

Workshop Manual

Audi A3 2013 ➤ ,
Audi A3 Limousine 2014 ➤ ,
Audi A3 Limousine China 2014 ➤ ,
Audi A3 Sportback 2013 ➤ ,
Audi A3 Sportback China 2014 ➤

5-speed manual gearbox 0A4

Edition 02.2014

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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 Identification

(ARL003677; Edition 02.2014)

⇒ **"1.1 Gearbox identification", page 1**

1.1 Gearbox identification

The 5-speed manual gearbox 0A4, front-wheel drive is installed in the Audi A3 2013 ►. Allocation ⇒ **page 2**.

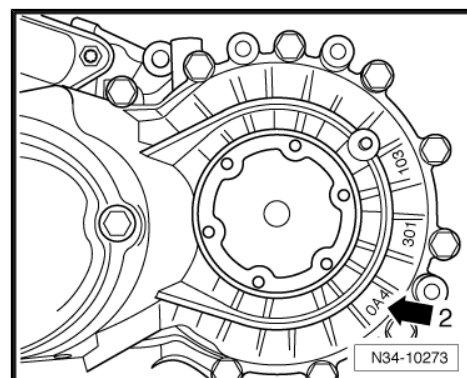
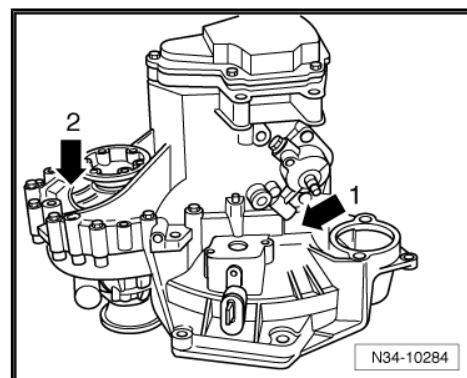
Location on gearbox

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



Manual gearbox 0A4 -arrow 2-

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Code letters and date of manufacture of gearbox

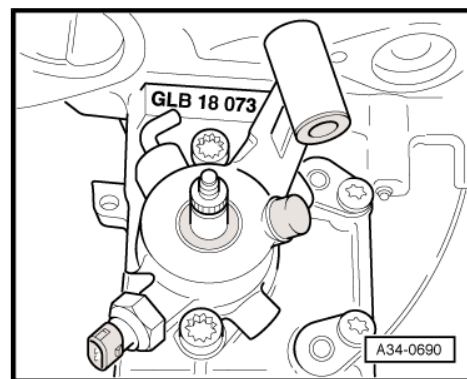
The following details are given at the top of the gearbox (example):

- ◆ GLB = gearbox code
- ◆ 18 073 = production date (last digit of year only): 18.07.13



Note

- ◆ Additional data identify the factory of manufacture.
- ◆ The code letters for the gearbox are also given on the vehicle data stickers.
- ◆ Location of vehicle data stickers ⇒ Maintenance ; Booklet 821.





2 Technical data

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

⇒ "2.2 Capacities", page 2

⇒ "2.3 Calculating gear ratios", page 2

2.1 Allocation of gearbox to engine

Manual gearbox		5-speed 0A4 (front-wheel drive)		
Code letters		MWX	PEW	
Allocation	Model	Audi A3 2013 ►	Audi A3 2013 ►	
	Engine	2.0 ltr. TDI - 81 kW Asia	1.4 ltr. TFSI - 110 kW China	
Ratio: $Z_2 : Z_1 = i$	Final drive	62 : 17 = 3.647	62 : 17 = 3.647	
The following data can be found in the ⇒ Electronic parts catalogue . ♦ Production dates ♦ Individual gear ratios ♦ Allocation of drive shaft flanges ♦ Allocation of clutch type				

2.2 Capacities

Manual gearbox	5-speed 0A4 (front-wheel drive)
Capacity of manual gearbox (gearbox fully dismantled)	1.9 ltr.
(gearbox partially dismantled)	1.7 ltr.
♦ Gear oil specifications ⇒ Electronic parts catalogue	

2.3 Calculating gear ratios

Example:

	5th gear	Final drive
Driving gear	$ZG_1 = 30$	$ZA_1 = 17$
Driven gear	$ZG_2 = 48$	$ZA_2 = 62$

$i = Z_2 : Z_1$ (Z_1 = number of teeth on driving gear, Z_2 = number of teeth on driven gear)

i_G = gear ratio = $ZG_2 : ZG_1 = 30 : 48 = 0.625$

i_A = axle ratio = $ZA_2 : ZA_1 = 62 : 17 = 3.647$

i_{ov} = overall ratio = $i_G \times i_A = 0.625 \times 3.647 = 2.279$

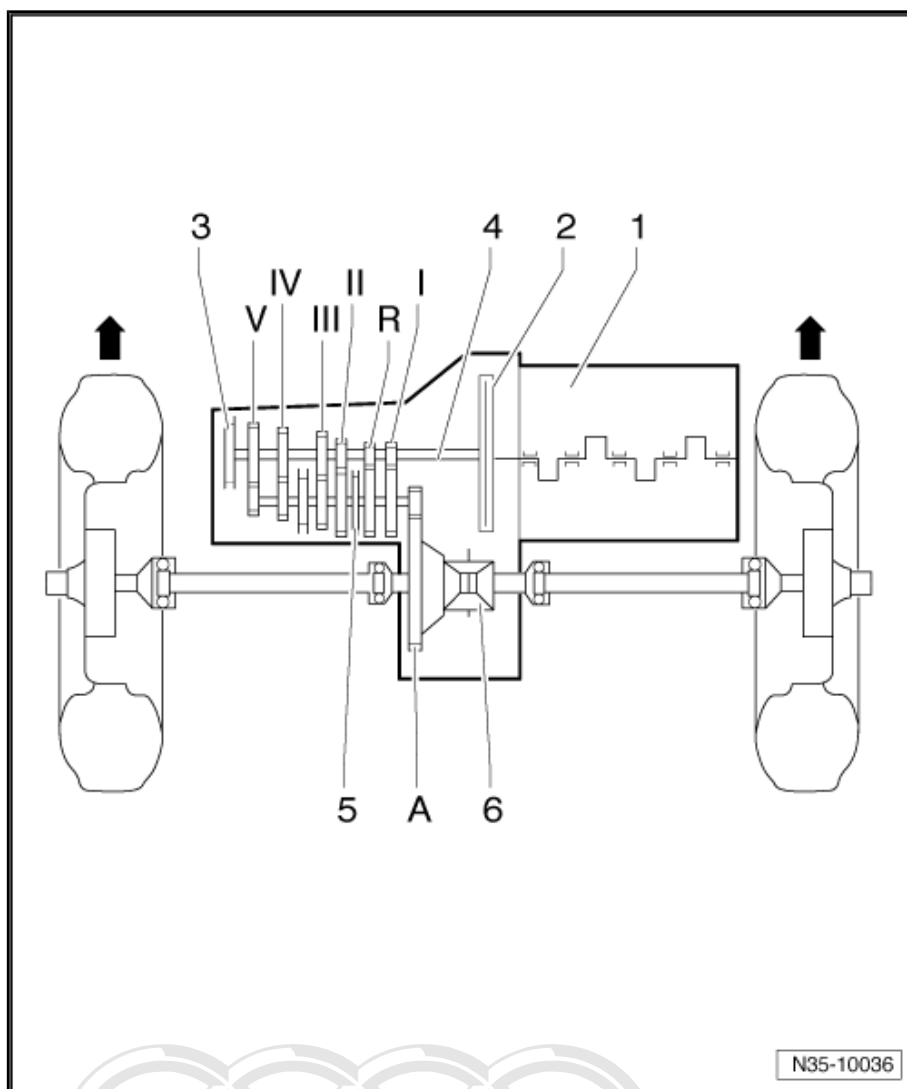
3 Transmission layout



Note

-Arrows- point in direction of travel

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



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4 Safety precautions

⇒ "4.1 Safety precautions when working on vehicles with start/stop system", page 4

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 Repair instructions

⇒ ["5.1 General repair instructions", page 5](#)

⇒ ["5.2 Contact corrosion", page 9](#)

5.1 General repair instructions

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

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

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Special tools

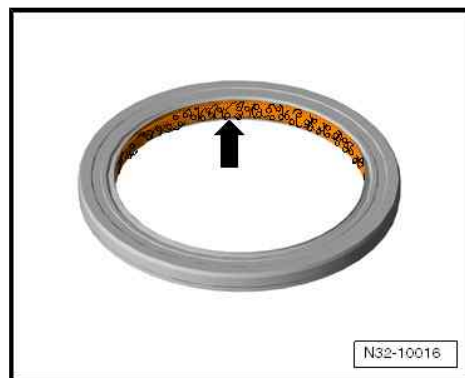
- ◆ For a complete list of special tools used in this Workshop Manual ⇒ Workshop equipment and special tools .

Gearbox

- ◆ When installing the gearbox, ensure that the dowel sleeves between the engine and the gearbox are correctly located.
- ◆ Allocate bolts and other components according to ⇒ Electronic parts catalogue .
- ◆ Clean contact surfaces when assembling mounting brackets and waxed components. The contact surfaces must be free of wax and grease.
- ◆ Thoroughly clean all joints and connections and the surrounding areas before dismantling.
- ◆ When installing a new gearbox, check the oil level and fill up with oil if necessary ⇒ ["5 Gear oil", page 91](#) .
- ◆ Capacities ⇒ [page 2](#) , specifications ⇒ Electronic parts catalogue .

Seals, O-rings and gaskets

- ◆ Always renew 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 seals faces toward the side with fluid filling.
- ◆ 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 in gearbox after installing new gaskets, O-rings and oil seals ⇒ [page 91](#) .

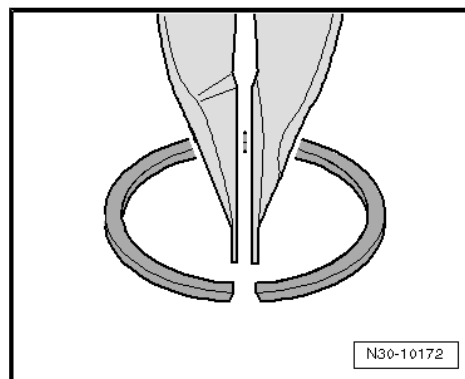


Sealants

- ◆ 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.

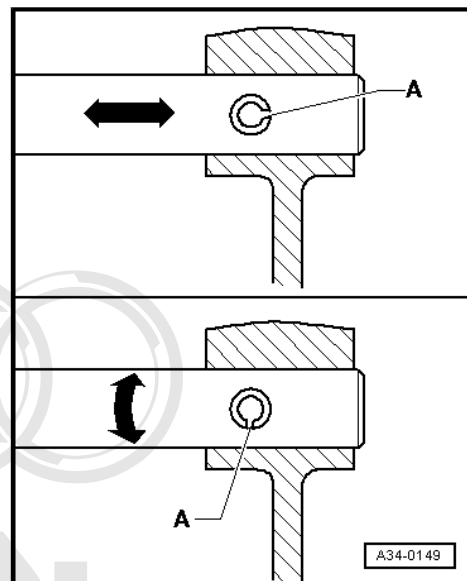
Locking elements

- ◆ 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.
- ◆ 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.



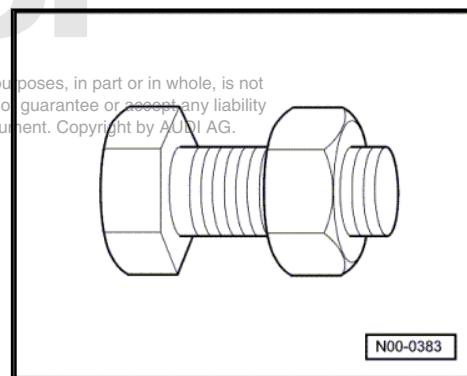
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- ◆ Renew spring pins. Position: the slit -A- should be in line with the line of force -arrow-.



Nuts, bolts

- ◆ Loosen the nuts and bolts in reverse sequence to the specified tightening sequence.
- ◆ 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.
- ◆ To avoid damage to thread, check thread pitch to ensure that correct thread tap is used for cleaning.



Bearings

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

Shims

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

Synchro-rings

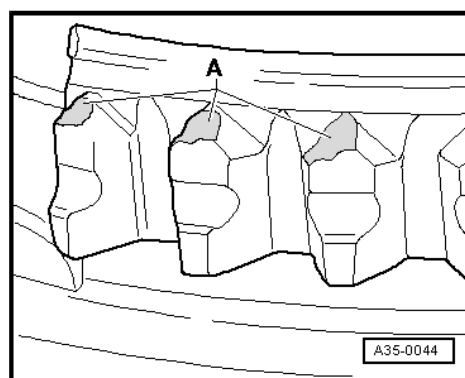
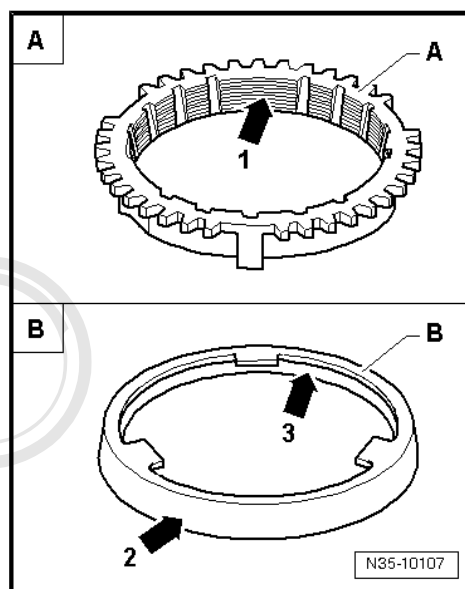
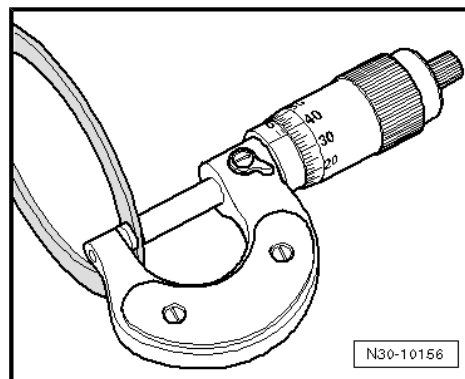
- ◆ Do not interchange synchro-rings. When reusing always fit to the same selector gear.
- ◆ Check for wear; renew if necessary.
- ◆ Lubricate synchro rings with gear oil before installing.
- ◆ Check the grooves -arrow 1- on synchro-ring -A- and on inner ring for wear (flattened sections in grooves).
- ◆ 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)«.

Gear wheels, synchro-hubs

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

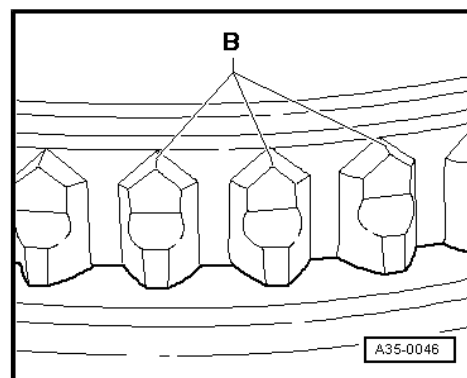
Selector gears and locking collars

- ◆ Check cone on selector gear for scoring and visible traces of wear.
 - ◆ After installing, check 1st to 6th speed selector gears for minimal axial play and freedom of movement.
 - ◆ Abnormal wear on synchro-ring or selector gear:
- A - Worn chamfer on dog teeth of synchro-ring or selector gear.



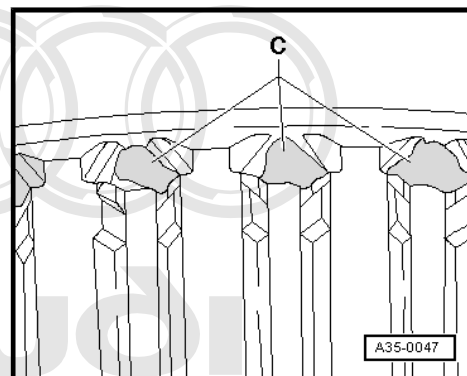
- ◆ In comparison: intact synchro-ring or selector gear:

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



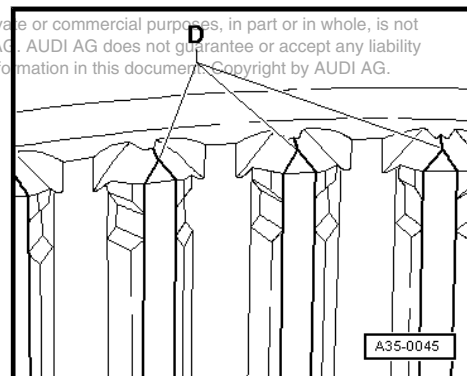
- ◆ Abnormal wear on locking collar:

C - Worn chamfer on internal splines of locking collar.



- ◆ In comparison: intact locking collar:

D - Intact chamfer on internal splines of locking collar.



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Clutch mechanism, clutch

- ◆ If the clutch pedal does not return to its initial position after releasing it (clutch pedal in rest position), you must bleed the clutch system (further measures ➔ [page 33](#)).
- ◆ 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.
- ◆ Blow off flywheel with compressed air only.

5.2 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.

30 – Clutch

1 Clutch mechanism

- ⇒ [“1.1 Exploded view - pedal cluster”, page 10](#)
- ⇒ [“1.2 Exploded view - clutch hydraulics”, page 13](#)
- ⇒ [“1.3 Exploded view - clutch release mechanism”, page 16](#)
- ⇒ [“1.4 Function check for clutch master cylinder and slave cylinder”, page 17](#)
- ⇒ [“1.5 Removing and installing bearing bush”, page 18](#)
- ⇒ [“1.6 Removing and installing clutch position sender G476 ”, page 19](#)
- ⇒ [“1.7 Removing and installing return spring”, page 19](#)
- ⇒ [“1.8 Removing and installing over-centre spring”, page 21](#)
- ⇒ [“1.9 Removing and installing clutch pedal”, page 23](#)
- ⇒ [“1.10 Removing and installing mounting bracket”, page 24](#)
- ⇒ [“1.11 Removing and installing clutch master cylinder”, page 29](#)
- ⇒ [“1.12 Removing and installing clutch slave cylinder”, page 30](#)
- ⇒ [“1.13 Removing and installing lines for clutch hydraulics”, page 31](#)
- ⇒ [“1.14 Bleeding clutch hydraulics”, page 33](#)
- ⇒ [“1.15 Servicing clutch release mechanism”, page 34](#)

1.1 Exploded view - pedal cluster



Note

Do not apply grease or lubricant to any components with the exception of the slide bush -item 15-.

1 - Clutch master cylinder

- ☐ Removing and installing
⇒ [page 29](#)
- ☐ Installing bearing bush
⇒ [page 18](#)

2 - Bearing bush

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

3 - Retaining clip

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

4 - Gasket

- ☐ Self-adhesive
- ☐ Renew after removal
- ☐ Glue onto clutch master cylinder

5 - Clutch position sender - G476-

- ☐ Checking in [Guided Fault Finding](#) ⇒ Vehicle diagnostic tester
- ☐ Removing and installing
⇒ [page 19](#)

6 - Pivot pin

- ☐ Renew after removal

7 - Stop buffer

8 - Nut

- ☐ For mounting bracket
- ☐ 25 Nm
- ☐ 3x
- ☐ Self-locking
- ☐ Renew after removal

9 - Bearing shell

- ☐ 2x
- ☐ Fitted on both sides
- ☐ Only fitted in conjunction with over-centre spring ⇒ [Item 13 \(page 12\)](#)

10 - Mounting bracket

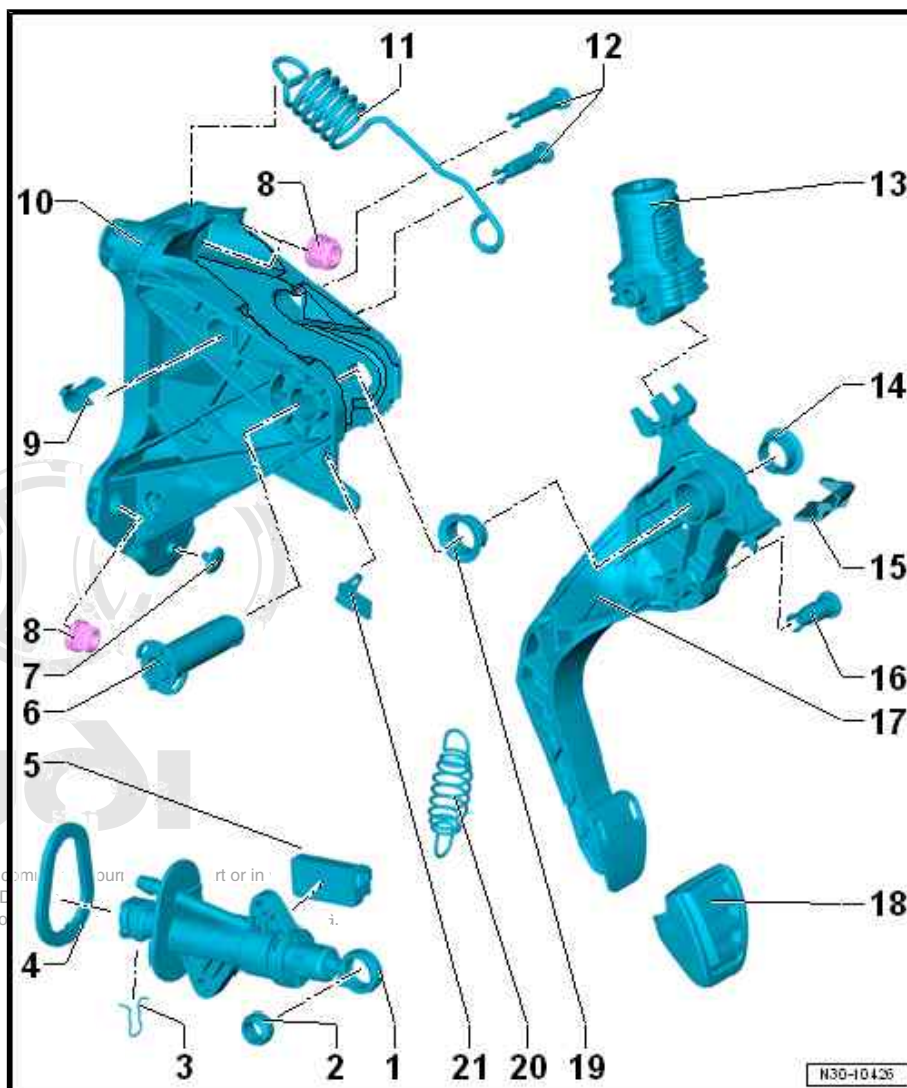
- ☐ For clutch pedal
- ☐ Removing and installing ⇒ [page 24](#)
- ☐ Use drift - VW 207- to drive bushes into holes for mounting pins securing mounting bracket to plenum chamber partition panel

11 - Return spring

- ☐ Not fitted on all versions
- ☐ Removing and installing ⇒ [page 19](#)

12 - Pivot pin

- ☐ For clutch master cylinder
- ☐ Renew after removal





13 - Over-centre spring

- ☐ Not fitted on all versions
- ☐ Different versions available; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 21](#)

14 - Bearing bush

15 - Slide bush

- ☐ Not fitted on all versions
- ☐ For return spring mounting
- ☐ Fit onto clutch pedal
- ☐ Grease before mounting return spring
- ☐ Grease ⇒ Electronic parts catalogue

16 - Pivot pin

- ☐ For plunger of clutch master cylinder
- ☐ Renew after removal

17 - Clutch pedal

- ☐ Removing and installing ⇒ [page 23](#)

18 - Pedal rubber

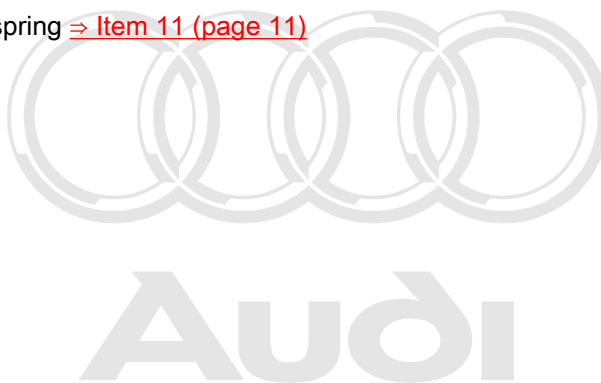
19 - Bearing bush

20 - Extension spring

- ☐ For clutch pedal
- ☐ Not fitted on all versions
- ☐ Removing and installing ⇒ [page 21](#)

21 - Damping piece

- ☐ Only fitted in conjunction with extension spring ⇒ [Item 11 \(page 11\)](#)



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1.2 Exploded view - clutch hydraulics

⇒ ["1.2.1 Exploded view - clutch hydraulics, LHD vehicles", page 13](#)

⇒ ["1.2.2 Exploded view - clutch hydraulics, RHD vehicles", page 15](#)

1.2.1 Exploded view - clutch hydraulics, LHD vehicles

1 - Bolt

- ☐ 20 Nm

2 - Bleeder screw

- ☐ 4.5 Nm
- ☐ Bleeding clutch system
⇒ [page 33](#)

3 - Dust cap

4 - Supply hose

5 - Brake fluid reservoir

6 - Seals

- ☐ Must be fitted in supply hose

7 - Clutch master cylinder

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

8 - Retaining clip

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

9 - Seal or O-ring

- ☐ Renew if damaged
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing
- ☐ Whether a seal or an O-ring is used depends on the type of connection
⇒ [page 14](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue

10 - Pipe/hose assembly

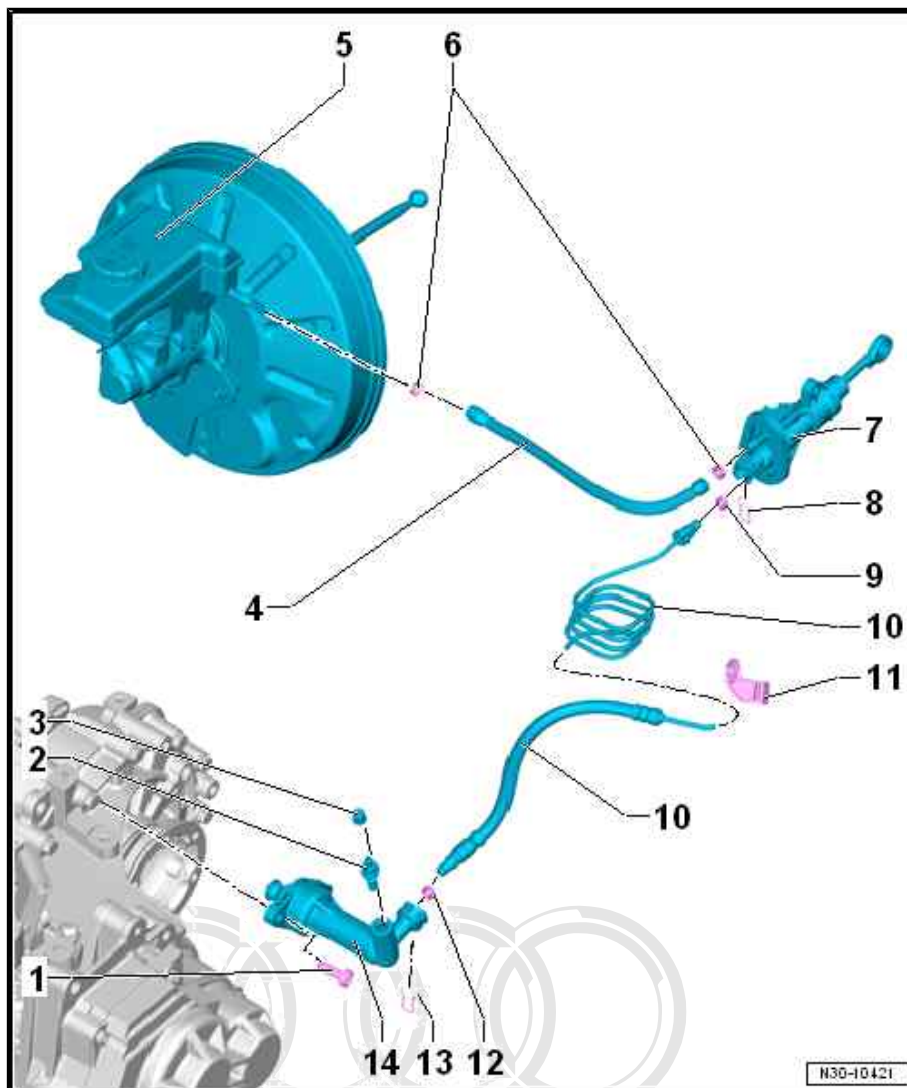
- ☐ Removing and installing ⇒ [page 31](#)

11 - Bracket

- ☐ For pipe/hose assembly

12 - Seal or O-ring

- ☐ Renew if damaged
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing
- ☐ Whether a seal or an O-ring is used depends on the type of connection ⇒ [page 14](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue



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13 - Retaining clip

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

14 - Clutch slave cylinder

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

Disconnecting and connecting lines for clutch hydraulics

Disconnecting

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

Connecting

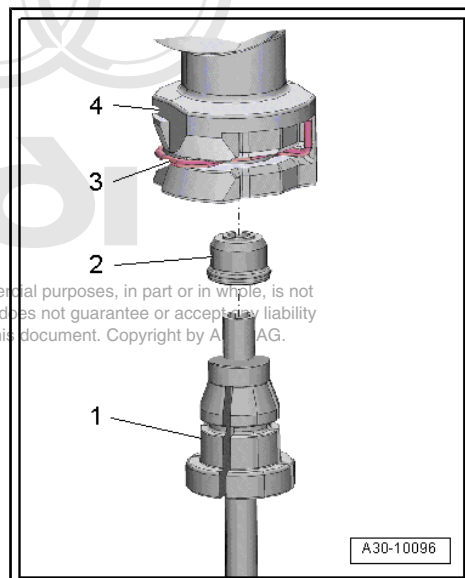


Note

- ♦ *Seal -2- is not fitted on version with O-ring at connection for pipe/hose assembly -1-.*

- ♦ *Renew seal -2- if damaged.*

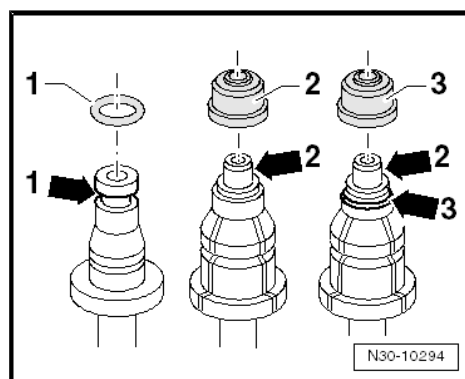
- Press pipe/hose assembly -1- into connection -4- so that retaining clip -3- snaps into place.
- Pull on pipe/hose assembly to check it is secure.



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

Item	Type of connection
1	Connection with annular groove -arrow 1-
2	Connection with shoulder -arrow 2-
3	Connection with shoulder -arrow 2- and annular groove -arrow 3-

- Connection with annular groove -arrow 1- and -arrow 3-: seal / O-ring must be inserted in groove.



1.2.2 Exploded view - clutch hydraulics, RHD vehicles

1 - Clutch slave cylinder

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

2 - Bleeder screw

- ☐ 4.5 Nm
- ☐ Bleeding clutch system
⇒ [page 33](#)

3 - Dust cap

4 - Supply hose

5 - Brake fluid reservoir

6 - Seals

- ☐ Must be fitted in supply hose

7 - Clutch master cylinder

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

8 - Retaining clip

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

9 - Seal / O-ring

- ☐ Renew if damaged
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing
- ☐ Whether a seal or an O-ring is used depends on the type of connection
⇒ [page 14](#)

10 - Bracket

- ☐ For pipe/hose assembly

11 - Pipe/hose assembly

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

12 - Seal or O-ring

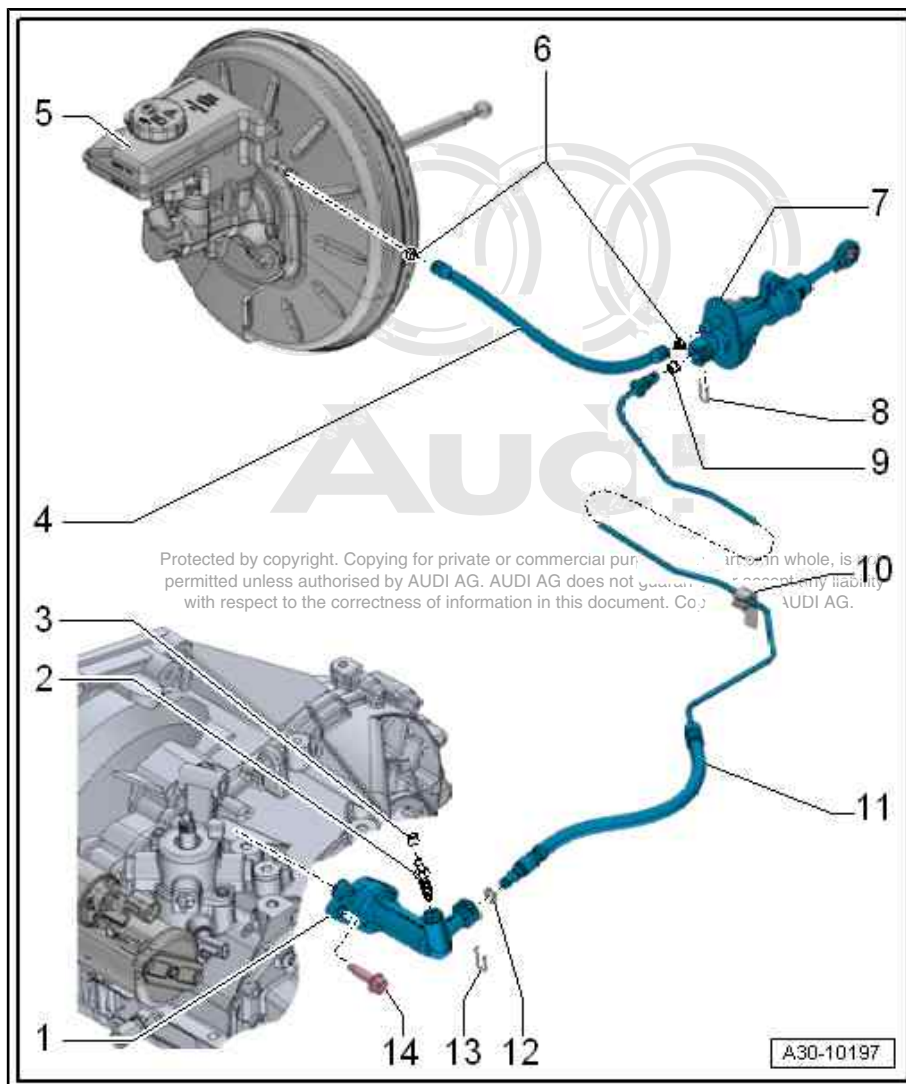
- ☐ Renew if damaged
- ☐ Push onto pipe connection
- ☐ Lubricate with brake fluid before installing
- ☐ Whether a seal or an O-ring is used depends on the type of connection ⇒ [page 14](#)
- ☐ For correct version, refer to ⇒ Electronic parts catalogue

13 - Retaining clip

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

14 - Bolt

- ☐ 20 Nm



1.3 Exploded view - clutch release mechanism

1 - Gearbox

2 - Ball-head pin

- ☐ To remove or install, remove gearbox
- ☐ Remove existing grease from contact surface of release lever
- ☐ Lubricate with grease; for grease refer to ⇒ Electronic parts catalogue
- ☐ 25 Nm

3 - Oil seal

- ☐ For input shaft
- ☐ Renewing ⇒ [page 147](#)

4 - Guide sleeve

- ☐ With vulcanised O-ring
- ☐ To remove or install, remove gearbox
- ☐ Renew guide sleeve and O-ring together if O-ring is damaged

5 - Retaining spring

- ☐ To remove or install, remove gearbox
- ☐ Secure to clutch release lever

6 - Bolt

- ☐ 20 Nm

7 - Clutch release lever

- ☐ To remove or install, remove gearbox
- ☐ Remove and install together with clutch release bearing ⇒ [page 34](#) and ⇒ [page 34](#)

8 - Clutch release bearing

- ☐ To remove or install, remove gearbox
- ☐ Do not wash out bearing; wipe clean only
- ☐ Renew noisy bearing
- ☐ Detaching/attaching on release lever ⇒ [page 34](#)
- ☐ Lubricate contact surfaces on clutch release bearing with grease; for grease refer to ⇒ Electronic parts catalogue

9 - Bolt

- ☐ 20 Nm

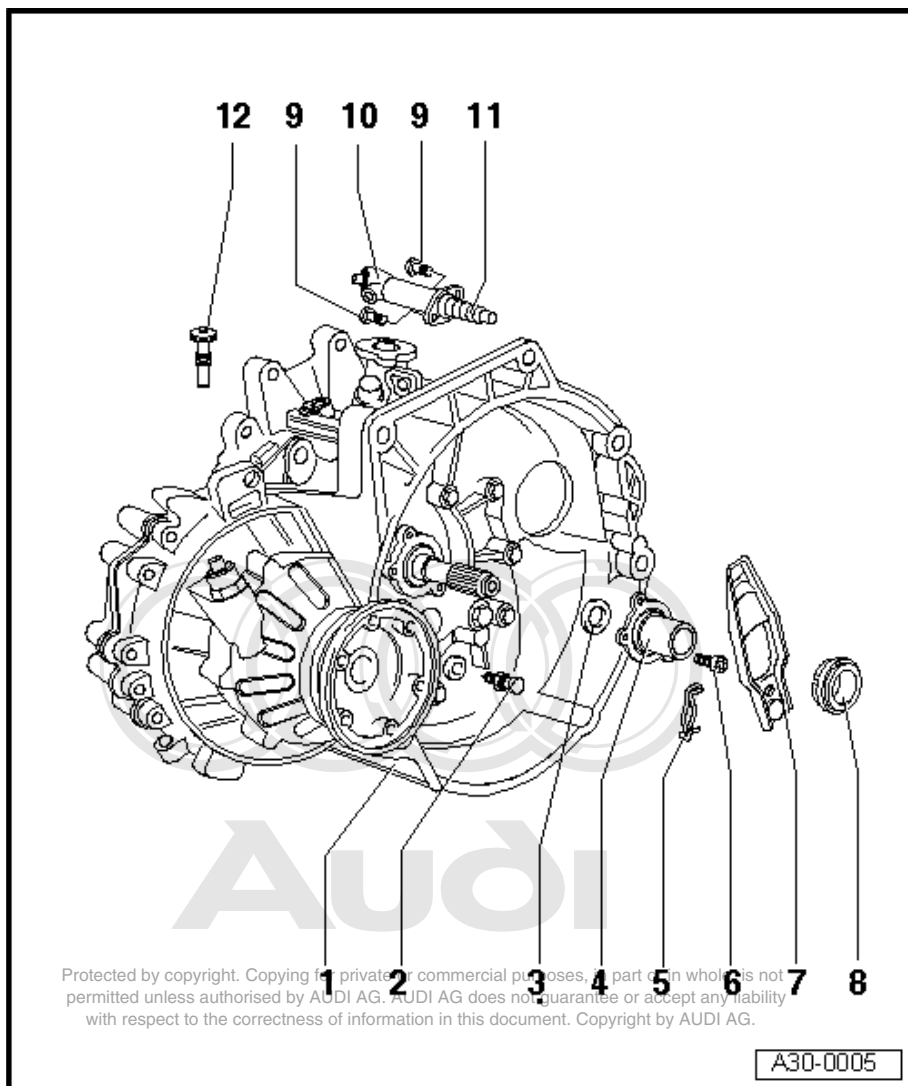
10 - Clutch slave cylinder

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

11 - Plunger

12 - Assembly bolt

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





Note

*If the assembly bolt is not available,
an M 8 x 35 bolt can be used in-
stead.*

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

After releasing clutch pedal it still remains 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 33](#) .

Pedal forces:

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

High pedal force:

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

Clutch does not disengage or does not disengage fully:

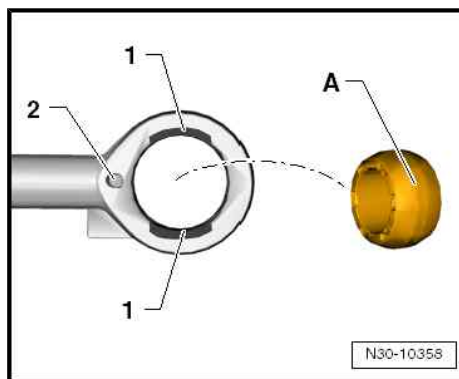
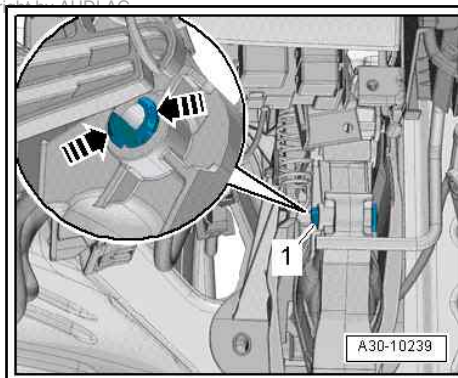
- ◆ Air in hydraulic system: bleed clutch system ⇒ [page 33](#) and check hydraulic system for external and internal leaks.

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

1.5 Removing and installing bearing bush

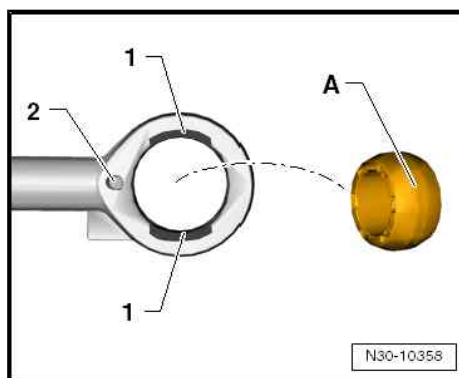
Removing

- Compress catches -arrows- and take out pin -1- towards right side.
- Turn plunger of clutch master cylinder so that recesses -1- and pin -2- are visible.
- Recesses -1- and pin -2- point in the same direction.
- Remove bearing bush -A- from recesses -1-.



Installing

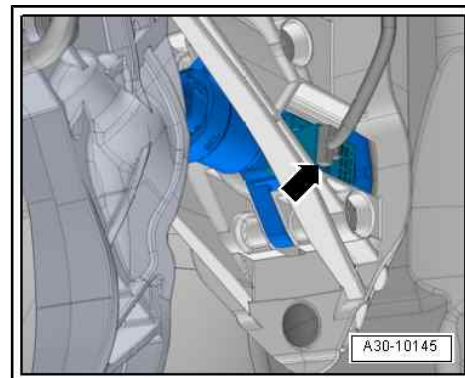
- Turn plunger of clutch master cylinder so that recesses -1- and pin -2- are visible.
- Recesses -1- and pin -2- point in the same direction.
- Insert bearing bush -A- into recesses -1- and pivot into position.
- Attach plunger of clutch master cylinder to clutch pedal
⇒ [page 10](#) .



1.6 Removing and installing clutch position sender - G476-

Removing

- Move driver's seat to rearmost position.
- Unplug electrical connector -arrow- at clutch position sender - G476- .

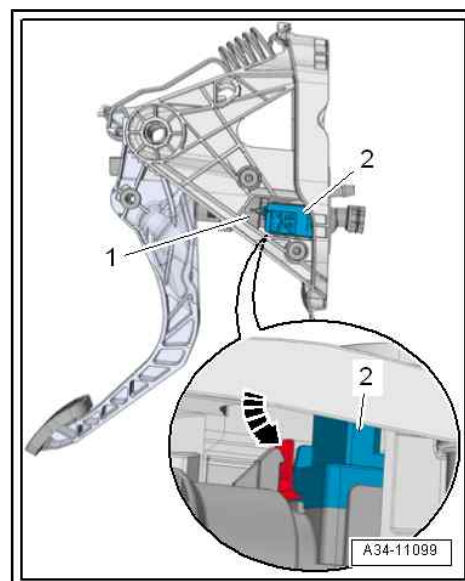


- Unclip clutch position sender - G476- -item 2- at clutch master cylinder -1- -arrow- and remove.

Installing

Perform installation in reverse sequence of removal.

- Lug -arrow- on clutch position sender - G476- must be intact.
- Clutch position sender - G476- must engage audibly.



1.7 Removing and installing return spring

Special tools and workshop equipment required

- ◆ Grease ⇒ Electronic parts catalogue

Removing

- Move driver's seat to rearmost position.
- Move steering wheel up as far as it will go, making use of full range of steering column adjuster.



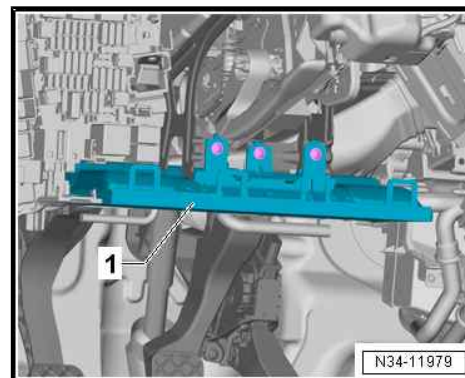
Caution

Risk of damage to the surface of the knee airbag due to mechanical stress.

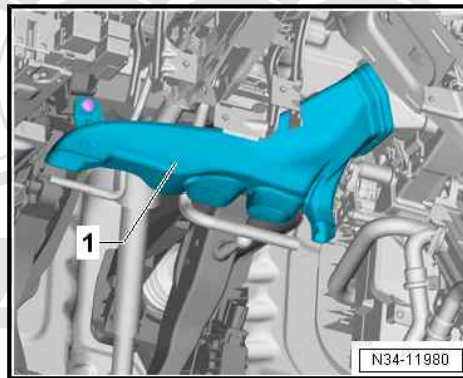
- ◆ **After completion of work, perform a visual check to ensure that the surface of the knee airbag (particularly in the area of the perforation) is undamaged.**

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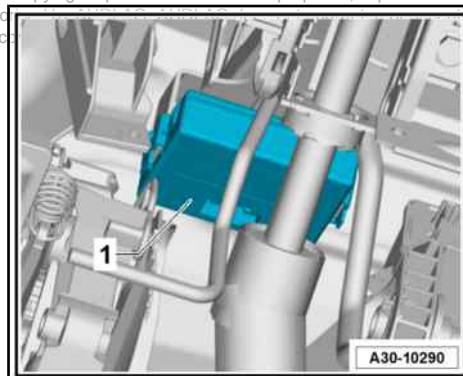
- Remove knee airbag on driver's side 1. General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .



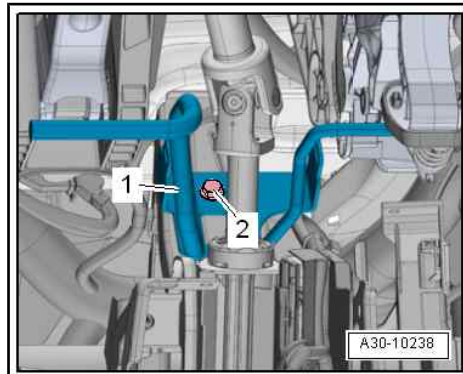
- Remove footwell vent on driver's side -1- ⇒ Rep. gr. 87 ; Air duct; Exploded view of air routing and air distribution in passenger compartment .



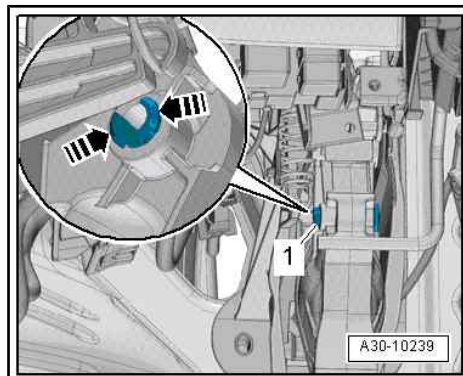
- Take data bus diagnostic interface - J533- -1- out of bracket ⇒ Electrical system; Rep. gr. 97 ; Control units; Overview of fitting locations - control units , and push to one side.



- Remove bolt -2-, detach crash bar -1- and push to one side.



- Compress catches -arrows- and take out pivot pin -1- towards right side.



- Swivel clutch pedal towards rear -arrow-, unhook return spring -1- and remove.

Installing

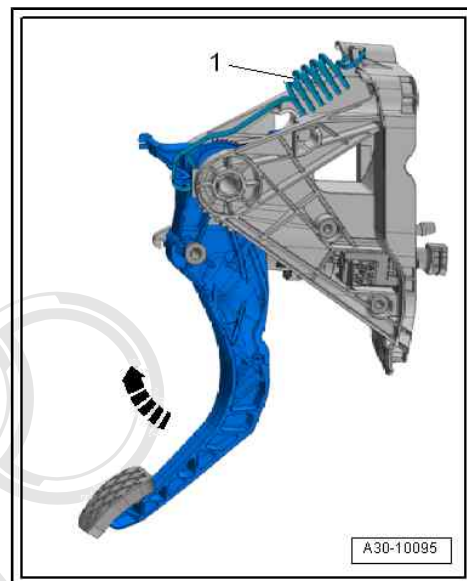
Installation is carried out in reverse sequence; note the following:



Note

Lubricate bearings and moving surfaces with grease; for grease refer to ⇒ Electronic parts catalogue

- Install crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Install data bus diagnostic interface - J533- ⇒ Electrical system; Rep. gr. 97 ; Control units; Overview of fitting locations - control units .
- Install footwell vent on driver's side ⇒ Rep. gr. 87 ; Air duct; Exploded view of air routing and air distribution in passenger compartment .
- Install knee airbag on driver's side ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .



1.8 Removing and installing over-centre spring

Special tools and workshop equipment required

- ◆ Grease ⇒ Electronic parts catalogue

Removing

- Move driver's seat to rearmost position.
- Move steering wheel up as far as it will go, making use of full range of steering column adjuster.

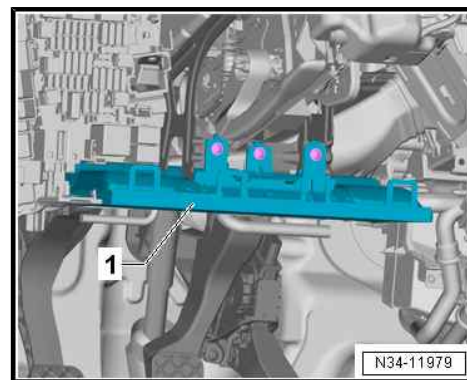


Caution

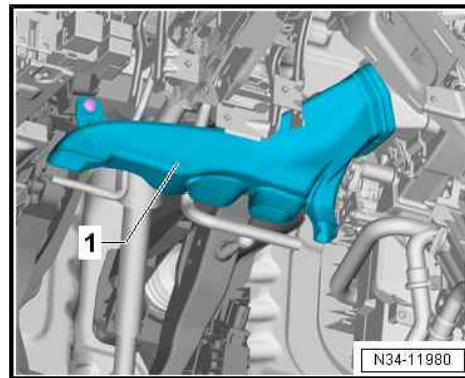
Risk of damage to the surface of the knee airbag due to mechanical stress.

- ◆ ***After completion of work, perform a visual check to ensure that the surface of the knee airbag (particularly in the area of the perforation) is undamaged.***

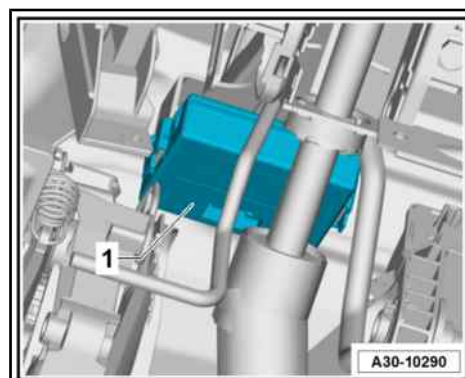
- Remove knee airbag on driver's side -1- ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .



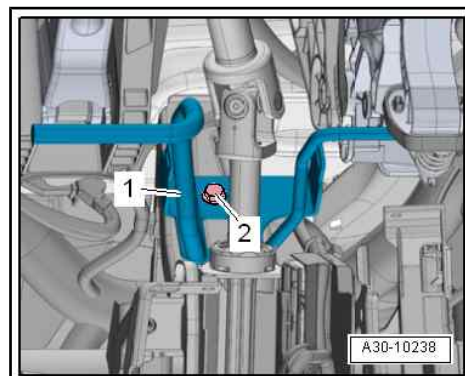
- Remove footwell vent on driver's side -1- ⇒ Rep. gr. 87 ; Air duct; Exploded view of air routing and air distribution in passenger compartment .



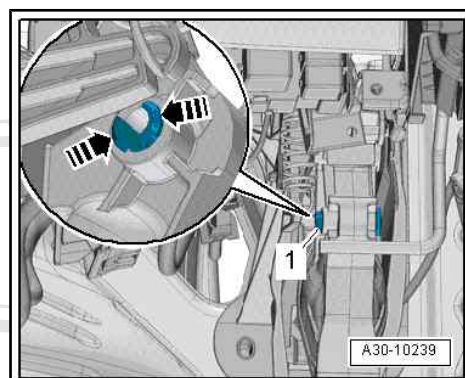
- Take data bus diagnostic interface - J533- -1- out of bracket ⇒ Electrical system; Rep. gr. 97 ; Control units; Overview of fitting locations - control units , and push to one side.



- Remove bolt -2-, detach crash bar -1- and push to one side.

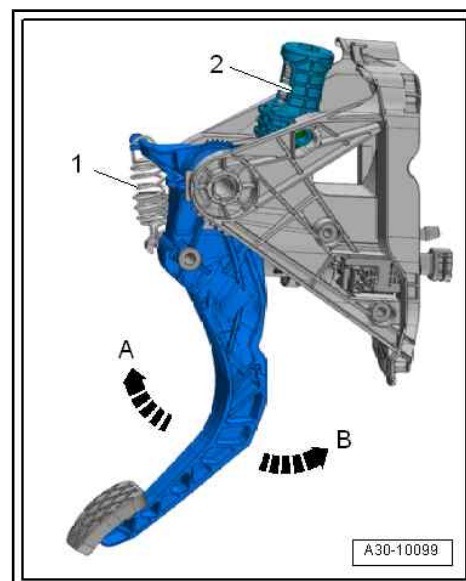


- Compress catches -arrows- and take out pin -1- towards right side.



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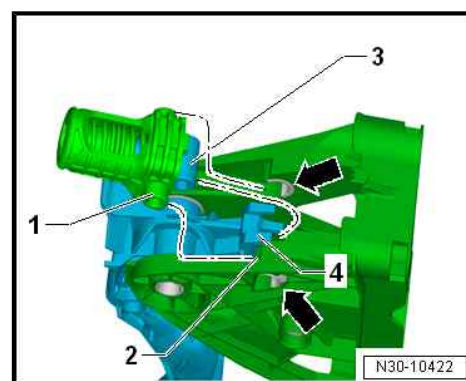
- Press clutch pedal towards front -arrow B-.
- If fitted, unhook extension spring -1- and remove.
- Swivel clutch pedal towards rear -arrow A-, unhook over-centre spring -2- and remove.



Installing

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

- Lubricate bearings and moving surfaces with grease; for grease refer to ⇒ Electronic parts catalogue
- Bearing shells -arrows- for pins -1- are fitted.
- Pull clutch pedal into the passenger compartment (⇒ direction of -arrow A- in previous illustration).
- Fit pins -1- into mountings -2- on mounting bracket.
- Insert bearing -3- into mounting -4- on clutch pedal.
- When clutch pedal is pressed in direction of -arrow B- (⇒ previous illustration), over-centre spring pivots towards mounting bracket.
- Attach plunger of clutch master cylinder to clutch pedal using a new pivot pin.
- Install crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Install data bus diagnostic interface - J533- ⇒ Electrical system; Rep. gr. 97 ; Control units; Overview of fitting locations - control units .
- Install footwell vent on driver's side ⇒ Rep. gr. 87 ; Air duct; Exploded view of air routing and air distribution in passenger compartment .
- Install knee airbag on driver's side ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .



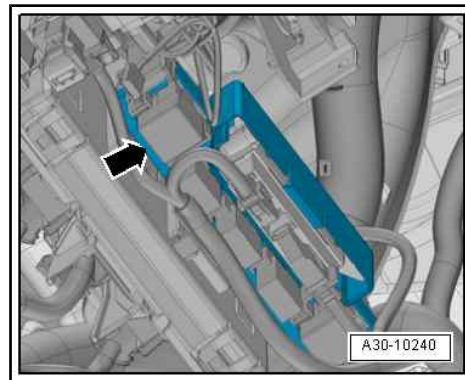
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1.9 Removing and installing clutch pedal

Removing

- Move driver's seat to rearmost position.
- Move steering wheel up as far as it will go, making use of full range of steering column adjuster.

- Remove return spring ⇒ [page 19](#) or over-centre spring ⇒ [page 21](#) .
- Remove bracket -arrow- with parking aid control unit - J446- ⇒ Electrical system; Rep. gr. 97 ; Control units; Overview of fitting locations - control units , and push to one side.



Remove pivot pin for clutch pedal as follows:

-1- = Hexagon key, 14 mm.

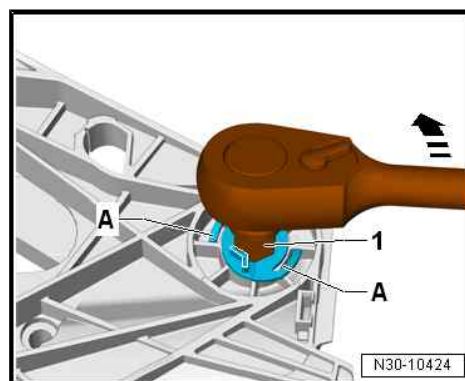
- Turn pivot pin for clutch pedal anti-clockwise as far as stop, in direction of -arrow-.



Note

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

- Move clutch pedal slightly so that pivot pin can be removed.
- Remove clutch pedal.

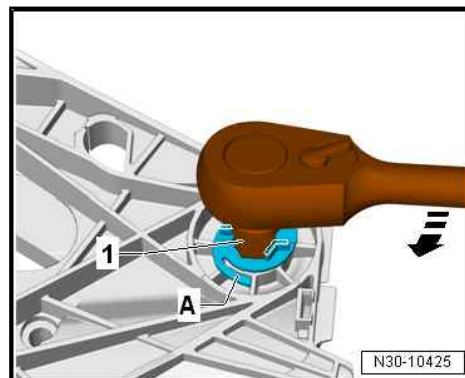


Installing

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

-1- = Hexagon key, 14 mm.

- Renew pivot pin after removing.
- Press clutch pedal slightly and slide in new pivot pin as far as stop.
- Turn pivot pin clockwise as far as stop, in direction of -arrow-.
- Retainers -A- must engage audibly.
- Install return spring ⇒ [page 19](#) or over-centre spring ⇒ [page 21](#) .
- Install bracket with parking aid control unit - J446- ⇒ Electrical system; Rep. gr. 97 ; Control units; Overview of fitting locations - control units .



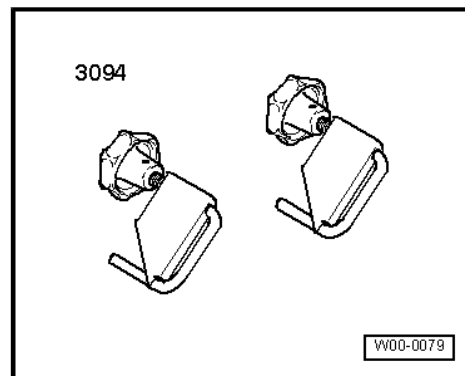
1.10 Removing and installing mounting bracket

Special tools and workshop equipment required

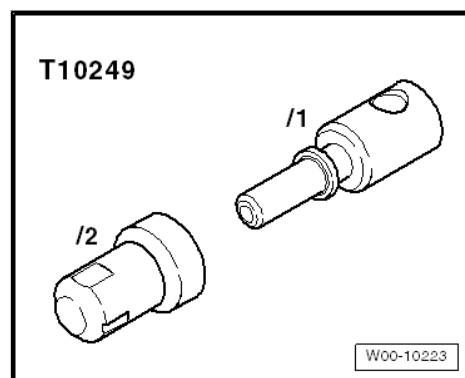


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- ◆ Hose clamps, up to 25 mm - 3094-



- ◆ Sealing tool - T10249-



Removing

- Move driver's seat to rearmost position.
- Move steering wheel up as far as it will go, making use of full range of steering column adjuster.

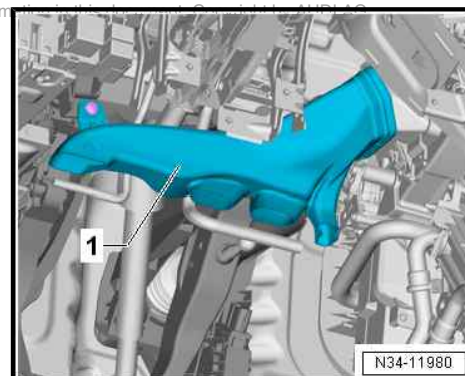
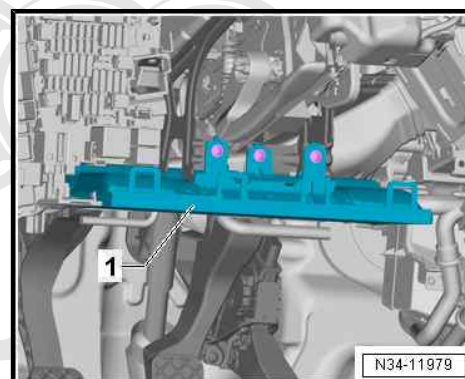


Caution

Risk of damage to the surface of the knee airbag due to mechanical stress.

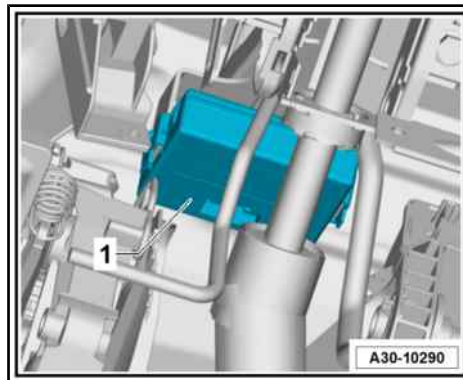
- ◆ ***After completion of work, perform a visual check to ensure that the surface of the knee airbag (particularly in the area of the perforation) is undamaged.***

- Remove knee airbag on driver's side -1- ➔ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .
- Remove footwell vent on driver's side -1- ➔ Rep. gr. 87 ; Air duct; Exploded view of air routing and air distribution in passenger compartment .



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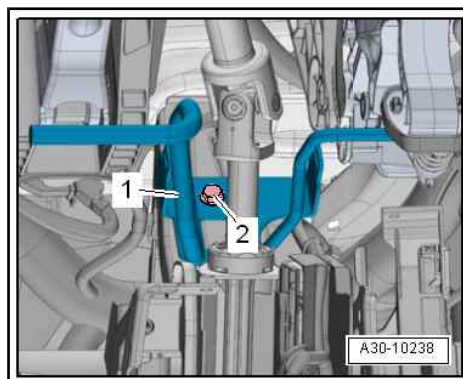
- Take data bus diagnostic interface - J533- -1- out of bracket
⇒ Electrical system; Rep. gr. 97 ; Control units; Overview of fitting locations - control units , and push to one side.



- Remove bolt -2-, detach crash bar -1- and push to one side.

LHD vehicles

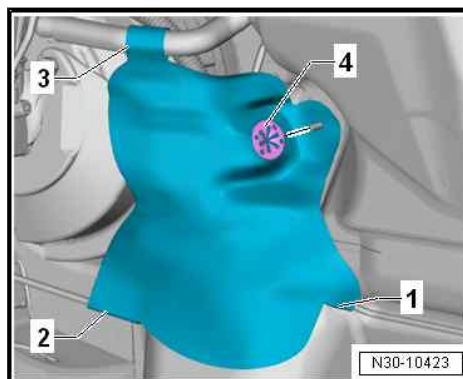
- Remove battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .



RHD vehicles

A heat insulation mat is fitted in conjunction with some engines. It may differ in appearance from the illustration.

- Remove heat insulation mat; note items -1..4-.



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Continued for all vehicles



Note

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

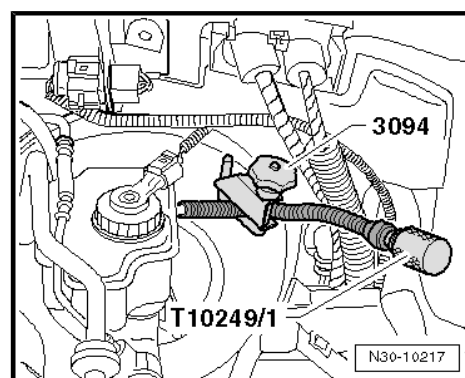
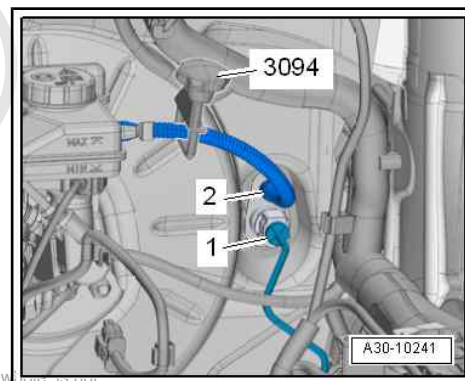
- Place lint-free cloth under clutch master cylinder.
- Using hose clamp - 3094- , clamp off supply hose -2- to clutch master cylinder.

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Note

- ◆ *Clamping off the supply hose with the hose clamp - 3094- will cause a permanent deformation.*
- ◆ *However, this does not damage the supply hose.*
- ◆ *After removing the hose clamp -3094- , the supply hose must be returned to its original shape.*
- Pull out retaining clip -1- as far as it will go and disconnect pipe/hose assembly from clutch master cylinder.
- Disconnect supply hose from clutch master cylinder and plug hose using sealing tool - T10249/1- .





Note

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

- Unplug electrical connector -2- at clutch position sender - G476- .
- Remove nuts -arrows- and detach mounting bracket -1-.

Installing

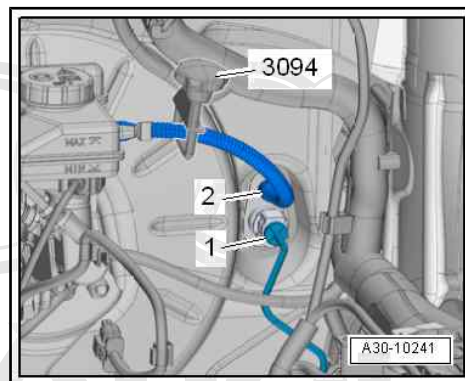
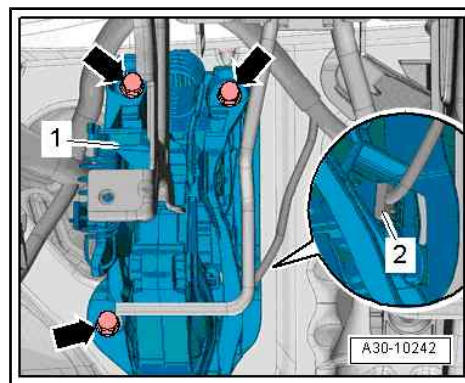
Installation is carried out in reverse sequence; note the following:



Note

Renew self-locking nuts.

- Install mounting bracket.
- Install crash bar ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel .
- Install data bus diagnostic interface - J533- ⇒ Electrical system; Rep. gr. 97 ; Control units; Overview of fitting locations - control units .
- Install footwell vent on driver's side ⇒ Rep. gr. 87 ; Air duct; Exploded view of air routing and air distribution in passenger compartment .
- Install knee airbag on driver's side ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .
- Connect pipe/hose assembly -1- to connection ⇒ [page 14](#) .
- Connect supply hose -2- at clutch master cylinder.
- After removing the hose clamp - 3094- , the supply hose must be returned to its original shape.



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RHD vehicles

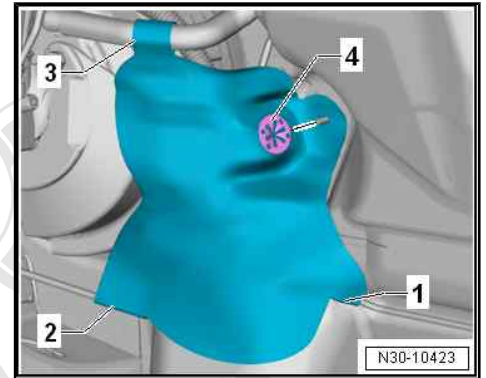
- If previously fitted, wrap heat insulation mat around pipe/hoses in the sequence -1, 2, 3-.
- Secure heat insulation mat with clamping washer -4-.

Continued for all vehicles

- Install battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Bleed clutch hydraulics ⇒ [page 33](#) .

Tightening torques

- ◆ Mounting bracket on plenum chamber partition panel
⇒ [“1.1 Exploded view - pedal cluster”, page 10](#)



1.11 Removing and installing clutch master cylinder

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Special tools and workshop equipment required

- ◆ Grease ⇒ Electronic parts catalogue

Removing



Note

- ◆ *If you suspect a defective clutch master cylinder, perform function test prior to renewing ⇒ [page 17](#) .*
- ◆ *When working in the footwell, put cloths on the floor covering to protect it from possible brake fluid spills.*
- Remove mounting bracket ⇒ [page 24](#) .
- Remove clutch position sender - G476- ⇒ [page 19](#) .
- Release catches -arrows- and press out pivot pin -2-.
- Detach clutch master cylinder -1-.

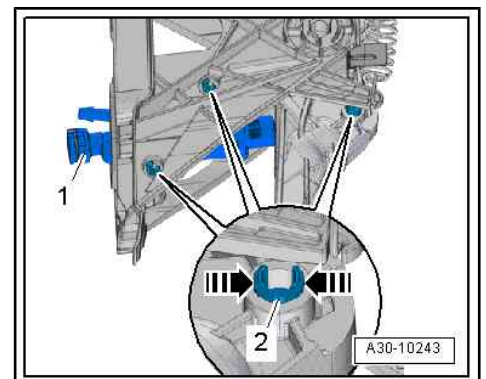
Installing

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



Note

- ◆ *Renew pivot pin after removing.*
- ◆ *Lubricate bearings and moving surfaces with grease; for grease refer to ⇒ Electronic parts catalogue*
- Install mounting bracket ⇒ [page 24](#) .



1.12 Removing and installing clutch slave cylinder

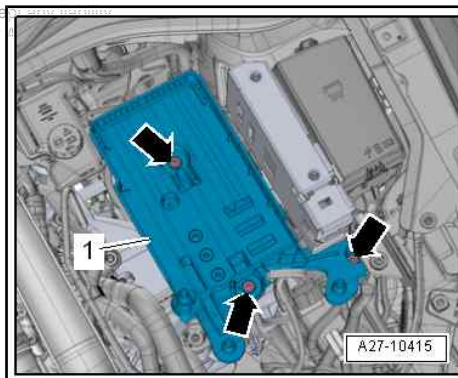
Removing



Note

- ◆ If you suspect a defective clutch slave cylinder, perform function test prior to renewing ➔ [page 17](#).
- ◆ 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.

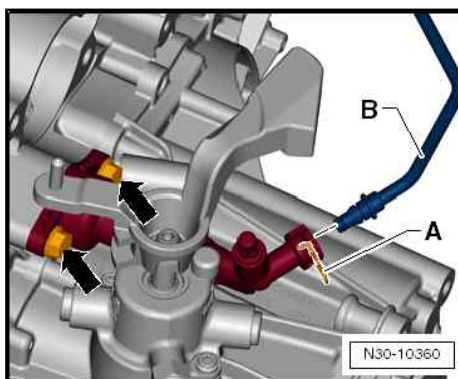
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- Remove battery tray -1- ➔ [Electrical system; Rep. gr. 27](#); Battery; Removing and installing battery tray.



Note

When performing the following steps, make sure that no brake fluid escapes onto the gearbox. If this does happen, clean the affected area thoroughly.

- Place lint-free cloth under clutch slave cylinder.
- Pull out retaining clip -A- as far as it will go and disconnect pipe/hose assembly -B- from connection.
- Remove bolts -arrows- and detach clutch slave cylinder.



Caution

Risk of brake fluid escaping.

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

Installing

Perform installation in reverse sequence of removal.



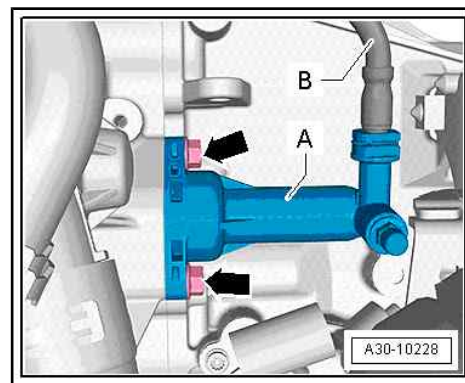
Note

Lubricate all contact surfaces with grease; for grease refer to ➔ [Electronic parts catalogue](#)

- Fit clutch slave cylinder -A- and secure with bolts -arrows-.
- Connect pipe/hose assembly -B- ➔ [page 14](#) .
- Bleed clutch hydraulics ➔ [page 33](#) .

Tightening torques

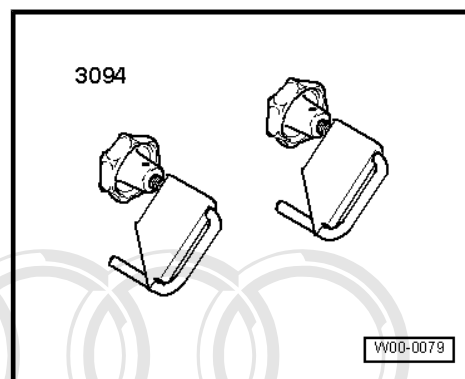
- ◆ ➔ [“1.2 Exploded view - clutch hydraulics”, page 13](#)
- ◆ Battery and battery tray ➔ Electrical system; Rep. gr. 27 ;
Battery; Exploded view - battery



1.13 Removing and installing lines for clutch hydraulics

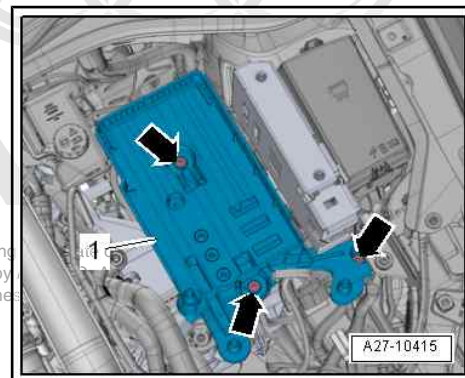
Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



Removing

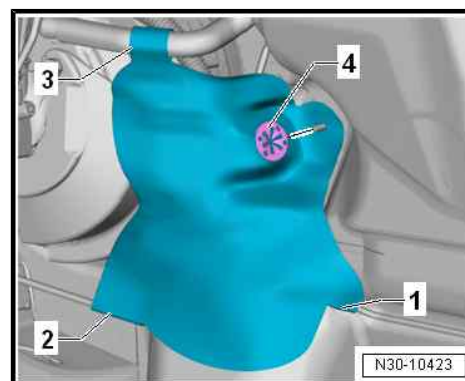
- Remove battery tray -1- ➔ Electrical system; Rep. gr. 27 ;
Battery; Removing and installing battery tray .



RHD vehicles

A heat insulation mat is fitted in conjunction with some engines. It may differ in appearance from the illustration.

- Remove heat insulation mat; note items -1..4-.



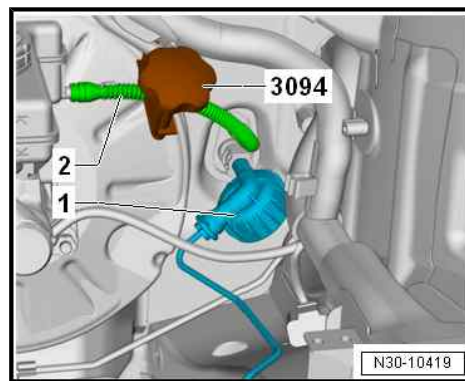
Continued for all vehicles



Note

When performing the following steps, make sure that no brake fluid escapes onto the gearbox. If this does happen, clean the affected area thoroughly.

- Place lint-free cloth under clutch master cylinder.
- Using hose clamp - 3094- , clamp off supply hose -2- to clutch master cylinder.



Note

- ◆ *Clamping off the supply hose with the hose clamp - 3094- will cause a permanent deformation.*
- ◆ *However, this does not damage the supply hose.*
- ◆ *After removing the hose clamp - 3094- , the supply hose must be returned to its original shape.*
- Pull out retaining clip -1- as far as it will go and disconnect pipe/ hose assembly from clutch master cylinder.



Caution

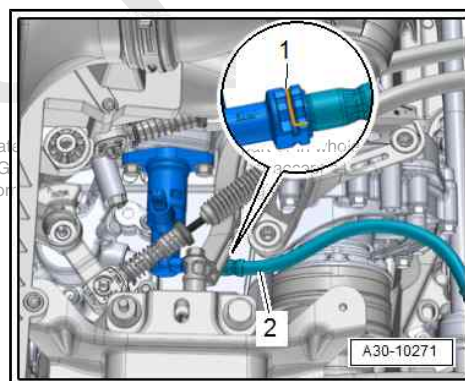
Catch escaping brake fluid.

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

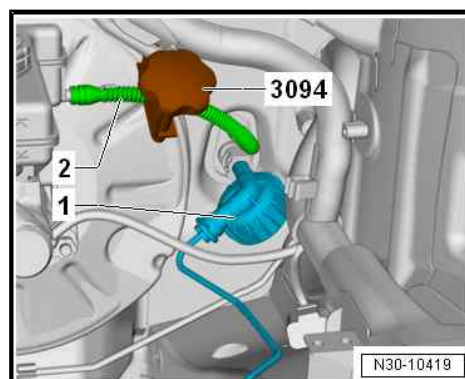
- Pull out retaining clip -1- as far as it will go and disconnect pipe/ hose assembly -2- from connection.
- Move pipe/hose assembly clear and remove.

Installing

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



- Connect pipe/hose assembly -1- to connection ⇒ [page 14](#) .
- After removing the hose clamp - 3094- , the supply hose must be returned to its original shape.



RHD vehicles

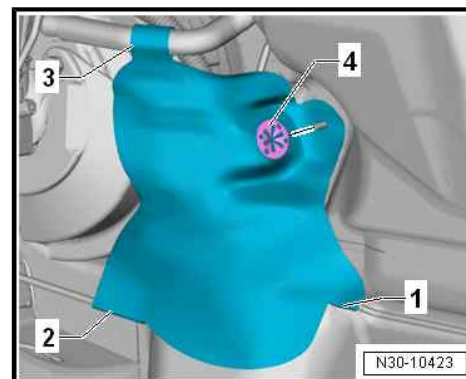
- If previously fitted, wrap heat insulation mat around pipe/hoses in the sequence -1, 2, 3-.
- Secure heat insulation mat with clamping washer -4-.

Continued for all vehicles

- Bleed clutch hydraulics ⇒ [page 33](#) .

Tightening torques

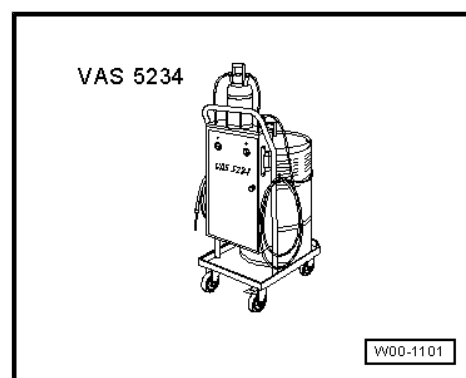
- ◆ Battery; Exploded view - battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Exploded view - battery



1.14 Bleeding clutch hydraulics

Special tools and workshop equipment required

- ◆ Brake filling and bleeding equipment - VAS 5234-



- ◆ Brake fluid specification ⇒ Rep. gr. 47 ; Hydraulic system; General notes on brake fluid .

Procedure

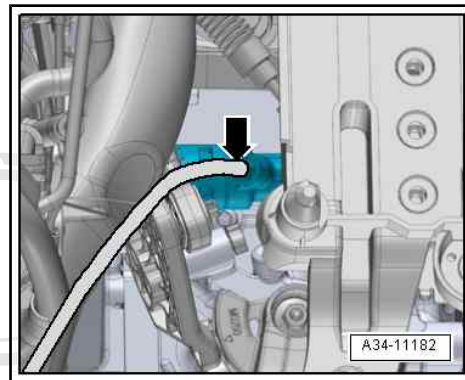


Note

- ◆ *The clutch system must be bled after performing work on the hydraulic clutch mechanism.*
- ◆ *When performing the following steps, make sure that no brake fluid escapes onto the gearbox.*
- ◆ *Prefilling the system is not necessary.*
- ◆ *Before bleeding the clutch system, top up the brake fluid reservoir to the "max." marking with brake fluid.*
- ◆ *The clutch pedal is in the normal position, i.e. not pressed down.*
- ◆ *The brake fluid in the clutch system should be changed at the same intervals as the brake fluid in the brake system ⇒ Maintenance ; Booklet 821 ; Description of work; Brake fluid: changing (every 2 years) .*
- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing or ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .

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- Pull clutch pedal back to rest position.
- Remove cap from bleeder screw.
- Connect bleeder hose -arrow- to pressure hose of fluid collector bottle.
- Switch on brake filling and bleeding equipment - VAS 5234- .
- Operating pressure 2.0 bar
- Open bleeder screw.
- Bleed off approx. 100 cm³ of brake fluid.
- Close bleeder screw.
- Rapidly pump clutch pedal through full range of travel 10 to 15 times.
- Open bleeder screw.
- Bleed off a further 50 cm³ of brake fluid.
- Close bleeder screw.
- Switch off brake filling and bleeding equipment - VAS 5234- and relieve pressure completely from bleeding equipment.
- Depress clutch pedal several times after bleeding process is completed.
- Check that clutch system is functioning properly.



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Tightening torques

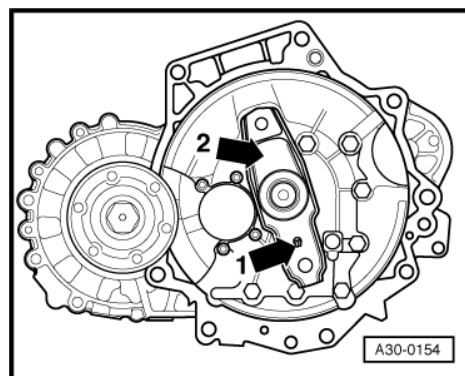
- ♦ ➔ ["1.2 Exploded view - clutch hydraulics", page 13](#)
- ♦ Air cleaner; Exploded view - air cleaner housing; for diesel ➔ Rep. gr. 23 ; Air cleaner; Exploded view - air cleaner housing ; for petrol ➔ Rep. gr. 24 ; Air cleaner; Exploded view - air cleaner housing

1.15 Servicing clutch release mechanism

Removing and installing clutch release lever with release bearing

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

Perform installation in reverse sequence of removal.

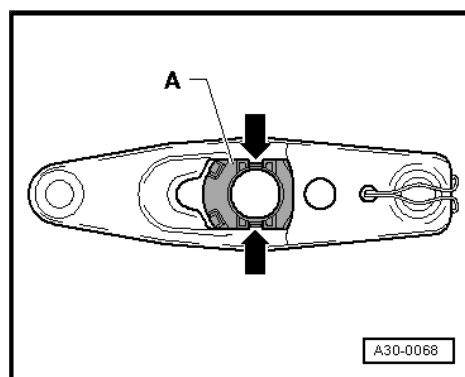


Removing and installing clutch release bearing

- Gearbox removed
- Press locking lugs -arrows- together on reverse side of clutch release lever and remove clutch release bearing -A- from clutch release lever.
- To install, press clutch release bearing -A- into clutch release lever until locking lugs -arrows- engage audibly.

Tightening torques

- ♦ ➔ ["1.3 Exploded view - clutch release mechanism", page 16](#)



2 Clutch

⇒ [“2.1 Identifying different makes of clutch”, page 35](#)

⇒ [“2.2 Exploded view - clutch unit”, page 36](#)

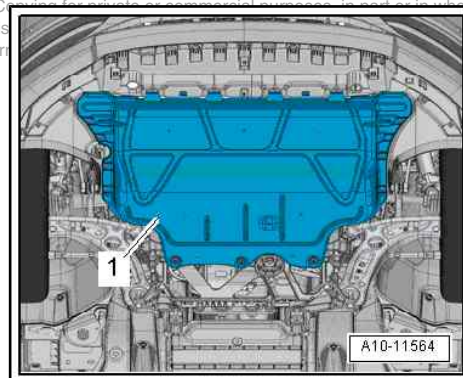
⇒ [“2.3 Removing and installing clutch”, page 38](#)

2.1 Identifying different makes of clutch

The clutch fitted in on vehicles with dual-mass flywheel is manufactured by either “Sachs” or “LuK”.

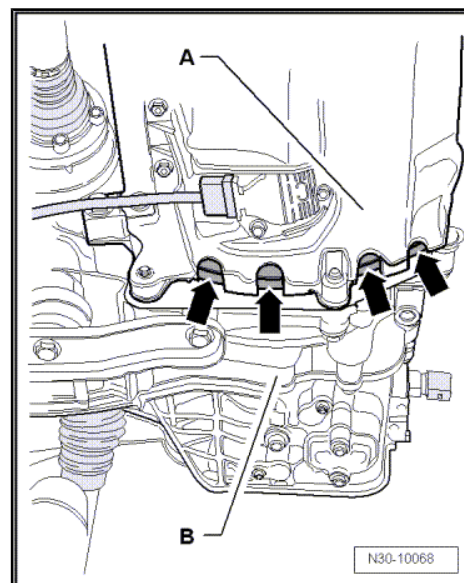
With gearbox installed, the clutch version fitted can be distinguished as follows:

- Remove noise insulation -1- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- If necessary, remove noise insulation from engine sump.

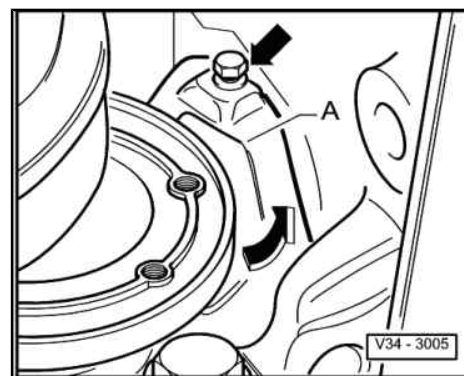


A number of recesses -arrows- are located in lower area of sump between engine -A- and gearbox -B-.

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



- The contour of the flywheel can also be checked by removing the small cover plate -A- (-arrows-), if fitted.

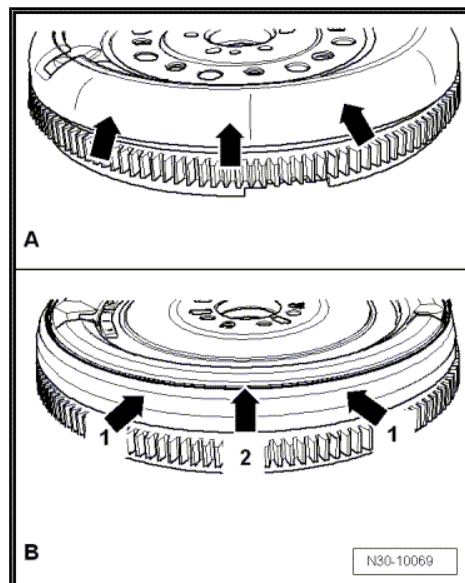


A - Round contour -arrows- = "Sachs" version clutch

- Exploded view - "Sachs" version clutch ⇒ [page 38](#)
- Removing and installing "Sachs" version clutch ⇒ [page 42](#)

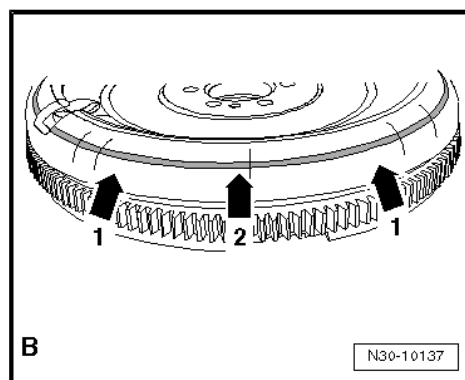
B - Square contour -arrows 1- and annular groove -arrow 2- = "LuK" version clutch.

or



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

- Exploded view - "LuK" version clutch ⇒ [page 36](#)
- Removing and installing "LuK" version clutch ⇒ [page 38](#)



2.2 Exploded view - clutch unit

⇒ ["2.2.1 Exploded view - LuK version clutch", page 36](#)

⇒ ["2.2.2 Exploded view - Sachs version clutch", page 38](#)

2.2.1 Exploded view - LuK version clutch



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1 - Flywheel

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

2 - Clutch plate

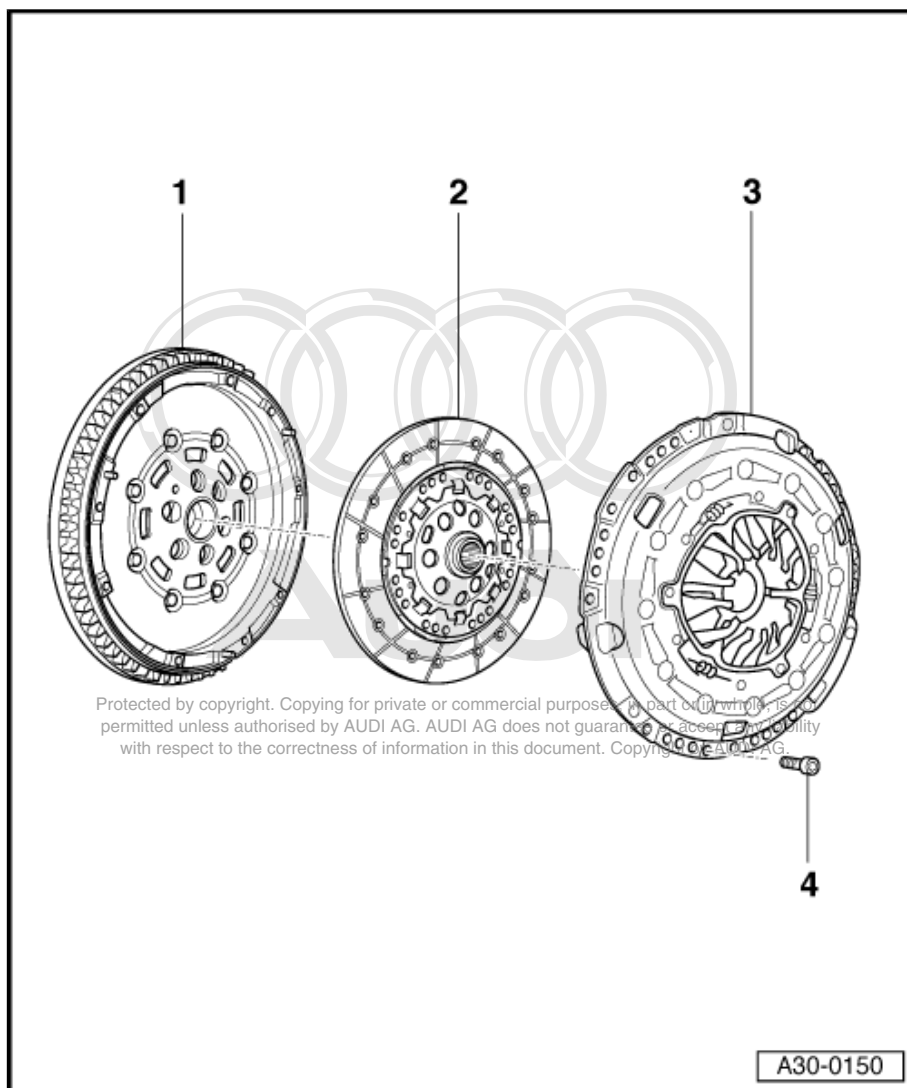
- ☐ Removing and installing
⇒ [page 38](#)
- ☐ Renew clutch pressure plate as well
- ☐ Allocate according to engine code ⇒ Electronic parts catalogue
- ☐ Installation position
⇒ [page 40](#)
- ☐ Lightly grease splines

3 - Pressure plate

- ☐ With adjustment mechanism
- ☐ Removing and installing
⇒ [page 38](#)
- ☐ Renew clutch plate as well
- ☐ Allocate according to engine code ⇒ Electronic parts catalogue
- ☐ Checking ends of diaphragm spring
⇒ [page 41](#)
- ☐ Checking springs and riveting ⇒ [page 41](#)
- ☐ Checking position of adjustment mechanism (new pressure plate only) ⇒ [page 42](#)

4 - Bolt

- ☐ Loosen and tighten bolts consecutively in steps of 90°
- ☐ M6: 13 Nm
- ☐ M7: 20 Nm
- ☐ 6x
- ☐ For correct version, refer to ⇒ Electronic parts catalogue



2.2.2 Exploded view - Sachs version clutch

1 - Flywheel

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

2 - Clutch plate

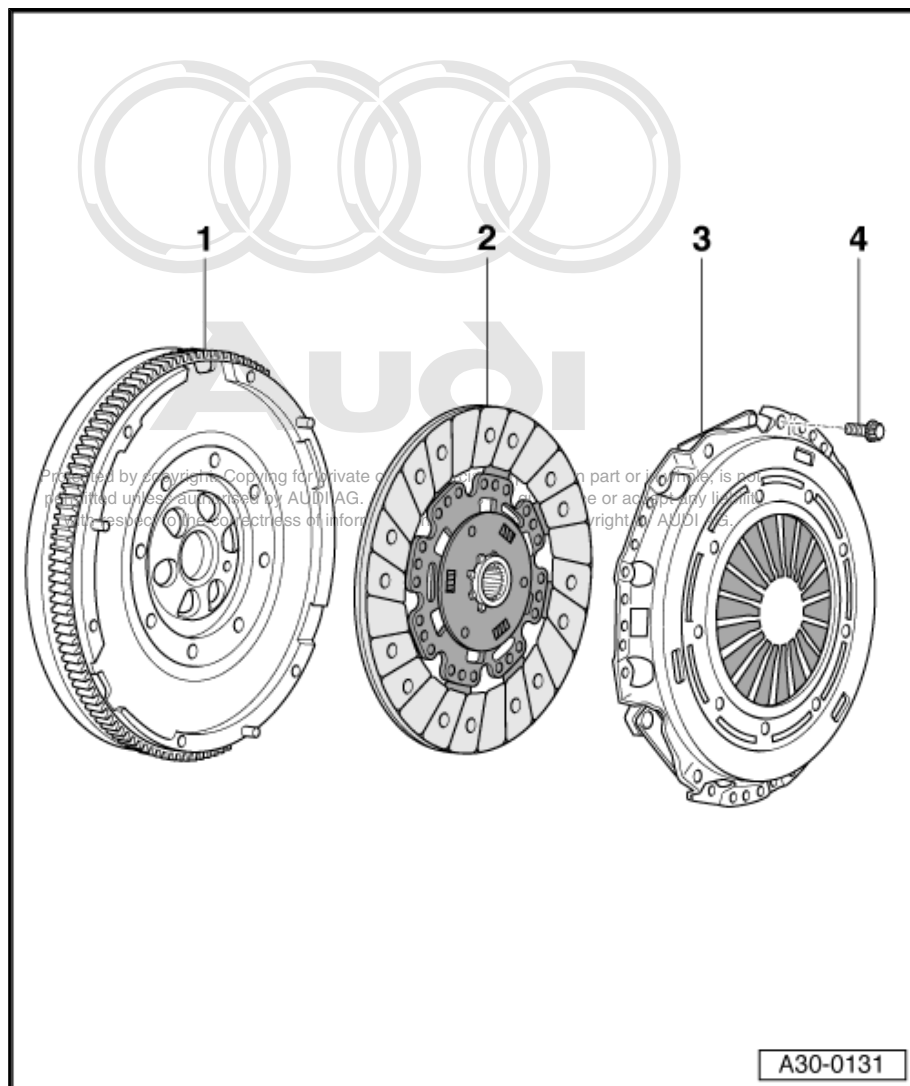
- ☐ Removing and installing
⇒ [page 42](#)
- ☐ Renew clutch pressure plate as well
- ☐ Allocate according to engine code ⇒ Electronic parts catalogue
- ☐ Installation position
⇒ [page 44](#)

3 - Pressure plate

- ☐ With adjustment mechanism
- ☐ Removing and installing
⇒ [page 42](#)
- ☐ Renew clutch plate as well
- ☐ Allocate according to engine code ⇒ Electronic parts catalogue
- ☐ Checking ends of diaphragm spring
⇒ [page 45](#)
- ☐ Checking spring connections and rivets ⇒ [page 45](#)

4 - Bolt

- ☐ Loosen and tighten bolts consecutively in steps of 90°
- ☐ M6: 13 Nm
- ☐ M7: 20 Nm
- ☐ 6x
- ☐ For correct version, refer to ⇒ Electronic parts catalogue



2.3 Removing and installing clutch

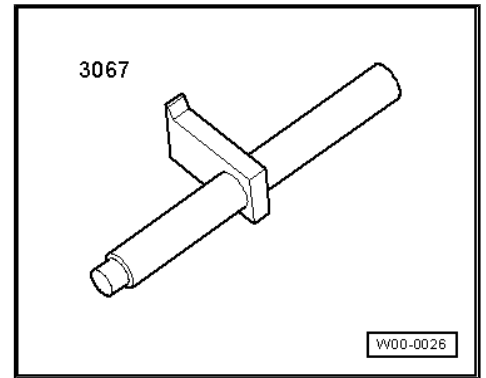
⇒ ["2.3.1 Removing and installing LuK version clutch", page 38](#)

⇒ ["2.3.2 Removing and installing Sachs version clutch", page 42](#)

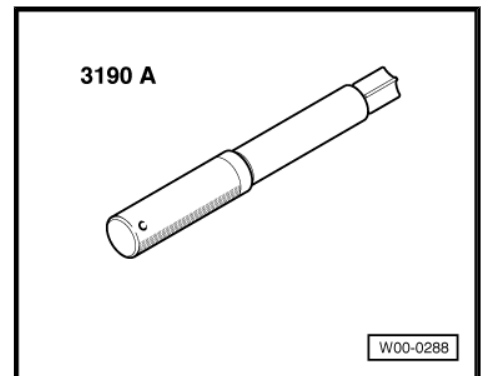
2.3.1 Removing and installing LuK version clutch

Special tools and workshop equipment required

◆ Counterhold tool - 3067-



◆ Centring mandrel - 3190 A-



◆ Grease for clutch plate splines - G 000 100-

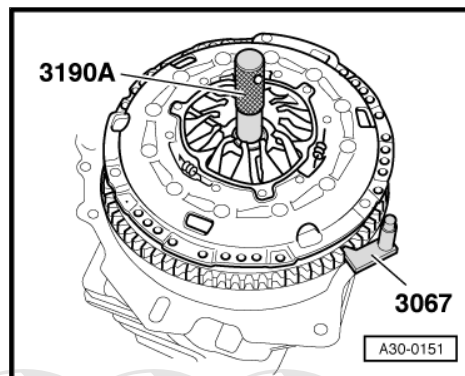
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Removing

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

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

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



Installing

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

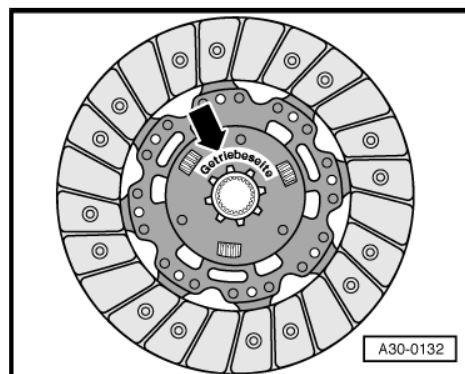


Note

- ◆ When performing repairs always match up clutch pressure plate and clutch plate by checking engine code ⇒ *Electronic parts catalogue*.
- ◆ Clean input shaft splines and hub splines on used clutch plates, remove corrosion and apply an extremely thin coat of clutch plate grease - G 000 100- to the splines. Then move clutch plate backwards and forwards on input shaft until hub moves freely on shaft. It is important to remove excess grease.
- ◆ Clutch pressure plates have an anti-corrosion coating and are greased. With the exception of the friction surface of the clutch plate, the clutch pressure plate must not be cleaned. Otherwise, the service life of the clutch will be considerably reduced.
- ◆ The friction surface of the clutch pressure plate and the flywheel must be cleaned (degreased) thoroughly.
- ◆ If the clutch has burnt out, thoroughly clean the gearbox housing in area of clutch and parts of the engine facing the gearbox in order to prevent odours.
- ◆ Blow off flywheel with compressed air only.
- ◆ Clutch plate linings must make full contact with flywheel and friction surface of clutch pressure plate. Only then insert bolts.
- ◆ Check that dowel sleeves for centralising engine/gearbox are in the cylinder block, install if necessary.
- ◆ If the dowel sleeves are not fitted, this will lead to gear-change problems, clutch malfunction and in some cases gearbox noise (gears will make rattling noises).

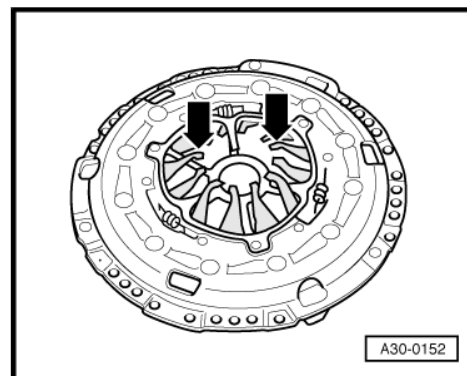
Installation position of clutch plate

- Marking "Getriebeseite" (gearbox side) -arrow- faces towards gearbox.



Checking ends of diaphragm spring

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



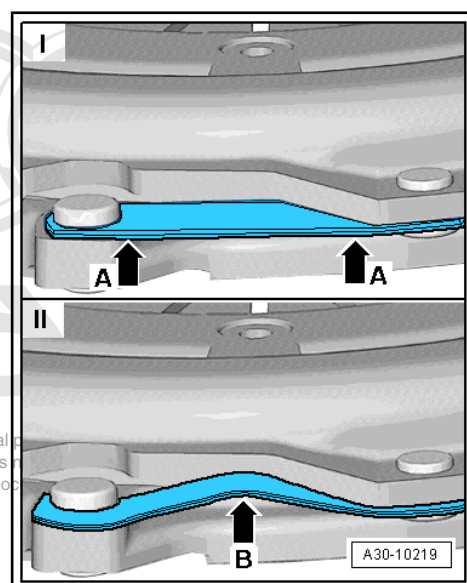
Checking springs and riveting

I - Springs OK

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

II - Springs damaged

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

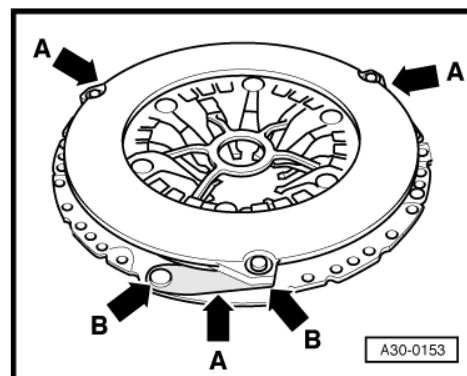


- Check that riveting -arrows B- is secure at all springs -arrows A-.
- Check spring connections -arrows A- for damage and make sure rivet fastenings -arrows B- are seated tightly.



Note

Renew clutch pressure plate if riveting -arrows B- is loose.



Checking position of adjustment mechanism (new pressure plate only)

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



Note

The position of the adjuster ring can be outside the notches on used clutches.

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

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

- Screw in all 6 bolts evenly by hand until bolt heads make contact with clutch pressure plate.
- Tighten all 6 bolts consecutively in clockwise direction and in steps of 90° until housing makes contact with flywheel.
- Tighten all 6 bolts to final torque consecutively in clockwise direction.

Tightening torques

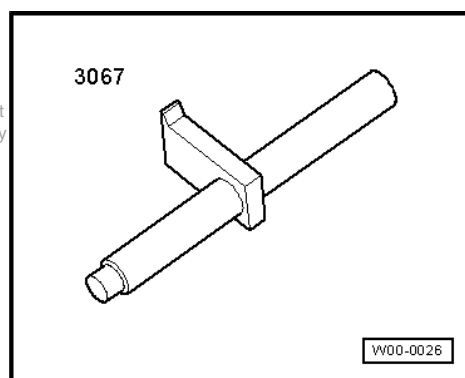
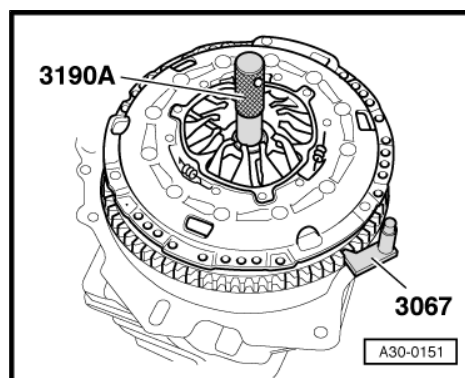
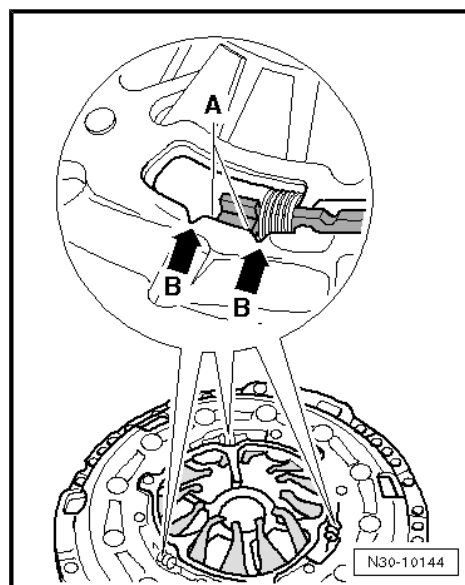
- ♦ ➔ ["2.2.1 Exploded view - LuK version clutch", page 36](#)

2.3.2 Removing and installing Sachs version clutch

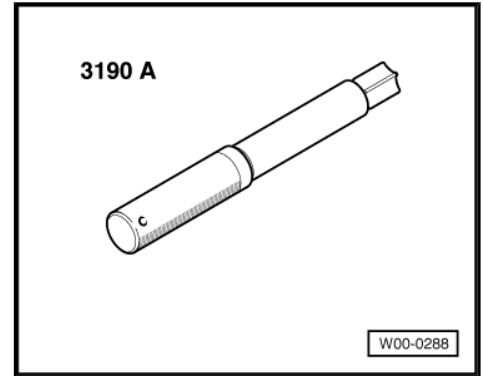
Special tools and workshop equipment required

- ♦ Counterhold tool - 3067-

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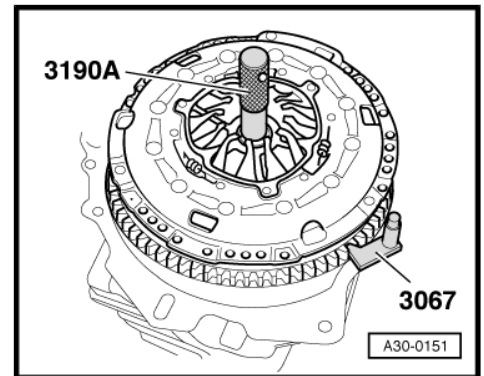
◆ Centring mandrel - 3190 A-



◆ Grease for clutch plate splines G 000 100-
Protect the clutch plate splines from corrosion. Grease the splines in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability for the correctness of information in this document. Copyright by AUDI AG.

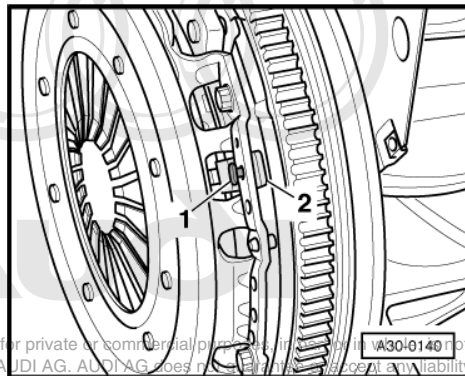
Removing

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



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

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



Installing

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

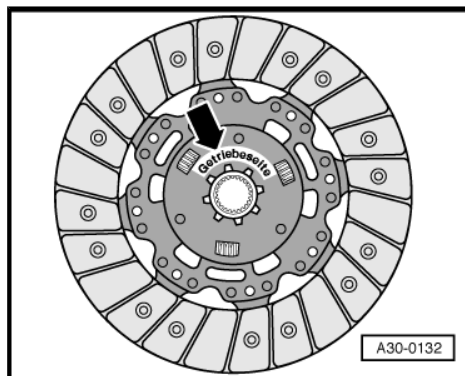


Note

- ◆ Clean input shaft splines and hub splines on used clutch plates, remove corrosion and apply an extremely thin coat of clutch plate grease - G 000 100- to the splines. Then move clutch plate backwards and forwards on input shaft until hub moves freely on shaft. It is important to remove excess grease.
- ◆ Clutch pressure plates have an anti-corrosion coating and are greased. With the exception of the friction surface for the clutch plate, the clutch pressure plate must not be cleaned. Otherwise, the service life of the clutch will be considerably reduced.
- ◆ The friction surface of the clutch pressure plate and the flywheel must be cleaned (degreased) thoroughly.
- ◆ If the clutch has burnt out, thoroughly clean the gearbox housing in area of clutch and parts of the engine facing the gearbox in order to prevent odours.
- ◆ Blow off flywheel with compressed air only.
- ◆ Clutch plate linings must make full contact with flywheel and friction surface of clutch pressure plate. Only then insert bolts.
- ◆ Check that dowel sleeves for centralising engine/gearbox are in the cylinder block, install if necessary.
- ◆ If the dowel sleeves are not fitted, this will lead to gear-change problems, clutch malfunction and in some cases gearbox noise (gears will make rattling noises).

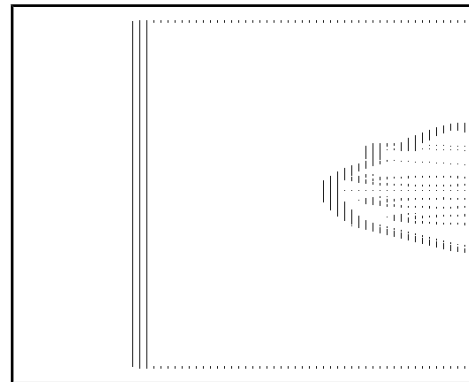
Installation position of clutch plate

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



Checking ends of diaphragm spring

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



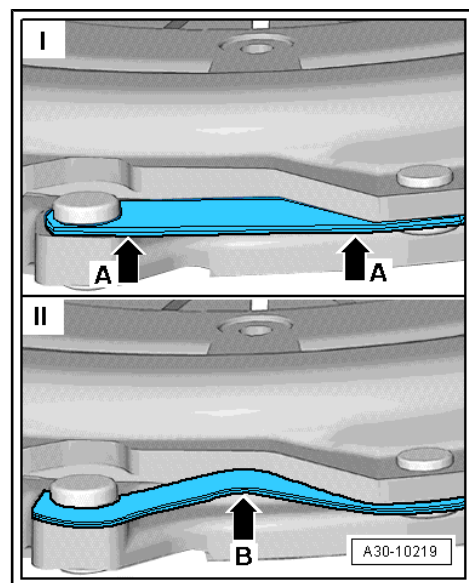
Checking spring connections and rivets

I - Springs OK

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

II - Springs damaged

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



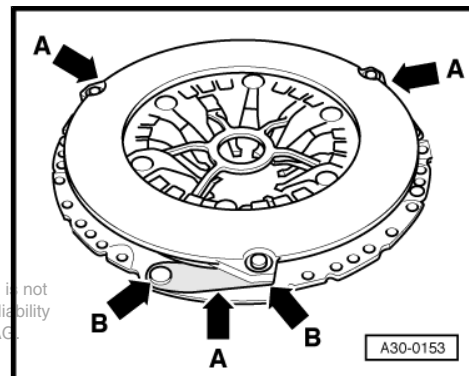
- Check that riveting -arrows B- is secure at all springs -arrows A-.



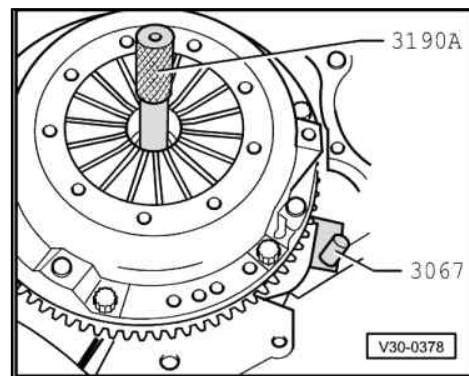
Note

Renew clutch pressure plate if riveting -arrows B- is loose.

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

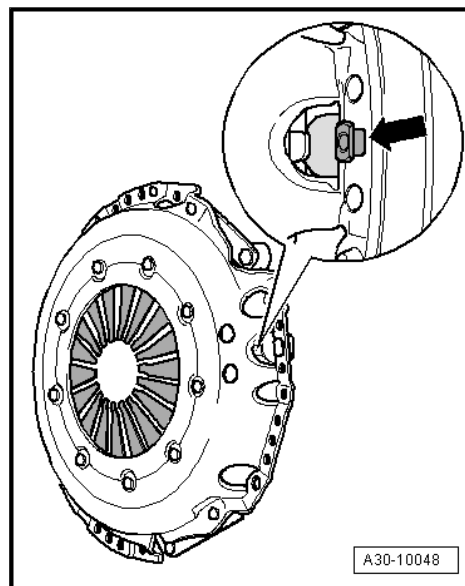


To prevent the clutch pressure plate from becoming distorted during installation (causes clutch grab when driving off), always adhere to the following procedure when attaching the clutch pressure plate:

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

Tightening torques

- ♦ ⇒ [“2.2.2 Exploded view - Sachs version clutch”, page 38](#)



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34 – Controls, housing

1 Selector mechanism

⇒ [“1.1 Overview - selector mechanism”, page 47](#)

⇒ [“1.2 Exploded view - gear knob and cover”, page 48](#)

⇒ [“1.3 Exploded view - gear lever and selector housing”, page 49](#)

⇒ [“1.4 Exploded view - selector cables”, page 50](#)

⇒ [“1.5 Removing and installing gear knob”, page 54](#)

⇒ [“1.6 Removing and installing selector mechanism”, page 55](#)

⇒ [“1.7 Adjusting selector mechanism”, page 58](#)

⇒ [“1.8 Checking selector mechanism”, page 61](#)

⇒ [“1.9 Renewing selector shaft oil seal”, page 61](#)

1.1 Overview - selector mechanism

1 - Selector unit

- ☐ Exploded view
⇒ [page 101](#)

2 - Selector cables

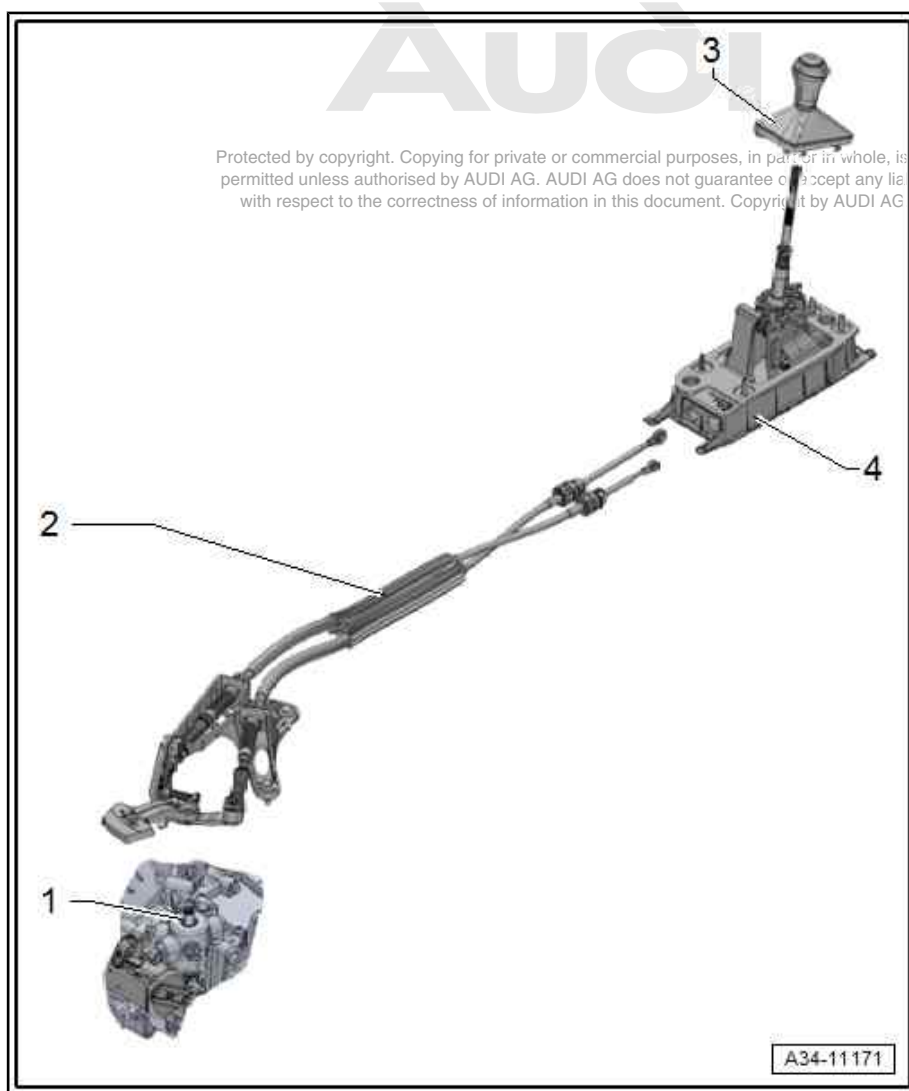
- ☐ With support bracket, gate relay lever and gearbox selector lever
- ☐ Exploded view
⇒ [page 50](#)

3 - Gear knob and boot

- ☐ Exploded view
⇒ [page 48](#)

4 - Selector mechanism

- ☐ Exploded view
⇒ [page 49](#)



1.2 Exploded view - gear knob and cover

1 - Gear lever

2 - Noise insulation cover (lower)

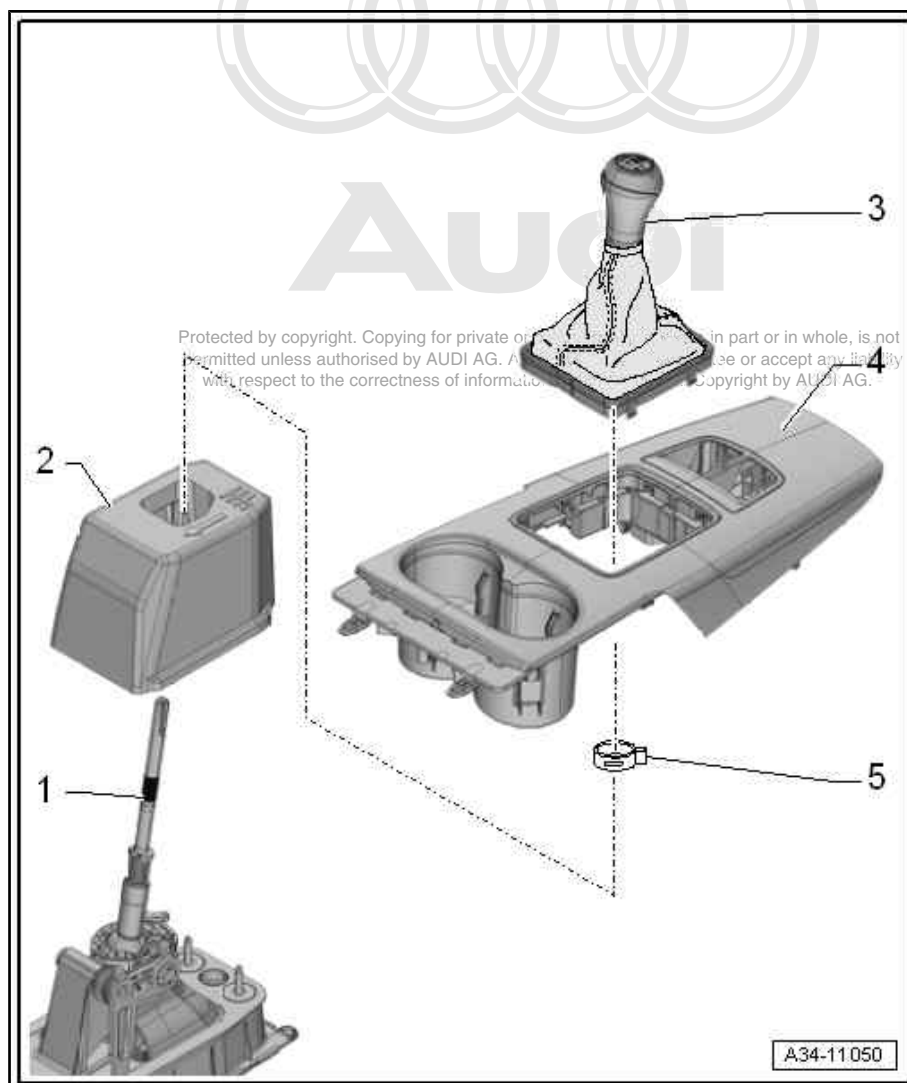
3 - Gear knob

- ☐ With gear lever boot
- ☐ Removing and installing
⇒ [page 54](#)

4 - Centre console insert

5 - Clamp

- ☐ Secures gear knob to gear lever



1.3 Exploded view - gear lever and selector housing

⇒ ["1.3.1 Exploded view - gear lever and selector housing, plastic housing", page 49](#)

1.3.1 Exploded view - gear lever and selector housing, plastic housing

1 - Selector housing

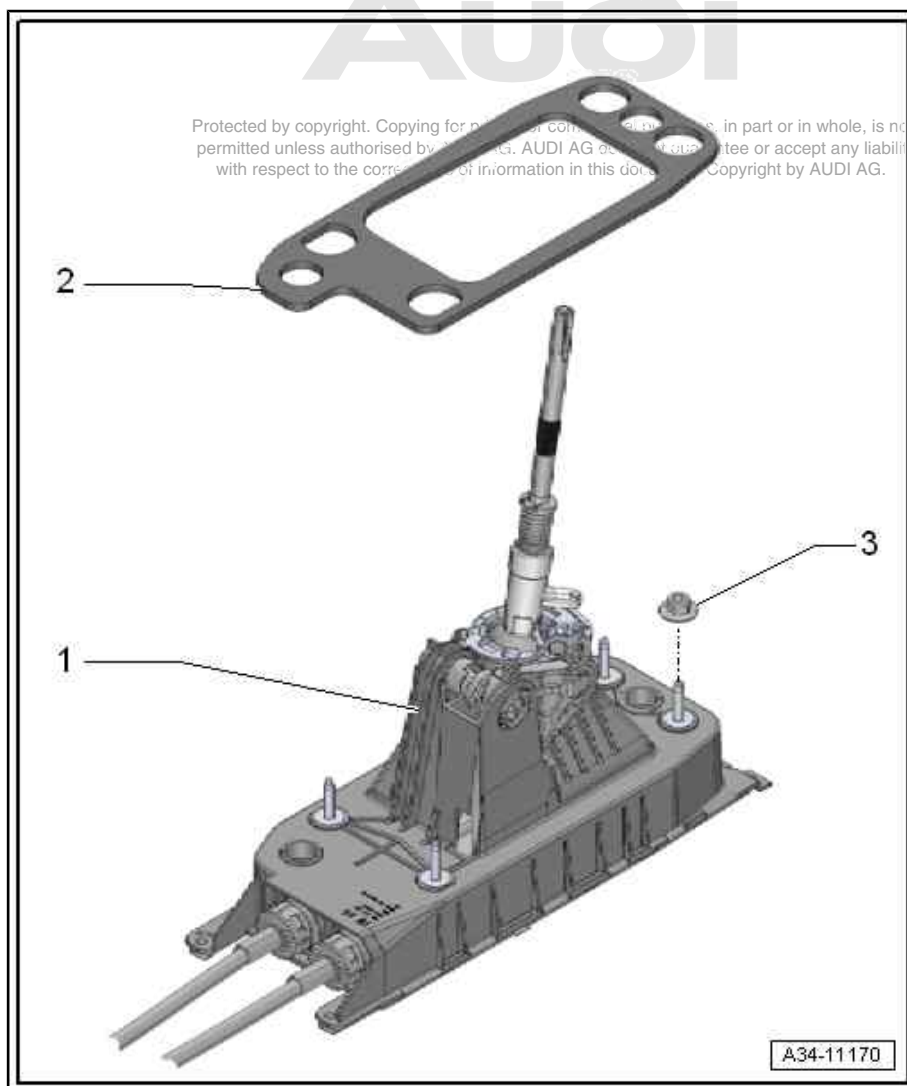
- ☐ Cannot be dismantled

2 - Gasket

- ☐ Renew after removal

3 - Nut

- ☐ 4x
- ☐ 8 Nm



1.4 Exploded view - selector cables



Note

Lubricate bearings and moving surfaces with grease; for grease refer to ⇒ *Electronic parts catalogue*

1 - Selector unit

- ☐ With selector mechanism cover and selector shaft
- ☐ Servicing ⇒ [page 101](#)

2 - Slide block

- ☐ Installation position ⇒ [page 52](#)

3 - Gate relay lever

- ☐ Installation position ⇒ [page 52](#)
- ☐ Detaching and securing at gearbox selector lever ⇒ [page 53](#)

4 - Cable end-piece

- ☐ Secures gate selector cable to gate relay lever
- ☐ Allocation ⇒ [page 51](#)
- ☐ Detaching from gate selector cable ⇒ [page 53](#)

5 - Cable support bracket

6 - Retaining clip

- ☐ Renew after removal

7 - Retaining clip

- ☐ Renew after removal

8 - Gear selector cable

- ☐ Detaching and securing at gearbox selector lever ⇒ [page 53](#)
- ☐ Cannot be detached from selector mechanism on models with plastic selector mechanism
- ☐ Adjusting ⇒ [page 58](#)

9 - Gate selector cable

- ☐ Cannot be detached from selector mechanism on models with plastic selector mechanism
- ☐ Adjusting ⇒ [page 58](#)

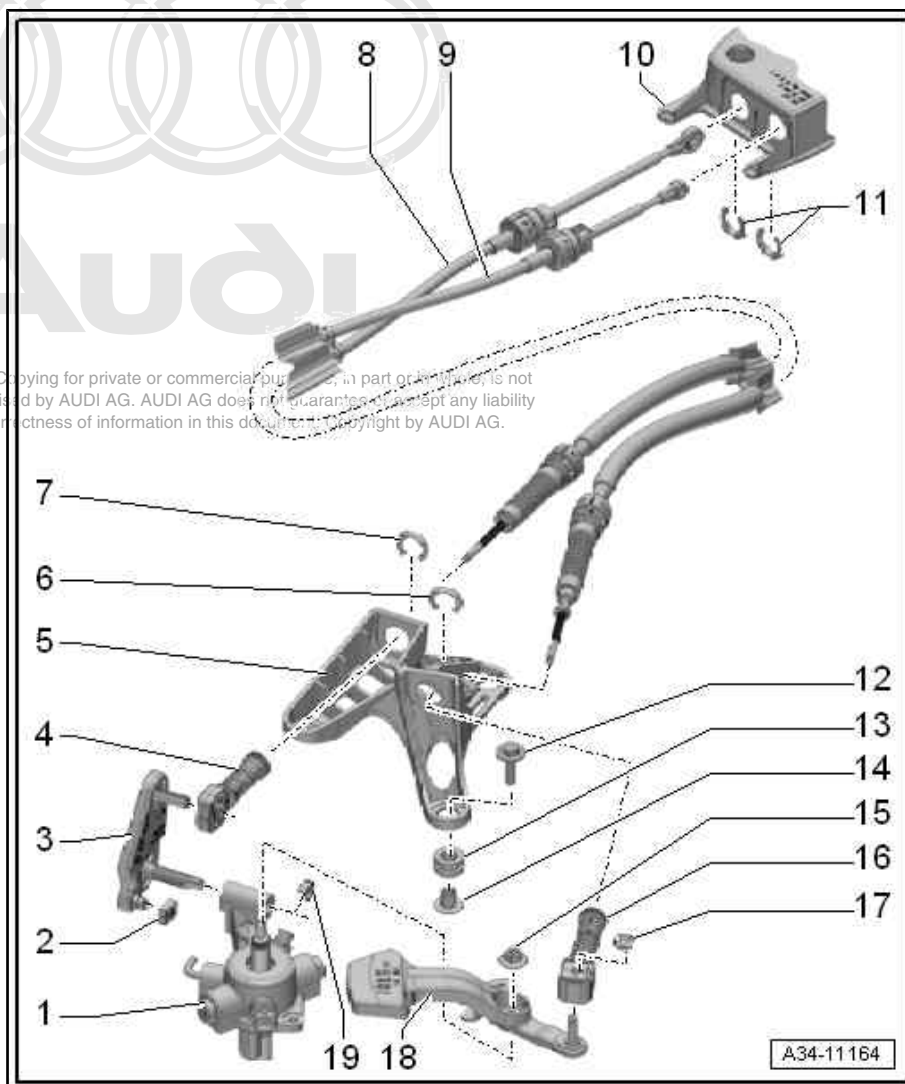
10 - Selector housing

11 - Retaining clips

- ☐ Only on models with aluminium selector mechanism
- ☐ Renew after removal

12 - Bolt

- ☐ 20 Nm



13 - Grommet

14 - Bush

15 - Nut

- ☐ Self-locking
- ☐ Renew after removal
- ☐ 23 Nm

16 - Cable end-piece

- ☐ Secures gear selector cable to gearbox selector lever
- ☐ Allocation ➔ [page 51](#)
- ☐ Detaching from gear selector cable ➔ [page 53](#)

17 - Securing clip

- ☐ Removing ➔ [page 53](#)
- ☐ Renew after removal

18 - Gearbox selector lever

- ☐ Fitting ➔ [page 52](#)
- ☐ Installation position ➔ [page 52](#)
- ☐ After installing, adjust selector mechanism ➔ [page 58](#)

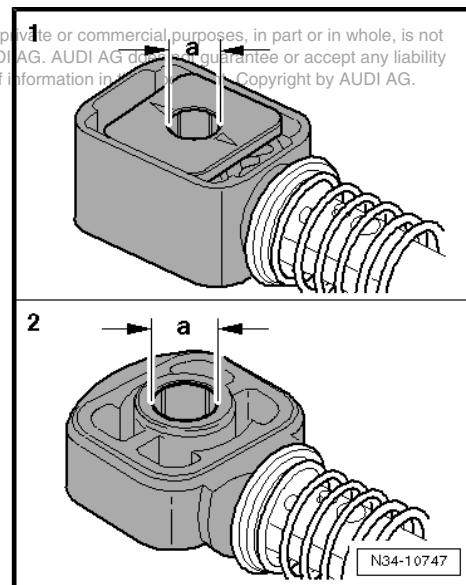
19 - Clip

- ☐ For gate relay lever
- ☐ Detaching and fitting ➔ [page 53](#)

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

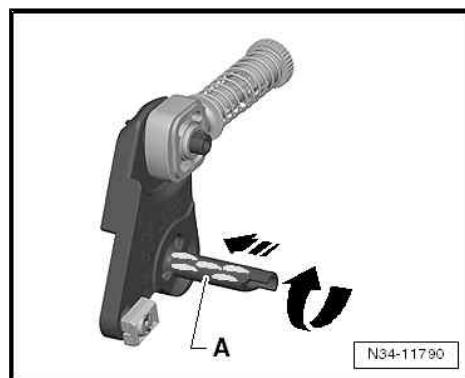
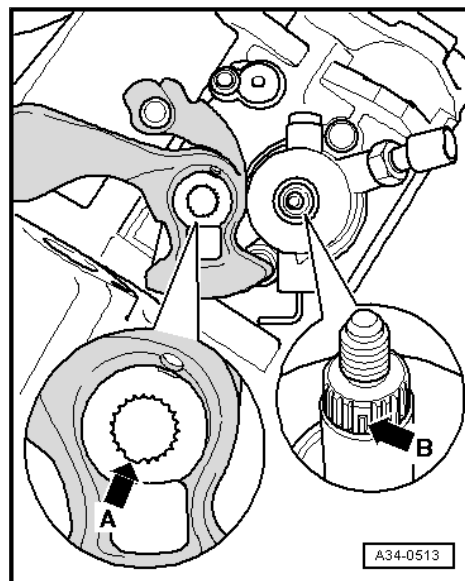


Installing gearbox selector lever

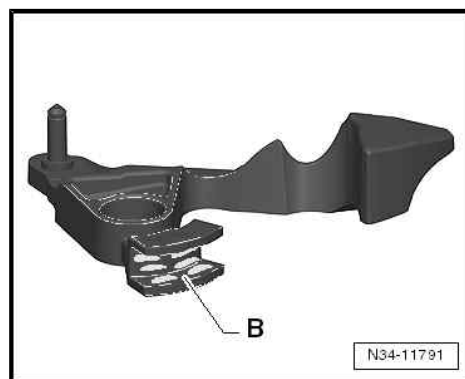
- When installing gearbox selector lever, make sure that the gap in the splines -arrow A- aligns with the wider spline -arrow B- on the selector shaft.



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- When installing, lubricate the following areas thoroughly:
- Shaft -A- of gate relay lever -arrows-.
- Guide rail -B- of gearbox selector lever into which gate relay lever engages.
- Illustration of gate relay lever and gearbox selector lever may differ from actual components.
- Lubricate with grease; for grease refer to ➔ Electronic parts catalogue



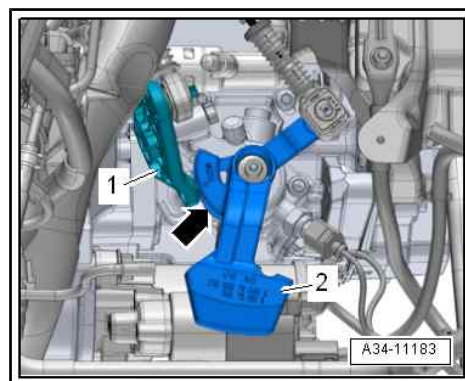
Installation position: gearbox selector lever/gate relay lever

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



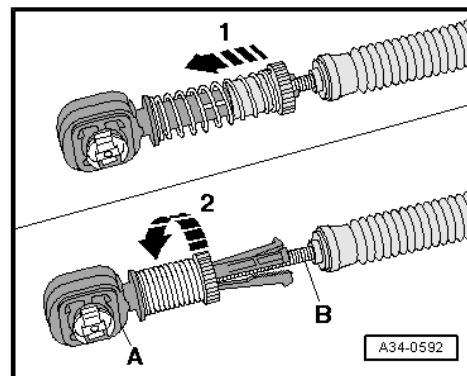
Note

Lubricate guide rail and slide block -arrow- with grease; for grease refer to -Electronic parts catalogue-.



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

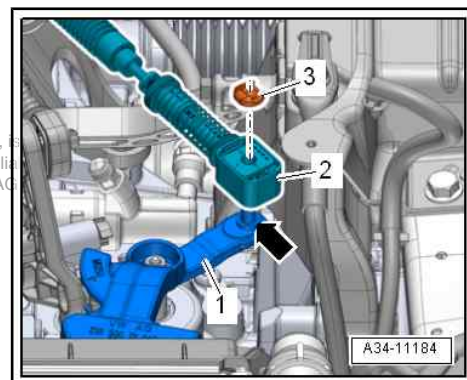
- Lift up tab and detach securing clip -3- for gear selector cable from gearbox selector lever -1-.
- Pull gear selector cable -2- off pin -arrow-.

Securing



Note

- ◆ *Renew securing clip for gear selector cable.*
- ◆ *Apply a small amount of grease to pin -arrow-; for grease refer to -Electronic parts catalogue-.*
- Push gear selector cable onto gearbox selector lever -2- and secure with securing clip -1-.



Detaching and securing gate relay lever at gearbox selector lever

Detaching

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

Securing



Note

Lubricate bearings and moving surfaces with grease; for grease refer to ⇒ Electronic parts catalogue

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



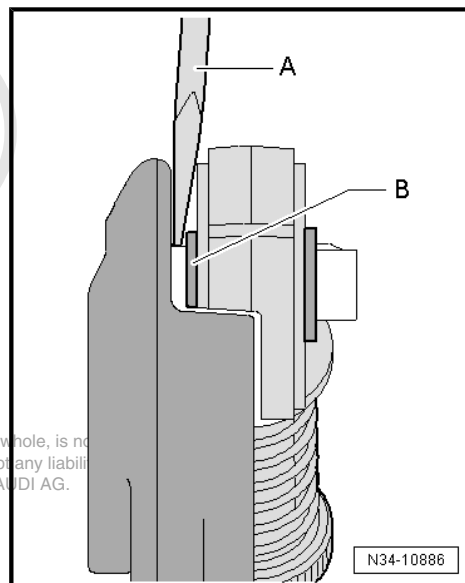
Note

-Arrow 2- can be disregarded.



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

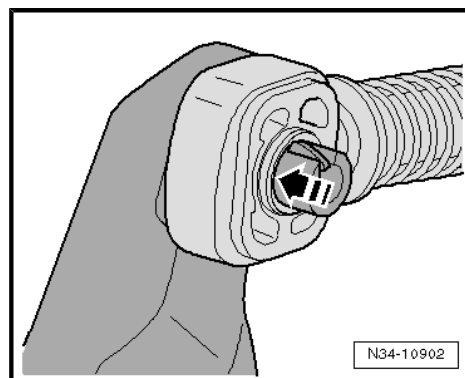
- Gate relay lever removed
- Apply plain slot screwdriver -A- between bush -B- and gate relay lever.



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

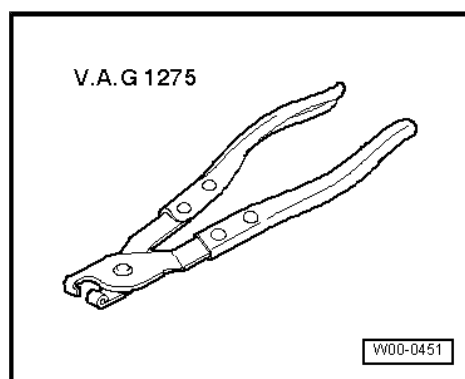
- Gate relay lever removed
- Press on cable end-piece only at bush -arrow-.
- Cable end-piece must move freely on gate relay lever.
- Cable end-piece must be behind detent.
- Ensure that components engage securely.



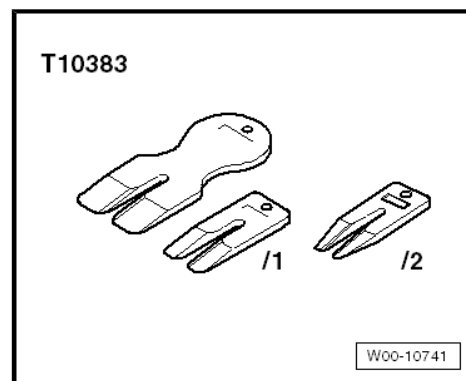
1.5 Removing and installing gear knob

Special tools and workshop equipment required

- ◆ Hose clip pliers - V.A.G 1275-

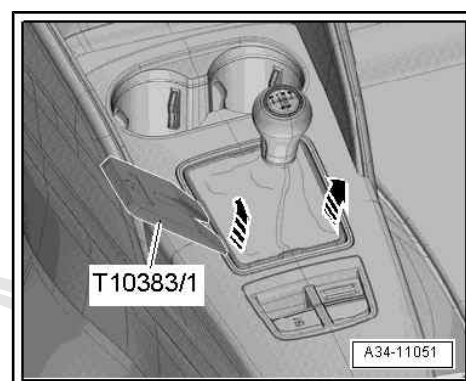


◆ Wedges - T10383-



Removing

- Using removal wedge -T10383/1-, carefully pry gear lever boot off centre console insert -arrows-.

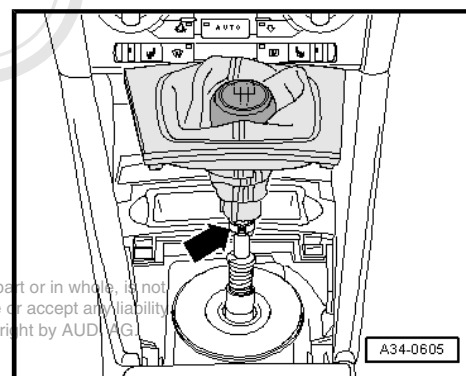


- Pull boot up and over gear knob.
- Open clip -arrow- and pull off gear knob together with boot.

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.



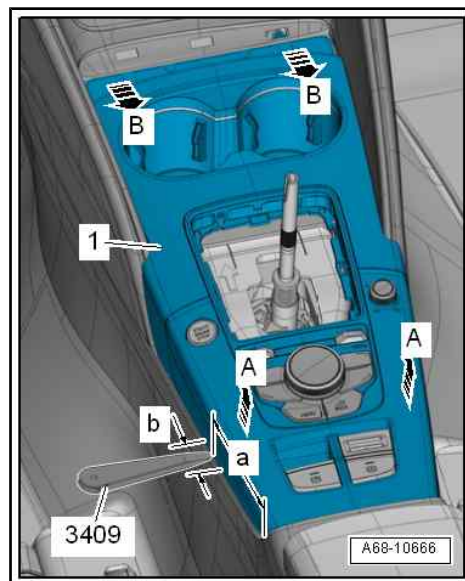
1.6 Removing and installing selector mechanism

Special tools and workshop equipment required

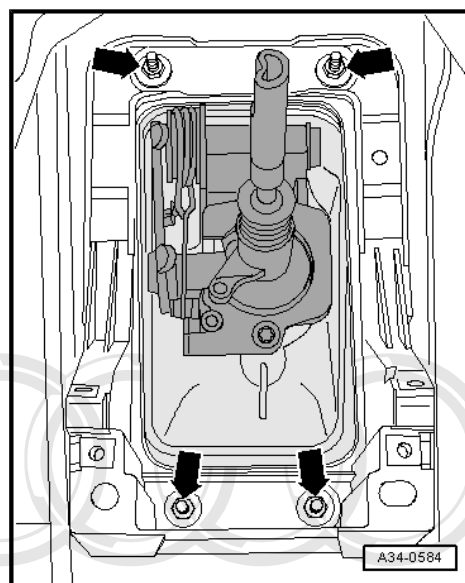
- ◆ Grease ⇒ Electronic parts catalogue

Removing

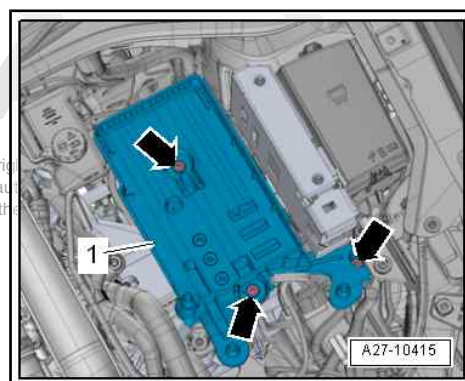
- Remove gear knob ➔ [page 54](#) .
- Remove centre console insert -1- ➔ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console insert .
- Lift out noise insulation above selector mechanism.



- Remove nuts -arrows-.



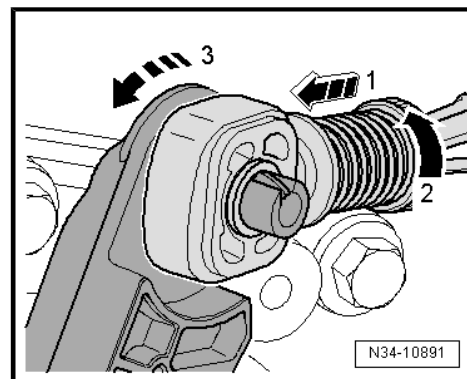
- Remove battery tray -1- ➔ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .



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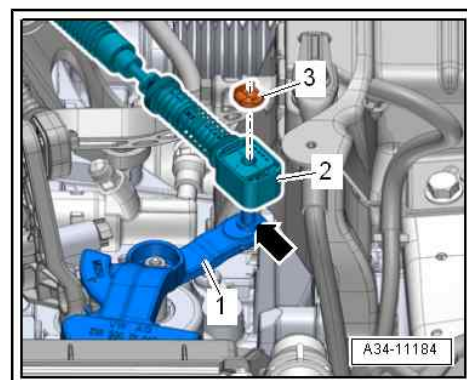
- Pull locking mechanism forwards -arrow 1- onto stop and then turn to left -arrow 2- to lock.
- Press gate relay lever forwards -arrow 3- and pull gate selector cable out of cable end-piece.



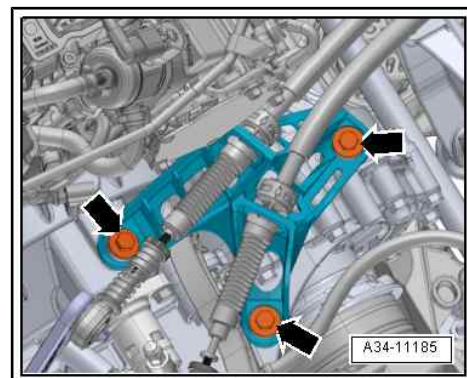
- Detach securing clip -3- for gear selector cable from gearbox selector lever -1- and pull selector cable -2- off pin -arrow-.



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The gate relay lever must be removed before detaching the cable end-piece ➔ page 54.



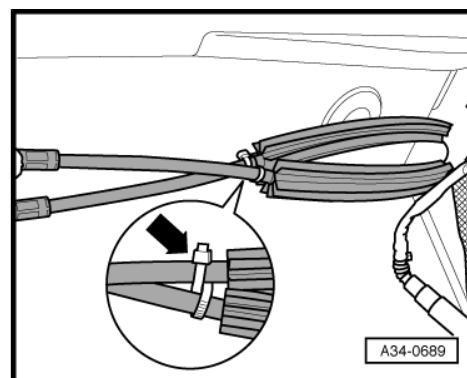
- Remove bolts -arrows- and detach support bracket from gearbox.
- Remove heat shield for underbody ➔ General body repairs, exterior; Rep. gr. 66 ; Strips / trim panels / extensions .
- Swing selector housing down and remove with selector cables.



Installing

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

- Wrap cable tie round selector cables in a figure-of-eight -arrow- and secure cable tie as shown in illustration.

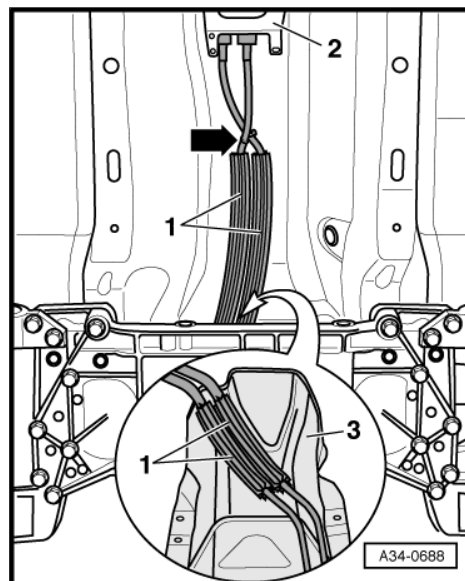


- Route cables -1- from selector mechanism -2- to gearbox as follows:
- After the point where they cross over -arrow-, the cables must run parallel as far as the cable support bracket on the gearbox.
- The cables must be routed in the slot provided in heat shield -3-.

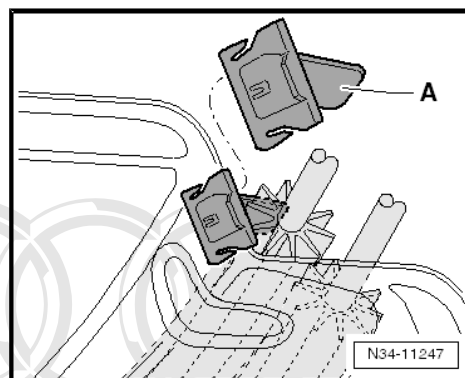


Note

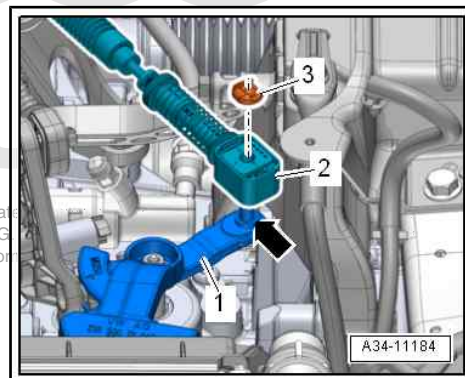
The enlargement shows the heat shield from above.



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



- Apply a small amount of grease to pin -arrow- of gearbox selector lever -1- and, if necessary, to pin of gate relay lever.
- Select correct type of grease from ⇒ Electronic parts catalogue .
- Fit cable end-piece -2- and secure with securing clip -arrow-.
- Install centre console insert ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console insert .
- Fit gear knob ⇒ [page 54](#) .
- Adjust selector mechanism ⇒ [page 58](#) .
- Install heat shield for floor ⇒ General body repairs, exterior; Rep. gr. 66 ; Strips / trim panels / extensions; Exploded view - heat shield .
- Install battery tray and battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Exploded view - battery .



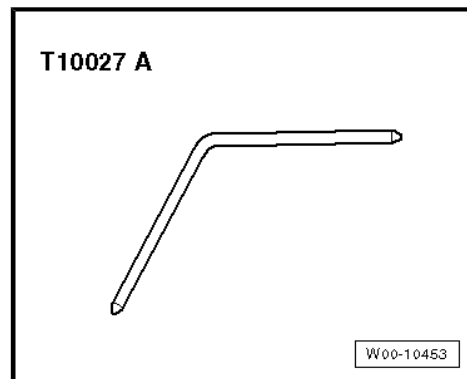
Tightening torques

- ◆ ⇒ [“1.3 Exploded view - gear lever and selector housing”, page 49](#)

1.7 Adjusting selector mechanism

Special tools and workshop equipment required

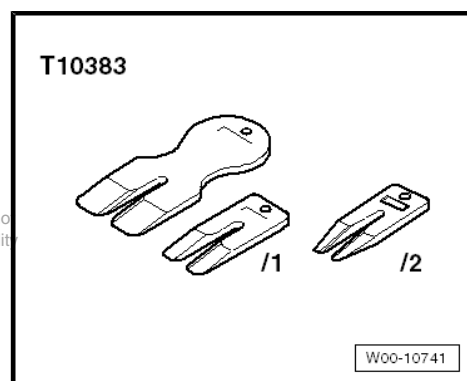
◆ Locking pin - T10027A-



◆ Wedges - T10383-



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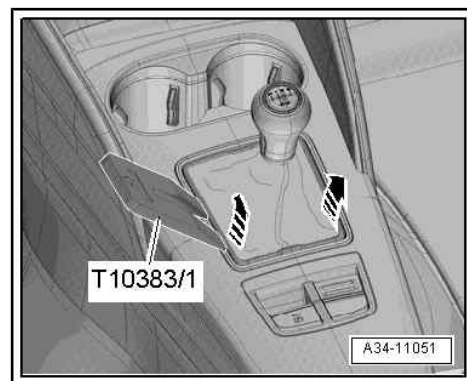


Requirements for adjustment

- 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

- Using wedge - T10383/1- , carefully pry gear lever boot off cover for 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.
- Then guide locking pin - T10027 A- through damper -A- and hole -B- into hole -C-.



Note

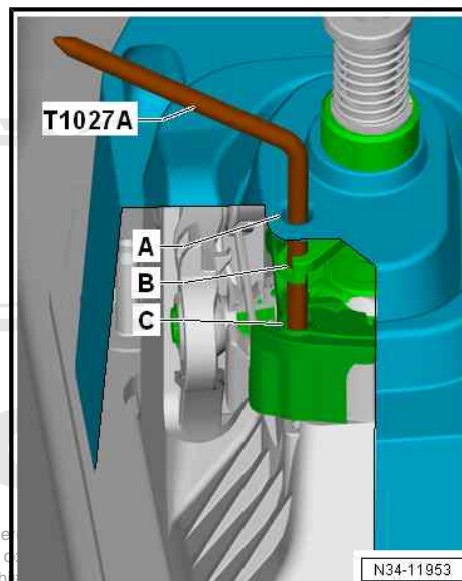
The noise insulation panels are removed to give a better illustration.

Vehicles with 2.0 ltr. TDI engine:

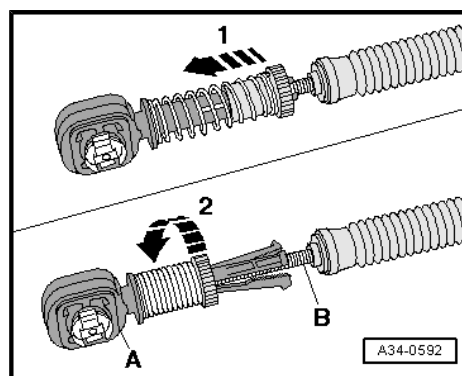
- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing or ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .

Continued for all vehicles:

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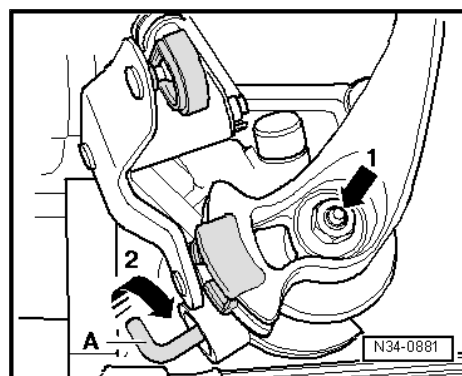


- Pull locking mechanism of cable end-piece -A- forwards onto stop -arrow 1- and then turn to left -arrow 2- to lock.
- It should be possible to move selector cable -B- in the cable end-piece.
- Gearbox in neutral.

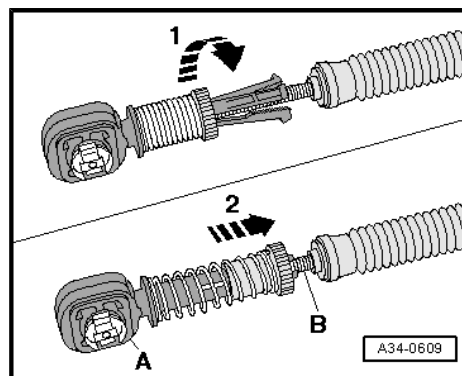


Lock selector shaft as follows:

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



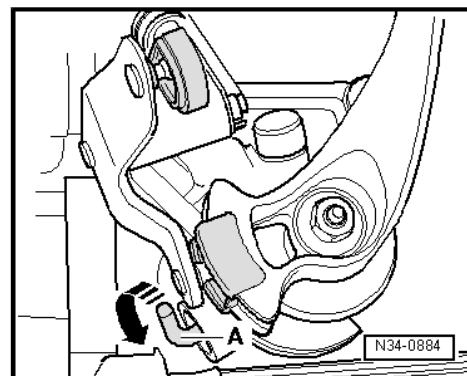
- Check that gate selector cable and gear selector cable -B- are located in cable end-pieces -A- without tension.
- Release locking sleeve -arrow 1-.
- Let locking sleeve slide back as far as stop -arrow 2-.



Note

Cable adjustment is now complete.

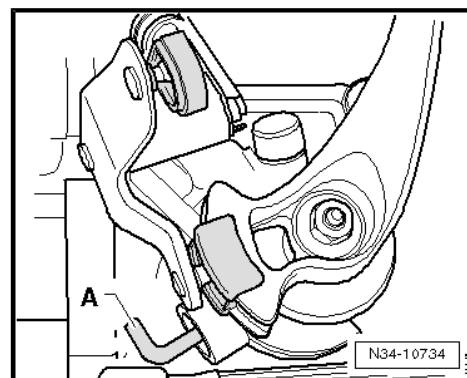
- Turn angled rod -A- back to original position in direction of -arrow-.



- Angled rod -A- should be pressed out of selector housing as far as stop and point towards rear.
- Pull locking pin - T10027A- out of selector mechanism.
- Check selector mechanism ⇒ [page 61](#) .
- Install gear lever boot in centre console.

Vehicles with 2.0 ltr. TDI engine:

- ◆ Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing or ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .



1.8 Checking selector mechanism

- With the gearbox in neutral, the gear lever should rest in the 3rd/4th gear gate.
- Depress clutch.
- Shift through all gears several times, paying special attention to function of reverse gear detent mechanism.
- The gear lever should return by itself from the reverse gear gate to the 3rd/4th gear gate.

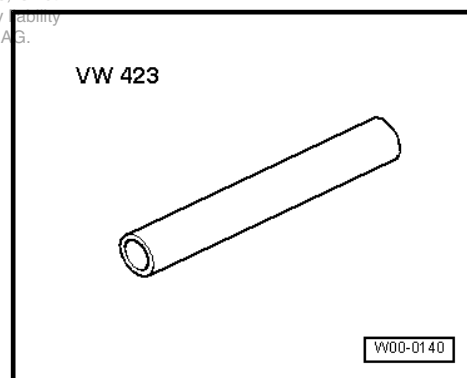
If the gear lever sticks or baulks repeatedly when engaging a gear, perform the adjustment procedure again ⇒ [page 58](#) .

1.9 Renewing selector shaft oil seal

Special tools and workshop equipment required

- ◆ Tube - VW 423-

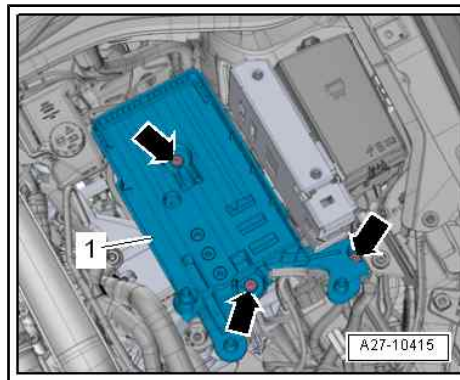
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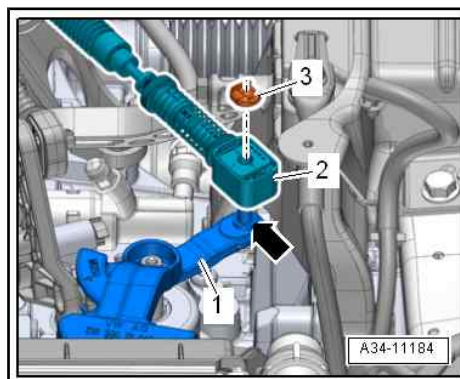
- ◆ Sealing grease ⇒ Electronic parts catalogue

Procedure

- Remove battery tray -1- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .



- Detach securing clip -3- from gearbox selector lever -1- and pull gear selector cable -2- off pin -arrow-.
- Remove gate relay lever ⇒ [page 53](#) .

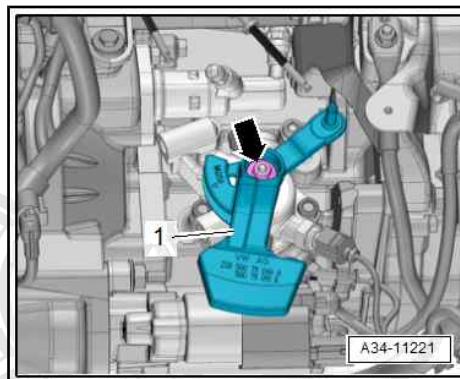


- Remove nut -arrow- and detach gearbox selector lever -1-.

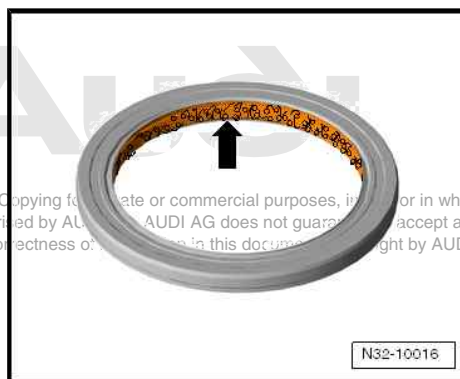


Note

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



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

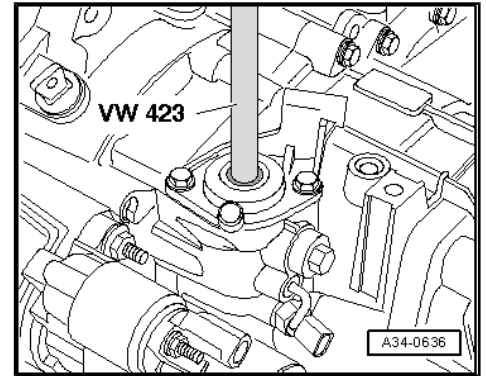


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- Drive in oil seal with tube - VW 423- .
- Install gearbox selector lever ⇒ [page 52](#) .
- Install gate relay lever ⇒ [page 53](#) .

Tightening torques

- ◆ ⇒ [“1.4 Exploded view - selector cables”, page 50](#)
- ◆ Battery and battery tray ⇒ Electrical system; Rep. gr. 27 ;
Battery; Exploded view - battery



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2 Removing and installing gearbox

⇒ ["2.1 Removing gearbox", page 64](#)

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

⇒ ["2.3 Tightening torques for gearbox", page 87](#)

2.1 Removing gearbox

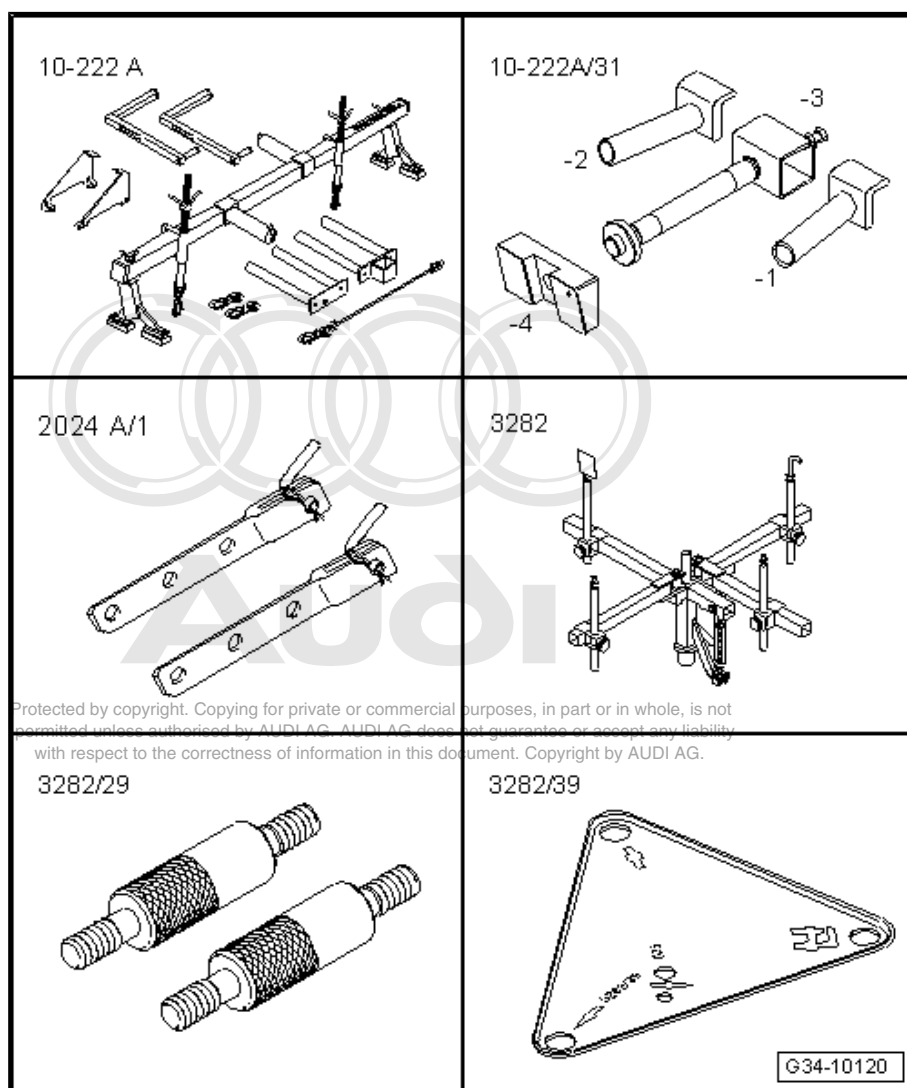
⇒ ["2.1.1 Removing gearbox - vehicles with 1.4 ltr. TFSI engine", page 64](#)

⇒ ["2.1.2 Removing gearbox in vehicles with 2.0 ltr. TDI engine", page 73](#)

2.1.1 Removing gearbox - vehicles with 1.4 ltr. TFSI engine

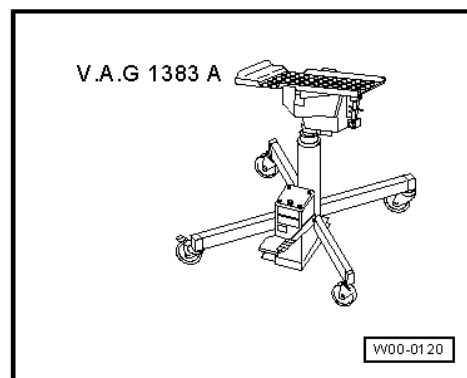
Special tools and workshop equipment required

- ◆ Support bracket - 10 - 222 A-
- ◆ Support bracket - 10 - 222 A /31-
- ◆ Hook of -2024 A /1- lifting tackle - 2024 A-
- ◆ Gearbox support - 3282-
- ◆ Pin - 3282/29-
- ◆ Adjustment plate - 3282/39-

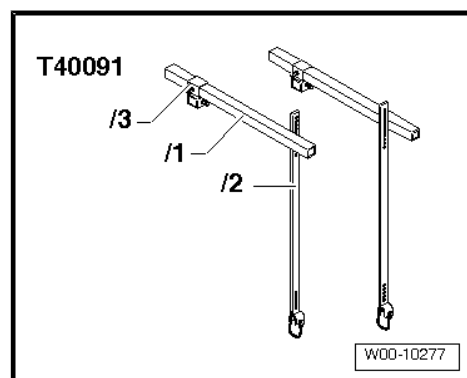


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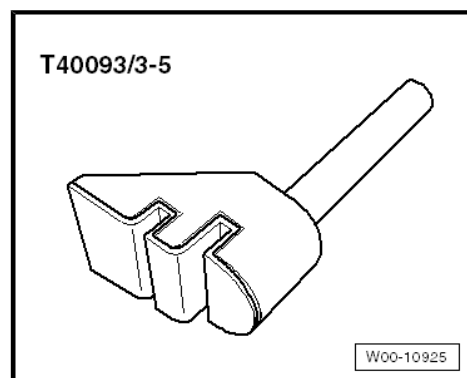
- ◆ Engine and gearbox jack - V.A.G 1383 A-



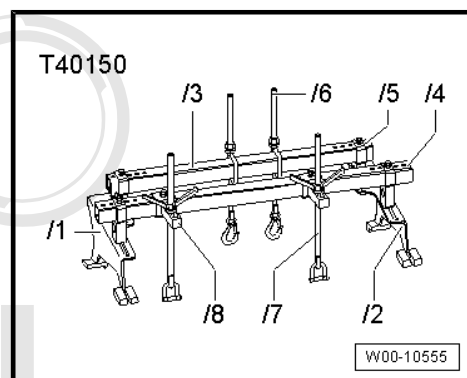
- ◆ Engine support bracket, basic set - T40091-



- ◆ -T40093/3-5- from engine support supplement set - T40093-



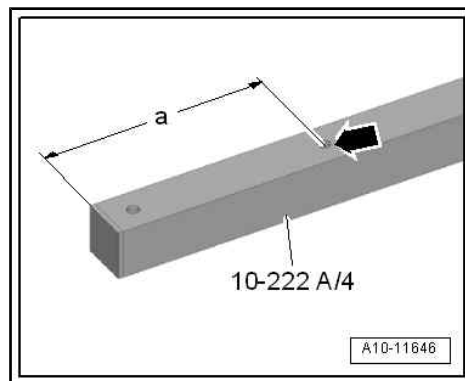
- ◆ -T40150/4- from support bracket - T40150-



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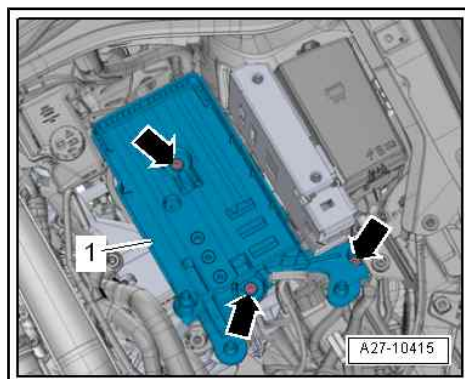
Preparing tool

- If adapter -10 - 222 A /4- does not yet have hole (marked with -arrow-), hole must now be drilled into adapter.
- Dimension -a- = 225 mm
- Hole $\varnothing$ = 12.5 mm



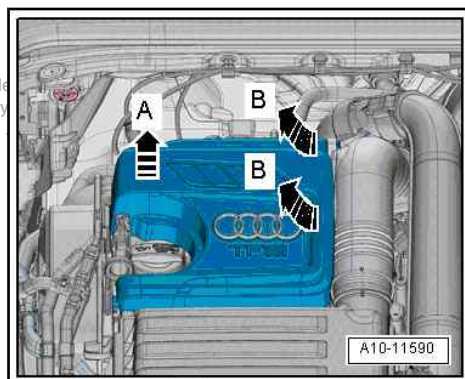
Procedure

- Remove battery tray -1- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .

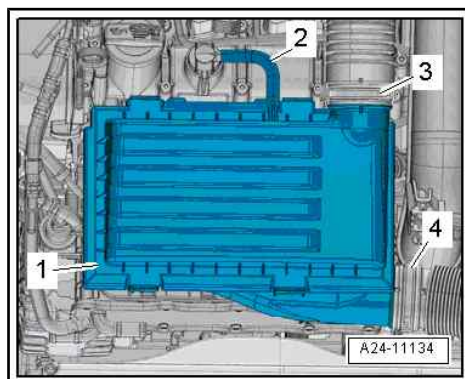


- Remove engine cover panel ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

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

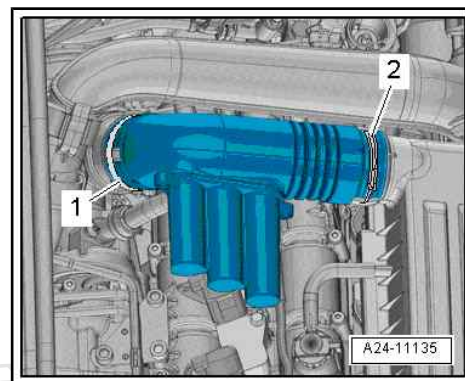


- Release hose clip -1- and detach air pipe.

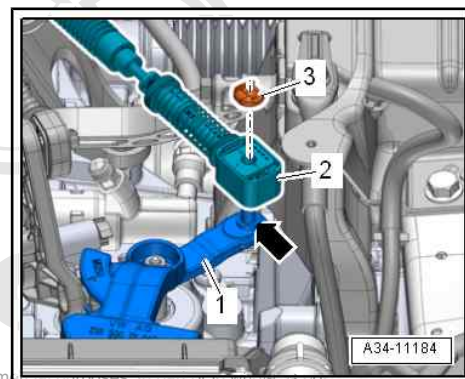


Note

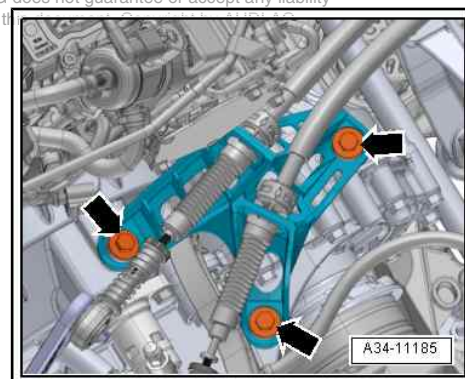
-Item 2- can be disregarded.



- Detach securing clip -3- from gearbox selector lever -1- and pull gear selector cable -2- off pin -arrow-.
- Remove gate relay lever ➔ [page 53](#) .



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



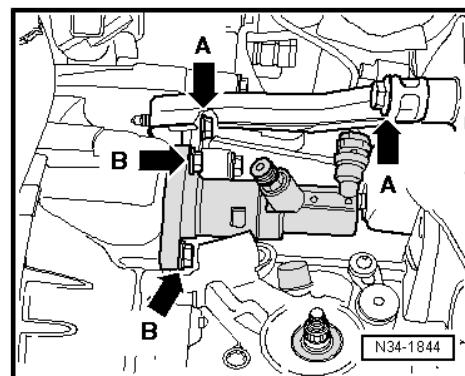
- Remove bolts -arrows A- and detach brace.
- Remove bolts -arrows B- and place clutch slave cylinder to one side with pipe/hose assembly still attached.



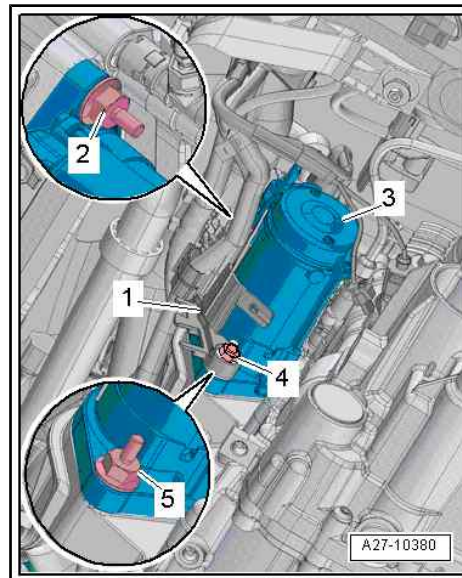
Caution

Risk of damage to clutch slave cylinder.

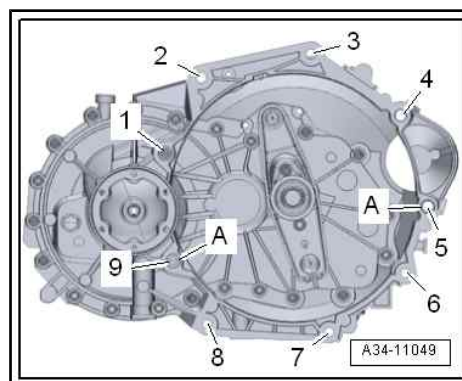
- ◆ **Do not press clutch pedal after removing clutch slave cylinder.**



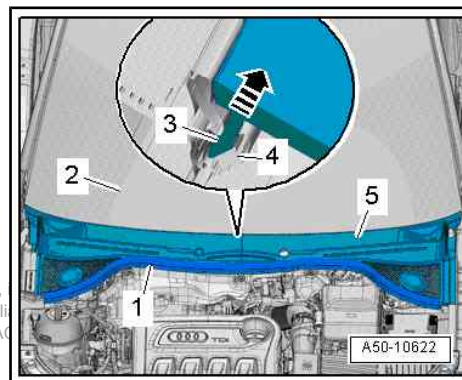
- Remove starter -3- ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter .



- Remove bolts -2, 3- securing gearbox to engine.

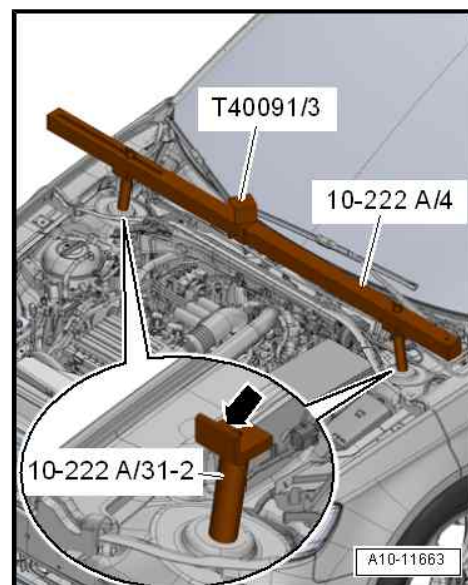


- Remove plenum chamber cover -5- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

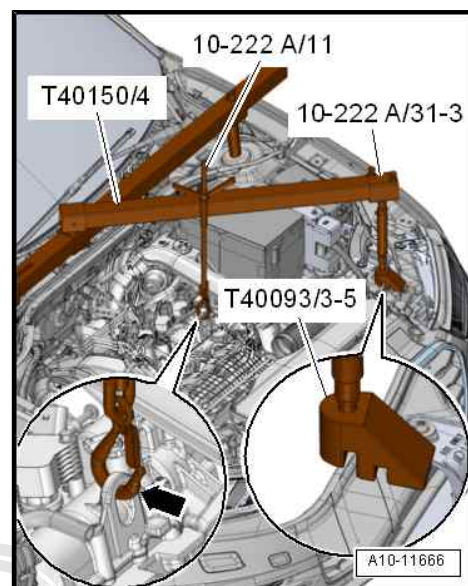


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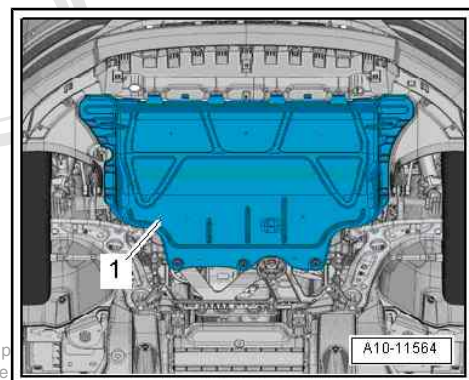
- Remove cover caps on bolted connections for front suspension struts.
- Position -10 - 222 A /31-1- and -10 - 222 A /31-2- on suspension strut mountings.
- Shoulders -arrow- face in direction of travel.
- Set up adapter -10 - 222 A /4- with -T40091/3- as shown in illustration.



- Set up additional tools required on left side of engine compartment, as shown in illustration.
- Engage hook of spindle - 10 - 222 A /11- in engine lifting eye (left-side) -arrow-.
- Take up weight of engine/gearbox assembly slightly with spindle; do not lift.

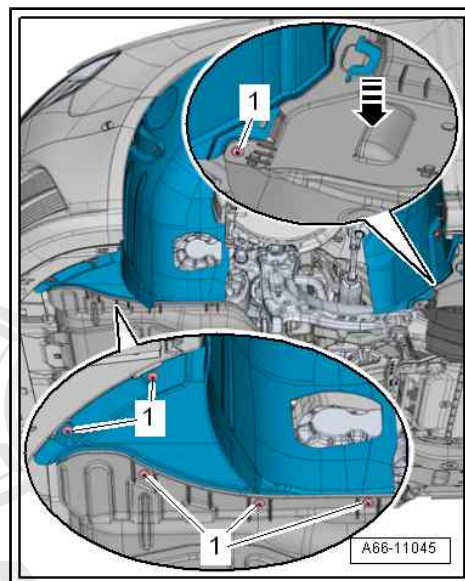


- Remove noise insulation -1- ➔ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



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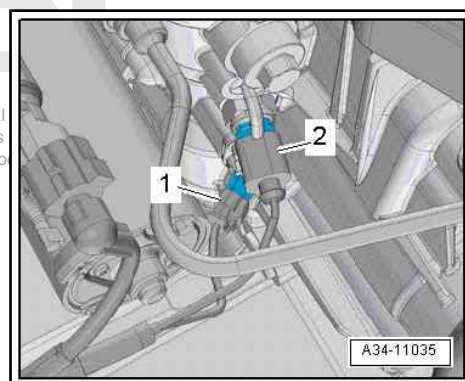
- Remove wheel housing liner (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .



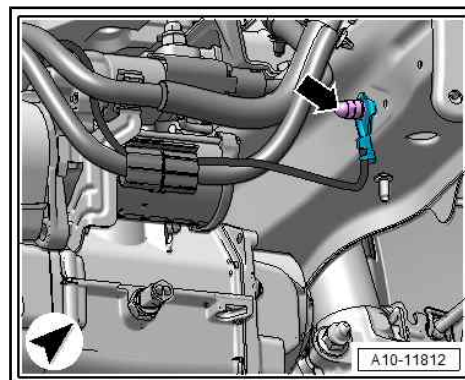
- Disconnect electrical connections on gearbox (front left).

1 - Gearbox neutral position sender - G701-

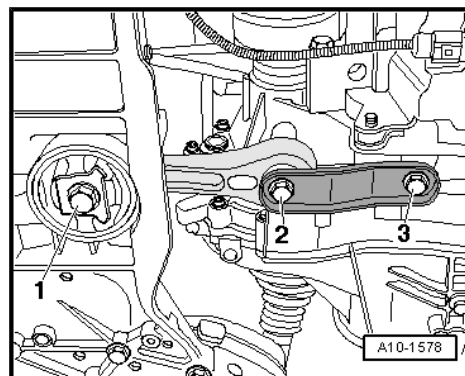
2 - Reversing light switch - F44-



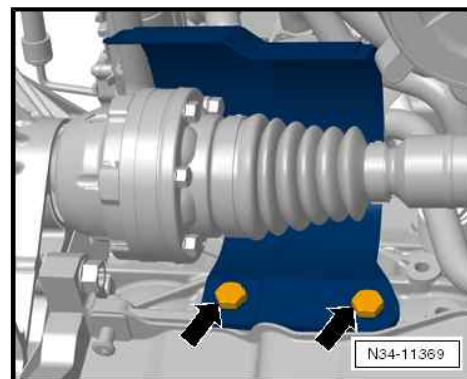
- Remove nut -arrow- and detach earth wire.



- Remove bolts -1, 2, 3- and detach pendulum support.



- Remove bolts -arrows- and detach heat shield for drive shaft (right-side).

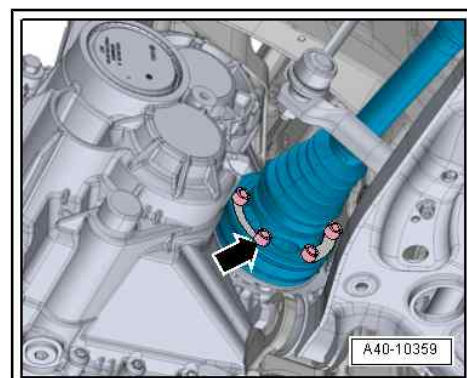


- Unbolt drive shaft (on both sides) -arrow- from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft ; tie up drive shaft (right-side).
- Swivel drive shaft (left-side) upwards and secure with a cable tie or similar.



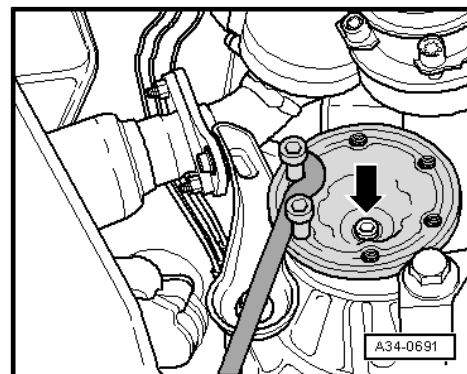
Note

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

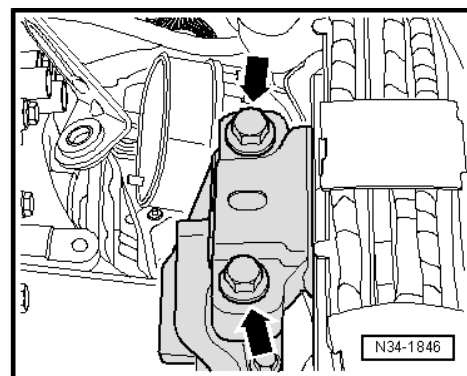


- Remove bolt -arrow- securing flange shaft (right-side). To do so, screw 2 bolts into flange and counterhold flange shaft with suitable lever.
- Pull out flange shaft together with spring, thrust washer and tapered ring.

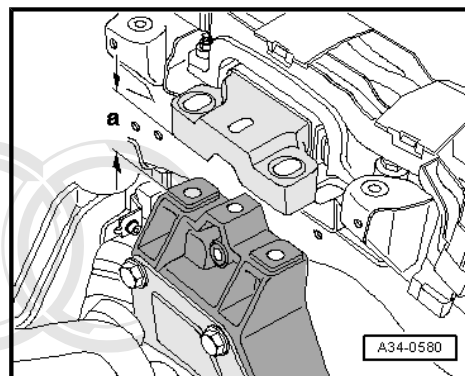
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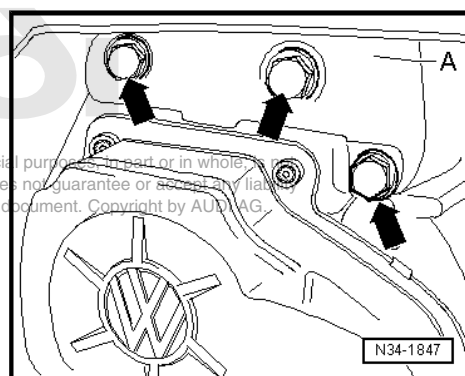
- Remove bolts -arrows- from gearbox mounting.



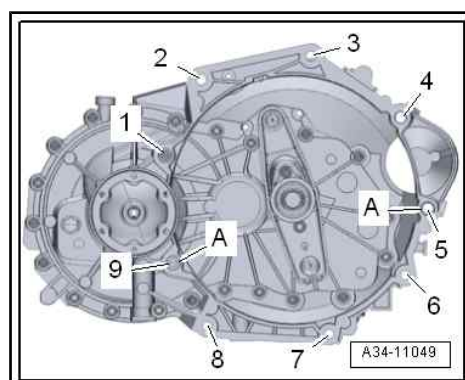
- Adjust spindle - 10 - 222 A /11- to lower gearbox by distance -a-.
- Dimension -a- = 60 mm



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

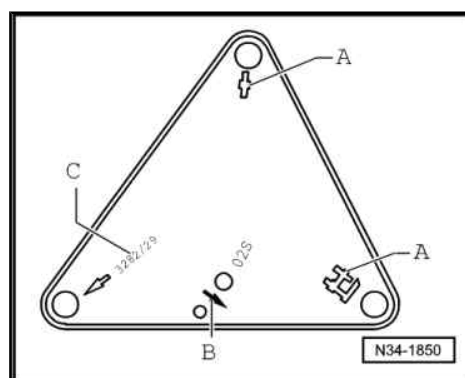


- Remove bolts -1, 6, 7, 8- securing gearbox to engine.

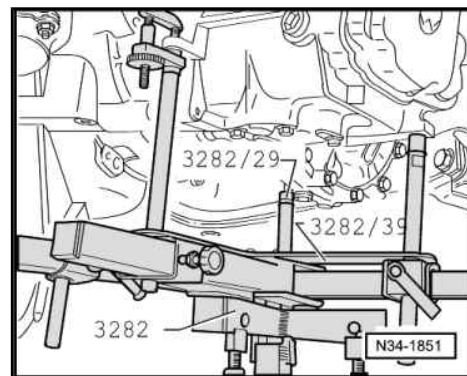


To remove gearbox 02S, set up gearbox support - 3282- with adjustment plate - 3282/39- .

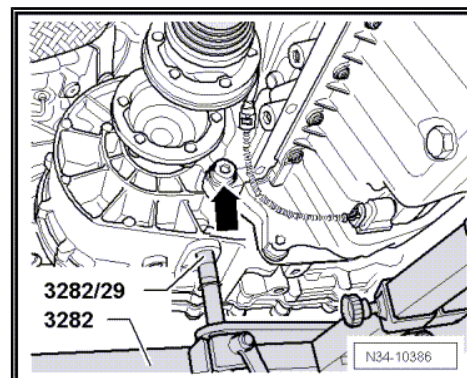
- Insert gearbox support - 3282- in engine and gearbox jack - V.A.G 1383 A- .
- Align arms of gearbox support according to holes in adjustment plate.
- Screw in support elements -A-, as illustrated on adjustment plate.
- Place engine and gearbox jack - V.A.G 1383 A- underneath vehicle.
- The arrow symbol -B- on the adjustment plate points in the direction of travel.



- Align adjustment plate parallel to gearbox and lock safety support on gearbox.
- Screw pin - 3282/29- into hole for bolt securing pendulum support.



- Remove last engine/gearbox securing bolt -arrow-.
- Push the gearbox off engine (dowel sleeves), paying attention to intermediate plate on engine.
- Lower gearbox, making sure there is sufficient clearance at subframe.
- When lowering gearbox, adjust position of gearbox using spindles on gearbox support - 3282- .



Caution

The electrical wiring can be damaged.

- ◆ *Check whether all electrical wiring between engine, sub-frame and body has been detached.*

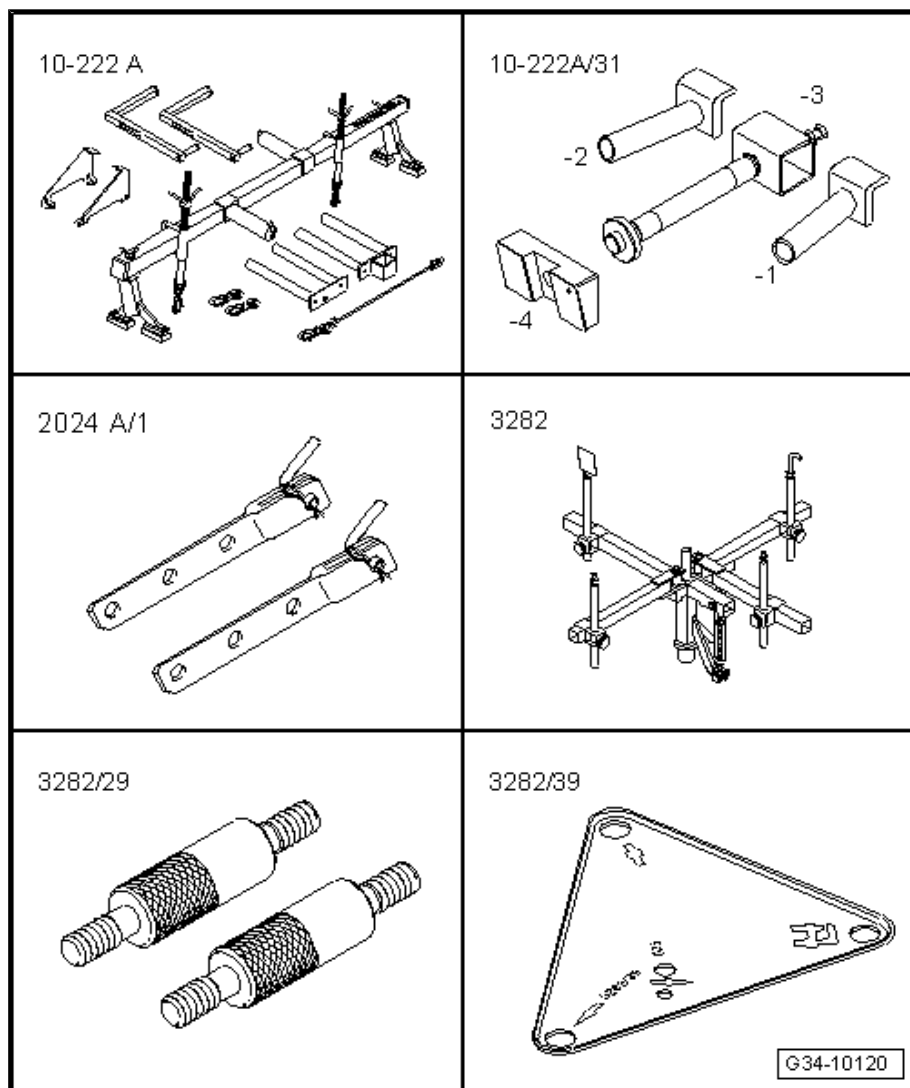
2.1.2 Removing gearbox in vehicles with 2.0 ltr. TDI engine

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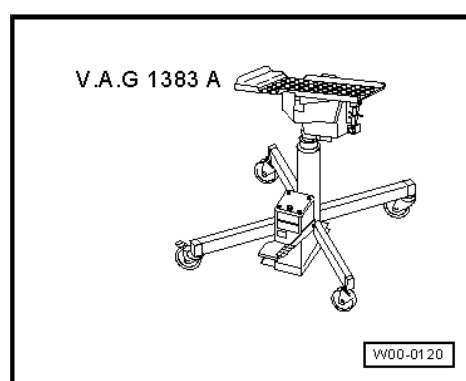


Special tools and workshop equipment required

- ◆ Support bracket - 10 - 222 A-
- ◆ Support bracket - 10 - 222 A /31-
- ◆ Hook of -2024 A /1- lifting tackle - 2024 A-
- ◆ Gearbox support - 3282-
- ◆ Pin - 3282/29-
- ◆ Adjustment plate - 3282/39-

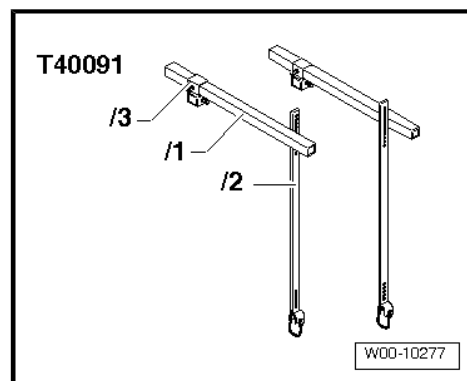


- ◆ Engine and gearbox jack - V.A.G 1383 A-

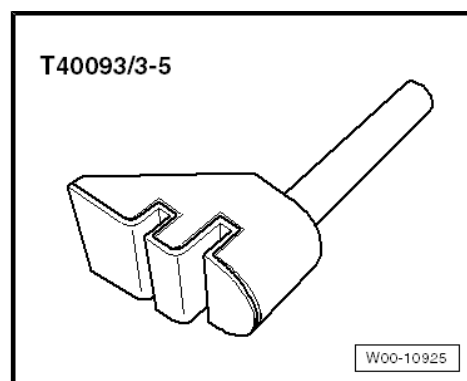


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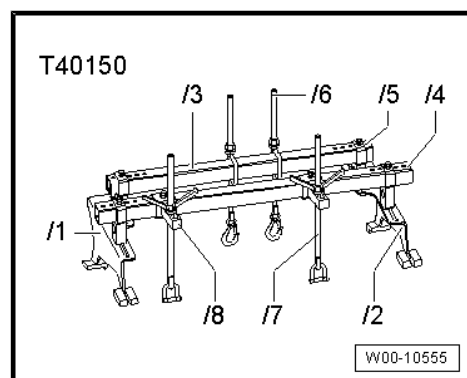
◆ Engine support bracket, basic set - T40091-



◆ -T40093/3-5- from engine support supplement set - T40093-

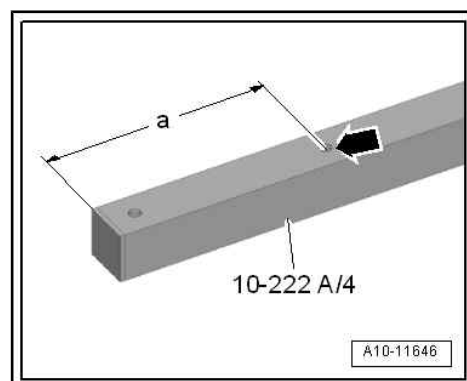


◆ -T40150/4- from support bracket - T40150-



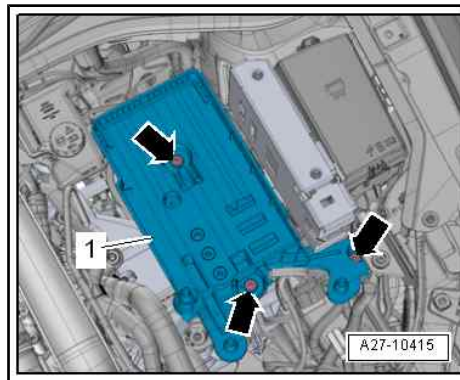
Preparing tool

- If adapter -10 - 222 A /4- does not yet have hole (marked with -arrow-), hole must now be drilled into adapter.
- Dimension -a- = 225 mm
- Hole $\varnothing$ = 12.5 mm

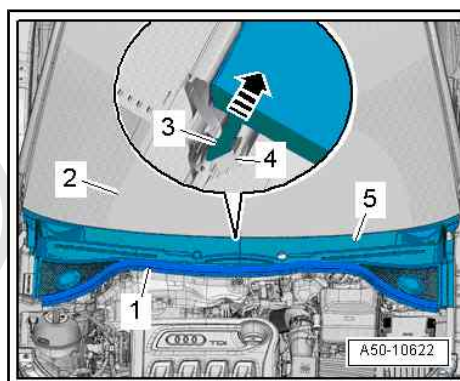


Procedure

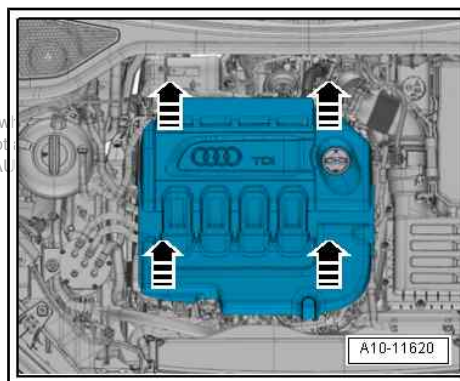
- Remove battery tray -1- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .



- Remove plenum chamber cover -5- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

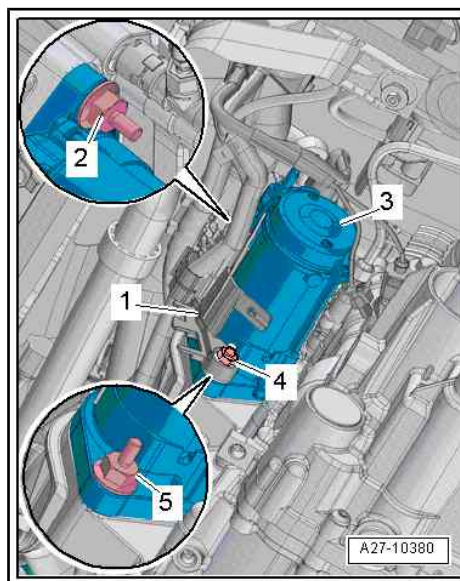


- Remove engine cover panel ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

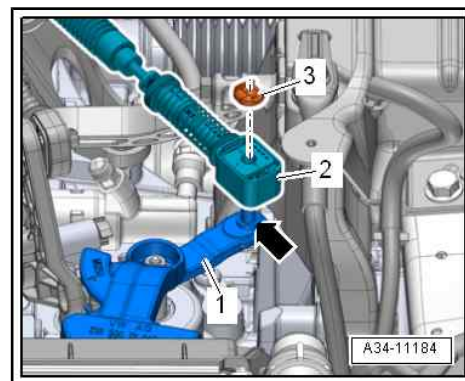


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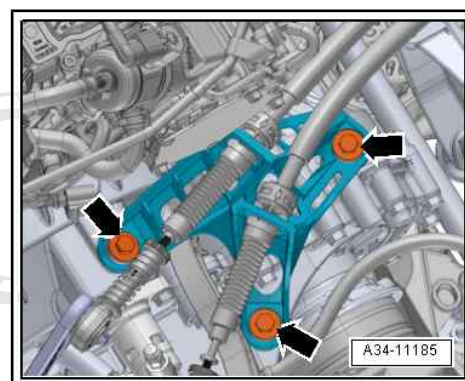
- Remove starter -3- ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter .



- Detach securing clip -3- from gearbox selector lever -1- and pull gear selector cable -2- off pin -arrow-.
- Remove gate relay lever ➔ [page 53](#) .



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

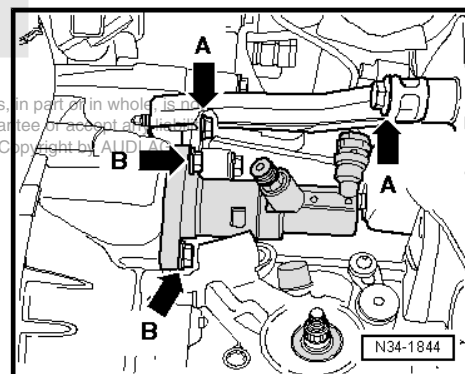


- Remove bolts -arrows A- and detach brace.
- Remove bolts -arrows B- and place clutch slave cylinder to one side with pipe/hose assembly still attached.

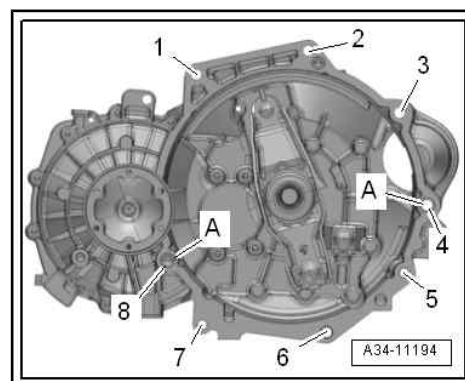
 **Caution**

Risk of damage to clutch slave cylinder.

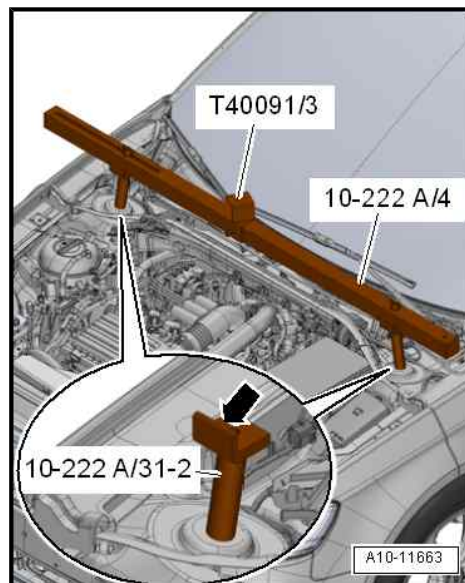
◆ **Do not press clutch pedal after removing clutch slave cylinder.**



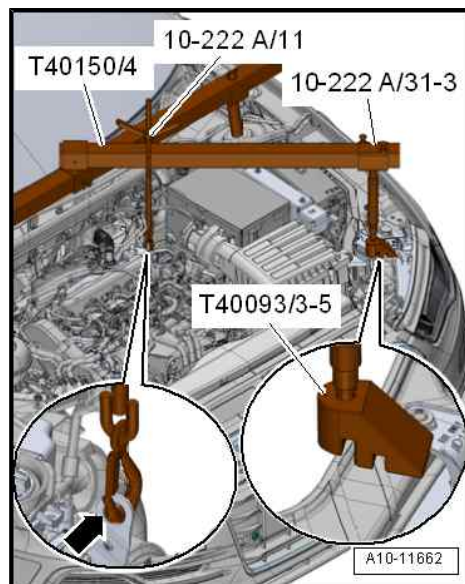
- Remove bolts -1, 2- securing gearbox to engine.



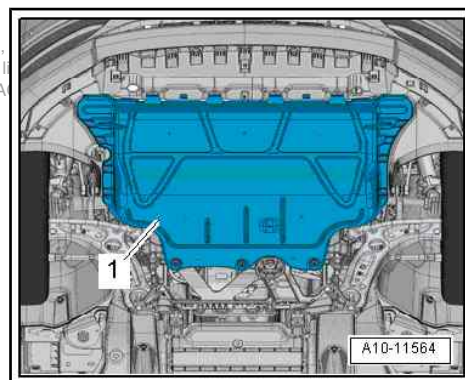
- Remove cover caps on bolted connections for front suspension struts.
- Position -10 - 222 A /31-1- and -10 - 222 A /31-2- on suspension strut mountings.
- Shoulders -arrow- face in direction of travel.
- Set up adapter -10 - 222 A /4- with -T40091/3- as shown in illustration.



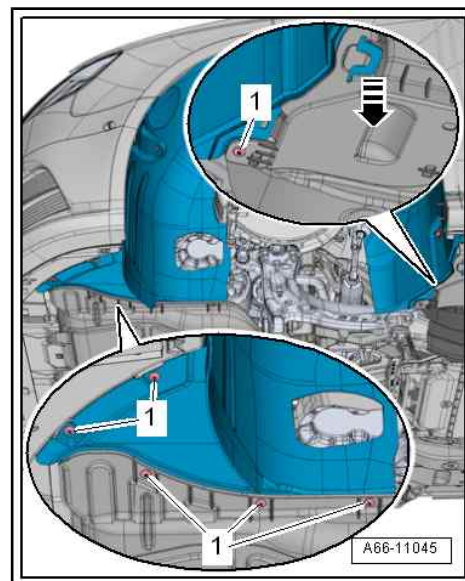
- Set up additional tools required on left side of engine compartment, as shown in illustration.
- Engage hook of spindle - 10 - 222 A /11- in engine lifting eye (left-side) -arrow-.
- Take up weight of engine/gearbox assembly slightly with spindle; do not lift.



- Remove noise insulation -1- ➔ General body repairs, exterior; Rep. gr. 66; Noise insulation; Removing and installing noise insulation



- Remove wheel housing liner (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .

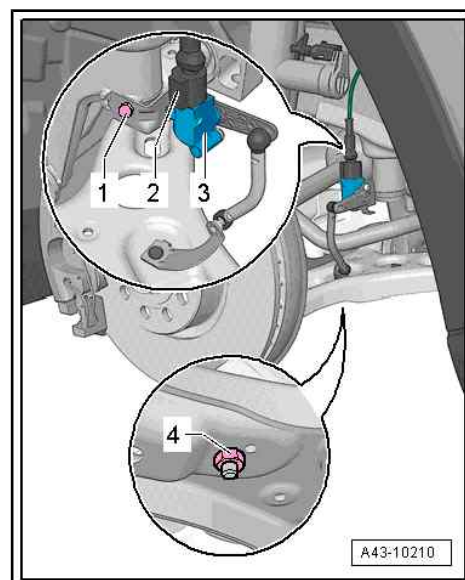


- If fitted, remove nut -4- and bolt -1-, place front left vehicle level sender - G78- -3- to one side.

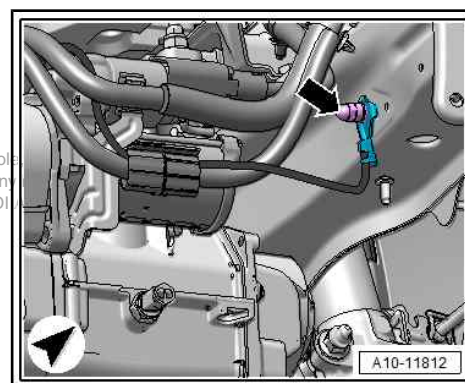


Note

-Item 2- can be disregarded.



- If fitted, remove nut -arrow- and detach earth wire.

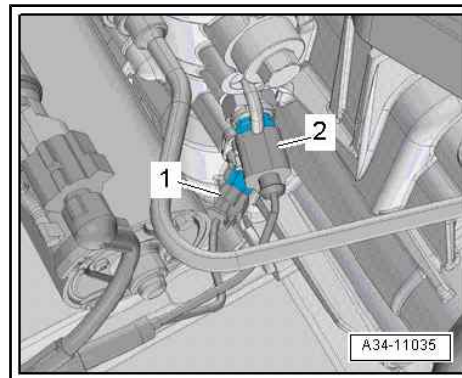


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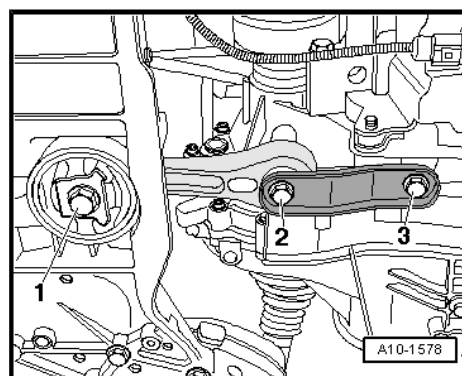
- Disconnect electrical connections on gearbox (front left).

1 - Gearbox neutral position sender - G701- (if fitted)

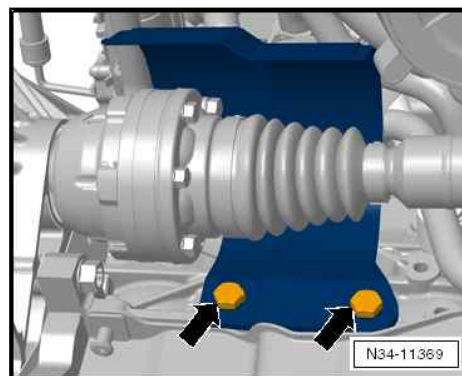
2 - Reversing light switch - F4-



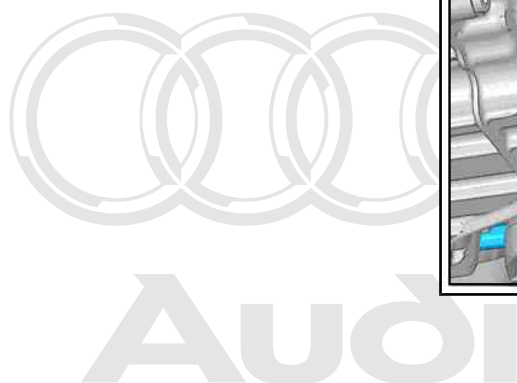
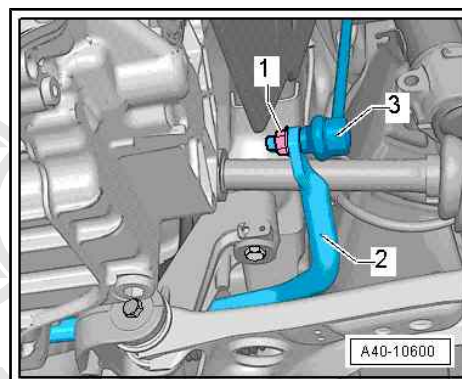
- Remove bolts -1, 2, 3- and detach pendulum support.



- If fitted, remove bolts -arrows- and detach heat shield for drive shaft (right-side).

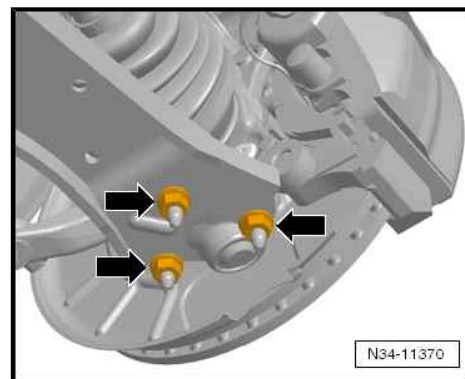


- Remove nut (on both sides) -1- for coupling rod -3- (right-side) on anti-roll bar -2-.



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- Remove nuts (on both sides) -arrows- securing swivel joint.
- Disengage swivel joint (on both sides) from wishbone.

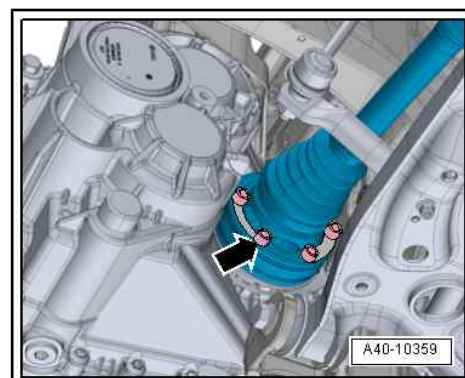


- Unbolt drive shaft (on both sides) -arrow- from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft ; tie up drive shaft (right-side).

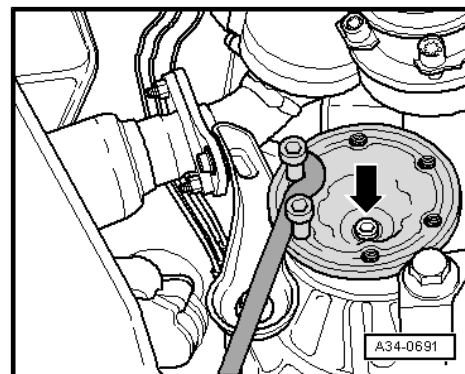


Note

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



- Remove bolt -arrow- securing flange shaft (right-side). To do so, screw 2 bolts into flange and counterhold flange shaft with suitable lever.
- Pull out flange shaft together with spring, thrust washer and tapered ring.



- Swivel suspension strut (left-side) outwards and support with hook -2024 A/1- as shown in illustration.

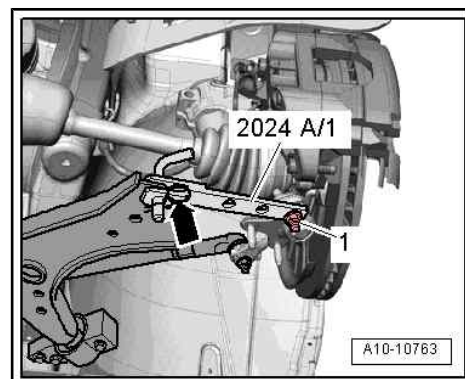


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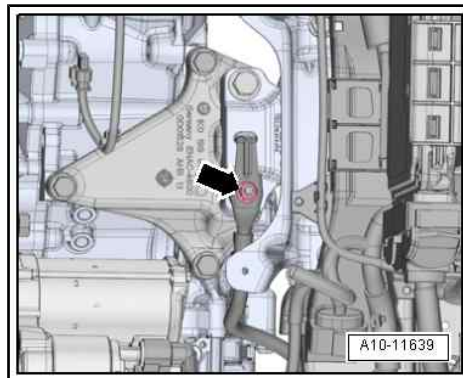
Risk of accident if parts of support are not properly secured.

- ◆ **Secure locking pin and swivel joint with retaining clip -arrow- and nut -1-.**

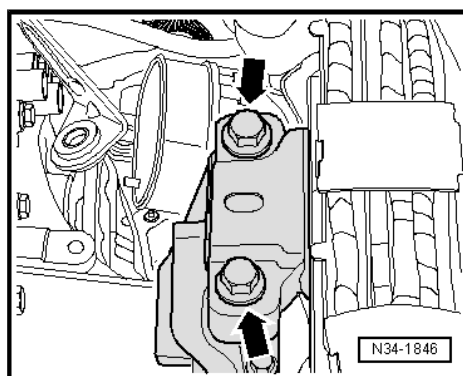


- Swivel drive shaft (left-side) towards front.

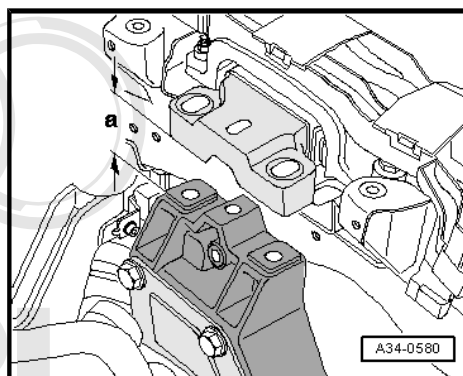
- If fitted, remove nut -arrow- and detach earth wire.



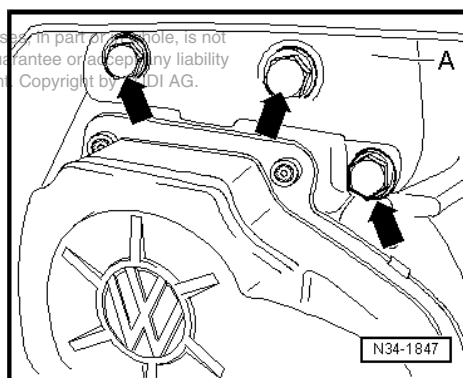
- Remove bolts -arrows- from gearbox mounting.



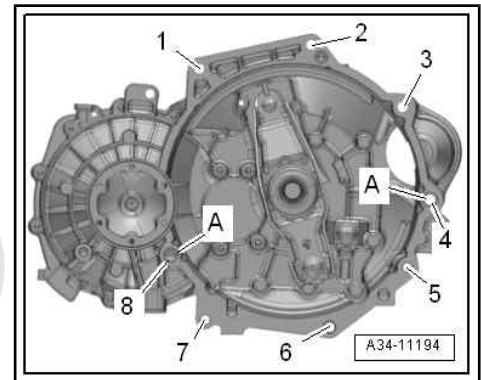
- Adjust spindle - 10 - 222 A /11- to lower gearbox by distance -a-.
- Dimension -a- = 60 mm



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

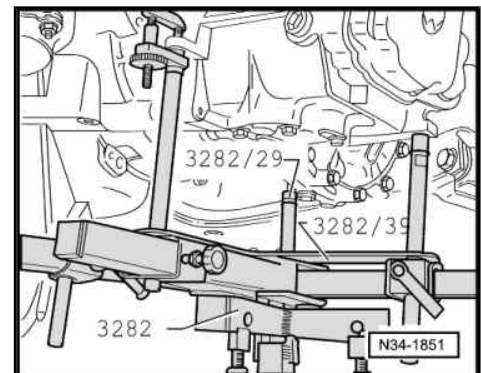
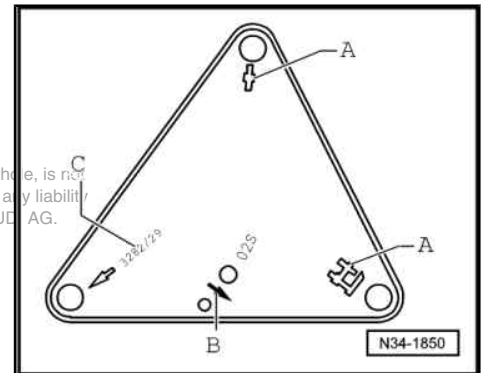


- Remove bolts -5, 6, 7- securing gearbox to engine.

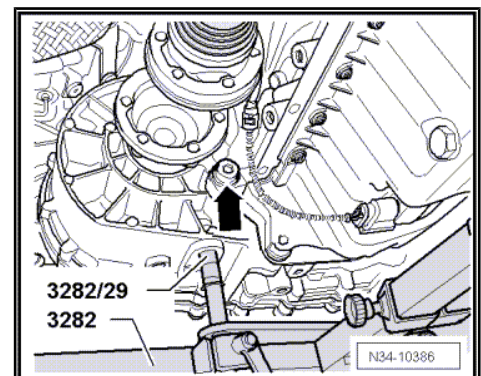


To remove gearbox "0A4" set up gearbox support - 3282- with adjustment plate - 3282/39- .

- Insert gearbox support - 3282- in engine and gearbox jack - V.A.G 1383 A- .
- Align arms of gearbox support according to holes in adjustment plate.
- Screw in support elements -A-, as illustrated on adjustment plate.
- Place engine and gearbox jack - V.A.G 1383 A- underneath vehicle.
- The arrow symbol -B- on the adjustment plate points in the direction of travel.
- Align adjustment plate parallel to gearbox and lock safety support on gearbox.
- Screw pin - 3282/29- into hole for bolt securing pendulum support.



- Remove last engine/gearbox securing bolt -arrow-.
- Push the gearbox off engine (dowel sleeves), paying attention to intermediate plate on engine.
- Lower gearbox, making sure there is sufficient clearance at subframe.
- When lowering gearbox, adjust position of gearbox using spindles on gearbox support - 3282- .



Caution

The electrical wiring can be damaged.

- ◆ *Check whether all electrical wiring between engine, sub-frame and body has been detached.*

2.2 Installing gearbox

Procedure

- Tightening torques for installing gearbox ⇒ [page 87](#)

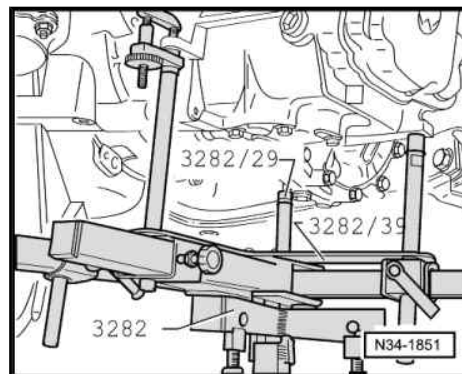
Please note the information in the table below - "Checking gear oil level and filling up with gear oil".

"Checking gear oil level and filling up with gear oil"				
		»No«	»Yes«	»Yes«
Gearbox	New gearbox (replacement part)	X		
	No oil escaping	X		
	Was completely dismantled.		X Before installing ⇒ Item 3 (page 129) Oil capacity ⇒ page 2	
	Was partially dismantled. (gearbox housing and clutch housing were not separated)			X After installing ⇒ page 91



Note

- ◆ *Renew bolts which are tightened by turning through a specified angle.*
- ◆ *Renew self-locking nuts and bolts, and seals, O-rings and gaskets.*
- ◆ *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ [Electronic parts catalogue](#) .*
- ◆ *Re-attach all cable ties at the same locations when re-installing.*
- When fitting a replacement gearbox: attach gearbox selector lever and gate relay lever to new gearbox.
- Place gearbox on gearbox support - 3282- and secure in position.
- Clean input shaft splines, remove corrosion and lubricate splines with only a very thin coating of grease ⇒ [Electronic parts catalogue](#) . It is important to remove excess grease.
- It should be possible to push the clutch plate back and forth slightly on the input shaft.

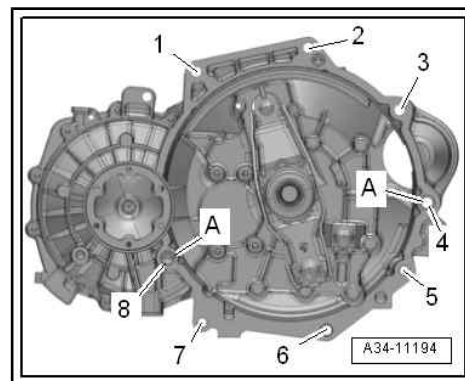


- Check that dowel sleeves -A- for centralising engine/gearbox are in the cylinder block; install any missing dowel sleeves.

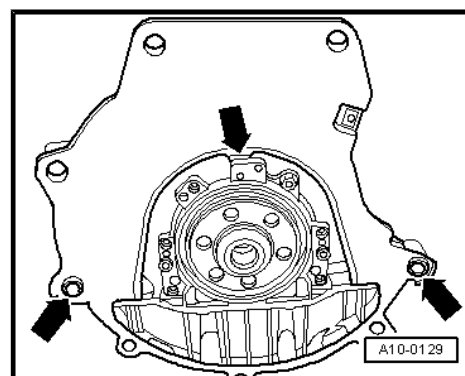


Note

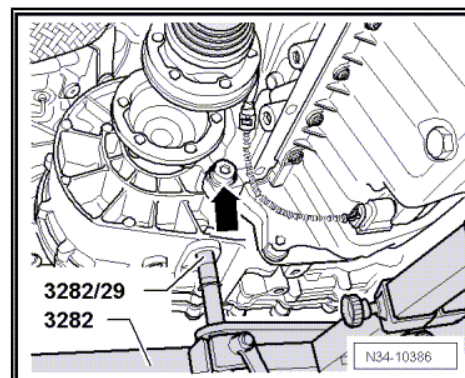
If the dowel sleeves are not fitted, this will lead to gear-change problems, clutch malfunction and in some cases gearbox noise (gears will make rattling noises).



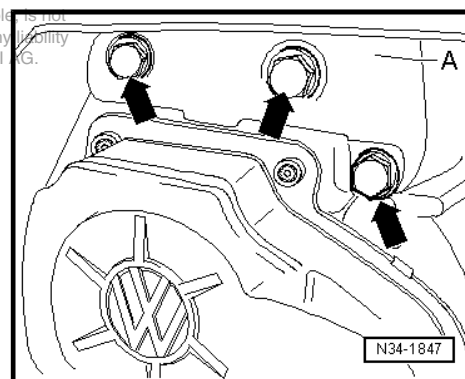
- Make sure that intermediate plate is engaged on sealing flange -top arrow- and fitted onto dowel sleeves -bottom arrows-.
- Check release bearing for wear. If necessary, renew clutch slave cylinder with release bearing ➔ [page 30](#) .
- Raise gearbox carefully using gearbox support - 3282- .
- Align gearbox with engine and install.



- Install and tighten engine/gearbox securing bolt -arrow-.
- Remove gearbox support - 3282- .
- Install and tighten remaining engine/gearbox securing bolts.



- Fit gearbox support -A- with new bolts -arrows-. Tightening torque ➔ [Item 18 \(page 89\)](#) .



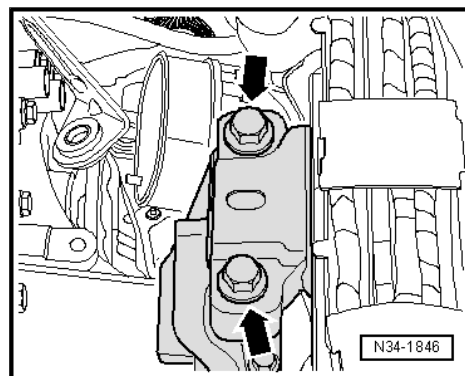
- Align engine/gearbox assembly in installation position; to do so, tighten spindles of support bracket - 10 - 222 A- until gearbox support makes contact with gearbox mounting.



Caution

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

- ◆ *Before fitting the bolts -arrows-, the gearbox support and the gearbox mounting must be aligned so they are exactly parallel. To do this, place engine and gearbox jack - V.A.G 1383 A- below gearbox (near differential) and lift until gearbox support is parallel with gearbox mounting.*



- Install pendulum support.
- Check adjustment of assembly mountings ⇒ Rep. gr. 10 ; Assembly mountings; Checking adjustment of assembly mountings .
- ◆ Tightening torques
⇒ ["3.1 Exploded view - assembly mountings", page 88](#)



Caution

Risk of accident.

- ◆ *Do not detach the support bracket - 10 - 222 A- until all gearbox mounting bolts have been tightened to specified torque.*

- Install flange shaft (right-side) ⇒ [page 181](#) .
- Install drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Install starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter .
- Install clutch slave cylinder ⇒ [page 30](#) .
- Install gate relay lever ⇒ [page 53](#) .
- Install cables and cable support bracket ⇒ [page 50](#) .
- Install engine cover panel ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover .
- Install battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .
- Install air cleaner housing ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing .

Vehicles with 2.0 ltr. TDI engine:

- Install radiator cowl ⇒ Rep. gr. 19 ; Radiator/radiator fan; Removing and installing radiator cowl .
- Install swivel joint and coupling rod ⇒ Running gear, axles, steering; Rep. gr. 40 ; Lower wishbone, swivel joint; Exploded view - lower wishbone, swivel joint .

- If originally fitted, install front vehicle level sender ⇒ Running gear, axles, steering; Rep. gr. 43 ; Vehicle level senders; Exploded view - front vehicle level sender .

Tightening torques for gearbox ⇒ [page 87](#)

2.3 Tightening torques for gearbox



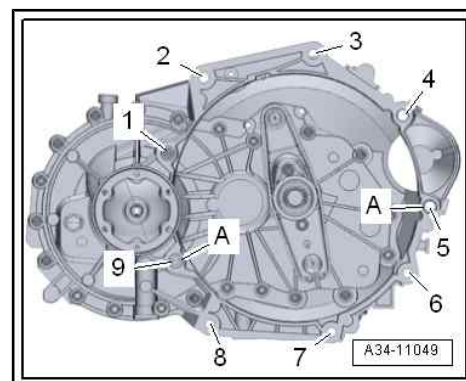
Note

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

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

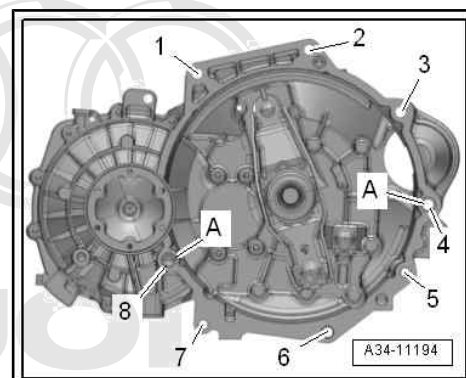
Securing manual gearbox to 1.4 ltr. TFSI engine

Item	Bolt	Nm
1, 9	M12x70	80
2, 3	M12x60	80
4 ¹⁾ , 5 ¹⁾	M12x165	80
6, 7, 8	M10x55	40
A	Dowel sleeves for centralising	
• ¹⁾ Also secures starter.		



Securing manual gearbox to 2.0 ltr. TDI engine

Item	Bolt	Nm
1, 2	M12x50	80
3 ¹⁾ , 4 ¹⁾	M12x150	80
5, 6, 7	M10x55	40
8	M12x60	80
A	Dowel sleeves for centralising	
• ¹⁾ Also secures starter.		



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3 Assembly mountings

⇒ "3.1 Exploded view - assembly mountings", page 88

3.1 Exploded view - assembly mountings

1 - Engine support

- ❑ Removing and installing
⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

2 - Bolt

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

3 - Engine mounting

- ❑ With support arm
- ❑ Removing and installing
⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

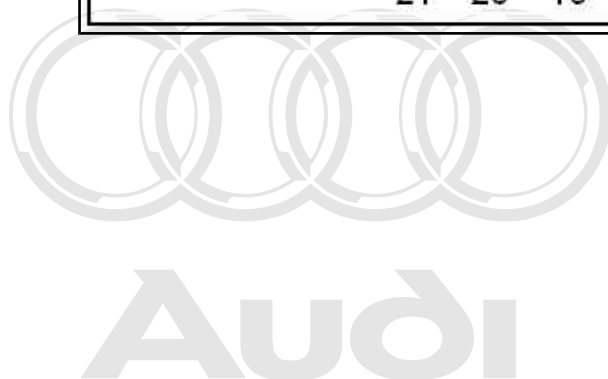
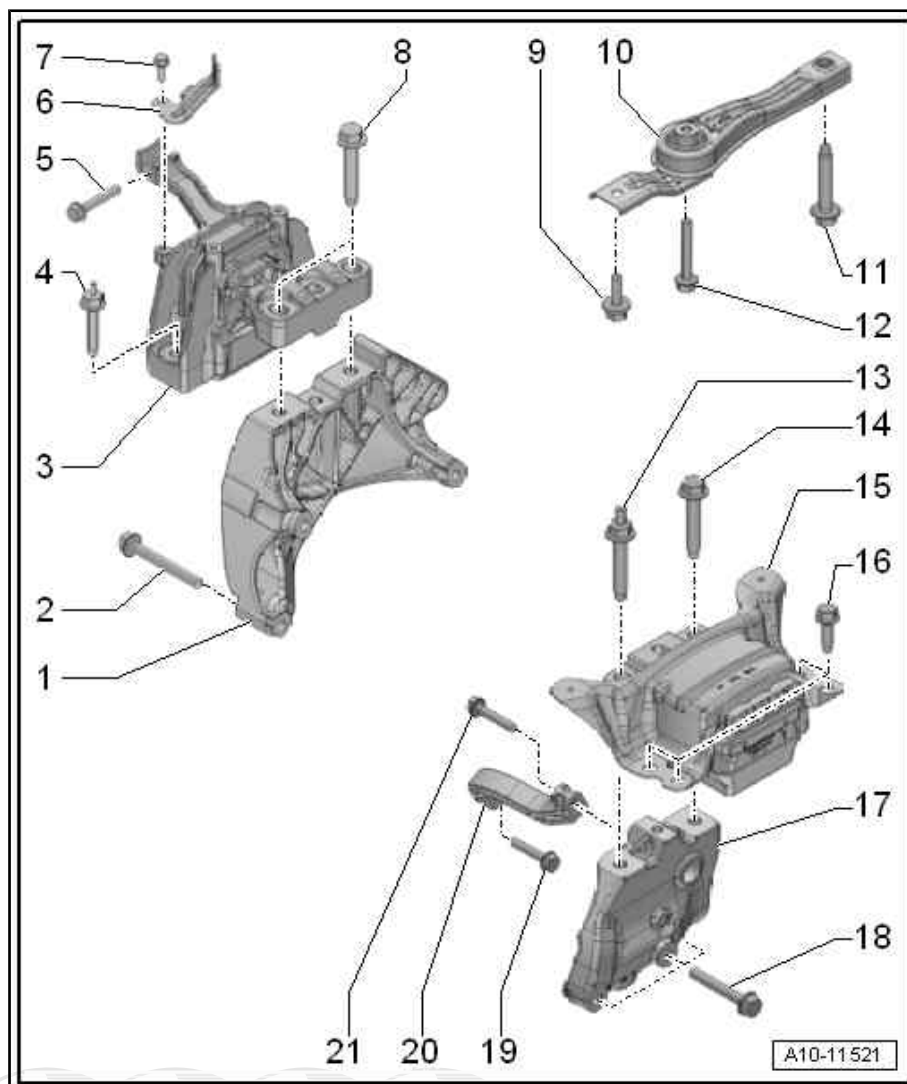
4 ... 5 - Bolts

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

6 - Not fitted

7 ... 9 - Bolts

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



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ings

10 - Pendulum support

- ☐ Removing and installing
⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

11 ... 14 - Bolts

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

15 - Gearbox mounting

- ☐ With support arm
- ☐ Removing and installing ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

16 - Bolt

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

17 - Gearbox support

18 - Bolt

- ☐ 3x
- ☐ Renew after removal
- ☐ 40 Nm +90°

19 - Bolt

- ☐ Renew after removal
- ☐ 20 Nm +90°

20 - Brace

21 - Bolt

- ☐ Renew after removal
- ☐ 20 Nm +90°

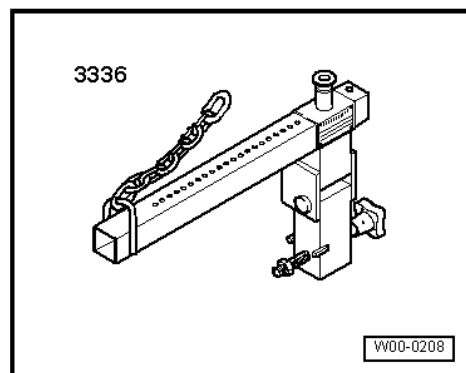


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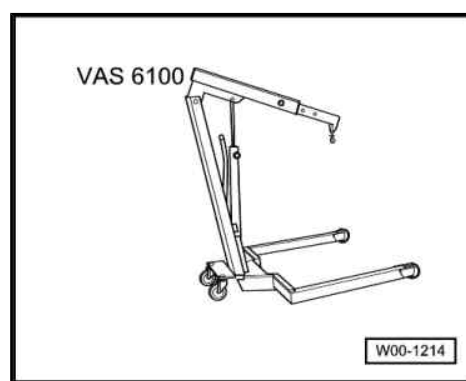
4 Transporting gearbox

Special tools and workshop equipment required

- ◆ Gearbox lifting tackle - 3336-

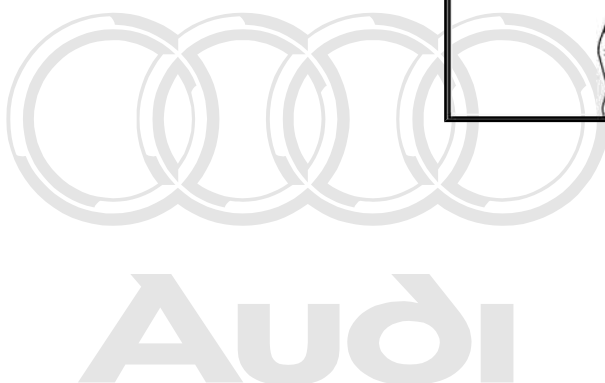
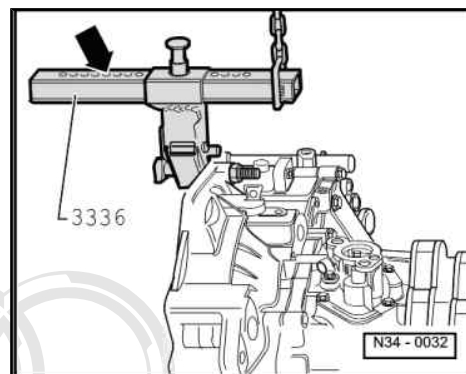


- ◆ Workshop hoist - VAS 6100-



Procedure

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



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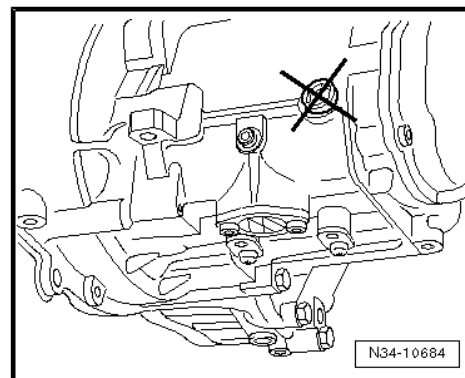
5 Gear oil

⇒ [“5.1 Checking gear oil level”, page 91](#)

⇒ [“5.2 Draining and filling gear oil”, page 91](#)

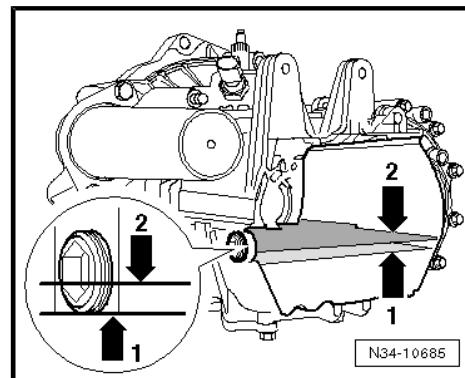
5.1 Checking gear oil level

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



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

The gear oil level can only be checked by draining the gear oil completely and then filling up again ⇒ [page 91](#) .



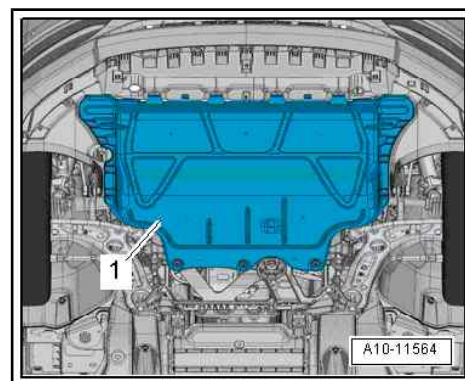
5.2 Draining and filling gear oil

Special tools and workshop equipment required

- ◆ Hose (length approx. 600 mm, outside diameter 10 mm) with funnel (commercially available)
- ◆ Gear oil specifications ⇒ Electronic parts catalogue

Draining

- Remove air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Remove noise insulation -1- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Clean gearbox.



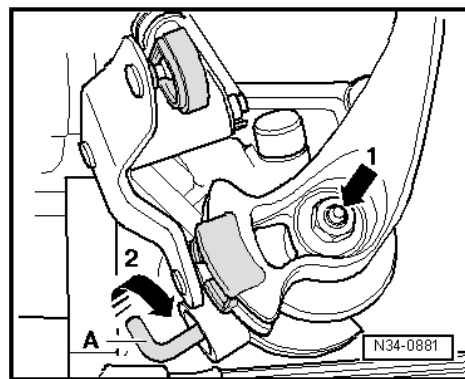


Caution

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

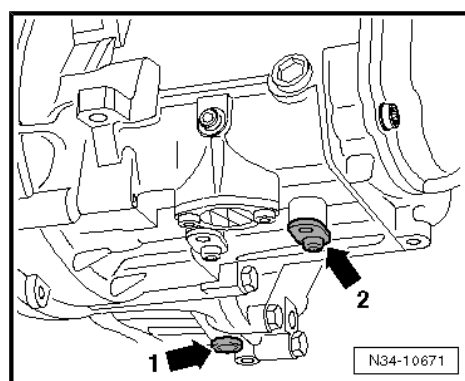
The selector shaft must be locked to prevent the position of the selector forks from being changed, e.g. due to accidental operation of the selector mechanism.

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



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

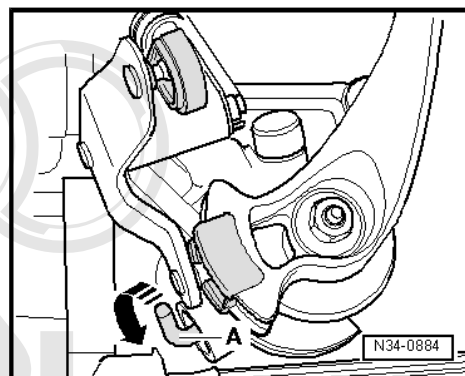
- Remove oil drain plug -arrow 1-, then remove pivot pin -arrow 2- for selector forks and drain off gear oil.
- Install pivot pin -arrow 2- for selector forks with a new O-ring ➔ [page 100](#) .
- Tighten oil drain plug -arrow 1- ➔ [Item 15 \(page 130\)](#) .



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

Fill up gear oil.

- Oil drain plug is tightened.
- Pivot pin for selector forks must be fitted with a new O-ring ➔ [page 100](#) .



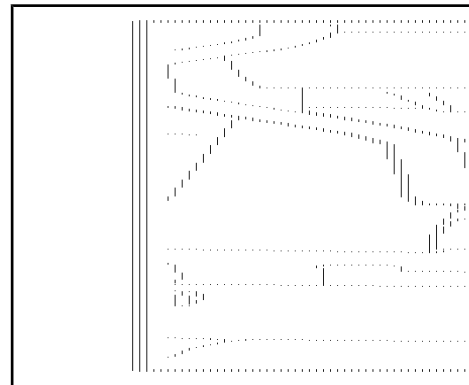
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Add gear oil to container until amount of gear oil in container is 1.7 ltr.

- Remove reversing light switch - F4- -arrow-.
- Fit hose (length approx. 600 mm, outside diameter 10 mm) to funnel (commercially available).
- Insert hose in mounting hole for reversing light switch - F4- and fill gearbox with gear oil (2nd mechanic required).
- Install reversing light switch - F4- ➔ [Item 5 \(page 101\)](#) .
- Check operation of selector mechanism ➔ [page 61](#) .

Tightening torques

- ◆ ➔ ["8.1 Exploded view - gearbox housing and clutch housing", page 129](#)
- ◆ Air cleaner housing ➔ Rep. gr. 23 ; Air cleaner; Exploded view - air cleaner housing
- ◆ Noise insulation ➔ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

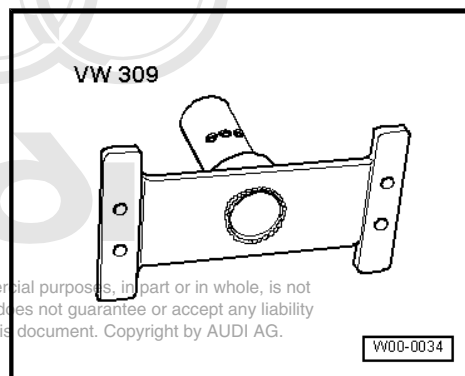


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6 Securing to engine and gearbox support

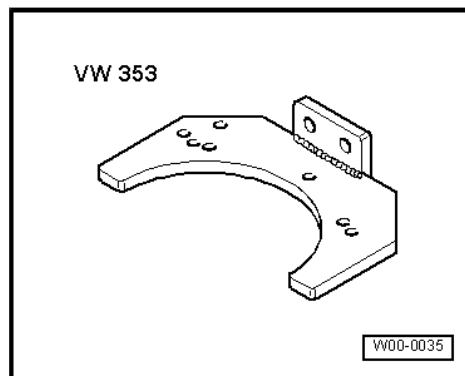
Special tools and workshop equipment required

- ◆ Support plate - VW 309-

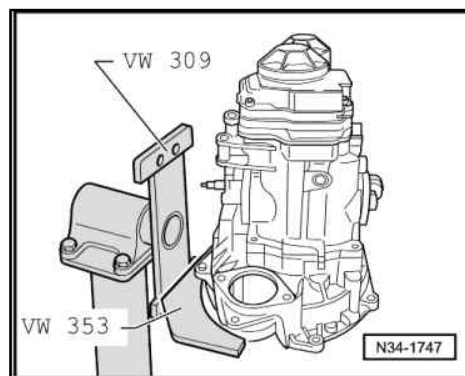


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- ◆ Gearbox support - VW 353-



- Secure gearbox on gearbox support - VW 353- .



7 Dismantling and assembling gearbox

⇒ [“7.1 Schematic overview - gearbox”, page 95](#)

⇒ [“7.2 Exploded view - gearbox”, page 97](#)

⇒ [“7.3 Exploded view - gearbox housing cover and 5th gear”, page 98](#)

⇒ [“7.4 Exploded view - gearbox housing and selector mechanism”, page 100](#)

⇒ [“7.5 Exploded view - selector unit”, page 101](#)

⇒ [“7.6 Exploded view - input shaft, output shaft, differential and selector forks”, page 102](#)

⇒ [“7.7 Exploded view - selector forks”, page 102](#)

⇒ [“7.8 Servicing selector unit”, page 103](#)

⇒ [“7.9 Removing and installing selector unit”, page 105](#)

⇒ [“7.10 Servicing selector forks”, page 105](#)

⇒ [“7.11 Removing gearbox housing cover and 5th gear”, page 109](#)

⇒ [“7.12 Dismantling and assembling gearbox”, page 114](#)

⇒ [“7.13 Installing 5th gear and gearbox housing cover”, page 125](#)

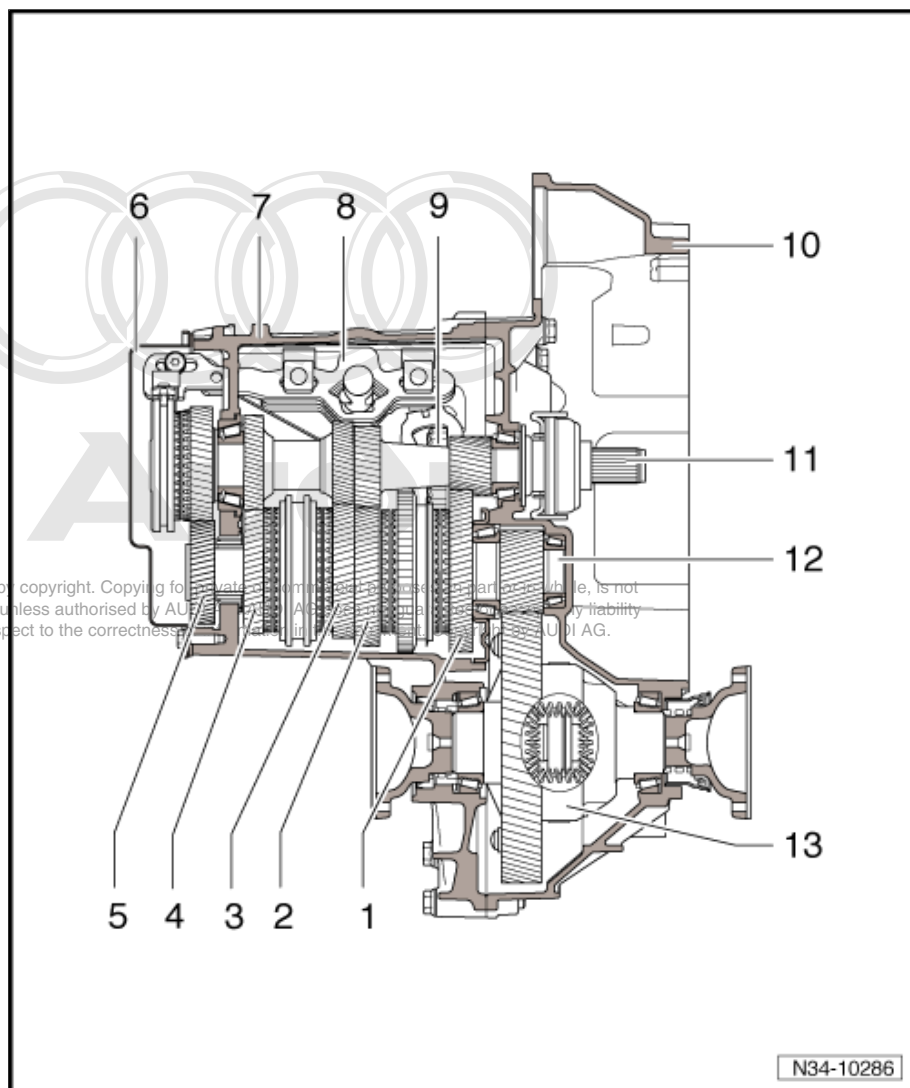
7.1 Schematic overview - gearbox



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

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7.2 Exploded view - gearbox

I -
⇒ [“7.3 Exploded view - gearbox housing cover and 5th gear”, page 98](#)

II -
⇒ [“7.4 Exploded view - gearbox housing and selector mechanism”, page 100](#)

II -
⇒ [“7.5 Exploded view - selector unit”, page 101](#)

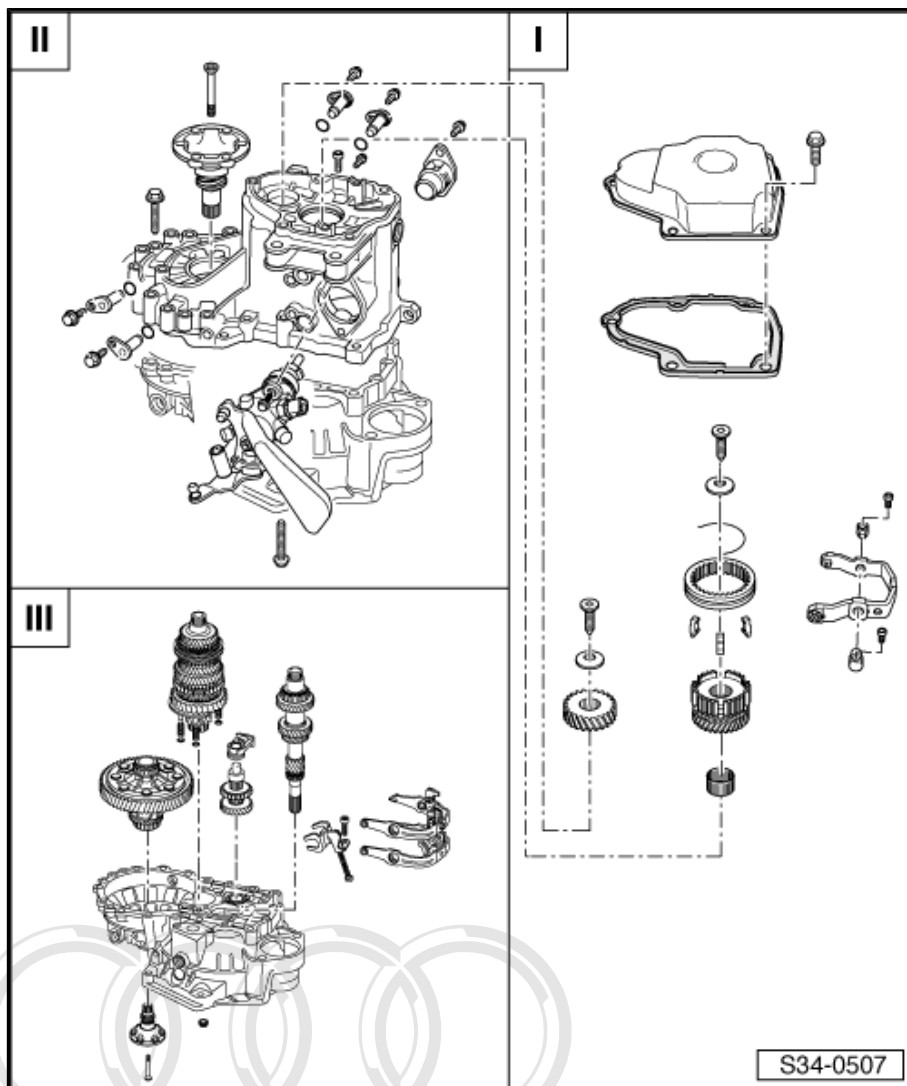
II -
⇒ [“7.8 Servicing selector unit”, page 103](#)

II -
⇒ [“1.9 Renewing selector shaft oil seal”, page 61](#)

III -
⇒ [“7.6 Exploded view - input shaft, output shaft, differential and selector forks”, page 102](#)

III -
⇒ [“7.7 Exploded view - selector forks”, page 102](#)

III -
⇒ [“7.10 Servicing selector forks”, page 105](#)



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7.3 Exploded view - gearbox housing cover and 5th gear

1 - Bolt

- ☐ 5x
- ☐ For gearbox housing cover
- ☐ 18 Nm

2 - Gearbox housing cover

- ☐ With magnet
- [⇒ page 99](#)



Note

- ◆ Please note that oil will escape when the cover for gearbox housing is detached if the gearbox is installed.
- ◆ Because of this, the gear oil must be drained and the gearbox filled with new gear oil [⇒ page 91](#)

3 - Gasket

4 - Bolt

- ☐ Renew after removal
- ☐ Fitted piece on bolt head holds dished spring in position [⇒ page 127](#)
- ☐ Use thread tap to remove any remaining locking fluid from threaded holes for bolts securing 5th gear synchrohub and 5th gear wheel. Otherwise there is a risk that the bolts will shear off
- ☐ 80 Nm +90°

5 - Dished spring

- ☐ Installing [⇒ page 127](#)

6 - Bolt

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

7 - Pivot pin

8 - 5th gear selector fork

- ☐ Dismantling and assembling [⇒ page 105](#)

9 - Spring

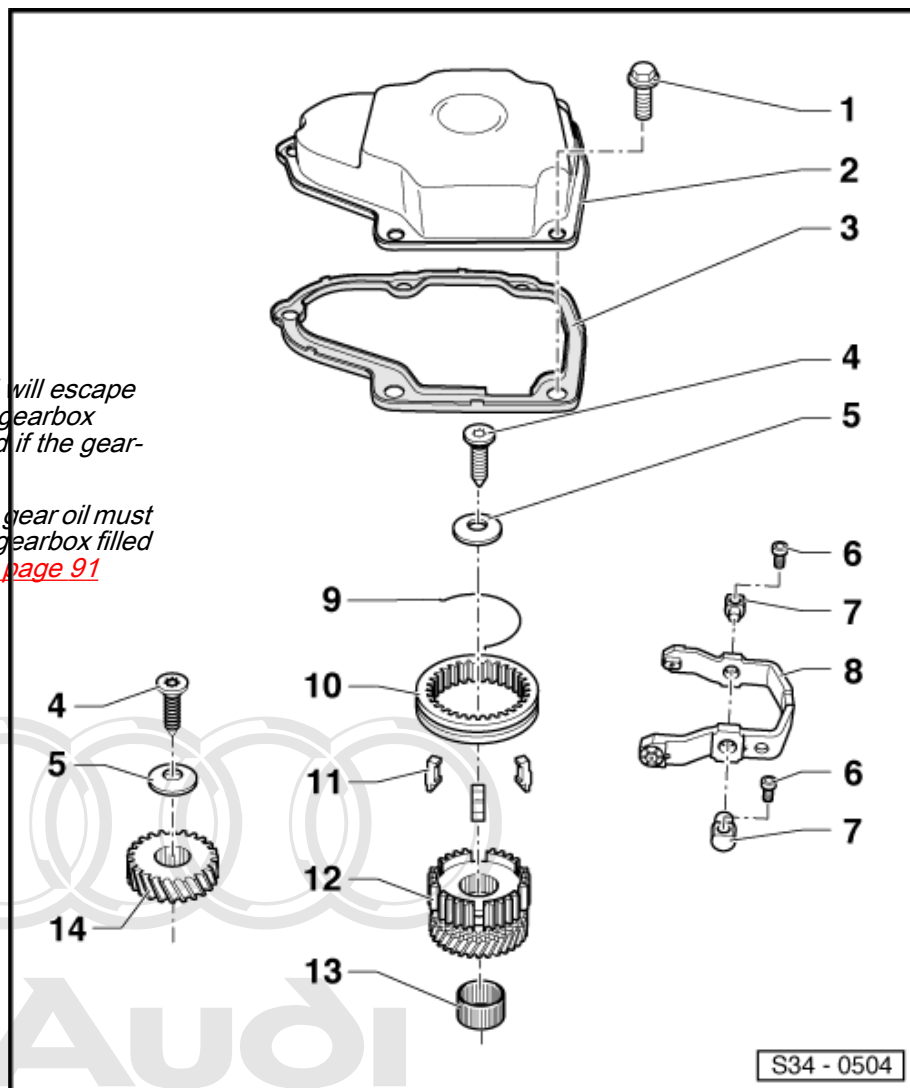
- ☐ Offset version
- ☐ Installing [⇒ page 142](#)

10 - 5th gear locking collar

- ☐ Installation position [⇒ page 142](#)
- ☐ Adjusting [⇒ page 128](#)

11 - Locking pieces

- ☐ 3x



- ❑ Installation position ⇒ [page 141](#)

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

- ❑ Pulling off together with gearbox housing ⇒ [page 114](#)
- ❑ Pulling off individually ⇒ [page 109](#)
- ❑ Dismantling and assembling ⇒ [page 142](#)

13 - Needle bearing

14 - 5th gear wheel

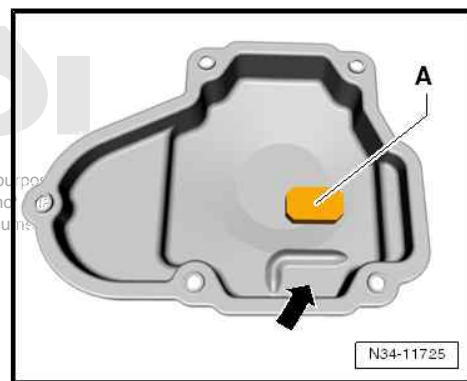
- ❑ Pulling off together with gearbox housing ⇒ [page 114](#)
- ❑ Pulling off individually ⇒ [page 109](#)
- ❑ Installation position ⇒ [page 126](#)

Gearbox housing cover with magnet -A-

Magnet -A- can only be fitted in a cover with a recess -arrow-.

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

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7.4 Exploded view - gearbox housing and selector mechanism

1 - Countersunk bolt

- ☐ 25 Nm

2 - Flange shaft with spring

- ☐ Removing and installing
⇒ [page 174](#)
- ☐ Assembling
⇒ [page 177](#)

3 - Bolt

- ☐ For reverse shaft support
- ☐ Self-locking
- ☐ Renew after removal
- ☐ 25 Nm

4 - Bolt

- ☐ For reverse shaft support
- ☐ Self-locking
- ☐ Renew after removal
- ☐ 30 Nm

5 - O-ring

- ☐ Renew after removal

6 - Pivot pin

7 - Bolt

- ☐ 25 Nm

8 - Bolt

- ☐ 25 Nm

9 - Sealing cap

10 - Bolt

- ☐ For reverse shaft support
- ☐ Renew after removal
- ☐ 25 Nm

11 - Bolt

- ☐ 6 Nm

12 - Gearbox neutral position sender - G701-

- ☐ For vehicles with start/stop system

13 - Gearbox housing

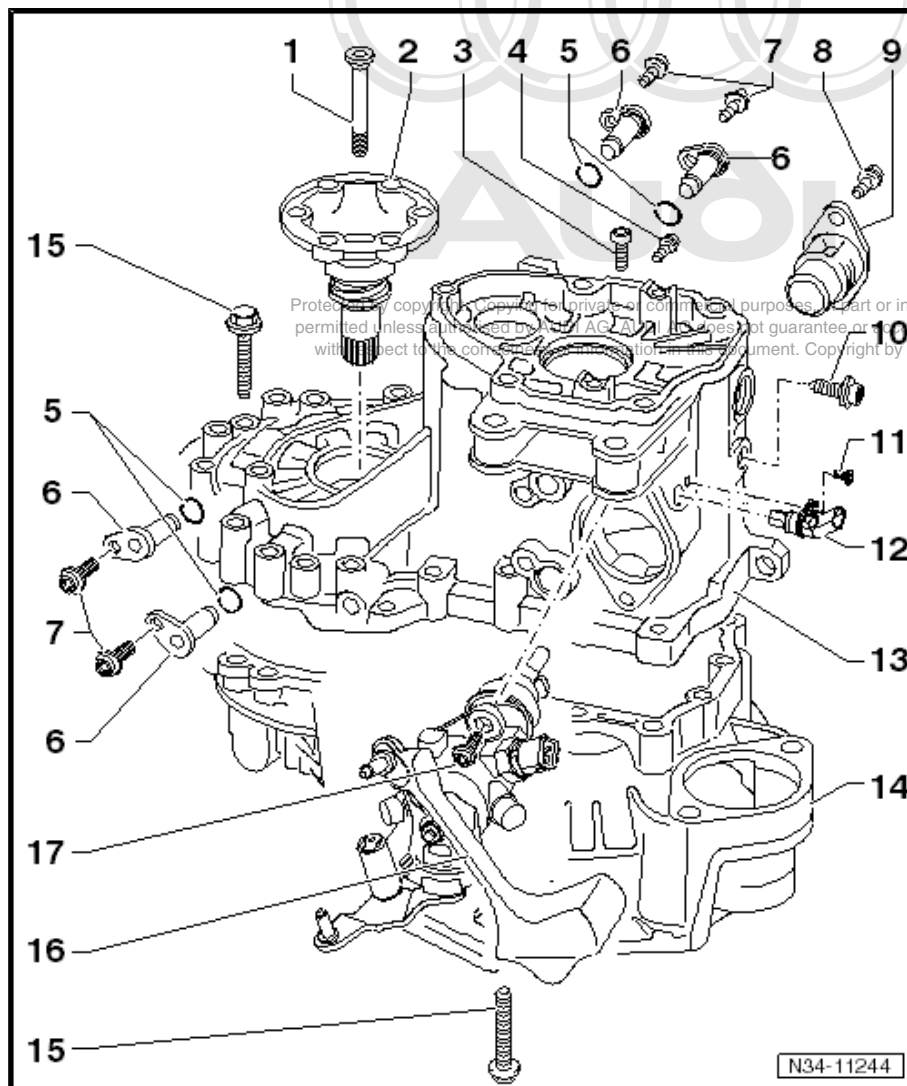
- ☐ Pulling off together with 5th gear ⇒ [page 114](#)
- ☐ Servicing ⇒ [page 129](#)

14 - Clutch housing

- ☐ Servicing ⇒ [page 129](#)

15 - Bolt

- ☐ Renew after removal
- ☐ 25 Nm +90°



16 - Selector shaft with selector mechanism cover

- ☐ (Selector unit)
- ☐ Servicing ⇒ [page 103](#)

17 - Bolt

- ☐ 25 Nm

7.5 Exploded view - selector unit

1 - Bolt

- ☐ 25 Nm

2 - Sealing cap

3 - Bearing bush

4 - Selector unit

- ☐ Consists of selector shaft, selector mechanism cover and oil seal
- ☐ ⇒ ["1.9 Renewing selector shaft oil seal", page 61](#)
- ☐ Removing and installing ⇒ [page 105](#)
- ☐ Selector shaft and selector mechanism cover cannot be separated from each other

5 - Reversing light switch - F4-

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

6 - Angled rod

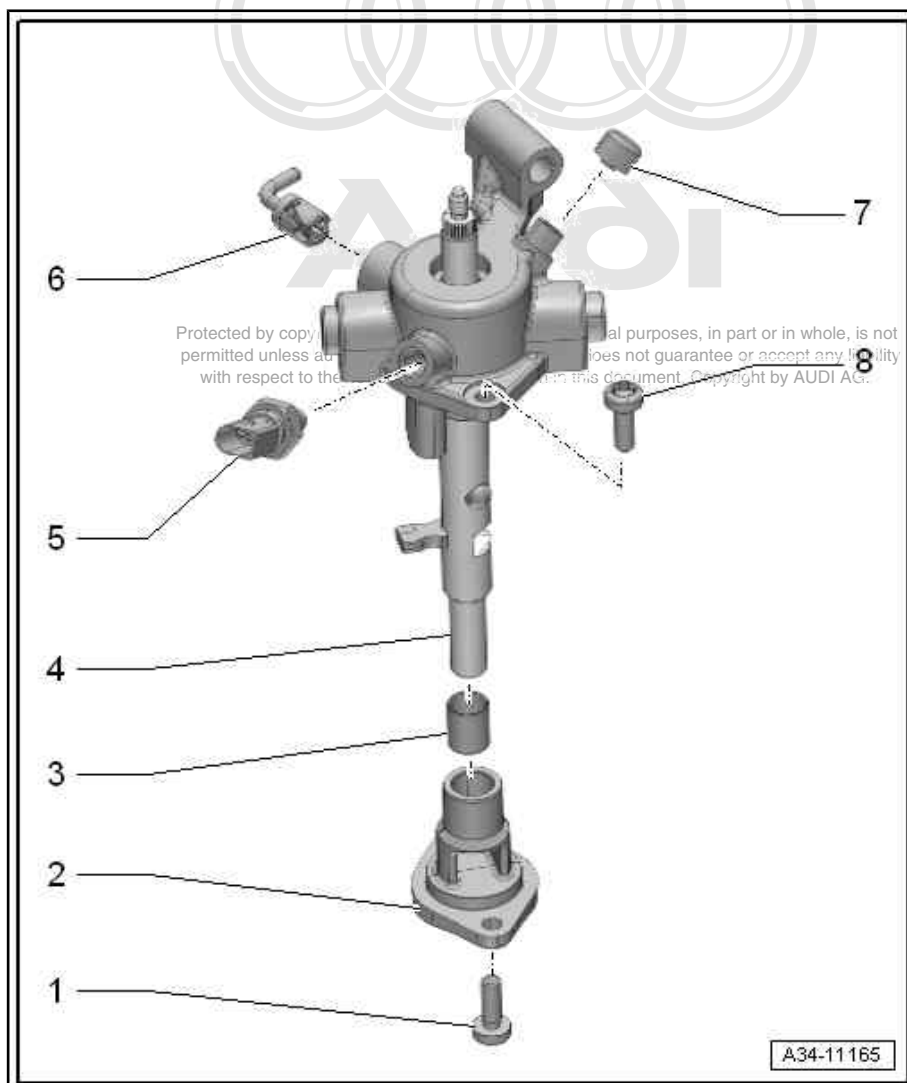
- ☐ For adjusting selector mechanism
- ☐ Removing ⇒ [page 104](#)
- ☐ Pressing in ⇒ [page 104](#)

7 - Cap

- ☐ For gearbox breather

8 - Bolt

- ☐ 25 Nm



7.6 Exploded view - input shaft, output shaft, differential and selector forks

1 - Differential

- ☐ Dismantling and assembling ⇒ [page 177](#)

2 - Seal

- ☐ 4x
- ☐ Renew after removal

3 - Output shaft

- ☐ ⇒ [page 150](#)

4 - Reverse shaft support

- ☐ ⇒ [page 168](#)

5 - Reverse shaft

- ☐ ⇒ [page 168](#)

6 - Input shaft

- ☐ ⇒ [page 135](#)

7 - Reverse gear selector fork

- ☐ Dismantling and assembling ⇒ [page 105](#)
- ☐ Installation position ⇒ [page 114](#)

8 - Torx socket head bolt

- ☐ 25 Nm

9 - Selector mechanism

- ☐ (Selector forks)
 - ☐ Dismantling and assembling ⇒ [page 105](#)
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10 - Clutch housing

- ☐ Servicing ⇒ [page 129](#)

11 - Hexagon nut

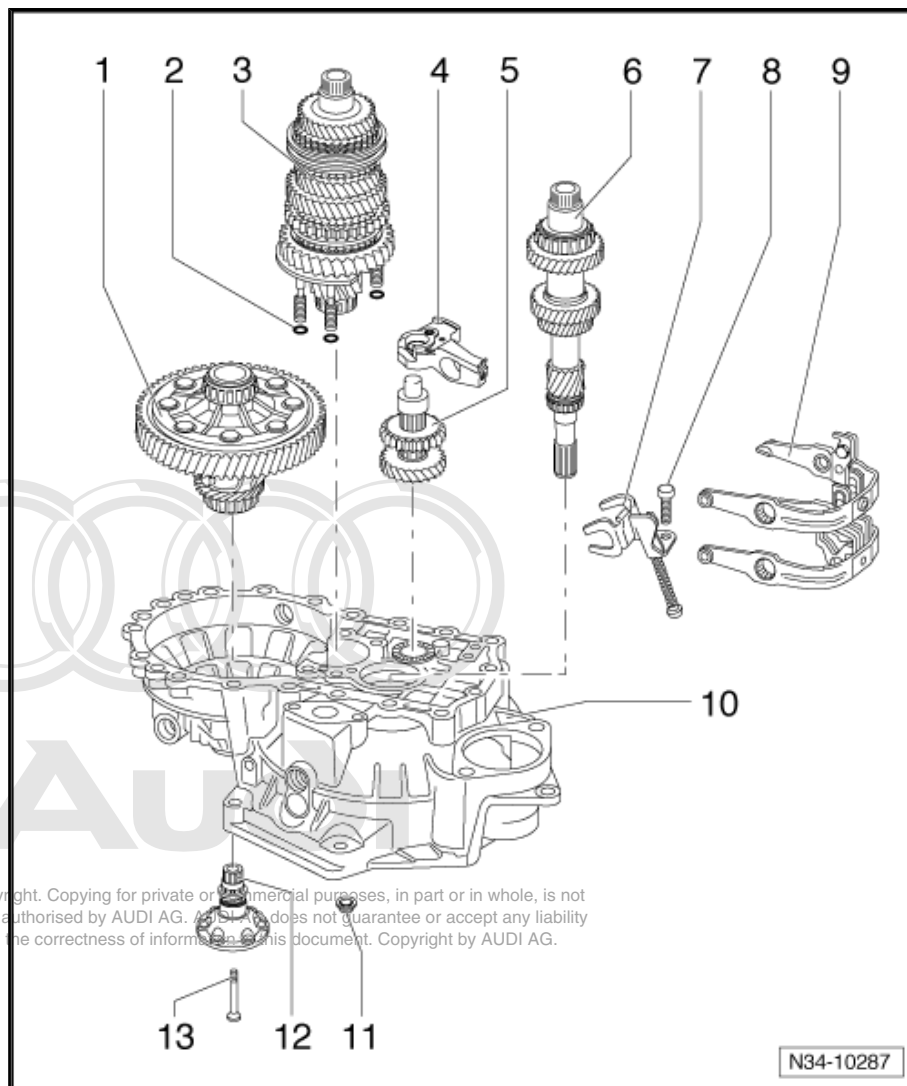
- ☐ 4x
- ☐ Renew after removal
- ☐ 25 Nm +90°

12 - Flange shaft with spring

- ☐ Removing and installing ⇒ [page 174](#)
- ☐ Assembling ⇒ [page 177](#)

13 - Countersunk bolt

- ☐ 25 Nm



7.7 Exploded view - selector forks



Note

- ◆ The selector fork cluster does not have to be dismantled in order to remove and install detent segments, clamping washers and angular contact ball bearings.
- ◆ Servicing selector forks ⇒ [page 105](#)

1 - 5th gear detent segment

- ☐ Identification
⇒ [page 107](#)
- ☐ Detent segment should turn freely after clamping washer is installed

2 - Clamping washer

- ☐ Renew after removal
- ☐ Removing ⇒ [page 108](#)
- ☐ Installing ⇒ [page 108](#)

3 - 5th gear selector fork

4 - Bolt

- ☐ 25 Nm

5 - 5th gear selector jaw

6 - Angular contact ball bearing

- ☐ 4x
- ☐ Removing ⇒ [page 108](#)
- ☐ Pressing inner bearing race into outer race
⇒ [page 108](#)
- ☐ Installing ⇒ [page 109](#)

7 - Selector fork cluster with selector plates

8 - 1st/2nd gear detent segment

- ☐ Identification
⇒ [page 107](#)
- ☐ The segment must rotate freely after installing the lock washer

9 - 3rd/4th gear detent segment

- ☐ Identification ⇒ [page 107](#)
- ☐ The segment must rotate freely after installing the lock washer

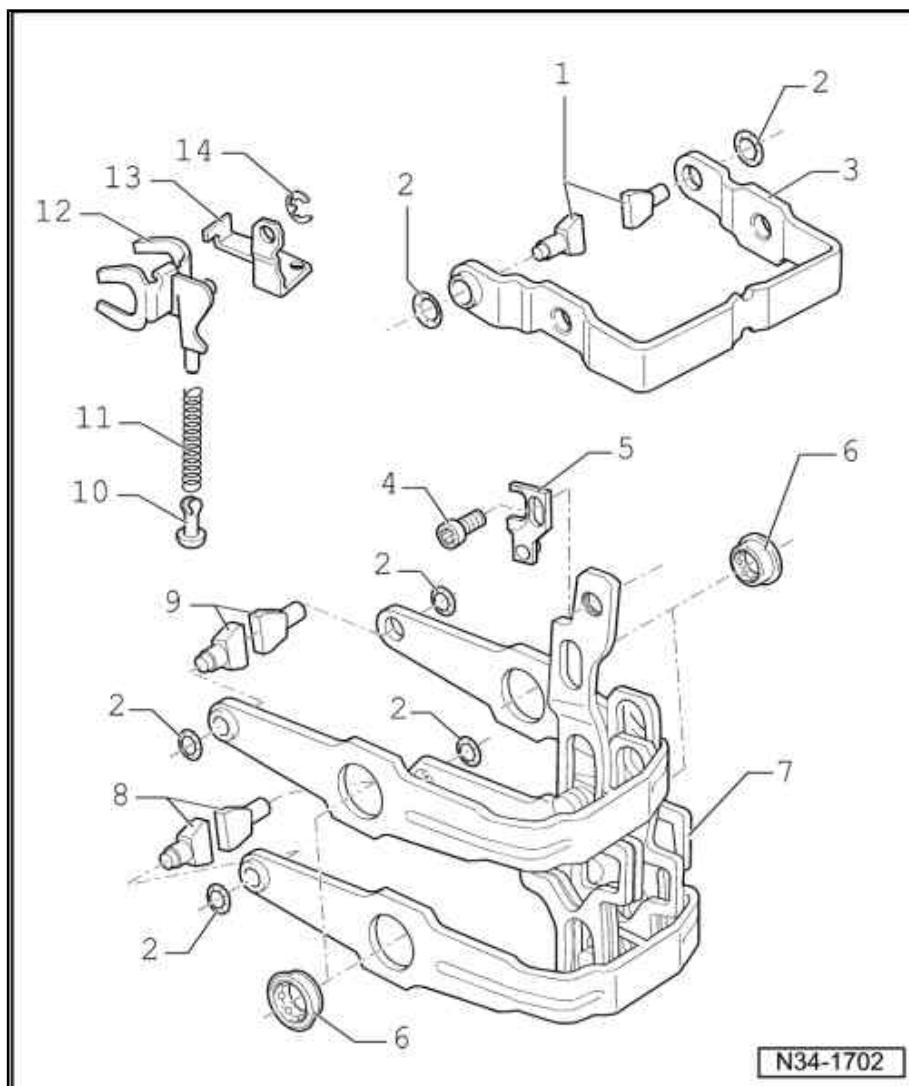
10 - Sliding piece

11 - Spring

12 - Reverse gear selector fork

13 - Support for reverse gear selector fork

14 - Circlip

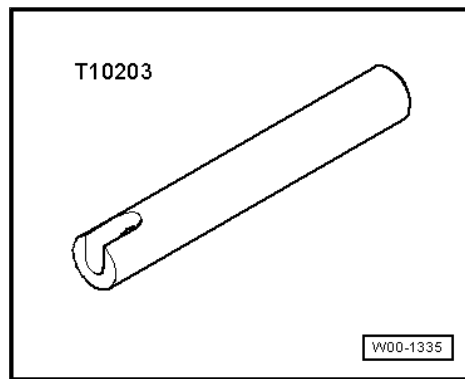


7.8 Servicing selector unit

Special tools and workshop equipment required

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◆ Tube - T10203-

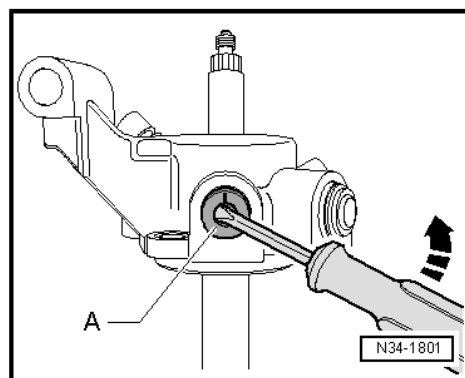


Procedure

- Remove selector unit ➔ [page 101](#) .

Removing angled rod -A- from selector mechanism cover

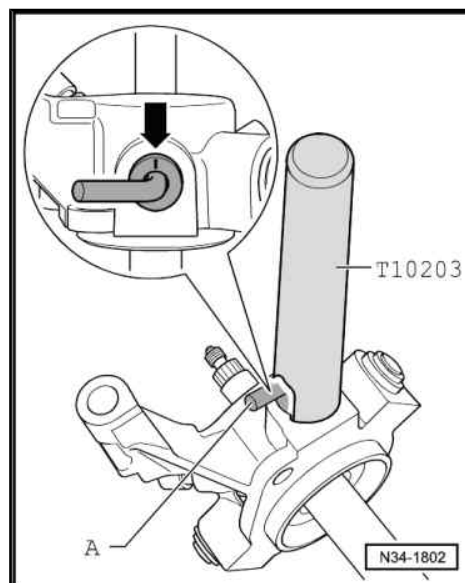
- Remove outer part of angled rod.
- Carefully lever out angled rod with a screwdriver.



Pressing angled rod -A- into selector mechanism cover

Installation position:

- Marking -arrow- points to upper section of selector shaft.
- Fit selector unit ➔ [page 101](#) .

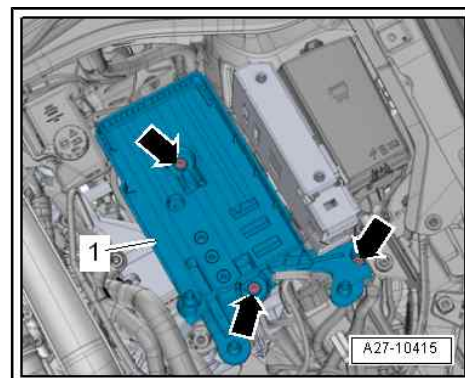


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7.9 Removing and installing selector unit

Removing

- Remove battery tray -1- ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .
- Remove gate relay lever ⇒ [page 53](#) .

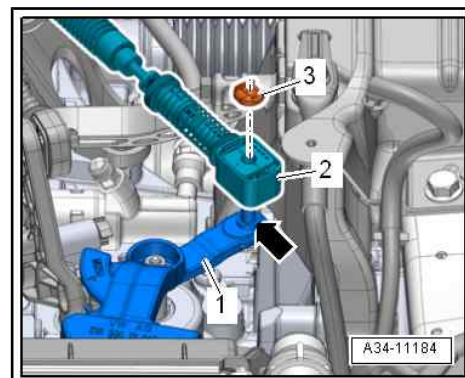


- Detach securing clip -3- for gear selector cable from gearbox selector lever -1- and pull selector cable -2- off pin -arrow-.



Note

The gate relay lever must be removed before detaching the cable end-piece ⇒ [page 54](#) .

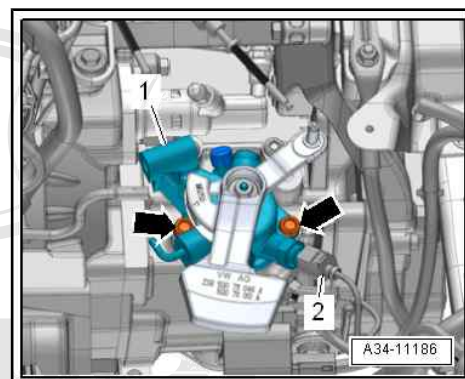


- Unplug electrical connector -2-.
- Remove bolts -arrows- and detach selector shaft -1-.

Installing

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

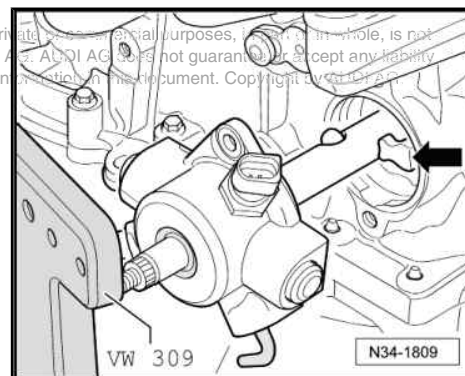
- Clean sealing surfaces.
- Set selector plates in neutral position.
- Apply sealant - AMV 188 200 03- evenly to sealing surface of selector mechanism cover.
- Put selector shaft in neutral position.



- Position selector shaft so that selector finger -arrow- is engaged in selector plates.
- Install and secure selector shaft cover.
- Install gate relay lever ⇒ [page 53](#) .

Tightening torques

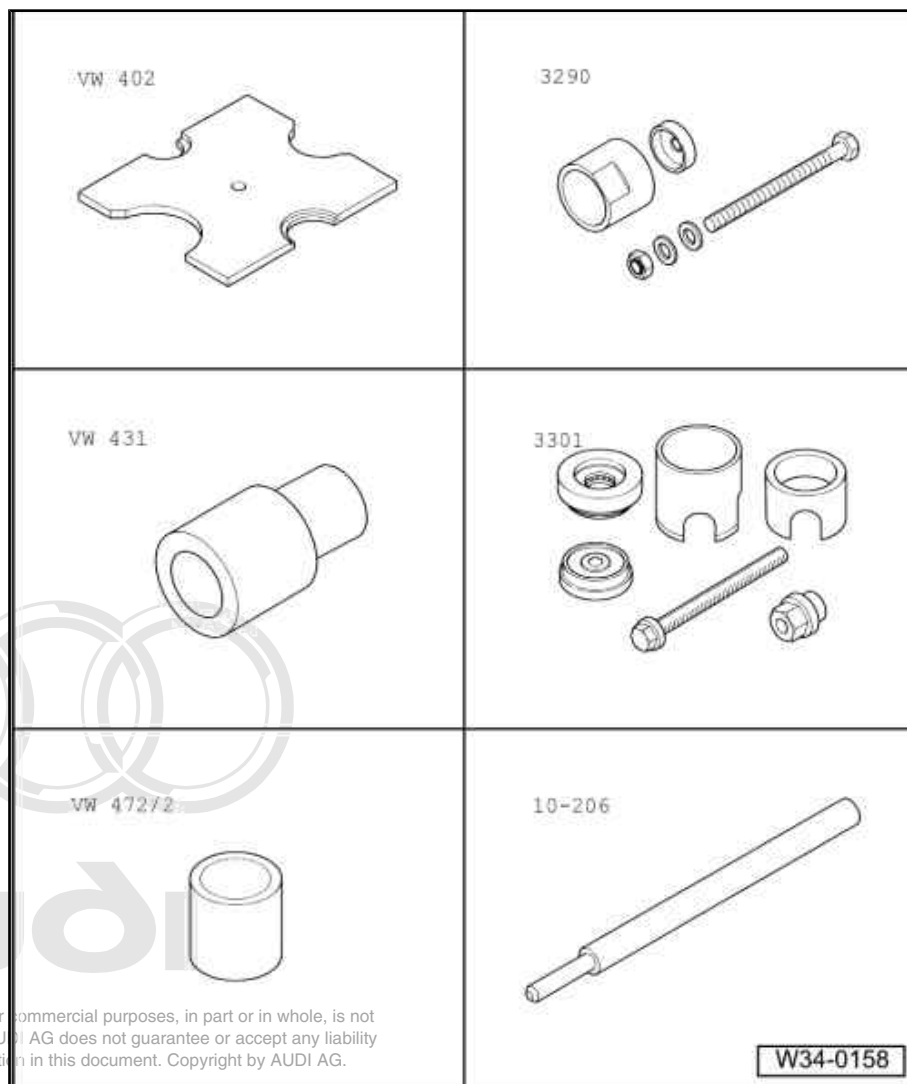
- ♦ ⇒ ["7.5 Exploded view - selector unit", page 101](#)
- ♦ Battery and battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Exploded view - battery



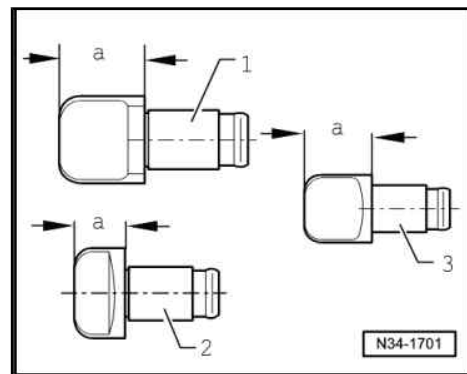
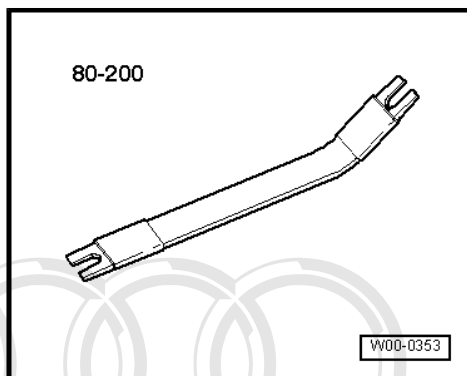
7.10 Servicing selector forks

Special tools and workshop equipment required

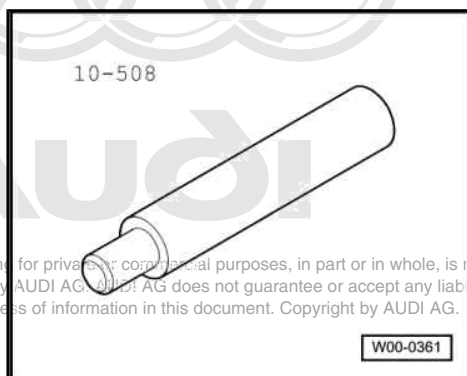
- ◆ Thrust plate - VW 402-
- ◆ Thrust piece - 3290/1-
- ◆ Assembly tool - 3301-
- ◆ Thrust piece - VW 431-
- ◆ Spacer sleeve - VW 472/2-
- ◆ Drift - 10 - 206-



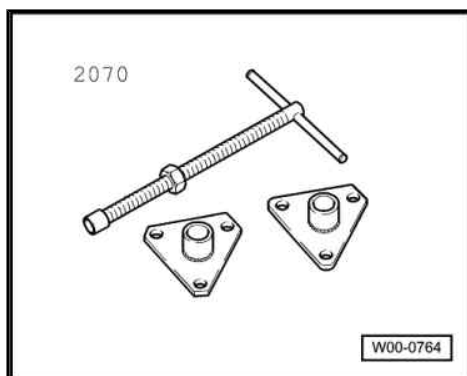
- ◆ Removal lever - 80-200-



- ◆ Assembly mandrel - 10 - 508-



- ◆ Tensioning device - 2070-



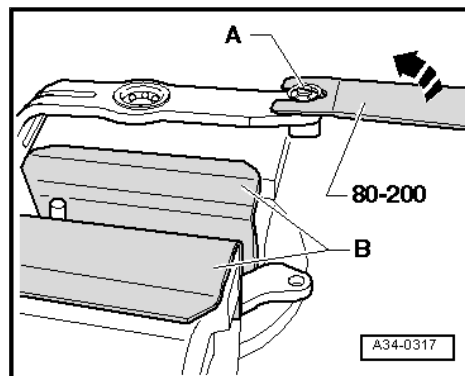
Identification of detent segments

Dimension -a-

- 1 - Detent segments, 1st/2nd gear = 11.4 mm
- 2 - Detent segments, 3rd/4th gear = 7.7 mm
- 3 - Detent segments, 5th gear = 12.1 mm

Removing lock washer

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



Installing lock washer

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

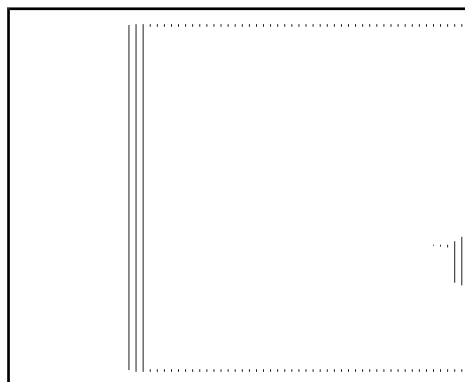


Note

Detent segment should turn freely after lock washer is installed.

A - Socket driver, 10 mm

B - Protective jaw covers

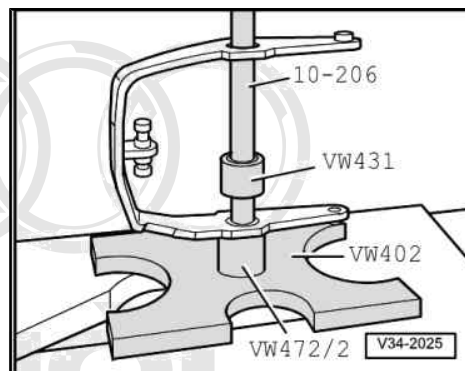


Removing angular contact ball bearing



Note

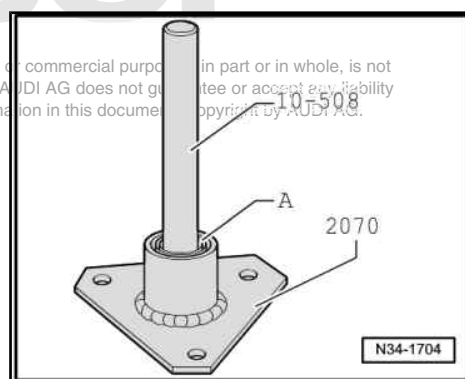
Do not bend selector forks when removing and installing the ball bearing.



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

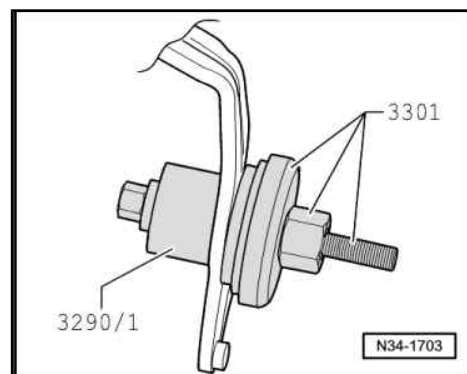
Bearing inner race must engage positively in outer race.

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

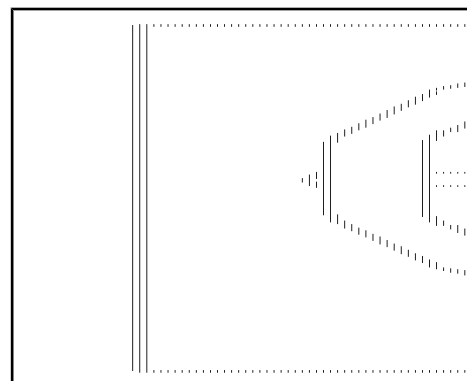
Recess in thrust piece - 3290/1- points towards ball bearing.



Selector forks with detent segments installed

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

For identification of detent segments ⇒ [page 107](#)



7.11 Removing gearbox housing cover and 5th gear

Installing 5th gear and gearbox housing cover ⇒ [page 125](#)



Note

- ◆ If only the 5th gear has to be removed, please refer to the work sequence described below.
- ◆ If the gearbox housing has to be removed, please refer to the procedure
⇒ [“7.12 Dismantling and assembling gearbox”, page 114](#).

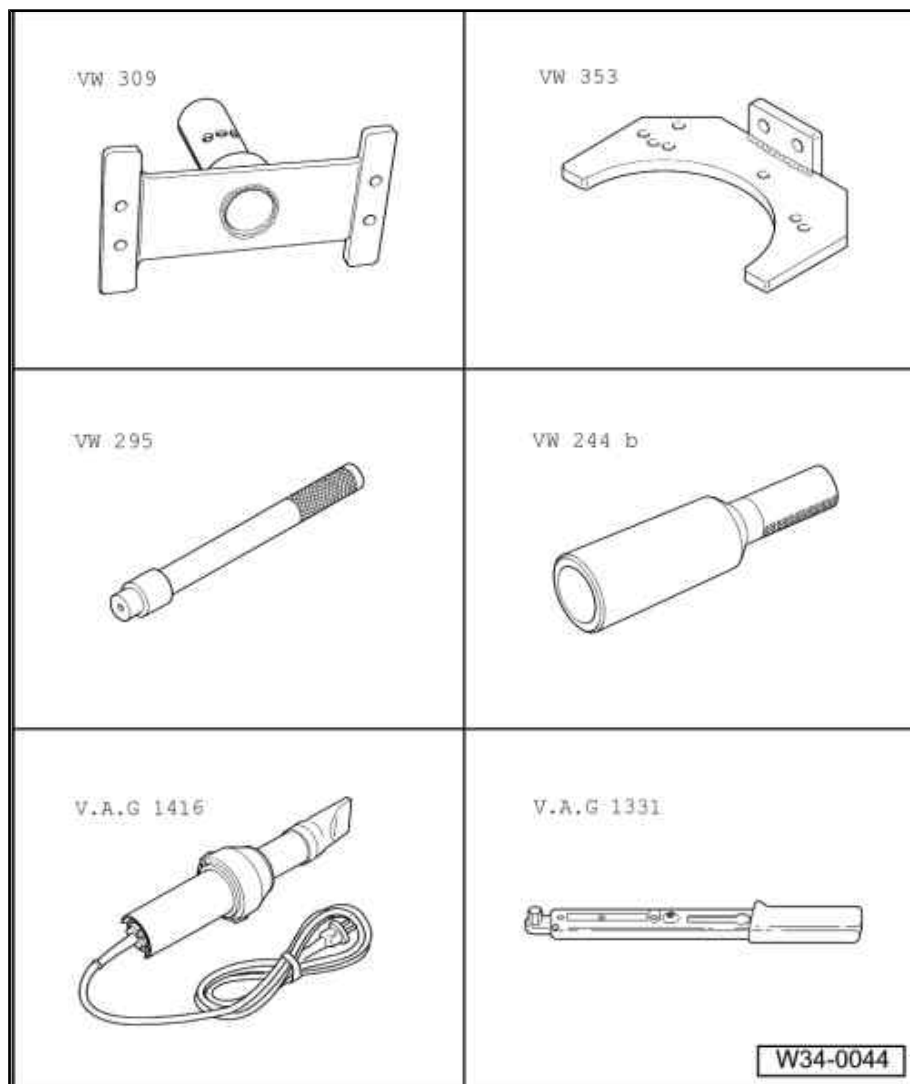


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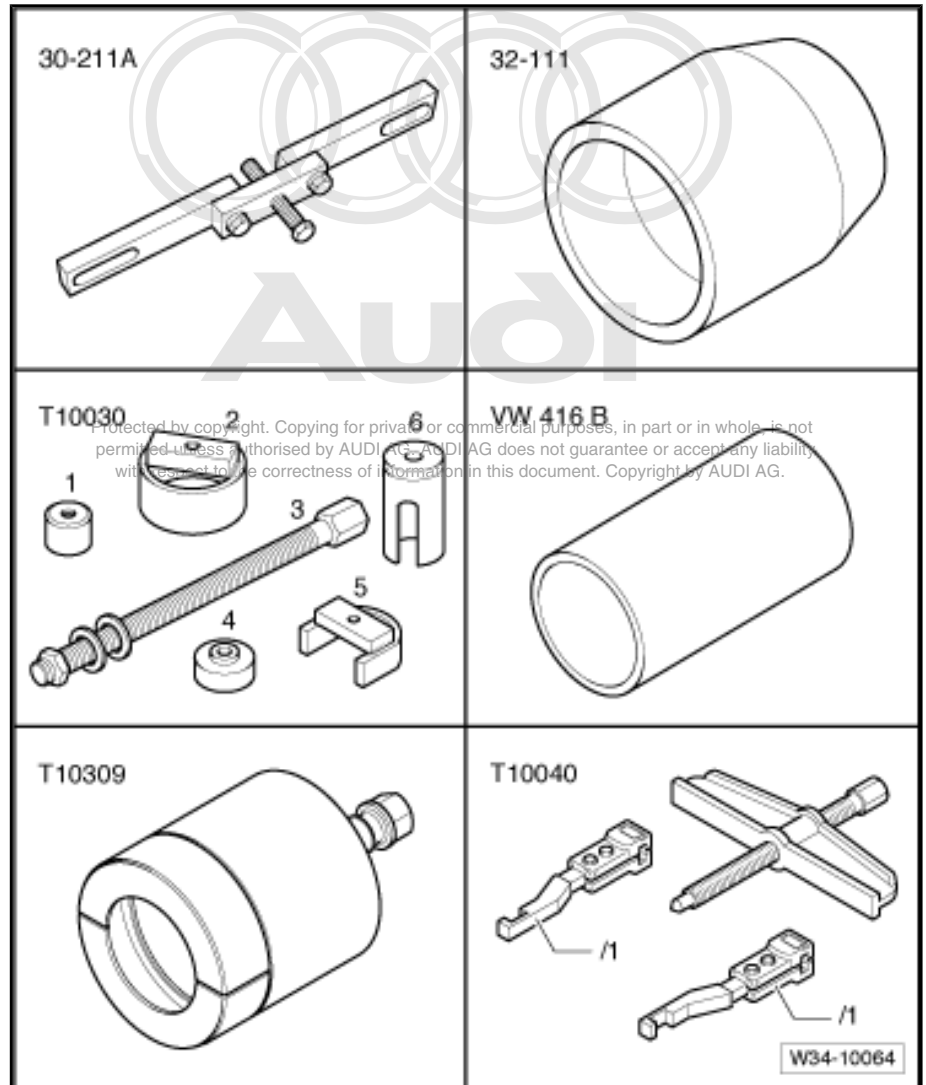
Special tools and workshop equipment required

- ◆ Support plate - VW 309-
- ◆ Gearbox support - VW 353-
- ◆ Drift - VW 295-
- ◆ Drift sleeve - VW 244 B-
- ◆ Hot air blower - V.A.G 1416- or similar
- ◆ Torque wrench - V.A.G 1331-
- ◆ Stud M8x100

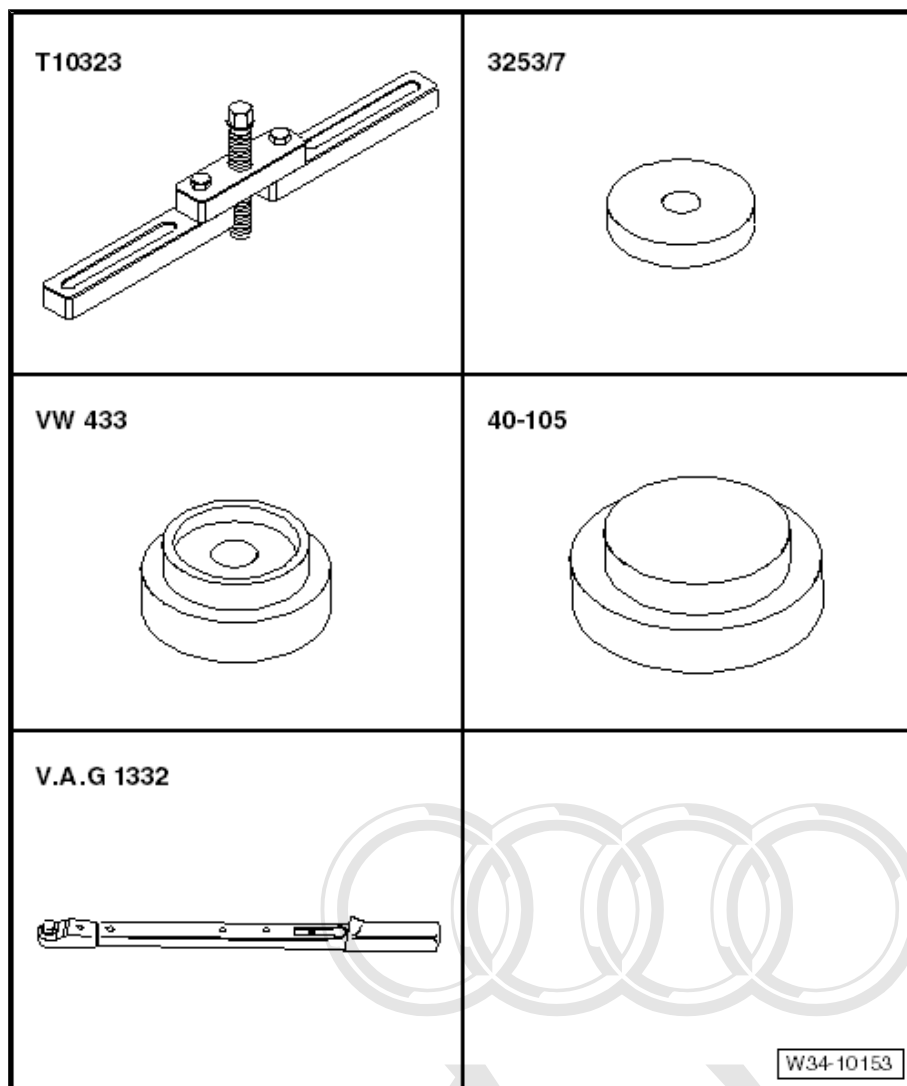


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- ◆ Support bridge - 30 - 211 A-
- ◆ Thrust piece - 32 - 111-
- ◆ Thrust piece of assembly tool - T10030/4-
- ◆ Tube - VW 416 B-
- ◆ Puller - T10309-
- ◆ Two-arm puller - T10040-
- ◆ With claws - T10040/2A-



- ◆ Support bridge - T10323-
- ◆ Assembly tool - 3253/7-
- ◆ Press tool - VW 433-
- ◆ Thrust plate - 40 - 105-
- ◆ Torque wrench - V.A.G 1332-



Procedure

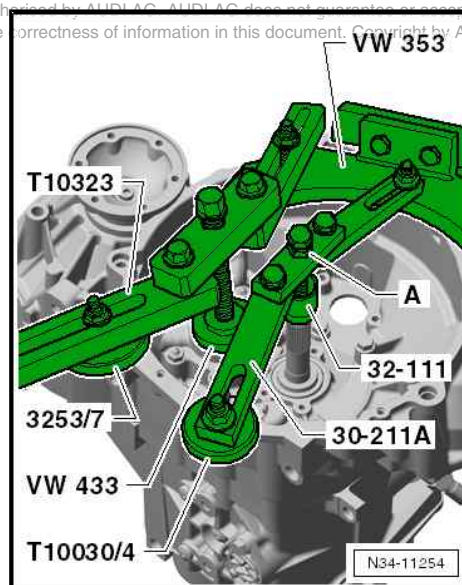
- Remove clutch release lever and release bearing ➔ [page 34](#)
- The bearings of the input shaft and output shaft must not be damaged when removing and installing 5th gear.
- For this reason, when attaching the gearbox to gearbox support - VW 353-, you must first attach the following tools to provide the necessary support:

Below input shaft:

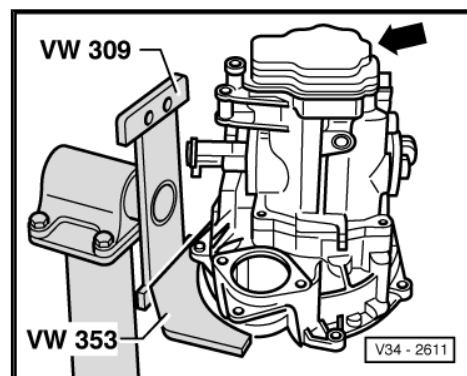
- ◆ Support bridge - 30 - 211 A-
- ◆ Thrust piece - 32 - 111-
- ◆ Thrust piece - T10030/4-
- The input shaft should not be supported by the thrust piece - 32 - 111- until it becomes necessary later on.

Below bearing mounting for output shaft:

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

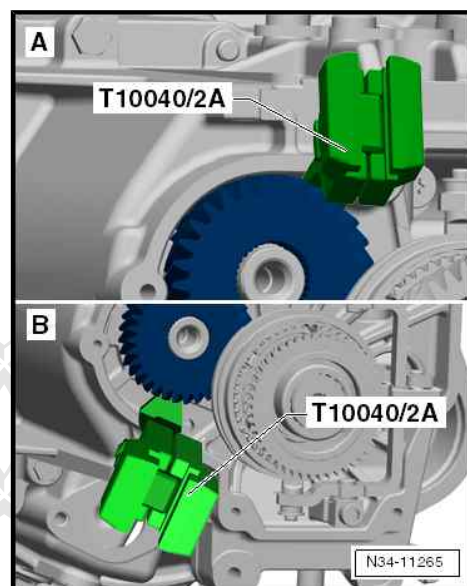


- Secure gearbox on gearbox support - VW 353- .
- Unbolt gearbox housing cover -arrow-.



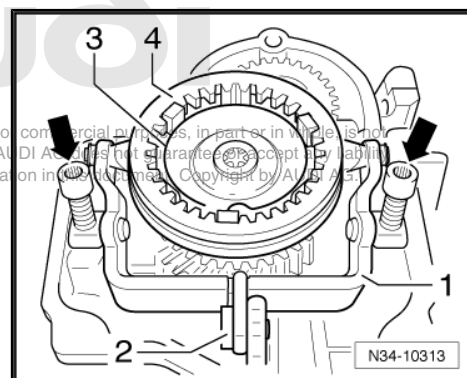
- Check whether claws - T10040/2A- can be applied correctly below 5th gear wheel.

If claws - T10040/2A- cannot be applied correctly:	
-A- Claws - T10040/2A- foul against: ◆ side of gearbox housing ◆ ribs in gearbox housing below gear wheel	In this case the 5th gear synchro-hub, 5th gear wheel and gearbox housing have to be removed together ⇒ page 34 .
-B- Claws - T10040/2A- foul against ribs in gearbox housing below gear wheel.	
If claws - T10040/2A- can be applied correctly:	
5th gear can be removed separately ⇒ page 113	



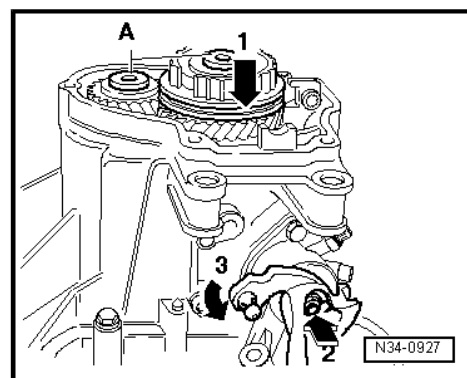
Removing 5th gear separately

- Cover over openings with a cloth.
- Set selector fork -1- in neutral position.
- Unscrew bolt -2- with 5th gear selector jaw.
- Then remove both bolts -arrows- for pivot pins.
- Pull out pivot pins.
- Remove selector fork.
- Spring -3- and locking collar -4- do not have to be removed.
- Remove bolts -A- for synchro-hub and 5th gear wheel; to do this engage 5th gear -arrow 1- and 1st gear -arrows 2- and -3-.
- The input and output shafts are both locked when these two gears are engaged. The two bolts can now be loosened.



Note

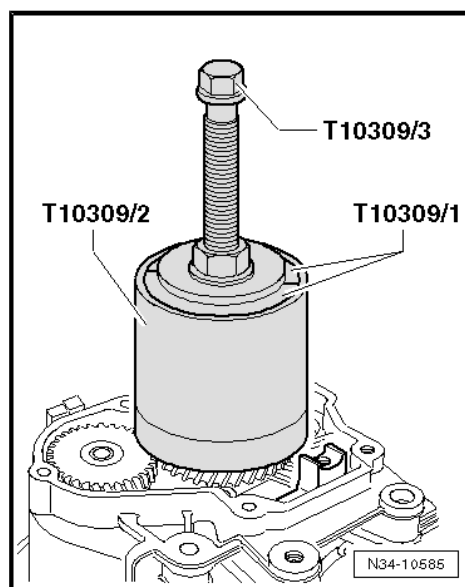
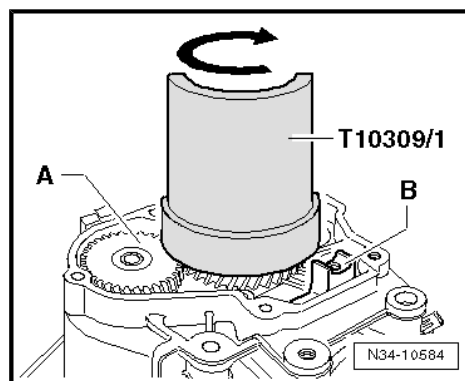
If the shafts are not being renewed, carefully clean remaining locking fluid out of tapped holes using a thread tap.



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

Use puller - T10309- .

- First insert shell half - T10309/1- between 5th gear wheel -A- and mounting for 5th gear selector fork -B-.
- Shell half - T10309/1- must be positioned underneath synchro-ring.
- If necessary, press shell half into end position.
- Then turn shell half - T10309/1- to opposite side in direction of -arrow-.
- Introduce thread insert - T10309/3- into shell half .
- Now fit second shell half - T10309/1- and slide tube - T10309/2- onto tool.
- Check synchro-hub for damage after removal.
- Renew synchro-ring.
- Remove 5th speed selector gear with needle bearing.



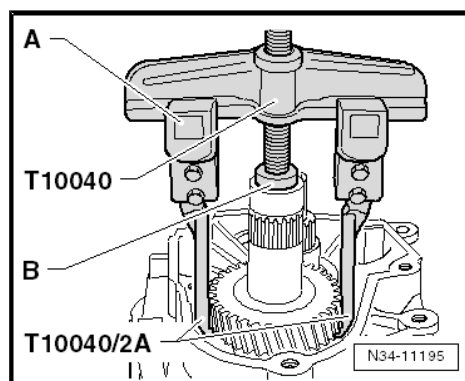
- Pull off 5th gear wheel (illustration shows a different gearbox).
- First fit claws -A-.
- B - Thrust plate - 40 - 105-



Note

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

⇒ ["7.13 Installing 5th gear and gearbox housing cover", page 125](#)



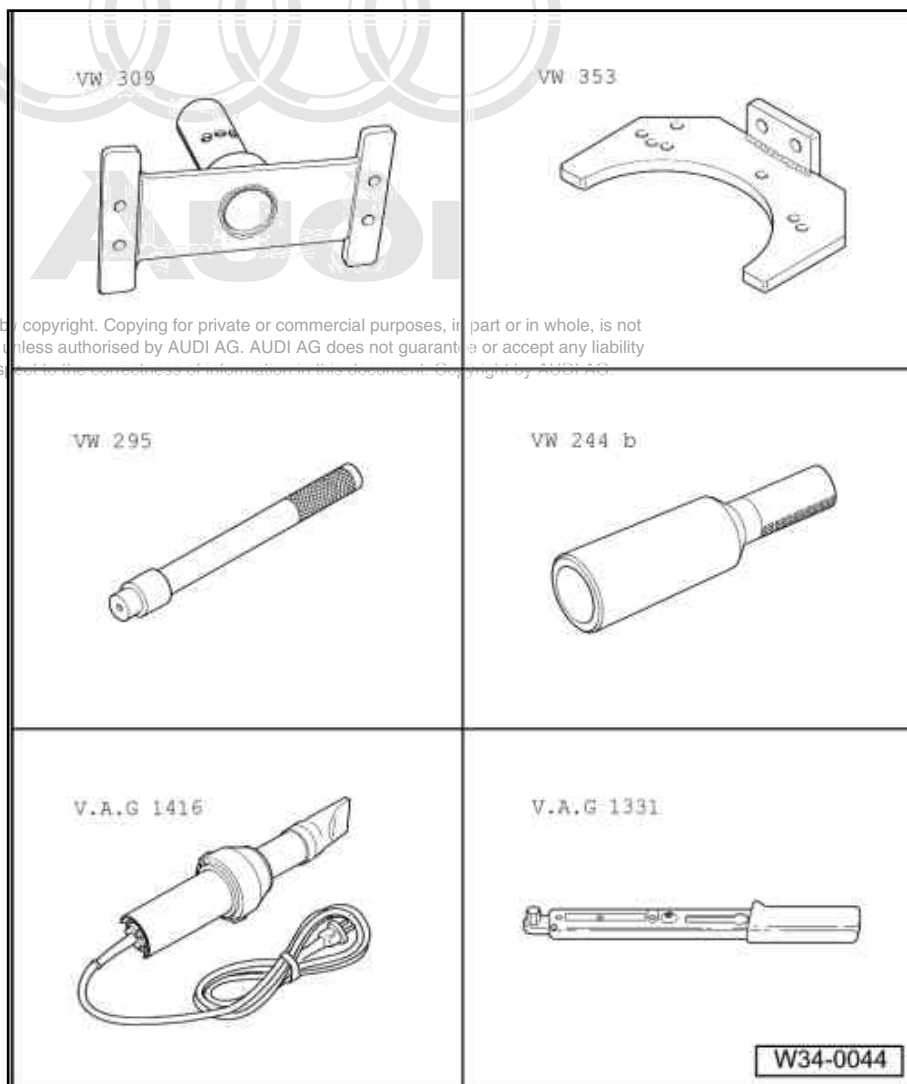
7.12 Dismantling and assembling gearbox

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

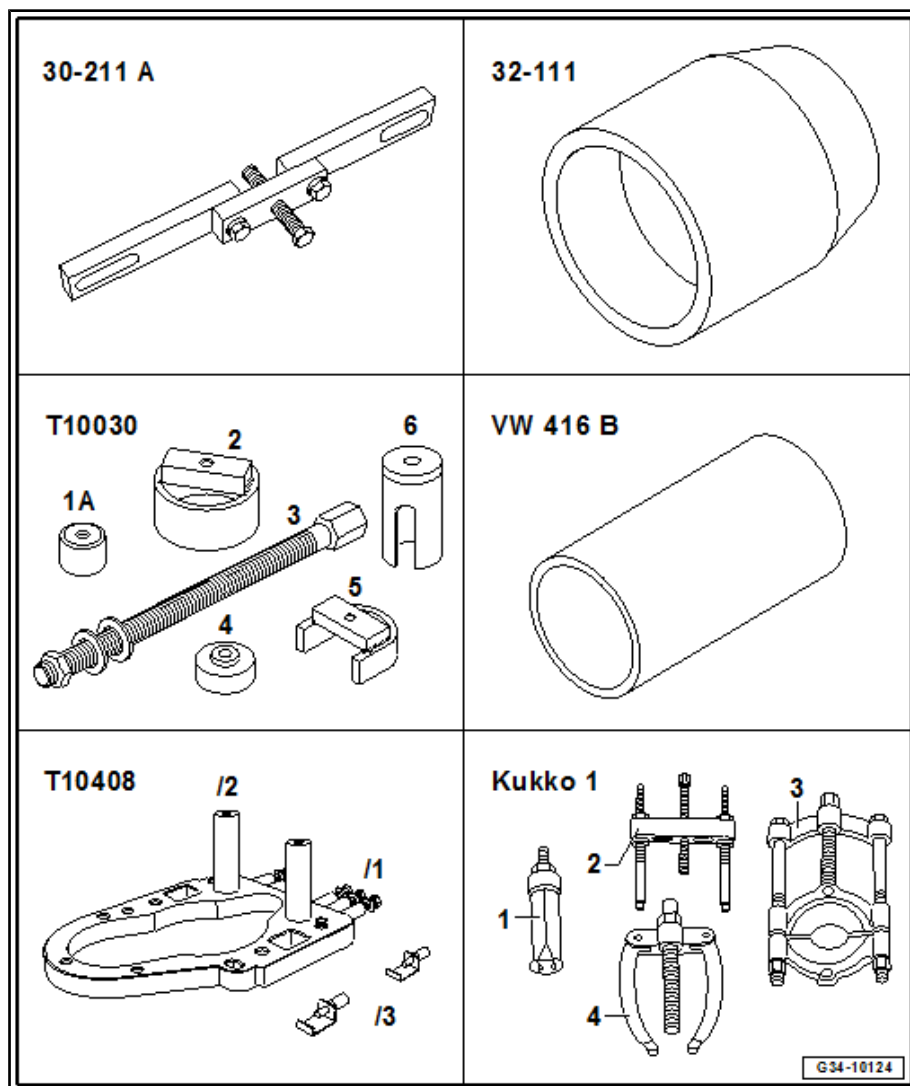
Special tools and workshop equipment required

- ◆ Support plate - VW 309-
- ◆ Gearbox support - VW 353-
- ◆ Drift - VW 295-
- ◆ Drift sleeve - VW 244 B-
- ◆ Hot air blower - V.A.G 1416- or similar
- ◆ Torque wrench - V.A.G 1331-
- ◆ Stud M8x100

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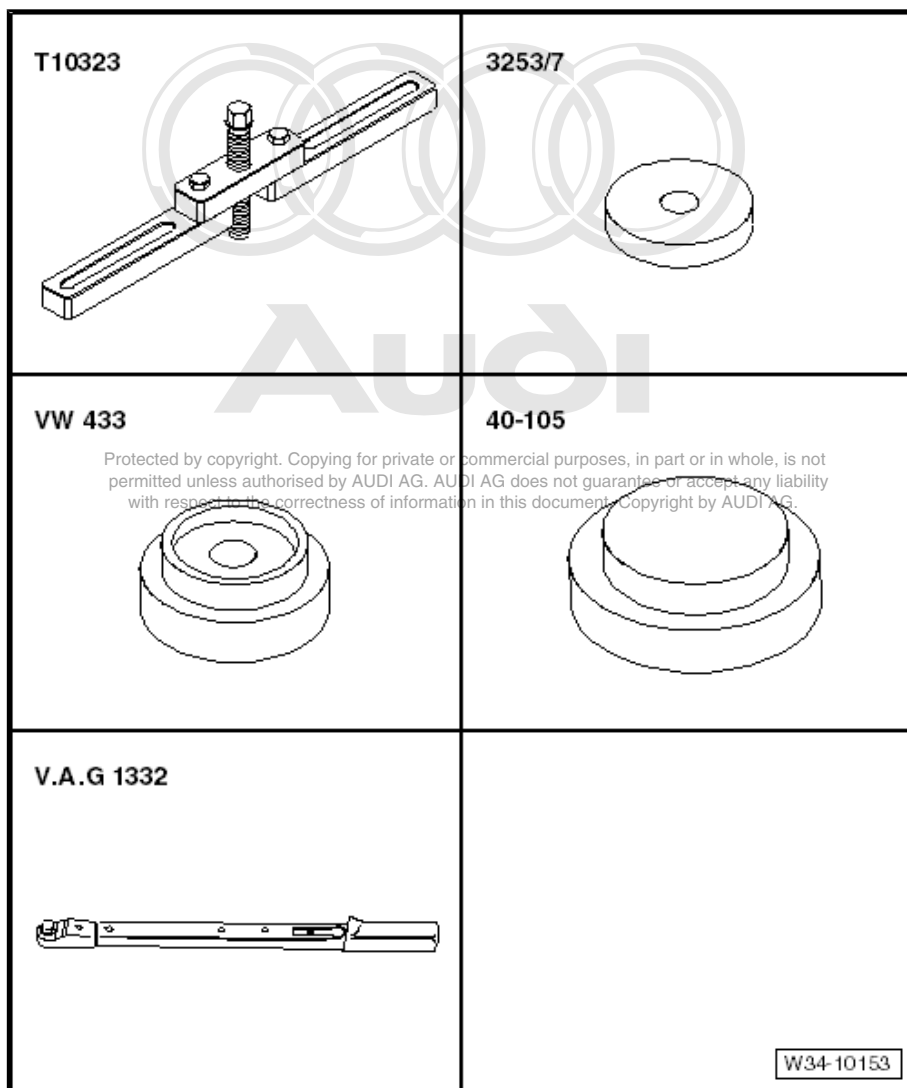


- ◆ Support bridge - 30 - 211 A-
- ◆ Thrust piece - 32 - 111-
- ◆ Thrust piece -T10030/4-
from assembly tool -
T10030-
- ◆ Tube - VW 416 B-
- ◆ Puller plate - T10408-
- ◆ -2- Puller - Kukko 18/1-
- ◆ Hexagon bolts M7x35 with
washers

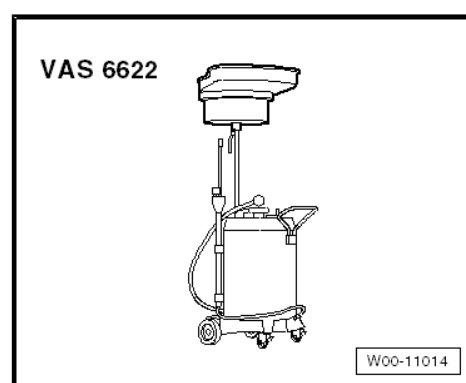


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- ◆ Support bridge - T10323-
- ◆ Assembly tool - 3253/7-
- ◆ Press tool - VW 433-
- ◆ Torque wrench - V.A.G 1332-



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



Dismantling gearbox

- Remove clutch release lever, release bearing and guide sleeve ➔ [page 34](#) .

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

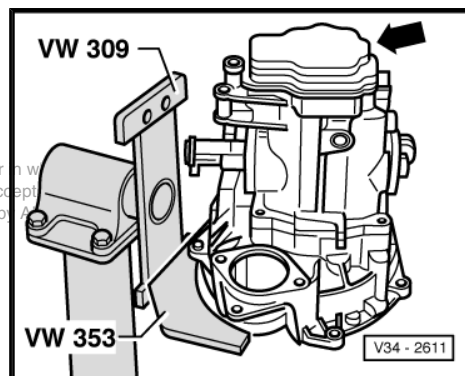
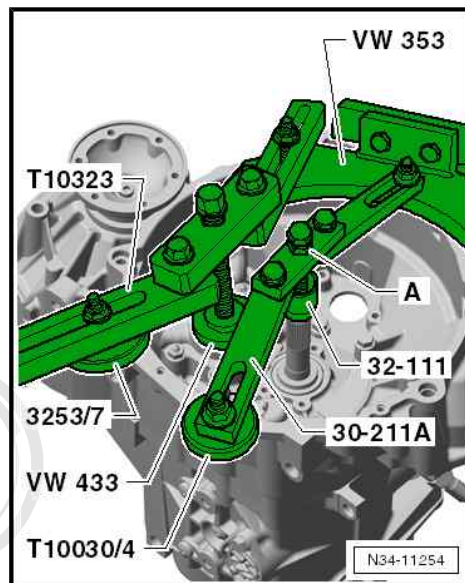
Below input shaft:

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

Below bearing mounting for output shaft:

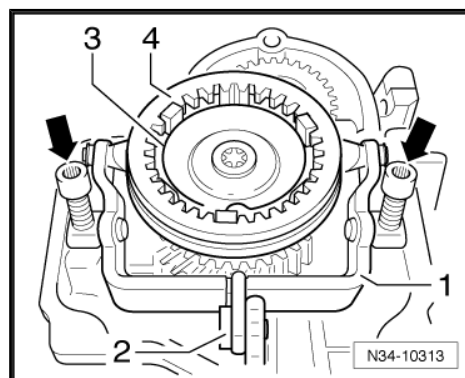
- ◆ Support bridge - T10323-
- ◆ Assembly tool - 3253/7-
- ◆ Press tool - VW 433-

- Secure gearbox on gearbox support - VW 353- .
- Place used oil collection and extraction unit - VAS 6622- underneath.
- Unscrew oil filler plug and oil drain plug.
- Drain off gear oil.
- Unbolt gearbox housing cover -arrow-.



Remove 5th gear selector fork as follows:

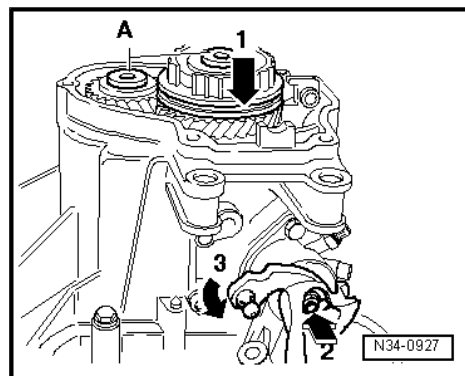
- Cover over openings with a cloth.
- Set selector fork -1- in neutral position.
- Unscrew bolt -2- with 5th gear selector jaw.
- Then remove both bolts -arrows- for pivot pins.
- Pull out pivot pins.
- Remove selector fork.
- Spring -3- and locking collar -4- do not have to be removed.



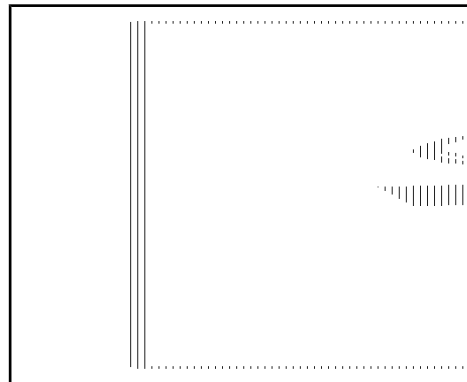
- Remove bolts -A- for synchro-hub and 5th gear wheel, to do this select 5th gear -arrow 1- and 1st gear -arrows 2- and -3-.
- The input and output shafts are both locked when these two gears are engaged. The two bolts can now be loosened.

Note

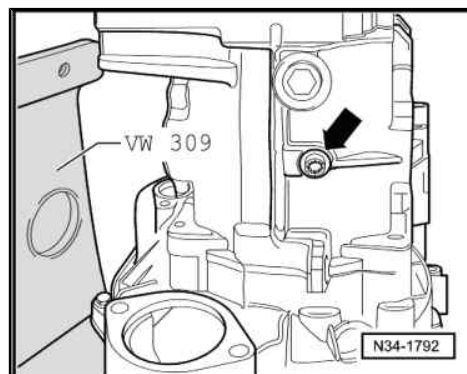
If the shafts are not being renewed, carefully clean remaining locking fluid out of tapped holes using a thread tap.



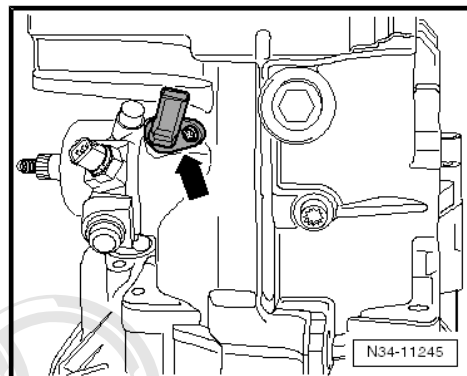
- Remove both bolts -arrows- for reverse shaft support.



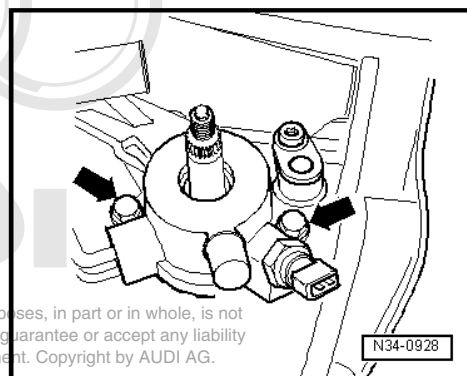
- Now remove 3rd bolt -arrow- for reverse shaft support.



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

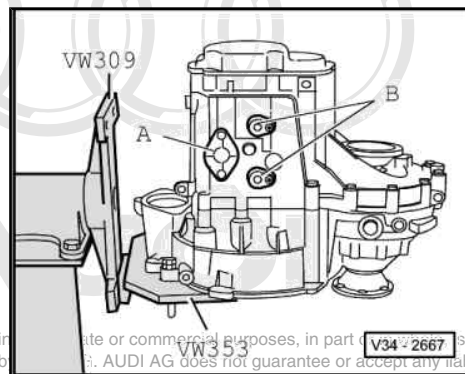


- Remove selector shaft with selector mechanism cover. To do this, set selector shaft in neutral position. Then remove bolts -arrows- and pull selector shaft out of gearbox housing.



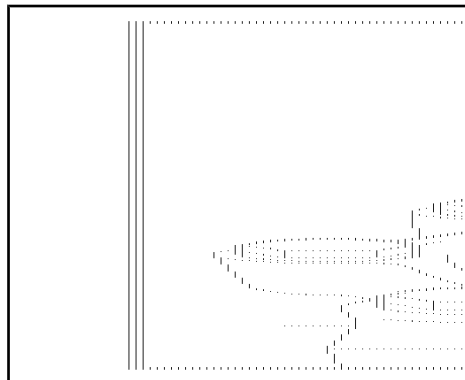
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- Remove cover plate -A- and pivot pins -B- from underside of gearbox.



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

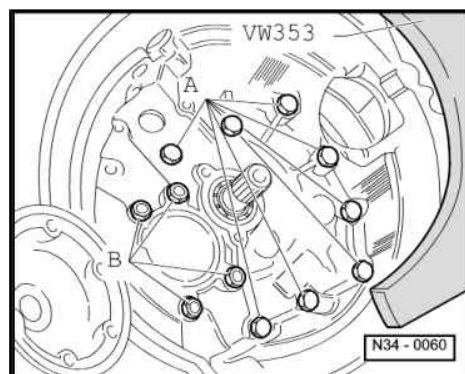


- Remove bolts -A- securing gearbox housing from inside clutch housing.

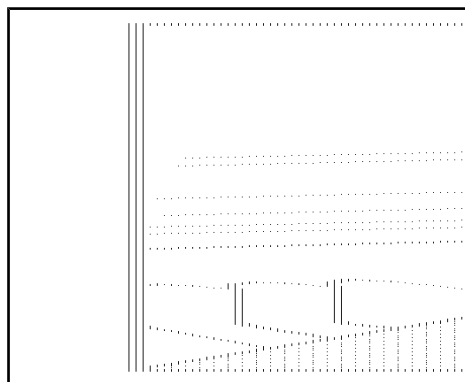


Note

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



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



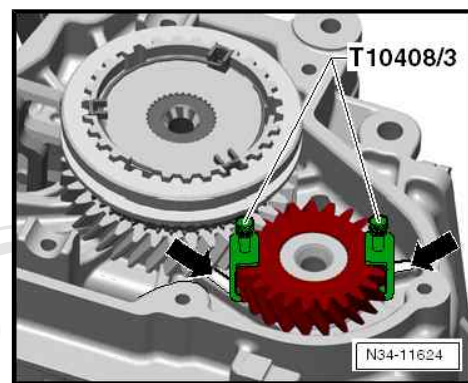
Pull off the following components, together with the gearbox housing:

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



Note

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



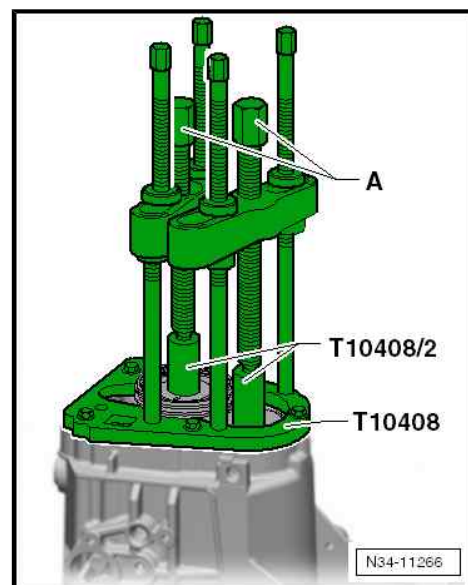
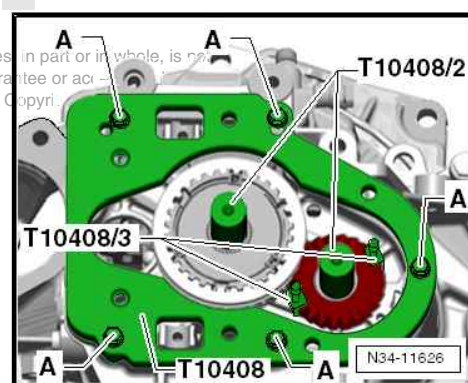
Use puller plate - T10408- together with the following special tools:

- ◆ Thrust blocks - T10408/2-
- ◆ Brackets - T10408/3-
- ◆ Puller Kukko 18/1
- Bolt on puller plate - T10408- using threaded holes for gearbox housing cover.

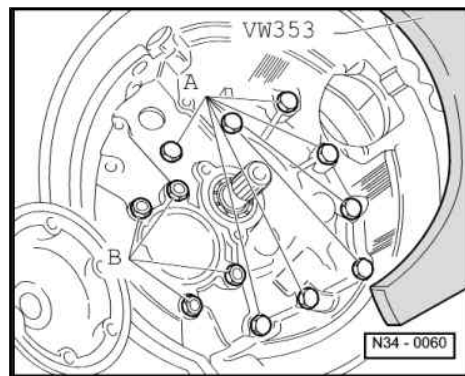
A - Hexagon bolts M7 x 35 with washers

Tightening torque: 18 Nm

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

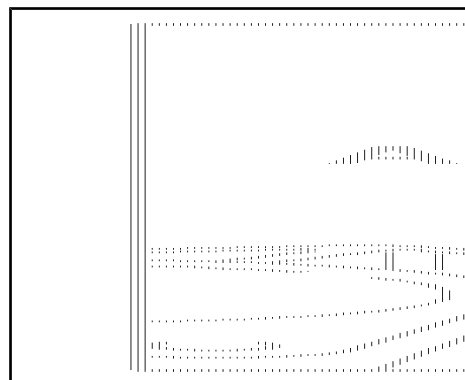


- Remove nuts -B- for output shaft bearing mounting.

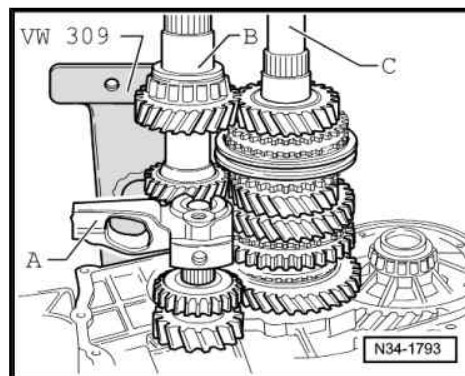


- Remove selector forks -A- together with selector plates.
- Unscrew bolt for reverse selector mechanism -B-.

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



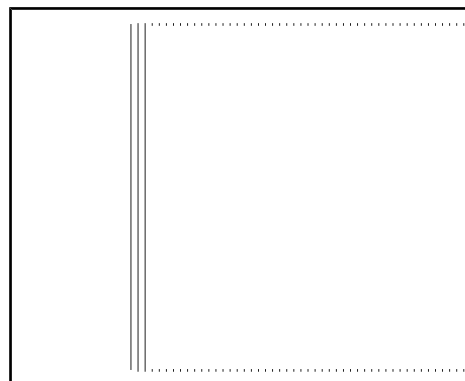
Assembling gearbox

- Fit differential.
- Renew seals -arrows- for output shaft bearing mounting after removal.

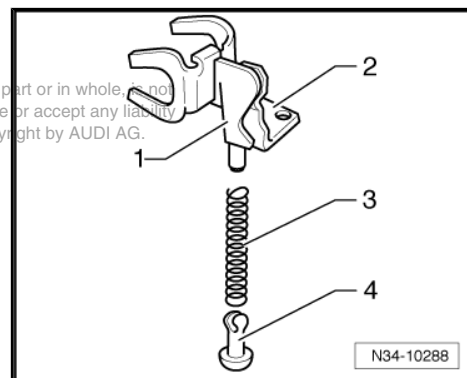
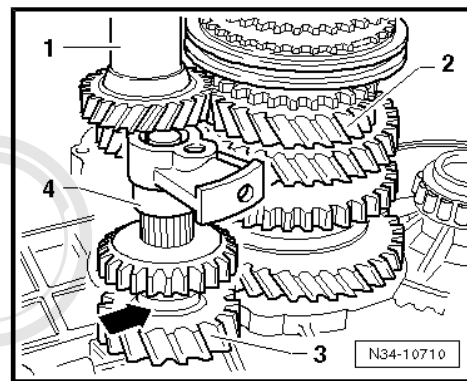


Note

The illustration only shows 3 of the 4 seals.

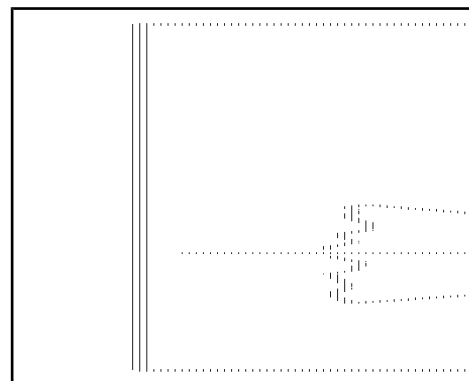


- Insert input shaft -1- and output shaft -2- together.
- Tighten nuts for output shaft bearing mounting.
- Place reverse gear wheel -3- on needle bearing in clutch housing.
- Shoulder -arrow- faces away from clutch housing.
- Check that reverse shaft -4- is complete ➔ [page 169](#) ; do not fit reverse shaft support onto reverse shaft yet.
- Insert reverse shaft in clutch housing.
- Clean locking fluid residue from all tapped holes in reverse shaft support (residue can be removed using a tap).
- Install reverse shaft support.
- Fit reverse gear selector fork -1- with support for reverse gear selector fork -2-, spring -3- and slide -4-.

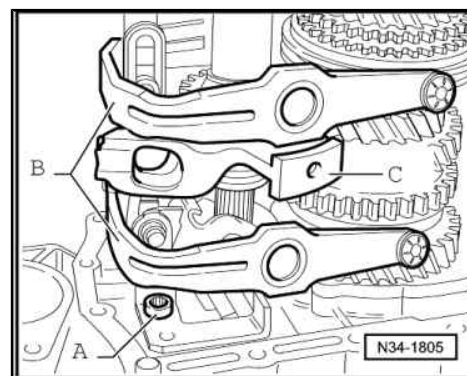


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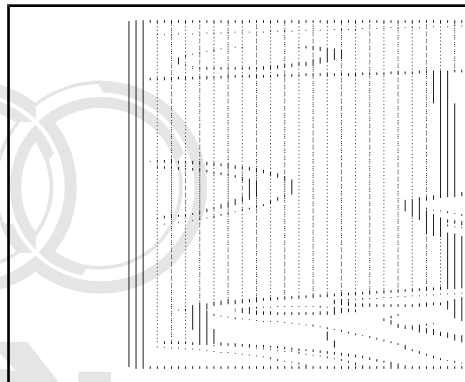
Installation position: reverse gear



- Tighten bolt for reverse gear selector mechanism -A-.
- Install selector forks -B- together with selector plates.
- Pin on reverse shaft support -C- is located in front of selector plates.

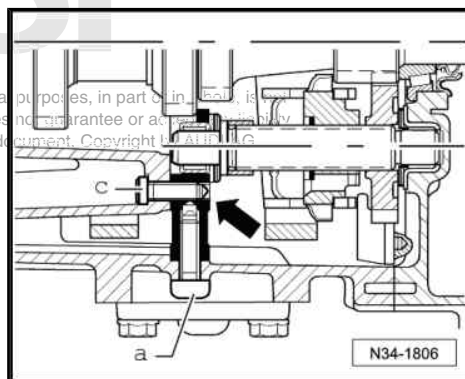


- Screw M8 x 100 mm stud -A- into reverse shaft support so that the shaft is aligned after fitting gearbox housing.
- Align selector plates.
- The detent segments must be positioned in the grooves on the locking collars.
- Apply sealant -AMV 188 200 03- evenly to sealing surface of clutch housing.
- Fit gearbox housing.



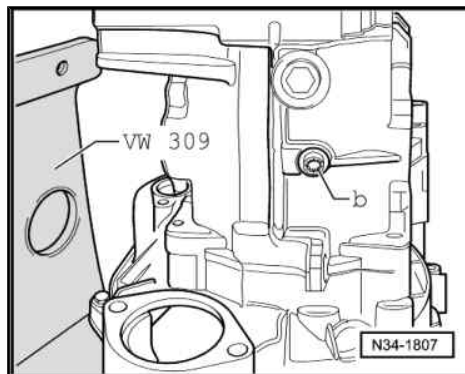
Install bolts for reverse shaft support -arrow- as follows:

- Fit bolt -a-.
- Remove stud -A- (⇒ top illustration).
- Fit bolt -c-.

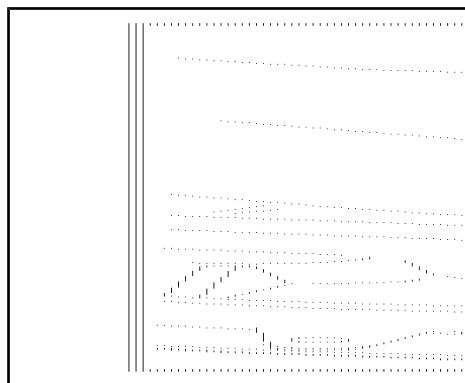


Tightening sequence:

- Tighten bolt -a- (see illustration above).
- Tighten bolt -b-.
- Tighten bolt -c- (see illustration above).

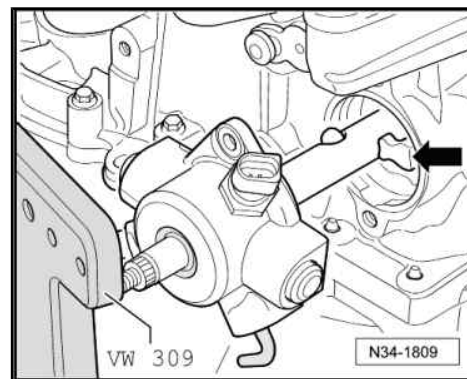


- Install pivot pins -arrow- for selector forks. To do this align selector mechanism using a screwdriver so that the relevant pivot pin can be inserted.
- Apply sealant -AMV 188 200 03- evenly to sealing surface of cover plate.
- Fit cover plate for selector shaft.

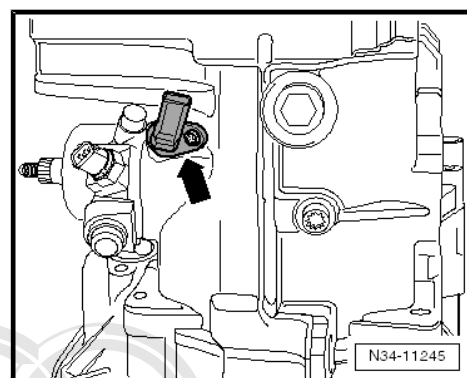


Install selector shaft and selector mechanism cover as follows:

- Set selector plates in neutral position.
- Apply sealant -AMV 188 200 03- evenly to sealing surface of selector mechanism cover.
- Put selector shaft in neutral position.
- Position selector shaft so that selector finger -arrow- is engaged in selector plates.
- Install and secure selector shaft cover.



- Gearbox for vehicles with start/stop system: install gearbox neutral position sender - G701- -arrow- and tighten securing bolt.
- Install both flange shafts with springs, thrust washers and tapered rings ⇒ [page 177](#) .



Tightening torques

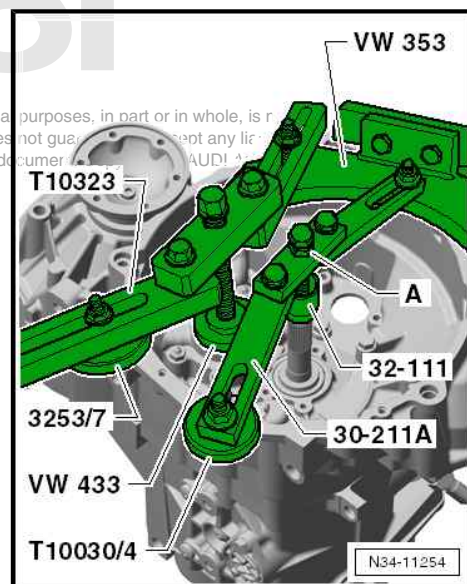
- ◆ ⇒ [“7.4 Exploded view - gearbox housing and selector mechanism”, page 100](#)
- ◆ Nuts for output shaft bearing mounting
⇒ [“7.6 Exploded view - input shaft, output shaft, differential and selector forks”, page 102](#)
- ◆ Flange shaft to gearbox
⇒ [“2.1 Exploded view - differential”, page 177](#)

Installing 5th gear and gearbox housing cover ⇒ [page 125](#)

7.13 Installing 5th gear and gearbox housing cover

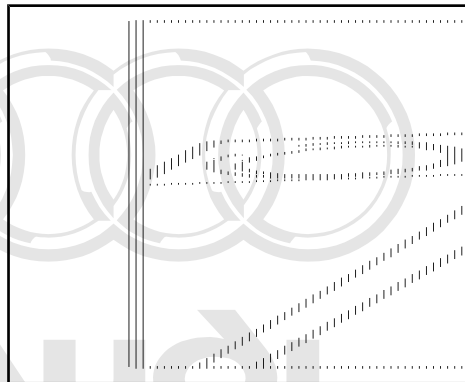
For special tools required, refer to procedure for “Removing gearbox housing cover and 5th gear” ⇒ [page 109](#) .

- Please ensure that the support bridge - 30 - 211 A- and support bridge - T10323- are fitted.
- Secure bolt of support bridge - 30 - 211 A- with lock nut -A-.



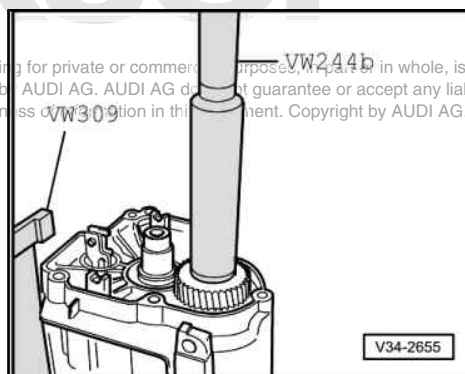
Installation position of 5th gear wheel

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



- Drive on 5th gear wheel.

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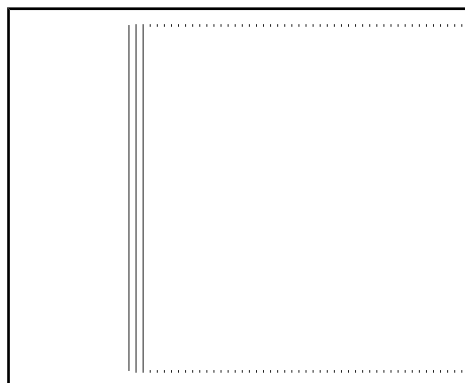


Checking 5th gear synchro-ring

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

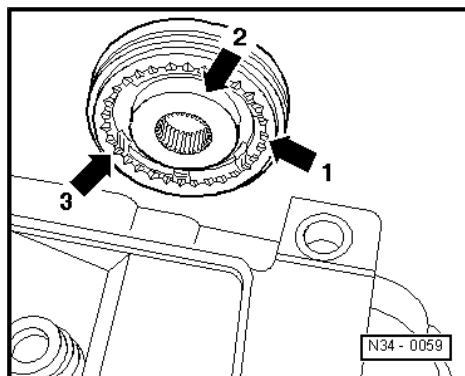
Gap -a-	Installation depth	Wear limit
5th gear	1.1 ... 1.7 mm	0.5 mm

- Install 5th speed selector gear with needle bearing.
- Fit 5th gear synchro-ring on selector gear.
- If previously dismantled, assemble 5th gear synchro-hub/locking collar before installing ⇒ [page 142](#) .



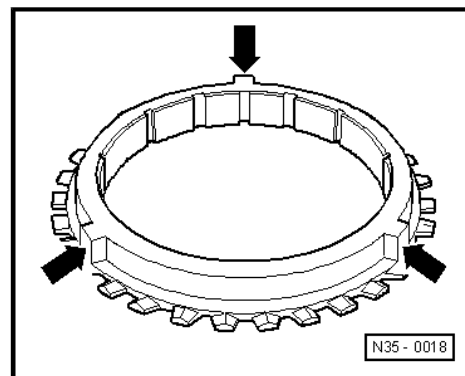
Installation position of 5th gear synchro-hub/locking collar

- The pointed teeth of the locking collar -arrow 1- and the high shoulder of the synchro-hub -arrow 2- face the gearbox housing.
- Retainers in synchro-hub -arrow 3- align with cast locking pieces on synchro-ring (⇒ [page 127](#) below).



5th gear synchro-ring with cast locking pieces

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

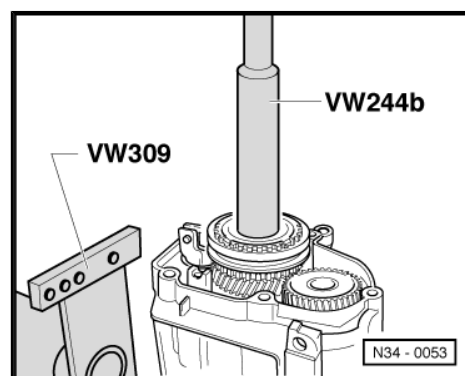


- Knock on 5th gear synchro-hub.



Note

When driving on, ensure clearance for synchro-ring.



- Loosen support for input shaft.

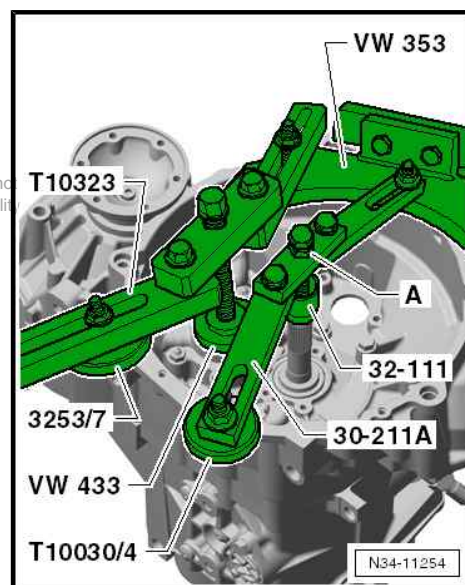


WARNING

Risk of injury

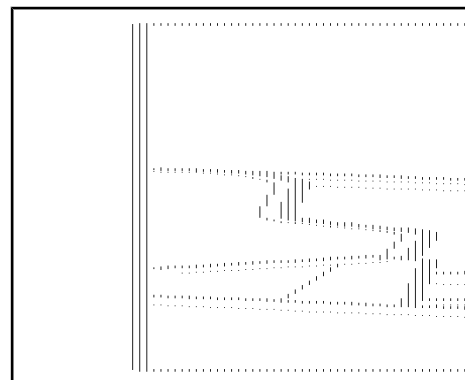
◆ **Wear protective gloves.**

- Use thread tap to remove any remaining locking fluid from threaded holes for bolts securing synchro-hub and 5th gear wheel. Otherwise there is a risk that the bolts will shear off.
- Screw in securing bolts for synchro-hub and 5th gear wheel.

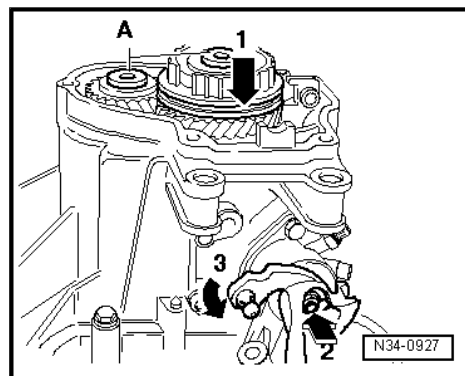


Installation position of dished springs for securing bolts for 5th gear wheel and synchro-hub

Concave side -arrows- faces 5th gear.

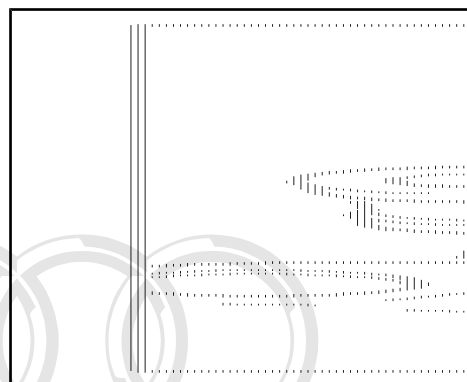


- Tighten securing bolts -A- for synchro-hub and 5th gear wheel; to do this select 5th gear -arrow 1- and 1st gear -arrows 2- and -3-.
- The input and output shafts are both locked when these two gears are engaged. The two bolts can now be tightened.
- Install 5th gear selector fork.



Adjusting 5th gear

- Engage 5th gear. Loosen bolt -1-. Press locking collar and selector jaw in direction of arrows, then tighten bolt -1- to 25 Nm.
- Check adjustment: It should not be possible to slide a 0.2 mm feeler gauge between locking collar and selector gear. Repeat adjustment if necessary.
- Disengage 5th gear. Locking collar should now be in the neutral position. Synchro-ring should move freely.
- Select all gears.
- Install gearbox housing cover ➔ [page 98](#) .
- Install release bearing guide sleeve ➔ [page 16](#) .
- Install clutch release lever and release bearing ➔ [page 34](#) .
- Fill up gear oil ➔ [page 91](#) .



Tightening torques

- ◆ ➔ [“7.3 Exploded view - gearbox housing cover and 5th gear”, page 98](#)
- ◆ 5th gear selector jaw
➔ [“7.7 Exploded view - selector forks”, page 102](#)

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8 Gearbox housing, clutch housing

⇒ ["8.1 Exploded view - gearbox housing and clutch housing", page 129](#)

⇒ ["8.2 Servicing gearbox housing", page 131](#)

⇒ ["8.3 Servicing clutch housing", page 132](#)

8.1 Exploded view - gearbox housing and clutch housing

1 - Gearbox housing

- ☐ If renewed: Adjust input shaft and differential
⇒ [page 193](#)

2 - Needle bearing

- ☐ For output shaft
- ☐ Removing ⇒ [page 131](#)
- ☐ Installing and securing
⇒ [page 132](#)

3 - Oil filler plug

- ☐ Gear oil level cannot be checked by removing oil filler plug
- ☐ If gearbox was dismantled, fill with gear oil before installing
⇒ [page 91](#)
- ☐ 35 Nm

4 - Tapered roller bearing outer race

- ☐ For output shaft
- ☐ ⇒ [page 153](#)
- ☐ If renewed: Adjust output shaft ⇒ [page 163](#)

5 - Shim

- ☐ For output shaft
- ☐ Table of adjustments
⇒ [page 193](#)

6 - Shim

- ☐ For input shaft
- ☐ Table of adjustments
⇒ [page 193](#)

7 - Tapered roller bearing outer race

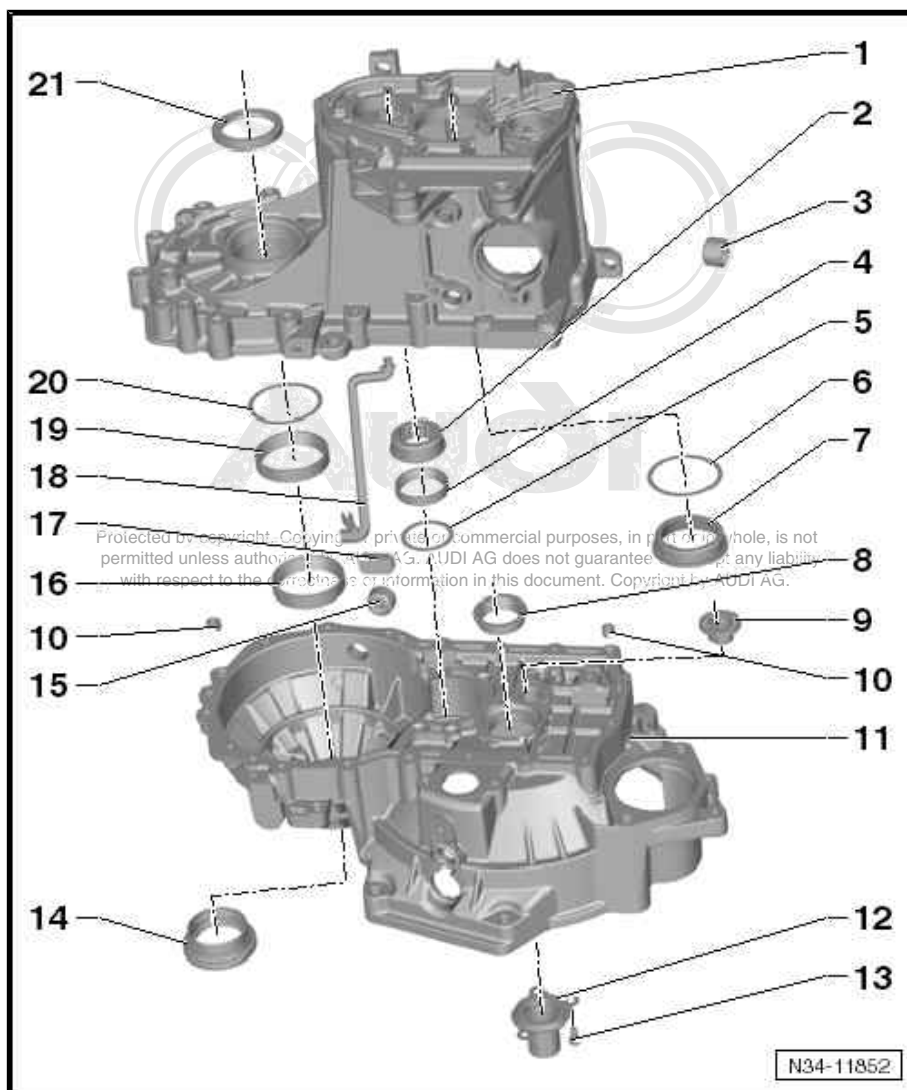
- ☐ For input shaft
- ☐ Removing and installing ⇒ [page 137](#)
- ☐ If renewed: Adjust input shaft ⇒ [page 142](#)

8 - Tapered roller bearing outer race

- ☐ For input shaft
- ☐ Removing and installing ⇒ [page 137](#)
- ☐ If renewed: Adjust input shaft ⇒ [page 142](#)

9 - Needle bearing

- ☐ Removing and installing ⇒ [page 169](#)





10 - Dowel sleeve

- ☐ 2x

11 - Clutch housing

- ☐ If renewed: ⇒ table of adjustments ⇒ [page 193](#)

12 - Guide sleeve

- ☐ With input shaft oil seal and vulcanised O-ring
- ☐ To remove or install, remove gearbox
- ☐ Knocking out oil seal ⇒ [page 132](#)
- ☐ Driving in oil seal ⇒ [page 132](#)
- ☐ Remove guide sleeve in order to renew oil seal
- ☐ If O-ring is damaged, renew both guide sleeve and O-ring

13 - Bolt

- ☐ Tightening torque ⇒ [Item 6 \(page 16\)](#)

14 - Oil seal with sleeve

- ☐ Renew oil seal together with sleeve
- ☐ Renewing ⇒ [page 174](#)

15 - Oil drain plug

- ☐ 35 Nm

16 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Pressing out and pressing in ⇒ [page 177](#)
- ☐ If renewed: adjust differential ⇒ [page 189](#)

17 - Magnet

- ☐ Held in place by joint surface of housing

18 - Oil collector

- ☐ Installing oil collector in gearbox housing ⇒ [page 132](#)

19 - Tapered roller bearing outer race

- ☐ For differential
- ☐ Pressing out and pressing in ⇒ [page 177](#)
- ☐ If renewed: adjust differential ⇒ [page 189](#)

20 - Shim

- ☐ For differential
- ☐ Table of adjustments ⇒ [page 193](#)

21 - Oil seal

- ☐ Renewing ⇒ [page 174](#)

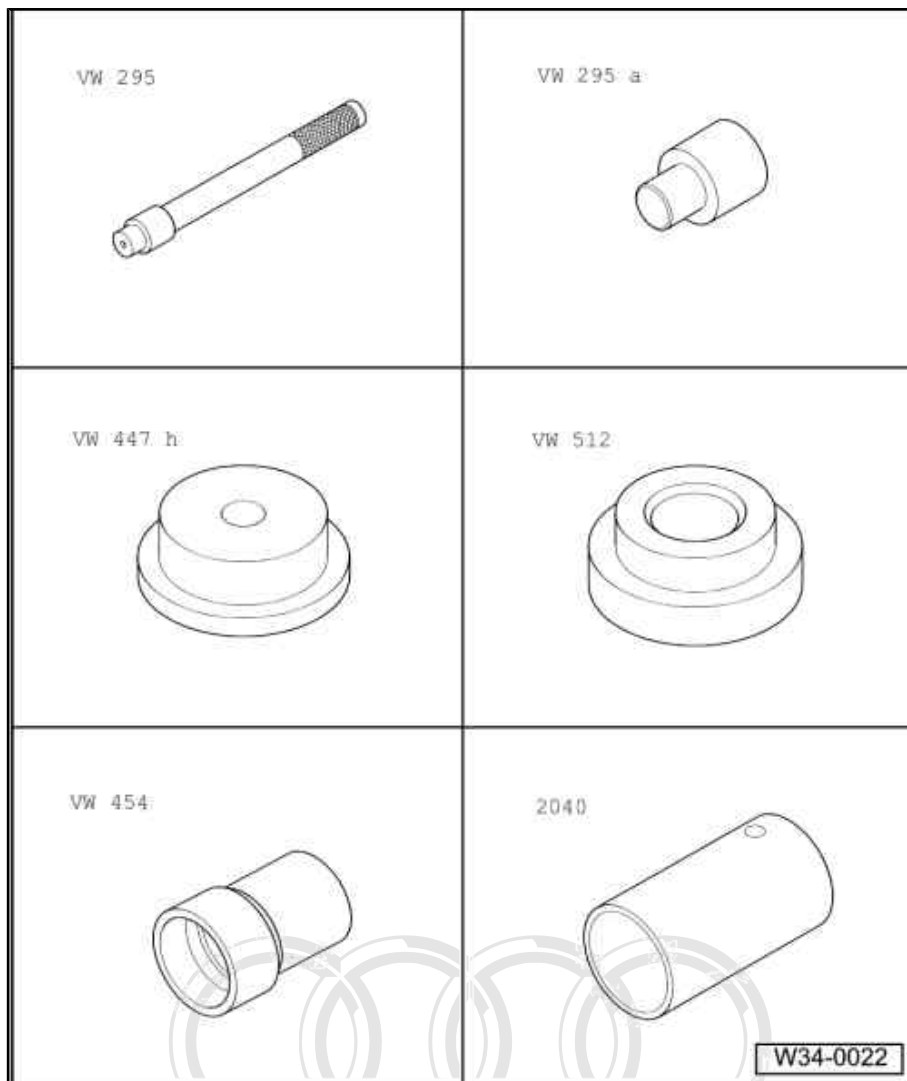


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8.2 Servicing gearbox housing

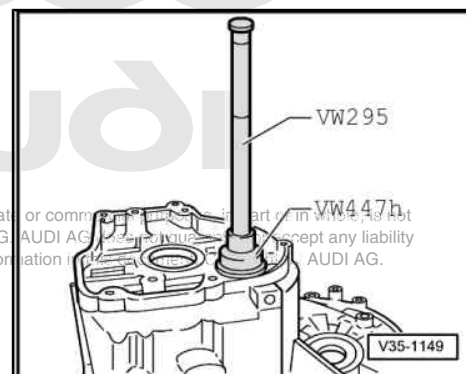
Special tools and workshop equipment required

- ◆ Drift - VW 295-
- ◆ Adapter - VW 295 A-
- ◆ Thrust plate - VW 447 H-
- ◆ Thrust pad - VW 512-
- ◆ Tube - VW 415 A-
- ◆ Press tool - VW 454-



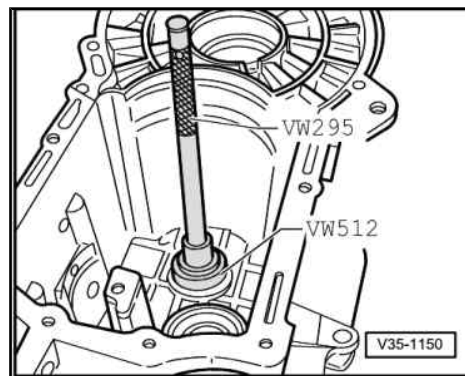
Driving out needle bearing

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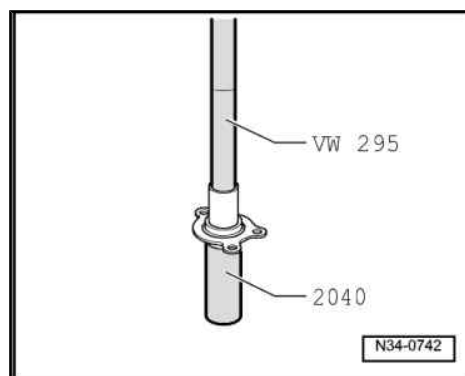


Driving in needle bearing onto stop

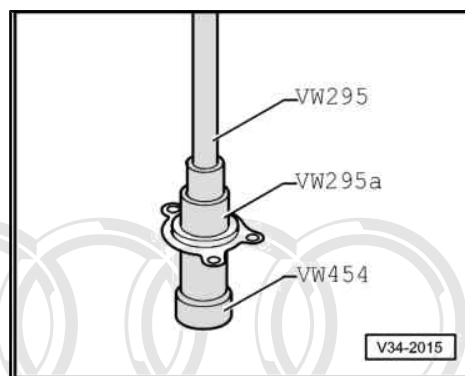
- Secure needle bearing in gearbox housing at three points (120° offset) with a punch.



Driving oil seal out of guide sleeve

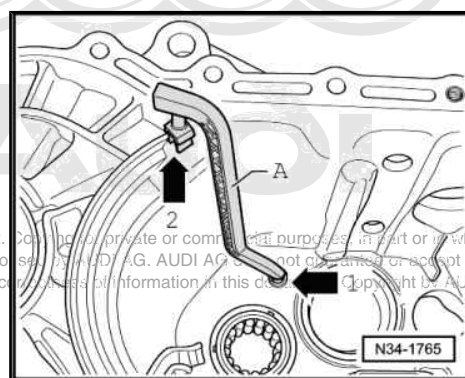


Driving oil seal into guide sleeve (drive in onto stop)



Installing oil collector -A- in gearbox housing

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

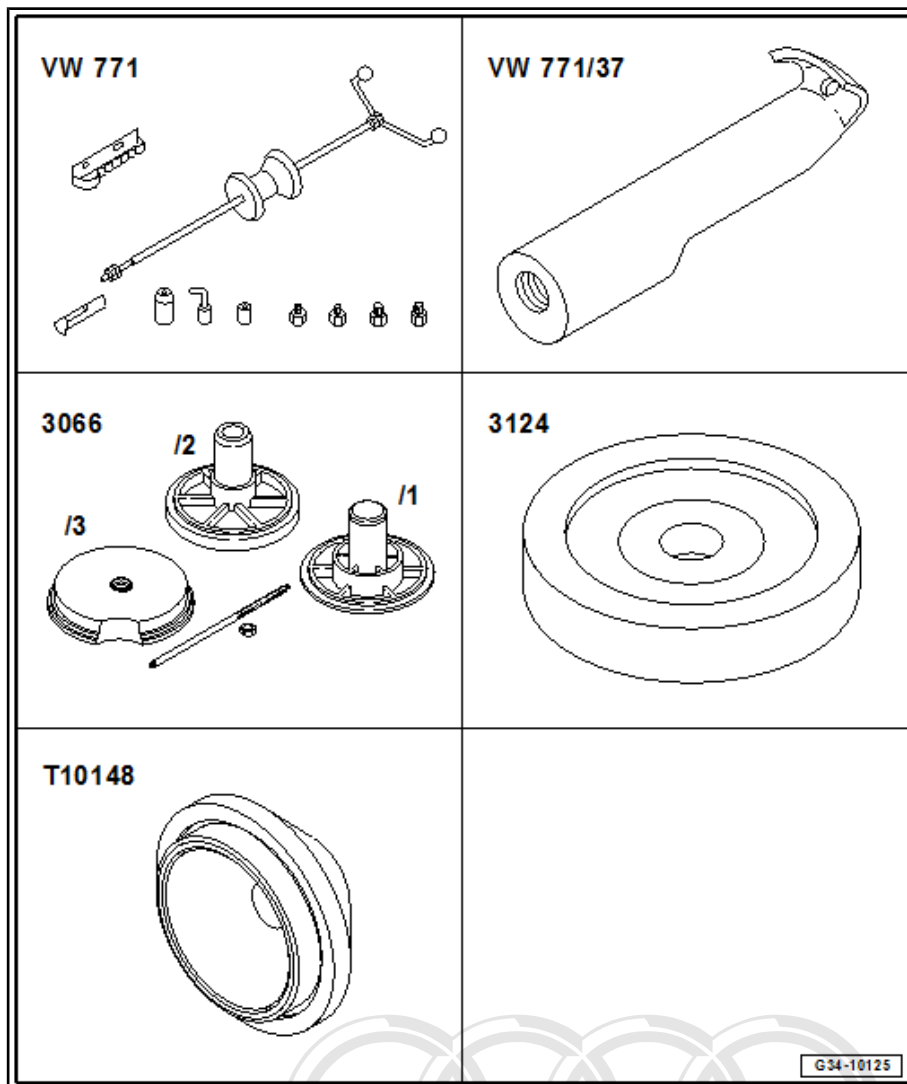


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8.3 Servicing clutch housing

Special tools and workshop equipment required

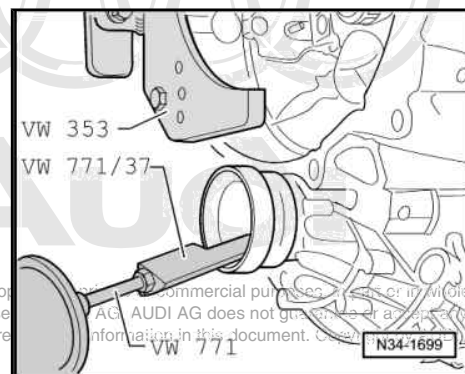
- ◆ Multi-purpose tool - VW 771-
- ◆ Puller hook - VW 771/37-
- ◆ Spindle from assembly tool - 3066-
- ◆ Thrust piece - 3124-
- ◆ Thrust piece - T10148-



Pulling out sleeve and oil seal

A shoulder is located on inside diameter of sleeve.

- Position puller hook - VW 771/37- behind shoulder inside sleeve.
- During pulling operation, press puller hook - VW 771/37- firmly in against sleeve.



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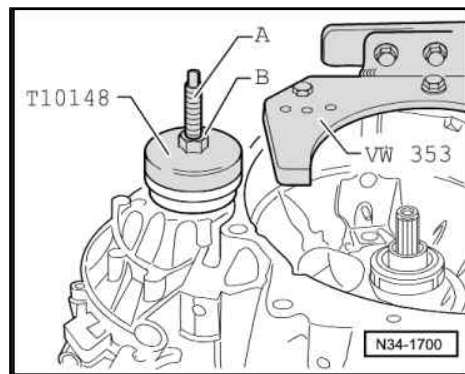
Drawing in sleeve and oil seal

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



Note

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



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35 – Gears, shafts

1 Input shaft

⇒ [“1.1 Exploded view - input shaft”, page 135](#)

⇒ [“1.2 Dismantling and assembling input shaft”, page 137](#)

⇒ [“1.3 Adjusting input shaft”, page 142](#)

⇒ [“1.4 Renewing input shaft oil seal”, page 147](#)

1.1 Exploded view - input shaft



Note

- ◆ When fitting new gear wheels or a new input shaft, refer to ⇒ *Electronic parts catalogue*.
- ◆ The input shaft must be re-adjusted if the position of tapered roller bearings is affected when renewing parts. Refer to table of adjustments ⇒ [page 193](#).

1 - Clutch housing

2 - Tapered roller bearing outer race

- ☐ Pressing out
⇒ [page 138](#)
- ☐ Pressing in
⇒ [page 139](#)

3 - Tapered roller bearing inner race

- ☐ Pressing off
⇒ [page 139](#)
- ☐ Pressing on
⇒ [page 139](#)

4 - Input shaft

- ☐ Adjusting ⇒ [page 142](#)

5 - 3rd gear wheel

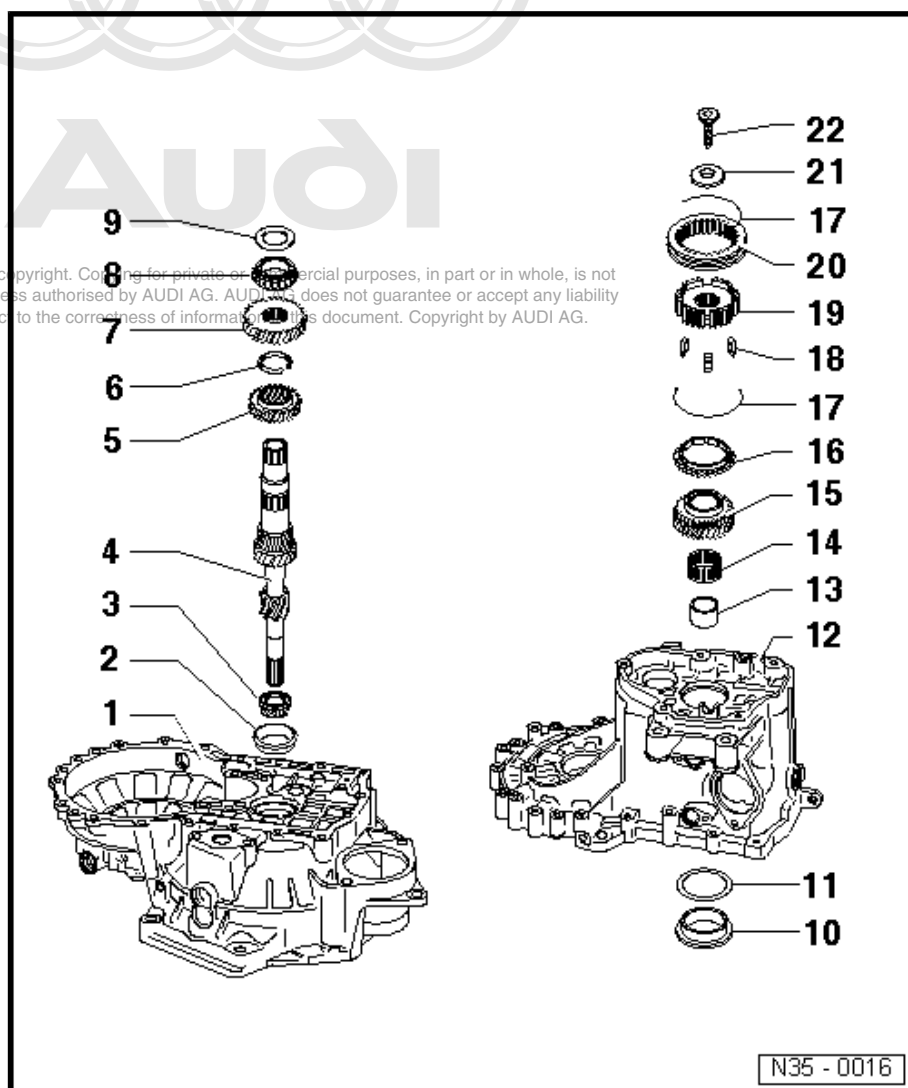
- ☐ Installation position:
Collar faces 4th gear
- ☐ Pressing off
⇒ [page 140](#)
- ☐ Pressing on
⇒ [page 140](#)

6 - Circlip

- ☐ Renew after removal

7 - 4th gear wheel

- ☐ Pressing off with tapered roller bearing outer race and sleeve
⇒ [page 139](#)
- ☐ Pressing on
⇒ [page 140](#)
- ☐ Shoulder faces towards 3rd gear



8 - Tapered roller bearing inner race

- ☐ Pressing off with 4th gear wheel and sleeve ⇒ [page 139](#)
- ☐ Pressing on ⇒ [page 140](#)

9 - Thrust washer

10 - Tapered roller bearing outer race

- ☐ Pressing out ⇒ [page 141](#)
- ☐ Pressing in ⇒ [page 141](#)

11 - Shim

- ☐ Determining thickness ⇒ [page 142](#)

12 - Gearbox housing

13 - Sleeve

- ☐ For needle bearing
- ☐ Pressing off with 4th gear wheel and tapered roller bearing inner race ⇒ [page 139](#)
- ☐ Pressing on ⇒ [page 141](#)
- ☐ Fit thrust washer before installing

14 - Needle bearing

15 - 5th speed selector gear

16 - 5th gear synchro-ring

- ☐ With cast locking pieces ⇒ [page 127](#)
- ☐ Checking for wear ⇒ [page 126](#)

17 - Spring

- ☐ Installation position ⇒ [page 142](#) and ⇒ [page 142](#)

18 - Locking pieces

- ☐ 3x
- ☐ Installation position ⇒ [page 141](#)

19 - 5th gear synchro-hub

- ☐ Pulling off from ⇒ [page 109](#) onwards

20 - 5th gear locking collar

- ☐ Pulling off with 5th gear synchro-hub from ⇒ [page 109](#) onwards

21 - Dished spring

- ☐ Installation position ⇒ [page 127](#)

22 - Bolt

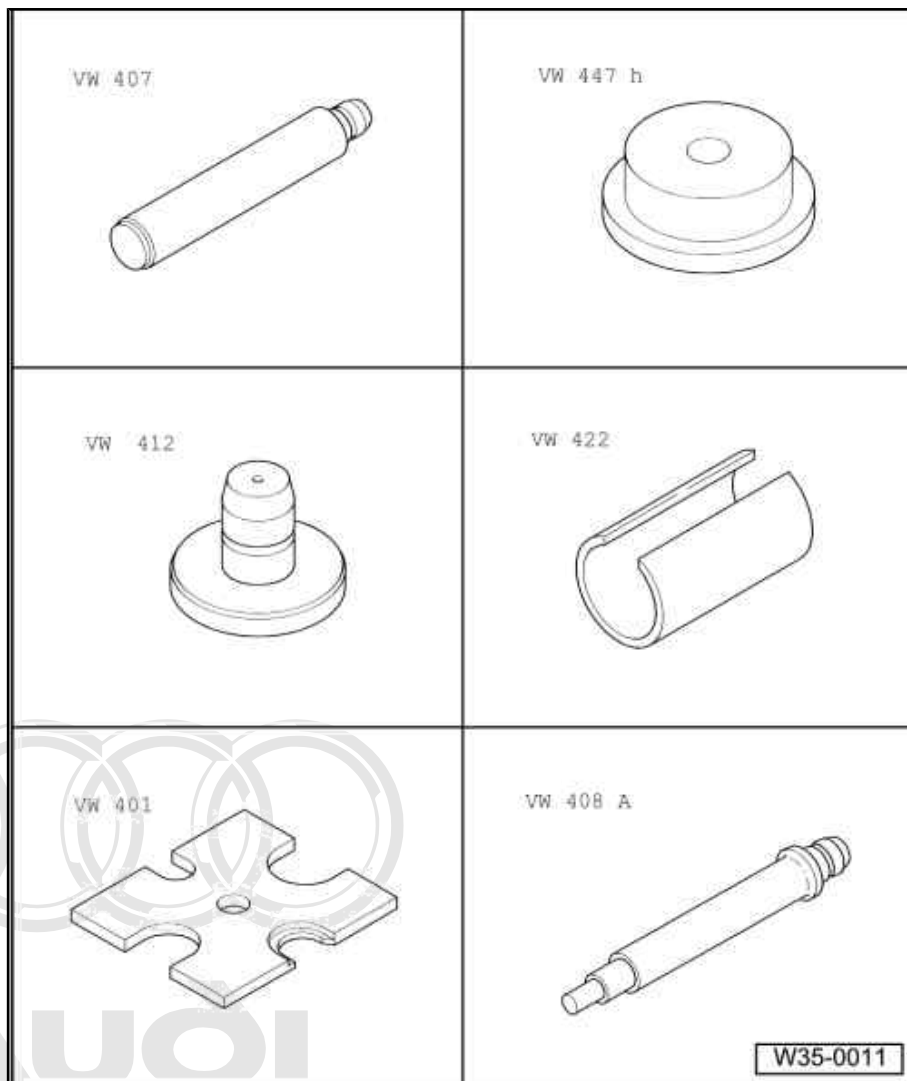
- ☐ Renew after removal
- ☐ Fitted piece on bolt head holds dished spring in position ⇒ [page 127](#)
- ☐ Removing and installing ⇒ [page 109](#)
- ☐ Tightening torque ⇒ [page 98](#)

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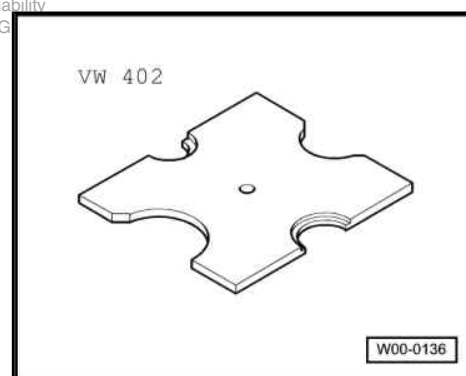
1.2 Dismantling and assembling input shaft

Special tools and workshop equipment required

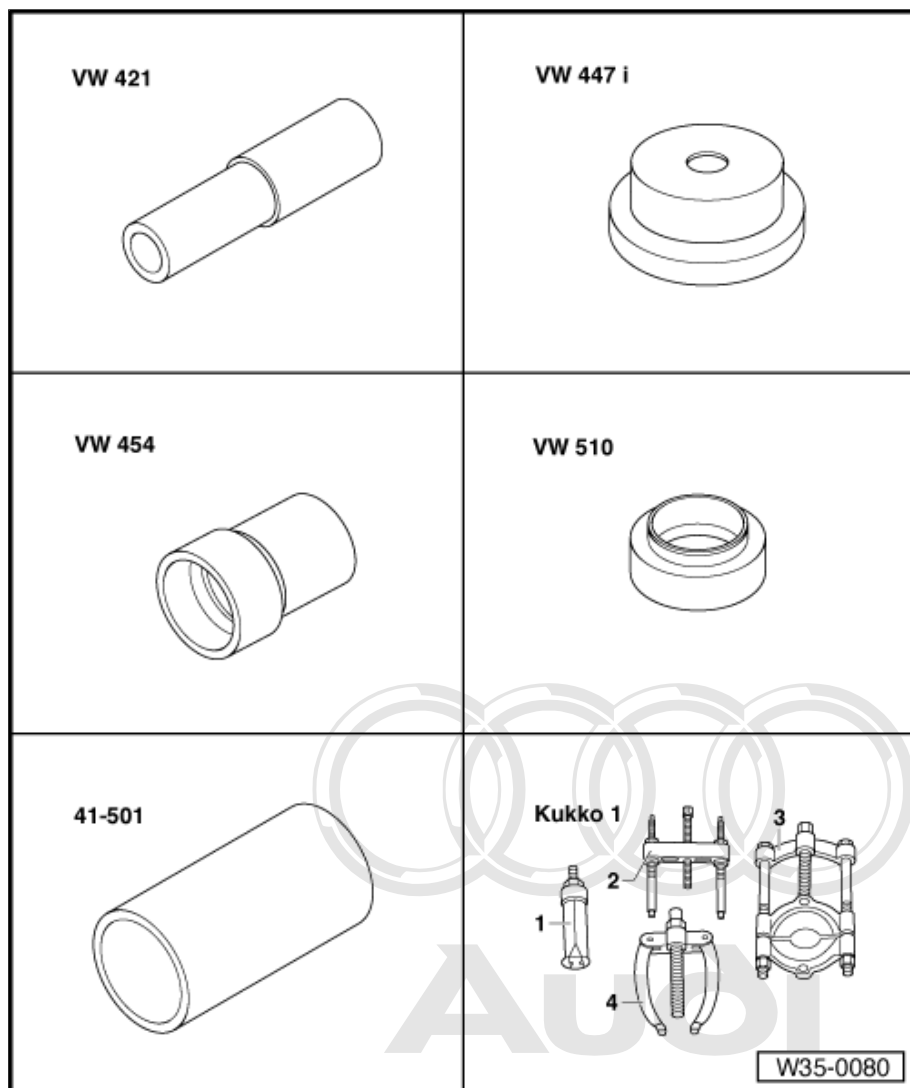
- ◆ Press tool - VW 407-
- ◆ Thrust plate - VW 447 H-
- ◆ Press tool - VW 412-
- ◆ Tube - VW 422-
- ◆ Thrust plate - VW 401-
- ◆ Press tool - VW 408 A-



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- ◆ Thrust plate - VW 402-

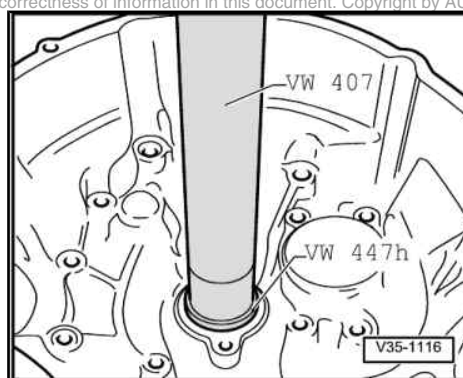


- ◆ Tube - VW 421-
- ◆ Thrust plate - VW 447 i-
- ◆ Press tool - VW 454-
- ◆ Thrust pad - VW 510-
- ◆ Drift sleeve - 41 - 501-
- ◆ -3- Splitter -Kukko 17/1-

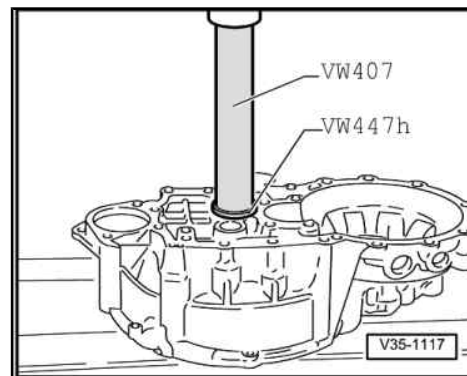


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Pressing out tapered roller bearing outer race

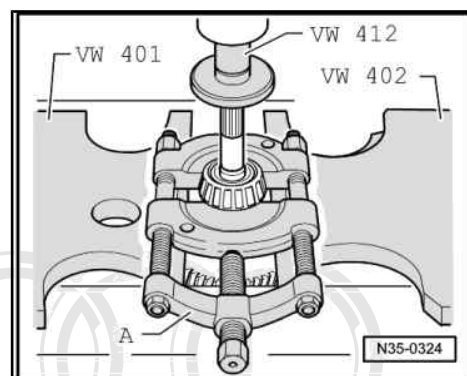


Pressing in tapered roller bearing outer race

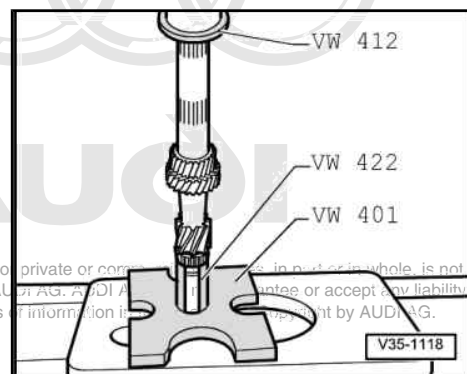


Pressing off tapered roller bearing inner race

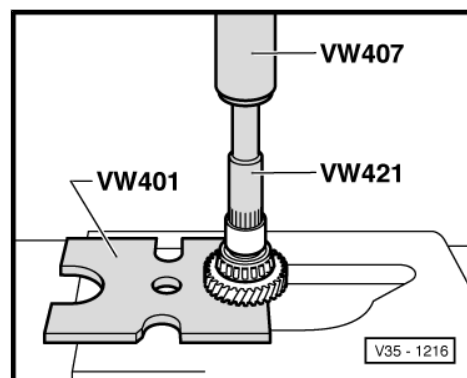
A - Splitter -Kukko 17/1-



Pressing on tapered roller bearing inner race

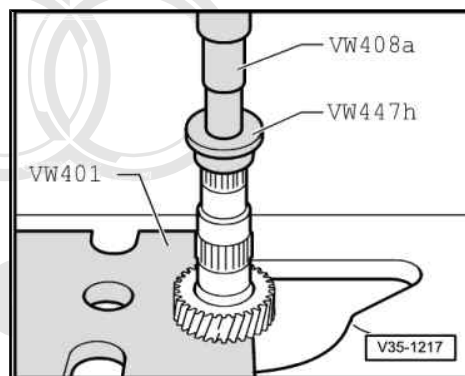


Pressing off 4th gear wheel with tapered roller bearing and sleeve

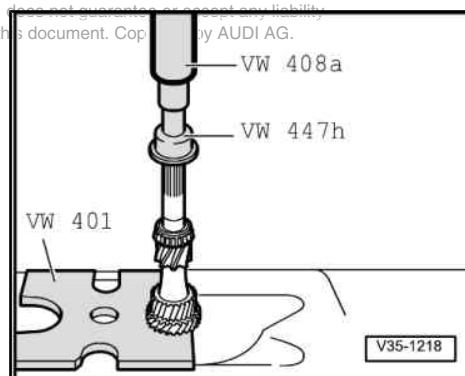


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Pressing off 3rd gear wheel

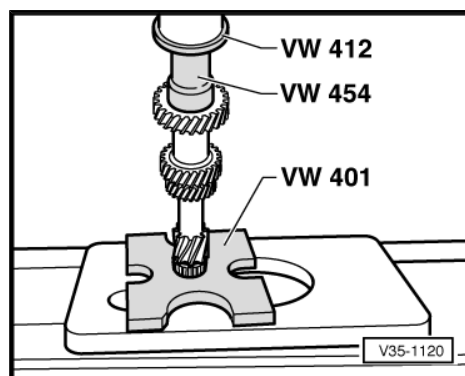


Pressing on 3rd gear wheel

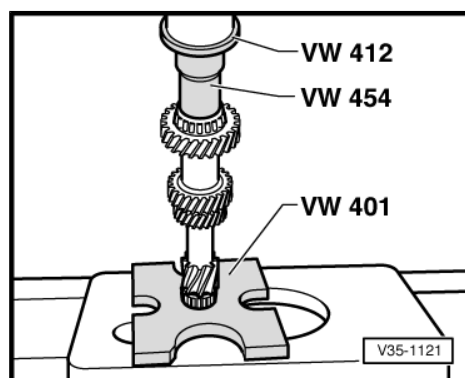


Pressing on 4th gear wheel

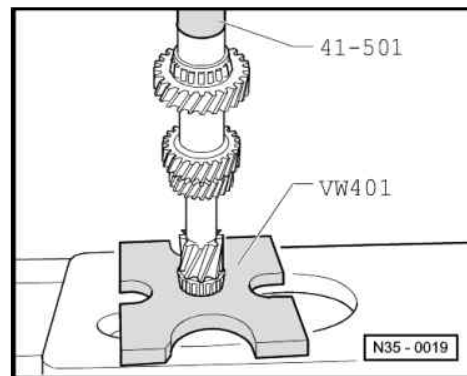
- Shoulder faces towards 3rd gear.



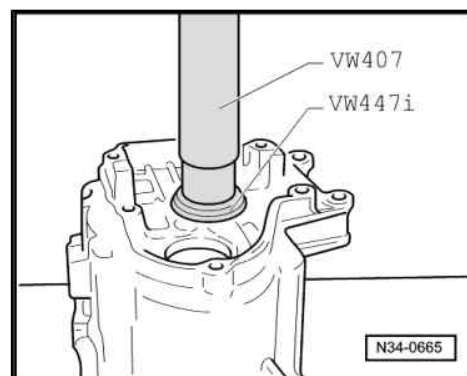
Pressing on tapered roller bearing inner race



Pressing on sleeve for needle bearing

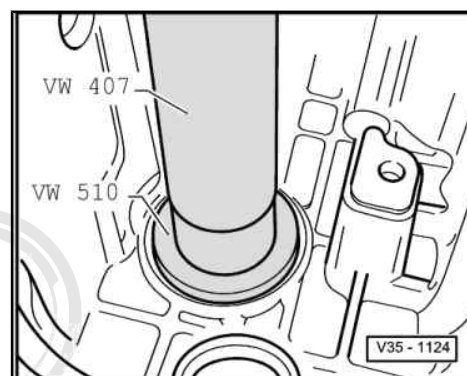


Pressing out tapered roller bearing outer race



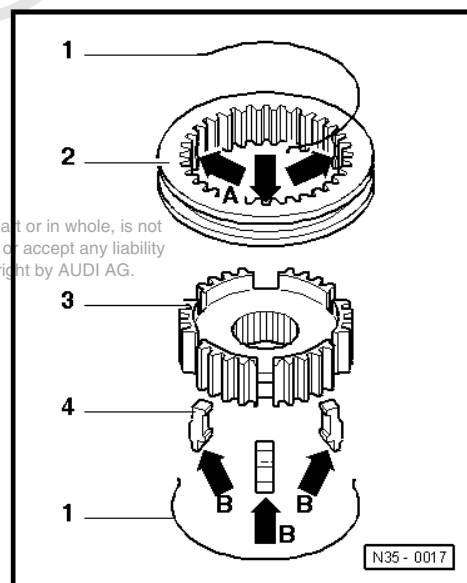
Pressing in tapered roller bearing outer race

- Install with shim after adjusting input shaft.



5th gear synchromesh

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



Assembling 5th gear locking collar/synchro-hub

- Slide locking collar over synchro-hub.
- Pointed teeth -A- and shoulder -B- of synchro-hub face in same direction. The recesses for the locking pieces in locking collar and synchro-hub must be aligned (➔ [page 141](#)).
- Fit locking pieces (installation position: ➔ [page 141](#)).
- Insert springs offset by 120° underneath lug -C- of locking piece.

Installation position of springs with solid locking pieces (no internal recess):

- Angled ends of spring must be in front of locking pieces -arrows-.

Installation position of springs with hollow locking pieces (with internal recess):

- Angled end of spring must locate in hollow locking piece (➔ illustration after next).

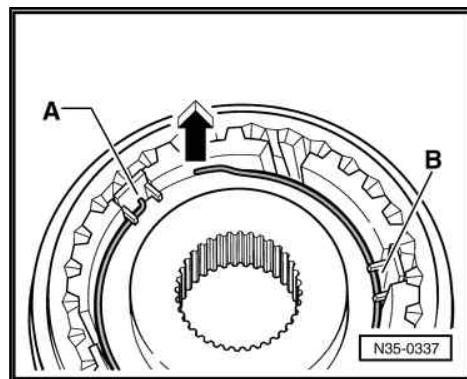
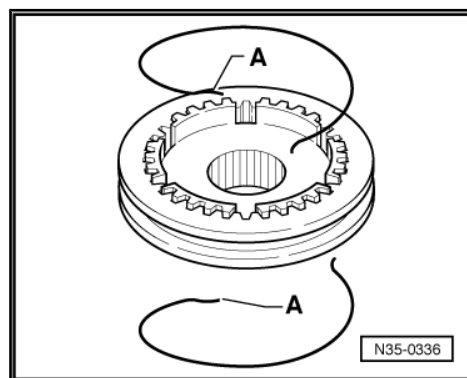
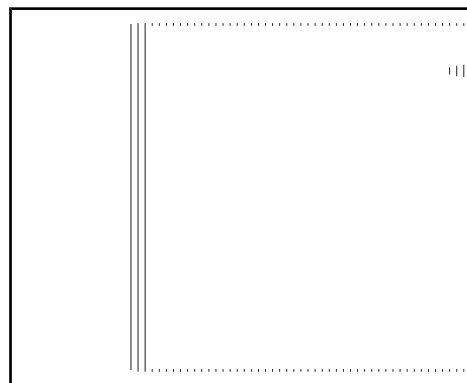
Installing offset springs -A-

This type of spring is fitted on both sides.

- The springs are only used together with hollow locking pieces (with internal recess).
- Fit locking pieces (installation position: ➔ [page 141](#)).

Installation position of springs:

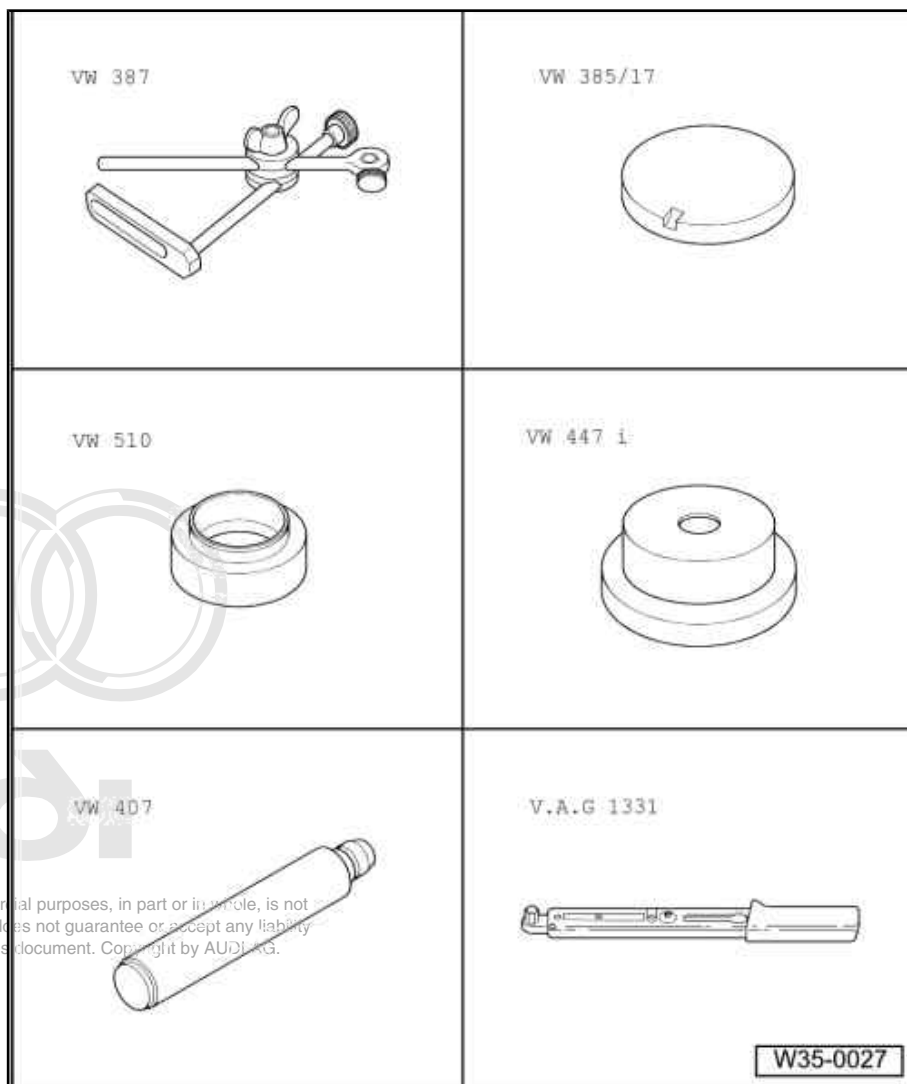
- Insert springs offset by 120°.
- Angled end -A- of spring must locate in hollow locking piece.
- Spring must be fitted under lug -B- of locking pieces.
- The offset end must always point away from synchro-hub (in direction of -arrow-).



1.3 Adjusting input shaft

Special tools and workshop equipment required

- ◆ Universal dial gauge bracket - VW 387-
- ◆ End measuring plate - VW 385/17-
- ◆ Thrust pad - VW 510-
- ◆ Thrust plate - VW 447 i-
- ◆ Press tool - VW 407-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Dial gauge



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Procedure

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

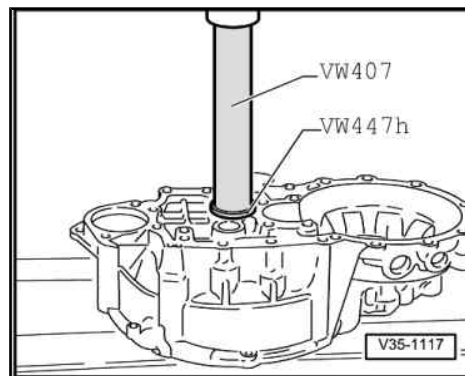
- ◆ Gearbox housing
- ◆ Clutch housing
- ◆ Input shaft
- ◆ 4th gear wheel
- ◆ Tapered roller bearing

Table of adjustments ⇒ [page 193](#)

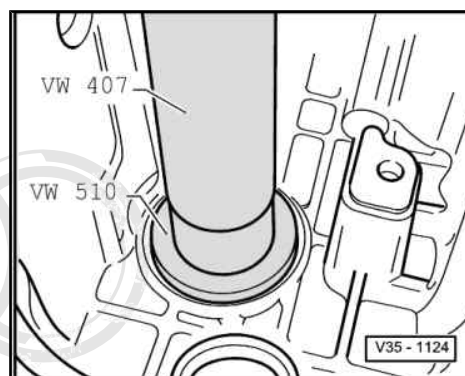
Requirement:

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

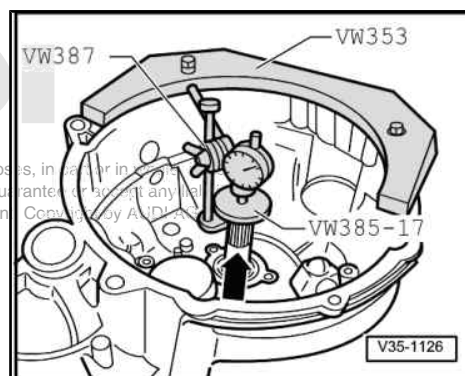
- Press tapered roller bearing outer race onto stop in clutch housing.



- Press tapered roller bearing outer race without shim onto stop in gearbox housing.
- Install input shaft in clutch housing and put on gearbox housing. Tighten hexagon bolts ➔ [page 100](#) .



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



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

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



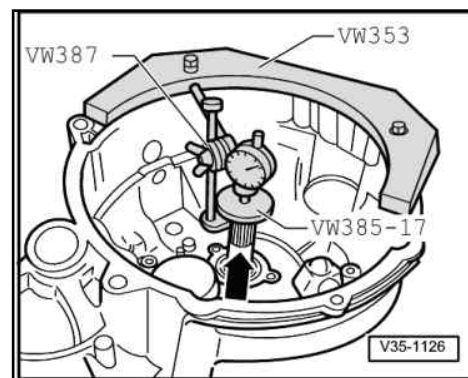
Note

Dial gauge does not return to original setting by itself.

Determining thickness of shim

Example:

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



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Table of shims

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

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Note

Select correct shims from ⇒ *Electronic parts catalogue* .

- Remove input shaft and press tapered roller bearing outer race out of gearbox housing using thrust plate - VW 447 i- .
- Install shims of the calculated thickness, thickest shim first.

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

- Press tapered roller bearing outer race together with the correct shim (1.175 mm in example) into gearbox housing using thrust pad - VW 510- .

- Fit gearbox housing and tighten hexagon bolts.

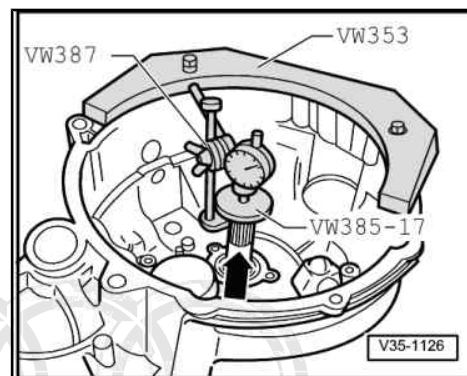
Check adjustment.

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



Note

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



Tightening torques

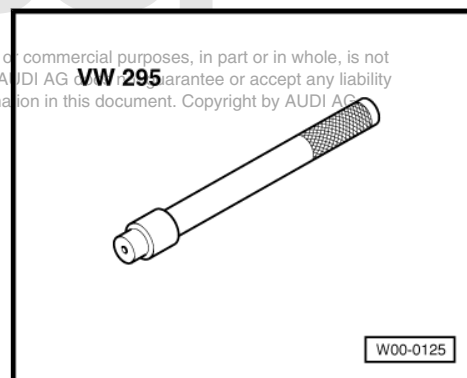
- ◆ Gearbox housing to clutch housing
⇒ ["7.4 Exploded view - gearbox housing and selector mechanism", page 100](#)

1.4 Renewing input shaft oil seal

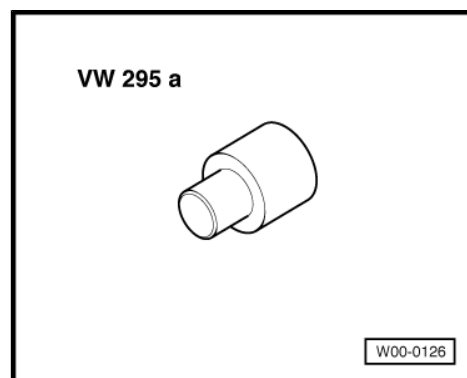
Special tools and workshop equipment required

- ◆ Drift - VW 295-

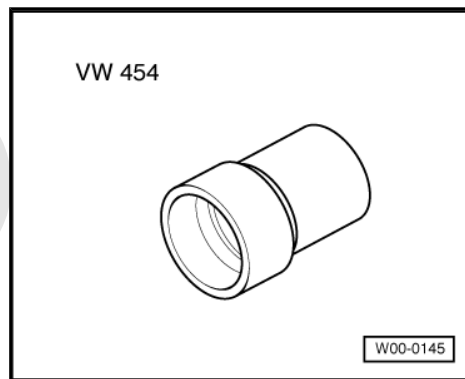
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- ◆ Adapter - VW 295 A-

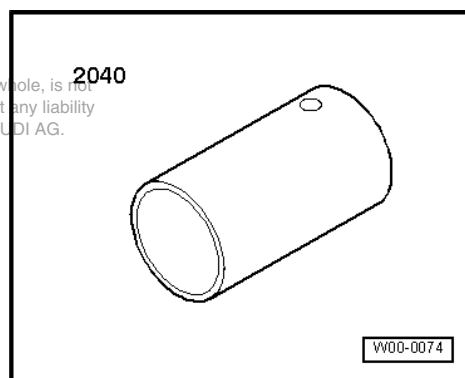


◆ Press tool - VW 454-



◆ Tube - 2040-

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◆ Sealing grease - G 052 128 A1-

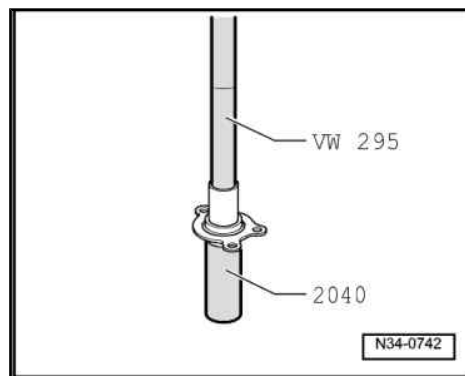
Procedure

- Gearbox removed
- Remove clutch release lever with release bearing and guide sleeve ➔ [page 34](#) .
- Drive oil seal out of guide sleeve.

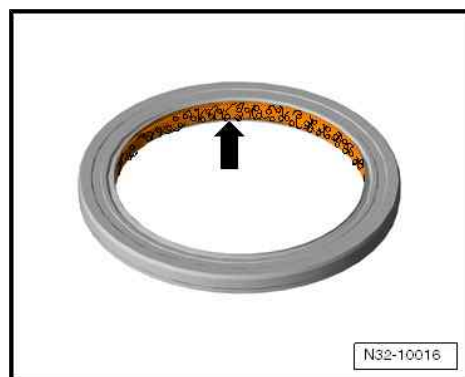


Note

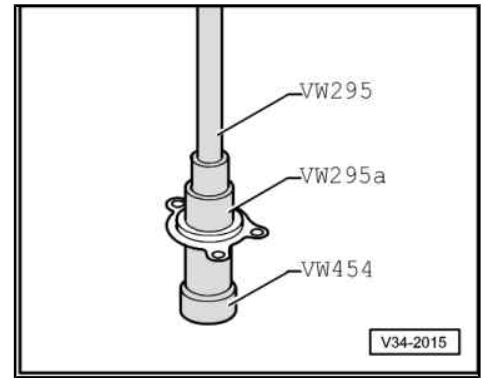
Take care not to damage contact surface for oil seal on input shaft.



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



- Drive oil seal into guide sleeve (drive in onto stop).
- Install clutch release lever with release bearing and guide sleeve ➔ [page 34](#) .



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2 Output shaft

⇒ "2.1 Exploded view - output shaft", page 150

⇒ "2.2 Dismantling and assembling output shaft", page 153

⇒ "2.3 Adjusting output shaft", page 163

2.1 Exploded view - output shaft



Note

- ◆ The output shaft is dismantled as follows:- Position splitter under 2nd speed selector gear (⇒ [Item 21 \(page 151\)](#)) and press off as described in ⇒ [page 157](#) . Remove circlip ⇒ [Item 17 \(page 151\)](#) . Then press off locking collar and synchro-hub for 1st and 2nd gear as shown in ⇒ [page 157](#) .
- ◆ When fitting new gear wheels or a new output shaft, refer to ⇒ *Electronic parts catalogue* .
- ◆ Always renew both tapered roller bearings together.

1 - Hexagon nut

- ☐ Tightening torque
⇒ [Item 11 \(page 102\)](#)

2 - Clutch housing

3 - Shim

- ☐ For output shaft
- ☐ Table of adjustments
⇒ [page 193](#)

4 - Small tapered roller bearing outer race

- ☐ Removing ⇒ [page 156](#)
- ☐ Pressing in
⇒ [page 156](#)

5 - Small tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 156](#)
- ☐ Pressing on
⇒ [page 157](#)

6 - Output shaft

- ☐ Adjusting ⇒ [page 163](#)

7 - Large tapered roller bearing inner race

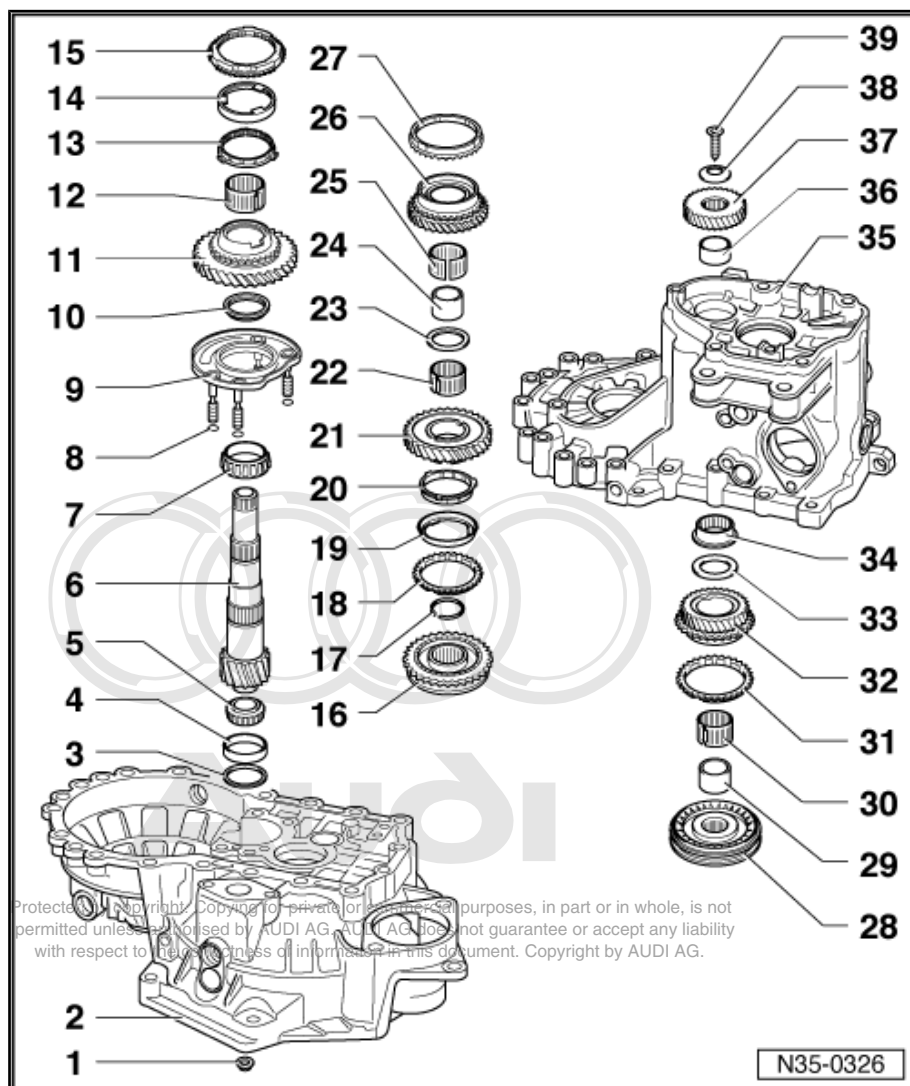
- ☐ Pulling off ⇒ [page 157](#)
- ☐ Pressing on
⇒ [page 158](#)

8 - Seal

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

9 - Bearing mounting

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



10 - Thrust washer

- ☐ Shoulder on thrust washer faces towards tapered roller bearing

11 - 1st speed selector gear

12 - Needle bearing

- ☐ For 1st gear

13 - Synchro-ring

- ☐ (Inner ring for 1st gear)
- ☐ Installation position ⇒ [page 158](#)
- ☐ Checking for wear ⇒ [page 158](#)
- ☐ Check lugs for scoring

14 - Outer ring for 1st gear

- ☐ Installation position ⇒ [page 158](#)
- ☐ Checking for wear ⇒ [page 158](#)
- ☐ Renew if scored or if there are visible traces of wear

15 - 1st gear synchro-ring

- ☐ Installation position ⇒ [page 158](#)
- ☐ Checking for wear ⇒ [page 158](#)

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

- ☐ Press off together with bearing mounting ⇒ [Item 17 \(page 151\)](#) after removing circlip ⇒ [page 157](#)
- ☐ Dismantling ⇒ [page 159](#)
- ☐ Assembling locking collar/synchro-hub ⇒ [page 159](#), ⇒ [page 159](#) and ⇒ [page 159](#)
- ☐ Installation position ⇒ [page 160](#)
- ☐ Pressing on ⇒ [page 160](#)

17 - Circlip

18 - 2nd gear synchro-ring

- ☐ Checking for wear ⇒ [page 158](#)
- ☐ Insert so that recesses engage in locking pieces of locking collar for 1st and 2nd gear

19 - Outer ring for 2nd gear

- ☐ Insert in 2nd gear synchro-ring ⇒ [Item 18 \(page 151\)](#)
- ☐ Installation position ⇒ [page 160](#)
- ☐ Renew if scored or if there are visible traces of wear

20 - Synchro-ring

- ☐ (Inner ring for 2nd gear)
- ☐ Checking for wear ⇒ [page 158](#)
- ☐ Check lugs for scoring
- ☐ Installation position ⇒ [page 160](#)

21 - 2nd speed selector gear

- ☐ Installation position ⇒ [page 161](#)

22 - Needle bearing

- ☐ For 2nd gear

23 - Thrust washer

24 - Sleeve for 3rd gear needle bearing

- ☐ Pressing off with 2nd speed selector gear ⇒ [page 157](#)
- ☐ Pressing on ⇒ [page 161](#)

25 - Needle bearing

- ☐ For 3rd gear

26 - 3rd speed selector gear

27 - 3rd gear synchro-ring

- ☐ Checking for wear ⇒ [page 161](#)

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

- ☐ Pressing off with 2nd speed selector gear and 3rd speed selector gear ⇒ [page 157](#)
- ☐ Dismantling ⇒ [page 161](#)
- ☐ Assembling locking collar/synchro-hub ⇒ [page 161](#) , ⇒ [page 162](#) and ⇒ [page 162](#)
- ☐ Installation position: Locking collar/synchro-hub ⇒ [page 162](#)
- ☐ Pressing on ⇒ [page 162](#)

29 - Sleeve

- ☐ For needle bearing
- ☐ Pressing off with locking collar and synchro-hub for 3rd and 4th gear ⇒ [page 157](#)
- ☐ Pressing on ⇒ [page 163](#)

30 - Needle bearing

- ☐ For 4th gear

31 - 4th gear synchro-ring

- ☐ Checking for wear ⇒ [page 161](#)

32 - 4th speed selector gear

33 - Thrust washer

34 - Needle bearing

- ☐ For output shaft
- ☐ Removing and installing ⇒ [page 131](#)

35 - Gearbox housing

36 - Sleeve

- ☐ For needle bearing/output shaft
- ☐ Pressing off ⇒ [page 157](#)
- ☐ Pressing on ⇒ [page 163](#)

37 - 5th gear wheel

- ☐ Removing and installing ⇒ [page 109](#)

38 - Dished spring

- ☐ Installation position ⇒ [page 127](#)

39 - Bolt

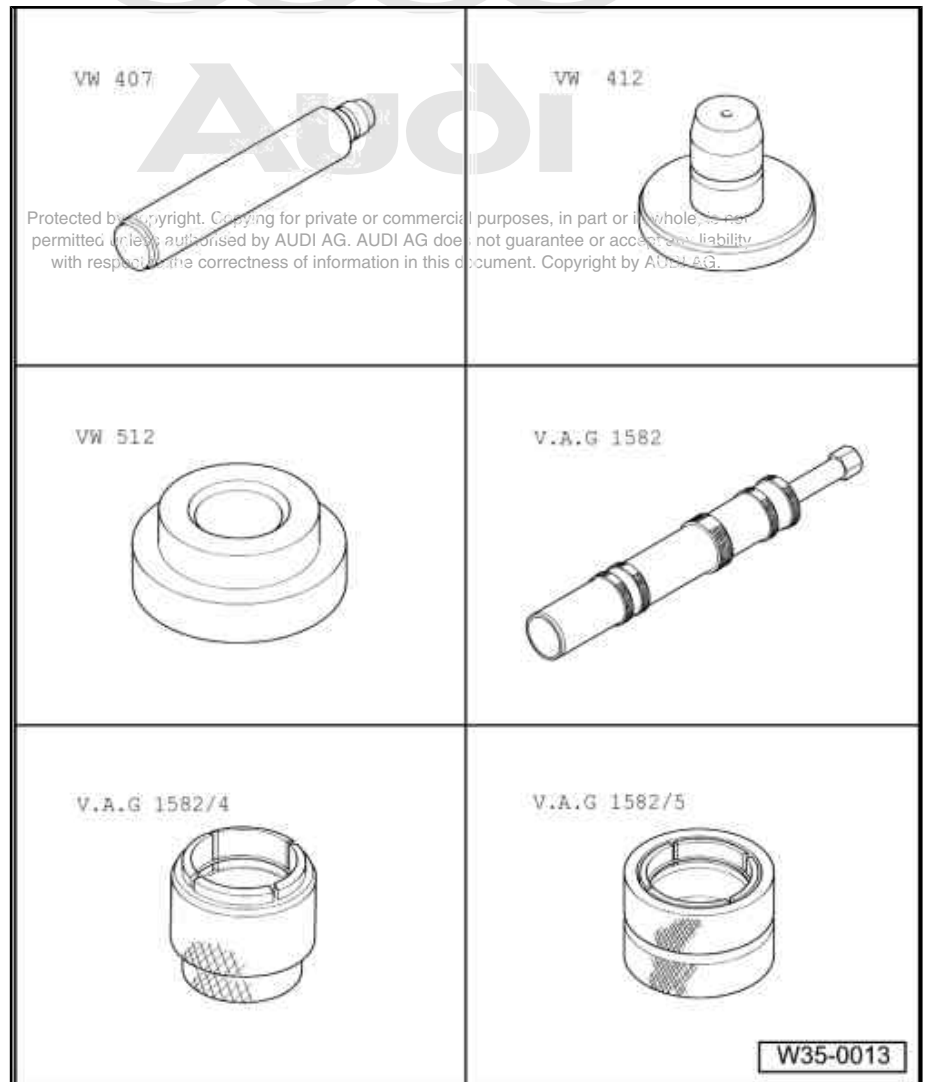
- ☐ Tightening torque ⇒ [Item 4 \(page 98\)](#)
- ☐ Renew after removal
- ☐ Fitted piece on bolt head holds dished spring in position ⇒ [page 127](#)
- ☐ Removing and installing ⇒ [page 109](#)

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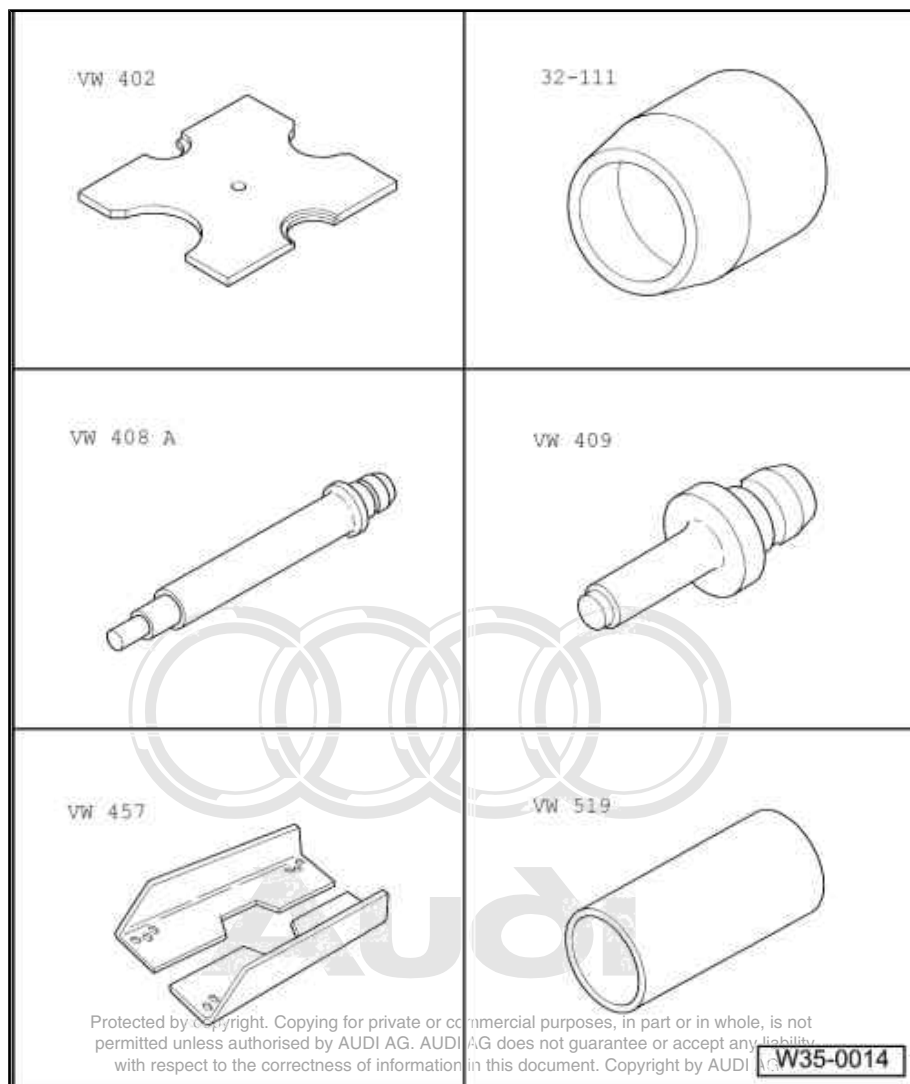
2.2 Dismantling and assembling output shaft

Special tools and workshop equipment required

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

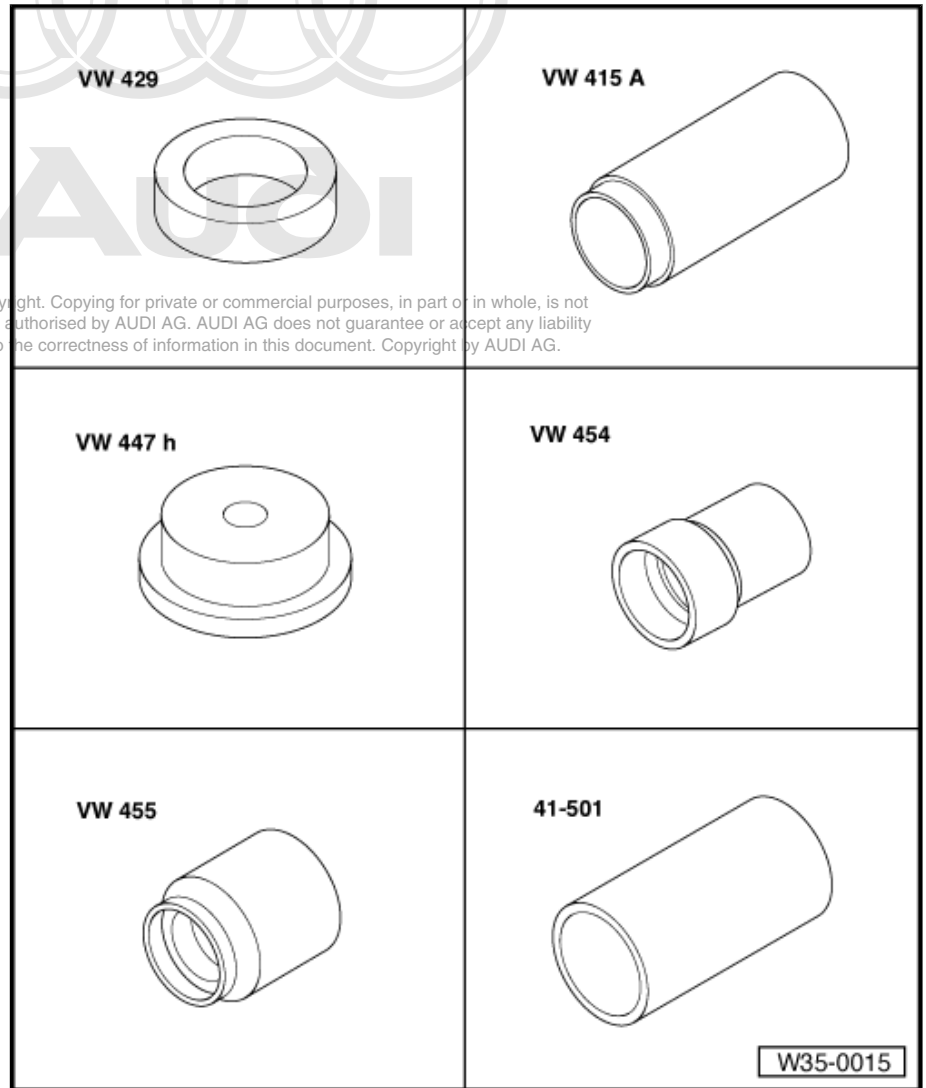


- ◆ Thrust plate - VW 402-
- ◆ Thrust piece - 32 - 111-
- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 409-
- ◆ Support rails - VW 457-
- ◆ Tube - VW 519-

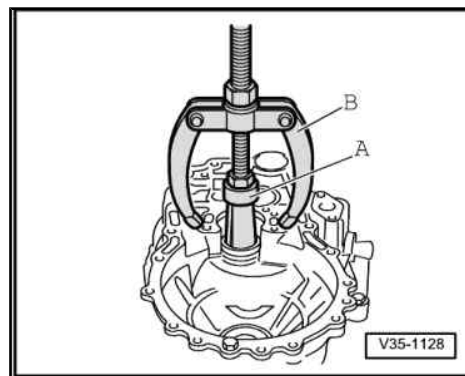
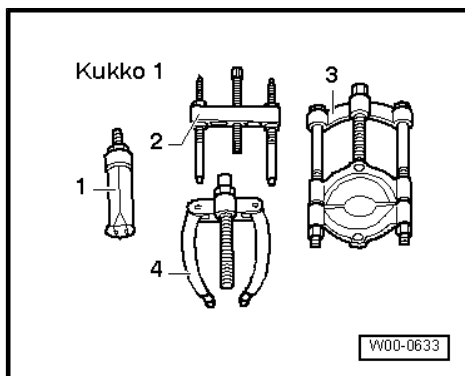


- ◆ Thrust ring - VW 429-
- ◆ Tube - VW 415 A-
- ◆ Thrust plate - VW 447 H-
- ◆ Press tool - VW 454-
- ◆ Installing sleeve - VW 455-
- ◆ Drift sleeve - 41 - 501-

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- ◆ -1- Internal puller -
Kukko 21/6-



- ◆ -3- Splitter -Kukko
17/2-

- ◆ -4- Counter-support -
Kukko 22/2-

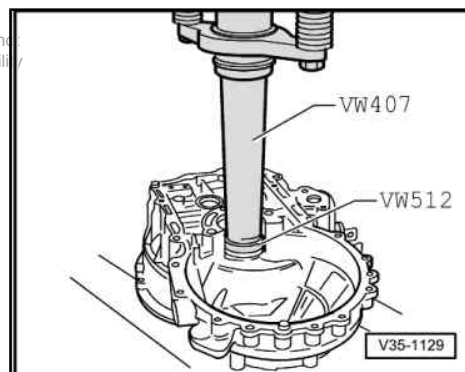
Pulling out outer race for small tapered roller bearing

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

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

Pressing in outer race for small tapered roller bearing

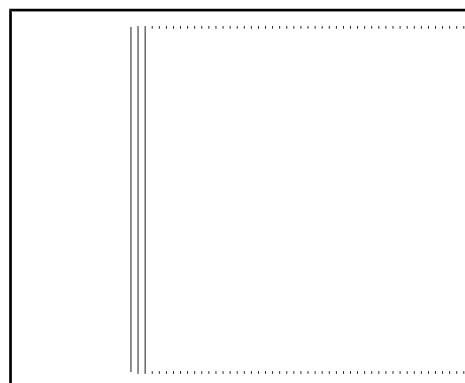
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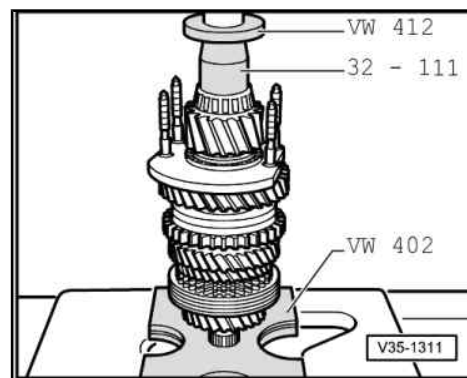
Pulling off inner race for small tapered roller bearing

A - Soft jaws/vice

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



Pressing on inner race for small tapered roller bearing



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

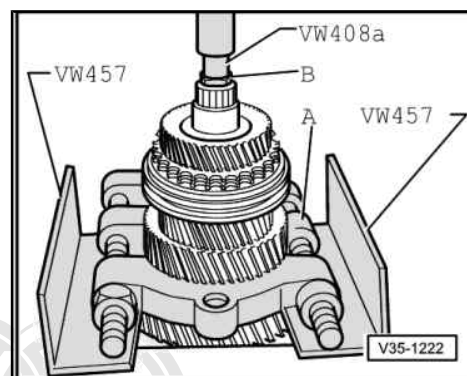
A - Splitter 22...115 mm , e.g. -Kukko 17/2-

B - Hexagon bolt M10 x 20, 17 mm



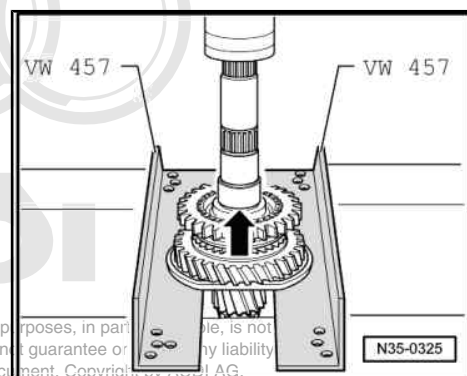
Note

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



Pressing off locking collar with synchro-hub and bearing mounting

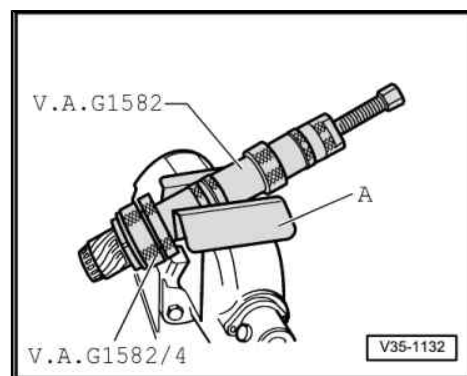
- First remove circlip -arrow-.



Pulling off inner race for large tapered roller bearing

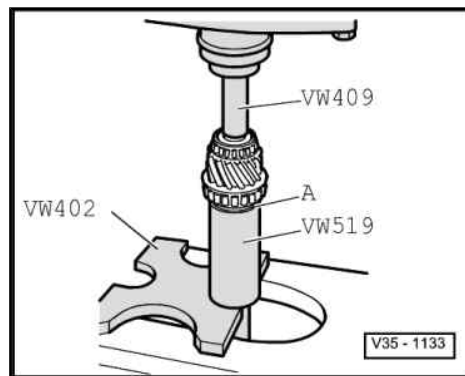
A - Soft jaws

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



Pressing on inner race for large tapered roller bearing

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



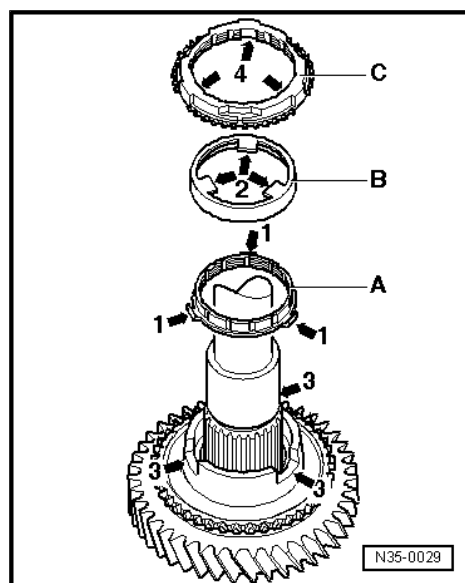
Installation position of inner ring, outer ring and synchro-ring for 1st gear

- Place inner ring -A- on 1st speed selector gear.
- The angled tabs -arrow 1- point towards the outer ring -B-.
- Fit outer ring -B-.
- The webs -arrow 2- lock in the recesses -arrow 3- of the selector gear.
- Fit synchro-ring -C-.
- The recesses -arrow 4- locate on the tabs -arrow 1- of the inner ring -A-.



Note

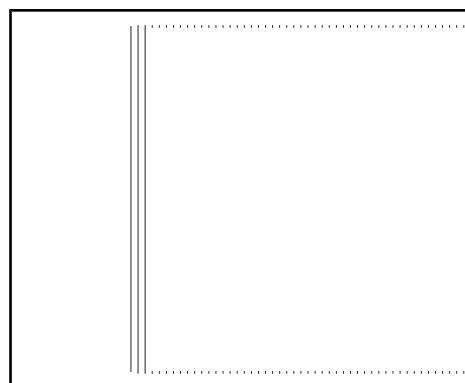
If components are not being renewed, make sure they are re-installed on the same gear.



Checking inner ring for 1st and 2nd gear for wear

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

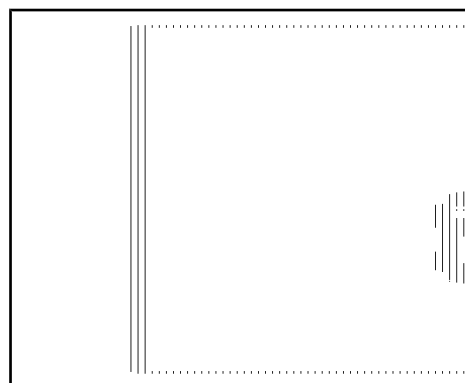
Gap -a-	Installation depth	Wear limit
1st and 2nd gear	0.75 ... 1.25 mm	0.3 mm



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

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

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



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

1 - Spring

- ◆ Allocate spring according to ⇒ Electronic parts catalogue
- ◆ Assembling version used together with hollow locking pieces
⇒ [page 159](#)
- ◆ Assembling version used together with solid locking pieces
(no internal recess) ⇒ [page 159](#)

2 - Locking collar

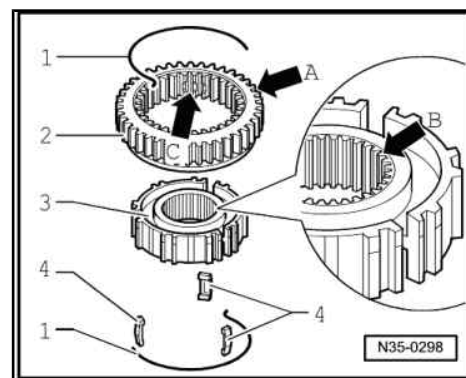
3 - Synchro-hub

4 - Locking piece

- ◆ Allocate locking pieces according to ⇒ Electronic parts catalogue .
- ◆ Shoulders on synchro-hub are of equal width on both sides.

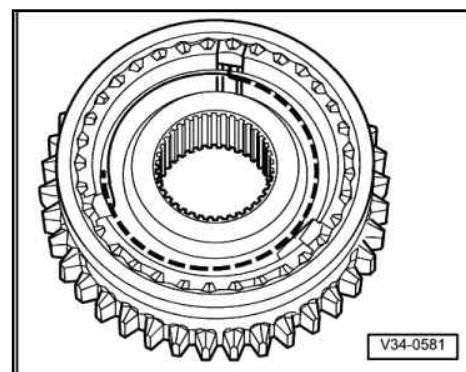
The shoulder on one side is chamfered -arrow B-.

- When assembled, the chamfer on the shoulder of the synchro-hub and the external teeth on the locking collar -arrow A- face in the same direction.
- The recesses for the locking pieces on synchro-hub and locking collar -arrow C- must align.



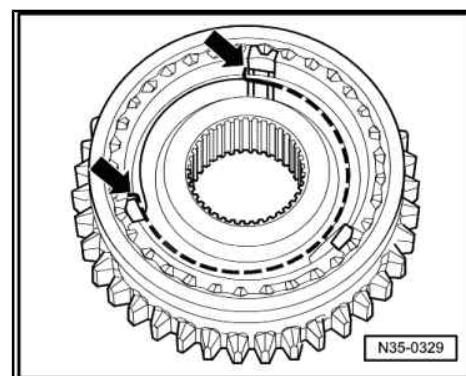
Assembling locking collar/synchro-hub for 1st and 2nd gear (version with hollow locking pieces)

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



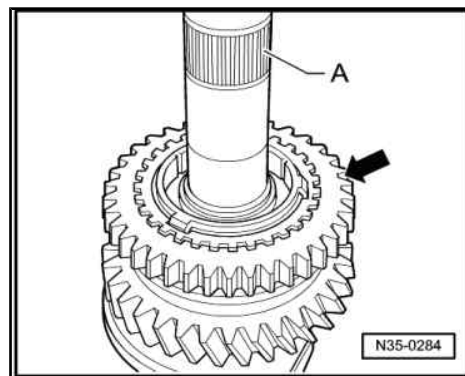
Assembling locking collar/synchro-hub for 1st and 2nd gear (version with solid locking pieces: no internal recess)

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



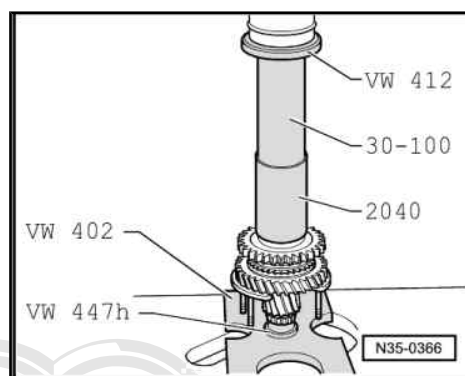
Installation position of 1st and 2nd gear locking collar/synchro-hub

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



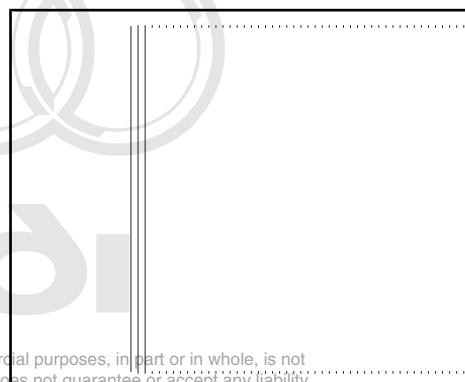
Pressing on 1st and 2nd gear locking collar/synchro-hub

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



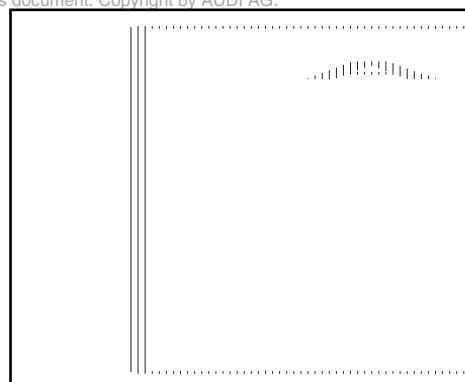
Installation position of outer ring for 2nd gear

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



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

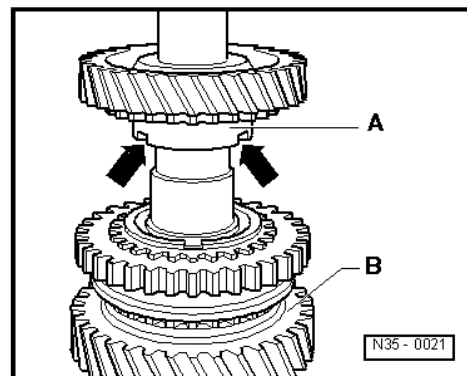
- The lugs -arrow 1- locate in the recesses -arrow 2- in the synchro-ring -B-.



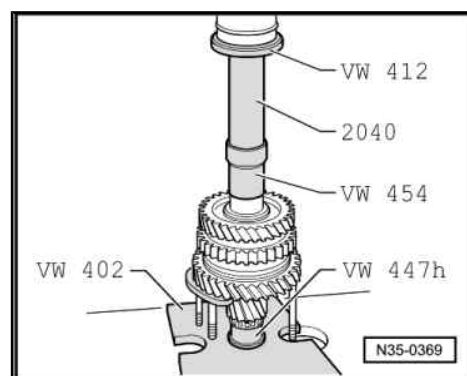
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Installation position of 2nd speed selector gear

- The higher shoulder -A- faces towards 1st gear -B-.
- The recesses in the shoulder -arrows- engage on the lugs on the outer ring ➔ [page 160](#) .



Pressing on sleeve for 3rd gear needle bearing

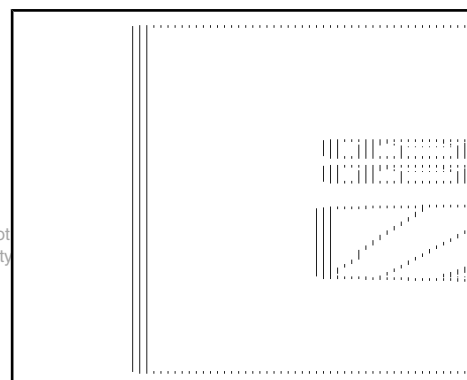


Checking 3rd and 4th gear synchro-ring for wear

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

Gap -a-	Installation depth	Wear limit
1st gear	1.0...1.7 mm	0.5 mm
3rd gear	1.0...1.7 mm	
4th gear	1.0...1.7 mm	

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

1 - Spring

- ◆ Allocate spring according to ➔ Electronic parts catalogue
- ◆ Assembling version used together with hollow locking pieces ➔ [page 159](#)
- ◆ Assembling version used together with solid locking pieces (no internal recess) ➔ [page 159](#)

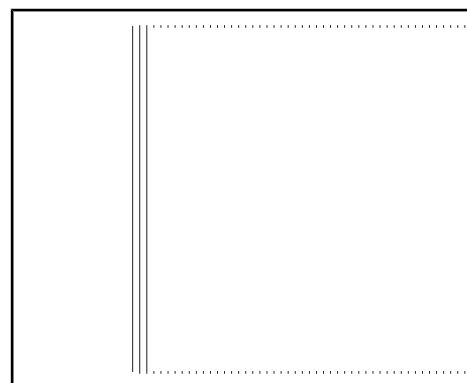
2 - Locking piece

Allocate locking pieces according to ➔ Electronic parts catalogue .

3 - Locking collar

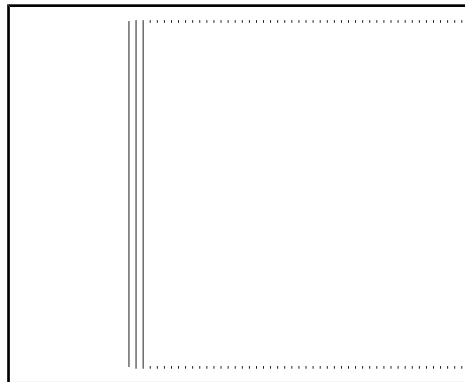
4 - Synchro-hub

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



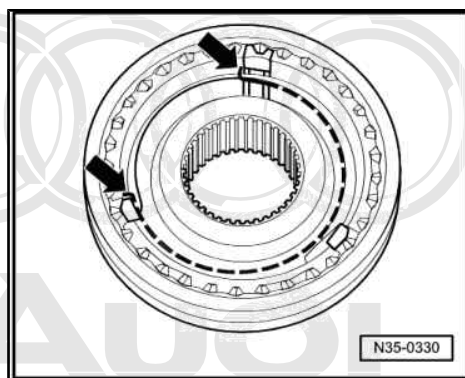
Assembling locking collar/synchro-hub for 3rd and 4th gear (version with hollow locking pieces)

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



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

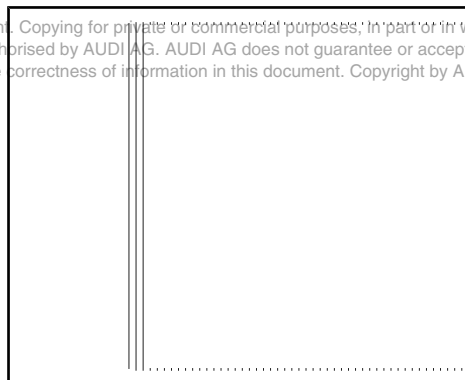
- Locking collar is pushed over synchro-hub.
- Insert locking pieces and install springs offset at 120°. Angled ends of spring must be in front of locking pieces -arrows-.



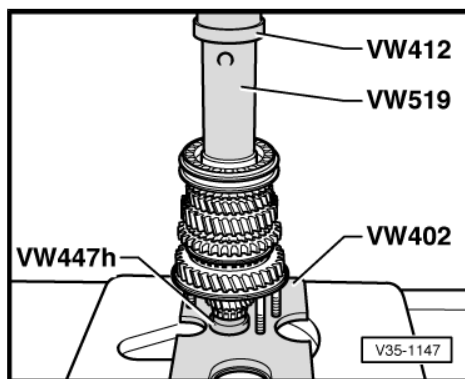
Installation position of 3rd and 4th gear locking collar/synchro-hub

- Chamfer -arrow- faces towards 4th gear.

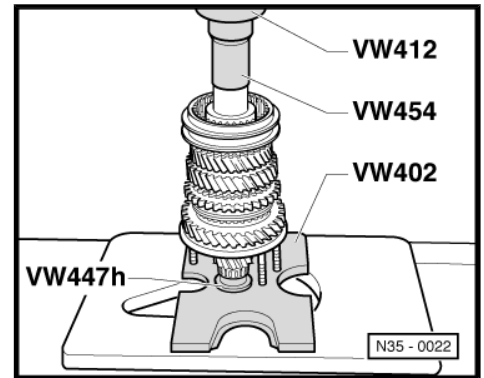
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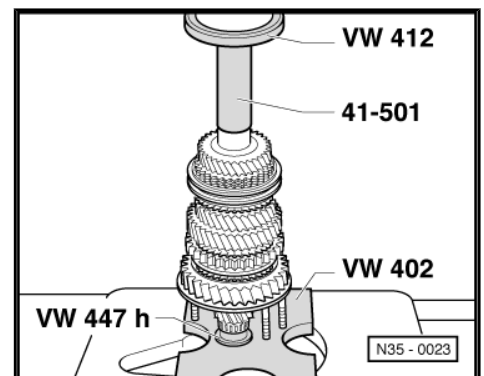
Pressing on 3rd and 4th gear synchro-hub with locking collar



Pressing on sleeve for 4th gear needle bearing



Pressing on sleeve for needle bearing/output shaft



2.3 Adjusting output shaft

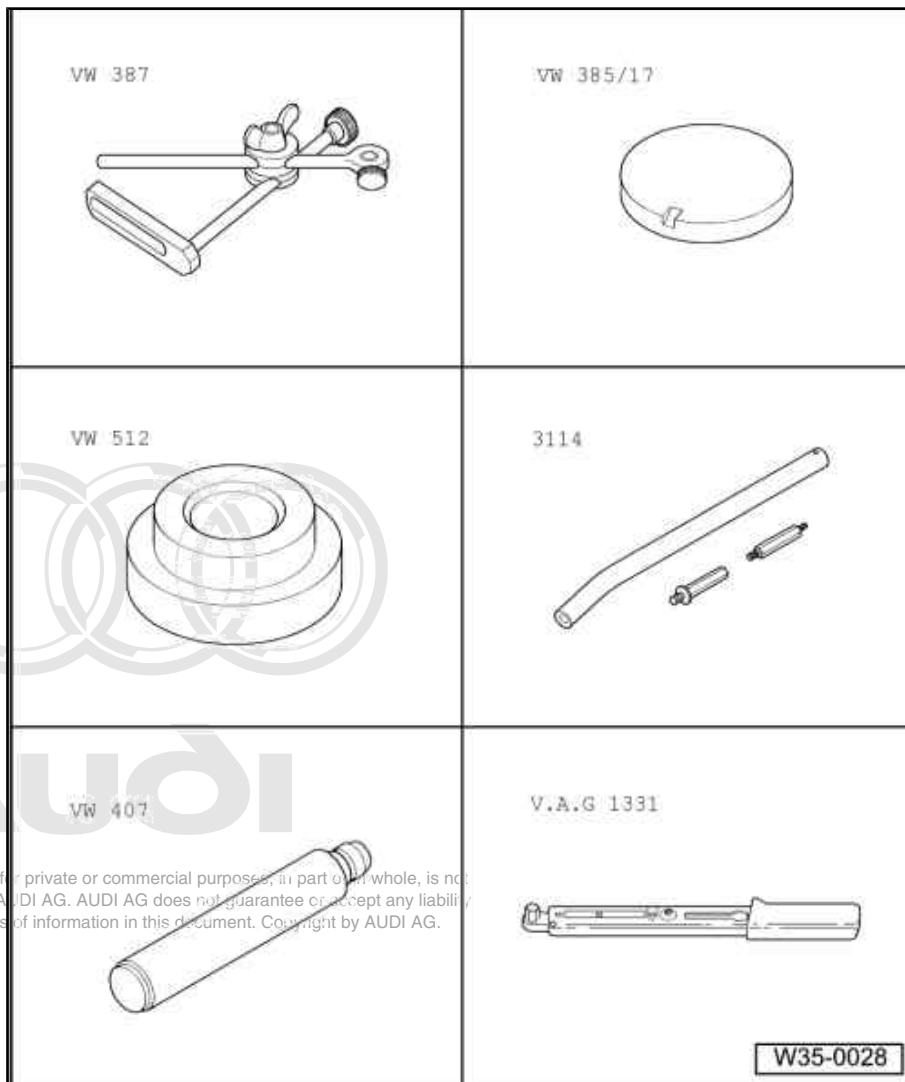
(Determining thickness of output shaft shim)



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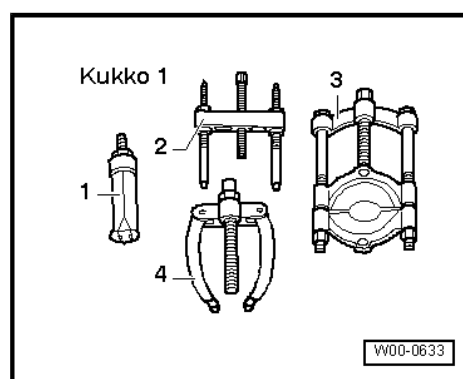
Special tools and workshop equipment required

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



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- ◆ -1- Internal puller -Kukko 21/6-



- ◆ -4- Counter-support -Kukko 22/2-

Procedure

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

- ◆ Output shaft
- ◆ Clutch housing
- ◆ Tapered roller bearing

Table of adjustments ➔ [page 193](#)

Requirements:

- Sealing surfaces of clutch and gearbox housings must be free of sealant.
- Press small tapered roller bearing outer race together with 0.65 mm shim onto stop in clutch housing ➔ [page 156](#) .
- Insert output shaft and tighten nuts for bearing mounting.
- Turn output shaft approx. 20 to 30 turns in one direction.



Note

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



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

Determining thickness of shim

The specified bearing preload is obtained by adding the measured value to the thickness of the shim installed (0.65 mm).

Example:

Bearing clearance = shim (0.65 mm) + measured value	Thickness of shim according to table
0.740 mm	0.900 mm

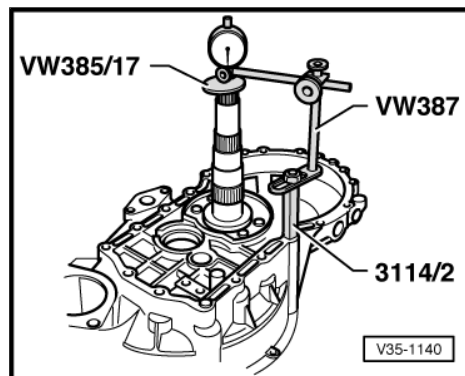


Table of shims

Bearing clearance = shim (0.65 mm) + measured value	Thickness of shim (mm)
0.650	0.750
0.660 ... 0.689	0.800
0.690 ... 0.739	0.850
0.740 ... 0.789	0.900
0.790 ... 0.839	0.950
0.840 ... 0.889	1.000
0.890 ... 0.939	1.050
0.940 ... 0.989	1.100
0.990 ... 1.039	1.150
1.040 ... 1.089	1.200
1.090 ... 1.139	1.250
1.140 ... 1.189	1.300
1.190 ... 1.239	1.350
1.240 ... 1.289	1.400
1.290 ... 1.339	1.450
1.340 ... 1.389	1.500
1.390 ... 1.429	1.550



Note

Select correct shims from ⇒ *Electronic parts catalogue* .

- Remove output shaft and pull out small tapered roller bearing outer race ⇒ [page 156](#) .
- Install shims of the calculated thickness, thickest shim first.
- If the original shim (0.65 mm) is to be refitted, check the shim for damage.

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

Tolerance variations make it possible to obtain the exact shim thickness required.

- Press in small tapered roller bearing outer race together with the correct shim (in example 0.70 mm) ⇒ [page 156](#) and install output shaft.
- Tighten nut for bearing mounting in clutch housing.



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Tightening torques

- ◆ Bearing mounting to clutch housing
⇒ [“7.6 Exploded view - input shaft, output shaft, differential and selector forks”, page 102](#)



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3 Reverse shaft

⇒ ["3.1 Exploded view - reverse shaft", page 168](#)

⇒ ["3.2 Dismantling and assembling reverse shaft", page 169](#)

3.1 Exploded view - reverse shaft



Note

After removal, renew needle bearing in clutch housing and in reverse shaft support.

1 - Clutch housing

2 - Needle bearing

- ☐ Pulling out ⇒ [page 170](#)
- ☐ Pressing in
⇒ [page 170](#)

3 - Reverse gear wheel

4 - Circlip

- ☐ Renew after removing

5 - Reverse selector gear

- ☐ Remove circlip before renewing
- ☐ Shoulder faces towards reverse gear wheel

6 - Reverse shaft

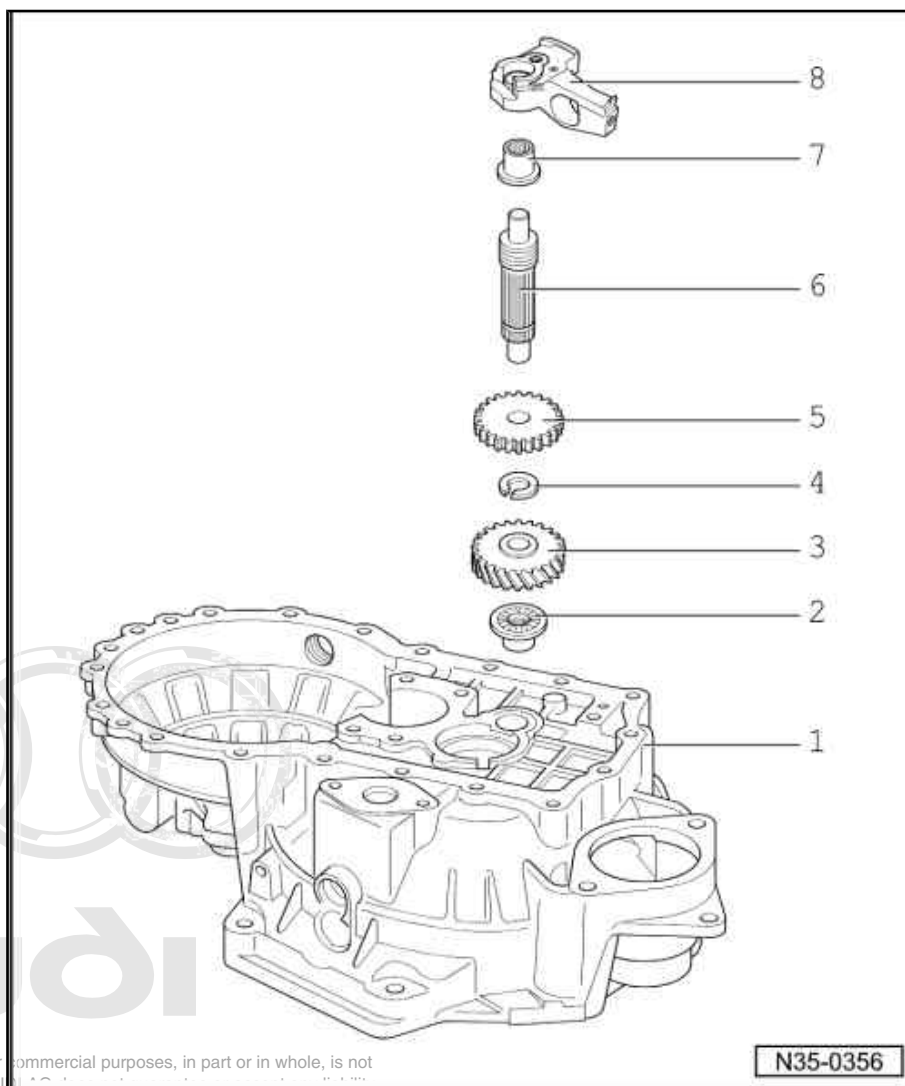
- ☐ Removing and installing
⇒ [page 114](#)

7 - Needle bearing

- ☐ Pressing out
⇒ [page 170](#)
- ☐ Pressing in
⇒ [page 171](#)

8 - Reverse shaft support

- ☐ Removing and installing
⇒ [page 114](#)



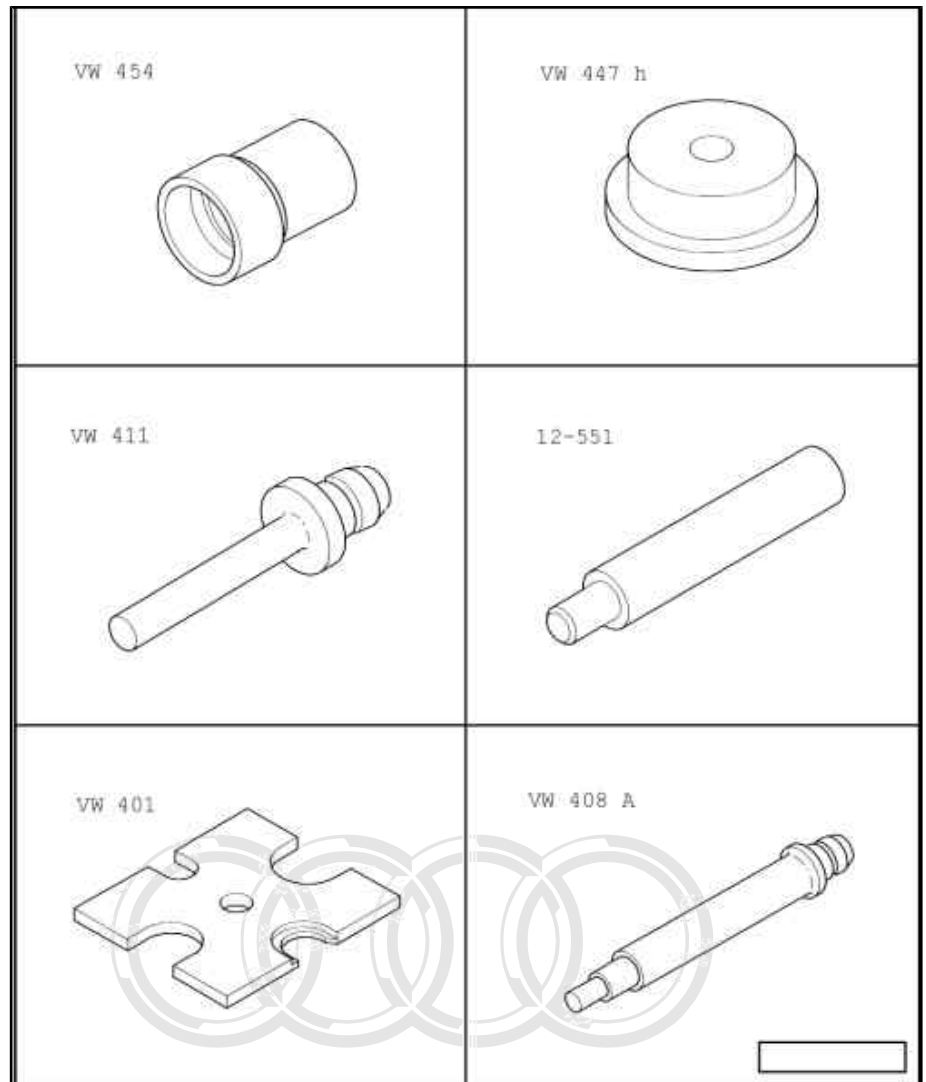
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N35-0356

3.2 Dismantling and assembling reverse shaft

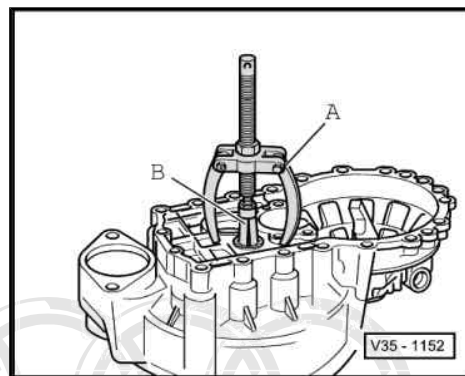
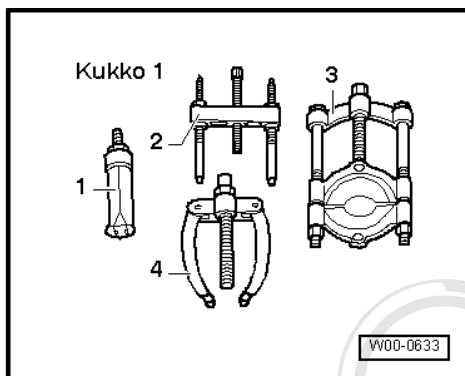
Special tools and workshop equipment required

- ◆ Press tool - VW 454-
- ◆ Thrust plate - VW 447 H-
- ◆ Press tool - VW 411-
- ◆ Centring mandrel - 12 - 551-
- ◆ Thrust plate - VW 401-
- ◆ Press tool - VW 408 A-



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- ◆ -1- Internal puller -
Kukko 21/2-



- ◆ -4- Counter-support -
Kukko 22/1-

Pulling needle bearing out of clutch housing

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

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

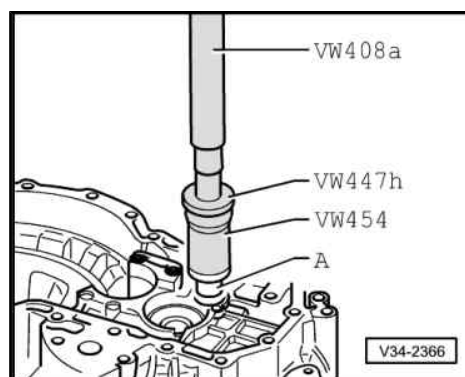


Note

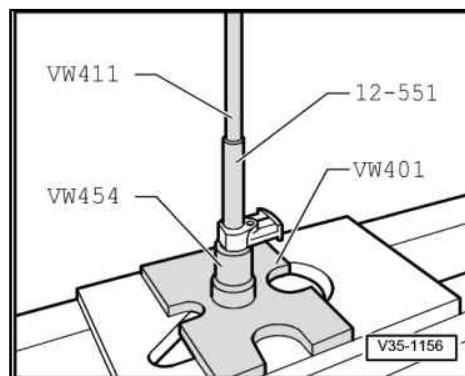
*The needle bearing is
destroyed during remov-
al and must be renewed.*

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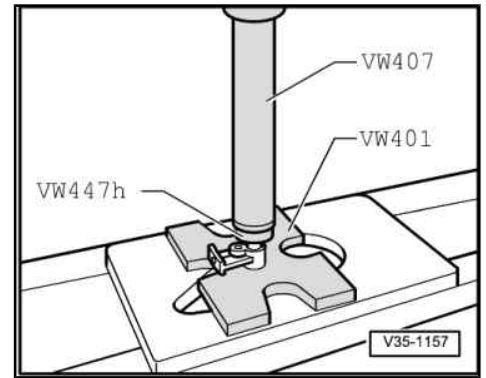
Pressing needle bearing -A- into clutch housing



Pressing needle bearing out of reverse shaft support



Pressing needle bearing into reverse shaft support



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39 – Final drive - differential

1 Oil seals

⇒ "1.1 Overview of fitting locations - oil seals", page 172

⇒ "1.2 Renewing oil seal (left-side)", page 172

⇒ "1.3 Renewing oil seal (right-side)", page 174

1.1 Overview of fitting locations - oil seals

1 - Oil seal

- ☐ For input shaft
- ☐ Renewing ⇒ [page 147](#)

2 - Oil seal

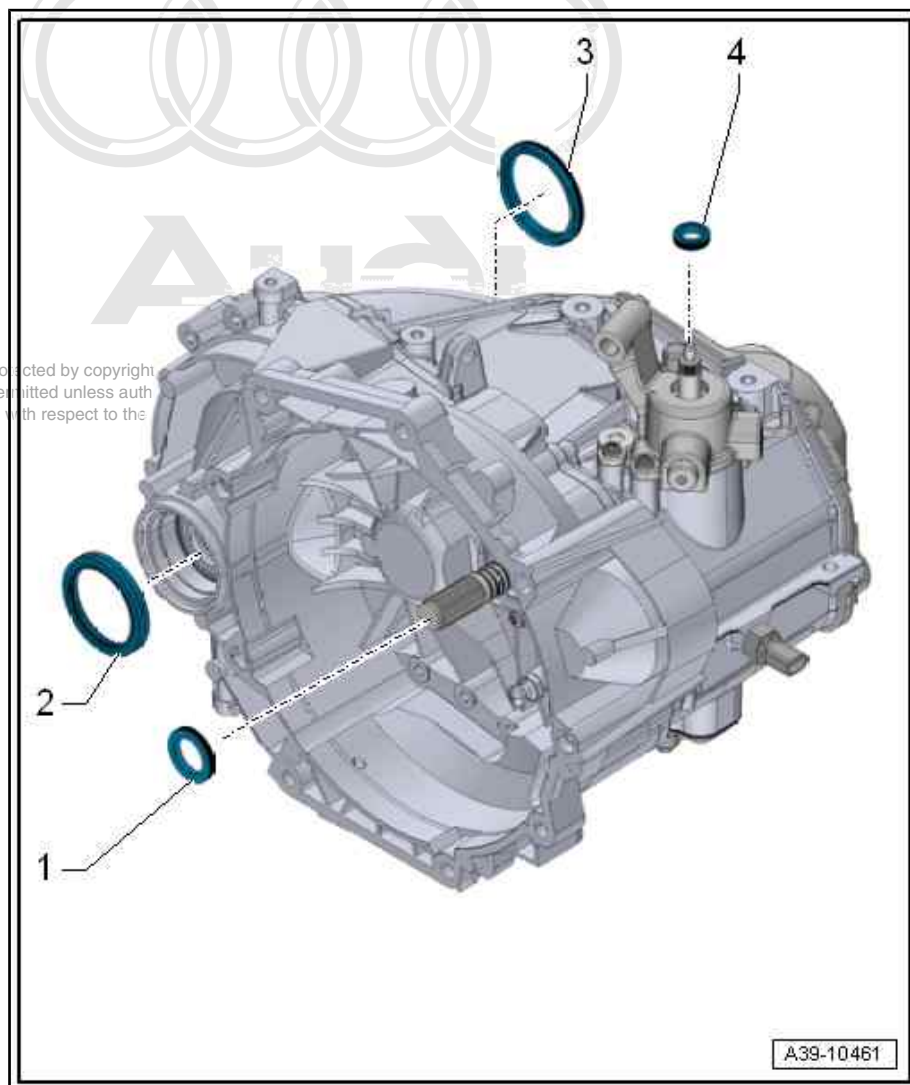
- ☐ For flange shaft (right-side)
- ☐ Renewing ⇒ [page 174](#)

3 - Oil seal

- ☐ For flange shaft (left-side)
- ☐ Renewing ⇒ [page 172](#)

4 - Oil seal

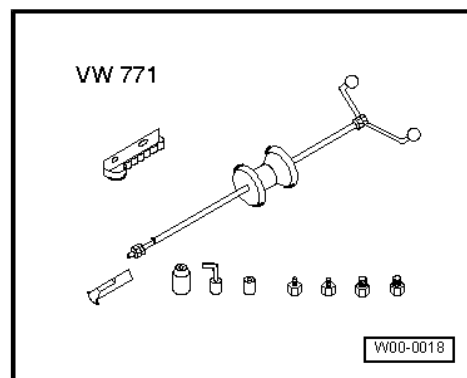
- ☐ For selector shaft
- ☐ Renewing ⇒ [page 61](#)



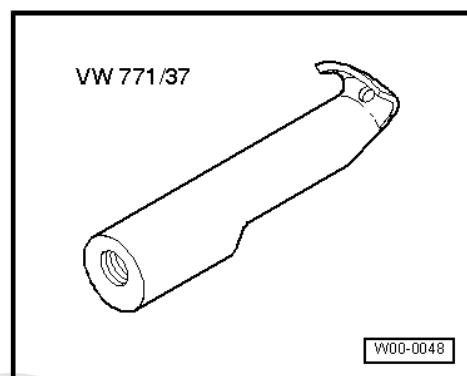
1.2 Renewing oil seal (left-side)

Special tools and workshop equipment required

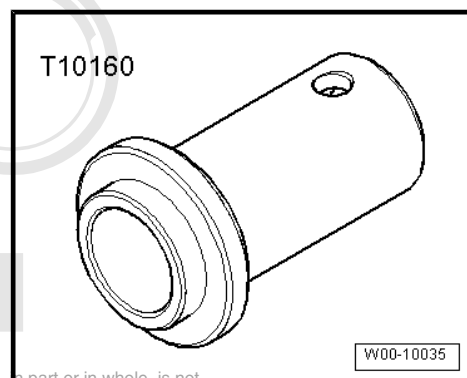
◆ Multi-purpose tool - VW 771-



◆ Extractor tool -VW 771/37-



◆ Thrust piece - T10160-

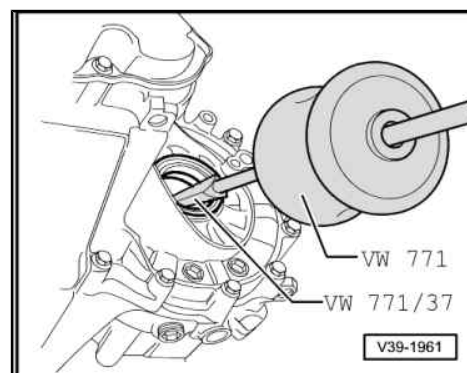


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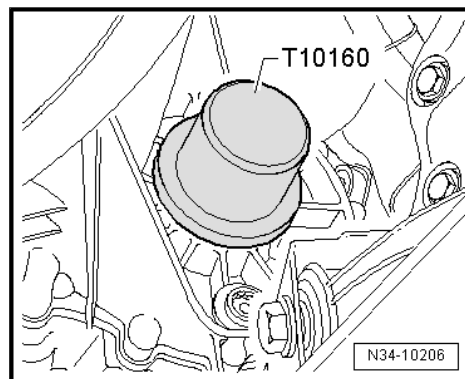
◆ Sealing grease - G 052 128 A1-

Procedure

- Gearbox in vehicle
- Remove flange shaft (left-side) ➔ [page 178](#) .
- Pull out flange shaft oil seal using multi-purpose tool - VW 771- and puller hook - VW 771/37- .



- Lightly lubricate outer circumference of seal with gear oil.
- Drive in new seal onto stop (take care to keep seal straight).



- Pack space between sealing lip and dust lip -arrow- half full with sealing grease - G 052 128 A1- .
- Install flange shaft (left-side) ➔ [page 178](#) .



1.3 Renewing oil seal (right-side)

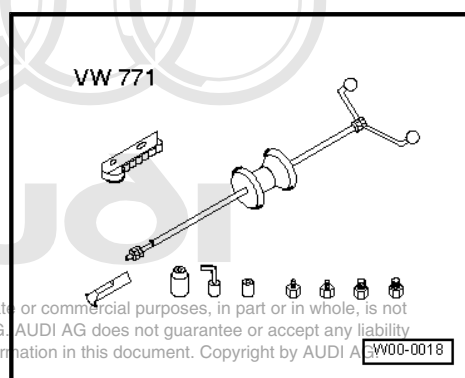


Note

The oil seal is located in a metal sleeve.

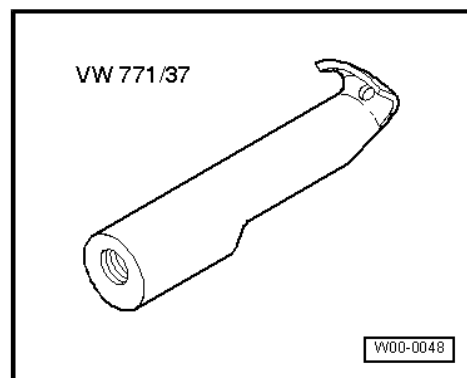
Special tools and workshop equipment required

- ◆ Multi-purpose tool - VW 771-

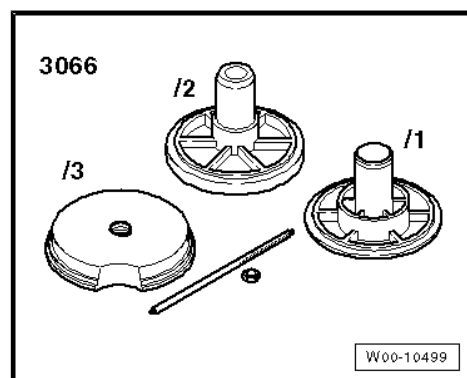


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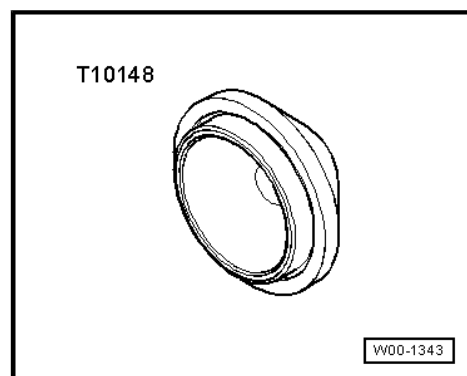
◆ Extractor tool -VW 771/37-



◆ Spindle from assembly tool - 3066-

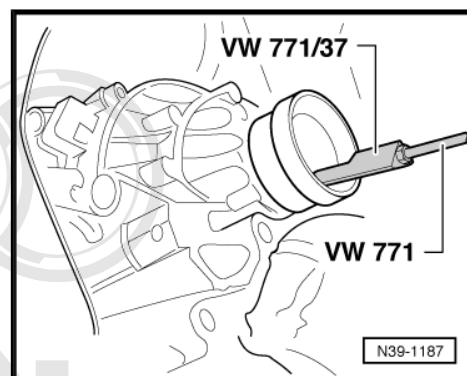


◆ Thrust piece - T10148-



Procedure

- Gearbox in vehicle
- Remove flange shaft (right-side) ➔ [page 181](#) .
- Extract oil seal using multi-purpose tool - VW 771- and puller hook -VW 771/37- . To do so, position puller hook immediately behind shoulder inside sleeve.
- During pulling operation, press puller hook - VW 771/37- firmly in against sleeve.
- Clean seat for oil seal in gearbox.



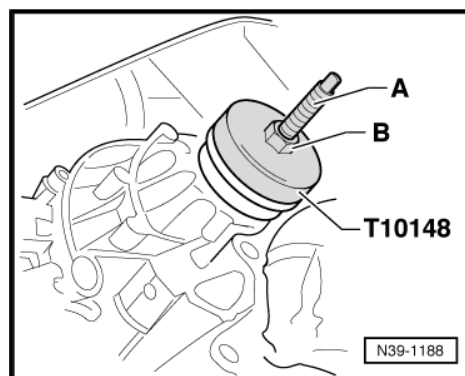
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- Pull in oil seal together with sleeve.

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

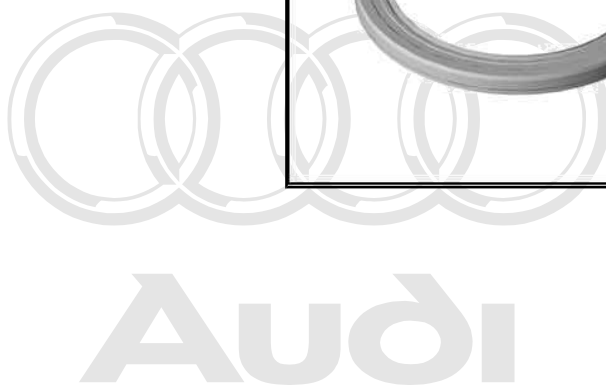
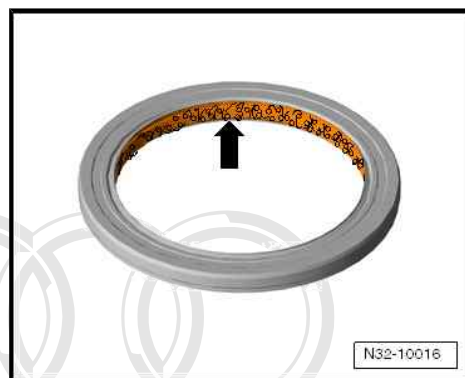
B - M12 nut

- Turn nut -B- and pull oil seal with sleeve in onto stop.



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

- Install flange shaft (right-side) ⇒ [page 181](#) .



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2 Differential

⇒ ["2.1 Exploded view - differential", page 177](#)

⇒ ["2.2 Removing and installing flange shaft \(left-side\)", page 178](#)

⇒ ["2.3 Removing and installing flange shaft \(right-side\)", page 181](#)

⇒ ["2.4 Dismantling and assembling differential", page 183](#)

⇒ ["2.5 Adjusting differential", page 189](#)

2.1 Exploded view - differential

1 - Gearbox housing

2 - Shim

- ☐ For differential
- ☐ Determining thickness
⇒ [page 189](#)

3 - Tapered roller bearing outer race

- ☐ Pulling out ⇒ [page 187](#)
- ☐ Pressing in
⇒ [page 187](#)

4 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 186](#)
- ☐ Pressing on
⇒ [page 186](#)

5 - Differential cage

- ☐ With final drive gear
- ☐ Differential cage is matched to one-piece thrust washer
⇒ [page 188](#)
- ☐ Hole for spring pin is matched to length of spring pin ⇒ [page 187](#)
- ☐ Allocation ⇒ Electronic parts catalogue (ETKA)

6 - Tapered roller bearing inner race

- ☐ Pulling off ⇒ [page 186](#)
- ☐ Pressing on
⇒ [page 186](#)

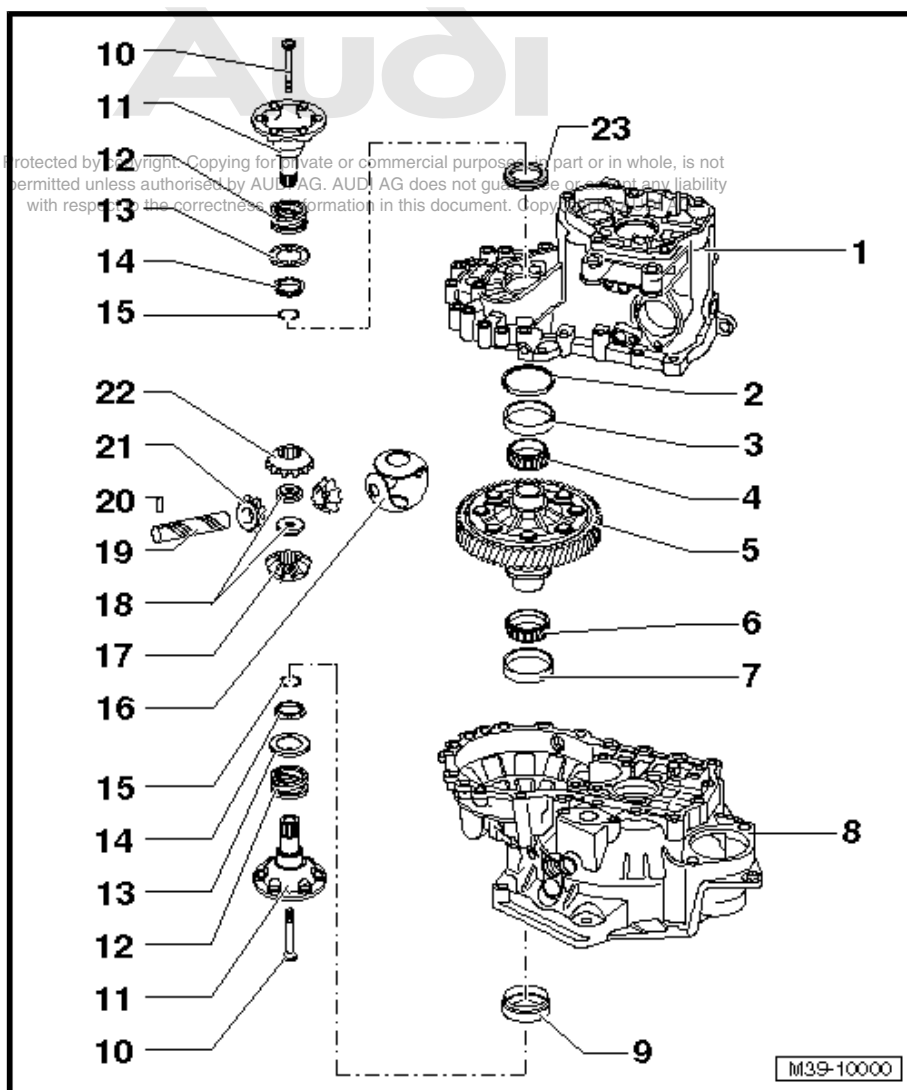
7 - Tapered roller bearing outer race

- ☐ Pressing out ⇒ [page 186](#)
- ☐ Pressing in ⇒ [page 186](#)

8 - Clutch housing

9 - Oil seal

- ☐ With sleeve
- ☐ For flange shaft (right-side)





- ☐ If oil seal is damaged, renew sleeve and oil seal together
⇒ ["1.3 Renewing oil seal \(right-side\)", page 174](#)

10 - Countersunk bolt

- ☐ Screws into threaded piece ⇒ [Item 18 \(page 178\)](#)
- ☐ 25 Nm

11 - Flange shaft

- ☐ Removing and installing:
- ◆ Left-side ⇒ [page 178](#)
- ◆ Right-side ⇒ [page 181](#)

12 - Spring for flange shaft

13 - Thrust washer

- ☐ Installation position ⇒ [page 189](#)

14 - Tapered ring

- ☐ With grooves to engage on thrust washer
- ☐ Installation position: Taper towards differential cage

15 - Circlip

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

16 - One-piece thrust washer

- ☐ Lubricate with gear oil before installing
- ☐ One-piece thrust washer has a projection on some versions ⇒ [page 188](#)

17 - Sun wheel

- ☐ Installing ⇒ [page 189](#)

18 - Threaded piece

- ☐ Installing ⇒ [page 189](#)

19 - Differential pinion pin

- ☐ Removing in conjunction with short spring pin ⇒ [page 188](#)
- ☐ Removing in conjunction with long spring pin ⇒ [page 188](#)
- ☐ Installing ⇒ [page 189](#)

20 - Spring pin

- ☐ For securing differential pinion pin
- ☐ Spring pins of two different lengths are fitted
- ☐ Identification of different types of spring pin ⇒ [page 187](#)
- ☐ Short spring pin: removing and installing ⇒ [page 188](#)
- ☐ Long spring pin: is sheared off on removal ⇒ [page 188](#)
- ☐ Long spring pin: installing ⇒ [page 188](#)

21 - Planet pinion

- ☐ Installing ⇒ [page 189](#)

22 - Sun wheel

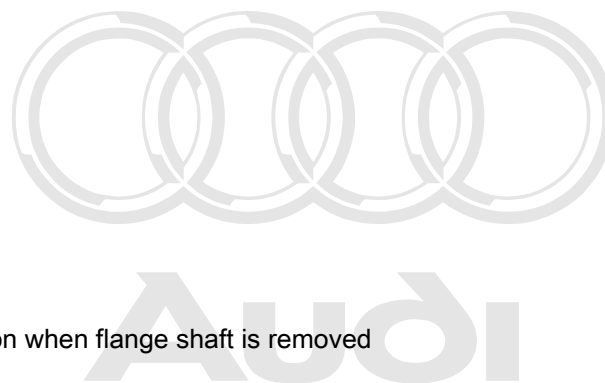
- ☐ Installing ⇒ [page 189](#)

23 - Oil seal

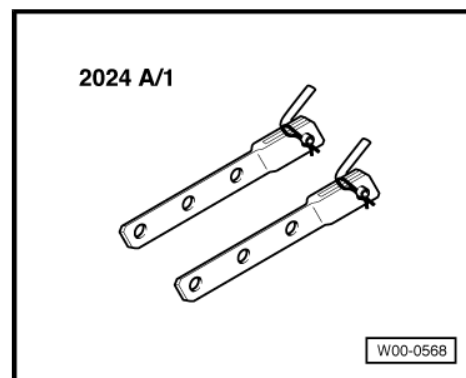
- ☐ For flange shaft (left-side)
- ☐ Renewing ⇒ [page 172](#)

2.2 Removing and installing flange shaft (left-side)

Special tools and workshop equipment required

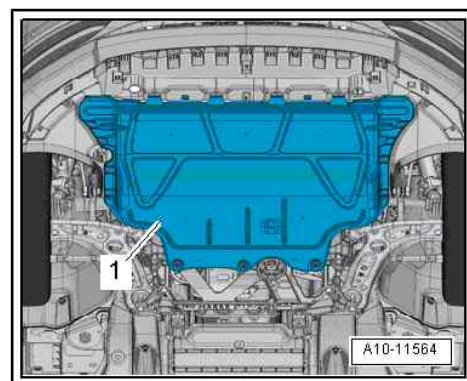


◆ Hook -2024 A /1-

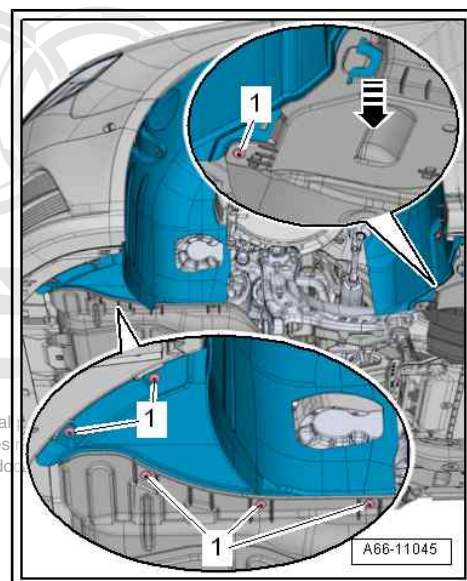


Removing

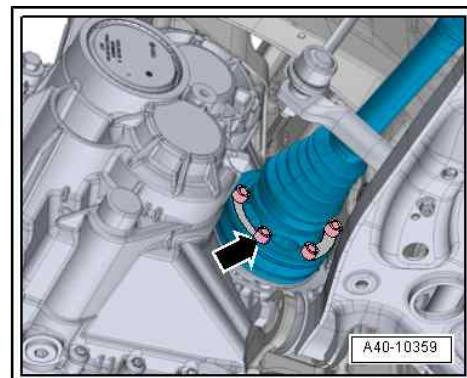
- Gearbox in vehicle
- Remove noise insulation -1- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



- Remove wheel housing liner (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .



- Unbolt drive shaft -arrow- (left-side) from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .



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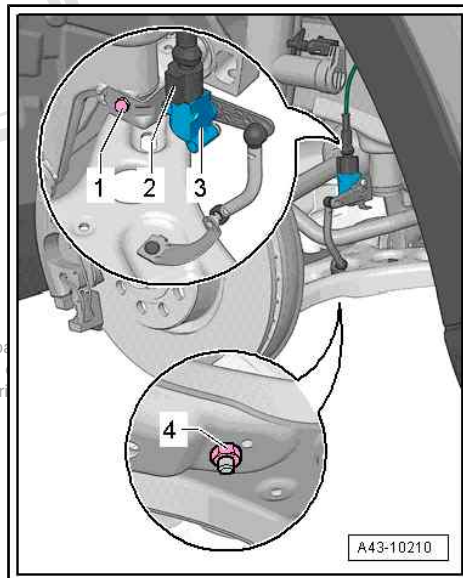
- If fitted, remove nut -4- and bolt -1-, place front left vehicle level sender - G78- -3- to one side.



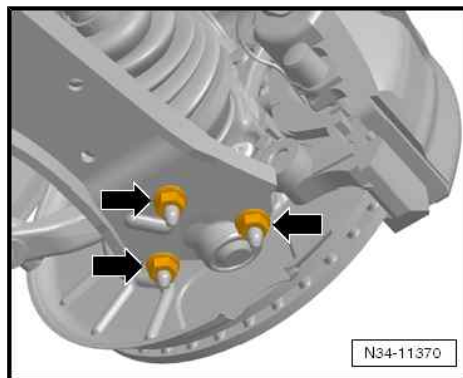
Note

-Item 2- can be disregarded.

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- Remove nuts -arrows- securing swivel joint (left-side).
- Disengage swivel joint (left-side) from wishbone.



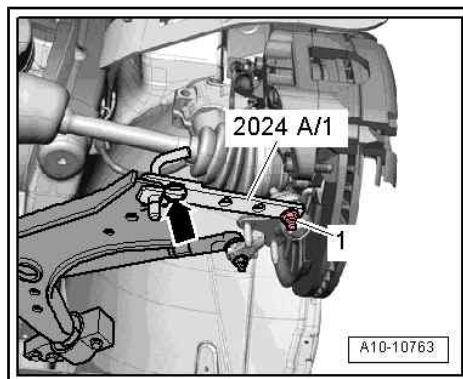
- Swivel suspension strut (left-side) outwards and support with hook -2024 A /1- as shown in illustration.



WARNING

Risk of accident if parts of support are not properly secured.

- ◆ Secure locking pin and swivel joint with retaining clip -arrow- and nut -1-.



- Tie up drive shaft (left-side).



Note

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

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

Installing

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

- Push flange shaft in against spring pressure and secure with bolt.
- Install wheel housing liner (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .

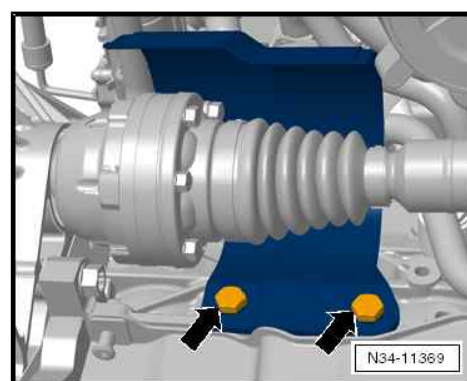
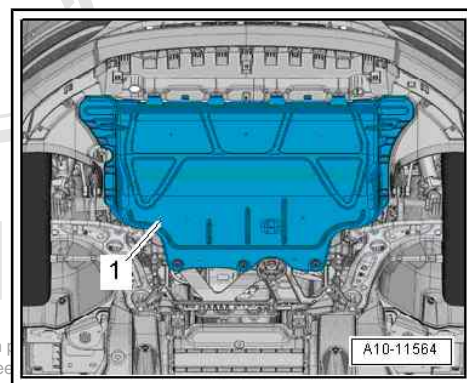
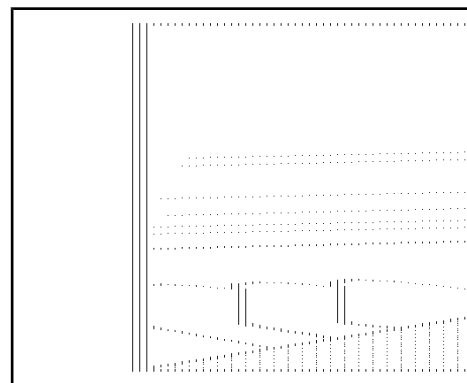
Tightening torques

- ◆ ⇒ [“2.1 Exploded view - differential”, page 177](#)
- ◆ Lower wishbone, swivel joint; Exploded view - lower wishbone, swivel joint ⇒ Running gear, axles, steering; Rep. gr. 40 ; Lower wishbone, swivel joint; Exploded view - lower wishbone, swivel joint
- ◆ Drive shaft; Exploded view - drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft
- ◆ Vehicle level senders; Exploded view - front vehicle level sender ⇒ Running gear, axles, steering; Rep. gr. 43 ; Vehicle level senders; Exploded view - front vehicle level sender
- ◆ Noise insulation; Exploded view - noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

2.3 Removing and installing flange shaft (right-side)

Removing

- Gearbox in vehicle
- Remove noise insulation -1- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



- Remove bolts -arrows- and detach heat shield for drive shaft (right-side).

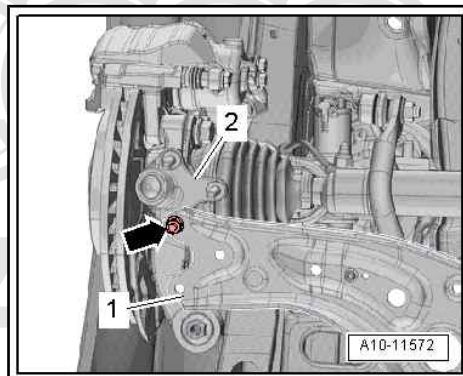
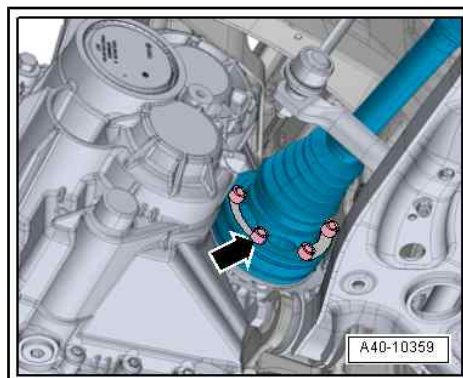
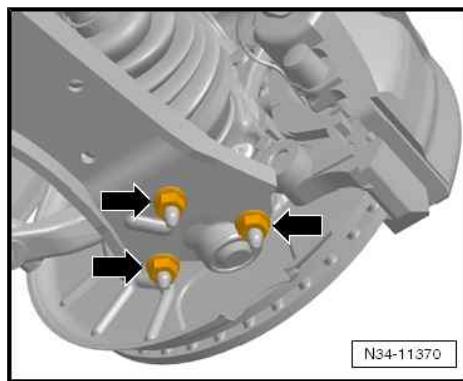
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Note

Some of the following work steps are shown on the left side of the vehicle.

- Remove nuts -arrows- securing swivel joint (right-side).
- If fitted, unscrew nut on bracket for front right vehicle level sender - G289- .
- Disengage swivel joint (right-side) from wishbone.
- Unbolt drive shaft -arrow- (right-side) from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
- Secure swivel joint -2- (right-side) to wishbone -1- with nut -arrow- as shown in illustration.
- Tie up drive shaft (right-side) to rear.



Note

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

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- Remove bolt -arrow- securing flange shaft (right-side). To do so, screw 2 bolts into flange and counterhold flange shaft with suitable lever.
- Pull out flange shaft together with spring, thrust washer and tapered ring.

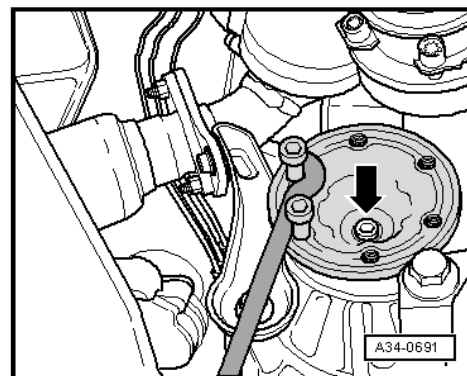
Installing

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

- Push flange shaft in against spring pressure and secure with bolt.

Tightening torques

- ◆ Exploded view - differential ⇒ [page 177](#)
- ◆ Lower wishbone, swivel joint; Exploded view - lower wishbone, swivel joint ⇒ Running gear, axles, steering; Rep. gr. 40 ; Lower wishbone, swivel joint; Exploded view - lower wishbone, swivel joint
- ◆ Drive shaft; Exploded view - drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft
- ◆ Noise insulation; Exploded view - noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



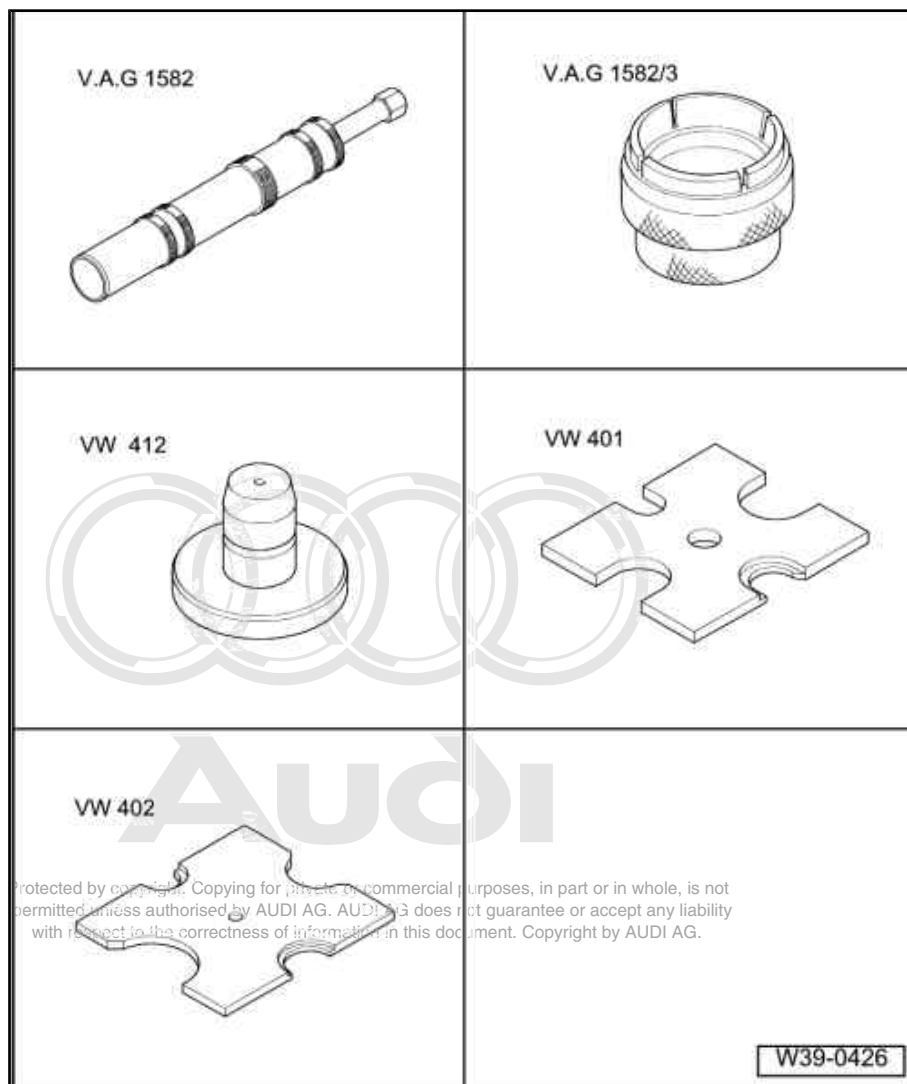
2.4 Dismantling and assembling differential



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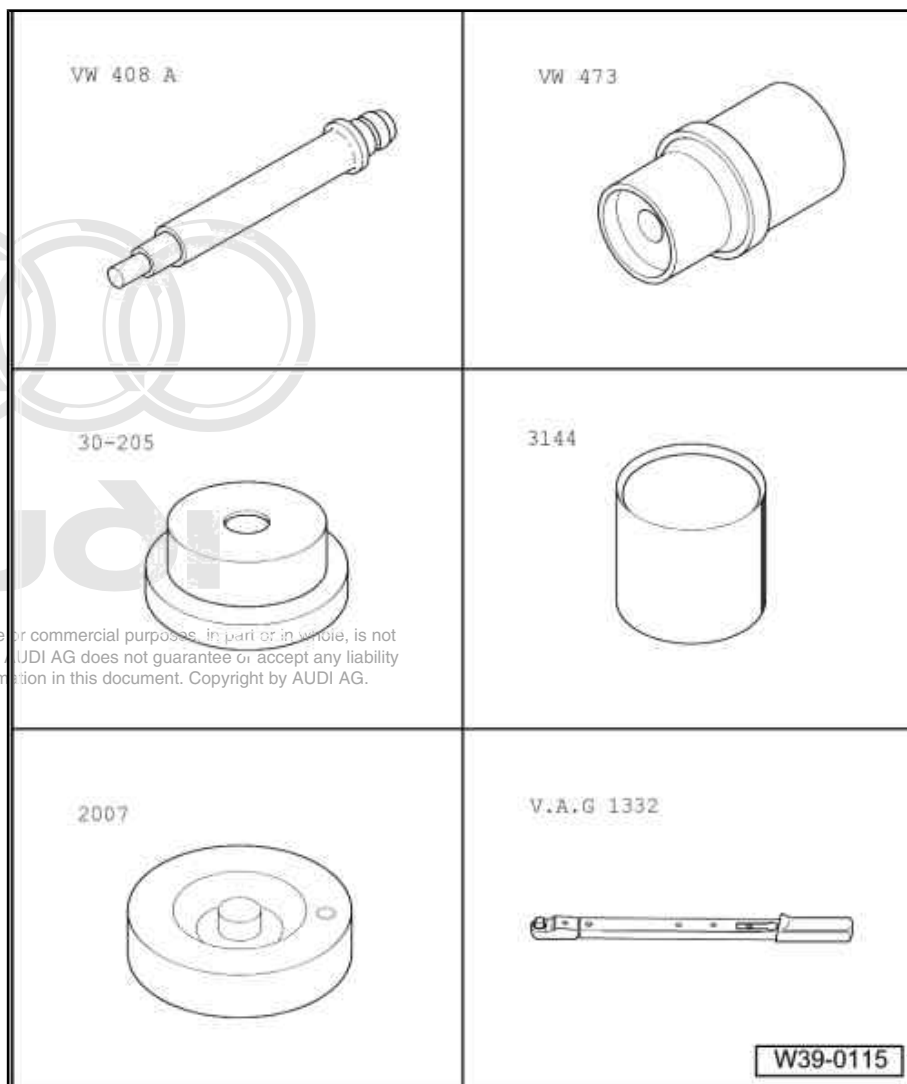
Special tools and workshop equipment required

- ◆ Tapered roller bearing puller - V.A.G 1582-
- ◆ Adapter - V.A.G 1582/3-
- ◆ Press tool - VW 412-
- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-



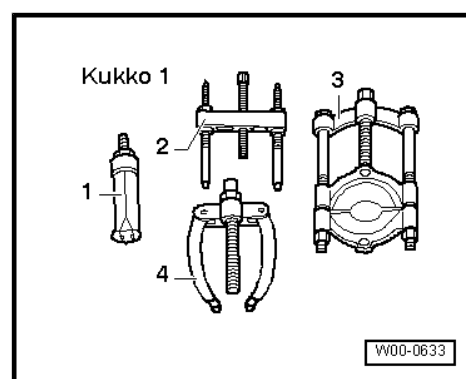
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- ◆ Press tool - VW 408 A-
- ◆ Press tool - VW 473-
- ◆ Thrust plate - 30 - 205-
- ◆ Sleeve - 3144-
- ◆ Press tool - 2007-
- ◆ Torque wrench - V.A.G 1332-



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- ◆ -1- Internal puller -Kukko 21/7-



- ◆ -4- Counter-support -Kukko 22/2-

Procedure



Note

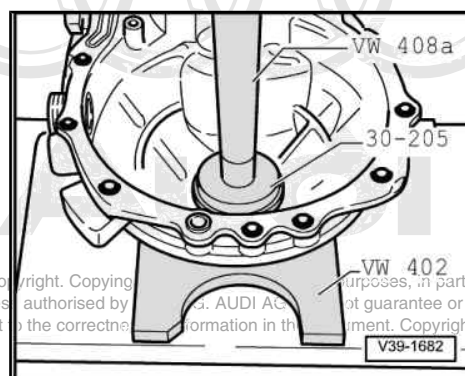
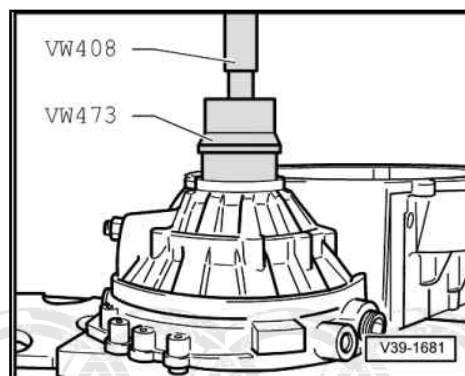
- ◆ Heat tapered roller bearing inner race to 100°C before installing.
- ◆ Always renew both tapered roller bearings together.
- ◆ Adjust differential ➔ [page 193](#) if tapered roller bearings, differential cage, gearbox housing or clutch housing are being renewed.

Pressing tapered roller bearing outer race out of clutch housing

- First remove mounting sleeve for flange shaft oil seal.

Pressing tapered roller bearing outer race into clutch housing

No shim is installed on the clutch housing side.



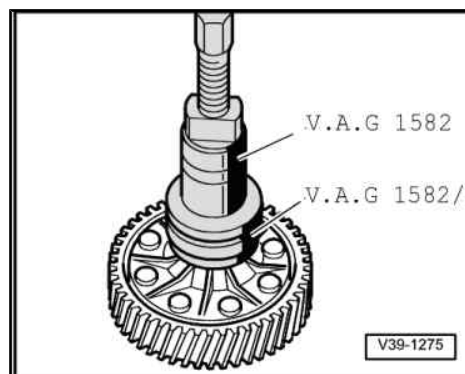
Pulling off tapered roller bearing inner races

- Before setting up the puller, place thrust plate - 40 - 105- on differential cage.



Note

The procedure for pulling the tapered roller bearing inner races off the differential cage is the same for both bearings.

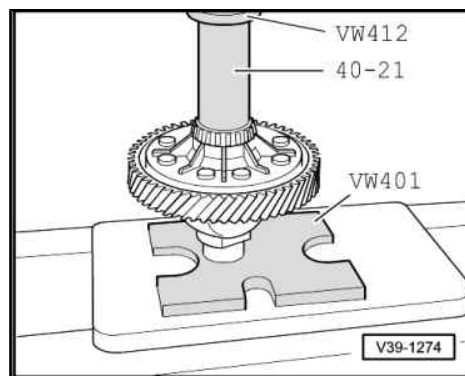


Pressing on tapered roller bearing inner races



Note

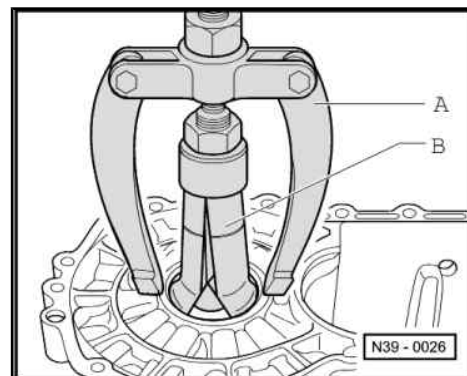
The same special tools are used for pressing on the tapered roller bearing inner races for the gearbox housing and the clutch housing.



Pulling tapered roller bearing outer race out of gearbox housing

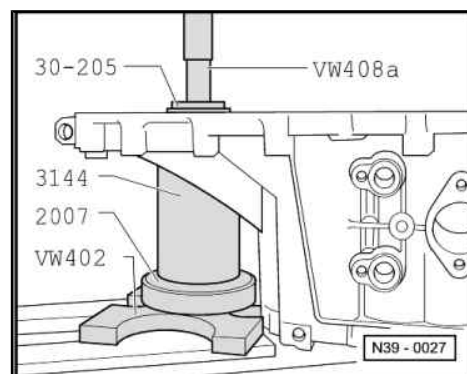
A - Counter-support , e.g. -Kukko 22/2-

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



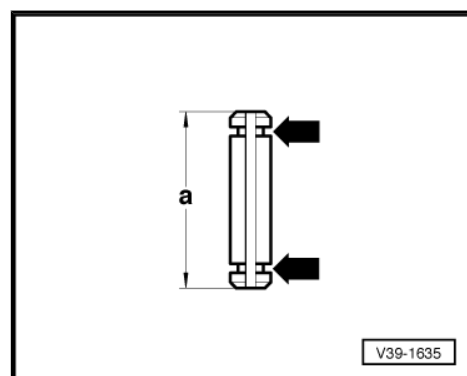
Pressing tapered roller bearing outer race into gearbox housing

- Fit shim below outer race.
- Support gearbox housing with sleeve - 3144- directly below bearing mounting.



Identification of different types of spring pin

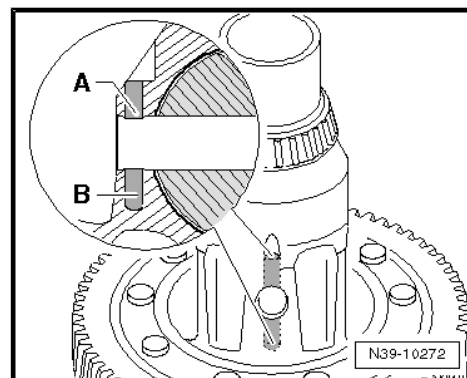
Dimension "a" (mm)	Identification
28.5 (short spring pin), removing and installing ⇒ page 188	Annular groove -arrows-
36.0 (long spring pin), removing ⇒ page 188 , installing ⇒ page 188	No annular groove



Identification of differential cage

The drilling in the differential cage has been modified to accommodate the longer spring pin.

Hole	Length of spring pin (mm)
-A-	28.5 (short spring pin)
-A- and -B-	36.0 (long spring pin)



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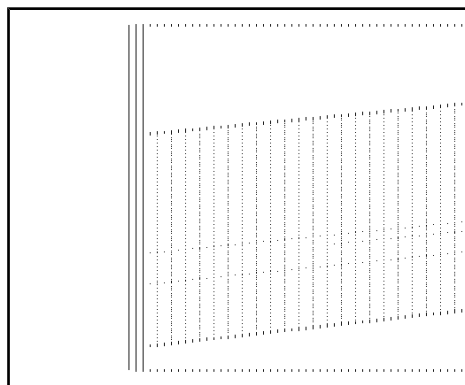
Spring pin with annular groove (short spring pin): removing and installing

Removing

- Cover up tapered roller bearing inner race and speedometer drive wheel to keep out metal particles and to prevent damage.
- Drive out spring pin with chisel, inserting chisel into annular groove.

Installing

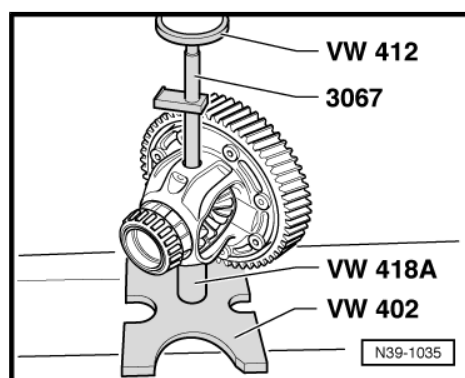
- Drive fully into differential cage.



Removing spring pin without annular groove (long spring pin): press out differential pin

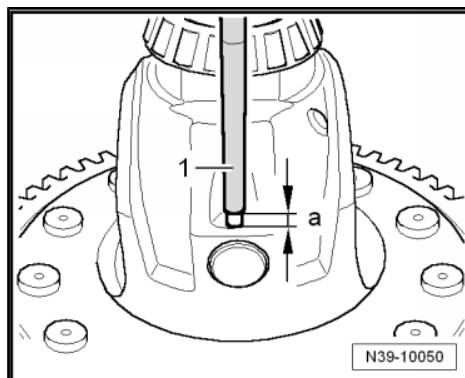
The spring pin is sheared off when it is pressed out.

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



Installing spring pin without annular groove (long spring pin)

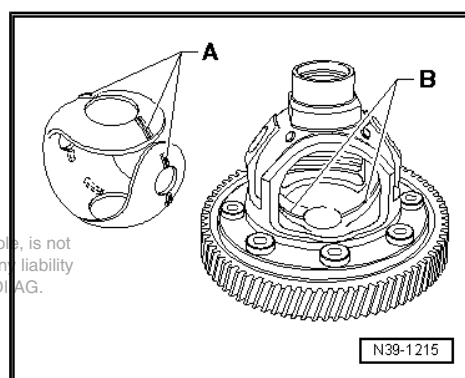
- Align drilling in differential pinion pin with drilling in differential cage.
- Use a punch -1- to drive in new spring pin to dimension -a- = 3.0 mm.
- The spring pin must not come into contact with the gearbox when the differential cage is installed.



On some versions the one-piece thrust washer has a projection next to the holes -A-.

In this case the differential cage has a corresponding annular slot -B-.

- Lubricate one-piece thrust washer with gear oil and install.
- Position one-piece thrust washer so that it engages in the slot -B- in the differential cage.

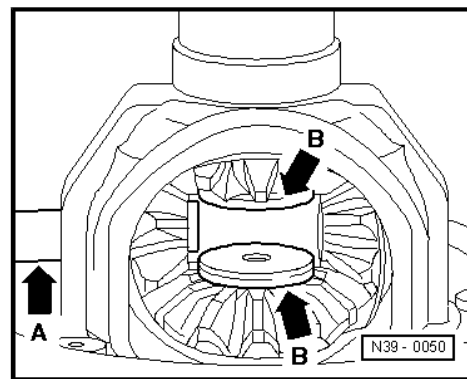


Installing differential bevel gears and differential pinion pin

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

Installation position: Stepped shoulder towards sun wheel

- Drive differential pinion pin into final position and secure with spring pin.

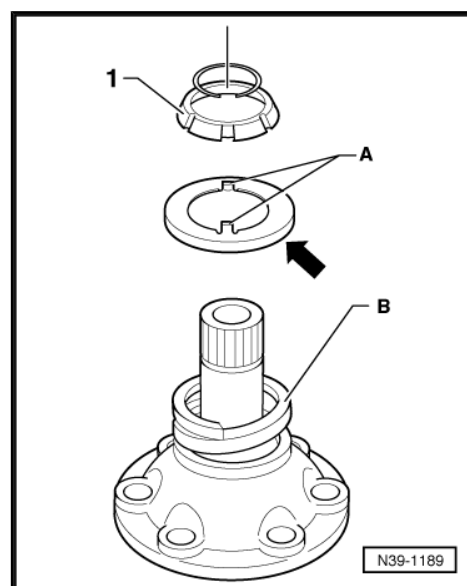


Installation position of thrust washer for tapered ring -1-

- Collar -arrow- faces spring -B-.

Some gearbox versions have projections -A-.

- The projections -A- face towards tapered ring -1-.



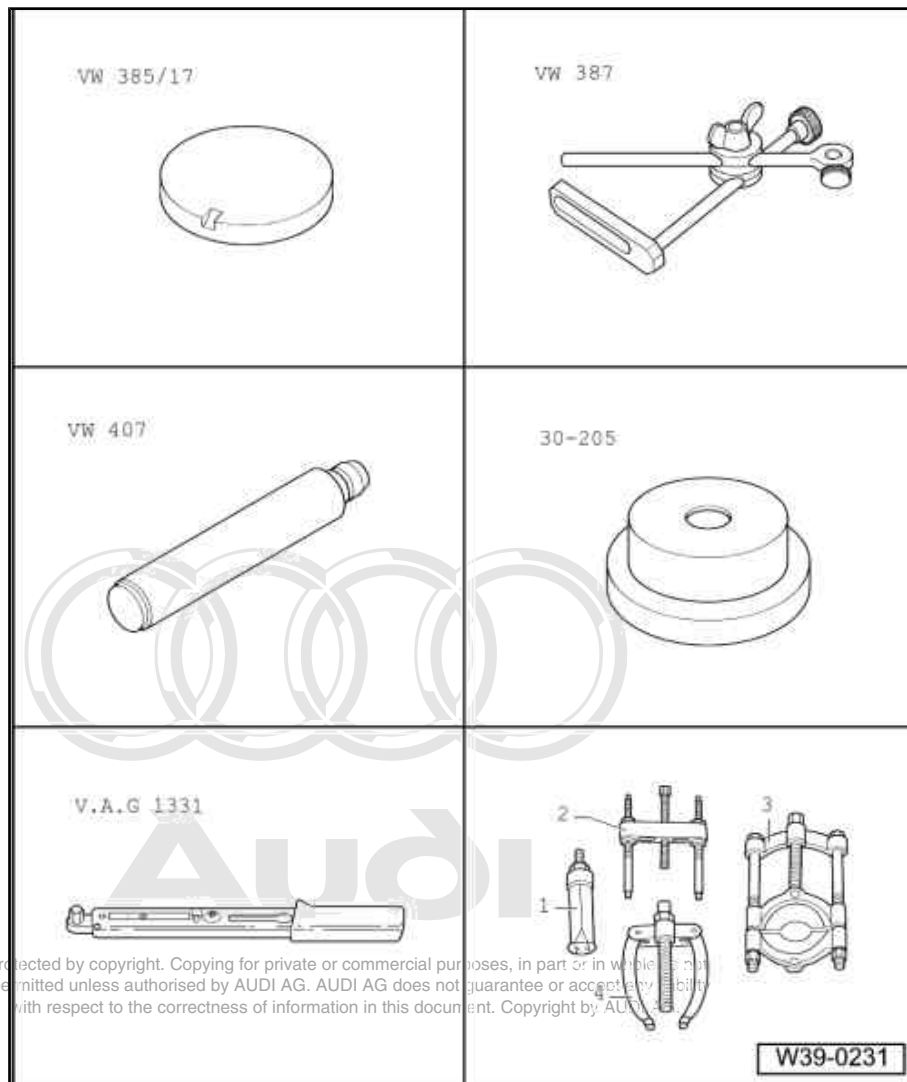
2.5 Adjusting differential



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Special tools and workshop equipment required

- ◆ End measuring plate - VW 385/17-
- ◆ Universal dial gauge bracket - VW 387-
- ◆ Press tool - VW 407-
- ◆ Thrust plate - 30 - 205-
- ◆ Torque wrench - V.A.G 1331-
- ◆ -1- Internal puller -Kukko 21/7-
- ◆ -4- Counter-support -Kukko 22/2-
- ◆ Dial gauge



Procedure

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

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

Table of adjustments ➤ [page 193](#)

- Press tapered roller bearing outer race without shim into gearbox housing using thrust plate - 30 - 205- ➤ [page 187](#) .



Note

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

- Press tapered roller bearing outer race into clutch housing ➤ [page 186](#) using thrust plate - 30 - 205- .
- Install differential in clutch housing.

- Place gearbox housing in position and tighten 5 bolts to 25 Nm.
- Attach dial gauge and set to “0” with a preload of 1 mm.
- Move differential up and down and read off and note play indicated on dial gauge. (0.70 mm in this example.)

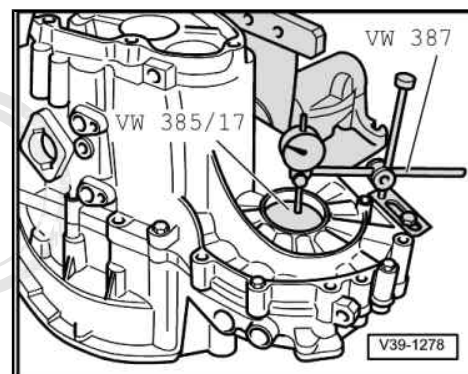
Determining thickness of shim

Example:

Bearing clearance (measured value)	Thickness of shim according to table
0.70 mm	0.95 mm

Table of shims

Bearing clearance	Shim
Measured value (mm)	Thickness (mm)
0.303 ... 0.449	0.650
0.450 ... 0.499	0.700
0.500 ... 0.549	0.750
0.550 ... 0.599	0.800
0.600 ... 0.649	0.850
0.650 ... 0.699	0.900
0.700 ... 0.749	0.950
0.750 ... 0.799	1.000
0.800 ... 0.849	1.050
0.850 ... 0.899	1.100
0.900 ... 0.949	1.150
0.950 ... 0.999	1.200
1.000 ... 1.049	1.250
1.050 ... 1.099	1.300
1.100 ... 1.149	1.350
1.150 ... 1.199	1.400



Note

Select correct shims from ⇒ *Electronic parts catalogue* .

- Detach gearbox housing and pull tapered roller bearing outer race out of gearbox housing.

Pulling tapered roller bearing outer race out of gearbox housing

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

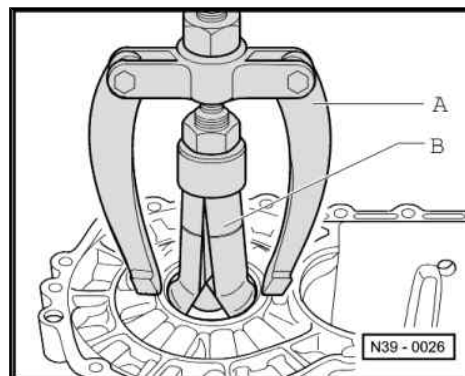
B - Internal puller 46 ... 58 mm , e.g. -Kukko 21/7-

- Install shims of the calculated thickness, thickest shim first.

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

Tolerance variations make it possible to obtain the exact shim thickness required.

- Press in tapered roller bearing outer race again and secure gearbox housing ⇒ [page 187](#) .



Tightening torques

- ◆ Gearbox housing to clutch housing
⇒ [“7.4 Exploded view - gearbox housing and selector mechanism”, page 100](#)



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3 Table of adjustments



Note

Readjustment of input shaft, output shaft or differential is only required if components have been renewed which have a direct effect on the adjustment of the gearbox. Refer to the following table to avoid unnecessary adjustment work:

		Components requiring adjustment:		
		Input shaft ⇒ page 142	Output shaft ⇒ page 163	Differential ⇒ page 189
Components renewed:	Gearbox housing	x		x
	Clutch housing	x	x	x
	Input shaft	x		
	Output shaft		x	
	Differential cage			x
	Tapered roller bearing for input shaft	x		
	Tapered roller bearing for output shaft		x	
	Tapered roller bearing for differential			x
	4th gear wheel	x		

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