

Workshop Manual Audi TT 2007 ➤

Direct shift gearbox 02E, front-wheel drive

Edition 12.2006



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List of Workshop Manual Repair GroupsList of Workshop Manual Repair Groups

Repair Group

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



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

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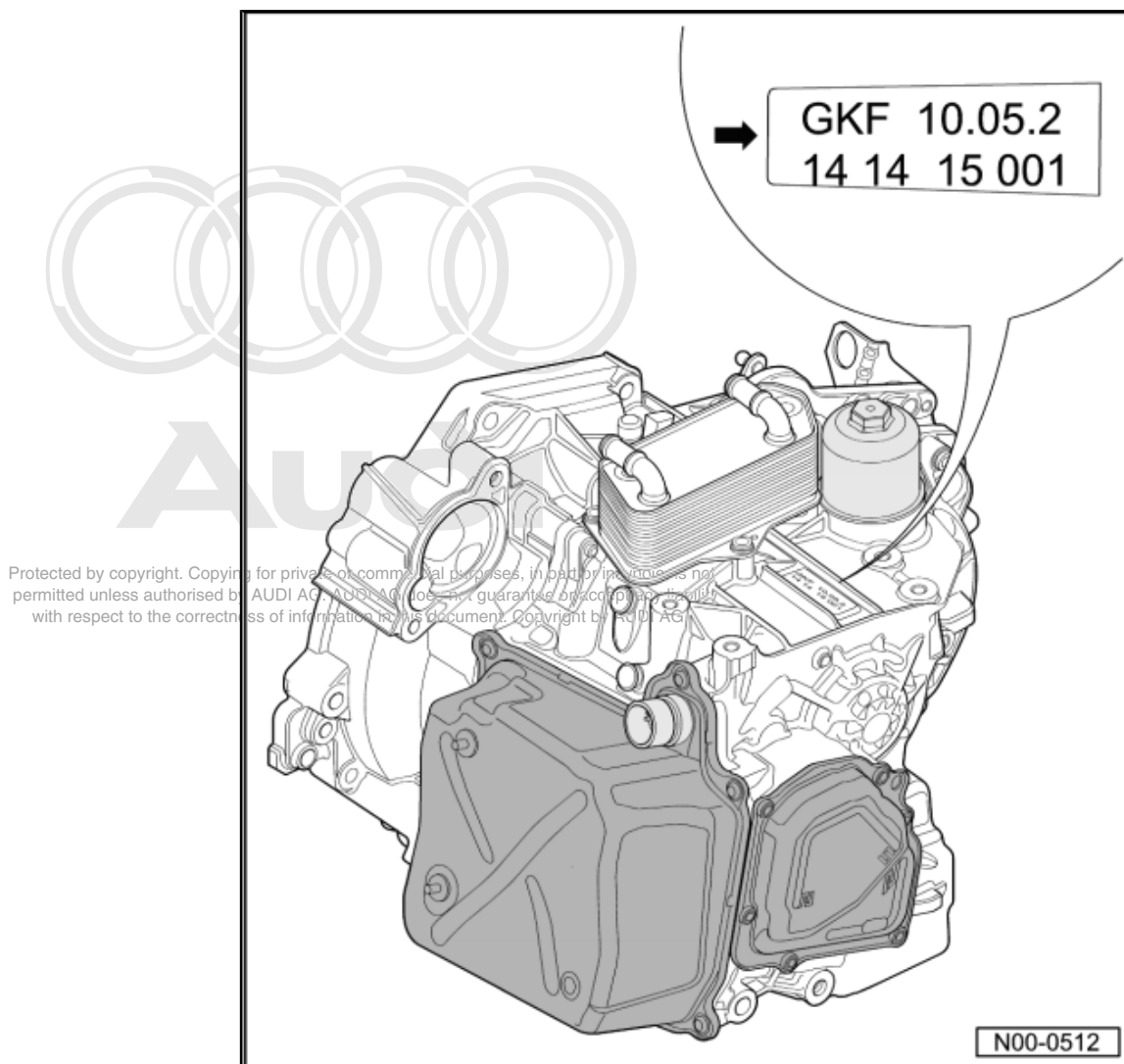


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00 – Technical data

1 Gearbox identification

The “6-speed direct shift gearbox 02E (front-wheel drive)” is installed in the Audi TT 2007 ➤. Allocation ➔ [page 2](#).



The gearbox code is located on the top of the gearbox, near the gearbox oil cooler.

Example:

- ◆ GKF = gearbox code
- ◆ 10.05.2 = date of production: 10th May 2002
- ◆ The other figures are production-related.



Note

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



2 Code letters, gearbox allocation, ratios, equipment

Direct shift gearbox			02E front-wheel drive		
Gearbox	Code letters		HXW	JPP	
	Manufactured from to		05.06	11.06	
Allocation	Model		Audi TT 2007 ▶	Audi TT 2007 ▶	
	Engine		2.0 ltr. - TFSI 147 kW 4 cylinders	2.0 ltr. - TFSI 147 kW 4 cylinders	
Ratios	Final drive I for 1st to 4th gear		69 : 17 = 4.059	69 : 17 = 4.059	
$Z_2 : Z_1$	Final drive II for 5th/6th gear and reverse gear		69 : 22 = 3.136	69 : 22 = 3.136	
	1st gear		45 : 13 = 3.461	45 : 13 = 3.461	
	2nd gear		43 : 20 = 2.150	43 : 20 = 2.150	
	3rd gear		41 : 28 = 1.464	41 : 28 = 1.464	
	4th gear		41 : 38 = 1.078	41 : 38 = 1.078	
	5th gear		35 : 32 = 1.094	35 : 32 = 1.094	
	6th gear		35 : 38 = 0.921	35 : 38 = 0.921	
	Reverse gear		22 : 14 x 33 : 13 = 3.99	22 : 14 x 33 : 13 = 3.99	
Overall ratio i_{ov} in top gear			2.888	2.888	

2.1 Calculating ratio "i"

Example:

	6th gear	Final drive
Drive gear	$ZG_1 = 40$	$ZA_1 = 20$
Driven gear	$ZG_2 = 33$	$ZA_2 = 72$

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

i_G = gear ratio = $ZG_2 : ZG_1 = 33 : 40 = 0.825$

i_A = axle ratio = $ZA_2 : ZA_1 = 72 : 20 = 3.6$

i_{ov} = overall ratio = $i_G \times i_A = 0.825 \times 3.6 = 2.97$

3 Capacities

Gearbox capacity

Capacities	Direct shift gearbox 02E, front-wheel drive
Initial filling	6.9 ltr.
Oil change	approx. 5.5 ltr.
Change interval	⇒ Maintenance ; Booklet 810
Lubricant	Gear oil for direct shift gearbox 02E Part No. ⇒ Parts catalogue

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Note

- ◆ *Use only the correct type of gear oil for the direct shift gearbox 02E (available as a replacement part). Other types of oil cause malfunctions and/or failure of the gearbox.*
- ◆ *You must also renew the gear oil filter when you change the gear oil ⇒ [page 78](#) .*
- Checking gear oil level and topping up ⇒ [page 66](#)
- Filling up with gear oil after repairs ⇒ [page 72](#)

4 Safety precautions

Observe the following precautions if tests have to be performed with the engine running.



WARNING

Accidents can be caused if a gear is inadvertently engaged while the engine is running.

- ◆ *Before working on the vehicle while the engine is running, shift the selector lever into position "P" and apply the handbrake.*

Observe the following precautions if test equipment has to be used while road-testing the vehicle:

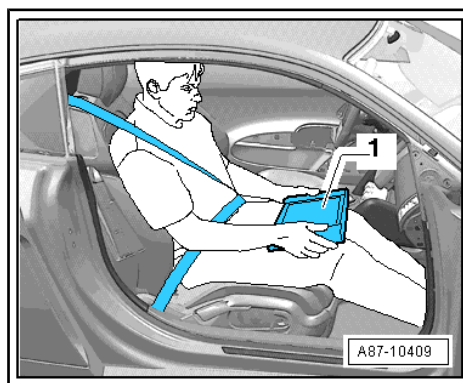


WARNING

Accidents can be caused if the driver is distracted by test equipment while road-testing, or if test equipment is not secured.

Injuries can also be caused if the passenger's airbag is triggered in a collision.

- *The use of test equipment while driving causes distraction.*
- *There is an increased risk of injury if test equipment is not secured.*
- ◆ *Move the passenger's seat to the rearmost position.*
- ◆ *Use only vehicle diagnosis and service information system -VAS 5052- or diagnosis system -VAS 5053-.*
- ◆ *Test equipment may only be operated by the passenger; the tester -1- must be placed flat on the passenger's lap as illustrated.*



Observe the following precautions to avoid possible injury and/or damage to electrical and electronic components:

- ◆ Switch off ignition before disconnecting and connecting test equipment.



Caution

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

- ◆ *Observe the correct procedure for disconnecting the battery.*
- ◆ *Always switch off the ignition before disconnecting the battery.*

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5 Notes on the direct shift gearbox 02E

5.1 General notes

Gearbox

The direct shift gearbox 02E is a dual-clutch gearbox, also referred to as "S tronic". It has the same basic construction as a 6-speed manual gearbox. The engine torque is transferred to the gearbox via the dual-mass flywheel. The two multi-plate "wet" clutches are controlled hydraulically and actuated alternately so that the gearbox is operated like an automatic gearbox, in other words the gears are engaged automatically (but can also be selected manually via the tiptronic function). There is no clutch pedal. For further information please refer to ⇒ Self-study programme No. 308 ; Direct shift gearbox 02E .

Selector mechanism

In selector lever position "P" the selector lever cable is used to engage the parking lock mechanically. All other gearshift commands and selector lever positions are transmitted via the CAN data bus from the selector lever -E313- (selector mechanism) to the mechatronic unit for direct shift gearbox -J743- .

Gear oil (gearbox and final drive)

The direct shift gearbox and front final drive have a common filling of gear oil ⇒ [page 66](#) .



Note

Use only the correct type of gear oil for the direct shift gearbox 02E (available as a replacement part). Other types of oil will cause malfunctions and/or failure of the gearbox; for Part No. refer to ⇒ Parts catalogue .

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Regulations for the disposal of oil

Drained oil must be disposed of properly.

- ◆ Improper disposal of used oil endangers the environment.
- ◆ It must not be mixed with solvents, brake fluid, coolant or similar.
- ◆ Please observe the information shown on the packaging of the oil.

Variation of gear-change points for gradients

Additional gear-change maps automatically select the gear-change points for gradients according to accelerator pedal position and road speed.

- The gear-change map for extreme uphill gradients is matched to the engine power.
- The gear-change map for extreme downhill gradients is matched to the engine braking effect.
- By selecting a gear directly via the tiptronic mode, it is possible to make use of the engine braking effect available in a particular gear, for instance when driving downhill with a trailer.

5.2 Safety functions of gearbox control unit

In the event of a failure of one or more components or sensors, the control unit J743 will activate appropriate backup functions.

This enables the gearbox to continue operating without damage, but will impair the operation and smoothness of the gearshifts.

Faults detected by the gearbox are classified in four different categories.

- 1 - The fault is stored in the memory and one of the backup programs is activated. The gear selection indicator in the instrument cluster will continue to show the currently engaged selector lever position in the normal way. The driver can continue to drive the vehicle (with certain restrictions), and the condition is not critical to the safety of the vehicle or to the gearbox itself. If at all, the driver will only notice the fault if he experiences driveability problems, and will then automatically contact an Audi Service Partner.
- 2 - Certain positions on the gear selection indicator in the instrument cluster start to flash. This is to inform the driver that this particular selector lever position is currently not available. Example: position "D" will start flashing if the selector lever is moved from position "R" to position "D" while the vehicle is still rolling backwards. To avoid damage to the gearbox, the mechatronic unit for direct shift gearbox -J743- prevents 1st gear from being engaged while the vehicle is moving backwards. 1st gear will only be engaged when the vehicle comes to a standstill.
- 3 - The complete gear selection indicator lights up and flashes; the currently engaged selector lever position is highlighted. This shows the driver that a temporary critical fault in the gearbox has been detected. Example: the gearbox has been overloaded or overheated, for instance by towing an excessively heavy load. The driver can continue to drive the vehicle when the gearbox has cooled off, but will need to avoid placing a heavy load on the transmission.
- 4 - The gear selection indicator flashes; the currently engaged selector lever position is no longer indicated. This shows the driver that a critical and permanent fault in the gearbox has been detected. It may no longer be possible to use all gears, so this condition is critical to the safety of the vehicle and to the gearbox itself. This display is intended to warn the driver that he should contact an Audi Service Partner.

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6 Notes on tow-starting and towing



Caution

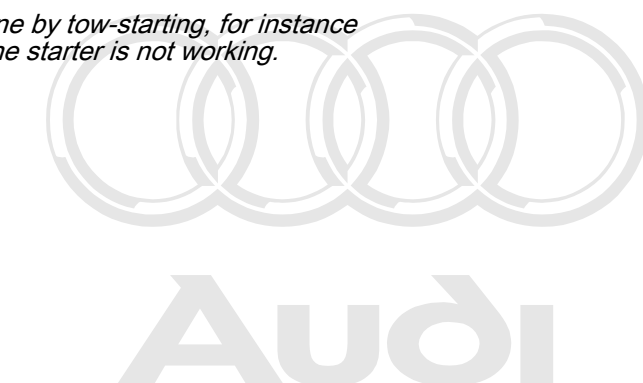
Risk of damage to the gearbox.

- ◆ *The selector lever must be in position "N" when the vehicle is towed.*
- ◆ *The vehicle must not be towed further than 50 km or at a speed in excess of 50 km/h.*



Note

It is not possible to start the engine by tow-starting, for instance if the battery is discharged or if the starter is not working.



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7 Repair instructions

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

A number of generally applicable instructions for the various repair procedures are summarised here. They apply to the work described in this Manual.

Guided fault finding, vehicle self-diagnosis and testing system

- ◆ Before servicing the gearbox, the exact cause of the failure must be determined using the functions "Guided Fault Finding", "Vehicle Self-diagnosis" and "Test Instruments" ⇒ Vehicle diagnosis, testing and information system VAS 5051.

Special tools

For a complete list of special tools used in this Workshop Manual
⇒ "Special tools, Workshop equipment"

Gearbox

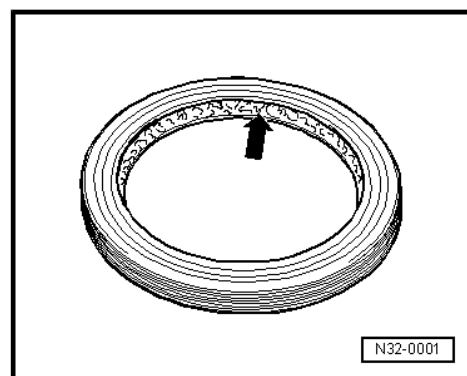
- ◆ Do not run the engine or tow the vehicle with the oil pan removed or when there is no gear oil in the gearbox.
- ◆ When installing a replacement gearbox, check the gear oil level and top up as required ⇒ [page 66](#) : capacities ⇒ [page 3](#) ; specification ⇒ Parts catalogue .
- ◆ When installing gearbox, ensure that dowel sleeves are fitted correctly.



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O-rings, oil seals and gaskets

- ◆ Renew O-rings, oil seals and gaskets.
- ◆ After removing gaskets and seals, always inspect the contact surface on the housing or shaft for burrs resulting from removal or for other signs of damage.
- ◆ Renew gaskets: completely remove the old gasket and clean the sealing surfaces thoroughly.
- ◆ Lightly lubricate O-rings with gear oil before installation to prevent them being trapped and damaged during assembly.
- ◆ Lightly oil the outer circumference of oil seals and pack the space between the sealing lips -arrow- about half full with grease ⇒ Parts catalogue .
- ◆ Do not use any other lubricants where gear oil is specified. Otherwise, there is a risk of problems occurring in the gearbox hydraulics.
- ◆ The open side of the oil seal should face the side containing the fluid.
- ◆ Observe rules for cleanliness ⇒ [page 10](#) .
- ◆ After installation, check gear oil level and top up as required ⇒ [page 66](#) .



Locking elements

- ◆ Do not overstretch circlips; renew if necessary.
- ◆ Circlips must be properly seated in the base of the groove.

Nuts, bolts

- ◆ Slacken bolts in reverse sequence to the specified tightening sequence.
- ◆ Nuts and bolts which secure covers and housings should be loosened and tightened in diagonal sequence and in stages if no tightening sequence is specified.
- ◆ Renew self-locking nuts.
- ◆ Use a wire brush to clean the threads of bolts which are secured with locking fluid. Then install bolts with locking fluid; for locking fluid refer to ⇒ Parts catalogue .
- ◆ The tightening torques stated apply to non-oiled nuts and bolts.
- ◆ Where instructions specify a torque setting plus an additional angle, these bolts must be tightened to the specified torque and then turned through the specified angle, e.g. 40 Nm + 90° (90° = a quarter turn).

8 Rules for cleanliness

- ◆ Carefully clean connection points and the surrounding area with engine cleaner or brake cleaner and dry thoroughly before opening.
- ◆ Seal off open lines and connections with clean plugs or sealing caps immediately.
- ◆ Place removed parts on a clean surface and cover them over. Use only lint-free cloths.
- ◆ Carefully cover or seal open components if repairs cannot be completed immediately.
- ◆ Only install clean components: do not remove replacement parts from packaging until just before installation.
- ◆ Protect unplugged electrical connectors against dirt and moisture and make sure connections are dry when attaching.



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30 – Clutch

1 Servicing multiple clutch - exploded view

- ◆ The clutch in the direct shift gearbox 02E consists of two sets of plates, and is therefore referred to as a "multiple clutch". The larger set of plates (located on the outside) is designated "K 1" (clutch 1), and controls the torque flow for reverse gear and gears "1", "3" and "5". The smaller set of plates (on the inside) is designated "K 2" (clutch 2), and controls the torque flow for gears "2", "4" and "6".
- ◆ Any work performed on the multiple clutch requires extra care because all the parts are balanced and matched together in production. If the components are rotated out of their original positions when repairing, this will cause imbalance and impair the smoothness of the gear-changes and reduce the service life of the unit.

Replacement parts

1 - Multiple clutch

- ☐ With circlip



Caution

The clutch plates can slip out of position inside the multiple clutch unit. The multiple clutch unit must not be dismantled at present.

! the drive plate (which forms the upper section of the multiple clutch unit) becomes detached from the splines in the outer plate carrier, the clutch plates can slip out of position in the clutch. It will then no longer be possible to adjust the clutch correctly.

The drive plate included with the replacement part is not secured with the large circlip; it is only a close fit inside the clutch.

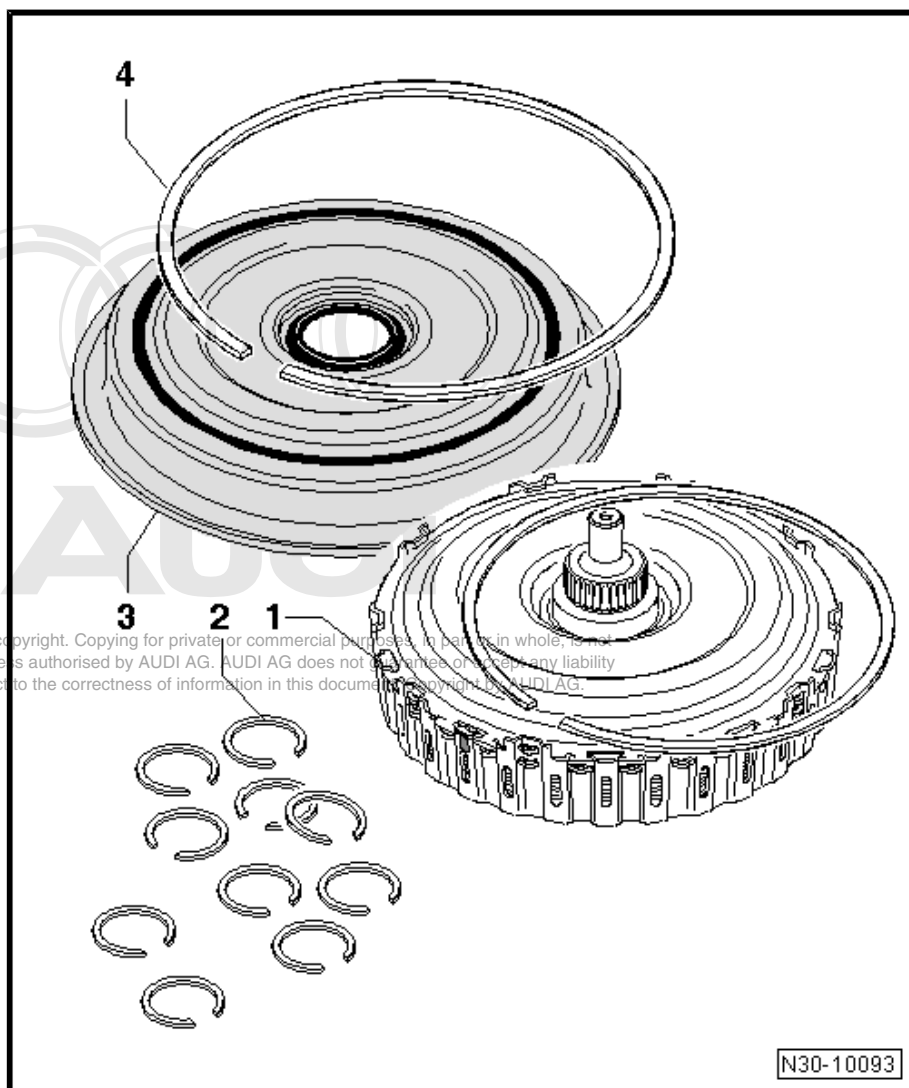
- ☐ Removing and installing
⇒ [page 13](#)

2 - Circlips

- ☐ 10x, with different thicknesses for adjusting multiple clutch
- ☐ Determining correct thickness when installing multiple clutch
⇒ [page 18](#)

3 - Clutch end cover

4 - Corrugated ring



N30-10093

Component parts of dismantled multiple clutch



Caution

The clutch plates can slip out of position inside the multiple clutch unit.

- ◆ *This diagram showing the components of the multiple clutch is for information only. The multiple clutch unit must not be dismantled at present.*
- ◆ *If the drive plate becomes detached from the splines in the outer plate carrier, the clutch plates can slip out of position in the multiple clutch. It will then no longer be possible to adjust the clutch correctly.*

1 - Outer plate carrier with clutch housing.

2 - Oil seals

□ 4 x

3 - Inner plate carrier



Caution

The clutch plates can slip out of position. If the inner plate carrier is lifted or taken out, the plates can slip out of position inside the clutch. It will then no longer be possible to adjust the clutch correctly.

4 - Outer plates

□ 4 x

5 - Inner plates

□ 4 x

6 - Thrust washer

7 - Circlip

- Fit a new circlip of the same thickness if the original circlip is removed in order to re-install the clutch plates.

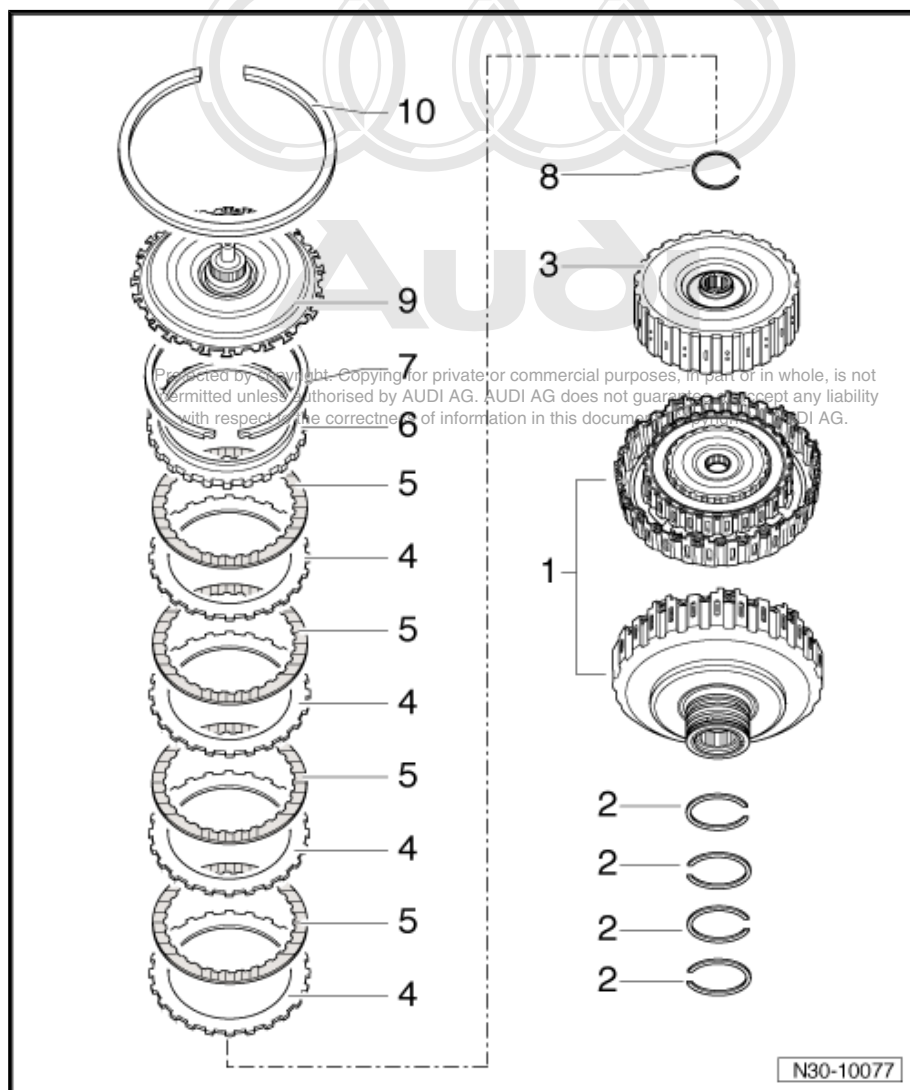
8 - Circlip

- Determining correct thickness when installing multiple clutch
⇒ [page 18](#)

9 - Drive plate

10 - Circlip

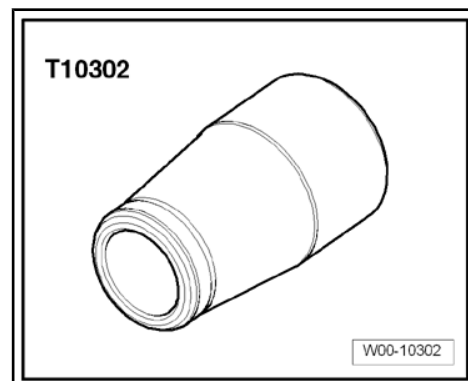
□ Renew



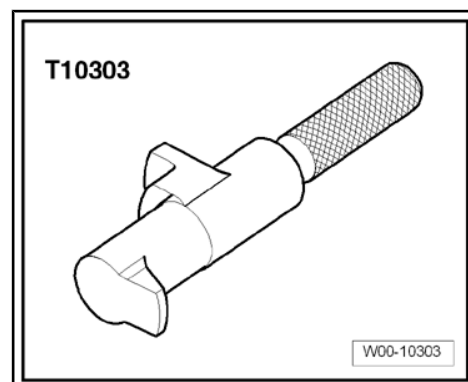
1.1 Removing and installing multiple clutch

Special tools and workshop equipment required

- ◆ Assembly sleeve -T10302-



- ◆ Retaining pin -T10303-



Note

Assembly sleeve -T10302- must be cleaned before use; do not use an assembly sleeve if it is scratched.

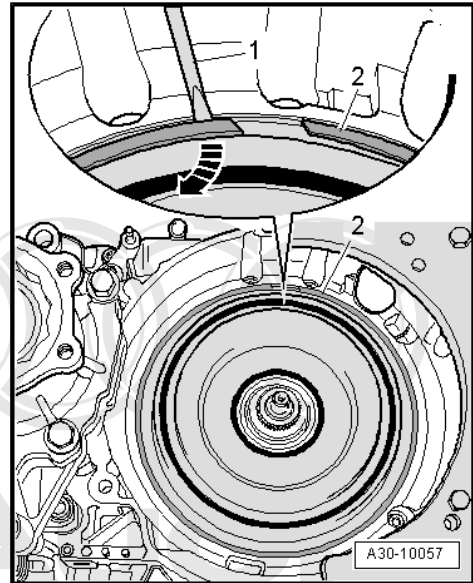
Removing

Proceed as follows:

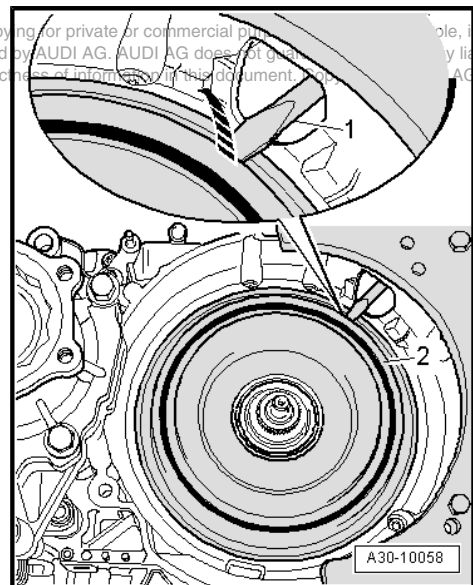
- Drain off gear oil ⇒ [page 72](#) .
- Remove direct shift gearbox ⇒ [page 43](#) .
- Secure direct shift gearbox to assembly stand in vertical position ⇒ [page 57](#) .
- Renew gear oil filter ⇒ [page 78](#) .

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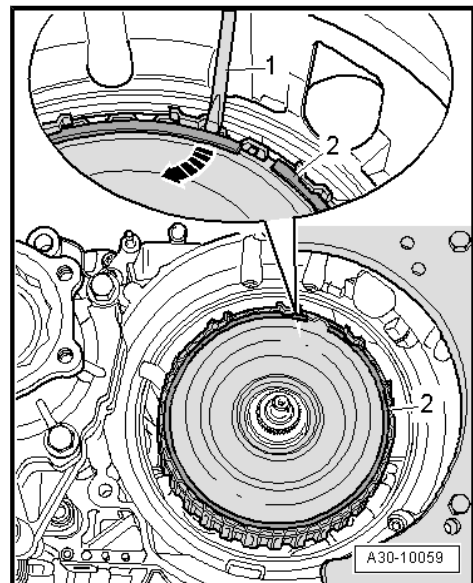
- Pry out and detach corrugated ring -2- for clutch end cover using a screwdriver -1- -arrow-.



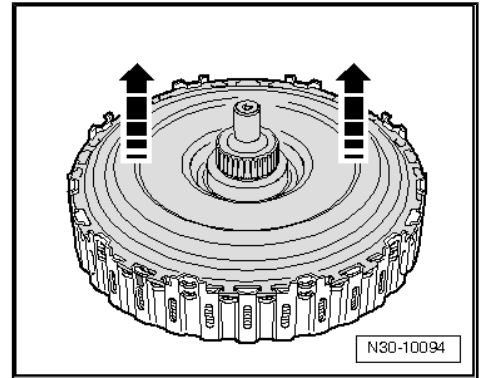
- Working through aperture for starter motor, pry out and detach clutch end cover -2- using a screwdriver -1- or other suitable lever -arrow-.



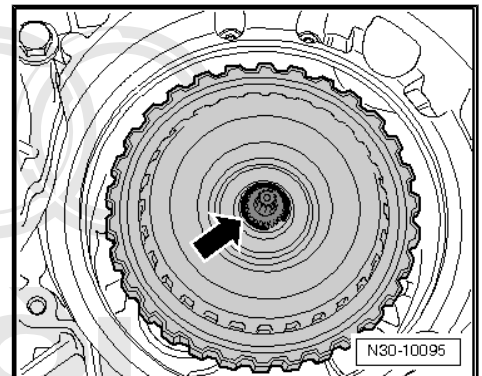
- Pry out circlip -2- for drive plate using a screwdriver -1- -arrow-.



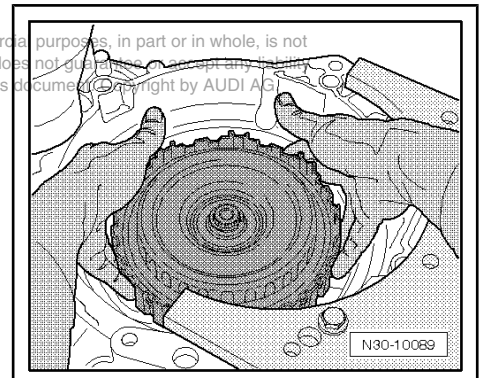
- Detach drive plate -arrows-.



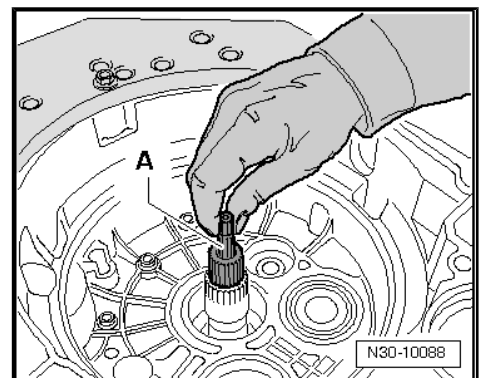
- Pry out circlip -arrow- using a screwdriver or long-nose pliers.



- Take multiple clutch out of gearbox.
- After removing multiple clutch, check whether clutch bell housing was damaged during removal.



- Pull out pump shaft -A- and place to one side.



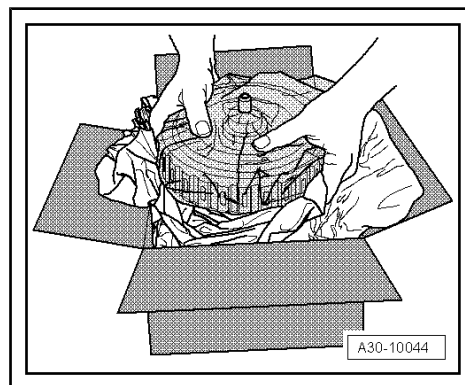
Installing



Caution

The clutch plates can slip out of position inside the multiple clutch unit.

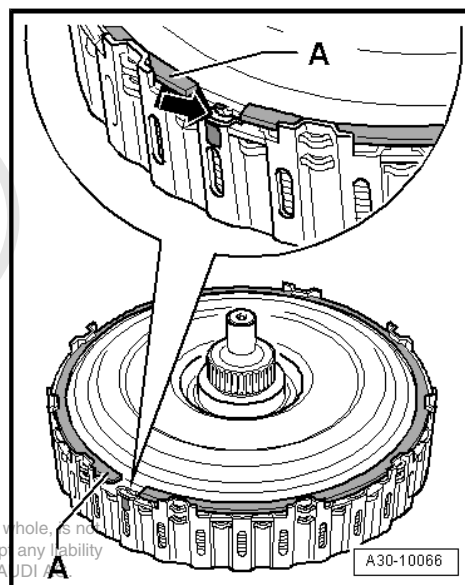
- ◆ *If the drive plate becomes detached from the splines in the outer plate carrier, the clutch plates can slip out of position in the multiple clutch. It will then no longer be possible to adjust the clutch correctly.*
- ◆ *To prevent the clutch plates from slipping inside the multiple clutch unit, keep the drive plate pressed into the outer plate carrier with both thumbs during all following steps.*



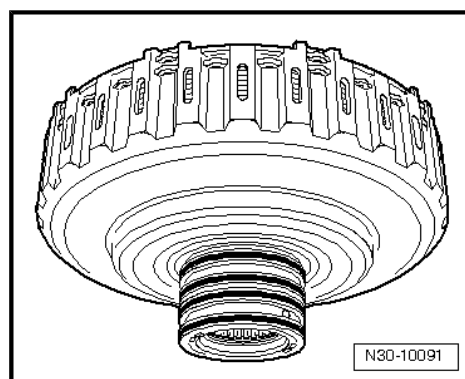
Note

The circlip for the drive plate that is supplied with the replacement parts is fitted at a later stage.

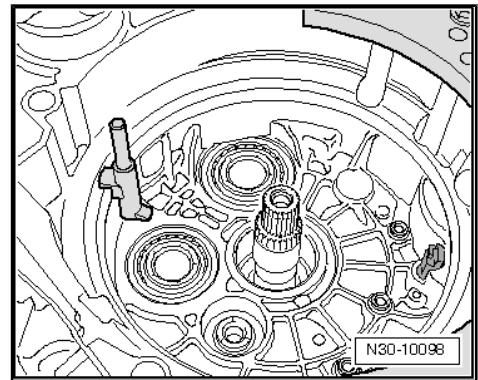
- Take new circlip for drive plate out of packaging and place to one side.
- Take multiple clutch out of packaging, holding drive plate in position.
- First fit old circlip -A- for drive plate from removed multiple clutch.
- Installation position: the lug on the drive plate and the colour-marked splines on the outer plate carrier must be located between the ends of the circlip.
- Using a screwdriver, check that circlip is fully engaged.



- Check that the 4 oil seals on the hub on the underside of the multiple clutch are correctly seated; engage in position if necessary.
- Installation position: joints of seals should be offset



- Apply retaining pin -T10303- to seat of clutch end cover as illustrated.

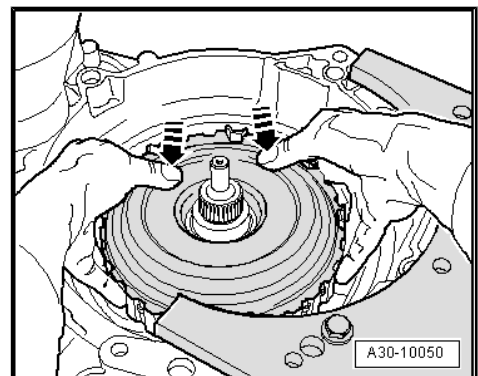


- Install multiple clutch in clutch bell housing (turn and move up and down as required), at the same time keeping the drive plate pressed into the outer plate carrier with both thumbs -arrows-.



Note

Do not allow the multiple clutch to drop into the inner plate carrier.

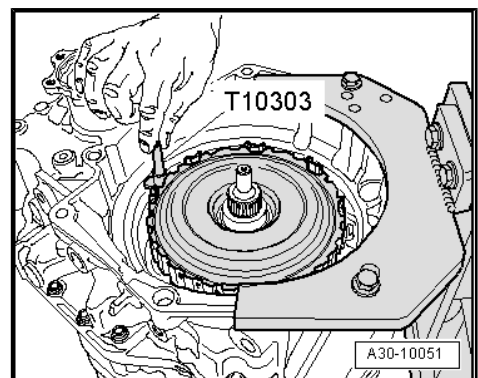


- Have a second mechanic hold the retaining pin -T10303- as illustrated until the clutch end cover is installed.



Note

The multiple clutch must not be turned from this point onwards, as this would turn the retaining pin -T10303- out of position.

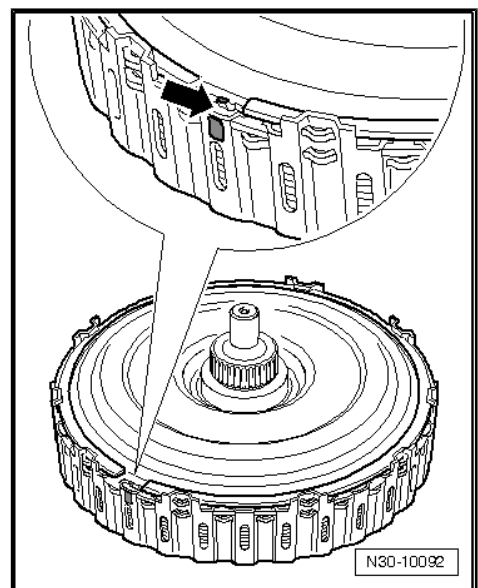


- Check whether the projecting lug -arrow- on the drive plate is positioned between the colour-marked splines on the outer plate carrier.
- If no marking is provided, use waterproof pen to mark position of drive plate in relation to outer rim of outer plate carrier as illustrated so it can be re-fitted in the same position.

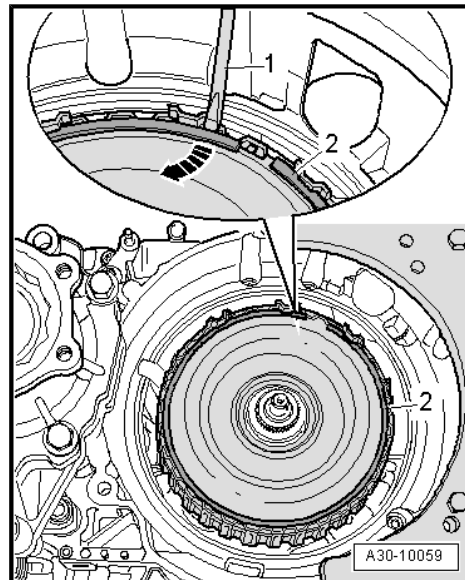


Note

When re-assembling, the lug on the drive plate must be located again at this marked position.



- Pry out old circlip -2- using a screwdriver -1- -arrow-.

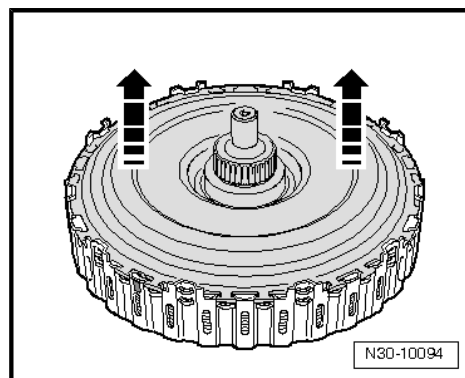


Caution

The clutch plates can slip out of position inside the multiple clutch unit.

- ◆ *If the inner plate carrier is taken out or lifted, the plates can slip out of position inside the clutch. It will then no longer be possible to adjust the clutch correctly.*

- Lift out drive plate -arrows-; if necessary lever it carefully out of splines on outer plate carrier using a screwdriver.
- Place drive plate to one side.



Adjusting multiple clutch (determining thickness of circlip)

- Select the 2 mm thick circlip from the circlips supplied with the unit.

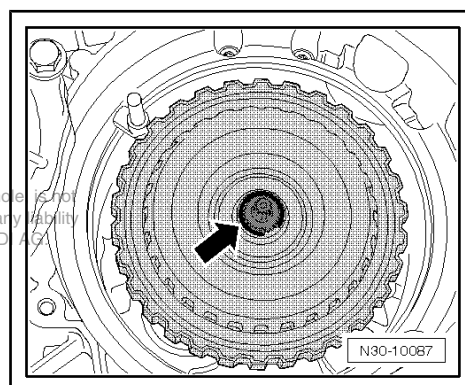


Note

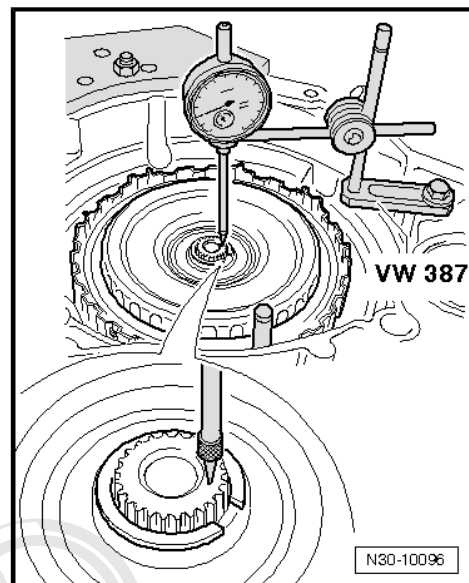
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The 2 mm circlip is fitted provisionally for measurement purposes and will be replaced later with the final circlip of the required thickness.

- Fit circlip of 2 mm thickness -arrow-.



- Secure universal dial gauge bracket -VW 387- to gearbox flange.
- For 1st measurement, apply tip of dial gauge to end of input shaft as shown in illustration.
- Preload dial gauge to 2 mm and set to "0".
- Lift up multiple clutch as far as it will go.
- Note reading on dial gauge (= axial clearance of input shaft).



- For 2nd measurement, apply tip of dial gauge to hub of inner plate carrier as shown in illustration.



Note

The tip of the dial gauge must not contact the circlip.

- Preload dial gauge to 2 mm and set to "0".
- Lift up multiple clutch as far as it will go.
- Take reading and note **down measured value**.

The thickness of the new circlip is calculated according to the following formula:

$$\text{Circlip} = 2\text{nd measured value} - 1\text{st measured value} + 1.85 (= \text{constant value})$$

The thickness of the new circlips is graduated in steps of 0.1 mm. When selecting the required circlip, round up or down to the nearest 10th of a millimetre as required. In other words, values up to 0.049 are rounded down and values of 0.050 and above are rounded up.

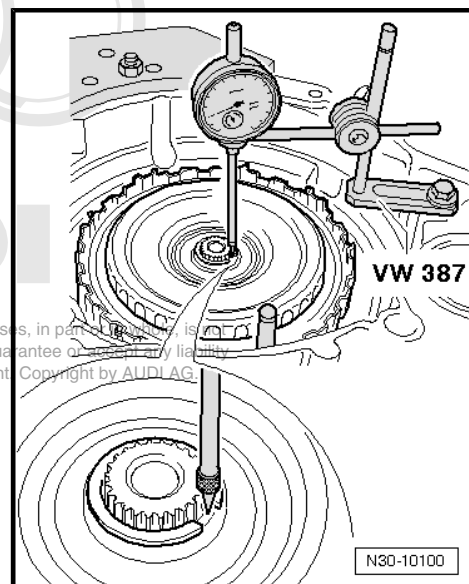
Example:

- ◆ Calculated value for new circlip is 2.27 mm: round up to the nearest 10th and select circlip with a thickness of 2.3 mm.
- ◆ Calculated value for new circlip is 2.24 mm: round down to the nearest 10th and select circlip with a thickness of 2.2 mm.



Note

If the calculated thickness of the new circlip is exactly 2.0 mm, the circlip fitted previously for taking the measurement does not have to be removed.



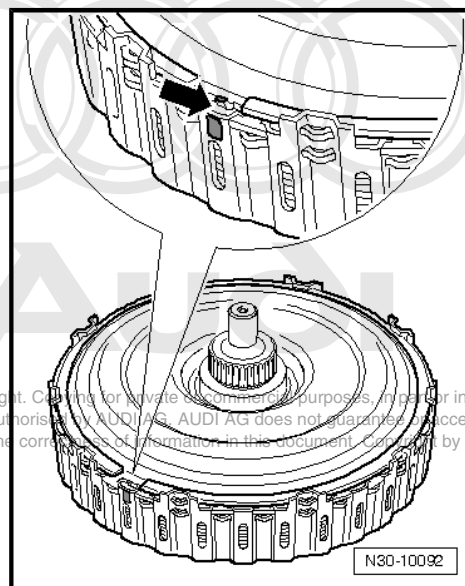
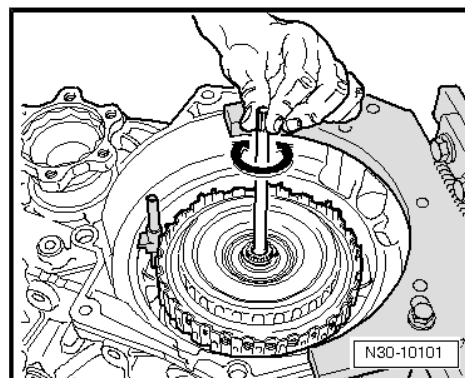
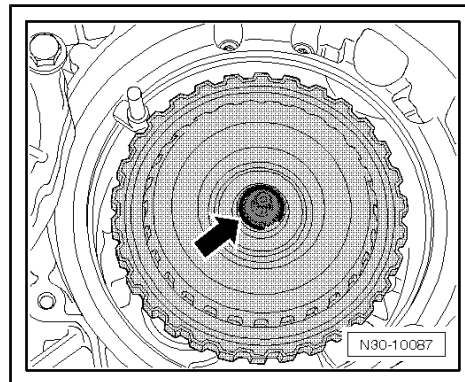
- Remove provisionally fitted circlip (2 mm) and fit new circlip with thickness as calculated above.


Note

- ◆ *Circlips must not be used more than once.*
- ◆ *The removed (provisional) circlip and all remaining circlips should be disposed of.*

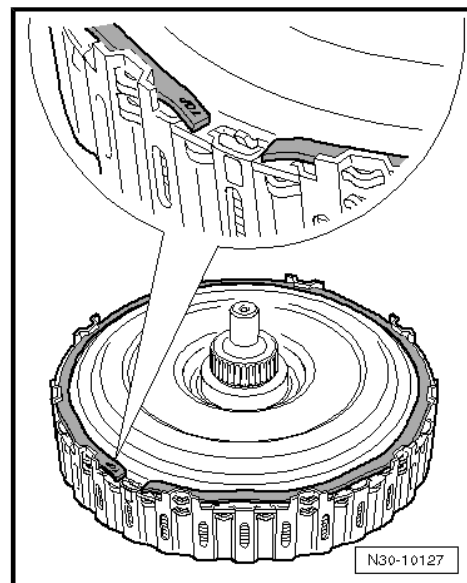
- Install pump shaft. When installing, lift the shaft and turn it slightly -arrow- so that it slides in and engages fully in the splines.

- Install drive plate in multiple clutch.
- The projecting lug -arrow- on the drive plate must be positioned between the colour-marked splines on the outer plate carrier, or the marks made earlier in this procedure.



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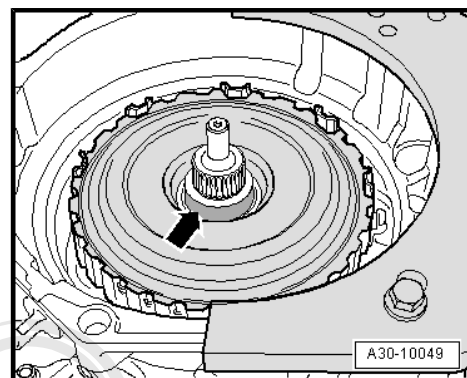
- Fit new circlip for drive plate.
- Installation position: the lug on the drive plate and the colour-marked splines on the outer plate carrier (or the corresponding marks made previously) must be located between the ends of the circlip.
- Using a screwdriver, check that circlip is fully engaged.
- Take out retaining pin -T10303- between multiple clutch and housing.



Caution

Leakage can occur at the contact surface of the clutch end cover.

- ◆ *Thoroughly degrease running surface -arrow- on drive plate for internal seal of clutch end cover.*



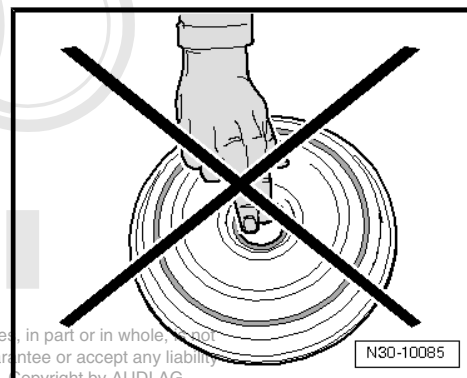
- Clean the contact surface for the outer seal of the clutch end cover.



Caution

Leakage can occur at the internal seal for the clutch end cover.

- ◆ *To ensure that the internal seal remains absolutely free of grease, do not touch the seal with your hands.*



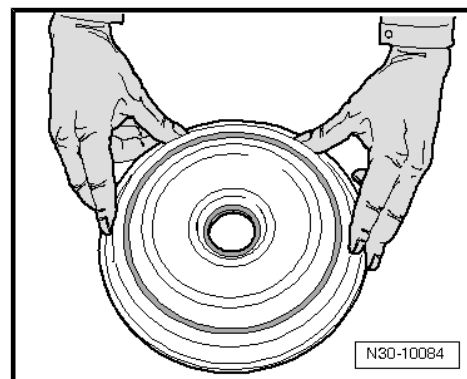
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- Take the clutch end cover out of its packaging, only taking hold of it on the outside as illustrated.
- Clean end of gearbox shaft.

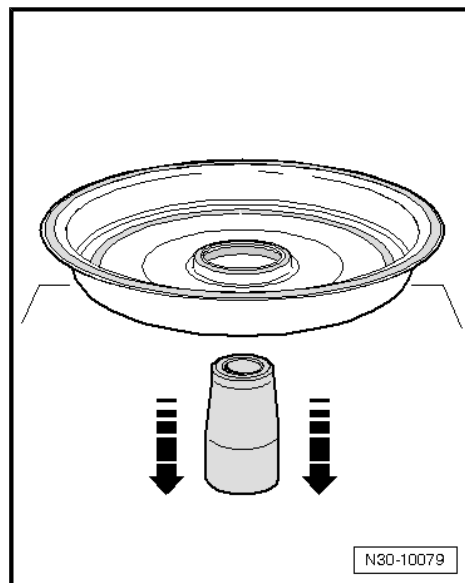


Note

- ◆ *Using gear oil, lightly lubricate the outer seal for the clutch end cover only.*
- ◆ *If there are any stickers on the inside or the outside of the clutch end cover, remove them thoroughly.*



- Place assembly sleeve -T10302- on a flat surface.
- The internal seal in the new clutch end cover must be pre-formed before installation; this is done by guiding the clutch end cover, with the outside downwards, horizontally and uniformly over the assembly sleeve -T10302- .
- Lift assembly sleeve -T10302- out of clutch end cover.



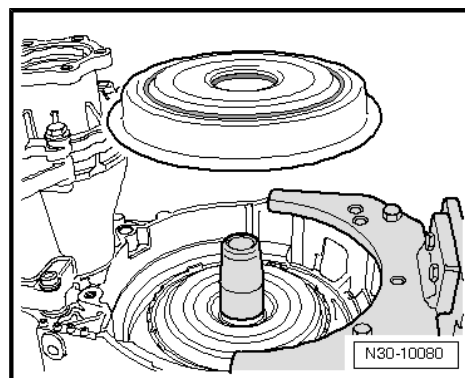
- Fit assembly sleeve -T10302- over end of multiple clutch shaft.



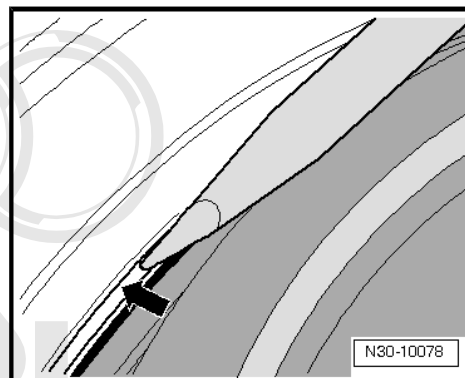
Caution

Clutch end cover can be damaged.

- ◆ *Do not attempt to drive on the clutch end cover with a hammer.*



- Guide clutch end cover with the outside upwards horizontally over assembly sleeve -T10302- and press cover uniformly on to its seat.
- If necessary use a screwdriver to lever the clutch end cover carefully into its seat as illustrated -arrow- so that the corrugated ring can be fitted.
- Install corrugated ring for clutch end cover in gearbox housing, always holding the ring in place on the opposite side so that it remains in its groove.
- Using a screwdriver, check that corrugated ring is fully engaged.
- Install gearbox ⇒ [page 53](#) .
- Fill up with gear oil for direct shift gearbox ⇒ [page 72](#) .
- Connect vehicle diagnostic, testing and information system - VAS 5051B- .
- Perform basic setting.



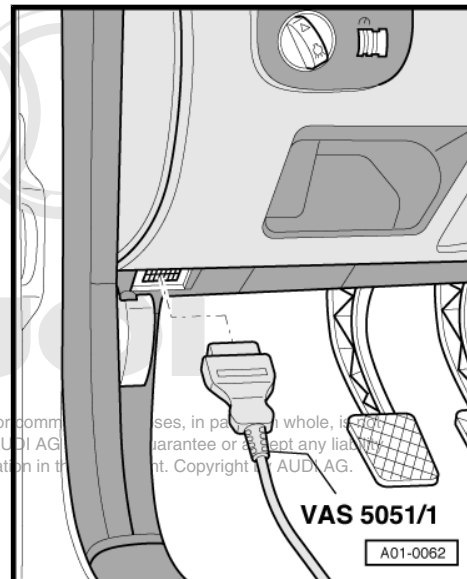
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34 – Controls, housing

1 Electrical/electronic components and fitting locations

Diagnostic connector

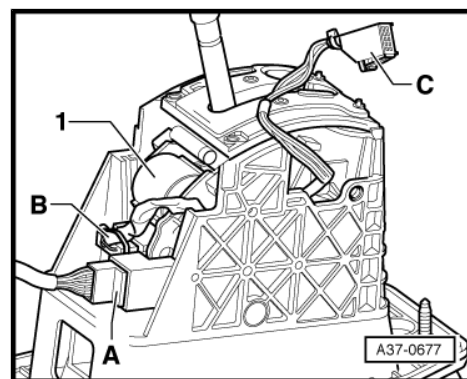
Fitting location: below knee padding on left side of steering wheel.



Selector lever lock solenoid -N110-

Fitting location: the selector lever lock solenoid -1- is located in the selector mechanism.

The solenoid is integrated in the selector mechanism; it is therefore not possible to renew only the solenoid on its own. It can only be removed or installed together with the selector mechanism
⇒ [page 33](#) .



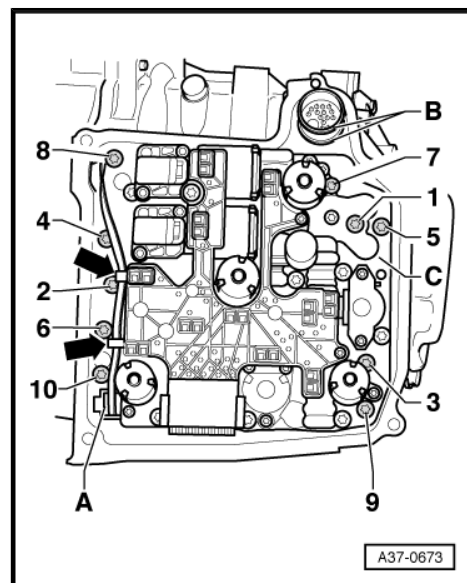
Mechatronic unit for direct shift gearbox -J743-

Fitting location: the mechatronic unit for direct shift gearbox -J743- is bolted to the front of the gearbox housing and covered by the gearbox oil pan.

The control unit is an integrated component of the mechatronic unit for direct shift gearbox -J743- .

◆ Checked via self-diagnosis

⇒ [“1.3 Removing and installing mechatronic unit for direct shift gearbox J743”, page 85](#)

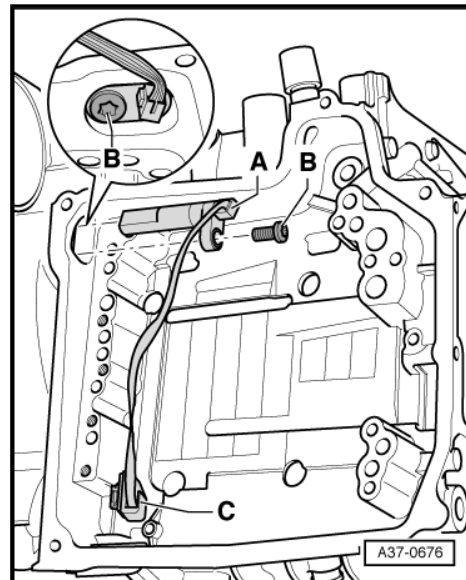


Gearbox input speed sender -G182- / oil temperature sender for multi-plate clutch -G509-

Fitting location: the gearbox input speed sender -G182- and clutch temperature sender -G509- -item A- are bolted to the gearbox housing below the mechatronic unit for direct shift gearbox -J743- .

◆ Checked via self-diagnosis

⇒ ["1.4 Removing and installing gearbox input speed sender G182 and clutch temperature sender G509"](#), page 89 .

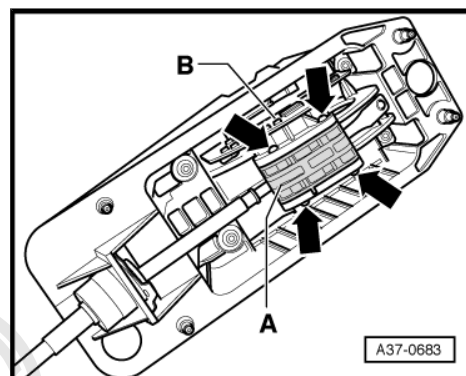


Selector lever -E313- with tiptronic switch -F189- , switch for selector lever locked in position P -F319-

Fitting location: the selector lever -E313- with tiptronic switch -F189- and switch for selector lever locked in position P -F319- is integrated in the printed circuit -B- of the selector mechanism. These components cannot be renewed separately.

◆ Checked via self-diagnosis

Selector lever -E313- with tiptronic switch -F189- and switch for selector lever locked in position P -F319- can only be removed and installed together with selector mechanism ⇒ [page 33](#) .



Selector lever position display -Y6-

Fitting location: integrated into instrument cluster

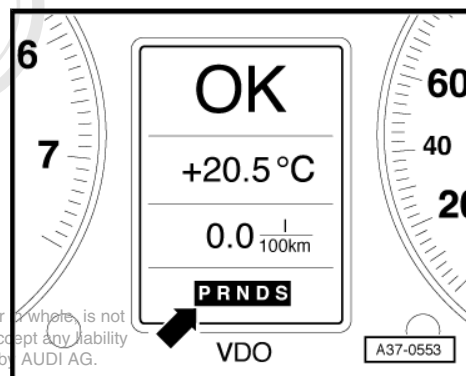


Note

Selector lever position indicator can only be renewed together with instrument cluster.

If the selector lever position indicator flashes or lights up, please refer to safety functions of gearbox control unit ⇒ [page 5](#) .

Removing and installing instrument cluster ⇒ Rep. Gr. 90

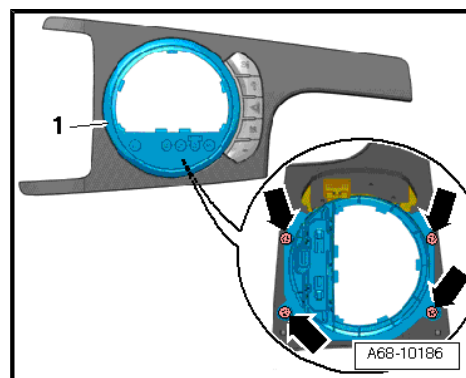


Selector lever display illumination bulb -L101-

Fitting location: in trim for selector lever boot -1-.

◆ Is checked via self-diagnosis

Removing and installing selector lever display illumination bulb -L101- ⇒ [page 28](#)



Brake light switch -F-

Fitting location: the brake light switch -arrow- is located on pedal cluster.

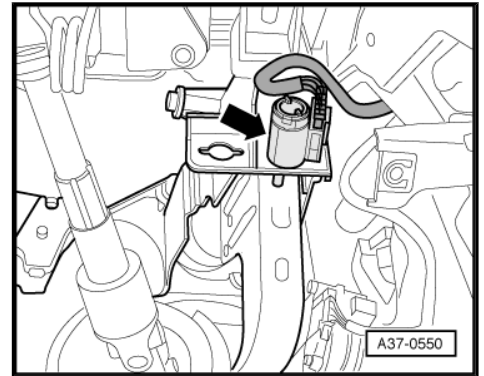
- ◆ Is checked via self-diagnosis

Removing and installing brake light switch ⇒ Rep. Gr. 46



Note

To ensure a secure fit, the switch may only be fitted once.

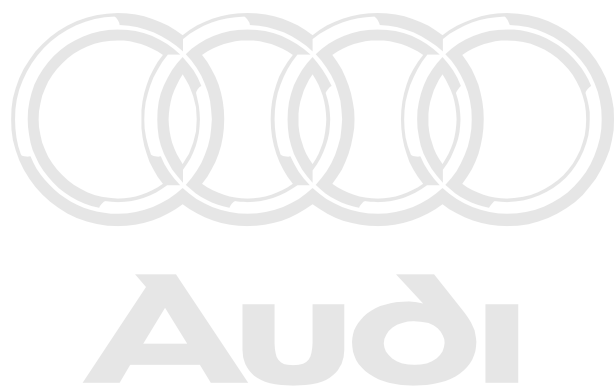
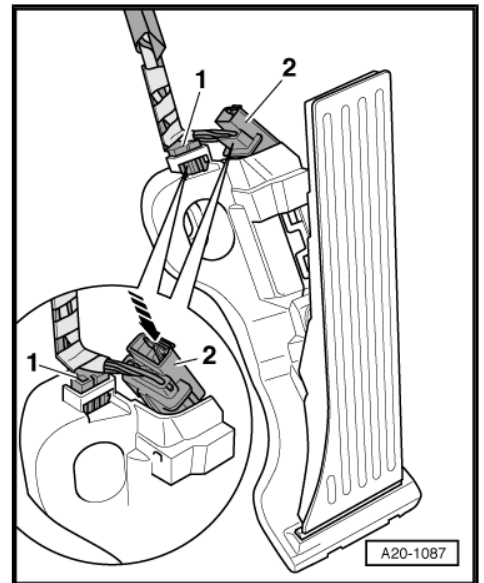


Kickdown switch -F8-

An adapted value from accelerator position sender -G79- and accelerator position sender 2 -G185- (integrated in accelerator pedal module) is stored in the engine control unit as the kickdown signal.

- ◆ Is checked via self-diagnosis
- ◆ Signal is transmitted from engine control unit to gearbox control unit via CAN bus.

Removing and installing accelerator pedal module ⇒ Rep. Gr. 20



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2 Selector lever handle, selector lever display illumination bulb -L101- - exploded view

1 - Bolt

- ☐ 1 Nm
- ☐ Secures trim for selector lever boot -item 2- to centre console trim panel

2 - Trim for selector lever boot with selector lever display illumination bulb -L101-

- ☐ Removing and installing
⇒ [page 28](#)

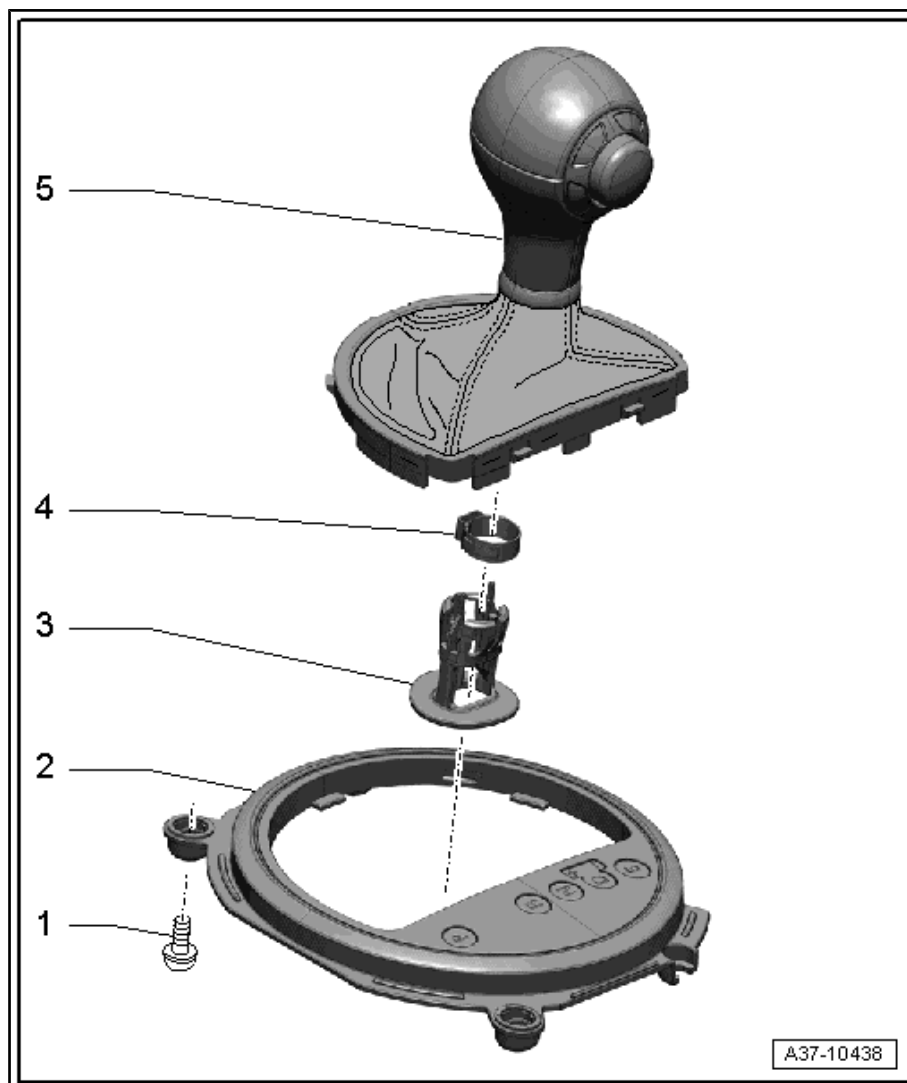
3 - Guide

4 - Hose clip

- ☐ Removing and installing
⇒ ["2.1 Removing and installing selector lever handle", page 26](#)

5 - Selector lever handle

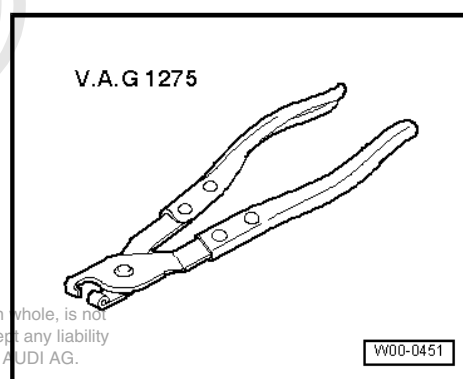
- ☐ Removing and installing
⇒ [page 26](#)



2.1 Removing and installing selector lever handle

Special tools and workshop equipment required

- ◆ Hose clip pliers -V.A.G 1275-



Removing

Proceed as follows:

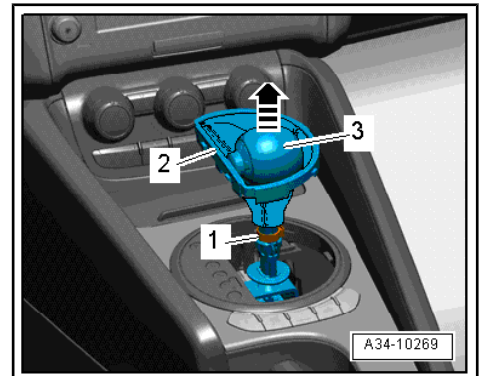
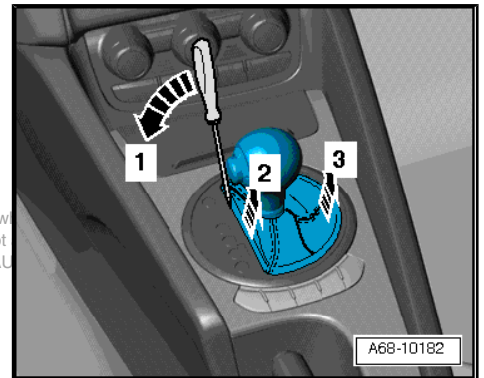
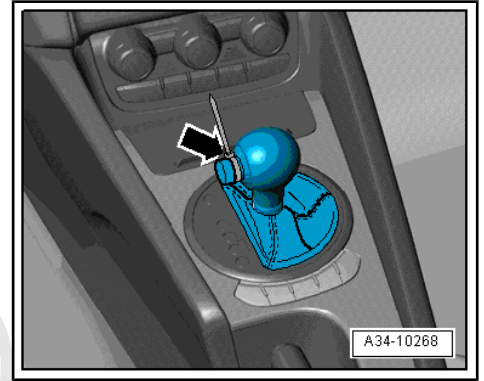


The selector lever handle is removed together with the selector lever boot.

- Apply handbrake.
- Shift selector lever into position "N".
- Use a cable tie to secure the interlock button in pulled-out position -arrow-, as shown in the illustration.
- Using a small screwdriver, carefully pry out selector lever boot at the side -arrow 1-.
- Pull up both sides of boot and detach boot -arrows 2 and 3-.

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- Turn selector lever boot -2- inside out over selector lever handle -3-.
- Release hose clip -1-.
- Pull off selector lever handle together with selector lever boot -arrow-, taking care not to touch interlock button.



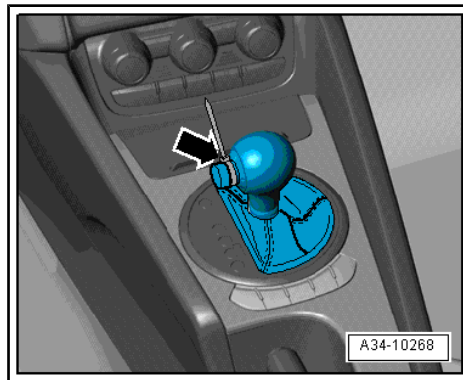
Installing

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

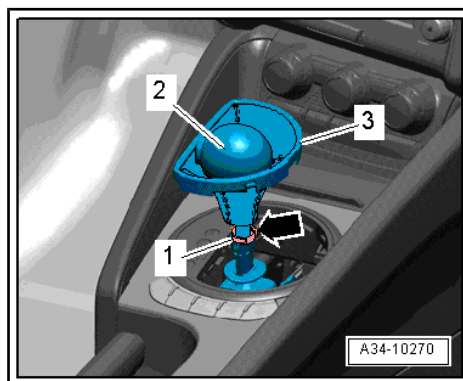


Note

- ◆ *To install the selector lever handle, the interlock button must be pulled out as far as it will go and secured with either a cable tie -arrow- or with the assembly aid supplied with the new handle.*
- ◆ *If the interlock button was not secured, do not attempt to pull it out of the selector lever handle using mechanical tools. Instead, apply a compressed air gun to the bottom of the handle, blow out the interlock button and secure it in this position.*



- Push selector lever handle fully onto selector lever.
- The interlock button faces the driver.
- The handle must engage in the annular groove on the selector lever.
- Remove cable tie or assembly aid.
- The interlock button mechanism should engage in the vertical groove on the selector lever. If not, press the interlock button into the selector lever handle.
- Bring hose clip -1- into correct position.
- The lug -arrow- on the hose clip faces front right.
- Clamp selector lever handle -2- on selector lever by tightening hose clip with hose clip pliers -V.A.G 1275- .
- Clip retainer frame -3- for selector lever boot onto trim for selector lever boot.



2.2 Removing and installing selector lever display illumination bulb -L101-

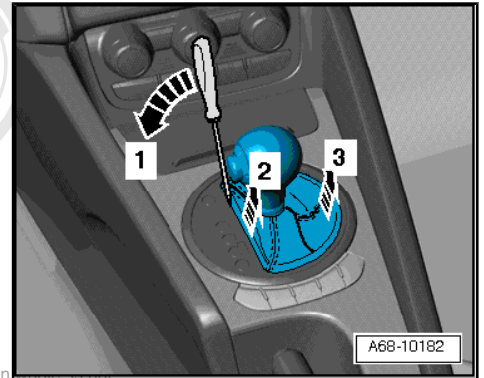
Removing

Proceed as follows:

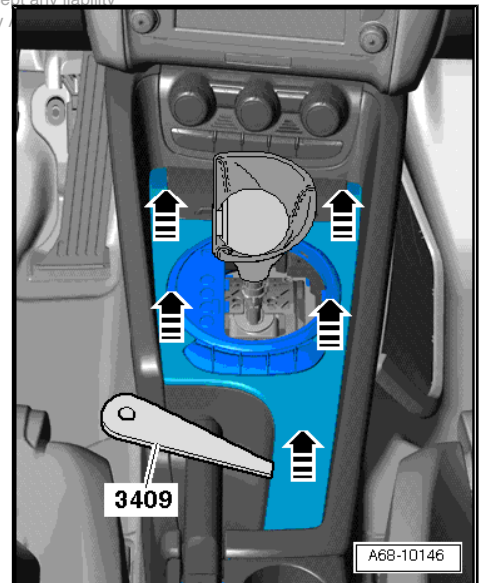
- Apply handbrake.
- Shift selector lever into position "N".
- Switch off ignition and take out ignition key.

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- Using a small screwdriver, carefully pry selector lever boot out of trim for selector lever boot -arrow 1-.
- Pull up both sides of boot and detach boot -arrows 2 and 3-.
- Turn selector lever boot inside out over selector lever handle.



- Using removal wedge 3409, pry trim panel for centre console out of centre console -arrows-.
- Unplug electrical connectors and remove trim panel for centre console.

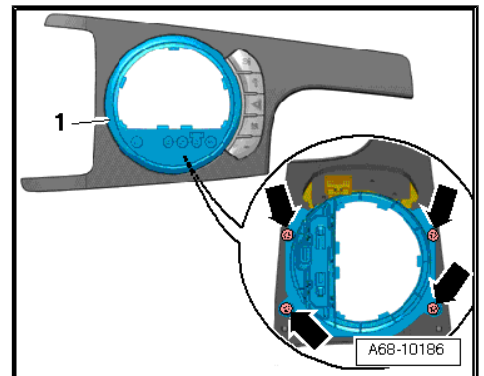


- Remove bolts -arrows- and detach trim for selector lever boot -1- together with selector lever display illumination bulb - L101- .

Installing

- Tightening torque ⇒ [page 26](#) .

Perform installation in reverse sequence of removal.



3 Servicing selector mechanism - exploded view



Note

Lubricate all bearings and moving surfaces with polycarbamide grease ⇒ Parts catalogue .

1 - Support bracket

- ☐ For selector lever cable

2 - Bolt

- ☐ 20 Nm + 90°
- ☐ 2 x
- ☐ Renew

3 - Retaining clip

- ☐ Renew

4 - Bolt

- ☐ 13 Nm

5 - Locking plate

- ☐ Renew

6 - Selector lever cable

- ☐ Do not bend or kink
- ☐ Renew selector lever cable if sleeves are damaged
- ☐ Adjusting ⇒ [page 40](#)
- ☐ Removing and installing ⇒ [page 36](#)
- ☐ Do not grease cable eye

7 - Nut

- ☐ 8 Nm
- ☐ Selector mechanism to body
- ☐ 4 x

8 - Buffer stop for selector lever

- ☐ Clipped onto selector mechanism

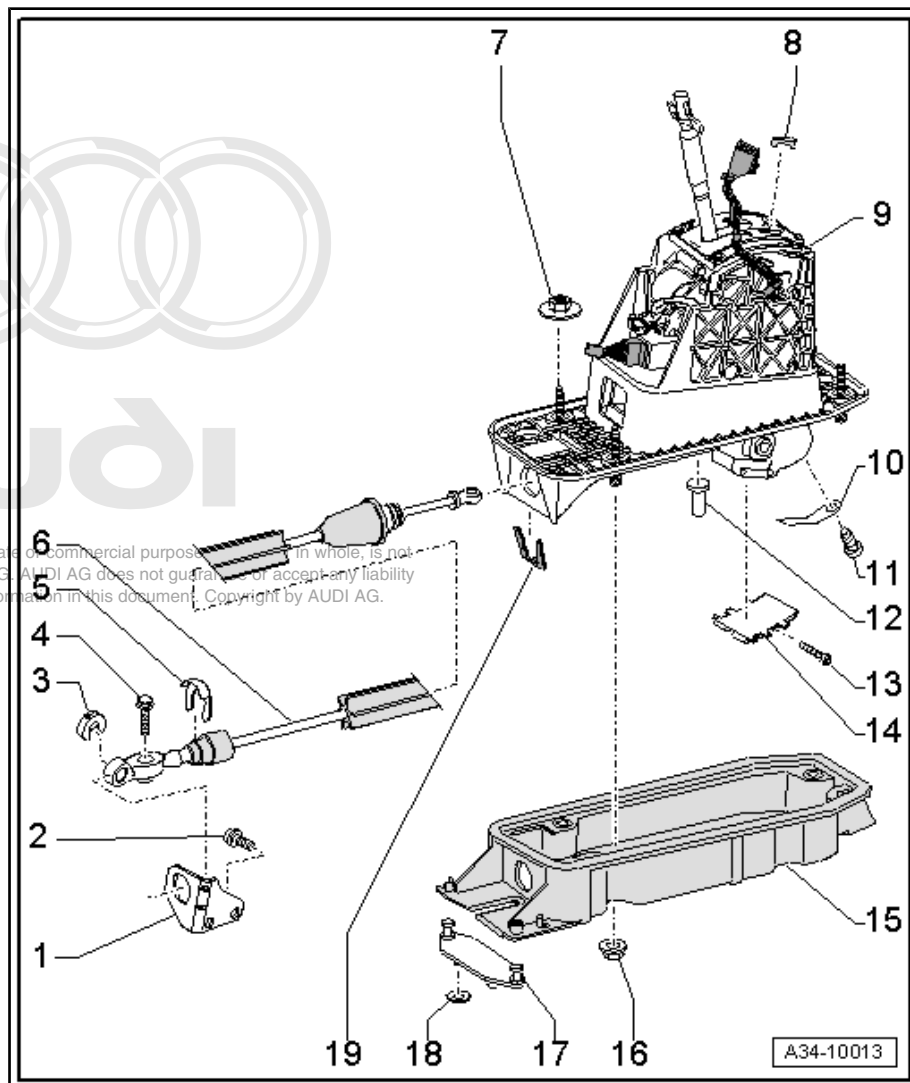
9 - Shift unit

- ☐ With integrated printed circuit for selector mechanism (selector lever -E313-)



Caution

Electronic components of selector mechanism can be damaged by electrostatic discharge.
Do not touch printed circuit with bare hands.



- ☐ Incorporates tiptronic switch -F189- and selector lever lock solenoid -N110-
- ☐ tiptronic switch -F189- and selector lever lock solenoid -N110- can be checked via "Guided Fault Finding" ⇒ Vehicle diagnosis, testing and information system VAS 5051
- ☐ If tiptronic switch -F189- or selector lever lock solenoid -N110- are defective, renew shift unit

- ☐ Manual release of selector mechanism ⇒ [page 31](#)
- ☐ Removing and installing ⇒ [page 41](#)

10 - Detent spring

11 - Bolt

- ☐ 3.5 Nm

12 - Pivot pin

13 - Bolt

- ☐ 3.5 Nm
- ☐ 4 x

14 - Detent plate

15 - Cover for shift unit

- ☐ With glued-on gasket

16 - Nut

- ☐ 9 Nm
- ☐ 4 x
- ☐ Self-locking
- ☐ Renew

17 - Bracket

18 - Lock washer

- ☐ 2 x

19 - Locking plate

- ☐ Renew

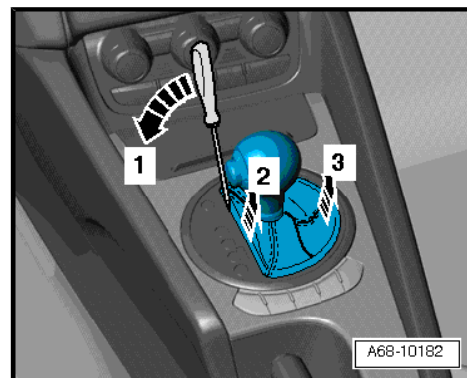
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3.1 Manual release of selector mechanism

In the event of failure of the supply voltage to the selector lever lock solenoid (discharged battery or defective fuse), or if the solenoid itself is defective, the selector lever cannot be shifted out of position "P". The vehicle then cannot be moved because the parking lock is engaged.

Proceed as follows:

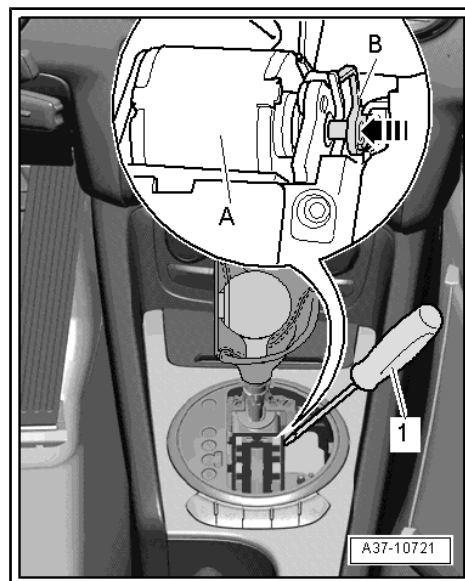
- Check fuses ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Check battery voltage ⇒ Rep. Gr. 27 .
- If no fault is found in the supply voltage, release the selector mechanism manually as follows:
- Using a small screwdriver, carefully pry selector lever boot out of trim for selector lever boot -arrow 1-.
- Pull up both sides of boot and detach boot -arrows 2 and 3-.
- Turn selector lever boot inside out over selector lever handle.



- Release selector lever lock solenoid -A- by pressing lever -B- inwards -arrow- with a screwdriver -1- and holding it in this position.
- The solenoid will then release the selector lever.
- Now press button on selector lever handle and shift selector lever out of “P”.


Note

However, if the selector lever is now moved back to “P”, the selector lever lock solenoid will again lock it mechanically in position “P” and it will have to be released once again.



3.2 Checking selector mechanism and ignition key removal lock

Proceed as follows:

- ◆ It should not be possible to operate the starter while the selector lever is in position “S”, “D” or “R” or in the tiptronic position.
- ◆ If the selector lever is moved into position “N” while the vehicle is rolling at a speed above 5 km/h, the solenoid for the selector lever lock must not engage and block the selector lever. The selector lever can be shifted into a driving gear.
- ◆ If the selector lever is moved into position “N” while the vehicle is rolling at a speed below 5 km/h (almost at a standstill), the solenoid for the selector lever lock should only engage after a delay of approx. one second. The selector lever cannot be shifted out of position “N” until brake pedal is depressed.

Selector lever in position “P” and ignition switched off:

The ignition key can be removed.

Selector lever in any position other than “P” and ignition switched off:

The ignition key cannot be removed.

Selector lever in position “P”, button on selector lever pressed in and ignition switched on:

- Brake pedal not depressed:

The selector lever is locked with the button pressed in, and cannot be shifted out of position “P”. The solenoid for selector lever lock blocks the selector lever.

- Brake pedal depressed:

The solenoid for selector lever lock releases the selector lever and a gear can be engaged. Shift the selector lever slowly from position “P” through “R, N, D and S” and check whether the display in the instrument cluster shows the correct selector lever position in each case.

Selector lever in position “N”, button on selector lever pressed in and ignition switched on:

- Brake pedal not depressed:

The selector lever is locked and cannot be shifted out of position "N". The solenoid for selector lever lock blocks the selector lever.

- Brake pedal depressed:

The solenoid for selector lever lock releases the selector lever and a gear can be engaged.



Note

- ◆ *If you depress the brake pedal you can shift from "N" to "D" without pressing the button on the selector lever.*
- ◆ *However, to shift from "N" to "R" you do have to additionally press the button on the selector lever.*

Selector lever in position "D", ignition switched on:

The selector lever is locked and cannot be shifted from "D" to "S".

- Press button on selector lever:

The selector lever is released and can be shifted from "D" to "S".

Selector lever in position "D", ignition and lights switched on:

- Shift selector lever into tiptronic gate:

The illuminated "D" symbol in the selector lever position indicator should go out and the "+" and "-" symbols should light up.

The selector lever position indicator in the instrument cluster should switch from "PRNDS" to "654321" when the selector lever is moved into the tiptronic gate.

- Move the selector lever in the tiptronic gate to "+" and "-".

When you move the selector lever to "+" or "-", the display "654321" in the instrument cluster should move one gear up or down accordingly.

- If the selector mechanism or the ignition key removal lock does not operate as described, connect vehicle diagnostic, testing and information system -VAS 5051B- .
- "Interrogate fault memory - all fault menus", trace and eliminate any faults displayed via "Guided Fault Finding".

3.3 Removing and installing selector mechanism

Removing

Proceed as follows:

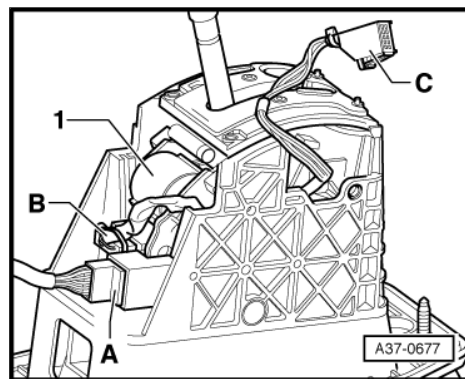
- Switch off ignition.
- Remove selector lever handle ⇒ [page 26](#) .
- Remove trim panel for centre console ⇒ Rep. Gr. 68 .
- Remove ashtray ⇒ Rep. Gr. 68 .

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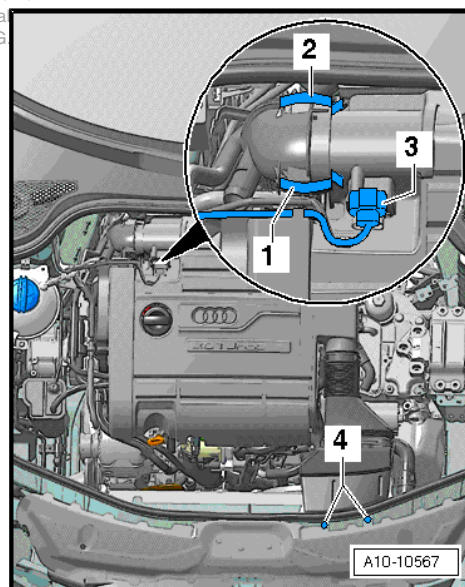
- Unplug electrical connector -A-.


Note

-Items 1, B, C- can be disregarded.



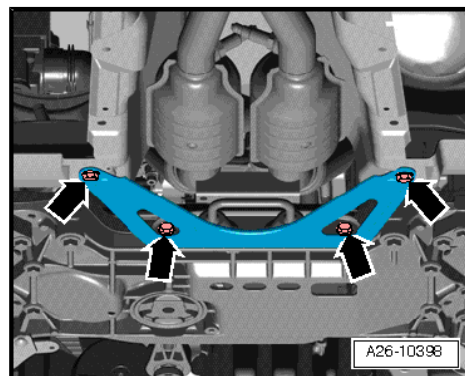
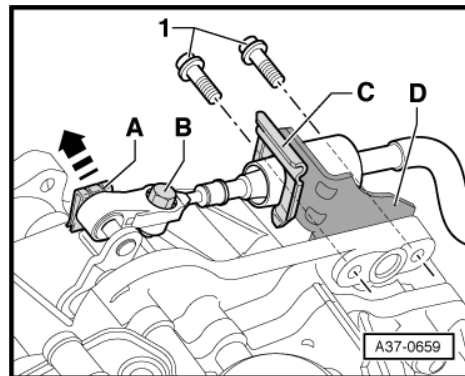
- Unplug electrical connector -3- from air mass meter -G70-.
- Release clamps -1 and 2- and disconnect air intake hose from air mass meter -G70-.
- Unbolt front intake duct from lock carrier -4-.
- Remove engine cover panel.
- Shift selector lever into position "P".



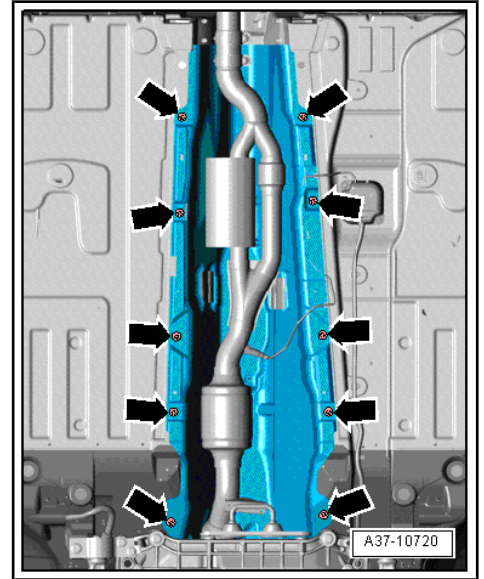
- Detach locking plate -C-.
- Press retaining clip -A- upwards and detach.
- Press selector lever cable off selector shaft lever -arrow- and pull out of support bracket -D-.


Note

- ◆ Do not bend or kink the selector lever cable.
- ◆ -Items 1 and B- can be disregarded.
- Remove Lambda probe after catalytic converter -G130- ➔ Rep. Gr. 24.
- Remove tunnel brace and bracket for exhaust system -arrows-.



- Remove heat shield -arrows-.

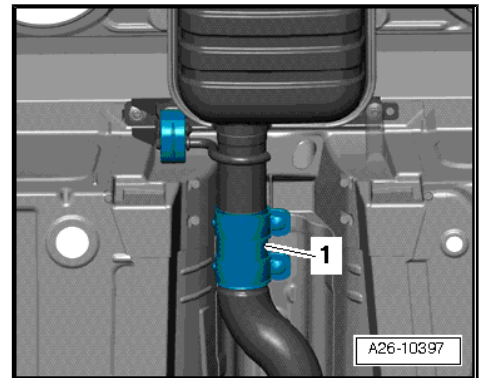


Caution

The flexible joints in the exhaust system can be damaged.

- ◆ *The flexible joints in the front exhaust pipe must not be bent further than 10°.*

- Disconnect exhaust system at clamp -1-.
- Lower front exhaust pipe with catalytic converter and front silencer slightly and pull out heat shield towards rear of vehicle.
- Re-connect exhaust system at clamp.



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**Note**

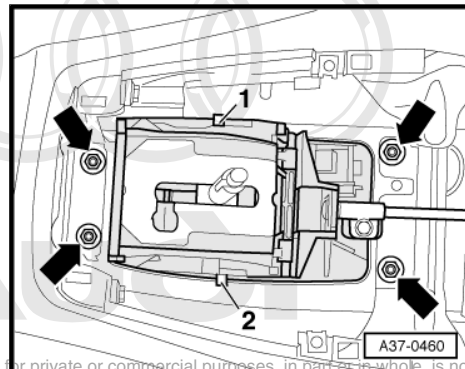
A second mechanic is required to help detach the selector mechanism under the vehicle.

- Unscrew nuts -arrows- (from above).

**Note**

-Items 1 and 2- can be disregarded.

- Detach selector mechanism together with selector lever cable from below.



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**Note**

- ◆ *Do not bend or kink the selector lever cable.*
- ◆ *It is also possible to remove the selector mechanism without the selector lever cable; to do so, you first have to detach the selector lever cable from the selector mechanism*
⇒ ["3.4 Removing and installing selector lever cable"](#)
[page 36](#) .

Installing

- Tightening torques ⇒ [page 30](#)

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

**Note**

- ◆ *Renew locking plate and retaining clip for selector lever cable.*
- ◆ *Do not bend or kink the selector lever cable.*
- Install heat shield ⇒ Rep. Gr. 66 .
- Install exhaust system and align so it is free of stress ⇒ Rep. Gr. 26 .
- Install ashtray ⇒ Rep. Gr. 68 .
- Install trim panel for centre console ⇒ Rep. Gr. 68 .
- Install selector lever handle ⇒ [page 26](#) .
- Adjust selector lever cable ⇒ [page 40](#) .
- Check selector mechanism and ignition key removal lock
⇒ [page 32](#) .

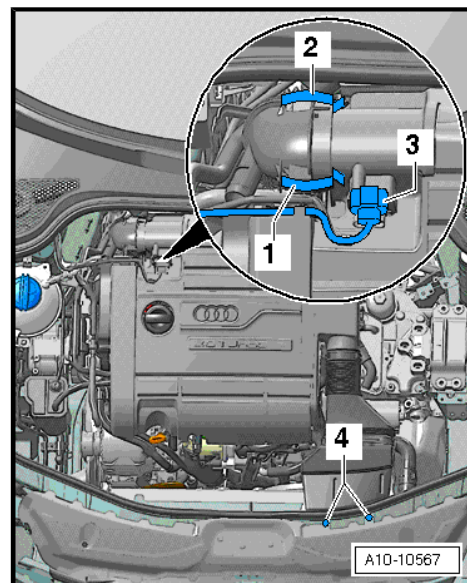
3.4 Removing and installing selector lever cable

Removing

Proceed as follows:

- Shift selector lever into position "P".
- Switch off ignition.

- Unplug electrical connector -3- from air mass meter -G70- .
- Release clamps -1 and 2- and disconnect air intake hose from air mass meter -G70- .
- Unbolt front intake duct from lock carrier -4-.
- Remove engine cover panel.

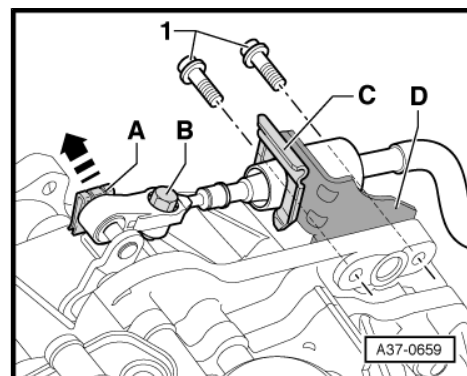


- Detach locking plate -C-.
- Press retaining clip -A- upwards and detach.
- Press selector lever cable off selector shaft lever -arrow- and pull out of support bracket -D-.

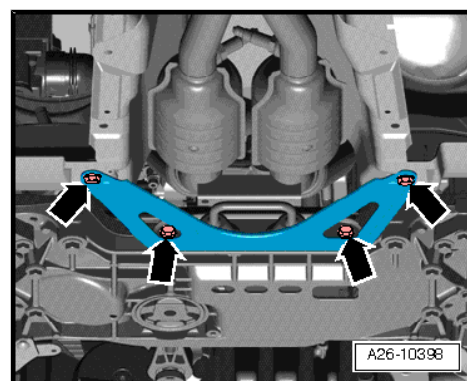


Note

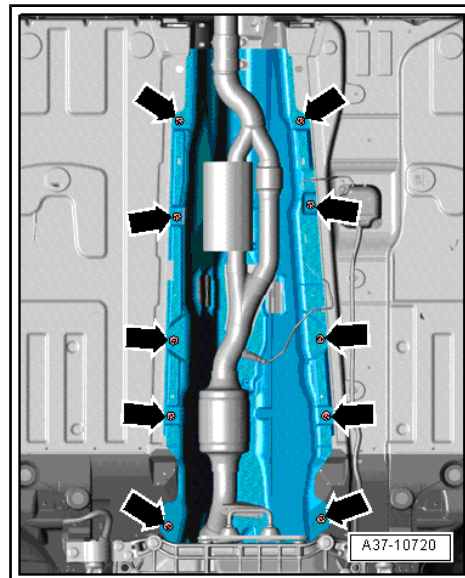
- ◆ **Do not bend or kink the selector lever cable**
- ◆ **-Items 1 and B- can be disregarded.**



- Remove Lambda probe after catalytic converter -G130- ⇒ Rep. Gr. 24 .
- Remove tunnel brace and bracket for exhaust system -arrows-.



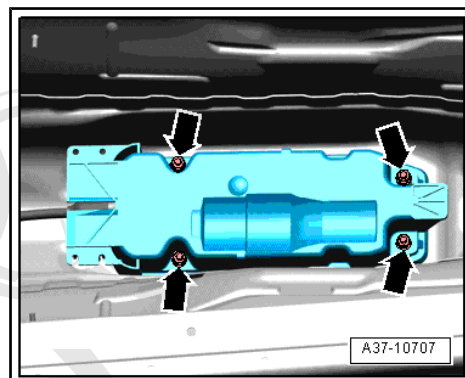
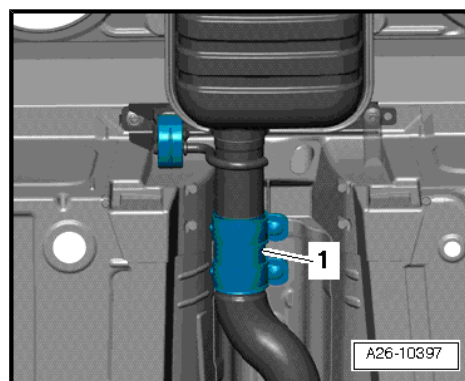
- Remove heat shield -arrows-.


Caution

The flexible joints in the exhaust system can be damaged.

- ◆ *The flexible joints in the front exhaust pipe must not be bent further than 10°.*

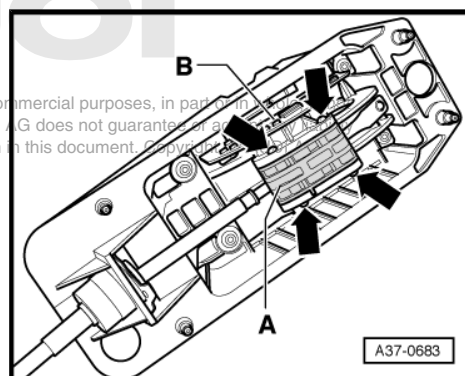
- Disconnect exhaust system at clamp -1-.
- Lower front exhaust pipe with catalytic converter and front silencer slightly and pull out heat shield towards rear of vehicle.
- Re-connect exhaust system at clamp.
- Detach cover for shift unit -arrows-.
- Carefully slide cover for shift unit together with sleeve along selector lever cable towards front of vehicle, taking care not to damage sleeve.


Caution

Electronic components of selector mechanism can be damaged by electrostatic discharge.

- ◆ *Do not touch printed circuit -B- with bare hands.*

- Unscrew bolts -arrows-.
- Unclip retaining tabs on both sides and detach detent plate -A- from shift unit.



- Shift selector lever to position “S”.
- Pull down locking plate -1- for selector lever cable and remove.
- Pull plastic retaining spring -2- forwards slightly and press pivot pin -3- upwards only as far as necessary -arrow-.

i Note

Ensure that pin is not pressed out completely.

- Pull selector lever cable -4- out of shift unit.

i Note

Do not bend or kink the selector lever cable.

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Installing

- Tightening torques ⇒ [page 30](#)

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

i Note

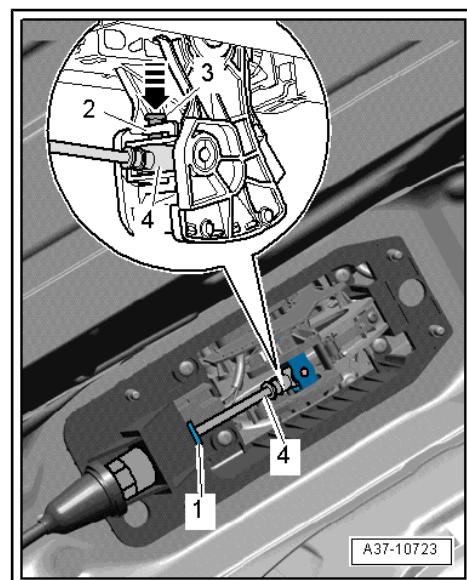
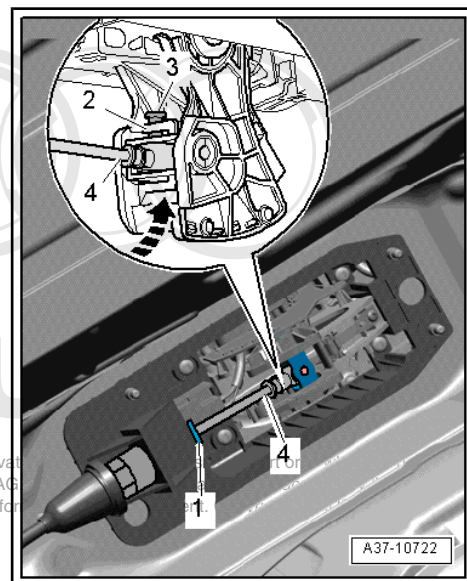
- ◆ *Renew locking plates and retaining clip for selector lever cable.*
- ◆ *The selector lever cable must be renewed if the sleeves are damaged.*

- Guide selector lever cable into cover for shift unit, taking care not to damage sleeve.
- Engage sleeve in cover for shift unit.

i Note

Check that the sleeve is seated correctly and not twisted.

- Insert end of selector lever cable -4- into joint on selector lever.
- Press pivot pin -3- downwards -arrow-.
- The plastic securing spring -2- should lock the pin in position.
- Secure selector lever cable to shift unit using new locking plate -1-.
- Installation position: angled end of locking plate faces shift unit.



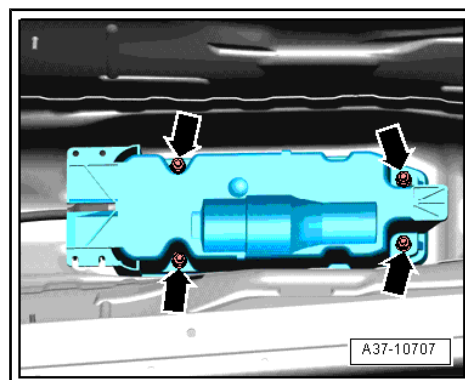
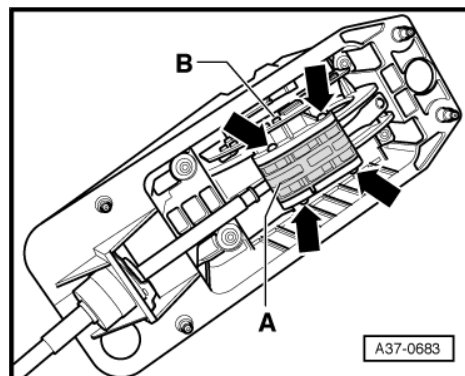


Caution

Electronic components of selector mechanism can be damaged by electrostatic discharge.

- ◆ *Do not touch printed circuit -B- with bare hands.*

- Clip detent plate -A- into position on both sides.
- Tighten bolts -arrows-.
- Loosely attach cover for shift unit (with glued-on seal) to shift unit -arrows-, making sure that seal is seated correctly.
- Fit sleeve for selector lever cable in cover for shift unit.

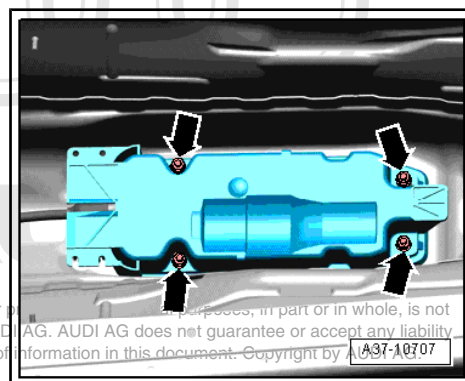
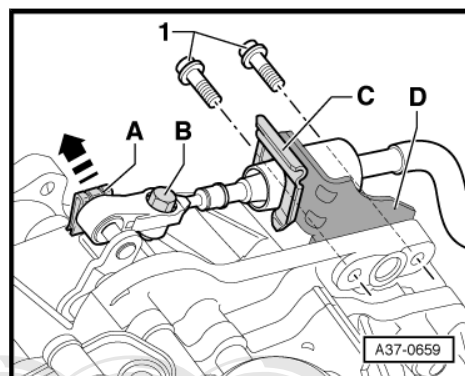


- Press selector lever cable onto selector shaft lever on gearbox in opposite direction of -arrow-.
- Fit retaining clip -A- and press downwards to secure.
- Install locking plate -C-.
- Move selector lever from "S" to "P".



Note

- ◆ *Check that selector lever moves freely.*
- ◆ *If the selector mechanism is stiff, renew the selector lever cable or service the selector mechanism.*
- Secure cover for shift unit -arrows-.
- Install heat shield ⇒ Rep. Gr. 66 .
- Install exhaust system so it is free of stress ⇒ Rep. Gr. 26 .
- Adjust selector lever cable ⇒ [page 40](#) .
- Check selector mechanism ⇒ [page 32](#) .



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3.5 Adjusting selector lever cable

Procedure

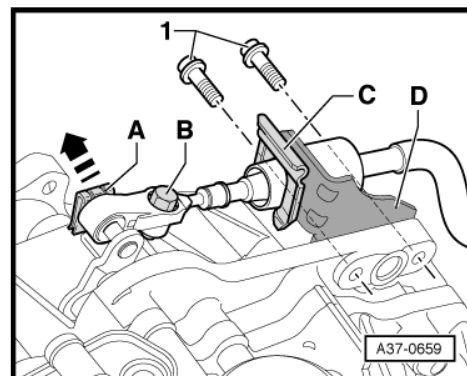
Proceed as follows:

- Remove air cleaner housing (top and bottom sections) ⇒ Rep. Gr. 24 .
- Selector mechanism and selector lever cable operate smoothly when changing gears.
- Sleeve on selector lever cable is undamaged.
- Retaining clip -A- is fitted correctly (pressed down and locked).



Note

- ◆ *If the selector mechanism is stiff, renew the selector lever cable or service the selector mechanism.*
- ◆ *The selector lever cable must be renewed if a sleeve is damaged.*



- Shift selector lever into position "P".
- Slacken bolt -B-.
- Set selector shaft lever on gearbox to position "P".
- Push vehicle forwards until wheels lock so that detent lever in gearbox engages in parking lock gear.
- To release tension in selector lever cable, carefully move selector lever slightly forwards and backwards, without shifting into a different position.
- Tighten bolt -B-, taking care not to alter position of selector lever cable.

Checking adjustment of selector lever cable

- Keep button pressed, while pulling selector lever approx. 5 mm to the rear out of position "P". Then keep lever in this position, do not move it into "R".
- Release selector lever.
- The selector lever should spring back into position "P" by itself.
- Shift selector lever into position "N".
- Keep button pressed, while pulling selector lever approx. 5 mm to the rear out of position "N". Then keep lever in this position, do not move it into "D".
- Release selector lever.
- The selector lever should spring back into position "N" by itself.
- Keep button pressed, while pushing selector lever approx. 5 mm to the front out of position "N". Then keep lever in this position, do not move it into "R".
- Release selector lever.
- The selector lever should spring back into position "N" by itself.
- Repeat the adjustment if the selector lever does not react as described.
- Check selector mechanism ⇒ [page 32](#)

3.6 Removing and installing tiptronic switch -F189-

The tiptronic switch -F189- is integrated in the shift unit; it cannot be renewed separately.

**Note**

The shift unit has to be renewed if the tiptronic switch -F189- is defective ⇒ [page 33](#).

3.7 Removing and installing selector lever lock solenoid -N110-

The selector lever lock solenoid -N110- is integrated in the shift unit; it cannot be renewed separately.



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Note

The shift unit has to be renewed if the selector lever lock solenoid -N110- is defective ⇒ [page 33](#).

3.8 Checking connectors on selector mechanism

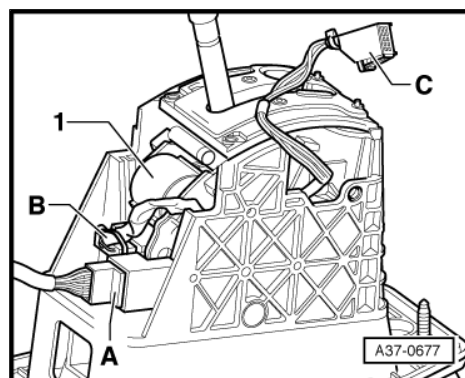
Proceed as follows if malfunctions occur in the selector mechanism:

- Connect vehicle diagnostic, testing and information system - VAS 5051B- .
- “Interrogate fault memory - all fault menus”, trace and eliminate any faults displayed via “Guided Fault Finding”.

A - 10-pin connector for wiring from selector mechanism to gearbox (with CAN wires)

B - 4-pin connector for wiring to selector lever lock solenoid - N110- and selector lever locked in position P switch -F319-

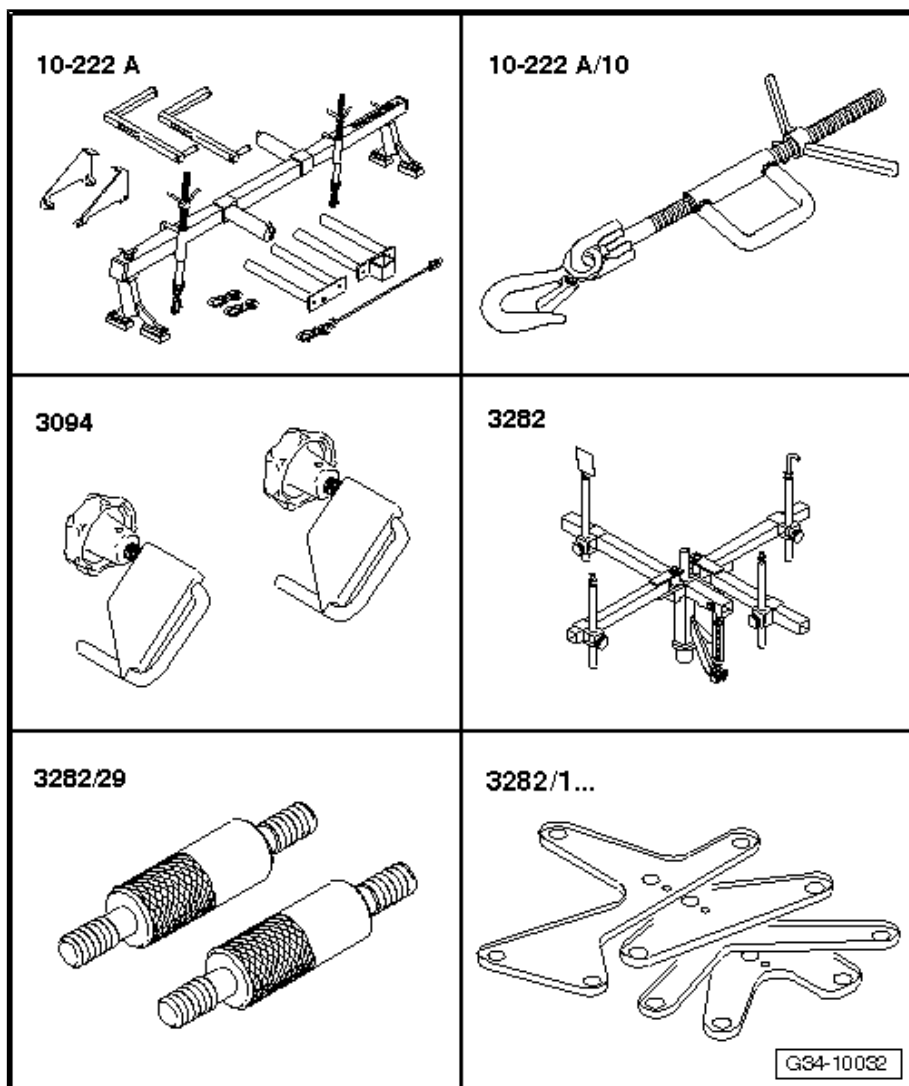
C - 10-pin connector for wiring to cover of selector mechanism



4 Removing gearbox

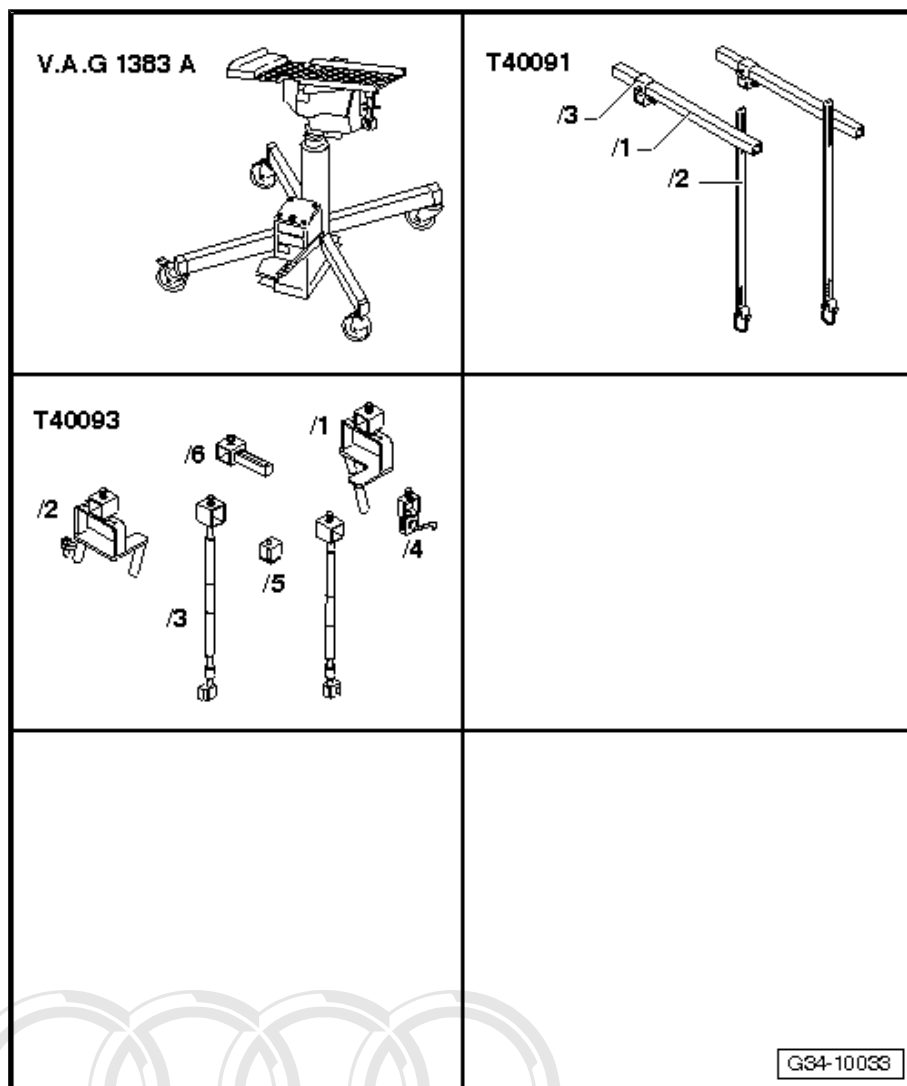
Special tools and workshop equipment required

- ◆ Support bracket -10 - 222 A-
- ◆ Hooks -10 - 222 A /10-
- ◆ Hose clamps, up to 25 mm -3094-
- ◆ Gearbox support -3282-
- ◆ Pin -3282/29-
- ◆ Adjustment plate -3282/42 A-



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- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Engine support bracket, basic set -T40091-
- ◆ Engine support bracket, supplementary set - T40093-



Procedure

Proceed as follows:



Note

- ◆ *Observe general repair instructions ⇒ [page 8](#).*
 - ◆ *Observe rules for cleanliness when working on the gearbox, ⇒ [page 10](#).*
 - ◆ *All cable ties which are released or cut open during removal must be fitted in the same position when installing.*
- Shift selector lever into position “P”.

- Unplug electrical connector -3- from air mass meter -G70- .
- Release clamps -1 and 2- and disconnect air intake hose from air mass meter -G70- .
- Unbolt front intake duct from lock carrier -4-.
- Remove engine cover panel.



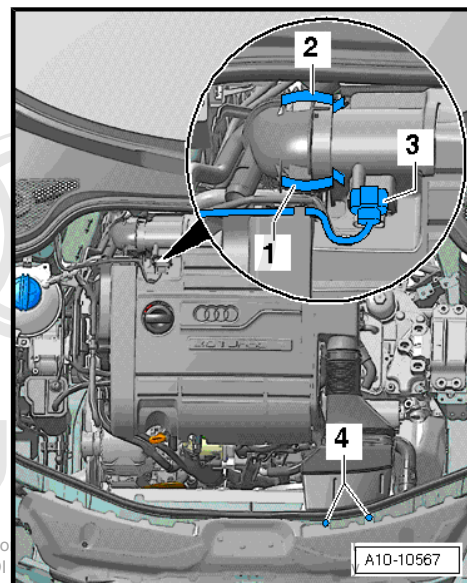
Caution

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

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

- With the ignition switched off, disconnect battery earth cable ⇒ Rep. Gr. 27 .

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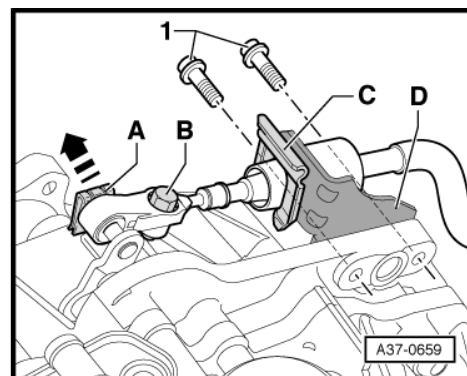


- Detach locking plate -C-.
- Press retaining clip -A- upwards and detach.
- Press selector lever cable off selector shaft lever -arrow- and pull out of support bracket -D-.



Note

- ◆ *Do not bend or kink the selector lever cable.*
- ◆ *-Items 1 and B- can be disregarded.*



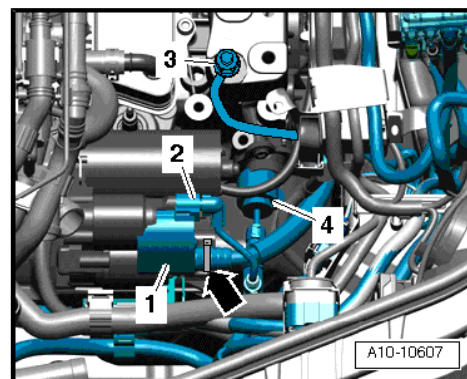
- Cut open cable tie -arrow- for dust boot.
- Unplug electrical connector -2-.
- Push back dust boot -1- and disconnect B+ wire from starter solenoid.
- Disconnect earth wire -3-.



Caution

The control unit (mechatronic unit) can be damaged by electrostatic discharge.

- ◆ *Do not touch contact pins in gearbox connector with bare hands.*

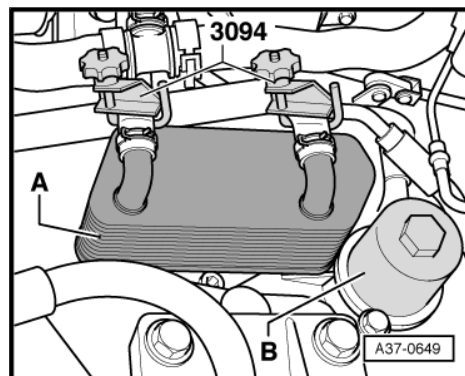


- Touch vehicle earth with your hand (without gloves) to discharge any static electricity.
- Turn fastener anti-clockwise and unplug electrical connector -4- on gearbox.

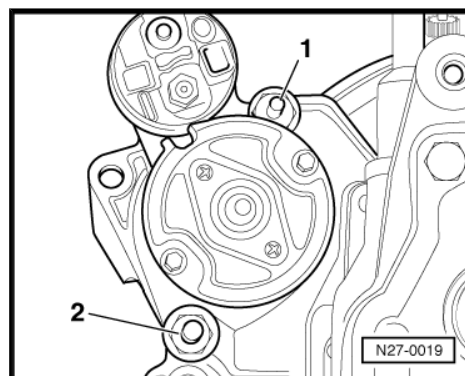
- Clamp off coolant hoses at gearbox oil cooler with hose clamps -3094- and disconnect hoses from gear oil cooler -A-.


Note

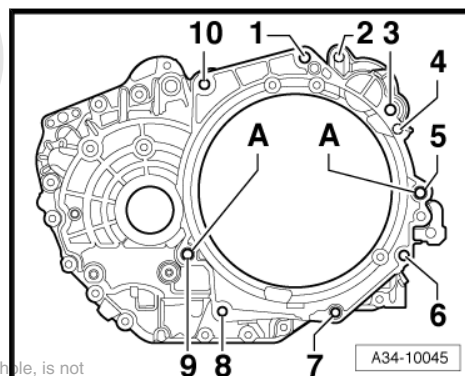
Seal off open lines and connections with clean plugs or sealing caps to prevent dirt from entering.



- Remove bottom bolt -2- for starter (accessible from above).
- Remove top bolt -1- for starter and detach starter.



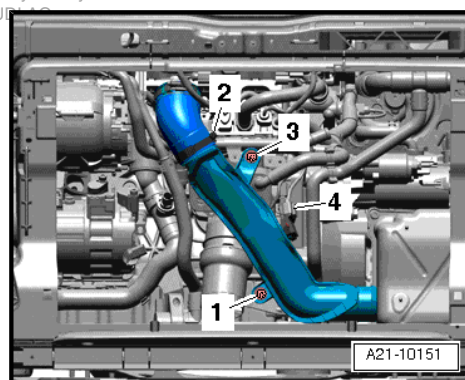
- Remove engine/gearbox securing bolts -1, 3, 10- (accessible from above).



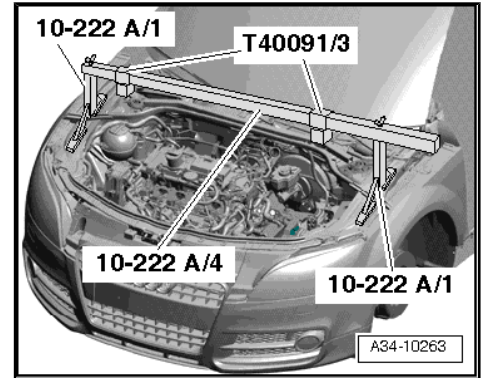
- Release clamp -2-.
- Remove nut -3-.
- Unplug electrical connector -4-.


Note

-Item 1- can be disregarded.



- Set up support bracket -10 - 222 A- on body flanges using the following equipment:
 - ◆ Rack -10 - 222 A /1- (2x)
 - ◆ Adapter -10 - 222 A /4-
 - ◆ Connecting piece -T40091/3- (2x)

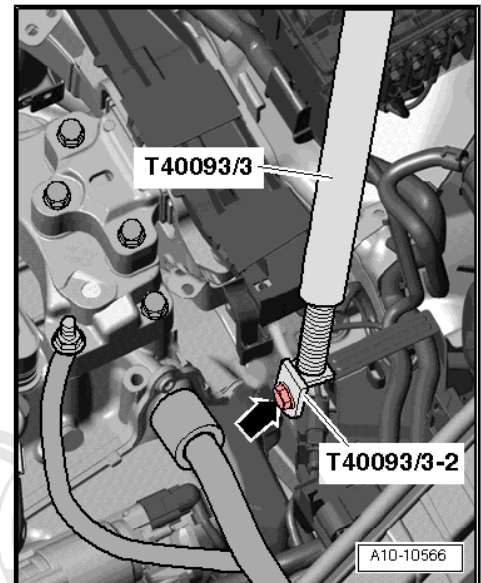


- Attach adapters -T40093/3-2- (left-side) and -T40093/3-3- (right-side) to supports -T40093/3- .
- Disconnect earth wire from longitudinal member (left-side).
- Remove securing bolt for front section of longitudinal member (both sides).
- Bolt adapters -arrow- to longitudinal members, using bolts removed previously.

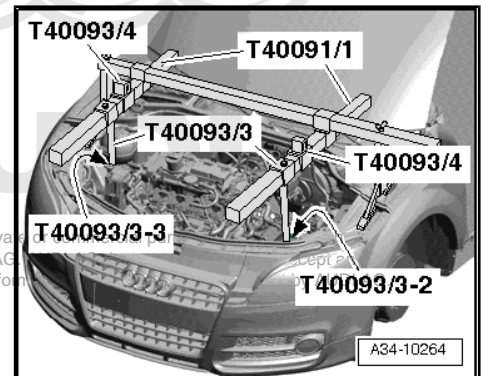


Note

Illustration shows left side of vehicle.



- Insert square bars -T40091/1- with connecting pieces -T40093/4- into connecting pieces -T40091/3- and supports -T40093/3- as illustrated.



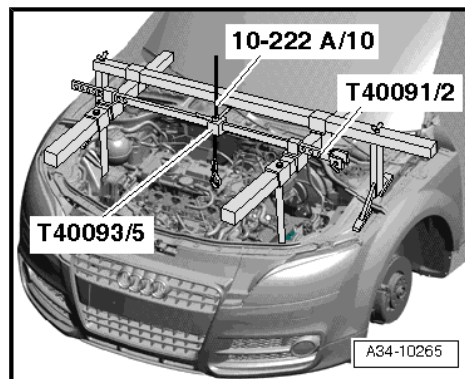
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- Insert support -T40091/2- with slide -T40093/5- into the two connecting pieces -T40093/4- .

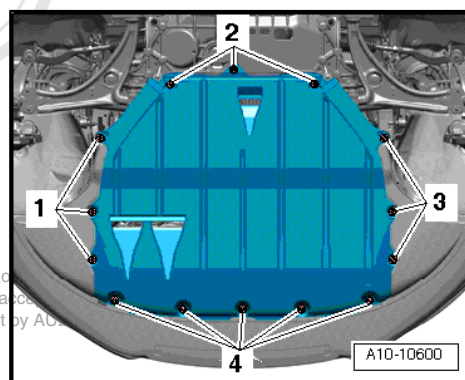

WARNING

Accidents can be caused if parts of the support bracket are not correctly secured.

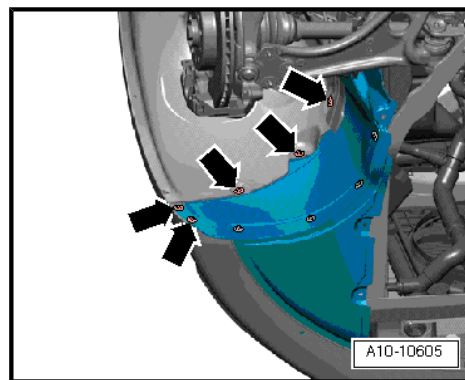
- ◆ *Secure support -T40091/2- using retaining pins and split pins of the connecting pieces -T40093/4- .*
- ◆ *Secure connecting pieces and supports using clamping bolts.*



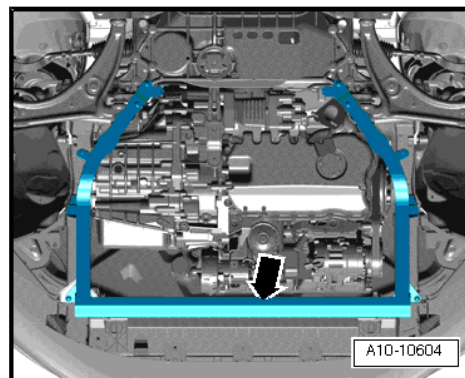
- Attach hook -10 - 222 A /10- to slide and to engine lifting eye.
- Take up weight of engine/gearbox assembly via the spindle, but do not raise.
- Remove both front wheels.
- Release fasteners -1 ... 4- and remove centre noise insulation.



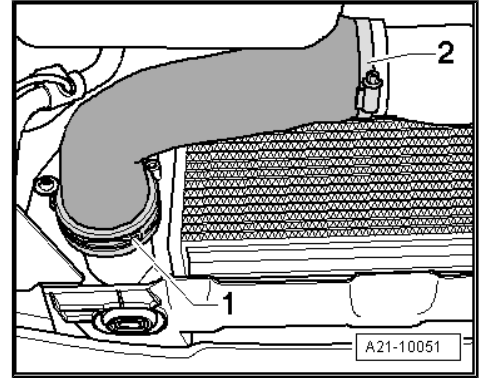
- Remove noise insulation (left and right) -arrows-.



- Remove frame for noise insulation -arrow-.



- Release spring-type clip -1- and hose clip -2- and remove air intake hose leading to charge air cooler.

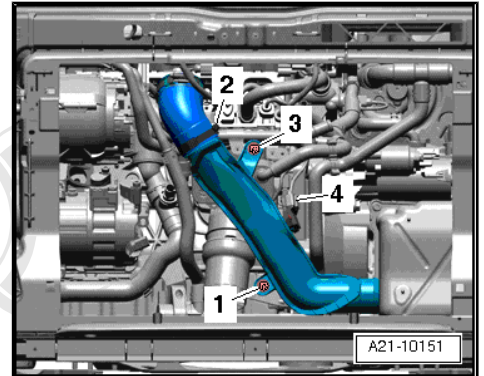


- Remove bolt -1- and take out intake connecting pipe from below.



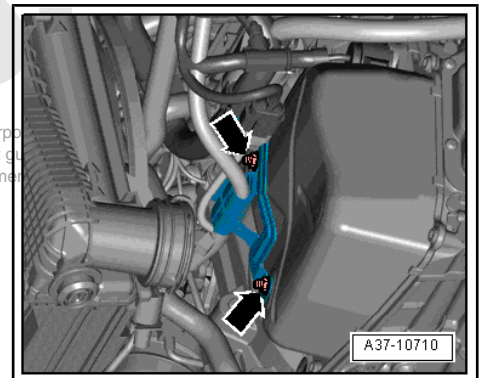
Note

-Items 2, 3, 4- can be disregarded.



- Remove nuts -arrows- and move bracket with wiring towards front of vehicle.
- Free coolant hose running from continued coolant circulation pump -V51- to radiator.

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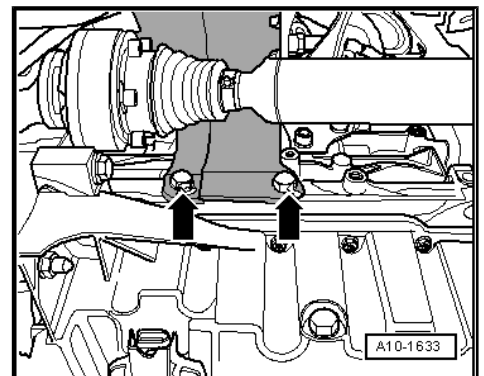


- Unbolt heat shield for drive shaft (right-side) -arrows-.
- Unbolt drive shafts (left and right) from flange shafts on gearbox ⇒ Rep. Gr. 40.
- Tie up drive shafts with cable ties.

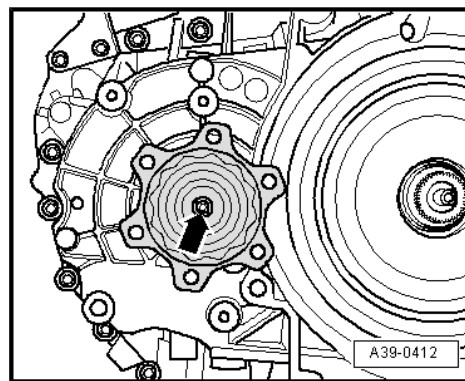


Note

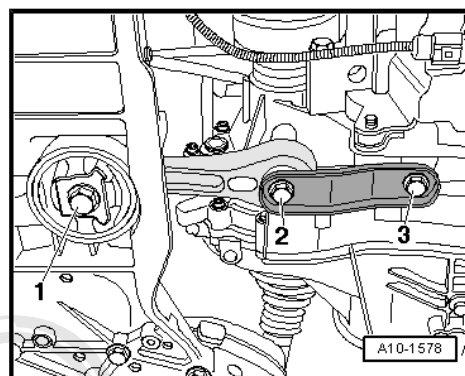
Make sure you do not damage surface coating on drive shafts.



- Remove bolt -arrow- and detach flange shaft (right-side) from gearbox.



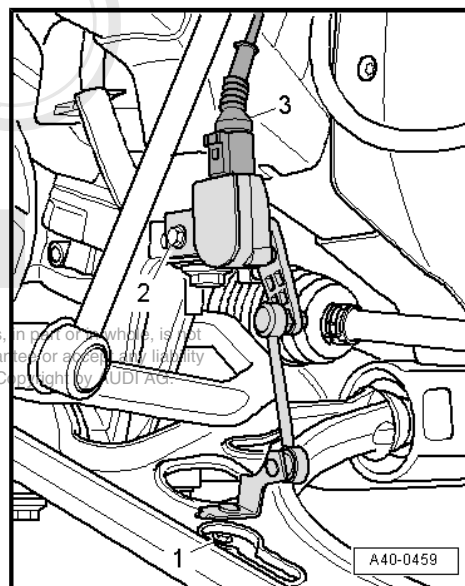
- Unscrew bolts -1 ... 3- and remove pendulum support.



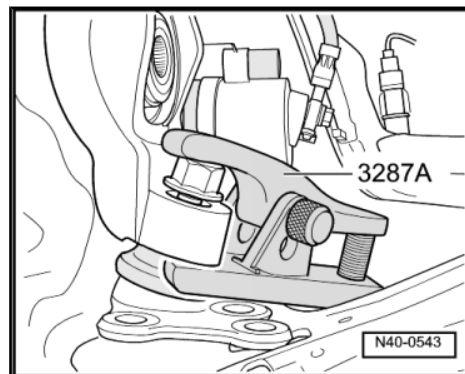
- Unplug electrical connector -3- from vehicle level sender (front left) -G78- .
- Remove bolt -2-.


Note

-Item 1- can be disregarded.

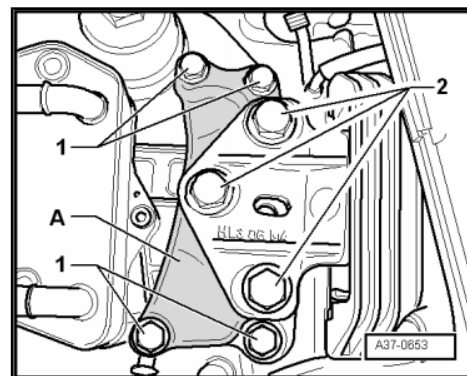


- Press swivel joint (left-side) off wheel bearing housing ⇒ Rep. Gr. 40 .
- Pull suspension strut outwards slightly and support in this position.

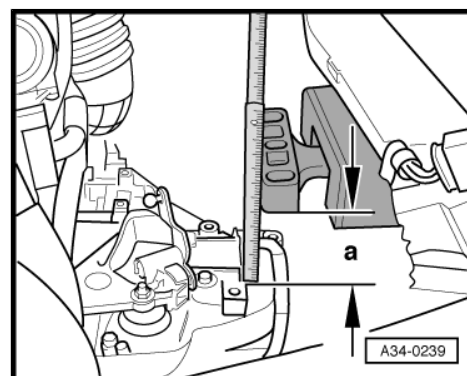


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- Remove bolts -1- and -2- and detach gearbox support -A-.



- Lower engine/gearbox assembly using spindle of support bracket -10 - 222 A- until distance -a- is obtained between gearbox housing and gearbox mounting.
- Dimension -a- = 100 ... 110 mm



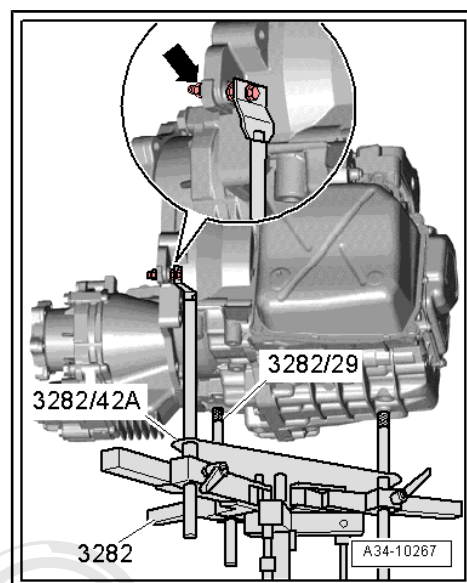
To remove the direct shift gearbox 02E, set up gearbox support -3282- with adjustment plate -3282/42A- and place on engine and gearbox jack -V.A.G 1383 A- .



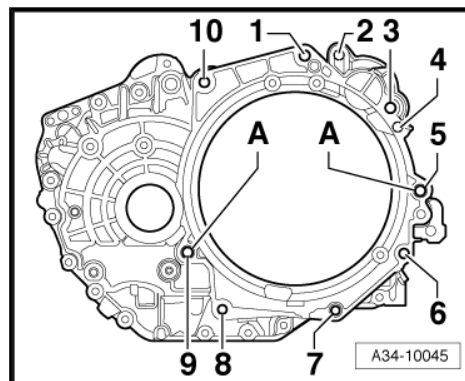
Note

The illustration shows a gearbox for a four-wheel drive vehicle; however, the attachment points are the same for the front-wheel drive version.

- Align arms of gearbox support according to holes in adjustment plate -3282/42A- .
- Secure support elements as illustrated on adjustment plate -3282/42A- . However, use -retainer plate with drilling- as front support element.
- Place engine and gearbox jack -V.A.G 1383 A- underneath vehicle.
- The arrow symbol on the adjustment plate points in the direction of travel.
- Align gearbox support -3282- parallel with gearbox.
- Screw pin -3282/29- into gearbox.
- Secure -retainer plate with drilling- firmly to gearbox as illustrated -arrow-.
- Insert last support element in gearbox as illustrated.
- Support gearbox by lifting from underneath with engine and gearbox jack -V.A.G 1383 A- .



- Remove remaining engine/gearbox securing bolts -5 ... 9-.
- Press gearbox off dowel sleeves.
- Pull gearbox off engine.
- Carefully lower gearbox using engine and gearbox jack -V.A.G 1383 A- .
- While lowering gearbox, change position of gearbox using spindles on gearbox support -3282- .



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5 Installing gearbox

Procedure

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



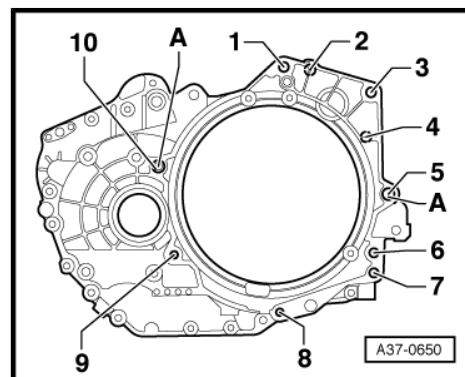
Note

- ◆ *Renew bolts which are tightened by turning through a specified angle.*
- ◆ *Renew seals, gaskets and self-locking bolts and nuts.*
- ◆ *Renew locking plate and retaining clip for selector lever cable.*
- ◆ *Hose connections and hoses for charge air system must be free from oil and grease before fitting.*
- ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ [Parts catalogue](#)*
- ◆ *Re-attach all cable ties at the same locations when re-installing.*

Tightening torques:

⇒ ["5.1 Tightening torques \(installing gearbox\)", page 55](#)

- Check needle bearing in crankshaft ⇒ Rep. Gr. 13 .
- Clean splines of input shaft and hub; remove corrosion.
- Grease clutch plate splines with a very small amount of grease for clutch plate splines ⇒ [Parts catalogue](#) . It is important to remove excess grease.
- Check that dowel sleeves -A- are correctly seated in cylinder block.
- Engage intermediate plate at sealing flange on engine and push onto dowel sleeves.
- Renew oil seal for flange shaft (right-side) ⇒ [page 98](#) .

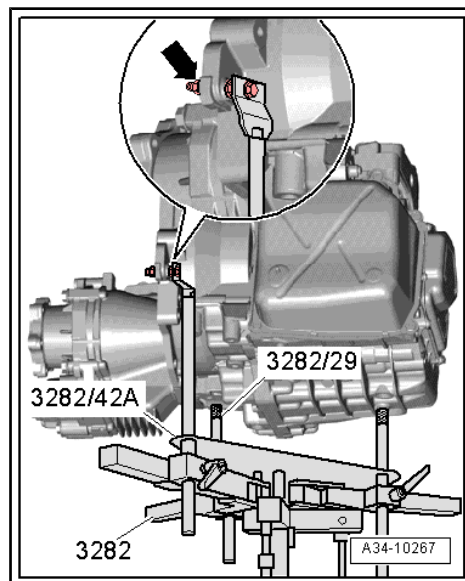


- Carefully raise gearbox using engine and gearbox jack -V.A.G 1383 A- and position correctly using gearbox support -3282- .

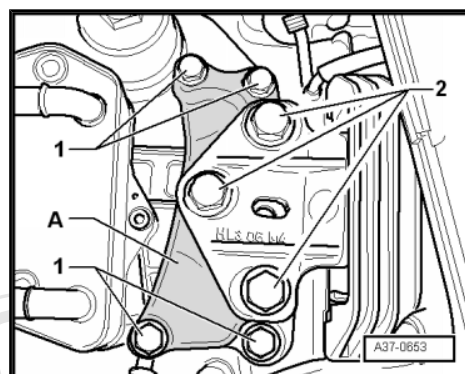

Note

The illustration shows a gearbox for a four-wheel drive vehicle; however, the attachment points are the same for the front-wheel drive version.

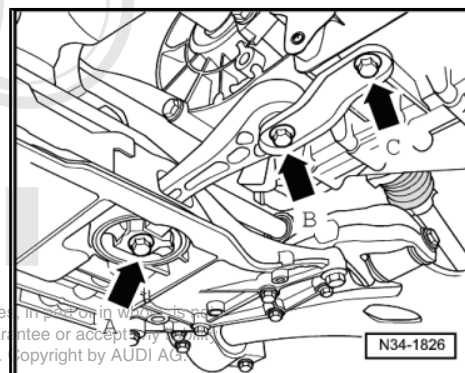
- Join gearbox to engine, taking care not to trap wiring or other connections.
- Secure gearbox to engine.



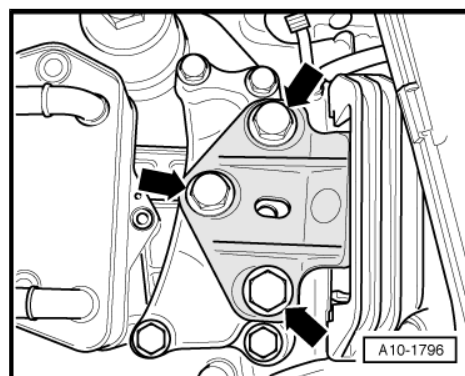
- Install assembly mountings (note correct sequence) ⇒ [page 60](#) .
- Detach gearbox support -3282- from gearbox.
- Secure swivel joint (left-side) to wheel bearing housing ⇒ Rep. Gr. 40 .
- Install flange shaft (right-side) ⇒ [page 95](#) .
- Install drive shafts ⇒ Rep. Gr. 40 .
- Install heat shield for drive shaft (right-side).



- First secure pendulum support to gearbox -arrow B- and -arrow C-, then on subframe -arrow A-. Tightening torques ⇒ [page 59](#) .
- Install starter ⇒ Rep. Gr. 27 .

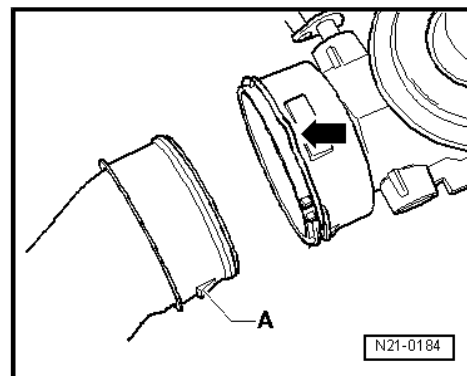


- Adjust assembly mountings ⇒ Rep. Gr. 10 .
- Tighten bolts -arrows- for assembly mounting (gearbox side).
- Detach support bracket -10 - 222 A- from engine.



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- When installing air intake hoses with plug-in connections, make sure retaining clip -arrow- snaps onto retaining lug -A-.
- Observe correct procedure after connecting battery ⇒ Rep. Gr. 27 .
- Adjust selector lever cable ⇒ [page 40](#) .
- Check gear oil level and top up as required ⇒ [page 66](#) .
- Check coolant level ⇒ Rep. Gr. 19 .



5.1 Tightening torques (installing gearbox)

Tightening torques

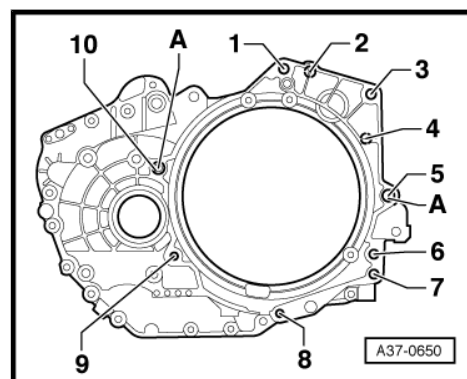


Note

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

Securing direct shift gearbox to engine

Item	Bolt	Nm
1, 3, 6	M12x55	80
5	M12x65	80
7, 8	M10x50	40
9	M10x45	40
10	M12x70	80
A	Dowel sleeves for centralising	



Note

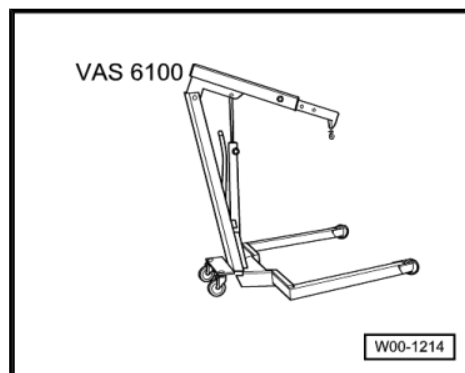
-Items 2 and 4- can be disregarded.

- Additional tightening torques
⇒ ["8 Assembly mountings - exploded view", page 59](#) .

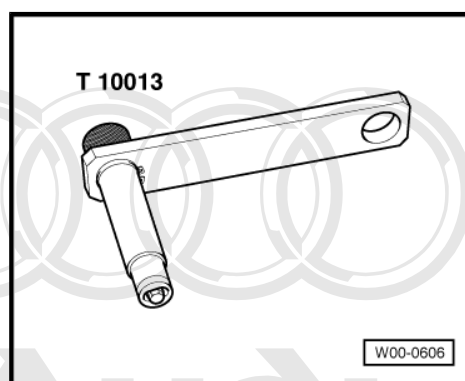
6 Transporting the direct shift gearbox

Special tools and workshop equipment required

- ◆ Workshop hoist -VAS 6100-



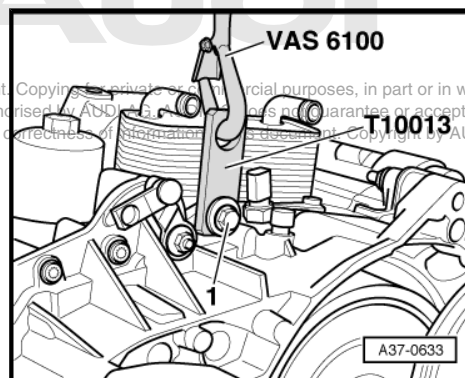
- ◆ Retainer -T10013-



Procedure

Use retainer -T10013- to transport the direct shift gearbox and when setting up gearbox support -3282- .

- Remove threaded pin from retainer -T10013- (release retaining ring).
- Secure retainer -T10013- to gearbox lifting eye with bolt (M8x40) -1- and washer (outside diameter 30 mm).
- Hook workshop hoist -VAS 6100- onto retainer -T10013- .



Caution

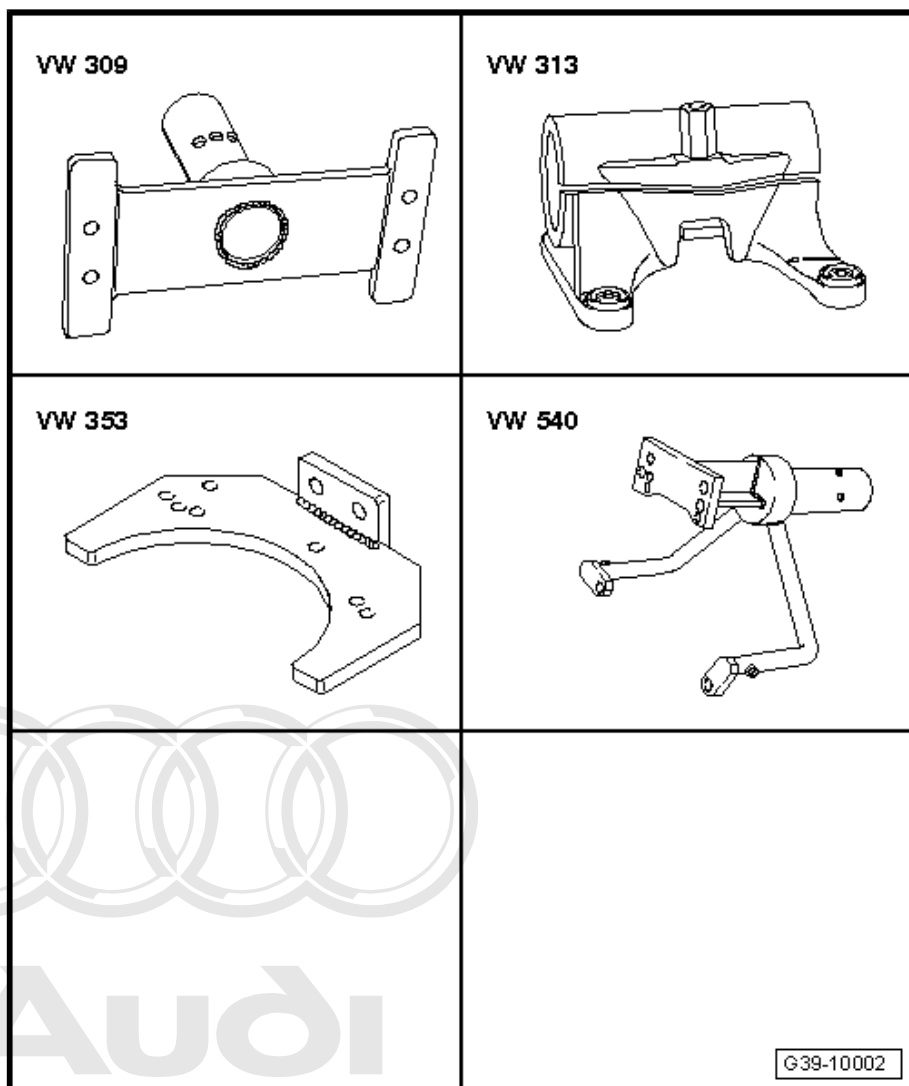
The gearbox oil cooler can be damaged when the gearbox is transported.

- ◆ Guide gearbox as required when transporting.

7 Securing gearbox to assembly stand

Special tools and workshop equipment required

- ◆ Support plate -VW 309-
- ◆ Support clamp -VW 313-
- ◆ Gearbox support -VW 353-
- ◆ Engine/gearbox support -VW 540-
- ◆ Workshop hoist -VAS 6100-



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Securing gearbox in horizontal position

- Secure gearbox to engine/gearbox support -VW 540-
-arrows-.
- Using workshop hoist -VAS 6100- , insert gearbox into support
clamp -VW 313- ➔ [page 56](#) .



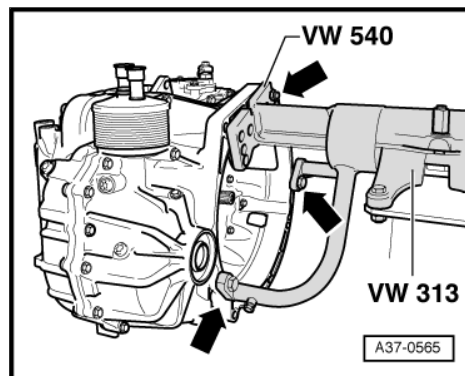
WARNING

The gearbox can swing round suddenly in the support clamp.

- ◆ *The centre of gravity of the gearbox is outside the pivot centre of the support clamp. A second mechanic is therefore required to hold the gearbox housing when the gearbox is rotated in the clamp.*

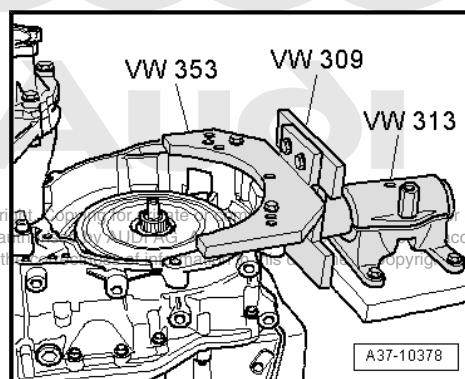
Oil can escape when the gearbox is rotated in the support clamp.

- ◆ *The breathers on the gearbox housing must be sealed off if the gearbox (with oil filling) is turned on the assembly stand so that the oil pan faces upwards.*



Securing gearbox in vertical position

- Secure gearbox to gearbox support -VW 353- and fit into support clamp -VW 313- using support plate -VW 309- .



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8 Assembly mountings - exploded view

1 - Bolt

- ☐ 40 Nm + 90°
- ☐ Gearbox support to gearbox
- ☐ Renew

2 - Bolts

- ☐ 40 Nm + 90°
- ☐ Pendulum support to gearbox
- ☐ Renew

3 - Engine support

4 - Bolt

- ☐ Engine support to engine
- ☐ Tightening torque ⇒ Rep. Gr. 10

5 - Engine mounting

6 - Bolt

- ☐ Engine mounting to body
- ☐ Tightening torque ⇒ Rep. Gr. 10

7 - Connecting bracket

8 - Bolt

- ☐ Connecting bracket to engine mounting
- ☐ Tightening torque ⇒ Rep. Gr. 10

9 - Bolt

- ☐ Connecting bracket to body
- ☐ Tightening torque ⇒ Rep. Gr. 10

10 - Bolt

- ☐ Engine mounting to body
- ☐ Tightening torque ⇒ Rep. Gr. 10

11 - Bolts

- ☐ Engine mounting to engine support
- ☐ Tightening torque ⇒ Rep. Gr. 10

12 - Pendulum support

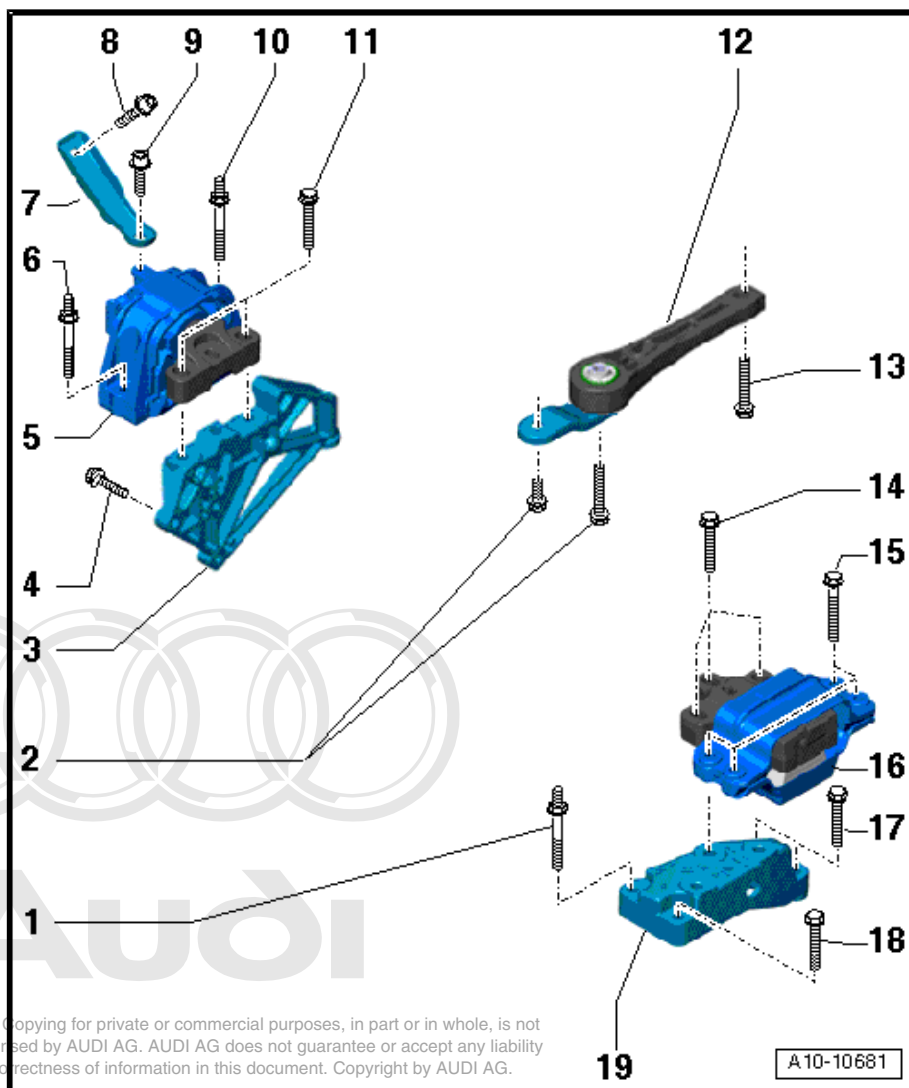
- ☐ Removing and installing ⇒ [page 64](#)

13 - Bolt

- ☐ 100 Nm + 90°
- ☐ Pendulum support to subframe
- ☐ Renew

14 - Bolt

- ☐ 60 Nm + 90°



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- ☐ Gearbox mounting to gearbox support
- ☐ Renew

15 - Bolt

- ☐ 40 Nm + 90°
- ☐ Gearbox mounting to body
- ☐ Renew

16 - Gearbox mounting

- ☐ Removing and installing ⇒ [page 61](#)
- ☐ Tightening sequence ⇒ [page 60](#)

17 - Bolt

- ☐ 40 Nm + 90°
- ☐ Gearbox support to gearbox
- ☐ Renew

18 - Bolt

- ☐ 40 Nm + 90°
- ☐ Gearbox support to gearbox
- ☐ Renew

19 - Gearbox support

- ☐ Tightening sequence ⇒ [page 60](#)

Assembly mounting on gearbox side: tightening sequence

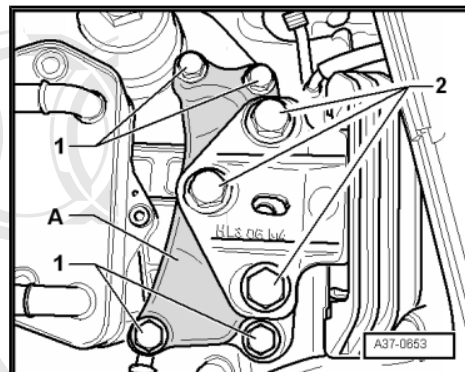
- Fit gearbox support -A- between gearbox and support arm of gearbox mounting.
- Bolt gearbox support to gearbox.
- Pull gearbox up to support arm of gearbox mounting using spindle of support bracket -10 - 222 A- .
- Screw in bolts -2- initially hand-tight.



Caution

Screw in bolts straight when fitting as otherwise the threads in the support arm of the gearbox mounting will be damaged.

- ◆ **Before fitting the bolts -2-, the gearbox support and the support arm of the gearbox mounting must be aligned absolutely parallel. If necessary, push the gearbox up at the rear with a trolley jack.**

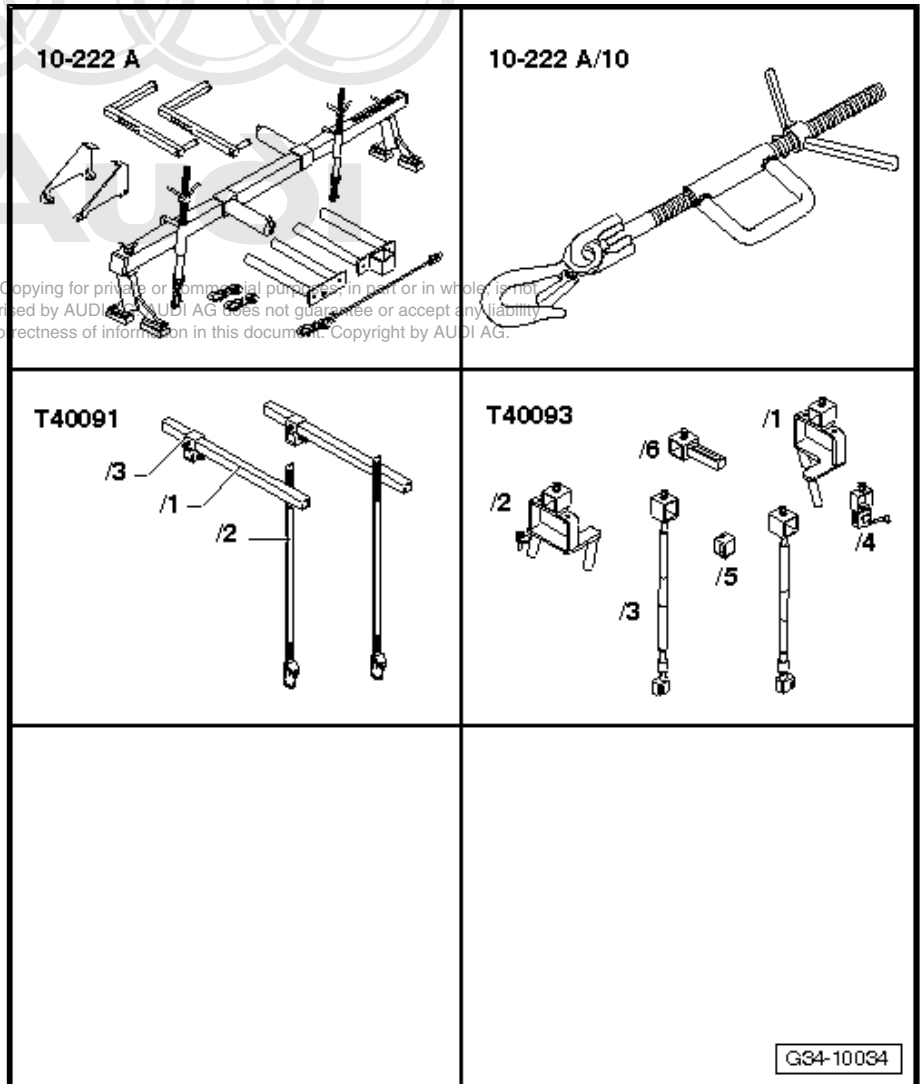


- Only tighten bolts after subframe has been installed ⇒ Rep. Gr. 40 and assembly mountings aligned ⇒ Rep. Gr. 10 .

8.1 Removing and installing gearbox mounting

Special tools and workshop equipment required

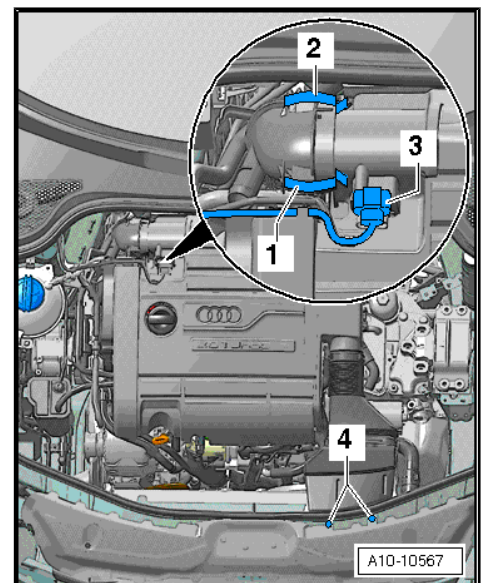
- ◆ Support bracket -10 - 222 A-
- ◆ Hooks -10 - 222 A /10-
- ◆ Engine support bracket, basic set -T40091-
- ◆ Engine support bracket, supplementary set -T40093-



Removing

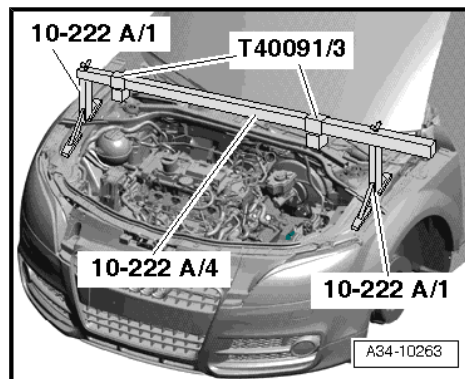
Proceed as follows:

- Unplug electrical connector -3- from air mass meter -G70- .
- Release clamps -1 and 2- and disconnect air intake hose from air mass meter -G70- .
- Unbolt front intake duct from lock carrier -4-.
- Remove engine cover panel.



- Set up support bracket -10 - 222 A- on body flanges using the following equipment:

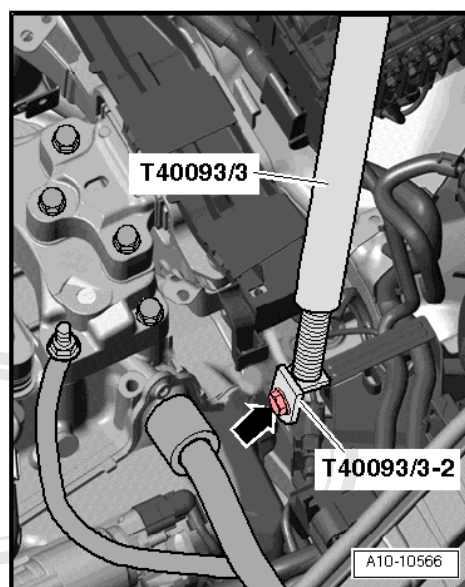
- ◆ Rack -10 - 222 A /1- (2x)
- ◆ Adapter -10 - 222 A /4-
- ◆ Connecting piece -T40091/3- (2x)



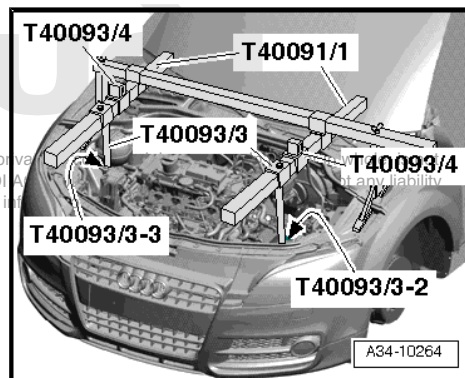
- Attach adapters -T40093/3-2- (left-side) and -T40093/3-3- (right-side) to supports -T40093/3- .
- Disconnect earth wire from longitudinal member (left-side).
- Remove securing bolt for front section of longitudinal member (both sides).
- Bolt adapters -arrow- to longitudinal members, using bolts removed previously.


Note

Illustration shows left side of vehicle.



- Insert square bars -T40091/1- with connecting pieces -T40093/4- into connecting pieces -T40091/3- and supports -T40093/3- as illustrated.



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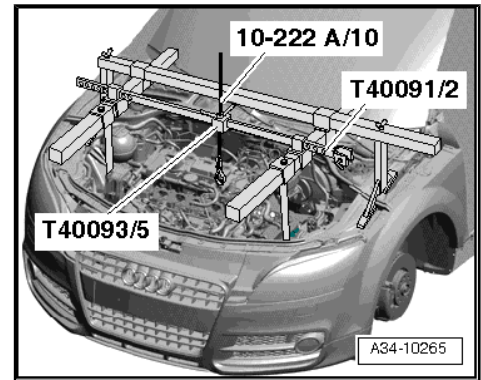
- Insert support -T40091/2- with slide -T40093/5- into the two connecting pieces -T40093/4- .



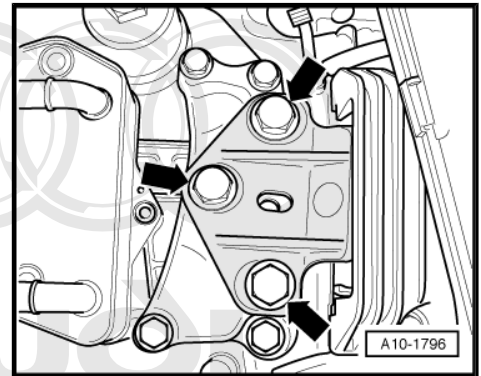
WARNING

Accidents can be caused if parts of the support bracket are not correctly secured.

- ◆ *Secure support -T40091/2- using retaining pins and split pins of the connecting pieces -T40093/4- .*
- ◆ *Secure connecting pieces and supports using clamping bolts.*

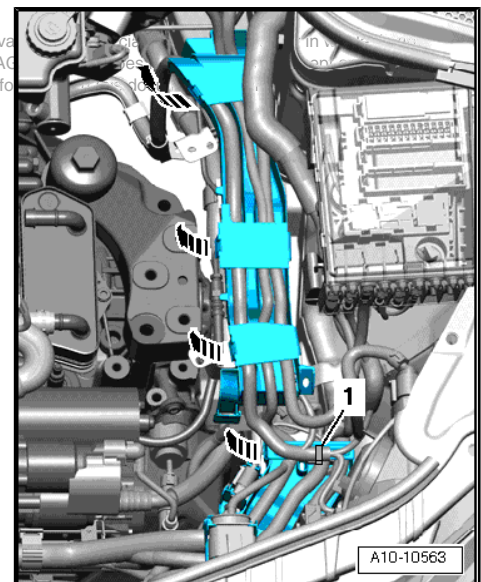


- Attach hook -10 - 222 A /10- to slide and to engine lifting eye.
- Take up weight of engine/gearbox assembly via the spindle, but do not raise.
- Unscrew bolts -arrows-.



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

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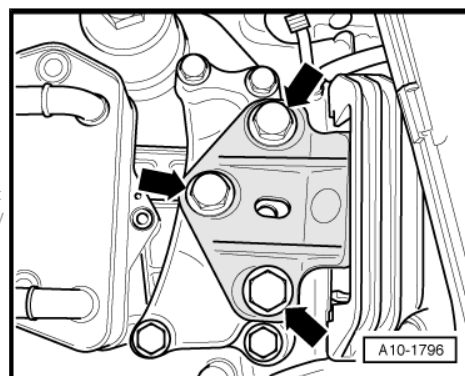
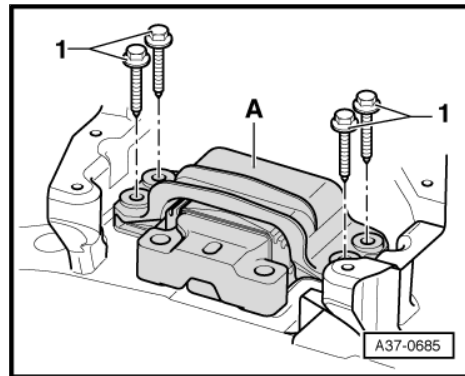
- Remove bolts -1- and detach gearbox mounting -A-.

Installing

- Tightening torques ⇒ [page 59](#)

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

- Secure gearbox mounting -A-.



Caution

Screw in bolts straight when fitting as otherwise the threads in the support arm of the gearbox mounting will be damaged.

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

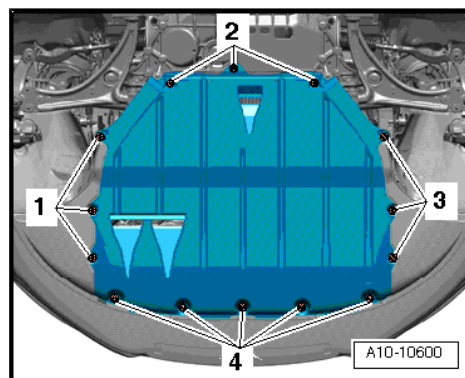
- Pull gearbox up with spindle on support bracket until gearbox support contacts support arm of gearbox mounting.
- Adjust assembly mountings ⇒ Rep. Gr. 10 .
- Secure support arm of gearbox mounting to gearbox support.
- Detach support bracket -10 - 222 A- from engine.

8.2 Removing and installing pendulum support

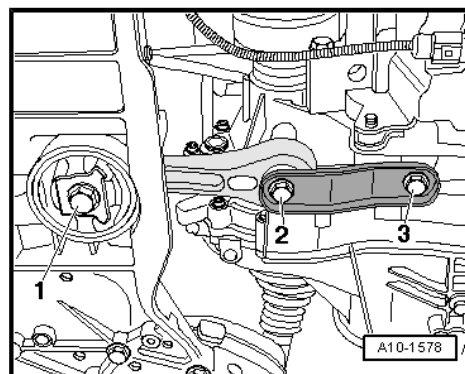
Removing

Proceed as follows:

- Release fasteners -1 ... 4- and remove centre noise insulation.



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

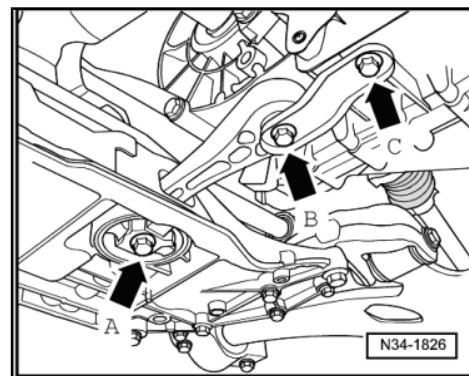


Installing

- Tightening torques ⇒ [page 59](#)

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

- First secure pendulum support to gearbox -arrow B- and -arrow C-, then on subframe -arrow A-.



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9 Gear oil in direct shift gearbox - overview

Inspection plug for gear oil

Inspection plug -arrow 1-

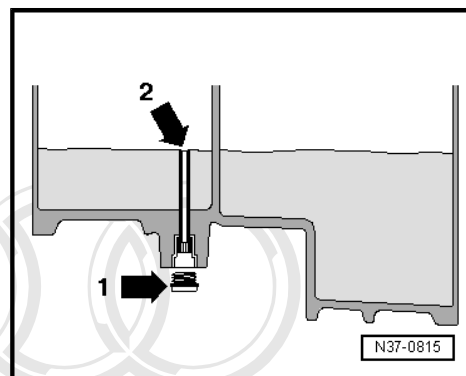
- 45 Nm
- Renew seal

Overflow pipe -arrow 2-

- 3 Nm

Overview:

- ◆ ⇒ [“9.1 Checking gear oil level and topping up”](#), page 66
- ◆ ⇒ [“9.2 Changing gear oil or filling up after performing repairs”](#), page 72

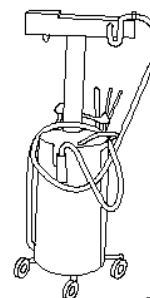


9.1 Checking gear oil level and topping up

Special tools and workshop equipment required

- ◆ Vehicle diagnostic, testing and information system -VAS 5051B-
- ◆ Used oil collection and extraction unit -V.A.G 1782-

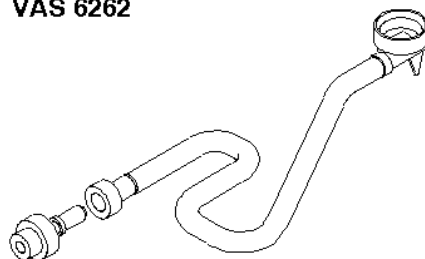
V.A.G 1782



W00-10211

- ◆ Adapter for oil filling -VAS 6262-

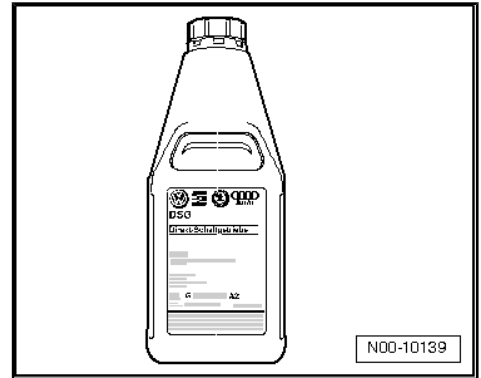
VAS 6262



W00-10191

- ◆ Safety goggles
- ◆ Protective gloves (acid resistant)

- ◆ Gear oil for direct shift gearbox 02E, Part No. ⇒ Parts catalogue



Procedure

Proceed as follows:



Note

- ◆ Observe general repair instructions ⇒ [page 8](#).
- ◆ Observe rules for cleanliness when working on the gearbox ⇒ [page 10](#).
- ◆ Observe notes on direct shift gearbox 02E, "Regulations for the disposal of oil" ⇒ [page 5](#).
- ◆ Use only the correct type of gear oil for the direct shift gearbox 02E (available as a replacement part). Other types of oil cause malfunctions and/or failure of the gearbox.



WARNING

Hot gearbox oil can cause burns.

- ◆ Wear safety goggles.
- ◆ Wear protective gloves (acid resistant).

Accidents can be caused if a gear is inadvertently engaged while the engine is running.

- ◆ Before working on the vehicle while the engine is running, shift the selector lever into position "P" and apply the handbrake.



Caution

Risk of damage to the gearbox.

- ◆ The engine must NOT be started if there is only little or no oil left in the gearbox after repair work or after excessive loss of oil.
- ◆ After repair work or after excessive loss of oil, put in a suitable amount of gear oil before proceeding.

- Gearbox not in backup mode (emergency running mode)
- Vehicle must be on a 4-pillar lifting platform or standing over an inspection pit so it is absolutely horizontal.
- Selector lever in position "P", handbrake applied.

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- Engine idling.
- Air conditioner and heating system switched off.

Reading off gear oil temperature



Note

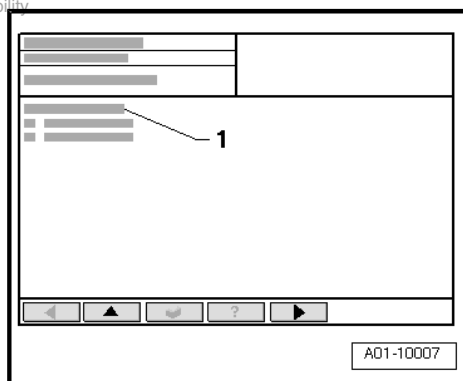
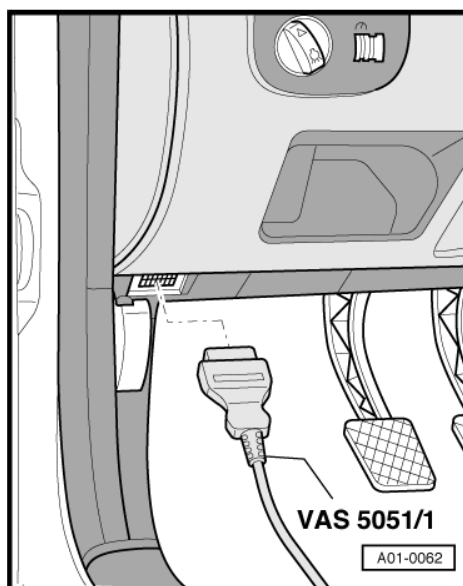
- ◆ *The gear oil level varies according to the oil temperature: if the oil temperature is too low, this will result in overfilling; if it is too high this will result in underfilling.*
- ◆ *An incorrect gear oil level will impair the function of the gearbox.*
- Connect vehicle diagnostic, testing and information system - VAS 5051B- .



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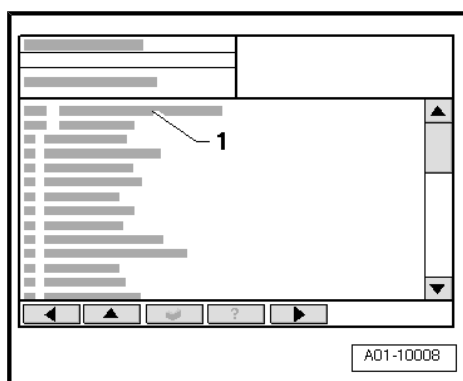
Display on -VAS 5051B-

- From menu -1-, select “Self-diagnosis” and activate by pressing button.




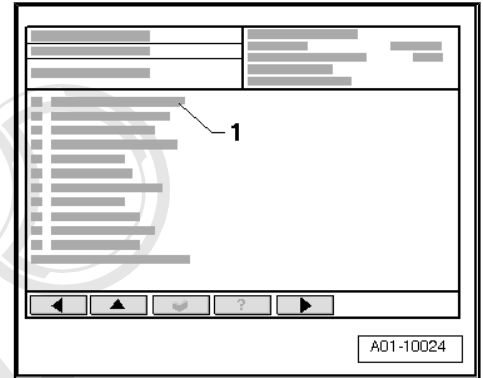
Display on -VAS 5051B- :

- From menu -1-, select vehicle system “02 - Gearbox electronics” and activate by pressing button.



Display on -VAS 5051B- :

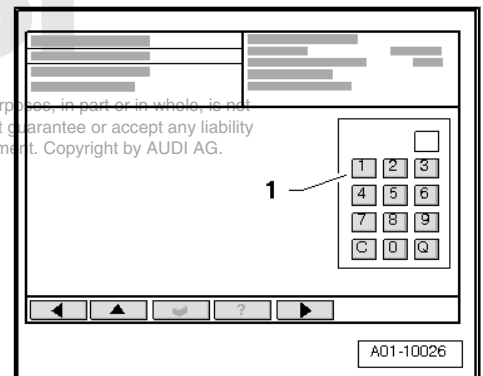
- From menu -1-, select function “011 - Measured values” and activate by pressing  button.



Display on -VAS 5051B- :

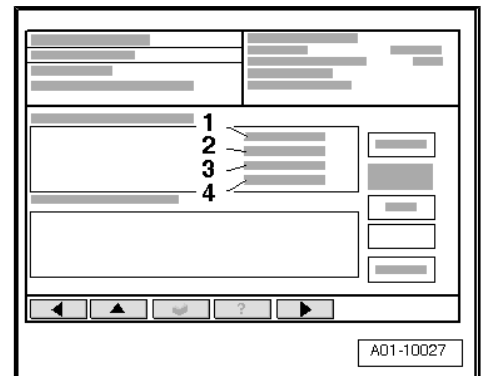
1 - Enter display group

- Using keypad -1- press buttons   for “Display group 019” and confirm entry by pressing  button.



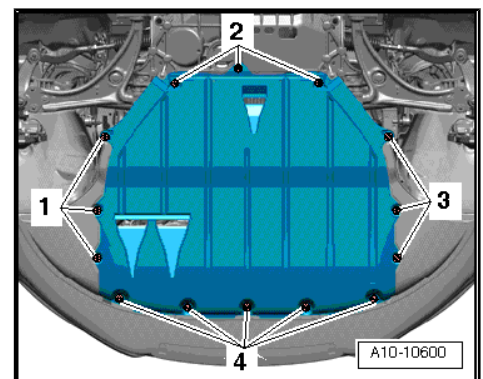
Display on -VAS 5051B- :

- Read off gear oil temperature in display zone -1-.
- Specification at commencement of test: Not higher than 30 ° C, otherwise allow gearbox to cool down.



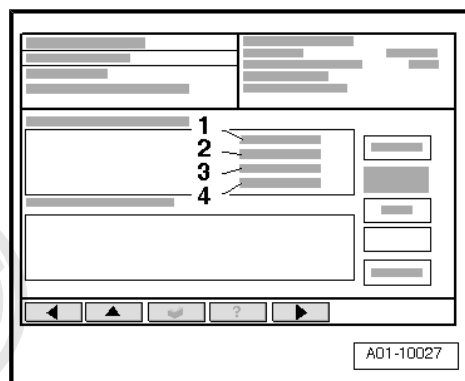
Checking gear oil level

- Tightening torques ⇒ [page 66](#)
- Release fasteners -1 ... 4- and remove centre noise insulation.
- Press and hold brake pedal.
- With brake pedal depressed, select all gear positions “P, R, N, D, S” one after the other at idling speed, maintaining each position for at least 3 seconds.
- Place used oil collection and extraction unit -V.A.G 1782- below gearbox.



Display on -VAS 5051B- :

- Read off gear oil temperature in display zone -1-.
- Specification: 35 °C.



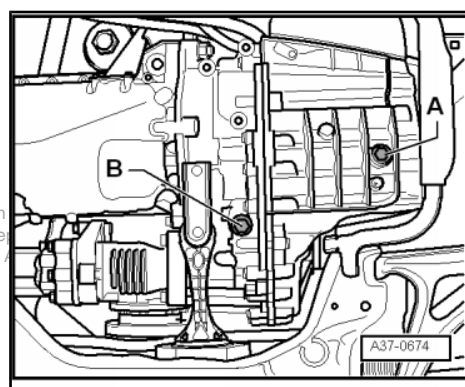
- Unscrew inspection plug -B- when specified temperature is reached.



Note

-Item A- can be disregarded.

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- The gear oil that has collected in the overflow pipe -arrow 2- will drain off first.



Note

Regardless of the gear oil level itself, a certain amount of gear oil will always drain off when inspection plug -arrow 1- is opened.

- Check that overflow pipe is securely screwed into inspection plug opening.



Note

The gear oil level cannot be checked reliably if the overflow pipe is loose.

- The gear oil level is correct if a small amount of oil drains out when the oil temperature is between 35 and 45 °C (the oil level rises as the oil temperature continues to increase).



Note

- ◆ *Every 30 seconds a small surge of oil will come out of the overflow pipe, regardless of the oil level (this is caused by the intermittent supply of cooling oil to the multiple clutch). This surge of oil is not relevant when checking the gear oil level and can be disregarded.*

- ◆ *Do not re-use drained-off gear oil.*

- If gear oil level is OK ⇒ [page 72](#) .

Filling up with gear oil

- If no gear oil drains out when the oil temperature is between 35°C and 45°C, top up gear oil as follows.

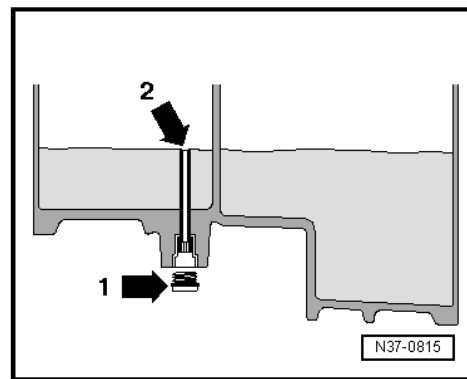


Caution

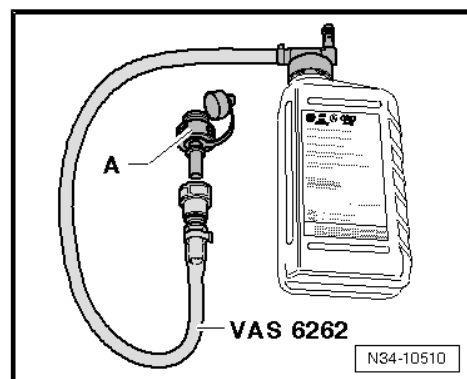
Take care not to mix the gear oil with different types of oil.

- ◆ ***Check that the adapter for oil filling -VAS 6262- is clean. The gear oil for the direct shift gearbox must not be mixed with different types of oil.***

- Screw container of gear oil for direct shift gearbox onto adapter for oil filling -VAS 6262- .
- Screw adapter for oil filling -VAS 6262- -item A- hand-tight into opening for inspection plug.
- Hold container with adapter for oil filling -VAS 6262- as high as possible over gearbox and let gear oil run into gearbox.
- To check whether enough oil has run into direct shift gearbox, detach quick-release coupling on adapter for oil filling -VAS 6262- at regular intervals and plug the connection with a finger or a clean plug.



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- The gear oil that has collected in the overflow pipe -arrow 2- will drain off first.



Note

Regardless of the gear oil level, a certain amount of gear oil will always drain off.

- The gear oil level is correct if a small amount of oil drains out when the oil temperature is between 35 and 45 °C (the oil level rises as the oil temperature continues to increase).



Note

- ◆ Every 30 seconds a small surge of oil will come out of the overflow pipe, regardless of the oil level (this is caused by the intermittent supply of cooling oil to the multiple clutch). This surge of oil is not relevant when checking the gear oil level and can be disregarded.

- ◆ Do not re-use drained-off gear oil.

- ◆ Check the gear oil temperature on vehicle diagnostic, testing and information system -VAS 5051B- while filling the gearbox with oil. Stop filling and allow the gearbox to cool down if the temperature exceeds 45 °C.

- If gear oil level is OK ⇒ [page 72](#) .

Final steps

- Tightening torques ⇒ [page 66](#)



Note

Renew seal -arrow- for inspection plug.

- Unscrew adapter for oil filling -VAS 6262- from gearbox.

- Tighten inspection plug -B-.

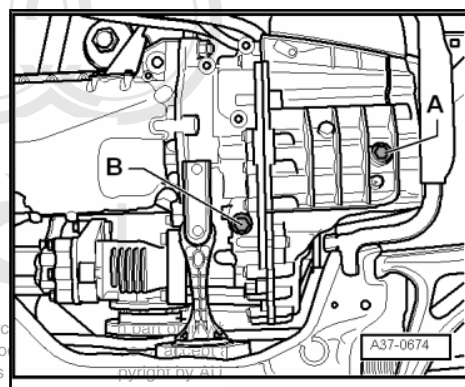
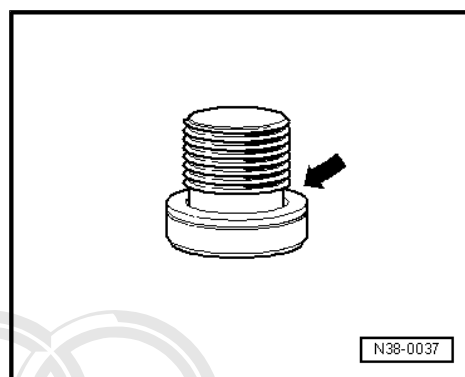
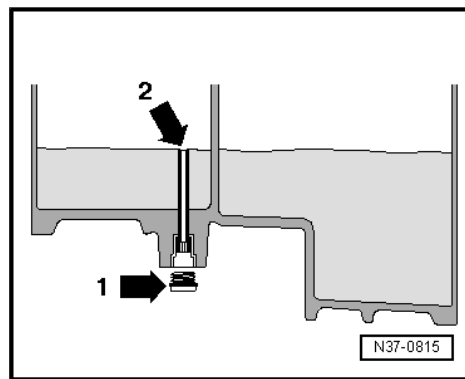


Note

-Item A- can be disregarded.

- Exit from function "011 - Measured values" by pressing button.
- Press "06 - End output".
- Switch off ignition and unplug diagnostic connector.

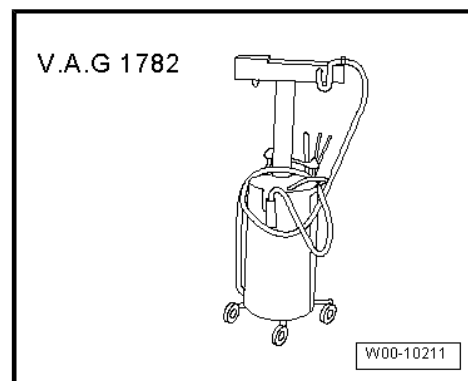
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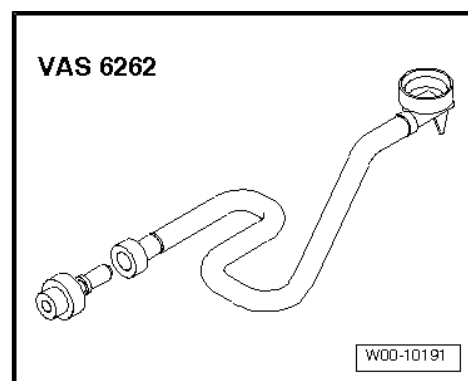
9.2 Changing gear oil or filling up after performing repairs

Special tools and workshop equipment required

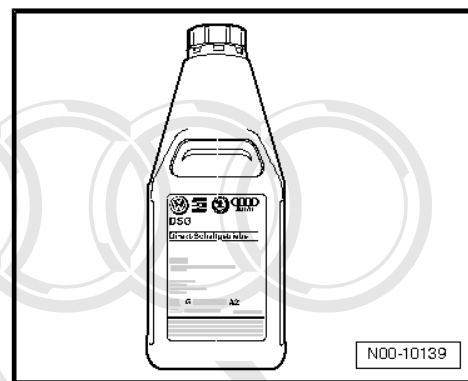
- ◆ Used oil collection and extraction unit -V.A.G 1782-



- ◆ Adapter for oil filling -VAS 6262-



- ◆ Safety goggles
- ◆ Protective gloves (acid resistant)
- ◆ Gear oil for direct shift gearbox 02E, Part No. ⇒ Parts catalogue



Procedure

Proceed as follows:



Note

- ◆ Observe general repair instructions ⇒ [page 8](#).
- ◆ Observe rules for cleanliness when working on the gearbox ⇒ [page 10](#).
- ◆ Observe notes on direct shift gearbox 02E, "Regulations for the disposal of oil" ⇒ [page 5](#).
- ◆ Use only the correct type of gear oil for the direct shift gearbox 02E (available as a replacement part). Other types of oil cause malfunctions and/or failure of the gearbox.

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WARNING

Hot gearbox oil can cause burns.

- ◆ *Wear safety goggles.*
- ◆ *Wear protective gloves (acid resistant).*


Caution

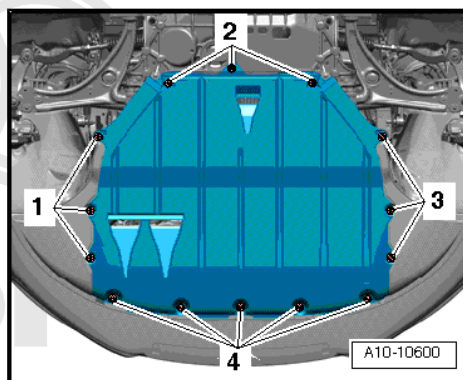
Risk of damage to the gearbox.

- ◆ *The engine must not be started when there is no oil in the gearbox.*

- Gearbox not in backup mode (emergency running mode)
- Vehicle must be on a 4-pillar lifting platform or standing over an inspection pit so it is absolutely horizontal.
- Selector lever in position "P", handbrake applied.
- Engine not running.

Draining off gear oil

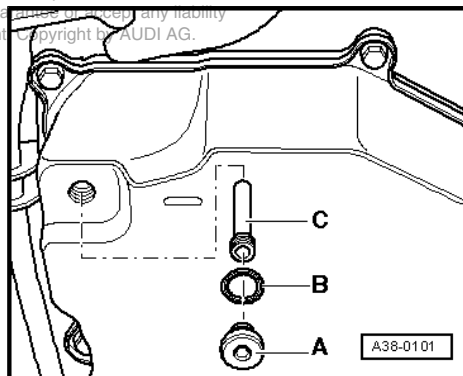
- Renew gear oil filter ➔ [page 78](#) .
- Release fasteners -1 ... 4- and remove centre noise insulation.
- Place used oil collection and extraction unit -V.A.G 1782- below gearbox.



- Unscrew inspection plug -A- and remove together with seal -B-.
- The gear oil that has collected in the overflow pipe -C- will drain off first.
- Unscrew overflow pipe and allow remaining gear oil to drain.

Filling up with gear oil

- Screw overflow pipe into inspection plug opening and tighten to specified torque.

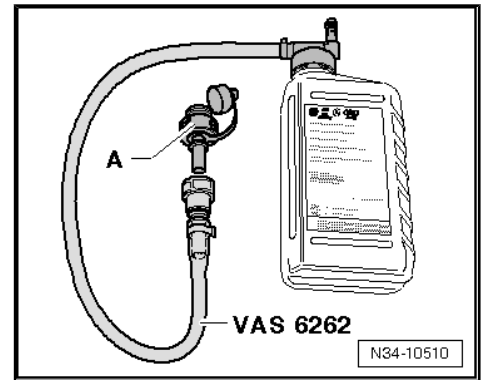

Caution

Take care not to mix the gear oil with different types of oil.

- ◆ *Check that the adapter for oil filling -VAS 6262- is clean.*
- The gear oil for the direct shift gearbox must not be mixed with different types of oil.*

- Screw container of gear oil for direct shift gearbox onto adapter for oil filling -VAS 6262- .

- Screw adapter for oil filling -VAS 6262- -item A- hand-tight into opening for inspection plug.
- Hold container with adapter for oil filling -VAS 6262- as high as possible over gearbox and fill 5.5 litres of gear oil into gearbox.
- Start engine and run at idling speed.
- Depress brake pedal and select all gear positions “P, R, N, D, S” one after the other at idling speed, maintaining each position for at least 3 seconds.
- Shift selector lever into position “P”.
- Check gear oil level and top up as required ⇒ [page 66](#).



After changing gear oil:

- Connect vehicle diagnostic, testing and information system - VAS 5051B- to vehicle.
- Select Guided Functions for gearbox.
- Perform the “Basic setting” program.

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10 Gear oil cooler and gear oil filter - exploded view



Note

-Items 1 ... 7, 15 ... 18, 24, 25- can be disregarded here. For description see
⇒ "1.1 Oil pan, mechatronic unit, gear oil pump", page 80 .

8 - Gear oil cooler

- ☐ Removing and installing
⇒ page 76

9 - Bolt

- ☐ 20 Nm + 90°
- ☐ Renew

10 - O-ring

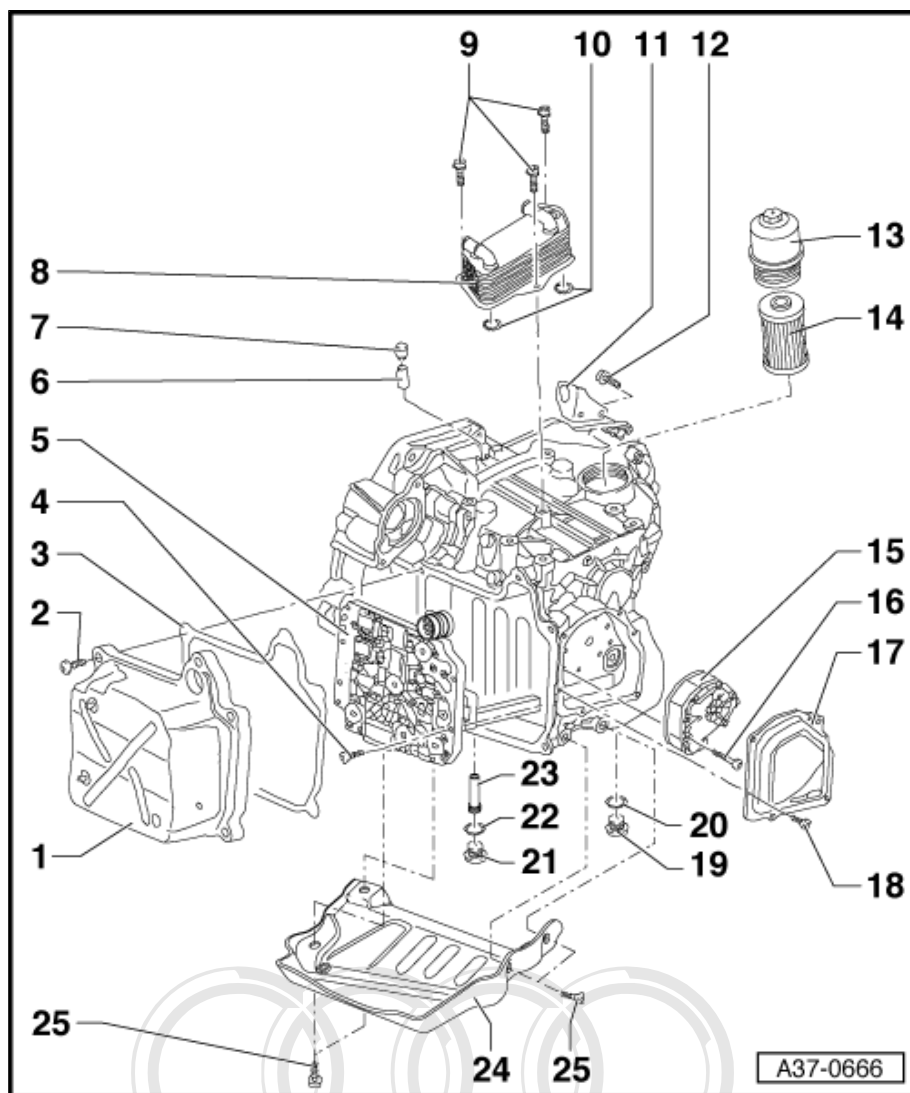
- ☐ Renew

13 - Housing

- ☐ 20 Nm
- ☐ For gear oil filter
- ☐ Removing and installing
⇒ page 78
- ☐ O-ring on housing
- ☐ Renew O-ring

14 - Filter element

- ☐ For gear oil filter
- ☐ Removing and installing
⇒ page 78
- ☐ With O-ring on intake neck
- ☐ Renew O-ring



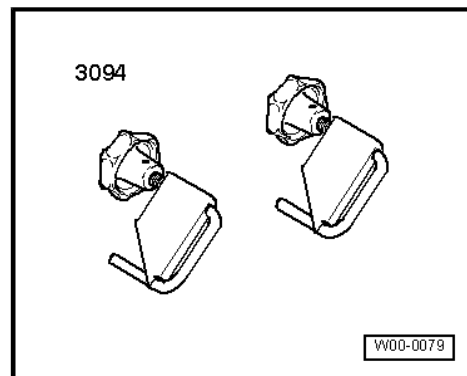
10.1 Removing and installing gear oil cooler

Special tools and workshop equipment required



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- ◆ Hose clamps, up to 25 mm -3094-



Removing

Proceed as follows:



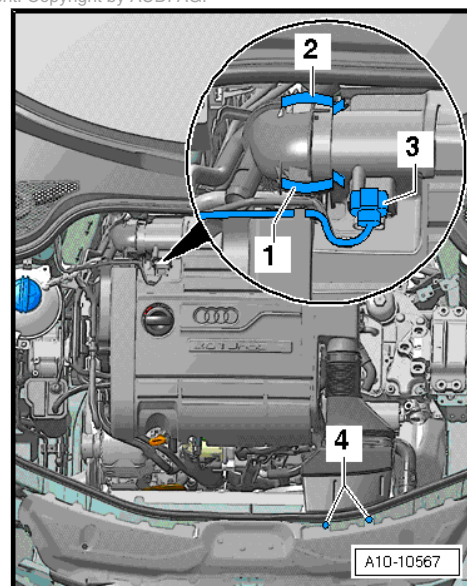
WARNING

Risk of scalding from hot steam and hot coolant.

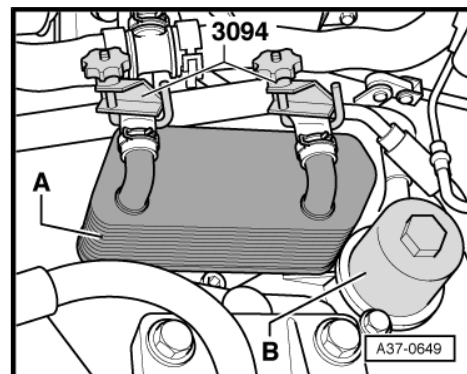
- ◆ *The cooling system is under pressure when the engine is hot.*
- ◆ *Cover filler cap on expansion tank with a cloth and open carefully to release pressure.*

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- Open filler cap on expansion tank.
- Unplug electrical connector -3- from air mass meter -G70- .
- Release clamps -1 and 2- and disconnect air intake hose from air mass meter -G70- .
- Unbolt front intake duct from lock carrier -4-.
- Remove engine cover panel.



- Clamp off coolant hoses at gear oil cooler using hose clamps -3094- .
- Disconnect coolant hoses from gear oil cooler.



- Remove bolts -A-.
- Detach gear oil cooler -B- together with two O-rings -C- from gearbox.


Caution

Do not allow coolant to drip into gearbox.

Installing

- Tightening torque ⇒ [page 76](#) .

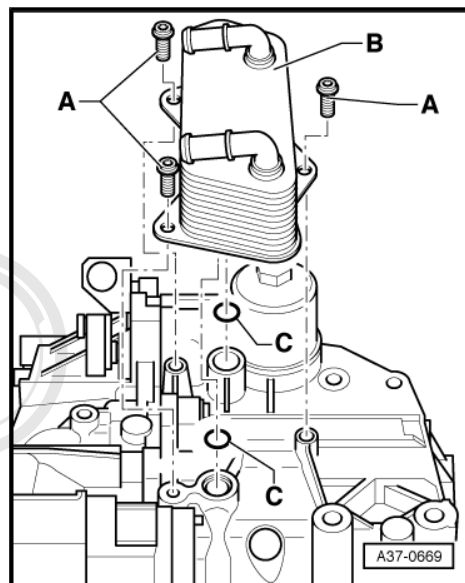
Installation is carried out in reverse sequence; note the following:


Note

- ◆ *Renew bolts for gear oil cooler.*
- ◆ *Renew O-rings.*

- Check coolant level ⇒ [Rep. Gr. 19](#)

- Check gear oil level and top up as required ⇒ [page 66](#)

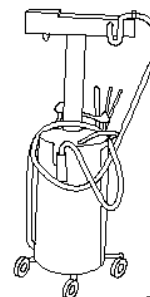


10.2 Removing and installing gear oil filter

Special tools and workshop equipment required

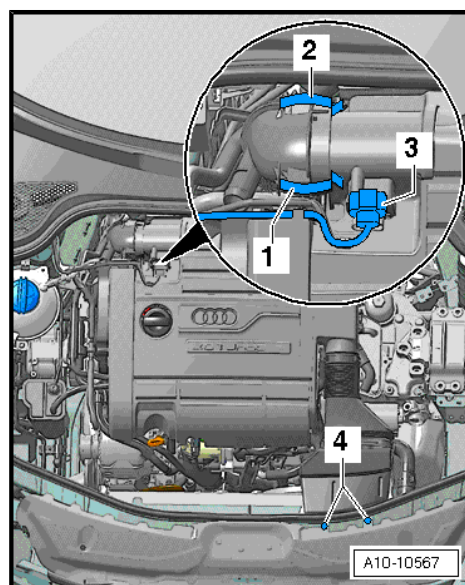
- ◆ Used oil collection and extraction unit -V.A.G 1782-

V.A.G 1782


Removing

Proceed as follows:

- Unplug electrical connector -3- from air mass meter -G70- .
- Release clamps -1 and 2- and disconnect air intake hose from air mass meter -G70- .
- Unbolt front intake duct from lock carrier -4-.
- Remove engine cover panel.



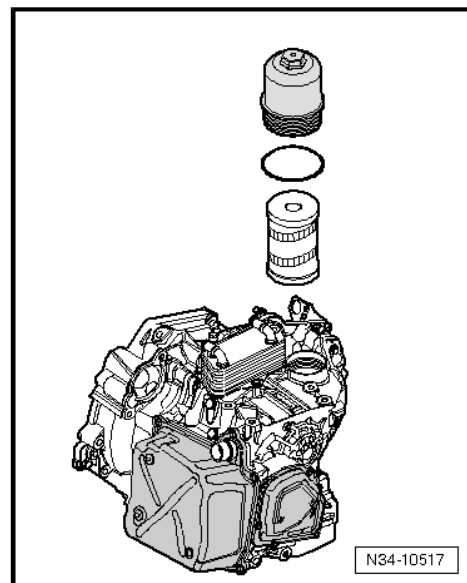
- Place used oil collection and extraction unit -V.A.G 1782- under gearbox.
- Unscrew housing for gear oil filter.



Note

To allow the gear oil to drain back into the gearbox from the housing for the gear oil filter, tilt the housing slightly in its seat before removing it.

- Then lift out filter element slowly.



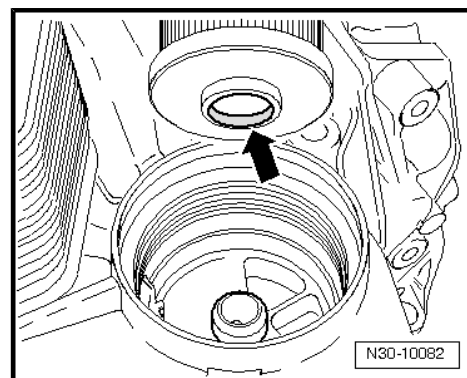
Note

If the O-ring on the intake neck -arrow- of the filter element does not come off together with the filter element, you must remove it from the gearbox separately.

Installing

- Tightening torque ⇒ [page 76](#) .

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



Note

Renew filter element and O-ring on oil filter housing.

- Lightly lubricate O-ring on intake neck -arrow- of filter element with gear oil.
- Install filter element with intake neck facing downwards.
- Lightly lubricate O-ring on housing of gear oil filter with gear oil.
- Tighten filter housing.
- Check gear oil level and top up as required ⇒ [page 66](#) .

35 – Gears, shafts

1 Oil pan, mechatronic unit, gear oil pump - exploded view

1.1 Oil pan, mechatronic unit, gear oil pump



Note

-Items 8 ... 14- can be disregarded here. For description see
⇒ ["10 Gear oil cooler and gear oil filter - exploded view", page 76](#).

1 - Oil pan

- ☐ Removing and installing
⇒ [page 82](#)

2 - Bolt

- ☐ 5 x
- ☐ Tightening sequence
⇒ [page 81](#)
- ☐ Renew

3 - Gasket

- ☐ Renew

4 - Bolt

- ☐ 10 x
- ☐ Tightening sequence
⇒ [page 81](#)
- ☐ Renew

5 - Mechatronic unit for direct shift gearbox -J743-

- ☐ With O-rings on connector
- ☐ Renew O-rings
- ☐ Removing and installing
⇒ [page 85](#)

6 - Breather pipe

- ☐ Pressed into gearbox
- ☐ Must be renewed if removed

7 - Breather cap

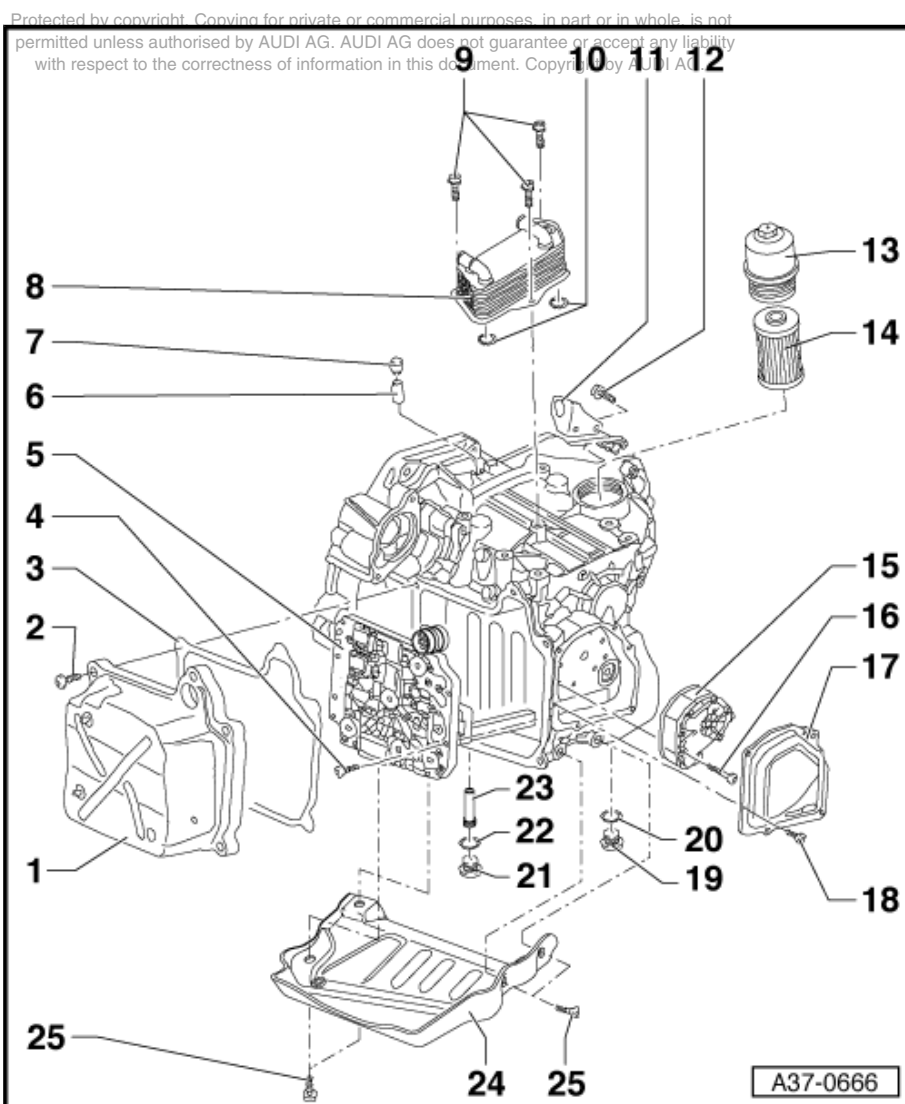
- ☐ Fitted onto breather pipe

15 - Gear oil pump

- ☐ Removing and installing
⇒ [page 90](#)
- ☐ Install with new gasket

16 - Bolt

- ☐ Tightening sequence ⇒ [page 82](#)
- ☐ 4 x



- ☐ Different bolts according to version
- ☐ Renew

17 - Cover for gear oil pump

- ☐ With gasket
- ☐ Renew
- ☐ Removing and installing ⇒ ["1.5 Removing and installing gear oil pump", page 90](#)

18 - Bolt

- ☐ Tightening sequence ⇒ [page 82](#)
- ☐ 4 x
- ☐ Different bolts according to version
- ☐ Renew

24 - Guard plate

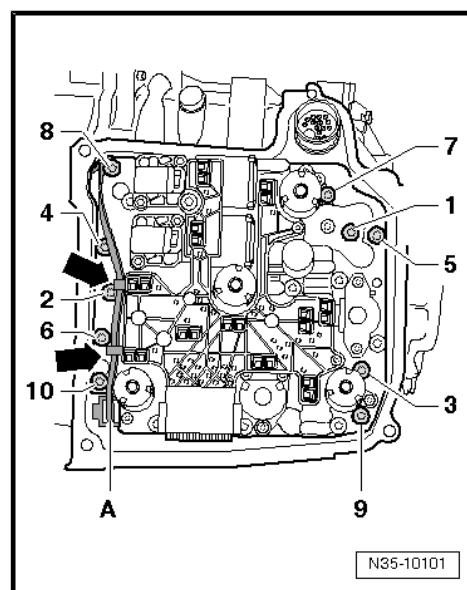
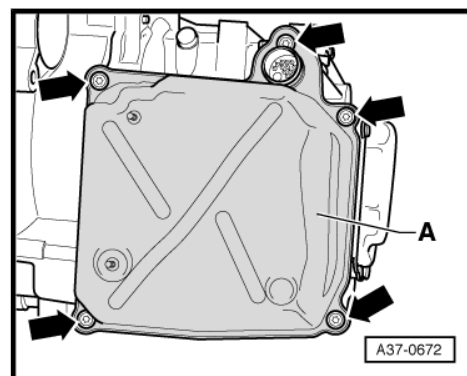
- ☐ Depending on version

25 - Bolt

- ☐ 32 Nm
- ☐ 4 x

Tightening sequence for oil pan

- Tighten bolts -arrows- diagonally in stages.
- 16 Nm



Mechatronic unit for direct shift gearbox -J743-; tightening sequence

- Tighten bolts in the sequence -1 ... 10- in 2 stages as follows:
 1. Tighten bolts to 5 Nm.
 2. Turn bolts 90° further.

Gear oil pump; tightening sequence



Note

There are different types of bolts -A or B-; observe correct tightening method.

- Tighten bolts -arrows- in diagonal sequence (different bolts according to version):

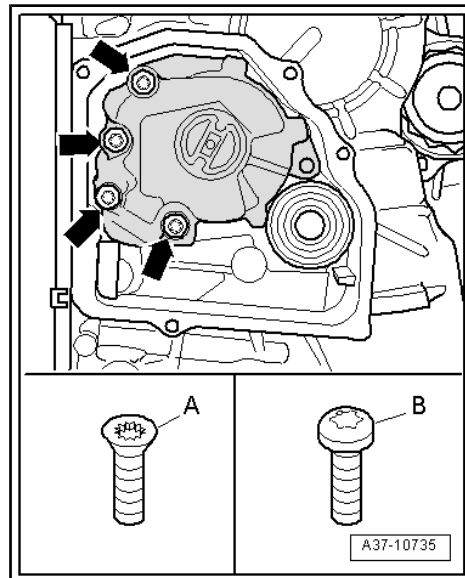
Countersunk-head bolts -A-:

- Tighten countersunk-head bolts to 8 Nm.

Pan-head bolts -B-:

- Tighten pan-head bolts in 2 stages as follows:

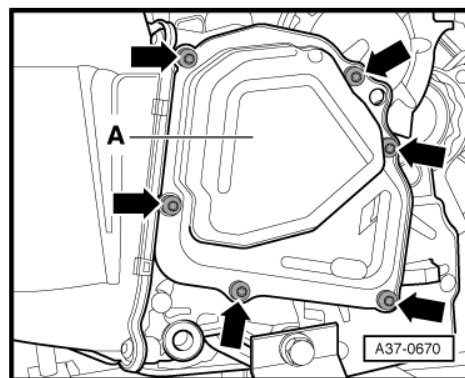
1. Tighten bolts to 8 Nm.
2. Turn bolts 90° further.



Cover for gear oil pump -A-; tightening sequence

- Tighten bolts -arrows- diagonally in stages.

- 8 Nm



Gearbox input speed sender -G182- and clutch temperature sender -G509-

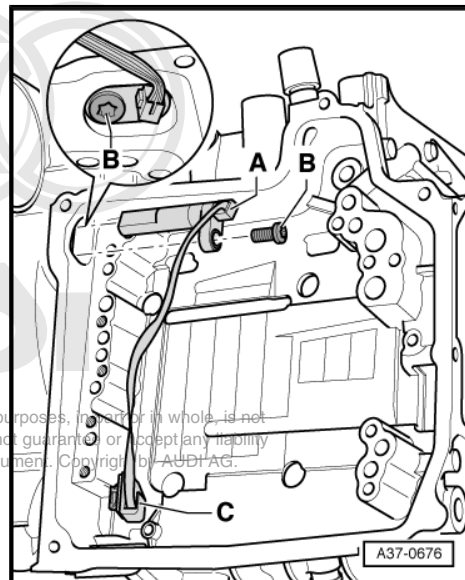
- A - Gearbox input speed sender -G182- and clutch temperature sender -G509-

- Removing and installing ⇒ [page 89](#)

- B - Bolt

- 10 Nm

- C - Electrical connector

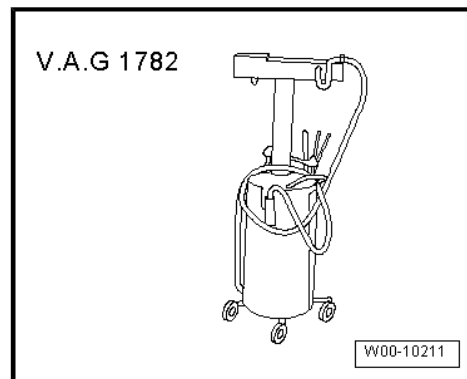


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1.2 Removing and installing oil pan

Special tools and workshop equipment required

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



Removing

Proceed as follows:



Caution

Risk of damage to the gearbox.

- ◆ *Do not run the engine or tow the vehicle with the oil pan removed or when there is no gear oil in the gearbox.*



Note

- ◆ *Observe the general repair instructions ⇒ [page 8](#).*
- ◆ *Observe rules for cleanliness when working on the gearbox ⇒ [page 10](#).*

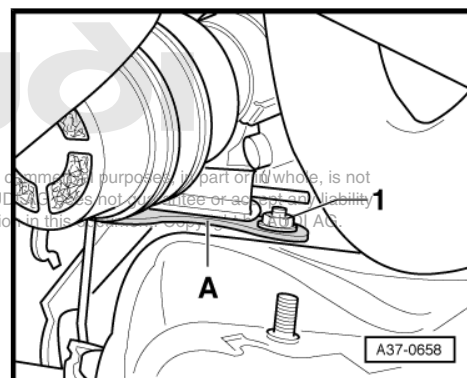


Caution

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

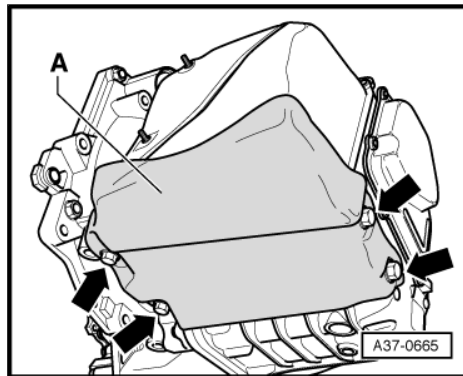
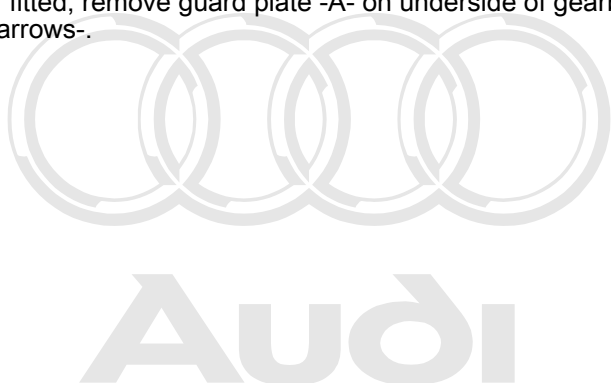
- ◆ *Observe the correct procedure for disconnecting the battery.*

- With the ignition switched off, disconnect battery earth cable ⇒ Rep. Gr. 27.
- Drain off gear oil ⇒ [page 72](#).
- Unscrew nut -1- at front of oil pan and press bracket -A- upwards.



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- If fitted, remove guard plate -A- on underside of gearbox -arrows-.

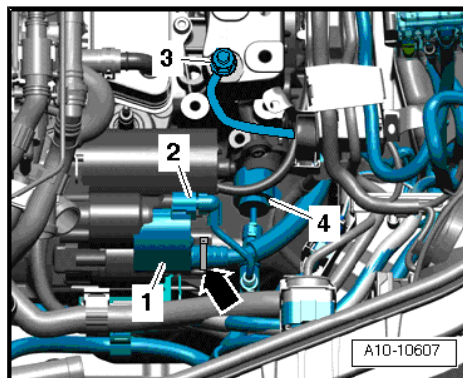


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Mechatronic unit for direct shift gearbox -J743- can be damaged by electrostatic discharge.

- ◆ Do not touch contact pins in connector for mechatronic unit for direct shift gearbox -J743- with bare hands.



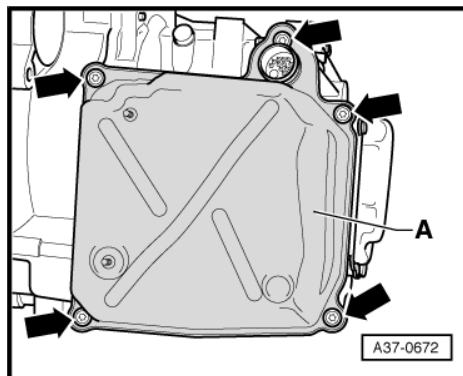
- Touch vehicle earth with your hand (without gloves) to discharge any static electricity.
- Turn fastener anti-clockwise and unplug electrical connector -4- on gearbox.



Note

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

- Place used oil collection and extraction unit -V.A.G 1782- under gearbox.
- Slacken oil pan bolts -arrows- in diagonal sequence.
- Detach oil pan together with oil pan gasket, allowing remaining gear oil in oil pan to drain off into used oil collection and extraction unit -V.A.G 1782- .



Installing

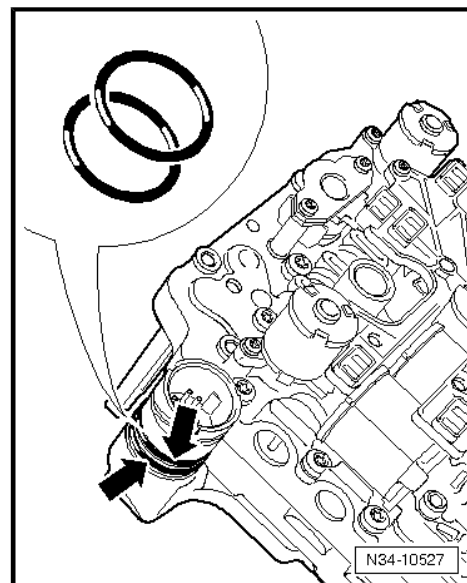
- Tightening torque ⇒ [page 81](#) .

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



Note

- ◆ *Renew gasket and bolts for oil pan.*
- ◆ *Renew O-rings -arrows- on connector for mechatronic unit for direct shift gearbox -J743- .*
- Clean sealing surfaces; they must be free from oil and grease.



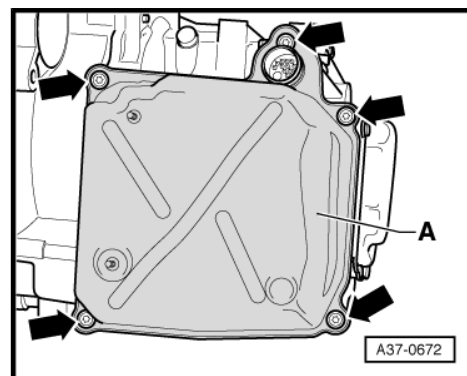
- Fit oil pan with oil pan gasket and tighten bolts ⇒ [page 81](#) .



Note

Make sure no electrical wiring is trapped when fitting oil pan.

- Lightly lubricate O-rings on connector for mechatronic unit for direct shift gearbox -J743- with gear oil
- Fill up with gear oil ⇒ [page 72](#) and check gear oil level ⇒ [page 72](#) .
- Observe correct procedure after connecting battery ⇒ Rep. Gr. 27.



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1.3 Removing and installing mechatronic unit for direct shift gearbox -J743-

Removing

Proceed as follows:



Caution

Risk of damage to the gearbox.

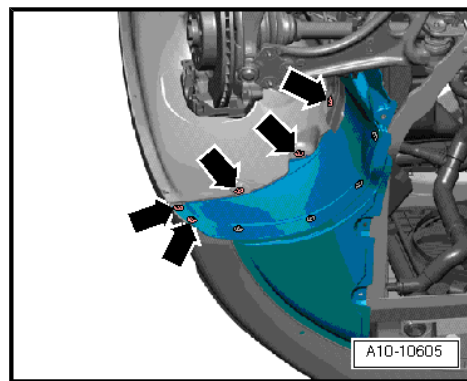
- ◆ ***Do not run the engine or tow the vehicle with the oil pan removed or when there is no gear oil in the gearbox.***



Note

- ◆ *Observe the general repair instructions ⇒ [page 8](#) .*
- ◆ *Observe rules for cleanliness when working on the gearbox ⇒ [page 10](#) .*
- Drain off gear oil ⇒ [page 72](#) .
- Remove oil pan ⇒ [page 82](#) .

- Remove noise insulation (left-side) -arrows-.

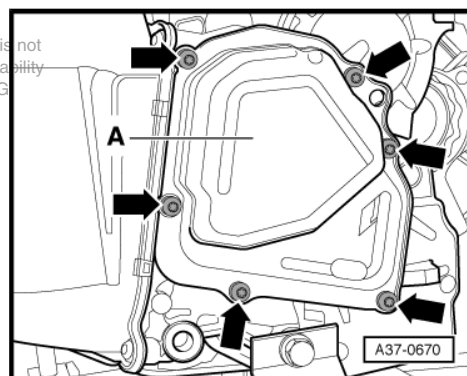


Note

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In order to pull the mechatronic unit out of the gearbox without damage, you must first remove the cover for the gear oil pump.

- Unscrew bolts -arrows- and detach cover for gear oil pump -A-.



Caution

The mechatronic unit can be damaged by electrostatic discharge.

- ◆ *Do not touch the contact pins in the connector with bare hands.*

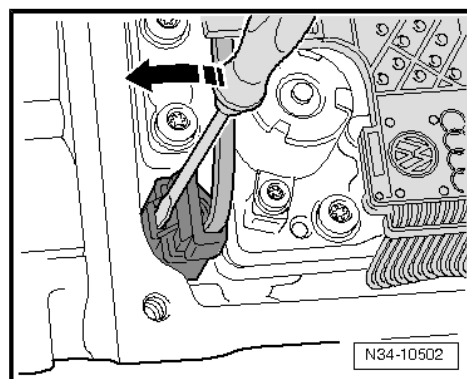
- Touch vehicle earth with your hand (without gloves) to discharge any static electricity.



Caution

The electrical wiring can be damaged.

- ◆ *Do not pull on the electrical wiring.*



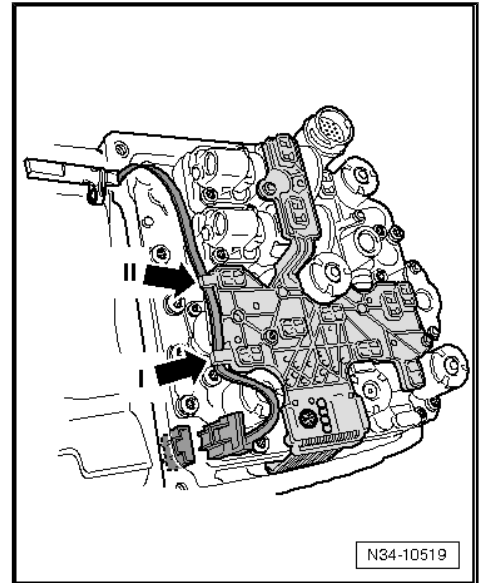
- Using a small screwdriver -arrow-, carefully release electrical connector for gear input speed sender -G182- and clutch temperature sender -G509- and unplug connector.



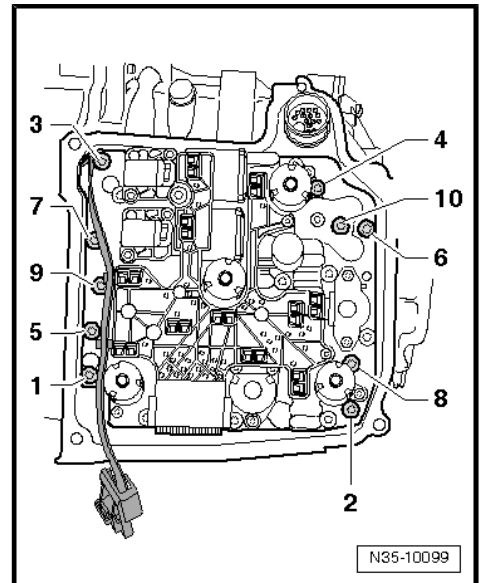
Note

-G182- and -G509- will have to be renewed if the electrical wiring is damaged.

- Release wiring leading to -G182- and -G509- from retaining tabs on mechatronic unit -arrows I and II-.



- Remove bolts in the sequence -1 ... 10-.



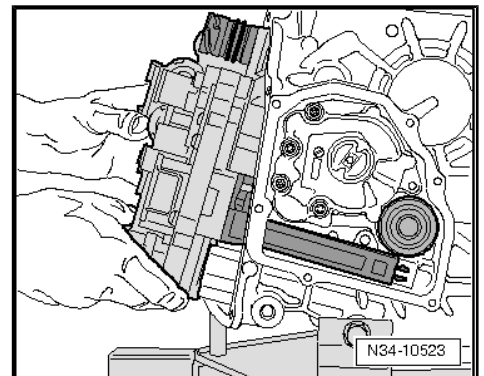
- Carefully pull the mechatronic unit out of the gearbox housing until the long sender "arm" is clear of the gearbox housing.
- Carefully swivel out mechatronic unit downwards.



Caution

The mechatronic unit can be damaged.

- ◆ *Do not lift the mechatronic unit by the sender "arm" or put down the unit so it rests on the sender arm.*



- Put down the mechatronic unit correctly.



Caution

The mechatronic unit can be damaged.

- ◆ *Do not lift the mechatronic unit by the sender "arm" or put down the unit so it rests on the sender arm.*



Note

The mechatronic unit must be renewed if the sender "arm" is damaged.

Installing

- Tightening torques ⇒ [page 80](#) , ⇒ [page 81](#)

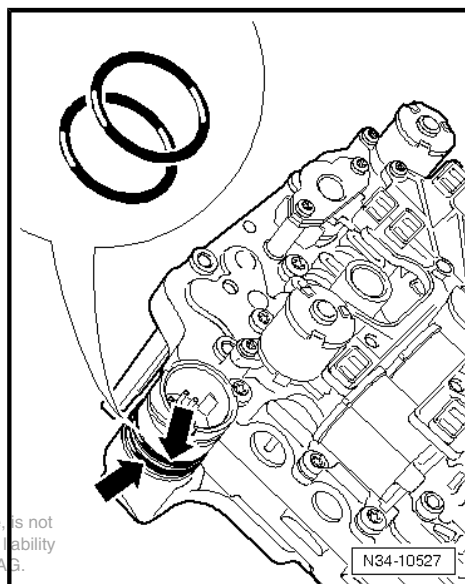
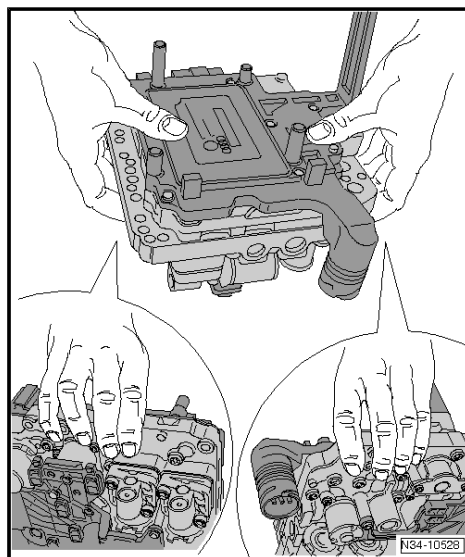
Installation is carried out in reverse sequence; note the following:



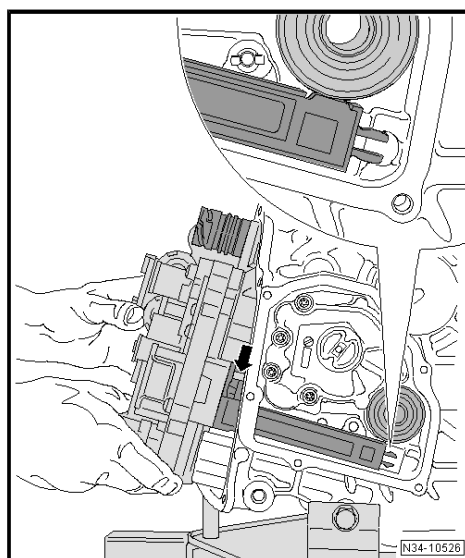
Note

- ◆ *Renew bolts for mechatronic unit for direct shift gearbox -J743- and for cover for gear oil pump.*
- ◆ *Renew cover for gear oil pump.*
- ◆ *When re-installing, renew O-rings -arrows- on connector for mechatronic unit for direct shift gearbox -J743- .*
- ◆ *The O-rings are supplied with the replacement unit if the mechatronic unit for direct shift gearbox -J743- is being renewed.*

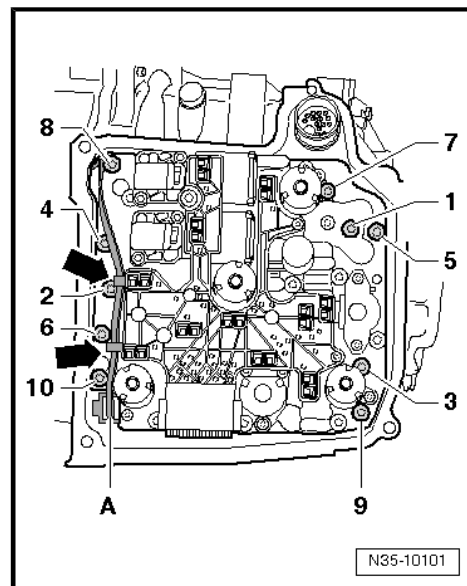
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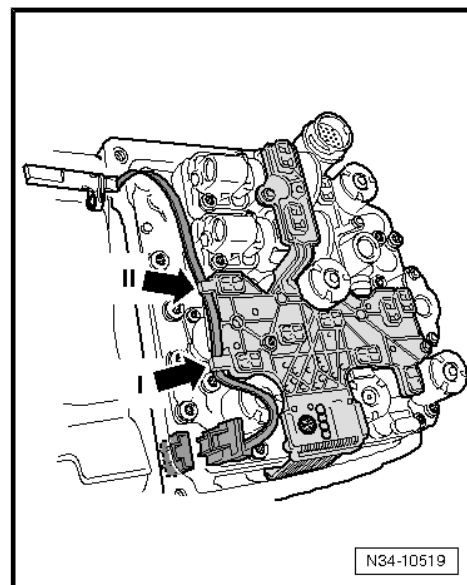
- Carefully fit mechatronic unit for direct shift gearbox -J743- in gearbox housing.
- The mechatronic unit must be fitted onto the dowel pins -arrow-.
- The "sender arm" must fit in the guide in the gearbox housing as shown in the detail view.
- The electrical wiring for -G182- and -G509- must not become trapped.



- Tighten bolts for mechatronic unit for direct shift gearbox - J743- ; note correct tightening sequence ⇒ [page 81](#) .



- Engage electrical wire in top retaining tab first -arrow II-, then in bottom tab -arrow I-.
- Attach connector for -G182- and -G509- , and check that it is properly engaged.
- Install oil pan ⇒ [page 82](#) .
- Attach electrical connector for mechatronic unit for direct shift gearbox -J743- and turn retainer to secure connector.
- Install cover for gear oil pump ⇒ [page 90](#) .
- Fill up with gear oil ⇒ [page 72](#) and check gear oil level ⇒ [page 72](#) .
- Connect vehicle diagnostic, testing and information system - VAS 5051B- .
- Perform basic setting.



1.4

Removing and installing gearbox input speed sender -G182- and clutch temperature sender -G509-

Removing

Proceed as follows:



Caution

Risk of damage to the gearbox.

- ◆ *Do not run the engine or tow the vehicle with the oil pan removed or when there is no gear oil in the gearbox.*



Note

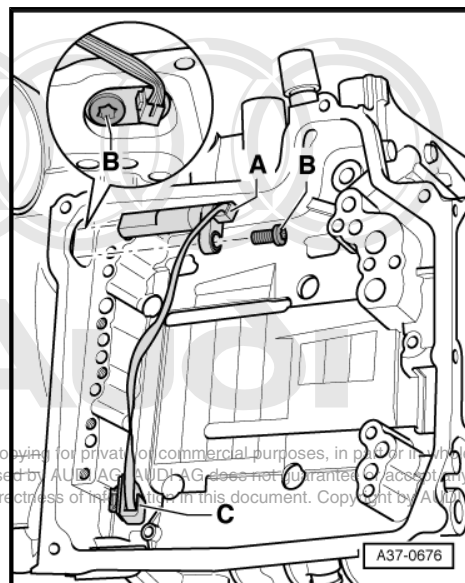
- ◆ *Observe the general repair instructions ⇒ [page 8](#) .*
- ◆ *Observe rules for cleanliness when working on the gearbox ⇒ [page 10](#) .*
- Drain off gear oil ⇒ [page 72](#) .
- Remove oil pan ⇒ [page 82](#) .
- Remove mechatronic unit for direct shift gearbox -J743- ⇒ [page 85](#) .
- Remove bolt -B-.
- Pull gearbox input speed sender -G182- and clutch temperature sender -G509- -item A- out of gearbox together with wiring.

Installing

- Tightening torques ⇒ [page 80](#) , ⇒ [page 82](#)

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

- Lightly lubricate -G182- and -G509- with gear oil.
- Insert -G182- and -G509- in opening on side of gearbox and secure with bolt ⇒ [page 82](#) .
- Install mechatronic unit for direct shift gearbox -J743- ⇒ [page 85](#) .
- Install oil pan ⇒ [page 82](#) .
- Fill up with gear oil ⇒ [page 72](#) and check gear oil level ⇒ [page 72](#) .
- Connect vehicle diagnostic, testing and information system - VAS 5051B- .
- Perform basic setting.



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1.5 Removing and installing gear oil pump

Removing

Proceed as follows:



Caution

Risk of damage to the gearbox.

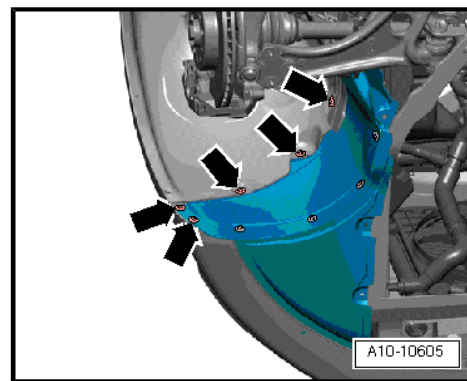
- ◆ *Do not run the engine or tow the vehicle with the oil pan removed or when there is no gear oil in the gearbox.*



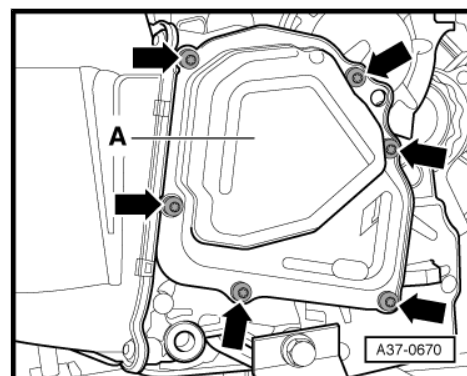
Note

- ◆ *Observe rules for cleanliness when working on the gearbox ⇒ [page 10](#) .*
- ◆ *Observe the general repair instructions ⇒ [page 8](#) .*
- Drain off gear oil ⇒ [page 72](#) and leave used oil collection and extraction unit -V.A.G 1782- in position below gearbox.

- Remove noise insulation (left-side) -arrows-.

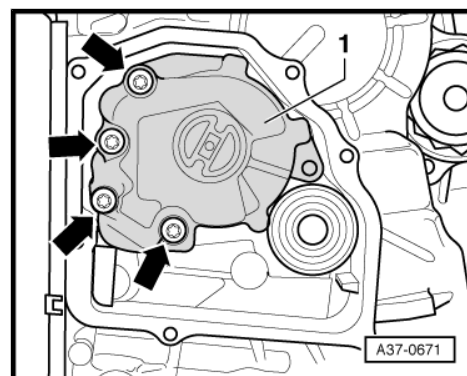


- Remove bolts -arrows- and detach cover for gear oil pump -A-, allowing remaining gear oil in cover to drain off into used oil collection and extraction unit -V.A.G 1782-.



- Remove bolts -arrows- and detach cover for gear oil pump -1-.

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Installing

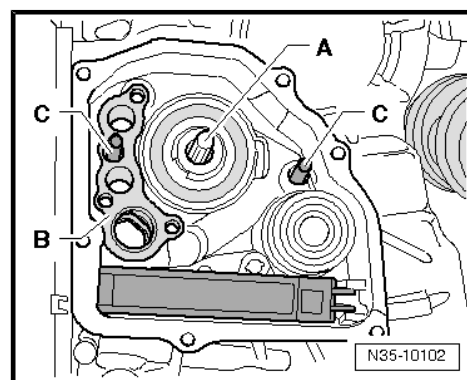
- Tightening torques ⇒ [page 80](#) , ⇒ [page 82](#)

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



Note

- ◆ Renew bolts for gear oil pump and for cover for gear oil pump.
- ◆ Renew gasket -B- and cover for gear oil pump.
- Check that dowel sleeves -C- are fitted in gearbox housing.
- Slide drive shaft -A- for gear oil pump into gearbox as far as stop, turning shaft slightly as required.

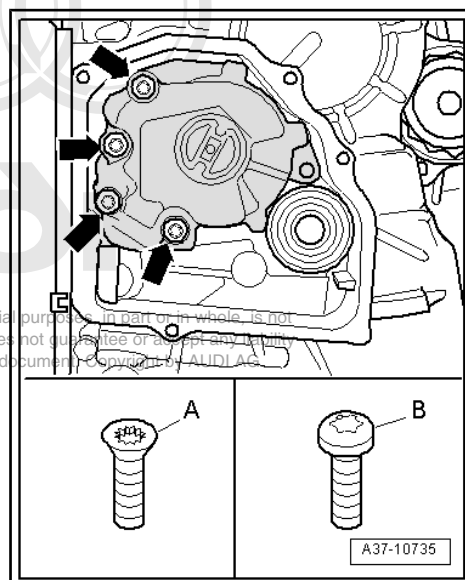
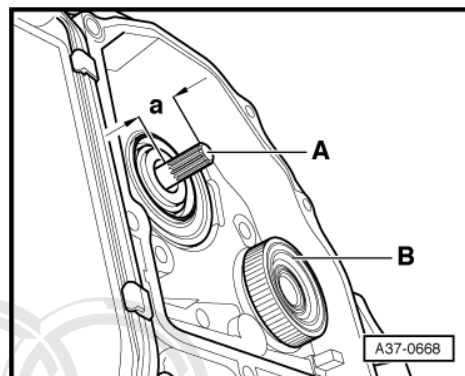


- If drive shaft -A- for gear oil pump is inserted correctly, dimension -a- = approx. 23 mm.
- If necessary, carefully remove any metal particles on sender wheel -B- (the sender wheel must not be demagnetised).
- Remove paper gasket between gear oil pump and gearbox.
- Remove remaining pieces of paper gasket and clean inside of gearbox.
- Clean sealing surfaces; they must be free from oil and grease.
- Fit new paper gasket between gear oil pump and gearbox, if necessary, apply gear oil to hold it in place while assembling.
- Fit gear oil pump -1- onto drive shaft and secure with bolts
⇒ [page 82](#) .

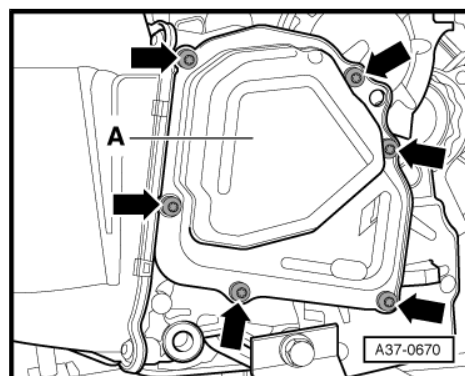


Note

There are different types of bolts -A or B-; observe correct tightening method ⇒ [page 82](#) .



- Clean sealing surface between gearbox housing and cover for gear oil pump.
- Fit cover -A- for gear oil pump and secure with bolts
⇒ [page 82](#) .
- Fill up with gear oil ⇒ [page 72](#) and check gear oil level
⇒ [page 72](#) .



39 – Final drive - differential

1 Flange shafts and oil seals - exploded view

1 - Oil seal

- ☐ For flange shaft (right-side)
- ☐ Renewing ⇒ [page 98](#)

2 - Flange shaft (right-side)

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

3 - Bolt

- ☐ 30 Nm
- ☐ Renew

4 - Nut

- ☐ 20 Nm

5 - Selector shaft lever

- ☐ Removing and installing ⇒ ["1.5 Renewing oil seal for selector shaft", page 100](#)

6 - Oil seal for selector shaft

- ☐ Renewing ⇒ [page 100](#)

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

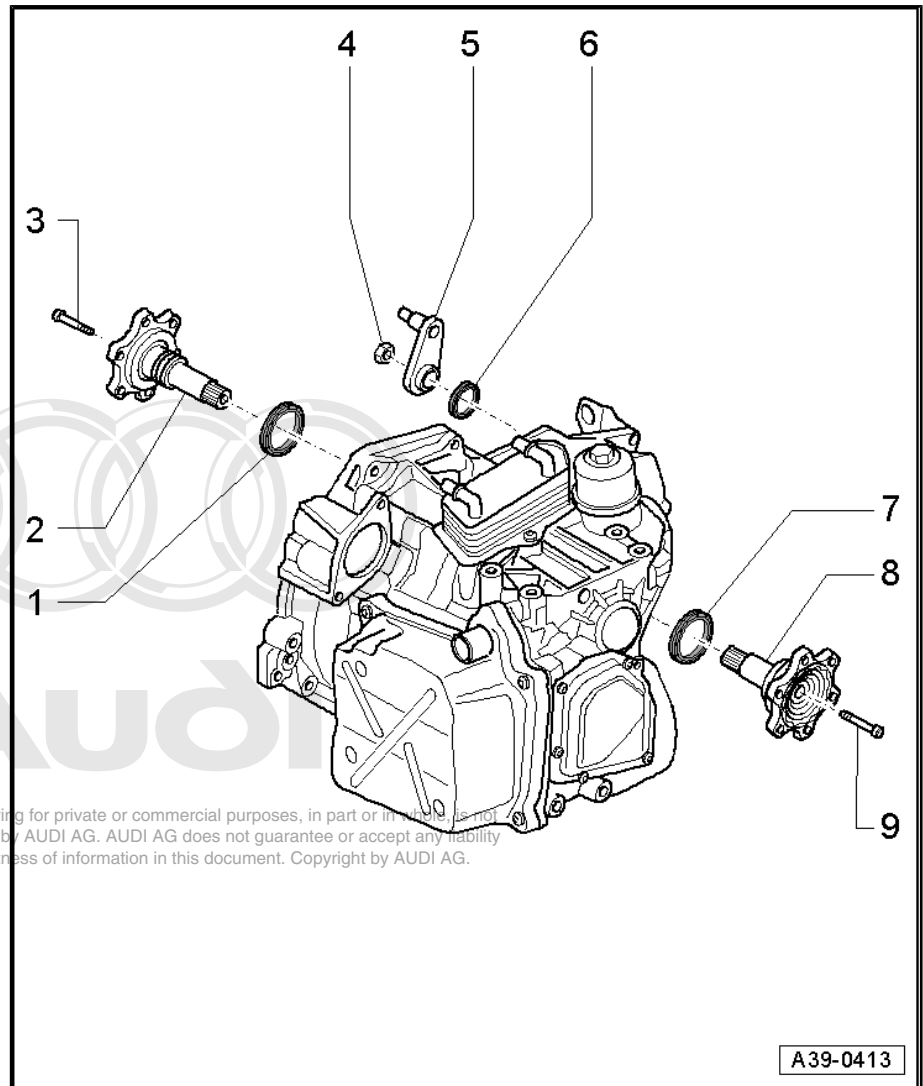
- ☐ Renewing ⇒ [page 97](#)

8 - Flange shaft (left-side)

- ☐ Removing and installing ⇒ [page 94](#)

9 - Bolt

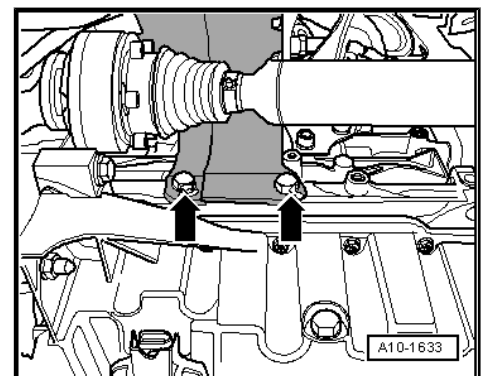
- ☐ 30 Nm
- ☐ Renew



Heat shield for drive shaft (right-side)

Bolts -arrows-

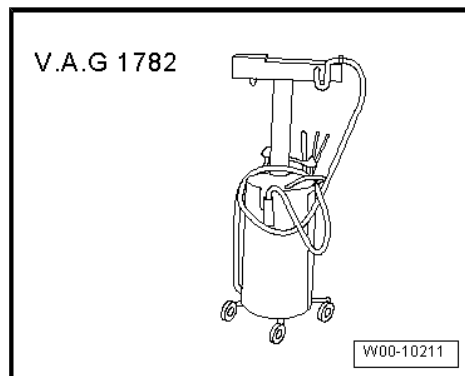
- 35 Nm



1.1 Removing and installing flange shaft (left-side)

Special tools and workshop equipment required

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



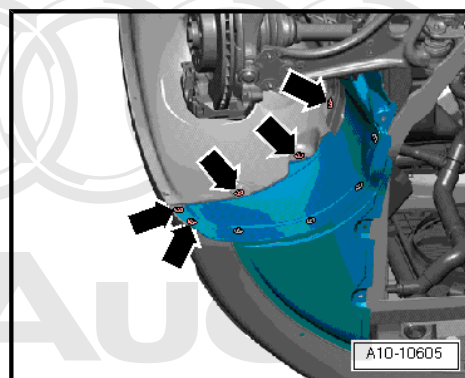
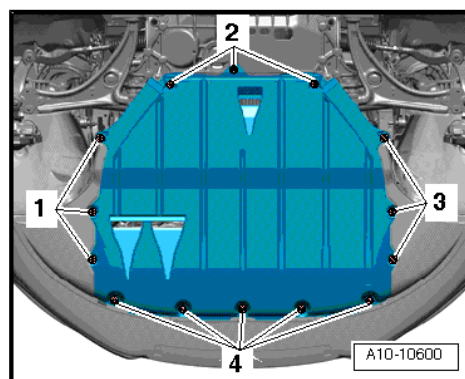
Removing

Proceed as follows:



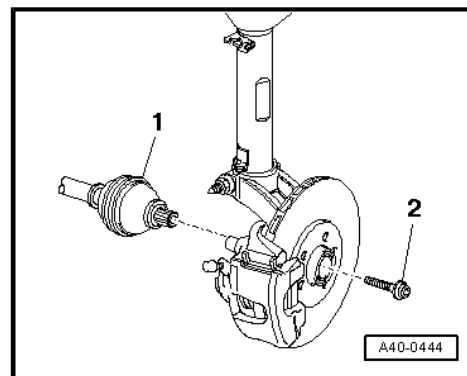
Note

- ◆ *Observe general repair instructions ⇒ [page 8](#).*
- ◆ *Observe rules for cleanliness when working on the gearbox ⇒ [page 10](#).*
- Remove front left wheel.
- Release fasteners -1 ... 4- and remove centre noise insulation.
- Remove noise insulation (left-side) -arrows-.

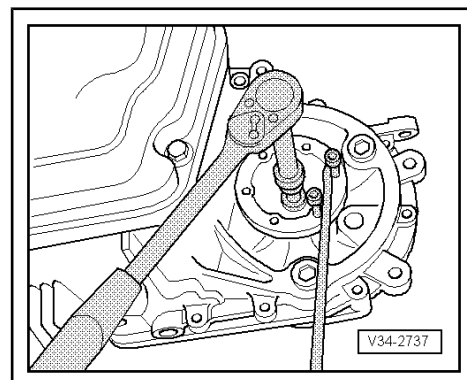


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- Carry out steps required for removing drive shaft (left-side); however, bolt -2- securing drive shaft -1- to wheel hub does not have to be removed ⇒ Rep. Gr. 40 .
- Move drive shaft (left-side) clear to the side and tie in position.



- Place used oil collection and extraction unit -V.A.G 1782- below gearbox.
- Remove bolt securing flange shaft (left-side). To do so, screw two bolts into flange and counterhold flange shaft with suitable lever.
- Pull out flange shaft together with spring, thrust washer and tapered ring.



Installing

- Tightening torque ⇒ [page 93](#) .

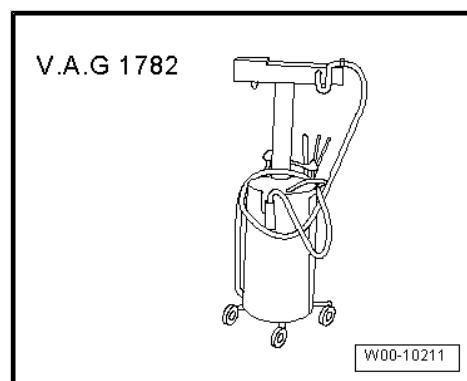
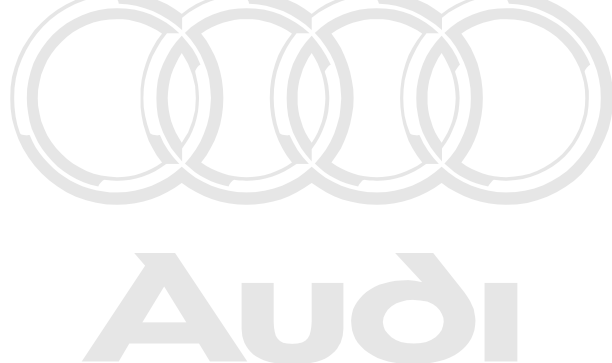
Installation is carried out in reverse sequence; note the following:

- Push flange shaft in against spring pressure securing bolt.
- Install drive shaft (left-side) ⇒ Rep. Gr. 40 .
- Secure swivel joint to wishbone ⇒ Rep. Gr. 40 .
- Secure coupling rod to anti-roll bar ⇒ Rep. Gr. 40 .
- Check gear oil level and top up as required ⇒ [page 66](#) .

1.2 Removing and installing flange shaft (right-side)

Special tools and workshop equipment required

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



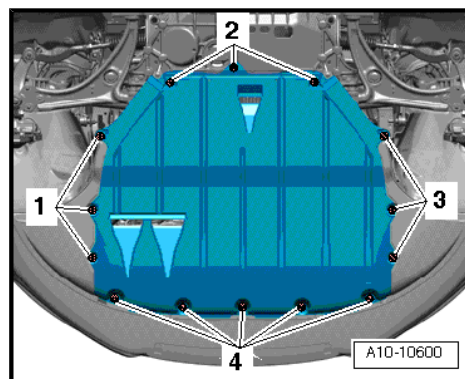
Removing

Proceed as follows:

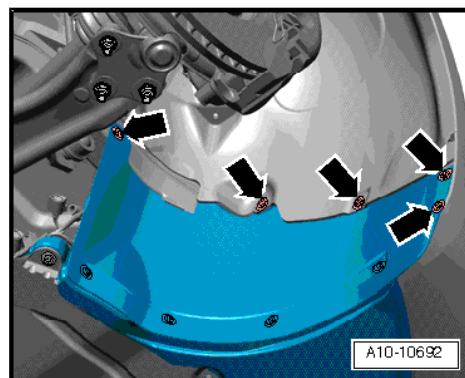


Note

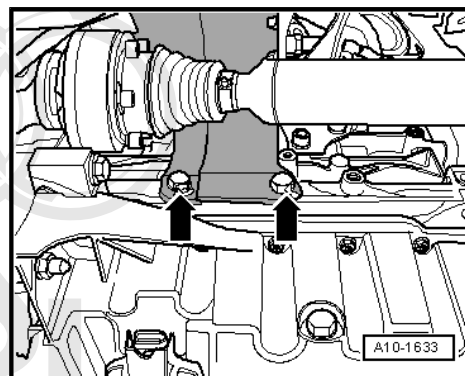
- ◆ Observe general repair instructions ⇒ [page 8](#).
- ◆ Observe rules for cleanliness when working on the gearbox ⇒ [page 10](#).
- Release fasteners -1 ... 4- and remove centre noise insulation.



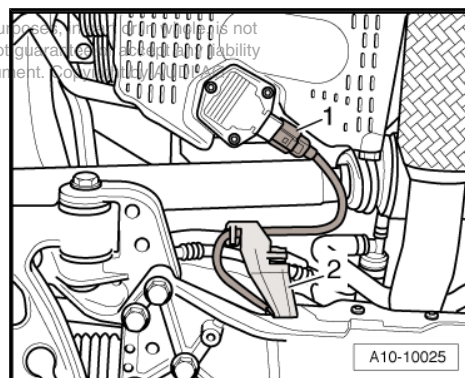
- Remove right noise insulation -arrows-.



- Remove heat shield for drive shaft (right-side) -arrows-.
- Unbolt drive shaft (right-side) from flange shaft on gearbox ⇒ Rep. Gr. 40.



- Unplug electrical connector -1- at oil level and oil temperature sender -G266-.
- Unclip bracket -2- for electrical wiring leading to oil level and oil temperature sender -G266- at subframe.



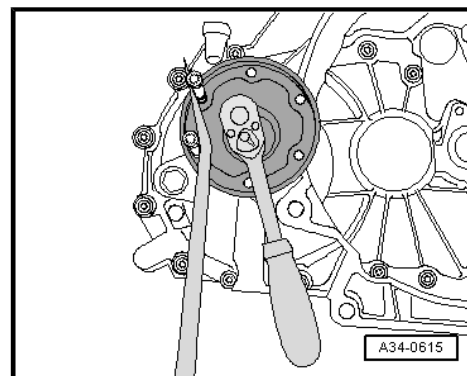
- Place used oil collection and extraction unit -V.A.G 1782- below gearbox.
- Remove bolt securing flange shaft (right-side). To do so, screw two bolts into flange and counterhold flange shaft with suitable lever.
- Pull out flange shaft together with spring, thrust washer and tapered ring.

Installing

- Tightening torque ⇒ [page 93](#) , ⇒ [page 93](#) .

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

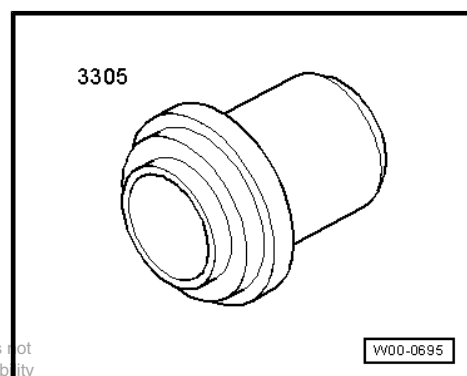
- Push flange shaft in against spring pressure securing bolt.
- Install drive shaft (right-side) ⇒ Rep. Gr. 40 .
- Check gear oil level and top up as required ⇒ [page 66](#) .



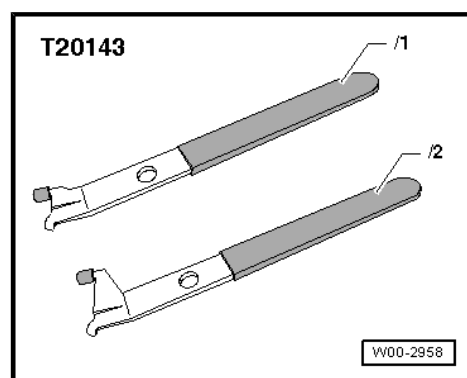
1.3 Renewing oil seal for flange shaft (left-side)

Special tools and workshop equipment required

- ◆ Thrust piece -3305-



- ◆ Extractor tool -T20143-



Removing

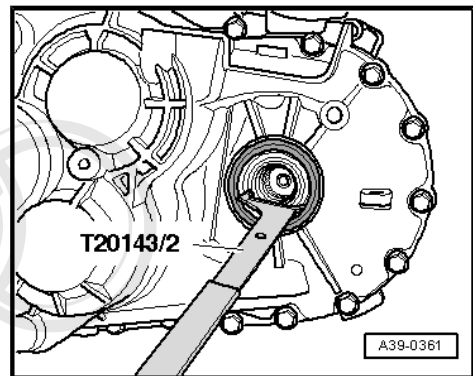
Proceed as follows:



Note

- ◆ The oil seal can be renewed with the gearbox installed.
- ◆ Observe general repair instructions ⇒ [page 8](#) .
- ◆ Observe rules for cleanliness when working on the gearbox ⇒ [page 10](#) .

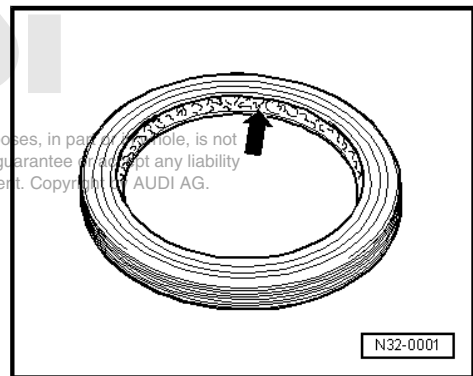
- Remove flange shaft (left-side) ⇒ [page 94](#) .
- Pull out oil seal with extractor tool -T20143/2- .



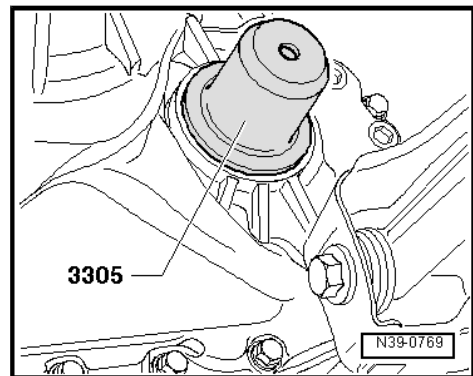
Installing

- Pack space between sealing lip and dust lip -arrow- half full with sealing grease ⇒ Parts catalogue .

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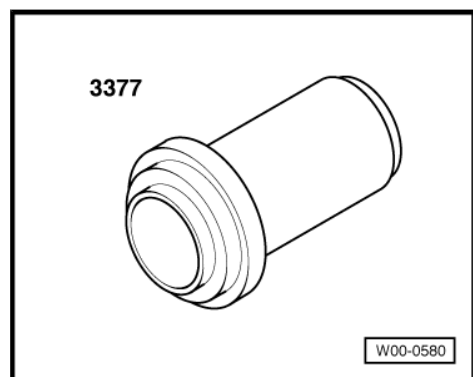
- Drive in new oil seal onto stop using thrust piece -3305- . Take care to keep seal straight when installing.
- Install flange shaft (left-side) ⇒ [page 94](#) .
- Check gear oil level and top up as required ⇒ [page 66](#) .



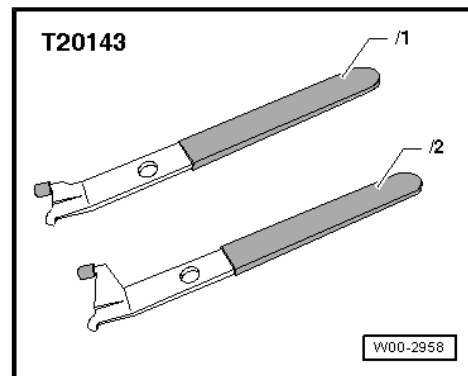
1.4 Renewing oil seal for flange shaft (right-side)

Special tools and workshop equipment required

- ♦ Thrust piece -3377-



◆ Extractor tool -T20143-



Removing

Proceed as follows:

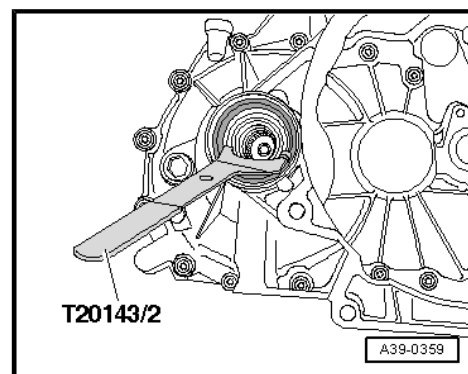


Note

- ◆ The oil seal can be renewed with the gearbox installed.
- ◆ Observe general repair instructions ⇒ [page 8](#).
- ◆ Observe rules for cleanliness when working on the gearbox ⇒ [page 10](#).

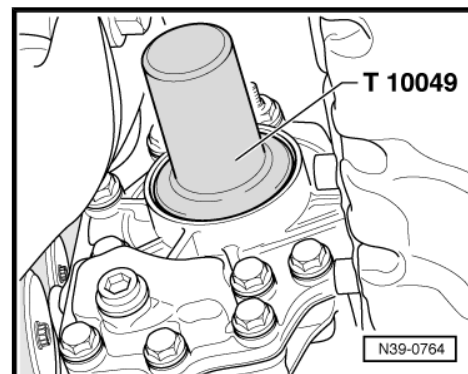
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- Remove flange shaft (right-side) ⇒ [page 95](#).
- Pull out oil seal with extractor tool -T20143/2- .



Installing

- Drive in new oil seal as far as stop using thrust piece -3377- (if tool designation in illustration is different, this can be disregarded).



- Pack space between sealing lip and dust lip -arrow- half full with sealing grease => Parts catalogue .
- Install flange shaft (right-side) => [page 95](#) .
- Check gear oil level and top up as required => [page 66](#) .

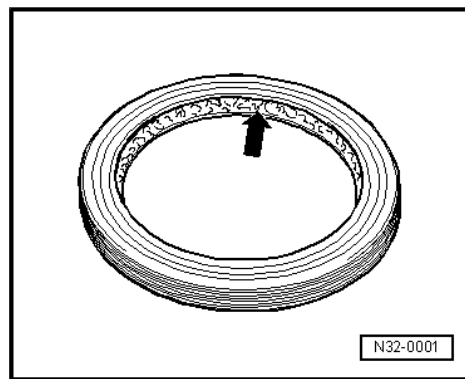
Audi

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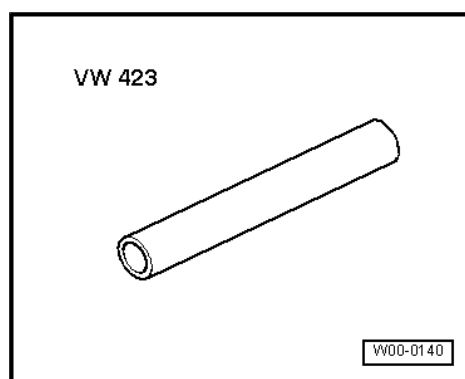
1.5 Renewing oil seal for selector shaft

Special tools and workshop equipment required

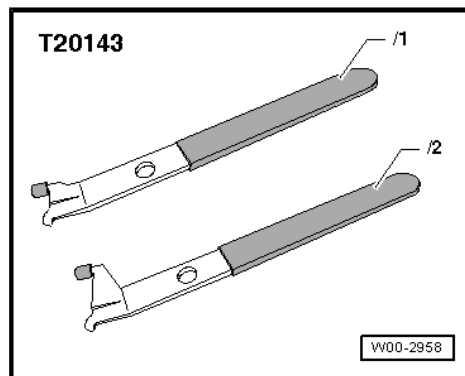
- ◆ Tube -VW 423-



VW 423



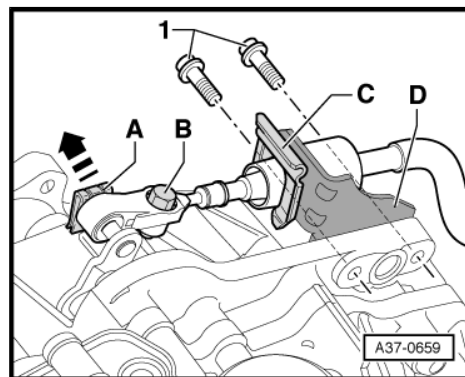
- ◆ Extractor tool -T20143-



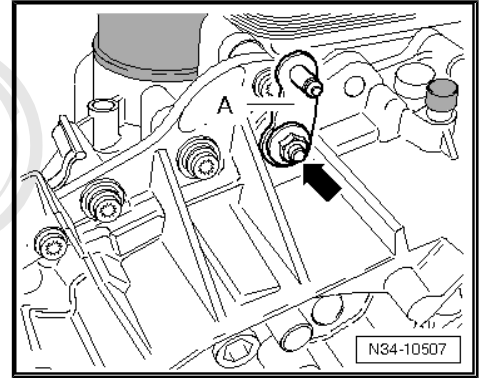
Removing

Proceed as follows:

- Detach selector lever cable from selector shaft lever
=> [page 36](#) .

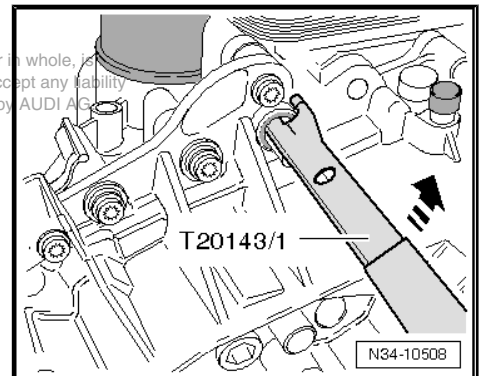


- Remove nut -arrow-.
- Carefully pry selector shaft lever -A- off selector shaft.



- Pry out oil seal with extractor tool -T20143/1-.

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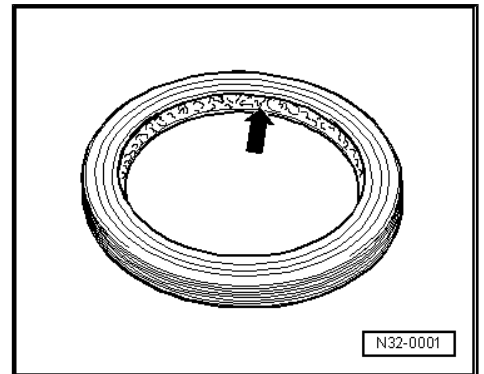


Installing

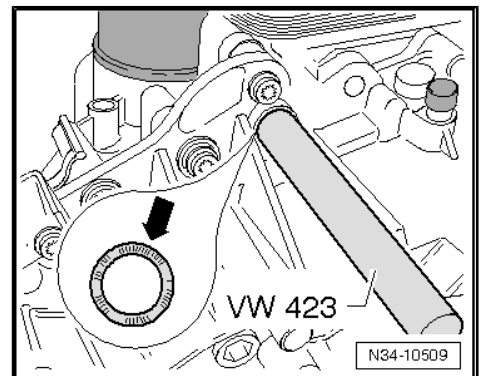
- Tightening torque ⇒ [page 93](#).

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

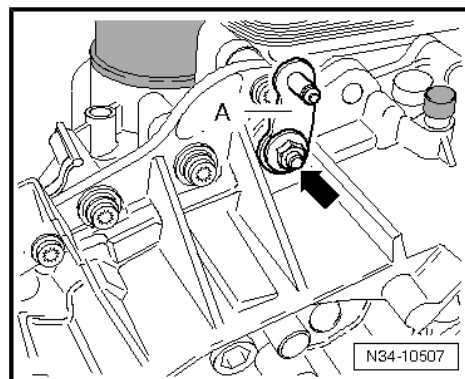
- Lightly oil outer circumference of new oil seal.
- Pack space between sealing lip and dust lip -arrow- half full with sealing grease ⇒ Parts catalogue.



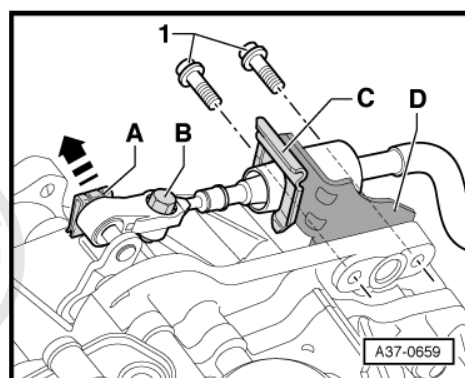
- Drive in oil seal onto stop (take care to keep oil seal straight).
- Closed side of seal -arrow- faces outwards.



- Fit selector shaft lever on selector shaft and secure in place -arrow-.
- Selector shaft lever can only be fitted in one correct position onto splines.



- Install selector lever cable ⇒ [page 36](#) .
- Adjust selector lever cable ⇒ [page 40](#) .



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