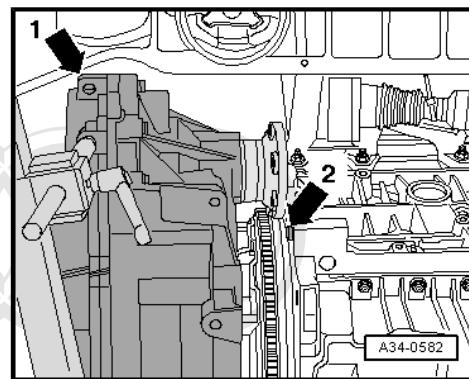
- Set up gearbox support - 3282- on engine and gearbox jack - V.A.G 1383 A-.
- Place adjustment plate - 3282/31- on gearbox support - 3282- (adjustment plate only fits in one position).
- Align arms of gearbox support to coincide with holes in adjustment plate.
- Screw in support elements -A- as shown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



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



- 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.



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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 hose clips (as original equipment); refer to → *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.*

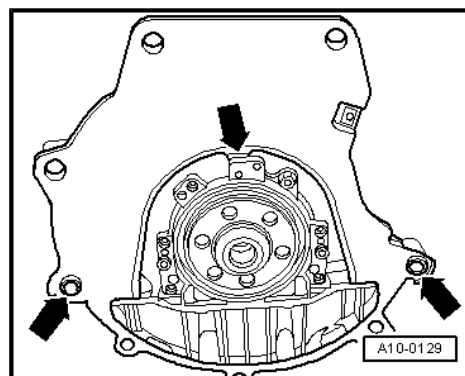
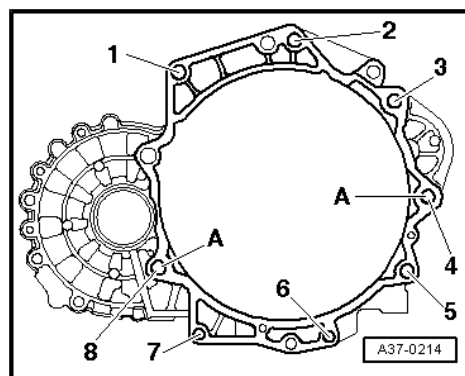
- Check that dowel sleeves -A- for centralising engine/gearbox are in the cylinder block; install any missing dowel sleeves.



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).

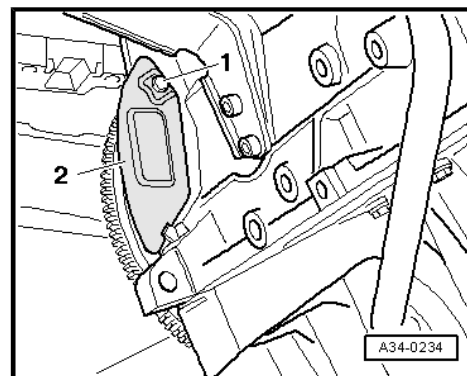
- Make sure that the intermediate plate is engaged on the sealing flange and fitted on the dowel sleeves -arrows-.
- Check clutch release bearing for wear and renew if necessary.
- Lubricate surface which contacts ball-head pin with MoS₂ grease.
- Raise gearbox carefully and move to installation position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



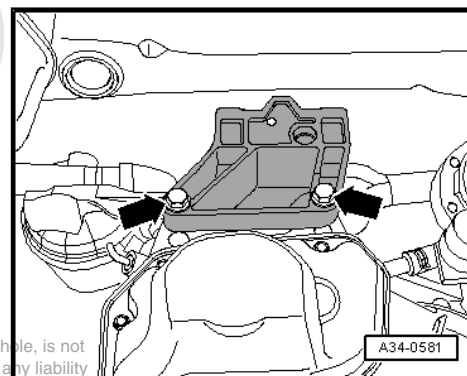
- Insert cover plate -2- so that that bottom lug engages on cylinder block and secure at the top with bolt -1-.

 Note

Shown in illustration with gearbox removed.

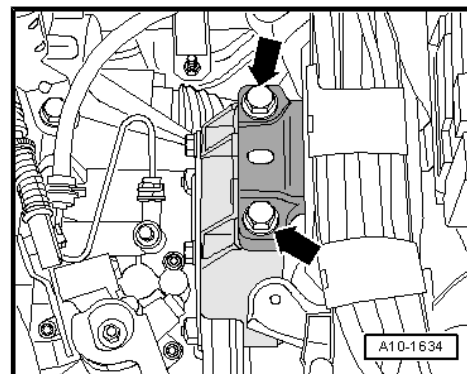


- Install gearbox support with new bolts -arrows-. Tightening torque ⇒ [Item 14 \(page 89\)](#)



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- Tighten bolts -arrows- on gearbox mounting finger-tight to start with.
- Use new bolts.
- Install pendulum support ⇒ [page 93](#) .
- 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 on gearbox mounting ⇒ [page 89](#) .



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

- Install clutch slave cylinder ⇒ [page 30](#) .
- Attach and adjust selector cables at gearbox ⇒ [page 72](#) .
- Fill up oil in gearbox and check oil level ⇒ [page 98](#) .
- Install noise insulation.
- Install wheel and tighten wheel bolts ⇒ Rep. gr. 44 .
- Install battery tray and battery ⇒ Rep. gr. 27 .
- Install air cleaner housing ⇒ Rep. gr. 24 .

Tightening torques

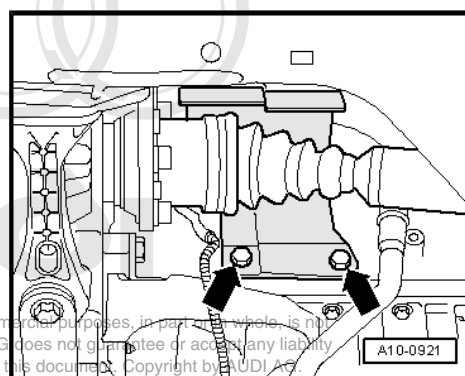
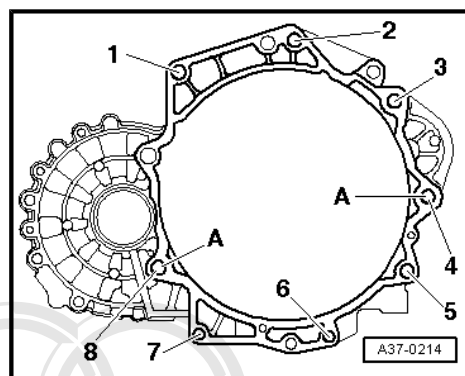
Item	Bolt	Nm
1, 2	M12×65	80
3 ²⁾ , 4 ²⁾	M12×135	80
5 ... 7	M10×60	40
8	M12×90	65

2) Bolt with stud M8

A - Dowel sleeves for centralising

Heat shield for drive shaft (right-side)

– Tighten bolts -arrows- to 35 Nm.

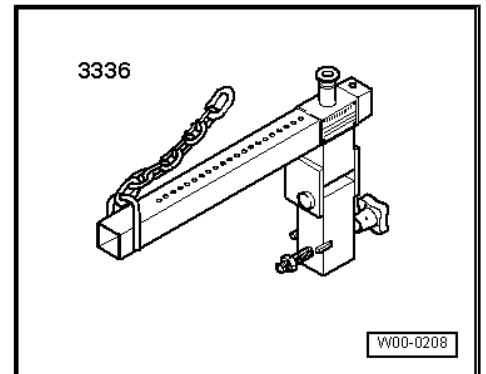


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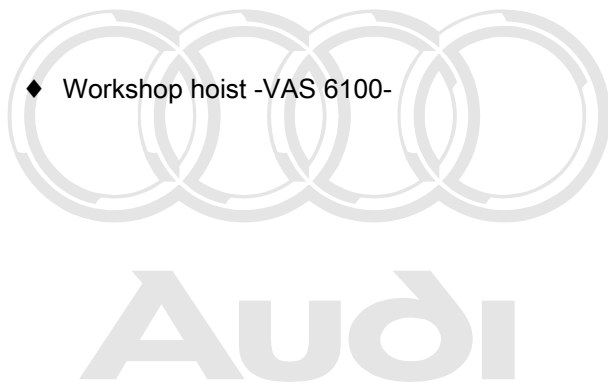
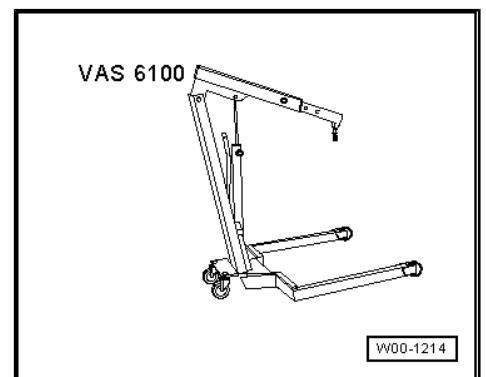
4 Transporting gearbox

Special tools and workshop equipment required

- ◆ Gearbox lifting tackle - 3336-

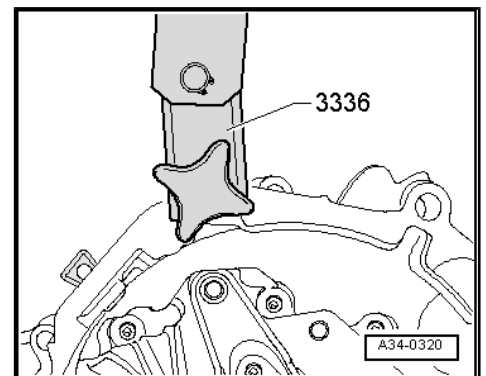


- ◆ Workshop hoist -VAS 6100-

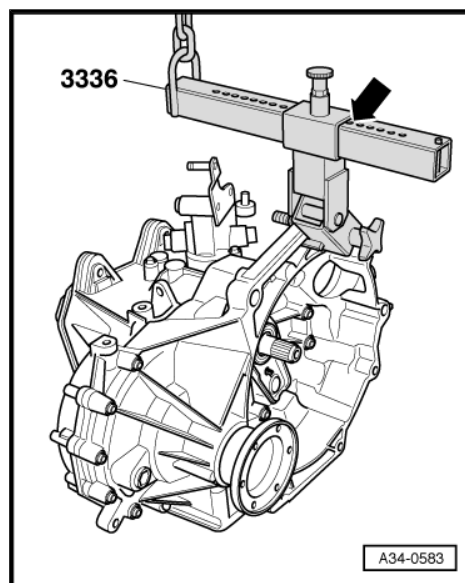


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Procedure



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



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5 Exploded view - assembly mountings

1 - Bolt

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

2 - Pendulum support

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

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 90](#)
- ☐ 60 Nm + 90°

11 - Bolt

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

12 - Gearbox mounting

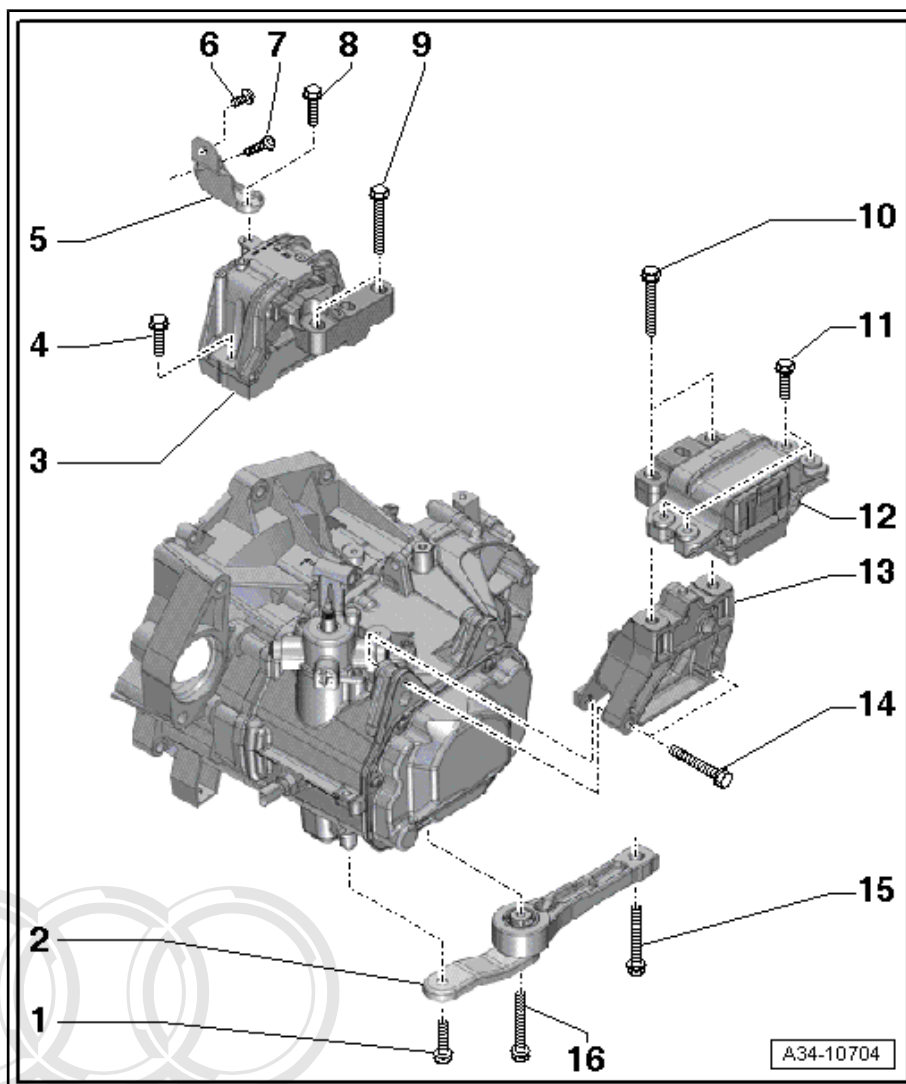
- ☐ Removing and installing ⇒ [page 90](#)
- ☐ Secure to gearbox support

13 - Gearbox support

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

14 - Bolt

- ☐ Renew
- ☐ 40 Nm + 90°



15 - Bolt

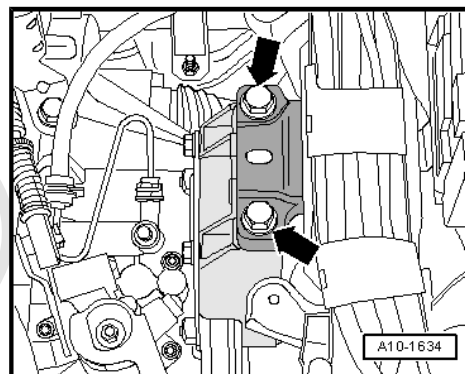
- ☐ Renew
- ☐ Tightening sequence ⇒ [page 90](#)
- ☐ 100 Nm + 90°

16 - Bolt

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

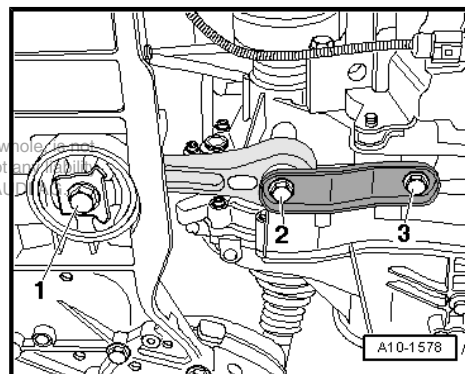
Attaching gearbox mounting to gearbox support

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



Installing pendulum support

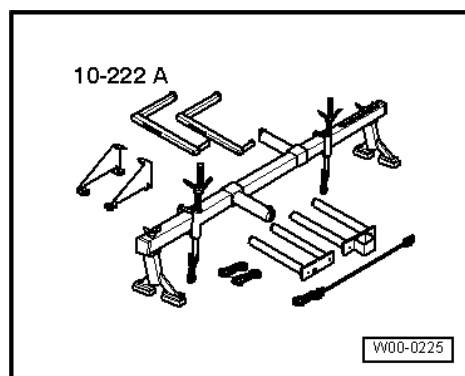
- Renew bolts.
- First secure pendulum support to gearbox (-2- and -3-), then on subframe -1-



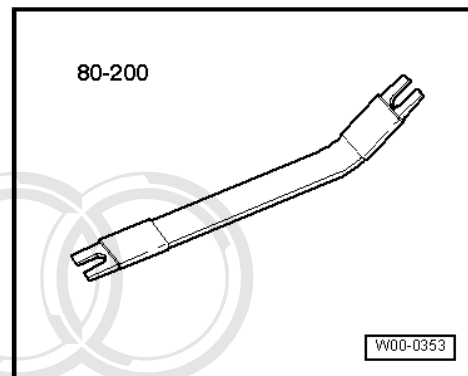
5.1 Removing and installing gearbox mounting

Special tools and workshop equipment required

- ◆ Support bracket - 10 - 222 A-



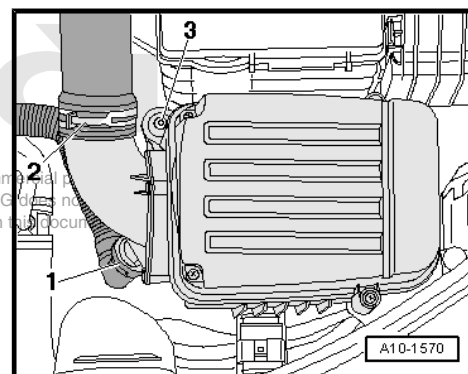
- ◆ Removal lever - 80 - 200- for vehicles from 06.2008 onwards



Removing

- Remove air cleaner housing completely ⇒ Rep. gr. 24 .

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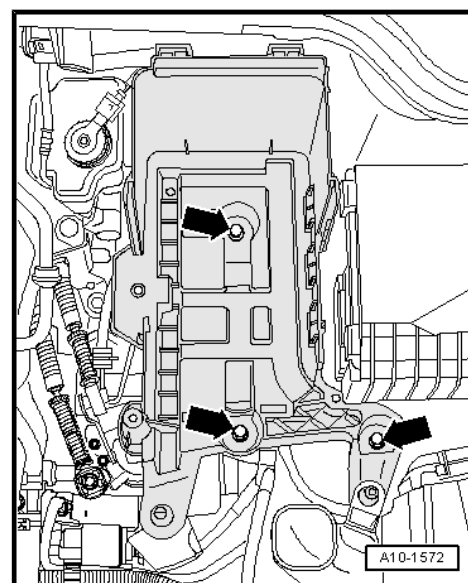


Caution

When disconnecting the battery there is a risk of serious damage to electronic components:

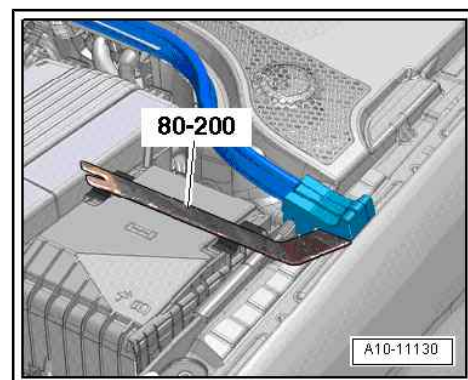
- ◆ *Observe the correct procedure for disconnecting the battery.*

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



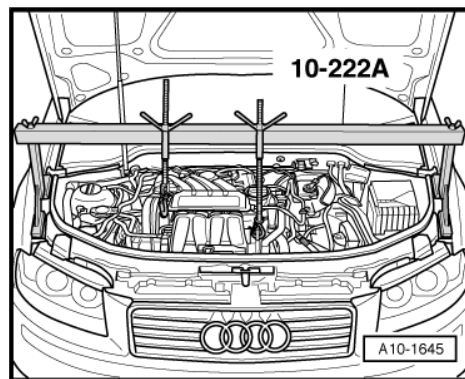
Vehicles from 06.2008 onwards:

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

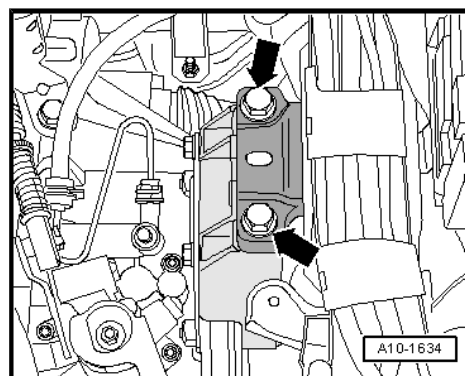


Continued for all vehicles:

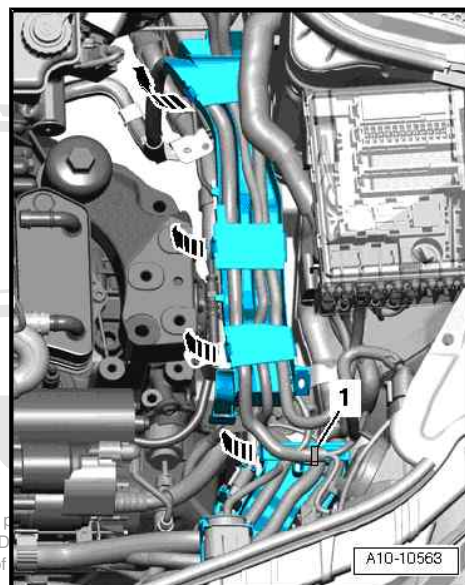
- Set up support bracket - 10 - 222 A- on wing mounting flanges (vehicles up to 05.2008) or on body flanges (vehicles from 06.2008 onwards).
- Spindles face to the front.



- Remove bolts -arrows-.



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

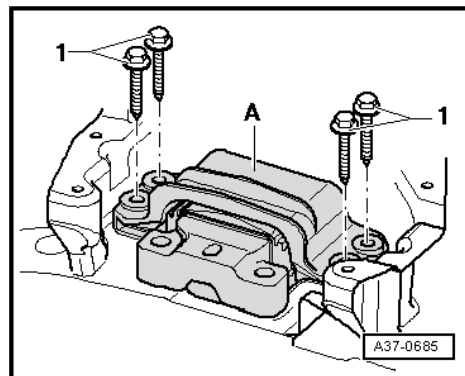


- Remove bolts -1- and detach gearbox mounting -A-.

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 \(page 89\)](#)

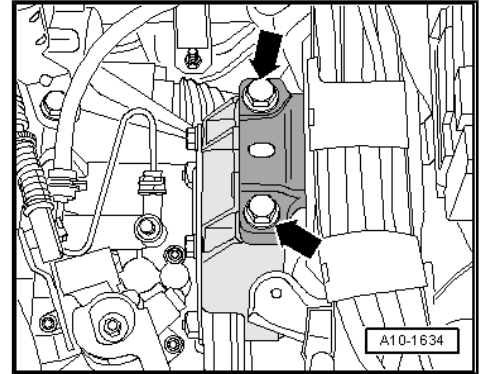




Caution

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.*

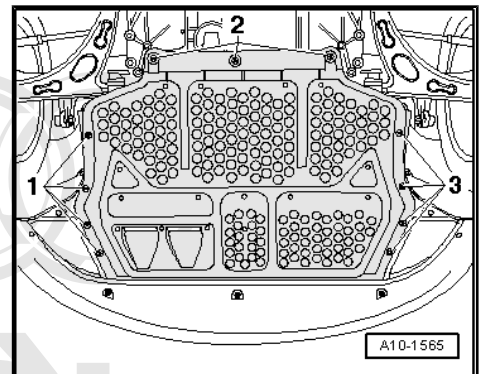


- Pull gearbox up with spindle on support bracket until gearbox support contacts support arm of gearbox mounting.
- Bolt support arm of gearbox mounting onto gearbox support using new bolts -arrows-. Tightening torque
⇒ [Item 10 \(page 89\)](#)
- Adjust assembly mountings ⇒ Rep. gr. 10 .
- Detach support bracket - 10 - 222 A- from engine.
- Install battery tray and battery ⇒ Rep. gr. 27 .
- Install air cleaner housing ⇒ Rep. gr. 24 .

5.2 Removing and installing pendulum support

Removing

- Remove noise insulation (centre) by releasing fasteners -1 ... 3-.

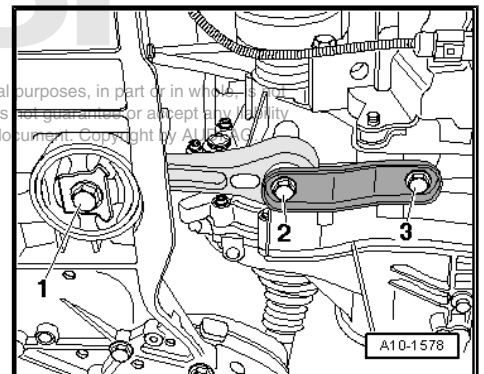


- Unscrew bolts -1 ... 3- and remove pendulum support.

Installing

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

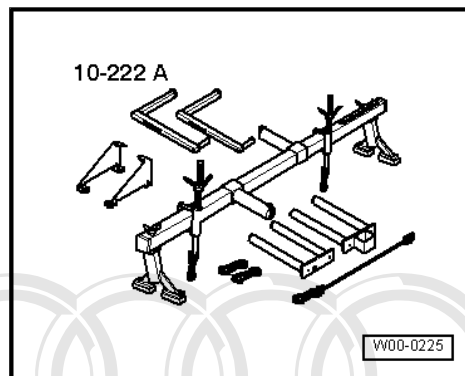
- Install noise insulation.
- Bolt pendulum support onto gearbox first, and then secure to subframe ⇒ [page 89](#) .



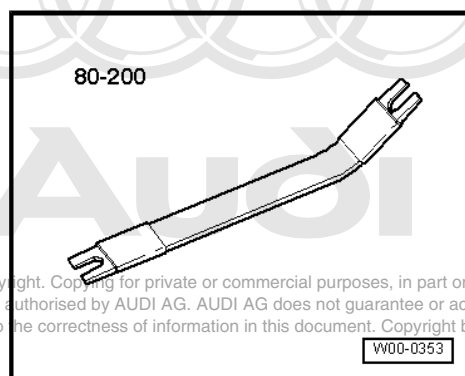
5.3 Removing and installing gearbox support

Special tools and workshop equipment required

◆ Support bracket - 10 - 222 A-



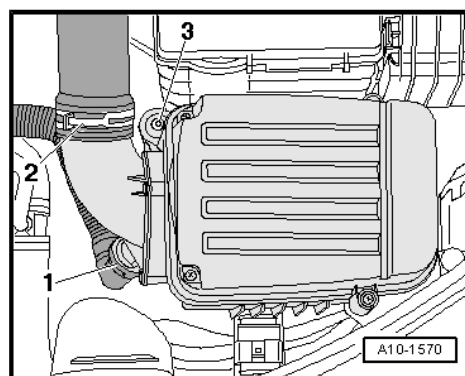
◆ Removal lever - 80 - 200- for vehicles from 06.2008 onwards



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Removing

- Remove air cleaner housing completely ⇒ Rep. gr. 24 .

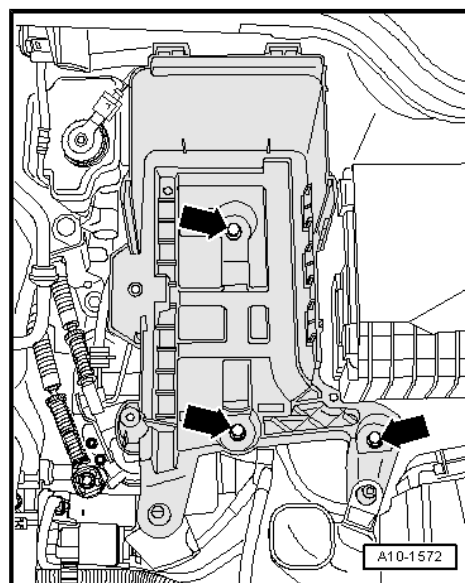


Caution

When disconnecting the battery there is a risk of serious damage to electronic components:

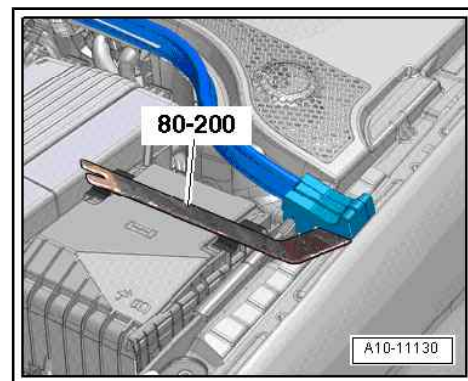
- ◆ **Observe the correct procedure for disconnecting the battery.**

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



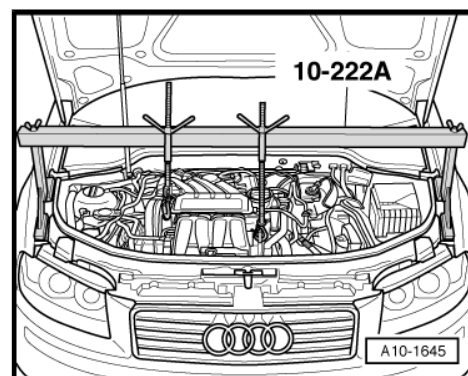
Vehicles from 06.2008 onwards:

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

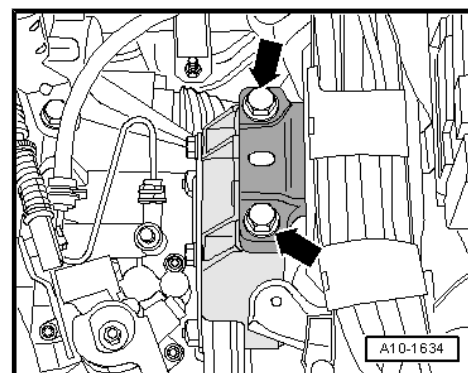


Continued for all vehicles:

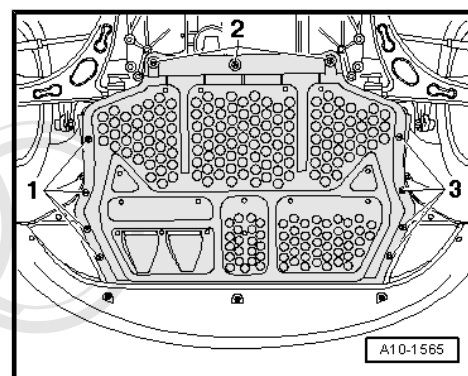
- Set up support bracket - 10 - 222 A- on wing mounting flanges (vehicles up to 05.2008) or on body flanges (vehicles from 06.2008 onwards).
- Spindles face to the front.



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

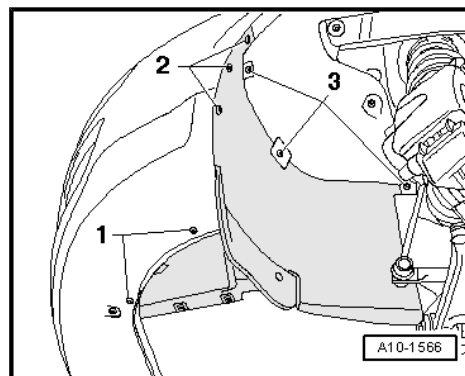


- Remove noise insulation (centre) by releasing fasteners -1 ... 3-.

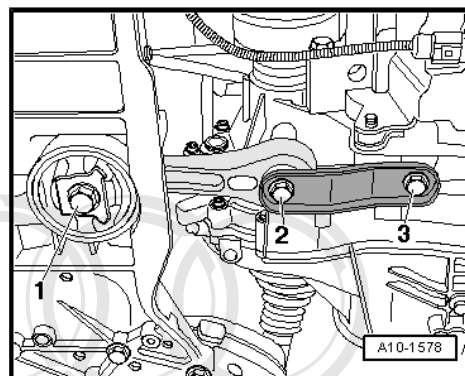


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- Remove front section of wheel housing liner (left-side) ⇒ Rep. gr. 66 .

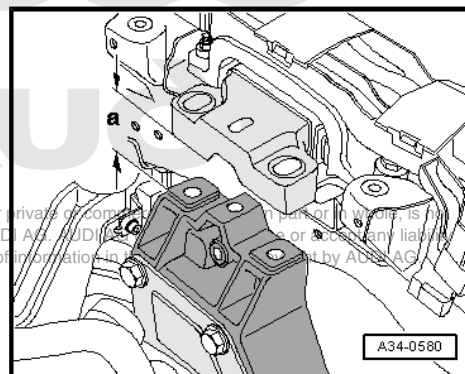


- Unscrew bolts -1 ... 3- and remove pendulum support.



- Adjust spindles of support bracket - 10 - 222 A- to lower gearbox by distance -a-.

- ◆ Dimension -a- = 50 mm

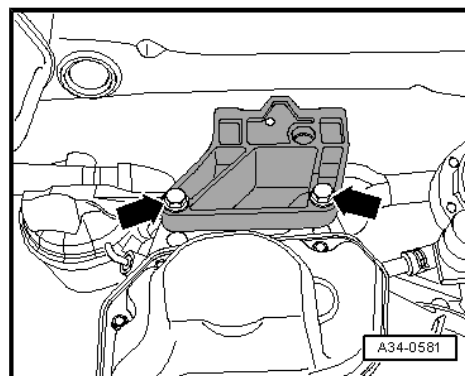


- Unbolt gearbox support from gearbox -arrows- and detach.

Installing

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

- Install gearbox support with new bolts -arrows-. Tightening torque ⇒ [Item 14 \(page 89\)](#)

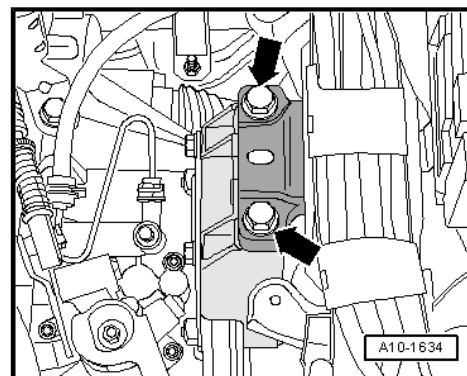




Caution

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 \(page 89\)](#)
- Adjust assembly mountings ⇒ Rep. gr. 10 .
- Detach support bracket - 10 - 222 A- from engine.
- Install pendulum support ⇒ [page 93](#) .
- Install noise insulation.
- Install wheel and tighten wheel bolts ⇒ Rep. gr. 44 .
- Install battery tray and battery ⇒ Rep. gr. 27 .
- Install air cleaner housing ⇒ Rep. gr. 24 .

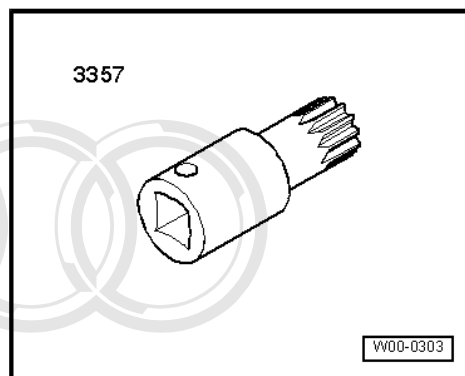


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6 Checking oil level in manual gearbox

Special tools and workshop equipment required

- ◆ Multi-point bit - 3357-

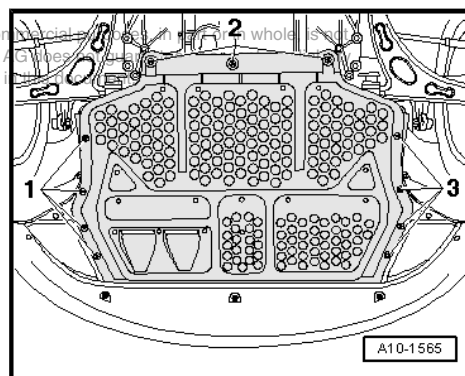


or

- ◆ 17 mm socket (hexagon key)

Procedure

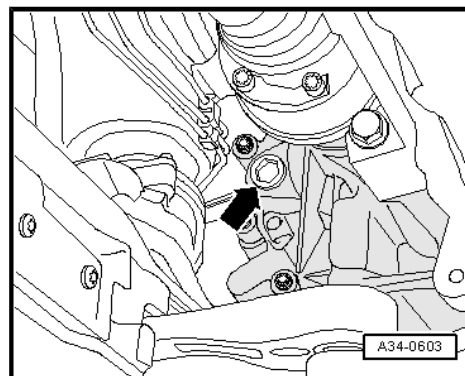
- Drive vehicle onto a four-column lifting platform or over an inspection pit (vehicle must be horizontal).
- Remove noise insulation (centre) by releasing fasteners -1 ... 3-.



- Remove oil filler plug -arrow-.
- Specification: oil level up to bottom lip of filler hole
- Top up gear oil if necessary. Specifications ⇒ Electronic parts catalogue
- Tighten oil filler plug to specified torque.

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.

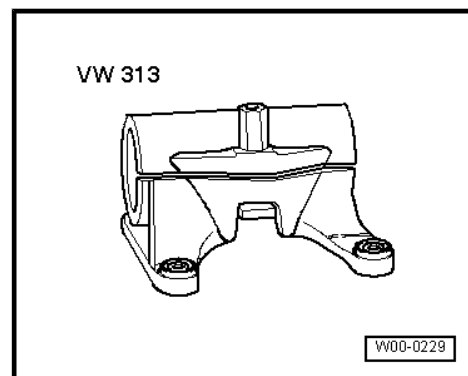


Tightening torque ⇒ [page 120](#)

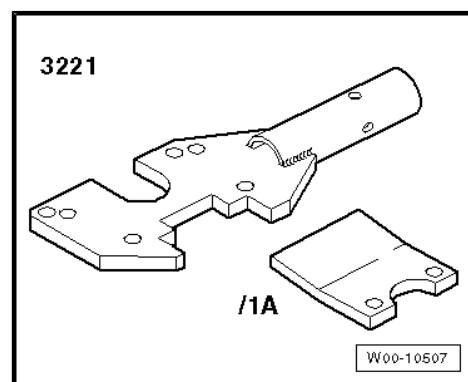
7 Securing gearbox to assembly stand

Special tools and workshop equipment required

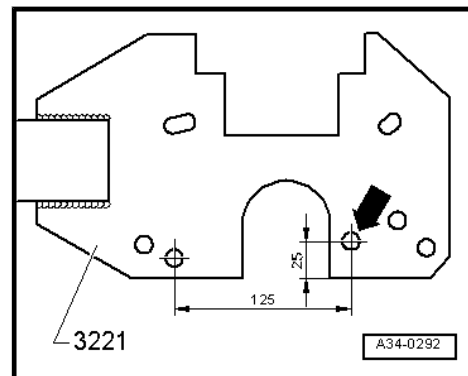
- ◆ Support clamp - VW 313-



- ◆ Gearbox support - 3221-

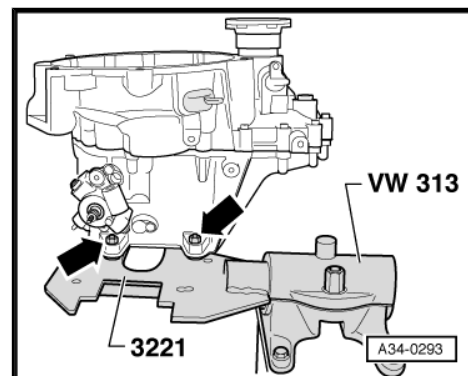


- Make an additional $\varnothing 11$ mm drilling -arrow- in gearbox support - 3221- according to the dimensions shown (dimensions in mm).



Procedure

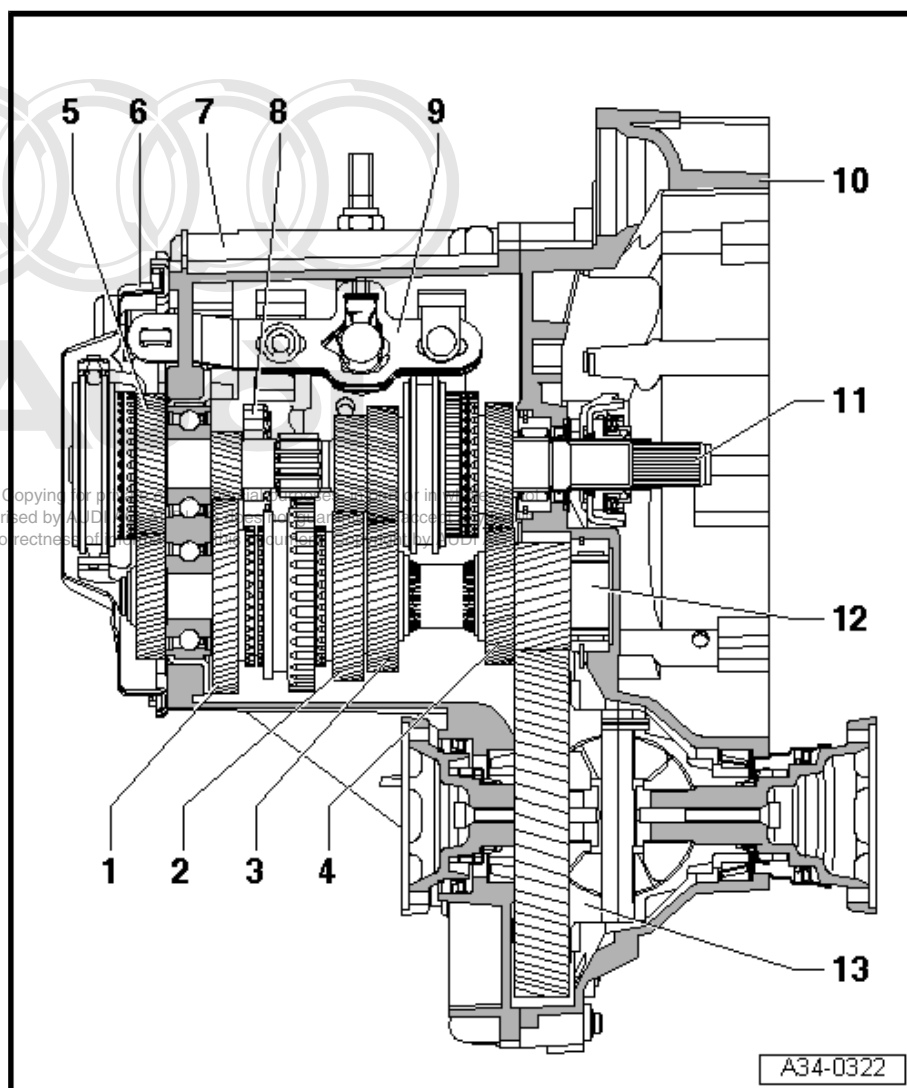
- Bolt gearbox housing to gearbox support - 3221- as illustrated -arrows-.



8 Dismantling and assembling gearbox

8.1 General layout of gearbox

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



8.2 Exploded view

I - Gearbox housing cover and 5th gear

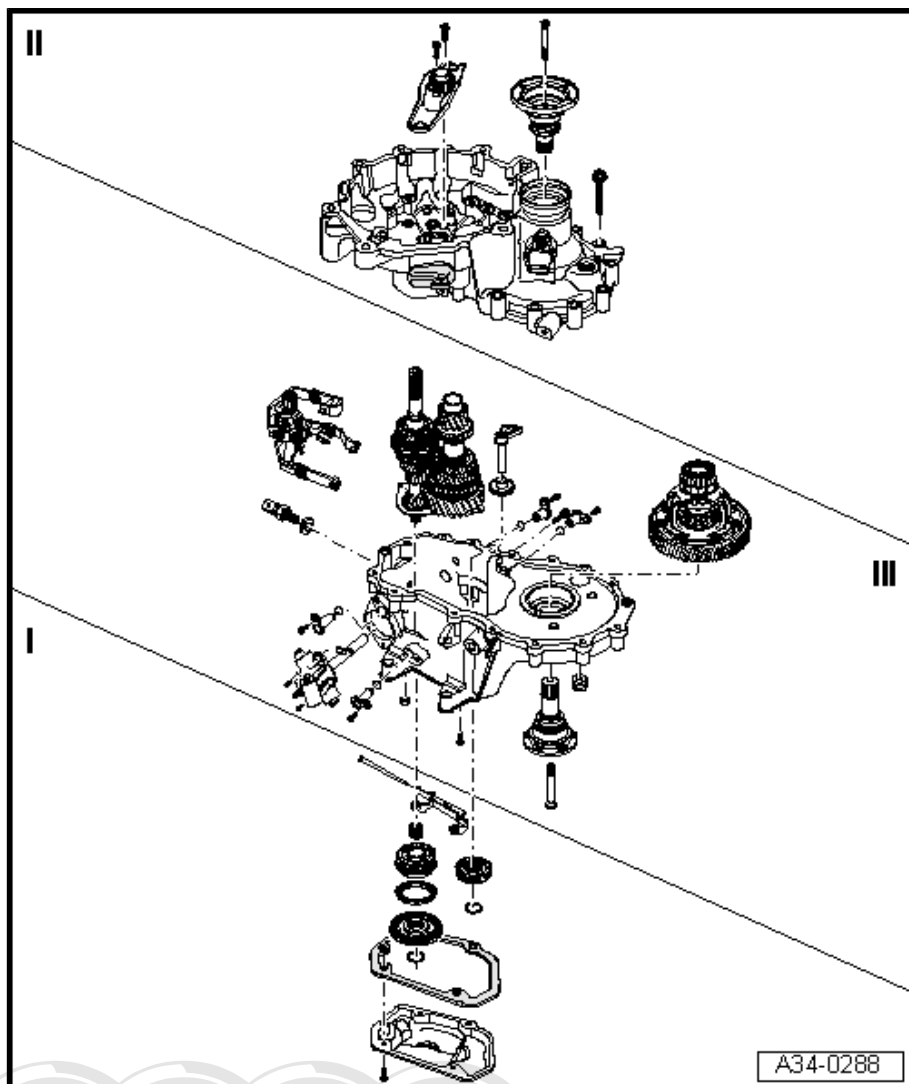
- ☐ Exploded view
⇒ [page 102](#)

II - Clutch housing

- ☐ Exploded view
⇒ [page 103](#)
- ☐ Removing and installing
⇒ [page 103](#)

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

- ☐ Exploded view
⇒ [page 105](#)
- ☐ Removing and installing
⇒ [page 108](#)



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8.3 Exploded view - gearbox housing cover and 5th gear

1 - Gearbox housing

2 - 5th gear wheel

- ☐ Installation position:
large collar faces gear-
box housing cover
⇒ [Item 5 \(page 102\)](#)

3 - Circlip

- ☐ Renew
- ☐ Determining thickness
⇒ [page 151](#)

4 - Gasket

- ☐ Renew

5 - Gearbox housing cover

6 - Bolt

- ☐ Renew
- ☐ 5 Nm + 90°

7 - Circlip

- ☐ Renew
- ☐ Determining thickness
⇒ [page 151](#)

8 - Synchro-hub with locking collar and check ring for 5th gear

- ☐ Dismantling and assembling ⇒ [page 149](#)

9 - 5th gear synchro-ring

10 - 5th speed selector gear

11 - Needle bearing

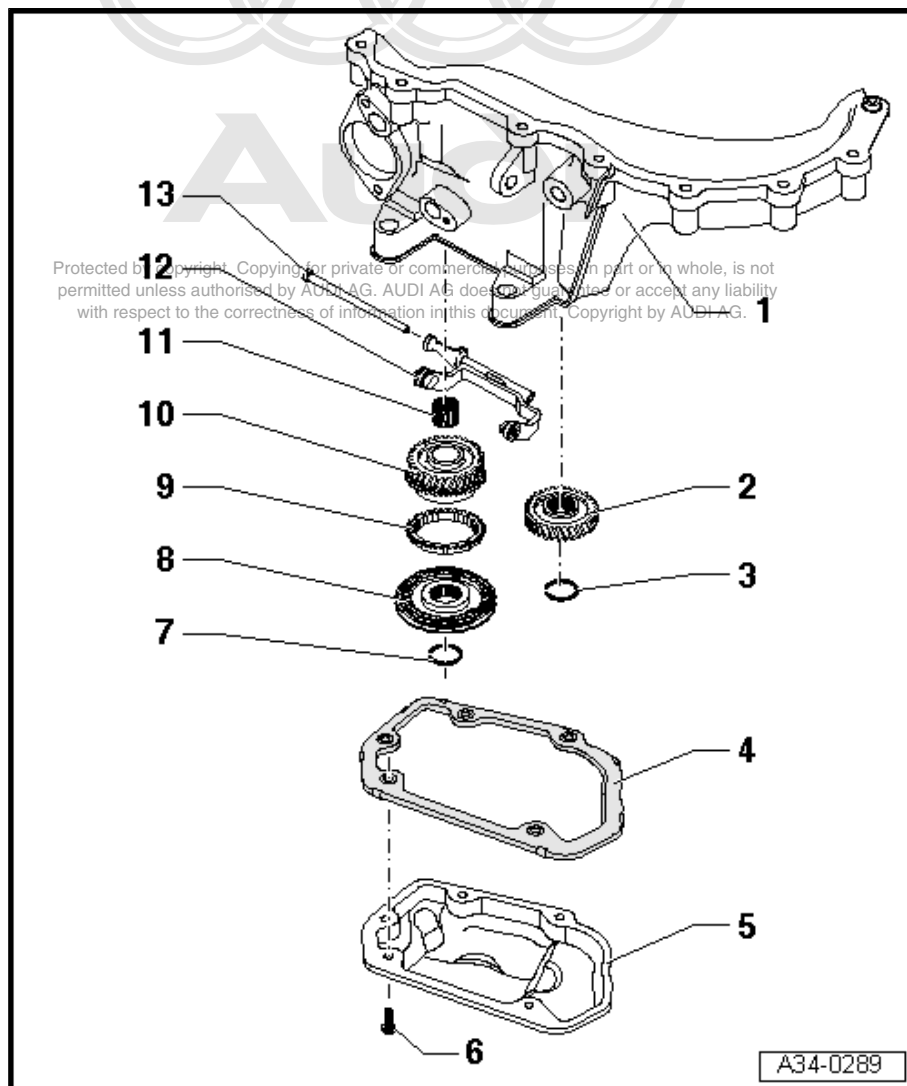
- ☐ For 5th gear

12 - 5th gear selector fork

- ☐ Dismantling and assembling ⇒ [page 130](#)

13 - Pivot pin

- ☐ for 5th gear selector fork



8.4 Exploded view - clutch housing

1 - Countersunk bolt

- ☐ When installing, push flange shaft in towards gearbox
- ☐ Tightening torque
⇒ [Item 1 \(page 159\)](#)

2 - Flange shaft with spring

- ☐ Removing and installing
⇒ [page 154](#)
- ☐ Assembling
⇒ [page 159](#)

3 - Bolt

- ☐ Renew
- ☐ 5 Nm + 90°

4 - Clutch housing

- ☐ Servicing ⇒ [page 119](#)

5 - Gearbox housing

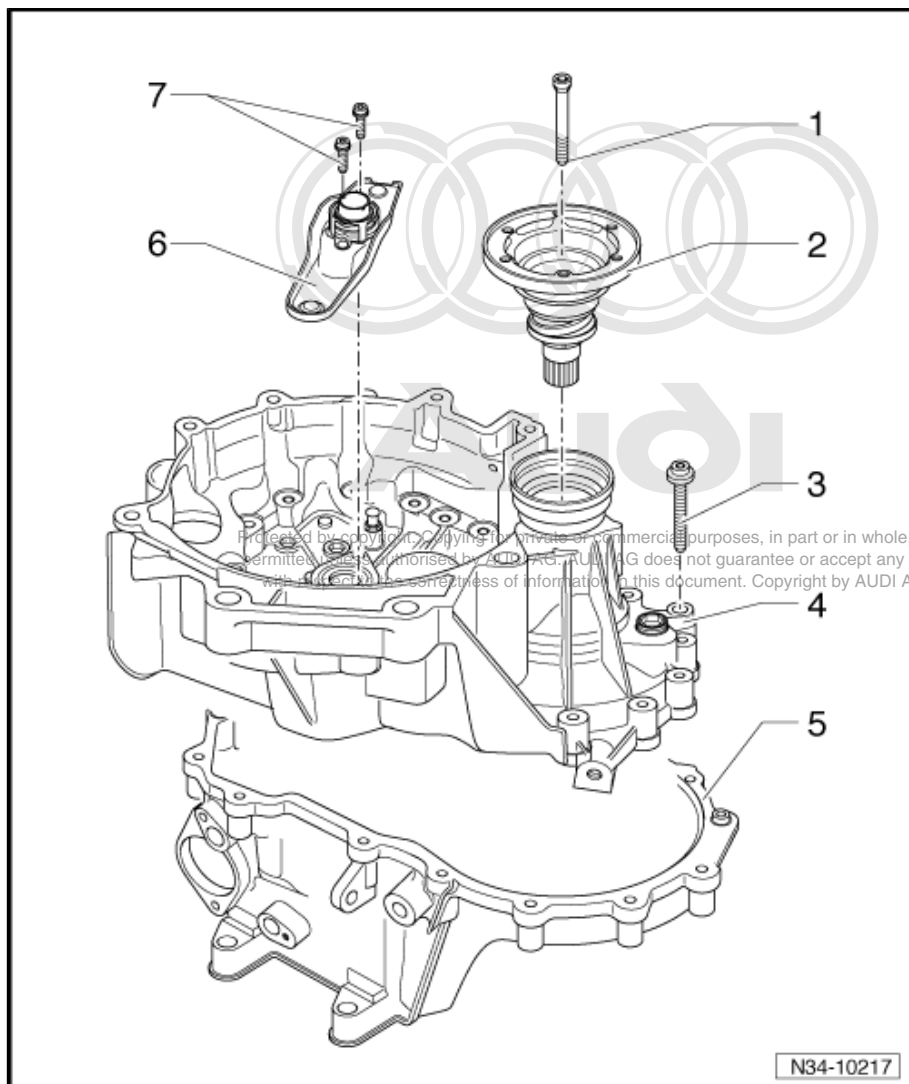
- ☐ Servicing ⇒ [page 119](#)

6 - Clutch release lever

- ☐ With guide sleeve and release bearing
- ☐ Removing and installing
⇒ [page 40](#)

7 - Bolt

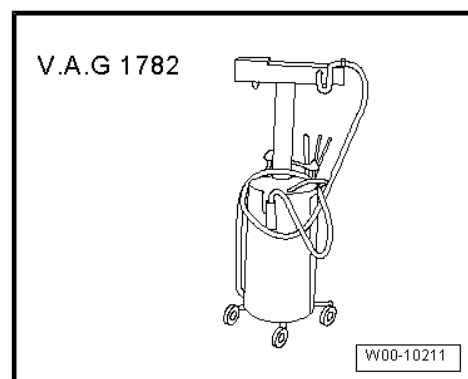
- ☐ Tightening torque
⇒ [Item 2 \(page 39\)](#)



8.5 Removing and installing clutch housing

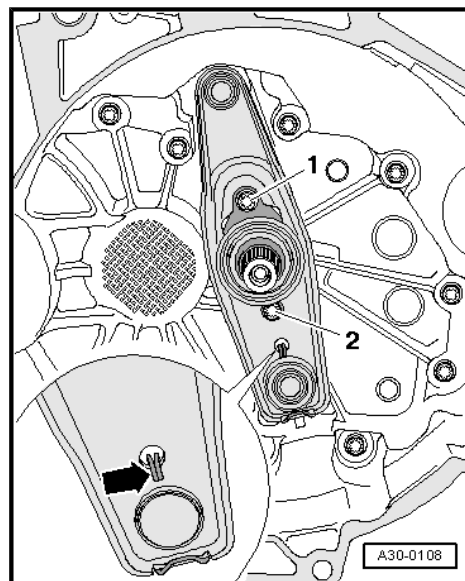
Special tools and workshop equipment required

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

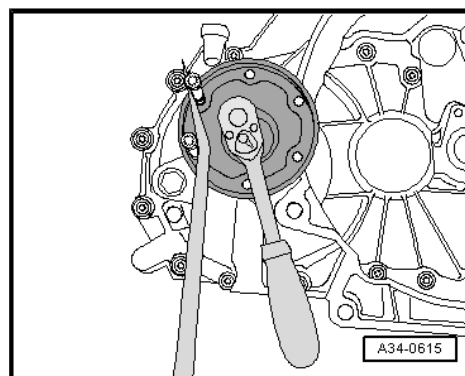


Removing

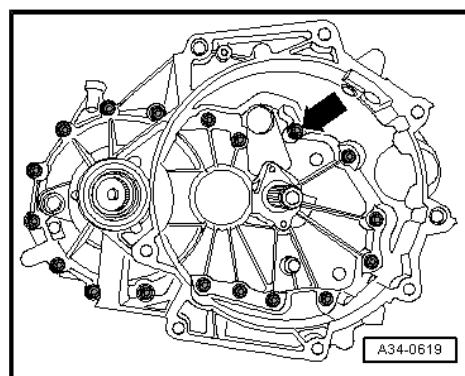
- Gearbox removed
- Secure gearbox to assembly stand ⇒ [page 99](#) .
- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.
- Drain off gear oil.
- Unhook spring -arrow- from clutch release lever.
- Remove bolts -1- and -2-.
- Remove release lever with release bearing and guide sleeve.



- 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.
- Turn gearbox on assembly stand so that clutch housing faces upwards.



- Remove all 18 bolts -arrow- securing clutch housing.
- Carefully remove clutch housing by levering alternately at the protruding webs on the housing, taking care not to damage the sealing surfaces.



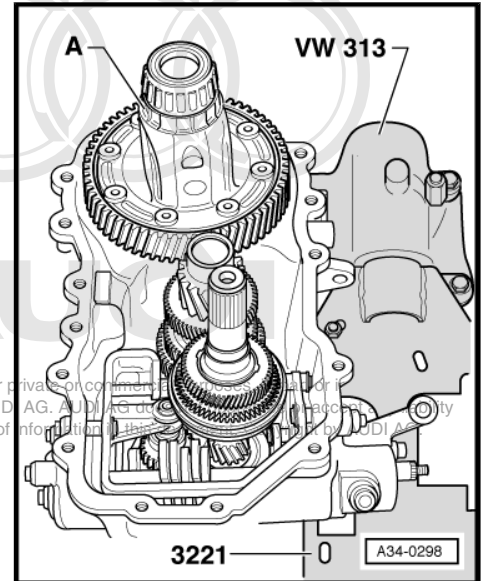
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Installing

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

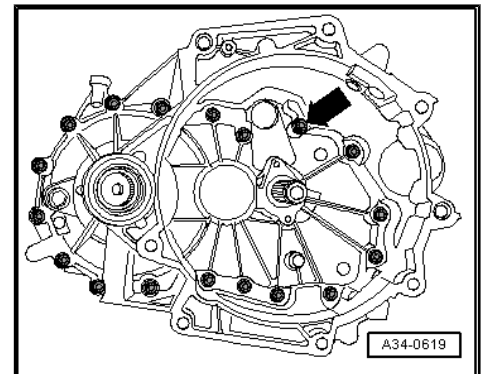
- Differential -A- installed
- Clean sealing surfaces; they must be free from oil and grease.
- Apply sealing paste - AMV 188 200 03- evenly to sealing surface.
- When installing housing, rotate input shaft by hand to enable bearing to slide easily onto its seat.



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- Tighten gearbox housing bolts -arrow- diagonally in stages.
- Push flange shaft in towards gearbox together with spring, thrust washer and tapered ring, and tighten bolt.
- Install release lever with release bearing and guide sleeve ⇒ [page 40](#) .
- Fill up oil in gearbox and check oil level ⇒ [page 98](#) .

Tightening torques ⇒ [page 103](#)



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



Note

Securing gearbox to assembly stand ⇒ [page 99](#)

1 - Differential

- ☐ Removing and installing
⇒ [page 108](#)
- ☐ Dismantling and assembling
⇒ [page 159](#)

2 - Gearbox housing

- ☐ Servicing ⇒ [page 121](#)
- ☐ 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 121](#)

3 - Oil drain plug

- ☐ Tightening torque
⇒ [page 120](#)

4 - Flange shaft with spring

- ☐ Removing and installing
⇒ [page 40](#)
- ☐ Assembling
⇒ [page 159](#)

5 - Countersunk bolt

- ☐ Tightening torque
⇒ [Item 1 \(page 159\)](#)

6 - Bolt

- ☐ Secures bearing mounting with grooved ball bearings for input and output shafts
⇒ [Item 18 \(page 107\)](#)
- ☐ Self-locking
- ☐ Renew
- ☐ 5 Nm + 90°

7 - Hexagon flange nut

- ☐ For selector mechanism ⇒ [Item 17 \(page 107\)](#)
- ☐ Self-locking
- ☐ Renew
- ☐ 23 Nm

8 - O-ring

- ☐ Renew

9 - Pivot pin

10 - Bolt

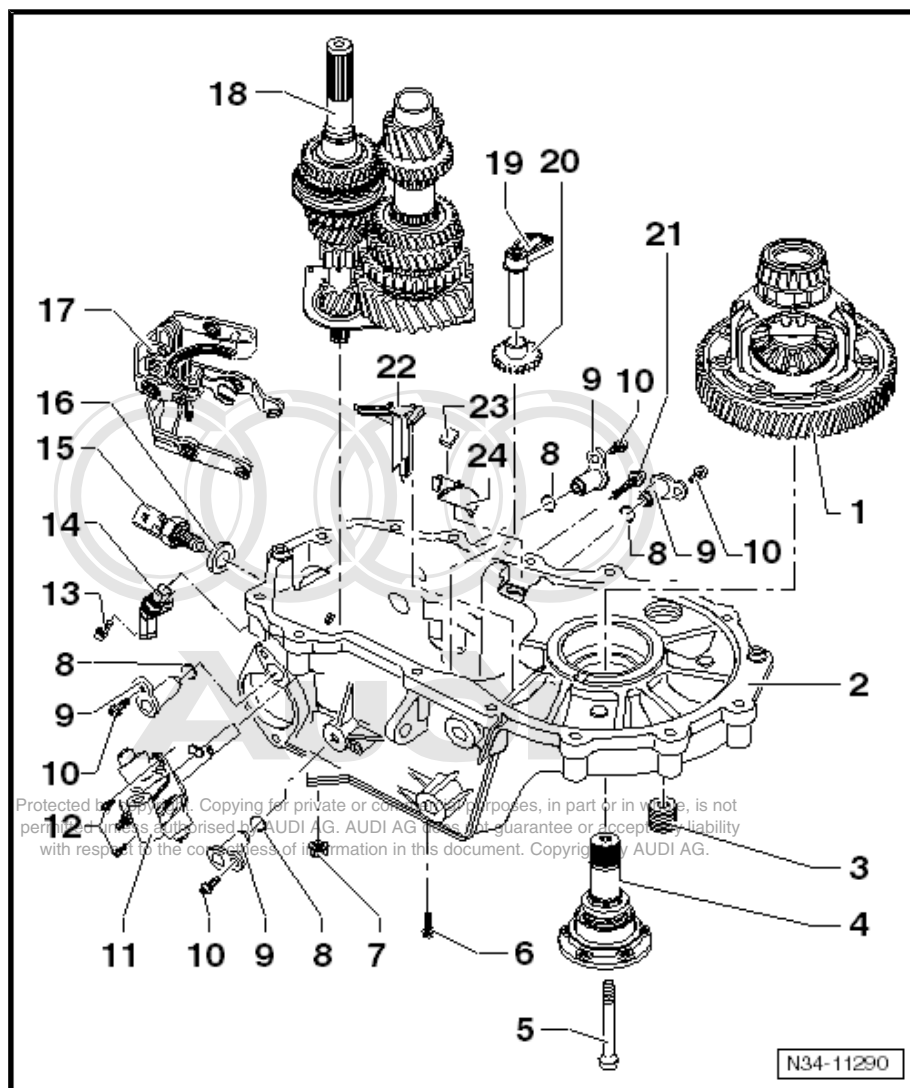
- ☐ Renew
- ☐ 5 Nm + 90°

11 - Selector unit

- ☐ Selector shaft with selector mechanism cover
- ☐ Dismantling and assembling ⇒ [page 125](#)

12 - Bolt

- ☐ Renew



- ☐ 5 Nm + 90°

13 - Bolt

- ☐ 6 Nm

14 - Gearbox neutral position sender - G701-

- ☐ For vehicles with start/stop system

15 - Reversing light switch - F4-

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

16 - Seal

- ☐ Renew
- ☐ Not fitted on all versions

17 - Selector mechanism

- ☐ Selector forks
- ☐ Dismantling and assembling ⇒ [page 130](#)

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

- ☐ Removing and installing ⇒ [page 108](#)
- ☐ Bearing mounting must always be renewed if it is separated from gearbox housing.
- ☐ Dismantling and assembling input shaft ⇒ [page 135](#)
- ☐ Dismantling and assembling output shaft ⇒ [page 141](#)

19 - Reverse gear shaft

20 - Reverse gear wheel

21 - Bolt

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

22 - Oil collector

- ☐ Depending on version

23 - Magnet

24 - Oil guide

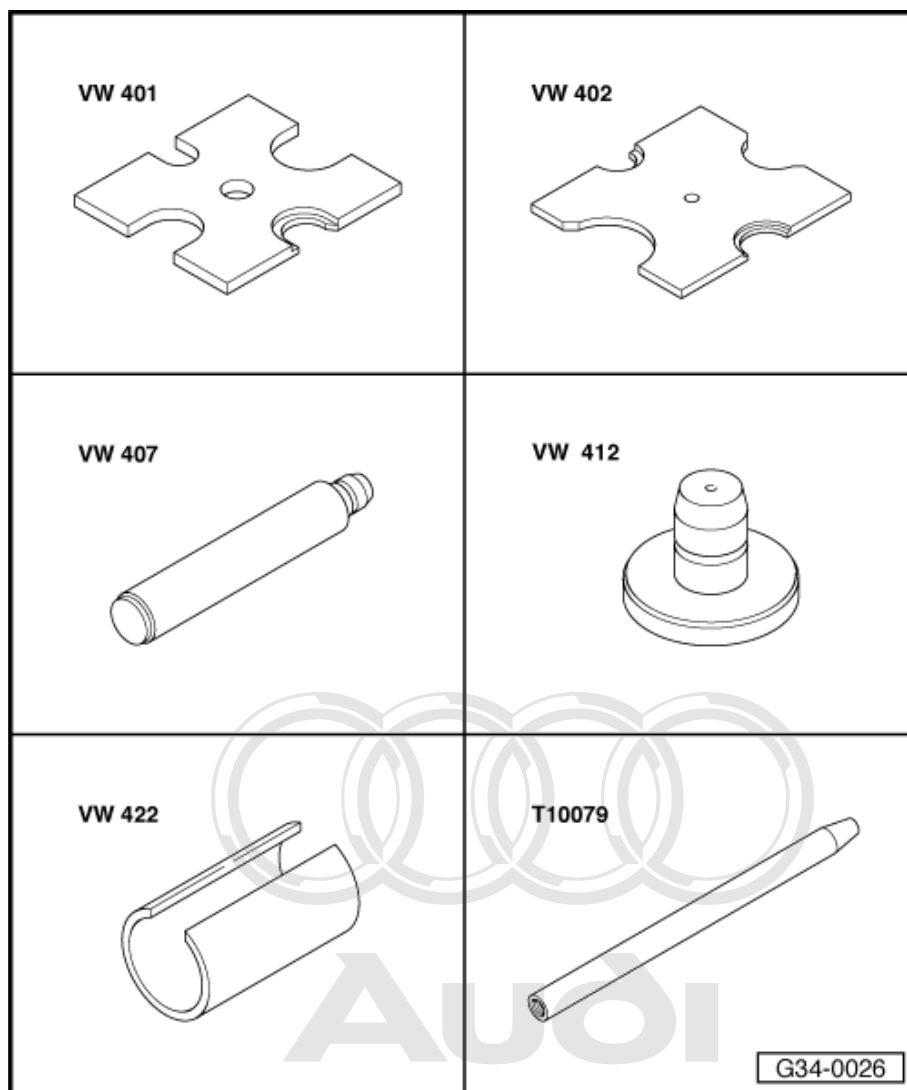
- ☐ Depending on version

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8.7 Removing and installing input shaft, output shaft, differential, selector mechanism and selector forks

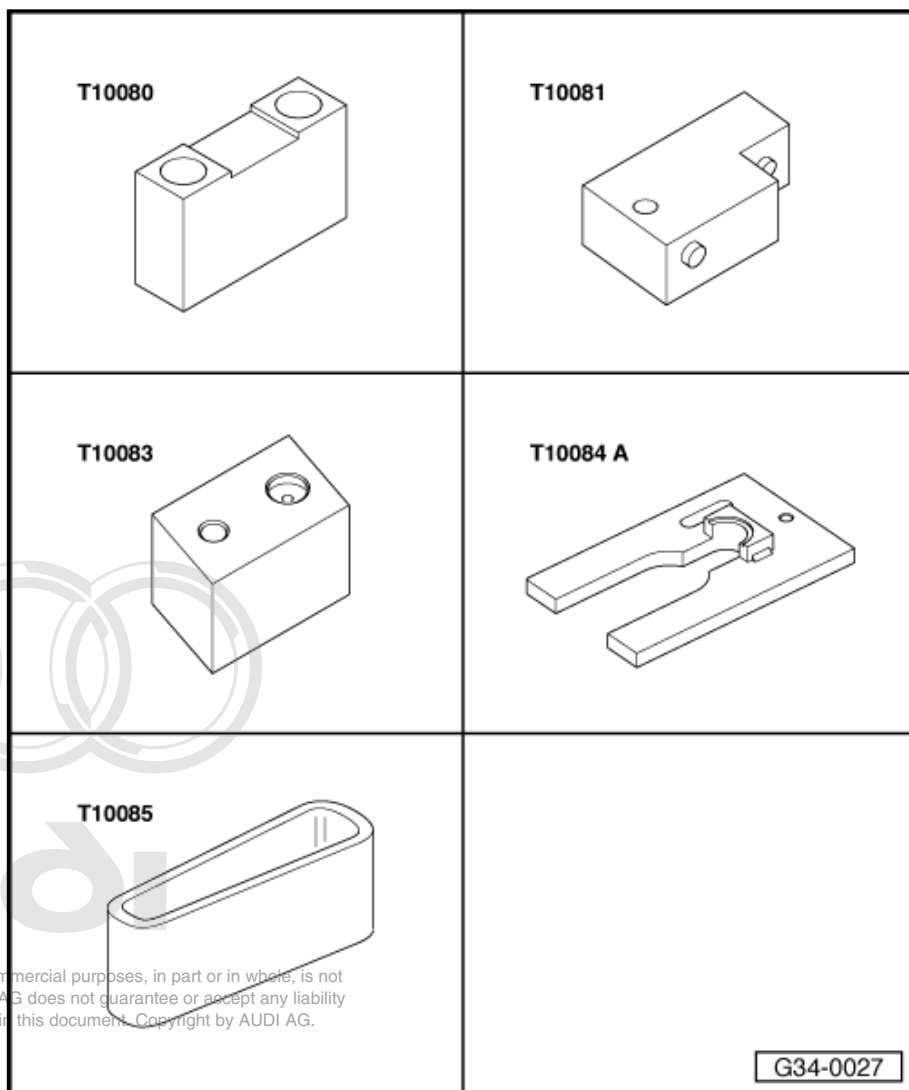
Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 422-
- ◆ Guide pin - T10079-



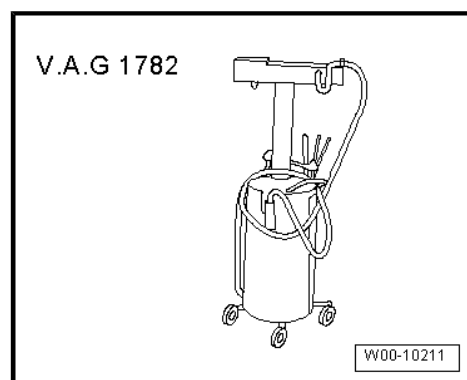
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- ◆ Thrust piece - T10080-
- ◆ Thrust piece - T10081-
- ◆ Thrust block - T10083- and shim - T10083/1-
- ◆ Thrust plate - T10084 A-
- ◆ Thrust piece - T10085-



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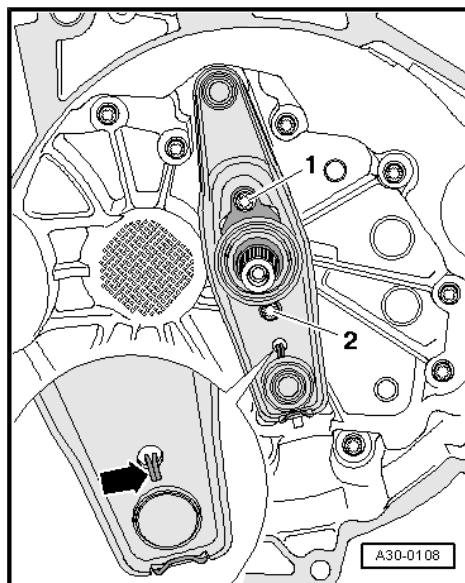
- ◆ Used oil collection and extraction unit - V.A.G 1782-



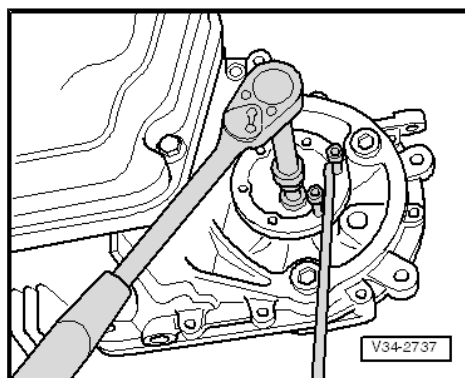
Removing

- Gearbox removed
- Secure gearbox to assembly stand ➔ [page 99](#) .
- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.
- Drain off gear oil.

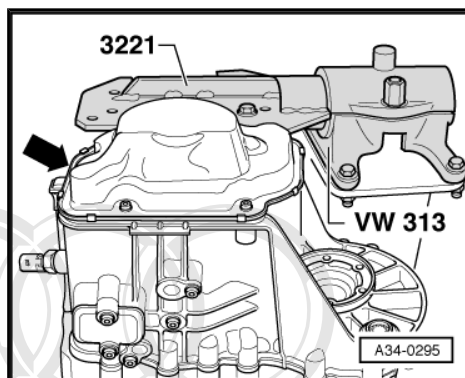
- Unhook spring -arrow- from clutch release lever.
- Remove bolts -1- and -2-.
- Remove release lever with release bearing and guide sleeve.



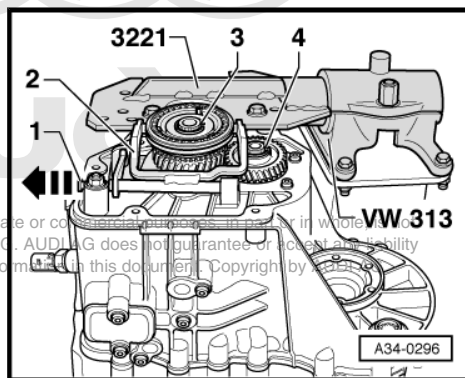
- Remove left flange shaft securing bolt; to do so, screw two bolts into flange and counterhold flange shaft with tyre iron or other suitable lever.
- Pull out flange shaft together with spring, thrust washer and tapered ring.



- Unbolt gearbox housing cover -arrow-.

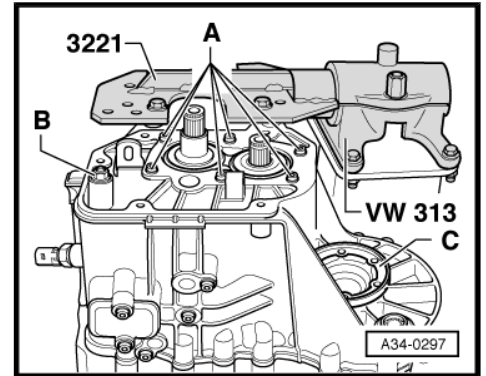


- Pull out pivot pin -1- for 5th gear selector fork -2- and remove selector fork.
- Remove circlip -3- for 5th gear synchro-hub.
- Remove circlip -4- for 5th gear wheel.
- Take off selector gear, locking collar with synchro-hub, and gear wheel.

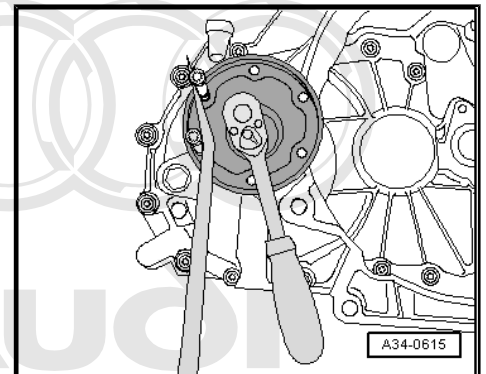


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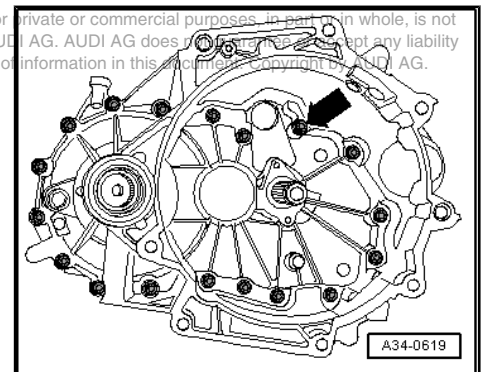
- Unscrew securing bolts -A- for bearing mounting for input and output shafts.
- Unscrew hexagon flange nut -B- for selector mechanism (reverse gear wheel mounting).
- Turn gearbox on assembly stand so that clutch housing faces upwards.



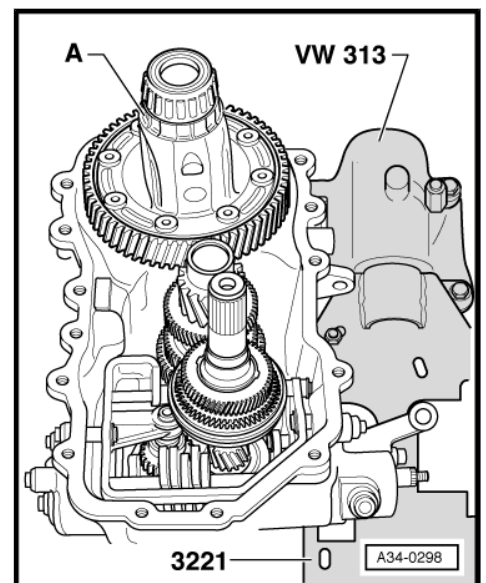
- Remove right flange shaft securing bolt; to do so, screw two bolts into flange and counterhold flange shaft with tyre iron or other suitable lever.
- Pull out flange shaft together with spring, thrust washer and tapered ring.



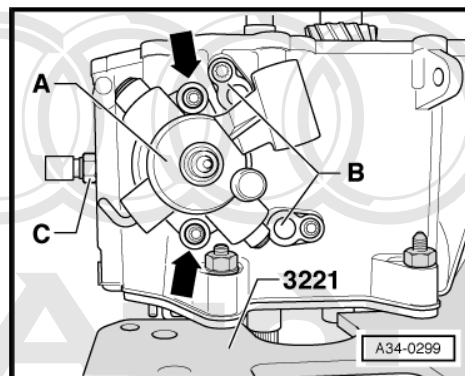
- Remove all 18 bolts -arrow- securing clutch housing.
- Carefully remove clutch housing by levering alternately at the protruding webs on the housing, taking care not to damage the sealing surfaces.



- Remove differential -A- from gearbox housing.

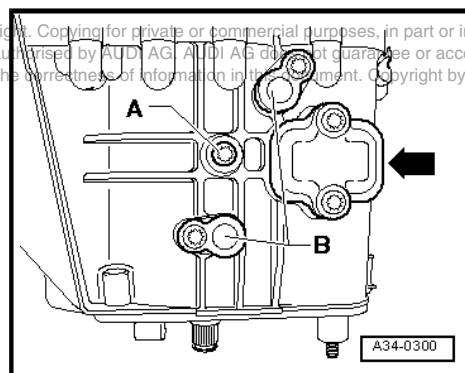


- Remove selector shaft with selector mechanism cover -A-. To do so, move selector shaft into neutral position. Then remove bolts -arrows- and pull selector mechanism cover and selector shaft out of gearbox housing.
- Remove pivot pins -B- from top of gearbox.
- Remove reversing light switch -C-.



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

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Note

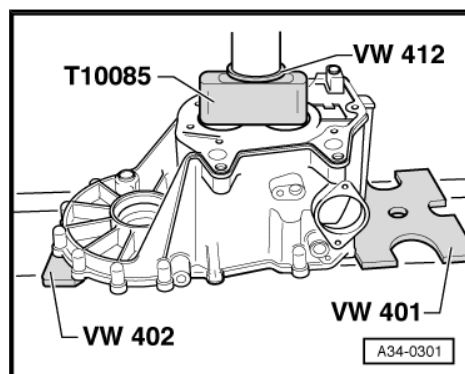
Do not remove cover plate -arrow- when dismantling gearbox.

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



Note

- ◆ *Place gearbox housing on thrust plates - VW 401- and - VW 402- so that the dowel sleeves in the gearbox housing do not become damaged.*
- ◆ *Make sure components do not drop out when being removed (get help from a second person if necessary).*

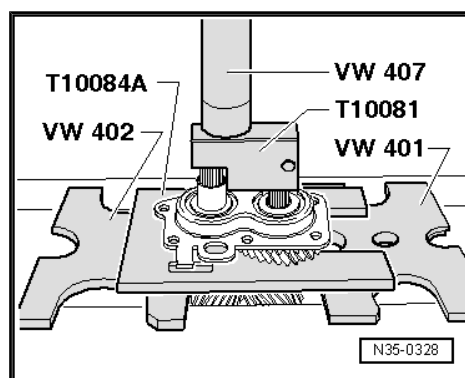


- Slide locking collar for 1st and 2nd gear onto 2nd gear.
- Slide in thrust plate - T10084 A- sideways until it contacts input shaft.
- Insert centralising pins in thrust piece - T10081- into bores in input and output shafts.



Note

Make sure components do not drop out when being removed (get help from a second person if necessary).



- Press input and output shafts out of bearing mounting.
- Take out bearing mounting.
- Dismantle input shaft if necessary ⇒ [page 135](#) .
- Dismantle output shaft if necessary ⇒ [page 141](#) .

Installing output and input shafts ⇒ [page 113](#)

8.7.1 Installing

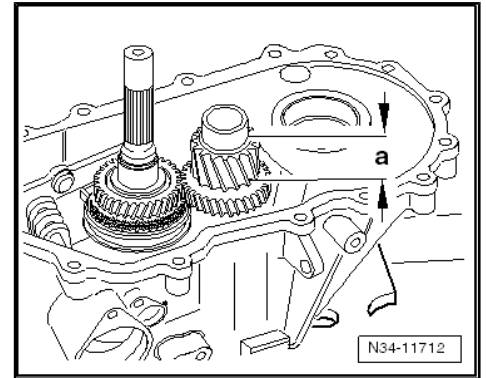
Tightening torques

⇒ ["8.3 Exploded view - gearbox housing cover and 5th gear", page 102](#) , ⇒ ["8.4 Exploded view - clutch housing", page 103](#) ,
⇒ ["8.6 Exploded view - input shaft, output shaft, differential, selector mechanism and selector forks", page 105](#)

Pressing bearing mounting with grooved ball bearings onto input and output shafts.

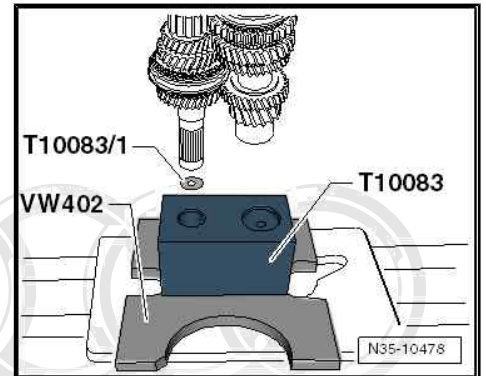
Note

- ◆ Always renew bearing mounting.
- ◆ 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).
- ◆ To ensure that the bearing mounting is pressed evenly onto the shafts, the shafts must always be fitted evenly in the thrust block - T10083- .
- ◆ It may be necessary to fit a washer - T10083/1- (3 mm thick) in the hole provided for the input shaft ⇒ [page 113](#) .
- ◆ Dimension -a- on teeth of output shaft must therefore be measured.



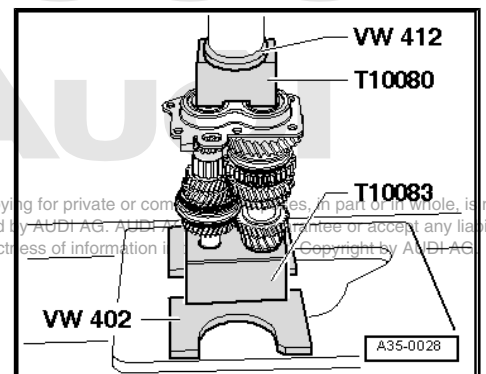
Dimension -a- = 30.6 mm
Insert shim - T10083/1- ⇒ next illustration.

Inserting washer - T10083/1-



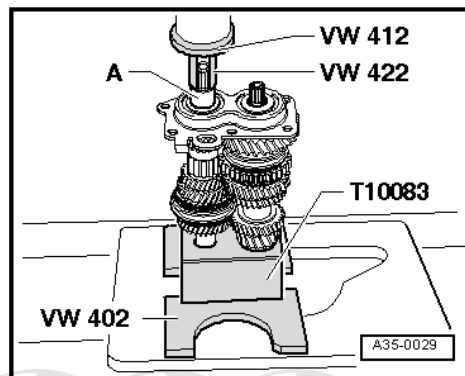
 **WARNING**
Wear protective gloves.

- Heat bearing mounting to about 100°C
- Press on bearing mounting with grooved ball bearings.

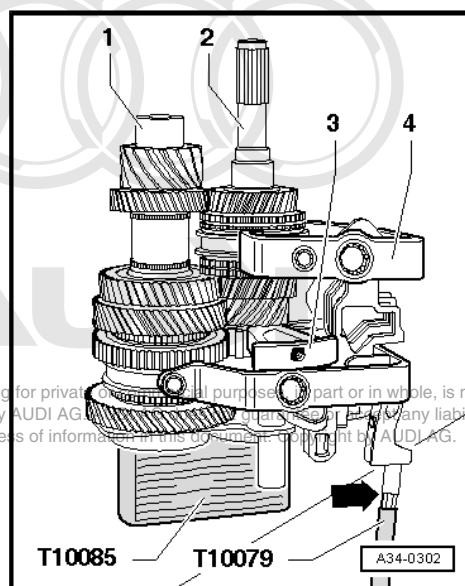


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- Press on sleeve -A- for 5th gear needle bearing.

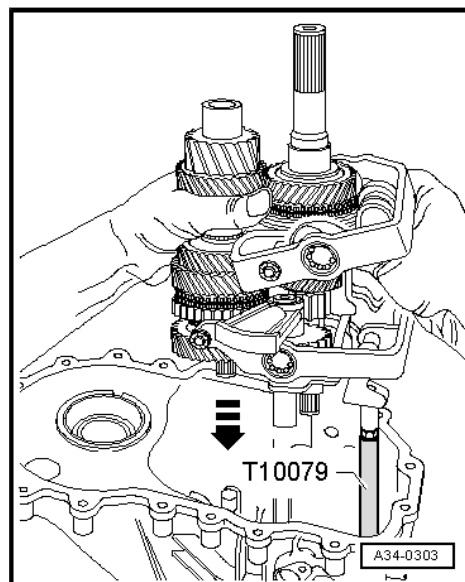


- Place the pre-assembled input shaft -2- and output shaft -1- with bearing mounting for grooved ball bearings in thrust piece - T10085- .
- Screw guide pin - T10079- onto threaded pin (reverse gear mounting) -arrow-.
- Insert selector mechanism (selector forks) -4- in locking collars on shafts.
- Fit reverse gear shaft -3- with reverse gear wheel.



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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- .



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 washer - 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

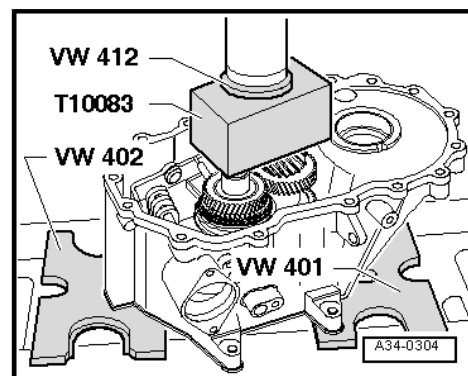
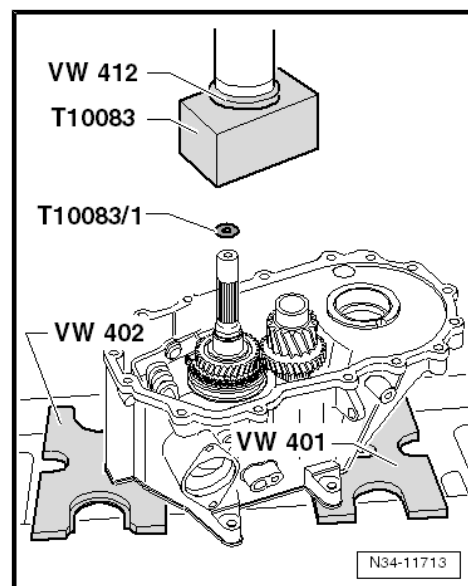
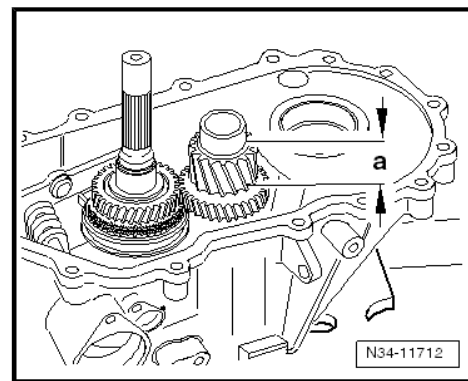
Place shim - T10083/1- on input shaft ⇒ next illustration.

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

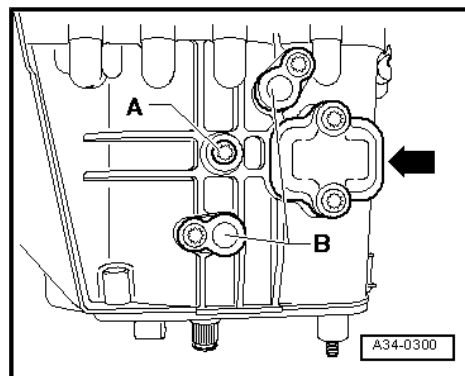
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Carefully pressing in bearing mounting together with input and output shafts as far as stop

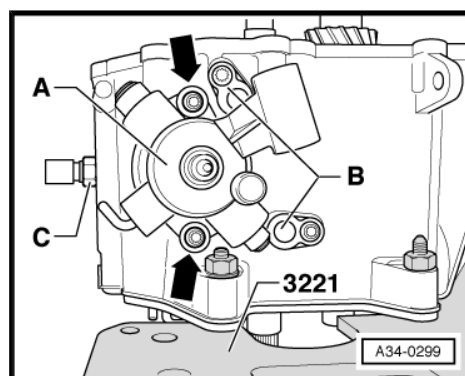
- Secure bearing mounting lightly with bolt tightened finger-tight.



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



- Screw in reversing light switch -C-.
- Align selector mechanism and install pivot pins -B- on top of gearbox.
- Set selector plates in neutral position.
- Clean sealing surfaces; they must be free from oil and grease.
- Apply sealing paste - AMV 188 200 03- evenly to sealing surface.
- Install selector shaft with selector mechanism cover -A-. Then tighten bolts -arrows-.



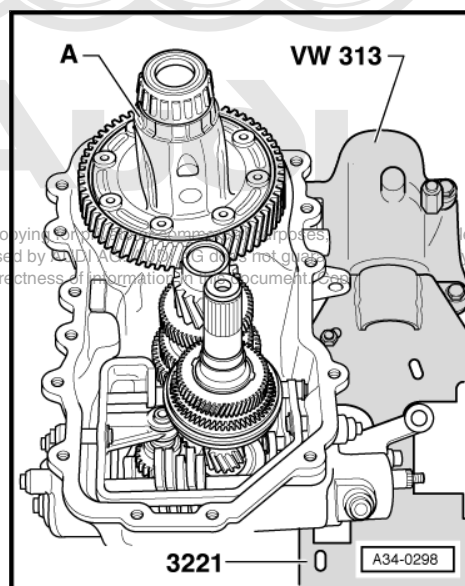
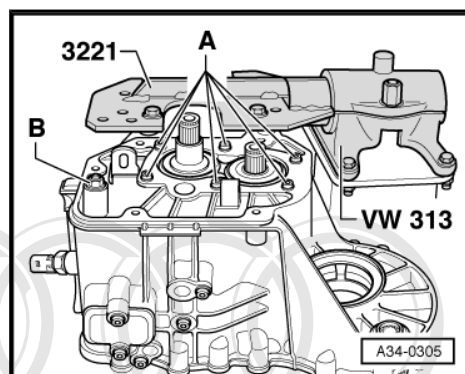
- Using new bolts -A-, secure bearing mounting for input and output shafts.



Note

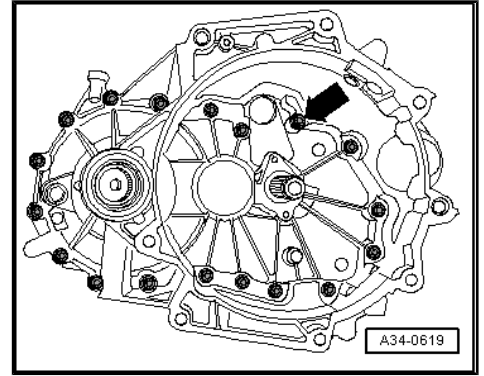
Tighten the bolts in stages to the specified torque in diagonal sequence, starting in the centre.

- Tighten hexagon flange nut -B- for selector mechanism (selector forks).
- Engage all gears to check function.
- Install differential -A-.
- Clean sealing surfaces; they must be free from oil and grease.
- Apply sealing paste - AMV 188 200 03- evenly to sealing surface.
- When installing housing, rotate input shaft by hand to enable bearing to slide easily onto its seat.

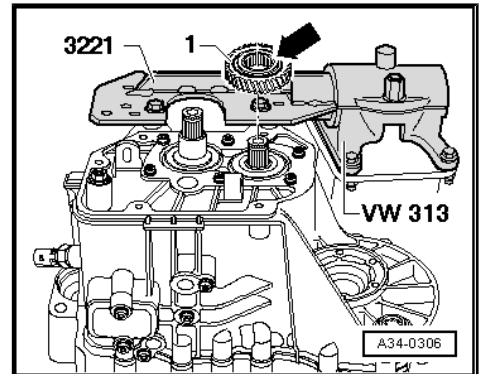


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- Tighten gearbox housing bolts -arrow- diagonally in stages.
- Turn gearbox on assembly stand so that gearbox housing faces upwards.

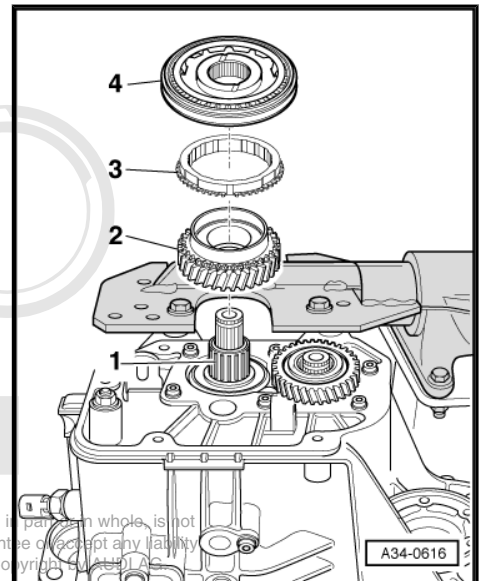


- Fit 5th gear wheel -1-.
- Installation position of 5th gear wheel: the large collar -arrow- points to the gearbox housing cover.



- Install the following components in the sequence indicated:

- 1 - Needle bearing for 5th speed selector gear
- 2 - 5th speed selector gear
- 3 - 5th gear synchro-ring
- 4 - 5th gear synchro-hub with locking collar and check ring



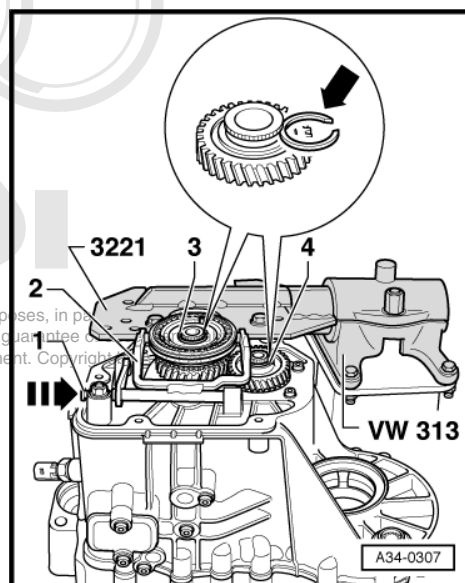
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- Fit 5th gear selector fork -2- and slide pivot pin -1- in onto stop in direction of -arrow-.
- Determine thickness of new circlips -arrow- for input shaft -3- and output shaft -4-.
- Determine the thickest circlip that will just fit and install it. For Part Nos. refer to ⇒ Electronic parts catalogue .

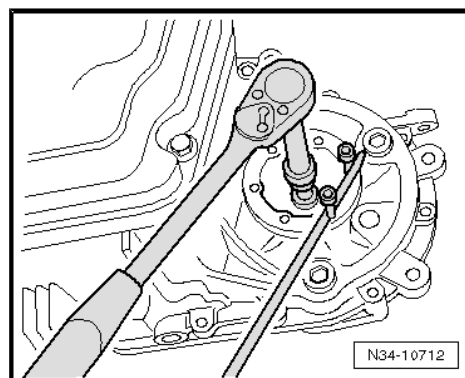
The following circlips are available:

Circlip thickness (mm)	
2.00	2.10 2.20

- Install gearbox housing cover.



- Install both flange shafts with springs, thrust washers and tapered rings (press in towards gearbox housing and tighten bolts).
- Install clutch release lever together with release bearing and guide sleeve ⇒ [page 40](#) .
- Fill up oil in gearbox and check oil level ⇒ [page 98](#) .



9 Exploded view - gearbox housing and clutch housing

1 - Sleeve

- ☐ For selector shaft
- ☐ Driving out ⇒ [page 123](#)
- ☐ Driving in ⇒ [page 123](#)

2 - Dowel sleeve

3 - Magnet

- ☐ Held in place by joint surface of housing

4 - Cover plate

- ☐ Apply sealing paste - AMV 188 200 03- before installing.

5 - Circlip

- ☐ Fit in groove on roller bearing
⇒ [Item 8 \(page 119\)](#)

6 - Circlip

- ☐ Fit in groove on roller bearing
⇒ [Item 7 \(page 119\)](#)

7 - Roller bearing

- ☐ For input shaft
- ☐ Pulling out ⇒ [page 123](#)
- ☐ Pressing in ⇒ [page 124](#)

8 - Roller bearing

- ☐ For output shaft
- ☐ Pulling out ⇒ [page 123](#)
- ☐ Pressing in ⇒ [page 124](#)

9 - Clutch housing

- ☐ If renewed: adjust differential ⇒ [page 167](#)

10 - Input shaft oil seal

- ☐ Removing and installing ⇒ [page 40](#)

11 - Ball-head pin

- ☐ Lubricate with MoS₂ grease
- ☐ 20 Nm

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

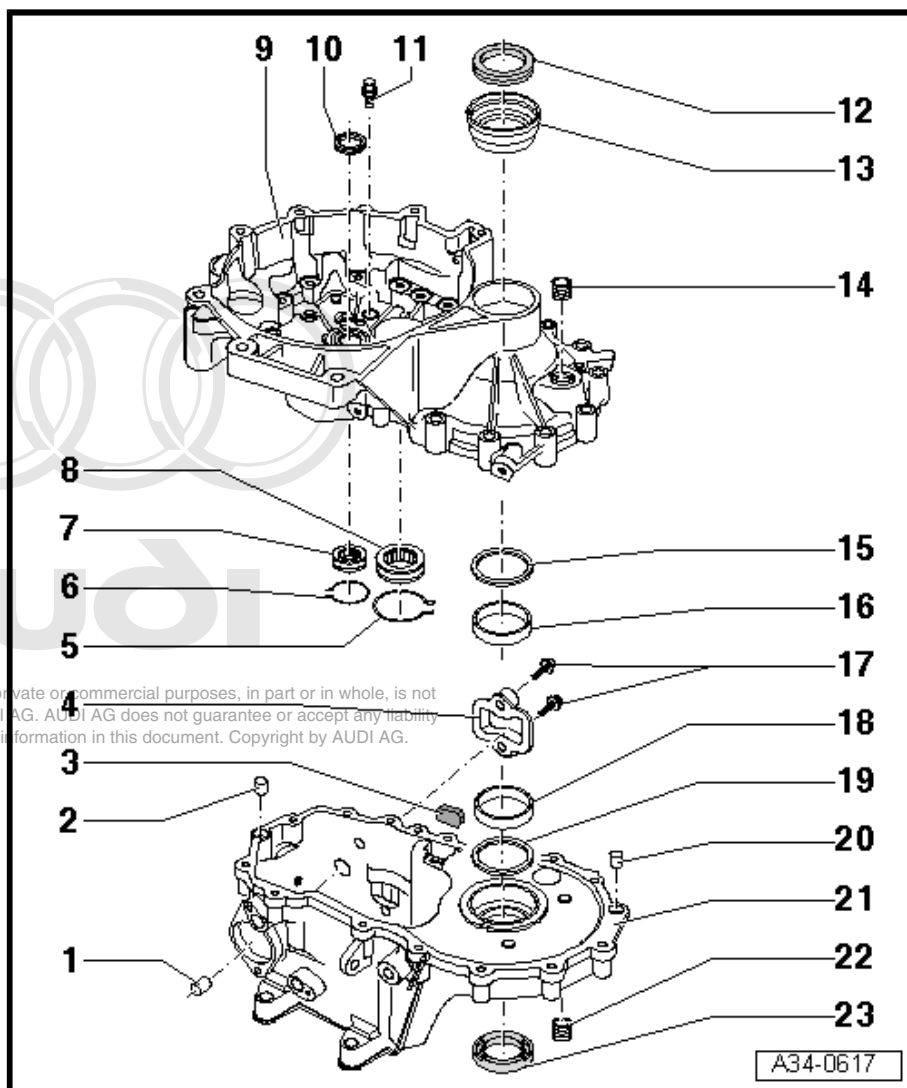
- ☐ Can be renewed with gearbox in vehicle ⇒ [page 156](#)

13 - Sleeve

- ☐ For oil seal
- ☐ Pulling out ⇒ [page 122](#)
- ☐ Drawing in ⇒ [page 123](#)

14 - Plug

- ☐ For oil filler hole
- ☐ Tightening torque ⇒ [page 120](#)



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 121](#)

16 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Pulling out and pressing in ⇒ [page 159](#)
- ☐ If renewed: adjust differential ⇒ [page 167](#)

17 - Bolt

- ☐ Renew
- ☐ 5 Nm + 90°

18 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Pulling out and pressing in ⇒ [page 159](#)
- ☐ If renewed: adjust differential ⇒ [page 167](#)

19 - Shim S₂

- ☐ For differential
- ☐ Determining thickness ⇒ [page 167](#)

20 - Dowel sleeve**21 - Gearbox housing**

- ☐ 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 121](#)
- ☐ If renewed: adjust differential ⇒ [page 167](#)

22 - Plug

- ☐ For oil drain hole
- ☐ Tightening torque ⇒ [page 120](#)

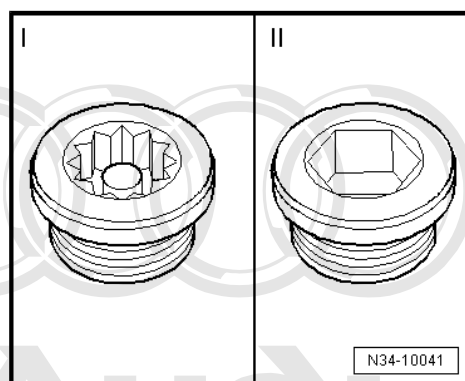
23 - Oil seal for flange shaft (left-side)

- ☐ Can be renewed with gearbox in vehicle ⇒ [page 154](#)

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

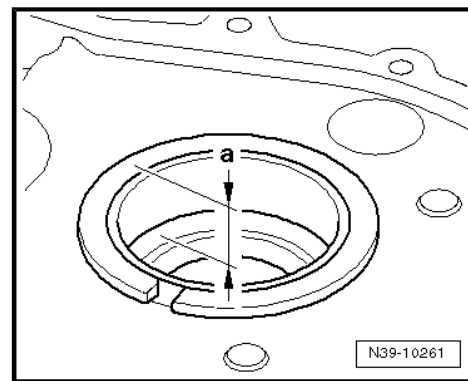


Bearing seat for tapered roller bearing outer race

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

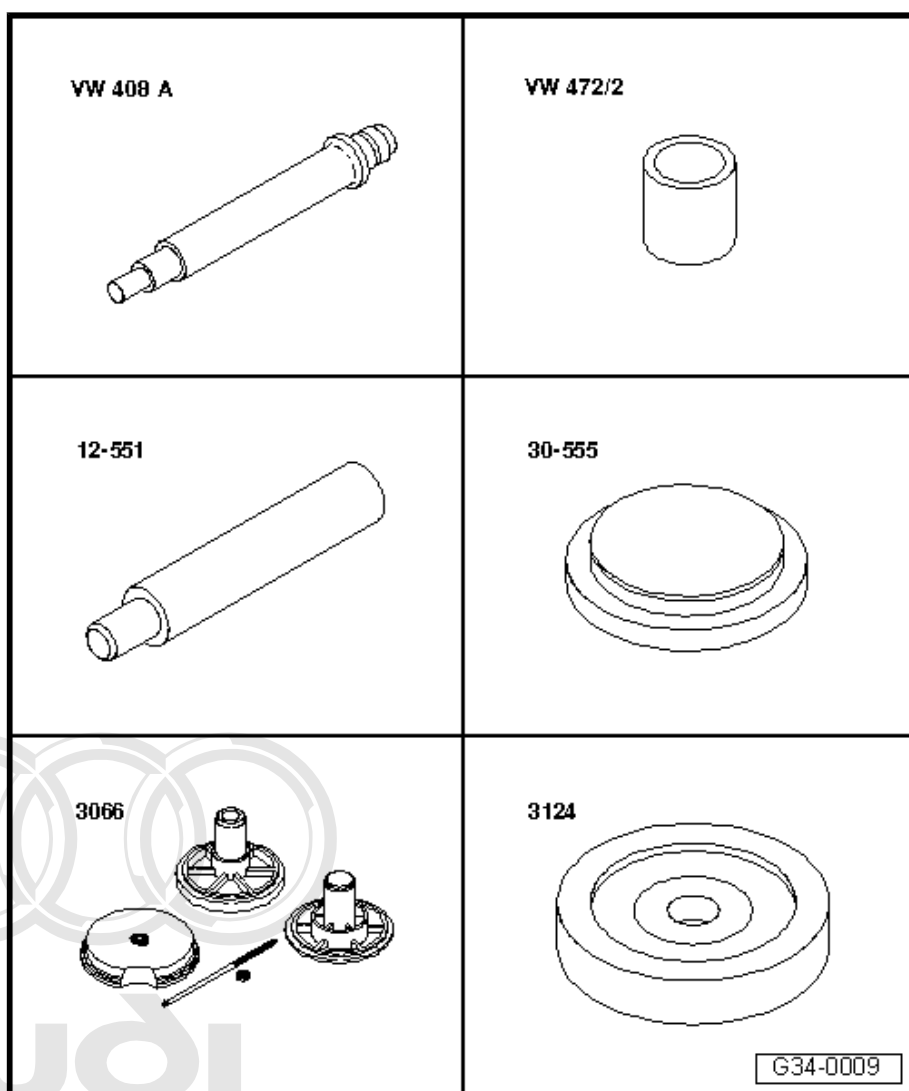
- Depth of seat for tapered roller bearing outer race with shim S₁: dimension -a- = 16.2 mm
- Depth of seat for tapered roller bearing outer race without shim S₁: dimension -a- = 15.2 mm



9.1 Servicing gearbox housing and clutch housing

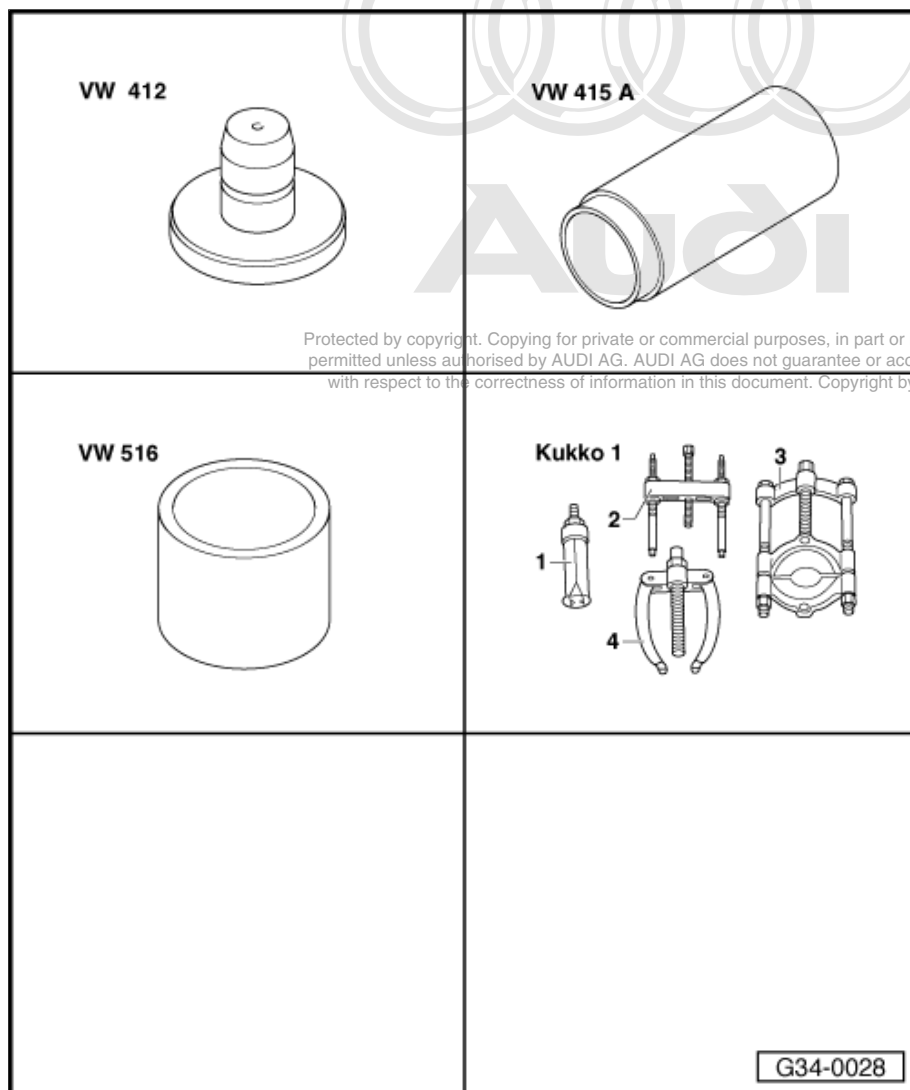
Special tools and workshop equipment required

- ◆ Press tool - VW 408 A-
- ◆ 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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- ◆ Press tool - VW 412-
- ◆ Tube - VW 415 A-
- ◆ Tube - VW 516-
- ◆ -1- Kukko 21/3 internal puller
- ◆ -2- Kukko 18/1 puller
- ◆ -3- Kukko 17/1 splitter
- ◆ -4- Kukko 22/1 counter-support



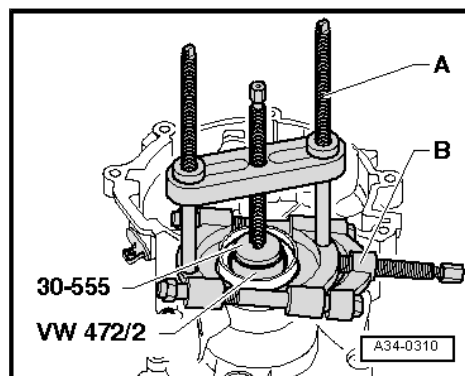
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Pulling out oil seal sleeve

- 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



Drawing in oil seal sleeve

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

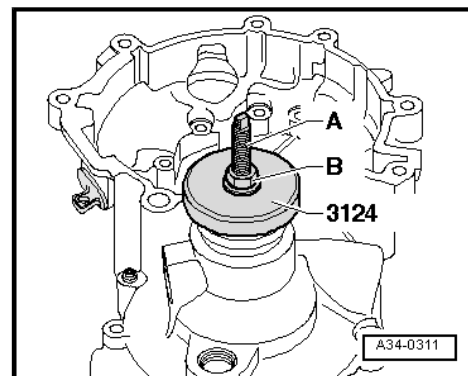
B - M12 nut with washer

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

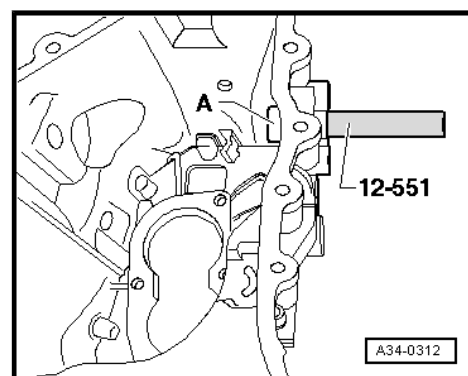


Note

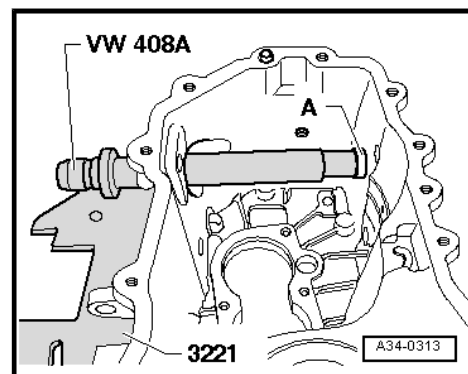
If gearbox has been dismantled, press in sleeve onto stop using thrust piece - 3124- .
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Driving out selector shaft sleeve -A-



Driving in selector shaft sleeve -A-

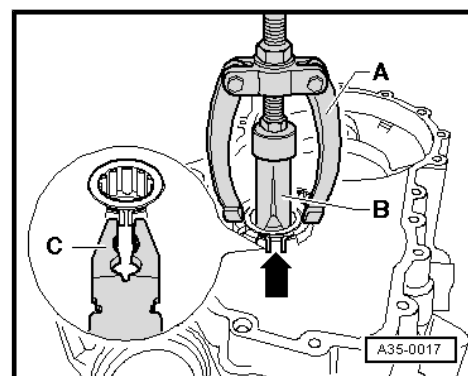


Pulling roller bearing out of clutch housing

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

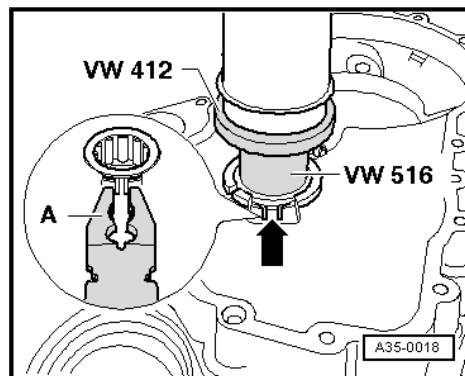
A - Counter-support, e.g. Kukko 22/1

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.



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10 Exploded view - selector mechanism in gearbox

1 - Sleeve

- ☐ For selector shaft
- ☐ Driving out ⇒ [page 123](#)
- ☐ Driving in ⇒ [page 123](#)

2 - Locking pin

- ☐ For adjusting selector mechanism ⇒ [page 72](#)
- ☐ Removing and installing ⇒ [page 125](#)

3 - Selector shaft with selector mechanism cover

- ☐ Selector unit
- ☐ Renew together

4 - Bolt

- ☐ Renew
- ☐ 5 Nm + 90°

5 - Oil seal

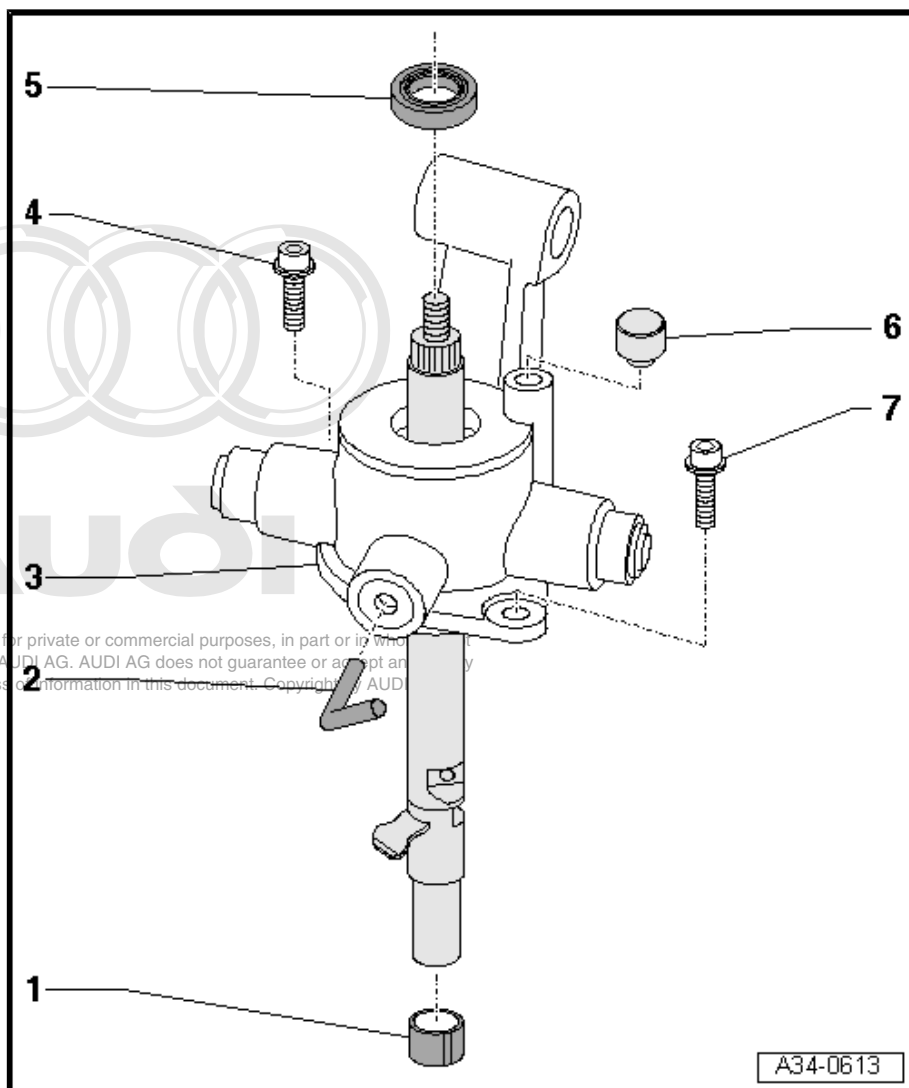
- ☐ Renewing ⇒ [page 127](#)

6 - Cap

- ☐ For gearbox breather

7 - Bolt

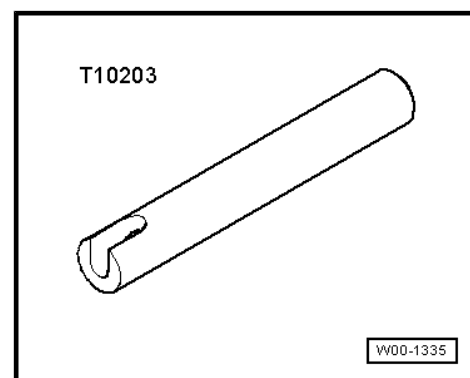
- ☐ Renew
- ☐ 5 Nm + 90°



10.1 Removing and installing locking pin

Special tools and workshop equipment required

- ◆ Tube - T10203-



Removing

- Remove air cleaner housing completely ⇒ Rep. gr. 24 .

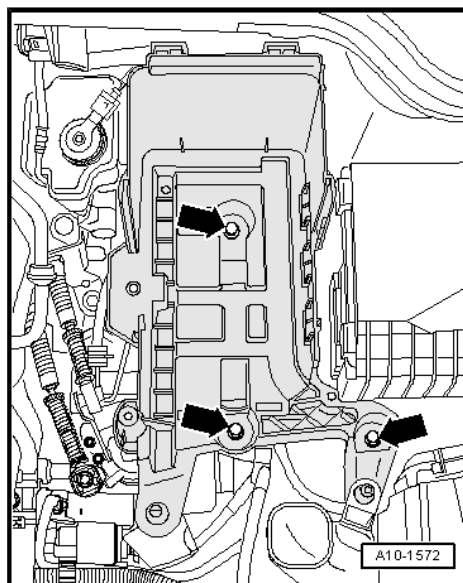
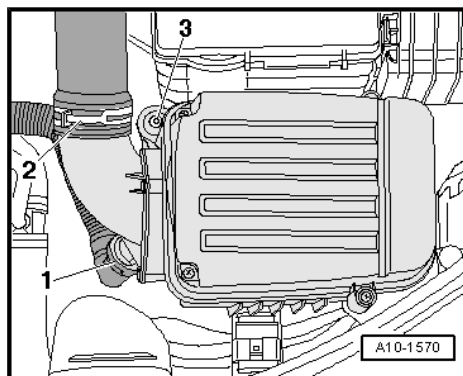


Caution

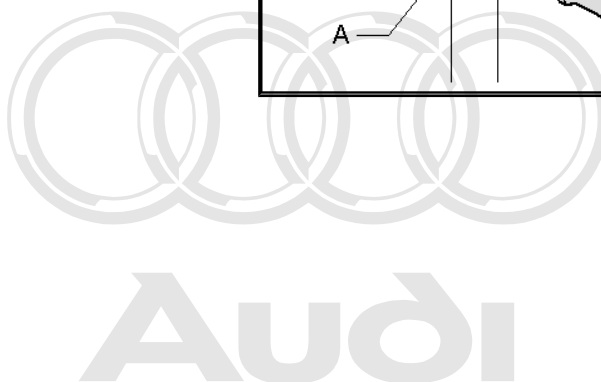
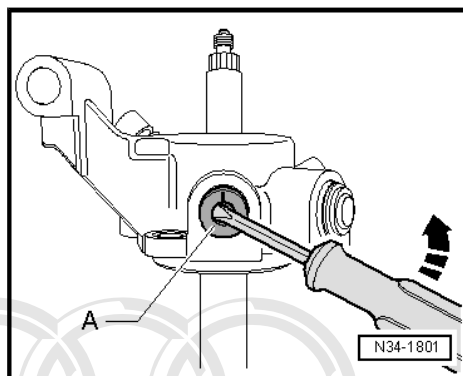
When disconnecting the battery there is a risk of serious damage to electronic components:

- ◆ *Observe the correct 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-.

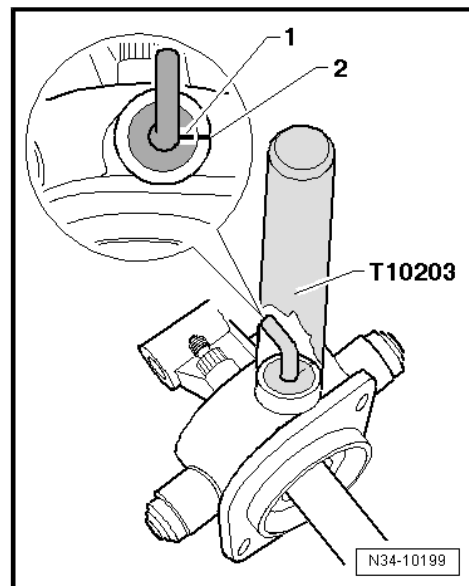


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Installing

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

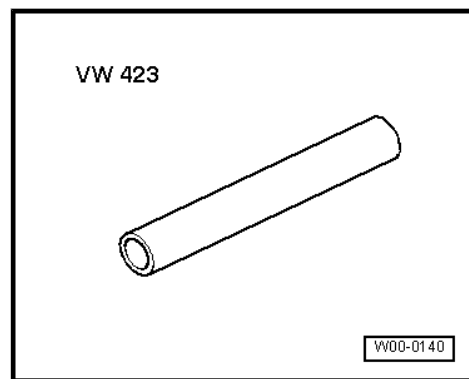
- Drive locking pin into selector mechanism cover with tube - T10203- .
- Installation position: Marking -1- should coincide with marking -2- on selector mechanism cover.
- Install battery tray and battery ⇒ Rep. gr. 27 .
- Install air cleaner housing ⇒ Rep. gr. 24 .



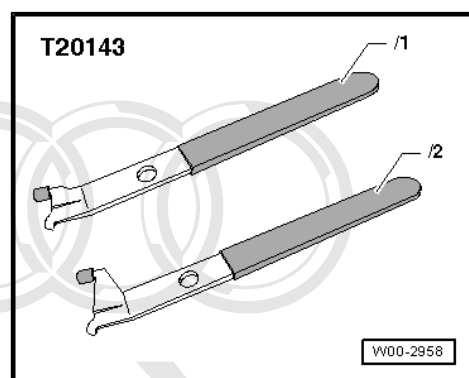
10.2 Renewing oil seal for selector mechanism in gearbox

Special tools and workshop equipment required

- ◆ Tube - VW 423-



- ◆ Extractor tool - T20143/1-



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Procedure

- Remove air cleaner housing completely ⇒ Rep. gr. 24 .

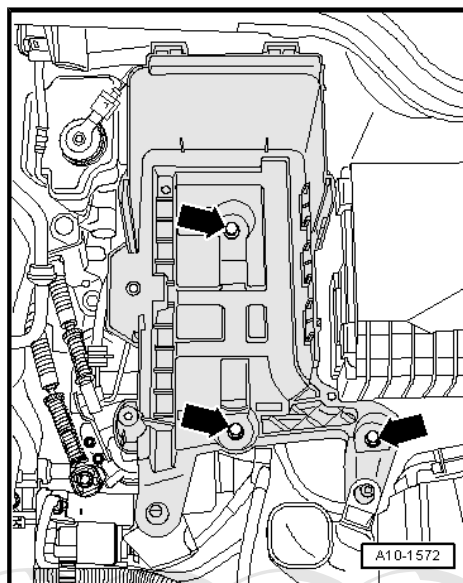
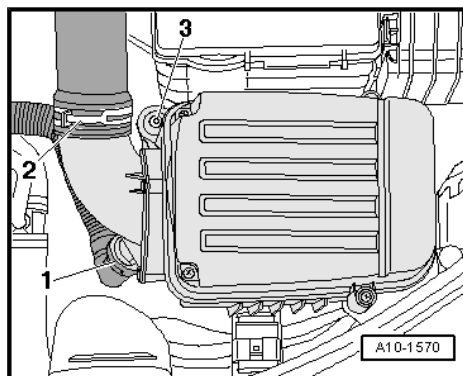


Caution

When disconnecting the battery there is a risk of serious damage to electronic components:

- ◆ *Observe the correct 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:

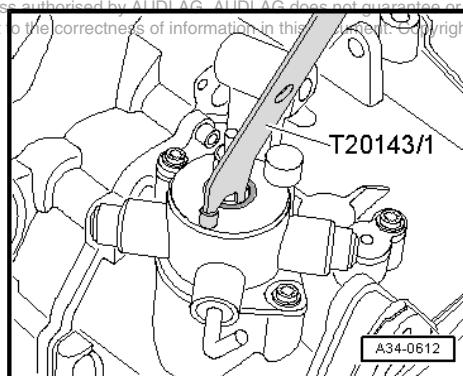
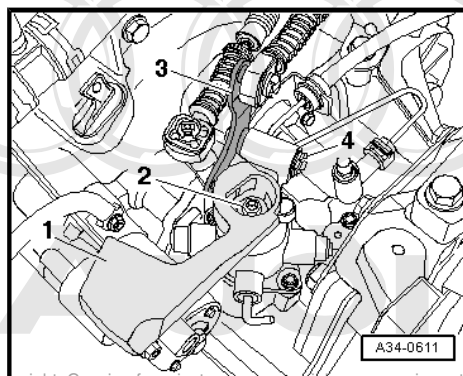
- Detach circlip -4- and push gate relay lever -3- sideways out of bearing.

Plastic gate relay lever:

- Detach gate relay lever (with detent catch) / gate relay lever (with clip) from gearbox selector lever ⇒ [page 69](#) / ⇒ [page 70](#) .

Continued for all vehicles:

- Remove nut -2- and take out gearbox selector lever -1-.
- Pry out oil seal using extractor tool - T20143/1- .



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

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

- Install gearbox selector lever and gate relay lever ⇒ [page 62](#) /
⇒ [page 66](#) .

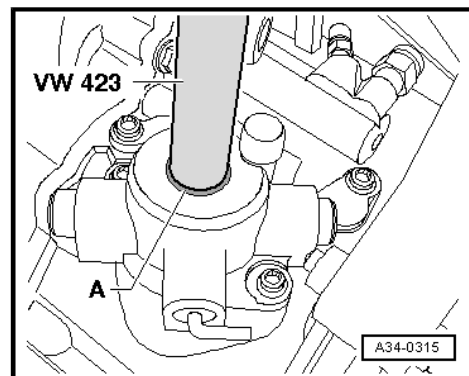


Note

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

- Install battery tray and battery ⇒ Rep. gr. 27 .
- Install air cleaner housing ⇒ Rep. gr. 24 .

Tightening torque ⇒ [page 125](#)



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11 Exploded view - selector forks



Note

The selector fork cluster ⇒ [Item 1 \(page 130\)](#) does not have to be dismantled in order to remove and install detent segments, clamping washers and angular contact ball bearings.

1 - Selector fork cluster with selector plates

2 - 3rd/4th gear detent segment

- ☐ Identification ⇒ [page 132](#)
- ☐ Detent segment should turn freely after installation.

3 - Angular contact ball bearing

- ☐ 4x
- ☐ Removing ⇒ [page 133](#)
- ☐ Pressing inner race into outer race ⇒ [page 133](#)
- ☐ Installing ⇒ [page 134](#)

4 - Clamping washer

- ☐ Renew
- ☐ Removing ⇒ [page 133](#)
- ☐ Installing ⇒ [page 133](#)

5 - 1st/2nd gear detent segment

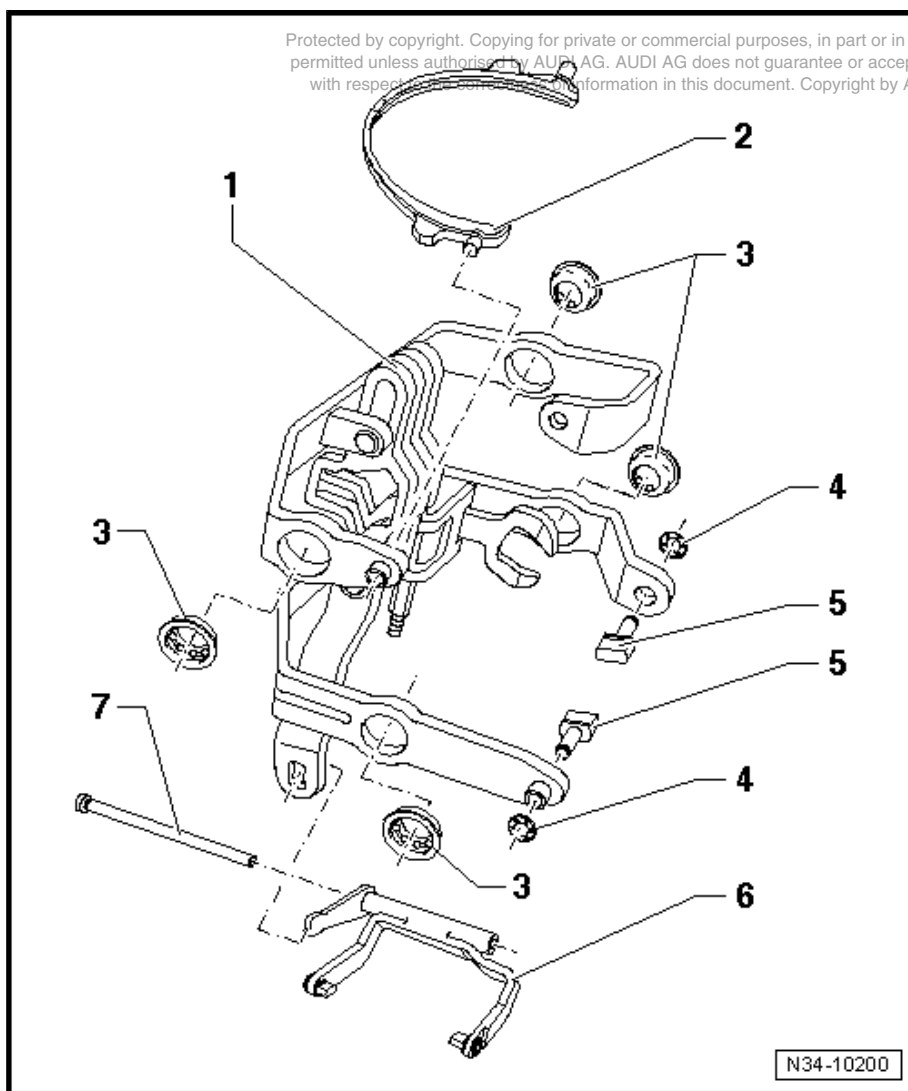
- ☐ Identification ⇒ [page 132](#)
- ☐ The segment must rotate freely after installing the lock washer
- ☐ Selector fork with detent segment ⇒ [page 132](#)

6 - 5th gear selector fork with detent segments

- ☐ Detent segments are inseparably joined with selector fork
- ☐ Identification ⇒ [page 132](#)

7 - Pivot pin

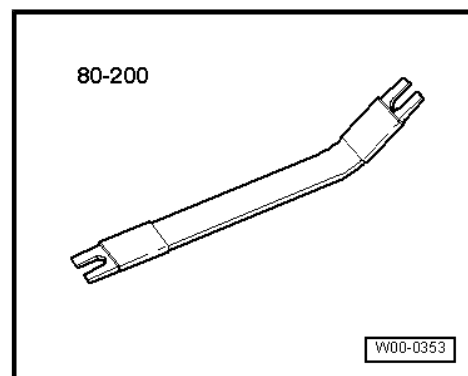
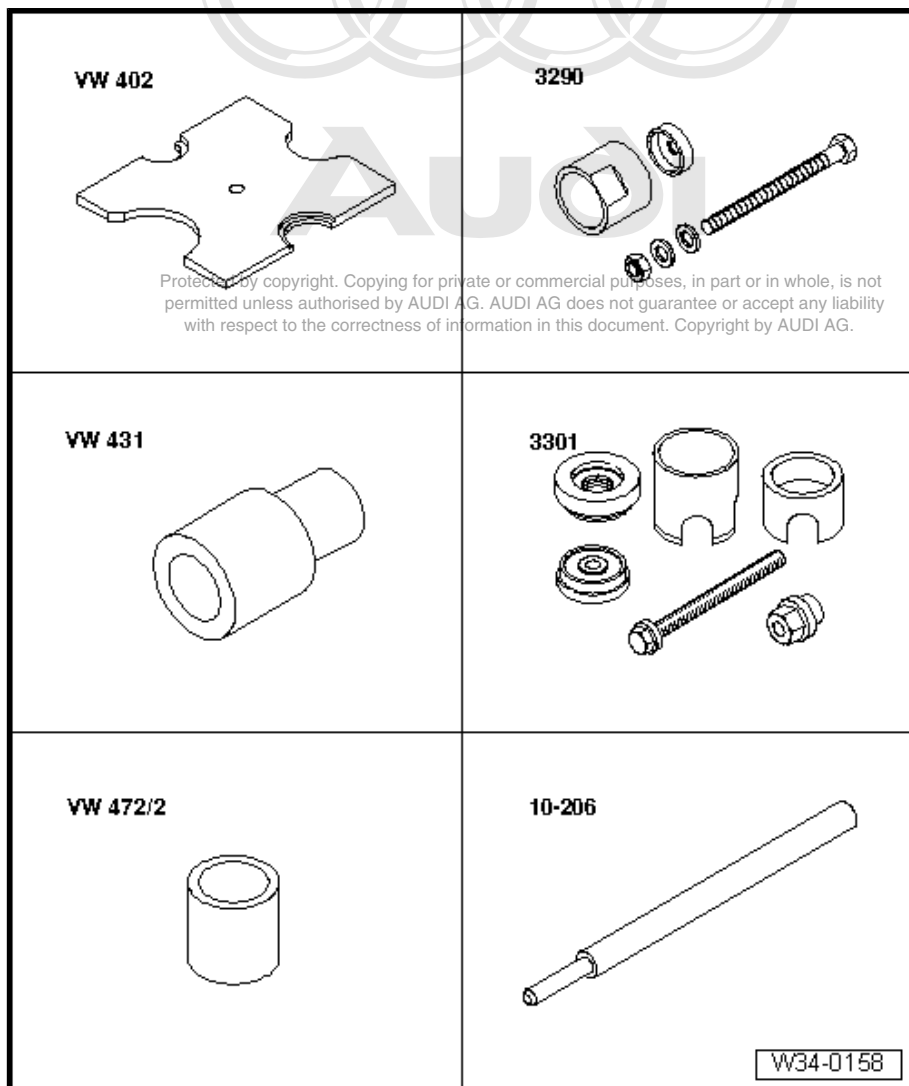
- ☐ for 5th gear selector fork



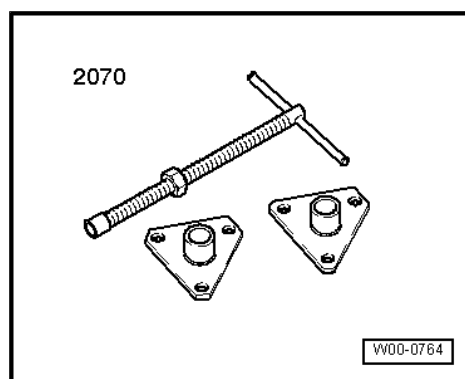
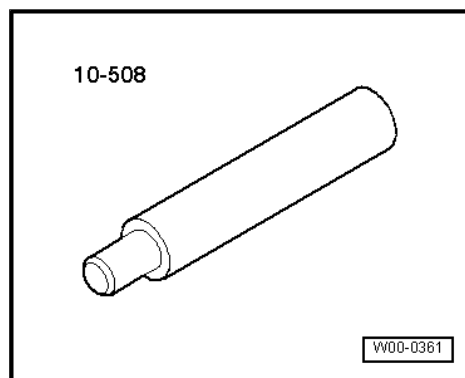
11.1 Dismantling and assembling selector forks

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 gear selector fork with detent segments

Dimension -a-

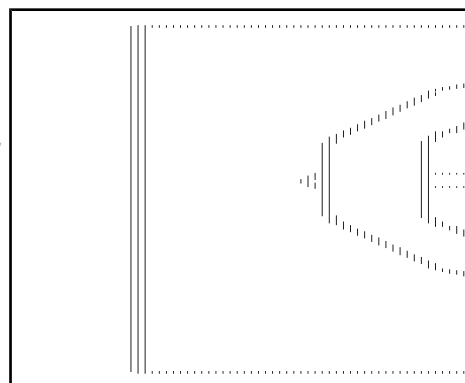
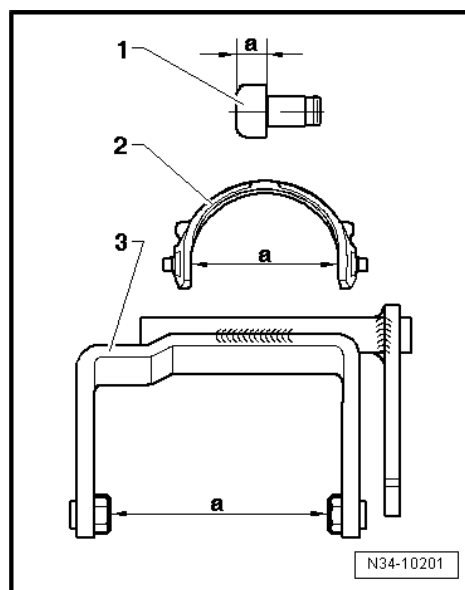
- 1 - Detent segments 1st/2nd gear = 10.2 mm
- 2 - Detent segment 3rd/4th gear = 78.6 mm
- 3 - 5th/6th gear selector fork with detent segments = 79.5 mm



1st/2nd gear selector fork with detent segments

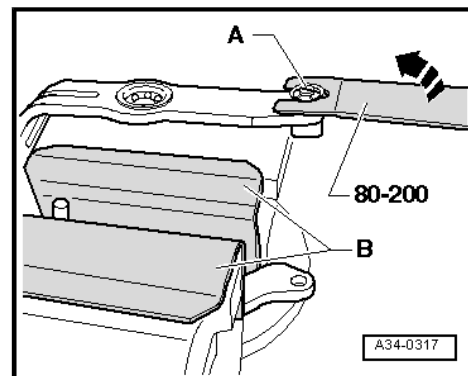
Dimension -a- = 75 mm

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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

- Press lock washer into groove on detent segment using socket attachment.

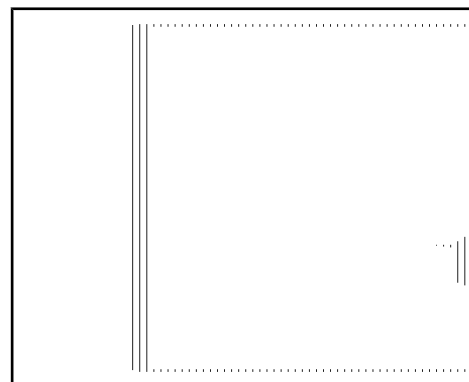
A - Socket (10 mm)

B - Protective jaw covers



Note

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Detent segment should turn freely after lock washer is installed.

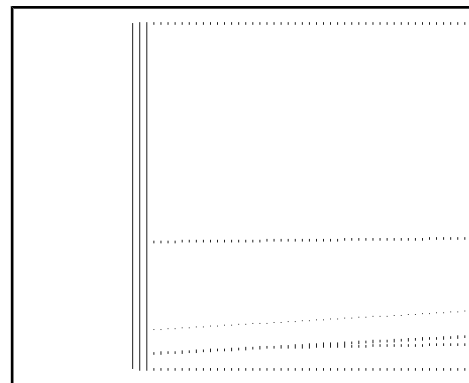


Removing angular contact ball bearing



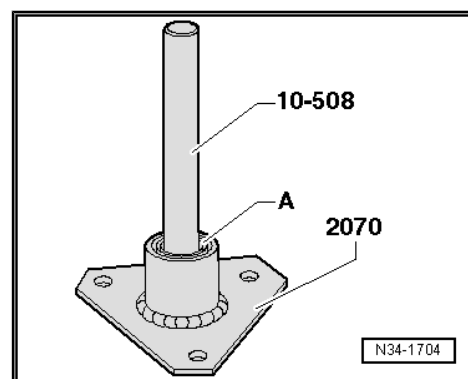
Note

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



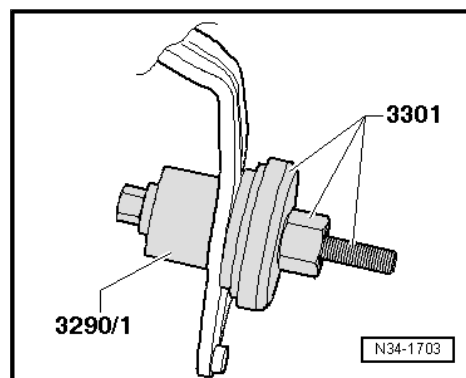
Pressing inner race -A- of angular contact ball bearing into outer race

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 99](#)
- ◆ 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 - Input shaft

2 - Needle bearing

- ☐ For 3rd gear

3 - 3rd speed selector gear

4 - 3rd gear synchro-ring

- ☐ Checking for wear
⇒ [page 140](#)

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

- ☐ Removing and installing
⇒ [page 136](#)
- ☐ Dismantling and assembling
⇒ [page 140](#)

6 - 4th gear synchro-ring

- ☐ Checking for wear
⇒ [page 140](#)

7 - Sleeve

- ☐ For 4th gear needle bearing
- ☐ Removing and installing
⇒ [page 136](#)
- ☐ Renew together with
⇒ [Item 8 \(page 135\)](#)

8 - Needle bearing

- ☐ For 4th gear
- ☐ Removing and installing
⇒ [page 136](#)
- ☐ Renew together with
⇒ [Item 7 \(page 135\)](#)

9 - 4th speed selector gear

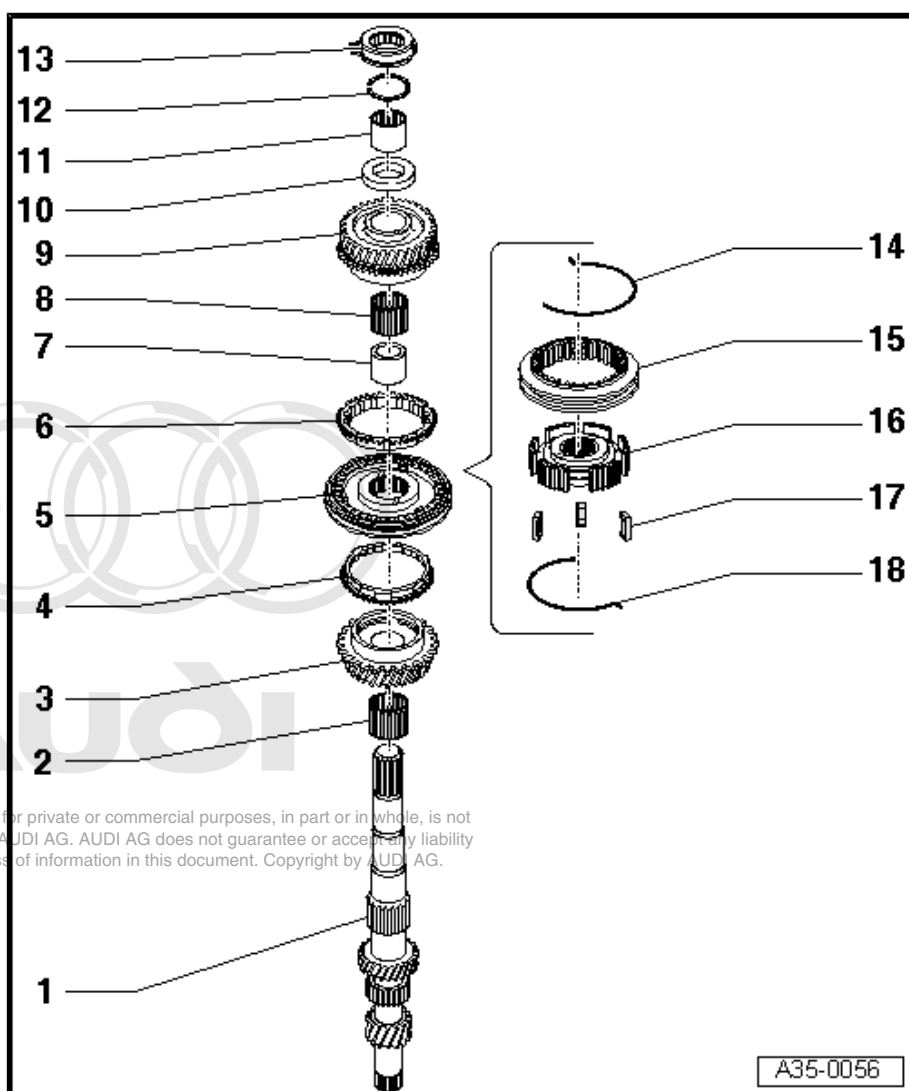
10 - Thrust washer

11 - Inner race for roller bearing

- ☐ Removing and installing ⇒ [page 136](#)

12 - Circlip

- ☐ Renew
- ☐ Determining thickness ⇒ [page 139](#)



13 - Roller bearing

- ☐ With circlip
- ☐ Removing and installing ⇒ [page 121](#)

14 - Spring

- ☐ Installation position: angled end of spring must locate in one of the locking pieces.

15 - Locking collar for 3rd and 4th gear

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

17 - Locking pieces

- ☐ 3x

18 - Spring

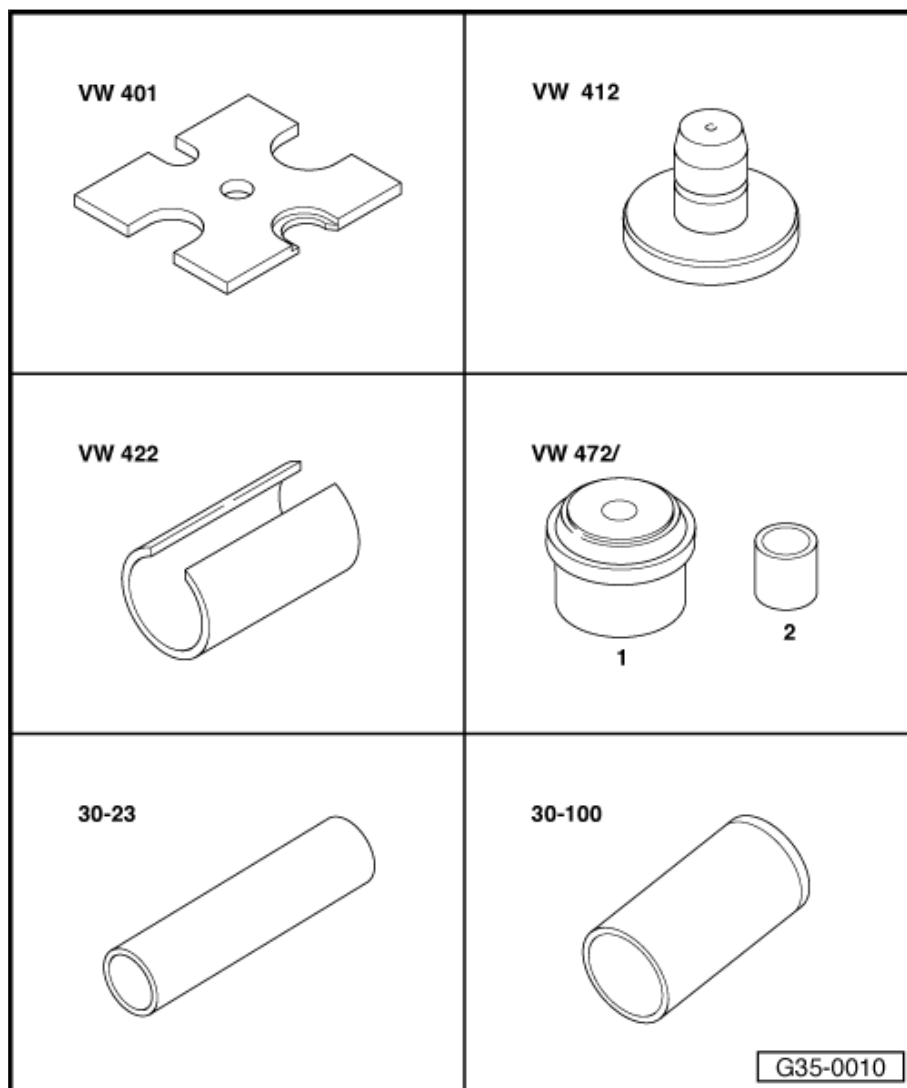
- ☐ Installation position: angled end of spring must locate in one of the locking pieces.

1.1 Dismantling and assembling input shaft

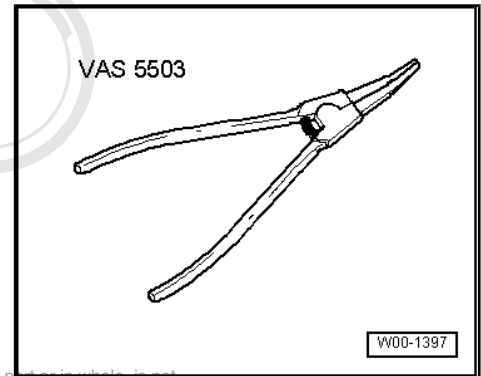
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Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 422-
- ◆ Spacer sleeve - VW 472/2-
- ◆ Extension - 30 - 23-
- ◆ Drift sleeve - 30 - 100-

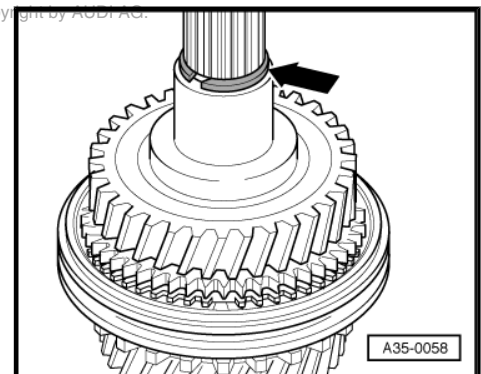


- ◆ Circlip pliers - VAS 5503-



Dismantling

- Input shaft removed ⇒ [page 108](#)
- Remove circlip -arrow- with circlip pliers - VAS 5503- .

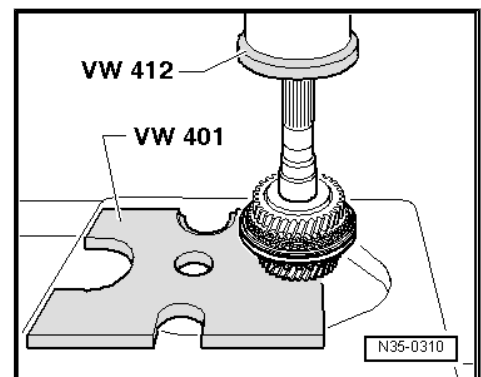


- Press off inner race of roller bearing together with the following components:
- Thrust washer
- 4th speed selector gear with needle bearing
- Locking collar/synchro-hub for 3rd and 4th gears
- 3rd speed selector gear



Note

Make sure components do not drop out when being removed (get help from a second person if necessary).



- Remove components from input shaft in the sequence indicated -1 ... 10-.

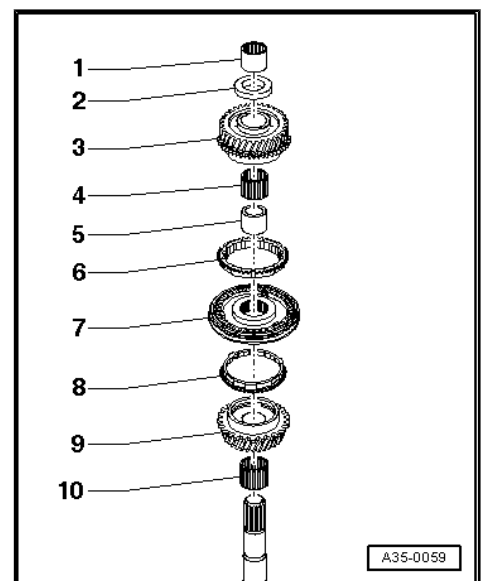
Assembling

- Checking synchro-rings for wear ⇒ [page 140](#) .
- Fit following components on input shaft:
- 10 - Needle bearing for 3rd gear
- 9 - 3rd speed selector gear
- 8 - 3rd gear synchro-ring
- 7 - Locking collar with synchro-hub for 3rd and 4th gear

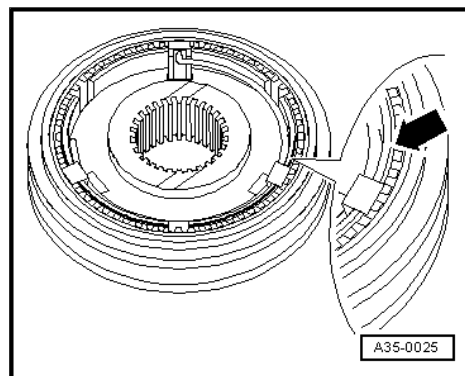


Note

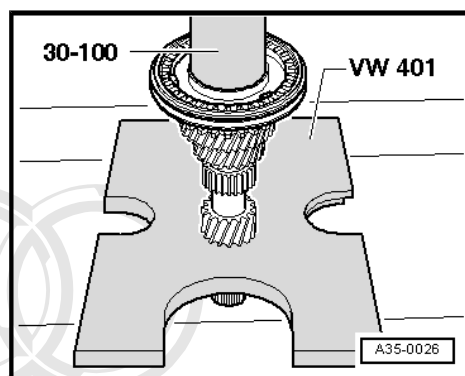
Dismantling and assembling 3rd and 4th gear locking collar and synchro-hub ⇒ [page 140](#)



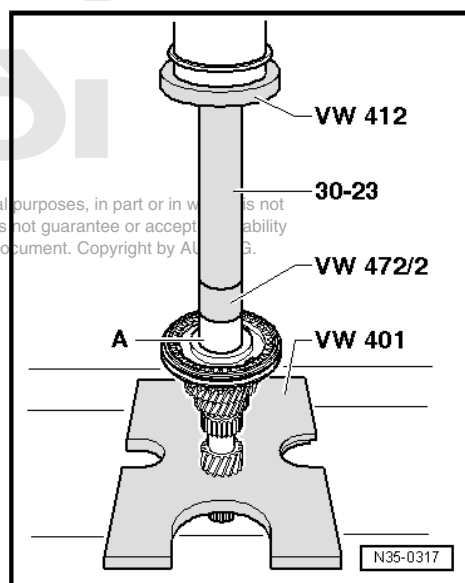
- Note correct position of synchro-hub for 3rd and 4th gears.
- The groove on the top -arrow- and the flatter contact shoulder face towards 4th gear.



- Press on synchro-hub with locking collar for 3rd and 4th gear.



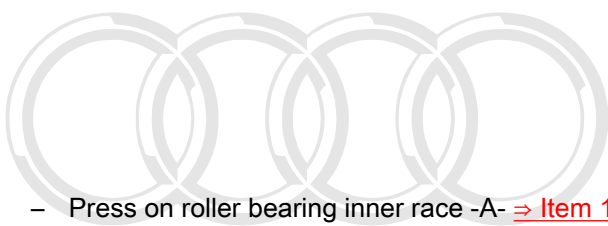
- Press on sleeve -A- for 4th gear needle bearing
⇒ [Item 7 \(page 135\)](#).



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– Fit following components on input shaft:

- 6 - 4th gear synchro-ring
- 4 - Needle bearing for 4th gear
- 3 - 4th speed selector gear
- 2 - Thrust washer



– Press on roller bearing inner race -A- ⇒ [Item 11 \(page 135\)](#) .

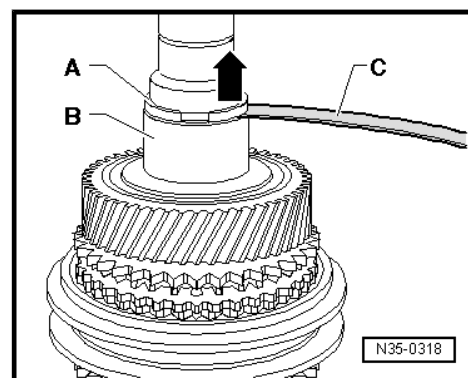
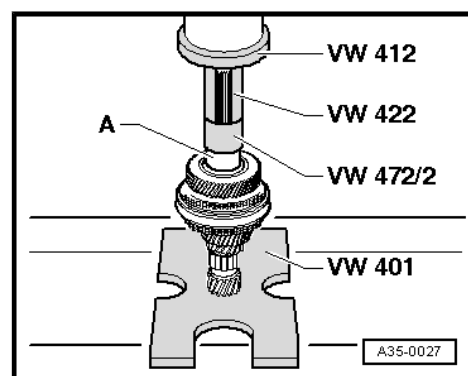
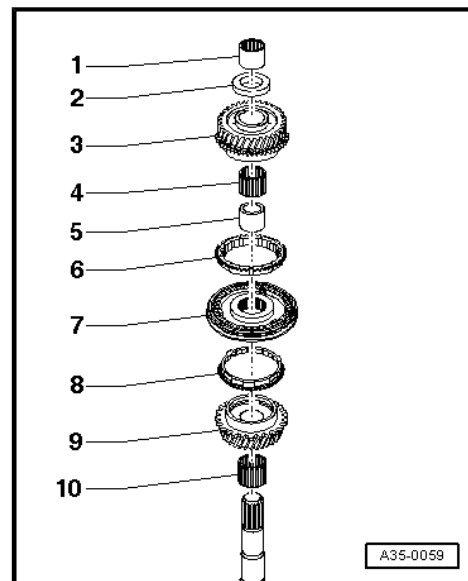


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- Insert a 2.0 mm thick circlip -A- in groove on input shaft and press upwards -arrow-.
- Measure gap between inner race -B- and fitted circlip -A- using feeler gauge -C-.
- Remove circlip fitted for measurement.
- Select required circlip from table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

The following circlips are available:

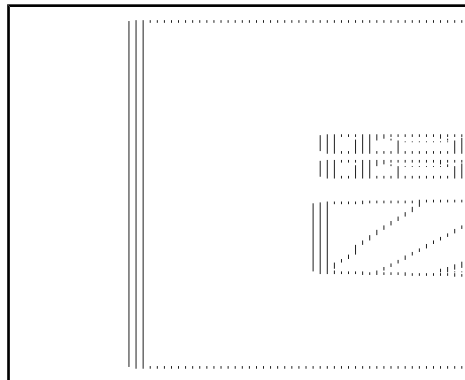
Measured value (mm)	Circlip thickness (mm)	Axial clearance (mm)
0.05 ... 0.10	2.0	0.05 ... 0.15
0.15 ... 0.20	2.1	0.05 ... 0.15
0.25 ... 0.30	2.2	0.05 ... 0.15
0.35 ... 0.40	2.3	0.05 ... 0.15
0.45 ... 0.50	2.4	0.05 ... 0.10



1.2 Checking 3rd and 4th gear synchro-ring for wear

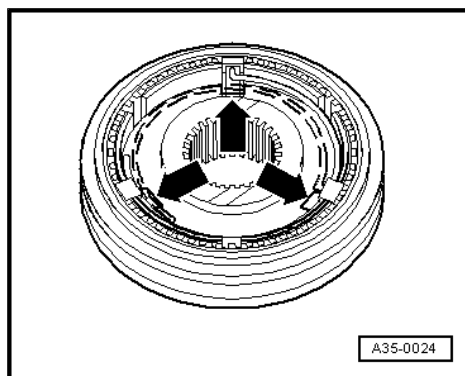
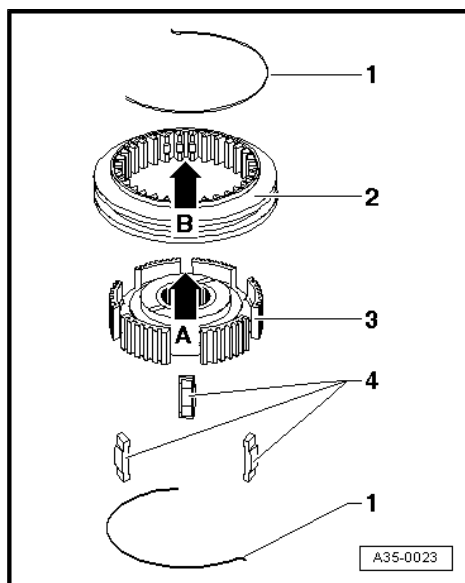
- Press synchro-ring onto cone on selector gear and measure gap -a- with a feeler gauge.

Installation depth	Wear limit
1.1...1.7 mm	0.5 mm



1.3 Dismantling and assembling 3rd and 4th gear locking collar and synchro-hub

- Take off springs -1- before dismantling.
- 2 - Locking collar
- 3 - Synchro-hub
- 4 - Locking piece
- To assemble, slide locking collar over synchro-hub. Installation position:
- The smaller slots -arrow A- in the synchro-hub should be in line with the slots -arrow B- in the locking collar.
- Fit locking pieces in the smaller slots -arrows- and install springs so they are offset 120°.
- Angled end of spring must locate in one of the locking pieces.



2 Exploded view - output shaft



Note

- ◆ *Securing gearbox to assembly stand ⇒ [page 99](#)*
- ◆ *Refer to technical data ⇒ [page 2](#) when installing new gears or a new output shaft.*
- ◆ *Lubricate all bearings, selector gears and synchro-rings on output shaft with gear oil before installing.*
- ◆ *Do not interchange synchro-rings. When re-using synchro-rings, always fit on the same selector gear.*

1 - Roller bearing

- ☐ With circlip
- ☐ Removing and installing ⇒ [page 121](#)
- ☐ Installation position: the circlip in the bearing faces the output shaft

2 - 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

3 - 4th gear wheel

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

4 - Circlip

- ☐ Renew

5 - Circlip

- ☐ Renew

6 - 3rd gear wheel

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

7 - Circlip

- ☐ Renew

8 - Needle bearing

- ☐ For 2nd gear

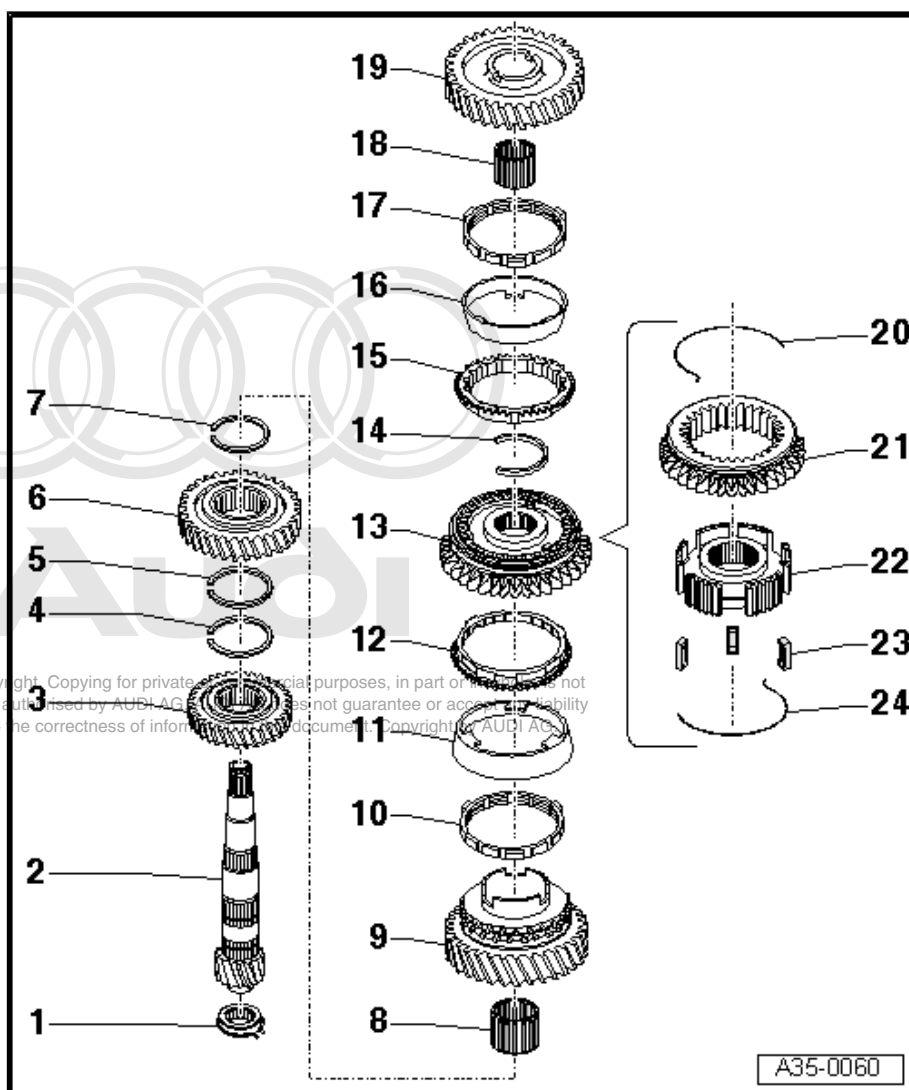
9 - 2nd speed selector gear

10 - Inner ring for 2nd gear

- ☐ Removing and installing ⇒ [page 143](#)
- ☐ Checking for wear ⇒ [page 147](#)

11 - Outer ring for 2nd gear

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



- ☐ Renew if scored or if there are visible traces of wear

12 - 2nd gear synchro-ring

- ☐ Removing and installing ⇒ [page 143](#)
- ☐ Checking for wear ⇒ [page 147](#)

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

- ☐ Removing and installing ⇒ [page 143](#)
- ☐ Dismantling and assembling ⇒ [page 148](#)

14 - Circlip**15 - 1st gear synchro-ring**

- ☐ Removing and installing ⇒ [page 143](#)
- ☐ Checking for wear ⇒ [page 147](#)

16 - Outer ring for 1st gear

- ☐ Removing and installing ⇒ [page 143](#)
- ☐ Renew if scored or if there are visible traces of wear

17 - Inner ring for 1st gear

- ☐ Removing and installing ⇒ [page 143](#)
- ☐ Checking for wear ⇒ [page 147](#)
- ☐ Check lugs for scoring

18 - Needle bearing

- ☐ For 1st gear

19 - 1st speed selector gear

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

20 - Spring

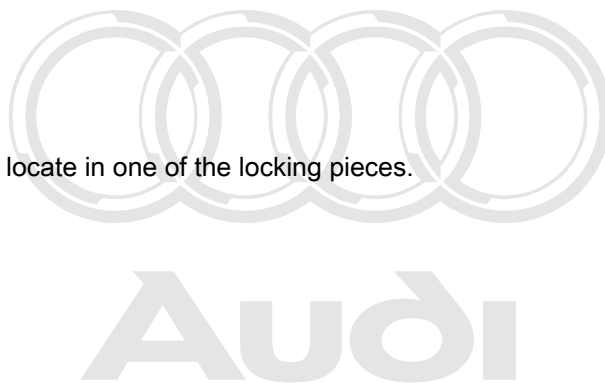
- ☐ Installation position: angled end of spring must locate in one of the locking pieces.

21 - Locking collar for 1st and 2nd gear**22 - Synchro-hub for 1st and 2nd gear****23 - Locking pieces**

- ☐ 3x

24 - Spring

- ☐ Installation position: angled end of spring must locate in one of the locking pieces.

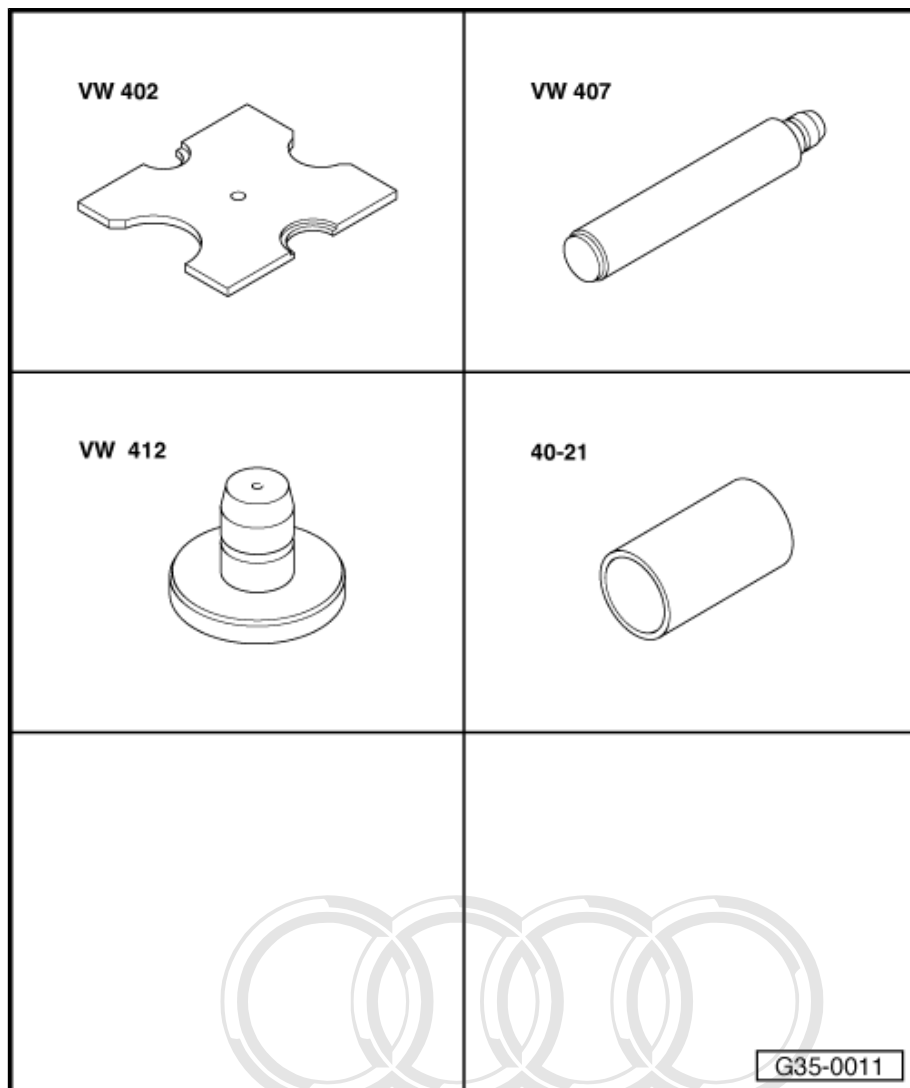


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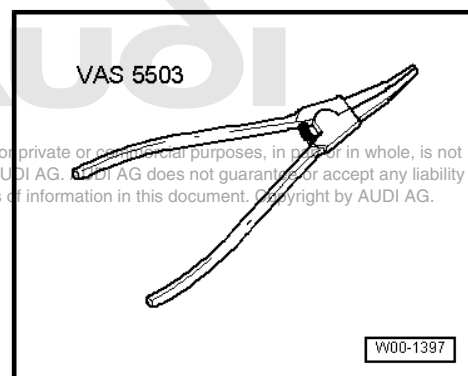
2.1 Dismantling and assembling output shaft

Special tools and workshop equipment required

- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 407-
- ◆ Press tool - VW 412-
- ◆ Drift sleeve - 40 - 21-
- ◆ Circlip pliers - VAS 5503-



- ◆ Circlip pliers - VAS 5503-



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Dismantling

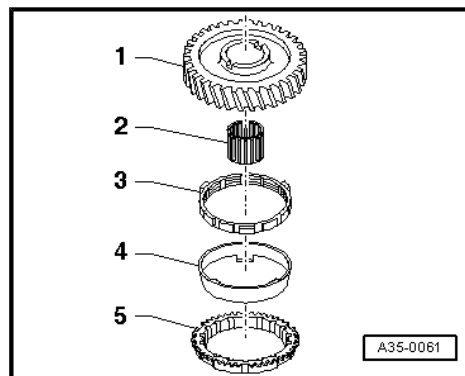
– Remove following components from output shaft:

- 1 - 1st speed selector gear
- 2 - Needle bearing for 1st gear
- 3 - Inner ring for 1st gear
- 4 - Outer ring for 1st gear
- 5 - 1st gear synchro-ring



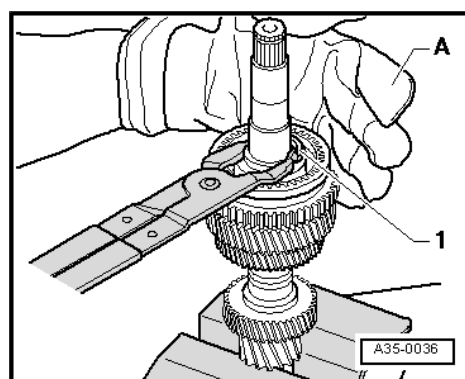
WARNING

Prevent circlip from springing off suddenly.

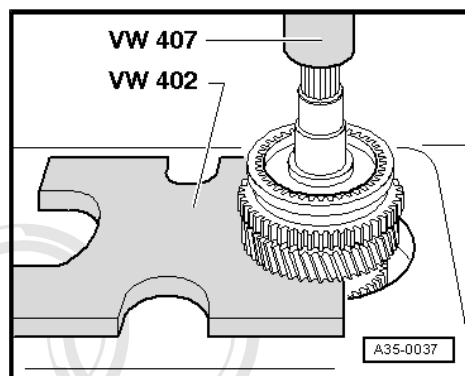


– Push circlip -1- out of groove.

A - Protective glove

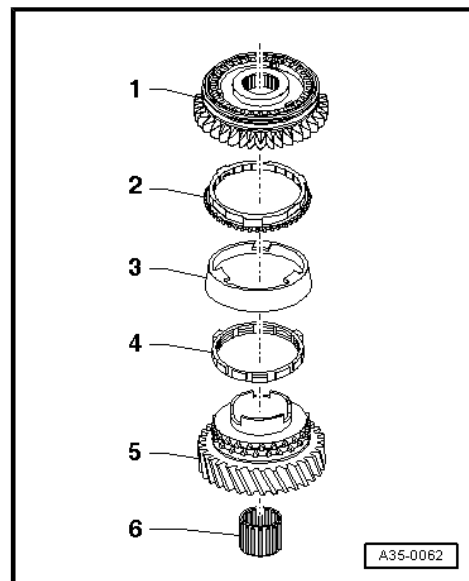


– Press off 2nd speed selector gear and locking collar/synchro-hub together.

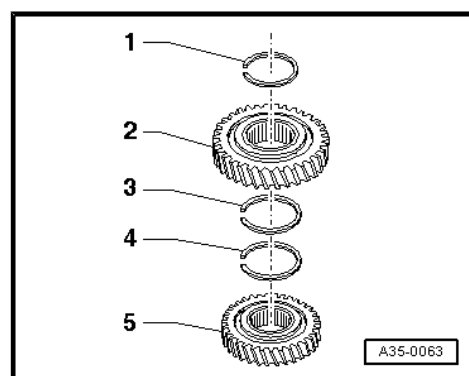


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- Remove following components from output shaft:
- 1 - Locking collar with synchro-hub for 1st and 2nd gear
- 2 - 2nd gear synchro-ring
- 3 - Outer ring for 2nd gear
- 4 - Inner ring for 2nd gear
- 5 - 2nd speed selector gear
- 6 - Needle bearing for 2nd gear

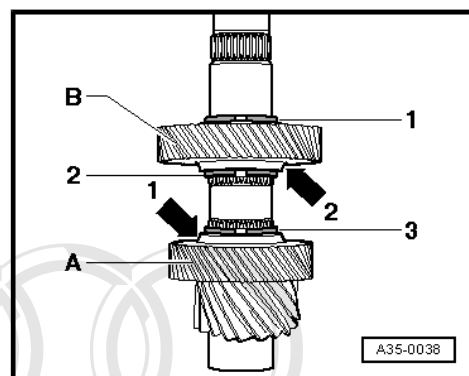


- Remove circlip -1- with circlip pliers - VAS 5503- .
- Take off 3rd gear wheel -item 2-.
- Remove circlips -3- and -4- with circlip pliers - VAS 5503- .
- Remove 4th gear wheel -Item 5- from output shaft.

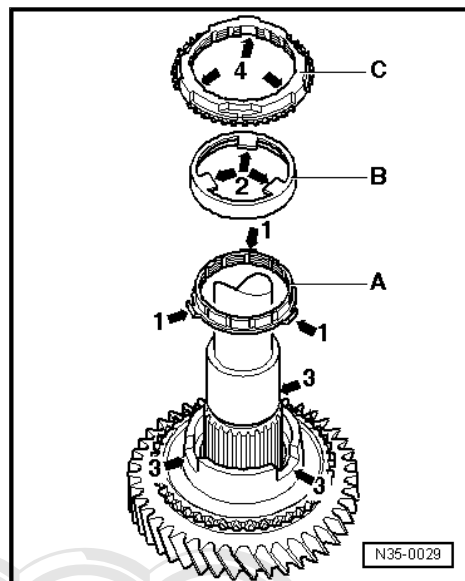


Assembling

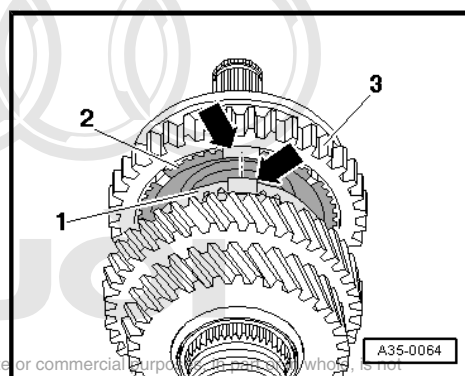
- Checking synchro-rings for wear ➔ [page 147](#) .
- Fit 4th gear wheel -A- onto output shaft.
 - Collar -arrow 1- faces 3rd gear wheel -B-.
- Fit circlips -2- and -3-.
- Fit 3rd gear wheel -B- onto output shaft.
 - Collar -arrow 2- faces 4th gear wheel -A-.
- Fit circlip -1-.
- Install needle bearing and 2nd speed selector gear on output shaft.



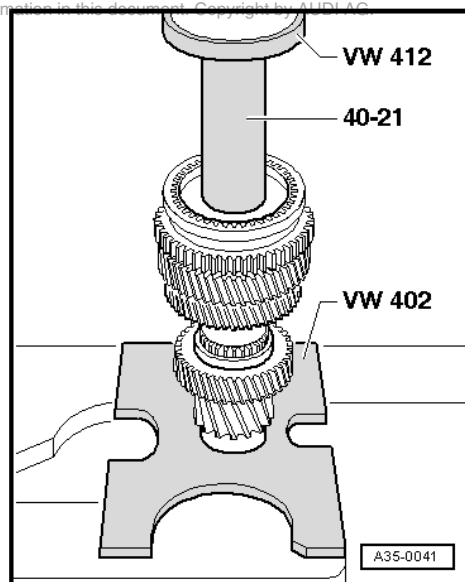
- Place inner ring -A- on 2nd speed selector gear.
- The angled lugs -arrows 1- point towards outer ring -B-.
- Fit outer ring -B-.
- Lugs -arrows 2- engage in slots -arrows 3- on selector gear.
- Fit synchro-ring -C-.
- Slots -arrows 4- engage on lugs -arrows 1- on inner ring -A-.



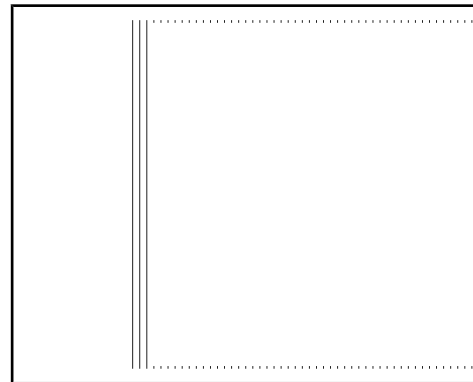
- Fit locking collar/synchro-hub -3- on output shaft.
- Splines on locking collar face towards 2nd gear.
- Rotate synchro-ring -1- so that coupling lugs on synchro-ring are in line with free slots in synchro-hub -2- -arrows-.



- Press 1st and 2nd gear locking collar/synchro-hub onto output shaft.
- After installing, check clearance of synchro-hub by turning 2nd speed selector gear backwards and forwards.
- 2nd speed selector gear should turn freely in both directions.



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



- Fit following components on output shaft:

5 - 1st gear synchro-ring

4 - Outer ring for 1st gear

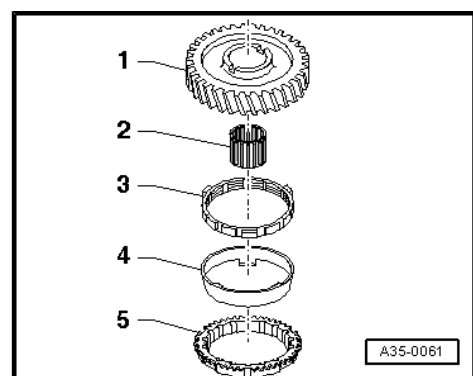
3 - Inner ring for 1st gear

- Coupling lugs must engage in slots in synchro-ring.

2 - Needle bearing for 1st gear

1 - 1st speed selector gear

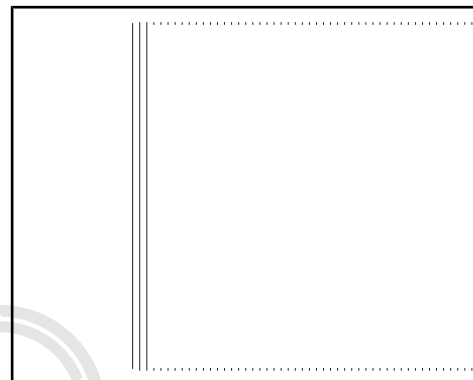
- Rotate selector gear so that coupling lugs on outer ring engage in slots in selector gear (selector gear will then slide down visibly).



2.2 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.

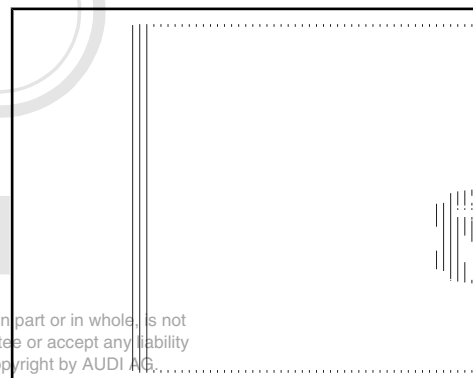
Installation depth	Wear limit
0.75...1.25 mm	0.3 mm



2.3 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.

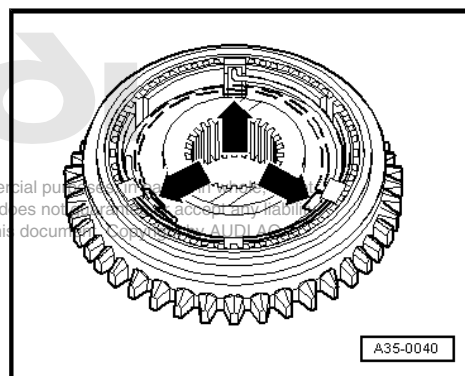
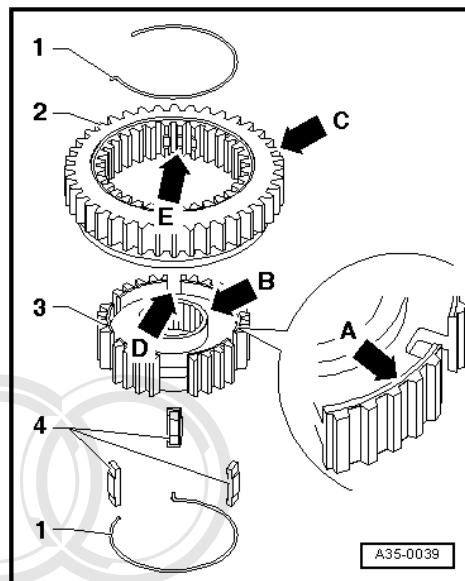
Installation depth	Wear limit
1.2...1.8 mm	0.5 mm



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

- Take off springs -1- before dismantling.
- 2 - Locking collar
- 3 - Synchro-hub
- 4 - Locking piece
- To assemble, slide locking collar over synchro-hub. Installation position:
- The groove on the top -arrow A- and the higher shoulder -arrow B- on the synchro-hub face towards the external splines on the locking collar -arrow C-.
- The smaller slots -arrow D- in the synchro-hub should be in line with the slots -arrow E- in the locking collar.
- Fit locking pieces in the smaller slots -arrows- and install springs so they are offset 120°.
- Angled end of spring must locate in one of the locking pieces.



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3 Exploded view - 5th gear

1 - Sleeve

- ☐ For 5th gear needle bearing
- ☐ Press off with bearing mounting/grooved ball bearing ➔ [page 108](#).
- ☐ Renew together with ➔ [Item 2 \(page 149\)](#)

2 - Needle bearing

- ☐ For 5th gear
- ☐ Removing and installing ➔ [page 150](#)
- ☐ Renew together with ➔ [Item 1 \(page 149\)](#)

3 - 5th speed selector gear

- ☐ Removing and installing ➔ [page 150](#)

4 - 5th gear synchro-ring

- ☐ Removing and installing ➔ [page 150](#)
- ☐ Checking for wear ➔ [page 153](#)

5 - Locking collar with synchro-hub for 5th gear

- ☐ Removing and installing ➔ [page 150](#)
- ☐ Dismantling and assembling ➔ [page 151](#)

6 - Circlip

- ☐ Renew
- ☐ Determining thickness ➔ [page 151](#)

7 - Check ring

- ☐ Prevents locking pieces from moving out
- ☐ Removing and installing ➔ [page 151](#)

8 - Spring

- ☐ Installation position: angled end of spring must locate in one of the locking pieces.

9 - 5th gear locking collar

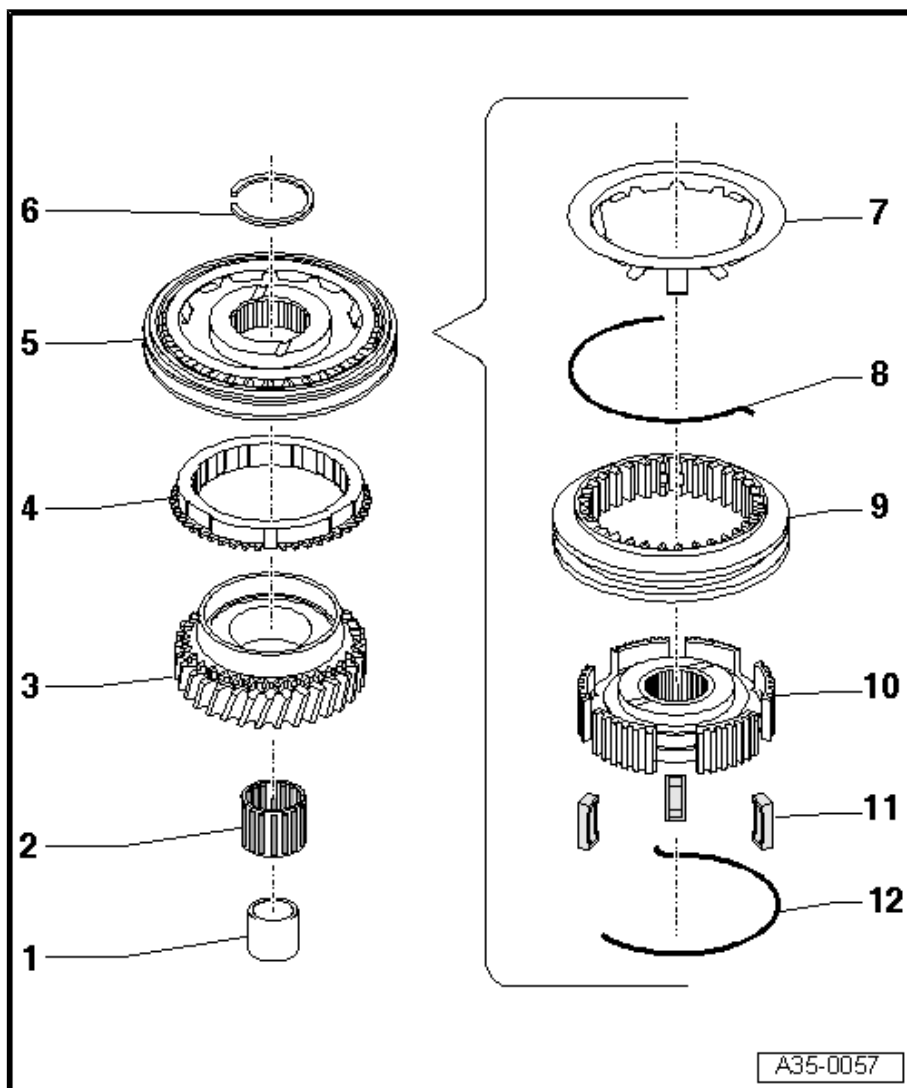
10 - 5th gear synchro-hub

11 - Locking pieces

- ☐ 3x

12 - Spring

- ☐ Installation position: angled end of spring must locate in one of the locking pieces.



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3.1 Removing and installing 5th gear

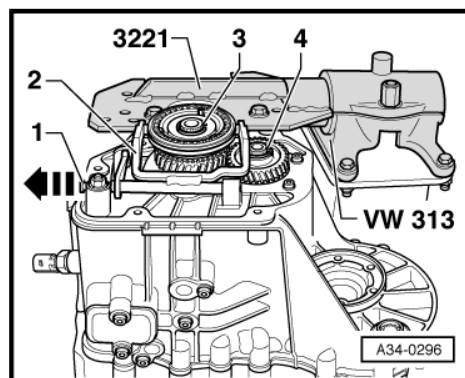
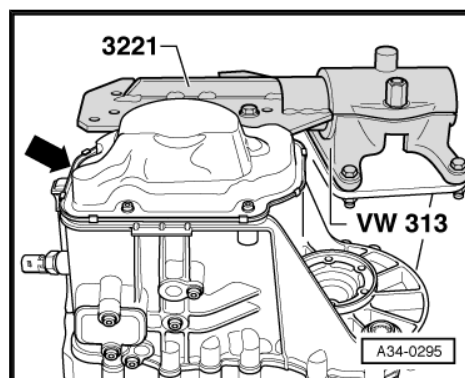


Note

The gearbox housing cover and 5th gear can also be removed without removing the gearbox from the vehicle. The gearbox oil must be drained off for this operation. The following instructions describe removal and installation with the gearbox removed from the vehicle.

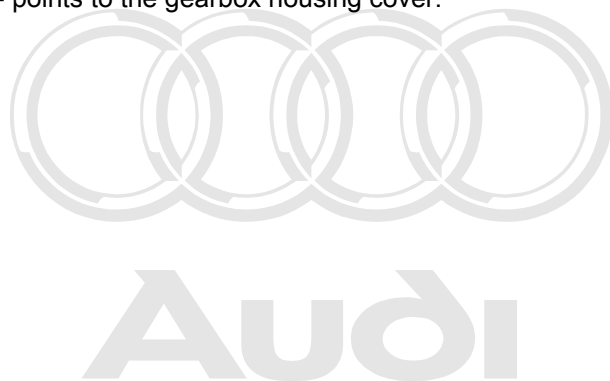
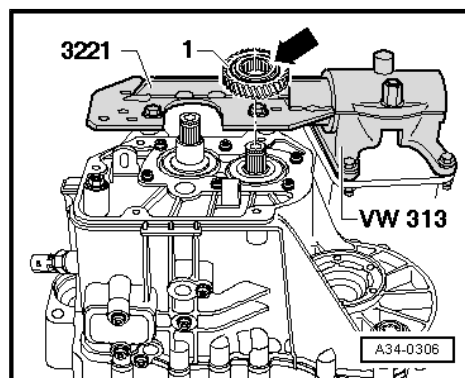
Removing

- Gearbox removed
- Secure gearbox to assembly stand ⇒ [page 99](#) .
- Unbolt gearbox housing cover -arrow-.
- Pull out pivot pin -1- for 5th gear selector fork -2- and remove selector fork.
- Remove circlip -3- for 5th gear synchro-hub.
- Remove circlip -4- for 5th gear wheel.
- Take off selector gear, locking collar with synchro-hub, and gear wheel.



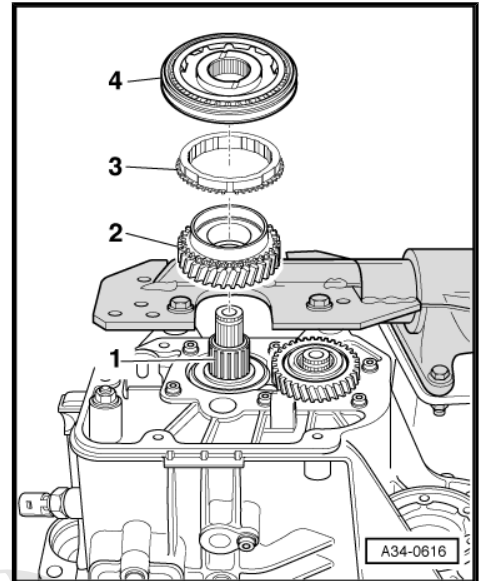
Installing

- Check synchro-ring for wear ⇒ [page 153](#) .
- Fit 5th gear wheel -1-.
- Installation position of 5th gear wheel: the large collar -arrow- points to the gearbox housing cover.



– Install the following components in the sequence indicated:

- 1 - Needle bearing for 5th speed selector gear
- 2 - 5th speed selector gear
- 3 - 5th gear synchro-ring
- 4 - 5th gear synchro-hub with locking collar and check ring



- Fit 5th gear selector fork -2- and slide pivot pin -1- in onto stop in direction of -arrow-.
- Determine thickness of new circlips -arrow- for input shaft -3- and output shaft -4-.
- Determine the thickest circlip that will just fit and install it. For Part Nos. refer to ⇒ Electronic parts catalogue .

The following circlips are available:

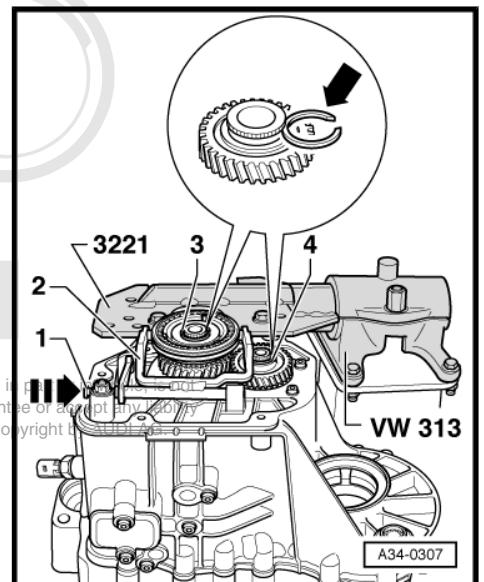
Circlip thickness (mm)		
2.00	2.10	2.20

- Install gearbox housing cover



Note

If the gearbox cover is installed with the gearbox in the vehicle, fill up with gear oil and check oil level ⇒ [page 98](#) .

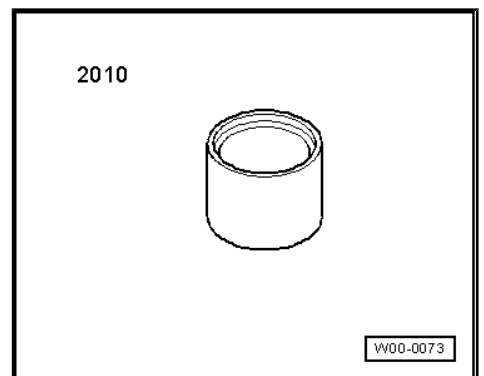


Tightening torques ⇒ [page 102](#)

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

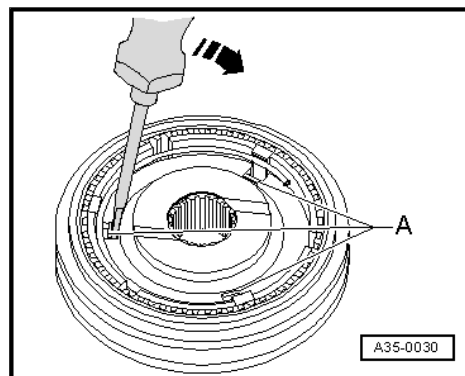
Special tools and workshop equipment required

- ◆ Tube - 2010-



Dismantling

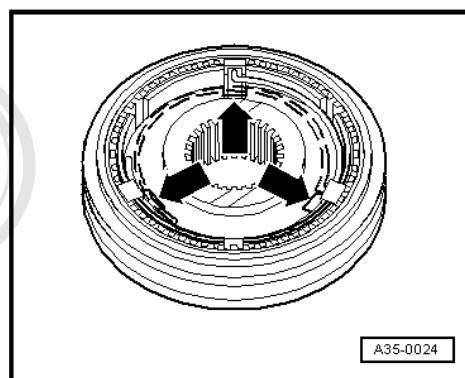
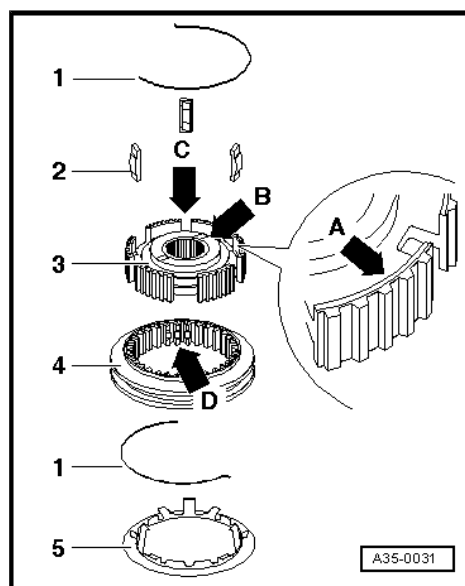
- Locking collar with synchro-hub removed ⇒ [page 150](#)
- Unclip hooks -A- of check ring from synchro-hub using a screwdriver.
- Remove check ring.



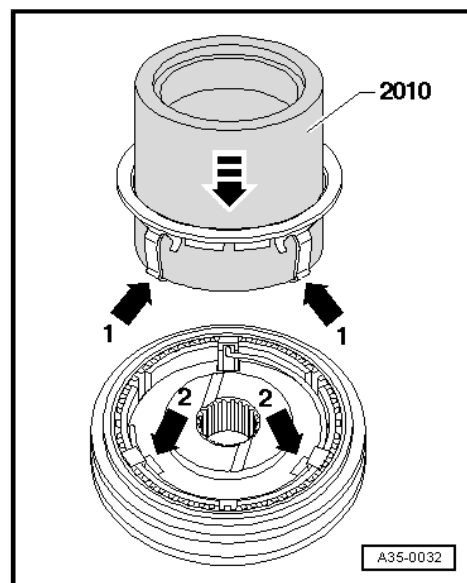
- Take off springs -1- before dismantling.
- 2 - Locking piece
- 3 - Synchro-hub
- Installation position: the groove on the top -arrow A- and the higher collar -arrow B- on the synchro-hub face towards 5th gear.
- 4 - Locking collar
- 5 - Check ring

Assembling

- To assemble, slide locking collar over synchro-hub.
- Installation position: the smaller slots -arrow C- for the locking pieces in the synchro-hub should be in line with the slots -arrow D- in the locking collar.
- 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.



- Push check ring onto tube - 2010- .
- Insert check ring together with tube - 2010- into 5th gear synchro-hub/locking collar (observe installation position ⇒ [page 151](#)).
- Hooks -arrow 1- engage in slots -arrow 2- for locking pieces in synchro-hub.
- Push check ring downwards until hooks engage.
- Pull off tube - 2010- .

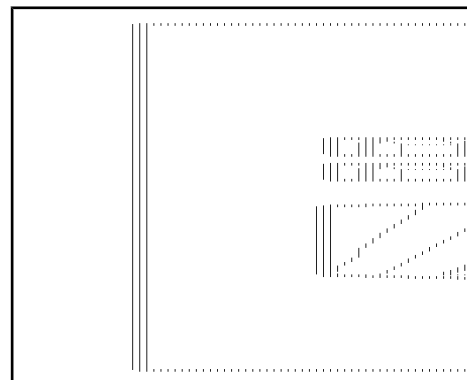


3.3 Checking 5th gear synchro-ring for wear

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

Installation depth	Wear limit
1.1...1.7 mm	0.5 mm

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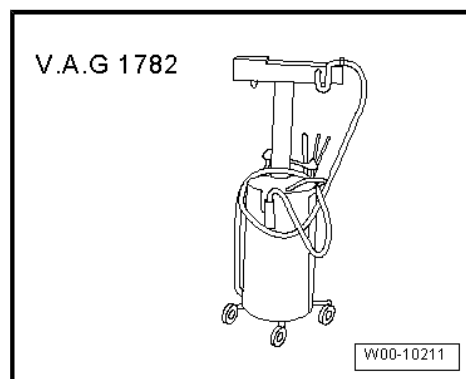
39 – Final drive - differential

1 Renewing oil seals for flange shafts

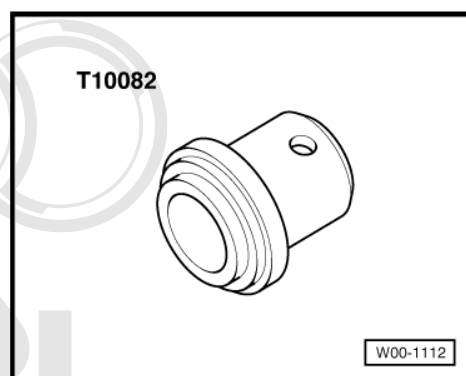
1.1 Renewing oil seal for flange shaft (left-side)

Special tools and workshop equipment required

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

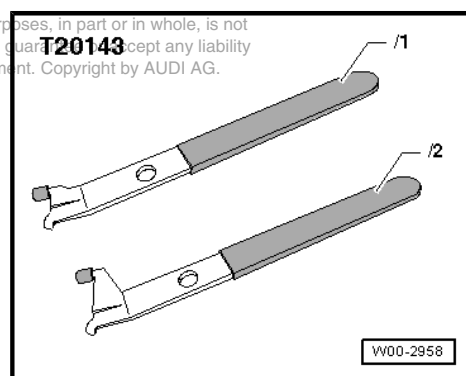


- ◆ Thrust piece - T10082-



- ◆ Extractor tool - T20143/2-

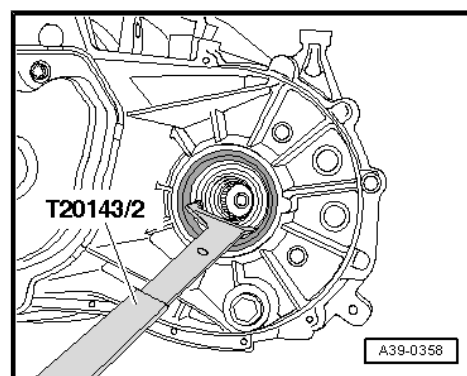
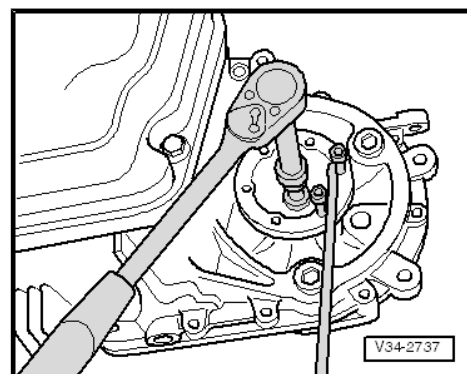
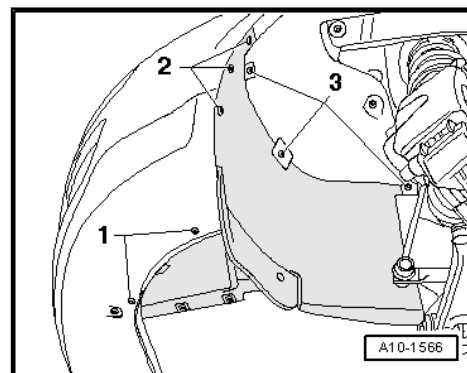
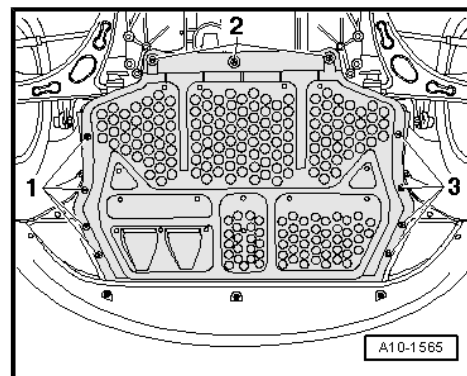
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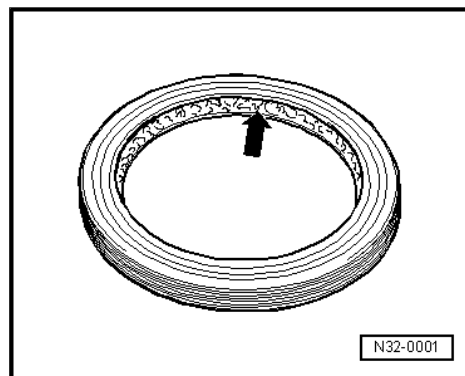
- ◆ Sealing grease - G 052 128 A1-

Procedure

- Gearbox in vehicle
- Remove noise insulation (centre) by releasing fasteners -1 ... 3-.
- Remove noise insulation (left-side) -fasteners 1 ... 3-.
- Unbolt drive shaft from gearbox flange.
- Lift drive shaft clear and tie in place. Do not damage surface coating.
- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.
- Remove left 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.
- Pull out flange shaft oil seal using extractor tool - T20143/2- .



- 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- .

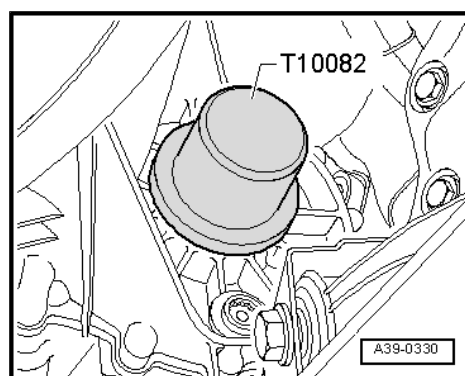


- Drive in new oil seal onto stop (take care to keep oil seal straight).
- Push flange shaft in towards gearbox housing together with spring, thrust washer and tapered ring, and tighten bolt.

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

- Bolt drive shaft to flange shaft ⇒ Rep. gr. 40. .
- Fill up oil in gearbox and check oil level ⇒ [page 98](#) .
- Install noise insulation.

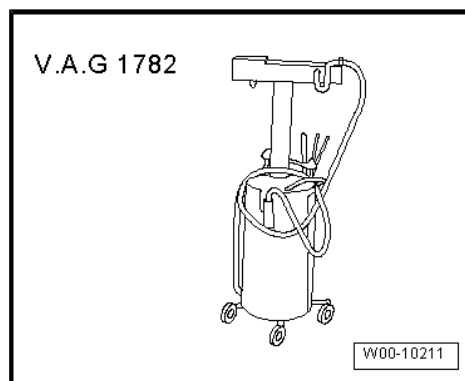
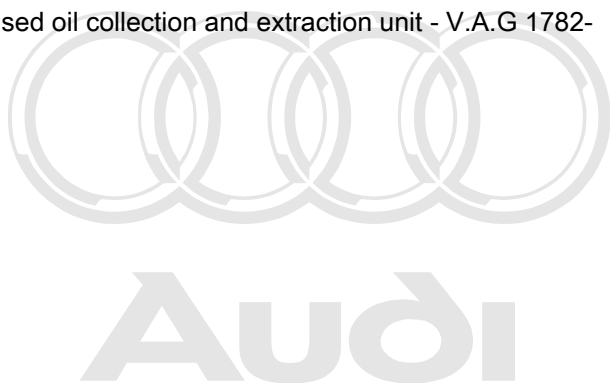
Tightening torque ⇒ [page 159](#)



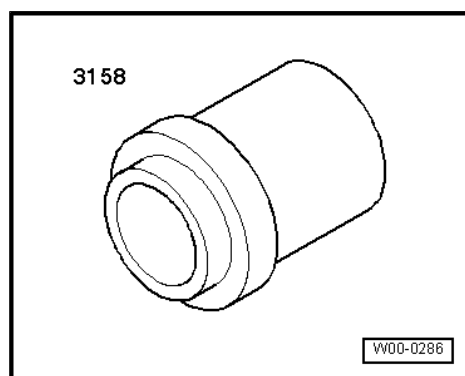
1.2 Renewing oil seal for flange shaft (right-side)

Special tools and workshop equipment required

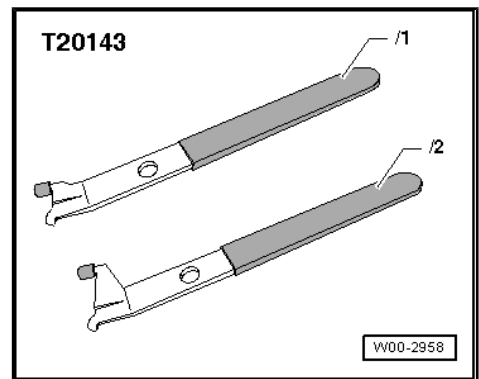
- ◆ Used oil collection and extraction unit - V.A.G 1782-



- ◆ Drift sleeve - 3158-
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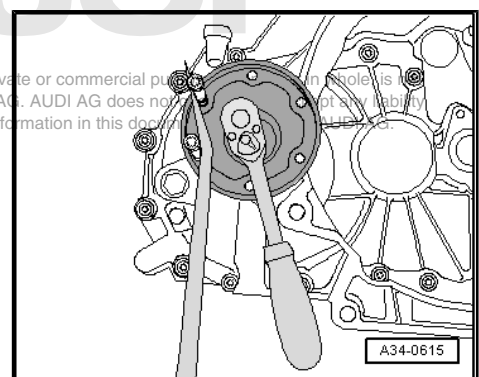
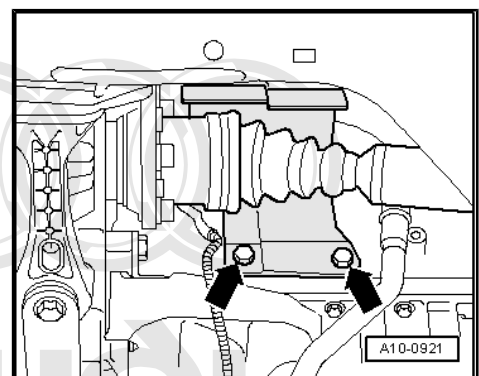
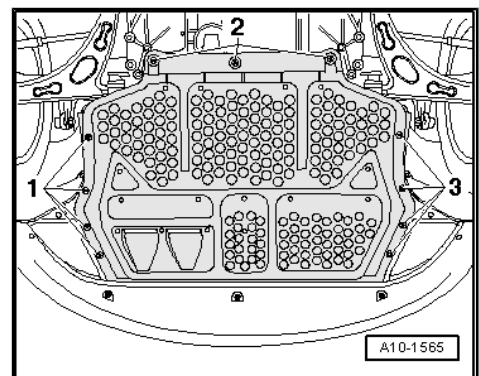


◆ Extractor tool - T20143/2-



Procedure

- Gearbox in vehicle
- Remove noise insulation (centre) by releasing fasteners -1 ... 3-.
- Unbolt heat shield for right-side drive shaft -arrows-.
- Unbolt drive shaft from gearbox flange.
- Lift drive shaft clear and tie in place. Do not damage surface coating.
- 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.

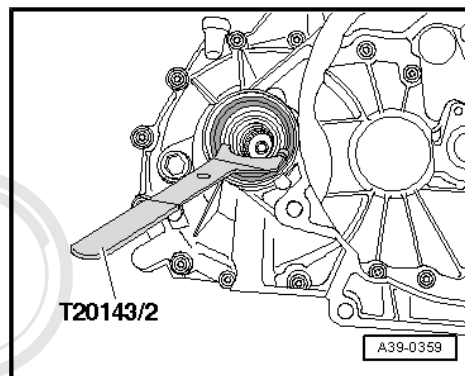


- Pull out flange shaft oil seal using extractor tool - T20143/2- .



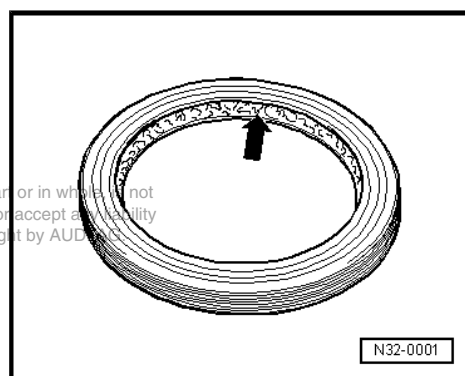
Note

- ◆ *Do not damage sleeve, otherwise leaks will occur.*
- ◆ *Renew sleeve if damaged.*



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

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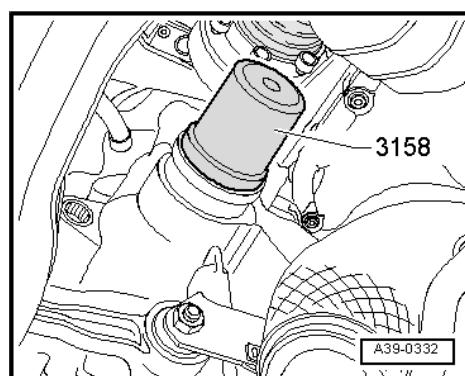


- Drive in new oil seal onto stop (take care to keep oil seal straight).
- Push flange shaft in towards gearbox housing together with spring, thrust washer and tapered ring, and tighten bolt.

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

- Bolt drive shaft to flange shaft ⇒ Rep. gr. 40. .
- Fill up oil in gearbox and check oil level ⇒ [page 98](#) .

Tightening torques ⇒ [page 159](#) , ⇒ [page 86](#)



2 Exploded view - differential



Note

- ◆ *Securing gearbox to assembly stand ⇒ [page 99](#)*
- ◆ *Always renew both tapered roller bearings together.*
- ◆ *Adjust differential if tapered roller bearings, differential cage, gearbox housing or clutch housing are renewed ⇒ [page 167](#).*

1 - Countersunk bolt

- ☐ Screws into threaded piece
⇒ [Item 8 \(page 159\)](#)
- ☐ 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 167](#)

8 - Threaded piece

- ☐ Installing ⇒ [page 167](#)

9 - Differential pinion pin

- ☐ To remove, shear off spring pin ⇒ [Item 18 \(page 160\)](#) ⇒ [page 166](#)
- ☐ Installing ⇒ [page 167](#)

10 - Planet pinion

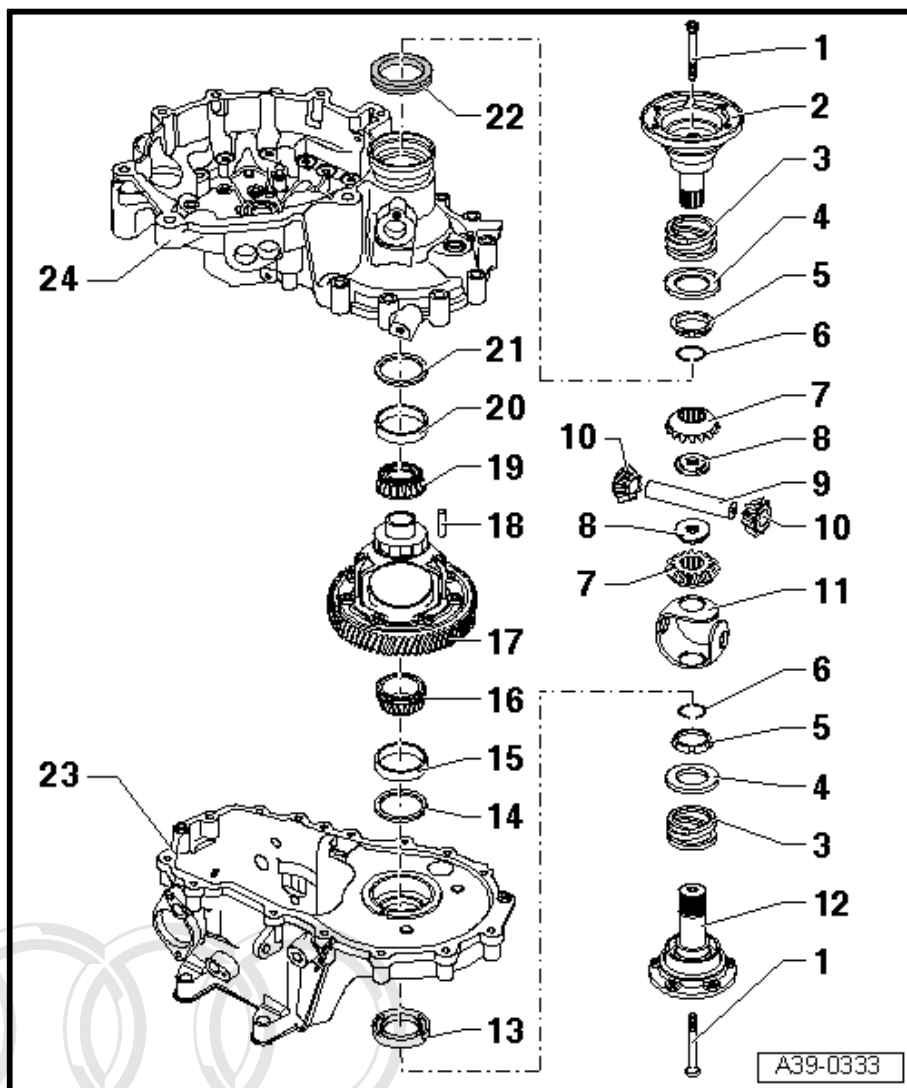
- ☐ Installing ⇒ [page 167](#)

11 - One-piece thrust washer

- ☐ Lubricate with gear oil before installing

12 - Flange shaft (left-side)

- ☐ With dust plate
- ☐ Do not interchange; left and right flange shafts are different





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

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

- ☐ Different diameters for left and right
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Can be renewed with gearbox in vehicle ⇒ [page 154](#)

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 121](#)
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15 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 164](#)
- ☐ Pressing in ⇒ [page 165](#)

16 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 165](#)
- ☐ Pressing on ⇒ [page 165](#)

17 - Differential cage

- ☐ With riveted final drive gear

18 - Spring pin

- ☐ Secures differential pinion pin
- ☐ Is sheared off on removal ⇒ [page 166](#)
- ☐ Installing ⇒ [page 167](#)

19 - Tapered roller bearing inner race

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

20 - Tapered roller bearing outer race

- ☐ Pressing out ⇒ [page 165](#)
- ☐ Pressing in ⇒ [page 166](#)

21 - Shim S₂

- ☐ For differential
- ☐ Determining thickness ⇒ [page 167](#)

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

- ☐ Different diameters for left and right
- ☐ For correct version, refer to ⇒ Electronic parts catalogue
- ☐ Can be renewed with gearbox in vehicle ⇒ [page 156](#)

23 - Gearbox housing

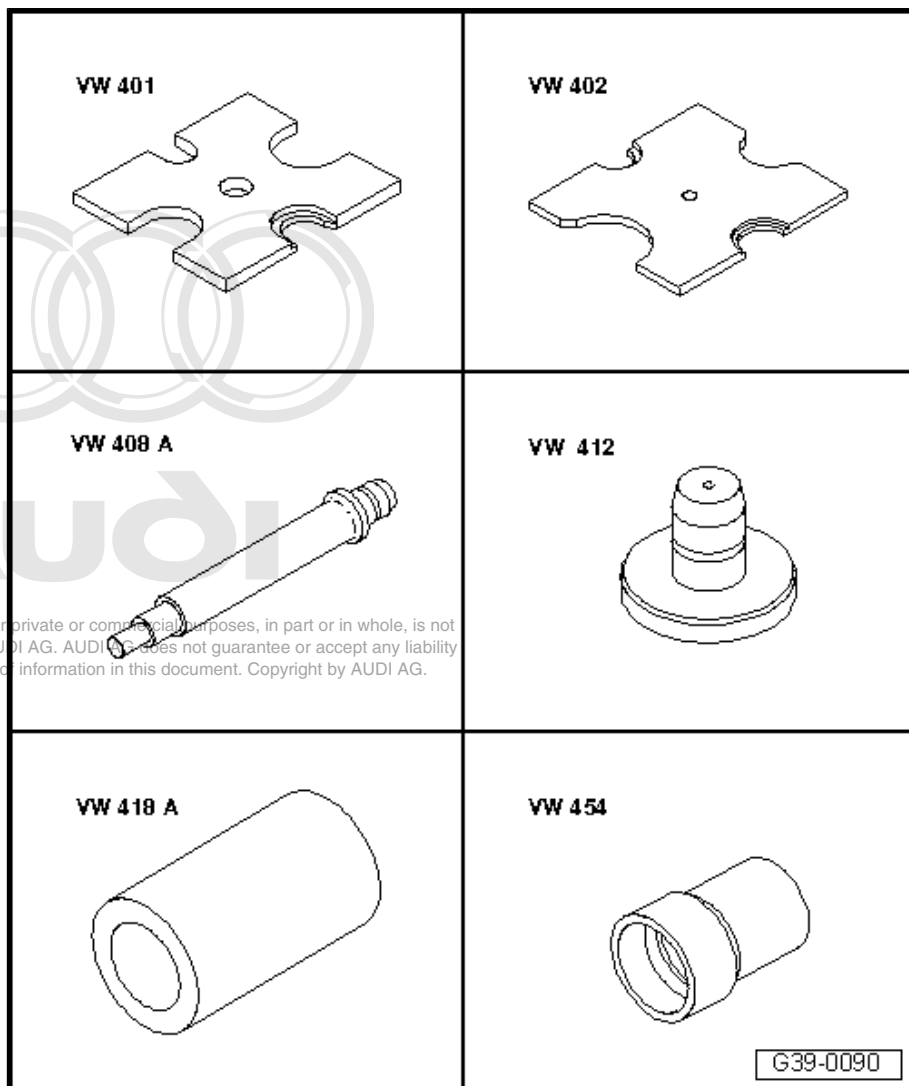
- ☐ Servicing ⇒ [page 121](#)
- ☐ Shim S₁ for tapered roller bearing outer race was discontinued as of gearbox manufacturing date 04 12 6. Bearing seat for tapered roller bearing outer race has been adapted ⇒ [page 121](#)

24 - Clutch housing

2.1 Dismantling and assembling differential

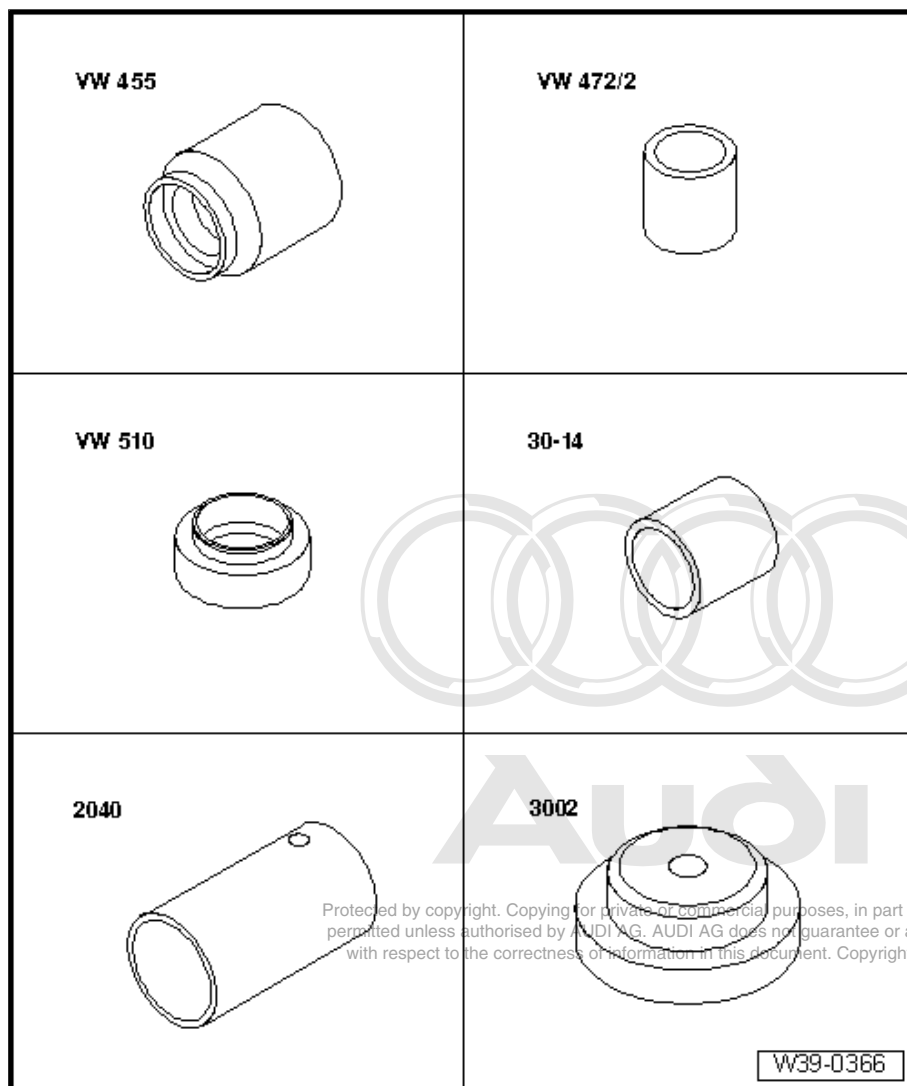
Special tools and workshop equipment required

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

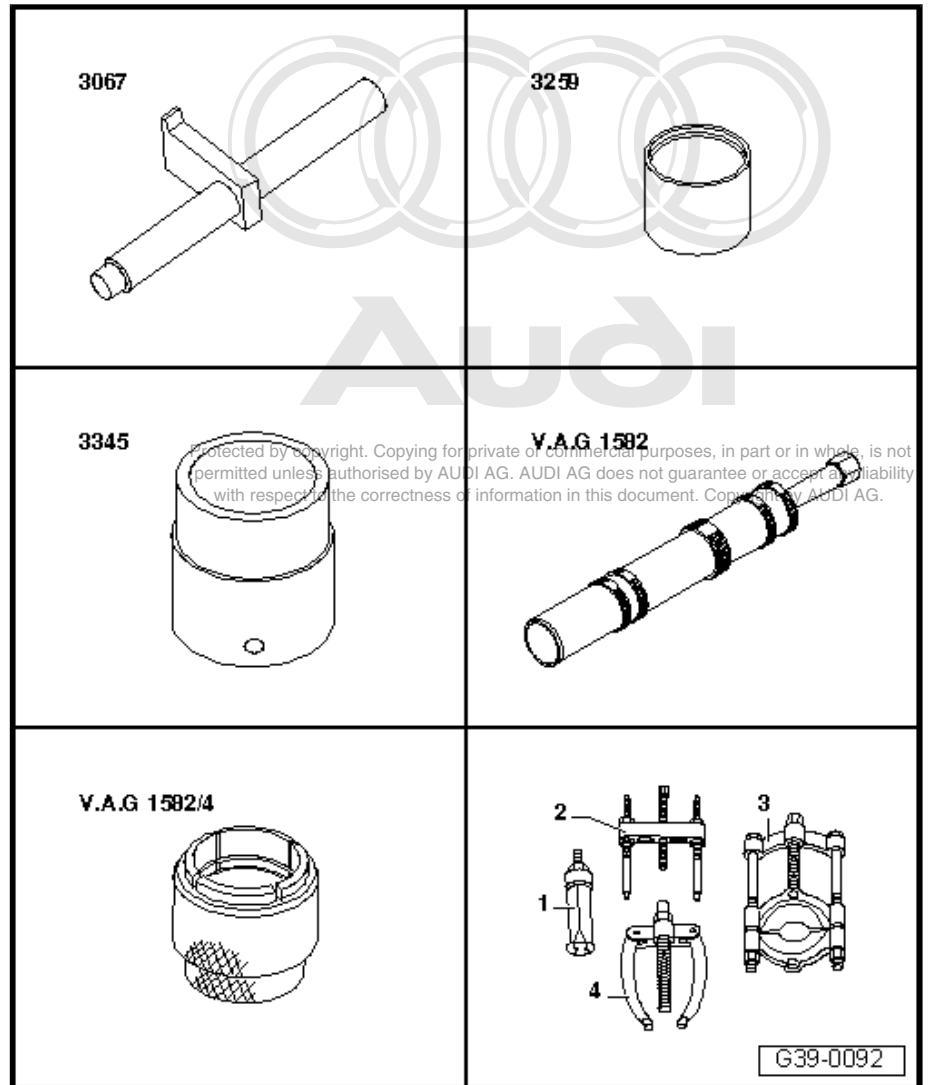


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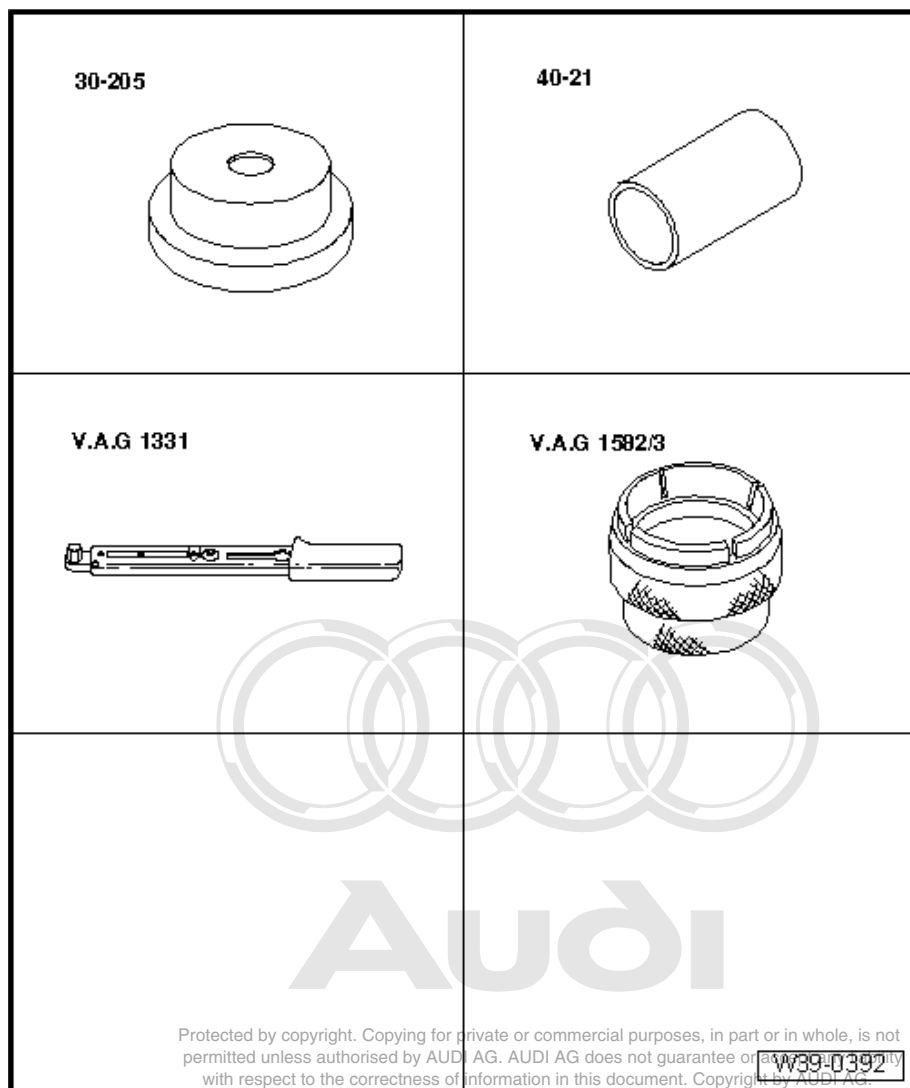
- ◆ Installing sleeve - VW 455-
- ◆ Spacer sleeve - VW 472/2-
- ◆ Thrust pad - VW 510-
- ◆ Tube - 30 - 14-
- ◆ Tube - 2040-
- ◆ Thrust piece - 3002-



- ◆ 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



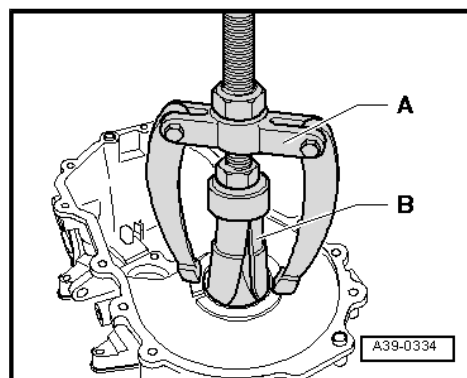
- ◆ Thrust plate - 30 - 205-
- ◆ Drift sleeve - 40 - 21-
- ◆ Torque wrench -
V.A.G 1331- (5 ... 50 Nm)
- ◆ Adapter - V.A.G 1582/3-



Pulling tapered roller bearing outer race out of gearbox housing

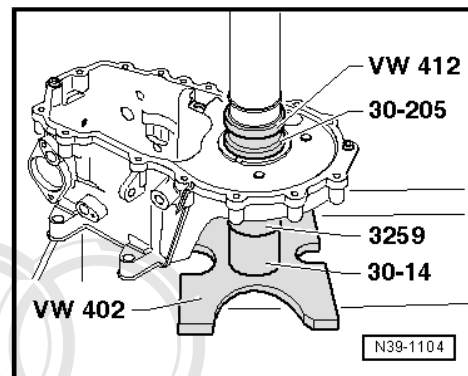
A - Counter support, e.g. Kukko 22/2

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



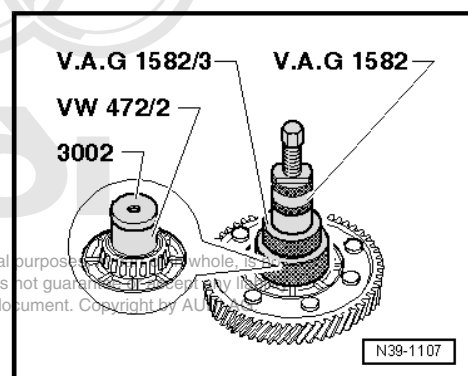
Pressing tapered roller bearing outer race into gearbox housing

- Check whether a shim S₁ needs to be inserted underneath outer race ➔ [page 121](#) .
- 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.



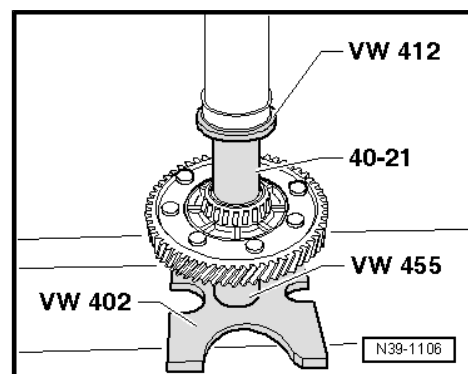
Pressing on tapered roller bearing inner race



WARNING

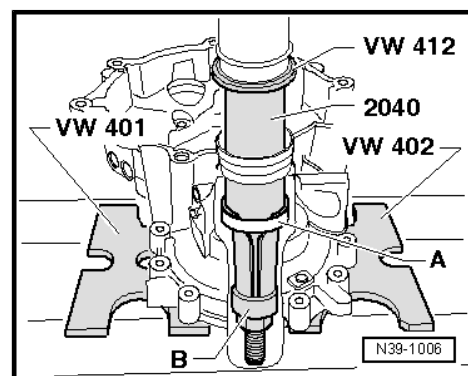
Wear protective gloves.

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



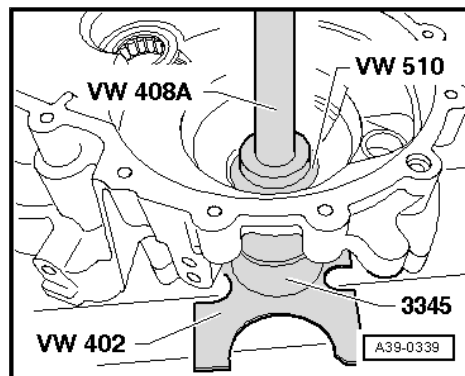
Pressing tapered roller bearing outer race -A- out of clutch housing

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



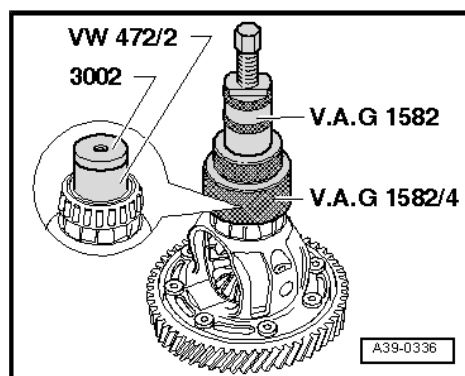
Pressing tapered roller bearing outer race into clutch housing

- 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.



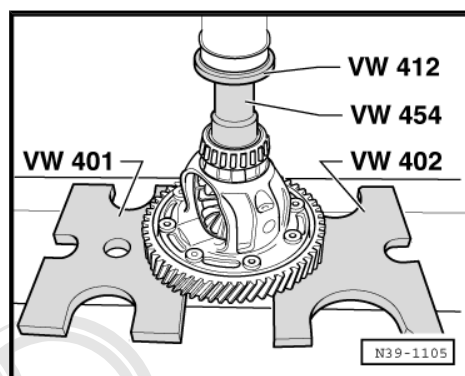
Pressing on tapered roller bearing inner race



WARNING

Wear protective gloves.

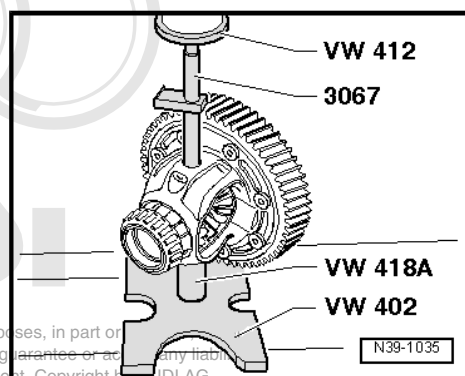
- Heat tapered roller bearing inner race to approx. 100°C before pressing on.



Pressing out differential pinion pin

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

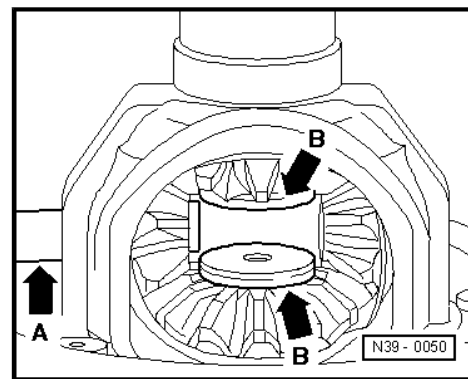
- Drive the remaining part of the spring pin out of the differential cage.



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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.
- Installation position: Stepped shoulder towards sun wheel
- Drive differential pinion pin into final position and secure with spring pin.



2.2 Adjusting differential

The differential must be readjusted when the following components have been renewed:

- ◆ Gearbox housing
- ◆ Clutch housing
- ◆ Differential cage
- ◆ Tapered roller bearings for differential



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 121](#).

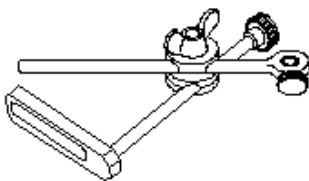
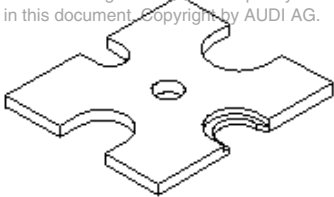
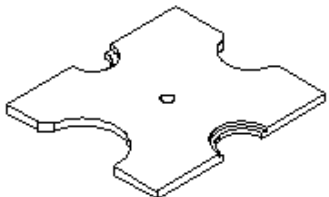
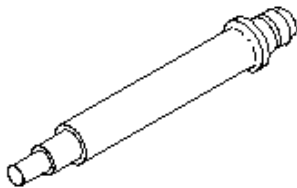
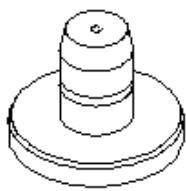


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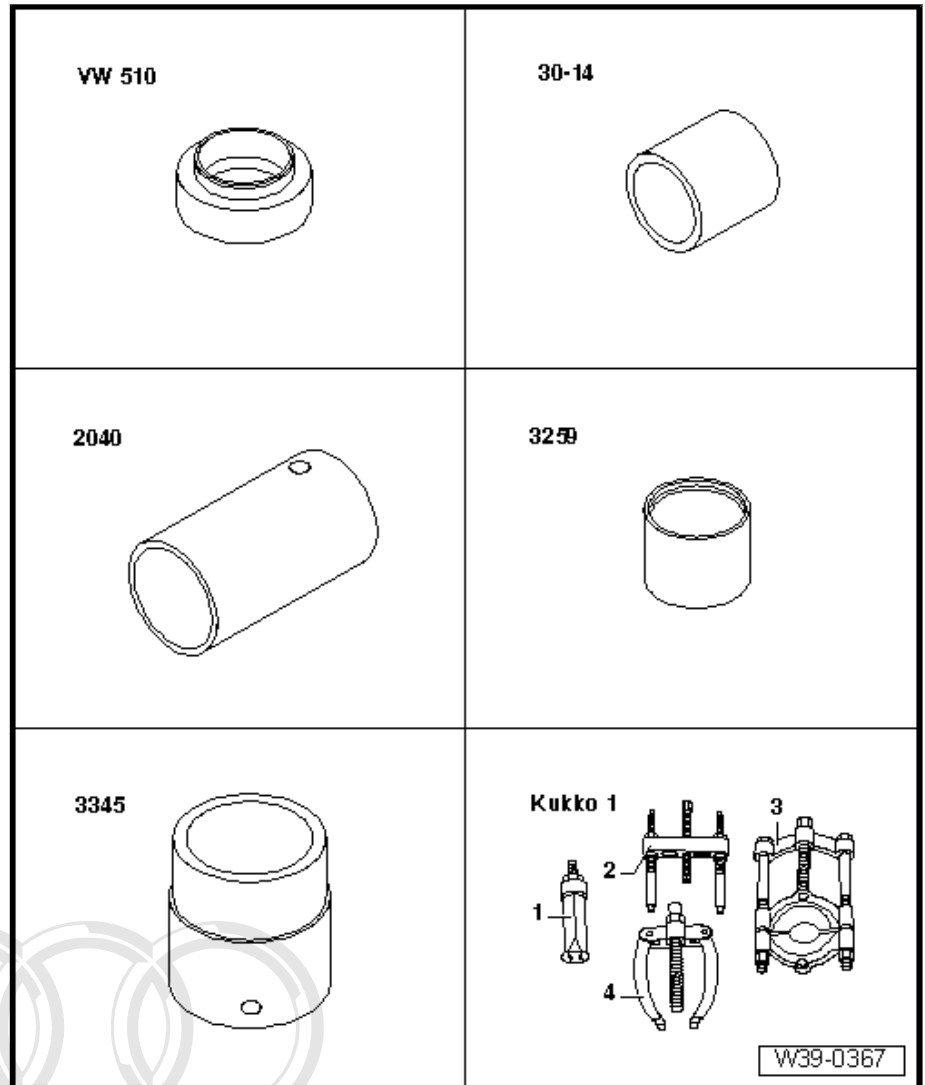
Special tools and workshop equipment required

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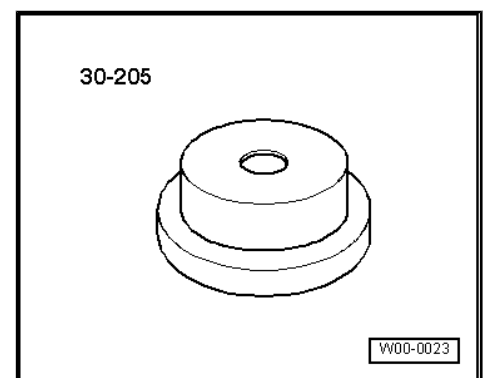
VW 385/17 	VW 387 
VW 401 	VW 402 
VW 408 A 	VW 412  G39-0093

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

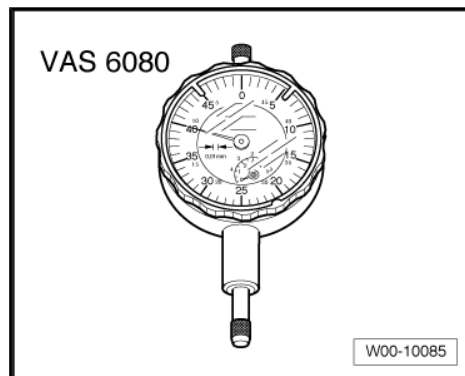


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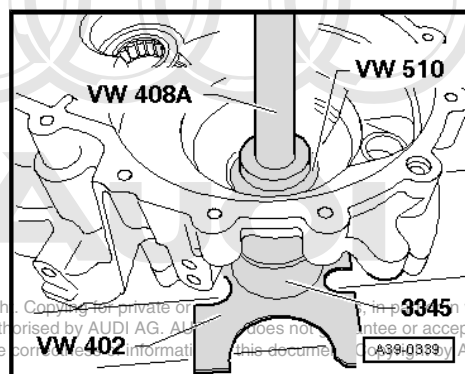
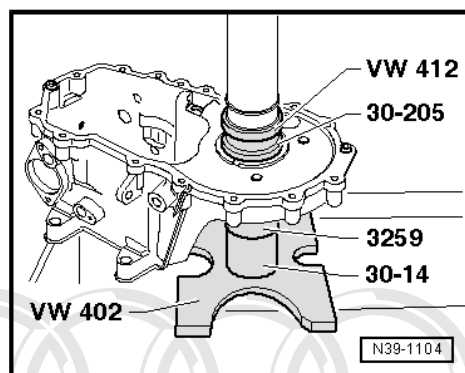


- ◆ Thrust plate - 30 - 205-
- ◆ Dial gauge - VAS 6080-
- ◆ Dial gauge extension, 30 mm



Procedure

- Drive in tapered roller bearing outer race (on side adjacent to final drive gear) into gearbox housing (if necessary with shim S₁, always 1 mm thick).
- Press tapered roller bearing outer race (on side opposite final drive gear) without shim into clutch housing.
- Install differential in gearbox housing.
- Install clutch housing and tighten 5 bolts to 5 Nm.



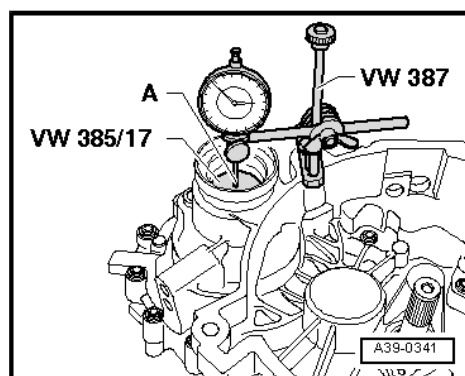
- Set up measuring tool and dial gauge (3 mm measuring range, dial gauge extension -A- approx. 30 mm).
- Preload dial gauge to 1 mm and set to "0".
- Move differential up and down and note play indicated on dial gauge (in this example: 0.50 mm).

Determining thickness of shim S₂

The specified bearing preload is achieved by adding a constant value (0.30 mm) to the measured value to obtain the required thickness for S₂.

Example:

Measured value	0.50 mm
+ Preload (constant value)	0.30 mm
Thickness of shim =	0.80 mm



- Take off clutch housing and press out tapered roller bearing outer race -A-.
- B - Internal puller 46 ... 58 mm, e.g. Kukko 21/7
- Fit shim S₂ of the required thickness as determined above (0.80 mm in example). For Part Nos. refer to ➔ Electronic parts catalogue .
- Press tapered roller bearing outer race into clutch housing again.

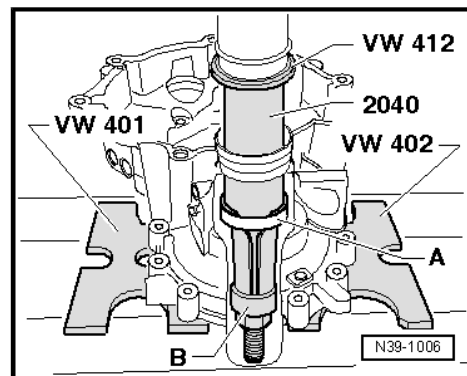
The following shims are available:

Thickness of shims in mm ³⁾			
0.65	0.85	1.05	1.25
0.70	0.90	1.10	1.30
0.75	0.95	1.15	1.35
0.80	1.00	1.20	1.40

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

- Install clutch housing and tighten bolts to final torque.

Tightening torque ➔ [page 103](#)



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