

Workshop Manual

León 2013 ➤

León ST 2013 ➤

6-speed manual gearbox 0AJ

Edition 11.2016

List of Workshop Manual Repair Groups

Repair Group

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

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

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00 – Technical data

1 Safety instructions

(ERL003213; Edition 11.2016)

1.1 Safety precautions for working on vehicles with start-stop system



WARNING

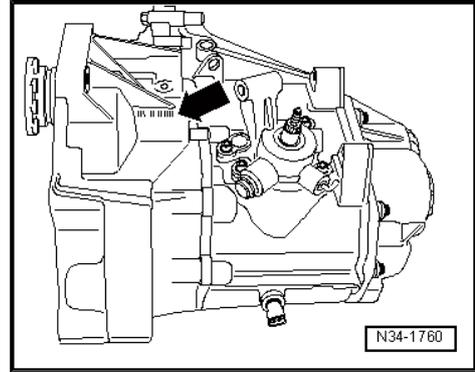
Risk of injury due to automatic engine start on vehicles with Start-Stop system.

- ◆ *When working on a vehicle, always deactivate the start/stop system. Switch off ignition.*
- ◆ *Switch on ignition only if it is necessary.*

2 Identification

2.1 Gearbox codes

Configuration of identification codes and construction data on manual gearbox -arrow-



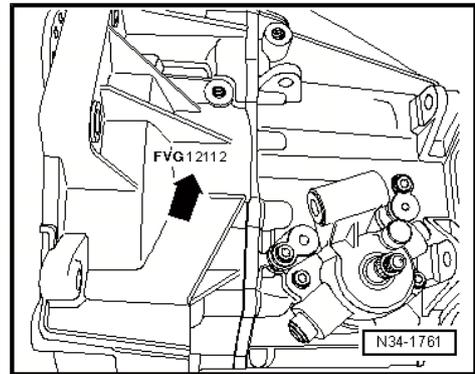
Identification letters and production date of the gearbox -arrow-

As an example:	FVG	12	11	2
	Identification letters	Day	Month	Year (2002) of manufacture

Additional data identify the factory where the unit was built.

 **Note**

The gearbox code is also included on the vehicle data stickers.



3 Repair notes

3.1 General repair notes

Extremely careful way of working as well as the highest possible cleanliness are necessary to ensure the trouble free repairing of the gearbox. Furthermore, the tools must be in perfect condition. Naturally, the customary basic safety rules must be observed during repair work.

A number of generally valid instructions applicable for the various repair procedures - which were formerly repeated a number of times at numerous places in the workshop manual - are summarised here. These instructions are valid for this Repair Manual,

Special tools

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

Gearbox:

- ◆ When installing the manual gearbox, ensure that the dowel sleeves between the engine and gearbox are positioned correctly.
- ◆ Clean contact surfaces on fitting blocks, supports or waxed components. The surfaces must be completely free from wax or grease.
- ◆ Allocate bolts and other components using ⇒ Electronic parts catalogue (ETKA) .
- ◆ If the gearbox is repaired, fill with gear oil.

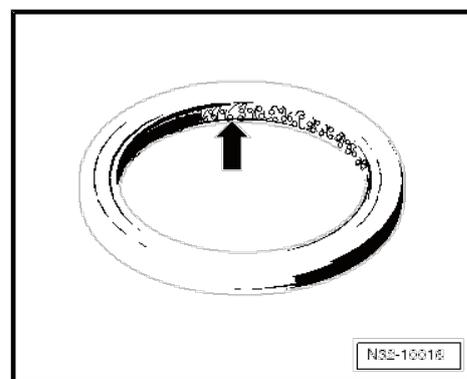
Gaskets, seals

After removing gaskets and seals, always inspect contact surface of housing or shaft for burrs resulting from removal or for other signs of damage.

- ◆ Thoroughly clean parting surfaces and apply sealant .
- ◆ Allocation ⇒ Electronic parts catalogue (ETKA)
- ◆ Before installing the oil seal, fill the space between the sealing lips halfway with sealing grease -arrow-.
- ◆ For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .
- ◆ The open side of the seals should face the liquid to be retained.
- ◆ Lightly oil the O-rings before installation, to prevent them from being pressed together during installation.

Sealant

- ◆ Thoroughly clean housing joint surfaces before applying sealant .
- ◆ Apply sealant evenly and not too thickly.
- ◆ Allocation ⇒ Electronic parts catalogue (ETKA)
- ◆ Breather holes must remain free of sealant .



Retaining rings

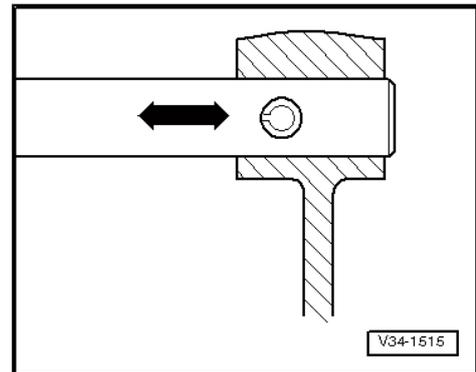
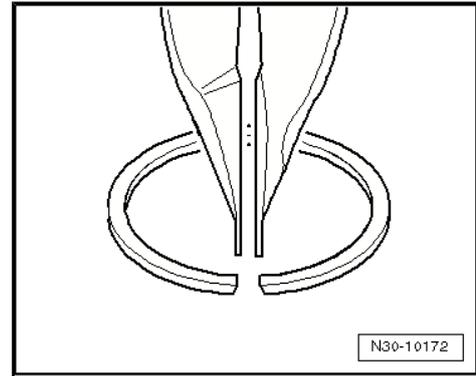
- ◆ Replace safety rings.
- ◆ Do not over-expand safety rings.
- ◆ The securing rings must be perfectly seated in their groove.
- ◆ Replace split pins. Installation position: the groove must face parallel to the direction in which force is transferred.

Bolts, nuts

- ◆ Loosen and tighten bolts and securing nuts for covers and housings diagonally.
- ◆ For delicate parts, e.g. the clutch press, do not tilt them and always loosen the bolts gradually and in diagonal sequence
- ◆ The specified torque values listed apply to unlubricated nuts, bolts and screws.
- ◆ Renew self-locking nuts and bolts after each removal.
- ◆ Contact surfaces, bolts and nuts for all threaded joints must be waxed when fitted if necessary.
- ◆ Use a thread chaser to clear residual locking fluid from all threaded holes into which self-locking bolts are to be screwed. Otherwise there is a danger of the bolts shearing off the next time they are removed.
- ◆ Check pitch of thread, to ensure correct thread chaser is used to clean threads and to ensure the threads are not damaged.

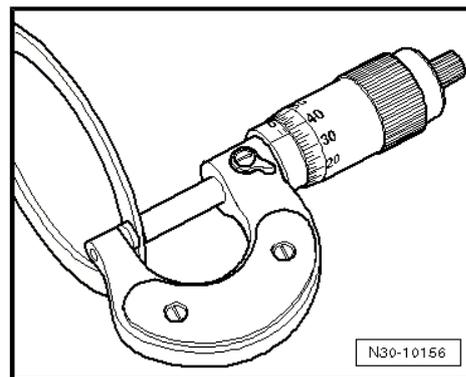
Antifriction bearings

- ◆ Lubricate all bearings with gear oil before installing.
- ◆ Install the new conical roller bearings unchanged and without greasing it.
- ◆ Install needle bearings with lettered side (thicker metal) towards fitting drift.
- ◆ Conical roller bearings fitted into one same shaft must be replaced together. They must have the same manufacturer.
- ◆ The inner races must be heated to about 100 °C before the installation with the inductive heater unit - VAS 6414- .
- ◆ Do not confuse the outside and inside rings of the bearing with the rings from other bearings of the same size. The bearings come in matched pairs.



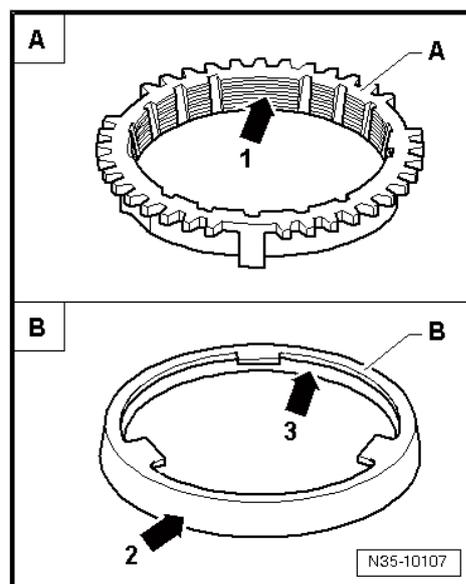
Shims

- ◆ Check shim settings at various points, using a micrometer. The various thicknesses make it possible to achieve the exact shim thickness required.
- ◆ Check that it is not burred or damaged.
- ◆ Only fit shims in perfect state.



Synchromesh rings

- ◆ Do not mix up. Do not mix up synchroniser rings from different gears.
- ◆ Check for wear and replace if necessary.
- ◆ Check grooves -arrow 1- of synchro ring -A- and inner ring for flat spots (worn grooves).
- ◆ If synchro-rings are coated, coating must not be damaged.
- ◆ If an intermediate ring -B- is installed, check the outer friction surface -arrow 2- and inner friction surface -arrow 3- of this intermediate ring for »scoring«, »signs of abnormal wear« and »blue discolouration (due to overheating)«.
- ◆ Check the cone of the synchromeshed gear for »scoring« and »signs of abnormal wear«.
- ◆ Moisten synchromesh mechanism with gear oil before installing.



Gears and synchro-hubs

- ◆ Before installing, clean and heat with the inductive heater - VAS 6414- to maximum 100° C.
- ◆ Note correct installation position.

Mobile pinions

- ◆ After assembly, check synchromeshed gears for slight play, or for freedom of movement.

Clutch mechanism

Disconnect vehicle battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

When the battery is re-connected, observe the ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

Clutch

- ◆ 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 as well as the friction surface of flywheel with a cloth to reduce the smell of burnt linings.

4 Technical data

4.1 Filling quantity

Capacity of manual gearbox	2.3 litres
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4.2 Allocation gearbox - engine

6-speed manual gearbox		0AJ			
Identification letters		MYF, PRL	QGG, REK, SEE	SEH	RGN
Correspondence	Type	Leon 2013			
	Engine	1.2 TSI 77 kW, 1.4L TSI 90 kW / 92 kW / 103kW	1.0 TSI 85 kW	1.0 TSI 85 kW	1.2 TSI 81 kW, 1.4L TSI 81 kW / 92 kW
Gear ratio: $Z_2 : Z_1$	Mechanism	73 : 18 = 4,056	73 : 18 = 4,056	73 : 18 = 4,056	73 : 18 = 4,056
	1st gear	47 : 13 = 3,615	49 : 13 = 3,769	47 : 13 = 3,615	47 : 13 = 3,615
	2nd gear	37 : 19 = 1,947	43 : 22 = 1,955	37 : 19 = 1,947	37 : 19 = 1,947
	3rd gear	41 : 32 = 1,281	41 : 32 = 1,281	41 : 32 = 1,281	41 : 32 = 1,281
	4th gear	36 : 37 = 0,973	36 : 37 = 0,973	36 : 37 = 0,973	36 : 37 = 0,973
	5th gear	35 : 45 = 0,778	35 : 45 = 0,778	35 : 45 = 0,778	35 : 45 = 0,778
	6th gear	31 : 48 = 0,646	31 : 48 = 0,646	34 : 53 = 0,642	31 : 48 = 0,646
	speed in reverse	24 : 11 x 35 : 24 = 3.181	24 : 11 x 35 : 24 = 3.181	24 : 11 x 35 : 24 = 3.181	24 : 11 x 35 : 24 = 3.181

Glean following data from ⇒ Electronic parts catalogue (ETKA) :

- ◆ Individual gear ratios
- ◆ Gear oil
- ◆ Allocation of clutch type

4.3 Ratio calculation

As an example:

	6th gear	Final drive
Driving gear	$TG_1 = 46$	$ZA_1 = 24$
Driven gear	$TG_2 = 33$	$ZA_2 = 70$

$$i = ZG_2 : ZG_1$$

$$i_G = \text{Gear ratio} = ZG_2 : ZG_1 = 33 : 46 = 0.717$$

$$i_A = \text{Final drive ratio} = ZA_2 : ZA_1 = 70 : 24 = 2.917$$

$$i_{\text{total}} = \text{overall ratio} = i_G \times i_A = 0.717 \times 2.917 = 2.091$$

1) T_1 = No. of teeth on driving gear, T_2 = No. of teeth on driven gear

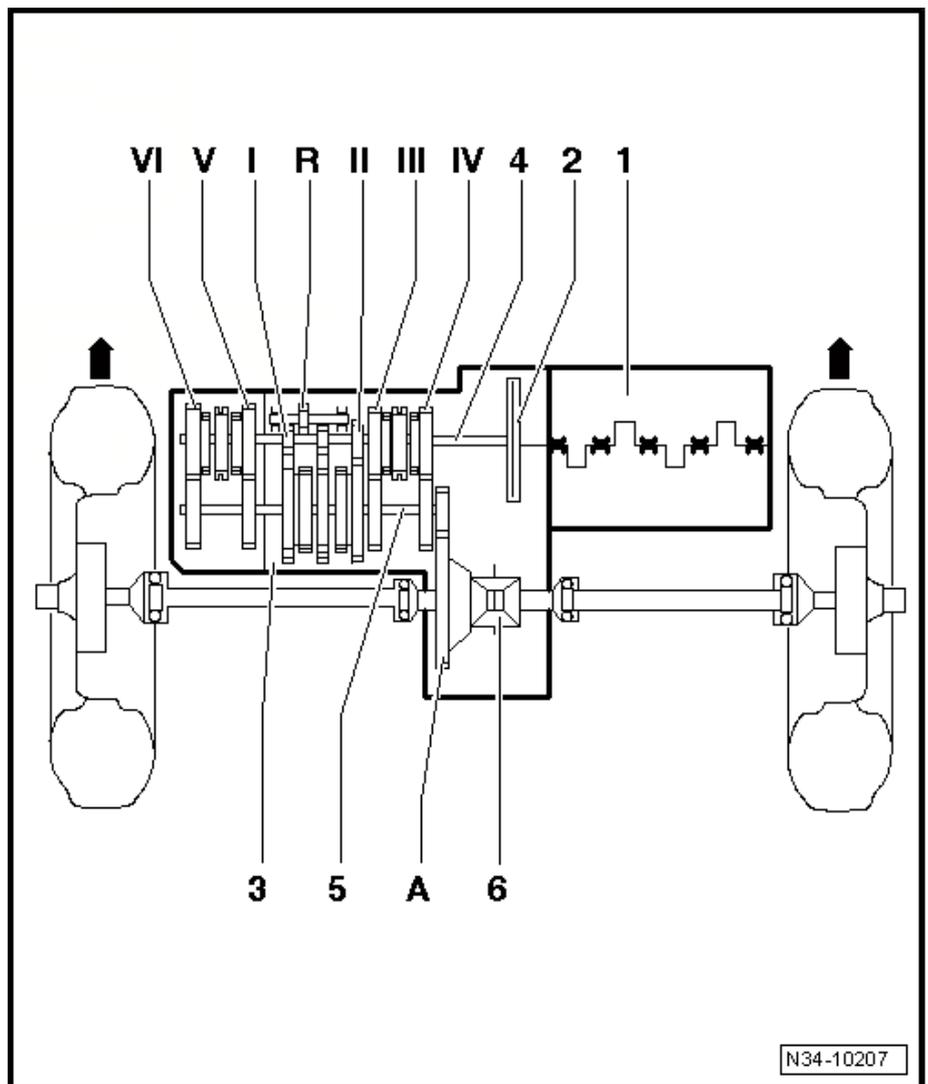
5 Overview of the drive force

5.1 Transmission layout - front-wheel drive

Denomination

-Arrows- point in direction of travel.

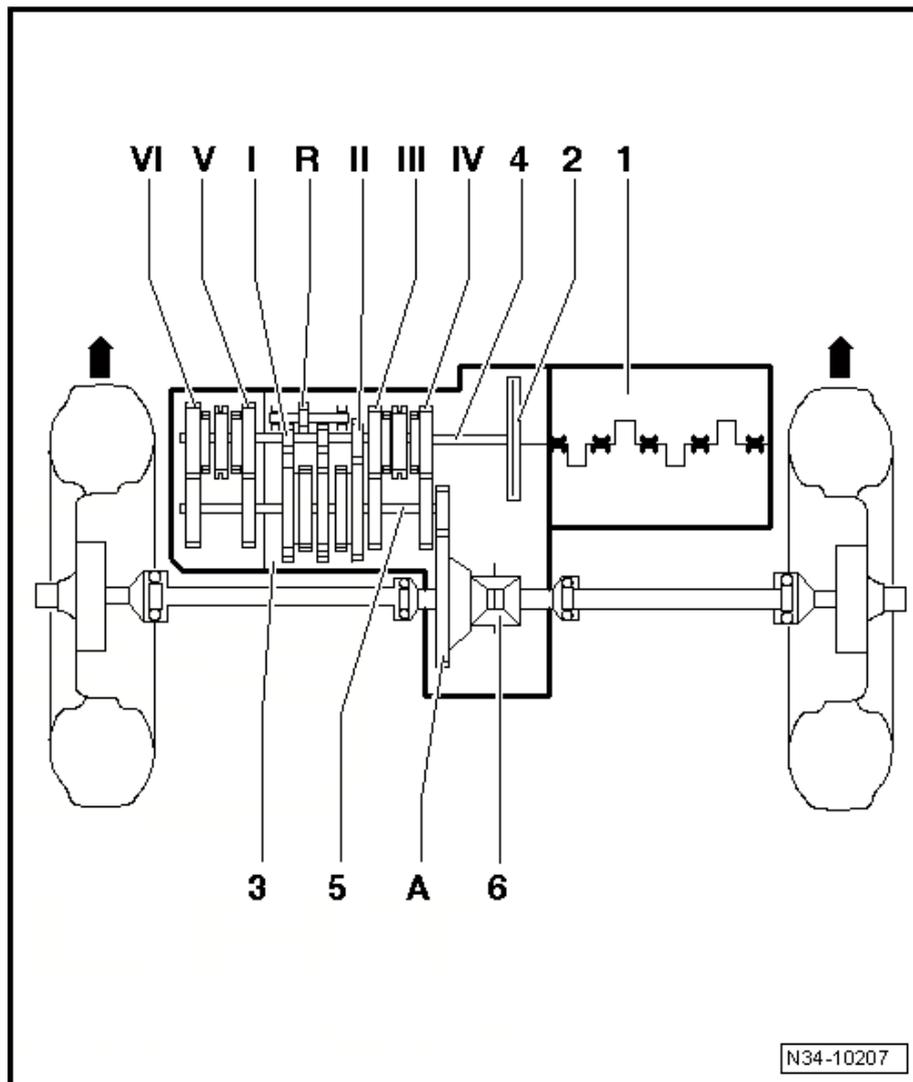
- 1 - Engine
- 2 - Clutch
- 3 - 6-speed manual gearbox
- 4 - Input shaft
- 5 - Secondary shaft
- 6 - Differential:



Ratio

-Arrows- point in direction of travel.

- I - 1st gear
- II - 2nd gear
- III - 3rd gear
- IV - 4th gear
- V - 5th gear
- VI - 6th gear
- R - speed in reverse
- A - Final drive



6 Electrical components

6.1 Fitting location overview - electrical components

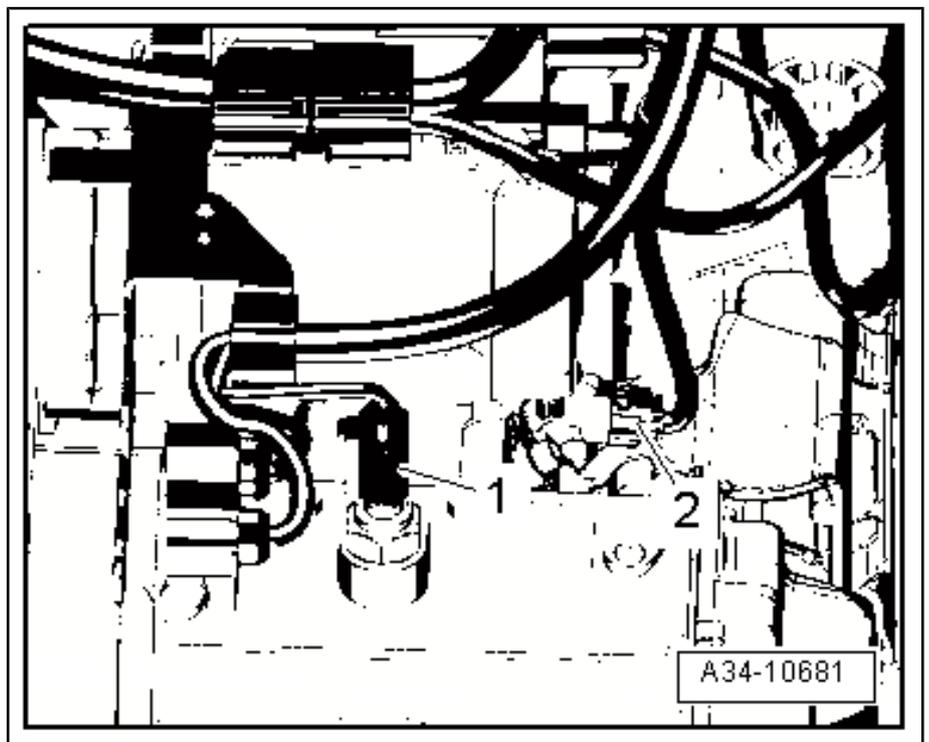
6.1.1 Fitting location overview - electrical components, manual gearbox

1 - Reversing light switch - F4-

- Fitting location: beneath starter
- Remove and install

2 - Gearbox neutral position sender - G701-

- Location: In area of selector unit beneath angled rod for securing selector shaft
- Remove and install



6.1.2 Fitting location overview - electrical components, clutch mechanism

Location: in passenger compartment on clutch master cylinder.

Removal and installation of the sender for the clutch position - G476-

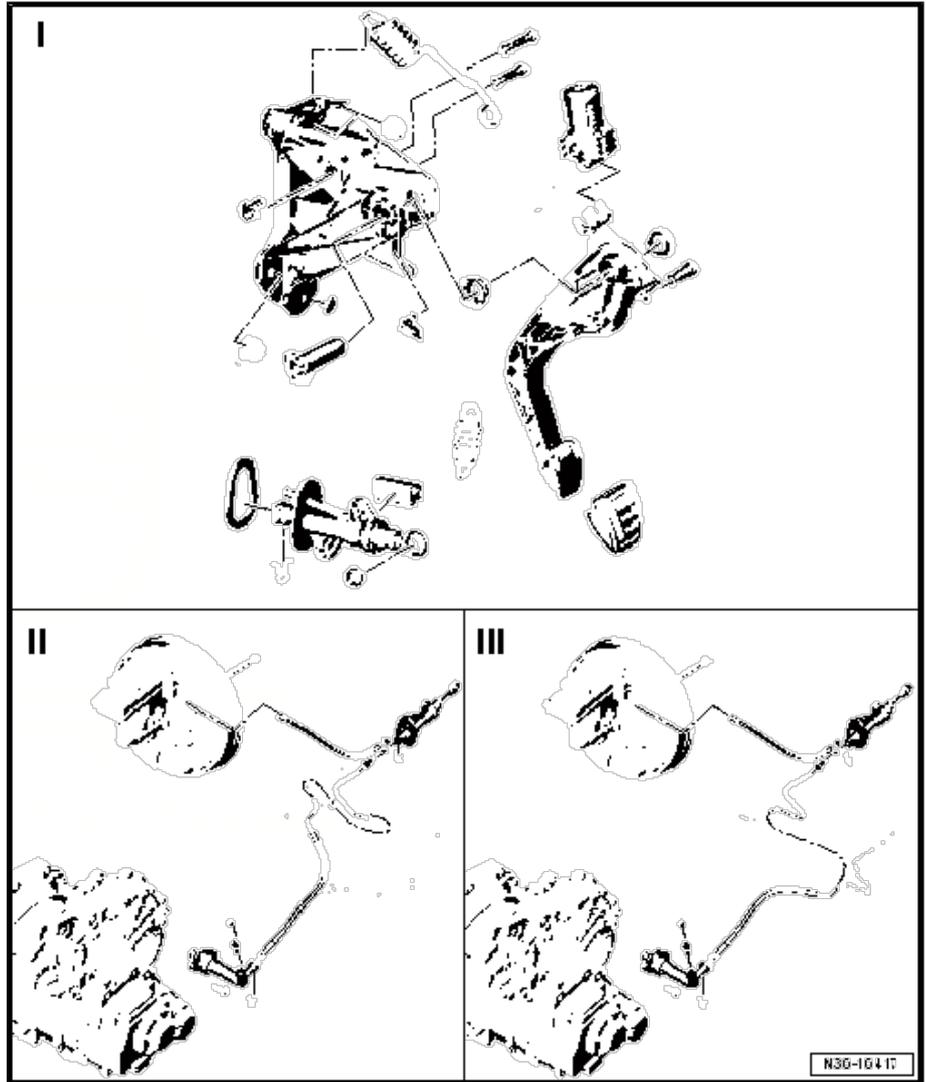


30 – Clutch

1 Clutch mechanism

1.1 Location overview - clutch mechanism

- I -
- II -
- III -



1.2 Assembly overview - pedal cluster

1 - Clutch master cylinder

- Remove and install

2 - Mounting bush

- Remove and install
- Cable must not be greased

3 - Staple

- To remove pipe, pull out clip to stop.
- Can be driven in fully before the line is installed

4 - Seal

- Self-adhesive
- Renew after removing the clutch master cylinder
- Glue onto clutch master cylinder

5 - Clutch position sender - G476-

- Can be checked with it in ⇒ Vehicle diagnostic tester Guided fault finding
- Allocation ⇒ Electronic parts catalogue (ETKA)
- Remove and install

6 - Pivot pin

- Must be renewed if removed
- Cable must not be greased

7 - Buffer stop

8 - Hexagon nut

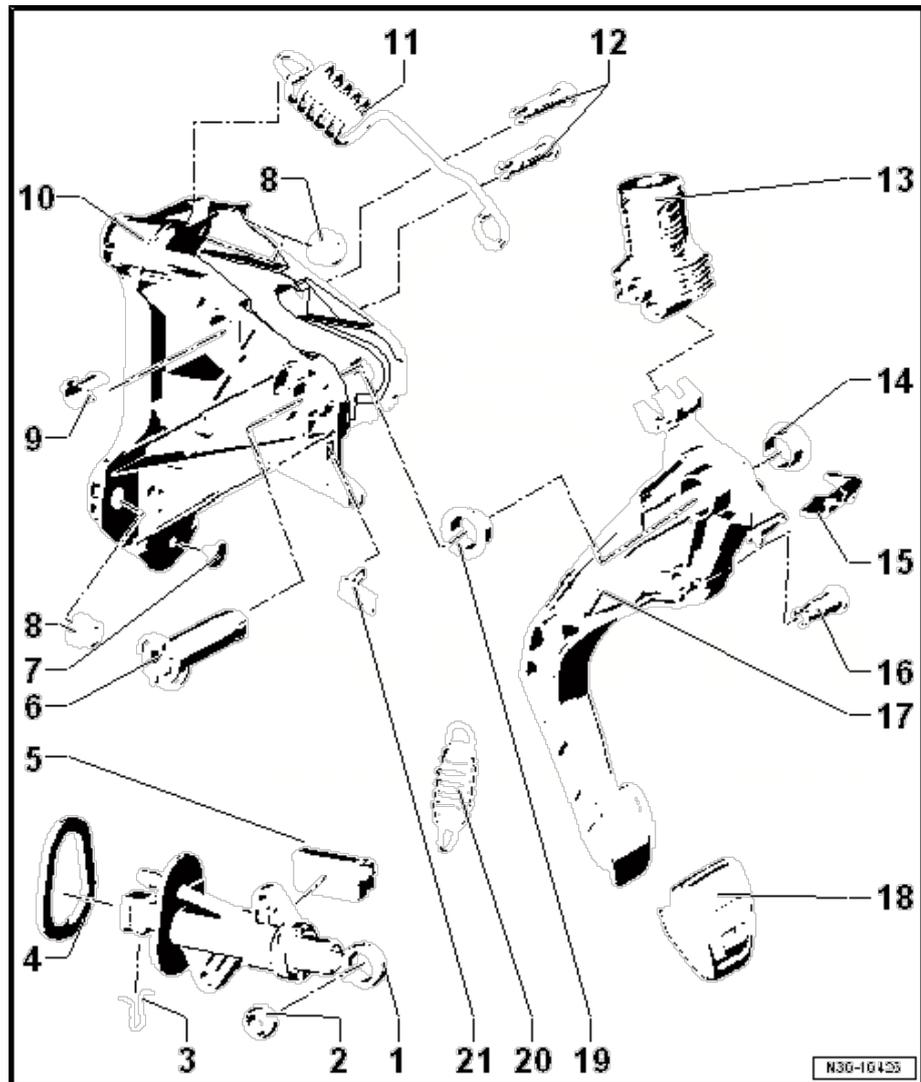
- For mounting bracket to bulkhead
- 3 Units
- Self-locking
- Must be renewed if removed
- 25 Nm

9 - Bearing shell

- 2 Units
- Installed on both sides
- Only fitted in conjunction with over-centre spring.
- Cable must not be greased

10 - Mounting

- For clutch pedal
- Remove and install



- Using drift - VW 207- drive bushes for the studs used to fasten the mounting bracket onto the bulkhead, into the holes in the mounting bracket

11 - Recovery spring

- Fitted depending on design status
- Remove and install
- Do not grease seat on mounting bracket

12 - Pivot pin

- For master cylinder
- Must be renewed if removed
- Cable must not be greased

13 - Over-centre spring

- Fitted depending on design status
- Different versions available; for correct version refer to ⇒ Electronic parts catalogue (ETKA) .⇒
- Remove and install
- Cable must not be greased

14 - Mounting bush

- Cable must not be greased

15 - Sliding bush

- Fitted depending on design status
- For mounting return spring
- Fit onto clutch pedal
- Grease when mounting return spring.
- Grease ⇒ Electronic Parts Catalogue (ETKA)

16 - Pivot pin

- for plunger of the clutch master cylinder
- Must be renewed if removed
- Cable must not be greased

17 - Clutch pedal

- Remove and install
- Cable must not be greased

18 - Pedal rubber

19 - Mounting bush

- Cable must not be greased

20 - Spring

- For clutch pedal
- Fitted depending on design status
- Installing and removing ⇒ Removing and installing over-centre spring
- Cable must not be greased

21 - Damping piece

- Only fitted in conjunction with extension spring.
- Cable must not be greased

1.3 Assembly overview - clutch hydraulics

1.3.1 Assembly overview - clutch hydraulics, left-hand drive

1 - Hexagonal bolt

- 20 Nm

2 - Bleeder screw

- Bleeding clutch mechanism
- Tightening torque

3 - Grease cap

4 - Supply hose

5 - Brake fluid reservoir

6 - Seals

- Must be fitted in supply hose
- If they are damaged, they must be renewed together with the supply hose

7 - Clutch master cylinder

- Remove and install

8 - Staple

- To remove pipe, pull out clip to stop.
- Can be driven in fully before the line is installed

9 - Seals / O-rings

- Replace if damaged
- Install on line connection
- Lubricate with brake fluid before installing
- Whether a seal or an O-ring is used depends on the type of connection
- Allocation ⇒ Electronic parts catalogue (ETKA)

10 - Support bracket

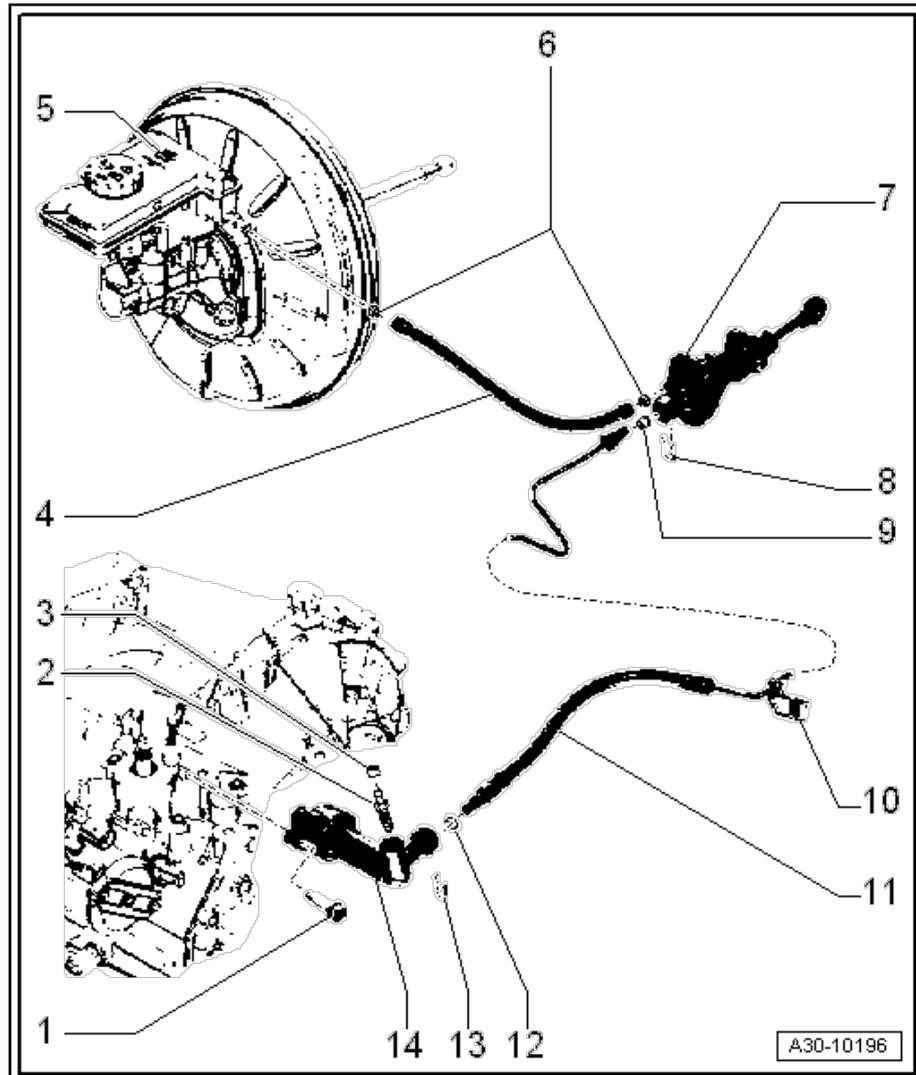
- For pipe/hose assembly
- Different supports for LHD and RHD vehicles.
- Allocation ⇒ Electronic parts catalogue (ETKA)

11 - Hose/metal pipe

- Different lengths for LHD and RHD vehicles.
- Allocation ⇒ Electronic parts catalogue (ETKA)
- Remove and install

12 - Seals / O-rings

- Replace if damaged



- Install on line connection
- Lubricate with brake fluid before installing
- Whether a seal or an O-ring is used depends on the type of connection
- Allocation ⇒ Electronic parts catalogue (ETKA)

13 - Staple

- To remove pipe, pull out clip to stop.
- Can be driven in fully before the line is installed

14 - Clutch cylinder:

- Remove and install

1.3.2 Assembly overview - clutch hydraulics, right-hand drive

1 - Clutch cylinder:

- Remove and install

2 - Bleeder screw

- Bleeding clutch mechanism
- Tightening torque

3 - Grease cap

4 - Supply hose

5 - Brake fluid reservoir

6 - Seals

- Must be fitted in supply hose
- If they are damaged, they must be renewed together with the supply hose

7 - Clutch master cylinder

- Remove and install

8 - Staple

- Pull out clip to stop to remove and install pipe/hose line

9 - Seals / O-rings

- Replace if damaged
- Install on line connection
- Lubricate with brake fluid before installing

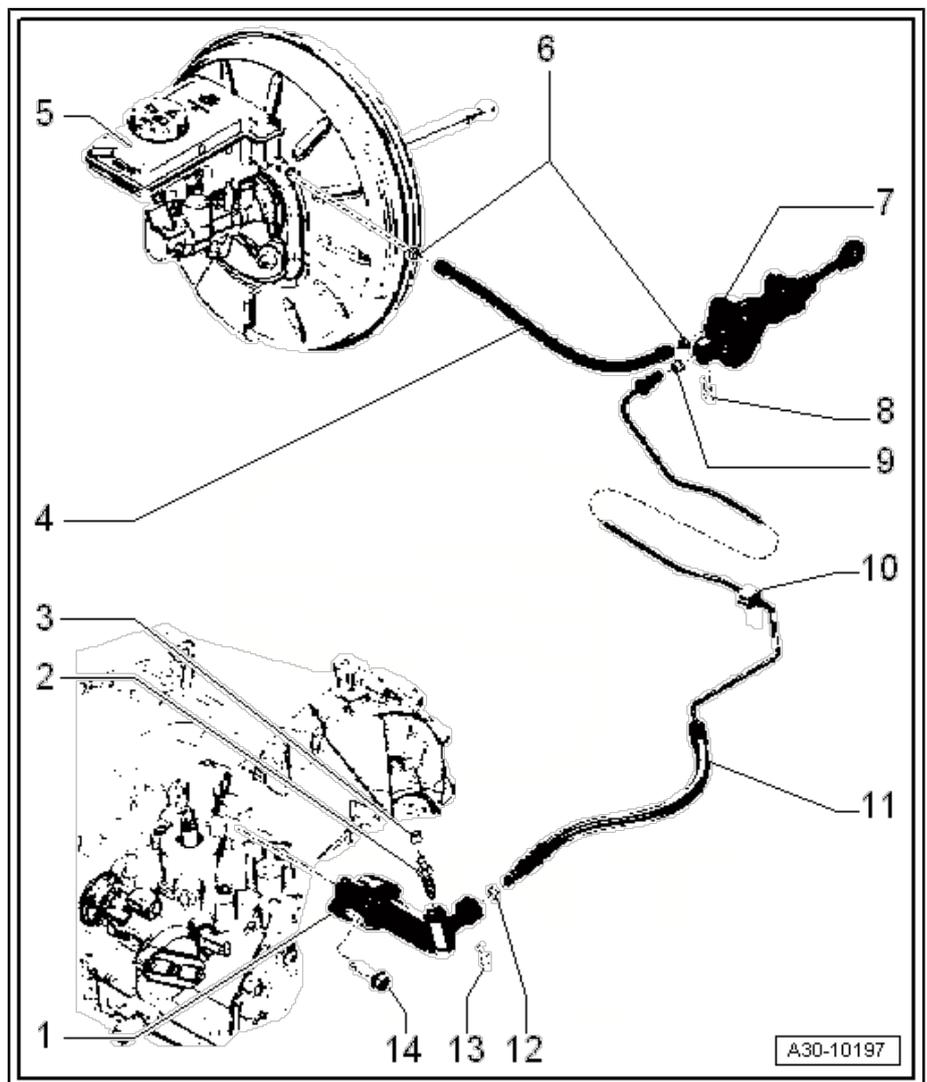
- Whether a seal or an O-ring is used depends on the type of connection
- Allocation ⇒ Electronic parts catalogue (ETKA)

10 - Support bracket

- For pipe/hose assembly

11 - Hose/metal pipe

- Allocation ⇒ Electronic parts catalogue (ETKA)
- Remove and install



12 - Seals / O-rings

- Replace if damaged
- Install on line connection
- Lubricate with brake fluid before installing
- Whether a seal or an O-ring is used depends on the type of connection
- Allocation → Electronic parts catalogue (ETKA)

13 - Staple

- Pull out clip to stop to remove and install pipe/hose line

14 - Hexagonal bolt

- 20 Nm

1.4 Assembly overview - clutch release mechanism

1 - Clutch release lever

- To remove and install, remove gearbox
- Remove and install together with clutch release bearing and guide sleeve to
- Remove any traces of grease
- Grease contact surface of ball-head pin with grease for clutch plate splines
- For grease allocation, refer to → Electronic parts catalogue (ETKA).

2 - Clutch release bearing

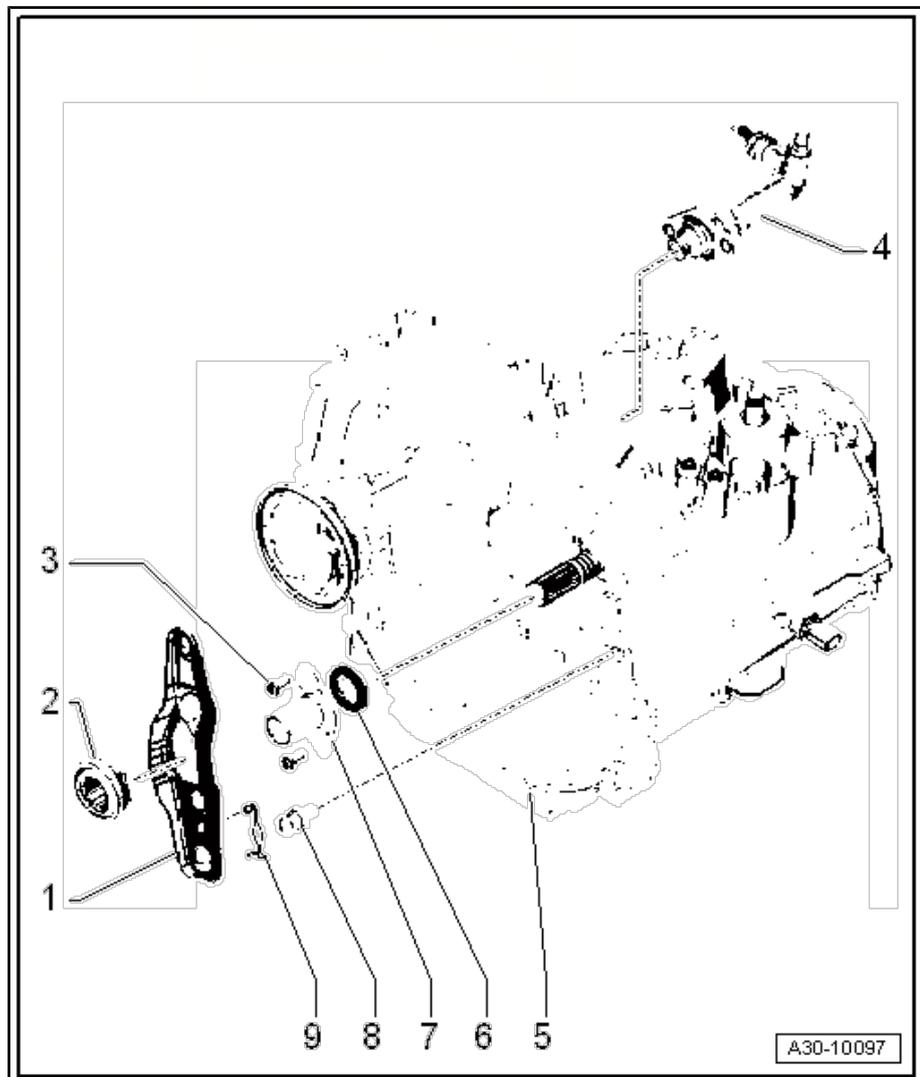
- Remove and install together with clutch release lever and guide sleeve
- Do not wash out bearing; wipe only
- Replace collars that make a noise

3 - Bolt.

- Must be renewed if removed
- 5 Nm + +90°

4 - Clutch cylinder:

- Remove and install



5 - Gearbox:

6 - Input shaft oil seal:

- Replace after removal

7 - Guide sleeve

- Remove and install together with release bearing and clutch release lever

8 - Ball head studs

- To remove and install, remove gearbox
- Remove any traces of grease
- Grease contact surface of ball-head pin with grease for clutch plate splines
- For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .
- 20 Nm

9 - Retaining spring

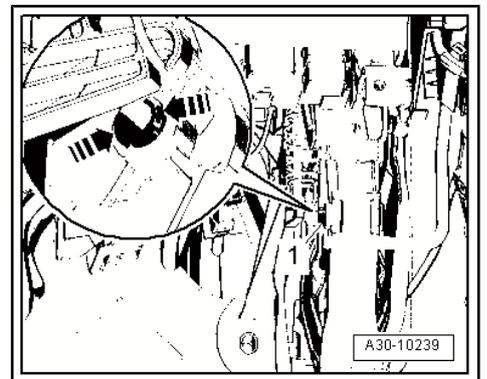
- Secure to clutch lever

1.5 Removing and installing bearing bush

Removal

Disconnect vehicle battery ⇒ Electrical system; Rep. gr. 27 ;
 Battery; Disconnecting and connecting battery .

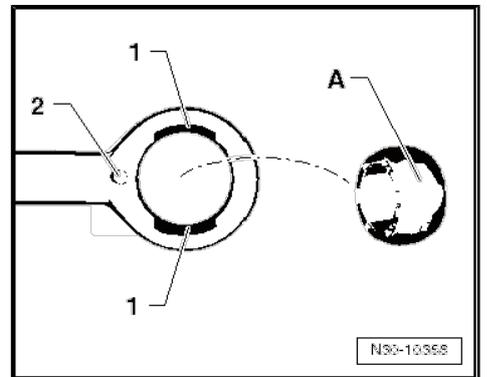
- Compress catches -arrows- and take out pin -1- towards right side.



- Turn plunger of master cylinder so that recesses -1- or pin -2- are visible.

Recesses -1- and pin -2- are facing the same direction.

- Remove bearing bush -A- from recesses -1-.

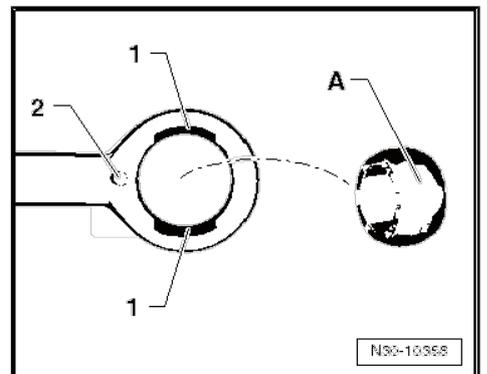


Installation

- Turn plunger of master cylinder so that recesses -1- or pin -2- are visible.

Recesses -1- and pin -2- are facing the same direction.

- Fit and swivel bearing bush -A- into recesses -1-.
- Connect plunger/clutch master cylinder with the clutch pedal using a new pivot pin.
- Connect vehicle battery ⇒ Electrical system; Rep. gr. 27 ;
 Battery; Disconnecting and connecting battery .



1.6 Clutch pedal: removing and installing

Removal

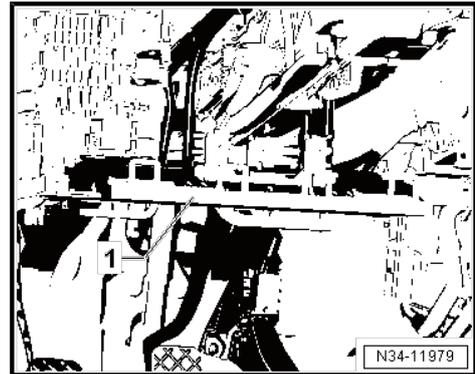
- Push driver's seat as far back as possible.
- Move steering wheel up as far as it will go, making use of full range of steering column adjuster.
- If fitted, remove footwell cover on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers .

Vehicles with knee airbag

- Remove the knee airbag -1- on the driver's side ⇒ Chassis - interior assembly work ; Rep. gr. 69 ; Knee airbags .

Vehicles without knee airbag

- Switch off ignition and all electrical consumers, and remove ignition key.



Continued for all vehicles

- Remove the footwell vent -1- on the driver side ⇒ heating, air-conditioning system; Rep. gr. 87 ; air ducting system; Assembly overview - air ducting and - distribution to interior .



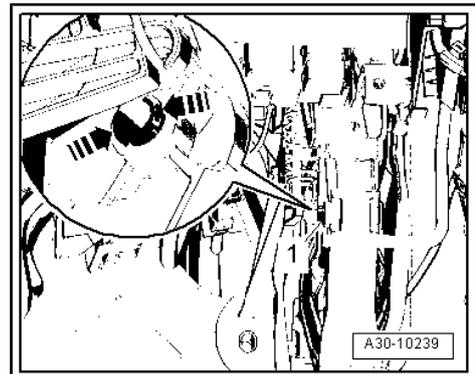
- Compress catches -arrows- and take out pin -1- towards right side.

Right-hand drive with Climatronic

- Remove the Servomotor of the right temperature valve - V159- ⇒ Heating, air conditioning; Rep. gr. 87 ; Servomotors; Servomotor of the right temperature valve V159: remove and install .

Continued for all vehicles

- Remove return spring from mounting bracket or remove over-centre spring from mounting bracket
- If it is fitted near the clutch pedal, remove the bracket for the control unit for parking sensor - J446- / control unit for park assist - J791- ⇒ Electrical system; Rep. gr. 27 ; Park assist system; Assembly overview - Park assist system . Do not uncouple cable connections.



Remove bearing shaft for clutch pedal, as follows:

-1- = 14 mm hexagon bit.

left-hand drive vehicle

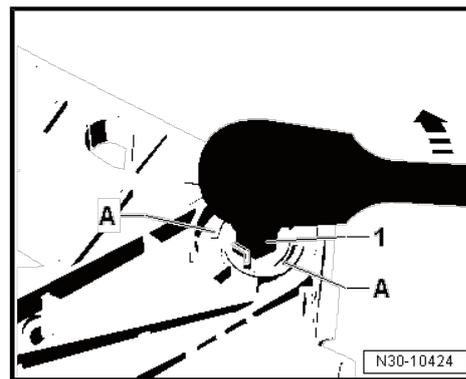
A 14 mm hexagon key can be used instead of the 14 mm hexagon bit

Continued for all vehicles

- The pivot pin for the clutch pedal must be turned to the left to stop, -direction of arrow-.

Locking devices -A- will be irreparably damaged.

- Move the clutch pedal slightly so that the pivot pin can be pulled out.



Installation

Install in the reverse order of removal, observing the following:

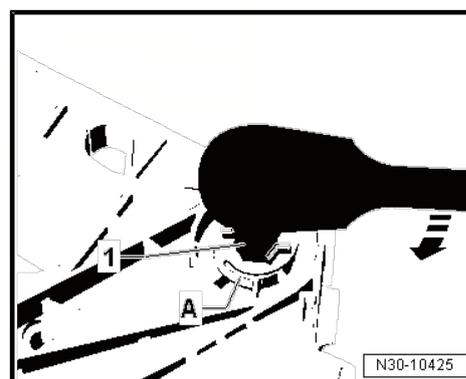
-1- = 14 mm hexagon bit.

left-hand drive vehicle

A 14 mm hexagon key can be used instead of the 14 mm hexagon bit

Continued for all vehicles

- Renew pivot pin after removal.
- Depress clutch pedal slightly and push new pivot pin through to stop.
- Turn pivot pin to right to stop, -direction of arrow-.
- Locking devices -A- must audibly engage.
- Mount return spring to the mounting bracket , or mount over-centre spring to the mounting bracket



Right-hand drive with Climatronic

- Install the Servomotor of the right temperature valve - V159- => Heating, air conditioning; Rep. gr. 87 ; Servomotors; Servomotor of the right temperature valve V159: remove and install .

Continued for all vehicles

- If fitted, install the bracket with the control unit for parking sensor - J446- / control unit for park assist - J791- => Electrical system; Rep. gr. 27 ; Park assist system; Assembly overview - Park assist system . Do not uncouple cable connections.
- Install the footwell vent on the driver side => heating, air-conditioning; Rep. gr. 87 ; air ducting system; Assembly overview - air ducting and - distribution to interior .

Vehicles with knee airbag

- Install driver-side knee airbag => General body repairs, interior; Rep. gr. 69 ; knee airbags; Removing and installing the knee airbag with fuse .

1.7 Removing and installing over-centre spring

Removal

- Push driver's seat as far back as possible.

- Move steering wheel up as far as it will go, making use of full range of steering column adjuster.
- If fitted, remove footwell cover on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers .

Vehicles with knee airbag

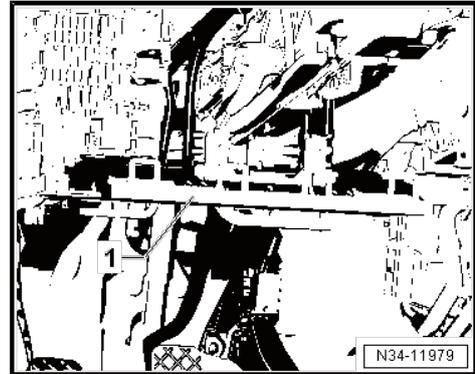
- Remove the knee airbag -1- on the driver's side ⇒ Chassis - interior assembly work ; Rep. gr. 69 ; Knee airbags .

Vehicles without knee airbag

Disconnect vehicle battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

Continued for all vehicles

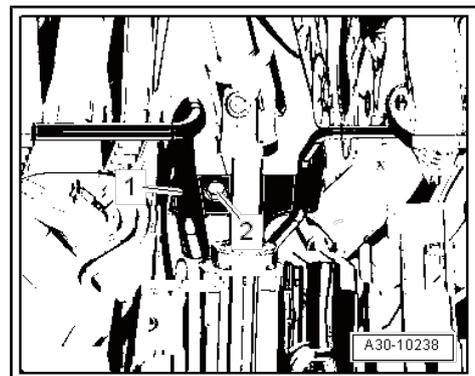
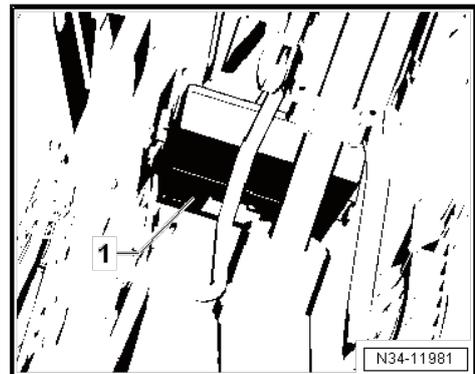
- Remove the footwell vent -1- on the driver side ⇒ heating, air-conditioning system; Rep. gr. 87 ; air ducting system; Assembly overview - air ducting and - distribution to interior .



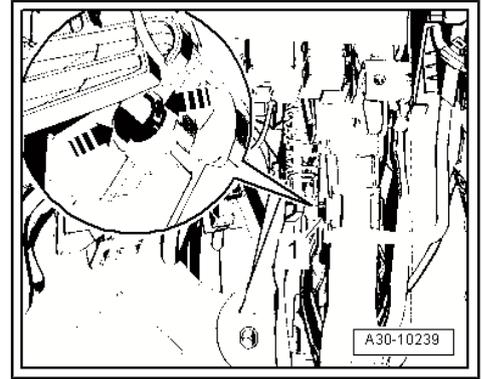
- Remove the diagnosis interface for the data bus - J533- from the bracket -1- ⇒ electrical system; Rep. gr. 97 ; control units; Installing and removing the diagnosis interface for the J533 data bus and push it to one side.



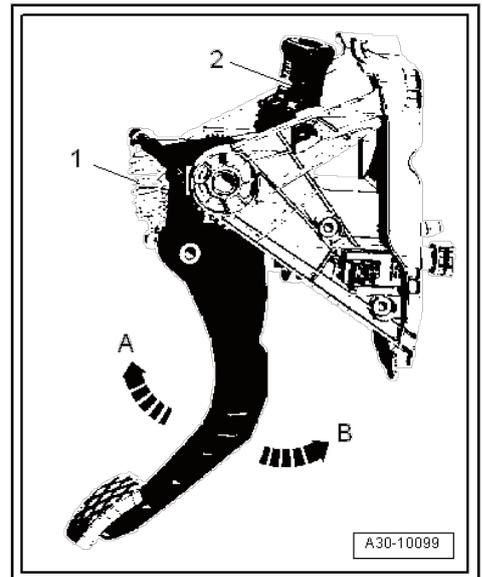
- Remove bolt -2-, detach crash bar -1- and push to one side.
- If it is fitted near the clutch pedal, remove the bracket for the control unit for parking sensor - J446- / control unit for park assist - J791- ⇒ Electrical system; Rep. gr. 27 ; Park assist system; Assembly overview - Park assist system . Do not uncouple cable connections.



- Compress catches -arrows- and take out pivot pin -1- for plunger/clutch master cylinder towards right side.



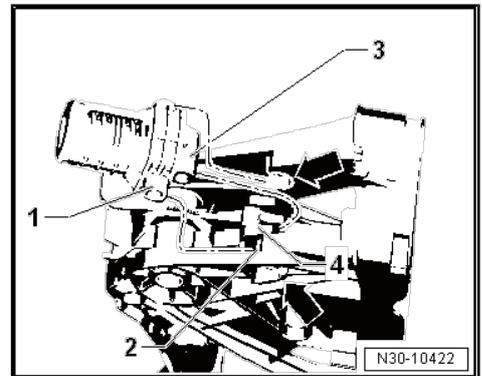
- If present, unhook and remove spring -1- whilst pushing the clutch pedal in -direction of arrow B-.
- Return clutch pedal to resting position.
- Pull clutch pedal in -direction of arrow A-, unhook and remove over-centre spring -2-.



Installation

Install in the reverse order of removal, observing the following:

- The bearing shells -arrow- for the pins -1- are installed.
- Pull clutch pedal towards vehicle interior (⇒ -arrow A- in previous Fig.).
- Place pins -1- in the supports -2- of the mounting bracket.
- Place bearing -3- in the support -4- of the clutch pedal.
- When the clutch pedal is pressed in -direction of arrow B- (⇒ previous Fig.), the over-centre spring flips over towards the mounting bracket.
- Connect plunger/clutch master cylinder with the clutch pedal using a new pivot pin.
- If fitted, install the bracket with the control unit for parking sensor - J446- / control unit for park assist - J791- ⇒ Electrical system; Rep. gr. 27 ; Park assist system; Assembly overview - Park assist system . Do not uncouple cable connections.



- Position the crash bar -1- and fully tighten the screw -2- => body installation tasks, interior; Rep. gr. 70 ; central tube for dash panel: Assembly overview - central tube for dash panel .
- Remove the diagnosis interface for the data bus - J533- from the bracket => electrical system; Rep. gr. 97 ; control units; Installing and removing the diagnosis interface for the J533 data bus and push it to one side.
- Install the footwell vent on the driver side => heating, air-conditioning; Rep. gr. 87 ; air ducting system; Assembly overview - air ducting and - distribution to interior .

Vehicles with knee airbag

- Install driver-side knee airbag => General body repairs, interior; Rep. gr. 69 ; knee airbags; Removing and installing the knee airbag with fuse .

Vehicles without knee airbag

- Connect vehicle battery => Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



1.8 Removing and installing return spring

Removal

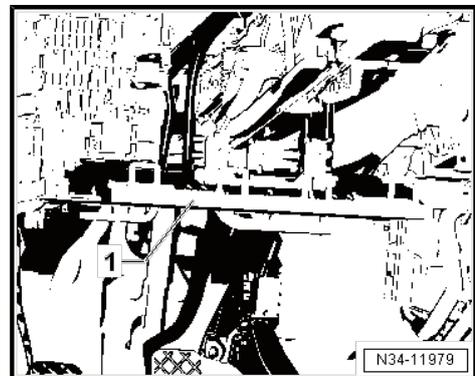
- Push driver's seat as far back as possible.
- Move steering wheel up as far as it will go, making use of full range of steering column adjuster.
- If fitted, remove footwell cover on driver side => General body repairs, interior; Rep. gr. 68 ; Compartments/covers .

Vehicles with knee airbag

- Remove the knee airbag -1- on the driver's side => Chassis - interior assembly work ; Rep. gr. 69 ; Knee airbags .

Vehicles without knee airbag

- Disconnect vehicle battery => Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

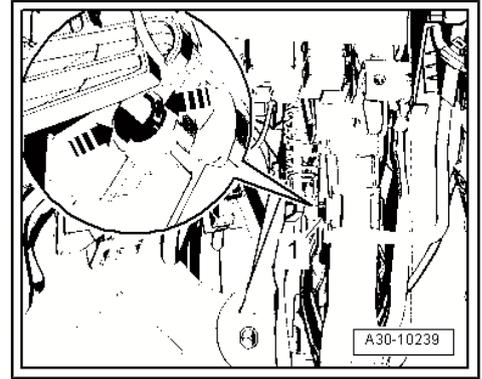


Continued for all vehicles

- Remove the footwell vent -1- on the driver side => heating, air-conditioning system; Rep. gr. 87 ; air ducting system; Assembly overview - air ducting and - distribution to interior .



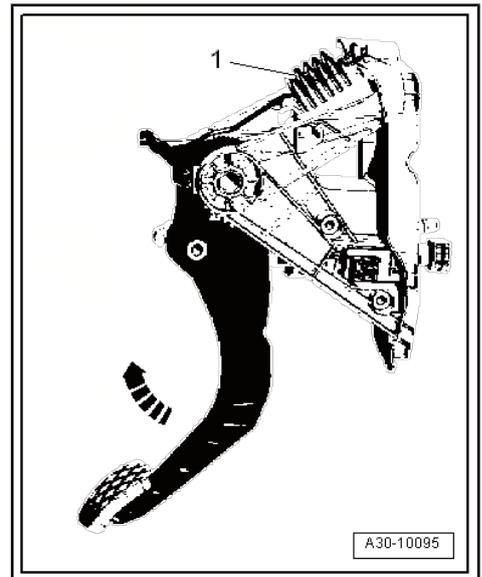
- Compress catches -arrows- and take out pin -1- towards right side.



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

Installation

Install in the reverse order of removal, observing the following:



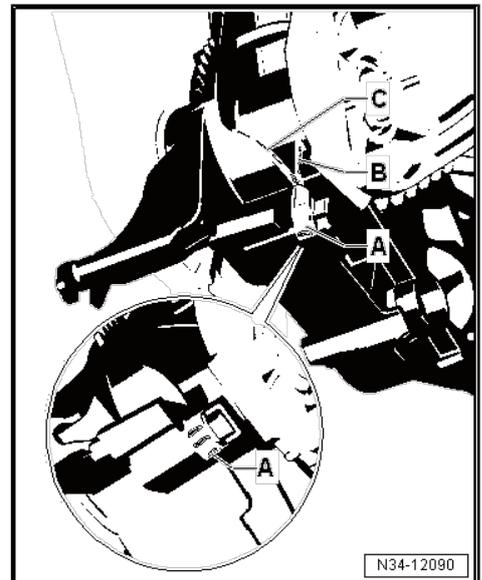
- For the return spring -1- (⇒ previous Fig.) lightly grease the following areas:
 - Sliding bush on the mounting areas -A- for the return spring.
 - Fillet -B-
 - Fillet -C-.
- For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .
- Swivel clutch pedal in -direction of arrow- and hook up return spring -1- (⇒ previous Fig.).
- Connect plunger/clutch master cylinder with the clutch pedal using a new pivot pin.
- Install the footwell vent on the driver side ⇒ heating, air-conditioning; Rep. gr. 87 ; air ducting system; Assembly overview - air ducting and - distribution to interior .

Vehicles with knee airbag

- Install driver-side knee airbag ⇒ General body repairs, interior; Rep. gr. 69 ; knee airbags; Removing and installing the knee airbag with fuse .

Vehicles without knee airbag

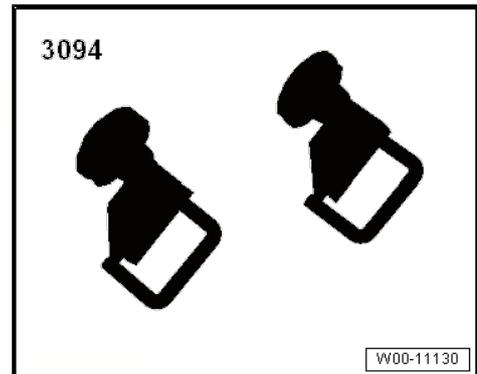
- Connect vehicle battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



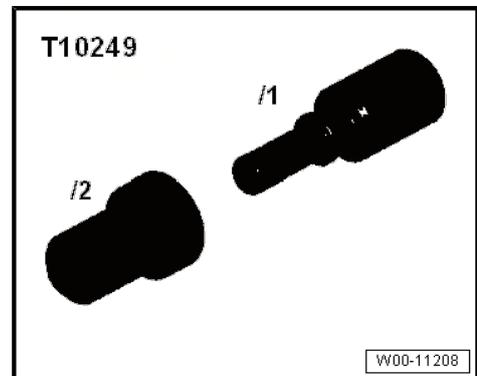
1.9 Removing and installing mounting bracket

Special tools and workshop equipment required

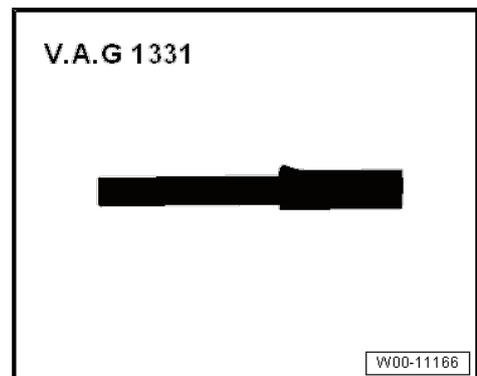
- ◆ Hose clamps, up to 25 mm - 3094-



- ◆ Sealing tool - T10249-



- ◆ Torque wrench - V.A.G 1331-



Removal

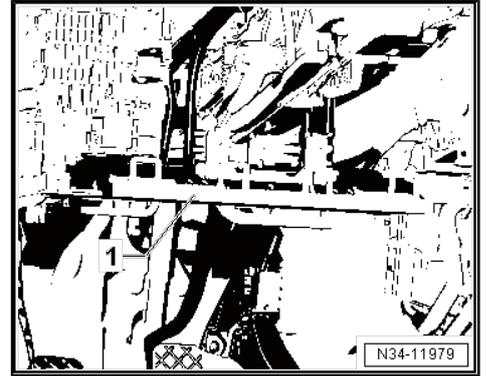
- Push driver's seat as far back as possible.
- Move steering wheel up as far as it will go, making use of full range of steering column adjuster.

Vehicles with knee airbag

- Remove the knee airbag -1- on the driver's side ⇒ Chassis - interior assembly work ; Rep. gr. 69 ; Knee airbags .

Vehicles without knee airbag

Disconnect vehicle battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

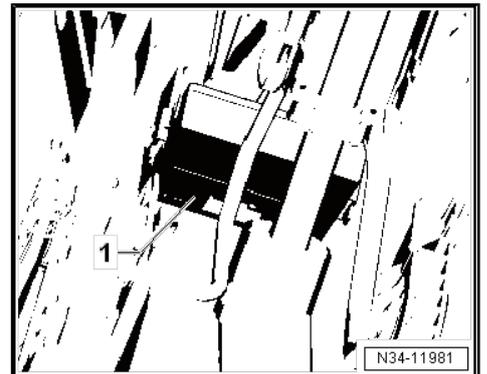


Continued for all vehicles

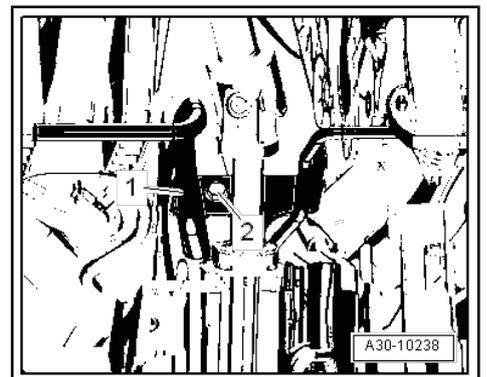
- Remove the footwell vent -1- on the driver side ⇒ heating, air-conditioning system; Rep. gr. 87 ; air ducting system; Assembly overview - air ducting and - distribution to interior .



- 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.
- If it is fitted near the clutch pedal, remove the bracket for the control unit for parking sensor - J446- / control unit for park assist - J791- ⇒ Electrical system; Rep. gr. 27 ; Park assist system; Assembly overview - Park assist system . Do not uncouple cable connections.
- The air filter housing must be completely removed if the access to the mechanism lines for the clutch movement is hindered⇒ Rep. gr. 24 ; air filter ⇒ Rep. gr. 23 ; air filter .



RHD

An insulation mat is installed in conjunction with some engines. Appearance may be different from that illustrated.

- Remove insulation mat. Note item -1...4-.

left-hand drive vehicle

- Remove battery and battery tray => Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .

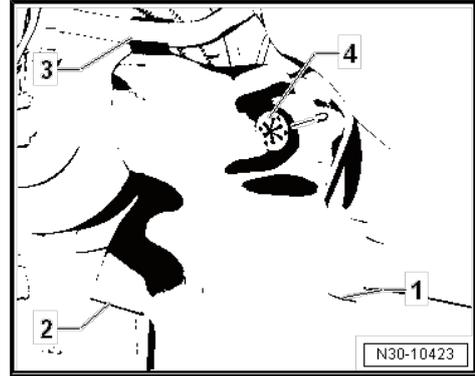
Continued for all vehicles



Caution

Risk of brake fluid escaping.

- ◆ *During the following work, ensure that no brake fluid lands on longitudinal member or gearbox. If this does happen, clean the affected areas thoroughly.*
- ◆ *Lay a lint-free cloth under master cylinder.*

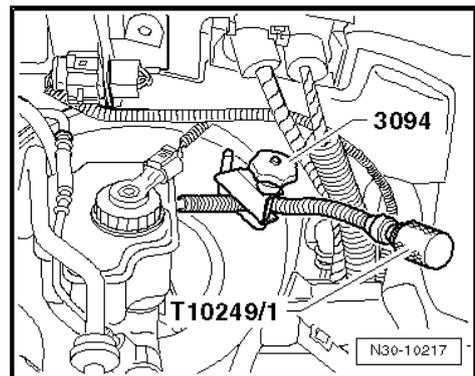
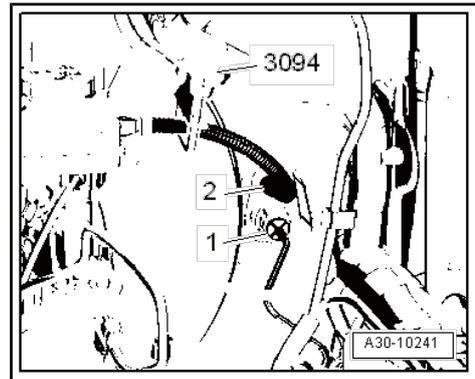


- Using hose clamp - 3094- , clamp off supply hose -2- to clutch master cylinder.



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 clip for pipe/hose line -1- all the way out and remove pipe/hose line.
- Seal openings.
- Disconnect supply hose from clutch master cylinder and plug hose using sealing tool - T10249/1- .



i Note

When working in the footwell, protect the floor covering with cloths from escaping brake fluid.

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

Installation

Install in the reverse order of removal, observing the following:

- Renew self-locking nuts and seal for clutch master cylinder after removing.
- If fitted, install the bracket with the control unit for parking sensor - J446- / control unit for park assist - J791- ⇒ Electrical system; Rep. gr. 27 ; Park assist system; Assembly overview - Park assist system . Do not uncouple cable connections.
- Insert crash bar -1- and tighten bolt -2- ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel central tube; Assembly overview - dash panel central tube .
- Install data bus diagnostic interface - J533- ⇒ Electrical system; Rep. gr. 97 ; Control units; Overview of fitting locations - control units .
- Remove footwell vent on driver's side ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct; Assembly overview - air routing and air distribution in passenger compartment .

Vehicles with knee airbag

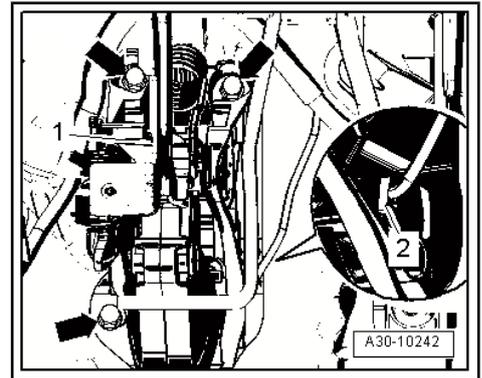
- Install knee airbag on driver's side ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .

i Note

The battery is installed and connected at a later stage.

Continued for all vehicles

- Connect pipe/hose assembly -1- to connection .
- Connect supply hose -2- at clutch master cylinder.
- After removing the hose clamp - 3094- , the supply hose must be returned to its original shape.



RHD

- If present, attach the insulation mat in the order -1, 2, 3- around the lines.
- Secure the insulation mat with the lock washer -4-.

Continued for all vehicles

- Bleeding clutch mechanism

Vehicles with knee airbag

- Install driver-side knee airbag ⇒ General body repairs, interior; Rep. gr. 69 ; knee airbags; Removing and installing the knee airbag with fuse .

Vehicles without knee airbag

- Install and/or connect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

Specified torques

- ◆ Mounting bracket to bulkhead

1.10 Removing and installing master cylinder

Removal



Note

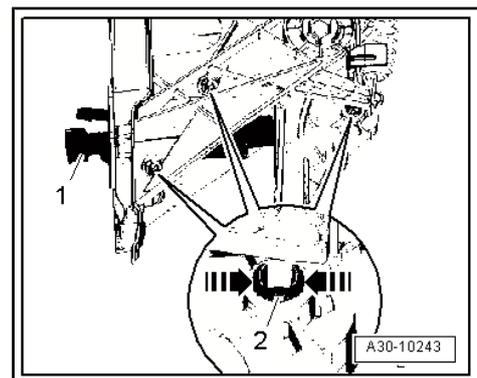
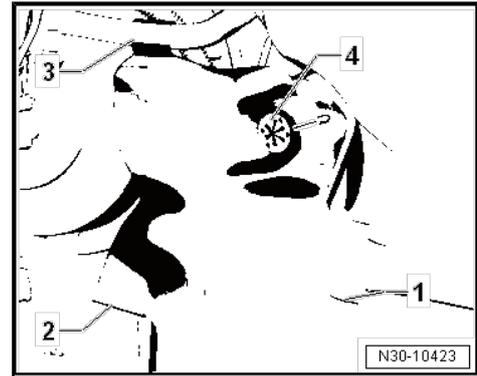
- ◆ Carry out Guided fault finding using ⇒ Vehicle diagnostic tester before you renew the clutch master cylinder with an assumed fault.
- ◆ When working in the footwell, protect the floor covering with cloths from escaping brake fluid.
- Remove mounting bracket
- Remove clutch position sender - G476-
- Release catches -arrows- and press out pivot pin -2-.
- Detach clutch master cylinder -1-.

Installation

Install in the reverse order of removal, observing the following:

Renew pivot pin after removal.

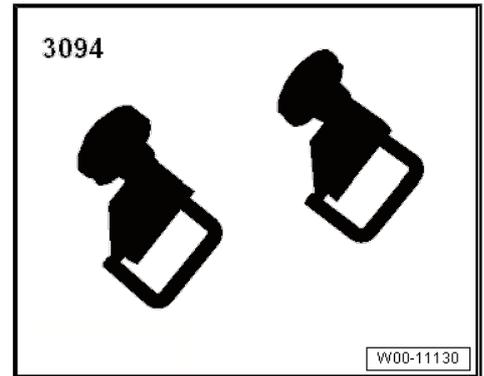
- Install mounting bracket
- Install clutch position sender - G476-



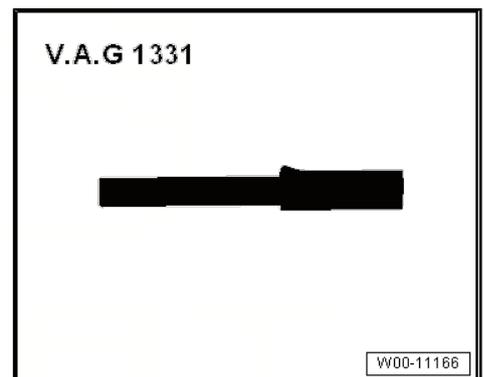
1.11 Removing and installing clutch slave cylinder

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



- ◆ Torque wrench - V.A.G 1331-



Removal



Note

- ◆ *Before replacing the clutch slave cylinder due a suspected defect, you must first use [guided fault finding](#) ⇒ Vehicle diagnostic tester.*
 - ◆ *If slave cylinder is removed from gearbox with pipe/hose assembly still attached, make sure you do not press clutch pedal. Otherwise, the piston will be pressed out of the slave cylinder and be destroyed.*
- Remove battery, battery cover and battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting the battery .

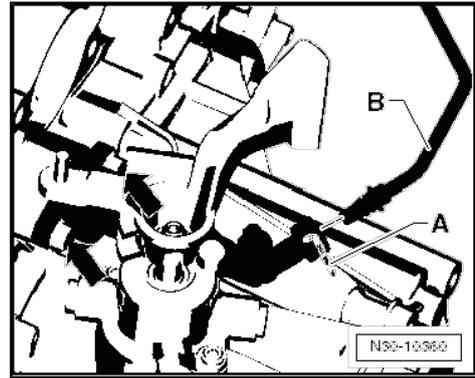
- Place lint-free cloth under clutch slave cylinder.
- Release clip -A- with a screwdriver and disconnect pipe/hose assembly -B- from connection.
- Pull pipe/hose assembly -B- out of clutch slave cylinder and seal both openings.
- Remove bolts -arrows- and remove clutch slave cylinder.



Caution

Catch escaping brake fluid.

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



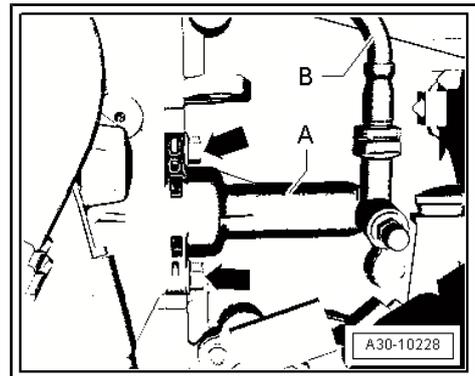
Installation

Install in the reverse order of removal, observing the following:



Note

- ◆ *Grease all bearing surfaces and contact surfaces.*
- ◆ *For grease allocation, refer to => Electronic parts catalogue (ETKA).*
- Fit clutch slave cylinder -A- and secure with bolts -arrows-.
- Connect pipe/hose assembly -B-



Disconnecting and connecting lines for clutch hydraulics

Cutting

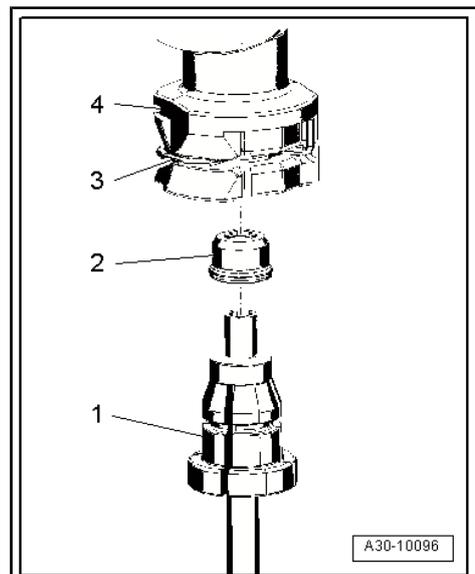
- Release clip -3- with a screwdriver and disconnect pipe/hose assembly -1- from connection -4-.

Connecting



Note

- ◆ *Instead of the seal -2- it is also possible to install an O-ring*
- ◆ *Renew seal -2- if damaged.*
- Press pipe/hose assembly -1- into connection -4- so that clip -3- snaps into place.
- Pull on pipe/hose assembly to check it is secure.



Seals and O-rings for pipe/hose line or pipe line

Position.	Material of line connection
1	Line connection with annular groove -arrow 1-
2	Connection with shoulder -arrow 2-
3	Line connection with shoulder -arrow 2- and circumferential groove -arrow 3-

- For line connection having circumferential groove -arrow 1- and -arrow 3-, a seal or O-ring must be set there.
- Bleeding clutch mechanism
- Install battery tray, battery and battery cover ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting the battery .

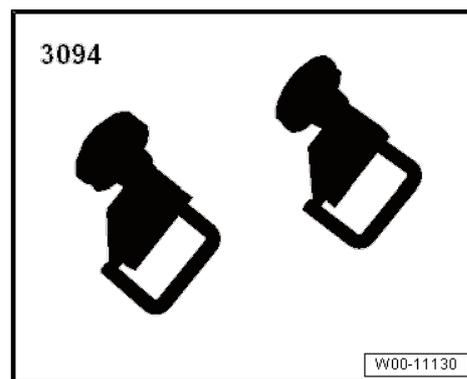
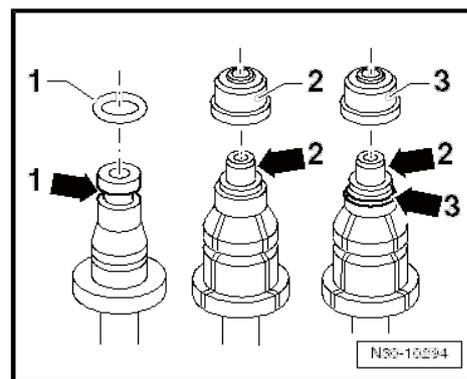
Specified torques

- ◆ Clutch slave cylinder to gearbox

1.12 Removing and installing lines for clutch hydraulics

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



Removal

- Remove complete air filter housing if it prevents access to the lines for clutch mechanism ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .

RHD

An insulation mat is installed in conjunction with some engines. Appearance may be different from that illustrated.

- Remove insulation mat. Note item -1...4-.

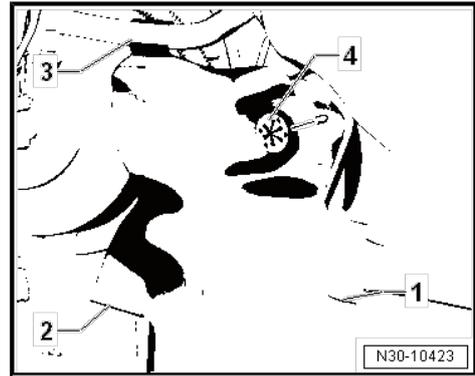
Continued for all vehicles



Caution

Risk of brake fluid escaping.

- ◆ *During the following work, ensure that no brake fluid lands on longitudinal member or gearbox. If this does happen, clean the affected areas thoroughly.*
- ◆ *Lay a lint-free cloth under master cylinder.*

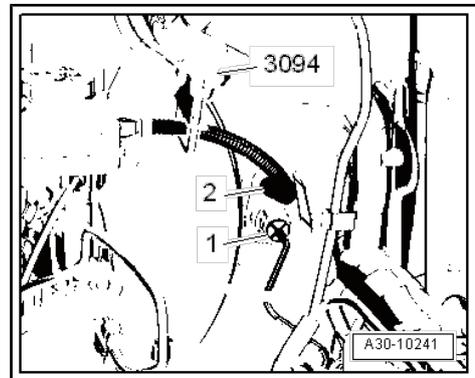


- Using hose clamp - 3094- , clamp off supply hose -2- to clutch master cylinder.



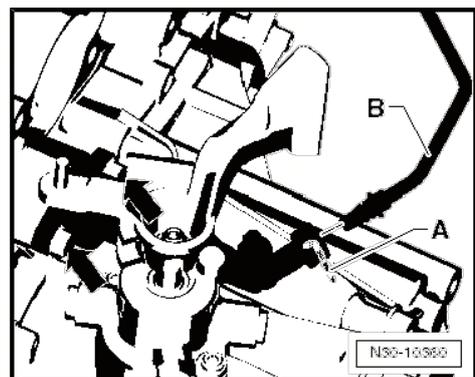
Note

- ◆ *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 clip for pipe/hose line -1- all the way out and remove pipe/hose line.
- Seal openings.
- Pull clip -A- all the way out and remove pipe/hose line -B-.
- Seal openings.



Note

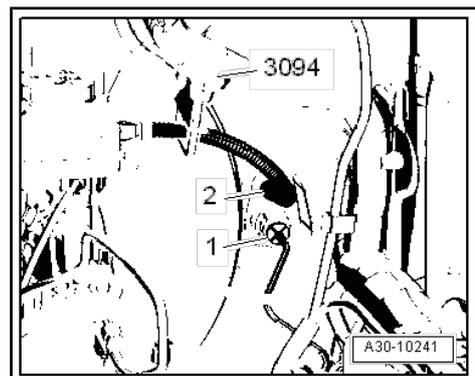
- *-Arrows- can be disregarded.*
- Seal off open lines and connections if necessary with clean plugs from engine bung set - VAS 6122- .
- Move pipe/hose assembly clear and remove.



Installation

Install in the reverse order of removal, observing the following:

- Connect hose/pipe assembly -1- to connection of clutch master cylinder and clutch slave cylinder.
- Pull on pipe to check it is secure.
- After removing the hose clamp - 3094- , the supply hose -2- must be returned to its original shape.



RHD

- If present, attach the insulation mat in the order -1, 2, 3- around the lines.
- Secure the insulation mat with the lock washer -4-.

Continued for all vehicles

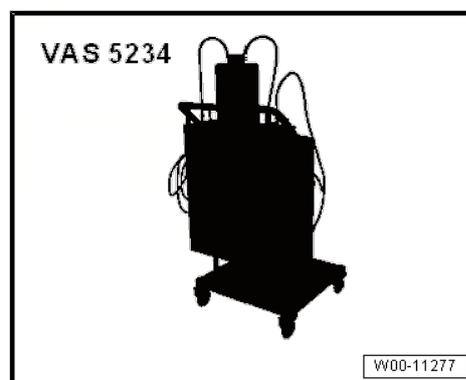
- Bleeding clutch mechanism
- Install battery tray and battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .



1.13 Bleeding clutch mechanism

Special tools and workshop equipment required

- ◆ Brake filling and bleeding equipment - VAS 5234-



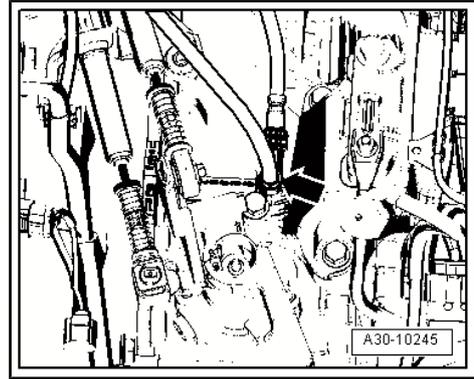
Note

- ◆ *After carrying out work on the hydraulic clutch mechanism, the system must be bled.*
- ◆ *When performing the following steps, make sure that no brake fluid escapes onto the gearbox.*
- ◆ *Prefilling system is not necessary!*
- ◆ *Before bleeding, fill brake fluid reservoir up to "max" marking with brake fluid.*
- ◆ *Clutch pedal is at rest position, is not being depressed.*
- ◆ *Brake fluid: allocation ⇒ Electronic parts catalogue (ETKA) .⇒*
- Remove complete air filter housing if it prevents access to bleeder valve (-arrow- figure below) ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing

- Pull clutch pedal back to rest position.
- Remove protective cap from the bleeder valve -arrow-.
- Connect brake filling and bleeding equipment - VAS 5234- .
- Connect bleeder hose to bleeder valve and to pressure hose of fluid collector bottle.

If necessary, use bleeder hose (670 mm long) - V.A.G 1238/B3- for bleeding.

- Switch on brake filling and bleeding equipment .
- Working pressure: 2.0 bar, positive pressure
- Open bleeder valve.
- Allow about 100 cm³ of brake fluid to flow out.
- Close bleeder valve.
- Rapidly operate pedal from stop to stop 10 to 15 times.
- Open bleeder valve.
- Allow another 50 cm³ of brake fluid to flow out.
- Close bleeder valve.
- Switch off brake filling and bleeding equipment and relieve pressure completely from bleeding equipment.
- After finishing air bleeding, the clutch pedal must be activated several times.



Tightening torque:

Component	Nm
Bleeder screw	4.5

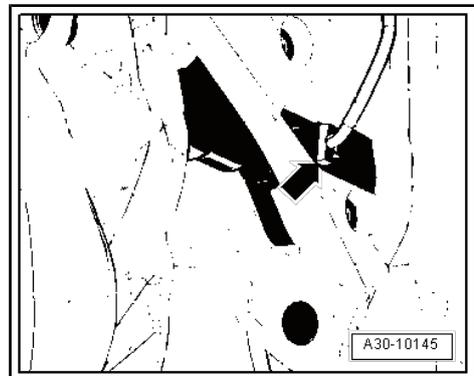
1.14 Checking clutch master cylinder and clutch slave cylinder

Carry out Guided fault finding using ⇒ Vehicle diagnostic tester before you renew the clutch master cylinder with an assumed fault.

1.15 Removing and installing clutch position sender - G476-

Removal

- Push driver's seat as far back as possible.
- Unplug electrical connector -arrow- at clutch position sender - G476- .

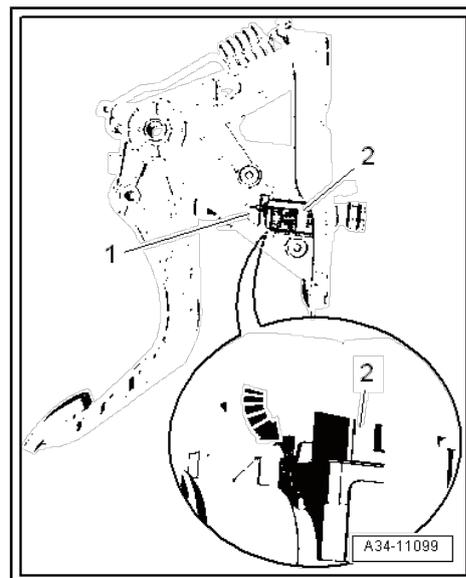


- Unclip clutch position sender - G476- -item 2- at clutch master cylinder -1- -arrow- and remove.

Installation

Install in the reverse order of removal, observing the following:

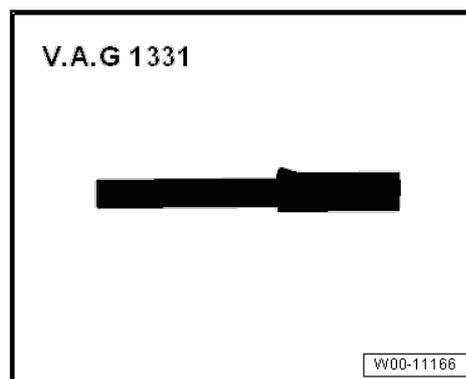
- The latch -arrow- at the clutch position sender - G476- must be in good order.
- The clutch position sender - G476- must audibly engage.
- Adapt clutch position sender - G476- in Guided fault finding using ⇒ Vehicle diagnostic tester.



1.16 Repair the clutch release assembly

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Grease for clutch plate splines
- ◆ For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .
- The gearbox must be removed.

Removing and installing clutch release lever -A- with release bearing and guide sleeve

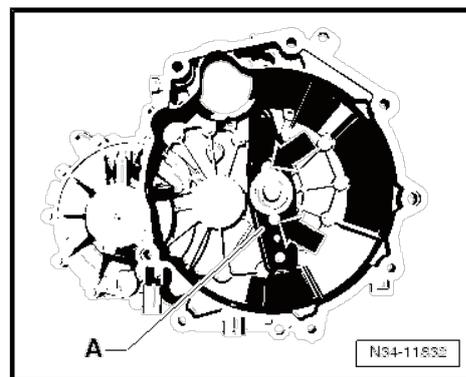
- Remove bolts -arrows-.
- Pull clutch release lever with release bearing and guide sleeve off input shaft and ball stud.

Installation is carried out in the reverse order.

- Installing gearbox

Specified torques

- Guide sleeve to gearbox

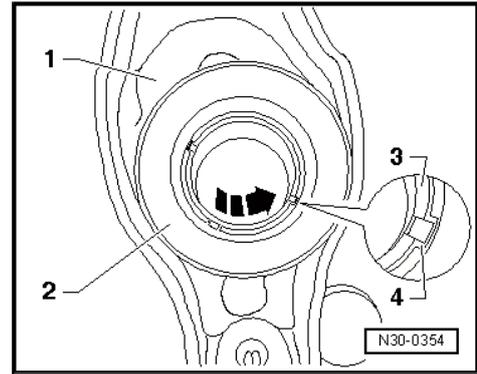


Removing and installing guide sleeve for clutch release bearing

- Remove clutch release lever together with release bearing and guide sleeve
- Remove the guide sleeve -3- from the clutch release collar -2- by pressing upwards.
- Rotate guide sleeve -3- approx. 90° in -direction of arrow- against the clutch release bearing -2-, until the safety brackets of the guide sleeve matches with the recesses -4- in the release bearing.
- Pull guide sleeve out of release bearing in this position.

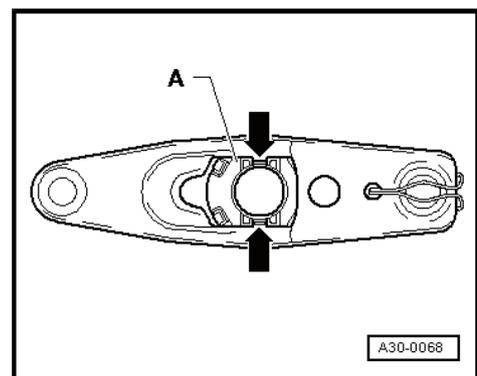
Installation is carried out in the reverse order.

- Install clutch release lever with release bearing and guide sleeve



Removing and fitting the clutch release bearing

- Remove clutch release lever together with release bearing and guide sleeve
- Press locking lugs -arrows- together on reverse side of clutch release lever and remove release bearing -A- from clutch release lever.
- To install, press release bearing -A- into clutch release lever until retaining hooks -arrows- engage.
- Lubricate the contact point of the release lever with the ball-head pin with lubricant for the grooved clutch .
- Install clutch release lever with release bearing and guide sleeve



2 Clutch

2.1 Exploded view - clutch unit

1 - Flywheel

- Removing and installing
⇒ Rep. gr. 13 ; Cylinder
block (gearbox end);
Assembly overview - fly-
wheel .
- check that the centring
pins are correctly seat-
ed
- Contact surface for
clutch lining must be
free of grooves, oil and
grease

2 - Clutch plate

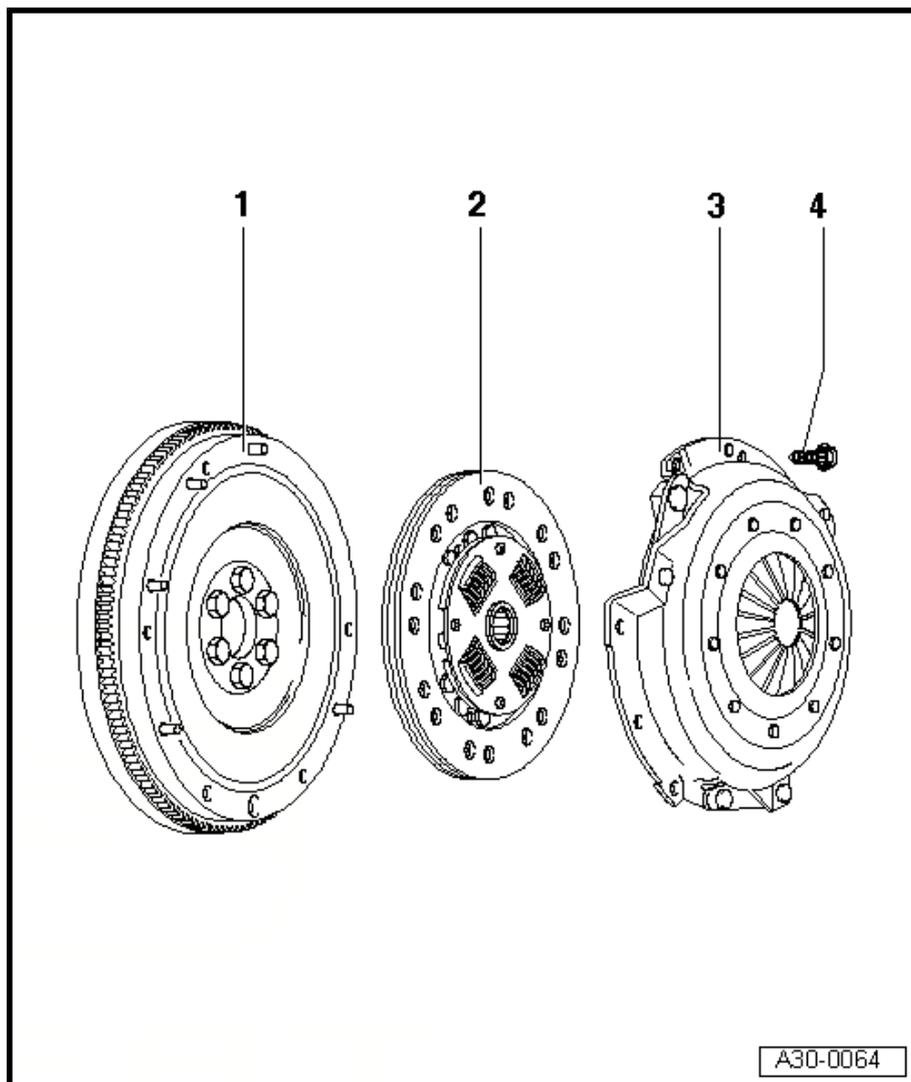
- Allocation ⇒ Electronic
parts catalogue (ETKA)
- Centralising

3 - Thrust plate

- Remove and install
- Checking ends of dia-
phragm spring
- Check spring connec-
tions and riveted con-
nections

4 - Bolt.

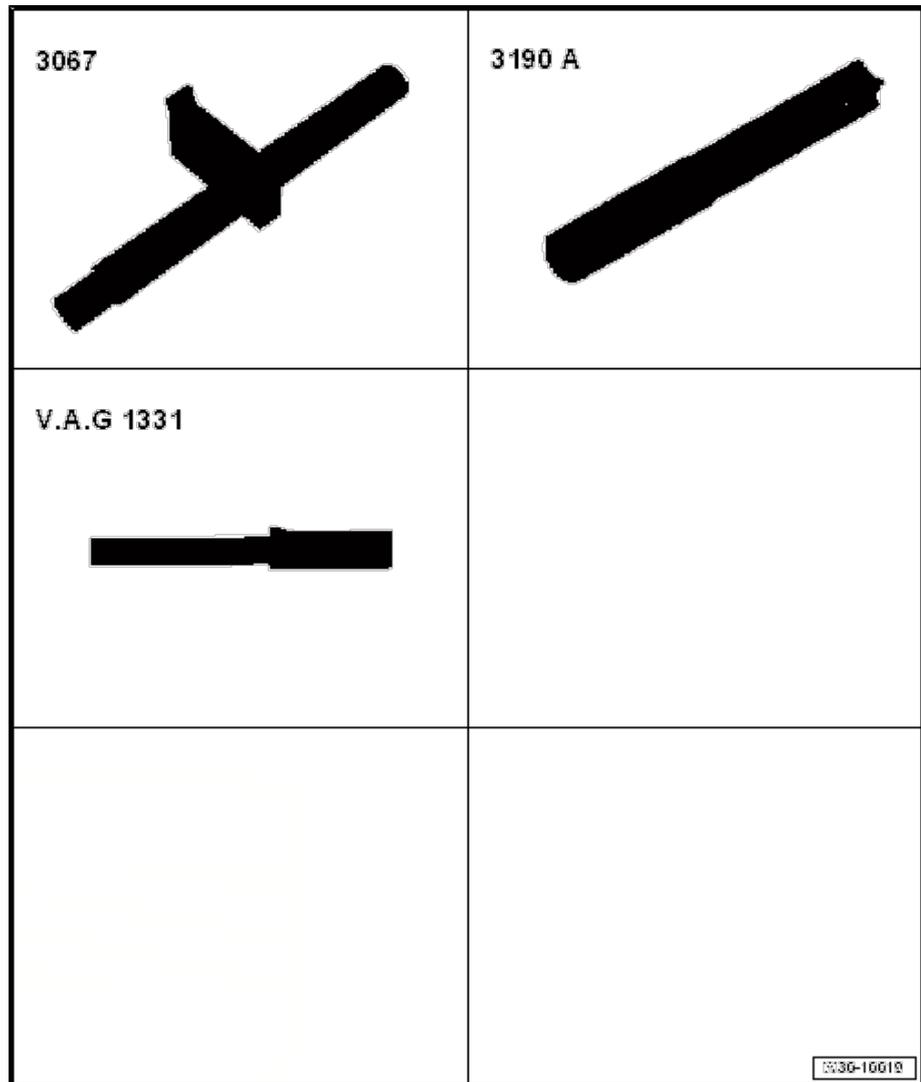
- Allocation ⇒ Electronic
parts catalogue (ETKA)
- Loosen and tighten in
small steps diagonally
- M 6: 13 Nm
- M 7: 20 Nm



2.2 Clutch: removing and installing

Special tools and workshop equipment required

- ◆ Counterhold - 3067-
- ◆ Centring chuck - 3190 A-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Grease for clutch plate splines
- ◆ For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .



Removal

- 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:

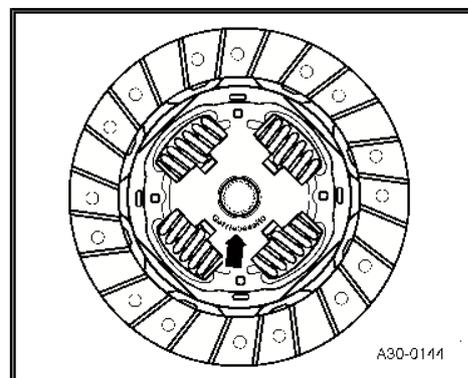
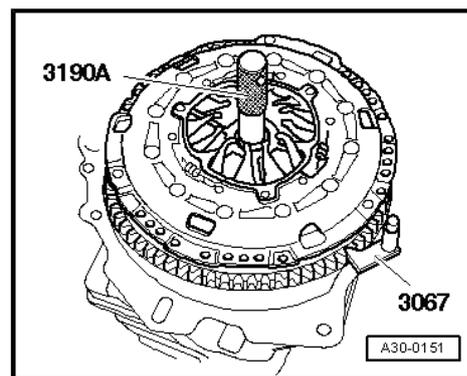
- Loosen all bolts in small steps and diagonally.
- Remove clutch press and clutch plate.

Installation



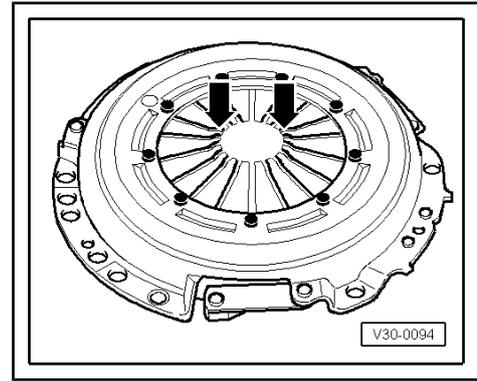
Note

- ◆ *Select correct clutch plate and pressure plate by checking engine code => Electronic parts catalogue (ETKA)*
 - ◆ *Clean input shaft splines and, on used clutch plates, hub splines. Remove corrosion and apply only a very thin coat of clutch plate spline grease to splines. Then move the clutch plate on the input shaft from side to side, until the hub moves smoothly on the shaft. Eliminate excess grease.*
 - ◆ *The pressure plates are greased and protected against corrosion. With the exception of the friction surface for the clutch plate, the clutch pressure plate must not be cleaned. Otherwise the working life of the clutch will be significantly 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.*
 - ◆ *Clutch plate linings must make full contact with flywheel and friction surface of clutch pressure plate. Only then insert securing bolts.*
 - ◆ *Tighten securing bolts in small steps diagonally in order not to damage centring holes of pressure plate and centring pins of flywheel .*
 - ◆ *Check whether dowel sleeves for aligning engine and gearbox are fitted in cylinder block and install if necessary.*
 - ◆ *If dowel sleeves are not fitted, difficulties shifting gears, clutch problems and possible noises from the gearbox (rattling of gears which are not engaged) could occur.*
- Installation location of clutch plate: labelling “gearbox end” or spring cage is aligned to pressure plate.



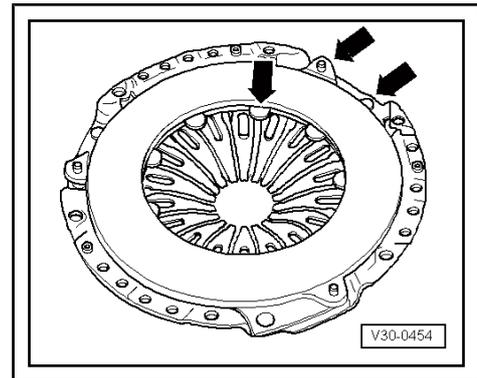
Checking ends of diaphragm spring

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



Check flexible connection and riveted unions

- Check spring connection between pressure plate and cover for cracks as well as rivet connections for secure seating.
- If pressure plate has damaged springs or loose rivet connections -arrows-, it must be renewed.



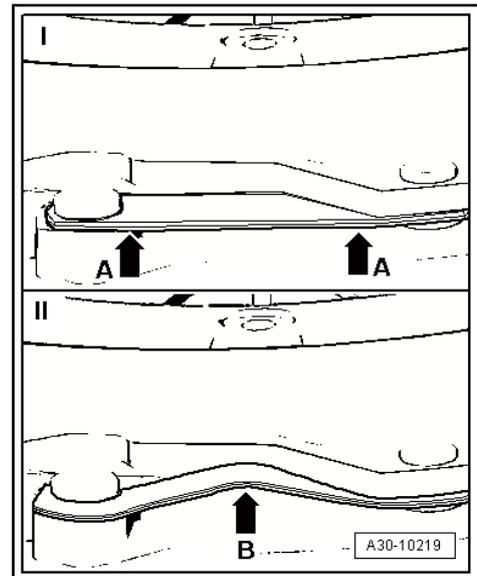
Check extension springs and riveting

I - Springs OK

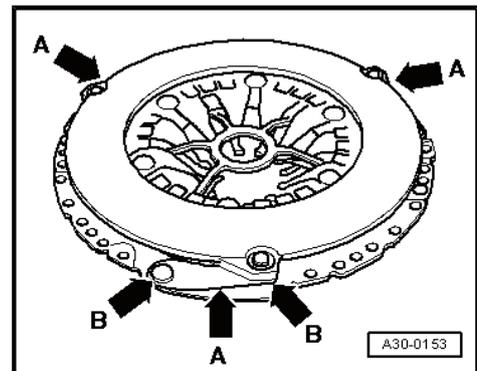
- Slight kinking on the outside -arrows A- is normal on production parts.

II - Extension spring damaged

- Renew clutch pressure plate if springs are broken or badly bent -arrow B-.
- Check spring connections -arrows A- for damage and make sure rivet fastenings -arrows B- are seated tightly.
- Renew clutch pressure plate if spring connections are broken or badly bent, or if riveting is loose.

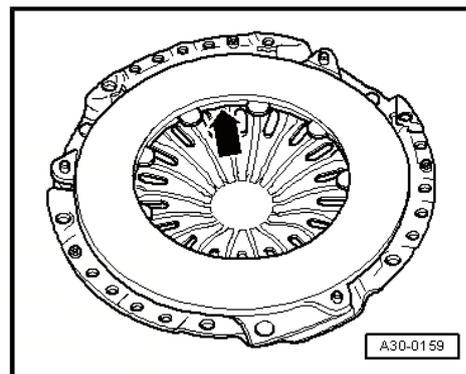


- Check that riveting -arrows B- is secure at all springs -arrows A-.
- Consecutively tighten all bolts to final setting in clockwise direction.
- Renew clutch pressure plate if riveting -arrow B- is loose.



Checking metal ring

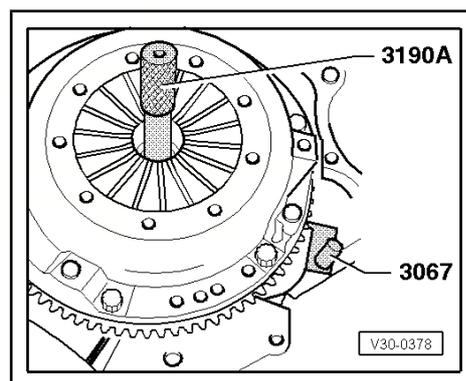
- Check that sheet metal ring in pressure plate -arrow- is not damaged.
- Renew clutch pressure plate if metal ring is broken.



- To centre the clutch plate the adapter - 3190 A- must be used.
- Tighten all bolts diagonally and in small steps.
- Installing gearbox

Specified torques

- ◆ Pressure plate on flywheel



34 – Controls, housing

1 Selector mechanism

1.1 Installation position: Gear shift mechanism

-Arrow A- gear selection movement

Arrow -B- Gate selection movement

A - Connection cable for gear engagement

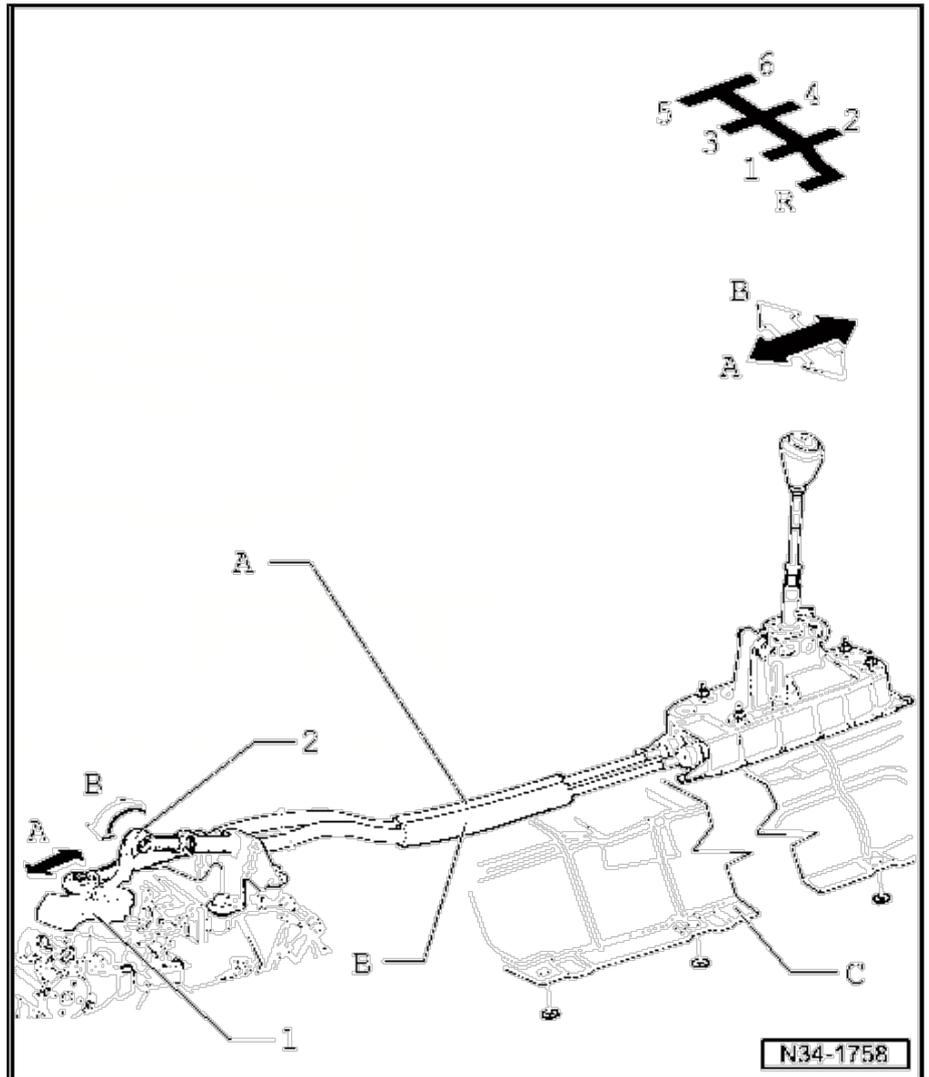
B - Selection control cable for selecting tracks

C - Heat shield

- Remove before removing selector mechanism

1 - Gear selection rod

2 - Gate relay lever



1.2 Overview - selector mechanism



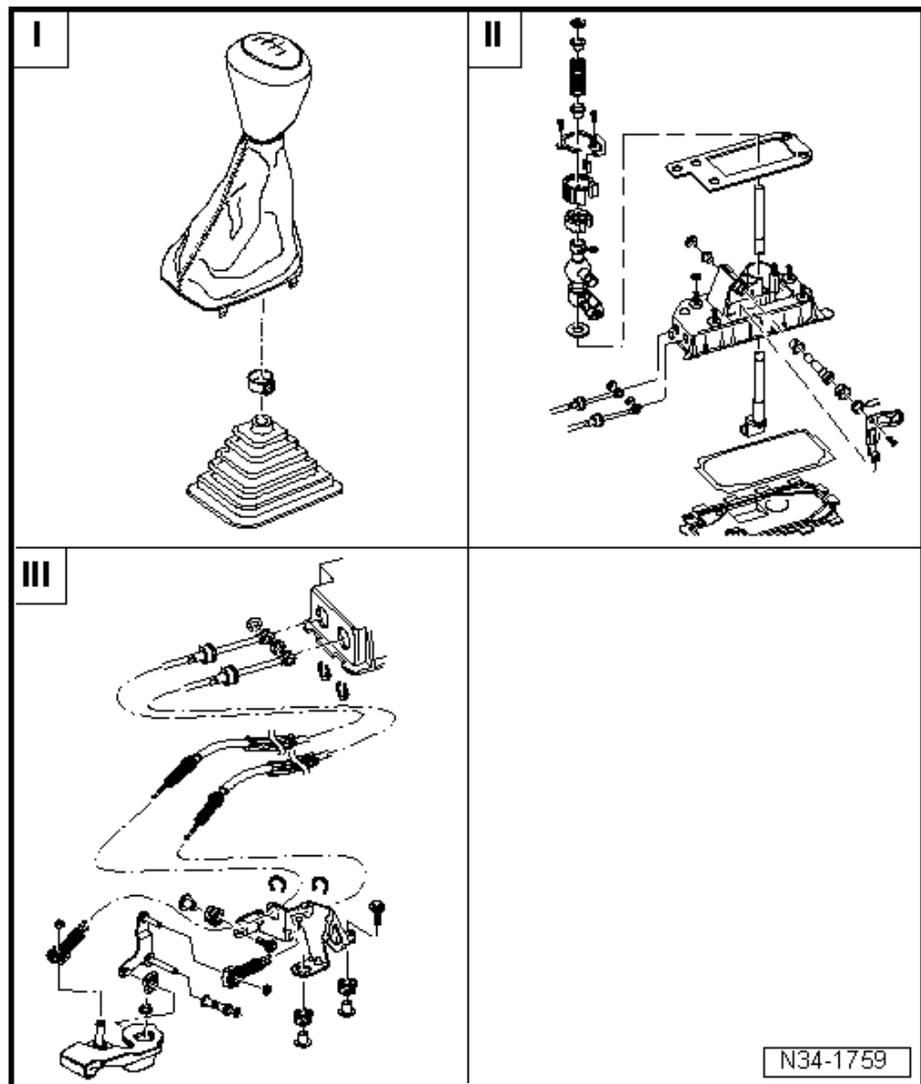
Note

- ◆ *Disconnect battery before working on selector mechanism in engine compartment ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .*
- ◆ *Removing and installing selector mechanism*

I -

II -

III -



1.3 Assembly overview - gear lever knob and cover

1.3.1 Assembly overview - gear lever knob and cover

1 - Selector housing with gear lever

2 - Hexagon nut

- M 6, 8 Nm

3 - Lower mounting bracket

- Selector housing with gear lever

4 - Top mounting bracket

- For the centre console

5 - Bolts

- 1.5 Nm

6 - Centre console

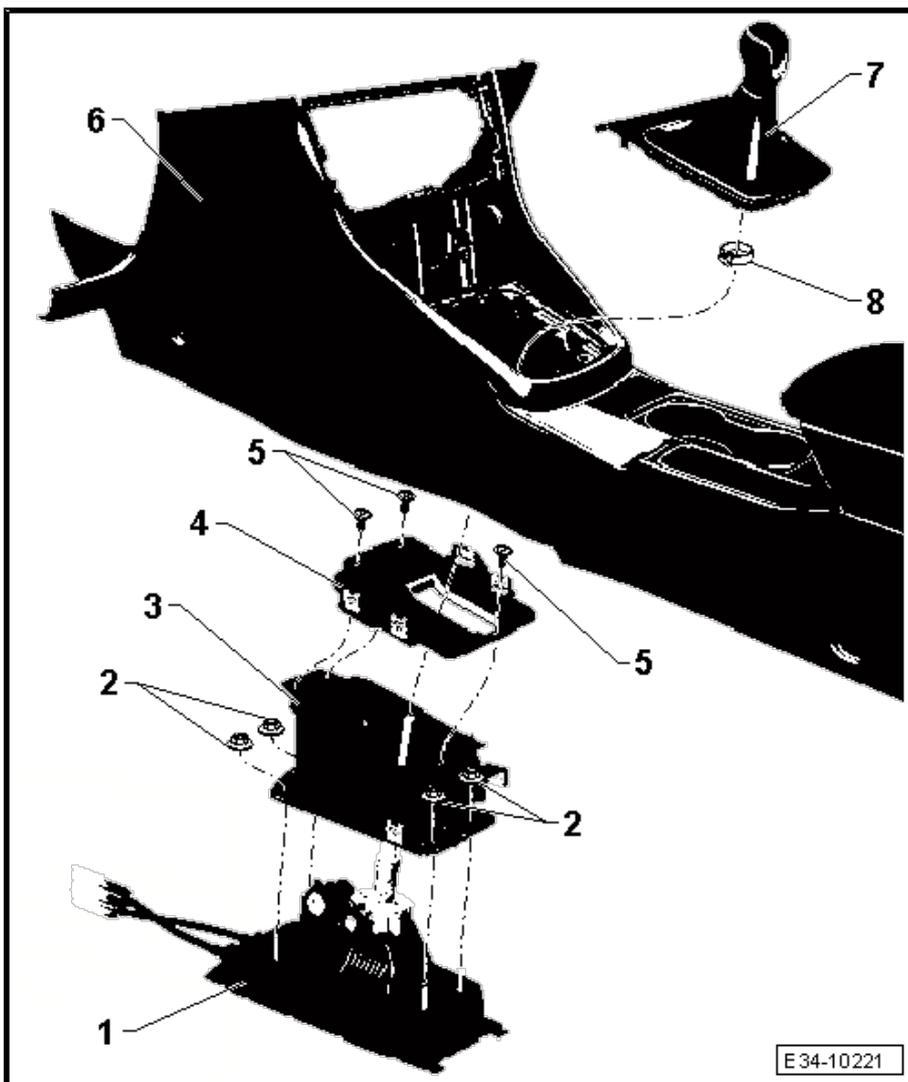
- Assembly overview ⇒ General body repairs, interior; Rep. gr. 68 ; central console; assembly overview - central console.

7 - Gear lever knob

- With gaiter
- Gear knob and gaiter cannot be separated from one another
- Always replace together
- Remove and install

8 - Clamp

- To hold knob onto gear lever
- Must be renewed if removed
- Secure to gear knob - V.A.G 1275 A- using hose clip pliers



1.4 Exploded view - selector mechanism



Note

- ◆ Lubricate bearing positions and sliding surfaces.
- ◆ For grease allocation, refer to ⇒ *Electronic parts catalogue (ETKA)* .

1 - Selector shaft with cover

2 - Oil seal

- Replace after removal

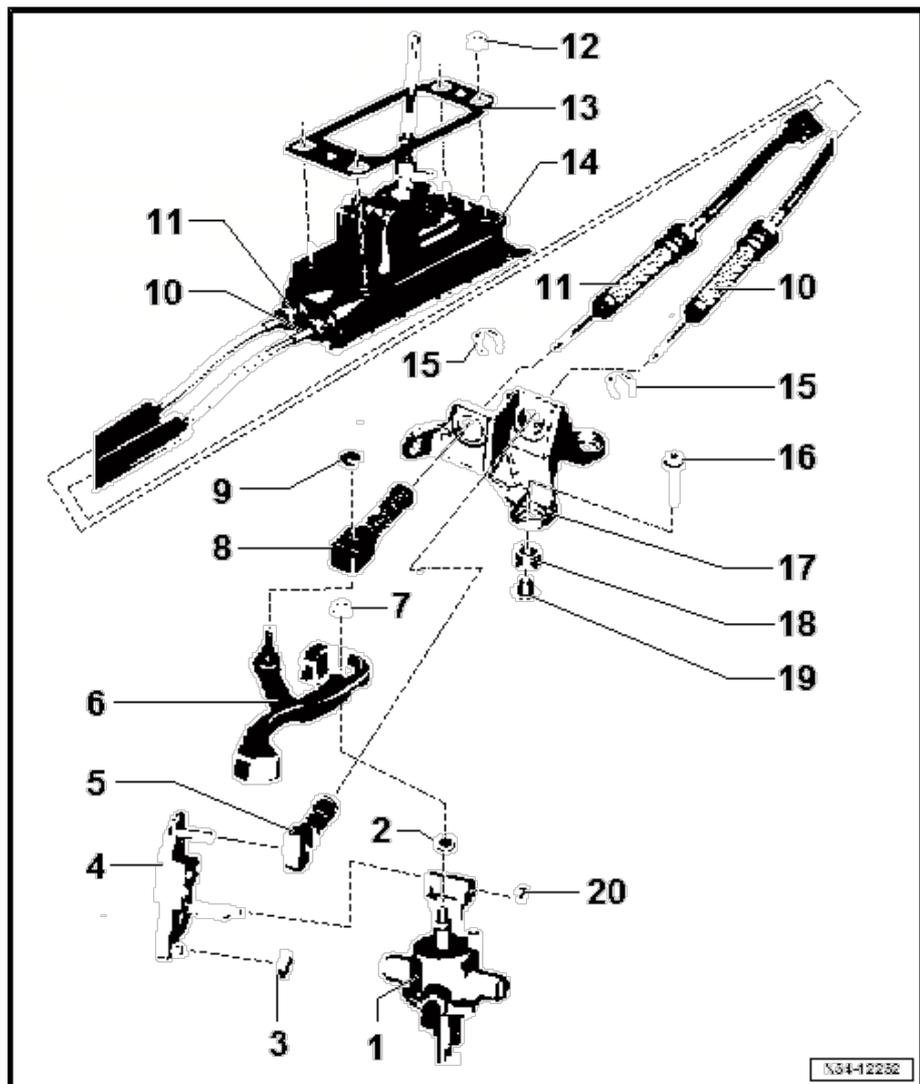
3 - Shoe

4 - Gate relay lever

- Allocation ⇒ *Electronic parts catalogue (ETKA)*
- Installation position
- After installing, adjust selector mechanism
- Remove and install relay lever together with cable end-piece

5 - Cable attachment

- To secure selection control cable to relay lever
- After installing, adjust selector mechanism
- Do not mix up. Cable end-pieces for gate selector cable to relay lever and gearbox selector cable to gear selector lever are different.
- Allocation.
- Remove from the gate relay lever
- Press onto relay lever



6 - Gear selection rod

- Install so that gap in splines aligns with selector shaft
- Grease before installing.
- Installation position
- After installing, adjust selector mechanism

7 - Hexagon nut

- Tightening torque

8 - Cable attachment

- To secure selection control cable to selection rod
- After installing, adjust selector mechanism

- Do not mix up. Cable end-pieces for gate selector cable to relay lever and gear selector cable to gearbox selector lever are different.
- Allocation.

9 - Retaining clip

- Must be renewed if removed

10 - Gear selection control cable

- Connect to cable end-piece.
- Installation position

11 - Gear selector cable

- Connect to cable end-piece.
- Installation position

12 - Hexagon nut

- Installation position

13 - Seal

- Between gear lever casing and vehicle underbody
- Replace after removal of the selector housing
- Self-adhesive
- Stick it onto the protective cover

14 - Gear stick protective cover

15 - Retaining clip

- Must be renewed if removed
- do not damage the gear selector cables when disassembling
- Installation position

16 - Hexagonal bolt

- 3 Units
- for cable support bracket
- 20 Nm

17 - Cable support bracket

- After installing, adjust selector mechanism

18 - Collar

- 3 Units
- Cable support bracket mounting on gearbox

19 - Spacer

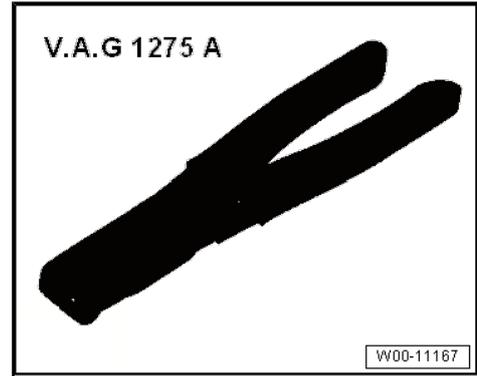
- 3 Units

20 - Clip

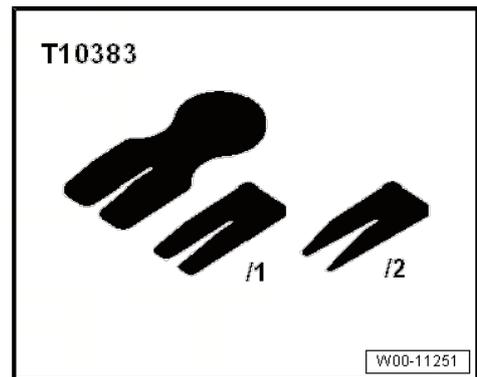
1.5 Removing and installing gear knob

Special tools and workshop equipment required

- ◆ Hose clip pliers - V.A.G 1275 A-

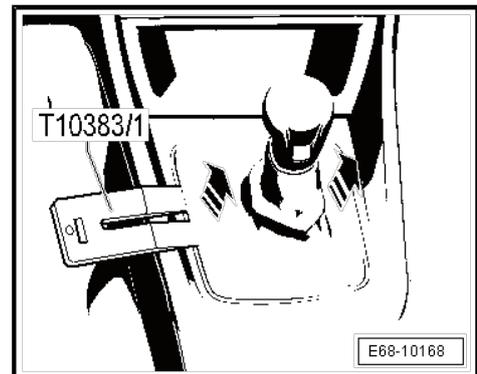


- ◆ Wedges - T10383-



Removal

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

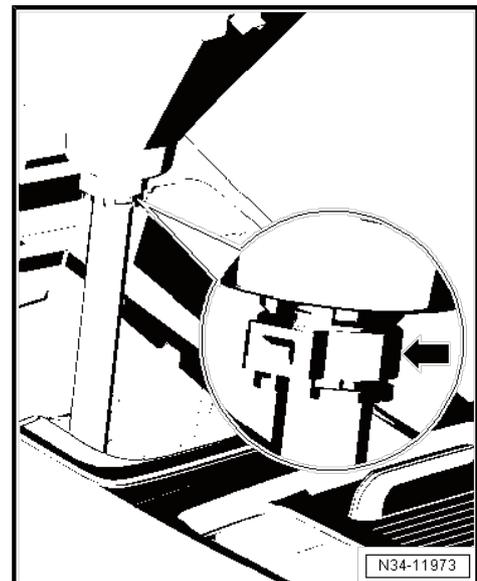


- Pull boot up and over gear knob.
- Open clip -arrow- and pull off gear knob together with boot.

Installation

Install in the reverse order of removal, observing the following:

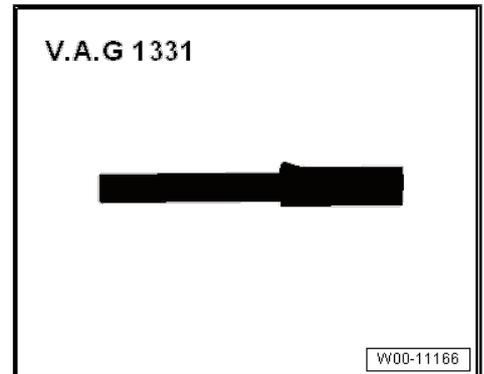
- Insert gear knob with the dust seal into the gear level all the way to the stop.
- Attach gear knob with O-type clip -arrow- (⇒ previous Fig.) to gear lever. Use hose clip pliers - V.A.G 1275 A- for this purpose.



1.6 Gear selection mechanism: removing and fitting

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Removal

- Disconnect vehicle battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Remove gear knob and gaiter

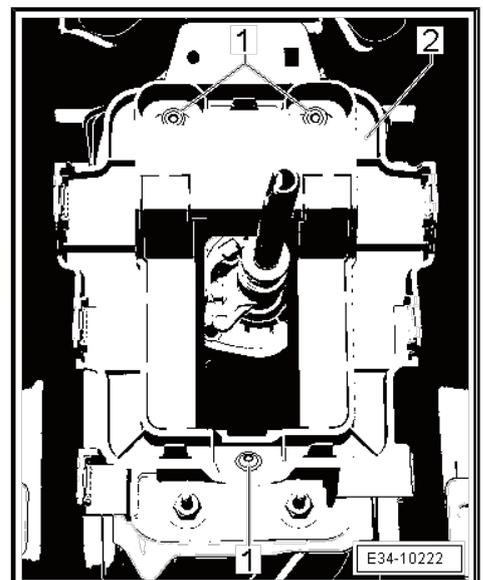
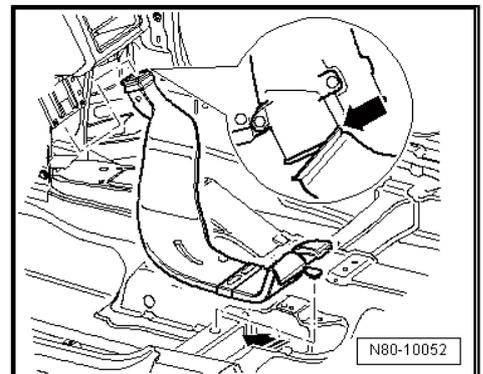
In some vehicles, the wiring for the rear footwell is located above the attachment support of the centre console:

- Remove the centre console ⇒ body installation tasks, interior; Rep. gr. 68 ; centre console .
- Remove the air channel for the rear foot area ⇒ Heating, Air conditioning; Rep. gr. 87 ; Air line system; assembly overview - ventilation and distribution in the interior .

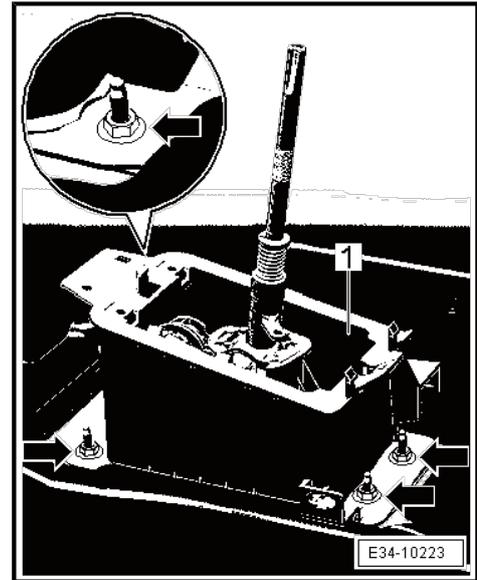
Note

- ◆ *It is very important to mark the position of the bolts for the upper support -2- before removing.*
- ◆ *If the bolts are not fitted in their original position, the centre console will not be correctly aligned.*

- Mark installation position of the screws -1- to the bore holes in the top bracket -2-.

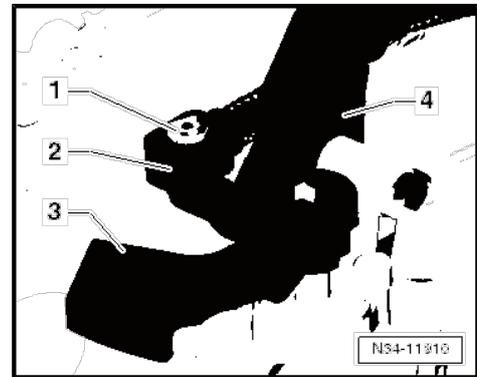


- Remove bolts -1- and remove upper bracket -2-.
- Remove nuts -arrows- and remove the holder -1- of the selector mechanism.
- Remove the battery and bracket => Electrical system; Rep. gr. 27 .



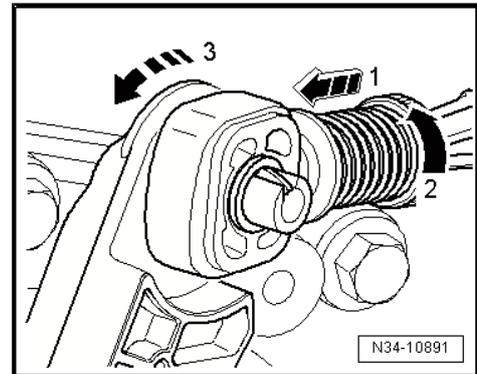
Remove gear selector cable and gate relay lever with cable end-piece for gate selector cable

- Remove circlip -1- for gear selector cable -2- from gearbox selector lever -3-.
- Pull gear selector cable -2- off pin.
- Remove gate relay lever -4- together with gate selector cable end-piece



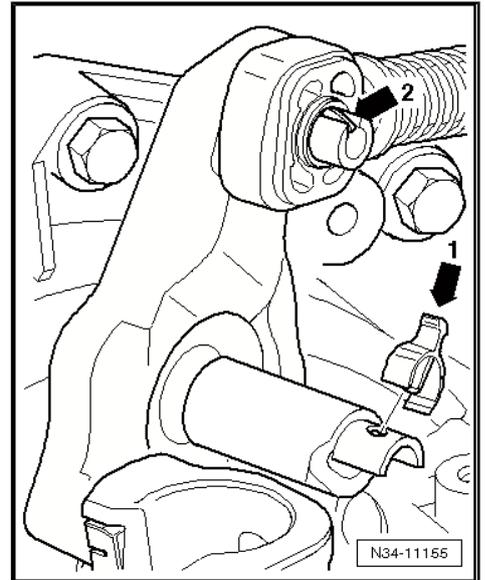
Releasing cable end-piece from gate selector cable

- Pull locking mechanism forwards in direction of -arrow 1- onto stop and then turn to left in direction of -arrow 2- to lock.
- Then push gate relay lever forwards and thread gate selector cable out of cable end-piece.



Remove gate relay lever together with the cable end-piece

- Pull off clip -arrow 1- and remove relay lever together with cable end-piece -arrow 2-.



- Remove cable support bracket from gearbox -arrows-.

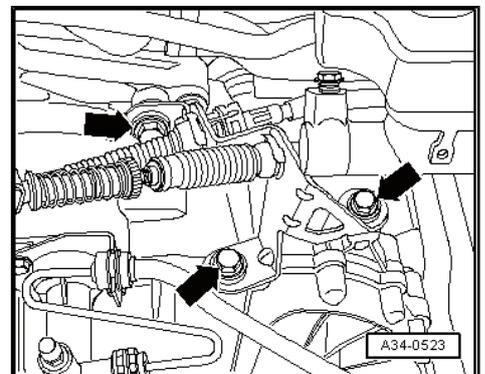


Caution

Risk of damage to decoupling element at exhaust pipe.

- ◆ ⇒ *Rep. gr. 26 ; Decontamination of exhaust gasses; Assembly overview - Decontamination of exhaust gasses .*

- Install thermal shield for the middle tunnel ⇒ General body repairs, exterior; Rep. gr. 66 ; Covers / Decorative trim / Pipe expander / Covers; Assembly overview - heat shield .



Note

Observe the installation position of the gear selector cables in the selector mechanism and in the gearbox console.

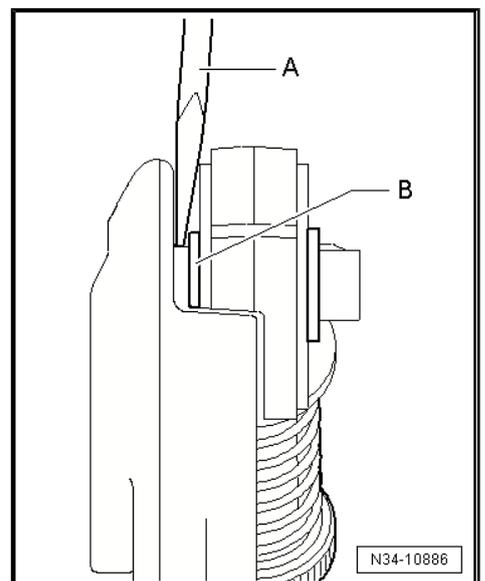
- Swing down selector housing and remove together with control cables.

With gate relay lever removed: lever cable end-piece for gate selector cable off gate relay lever

- Insert a flat-blade screwdriver -A- between bush -B- and relay lever.

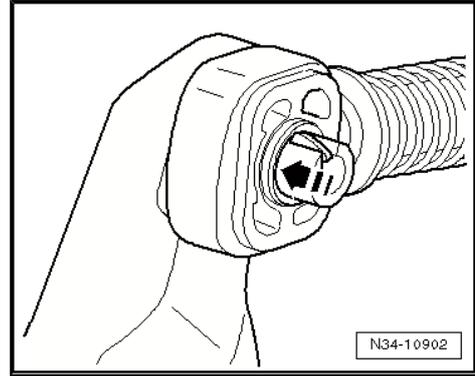
Installation

Install in the reverse order of removal, observing the following:



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

- Relay lever has been removed
- Grease support pins for cable end-piece.
- For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .
- Press on cable end-piece only at bush -arrow-.
- Cable end-piece must move freely on relay lever.
- Cable end-piece must be behind catch.
- Ensure that components engage securely.
- Align selector housing parallel to body.
- Distance to body must then be the same on both sides.



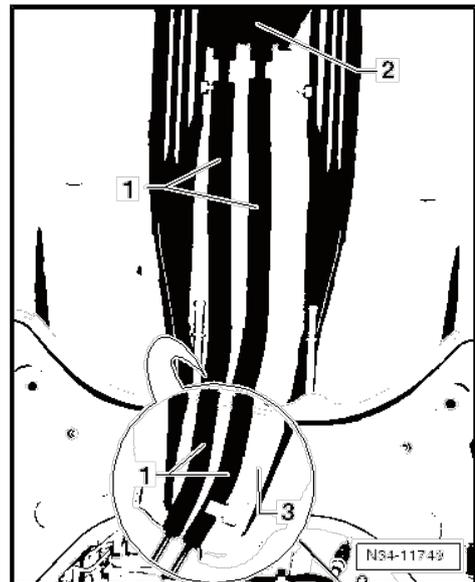
Bolt gear stick housing

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



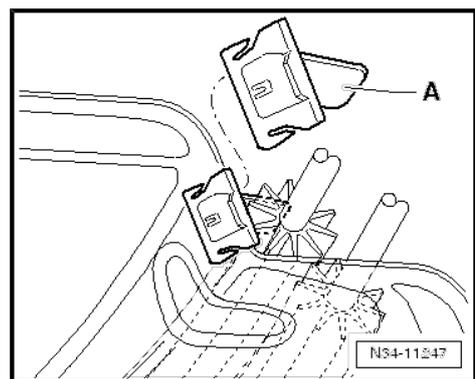
Note

The enlargement shows the heat shield from above.



Clip -A- holds cables and heat shield together in position.

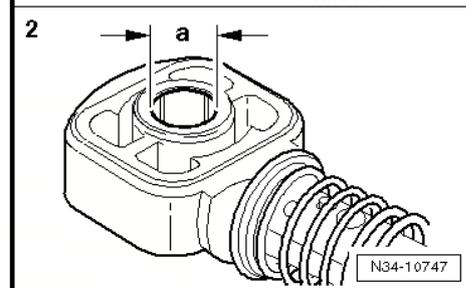
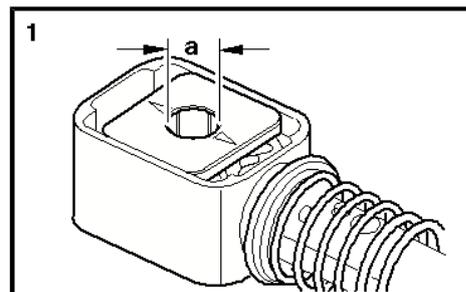
The holes on the cable securing elements have different diameters.



Identification of cable end-pieces

The holes on the cable securing elements have different diameters.

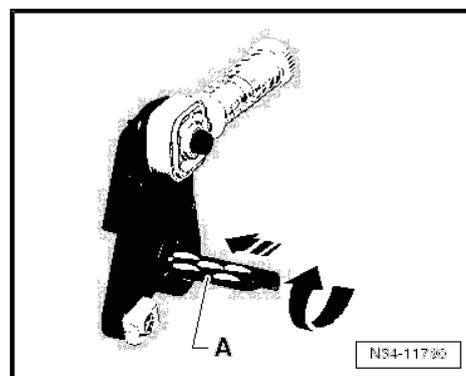
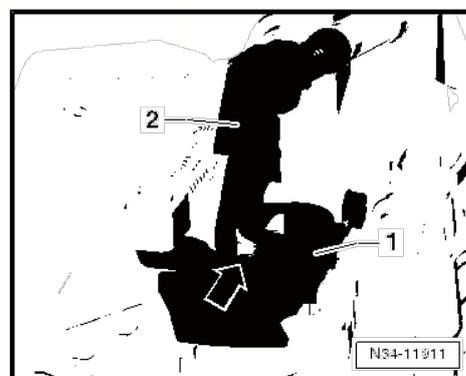
Cable end-piece for:	Gap "a".
1. - Gear selector cable to gearbox selector lever	8.5 mm
2. - Gate selector cable to relay lever	10 mm



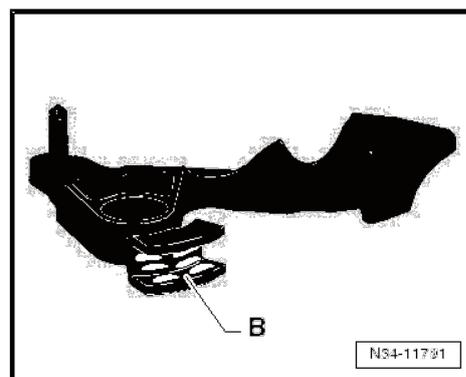
Installation position of gear selector lever and relay lever

1 - Gear selection rod

2 - Relay lever engages in guide rail of gearbox selector lever via shoe -arrow-.

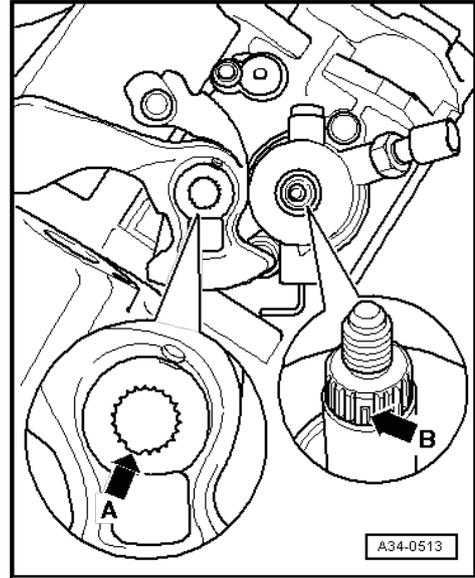


- When installing, grease following areas particularly carefully.
- Shaft -A- of gate relay lever -arrows-.
- Guide rail -B- of gearbox selector lever into which gate relay lever engages
- Support pin for cable end-piece
- For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .
- The relay lever and gearbox selector lever may look different from the original part.



Install gearbox selector lever

- When fitting the gearbox selector lever, ensure that the gap -arrow A- is aligned with the master spline -arrow B-.
- Secure gear selector cable with new securing clip to gearbox selector lever.



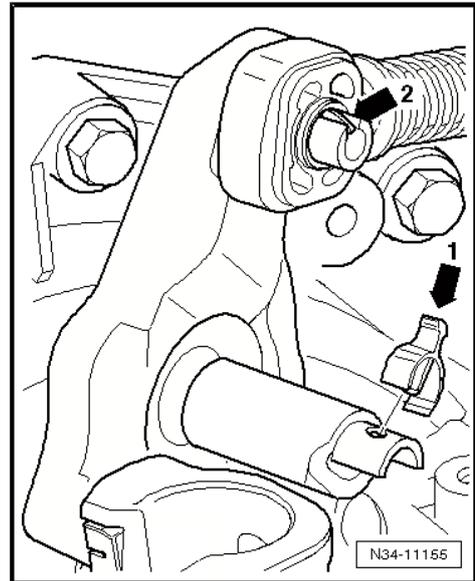
Installing relay lever together with cable end-piece



Note

Lubricate bearing positions and sliding surfaces. For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA).

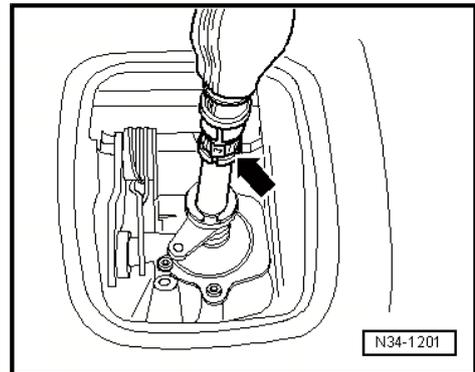
- Insert relay lever together with cable end-piece -arrow 2- into selector mechanism cover as far as stop.
- Press on clip -arrow 1-, making sure it engages securely.
- Insert the selector cable in the fastening element.
- Install damping into selector housing ⇒ General body repairs, interior; Rep. gr. 68 .
- Install centre console ⇒ General body repairs, interior; Rep. gr. 68 ; central console; assembly overview - central console .



- Renew clamp -arrow-.

Adjust selector mechanism

- Install gaiter with selector knob
- Install thermal shield for the middle tunnel ⇒ General body repairs, exterior; Rep. gr. 66 ; Floor covering; assembly overview - floor covering .
- Assemble exhaust system ⇒ Rep. gr. 26 ; Exhaust pipes/ silencers; Assembly overview - silencer .
- Install battery tray if installed ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .
- Connect vehicle battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



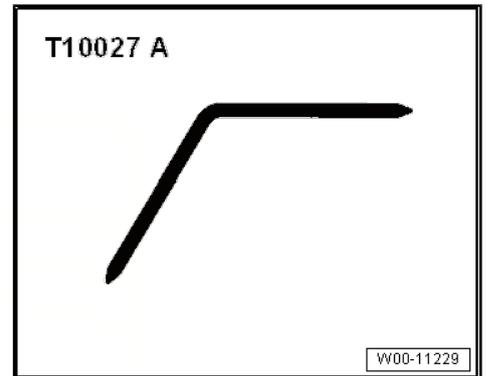
Specified torques

- ◆ Selector housing to body
- ◆ Selector cable support bracket to gearbox

1.7 Adjusting selector mechanism

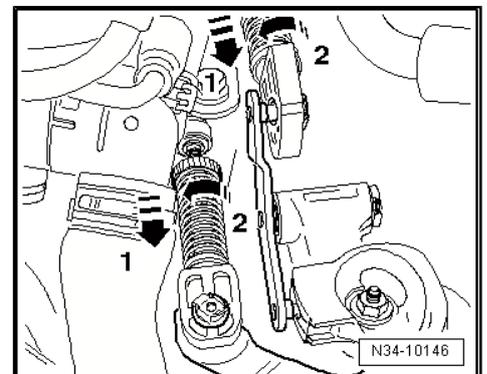
Special tools and workshop equipment required

- ◆ Locking bolt - T10027 A-



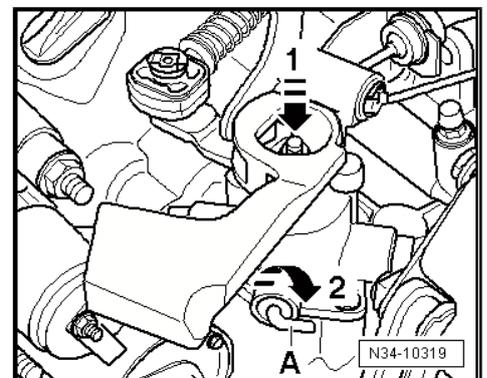
Conditions for the adjustment

- Drive and transmission elements of the gear drive mechanism in perfect condition.
- Selector mechanism must move freely.
- Gearbox, clutch and clutch mechanism in perfect condition.
- Gearbox in neutral.
- Remove complete air filter housing if angled rod for securing selector shaft and securing mechanism for gear selector cable and gate selector cable are not accessible ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Pull locking mechanisms on gate selector cable and gear selector cable end-pieces forward to stop -direction of arrow 1- and then turn to left to lock -direction of arrow 2-.

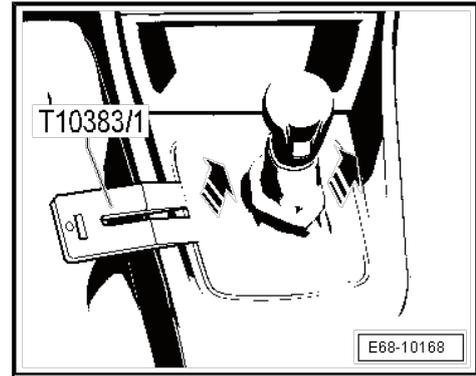


Lock selector shaft as follows:

- Press selector shaft down in -direction of arrow 1-.
- While pressing down selector shaft, turn angled rod -A- in -direction of arrow 2- and at the same time press it in until it engages in selector shaft.



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

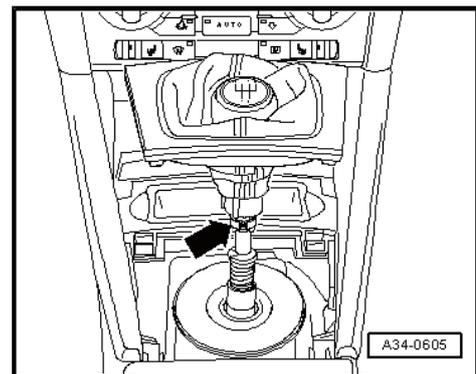


- Pull boot up and over gear knob.



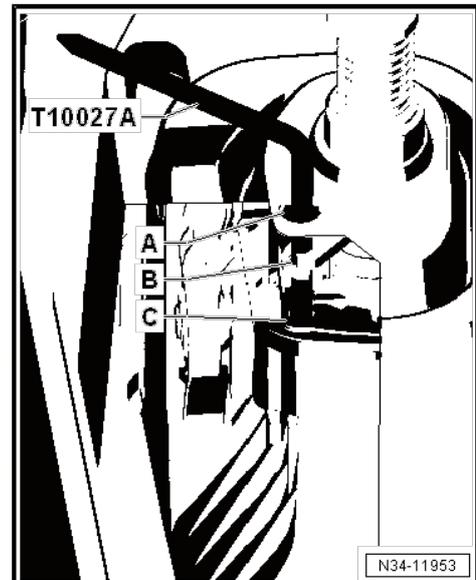
Note

-Arrow- can be disregarded.



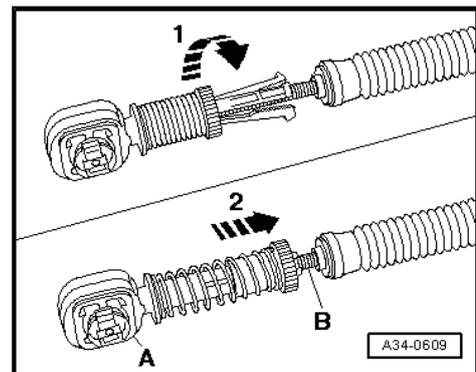
Now secure gear lever as follows:

- Move gear lever to neutral position and, if necessary, keep pressing the gear lever to the left.
- Guide locking pin - T10027 A- through the damping -A-, hole -B- into hole -C-.

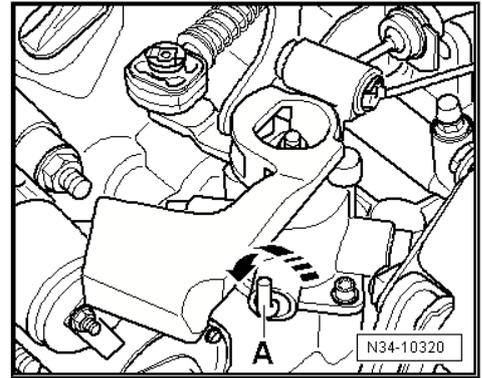


- Gate and selector cables -B- must be inserted, free of tension, into locking mechanisms -A-.
- Now turn locking mechanisms on gear selector cable and gate selector cable end pieces clockwise to stop -direction of arrow 1-.

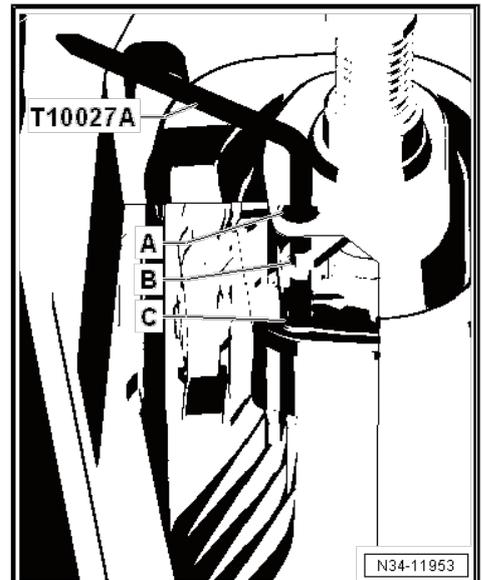
The spring presses the locking mechanism into normal position in direction of -arrow 2-.



- Turn angle lever -A- back to the initial position
-in direction of arrow-.
- During this procedure, locking pin -A- must be pressed out of gearbox in -direction of arrow-.



- Pull locking pin out of damping -A- and holes -B- and -C-.
- Install gaiter with selector knob
- Ensure that the selector shaft can move freely.
- If removed, install complete air filter housing => Rep. gr. 24 ;
Air filter; Removing and installing air filter housing .



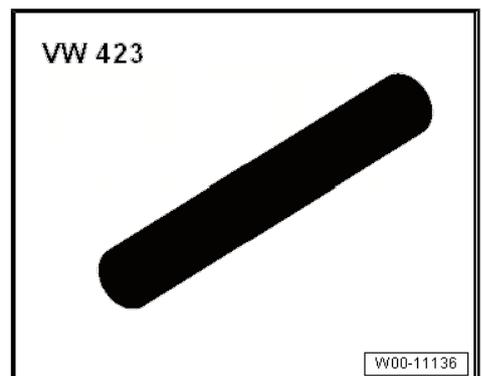
1.8 Gear mechanism: verification

- With gearbox in neutral, selector lever must be in selector lever gate for 3rd and 4th gear.
- Engage clutch.
- Select all the gears several times. Pay particular attention to the operation of the reverse gear locking mechanism.
- If it continues to be difficult to engage a gear after repeated attempts, repeat adjustment procedure of selector mechanism

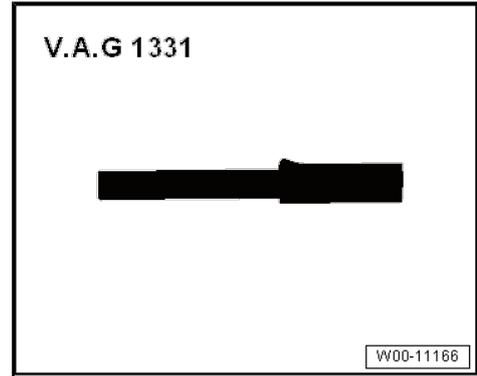
1.9 Seal for the selector shaft: replacement

Special tools and workshop equipment required

- ◆ Tube element - VW 423-



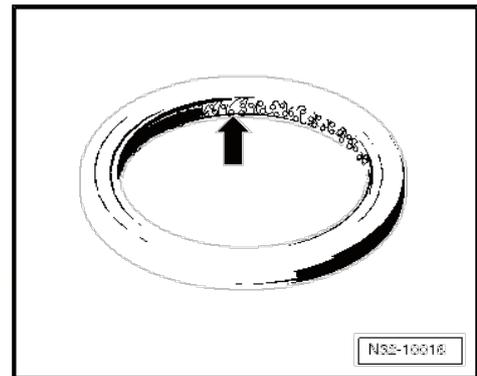
◆ Torque wrench - V.A.G 1331-



◆ Sealing grease

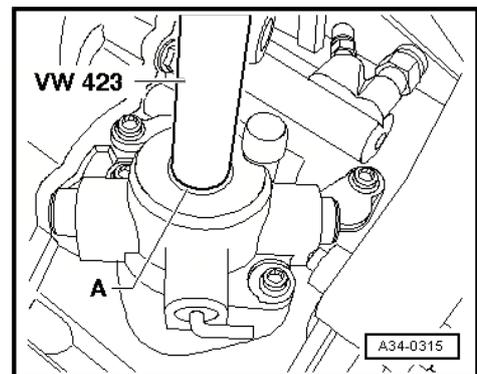
◆ For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .

- Remove gearbox selector lever and gate relay lever
- Lever seal out using a screwdriver.
- Lightly oil outer circumference of new oil seal.
- Fill space between sealing lip and dust lip -arrow- with sealing grease .



Inserting oil seal -A- onto stop

- Install gearbox selector lever and gate relay lever



1.10 Gear mechanism: repairing

Identification of cable end-pieces

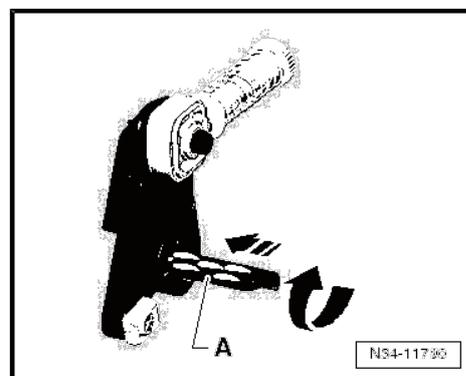
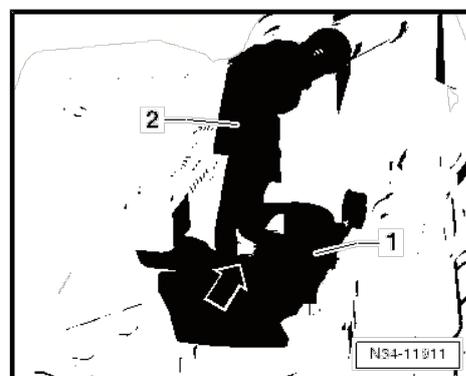
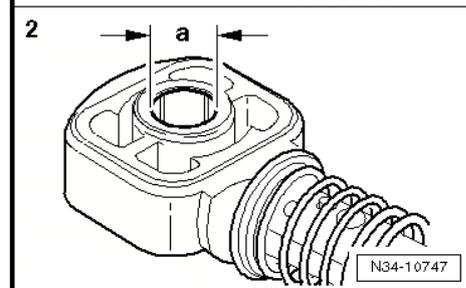
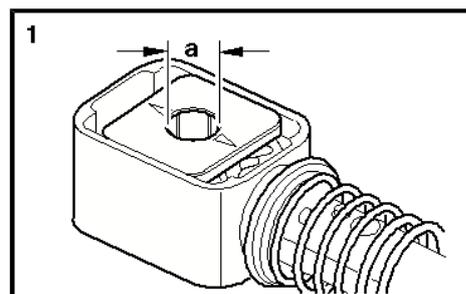
The holes on the cable securing elements have different diameters.

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

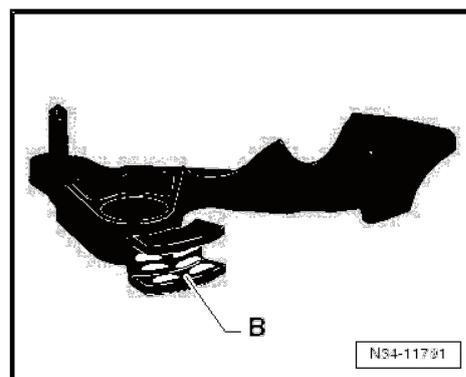
Installation position of gear selector lever and relay lever

1 - Gear selection rod

2 - Relay lever engages in guide rail of gearbox selector lever via shoe -arrow-.

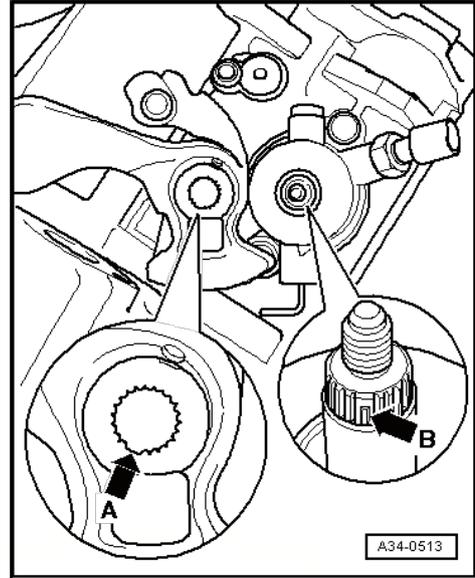


- When installing, grease following areas particularly carefully.
- Shaft -A- of gate relay lever -arrows-.
- Guide rail -B- of gearbox selector lever into which gate relay lever engages
- Pin for mounting cable-end piece.
- For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .
- The relay lever and gearbox selector lever may look different from the original part.



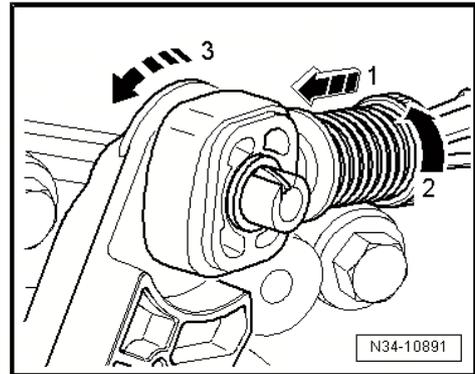
Install gearbox selector lever

- When fitting the gearbox selector lever, ensure that the gap -arrow A- is aligned with the master spline -arrow B-.



Relay lever: removing and installing

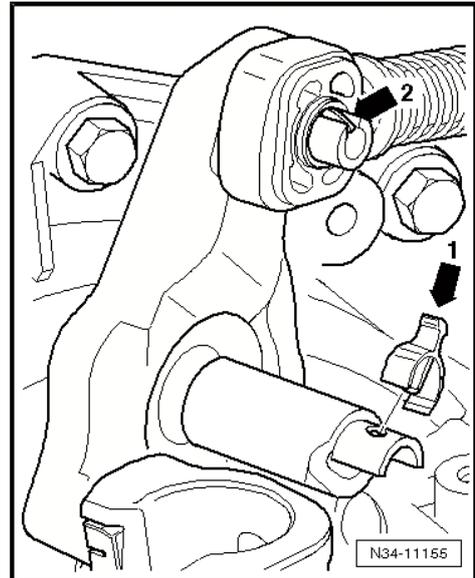
- Pull locking mechanism forwards in direction of -arrow 1- onto stop and then turn to left in direction of -arrow 2- to lock.



- Then push relay lever forwards (-direction of arrow 3-).
- Pull off clip -arrow 1- and remove relay lever together with cable end-piece.

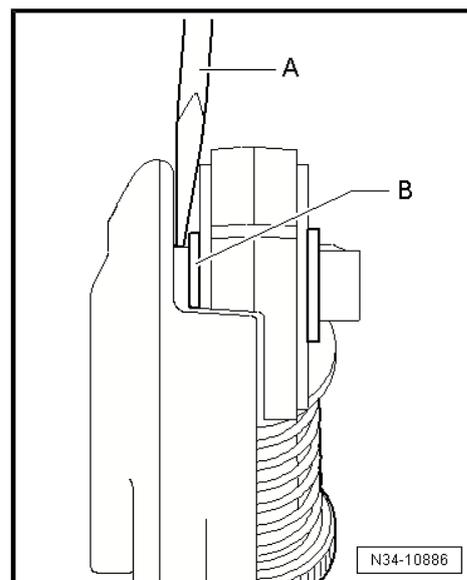
Cable end-piece must be located behind catch -arrow 2-.

- It is only permissible to remove cable end-piece after relay lever has been removed
- Press cable end-piece onto relay lever
- Insert gate relay lever with cable end-piece as far as stop.
- Clip -arrow 1- secures the relay lever.
- Ensure proper engagement of clip.
- Cable end-piece must be located behind catch -arrow 2- (=> previous figure).



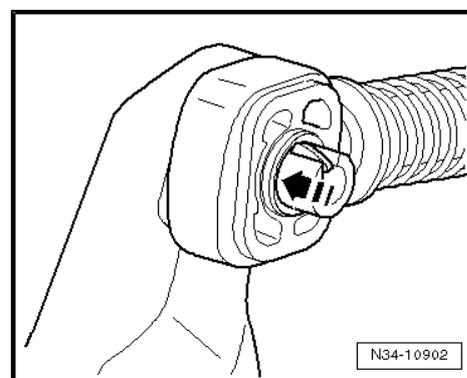
With gate relay lever removed: lever cable end-piece for gate selector cable off gate relay lever

- Relay lever has been removed
- Insert a flat-blade screwdriver -A- between bush -B- and relay lever.

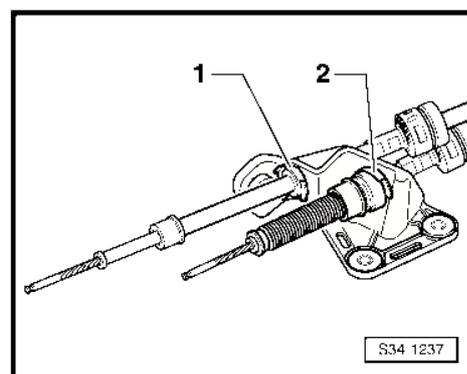


Pressing on cable end-piece

- Relay lever has been removed
- Grease pin for cable end-piece
- For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .
- Press on cable end-piece only at bush -arrow-.
- Cable end-piece must move freely on relay lever.
- It must be located behind catch -arrow 2-



Installation position of securing clips -1- and -2-.

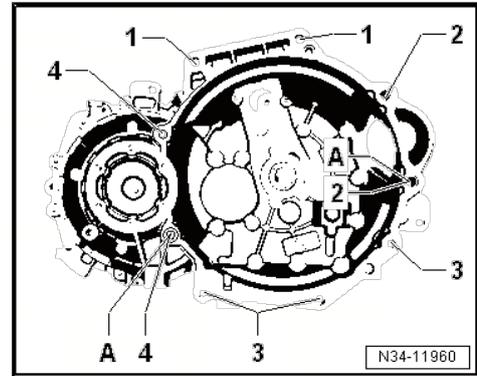


2 Gearbox : removing and fitting

2.1 Specified torques for gearbox

Position.	Bolt.	Quantity	Nm
1	M12×60	2	80
2	M12×165 ◆ Additionally, starter to gearbox	2	80
3	M 10 x 55	3	40
4	M12×70	2	80

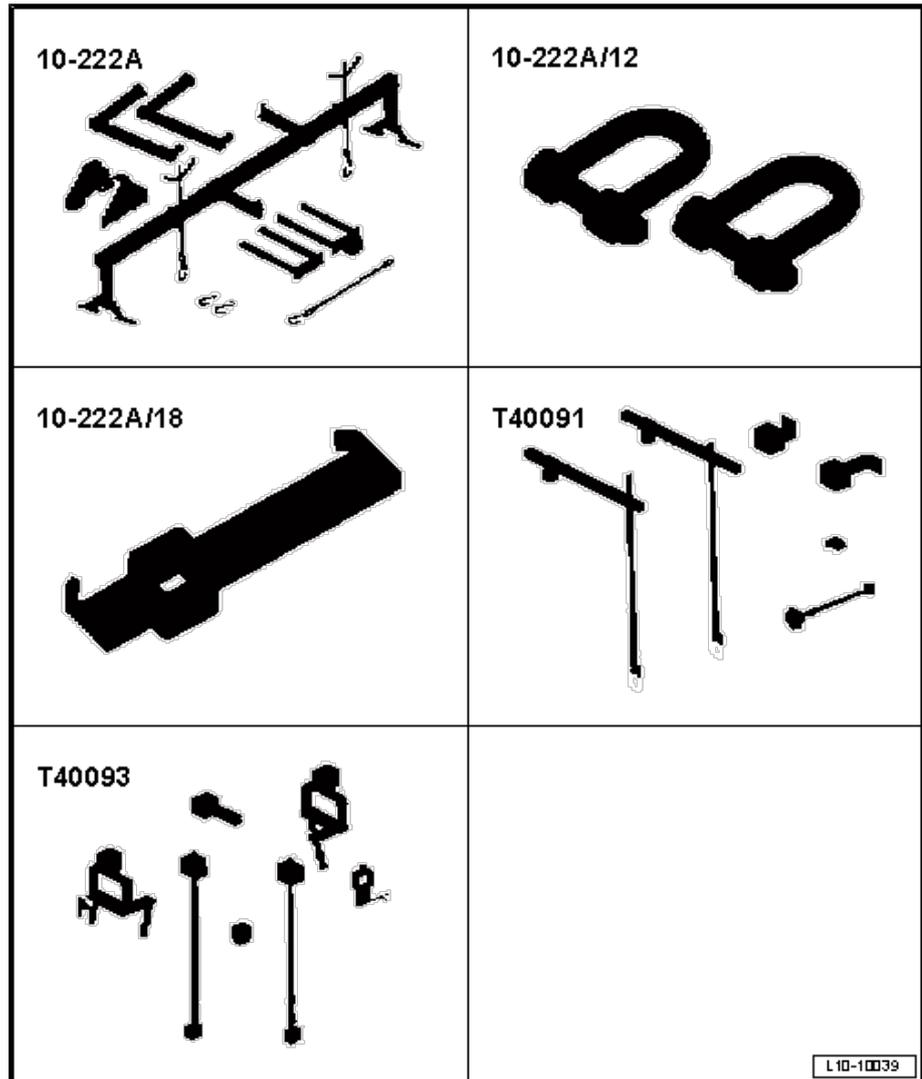
Item -A- dowel sleeves for centring



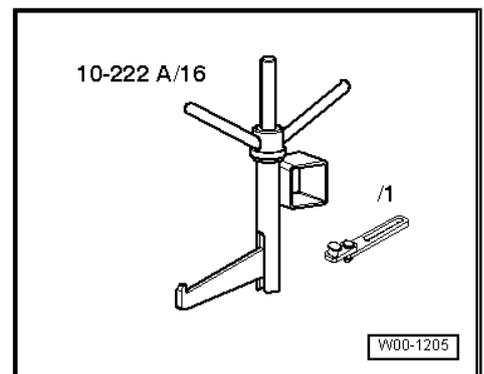
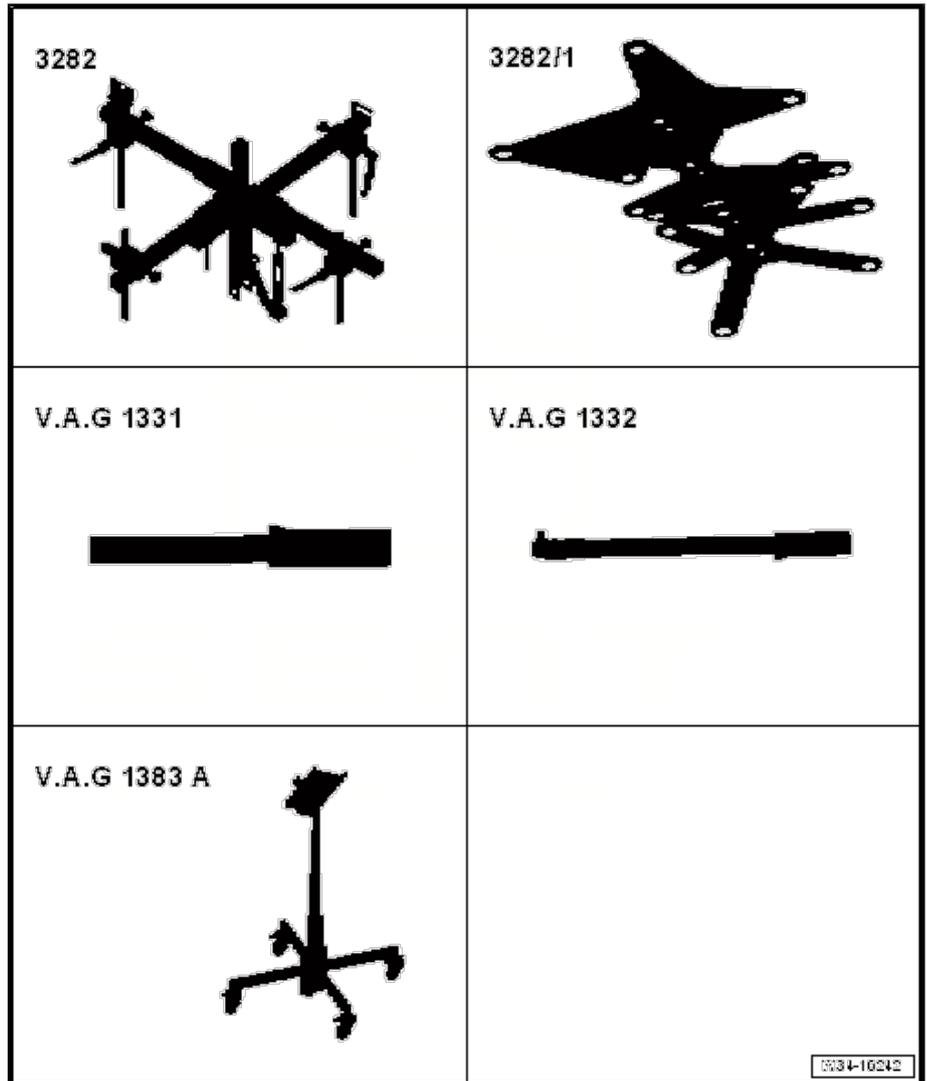
2.2 Removing gearbox

Special tools and workshop equipment required

- ◆ Support. - 10 - 222 A-
- ◆ Shackle - 10 - 222 A /12-
- ◆ Adapter for the engine bracket. - 10 222A/18-
- ◆ Square pipe - T40091/1- and connector - T40091/3-
- ◆ Spindle from engine support supplement set - T40093 /3-



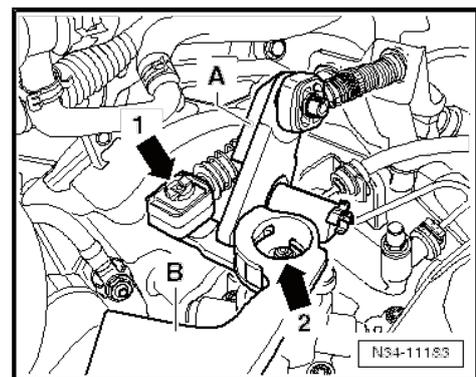
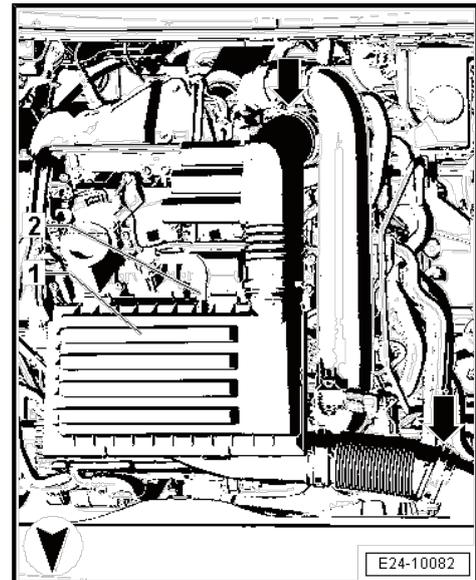
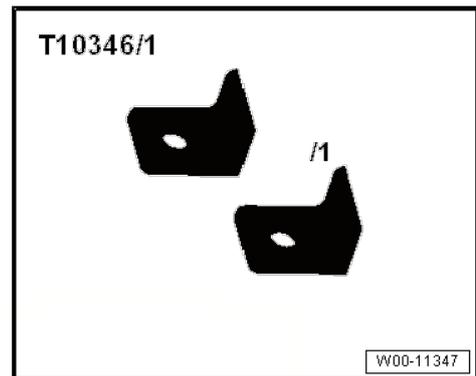
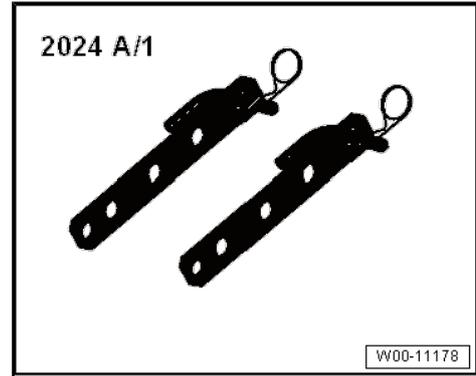
- ◆ Template - 3282/46-
- ◆ Support elements for gearbox (determine when setting adjustment plate on gearbox support)
- ◆ Torque wrench - V.A.G 1331-
- ◆ Torque wrench - V.A.G 1332-
- ◆ Engine/gearbox elevator - V.A.G 1383 A-



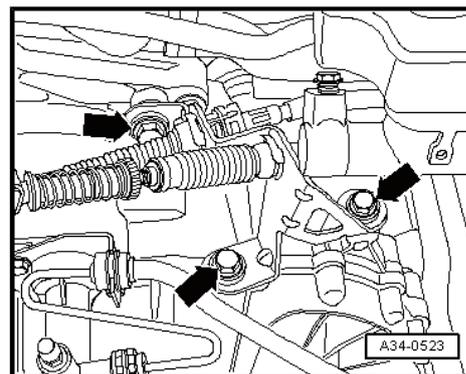
- ◆ Adapter - 10-222A/16-
- ◆ Bar - 2024 A / 1- from lifting tackle - 2024A-
- ◆ Support bracket - T10346-
- ◆ or bracket - T10346/1-
- ◆ Hexagon head bolt M10 x 20
- ◆ Continued for all vehicles, clutch plate spline grease
- ◆ For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .

Removal

- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .
 - Loosen the brackets -arrow- for the air duct hose.
 - Separate air intake hose -2- from air filter housing -1-.
 - Carefully disconnect the air filter housing -1- from the retaining bolts in an upward motion, sequentially.
 - Disconnect the air filter housing -1- with the air duct hoses.
-
- Remove securing clip -arrow 1- for gear selector cable from gearbox selector lever -B-.
 - Remove the relay lever -A- together with cable end-piece
 - Remove gearbox selector lever -B- after removing the nut -arrow 2- .



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

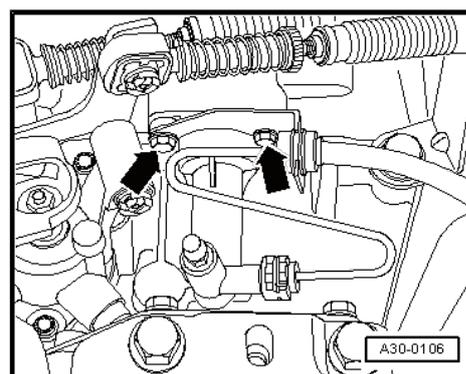


- Unscrew bolts -arrows- and place clutch slave cylinder to one side. Do not open pipes.

 **Caution**

Risk of damage to clutch slave cylinder.

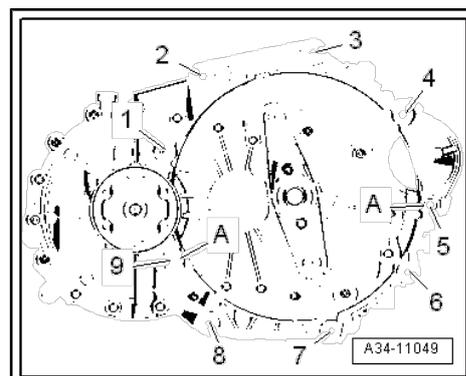
◆ *If slave cylinder is removed from gearbox with pipe/hose assembly still attached, make sure you do not press clutch pedal.*



- Then remove upper securing bolt on starter.
- Remove the upper screws -2 and 3- of top engine/gearbox.
- Then, if required, remove the hoses and lines in the area of the lifting eyes of the engine to secure the gearbox support - 10 - 222 A- .
- Install support bracket - 10-222 A- as follows:

Required special tools, workshop equipment and auxiliary items:

- ◆ Adapter - 10 - 222 A /18-
- ◆ 2 shackles - 10 - 222 A /12- (required when spindles of engine support bracket cannot be engaged in lifting eyes of engine)
- ◆ 2 Adapter - 10 - 222 A /29-
- ◆ 2 Square tubes - T40091/1-
- ◆ 2 Attachment elements - T40091/3-
- ◆ 2 Spindles - T40093 /3-
- ◆ 2 Adapter - T40093/3 6A-



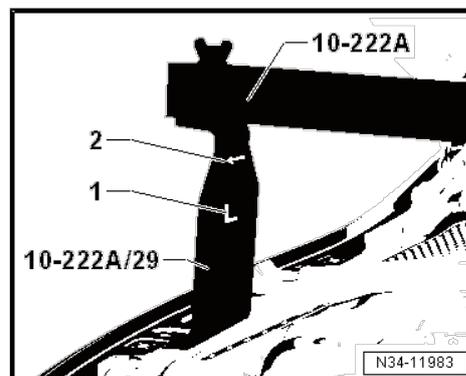
- On both sides of vehicle, insert adapters - 10 - 222 A /29- between upper wheel housing longitudinal member and mounting plate for wing located underneath.

◆ Installation position:

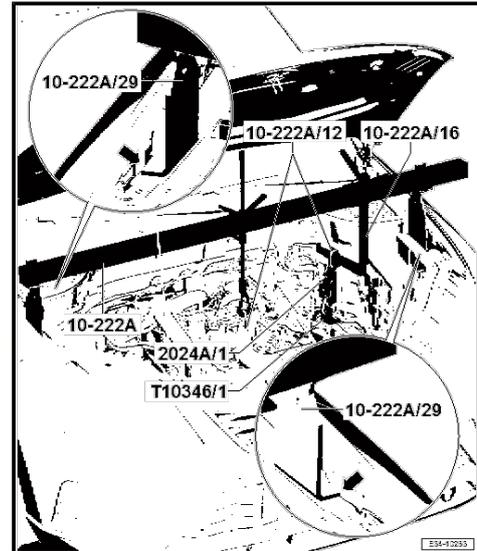
“L” -1- adapter is to be inserted on “right” side of vehicle (adapter is engaged in recess of wing).

“R” (not shown in figure) adapter is to be inserted on “left” side of vehicle.

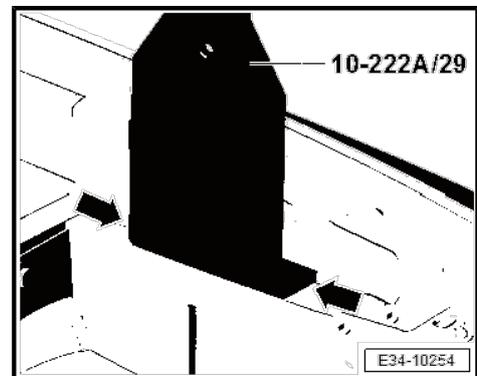
Arrow -2- points in direction of travel.



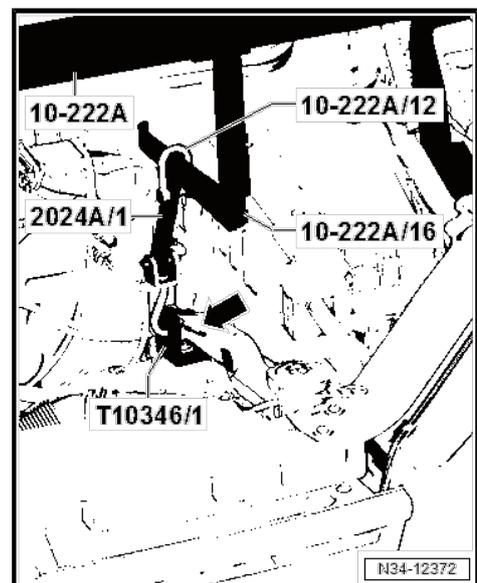
- Fit support bracket - 10-222 A- with adapters - 10 - 222 A /29- right behind mounting plate -arrow- onto carrier.



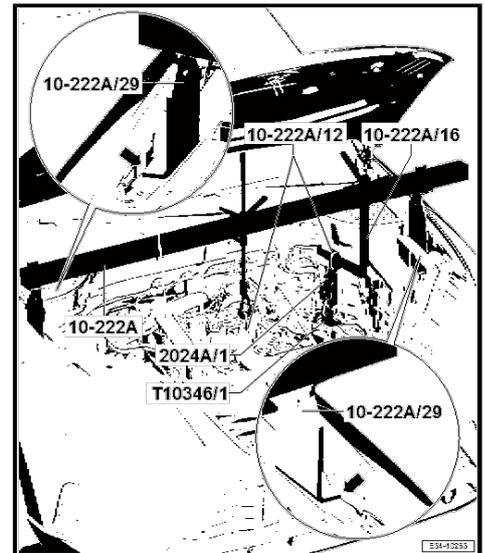
- Fit adapter - 10 - 222 A /29- as close as possible to the outer edge -arrows- which faces towards the wing.



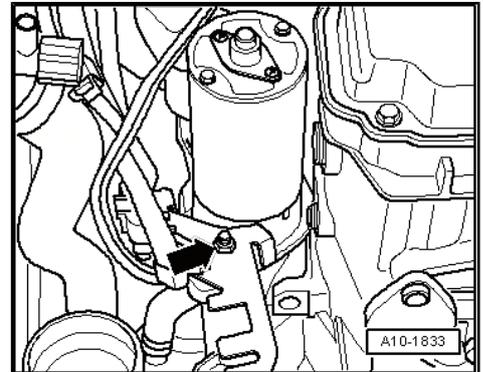
- Bolt bracket - T10346- or -T10346/1- to rear left mounting hole for battery tray.
- To do this, use a collar bolt M 6 x 80 or a securing bolt for battery tray.
- Attach bar - 2024 A / 1- from lifting tackle - 2024 A- at top to shackle - 10-222A/16- on adapter - 10 - 222 A /12- , and secure it at bottom to bracket - T10346/1- using a cotter pin -arrow-.



- Hook the spindle using the shackle - 10 - 222 A /12- into the eyelets.
- Slightly take up weight of engine/gearbox assembly on the spindles of the carrier - 10 222A- .
- Remove noise insulation components ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .
- Remove the lower part of the front left wheel housing liner ⇒ body installation tasks, exterior; Rep. gr. 66 ; wheel housing liner; Assembly overview - front wheel housing liner .



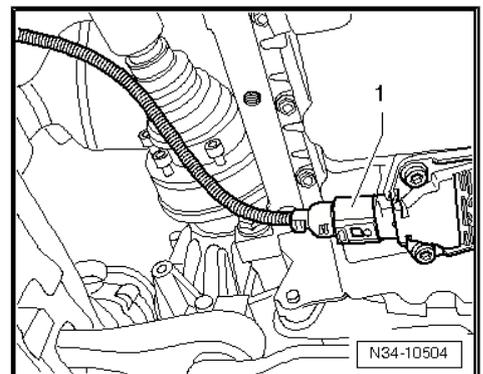
- Remove nut -arrow- and remove retainer for electrical lines.
- Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter .



- If fitted, unscrew front left vehicle level sender - G78- from transverse link ⇒ Running gear, axles, steering; Rep. gr. 43 ; Vehicle level sender; Assembly overview - front vehicle level sender .



- Pull connector -1- off oil level and oil temperature sender - G266- .



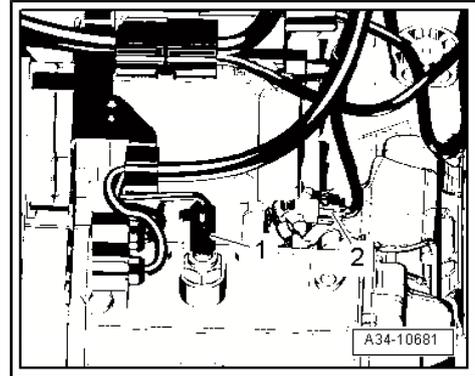
- Unplug electrical connectors:
- 1- Reversing light switch - F4-
- 2- Gearbox neutral position sender - G701-



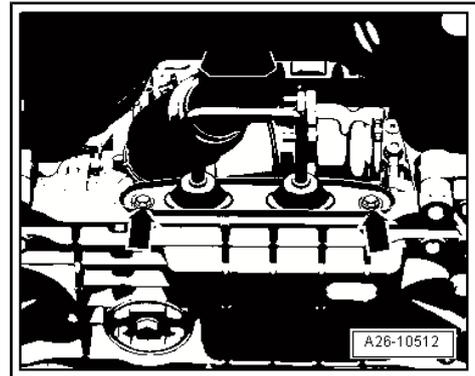
Caution

Risk of damage to decoupling element.

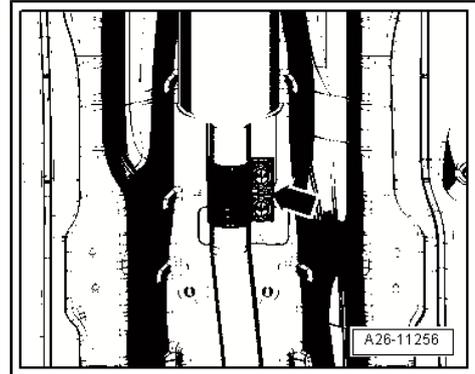
◆ ⇒ *Rep. gr. 26 ; Decontamination of exhaust gasses; Assembly overview - Decontamination of exhaust gasses .*



- Remove bolts -arrows- for exhaust pipe bracket from sub-frame.



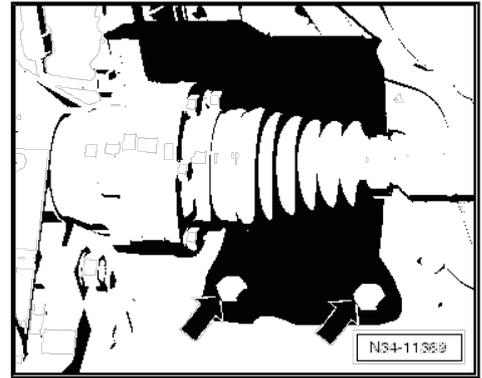
- Disconnect exhaust system at clamp -arrow-.



- Remove pendulum support.
- Remove left coupling rod of anti-roll bar and place to one side
⇒ Running gear, axles, steering; Rep. gr. 42 ; Removing and installing anti-roll bar, coupling rod .



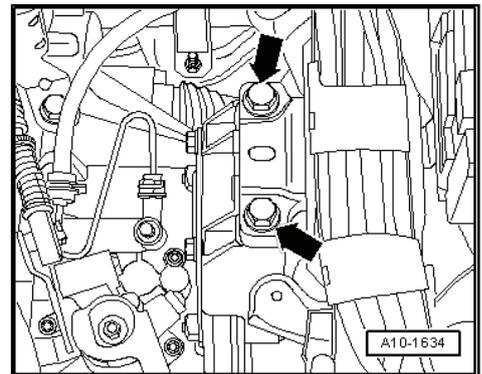
- If required, remove drive shaft heat shield -Arrows- ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; remove and install drive shaft heat shield .
- Remove drive shafts from flange shafts and tie them up as high as possible, do not damage surface protection ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; removing and installing drive shaft .



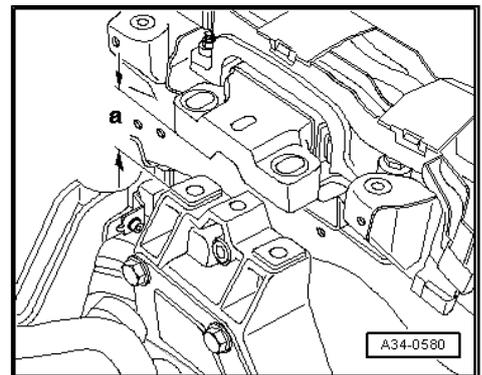
- Remove nut -arrow- and detach earth wire.



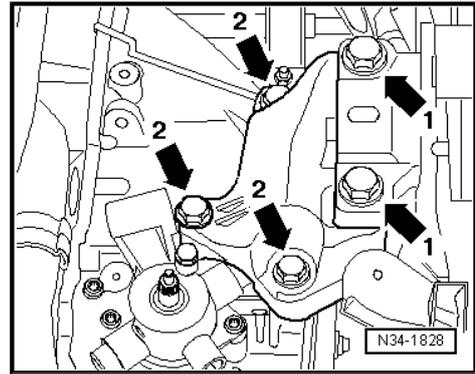
- Remove hexagon bolts -arrows- at left mounting from gearbox mounting.



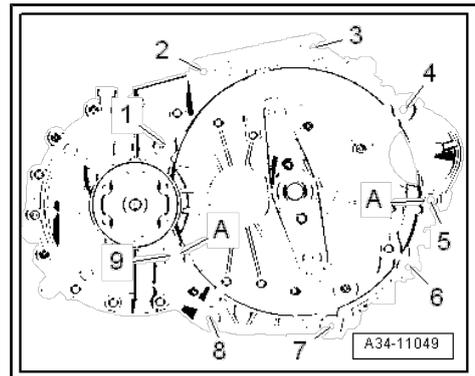
- Lower gearbox distance -a- by adjusting spindles of support bracket - 10 - 222 A- .
- Measurement -a- =60 mm.



- Removing gearbox support:
 - The bolts -arrows 1- for the gearbox mounting are screwed out.
- Unscrew the screws -arrows 2- and remove the gearbox support.

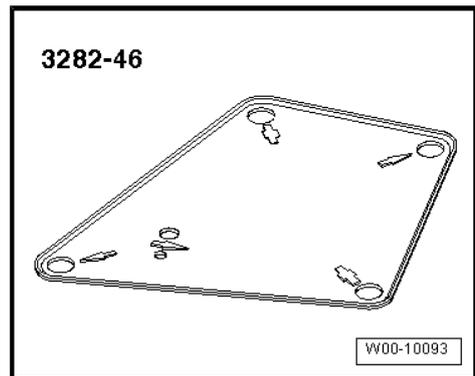


- Unscrew bolts - 7, 8- of the connection between gearbox and engine.
- Bolts -1, 6, 9- securing gearbox to engine are unscrewed at a later stage.



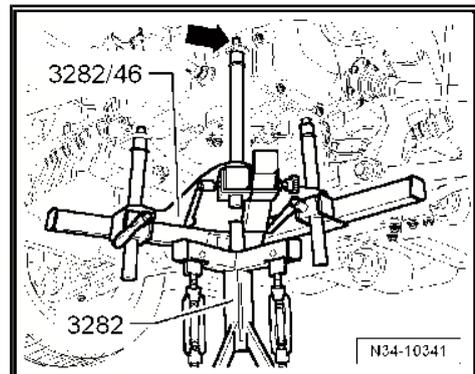
To remove gearbox "0AJ" set up gearbox support - 3282- with adjustment plate - 3282/46- .

- Insert gearbox support - 3282- in engine and gearbox jack .
- Place adjustment plate - 3282/46- on gearbox support - 3282- .
- The adjustment plate can only be fitted in one position.
- Align arms of gearbox support according to holes in adjustment plate
- Secure support elements as illustrated on adjustment plate.
- The arrow symbol on the adjustment plate points in the direction of travel. Align adjustment plate parallel with gearbox.

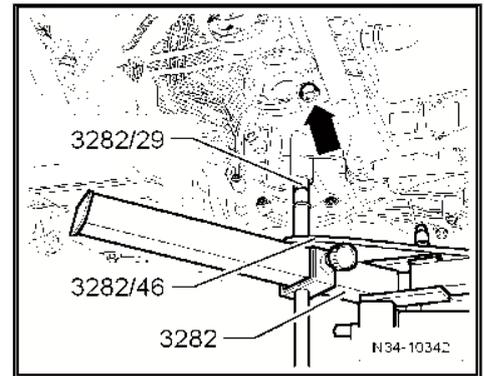


- Secure bolts - 3282/45- -arrow- to gearbox using a M 8 nut.

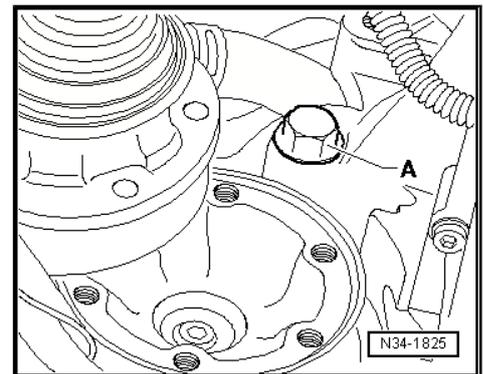
The bolts - 3282/45- should be flush below with the guide from the gearbox support - 3282- .



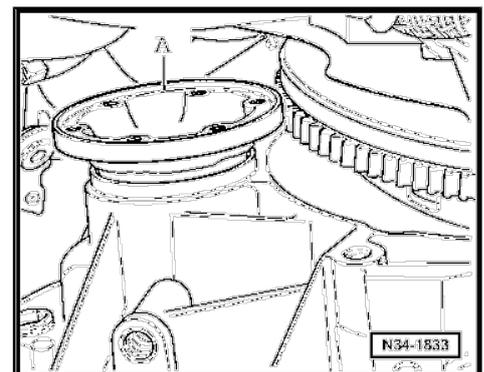
- Screw pin - 3282/29- into rear hole for bolt securing pendulum support to gearbox.
- Remove engine/gearbox connecting bolt -arrow-.



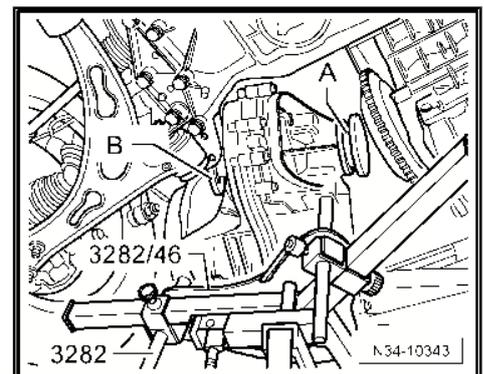
- Remove engine/gearbox connecting bolt -A- .
- Remove the remaining bolts connecting the engine to the gearbox.



- Press gearbox out of dowel sleeves and carefully swing towards front end.
- Carefully guide gearbox with right-hand flange shaft -A- past flywheel/intermediate plate.



- Turn gearbox in the area of the differential upwards and in the area of the 5th/6th gear downwards.
- Lower gearbox, paying attention to the clearance of flange shaft -A- to flywheel and flange shaft -B- to subframe.
- If necessary, carefully push engine towards front (2nd mechanic required).
- On lowering it, modify the position of the gearbox using the spindles of the gearbox support unit - 3282- .



i Note

Pay attention to all pipes/hoses/wiring when lowering gearbox.

2.3 Installing gearbox



Note

Refer to procedure "Removing gearbox" for required special tools

- All threaded holes into which self-locking bolts are to be screwed must be carefully cleaned of residual locking fluid using a thread chaser.
- Renew self-locking nuts and bolts after each removal.
- Check whether dowel sleeves for centring engine/gearbox have been fitted in cylinder block, install if necessary.

If dowel sleeves are not fitted, difficulties shifting gears, clutch problems and possible noises from the gearbox (rattling of gears which are not engaged) could occur.

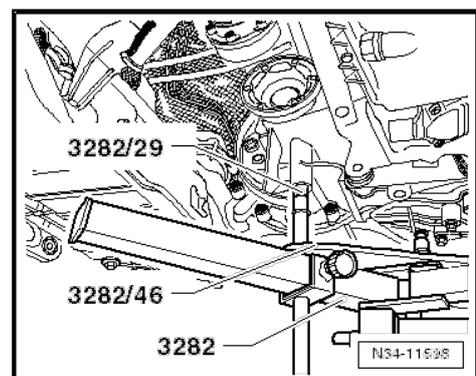
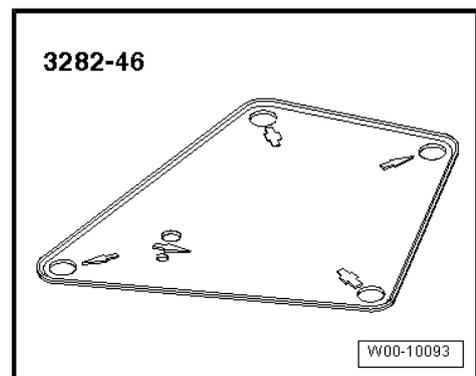
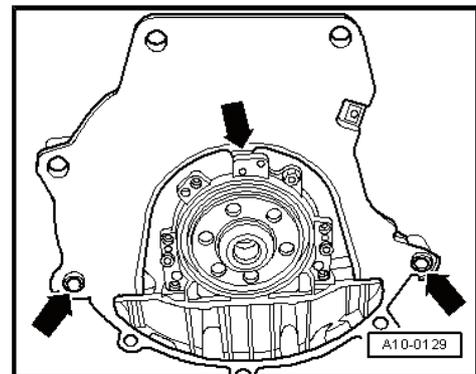
- Make sure that intermediate plate is engaged on sealing flange -top arrow- and fitted onto dowel sleeves -bottom arrows-.
- Clean splines of input shaft and apply a thin coat of grease for clutch plate splines .

It must be possible to move the clutch plate from side to side on the input shaft.

- Insert gearbox support - 3282- in engine and gearbox jack .

Gearbox support - 3282- is aligned with adjustment plate - 3282/46- for installation of gearbox.

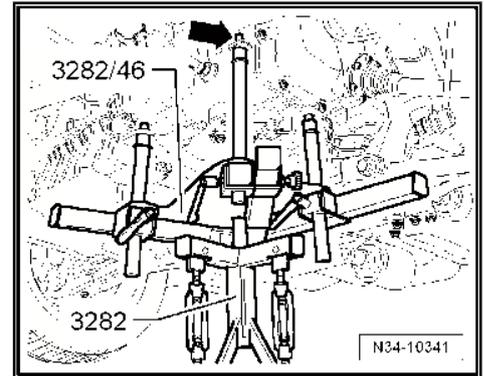
- Fit adjustment plate - 3282/46- on gearbox support - 3282- (adjustment plate fits in only one position).
- Align arms of gearbox support - 3282- according to holes in adjustment plate - 3282/46- .
- Screw mounts into adjustment plate - 3282/46- as illustrated.
- Place gearbox on engine and gearbox jack .
- Align adjustment plate - 3282/46- and gearbox parallel to one another.
- Screw pin - 3282/29- into rear hole on gearbox for securing bolt of pendulum support.



- Secure bolts - 3282/45- -arrow- to gearbox using a M 8 nut.

The bolts - 3282/45- should be flush below with the guide from the gearbox support - 3282- .

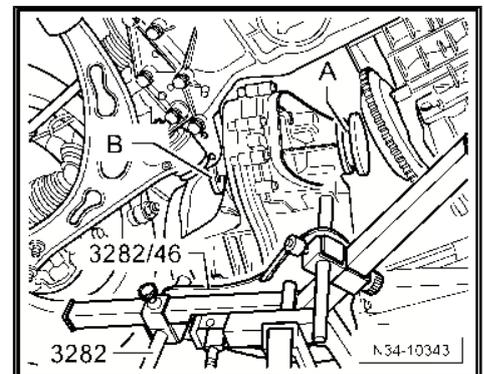
- Turn gearbox in the area of the differential upwards and in the area of the 5th/6th gear downwards.
- Position engine and gearbox jack under the vehicle; arrow the adjustment plate points in the direction of travel of the vehicle.
- Raise gearbox carefully.
- 6th gear cover of gearbox faces front end.



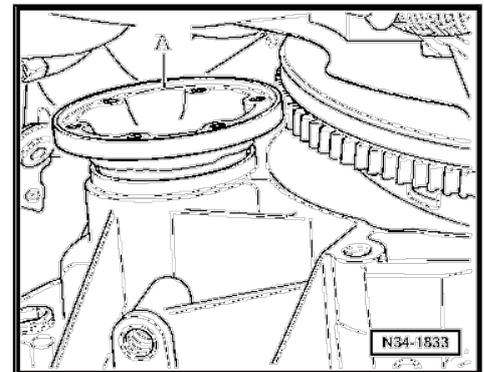
 **Note**

Be careful of all lines when installing gearbox.

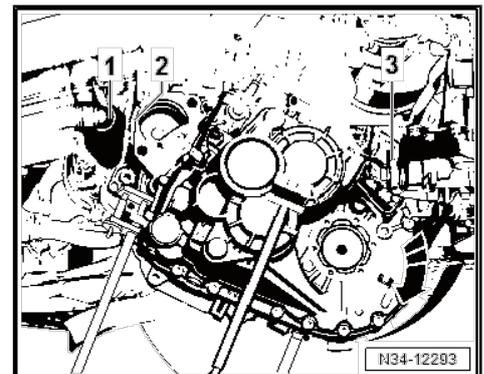
- Carefully push the engine forwards with the assistance of another mechanic.
- Then carefully guide gearbox and left-hand flange shaft -B- past subframe and guide right-hand flange shaft -A- past clutch pressure plate.



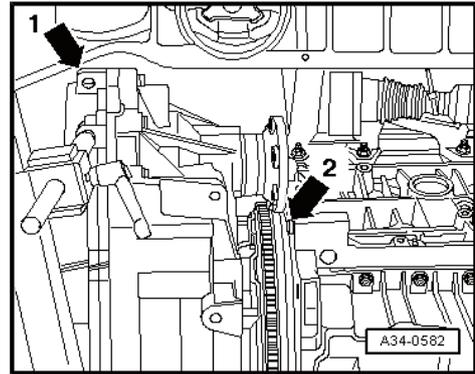
- Carefully guide gearbox with right-hand flange shaft -A- past flywheel, as shown.
- Align gearbox in installation position to engine.



- Position engine and gearbox jack under the vehicle; arrow the adjustment plate points in the direction of travel of the vehicle.
- Lower gearbox in area of differential to stop in -direction of arrow- (different gearbox shown in illustration).
- Raise gearbox carefully.
- Carefully push the engine forwards with the assistance of another mechanic.



- While doing so, guide gearbox with flange shaft past flywheel, dowel sleeve -arrow 2- and, if necessary, past subframe -arrow 1-.
- Be aware of coolant hose -1- and starter mounting -2- when guiding gearbox past subframe -3- (⇒ previous illustration).



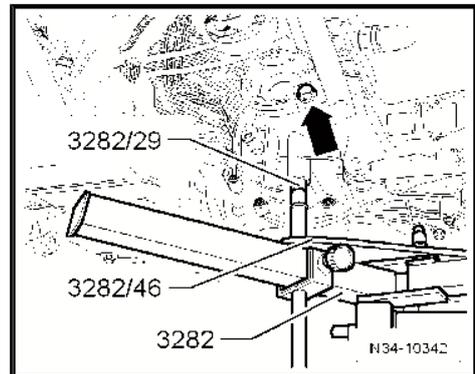
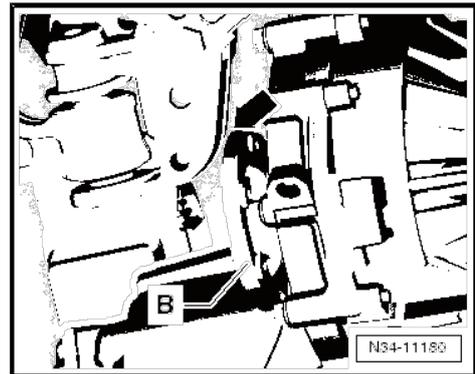
- Guide left flange shaft -B- past subframe bracket -arrow-.
- When raising gearbox, change position of gearbox as necessary using spindles of gearbox support - 3282- .



Note

Be careful of all lines when raising the gearbox.

- Align gearbox in installation position to engine.
- Install gearbox, screw and tighten bolts above and below -arrow- of right-hand flange shaft
- Screw and tighten the remaining bolts connecting gearbox to engine
- After gearbox has been bolted to engine, remove engine and gearbox jack from gearbox.



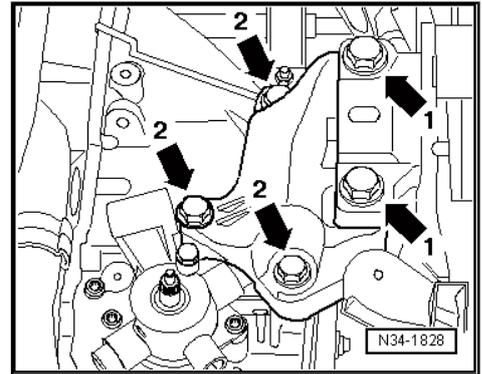
- Install gearbox support with new bolts -arrows 2-
- Align engine/gearbox assembly in installation position; to do so, tighten spindles of support bracket - 10 - 222 A- until gearbox support makes contact with gearbox mounting.



Caution

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

- ◆ *So that the threads in the gearbox support do not become damaged, the gearbox mounting and console must be parallel to each other.*



- Screw in new bolts and tighten them -arrows 1-



Note

Install engine and gearbox mounting free of tension => Rep. gr. 10 ; Removing and installing engine; Installing engine .

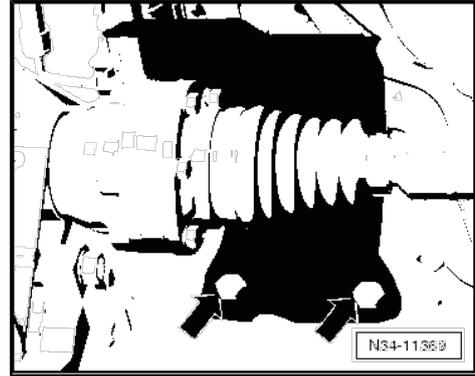
- Install earth wire -arrow-.
- Do not remove support bracket - 10 - 222 A- until all bolts securing the assembly mounting have been tightened to specified torque!
- Screw in upper engine/gearbox securing bolts and tighten them



- Install pendulum support with new bolts => Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings .
- Check the settings of the mechanical components => Rep. gr. 10 ; all mechanical brackets; Check mechanical brackets .
- Assemble exhaust system => Rep. gr. 26 ; Emission control; Assembly overview - emission control .



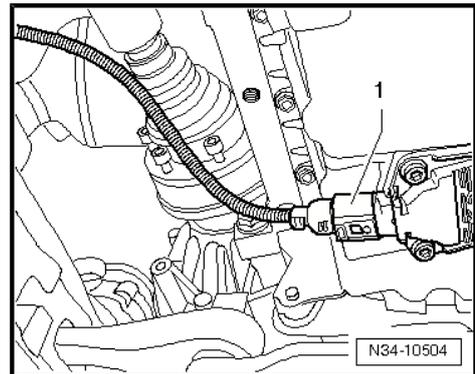
- Install drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shafts .
- Install heat shield for drive shaft, if present -arrows- ⇒ chassis, axles, steering; Rep. gr. 40 ; Drive shaft; heat shield remove and re-install drive shaft .



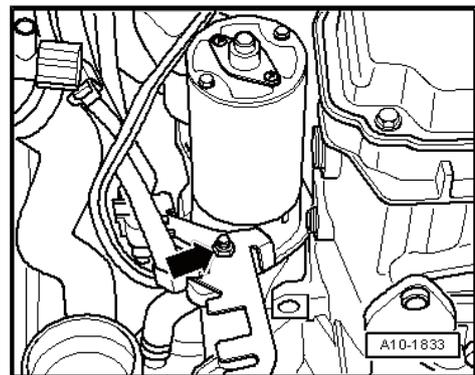
- If present screw the indicator for the front vehicle level - G78- to the crossbeam ⇒ Running gear, axles, steering; Rep. gr. 43 ; Indicator of vehicle level; installing and removing the indicator for front vehicle level G78/G289 .
- Install coupling rod ⇒ Running gear, axles, steering; Rep. gr. 40 .



- Attach connector -1- to oil level and oil temperature sender - G266- .
- Ensure the braking system vacuum hose is positioned correctly. If necessary, install the hose ⇒ Brake system; Rep. gr. 47 ; Servo brake / main brake cylinder; Assembly Overview - servo brake / main brake cylinder .



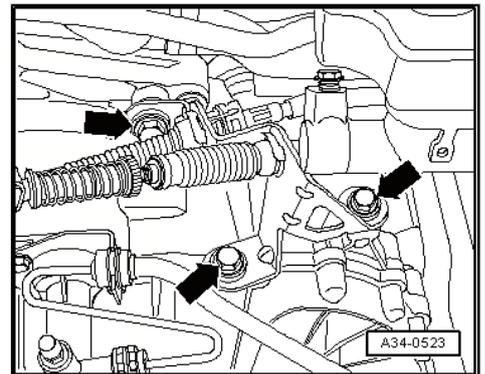
- Install starter and attach bracket for electrical wiring -Arrow- ⇒ Electrical system; Rep. gr. 27 ; Starter .
- Install clutch slave cylinder .



- Gearboxes for vehicles with start-stop system: join connector -arrow- to gearbox neutral position sender - G701- .



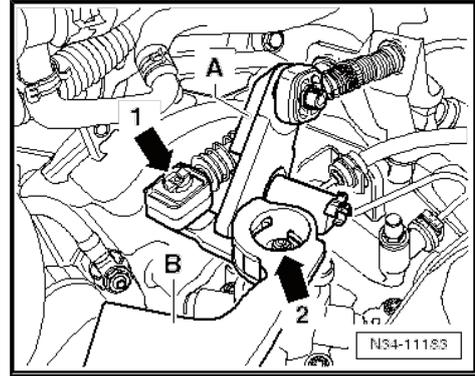
- Install cable support bracket on gearbox and tighten bolts -arrows-



- Install gearbox selector lever -B-
- Tighten hexagon nut -arrow 2-.
- Install relay lever -A- together with cable end-piece
- Spread a small amount of grease on pin of gearbox selector lever -B-.

Allocate grease for selector mechanism using ⇒ Electronic parts catalogue (ETKA) .

- Attach gear selector cable to gearbox selector lever.
- Renew securing clip -arrow 1- each time after removing.
- Adjust selector mechanism
- Install battery tray, battery and battery cover ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery .
- Install engine cover and air filter ⇒ Rep. gr. 24 ; Air filter; Removing and installing air filter housing .
- Check the position of the filler neck of the screen wash water container ⇒ Electrical system; Rep. gr. 92 ; Windscreen washing system; Assembly overview - windscreen washing system .
- Remove the lower part of the front left wheel housing liner ⇒ body installation tasks, exterior; Rep. gr. 66 ; wheel housing liner; Assembly overview - front wheel housing liner .
- Check the gear oil
- Install the lower part of the front left wheel housing liner ⇒ body installation tasks, exterior; Rep. gr. 66 ; wheel housing liner; Assembly overview - front wheel housing liner .
- Remove the noise silencer ⇒ chassis installation work, exterior; Rep. gr. 66 ; Noise silencer; installation overview - noise silencer .
- If the vehicle has an indicator for the front vehicle level - G78- , the headlight adjustment must be checked ⇒ Running gear, axles, steering; Rep. gr. 43 ; Vehicle level indicator; Assembly overview - Indicator for front vehicle level ⇒ electrical system; Rep. gr. 94 .
- If the surface protection has been damaged, a repair must be undertaken with materials prescribed by the manufacturer ⇒ Paintwork guidelines .



3 Engine/gearbox mountings

3.1 Exploded view - assembly mountings

1 - Bolt.

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

2 - Engine support

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

3 - Engine mounting

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

4 - Bolt.

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

5 - Bolt.

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

6 - Bolt.

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

7 - Support bracket

8 - Bolt.

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

9 - Pendulum support

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings or ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Assembly overview - subframe

10 - Bolt.

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

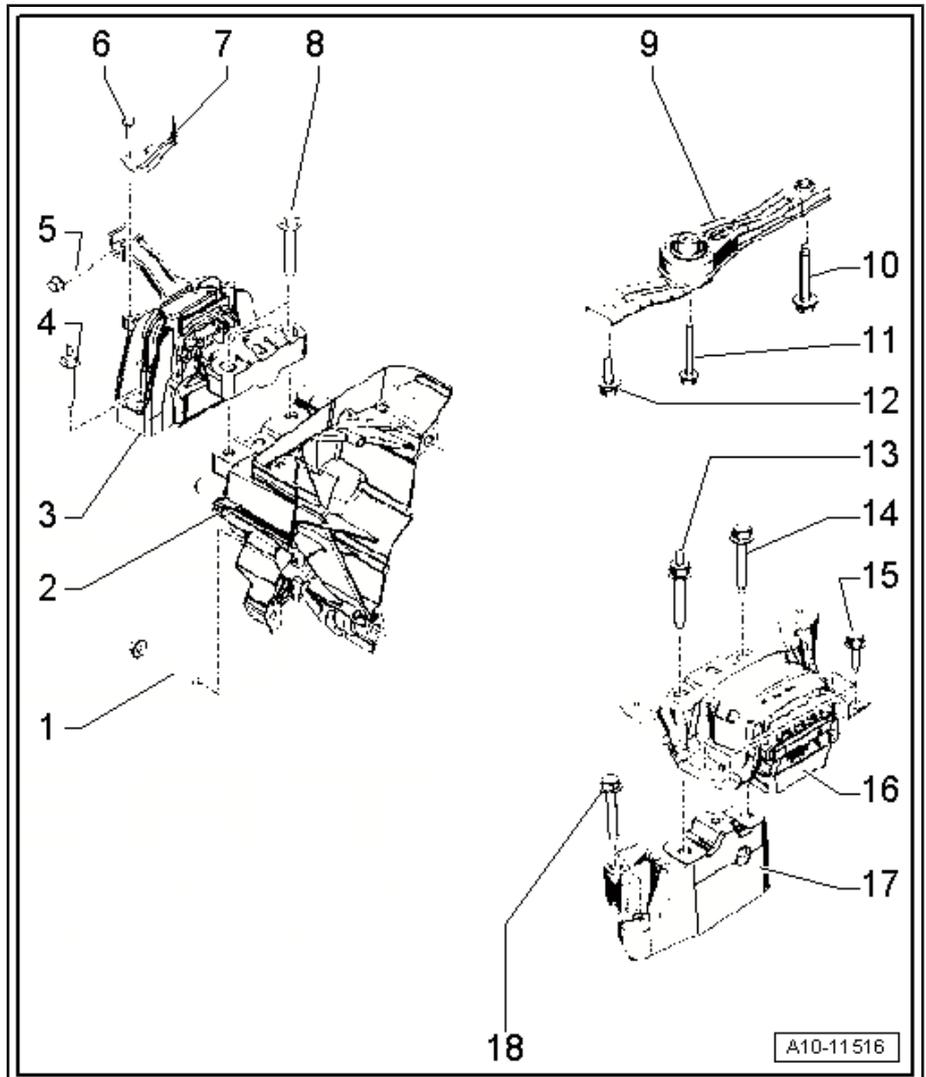
or ⇒ Running gear, axles, steering; Rep. gr. 40 ; Mechanics bearing saddle; assembly overview - mechanics bearing saddle

11 - Bolt.

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings or ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Assembly overview - subframe

12 - Bolts

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings or ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Assembly overview - subframe



13 - Bolt.

- Must be renewed if removed
- 60 Nm + +90°

14 - Bolt.

- Must be renewed if removed
- 60 Nm + +90°

15 - Bolt.

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

16 - Gearbox mounting

- ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

17 - Final drive support

18 - Bolt.

- Must be renewed if removed
- 3 Units
- 40 Nm + +90°

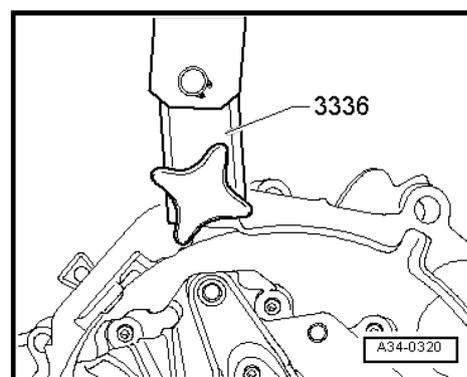
4 Transport of gearbox

Special tools and workshop equipment required

- ◆ Gearbox lifting tackle - 3336-



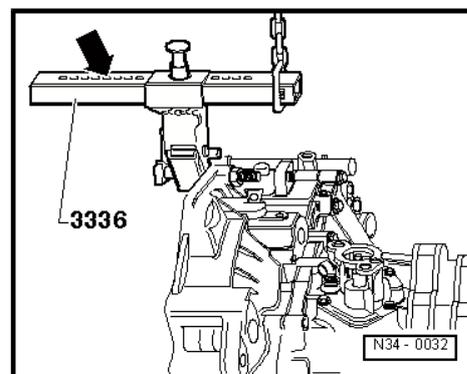
- Bolt gearbox lifting tackle - 3336- to clutch housing.



- Adjust support beam on sliding piece using locking pin -arrow-.

No. of holes visible = 5

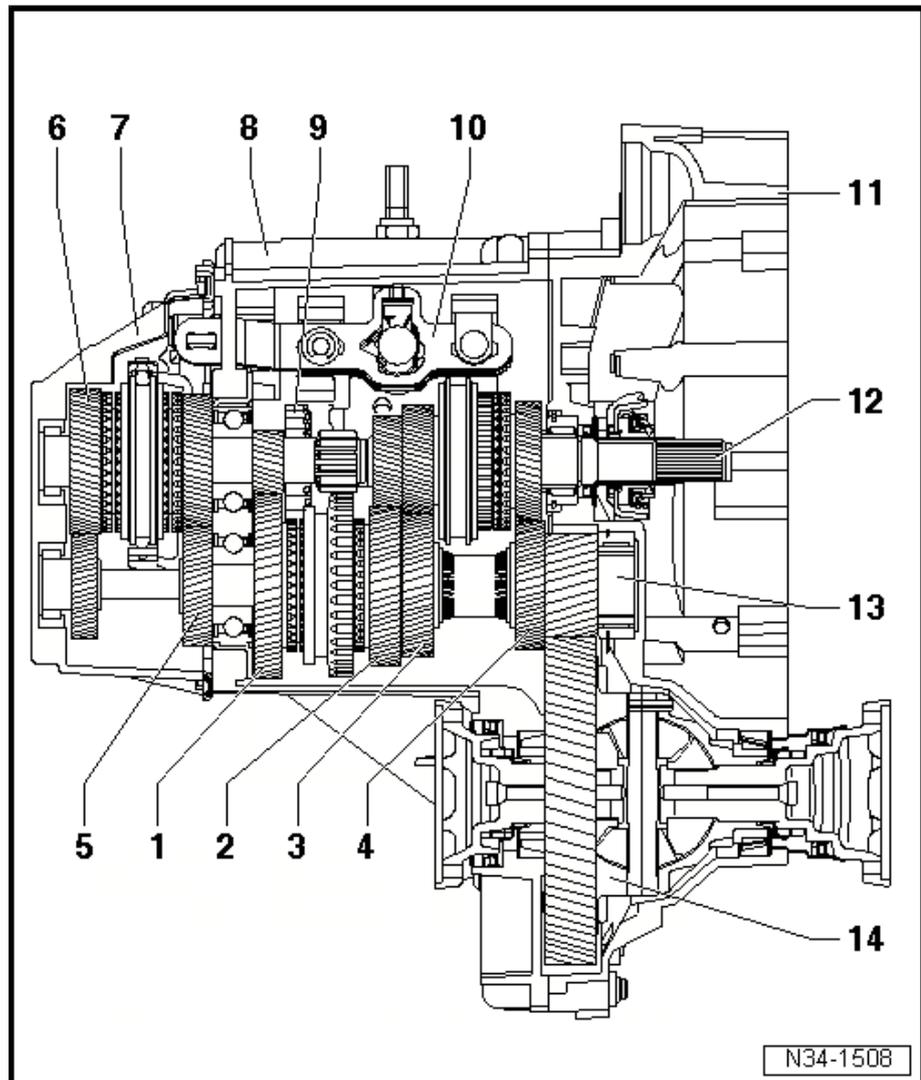
- Lift gearbox using workshop crane and gearbox lifting tackle - 3336- .
- Set down gearbox as required (for example in transport container).



5 Gearbox: disassembly and assembly

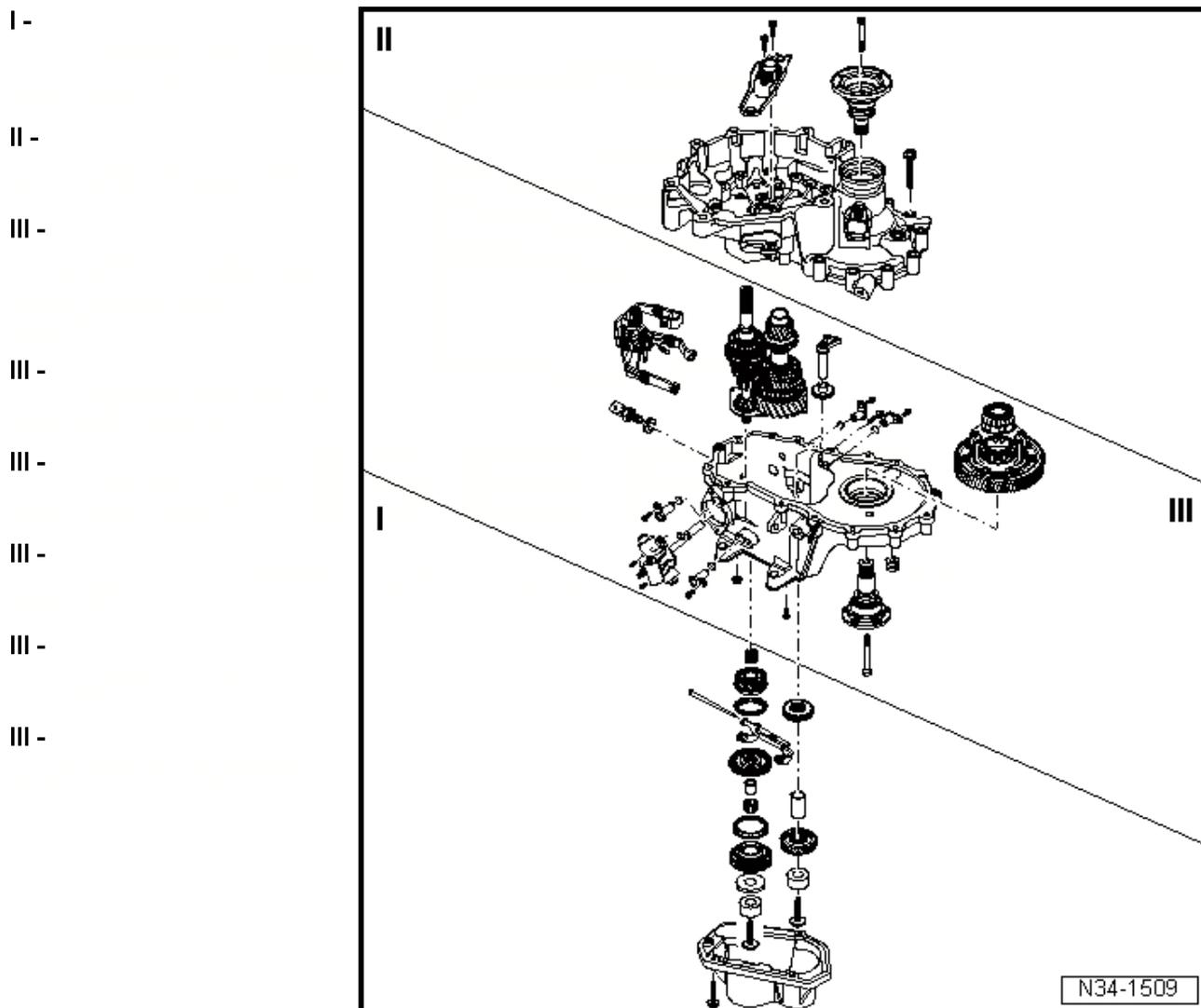
5.1 Schematic overview - gearbox

- 1 - 1st gear
- 2 - 2nd gear
- 3 - 3rd gear
- 4 - 4th gear
- 5 - 5th gear
- 6 - 6th gear
- 7 - Gearbox casing cover
- 8 - Gearbox housing
- 9 - Reverse gear wheel
- 10 - Selector mechanism
□ (Gear change prongs)
- 11 - Clutch housing or
- 12 - Input shaft
- 13 - Secondary shaft
- 14 - Differential:



N34-1508

5.2 System overview - gear box



5.3 Assembly overview - selector unit

i Note

- ◆ Lubricate bearing positions and sliding surfaces.
- ◆ For grease allocation, refer to → *Electronic parts catalogue (ETKA)*.

1 - Collar

- For the gear selection shaft
- Press out
- Press on

2 - Selector shaft with cover

- Renew together

3 - Angled rod

- For adjusting selector mechanism
- Removal
- Press on

4 - Relay lever

- Installation position

5 - Clip

6 - Oil seal

- Replace after removal

7 - Cap

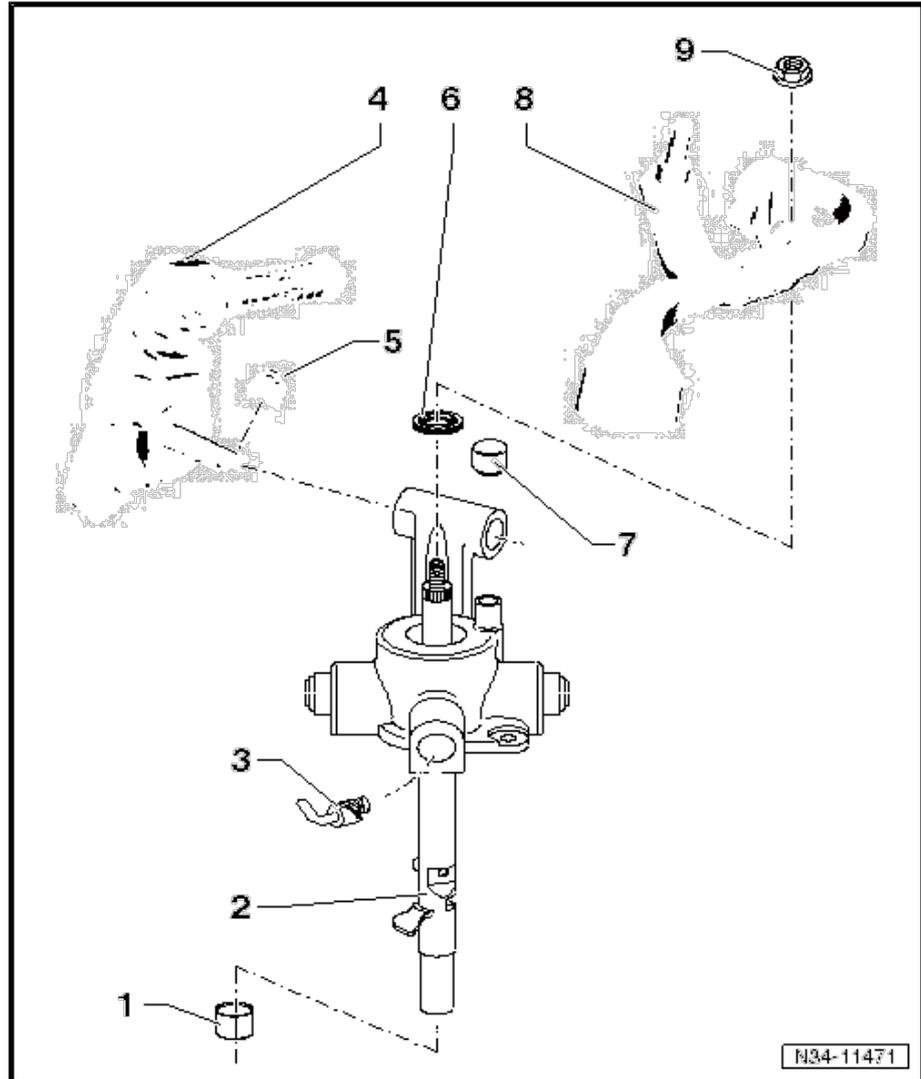
- For gearbox breather

8 - Gear selection rod

- Position so that the teeth free area is inserted on the selector shaft
- Can be replaced with the gearbox drive mechanism in place
- Installation position

9 - Hexagon nut

- Self-locking
- Must be renewed if removed
- 23 Nm



5.4 Assembly overview - input shaft, output shafts, differential, selector rods

1 - Differential:

- Dismantling and assembling

2 - Gearbox housing

- Repairing

3 - Oil drain plug

- Tightening torque

4 - Flanged shaft with pressure spring

- Remove and install
- Assembling, from

5 - Conical bolt

- Remove and install

6 - Bolt.

- Self-locking
- Must be renewed if removed
- For securing bearing support for input and output shafts
- Tighten with 5 Nm + 90°

7 - Hexagon flange nut

- For selector mechanism
- Self-locking
- Must be renewed if removed
- 23 Nm

8 - O-ring

- Must be renewed if removed

9 - Pivot pin

10 - Bolt.

- Must be renewed if removed
- Tighten with 5 Nm + 90°

11 - Selector shaft with cover

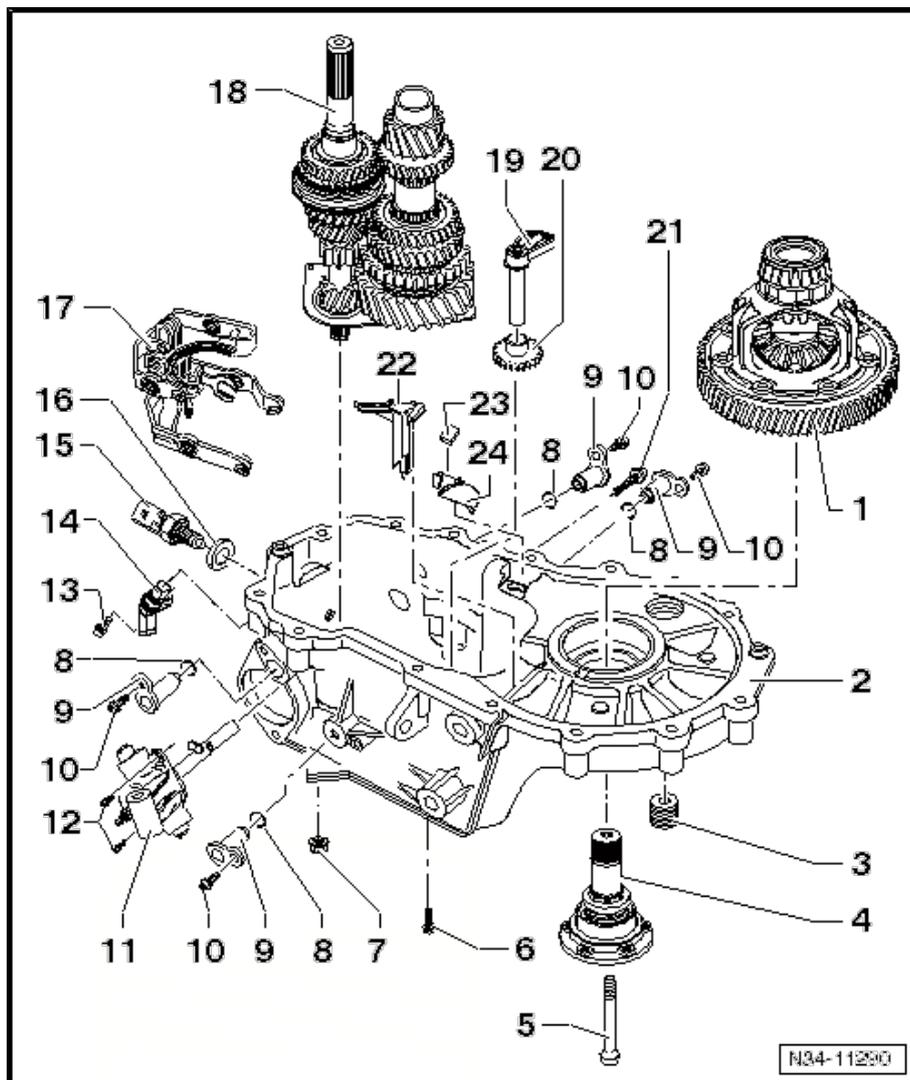
- (Selector unit)
- Repairing

12 - Bolt.

- Must be renewed if removed
- Tighten with 5 Nm + 90°

13 - Bolt.

- 6 Nm



14 - Gearbox neutral position sender - G701-

- For vehicles with start stop system

15 - Reversing light switch - F4-

- With captive seal (fitted shortly after gearbox was first introduced)
- Renewing with gearbox installed: removing noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- 20 Nm

16 - Oil seal

- Not fitted in all gearboxes

17 - Selector mechanism

- (Gear change prongs)
- Repairing

18 - Input and secondary shafts with allotment/grooved ball bearings

- If bearing mounting is separated from gearbox housing, then mounting must always be renewed.
- Remove and press on allotment: disassemble and assemble input shaft
- Disassembly and assembly of the input shaft
- Dismantling and assembling output shaft

19 - Reverse gear shaft

20 - Reverse gear wheel

21 - Bolt.

- Must be renewed if removed
- To fasten reverse gear pinion axis
- Tighten with 25 Nm + 45°

22 - Oil collector

23 - Magnet

24 - Oil guide

5.5 Assembly overview - selector forks

Note

It is not necessary to dismantle the selector fork group in order to dismantle and assemble selector segments, lock washers and angular contact ball bearings.

1 - Selector fork group with selector plate

2 - 3rd/4th gear base strip

- Identification
- After installation, selector segment must still rotate freely

3 - Ball bearing

- 4 Units
- Removal
- Press inner race into outer race
- Installation

4 - Retainer

- Must be renewed if removed
- Removal
- Installation

5 - 1st/2nd gear selection group

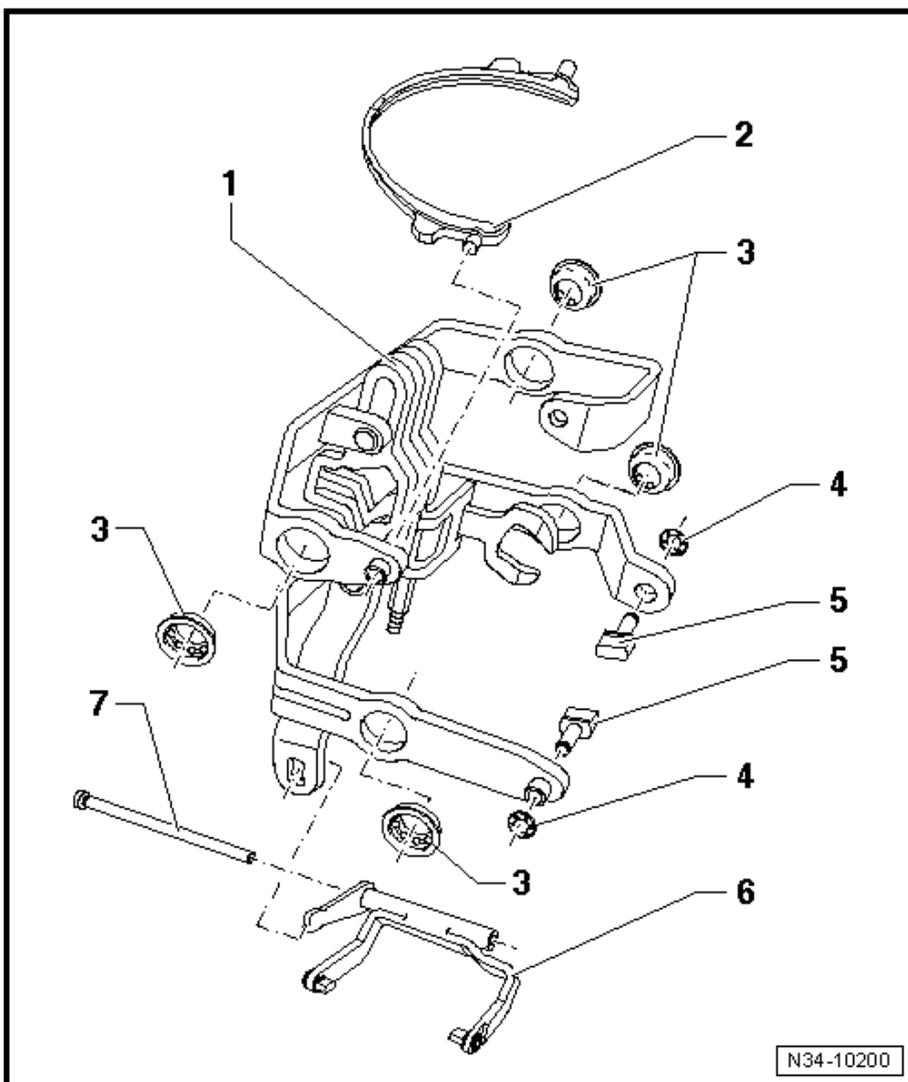
- Identification
- The segment must rotate freely after installing the lock washer.
- Selector fork with selector segment

6 - Prongs of 5th/6th gear with gear selection.

- Selector segment is permanently connected to selector fork.
- Identification

7 - Pivot pin

- For the 5th/6th gear prong

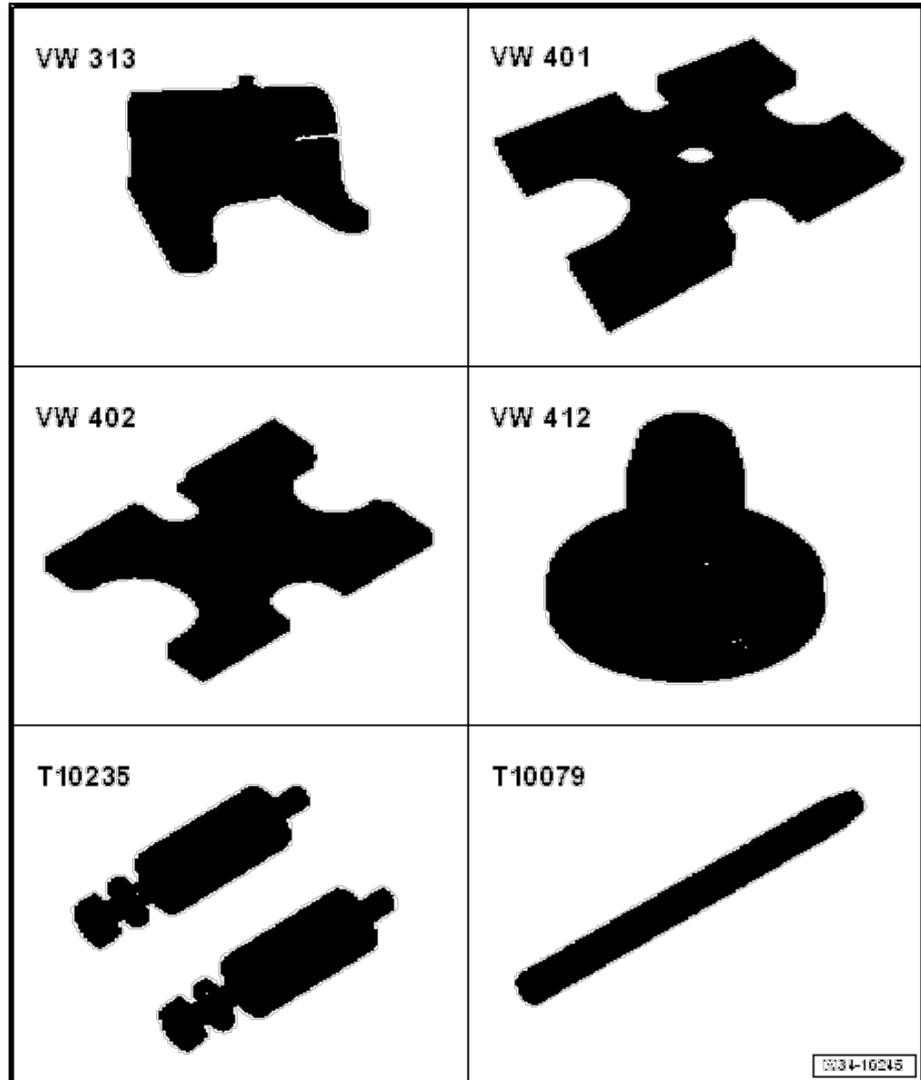


5.6 Gearbox: disassembly and assembly

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

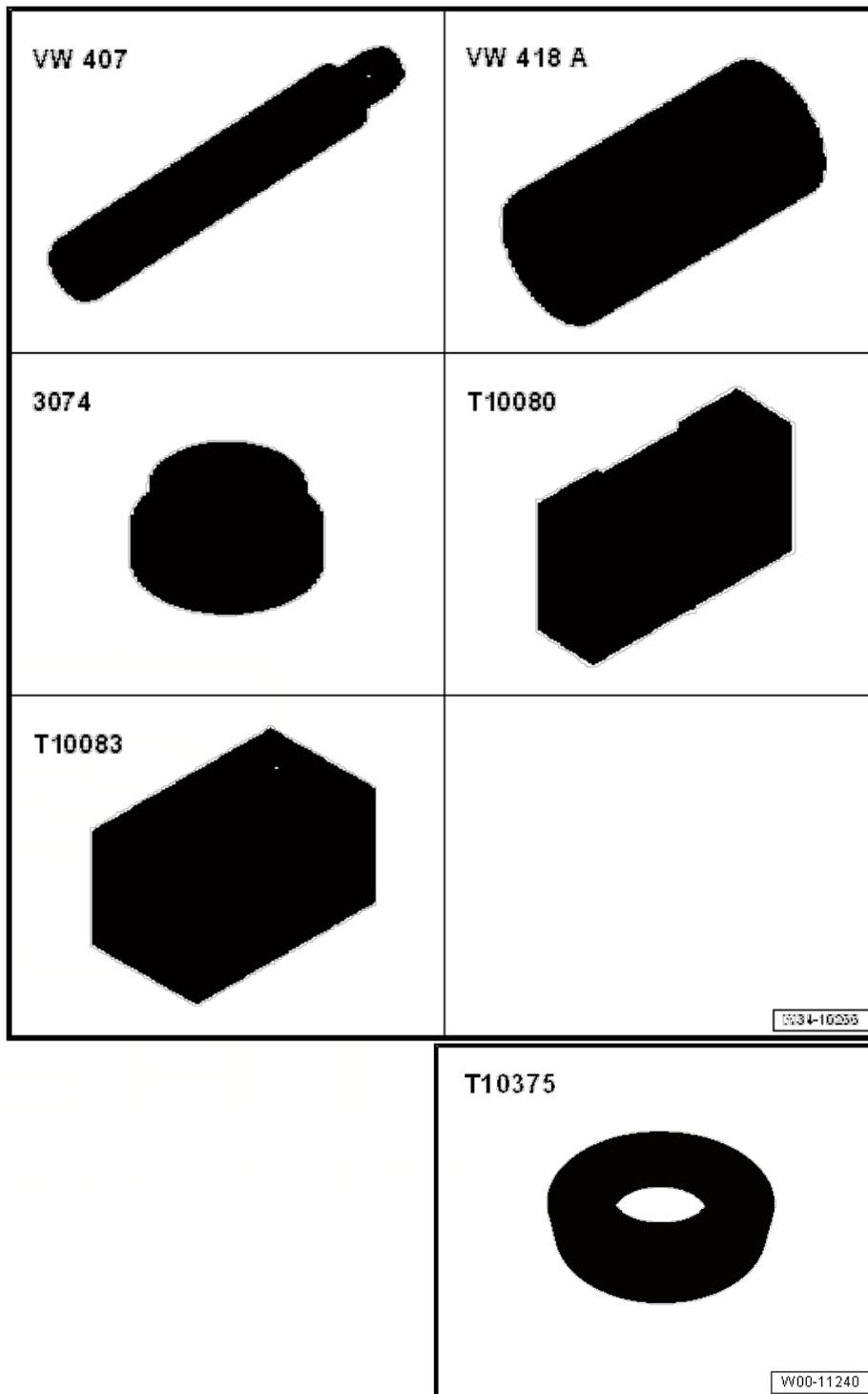
Special tools and workshop equipment required

- ◆ Clamping frame - VW 313-
- ◆ Tightening plate - VW 401-
- ◆ Tightening plate - VW 402-
- ◆ Die - VW 412-
- ◆ Adapter - T10235-

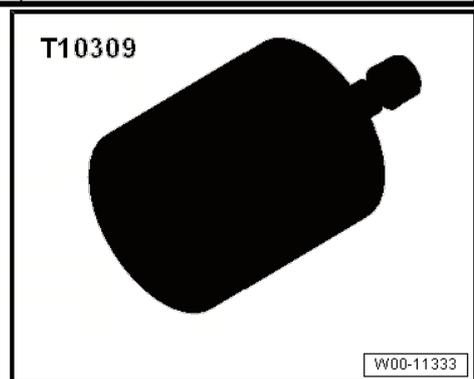
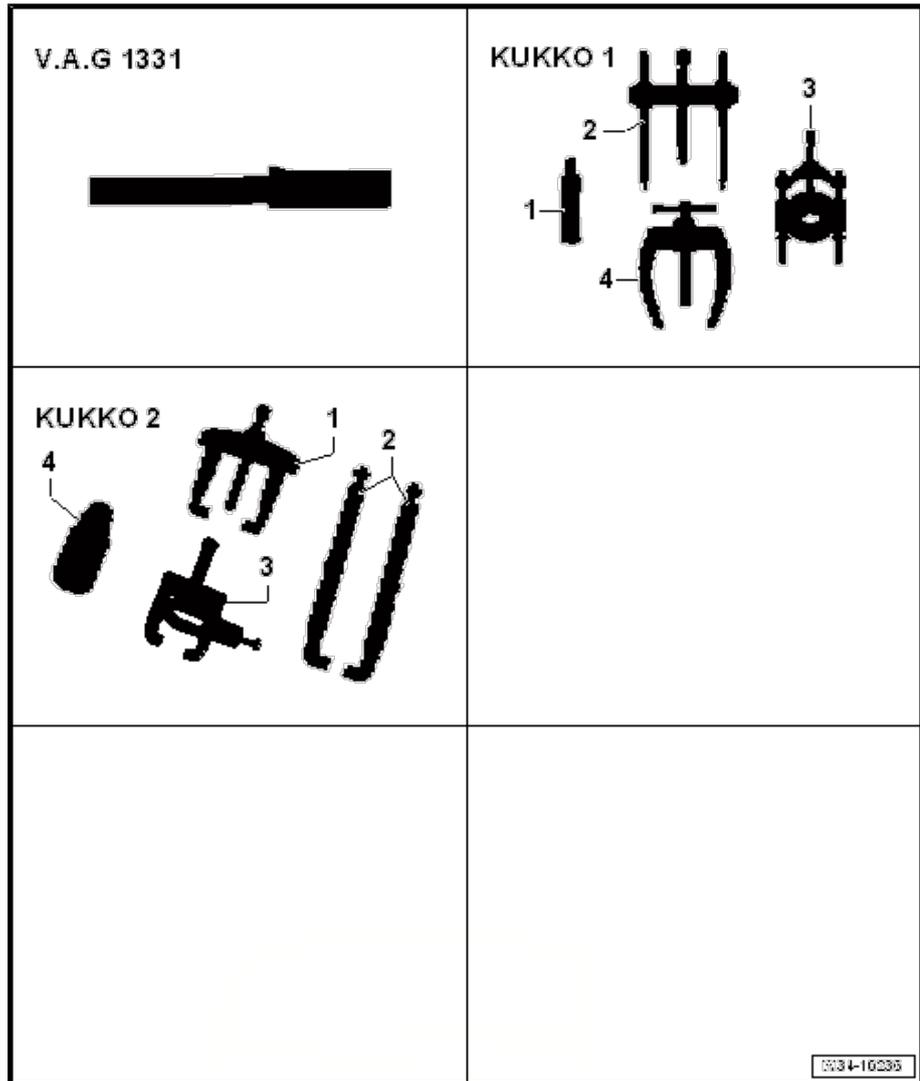


034-16245

- ◆ Die - VW 407-
- ◆ Tube element - VW 418 A-
- ◆ Thrust piece - T10080-
- ◆ Thrust block - T10083-
- ◆ Plate - T10083/1-
- ◆ Drip tray - V.A.G 1306-
- ◆ or drip tray for workshop hoist - VAS 6208-
- ◆ If 5th gear wheel was pressed off earlier
- ◆ Thrust pad - 3074-
- ◆ If 5th gear wheel was not pressed off earlier
- ◆ Thrust pad - T10375-



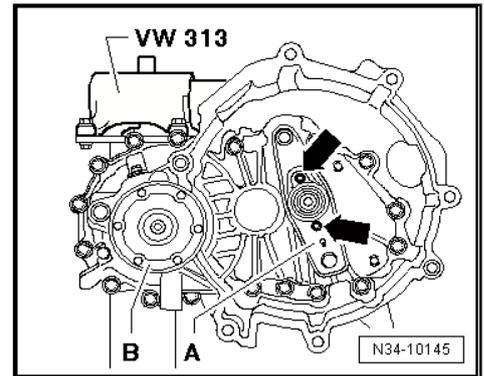
- ◆ Torque wrench - V.A.G 1331-
- ◆ -1- Three arm puller - Kukko 30/1-
- ◆ -3- Two-arm puller - Kukko 204/2-
- ◆ Hexagon socket head bolts M8 x 15
- ◆ Puller - T10309-
- ◆ Half sleeve - T10309/4-
- ◆ If pulling off is not possible using half-sleeve mentioned above, use
- ◆ Half sleeve - T10309/4A-
- ◆ Adapter - T10309/5-
- ◆ Sealant
- ◆ Allocation ⇒ Electronic parts catalogue (ETKA)



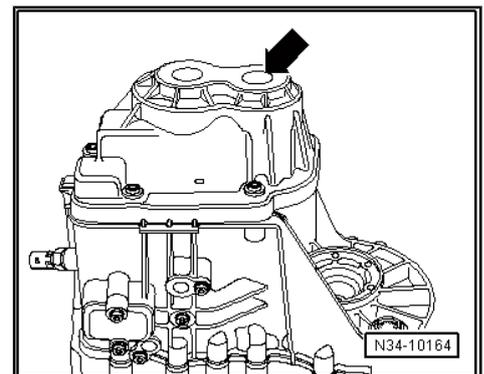
Gearbox disassembly

- Secure gearbox to engine and gearbox support
- Place the collecting tray below the gearbox.
- Drain gear oil.

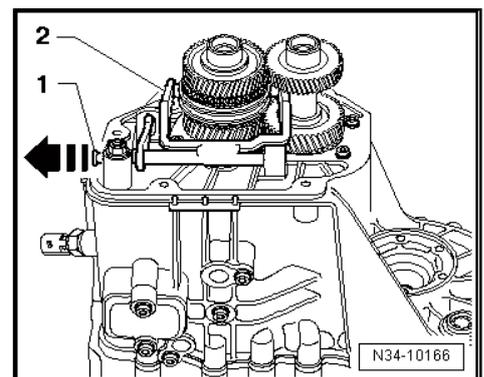
- Remove clutch release lever -A- with clutch release collar and guide sleeve -arrows-.
- Remove right flange shaft securing bolt -B-.
- Screw 2 bolts into flange and counterhold flange shaft using a lever.
- Remove the flanged shaft with the compression spring, thrust washer and conic ring.



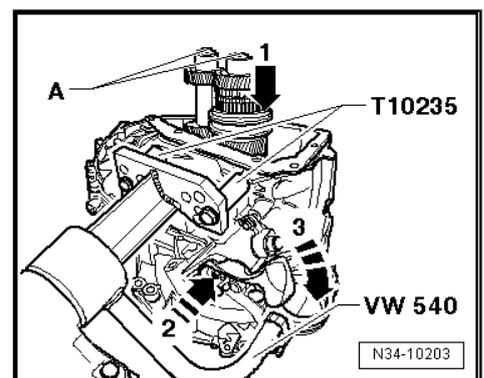
- Unscrew the gearbox casing cover -arrow- and remove with care.



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



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



i Note

- ◆ If the shafts are not being renewed, clean residual locking compound out of tapped holes using a thread tap.
- ◆ Pull off gear wheel for 6th gear with three arm puller - Kukko 30/1- .
- ◆ If necessary, gear wheel for 6th gear can be pulled off to stop on spindle with two arm puller - Kukko 204/2- . Then pull off further with three arm puller - Kukko 30/1- .

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

A - Three-arm puller - Kukko 30/1-

B - Hexagon socket head bolt - M8 x 15-

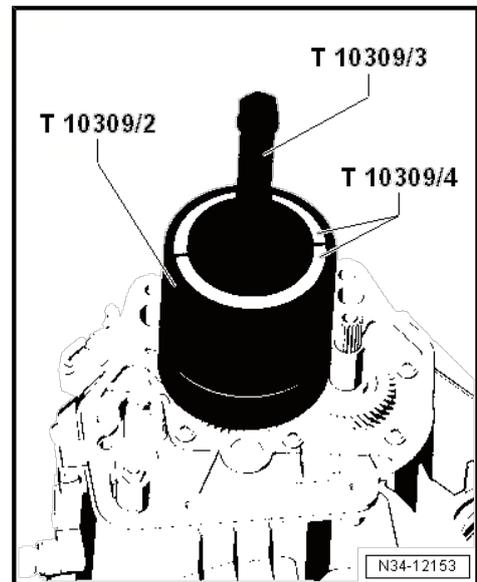
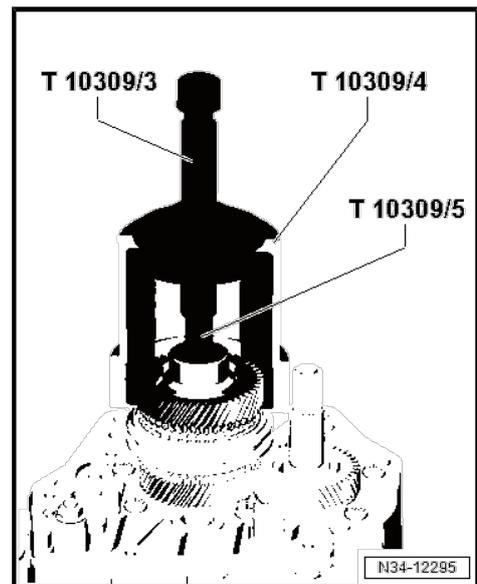
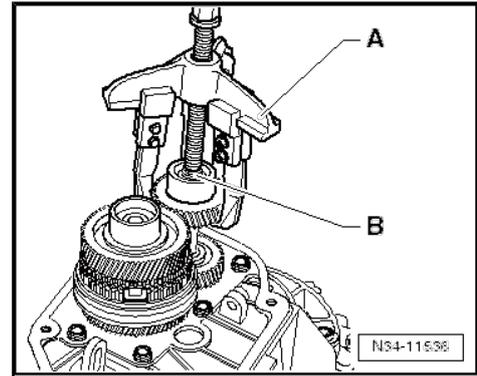
Adhere to the sequence for pulling off the following components:

- Synchronmeshed gear for 6th gear: pull off together with inner race of cylindrical roller bearing for input shaft.
- Synchro-hub for 5th and 6th gear: pull off together with inner race for 6th gear needle bearing.

Use puller - T10309- .

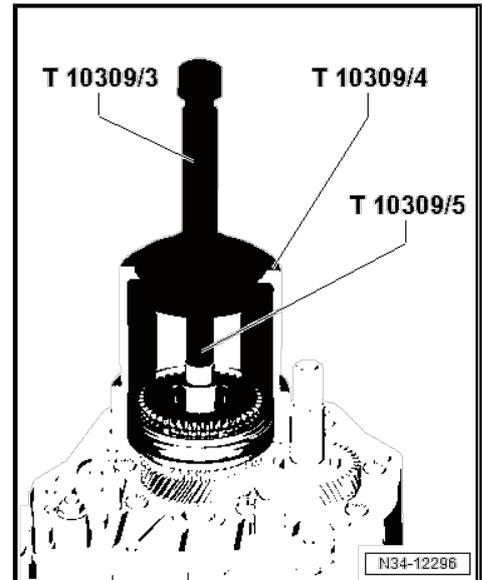
Pull off synchronmeshed gear for 6th gear together with inner race of cylindrical roller bearing for input shaft.

- First insert one of the half sleeves - T10309/4- or - T10309/4A- .
 - The half sleeve must be positioned beneath the synchronmeshed gear for 6th gear.
 - If necessary, half sleeve must be pressed to end position.
 - Attach adapter - T10309/5- .
 - Place the thread insert - T10309/3- into the half shell and lightly brace.
-
- Then fit the second half sleeve - T10309/4- or - T10309/4A- and plate tube - T10309/2- on assembly.



Then, pull off synchro-hub for 5th and 6th gear together with inner race for needle bearing for 6th gear synchromeshed gear.

- First insert one of the half sleeves - T10309/4- or - T10309/4A- .
- Half sleeve must be positioned beneath synchro-ring.
- If necessary, half sleeve must be pressed to end position.
- Position adapter - T10309/5- .
- Place the thread insert - T10309/3- into the half shell and lightly brace.

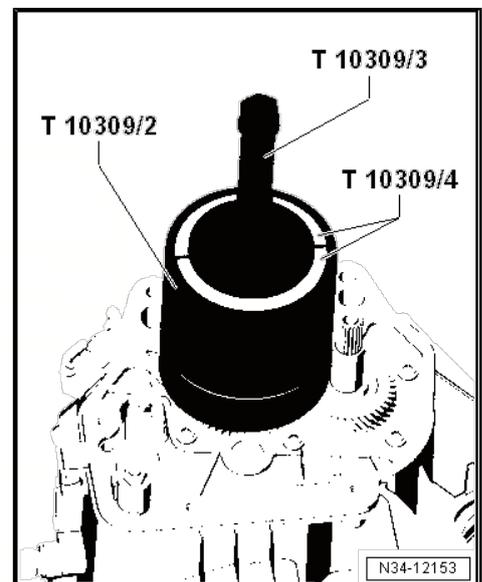


- Then fit the second half sleeve - T10309/4- or - T10309/4A- and plate tube - T10309/2- on assembly.

i Note

Once it has been removed, the synchromesh ring for 5th gear must always be renewed.

- Remove selector gear for 5th gear.



- Remove the securing bolt of the flange shaft -1-. To do this, screw 2 bolts into flange and counterhold flange shaft with an assembly lever.
- Remove flanged shaft together with compression spring.
- Remove sleeve -2- and needle bearing -4-.
- Unscrew the hexagonal nut with the collar -5- from the gear operation mechanism (to secure the reverse gear).
- Remove bearing mounting securing bolts -6- from input and output shafts.

Gear wheel for 5th gear can be removed by hand

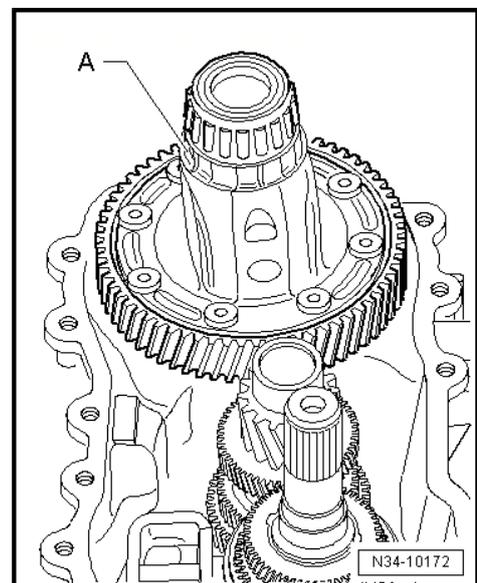
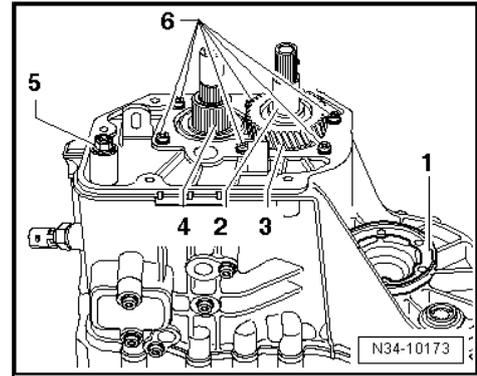
- Remove gear wheel for 5th gear -3-.

Gear wheel for 5th gear cannot be removed by hand

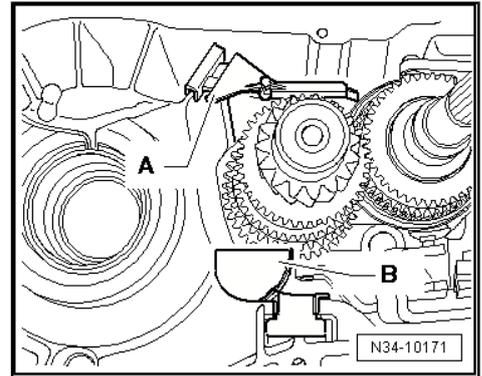
- The gear wheel for 5th gear -3- will be pressed off later when the bearing support for the deep groove ball bearing
- Turn gearbox in support bracket so that clutch housing is upwards.

Continued for all vehicles

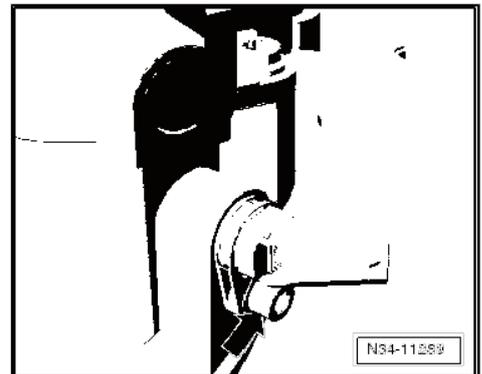
- Remove securing bolts from clutch housing side for securing clutch housing to gearbox housing.
- Remove clutch housing, if necessary carefully levering up all around along protruding housing flange and alternating between sides, being careful not to damage sealing surfaces.
- Do not cant the clutch housing. This prevents damage to roller bearings and their bearing seats on the input and output shafts.
- Remove differential -A- from gearbox housing.



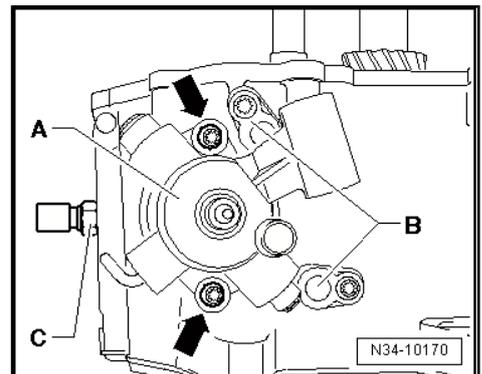
- Then remove oil collector -A- and oil guide -B- with magnet from gearbox housing.



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



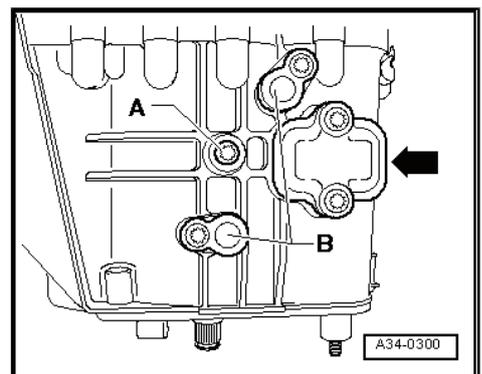
- Remove selector shaft with shaft cover -A-. To do so, the selector shaft must be brought into the gearbox neutral position. Then remove the bolts -arrows- and take the selector shaft out of the gearbox casing.
- Remove pivot pins -B- located on underside of gearbox.
- Unscrew reverse light switch - F4- -C-.



- Remove bolt -A- for securing reverse gear wheel shaft.
- Remove pivot pins -B- located on bottom of gearbox.

i Note

Do not remove the cover -arrows- to remove the gearbox.



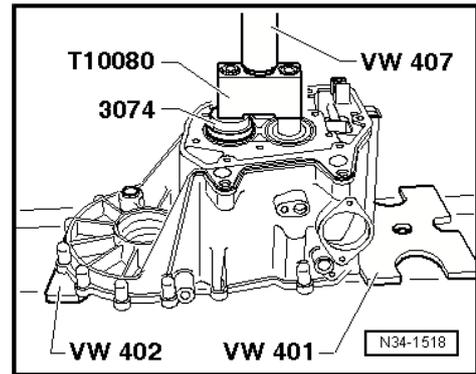
Gear wheel for 5th gear could be removed by hand

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



Note

- ◆ Position gearbox housing so that dowel sleeves in the gearbox will not be damaged.
- ◆ When pressing out, get help from second mechanic to ensure components do not fall out.



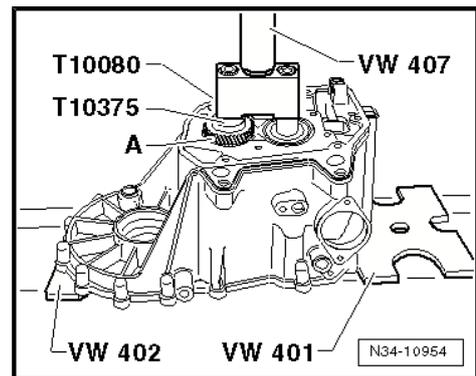
Gear wheel for 5th gear could not be removed by hand

- Press out input shaft, output shaft with gear wheel for 5th gear -A-, bearing mounting, selector mechanism (selector forks) and reverse gear together.



Note

- ◆ Position gearbox housing so that dowel sleeves in the gearbox will not be damaged.
- ◆ When pressing out, get help from second mechanic to ensure components do not fall out.



- Press input and output shafts with deep groove ball bearing and, as appropriate, gear wheel for 5th gear off bearing mounting.

Assembling gearbox

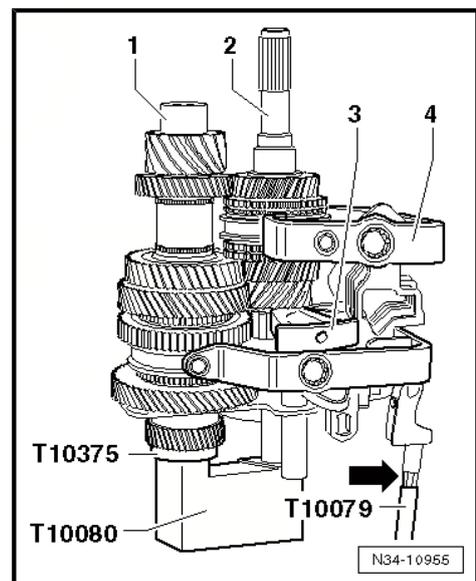


Note

- ◆ If bearing mounting with deep groove ball bearing was removed, press onto input shaft and output shaft
- ◆ If needle roller bearing sleeve for synchromeshed gear for 5th gear was removed, press onto input shaft

If 5th gear wheel was not pressed off earlier

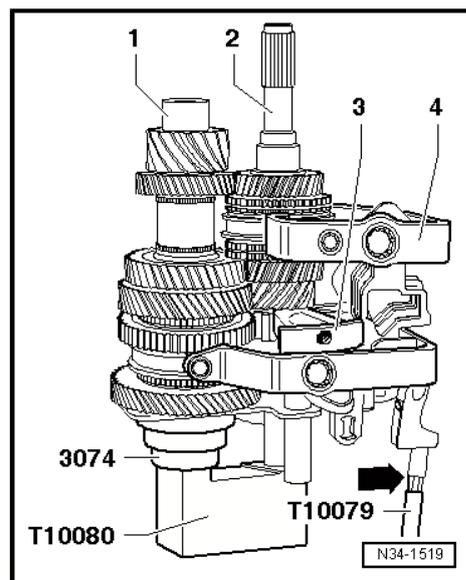
- Place the assembled components of drive shaft -2- and output shaft -1- with bearing mounting/grooved ball bearing in the thrust block - T10080- .
- Insert selector mechanism (selector forks) -4- in the shaft locking collars.
- Install reverse gear shaft -3- with reverse gear.



- Screw guide pin - T10079- onto stud (secures reverse gear) -arrow-.

If 5th gear wheel was pressed off earlier

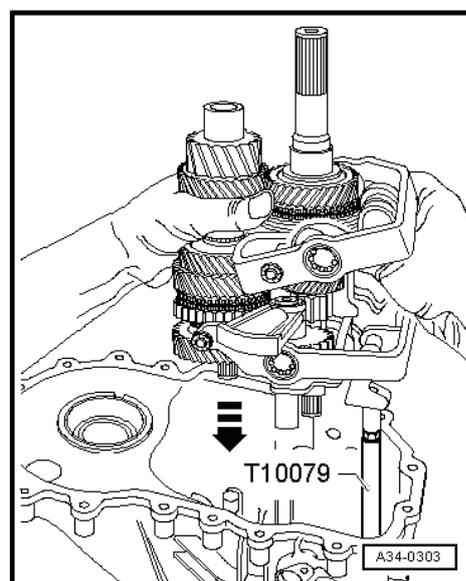
- Place the assembled components of drive shaft -2- and output shaft -1- with bearing mounting/grooved ball bearing in the thrust block - T10080- .
- Insert selector mechanism (selector forks) -4- in the shaft locking collars.
- Install reverse gear shaft -3- with reverse gear.
- Screw guide pin - T10079- onto stud (secures reverse gear) -arrow-.



Continued for all vehicles

- Insert components together in gearbox housing. To do this, guide guide pin - T10079- through hole for attachment of selector mechanism in gearbox housing.
- Unscrew the guide pin - T10079- .

Before adapting, the following must be checked.

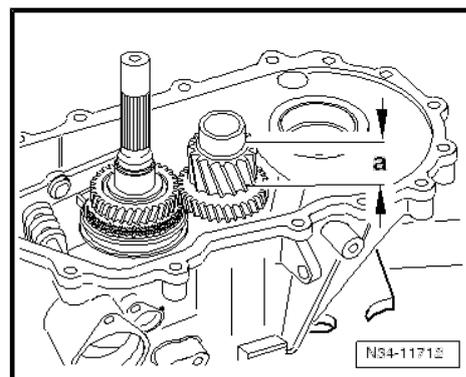


- ◆ Selector forks engage correctly in locking collars.
- ◆ Dimension -a- of the input shaft splines.



Note

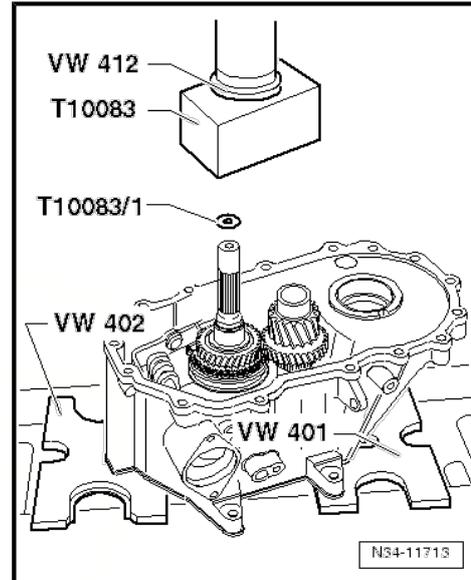
- ◆ *The input shafts of the different gearboxes have different lengths as dimension -a- is different.*
- ◆ *A shim - T10083/1- (3 mm thick) may have to be fitted on the input shaft to ensure that the input shaft and the output shaft are always pressed in evenly.*
- ◆ *For this person, dimension -a- of the secondary shaft splines has to be measured.*



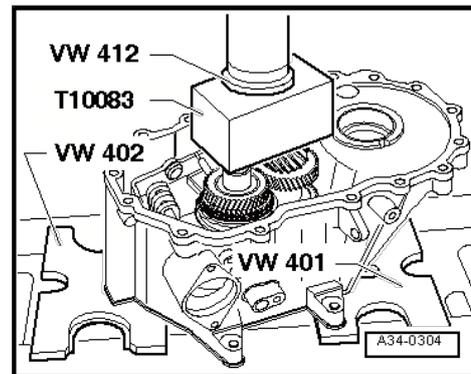
Measurement -a- =30.6 mm.

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

Place shim - T10083/1- onto input shaft and carefully press in bearing mounting together with input shaft and output shaft to stop



Carefully press in bearing mounting together with input shaft and output shaft to stop.

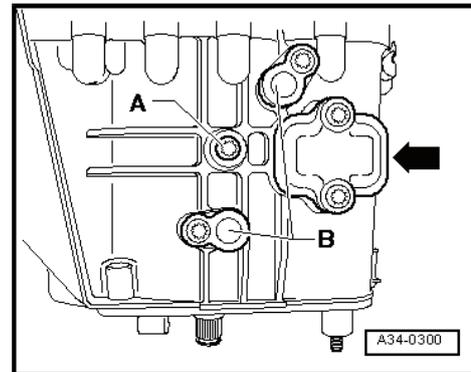


- Install bolt -A- for securing reverse gear wheel shaft.
- Install pivot pin -B- in bottom of gearbox.

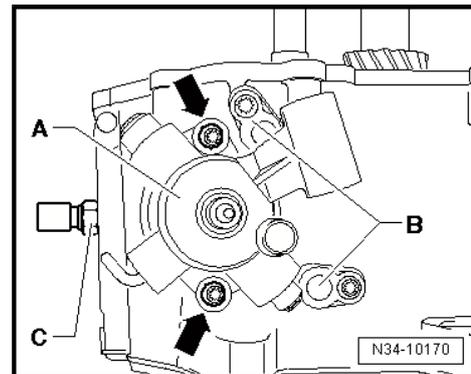


Note

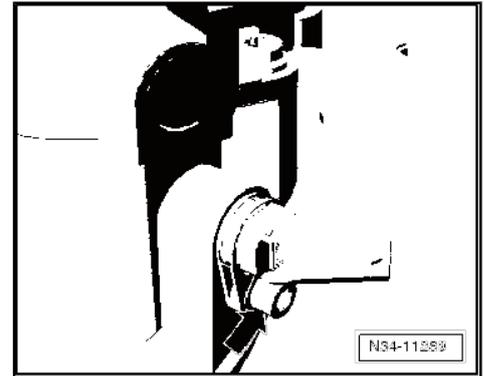
Sealing cover -arrow- is installed.



- Install pivot pin -B- in top of gearbox.
- Move selector plates and selector shaft to neutral.
- Apply sealant evenly to sealing surface of selector mechanism cover.
- Install selector shaft with selector cover -A-. Then tighten the bolts -arrows-.
- Screw in reversing light switch - F4- -A-



- Gearbox for vehicles with start/stop system: insert gearbox neutral position sender - G701- -arrow- and tighten securing bolt

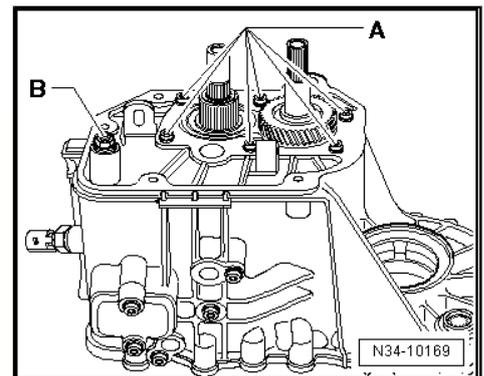


- Using new bolts -A-, tighten bearing mounting for input and output shafts.

i Note

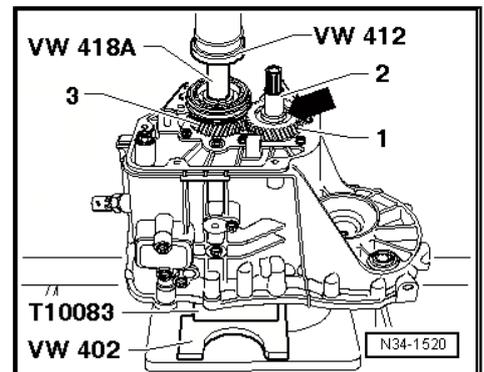
Tighten bolts alternately and diagonally, working from centre outwards.

- Tighten hexagon flange nut -B- for selector mechanism (selector forks).
- Insert input and output shafts together with gearbox housing into thrust block - T10083- .



Fitting position for pressing on gear wheel for 5th gear and 6th gear synchro-hub and locking collar

The high shoulder -arrow- faces gearbox housing cover.

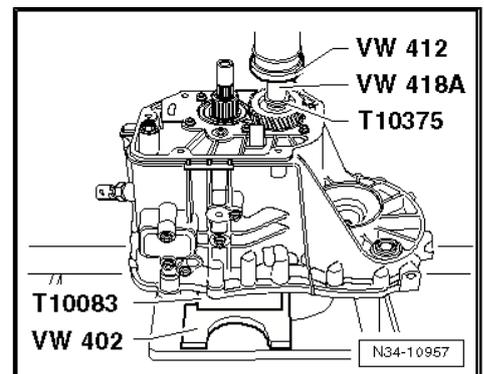


If 5th gear wheel was pressed off earlier

- Pressing on 5th gear wheel
- Set sleeve on gear wheel for 5th gear item -2-.

Continued for all vehicles

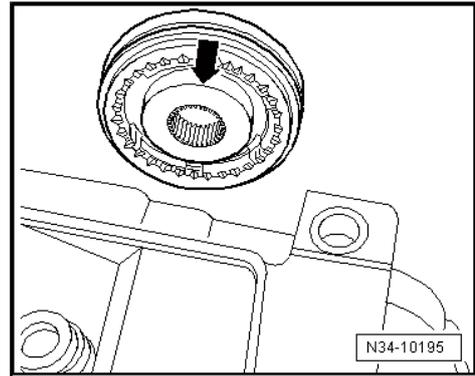
- Fit the mobile 5th gear pinion -3- with the needle bearing.
- Fit the 5th gear synchromesh ring on the mobile pinion



Installation position of 5th/6th gear synchronising hub/locking collar

The high shoulder -arrow- faces 5th gear and gearbox housing.

- Press on synchro-hub and locking collar for 5th and 6th gear



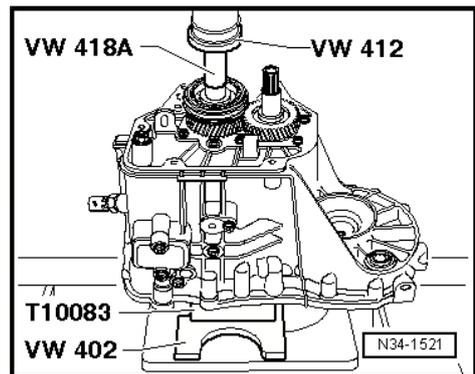
- Heat the inner ring of the needle bearing of 6th gear to a maximum of 100 °C and fit.



WARNING

Use protective gloves!

- Install synchromeshed gear for 6th gear with needle bearing and synchro-ring.



- Fit the thrust ring -A- on top.



Note

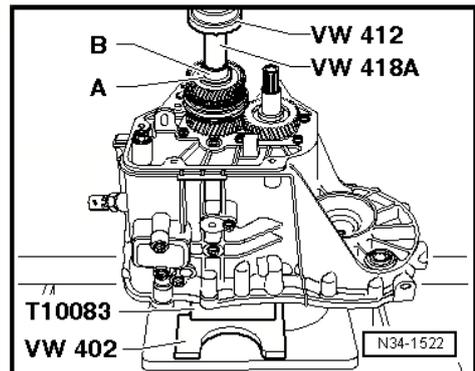
- ◆ Do not interchange inner races of cylindrical roller bearings of input and output shafts.
- ◆ For some gearboxes, the thrust washer -A- and the inner race for the cylindrical bearing -B- are combined in one component.
- They can be pressed on together only.



WARNING

Use protective gloves!

- Heat the roller bearing inner ring -B- to approx. 100 °C, and fit it onto the input shaft.



Installation position of 6th gear wheel:

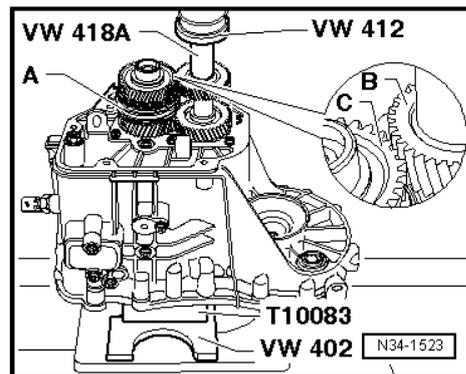
High collar faces sleeve.

- Set locking collar -A- for 5th/6th gear to neutral position to allow 6th speed selector gear to turn while pressing on 6th gear wheel.

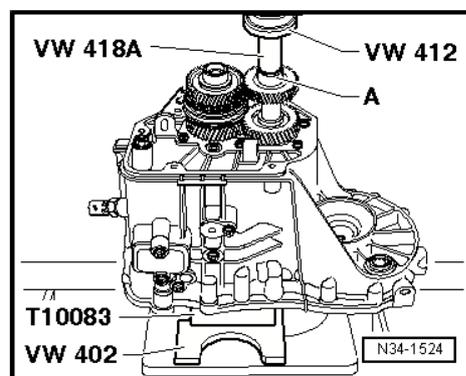


WARNING
Use protective gloves!

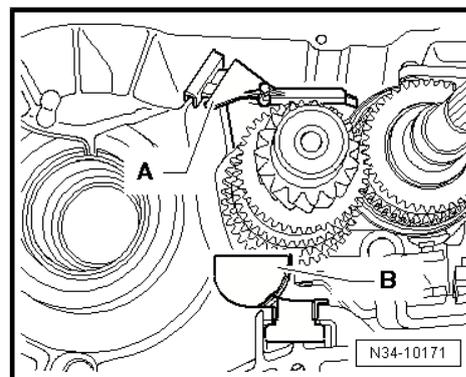
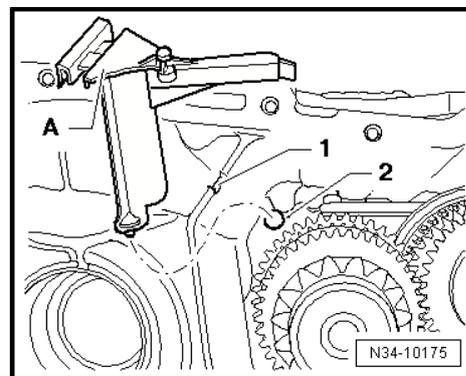
- Heat gear wheel for 6th gear to maximum 100° C.
- Pressing on gear wheel for 6th gear When doing this, ensure that teeth of gear wheel -B- for 6th gear and those of synchro-meshed gear -C- for 6th gear mesh properly.
- Heat the roller bearing inner ring -A- to approx. 100 °C, and fit it onto the lay shaft.



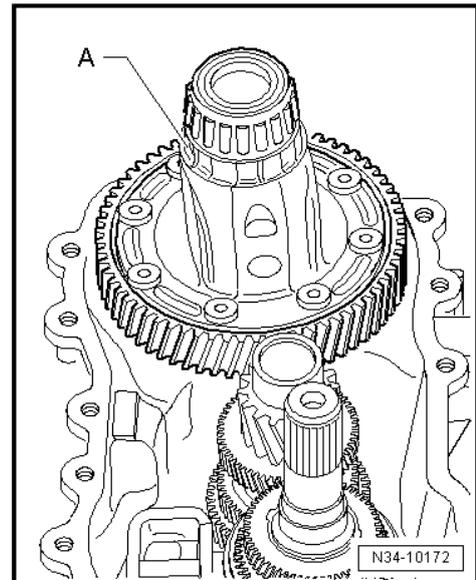
- Next, place the oil collector -A- in the recess -1- and in the drill hole -2- of the gearbox casing.



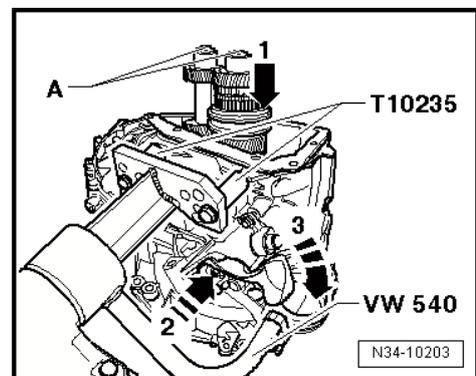
- Mount the oil guide -B- on the gearbox casing.
- Place the magnet on the oil guide -B-.



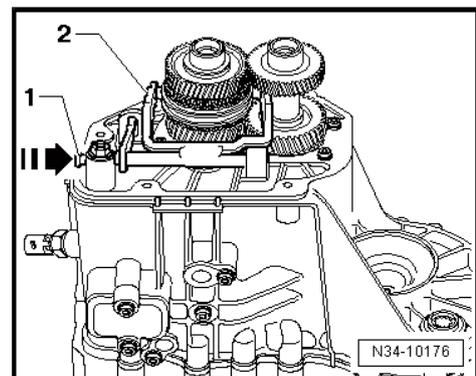
- Install differential -A-.
- Apply sealant evenly to sealing surface.
- Secure clutch housing to gearbox housing.
- Turn gearbox in support bracket so that gearbox housing is upwards.



- Before tightening the fastening bolts -A- 2 gears should be engaged -arrow 1- to -arrow 3-.



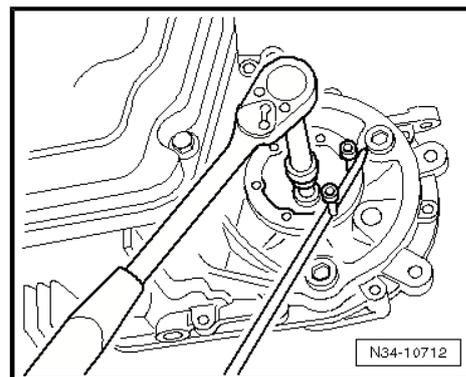
- Insert the 5th / 6th gear selector fork -2- and slide the pivot pin -1- in onto stop in direction of -arrow-.
- Apply sealant - AMV 188 200 03- evenly to sealing surface.
- Tighten gearbox housing cover.



- Fit the two flanged shafts with the pressure springs, the thrust washers and the conical rings.
- Install clutch release lever together with release bearing and guide sleeve

Specified torques

- ◆
- ◆ Gearbox housing to clutch housing
- ◆ Gearbox housing cover
- ◆ Flange shaft to gearbox (countersunk bolt)



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

1 - Gearbox housing

- Repairing

2 - Gear wheel for 5th gear

- Installation position
- Must be pressed off and pressed on in gearboxes for the 1.4 l engine

3 - Collar

4 - 6th gear pinion

- Installation position

5 - Tapered roller bearing inner race

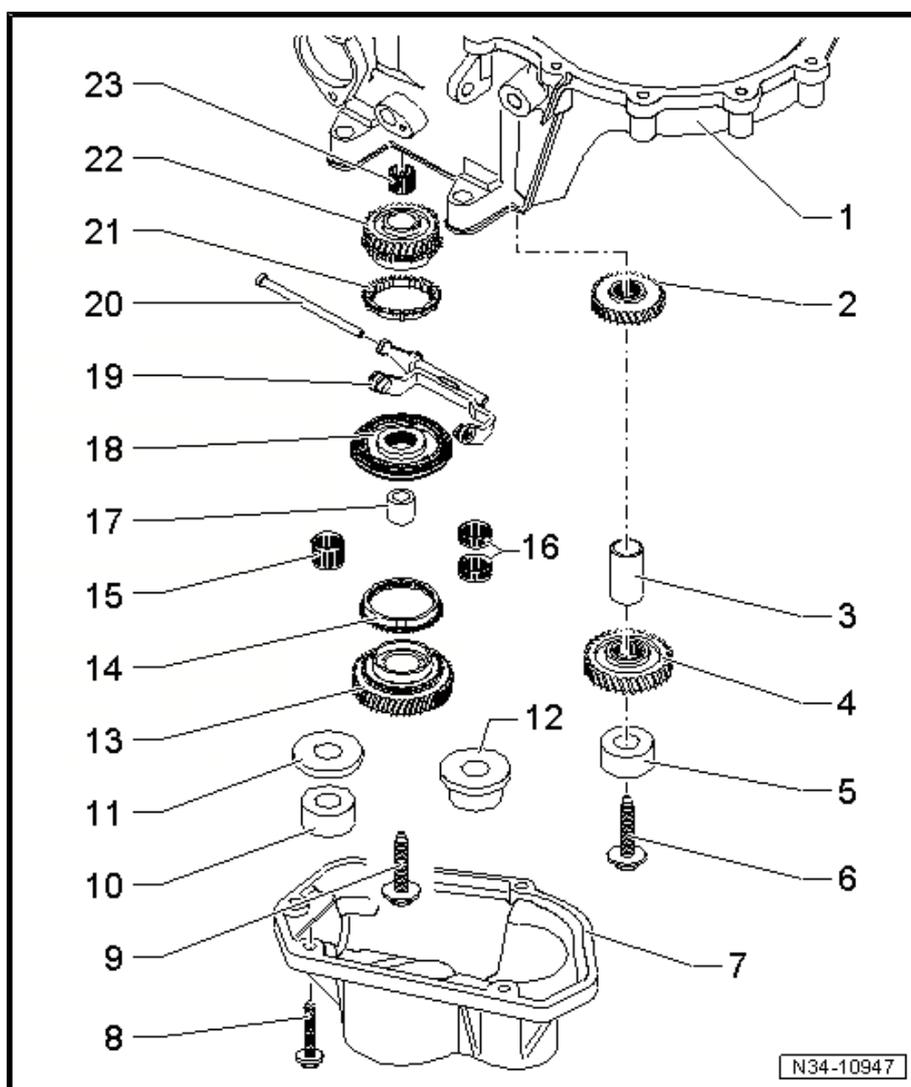
- From the output shaft
- Mark before removing
- Do not confuse with the inner ring of the input shaft roller bearing socket

6 - Bolt.

- For output shaft
- Self-locking
- Must be renewed if removed
- M8 = 30 Nm then turn 90° further
- M10 = 75 Nm then turn 45° further

7 - Gearbox casing cover

- With cylinder roller bearings for drive shaft 1 and for drive shaft 2
- Repairing



8 - Bolt.

- Must be renewed if removed
- Tighten with 5 Nm + 90°

9 - Bolt.

- For the input shaft
- Self-locking
- Must be renewed if removed
- M8 = 30 Nm then turn 90° further
- M10 = 75 Nm then turn 45° further

10 - Tapered roller bearing inner race

- For the input shaft
- Mark before removing
- Do not confuse with the inner ring of the secondary shaft roller bearing socket

11 - Attack washer

12 - Inner race for cylindrical roller bearing with thrust washer

- For the input shaft
- Installed in some gearboxes
- Allocation ⇒ Electronic parts catalogue (ETKA)

13 - Synchroneshed gear for 6th gear

14 - 6th gear synchro-ring

15 - Needle roller bearing

- One-piece
- for 6th gear
- Allocation ⇒ Electronic parts catalogue (ETKA)
- Replace together with sleeve.

16 - Needle roller bearing

- Two-part
- for 6th gear
- Installed in some gearboxes
- Allocation ⇒ Electronic parts catalogue (ETKA)
- Replace together with sleeve.

17 - Collar

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

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

- Dismantling and assembling

19 - Selector fork for 5th / 6th gears

20 - Pivot pin

- For 5th gear selector fork.

21 - Synchronesh ring of 5th gear

- This will be damaged when the input shaft is removed
- Must be renewed if removed

22 - Synchroneshed gear for 5th gear

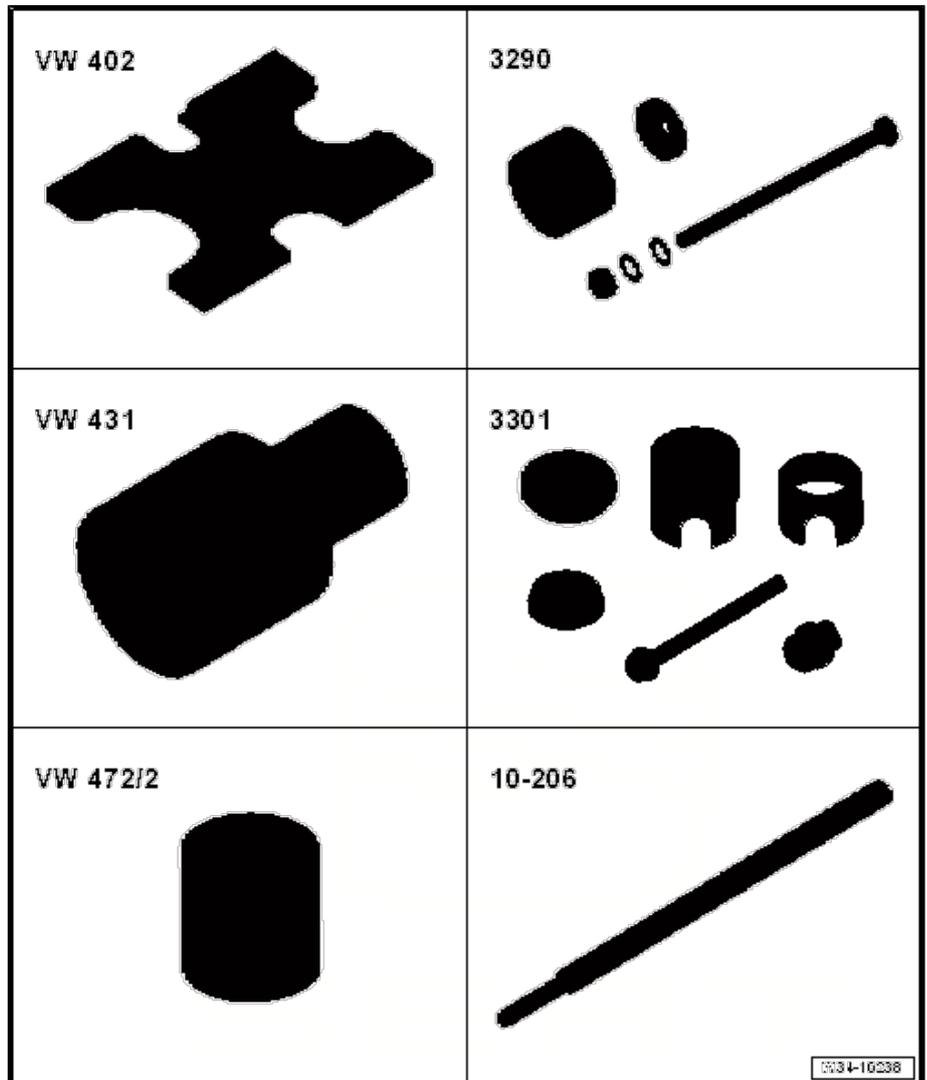
23 - Needle roller bearing

- For 5th gear

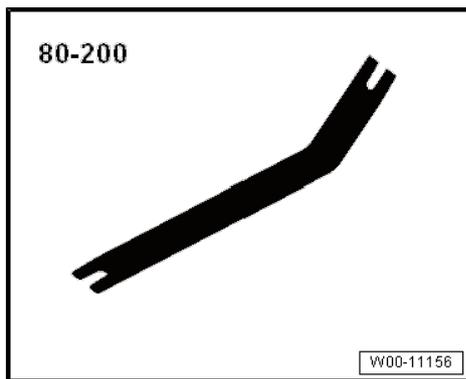
5.8 Repair selector forks

Special tools and workshop equipment required

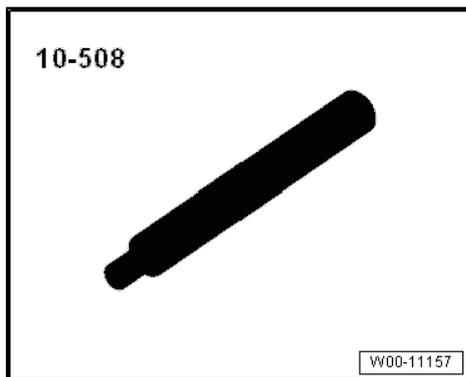
- ◆ Tightening plate - VW 402-
- ◆ Thrust piece - 3290/1-
- ◆ assembly tool - 3301-
- ◆ Thrust piece - VW 431-
- ◆ Separation cap - VW 472/2-
- ◆ Assembly mandrel - 10 - 206-



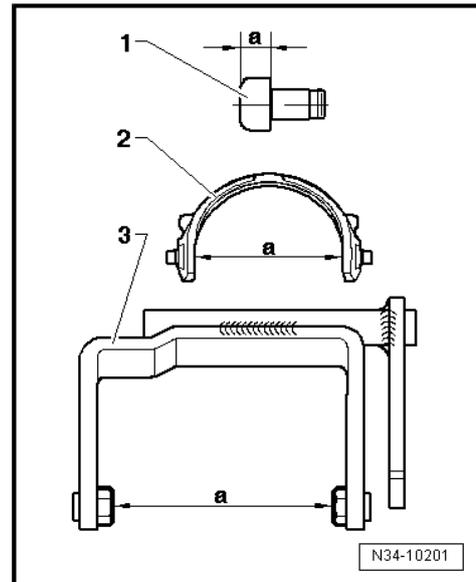
- ◆ Pressing-off lever - 80-200-



- ◆ Assembly Mandrill - 10-508-



- ◆ Tensioning tool - 2070-



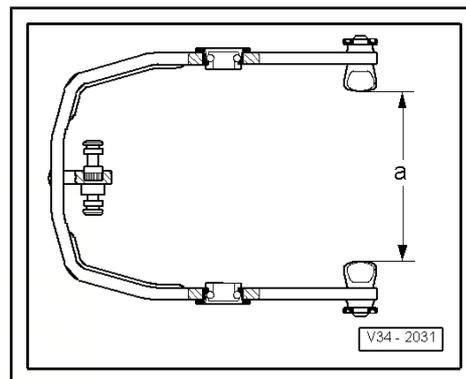
Identification of selector segments and selector fork for 5th and 6th gear with selector segments

Gap -a-

- 1 - 1st/2nd gear selection group = 10.0 mm
- 2 - 3rd/4th gear selection group = 78.6 mm
- 3 - Prongs of 5th/6th gear with gear selection = 79.5 mm.

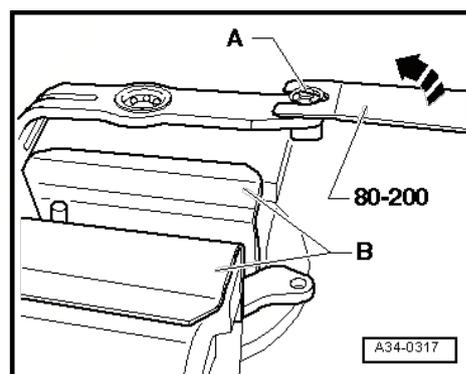
Prongs of 1st/2nd gear with gear selection

Measurement -a- =78 mm.



Remove the securing ring

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



Fit the securing ring

- Press the spring washer in the groove of the gear change with a handled socket spanner.

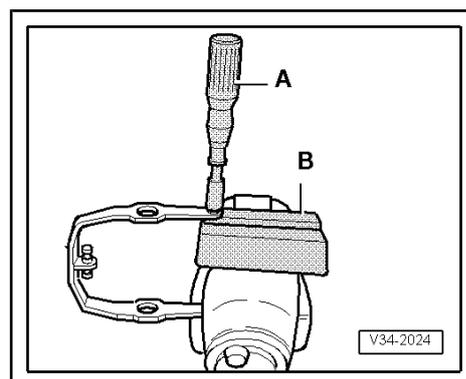


Note

The segment must rotate freely after installing the lock washer.

A - Socket spanner with handle, size 10

B - Protection gags

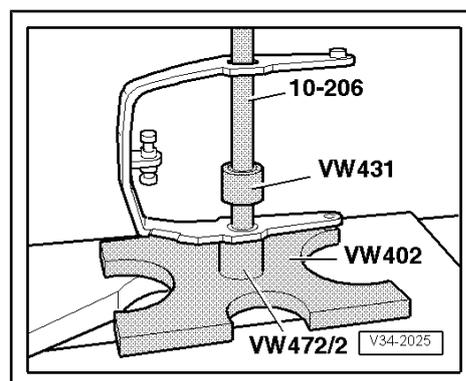


Removing angular contact ball bearing



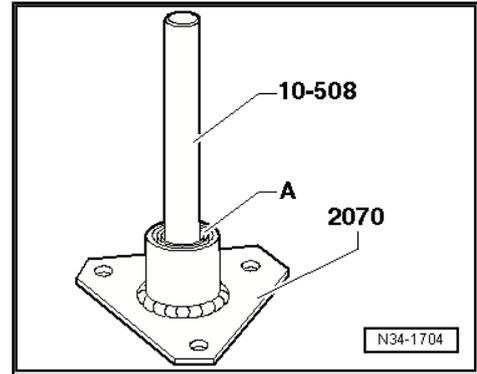
Note

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



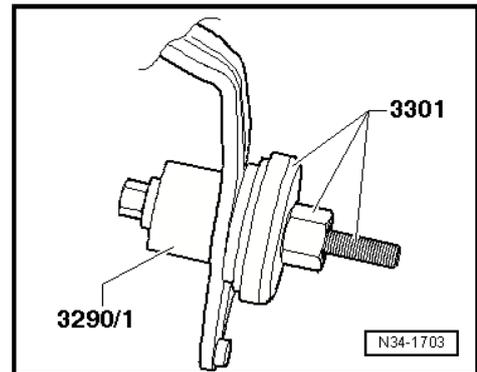
Pressing inner race -A- of angular contact ball bearing into outer race

Inner race must engage in outer race.



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

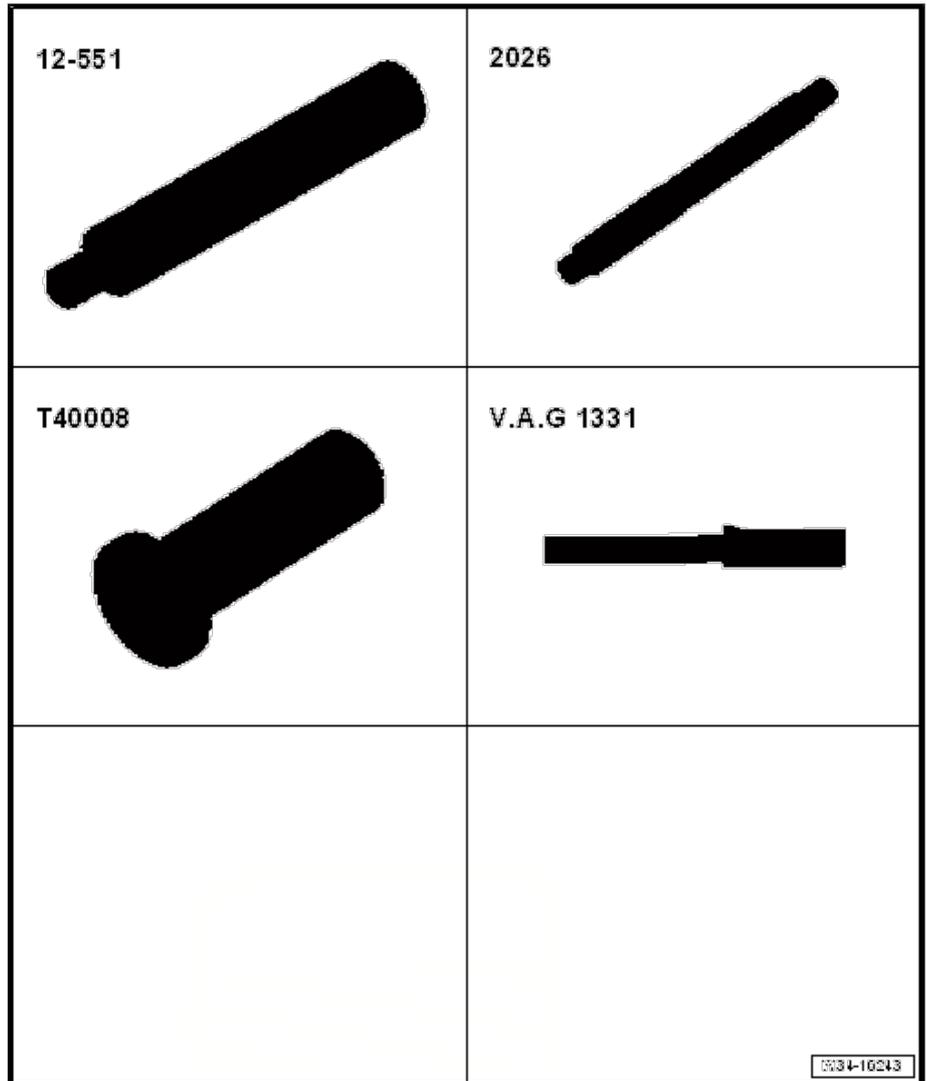
The groove on the pressure tool - 3290/1- facing towards the ball bearing



5.9 Repairing selector unit

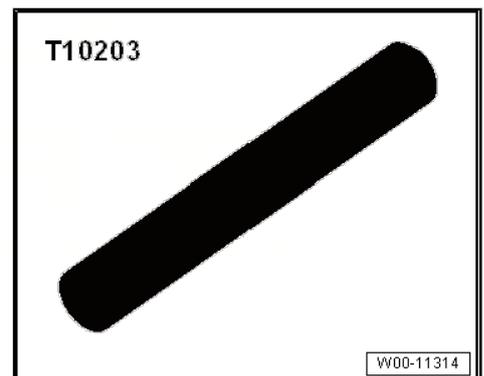
Special tools and workshop equipment required

- ◆ Centring chuck - 12-551-
- ◆ Mandrel - 2026-
- ◆ Thrust piece - T40008-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Sealant - AMV 188 200 03-



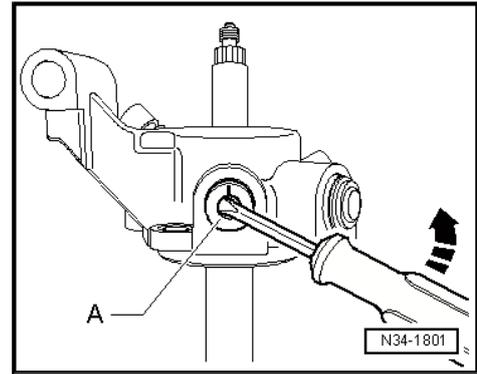
Tube - T10203-

- Remove selector mechanism



Removing angled rod -A- from selector shaft cover

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

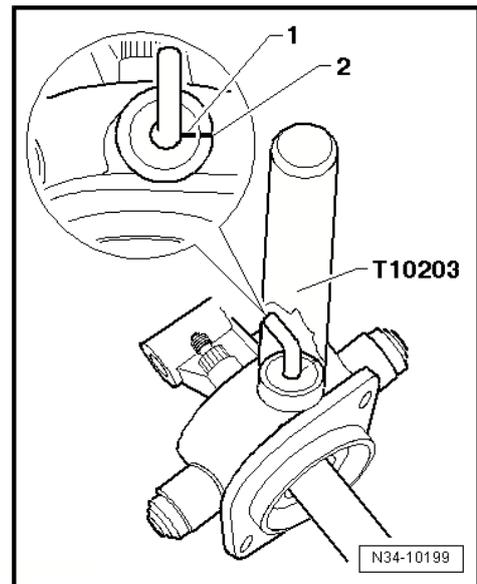


Drive angled rod -A- into selector shaft cover

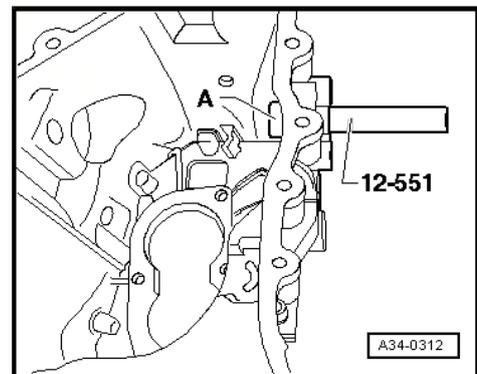
Installation position:

Marking -1- aligns with marking -2- on selector cover.

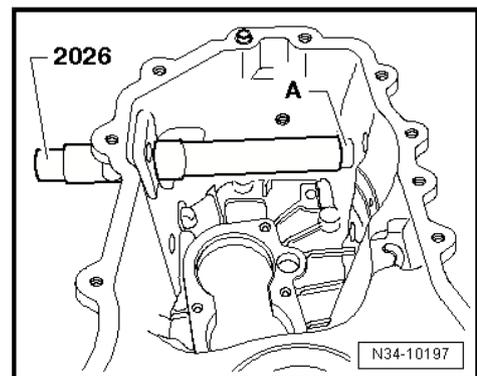
- Install selector mechanism



Driving out selector shaft sleeve -A-



Driving in selector shaft sleeve -A- to stop



6 Gearbox housing, clutch housing

6.1 Assembly overview - clutch housing

1 - Conical bolt

- Remove and install

2 - Flanged shaft with pressure spring

- Remove and install
- Assembling

3 - Bolt.

- Must be renewed if removed
- Tighten with 5 Nm + 90°

4 - Clutch housing or

- Repairing

5 - Gearbox housing

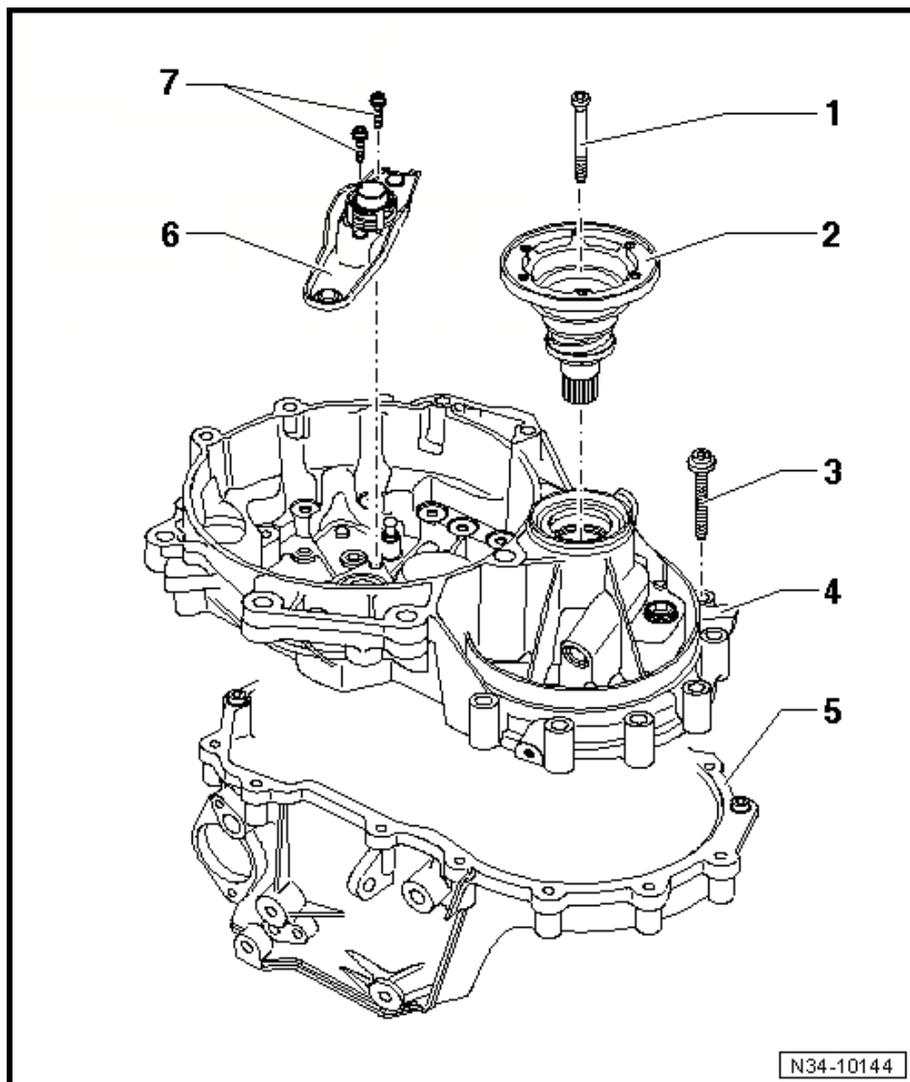
- Repairing

6 - Clutch release lever

- With guide sleeve and clutch release collar
- Remove and install

7 - Bolt.

- Must be renewed if removed
- 5Nm + 90°



6.2 Assembly overview - gearbox housing and clutch housing

1 - Clutch housing or

- If replaced, adjust the differential

2 - Input shaft oil seal:

- Replace after removal

3 - Ball head studs

- To remove and install, remove gearbox
- Remove any traces of grease
- Lubricate surface which contacts ball head stud with grease - G 000 100-
- 20 Nm

4 - Oil seal for right flange shaft

- Replace after removal

5 - Oil filler plug

- Tightening torque

6 - Shim

- for the differential gear
- Determine thickness

7 - Outer ring / conical roller bearing

- for the differential gear
- Pressing out of and into clutch housing

- If replaced, adjust the differential

8 - Bolt.

- Must be renewed if removed
- Tighten with 5 Nm + 90°

9 - Outer ring / conical roller bearing

- for the differential gear
- Pulling out of and pressing into clutch housing
- If replaced, adjust the differential

10 - Dowel sleeve

- 2 Units

11 - Gearbox housing

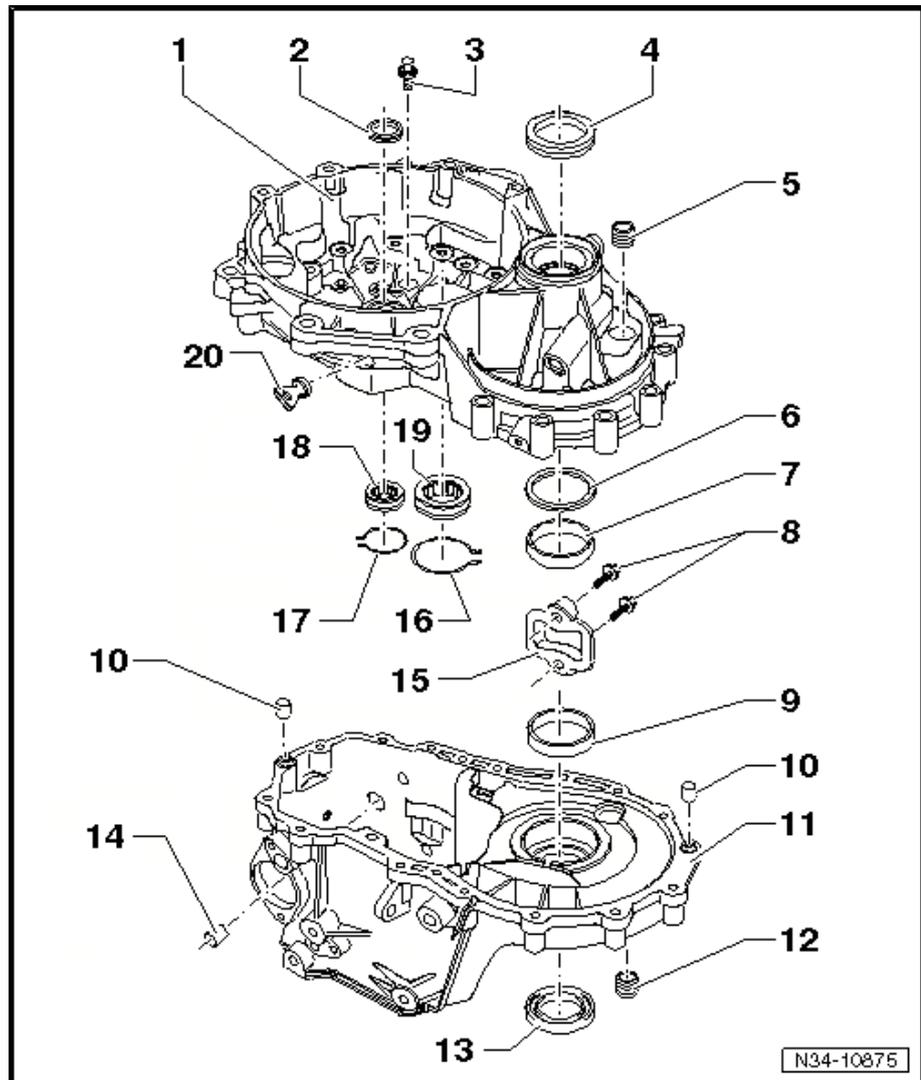
- If replaced, adjust the differential

12 - Oil drain plug

- Tightening torque

13 - Oil seal for left flange shaft

- Replace after removal



14 - Collar

- For the gear selection shaft
- Press out
- Press on

15 - Sealing cap

- Apply sealant on sealing surfaces before screwing on
- Allocation ⇒ Electronic parts catalogue (ETKA)

16 - Circlip

- Insert in groove of cylindrical roller bearing

17 - Circlip

- Insert in groove of cylindrical roller bearing

18 - Cylindrical roller bearing

- For the input shaft
- Pulling out and pressing in

19 - Cylindrical roller bearing

- From the output shaft
- Pulling out and pressing in

20 - Sealing plug

- In some gearboxes
- Insert into hole in clutch housing.

6.3 Assembly overview - gearbox housing cover

1 - Countersunk-head bolt

- Tighten diagonally, together with bearing plate
- 2 Nm

2 - Retaining plate

- For securing cylindrical roller bearing
- Installation position: depression for the screws must point to the gear housing.
- Not installed in all gearboxes; alternatively secured with bolts

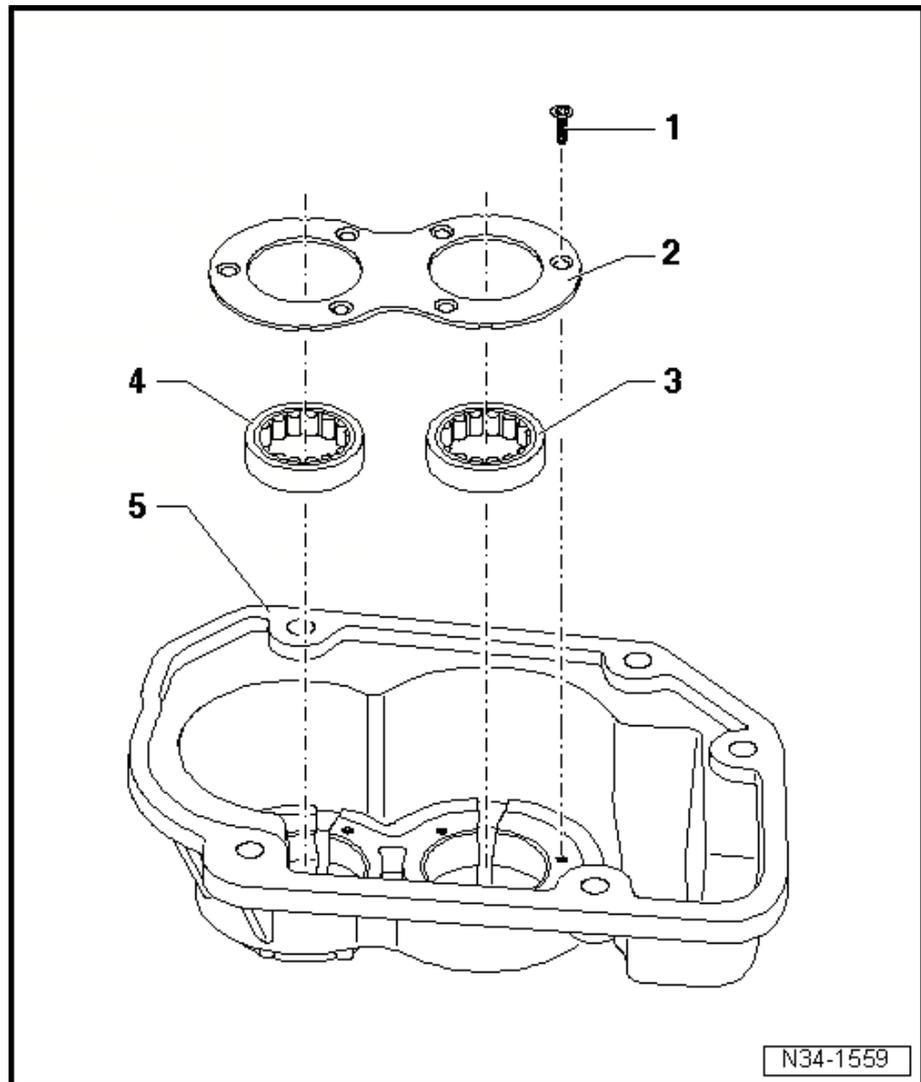
3 - Cylindrical roller bearing

- For the input shaft
- Do not interchange with roller bearing for output shaft
- Pull out
- Press on
- Various means of securing

4 - Cylindrical roller bearing

- From the output shaft
- Do not interchange with roller bearing for input shaft
- Pull out
- Press on
- Various means of securing

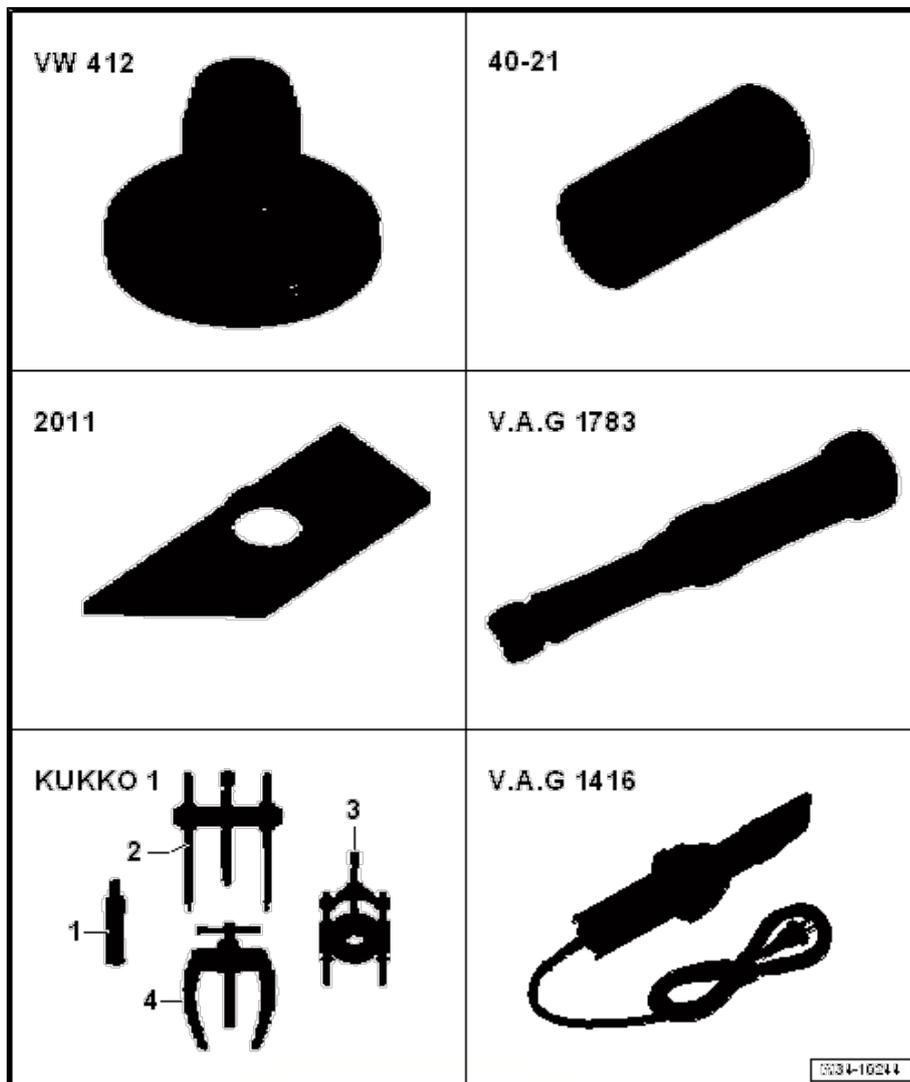
5 - Gearbox casing cover



6.4 Repairing the gearbox housing cover

Special tools and workshop equipment required

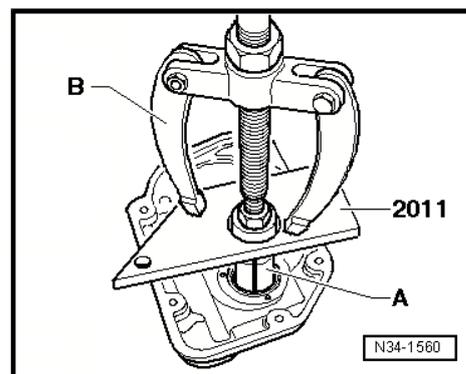
- ◆ Die - VW 412-
- ◆ Inlay socket - 40-21-
- ◆ Support bridge - 2011-
- ◆ -1- Internal puller - Kukko 21/5-
- ◆ -4- Counter support - Kukko 22/2-
- ◆ E.g. Hot air gun - V.A.G 1416- .



Pulling cylindrical roller bearing out of gearbox housing cover

A - Internal puller 28...37 mm , e.g. -Kukko 21/5-

B - Support bracket , ex. -Kukko 22/1-



Insert the roller bearing socket on the gearbox casing cover

- Heat gearbox housing cover with, for example, hot air blower - V.A.G 1416- to about 100°C in vicinity of bearing seat.
- Insert roller bearing after heating housing and push into position under workshop press until heat exchange has taken place.



Note

Roller bearings must be pressed fully home into cover. Do not try to tighten via bolts on base plate.

- Secure cylindrical roller bearing.

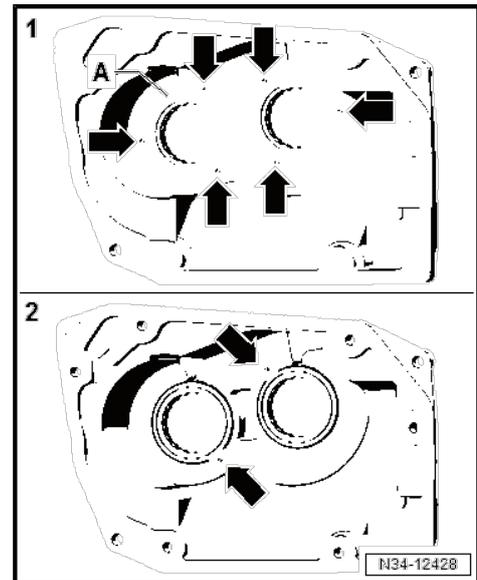
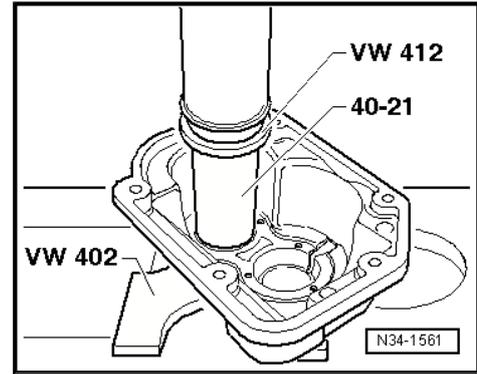
Various means of securing cylindrical roller bearing

The cover was adapted.

Staple	Threaded holes in cover
1. - Secured with bearing plate -A- and countersunk head bolts M 4 x 14 -arrows-	6
2. - Secured with countersunk head bolts M 4 x 12 -arrows-	2

Tightening torque:

- ◆ Countersunk bolt



7 Installing to engine and gearbox support

Special tools and workshop equipment required

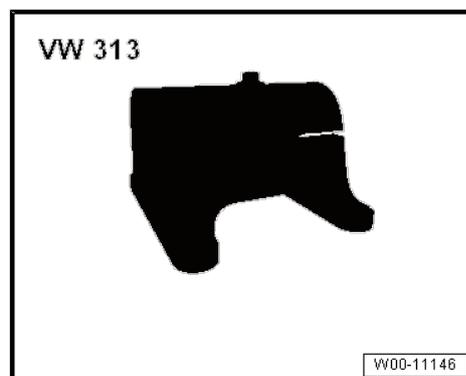
- ◆ Engine and gearbox support - VW 540-



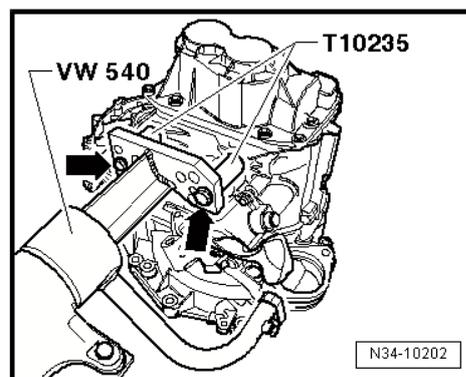
- ◆ Adapter - T10235-



- ◆ Clamping frame - VW 313-



- Secure gearbox to engine and gearbox support - VW 540-
-arrows-.

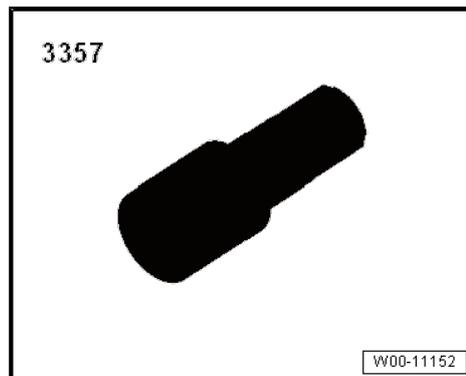


8 Gear oil

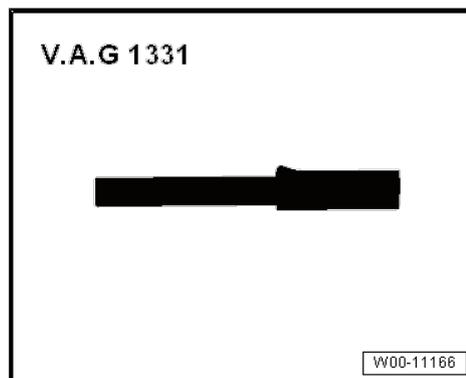
8.1 Checking gear oil level

Special tools and workshop equipment required

- ◆ Socket bit - 3357- for oil filler plug with multi-point socket head bolt



- ◆ Torque wrench - V.A.G 1331-

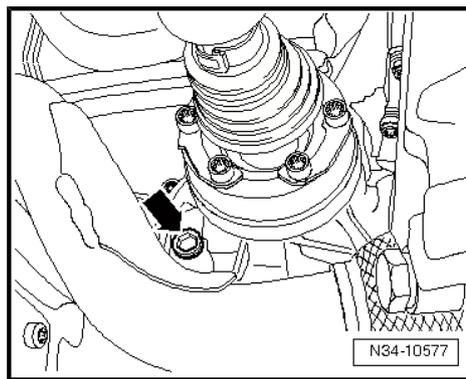


Gearbox oil ⇒ Electronic parts catalogue (ETKA)

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- To check gear oil, remove oil plug -arrow-.

The gearbox oil level is correct if the box is full up to the lower edge on the filling hole.

- If necessary, fill with gear oil to lower edge of filler hole.
- Tighten bolt -arrow-.

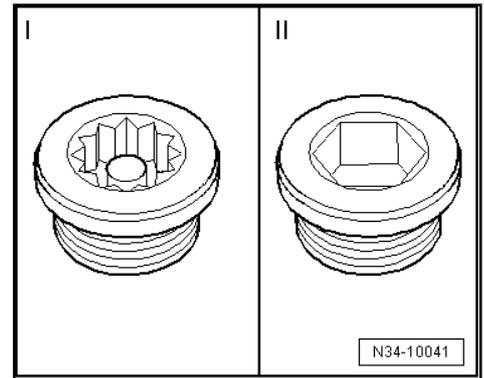


Various versions of oil filler and drain plugs

I - Oil filler or oil drain plug with multi-point socket head, 25 Nm

II - Oil filler or oil drain plug with hexagon socket head, 30 Nm

- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .



35 – Gears, shafts

1 Input shaft

1.1 Assembly overview - input shaft



Note

- ◆ When installing new sliding gears or a new input shaft, all details of the ⇒ *Electronic parts catalogue ETKA and technical data must be observed.*
- ◆ Install all bearings, synchromeshed gears and synchro-rings on input shaft with gear oil.
- ◆ Do not mix up synchromesh rings. If reused, always install with the original synchromeshed gear.

1 - Bolt.

- Remove and install

2 - Tapered roller bearing inner race

- Combined with thrust washer
- Mark before removing
- Do not confuse with the inner ring of the secondary shaft roller bearing socket
- Remove and install

3 - Attack washer

- Combined with inner race of cylindrical roller bearing

4 - Synchromeshed gear for 6th gear

5 - 6th gear synchro-ring

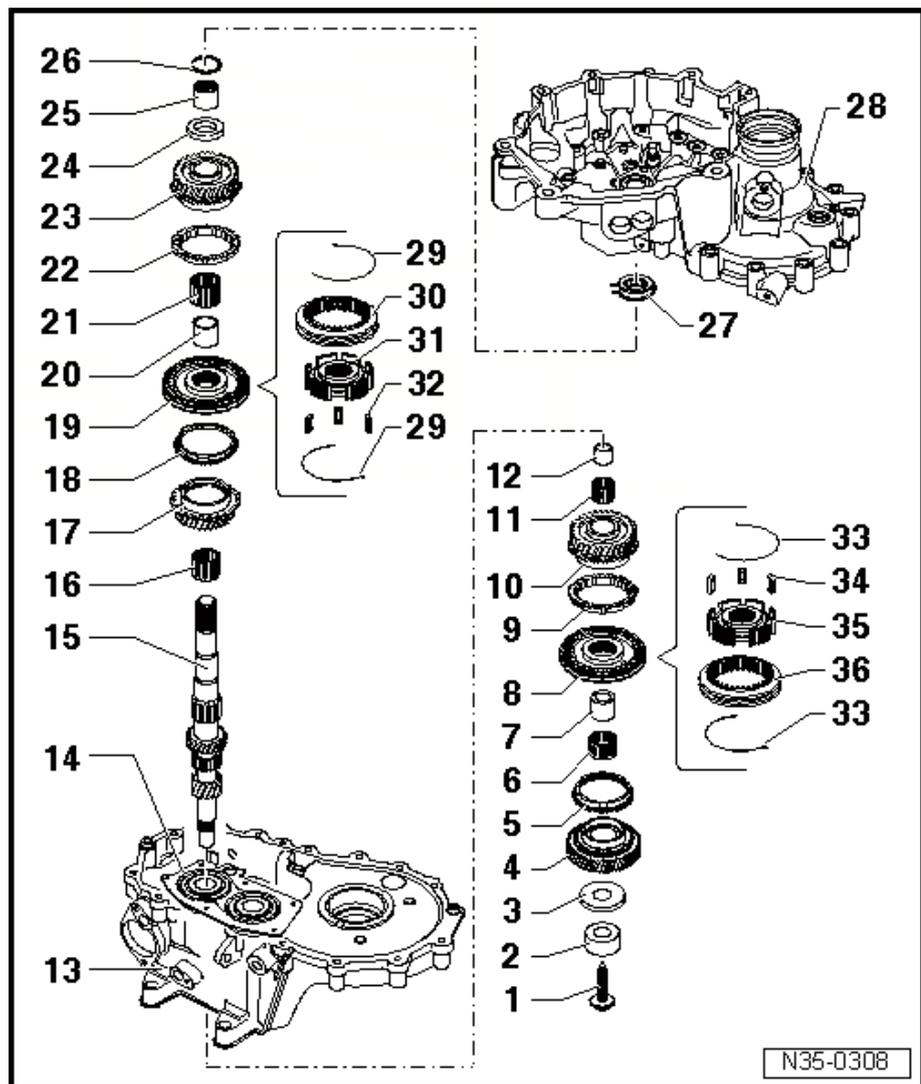
- Check for wear

6 - Needle roller bearing

- for 6th gear
- Replace together with sleeve.
- Two-part

7 - Collar

- For 6th gear needle bearing.
- Renew together with needle bearing.
- Remove and install



N35-0308

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

- Remove and install
- Dismantling
- Insert the unit comprising locking collar and synchromesh body of 5th / 6th gear and
- Installation position

9 - Synchromesh ring of 5th gear

- Will be damaged during removal of input shaft
- Must be renewed if removed
- Check for wear

10 - Synchromeshed gear for 5th gear

11 - Needle roller bearing

- For 5th gear
- Renew together with sleeve

12 - Collar

- For 5th gear needle bearing
- Replace together with needle bearing
- Press off with bearing mounting with deep groove ball bearing
- Press on

13 - Gearbox housing

- Repairing

14 - Bearing mounting with grooved ball bearing

- Renew deep groove ball bearing only together with bearing mounting
- If bearing mounting is separated from gearbox housing, then mounting must always be renewed.
- Gear wheel for 5th gear could be removed by hand: Press off without gear wheel for 5th gear
- Gear wheel for 5th gear could not be removed by hand: Press off with gear wheel for 5th gear
- Press on

15 - Input shaft

- Clean any traces of fixing agent from the threaded holes in the input shaft using a tap.

16 - Needle roller bearing

- for 3rd gear

17 - Synchromeshed gear for 3rd gear

18 - Synchro ring 3rd gear

- Check for wear

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

- Press off with 3rd gear synchromeshed gear
- Dismantling
- Installation position of the locking collar/synchro-hub.
- Assembling
- Press on

20 - Collar

- For 4th gear needle bearing
- Renew together with needle bearing.
- Press off with 3rd gear synchromeshed gear
- Press on

21 - Needle roller bearing

- for 4th gear
- Renew together with sleeve

22 - Syncromesh ring for 4th gear

- Check for wear

23 - Synchronised gear for 4th gear

24 - Attack washer

25 - Tapered roller bearing inner race

- Press out
- Press on

26 - Circlip

- Must be renewed if removed
- Determine thickness

27 - Cylindrical roller bearing

- Circlip
- Pull out
- Press on
- Installation position: the securing ring of the bearing must point to the input shaft

28 - Clutch housing or

- Repairing

29 - Spring

- Installation position

30 - 3rd and 4th gear locking collar

31 - 3rd and 4th gear synchro-hub

32 - Locking pieces (3 units)

33 - Spring

- Installation position

34 - Locking pieces (3 units)

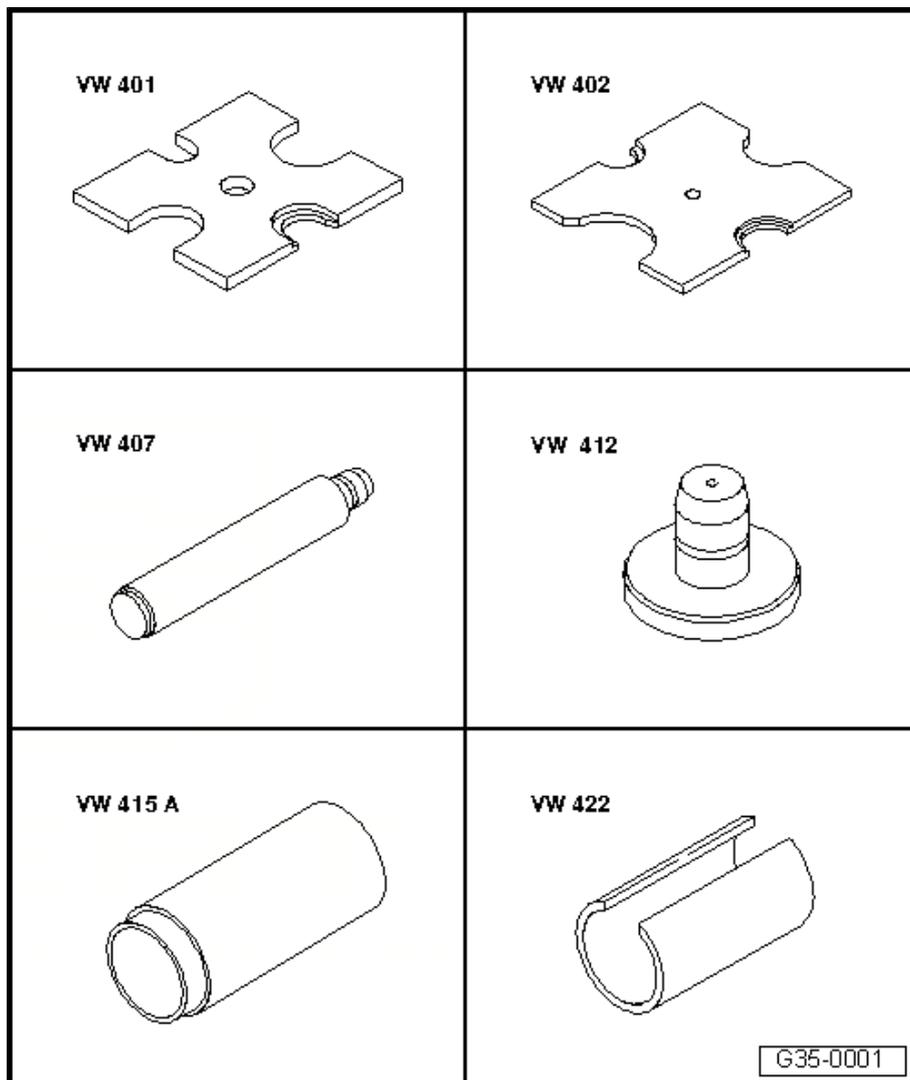
35 - Synchronising hub for 5th and 6th gear

36 - Locking collar for 5th and 6th gear

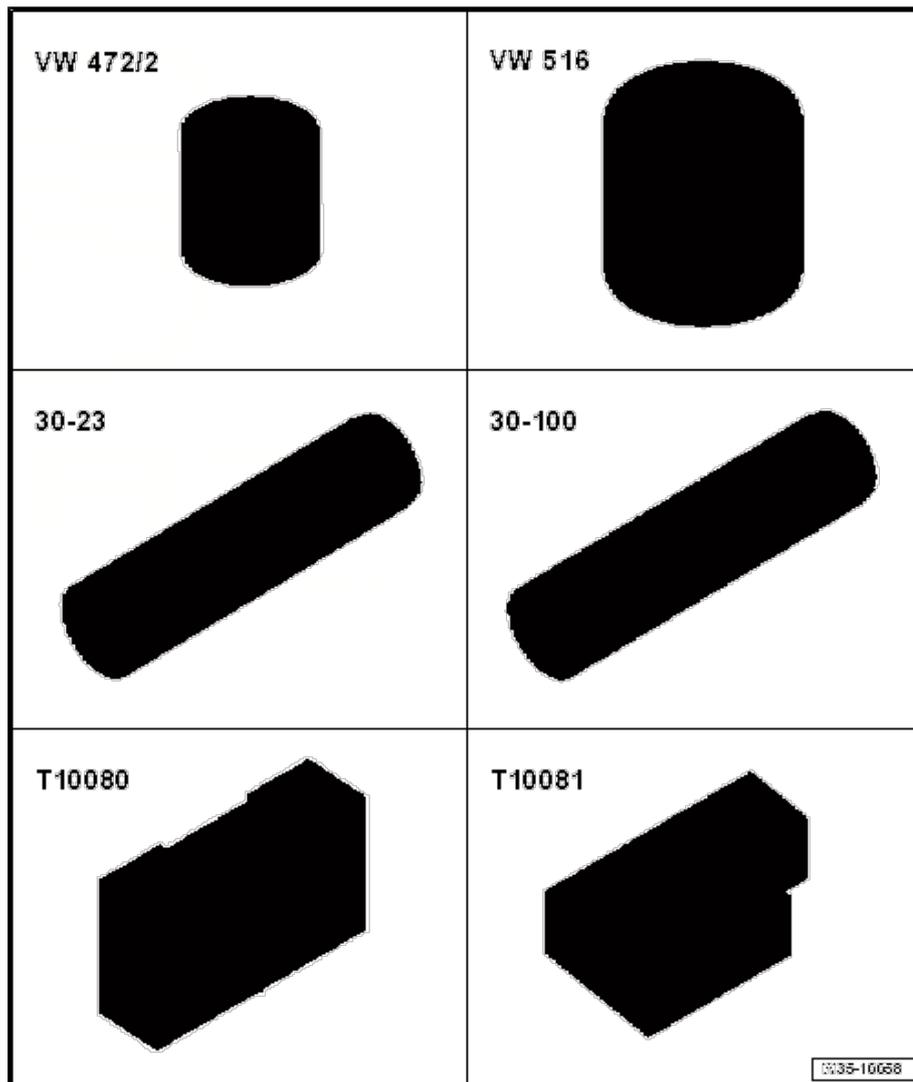
1.2 Disassembly and assembly of the input shaft

Special tools and workshop equipment required

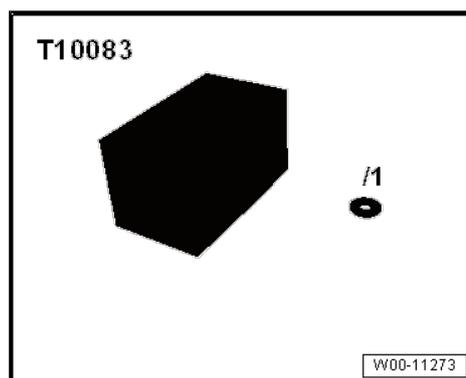
- ◆ Tightening plate - VW 401-
- ◆ Tightening plate - VW 402-
- ◆ Die - VW 407-
- ◆ Die - VW 412-
- ◆ Tube element - VW 415 A-
- ◆ Tube element - VW 422-



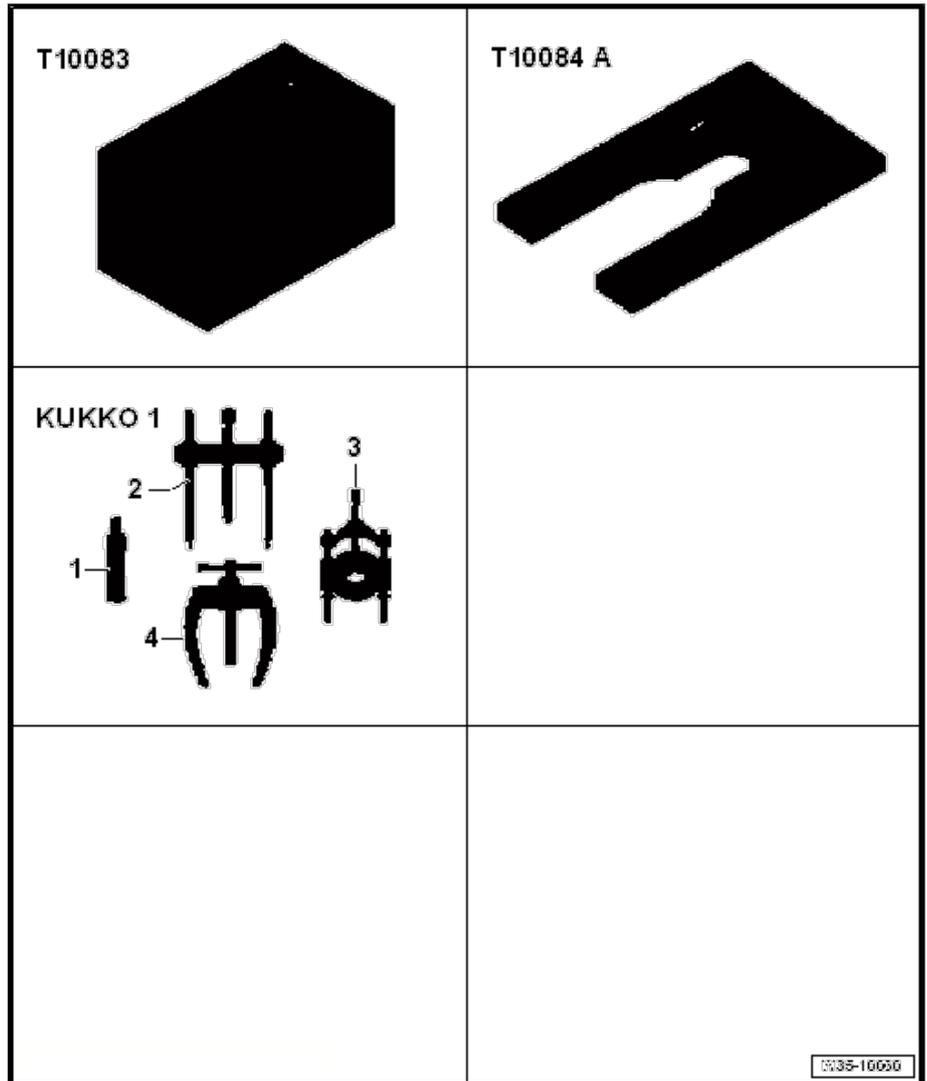
- ◆ Separation cap - VW 472/2-
- ◆ Tube element - VW 516-
- ◆ Extension - 30-23-
- ◆ Inlay socket - 30-100-
- ◆ Thrust piece - T10080-
- ◆ Thrust piece - T10081-



- ◆ Plate - T10083/1-



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

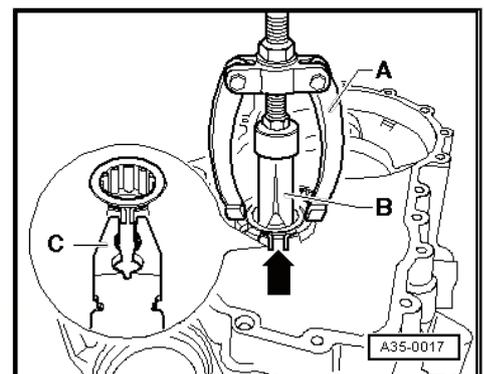


Pulling cylindrical roller bearing out of clutch housing

- When pulling out, squeeze together retaining ring -arrow- of cylindrical roller bearing, using pliers -C-.

A - Support bracket , ex. -Kukko 22/1-

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



Extract the roller bearing from the clutch housing

- Support gearbox housing with tube - VW 415 A- (not visible in figure) directly below bearing support.
- When pressing in, compress circlip -arrow- for roller bearing using pliers -A-.
- Remove the pliers before the bearing is in its final installation position. The securing ring should insert into the groove of the clutch pan.

Gear wheel for 5th gear could not be removed by hand

Press off the bearing support with the grooved ball bearing and the 5th gear° pinion -A-

- Slide locking collar for 1st and 2ndgear onto 2ndgear.
- Then slide pressure plate - T10084 A- onto input shaft to stop from side.

Gear wheel for 5th gear could be removed by hand

Detach the allotment with grooved ball bearings

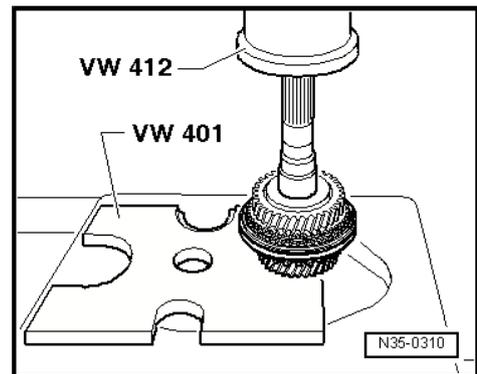
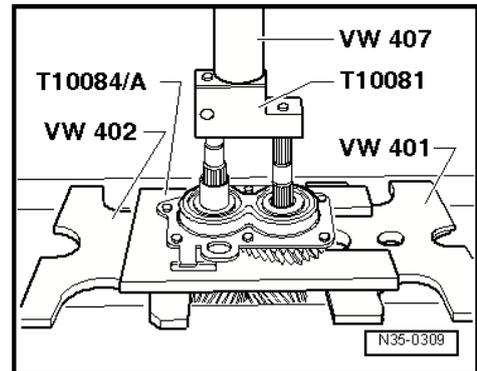
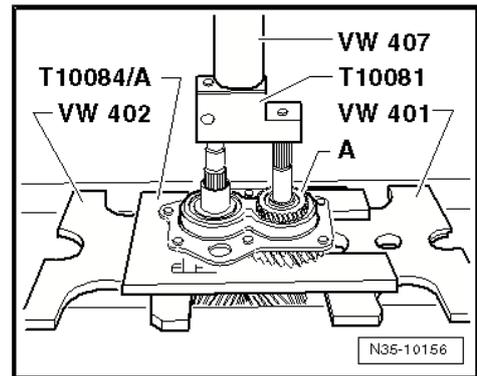
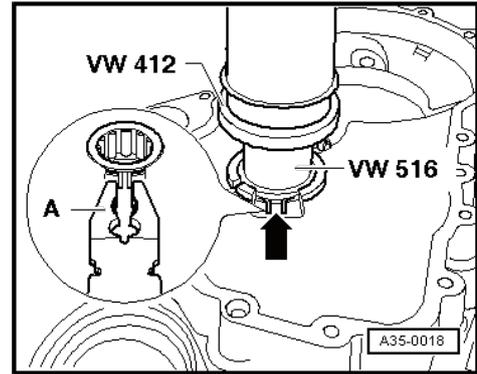
- Slide locking collar for 1st and 2ndgear onto 2ndgear.
- Then slide pressure plate - T10084 A- onto input shaft to stop from side.

Continued for all vehicles

Releasing

Interior bearing ring for cylinder roller bearing together with: Guard plate for 4th with needle bearing, gear synchronising hub/locking collar for 3rd and 4th as well as 3rd gear speed selector gear

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



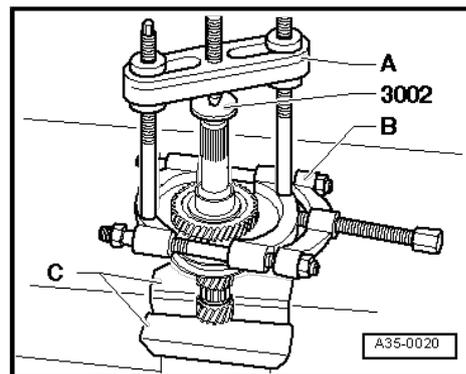
The inner bearing races of roller bearings too can only be removed individually together with the 4th gear selector gear

- First remove retaining ring with Circlip pliers - VW 161 A- .
- Position splitter -B- behind teeth of synchromeshed gear for 4th gear which engage in the other gear wheel (not dog teeth) and tension.

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

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

C - Protection gags

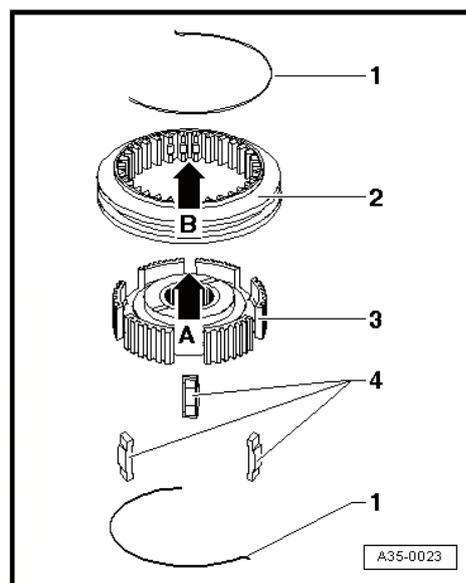


Dismantling and assembling 3rd and 4th gear locking collar and synchro-hub

- 1 - Spring
- 2 - Mobile element
- 3 - Synchromesh hub
- 4 - Locking element

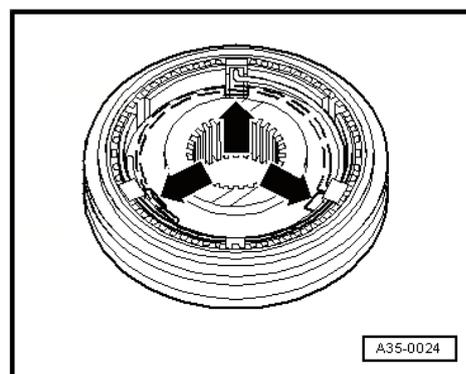
- The locking collar is fitted onto the synchro-hub.

Deepest notches -arrow A- for locking pieces in synchro-hub and notches -arrow B- in locking collar must align.



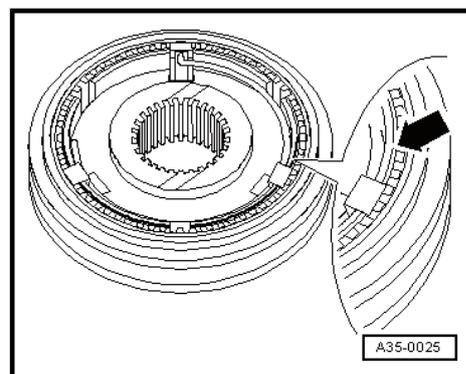
Assemble the mobile sleeve and synchromesh unit for 3rd and 4th gear

- Locking collar has been pushed over synchro hub.
- Fit the locking elements in the deepest grooves -arrows- and fit the elastic rings off-set by 120°. Angled end of spring must locate in hollow locking piece.



Installation position locking collar/synchronising hub 3rd and 4th gear

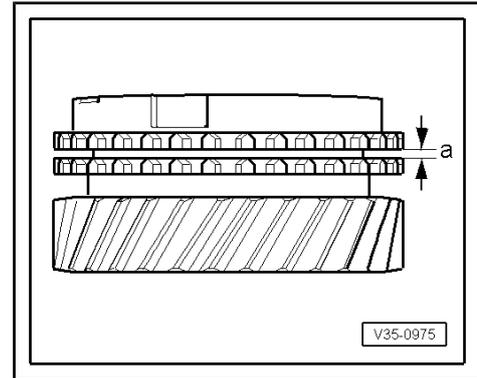
The groove on the front -arrow- should face towards 4th gear.



Checking synchro-ring for wear

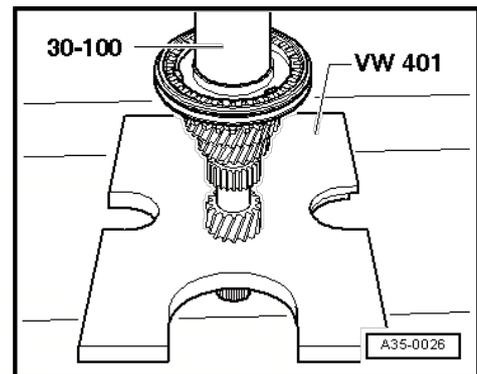
- Press synchro-ring onto cone of synchmeshed gear and measure gap -a- using feeler gauge.

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



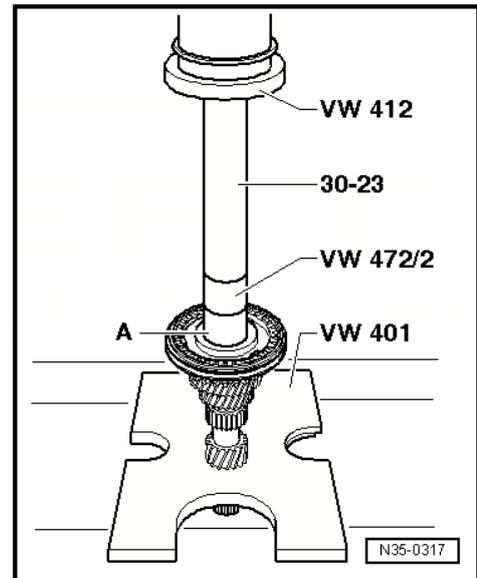
Pressing on synchro-hub with locking collar for 3rd and 4th gears

Installation position: The high collar faces 3rd gear wheel

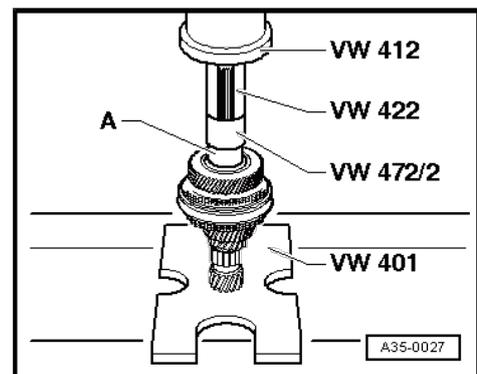


Pressing on sleeve -A- for 4th gear needle bearing

- After installing the sleeve -A-, mount the needle bearing and the mobile pinion of 4th gear together with the thrust ring.



Insert the inner ring -A- of the cylindrical roller bearing.



Determining thickness of retaining ring

- Insert a 2.0 mm thick retaining ring -A- in groove of input shaft and press upwards -arrow-.
- Measure distance between inner race -B- and installed retaining ring -A- using feeler gauge -C-.
- Remove retaining ring used for measuring purposes.
- Select the securing ring using the table.



Note

Allocate retaining rings using \Rightarrow Electronic parts catalogue (ET-KA).

The following circlips (retaining rings) are available:

Measured value (mm)	Thickness of the securing ring (mm)	Axial play (mm)
0.05 ... 0.14	2.0	0.05 ... 0.15
0.15 ... 0.24	2.1	0.05 ... 0.15
0.25 ... 0.34	2.2	0.05 ... 0.15
0.35 ... 0.44	2.3	0.05 ... 0.15
0.45 ... 0.51	2.4	0.05 ... 0.10

Pressing the bearing support with grooved ball bearings onto the drive and output shaft



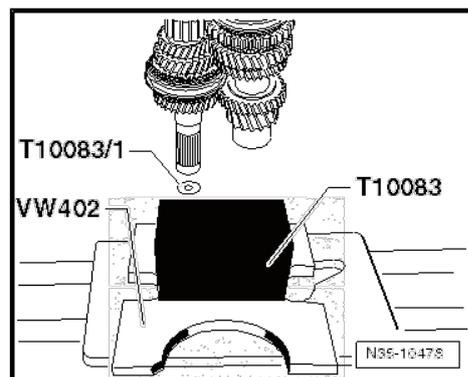
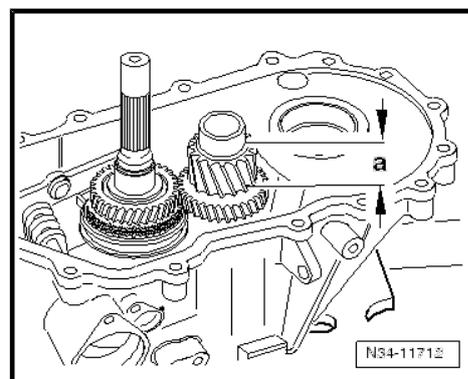
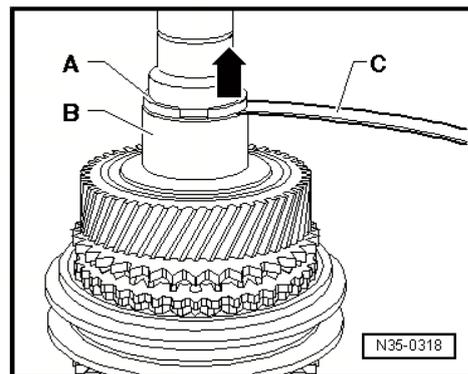
Note

- ◆ The input shafts of the different gearboxes have different lengths as the dimension of the splines - dimension -a- are different (the figure shows the shaft mounted).
- ◆ To ensure that bearing support is always evenly pressed onto shafts, it is necessary for shafts always to be inserted evenly into thrust block - T10083- .
- ◆ If necessary, insert a shim - T10083/1- (3 mm thick) into fitting hole for input shaft .
- ◆ For this person, dimension -a- of the secondary shaft splines has to be measured.

Measurement -a- =30.6 mm.

Insert shim - T10083/1- \Rightarrow next figure.

Fit shim - T10083/1- .



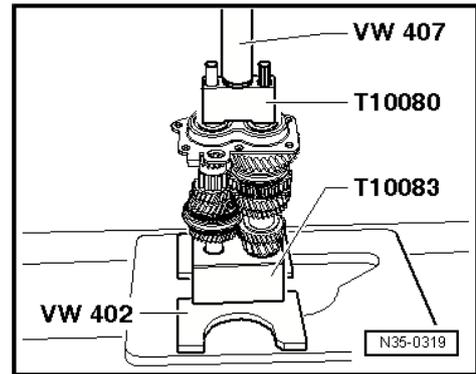
Adapt the bearing mount

- Before fitting, heat the allotment to a max. of 100 °C.

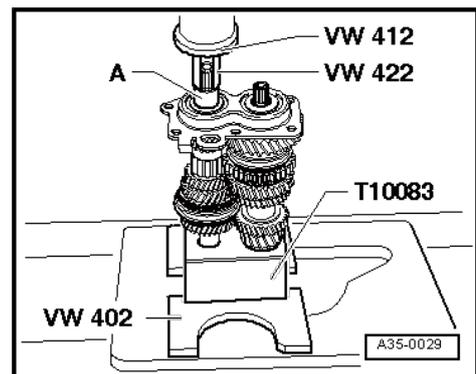


WARNING

Use protective gloves!



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

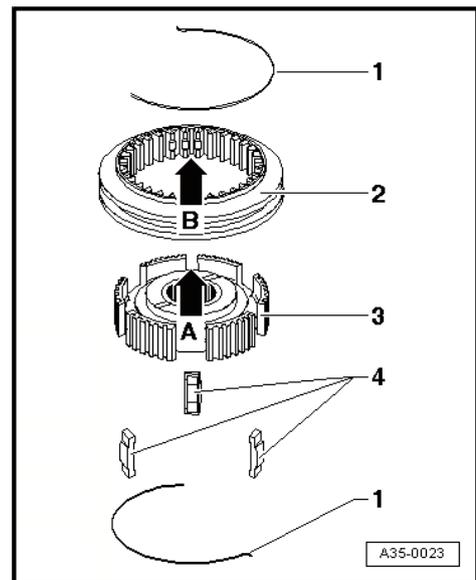


Dismount and assemble mobile element and synchromesh body of 5th / 6th gear

- 1 - Spring
- 2 - Mobile element
- 3 - Synchromesh hub
- 4 - Locking element

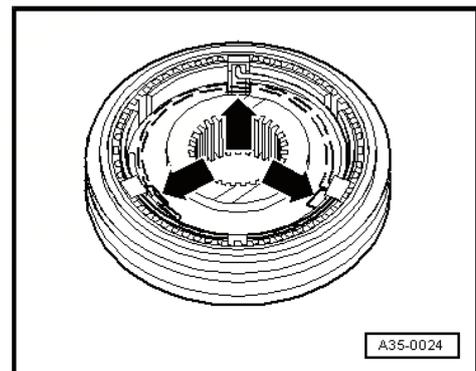
- The locking collar is fitted onto the synchro-hub.

Deepest notches -arrow A- for locking pieces in synchro-hub and notches -arrow B- in locking collar must align.



Insert the unit comprising locking collar and synchromesh body of 5th / 6th gear.

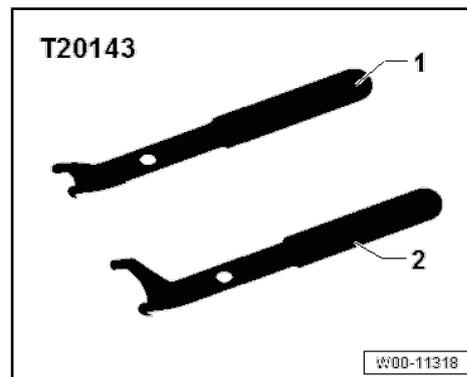
- Locking collar has been pushed over synchro hub.
- Fit the locking elements in the deepest grooves -arrows- and fit the elastic rings off-set by 120°.
- Angled end of spring must locate in hollow locking piece.



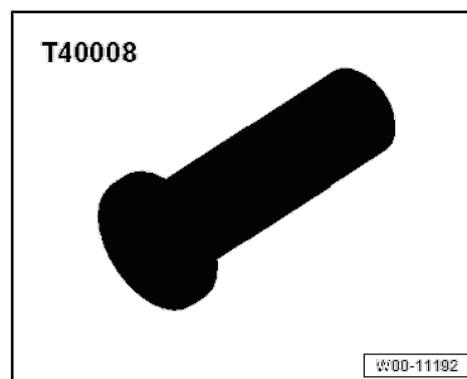
1.3 Input shaft oil seal: replacement

Special tools and workshop equipment required

- ◆ Puller hooks - T20143/1-



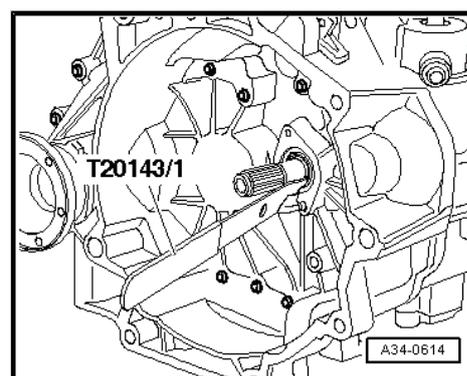
- ◆ Thrust piece - T40008-



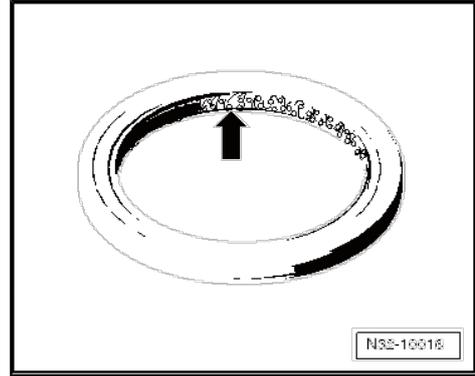
- ◆ Sealing grease
- ◆ For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .
- Remove manual gearbox.
- Remove clutch release lever together with release bearing and guide sleeve
- Lever out oil seal for input shaft.

i Note

Do not damage running surface of input shaft for oil seal.

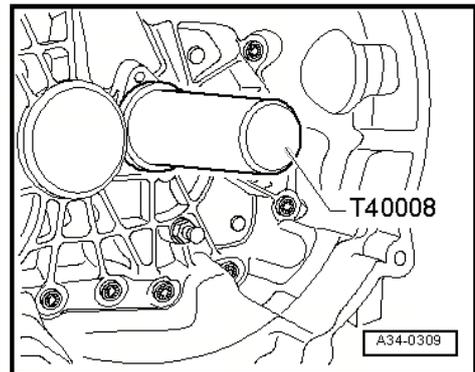


- Fill space between sealing lip and dust lip -arrow- with sealing grease .
- Lightly moisten outer circumference of oil seal with gear oil.



Insert the input shaft seal so it is flush

- Install clutch release lever with release bearing and guide sleeve
- Installing gearbox



2 Secondary shaft

2.1 Assembly overview - output shaft

Note

- ◆ When installing new gears or new input shaft, refer to ⇒ *Electronic parts catalogue (ETKA) and technical data.*
- ◆ Install all bearings, synchromeshed gears and synchro-rings on output shaft with gear oil.
- ◆ Do not mix up synchromesh rings. If reused, always install with the original synchromeshed gear.

1 - Clutch housing or

- Repairing

2 - Cylindrical roller bearing

- Circlip
- Pull out
- Press on
- Installation position: retaining ring in bearing faces output shaft

3 - Secondary shaft

- If an inner race as bearing seat for cylindrical roller bearing is present, it cannot be removed from output shaft
- Check the seating or the inner cylindrical bearing ring for damage or scoring
- If the seating or the inner cylindrical bearing ring shows scoring or damage then replace the secondary shaft and the cylindrical roller bearing

4 - 4th gear pinion

- Fitting location: Collar faces 3rd gear

5 - Circlip

6 - Circlip

7 - 3rd gear pinion

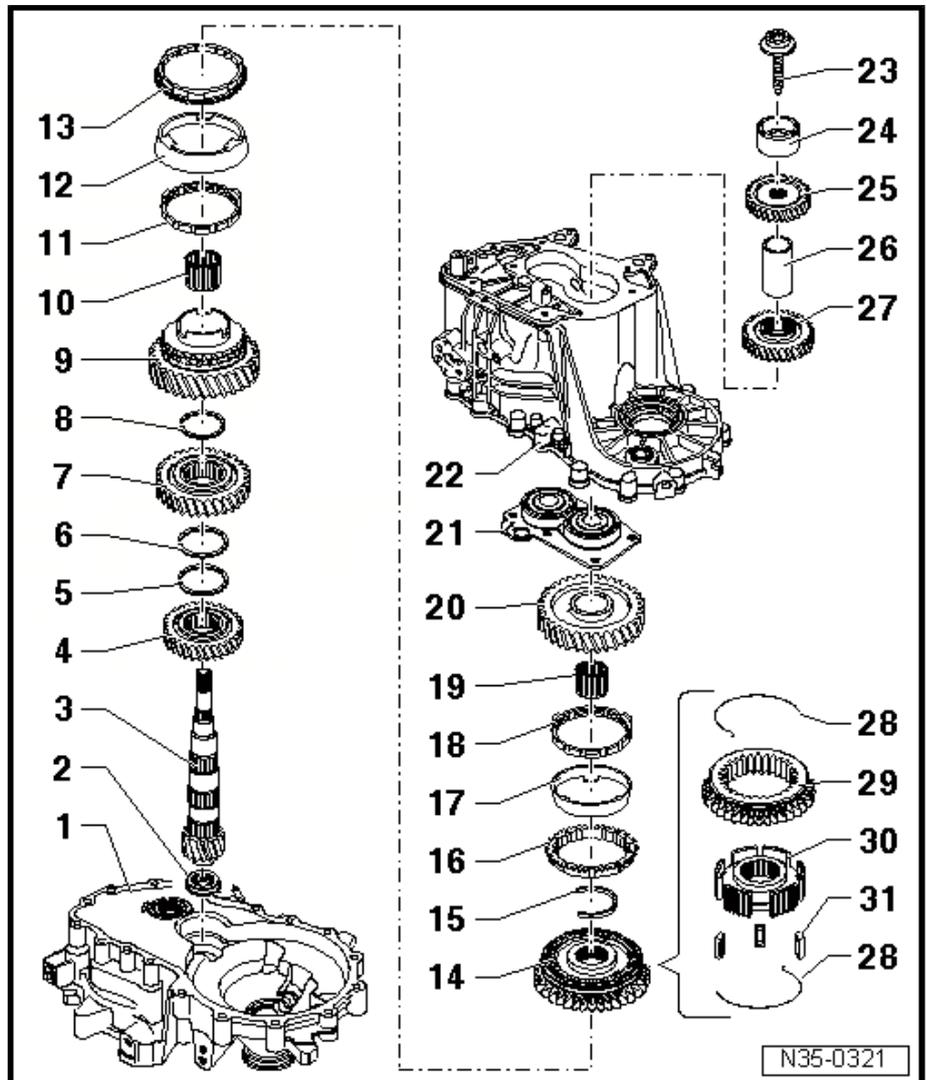
- Fitting location: Collar faces 4th gear

8 - Circlip

9 - 2nd gear mobile pinion

10 - Needle roller bearing

- for 2nd gear



11 - Inner ring for 2nd gear

- Check for wear
- Installation position

12 - Outer ring of 2nd gear

- Set on inner ring.
- Replace this if there are grooves or treads caused by wear
- Installation position

13 - Synchro ring 2nd gear

- Check for wear
- Installation position

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

- Press off together with 2nd speed selector gear after removing circlip
- Dismantling
- Assembling locking collar/synchronising hub and
- Installation position
- Press on

15 - Circlip

- Must be renewed if removed
- Press out
- Installation

16 - Synchro ring 1st gear

- Check for wear
- Assemble so that notches engage in locking pieces of locking collar.

17 - Outer ring of 1st gear

- Insert in synchro-ring
- Installation position
- Replace this if there are grooves or treads caused by wear

18 - Inner ring for 1st gear

- Check for wear
- Check that the tabs show no signs of wear
- Installation position

19 - Needle roller bearing

- Of 1st gear

20 - Synchronised Electronic parts catalogue for 1st gear

- Installation position

21 - Bearing mounting with grooved ball bearing

- Renew deep groove ball bearing only together with bearing mounting
- If bearing mounting is separated from gearbox housing, then mounting must always be renewed.
- Press off without gear wheel for 5th gear
- Press off with gear wheel for 5th gear
- Press on

22 - Gearbox housing

- Repairing

23 - Bolt.

- Remove and install

24 - Tapered roller bearing inner race

- Mark before removing

- Do not confuse with the inner ring of the input shaft roller bearing socket
- Remove and install

25 - 6th gear pinion

- Installation position:
- Remove and install

26 - Collar

- Remove and install

27 - Gear wheel for 5th gear

- Installation position
- Must be pressed off and pressed on in gearboxes for the 1.4 l engine

28 - Spring

- Installation position

29 - Mobile element

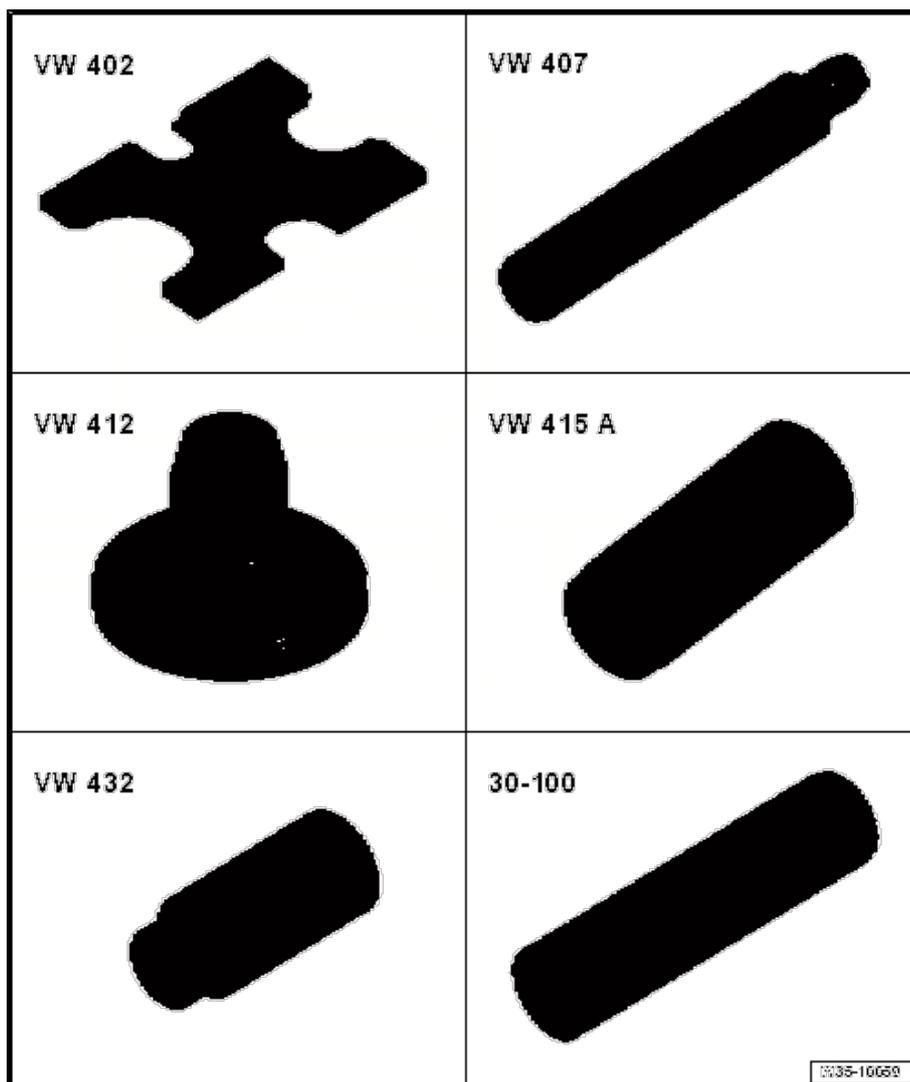
30 - Synchromesh hub

31 - Locking pieces (3 units)

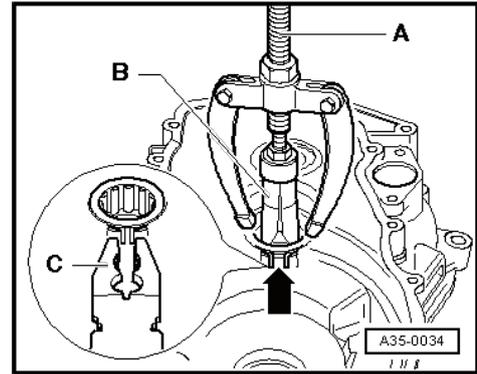
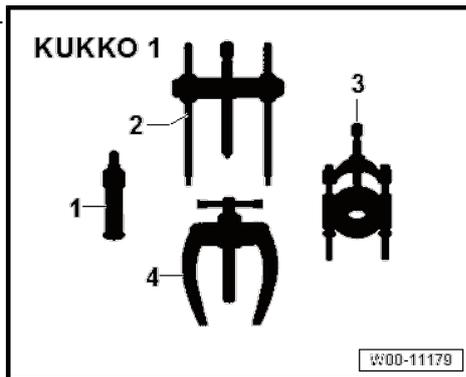
2.2 Dismantling and assembling output shaft

Special tools and workshop equipment required

- ◆ Tightening plate - VW 402-
- ◆ Die - VW 407-
- ◆ Tube element - VW 415 A-
- ◆ Thrust piece - VW 432-
- ◆ Inlay socket - 30-100-



- ◆ -1- Internal puller - 1-
Kukko 21/5-



- ◆ Support bracket - 4-
Kukko 22/1-

Pulling cylindrical roller bearing out of clutch housing

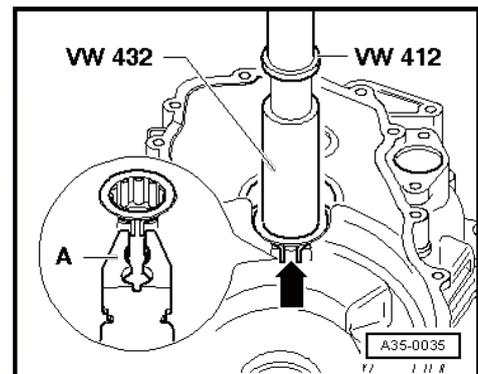
- When pulling out, squeeze together retaining ring -arrow- of cylindrical roller bearing, using pliers -C-.

A - Support bracket , ex.
-Kukko 22/1-

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

Extract the roller bearing from the clutch housing

- Support the clutch casing by placing the tubular section - VW 415 A- (not seen in the fig.) directly below the allotment.
- When pressing in, compress circlip -arrow- for roller bearing using pliers -A-.
- Remove the pliers before the bearing is in its final installation position. The securing ring should insert into the groove of the clutch pan.
- Press bearing mounting with grooved ball bearing off the drive shaft and output shaft



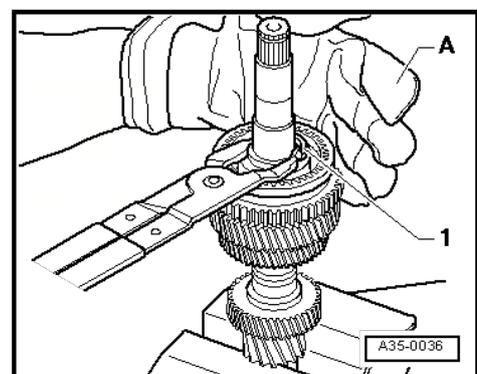
Press out securing ring -1- from its slot

A - Protective gloves



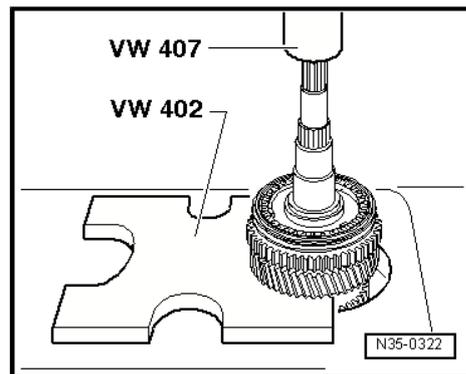
WARNING

Ensure retaining ring does not spring out uncontrolled.



Press out the mobile sleeve / synchroniser body of 1st and 2nd gear

- After removing retaining ring, press off synchronised gear for 2nd gear together with locking collar and synchro-hub.



Installation position of 3rd gear and 4th gear

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

Installation position:

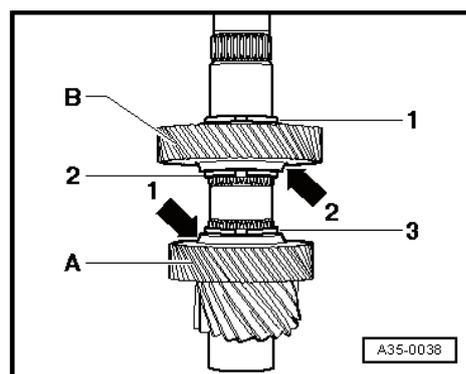
The collar -arrow 1- should face towards the 3rd gear pinion -B-.

- Fit the securing rings -2- and -3-.
- Fit 3rd gear wheel -B- onto output shaft.

Installation position:

The collar -arrow 2- should face towards the 4th gear pinion -A-.

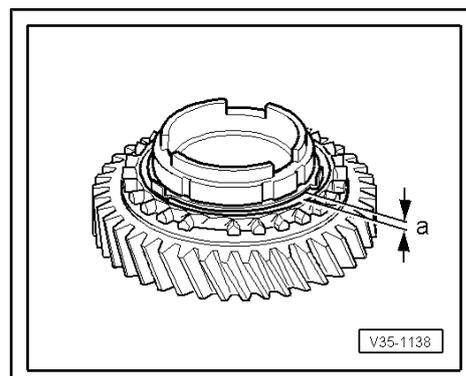
- Fit the securing ring -1-.



Checking 1st and 2nd gear inner ring for wear

- Press the inner ring against the mobile pinion cone and measure the distance "a" with a thickness jig.

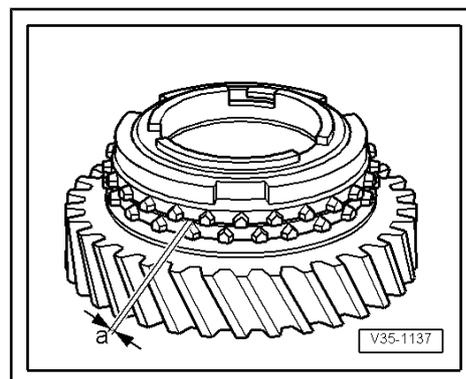
Gap "a".	Assembly level	Wear limit
1st and 2nd gears	0.75 ... 1.25 mm	0.3 mm



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

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

Gap "a".	Assembly level	Wear limit
1st and 2nd gears	1.2 ... 1.8 mm	0.5 mm



Installation position of the outer, inner and synchroniser rings for 2nd gear

– Fit the interior ring -A- onto the mobile pinion for 2nd gear.

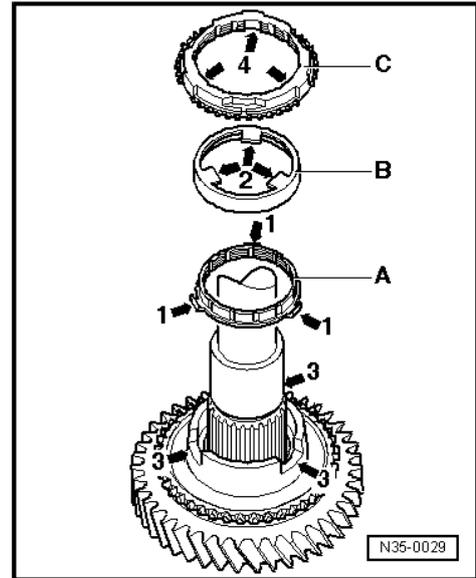
Angled lugs -arrow 1- face outer ring -B-.

– Fit the outer ring -B-.

Lugs -arrow 2- engage in notches -arrow 3- of synchronised gear.

– Fit the synchroniser ring -C-.

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



Disassembly and assembly of the locking collar / synchro-hub unit for 1st and 2nd gear

1 - Spring

2 - Mobile element

3 - Synchronmesh hub

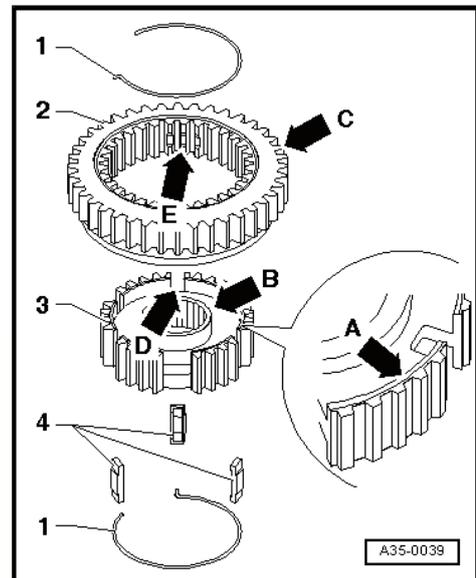
4 - Locking element

– The locking collar is fitted onto the synchro-hub.

Installation position:

After assembly, the groove on the face -arrow A- and the higher shoulder -arrow B- of synchro-hub face outer splines of the locking collar -arrow C-.

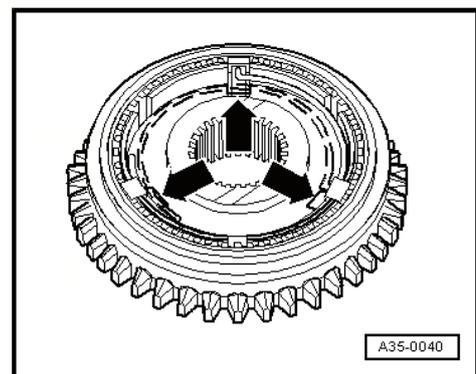
The deeper grooves -arrow D- of the locking piece in the synchronmesh must be aligned with the grooves -arrow E- of the mobile sleeve.



Assemble the mobile gearshift sleeve / synchroniser body unit of 1st and 2nd gear

• Locking collar has been pushed over synchro hub.

– Fit the locking elements in the deepest grooves -arrows- and fit the elastic rings off-set by 120°. Angled end of spring must locate in hollow locking piece.

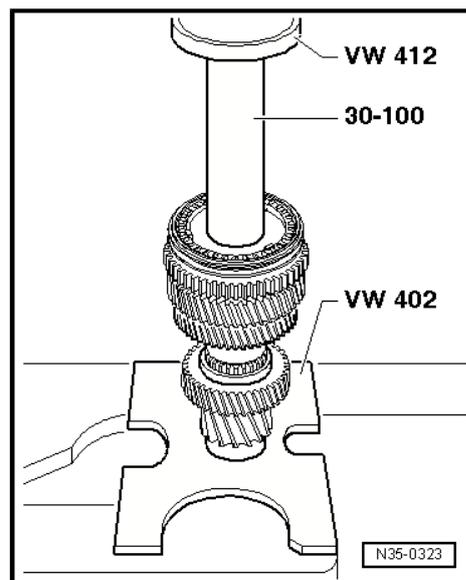


Insert mobile element/synchroniser body of the 1st and 2nd gear

Installation position:

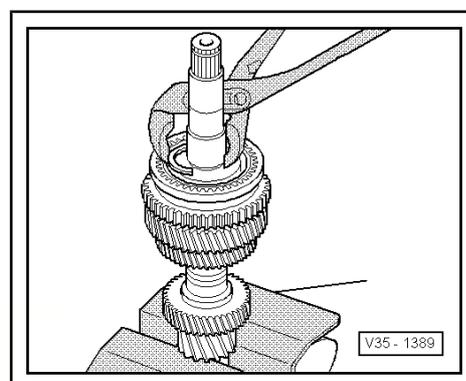
Groove in locking collar for selector fork faces 1st gear and teeth for reverse gear face 2nd gear.

- Turn the synchromesh ring so that the notches coincide with the locking elements.



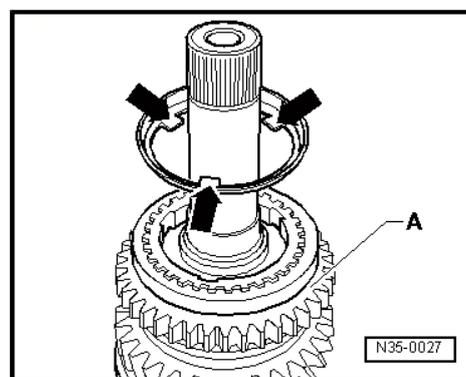
Fitting retaining ring

- Fit the 1st gear securing ring on the mobile sleeve / synchromesh assembly.



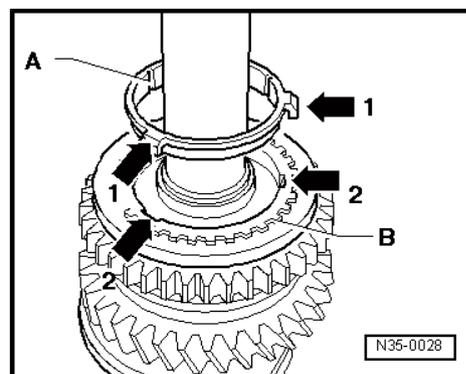
Installation position of outer ring for 1st gear

The tabs -arrows- point towards the teeth of the reverse gear.



Installation position of 1st gear inner ring -A-

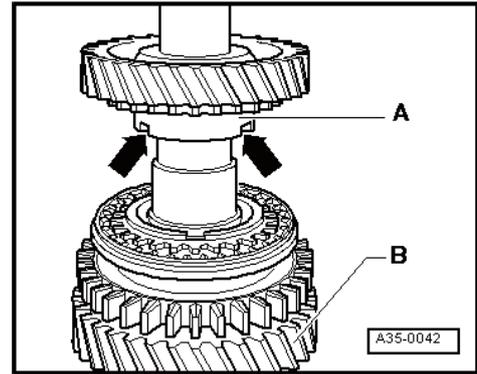
The tabs -arrows 1- insert into the recesses -arrows 2- of the synchromesh ring -B-.



Installation position of synchromeshed gear for 1st gear

The highest collar -A- should face 2nd gear -B-. The collar grooves -arrows- engage into the outer ring tabs

- Press bearing mounting with grooved ball bearing onto the drive shaft and output shaft
- Before fitting, heat the allotment to a max. of 100 °C.



39 – Final drive - differential

1 Sealing rings

1.1 Location overview - seals

1 - Oil seal

- For the input shaft
- Replace after removal

2 - Oil seal

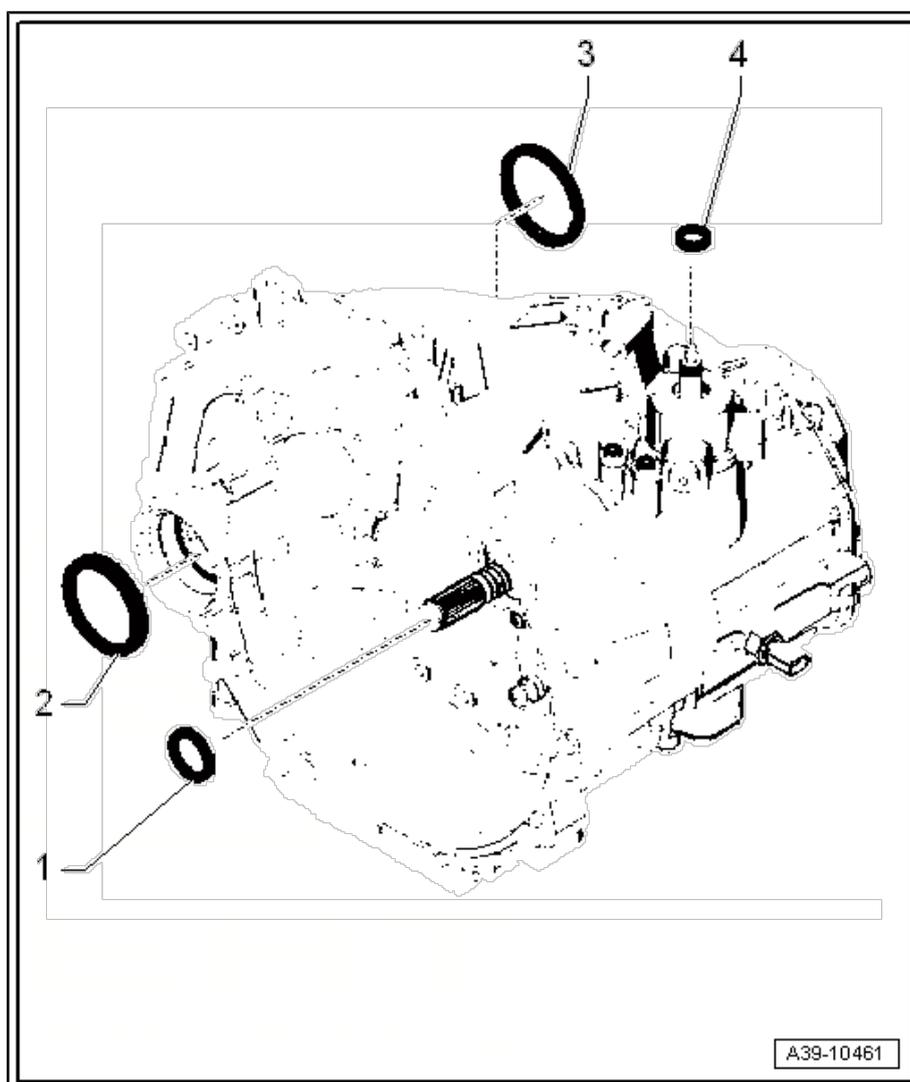
- For right flange shaft
- Replace after removal

3 - Oil seal

- For left flange shaft
- Replace after removal

4 - Oil seal

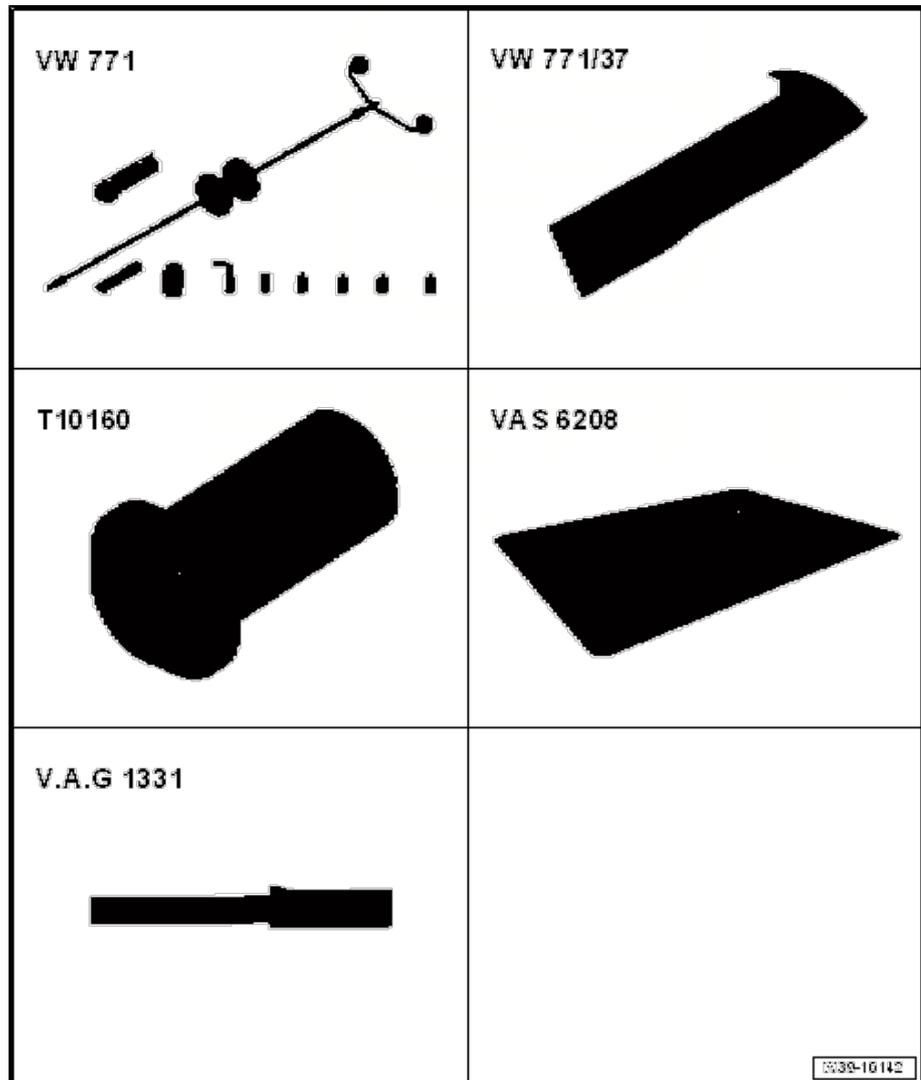
- of the selection shaft
- Replace after removal



1.2 Renewing left oil seal

Special tools and workshop equipment required

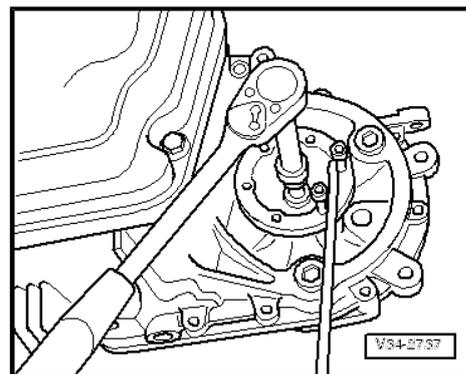
- ◆ Universal tool - VW 771-
- ◆ Puller hooks - VW 771/37-
- ◆ Thrust piece - T10160-
- ◆ Drip tray - V.A.G 1306-
- ◆ or drip tray for workshop hoist - VAS 6208-
- ◆ Drip tray for workshop hoist - VAS 6208-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Sealing grease
- ◆ For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .



Removal

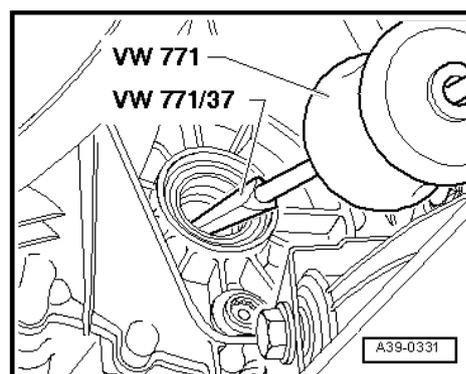
- Remove the left hand side wheel.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Turn the steering toward the left.
- Unbolt the drive shaft from the flanged shaft ⇒ Running gear, axles, steering; Rep. gr. 40 .
- Raise drive shafts as high as possible and secure, taking care not to damage surfaces.
- Place drip tray under the gearbox.

- Extract the bolt fastening the flanged shaft. To do so, thread 2 bolts on the flange and lock the shaft using the assembly lever.
- Remove flanged shaft together with compression spring.

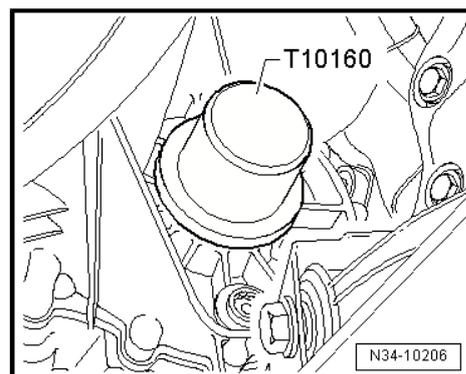


- Remove the flanged shaft seal with the universal tool - VW 771- and the extraction hook - VW 771/37- .

Installation



- Drive in new seal to stop, being careful not to cant seal.
- Half-fill space between sealing lip and dust lip with sealing grease .
- Insert flange shaft.
- Secure flange shaft with countersunk bolt and tighten to 25 Nm.
- Screw the driveshaft to the flanged shaft ⇒ Running gear, shafts, steering; Rep. gr. 40 .
- Check gear oil level and top up to lower edge of oil filler hole if necessary .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Install wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels and tyres; Tightening torque of the wheel bolts .



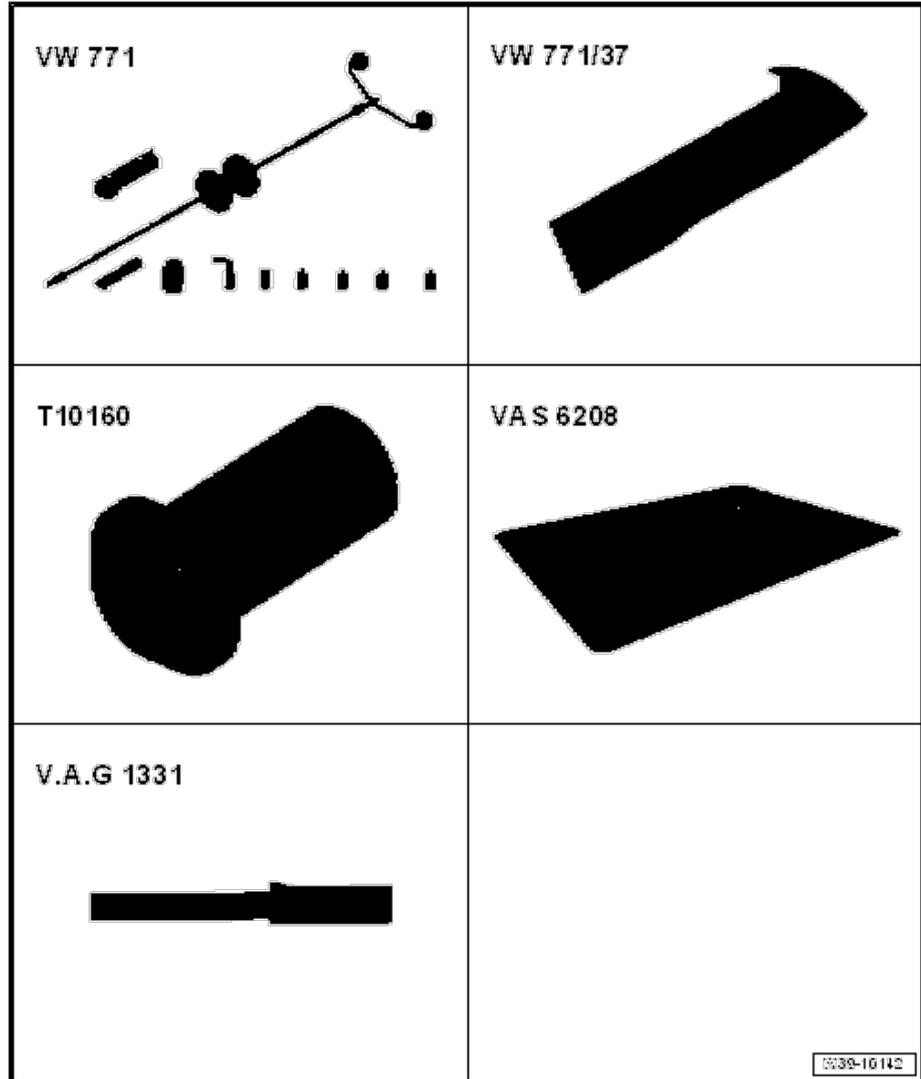
Specified torques

- ◆ Flange shaft to gearbox

1.3 Renewing right oil seal

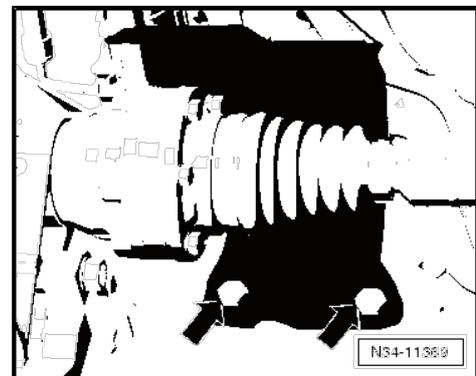
Special tools and workshop equipment required

- ◆ Universal tool - VW 771-
- ◆ Puller hooks - VW 771/37-
- ◆ Thrust piece - T10160-
- ◆ Drip tray - V.A.G 1306-
- ◆ or drip tray for workshop hoist - VAS 6208-
- ◆ Drip tray for workshop hoist - VAS 6208-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Sealing grease
- ◆ For grease allocation, refer to ⇒ Electronic parts catalogue (ETKA) .

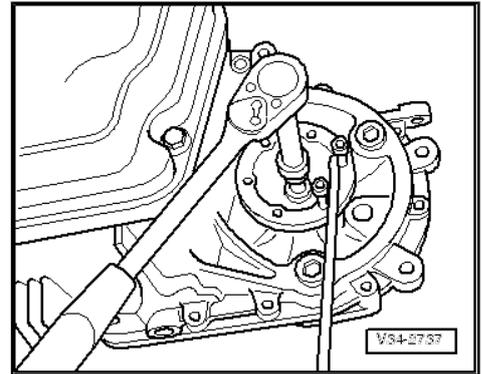


Removal

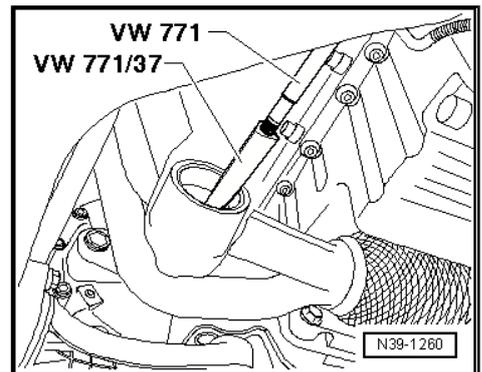
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Remove drive shaft heat shield, if present -arrows- ⇒ Running gear, axles, steering; Rep. gr. 40 .
- Unbolt the drive shaft from the flanged shaft ⇒ Running gear, axles, steering; Rep. gr. 40 .
- Raise drive shaft as high as possible and secure, taking care not to damage surfaces.
- Place drip tray under the gearbox.



- Extract the bolt fastening the flanged shaft. To do so, thread 2 bolts on the flange and lock the shaft using the assembly lever.
- Remove flanged shaft together with compression spring.

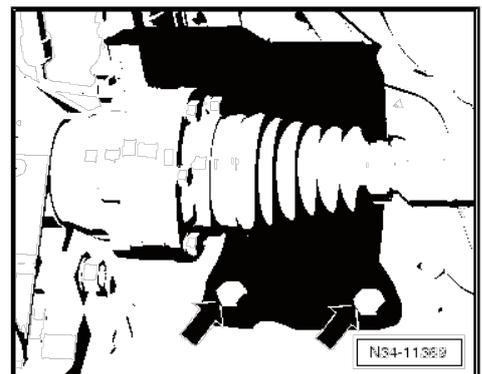
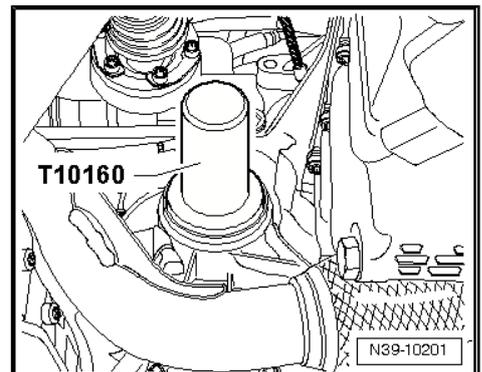


- Pull out flange shaft oil seal using multi-purpose tool - VW 771- and puller hooks - VW 771/37- or prise out using a lever.



Installation

- Drive in new seal to stop, being careful not to cant seal.
- Half-fill space between sealing lip and dust lip with sealing grease .
- Insert flange shaft.
- Secure flange shaft with countersunk bolt and tighten to 25 Nm.
- Install drive shafts => Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .
- Attach the drive shaft heat shield, if present -arrows- => Running gear, axles, steering; Rep. gr. 40 .
- Check gear oil level and top up to lower edge of oil filler hole if necessary .
- Install noise insulation => General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .



Specified torques

- ◆ Flange shaft to gearbox

2 Differential:

2.1 Assembly overview - differential

1 - Conical bolt

- Must be renewed if removed
- 25 Nm

2 - Right-hand articulation flange

3 - Flanged shaft compression spring

- Fit behind the flanged shafts

4 - Attack washer

- Installation position: the collar faces the spring

5 - Conical ring

- Installation position: conical side facing the differential casing

6 - Circlip

- Keep the following in position: conical ring, shim and pressure spring for flanged shaft when it is dismantled

7 - Left hand side flanged shaft

8 - Oil seal for left flange shaft

- Replace after removal

9 - Outer ring / conical roller bearing

- Pull out
- Press on

10 - Tapered roller bearing inner race

- Press out
- Press on

11 - Differential:

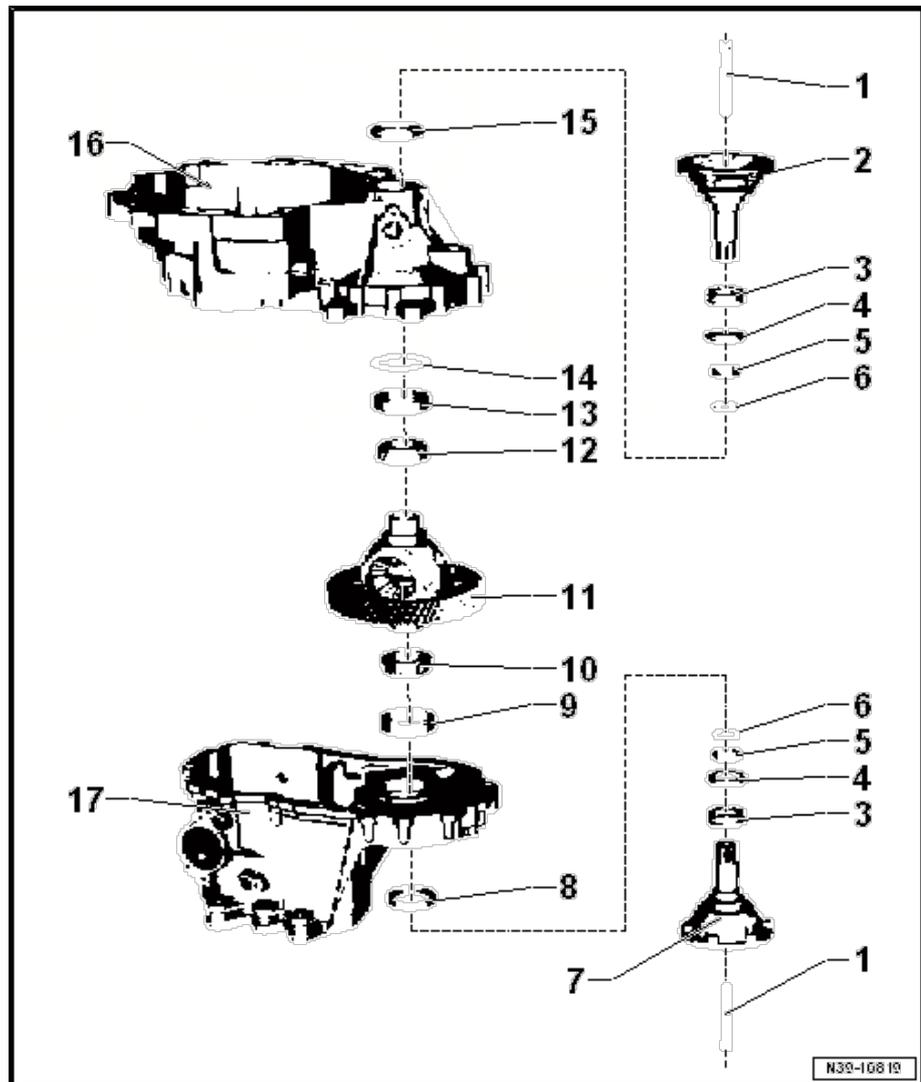
- With final drive gear

12 - Tapered roller bearing inner race

- Press out
- Press on

13 - Outer ring / conical roller bearing

- Press out
- Press on



14 - Shim

- for the differential gear
- Determine thickness

15 - Oil seal for right flange shaft

- Replace after removal

16 - Clutch housing or

- Repairing

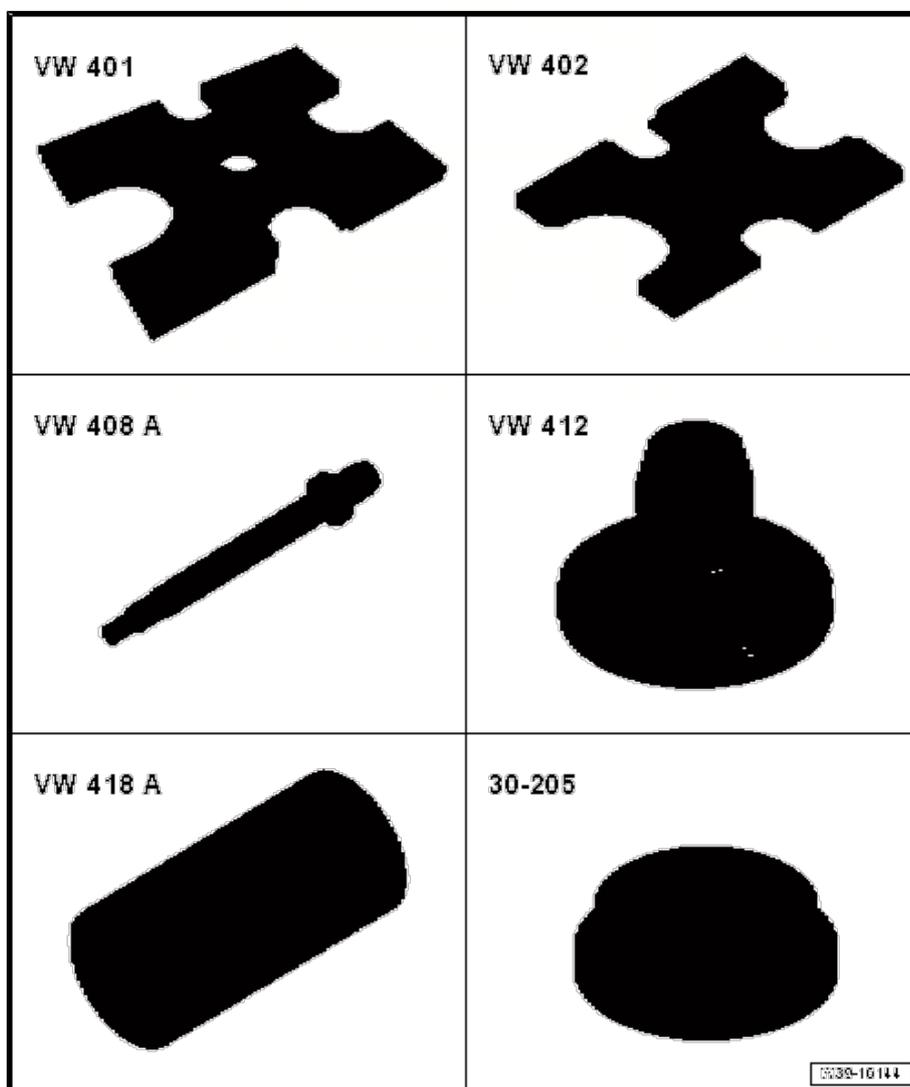
17 - Gearbox housing

- Repairing

2.2 Differential: assembly and disassembly

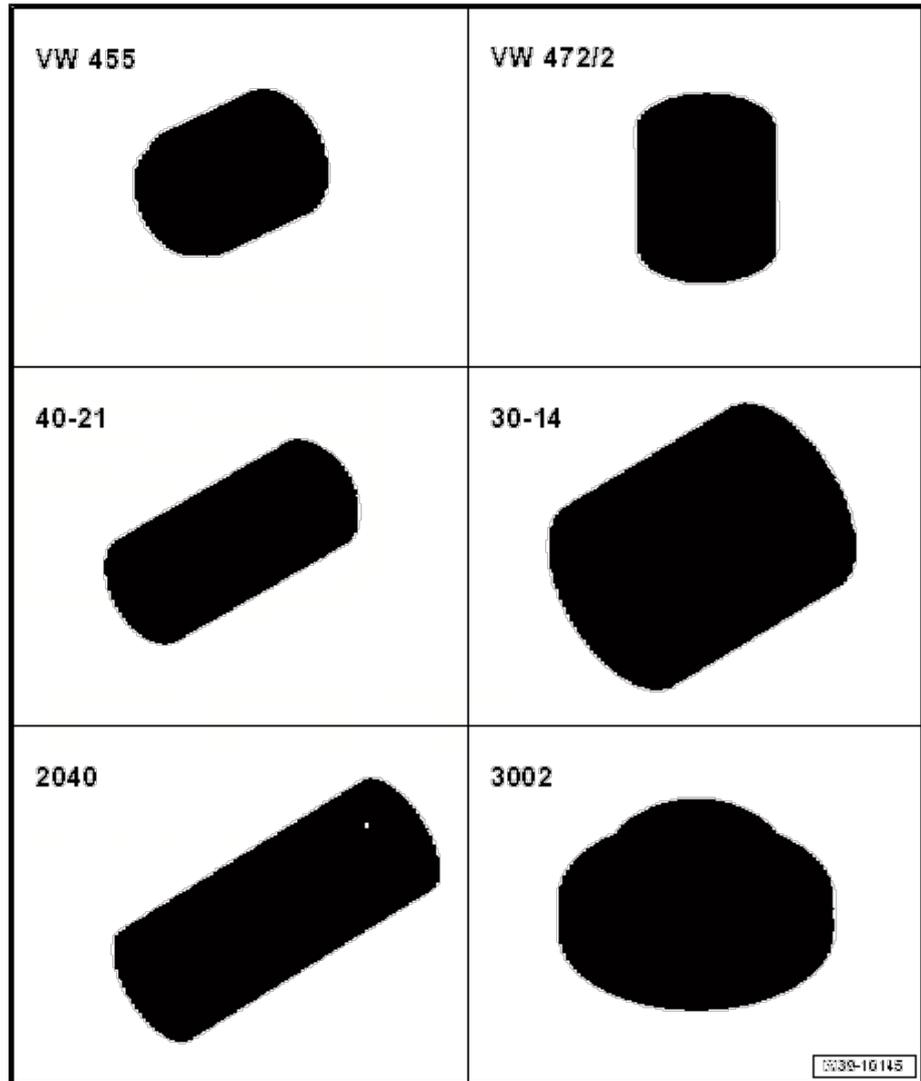
Special tools and workshop equipment required

- ◆ Tightening plate - VW 402-
- ◆ Tightening plate - VW 401-
- ◆ Die - VW 408 A-
- ◆ Die - VW 412-
- ◆ Tube element - VW 418 A-
- ◆ Thrust plate - 30-205-

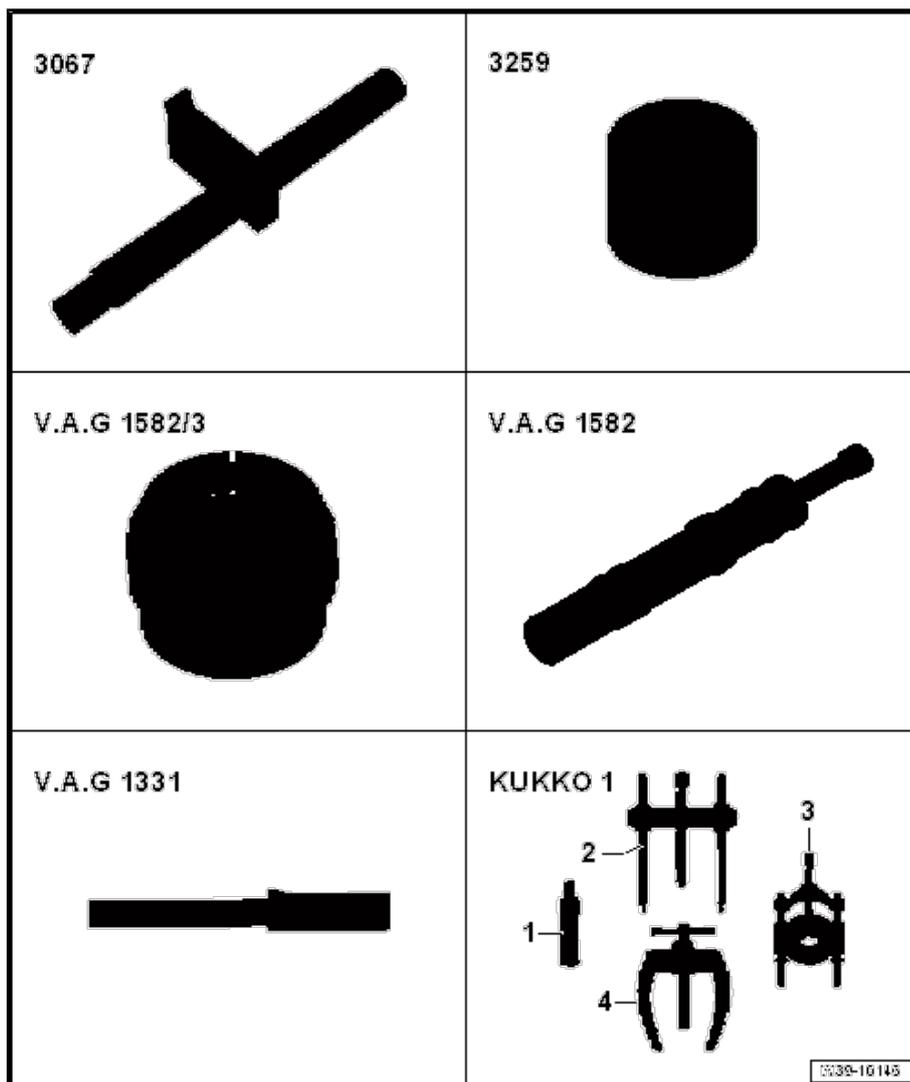


039-16144

- ◆ Drift sleeve - VW 455-
- ◆ Separation cap - VW 472/2-
- ◆ Inlay socket - 40-21-
- ◆ Tube for releasing - 30-14-
- ◆ Tube element - 2040-
- ◆ Thrust piece - 3002-



- ◆ Counterhold - 3067-
- ◆ Pipe - 3259-
- ◆ Tapered roller bearing puller - V.A.G 1582-
- ◆ Locking device - V.A.G 1582/3-
- ◆ -1- Internal puller - Kukko 21/7-
- ◆ -4- Counter support - Kukko 22/2-



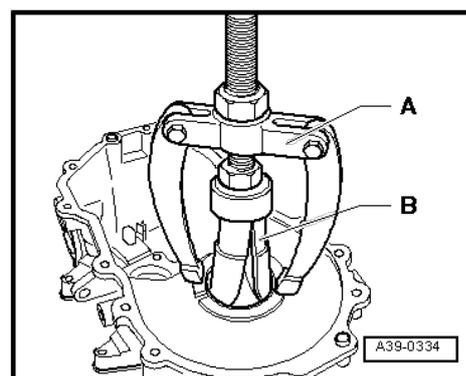
i Note

- ◆ Heat the inner ring of the roller bearing to 100 °C before fitting.
- ◆ Replace both conical roller bearings together.
- ◆ If tapered roller bearings, differential cage, gearbox housing or clutch housing is renewed, adjust differential

Remove the outer ring of the roller bearing from the gearbox casing

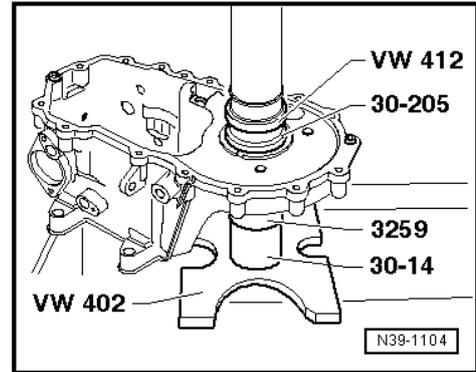
A - Support bracket , ex. -Kukko 22/2-

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



Pressing tapered roller bearing outer race into gearbox housing

- Support the gearbox casing by fitting the tube - 3259- directly underneath the bearing allotment.

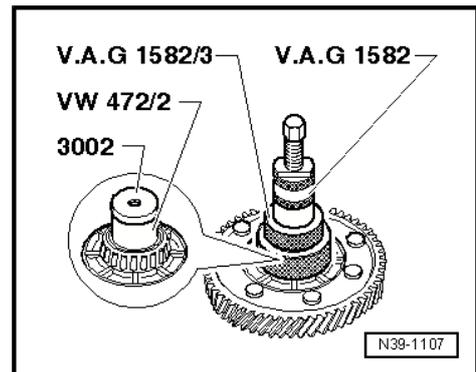


Remove the inner ring and roller bearing unit



Note

Both tapered roller bearing inner races are pulled off the differential cage in the same way.



Drive in the inner ring and conical roller bearing unit

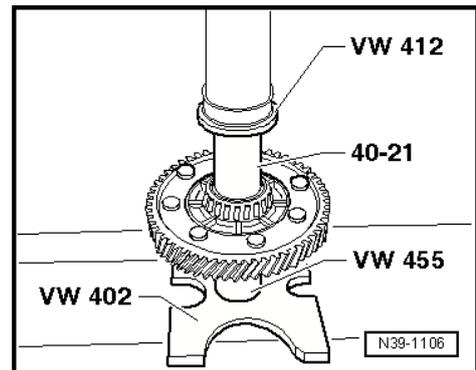
- Support inner race on opposite side using installing sleeve - VW 455- .

Shoulder of installing sleeve - VW 455- faces towards differential cage.



Note

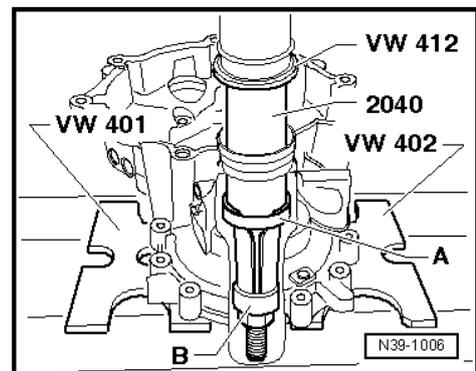
Both tapered roller bearing inner races are pressed onto the differential cage in the same way.



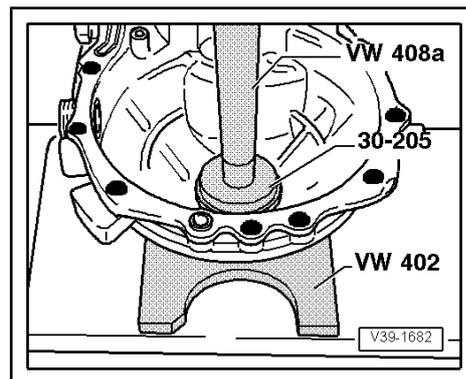
Press the outer ring of the tapered roller bearing -A- out of the clutch casing

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

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



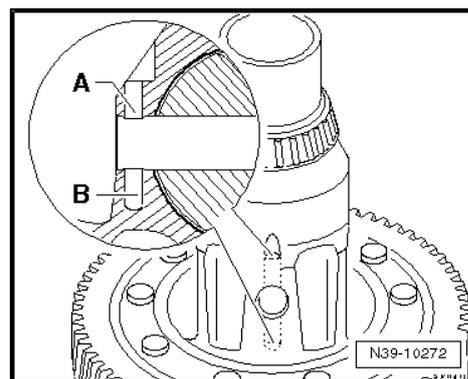
Insert the outer ring of the roller bearing into the clutch casing



Arrangement of differential cage to remove and install the clamping sleeve

- Check hole for spring pin in differential cage.

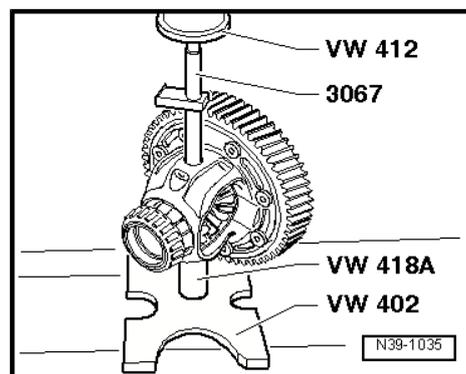
Bore	Length of spring pin (mm)	Tension sleeve	
		Removal	Installation
-A-	24.0 (short spring pin)	Removal	Installation
-A- and -B-	36.0 (long spring pin)	Removal	Installation
Continuous	36.0 (long spring pin)	Removal	Installation



Press out differential pin pin and shear off clamping sleeve

The spring pin is sheared off when pressing out.

- Remove the remaining piece of sleeve from the differential casing.

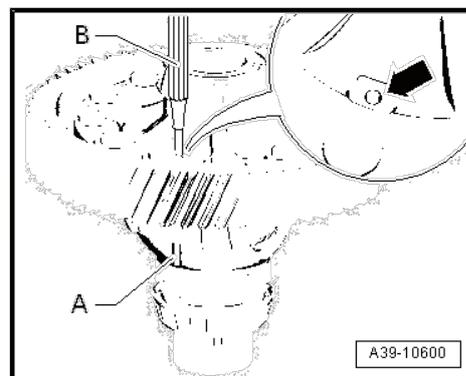


Remove the long clamping sleeve to remove the differential pin pin

- Drive clamping sleeve -A- with a drift -B- diameter 5 mm out of bore-arrow-in the differential cage.

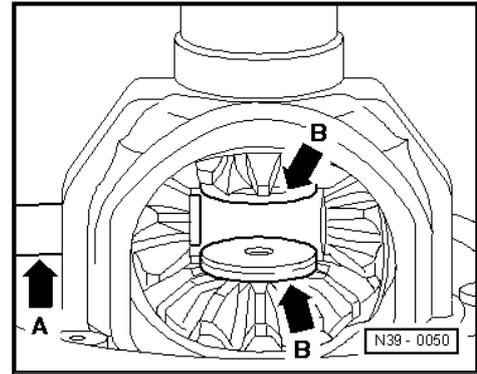
 **Note**

If there is no bore -arrow- in the differential cage, shear the clamping sleeve off



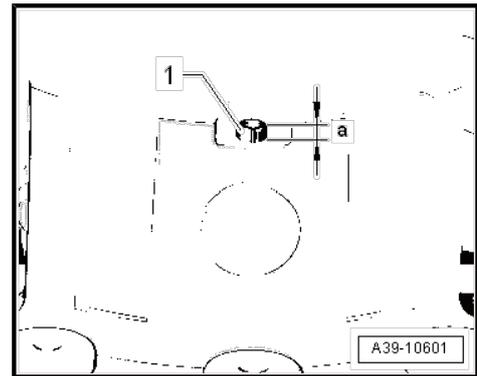
Fitting sun gear and planetary gears

- Fit the complete assembly of thrust washers lubricating with gear oil.
- Fit the two large planetary gears and secure them (for example using the flanged axle).
- Fit the small planetary gears offset by 180° and rotate them inwards.
- Press in differential pinion pin -arrow A- to first planet pinion.
- Place threaded pieces -arrows B- in the sun gears.



Installing spring pin for differential pinion pin

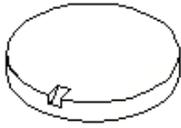
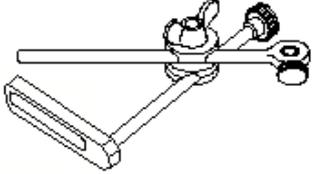
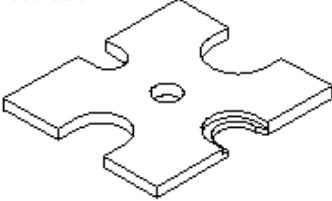
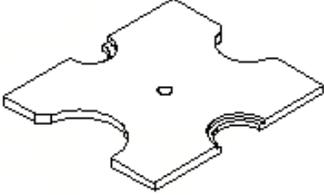
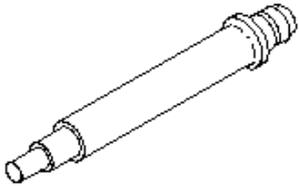
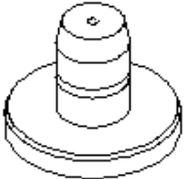
- Align hole in differential pinion pin with hole in differential cage.
- Drive in the clamping sleeve -1- with a drift to the dimension -a- = 2.5 mm.
- The clamping sleeve -1- must not touch the clutch housing.



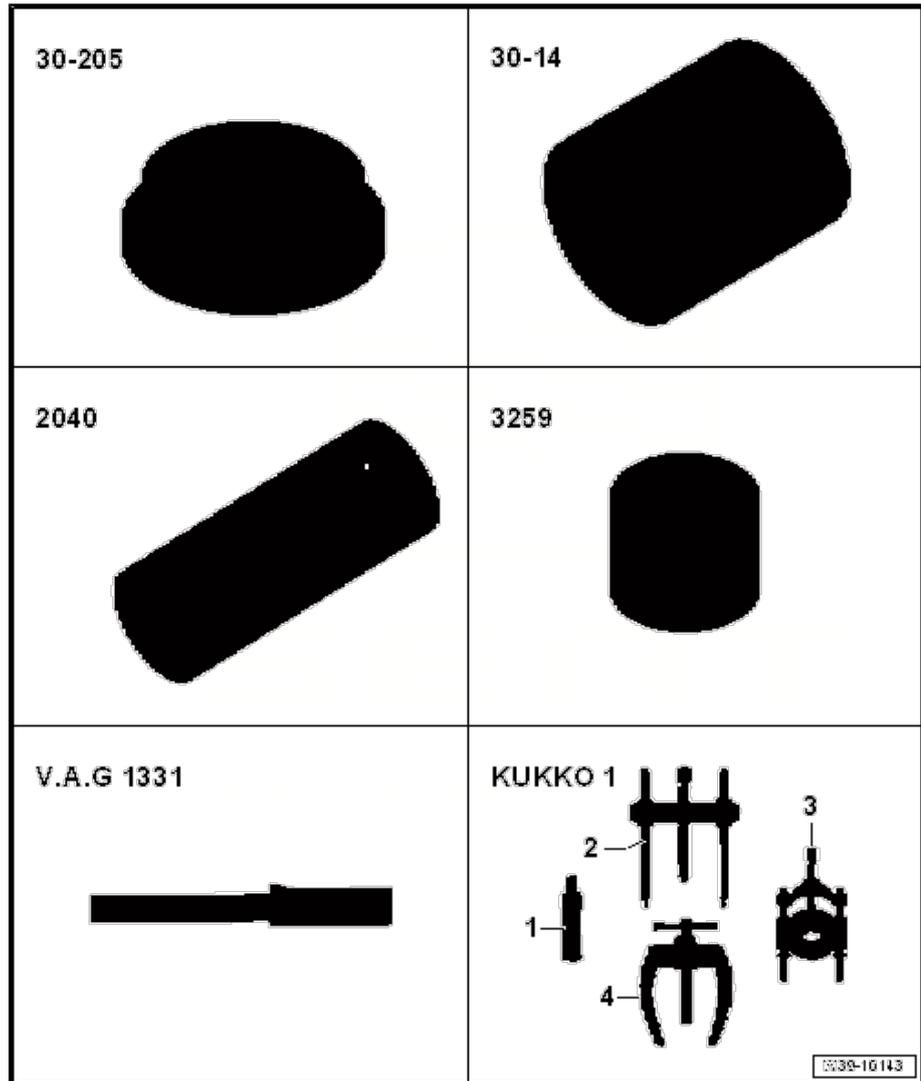
2.3 Differential: Adjust

Special tools and workshop equipment required

- ◆ End dimension plate - VW 385/17-
- ◆ Universal dial gauge bracket - VW 387-
- ◆ Tightening plate - VW 402-
- ◆ Tightening plate - VW 401-
- ◆ Die - VW 408-
- ◆ Die - VW 412-

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

- ◆ Thrust plate - 30-205-
- ◆ Tube for releasing - 30-14-
- ◆ Tube element - 2040-
- ◆ Pipe - 3259-
- ◆ Torque wrench - V.A.G 1331-
- ◆ -1- Internal puller - Kukko 21/7-
- ◆ Dial gauge

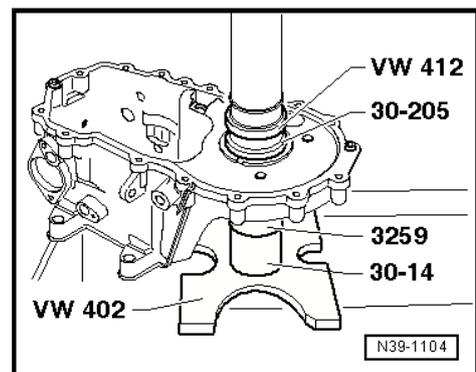


It is necessary to readjust the differential when the following components are renewed:

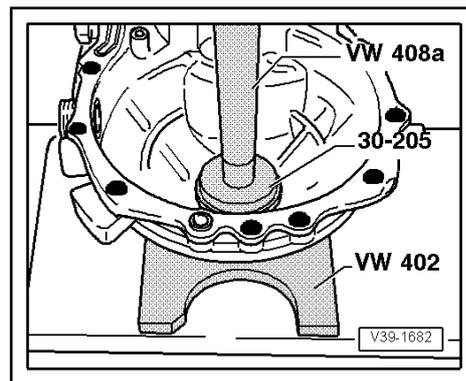
- ◆ Gearbox housing
 - ◆ Clutch housing or
 - ◆ Differential cage
- or the
- ◆ Differential tapered roller bearing
- Insert the outer ring of the roller bearing (crown side) into the gearbox casing

i Note

Inner and outer tapered roller bearing races are paired. Do not mix up.



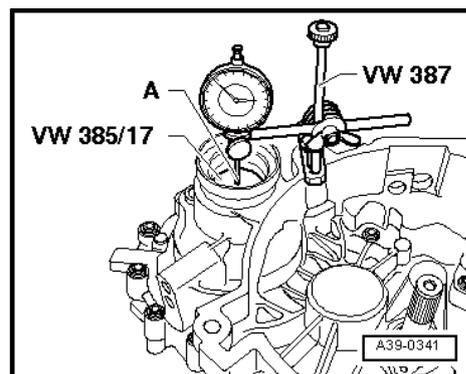
- Press tapered roller bearing outer race (opposite gear wheel) with no shim into gearbox housing.
- Insert differential in gearbox housing.
- Fit clutch housing and tighten the 5 bolts.



- Fit the gauge and set to "0" with a pretension of 1 mm.

A - 30 mm gauge extension

- Set dial gauge to "0" with 1 mm preload for bearing.
- Move the differential up and down while reading the measurement on the gauge and noting the results (for example: 1.50 mm raised).



Determining thickness of shim.

The specified bearing preload is obtained by adding a constant value for preload (0.35 mm) to the reading obtained.

As an example:

Average value	1.50 mm
+ Pressure value (const. value)	0.35 mm
Shim thickness =	1.85 mm

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

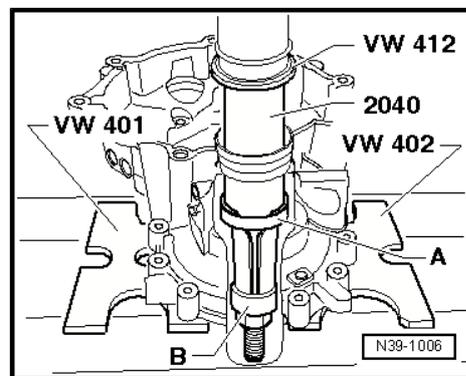
B - Internal puller 46...58 mm , e.g. -Kukko 21/7-

- Allocate the shim(s) using ⇒ Electronic parts catalogue (ETKA) .

The existence of different thickness shims will enable the selection of the correct thickness required.

If the size of the shim required is larger than those listed in ⇒ Electronic spare parts catalogue (ETKA) install two shims amounting to the correct value.

- Fit the shim of right thickness (for this example 1.85 mm) and reinsert the outer ring of the conical bearing into the clutch housing.
- Fit clutch housing and tighten bolts to specified torque setting.



Specified torques

- ◆ Gearbox housing to clutch housing