

Workshop Manual Audi A3 1997 ➤

Automatic gearbox 09A

Edition 11.2010



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List of Workshop Manual Repair Groups

Repair Group

- 00 - Technical data
- 32 - Torque converter
- 37 - Controls, housing
- 38 - Gears, control
- 39 - Final drive - differential



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

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00 – Technical data

1 Gearbox identification

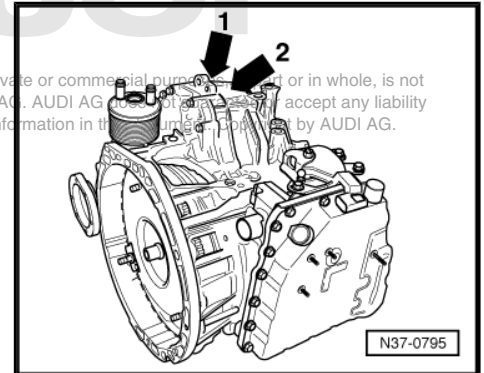
The „automatic gearbox 09A“ is installed in the Audi A3 1997 ▶ in combination with the 4-cylinder petrol and diesel engines. Allocation ⇒ [page 5](#).

1.1 Location on gearbox

Code letters -arrow 1-

5-speed automatic gearbox 09A -arrow 2-

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Code letters -arrow 1-

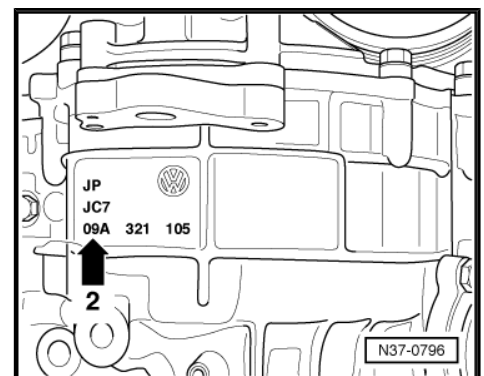
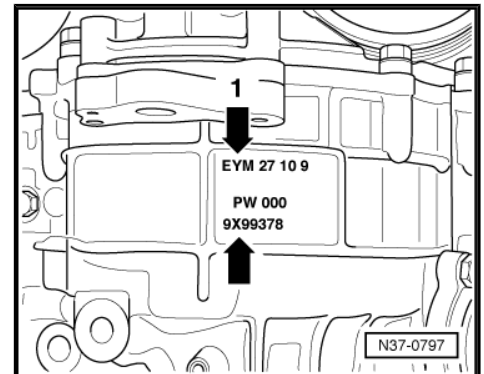
Example:

EYM	27	10	9
Code letters	Day	Month	Year -1999- of manufacture

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

Manufacturer's code -arrow-

5-speed automatic gearbox 09A -arrow 2-





2 Notes on automatic gearbox 09A

Information on this gearbox can be found in ⇒ Self-study programme No. 232 ; 5-speed automatic gearbox 09A/09B .

Gearbox

The automatic gearbox 09A is equipped with 5 hydraulically actuated forward gears. When the lock-up clutch is closed in 2nd, 3rd, 4th or 5th gear, power is transmitted by a direct mechanical connection, which eliminates the torque converter slip.

Torque converter

The torque converter is equipped with a lock-up clutch. The lock-up clutch is closed dependent on load and speed. The 2nd, 3rd, 4th and 5th gears can be driven mechanically (no slip).

ATF

The ATF is filled for life. The ATF need not be changed as part of a service.

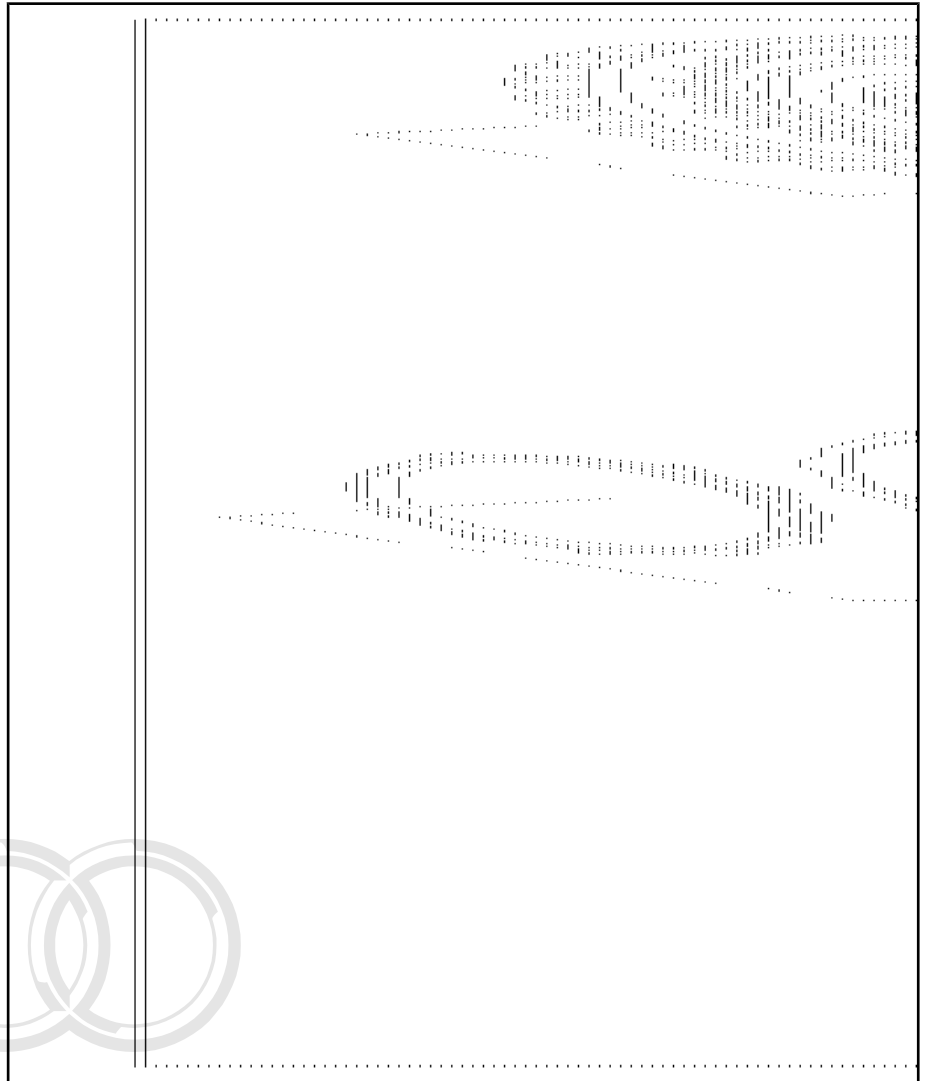
ATF is available as a replacement part; for part number refer to ⇒ Electronic parts catalogue .

The planetary gearing and final drive have a common filling; the ATF level is checked and filled up for both sections of the gearbox together ⇒ [page 38](#) .

2.1 Repairing gearbox



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All selector elements (clutches and brakes) can be renewed.

Dismantling and assembling gearbox ⇒ [page 66](#)

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3 Capacities of planetary gearbox and final drive

Capacity	5-speed automatic gearbox 09A
Initial filling	7.0 ltr. ATF (filled for life)

ATF is obtainable as a replacement part.

The planetary gearbox and final drive are checked and filled together as described in the section

⇒ „3.1 Checking and topping up ATF level“, page 38 .



Caution

Risk of malfunction or gearbox failure.

- ◆ *Use only the ATF available as a replacement part for automatic gearbox 09A ⇒ Electronic parts catalogue .*



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4 Code letters, gearbox allocation, ratios, equipment

Automatic gearbox			09A					
Gearbox	Code letters		EYM		EYN		EGQ	
	Manufactured	from to	07.00		10.00		01.01	
Allocation	Model		Audi A3 1997 ►		Audi A3 1997 ►		Audi A3 1997 ►	
	Engine		1.9 ltr. - 85 kW TDI unit injector		1.8 ltr. - 132 kW 5-valve turbo		1.8 ltr. - 110 kW 5-valve turbo	
Torque converter	Code letters		SIM		AAA		AAA	
Number of plates			Inner	Outer	Inner	Outer	Inner	Outer
	Clutch „K1“		7	7	7	7	6	6
	Clutch „K2“		2	2	2	2	2	2
	Clutch „K3“		5	5	5	5	4	4
	Clutch „K4“		4	4	4	4	3	3
	Brake „B1“		7	6	7	6	6	5
	Brake „B2“		3	3	3	3	2	2
	Brake „B3“ piston Ø in mm		58		58		58	
Ratios	1st gear		3.801		3.801		3.801	
	2nd gear		2.131		2.131		2.131	
	3rd gear		1.364		1.364		1.364	
	4th gear		0.935		0.935		0.935	
	5th gear		0.685		0.685		0.685	
	Reverse gear		2.970		2.970		2.970	
Intermediate drive	No. of teeth	Input gear	52		52		52	
		Output gear	67		67		67	
	Ratio		1.288		1.288		1.288	
Final drive	No. of teeth	Output shaft	24		20		20	
		Crown wheel	65		69		69	
	Ratio		2.708		3.450		3.450	

Automatic gearbox			09A					
Gearbox	Code letters		ELD		EYP		FST	
	Manufactured	from to	01.01		06.01		07.01	
Allocation	Model		Audi A3 1997 ►		Audi A3 1997 ►		Audi A3 1997 ►	
	Engine		1.9 ltr. - 74 kW TDI unit injector		1.8 ltr. - 132 kW 5-valve turbo		1.9 ltr. - 74 kW TDI unit injector	
Torque converter	Code letters		SIM		AAA		SIM	
Number of plates			Inner	Outer	Inner	Outer	Inner	Outer
	Clutch „K1“		6	6	7	7	6	6
	Clutch „K2“		2	2	2	2	2	2
	Clutch „K3“		5	5	5	5	5	5
	Clutch „K4“		4	4	4	4	4	4



Automatic gearbox			09A					
	Brake „B1“		6	5	7	6	6	5
	Brake „B2“		3	3	3	3	3	3
Brake band	Brake „B3“ piston Ø in mm		58		58		58	
Ratios	1st gear		3.801		3.801		3.801	
	2nd gear		2.131		2.131		2.131	
	3rd gear		1.364		1.364		1.364	
	4th gear		0.935		0.935		0.935	
	5th gear		0.685		0.685		0.685	
	Reverse gear		2.970		2.970		2.970	
Intermediate drive	No. of teeth	Input gear	52		52		52	
		Output gear	67		67		67	
	Ratio		1.288		1.288		1.288	
Final drive	No. of teeth	Output shaft	23		20		24	
		Crown wheel	66		69		65	
	Ratio		2.870		3.450		2.708	

Automatic gearbox			09A					
Gearbox	Code letters		FYL		FYP ¹⁾		GNZ ¹⁾	
	Manufactured from to		09.01		01.02		05.03	
Allocation	Model		Audi A3 1997 ►		Audi A3 1997 ►		Audi A3 1997 ►	
	Engine		1.8 ltr. - 110 kW 5-valve turbo		1.9 ltr. - 96 kW TDI unit injector		1.8 ltr. - 132 kW 5-valve turbo	
Torque converter	Code letters		AAA		SIM		AAA	
Number of plates			Inner	Outer	Inner	Outer	Inner	Outer
	Clutch „K1“		6	6				
	Clutch „K2“		2	2				
	Clutch „K3“		5	5				
	Clutch „K4“		4	4				
	Brake „B1“		6	5				
	Brake „B2“		3	3				
Brake band	Brake „B3“ piston Ø in mm		58		58		58	
Ratios	1st gear		3.801		3.801		3.801	
	2nd gear		2.131		2.131		2.131	
	3rd gear		1.364		1.364		1.364	
	4th gear		0.935		0.935		0.935	
	5th gear		0.685		0.685		0.685	
	Reverse gear		2.970		2.970		2.970	
Intermediate drive	No. of teeth	Input gear	52		52		38	
		Output gear	67		67		49	

Automatic gearbox			09A		
	Ratio		1.288	1.288	1.289
Final drive	No. of teeth	Output shaft	20	24	20
		Crown wheel	69	65	69
	Ratio		3.450	2.708	3.450
The following data can be found in the ⇒ Electronic parts catalogue .					
◆ ¹⁾ Number of plates for clutches and brakes					

Automatic gearbox			09A					
Gearbox	Code letters		FGA ¹⁾		GPC ¹⁾		GPD ²⁾	
	Manufactured	from to	11.00					
Allocation	Model		Audi A3 1997 ►		Audi A3 1997 ►		Audi A3 1997 ►	
	Engine		1.8 ltr. - 132 kW 5-valve turbo		1.9 ltr. - 74 kW TDI unit injector		1.8 ltr. - 132 kW 5-valve turbo	
Torque converter	Code letters						AAA	
Number of plates			Inner	Outer	Inner	Outer	Inner	Outer
	Clutch „K1“							
	Clutch „K2“							
	Clutch „K3“							
	Clutch „K4“							
	Brake „B1“							
	Brake „B2“							
Brake band	Brake „B3“ piston Ø in mm		58		58		58	
Ratios	1st gear		3.801		3.801		3.801	
	2nd gear		2.131		2.131		2.131	
	3rd gear		1.364		1.364		1.364	
	4th gear		0.935		0.935		0.935	
	5th gear		0.685		0.685		0.685	
	Reverse gear		2.970		2.970		2.970	
Intermediate drive	No. of teeth	Input gear					38	
		Output gear					49	
	Ratio						1.289	
Final drive	No. of teeth	Output shaft					20	
		Crown wheel					69	
	Ratio						3.450	
The following data can be found in the ⇒ Electronic parts catalogue .								
◆ 1) Number of plates for clutches and brakes and code letters of torque converter								
◆ 2) Number of plates for clutches and brakes								

5 Safety precautions

Observe the following precautions to avoid possible injury and/or damage to the vehicle:



WARNING

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

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

Danger from toxic exhaust gases when engine is running.

- ◆ *When the engine is running, the exhaust system must always be connected to an exhaust gas extractor unit.*

Observe the following precautions to avoid possible injury and/or irreparable 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.*

– Disconnect battery ⇒ Electrical system; Rep. gr. 27 .

Observe the following precautions if test equipment has to be used when road-testing the vehicle.



WARNING

Accidents can be caused if the driver is distracted by test equipment or if test equipment is not secured.

Injuries can 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.*
- ◆ *Always secure testing equipment to the rear seat with a strap and have them operated from there by a second person.*

6 Notes on tow-starting and towing



Caution

Risk of irreparable damage to gearbox.

- ◆ *When the vehicle is towed, the selector lever must be set to position „N“; the vehicle must not be towed for a distance of more than 50 km or at any speed higher than 50 km/h.*



Note

It is not possible to start the engine by means of tow-starting, for instance in the case of insufficient battery charge or if the starter is not working.



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7 Repair instructions

7.1 Contact corrosion!

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

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

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

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

Please note:

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

7.2 General repair instructions

Proper tools and the maximum possible care and cleanliness are essential for satisfactory 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 - which were previously repeated at numerous places in the Workshop Manual - are summarised here. They apply to the work described in this Manual.

Vehicle self-diagnosis

Before servicing the gearbox, the exact cause of the fault must be determined as precisely as possible. Self-diagnosis is described in a separate manual ⇒ Automatic gearbox 09A, self-diagnosis; Rep. gr. 01 .

Environmental and waste disposal regulations for oil

- ◆ ATF and any other type of oil must be handled with care.
- ◆ Dispose of drained oil properly.
- ◆ Always adhere to statutory environmental and waste disposal regulations.
- ◆ Observe the information shown on the packaging of the oil.

Special tools

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

Replacement parts

Many components of this gearbox are dismantled for cleaning; however, they may not always be available as replacement parts. To see which parts are available, please refer to the ⇒ Electronic parts catalogue .

Gearbox

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

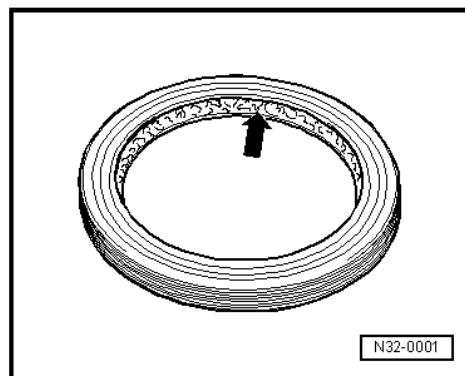
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- ◆ When installing a new automatic gearbox, check the ATF level and fill up if necessary ⇒ [page 38](#) . Capacities ⇒ [page 4](#) , specifications ⇒ Electronic parts catalogue .
- ◆ If gearbox has been removed from vehicle, secure torque converter to prevent it from falling out.
- ◆ Thoroughly clean all joints and connections and the surrounding areas before dismantling.
- ◆ Before installing gearbox check position of torque converter ⇒ [page 16](#) .
- ◆ When installing gearbox, ensure that dowel sleeves are fitted correctly.
- ◆ Place removed parts on a clean surface and cover them over. Use sheeting and paper. Use lint-free cloths.
- ◆ Carefully cover or seal open components if repairs cannot be carried out immediately.
- ◆ Only install clean components: do not remove replacement parts from packaging until just before installation.

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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 ATF before installation to prevent them from being crushed during assembly.
- ◆ Lightly lubricate the outer circumference of oil seals and the space between the sealing lips -arrow- with ATF.
- ◆ Do not use any other lubricants where ATF is used. 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 13](#) .
- ◆ After installing, check ATF level and correct as necessary ➔ [page 38](#) .



Locking elements

- ◆ Do not over-stretch circlips.
- ◆ Renew circlips which have been damaged or over-tensioned.
- ◆ 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 ➔ Electronic 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).

Valve body

- ◆ Renew valve body if any of the shift elements are scorched.

Clutches

- ◆ Clutches „K1“, „K2“, „K3“ and „K4“ should be dismantled only for cleaning; renew clutches if any components are defective. Clutches are assigned according to the gearbox code.

8 Rules for cleanliness when working on the automatic gearbox

- ◆ Carefully clean connection points and the surrounding area with engine cleaner or brake cleaner and dry thoroughly before opening.
- ◆ Use cleaning fluid -D 009 401 04- to clean the gearbox and its components.
- ◆ Use lint-free cloths for cleaning, such as the „WYPALL X70 / WORKHORSE“ cloth from Kimberly-Clark Professional.
- ◆ Seal off open lines and connections immediately with clean plugs or sealing caps from engine bung set -VAS 6122- immediately.
- ◆ Place removed parts on a clean surface and cover them over. Use sheeting and paper. Use lint-free cloths.
- ◆ Carefully cover or seal open components if repairs cannot be carried out 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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32 – Torque converter

1 Torque converter



Note

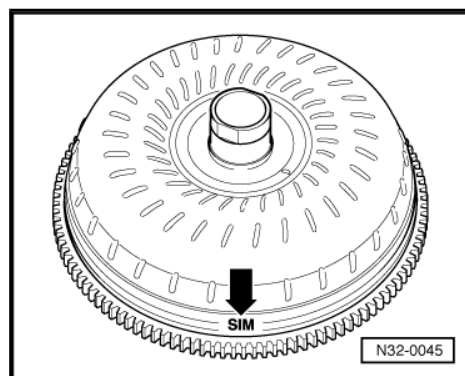
- ◆ *Repair instructions ⇒ [page 10](#) .*
- ◆ *Lubricate oil seals lightly with ATF. Other types of lubricant will cause the gearbox hydraulics to malfunction.*

1.1 Identification of torque converter

There are various types of torque converter. They are marked with code letters -arrow-.

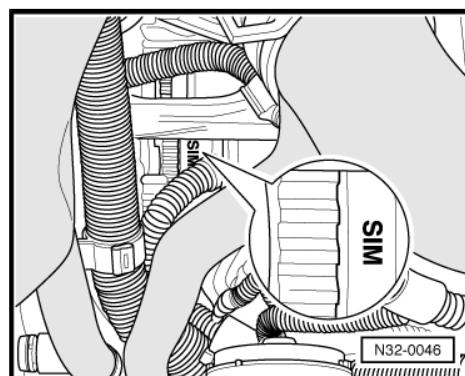
Torque converter/gearbox allocation ⇒ [page 5](#)

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Torque converter code letters

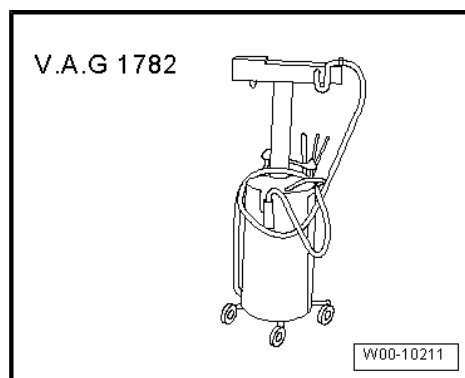
(Gearbox fitted in vehicle)



1.2 Draining torque converter

Special tools and workshop equipment required

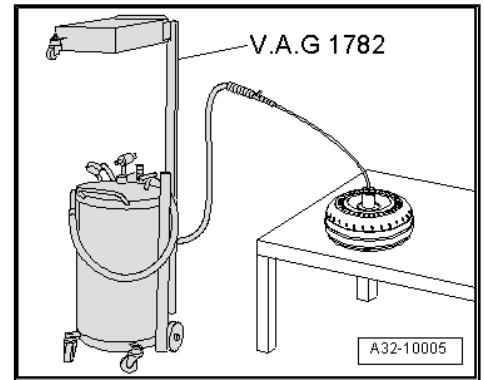
- ◆ Used oil collection and extraction unit -V.A.G 1782-



Procedure

If the ATF has become contaminated by abrasion, or when performing a major gearbox overhaul, drain the torque converter as follows:

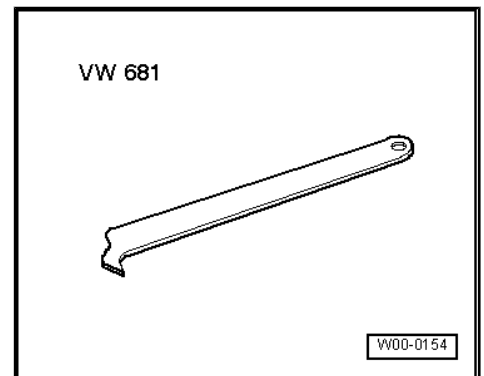
- Extract ATF from torque converter with used oil collection and extraction unit -V.A.G 1782- and oil extractor probe.



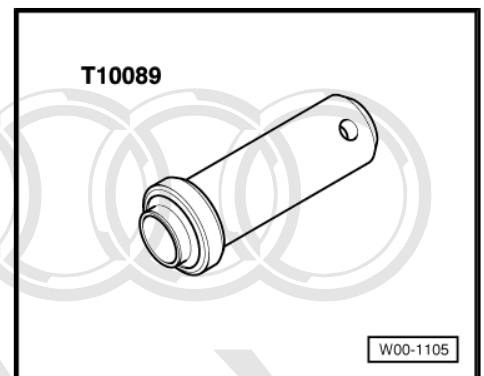
1.3 Removing and installing torque converter oil seal

Special tools and workshop equipment required

- ◆ Oil seal extractor lever -VW 681-

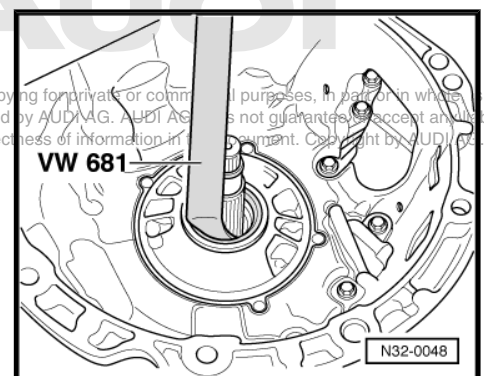


- ◆ Thrust piece -T10089-

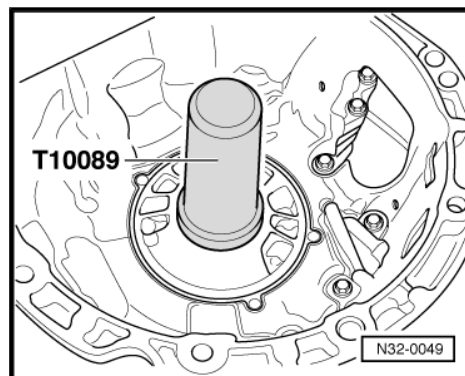


Removing torque converter oil seal

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Installing torque converter oil seal (drive in until flush)

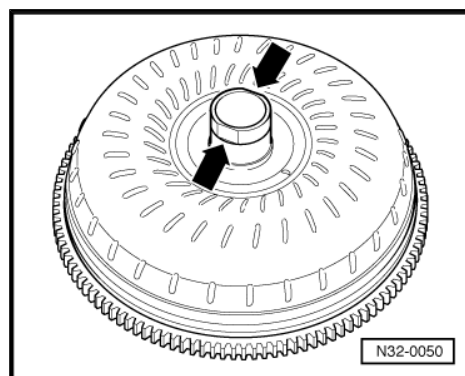


1.4 Installing torque converter

The ATF pump is driven via the torque converter -arrows-.

When installing the torque converter, ensure that this drive engages in the recesses of the internal gear in the ATF pump.

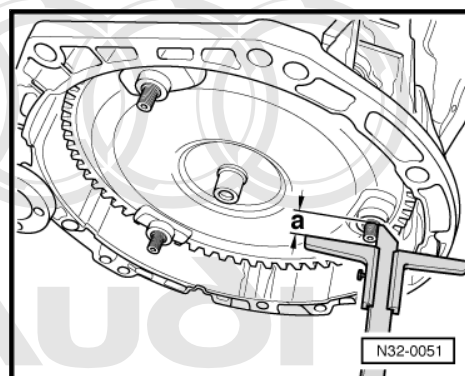
- Push torque converter hub through oil seal onto input shaft as far as first stop.
- Press torque converter against ATF pump by hand, turning it so that torque converter hub engages in recesses of internal gear in ATF pump. You should feel the torque converter sliding into place.



The torque converter is fitted correctly if the distance -a- between the flange on gearbox housing and the contact surface of torque converter studs is at least

a = 21 mm

- It is important to ensure that distance -a- remains unchanged during subsequent assembly work. The torque converter must not slip forwards.



WARNING

If the torque converter is not fitted correctly, the torque converter drive lugs or the ATF pump will be irreparably damaged when the gearbox is joined to the engine.

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37 – Controls, housing

1 Servicing selector mechanism



WARNING

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

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

1.1 Checking selector mechanism

- ◆ It should not be possible to operate the starter while the selector lever is in position „2“, „3“, „4“, „D“ or „R“.
- ◆ On right-hand drive vehicles the starter should not operate in selector lever positions „P“ and „N“ when the interlock button in the selector lever handle is pressed.
- ◆ When travelling at speeds above 5 km/h and shifting into selector lever position „N“, 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.
- ◆ When travelling at speeds below 5 km/h (almost stationary) and shifting into selector lever position „N“, the solenoid for the selector lever lock should only engage after about 1 second. Selector lever cannot be shifted out of position „N“ until brake pedal is depressed.

Selector lever in „P“ position and ignition switched on:

- Brake pedal not depressed:

Selector lever is locked and cannot be shifted out of position „P“. Solenoid for selector lever lock blocks selector lever.

- Brake pedal depressed:

Solenoid for selector lever lock releases selector lever. It is possible to shift into a driving gear. Shift selector lever slowly from position „P“ through „R, N, D, 4, 3, 2“ and check whether display in instrument cluster shows correct selector lever position in each case.

Selector lever in position „N“ and ignition switched on:

- Brake pedal not depressed:

Selector lever is locked and cannot be shifted out of position „N“. Solenoid for selector lever lock blocks selector lever.

- Brake pedal depressed:

Solenoid for selector lever lock releases selector lever. It is possible to shift into a driving gear.

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 display should go out and the „+“ and „–“ symbols should light up.

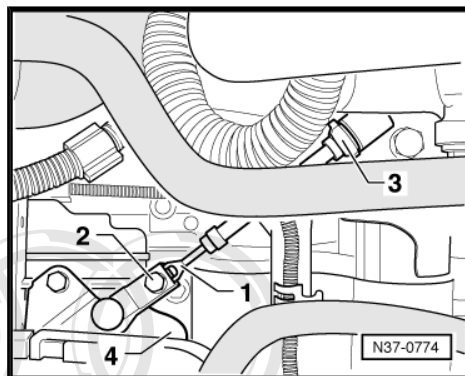
The selector lever position indicator in the instrument cluster should switch from „PRND432“ to „54321“ when the selector lever is shifted into the tiptronic gate.

- Checking and adjusting selector lever cable ⇒ [page 18](#)
- Checking ignition key removal lock ⇒ [page 19](#)

1.2 Checking and adjusting selector lever cable

Checking selector lever cable

- Shift selector lever into position „P“.
- Pull selector lever cable -1- upwards off selector shaft lever -4- and position cable so that end of cable is free to move.
- ◆ Do not bend or kink the selector lever cable.
- Shift selector lever from position „P“ to „2“.
- Check front protective sleeve on selector lever cable for damage, if necessary renew cable.
- Shift selector lever into position „P“.
- Selector mechanism and selector lever cable should move smoothly, if necessary renew selector lever cable (⇒ [page 28](#)) or service selector mechanism.
- Press selector lever cable onto selector shaft lever using pliers.



Renew securing clip -3- if it has been removed.

Adjusting selector lever cable

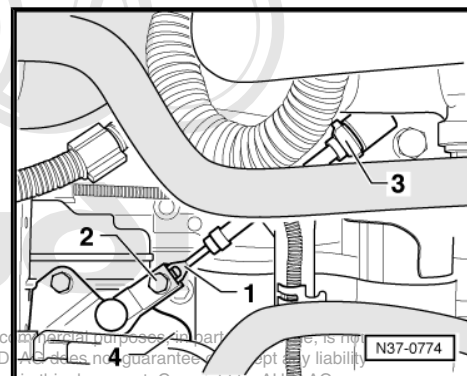
- Shift selector lever into position „P“.

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- Loosen bolt -2- at front ball socket of selector lever cable -1-.
- Bring selector shaft lever into position „P“ on gearbox. Detent lever must engage in parking lock gear, both front wheels are locked (cannot be turned together in one direction).
- Tighten bolt -2- to 13 Nm without altering 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 17](#) .



1.3 Checking ignition key removal lock

- Press and hold brake pedal.
- When interlock button in selector lever handle is pressed, it should be possible to move selector lever out of position „P“ without „catching“.
- Switch off ignition.
- It should not be possible to remove the ignition key when the selector lever is in any position other than „P“.
- Shift selector lever into position „P“.
- Pull out ignition key.
- It should only be possible to remove ignition key in selector lever position „P“.
- Selector lever can then not be shifted out of „P“ position with interlock button pressed and brake pedal depressed.

If the ignition key removal lock does not function as described, perform self-diagnosis ⇒ Automatic gearbox 09A, self-diagnosis; Rep. gr. 01 .

1.4 Removing and installing selector mechanism

Removing

- Shift selector lever into position „P“.



Caution

Follow steps required when disconnecting battery ⇒ Electrical system; Rep. gr. 27.

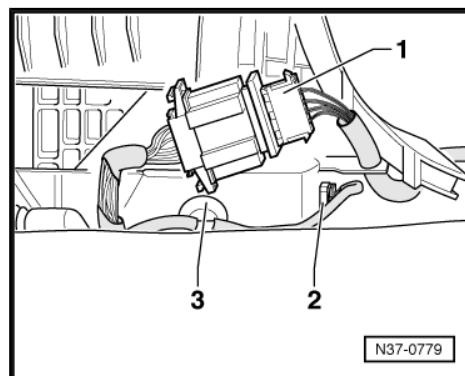


Note

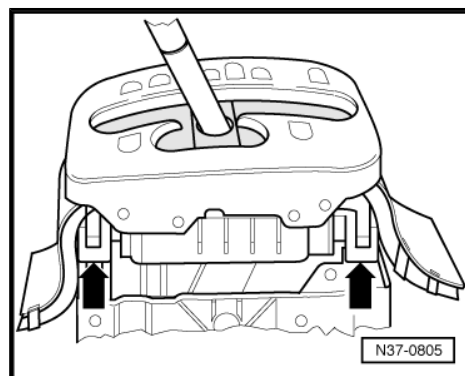
Before continuing the procedure, the battery earth strap must be disconnected. First check whether a coded radio is fitted and obtain anti-theft coding if necessary.

- With the ignition switched off, disconnect battery earth strap.
- Remove selector lever handle ⇒ [page 25](#) .
- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 .
- Disconnect locking cable from selector mechanism locking lever ⇒ [page 31](#) .
- Unplug electrical connector -1- for printed circuit.
- Use screwdriver to carefully pry retainer -3- on connector for selector lever lock solenoid -N110- -2- out of shift unit.
- Unplug connector -2- for selector lever lock solenoid -N110- .

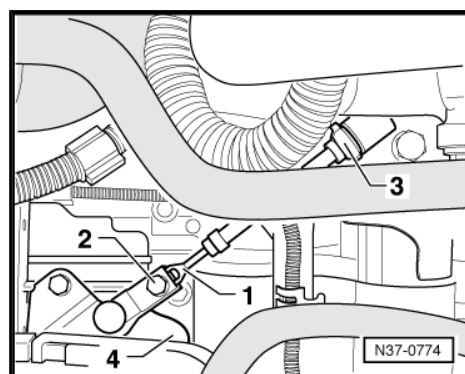
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- Carefully lever off four corners of frame -arrows- and remove.
- Unscrew front shift unit mountings (two nuts).



- Pull selector lever cable -1- upwards off selector shaft lever -4-.
- Remove securing clip -3- at cable support bracket.



- Unhook selector lever cable -1- from retainer -arrow- on engine.
- Raise vehicle.
- Unscrew retainer for catalytic converter at subframe and pull towards rear of vehicle; release double clamp ⇒ Engine, mechanics; Rep. gr. 26 .

The catalytic converter does not have to be removed; it can be left in place on the subframe.

- Detach selector lever cable from bracket on heat shield (front).
- Remove heat shield for tunnel (front).
- Detach centre heat shield for tunnel and move towards rear.
- First unscrew four nuts -arrows A-.
- Then unscrew two bolts -arrows B-.
- Carefully push cover including protective sleeve forwards over selector lever cable.



Note

Take care not to damage the protective sleeve.

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- Lever selector lever cable -3- off selector lever -2- with a screwdriver.
- Pull locking plate -1- securing selector lever cable to shift unit downwards and remove.
- Carefully pull selector lever cable out of shift unit.
- Remove shift unit completely from tunnel.

Installing

- ◆ Check the protective sleeve for damage; the protective sleeve can only be renewed together with the selector lever cable.
- ◆ Check that the protective sleeve is not twisted and is fitted correctly.
- ◆ Do not bend or kink the selector lever cable.
- Selector lever and selector shaft lever are in position „P“; both front wheels are locked (cannot be turned together in one direction).
- Guide selector lever cable -3- into shift unit and press onto selector lever -2-.

Installation position of selector lever cable:

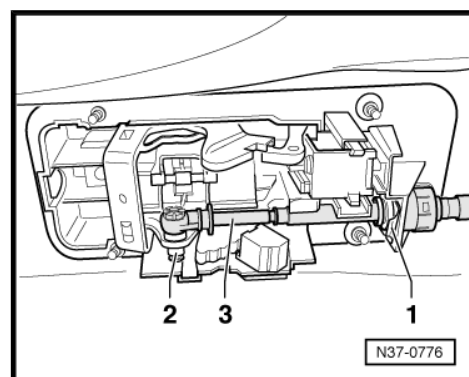
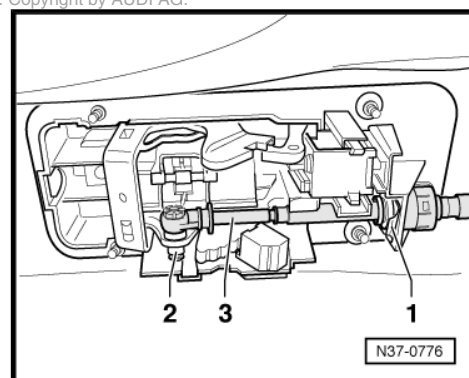
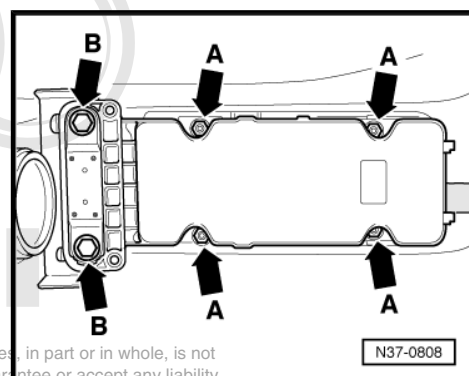
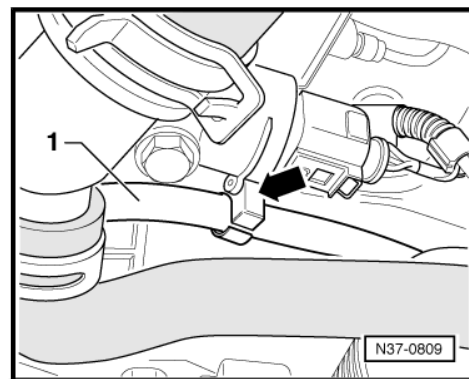
The flat side of the selector lever cable bearing must be fitted onto the selector lever -2- first (towards the inside).

- Fit new locking plate -1- for selector lever cable on shift unit.

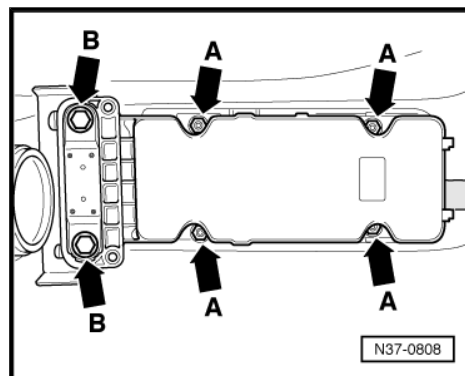
Installation position of locking plate:

The angled end of the locking plate must point towards the end of the selector lever cable.

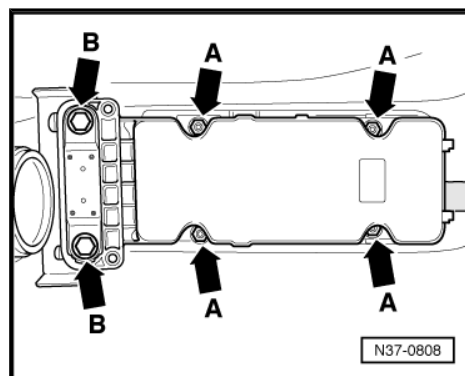
- Insert complete selector mechanism with selector lever cable into tunnel from underneath.



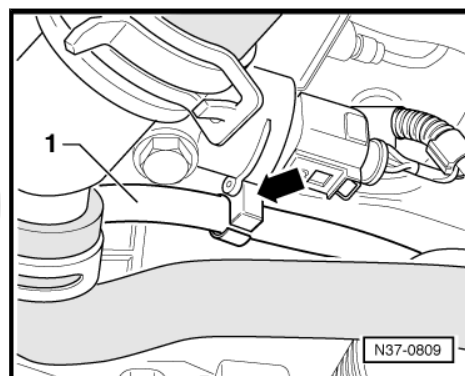
- Screw in bolts -arrows B- by hand.
- Secure front shift unit mountings (two nuts: 25 Nm).
- Shift selector lever from position „P“ to „2“.
- Selector mechanism and selector lever cable must move freely. If necessary renew selector lever cable or service selector mechanism.
- Shift selector lever into position „P“.



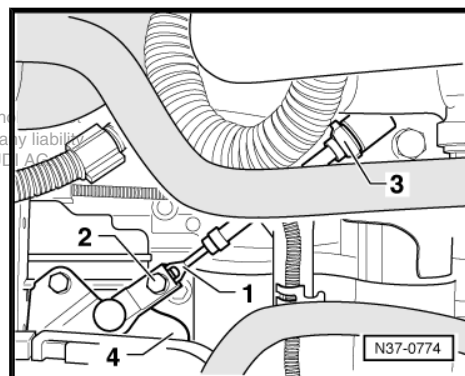
- First tighten nuts -arrows A- to 10 Nm.
- Then tighten two bolts -arrows B- to 25 Nm. When doing this check that gasket makes full contact.
- Insert protective sleeve on selector lever cable in cover.
- Install tunnel heat shields (front and centre).
- Attach selector lever cable at bracket on heat shield (front).
- Assemble exhaust system ⇒ Engine, mechanics; Rep. gr. 26 .



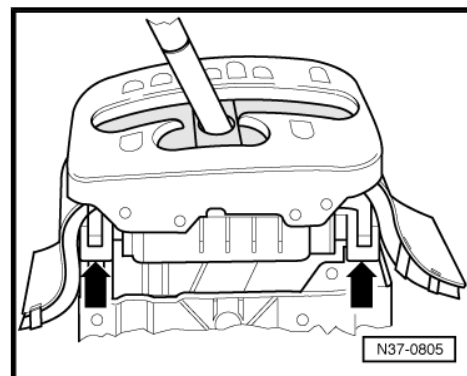
- Hook selector lever cable -1- into retainer -arrow- on engine.



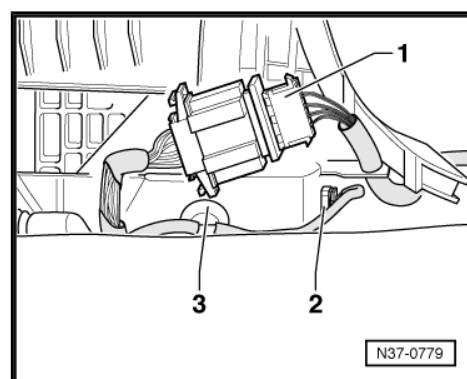
- Loosen bolt -2- at the front ball socket of the selector lever cable -1-.
- Insert selector lever cable in cable support bracket on gearbox and push onto selector shaft lever -4- using pliers.
- Fit new securing clip -3- to selector lever cable at cable support bracket on gearbox.



- Carefully fit four corners of frame -arrows- and engage in position.



- Plug in connector -2- for selector lever lock solenoid -N110- .
- Fit retainer -3- on connector for selector lever lock solenoid - N110- into shift unit.
- Plug in electrical connector -1- for printed circuit.
- Connect locking cable to locking lever on shift unit
⇒ [page 31](#) .
- Adjust locking cable ⇒ [page 33](#) .
- Check ignition key removal lock ⇒ [page 19](#) .
- Install centre console ⇒ General body repairs, interior; Rep. gr. 68 .
- Install selector lever handle ⇒ [page 25](#) .
- Connect earth strap to battery (observe procedure required after connecting battery ⇒ Electrical system; Rep. gr. 27) .
- Adjust selector lever cable ⇒ [page 18](#) .
- Check selector mechanism ⇒ [page 17](#) .



1.5 Dismantling and assembling selector mechanism

Lubricate all bearings and moving surfaces with polycarbamide grease -G 052 142 A2- .

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1 - Selector lever handle

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

2 - Sleeve

- ❑ Clips into selector lever handle
- ❑ Prevents selector lever handle from being pulled off

3 - Cover

- ❑ Includes symbol panel
- ❑ Clipped into frame -item 5-

4 - Printed circuit

- ❑ Can be tested via electrical check and measured value block ⇒ Automatic gearbox 09A, self-diagnosis; Rep. gr. 01

5 - Frame

- ❑ With sliding cover

6 - Cable clip

- ❑ Inserted in frame -item 5-

7 - Bracket

- ❑ For selector lever cable
- ❑ Fitted on heat shield for tunnel (front)

8 - Locking plate

- ❑ Secures selector lever cable to shift unit
- ❑ Always renew

9 - Selector lever cable

- ❑ Do not bend or kink
- ❑ If the protective sleeve is damaged, the selector lever cable must be renewed
- ❑ Checking and adjusting ⇒ [page 18](#)
- ❑ Removing and installing ⇒ [page 28](#)
- ❑ Do not lubricate cable eye and ball socket

10 - Flange nut

- ❑ 10 Nm
- ❑ For securing cover to shift unit
- ❑ 4x
- ❑ Self-locking
- ❑ Always renew

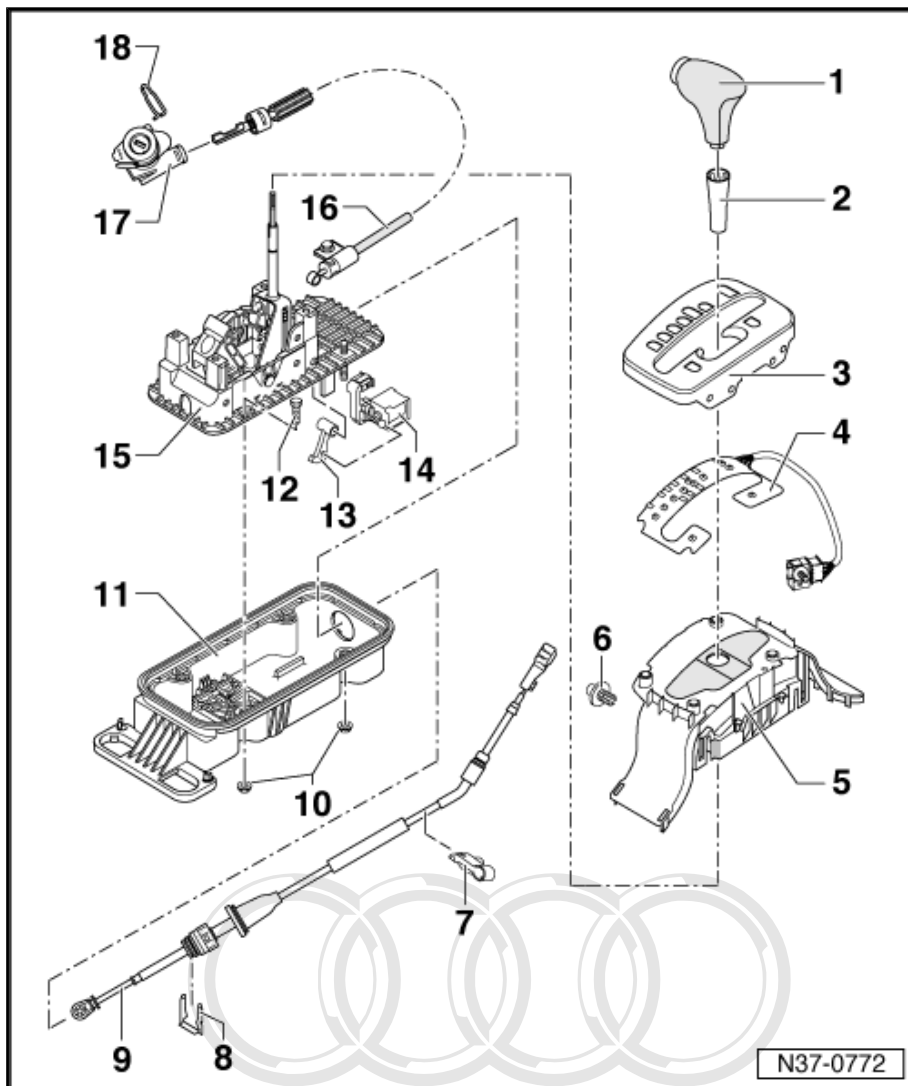
11 - Cover

- ❑ For shift unit
- ❑ With glued-on gasket

12 - Bolt

13 - Pawl

- ❑ For selector lever lock



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- ☐ Engages in cable lever of shift unit

14 - Selector lever lock solenoid -N110-

- ☐ Can be renewed with selector mechanism installed in vehicle
- ☐ Removing and installing ⇒ [page 26](#)
- ☐ Can be tested via electrical check and measured value block ⇒ Automatic gearbox 09A, self-diagnosis; Rep. gr. 01

15 - Shift unit

- ☐ Removing and installing ⇒ [page 19](#)

16 - Locking cable

- ☐ For ignition key removal lock
- ☐ Must not be kinked
- ☐ Removing and installing ⇒ [page 31](#)
- ☐ Adjusting ⇒ [page 33](#)
- ☐ Checking ignition key removal lock ⇒ [page 19](#)

17 - Steering lock

18 - Clip

- ☐ Installation position: Fit clip from above. Angled ends of clip must point towards steering lock.

1.6 Removing and installing selector lever handle

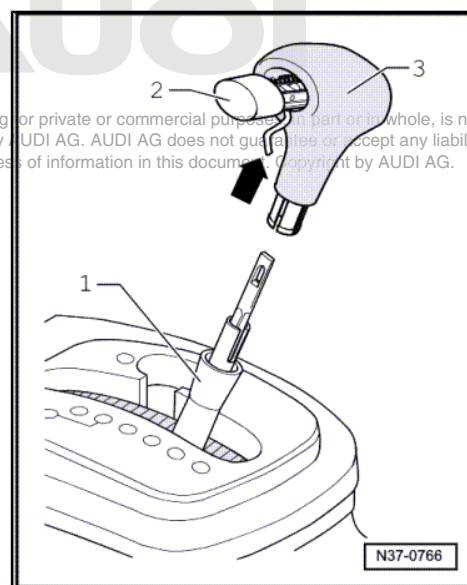
Removing

- Shift selector lever to position „R“.
- Slide sleeve -1- downwards.
- Pull button -2- out of handle -3- just far enough to allow actuating lever -arrow- to hang downwards.
- Now pull the handle off the selector lever.

Installing

- Shift selector lever to position „R“.

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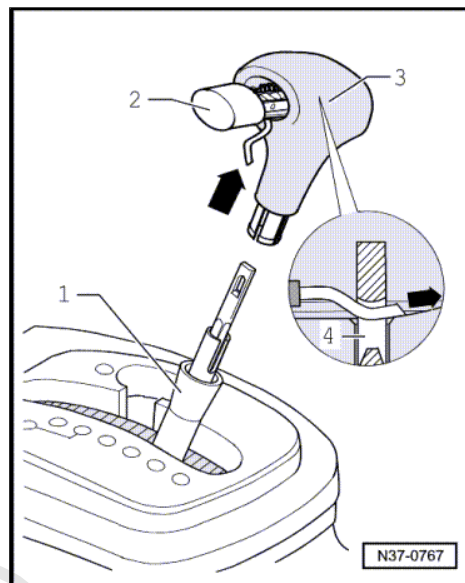
- Pull button -2- out of handle -3- just far enough to allow actuating lever -arrow- to hang downwards.
- Now press the handle onto selector lever as far as it will go.

Installation position: Button points to driver.

- Pull button out further and guide actuating lever -arrow- into handle.
- Press button so that actuating lever engages in pull rod -4-.

The button should now spring back onto the stop.

- Slide sleeve -1- upwards, turning so that the two wide lugs on the sleeve locate in the slots in the handle and the sleeve can be felt to engage in the handle.
- Shift selector lever to position „P“.



1.7 Removing and installing selector lever lock solenoid -N110-

Removing

- Shift selector lever into position „P“.



Caution

Follow steps required when disconnecting battery ⇒ Electrical system; Rep. gr. 27 .

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Note

Before continuing the procedure, the battery earth strap must be disconnected. First check whether a coded radio is fitted and obtain anti-theft coding if necessary.

- With the ignition switched off, disconnect battery earth strap.
- Raise vehicle.
- Unscrew retainer for catalytic converter at subframe and pull towards rear of vehicle; release double clamp ⇒ Engine, mechanics; Rep. gr. 26 .

The catalytic converter does not have to be removed; it can be left in place on the subframe.

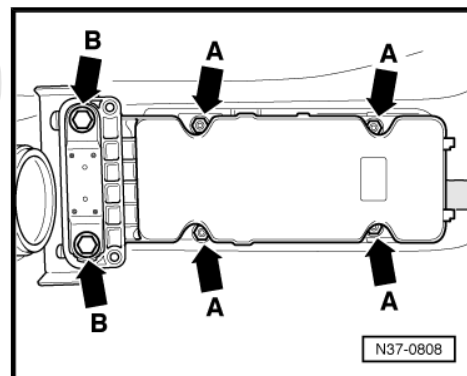
- Detach selector lever cable from bracket on heat shield (front).
- Remove heat shield for tunnel (front).
- Detach centre heat shield for tunnel and move towards rear.

- First unscrew four nuts -arrows A-.
- Then unscrew two bolts -arrows B-.
- Carefully push cover including protective sleeve forwards over selector lever cable.

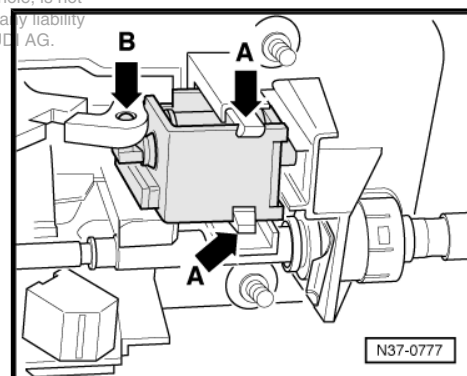


Note

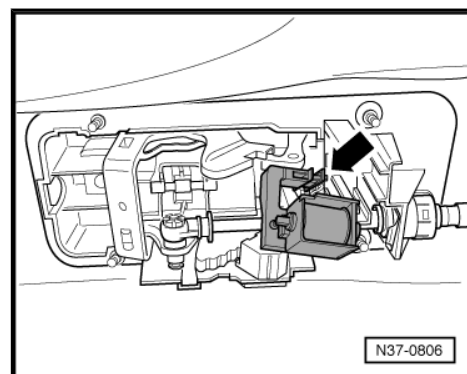
Take care not to damage the protective sleeve.



- Unclip selector lever lock solenoid -N110- from retainers -arrows A-.
- Pull selector lever lock solenoid -N110- out of locking pawl -arrow B-.

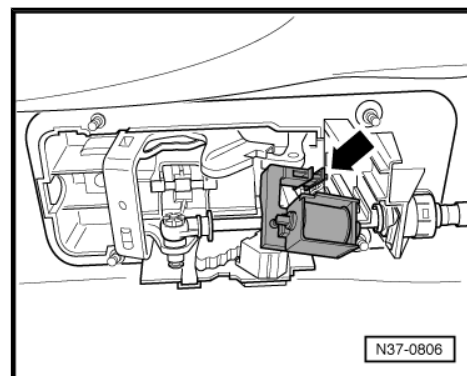


- Unplug connector -arrow- and take out selector lever lock solenoid -N110- from below.

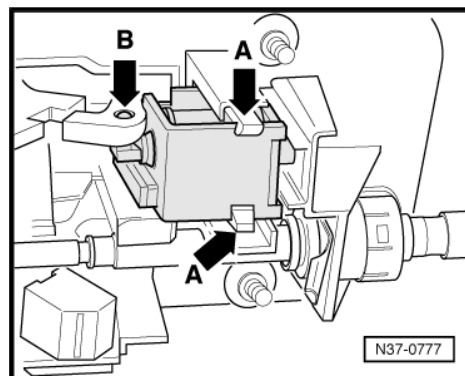


Installing

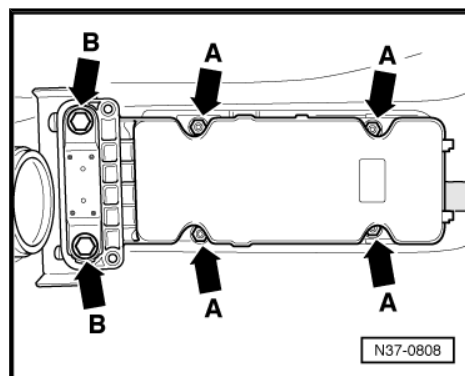
- Plug in electrical connector -arrow- for selector lever lock solenoid -N110- .



- Engage selector lever lock solenoid -N110- in locking pawl -arrow B-.
- Clip selector lever lock solenoid -N110- into retainers -arrows A-.
- Secure cover (with glued-on seal) to shift unit, making sure that seal is seated correctly.



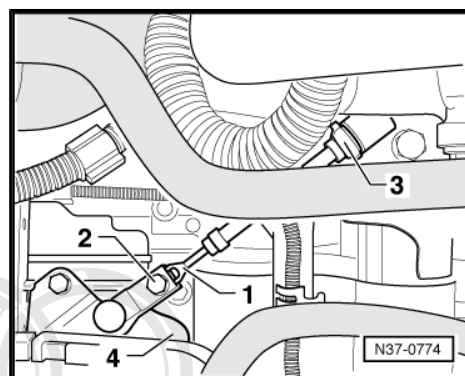
- First tighten nuts -arrows A- to 10 Nm.
- Then tighten two bolts -arrows B- to 25 Nm.
- Install tunnel heat shields (front and centre).
- Attach selector lever cable at bracket on heat shield (front).
- Assemble exhaust system ⇒ Engine, mechanics; Rep. gr. 26 .
- Connect earth strap to battery (observe procedure required after connecting battery ⇒ Electrical system; Rep. gr. 27).
- Check selector mechanism ⇒ [page 17](#) .



1.8 Removing and installing selector lever cable

Removing

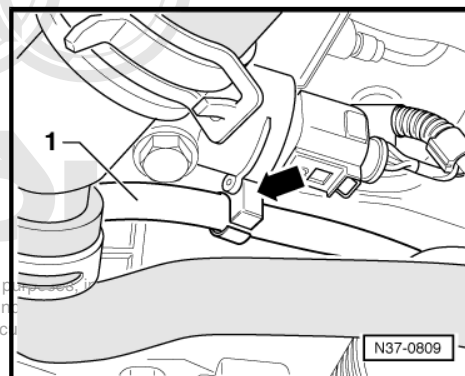
- Shift selector lever into position „P“.
- Pull selector lever cable -1- upwards off selector shaft lever -4-.
- Remove securing clip -3- at cable support bracket.



- Unhook selector lever cable -1- from retainer -arrow- on engine.
- Raise vehicle.
- Unscrew retainer for catalytic converter at subframe and pull towards rear of vehicle; release double clamp ⇒ Engine, mechanics; Rep. gr. 26 .

The catalytic converter does not have to be removed; it can be left in place on the subframe.

- Detach selector lever cable from bracket on heat shield (front).
- Remove heat shield for tunnel (front).
- Detach centre heat shield for tunnel and move towards rear.



- First unscrew four nuts -arrows A-.
- Then unscrew two bolts -arrows B-.
- Carefully push cover including protective sleeve forwards over selector lever cable.



Note

Take care not to damage the protective sleeve.

- Lever selector lever cable -3- off selector lever -2- with a screwdriver.
- Pull locking plate -1- securing selector lever cable to shift unit downwards and remove.
- Carefully pull selector lever cable out of shift unit.

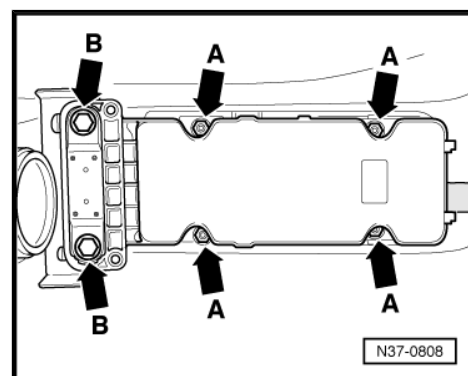
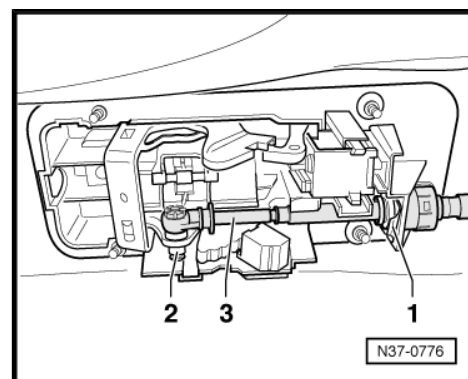
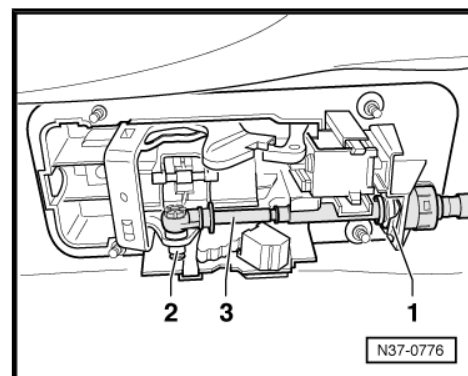
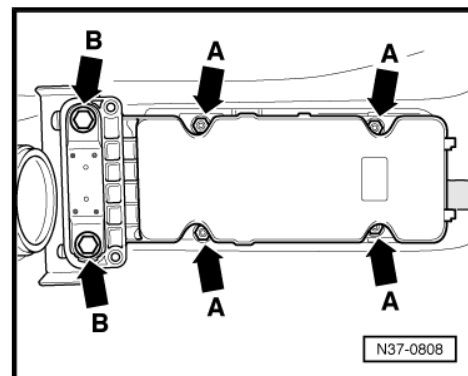
Installing

- ◆ Check the protective sleeve for damage; the protective sleeve can only be renewed together with the selector lever cable.
- ◆ Check that the protective sleeve is not twisted and is fitted correctly.
- ◆ Do not bend or kink the selector lever cable.
- Selector lever and selector shaft lever are in position „P“; both front wheels are locked (cannot be turned together in one direction).
- Guide selector lever cable -3- into shift unit and press onto selector lever -2-.
- Fit new locking plate -1- for selector lever cable on shift unit.

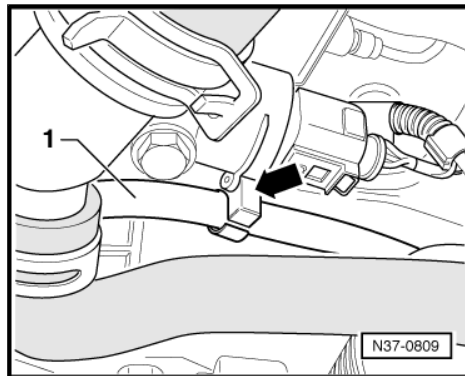
Installation position:

Angled end of locking plate must point towards end of selector lever cable.

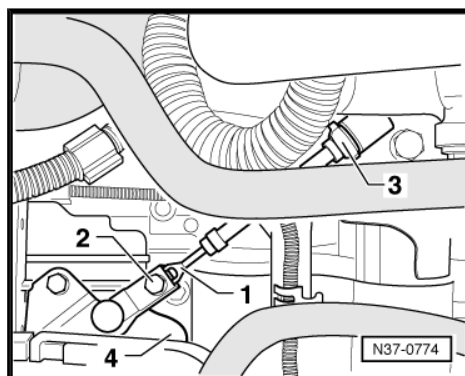
- Shift selector lever from position „P“ to „2“.
- Selector mechanism and selector lever cable must move freely. If necessary renew selector lever cable or service selector mechanism.
- Shift selector lever into position „P“.
- Secure cover (with glued-on seal) to shift unit, making sure that seal is seated correctly.
- First tighten nuts -arrows A- to 10 Nm.
- Then tighten two bolts -arrows B- to 25 Nm.
- Insert protective sleeve on selector lever cable in cover.
- Install tunnel heat shields (front and centre).
- Attach selector lever cable at bracket on heat shield (front).
- Assemble exhaust system ⇒ Engine, mechanics; Rep. gr. 26 .



- Hook selector lever cable -1- into retainer -arrow- on engine.



- Loosen bolt -2- at front ball socket of selector lever cable -1-.
- Insert selector lever cable in cable support bracket on gearbox and push onto selector shaft lever -4- using pliers.
- Fit new securing clip -3- to selector lever cable at cable support bracket on gearbox.
- Tighten bolt -2- to 13 Nm.
- Check selector mechanism ⇒ [page 17](#) .



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1.9 Removing and installing locking cable

Removing

Installation position of locking cable

- 1 - Footwell vents
- 2 - Support for dash panel
- 3 - Heater unit



Caution

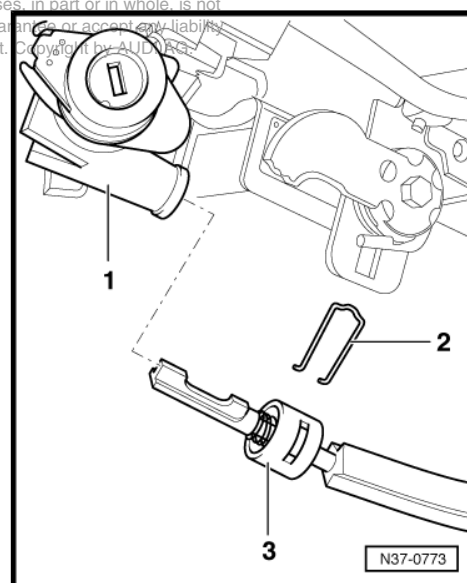
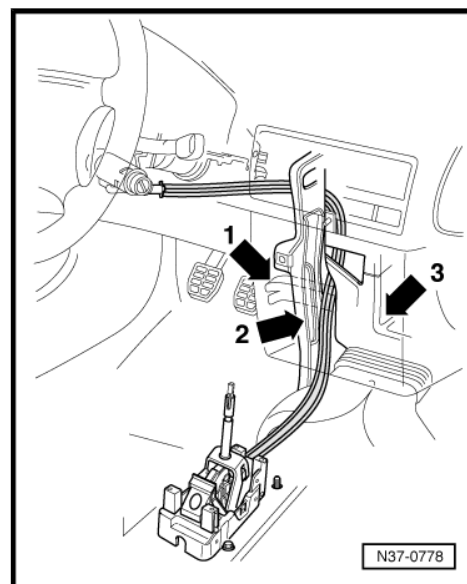
Follow steps required when disconnecting battery ⇒ Electrical system; Rep. gr. 27.



Note

Before continuing the procedure, the battery earth strap must be disconnected. First check whether a coded radio is fitted and obtain anti-theft coding if necessary.

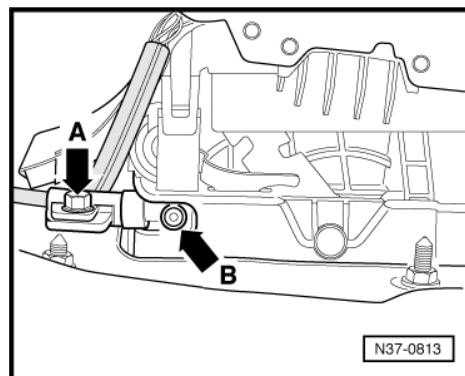
- With the ignition switched off, disconnect battery earth strap.
- Remove airbag module (driver's side) and steering wheel ⇒ General body repairs, interior; Rep. gr. 69.
- Remove trim (left-side) below dash panel ⇒ General body repairs, interior; Rep. gr. 68.
- Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 70.
- Unscrew handle for adjusting steering column height and position.
- Turn ignition key to "ignition on" position.
- Shift selector lever into position „P“.
- Pull out clip -2- for locking cable -3-.
- Pull locking cable out of steering lock -1-.
- Remove selector lever handle ⇒ [page 25](#).
- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68.



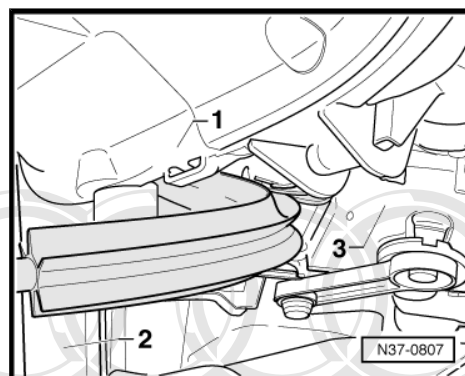
- Loosen bolt -arrow A- on support bracket of locking cable.
- Carefully remove locking cable from selector mechanism and disengage from locking lever -arrow B-.
- Pull locking cable out of dash panel.

Installing

- ◆ The locking cable must not be kinked.
- ◆ Adjust locking cable after installing ⇒ [page 33](#) .

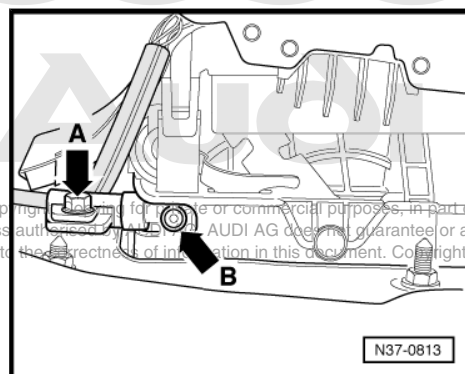


- Guide locking cable between heater unit -3- and footwell vent -1- behind support for dash panel -2-.
- Shift selector lever into position „P“.



- Pull locking cable slightly out of cable sleeve and engage in locking lever -arrow B-.
- Engage support bracket of locking cable in selector mechanism.
- Push locking cable into steering lock ⇒ [page 31](#) .

The flat side of the locking cable points downwards.



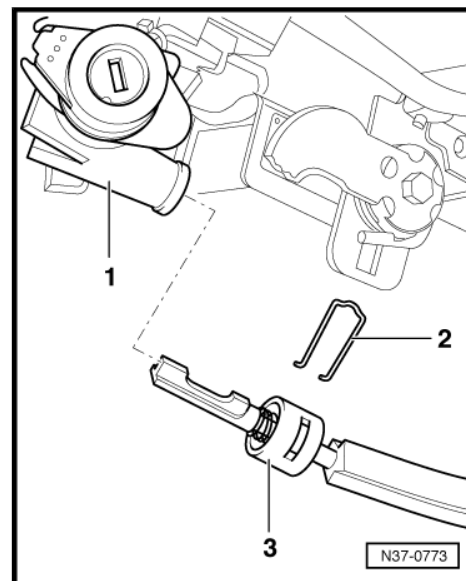
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- Fit clip -2- securing locking cable -3-.

Installation position:

Fit clip from above. Angled ends of clip must point towards steering lock.

- Ensure that the clip is properly engaged.
- Adjust locking cable ⇒ [page 33](#) .
- Check ignition key removal lock ⇒ [page 19](#) .
- Install centre console ⇒ General body repairs, interior; Rep. gr. 68 .
- Install selector lever handle ⇒ [page 25](#) .
- Install trim (left-side) below dash panel ⇒ General body repairs, interior; Rep. gr. 68 .
- Install steering column trim ⇒ General body repairs, interior; Rep. gr. 70 .
- Install handle for adjusting steering column height and position.
- Install steering wheel and airbag ⇒ General body repairs, interior; Rep. gr. 69 .
- Connect earth strap to battery (observe procedure required after connecting battery ⇒ Electrical system; Rep. gr. 27).



1.10 Adjusting locking cable

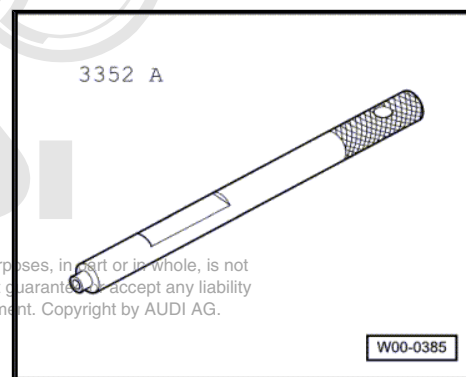


WARNING

When adjusting the locking cable it is important to keep to the procedure described below.

Special tools and workshop equipment required

- ◆ Locking cable adjustment gauge -3352 A-



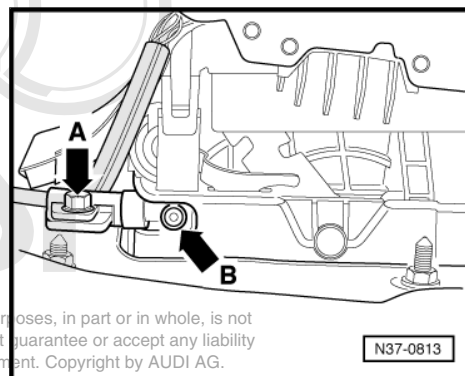
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Requirements before starting adjustment:

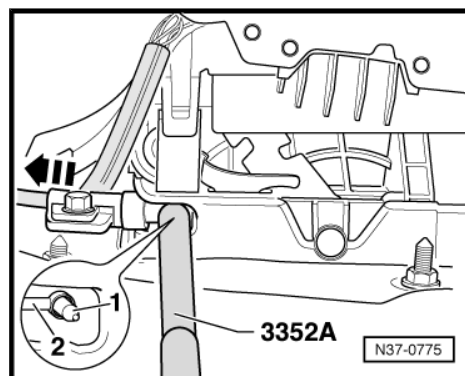
- Locking cable is in installation position.
- Centre console removed.
- Selector lever is in position „P“.
- Ignition key is in removal position.
- Steering column is in lowest/rearmost position.

Adjustment sequence:

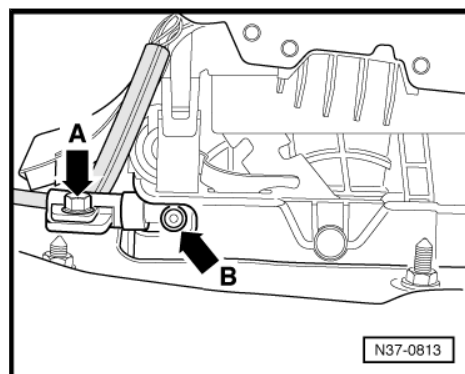
- Loosen bolt -arrow A- on support bracket of locking cable.
- Locking cable is attached to locking lever -arrow B-.



- Fit locking cable adjustment gauge -3352 A- between locking lever -1- and eye of locking cable -2-.
- To take up play, pull support bracket as far as stop in direction of -arrow-.
- In this position it should be easy to remove and insert the locking cable adjustment gauge -3352 A- .



- Tighten bolt -arrow A- on support bracket of locking cable to 10 Nm.
- Remove locking cable adjustment gauge -3352 A- from locking lever -arrow B-.
- Check ignition key removal lock ➔ [page 19](#) .



2 Exploded view - ATF cooler

Removing and installing ATF cooler ⇒ [page 35](#)

1 - Gearbox housing

2 - O-ring

□ Always renew

3 - ATF cooler

4 - Bolt

□ 40 Nm

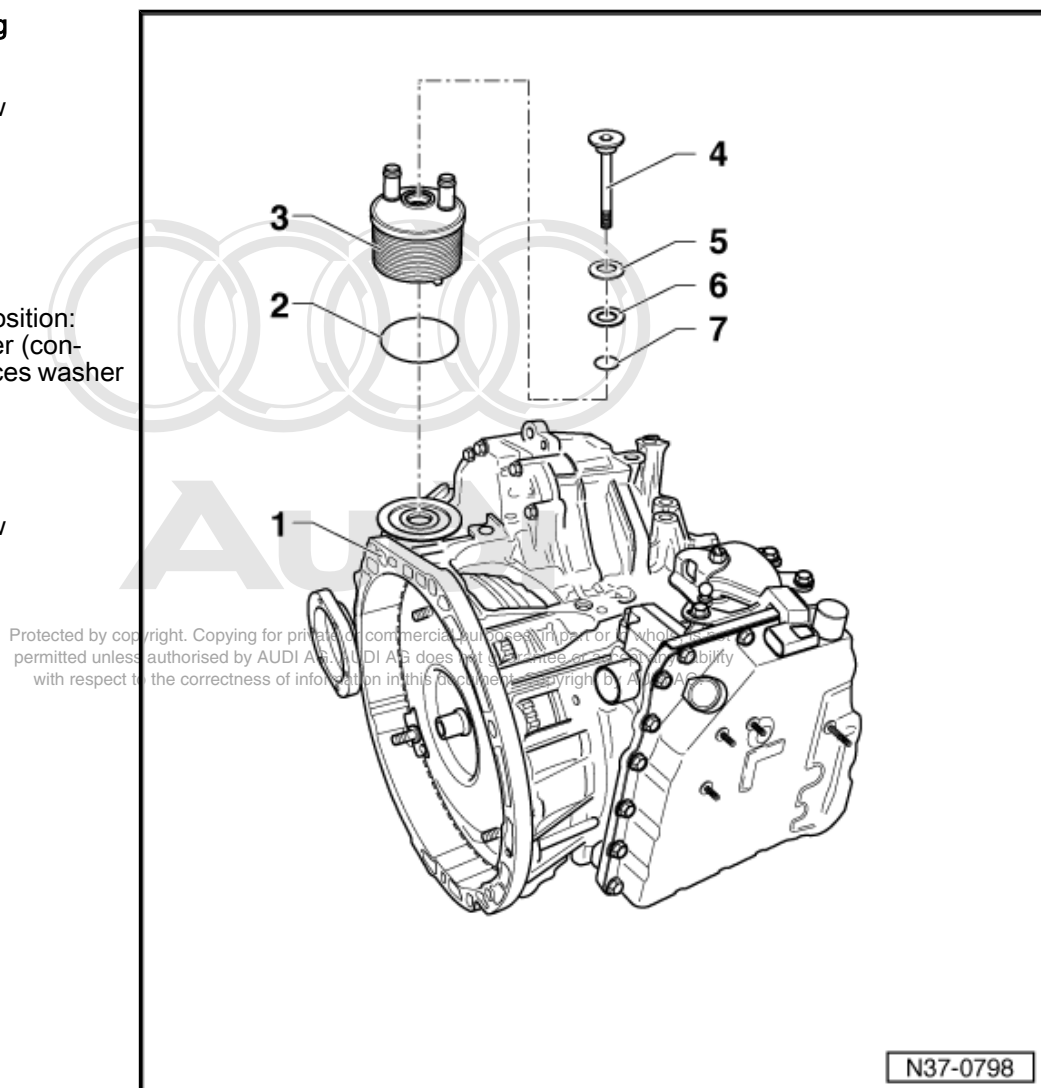
5 - Dished spring

□ Installation position:
outer diameter (con-
cave side) faces washer
-item 6-

6 - Washer

7 - O-ring

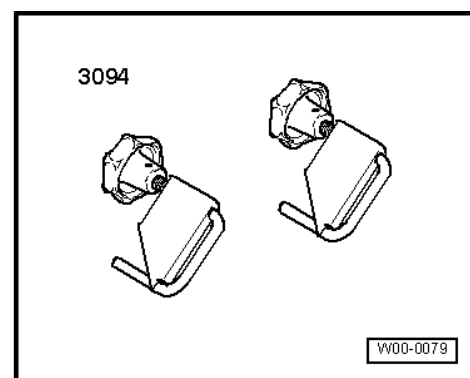
□ Always renew



2.1 Removing and installing ATF cooler

Special tools and workshop equipment required

◆ Hose clamps, up to 25 mm -3094-



Removing ATF cooler



Caution

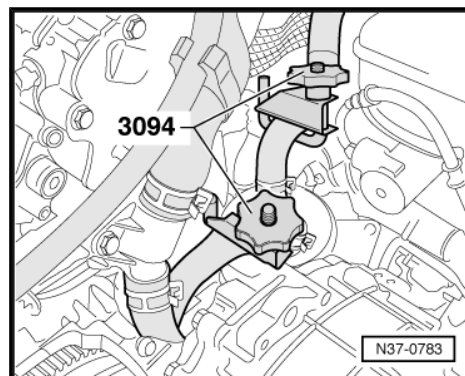
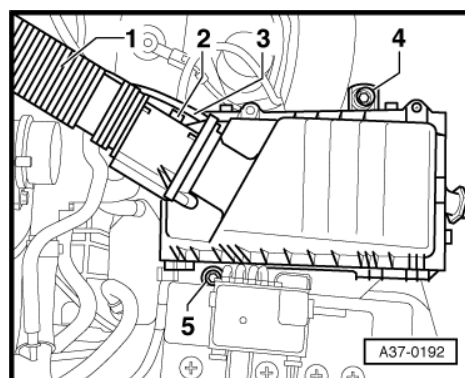
Follow steps required when disconnecting battery ⇒ Electrical system; Rep. gr. 27.



Note

Before continuing the procedure, the battery earth strap must be disconnected. First check whether a coded radio is fitted and obtain anti-theft coding if necessary.

- With the ignition switched off, disconnect battery earth strap.
- Remove engine cover panel.
- Remove intake hose -1-, connector -2- and hose -3- from air mass meter.
- Remove complete air cleaner housing; to do this, unscrew bolts -4- and -5-.
- Clamp off ATF cooler hoses using hose clamps -3094- and detach at ATF cooler.



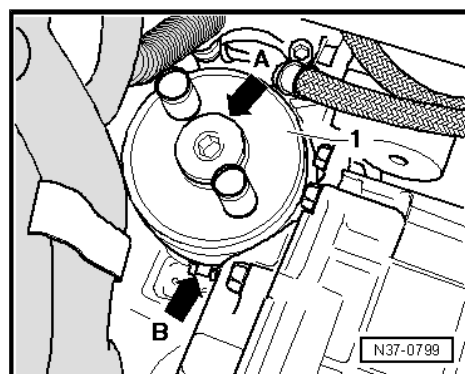
- Remove ATF cooler -1- from gearbox -arrow A-.

Installing ATF cooler

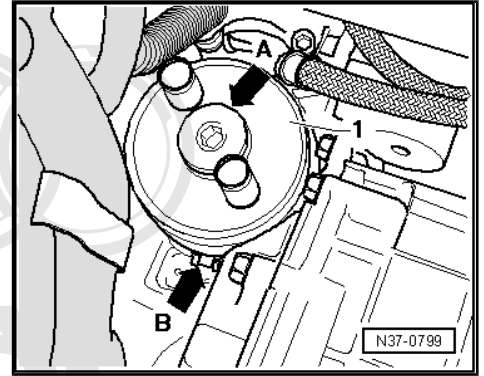
Perform installation in reverse sequence of removal. Note the following:

- Renew O-rings on ATF cooler.

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- When installing ATF cooler -1- insert lug -arrow B- in slot on gearbox housing.
- Tighten bolt -arrow A- to specified torque
⇒ [Item 4 \(page 35\)](#) .



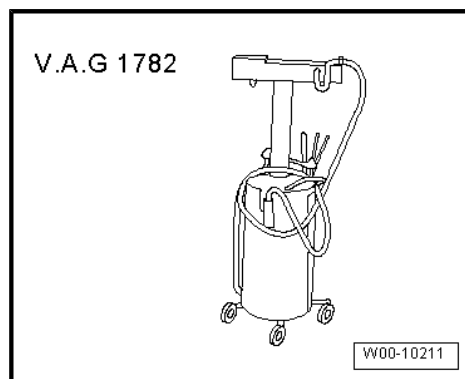
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3 ATF in gearbox

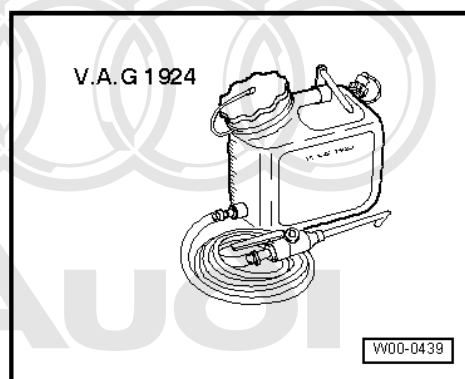
3.1 Checking and topping up ATF level

Special tools and workshop equipment required

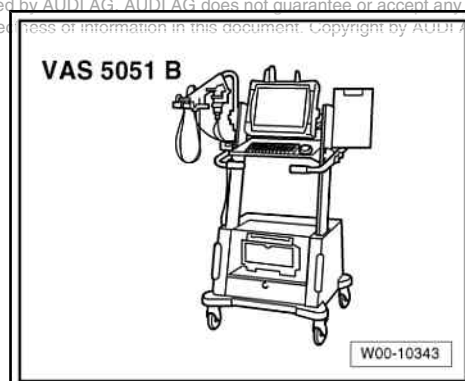
- ◆ Used oil collection and extraction unit -V.A.G 1782-



- ◆ ATF filling unit -V.A.G 1924-



- ◆ Vehicle diagnostic, testing and information system e.g. VAS 5051B-



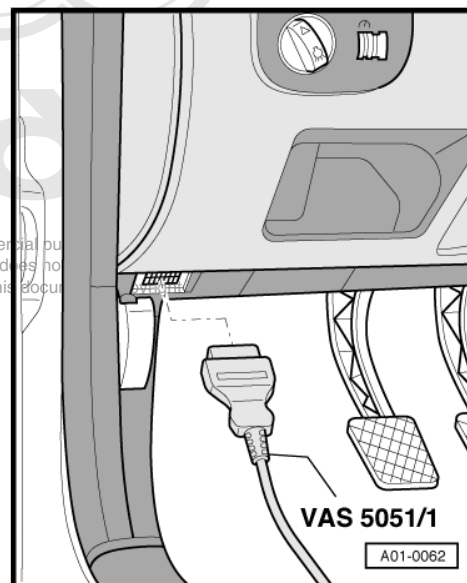
- ◆ Safety goggles

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Procedure

- Gearbox must not be in emergency running (backup) mode.
- Drive vehicle onto lifting platform or inspection pit to make sure it is placed absolutely horizontal.
- Selector lever at position „P“.
- Extraction hose of an exhaust gas extractor connected and extractor switched on.
- Engine idling.
- The air-conditioner and heating system must be switched off.
- Vehicle diagnostic, testing and information system e.g. -VAS 5051B- connected up; Vehicle self-diagnosis and vehicle system „02 - Gearbox electronics“ selected.
- The ATF temperature at the beginning of the test must not be higher than 35 °C. If necessary, first allow the gearbox to cool down.

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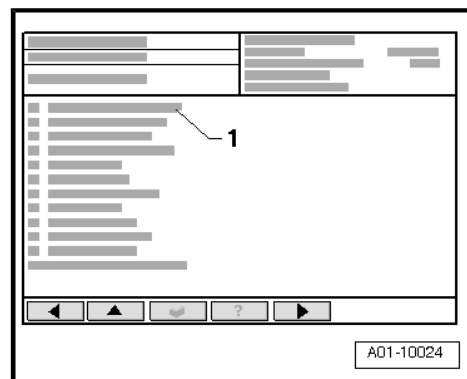
Note

- ◆ The ATF level will vary according to the ATF temperature.
- ◆ If the ATF level is checked when the ATF temperature is too low, this will result in overfilling.
- ◆ If the ATF level is checked when the ATF temperature is too high, this will result in underfilling.
- ◆ Both overfilling and underfilling will impair the function of the gearbox.
- ◆ The ATF temperature is taken from the reading on the vehicle diagnostic, testing and information system e.g. -VAS 5051B-.

ATF temperature reading

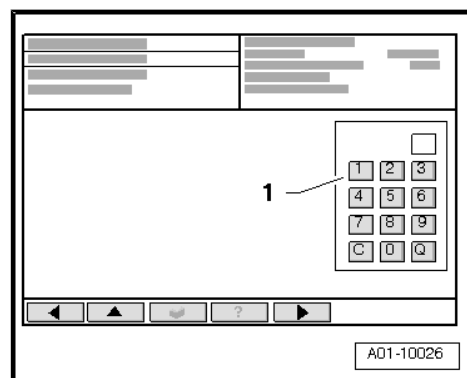
Display on -VAS 5051B- :

- From menu -1-, select function „Measured values“ and advance by pressing  button.



Display on -VAS 5051B- :

- Using keypad -1-, press button  for „Display group 005“ and confirm entry by pressing  button.



Display on -VAS 5051B- :

- Read off ATF temperature in display zone -1-.

Checking and correcting ATF level



Note

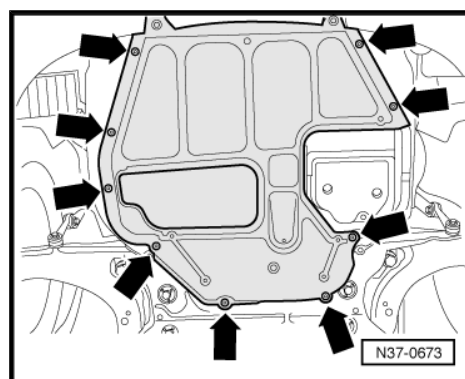
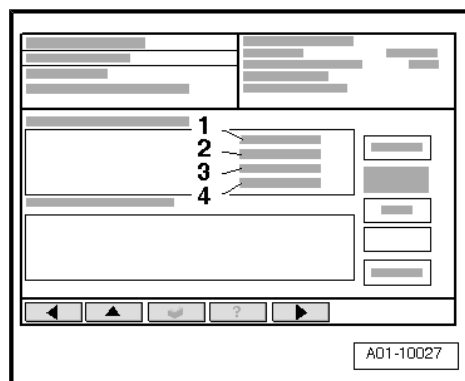
- ♦ *The ATF level is checked at the ATF inspection hole.*
- ♦ *The ATF level is correct if a small amount of fluid comes out at the ATF inspection plug when ATF temperature is between 35°C and 45°C, or 50°C in hot climates (the fluid level rises due to expansion as it warms up).*
- Fill ATF filling unit -V.A.G 1924- with ATF for automatic gearbox 09A.
- ATF specifications ⇒ Electronic parts catalogue .



WARNING

The ATF filling unit must be clean and the ATF must not be mixed with other types of ATF!

- Remove centre noise insulation (loosen fasteners -arrows-).



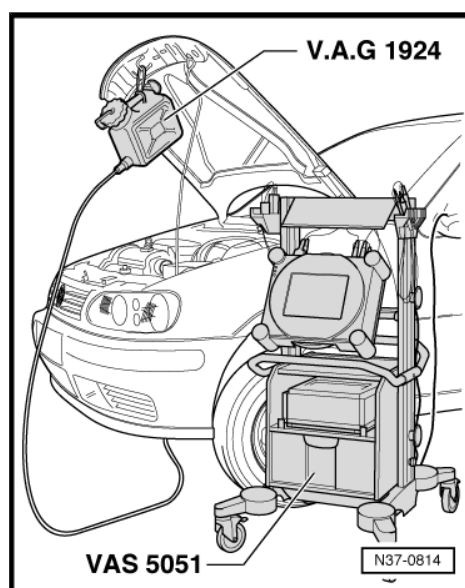
- Secure reservoir for ATF filling unit -V.A.G 1924- as high as possible on vehicle.
- Place used oil collection and extraction unit -V.A.G 1782- below gearbox.



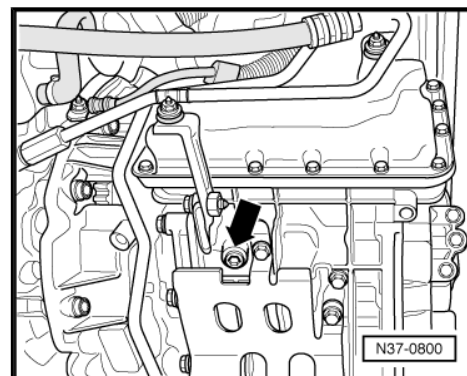
WARNING

Wear safety goggles.

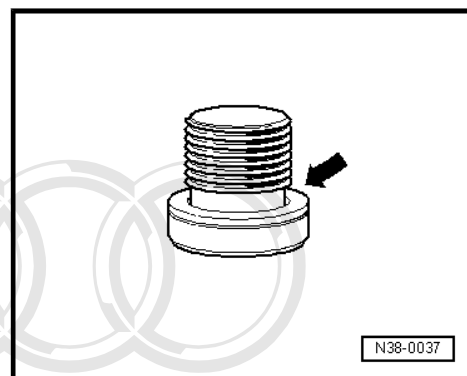
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- When ATF temperature reaches 35 °C, unscrew ATF inspection plug -arrow-.



- Cut open seal -arrow- for plug and renew.

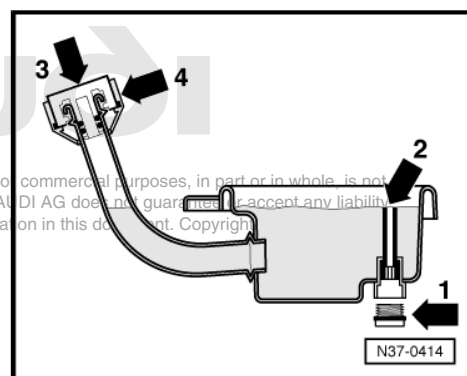


i Note

When the plug is unscrewed, a small amount of ATF will always run out of the overflow pipe -arrow 2-.

- Check whether overflow pipe is screwed in as far as it will go (2 Nm).

If ATF continues to come out through the ATF inspection hole via the overflow pipe before the ATF has reached a temperature of 40 °C, the ATF level is OK.



i Note

- ◆ *The ATF inspection plug must be screwed in again at the latest when the ATF reaches a temperature of 45 °C (countries with hot climates: 50 °C).*
- ◆ *If ATF temperature exceeds 45 °C, too much fluid will escape as it expands when heated. In this case the quantity of fluid in the gearbox is NOT sufficient!*

- Fit new seal on plug -arrow 1- and tighten.
- Tightening torque: 15 Nm

The ATF level check is now completed.

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

If no ATF emerges from ATF inspection hole when ATF has reached 40 °C, fill up with ATF ⇒ [page 42](#) .

Filling up ATF



Note

Engine keeps running at idle speed.

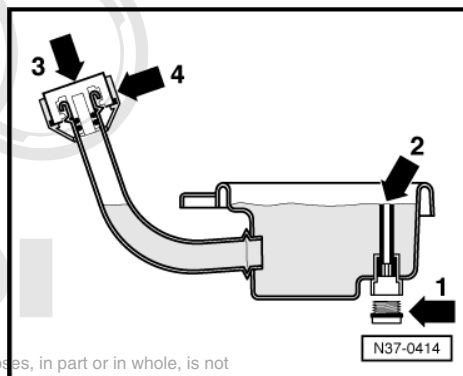


WARNING

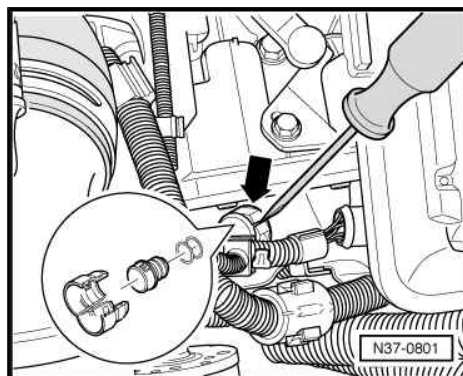
When working close to the radiator always maintain a safe distance from the fan - danger of injury!

Fan may switch on automatically.

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- Use screwdriver to prise off cap -arrow- securing sealing plug. The locking tabs on the cap will be destroyed, so the cap must always be renewed.
- Detach sealing plug from filler pipe and attach pipe of ATF filling unit -V.A.G 1924- to filler pipe.

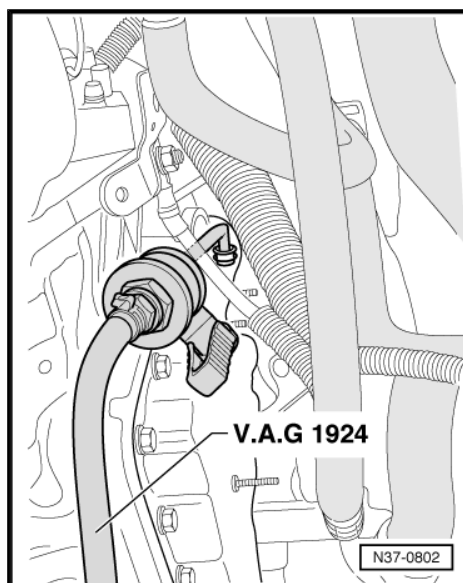


- Fill with ATF using ATF filling unit -V.A.G 1924- until ATF comes out of inspection hole.

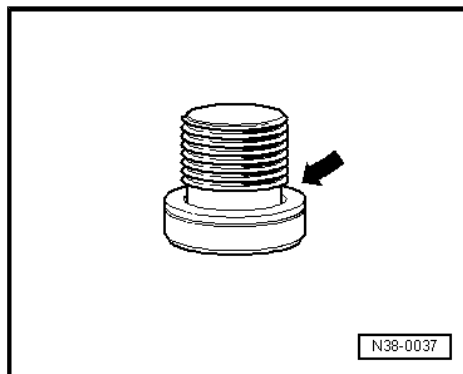


Note

- ♦ The ATF inspection plug must be screwed in again at the latest when ATF reaches temperature of 45 °C (countries with hot climates: 50 °C).
- ♦ If ATF temperature exceeds 45 °C, too much fluid will escape as it expands when heated. In this case the quantity of fluid in the gearbox is NOT sufficient!
- ♦ If necessary, switch off engine and allow gearbox to cool down.



- Cut open seal -arrow- for plug and renew.
- Fit new seal on plug -arrow 1- and tighten.

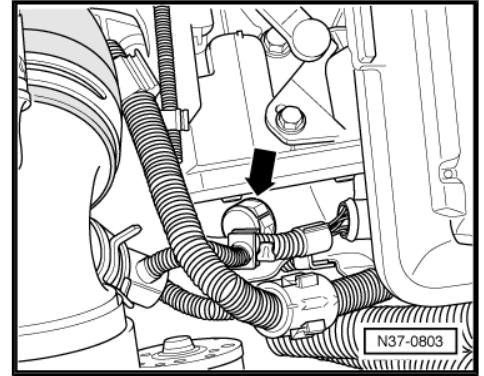


- Fit sealing plug on filler pipe and secure with a new cap -arrow-.
- Engage cap.

i Note

Always renew cap. The cap secures the sealing plug.

- Exit from function „Measured values“ by pressing  button.
- Press „End output“.
- Switch off ignition and unplug diagnostic connector.
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .

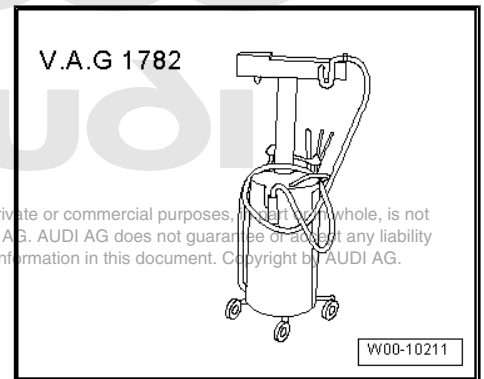


3.2 Changing ATF or filling up after performing repairs

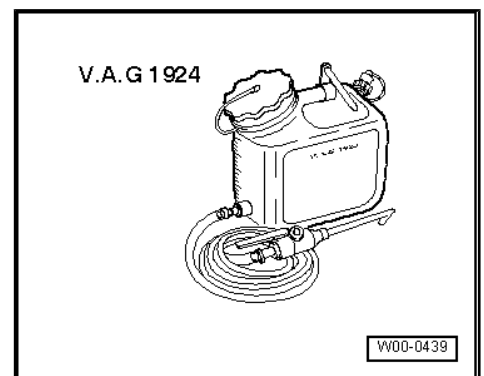
Special tools and workshop equipment required

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

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- ◆ ATF filling unit -V.A.G 1924-



- ◆ Safety goggles

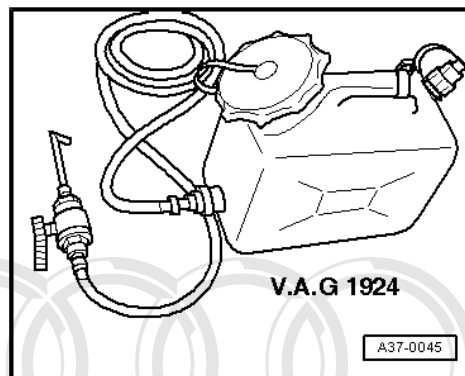
Procedure

- Engine not running.
- Fill ATF filling unit -V.A.G 1924- with ATF for automatic gearbox 09A.
- ATF specifications ➔ Electronic parts catalogue .



WARNING

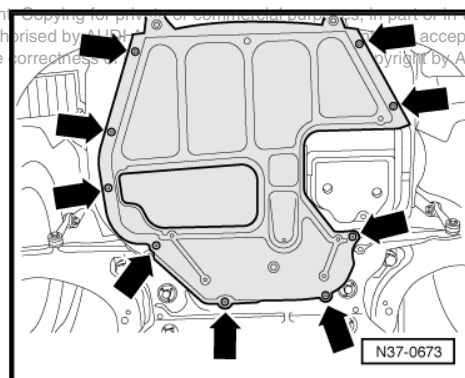
The ATF filling unit must be clean and the ATF must not be mixed with other types of ATF!



Note

- ◆ Observe relevant disposal regulations.
- ◆ The engine must not be started and vehicle must not be towed without ATF in gearbox.

- Remove centre noise insulation (loosen fasteners -arrows-).



Draining ATF

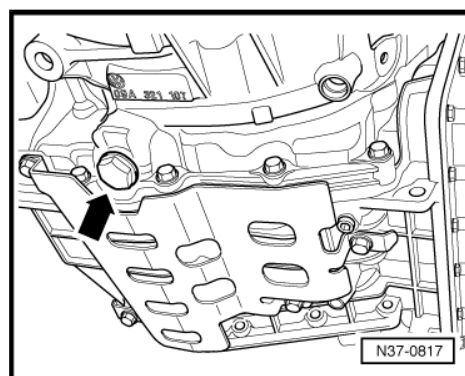
- Place used oil collection and extraction unit -V.A.G 1782- below gearbox.



WARNING

Wear safety goggles.

- Remove drain plug -arrow- in gearbox housing.
- Drain ATF.
- Fit drain plug with new seal and tighten to 45 Nm.



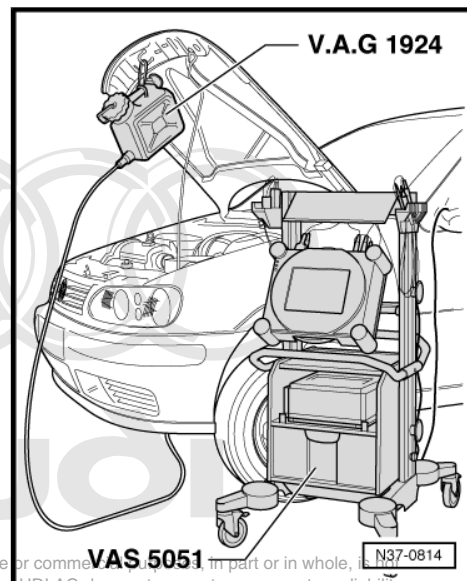
- Secure reservoir for ATF filling unit -V.A.G 1924- as high as possible on vehicle.



WARNING

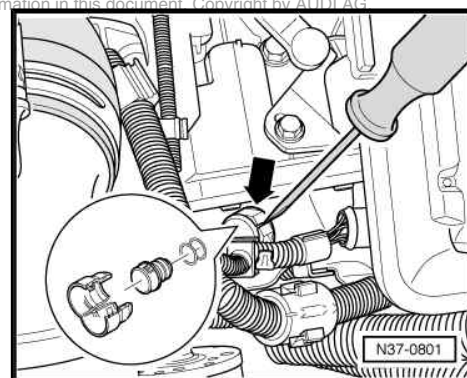
When working close to the radiator always maintain a safe distance from the fan - danger of injury!

Fan may switch on automatically.

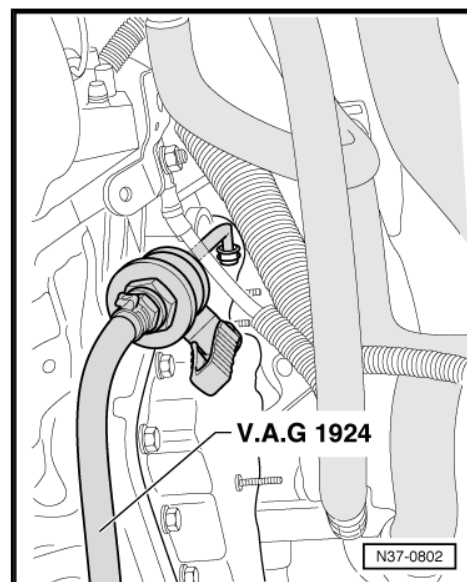


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- Use screwdriver to prise off cap -arrow- securing sealing plug. The locking tabs on the cap will be destroyed, so the cap must always be renewed.
- Detach sealing plug from filler pipe and attach pipe of ATF filling unit -V.A.G 1924- to filler pipe.

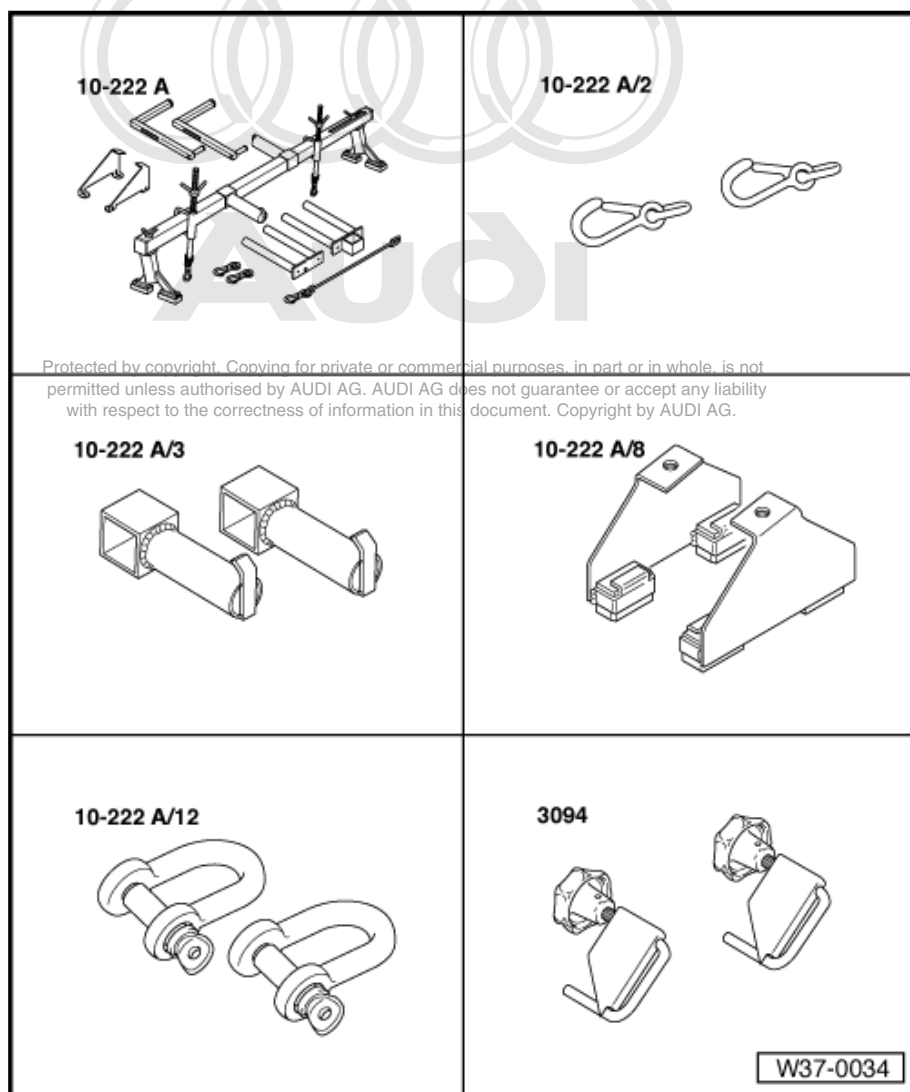


- Use ATF filling unit -V.A.G 1924- to fill gearbox with approx. 2.5 litres of ATF.
- Then start engine and shift through all selector lever positions once with vehicle stationary.
- Then check and top up ATF level ➔ [page 38](#) .



4 Removing and installing gearbox

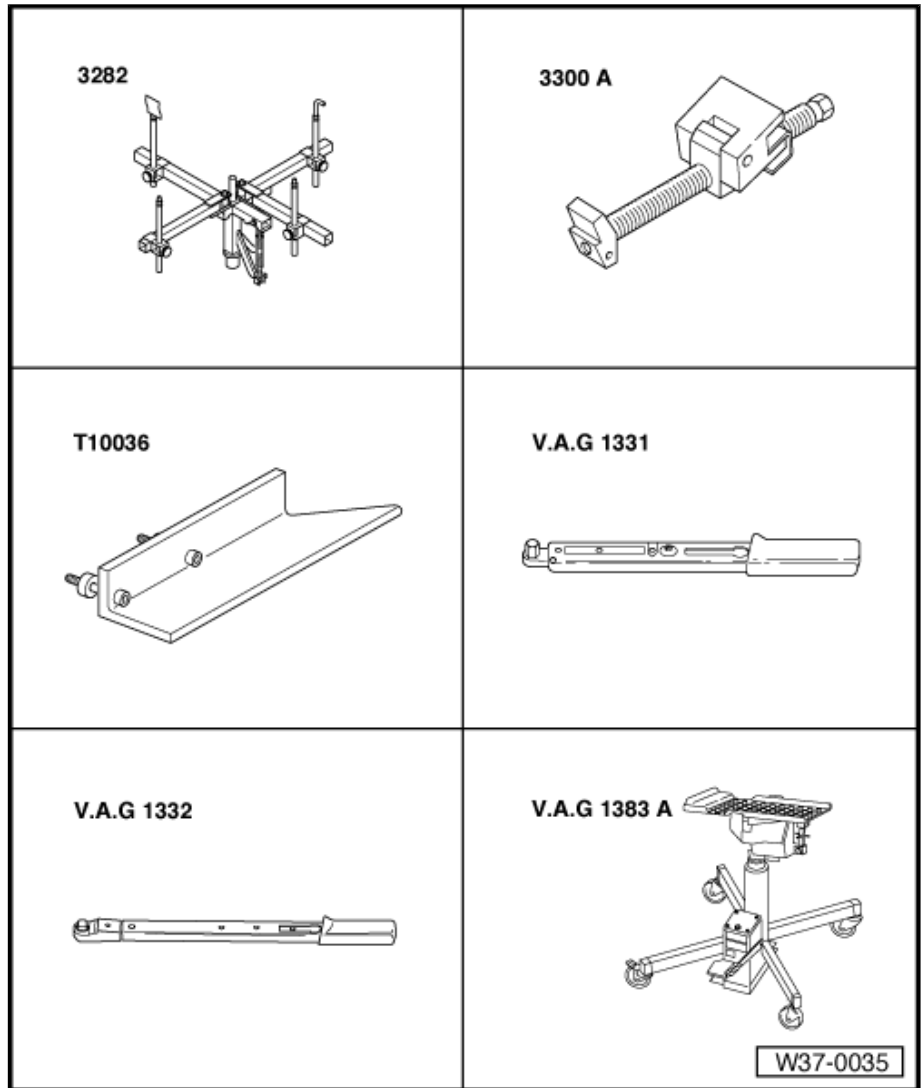
4.1 Removing gearbox



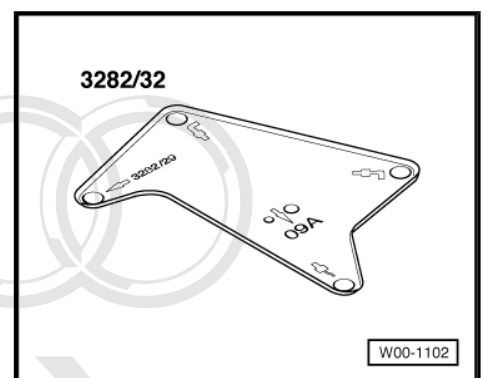
Special tools and workshop equipment required

- ◆ Support bracket -10 - 222 A-
- ◆ Hook -10 - 222 A /2-
- ◆ Adapters -10 - 222 A /3-
- ◆ Adapters -10 - 222 A /8-
- ◆ Shackles -10 - 222 A /12-
- ◆ Hose clamps, up to 25 mm -3094-

- ◆ Gearbox support -3282-
- ◆ Engine support -3300 A-
- ◆ Support -T10036 A-
- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Engine and gearbox jack - V.A.G 1383 A-

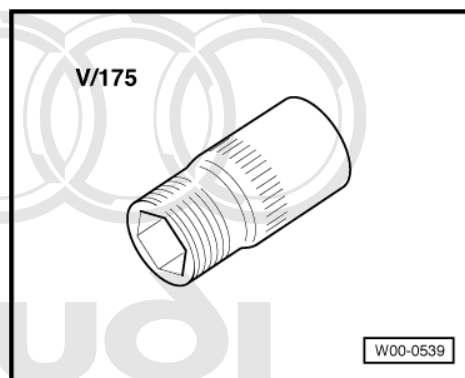


- ◆ Adjustment plate -3282/32-



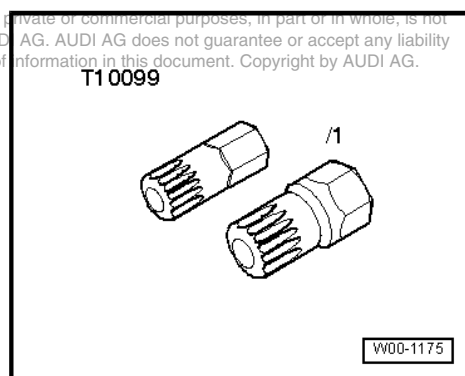
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◆ Socket -V/175-



◆ Bits -T10099-

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Procedure



Note

- ◆ Observe the general repair instructions ⇒ [page 10](#).
- ◆ Observe rules for cleanliness when working on the gearbox ⇒ [page 13](#).
- ◆ Refer to notes on automatic gearbox 09A ⇒ [page 2](#).
- ◆ All cable ties which are released or cut open during removal must be fitted in the same position when installing.

- Move selector lever to position „P“.



Caution

Follow steps required when disconnecting battery ⇒ Electrical system; Rep. gr. 27.

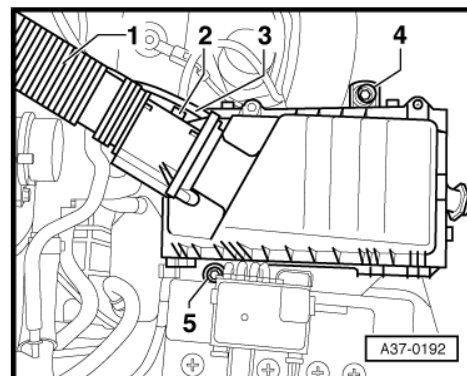


Note

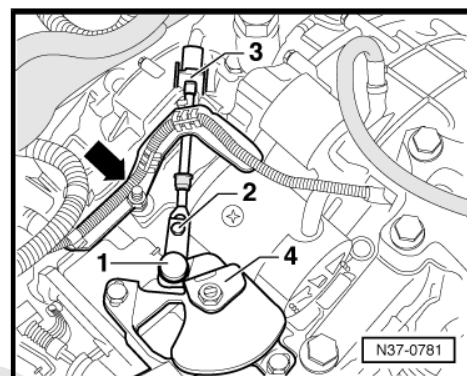
Before continuing the procedure, the battery earth strap must be disconnected. First check whether a coded radio is fitted and obtain anti-theft coding if necessary.

- With the ignition switched off, disconnect battery earth strap.
- Remove engine cover panel.
- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27.

- Remove intake hose -1-, connector -2- and hose -3- from air mass meter.
- Remove complete air cleaner housing; to do this, unscrew bolts -4- and -5-.
- Remove intake hose -1-.



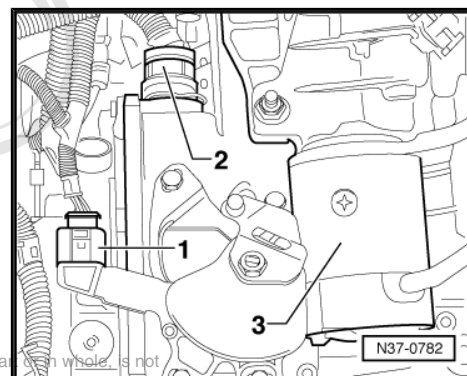
- If fitted, remove bracket -arrow- from gearbox.
- Push selector lever cable -1- off selector shaft lever -4- with screwdriver.
- Do not loosen bolt -2-.
- Remove securing clip -3- at selector lever cable support bracket and tie up selector lever cable.



Note

Do not kink selector lever cable.

- Unplug connector -1- on wiring for multifunction switch -F125-.
- Turn locking lever -2- and unplug connector for gearbox wiring harness.
- Remove electrical connections from starter.
- Remove starter -3- → Electrical system; Rep. gr. 27.



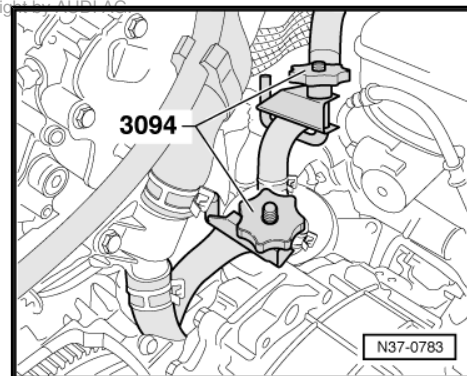
- Clamp off ATF cooler hoses using hose clamps -3094- and detach at ATF cooler.
- Seal off ATF cooler with clean plugs.



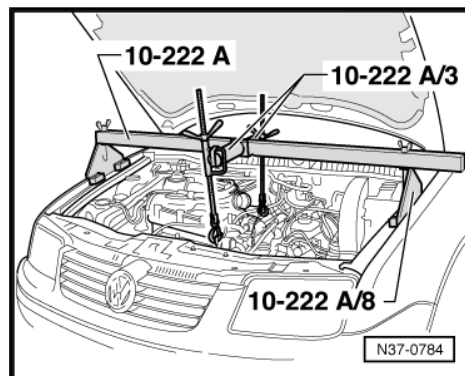
Note

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

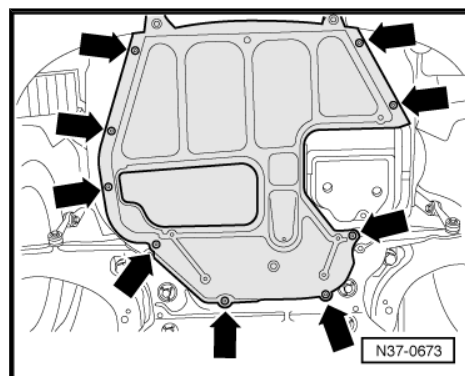
- Remove engine/gearbox connecting bolts (top) with bit -T10099/1- (14 mm) or socket/multi-point bit -T10061-.
- Detach fuel line at cylinder head cover.
- If there are hoses and cable connections in area of engine lifting eyes for support bracket -10 - 222 A-, remove these now.



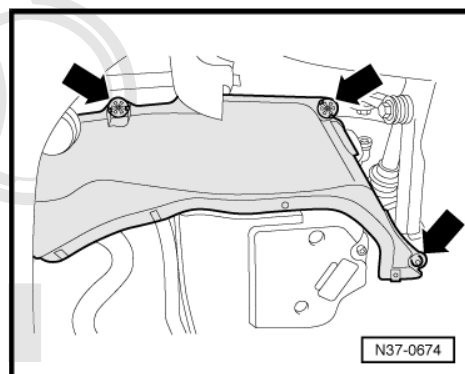
- Set up support bracket -10 - 222 A- together with adapters -10 - 222 A /3- and adapters -10 - 222 A /8- .
- Partly take up weight of engine/gearbox assembly with the spindles.
- Loosen bolts for left front wheel.
- Raise vehicle.
- Remove left wheel.



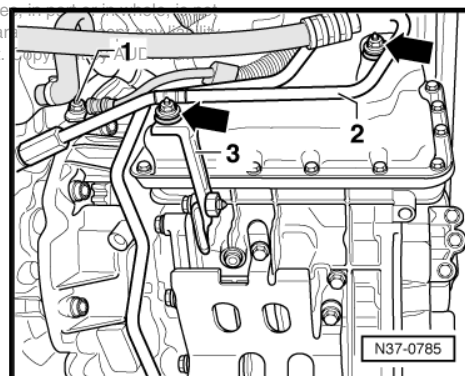
- Detach noise insulation below engine/gearbox -arrows-.



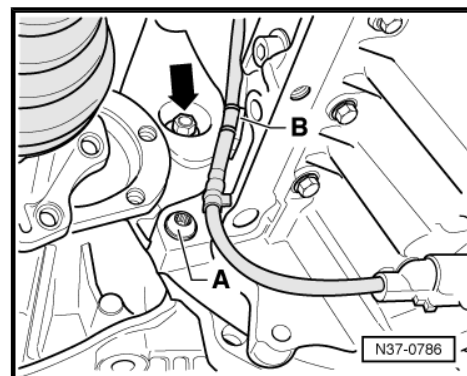
- Remove left noise insulation -arrows-.
- Detach pressure pipe between charge air cooler and turbo-charger from longitudinal member.
- Remove noise insulation (right-side).
- Remove front exhaust system with catalytic converter → Engine, mechanics; Rep. gr. 26 .



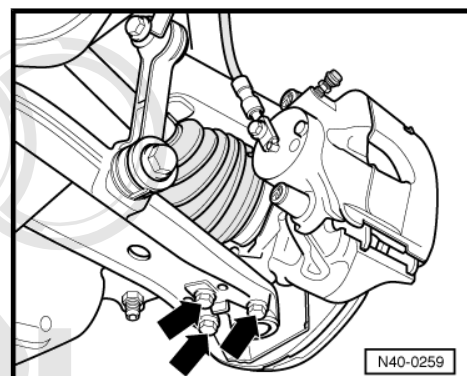
- Detach earth strap -1- from bracket on gearbox.
- Detach power steering line -2- from front of gearbox -arrows-.
- Detach bracket -3-.
- Then detach power steering line from rear of gearbox (near pendulum support) and tie up to one side.
- Detach bracket from cover of valve body.
- Unbolt drive shafts from gearbox flange shafts.
- Lift drive shaft (right-side) up and secure.



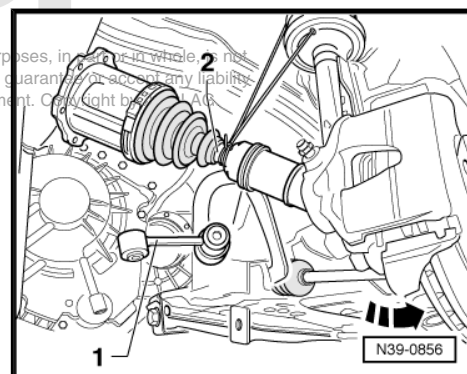
- Remove engine/gearbox connecting bolt -A- (bottom rear).
- Unclip cap for torque converter nuts.
- Unscrew nuts -arrow- from torque converter (3x) using socket -V/175- .
- To do so, turn crankshaft 120° further each time.
- Detach bracket -B- for wiring of oil level and oil temperature sender -G266- and turn to one side.
- Turn steering to the left.



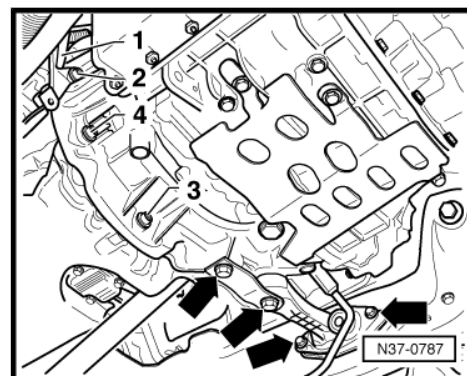
- Mark positions of bolts -arrows- securing swivel joint to wishbone (left-side), otherwise wheel alignment will have to be checked.
- Remove bolts -arrows-.



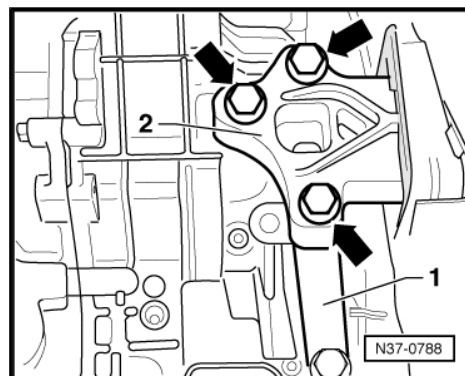
- Detach coupling rod (left-side) -1- from wishbone and turn coupling rod upwards.
- Swivel wheel bearing housing outwards.
- Guide drive shaft -2- (left-side) out between subframe and gearbox.
- Lift drive shaft and secure to suspension strut with wire.



- Remove engine/gearbox connecting bolts (bottom) -2- and -3-.
- When doing so, detach bracket -1- for earth strap from gearbox.
- Do not remove connecting bolt -4- at this stage.
- Remove bolts -arrows- and detach pendulum support.



- Remove hexagon bolts -arrows- for assembly mounting (left-side) -2- from gearbox bracket -1-.
- Carefully tilt engine/gearbox assembly by screwing down both spindles of support bracket -10 - 222 A- approx. 90 mm.

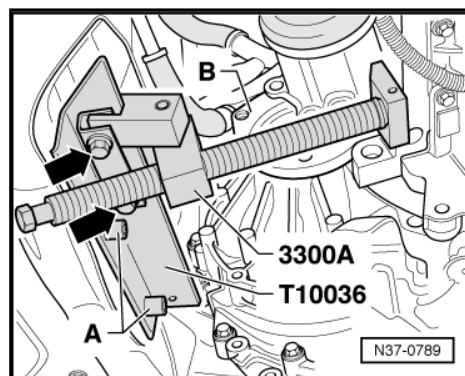


- Turn flange shaft (right-side) -B- so that flat section is vertical.
- Bolt support -T10036 A- to both securing holes for pendulum support on subframe (bolts -A-).
- Attach engine support -3300 A- so that it is almost touching subframe and secure -arrows-.
- Carefully press engine/gearbox unit forwards.



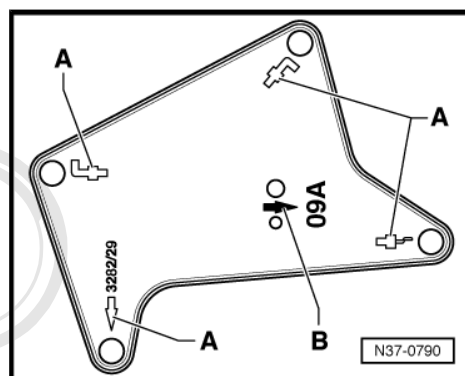
Note

Take care not to damage any of the connecting pipes and hoses when moving the engine/gearbox assembly.

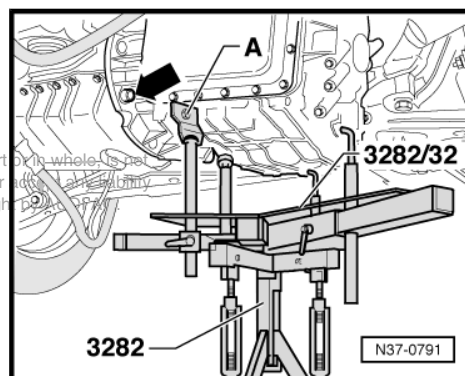


Set up gearbox support -3282- to remove 5-speed automatic gearbox 09A with adjustment plate -3282/32- .

- Align arms of gearbox support according to holes in adjustment plate .
- Screw in support elements -A- as illustrated on adjustment plate .
- Place engine and gearbox jack -V.A.G 1383 A- under vehicle; arrow symbol -B- on adjustment plate points to front of vehicle.
- Align adjustment plate parallel with gearbox.

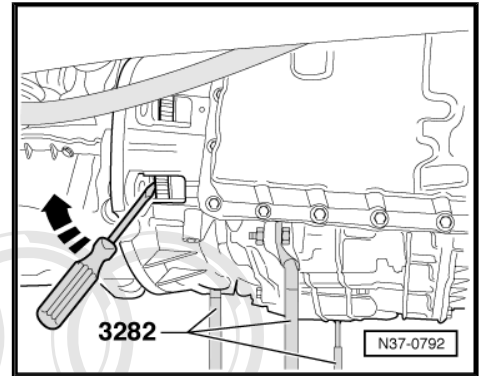


- Secure gearbox to gearbox support -3282- with bolt -A-.
- Remove engine/gearbox connecting bolt -arrow-.

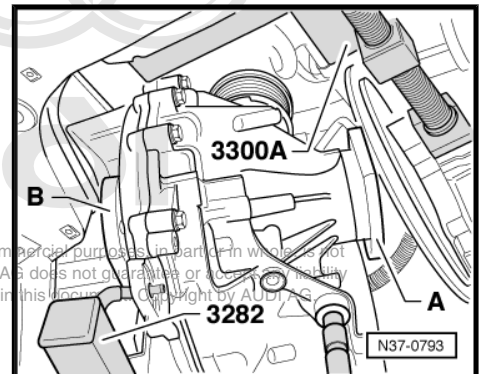


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- Push gearbox off engine and at the same time press torque converter out of drive plate.
- Press torque converter against ATF pump -arrow-.
- Carefully pivot gearbox towards subframe.

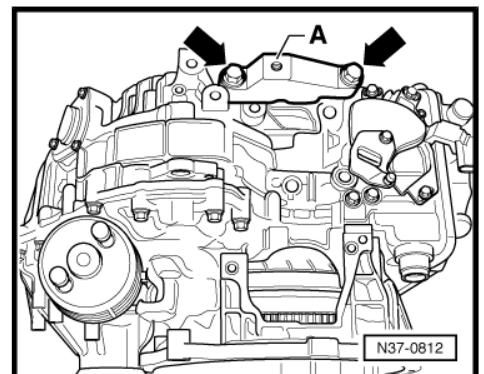


- Then lower gearbox carefully, guiding right-hand flange shaft -A- past drive plate and left-hand flange shaft -B- past sub-frame.
- When lowering the gearbox, change position of gearbox using the spindles on gearbox support -3282- .
- Secure torque converter to prevent it from falling out.



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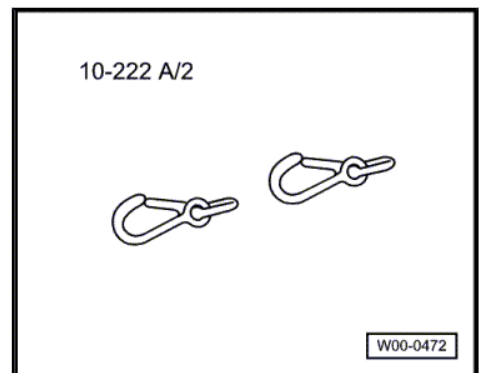
- If gearbox is being renewed, transfer gearbox bracket -A- -arrows-.



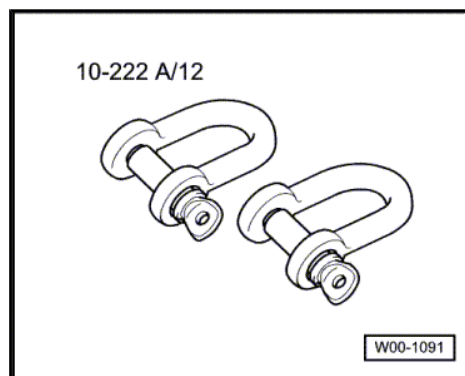
4.2 Transporting automatic gearbox

Special tools and workshop equipment required

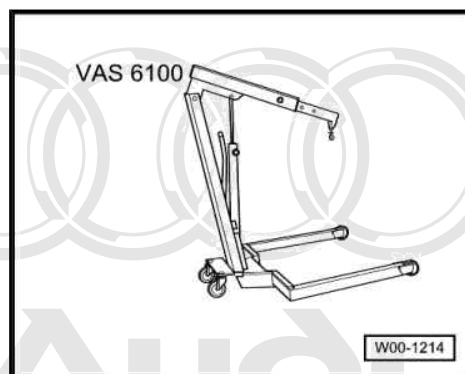
- ◆ Hook -10 - 222 A /2-



◆ Shackle -10 - 222 A /12-

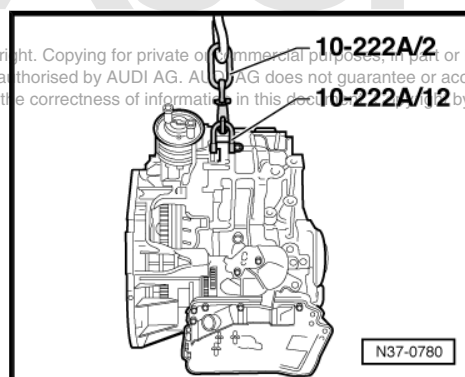


◆ Workshop hoist -VAS 6100- or workshop crane - V.A.G 1202 A-



To transport the automatic gearbox and set up gearbox support -3282-, shackle -10 - 222 A /12- can be used in conjunction with hook -10 - 222 A /2- .

- Secure shackle -10 - 222 A /12- to gearbox housing.



4.3 Installing gearbox

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



Note

- ◆ The special tools required are listed in the procedure for „Removing gearbox“ ➔ [page 46](#) .
 - ◆ Renew bolts which are tightened by turning through a specified angle.
 - ◆ Renew self-locking nuts and bolts, and O-rings, seals, and gaskets.
 - ◆ Hose connections and air pipes and hoses must be free from oil and grease before fitting.
 - ◆ Secure all hose connections with the correct hose clips (as original equipment); refer to ➔ *Electronic parts catalogue* .
 - ◆ To ensure that the charge air hoses can be connected securely, you must spray the screws on used screw-type clips with rust remover prior to installation.
 - ◆ Re-attach all cable ties at the same locations when re-installing.
- Tightening torques ➔ [page 57](#)
 - Before installing the gearbox ensure that the torque converter has been correctly fitted in the gearbox ➔ [page 16](#) .

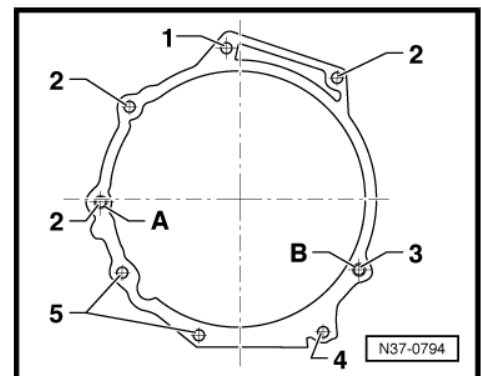
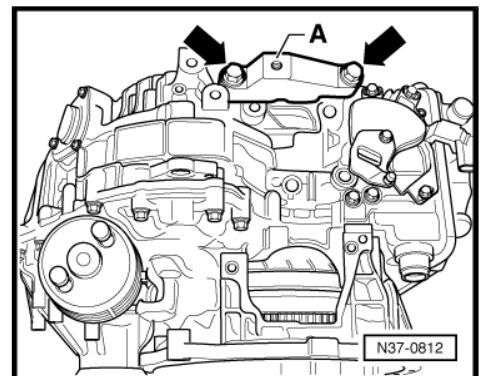
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WARNING

If the torque converter is not fitted correctly, the torque converter drive lugs or the ATF pump will be irreparably damaged when the gearbox is joined to the engine.

- If gearbox is being renewed, transfer gearbox bracket -A- arrows-.
-
- Before installing, ensure that dowel sleeves -A- and -B- are correctly located on engine.
 - Fit intermediate plate onto dowel sleeves.
 - When installing gearbox, observe torque converter contact impression on drive plate.
 - When pushing the engine and gearbox together, ensure that no wiring or pipes etc. can become trapped.
 - Secure gearbox to engine.
 - Use genuine nuts for attaching torque converter to drive plate ➔ *Electronic parts catalogue* .
 - Tighten torque converter nuts with socket -V/175- .



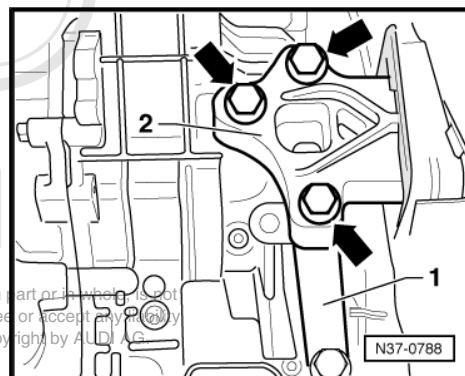
- Align engine/gearbox assembly in installation position. To do so, raise with support bracket -10 - 222 A- until gearbox bracket makes full contact with gearbox mounting.



Caution

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

- ◆ *Before fitting the bolts -arrows-, the gearbox bracket -1- and the gearbox mounting -2- must be aligned so they are parallel. If necessary, press gearbox up with engine and gearbox jack .*



- Check adjustment of assembly mountings; adjust if necessary
⇒ Engine, mechanics; Rep. gr. 10 .
- Bolt gearbox mounting to gearbox bracket ⇒ [page 57](#) .



WARNING

Do not remove support bracket -10 - 222 A- until all bolts securing the left-hand engine/gearbox mounting have been tightened to the specified torque.

- Install starter ⇒ Electrical system; Rep. gr. 27 .
- Bolt drive shafts to gearbox ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 .
- Secure swivel joint and coupling rod to wishbone ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 .
- Install pendulum support ⇒ [page 60](#) .
- Install exhaust system so it is free of stress ⇒ Engine, mechanics; Rep. gr. 26 .
- Secure bracket for power steering line to gearbox ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 48 .
- Renew securing clip on support bracket for selector lever cable.
- Check selector lever cable setting and adjust if necessary
⇒ [page 18](#) .
- Check and top up ATF level ⇒ [page 38](#) .
- Check coolant level ⇒ Engine, mechanics; Rep. gr. 19 .
- Install battery tray and battery. Observe steps required after connecting battery ⇒ Electrical system; Rep. gr. 27 .
- Perform self-diagnosis and initiate basic setting ⇒ Automatic gearbox 09A, self-diagnosis; Rep. gr. 01 .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .
- Fit wheels ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 44 .

Tightening torques

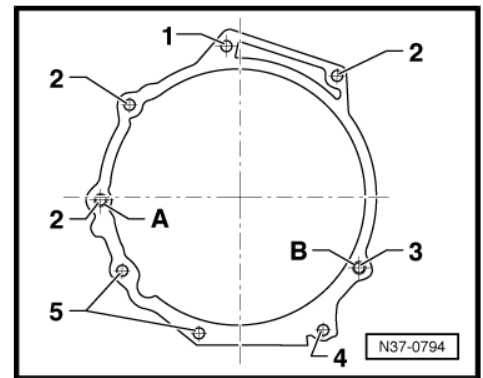


Note

- ◆ 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 is $\pm 15\%$.

Gearbox to engine:

Item	Bolt	Number	Nm
1	M 12 x 40	1	80
2 ¹⁾	M 12 x 60	3	80
3	M 12 x 70	1	80
4	M 10 x 70	1	45
5	M 10 x 55	2	45
A + B	Dowel sleeves in engine		
1)	The two bolts marked item 2 on the left of the illustration also secure a retainer bracket for engine wiring/pipework.		



Gearbox bracket -A- to gearbox

– Renew bolts.

Bolts -arrows-

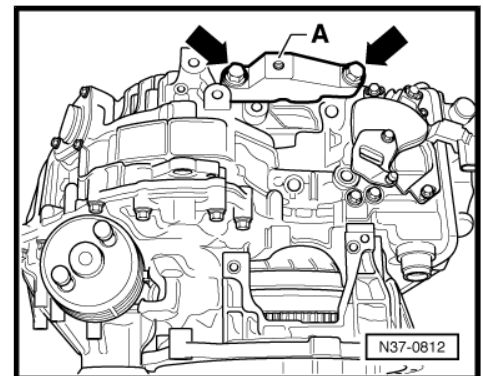
50 Nm

Torque converter to drive plate

57 Nm

All remaining bolted joints:

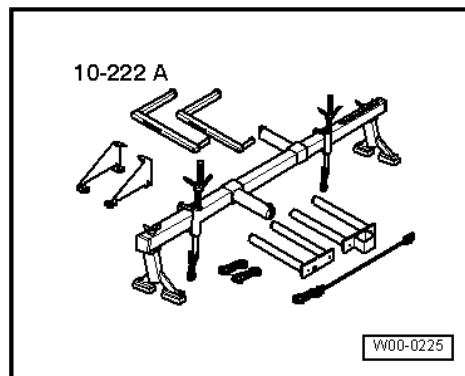
Component		Nm
Bolts/nuts	M6	10
	M8	20
	M10	45
	M12	65



4.4 Removing and installing gearbox mounting

Special tools and workshop equipment required

◆ Support bracket -10 - 222 A-



Removing



Caution

Follow steps required when disconnecting battery ⇒ Electrical system; Rep. gr. 27 .

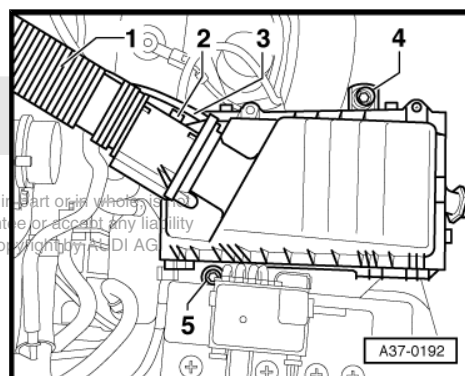


Note

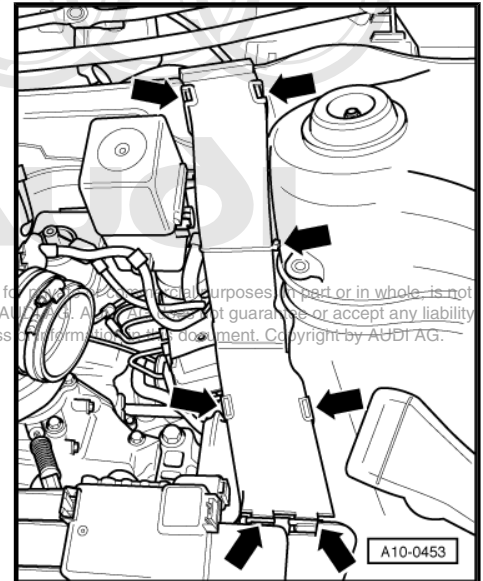
Before continuing the procedure, the battery earth strap must be disconnected. First check whether a coded radio is fitted and obtain anti-theft coding if necessary.

- With the ignition switched off, disconnect battery earth strap.
- Remove engine cover panel.
- Remove intake hose -1- , connector -2- and hose -3- from air mass meter.
- Remove complete air cleaner housing; to do this, unscrew bolts -4- and -5-.
- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27 .

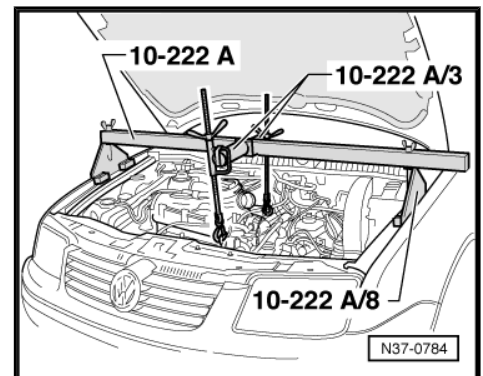
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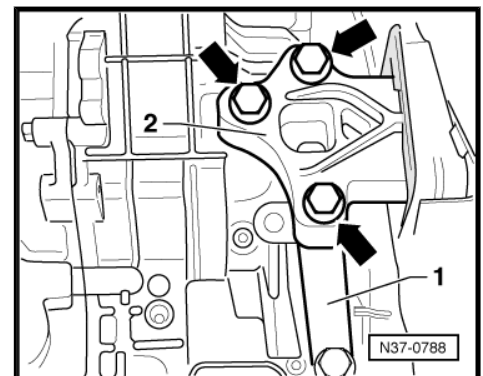
- Open wiring duct on left in engine compartment -arrows-.
- Unclip wiring duct and push to side.
- If there are hoses and cable connections in area of engine lifting eyes for support bracket -10 - 222 A- , remove these now.



- Set up support bracket -10 - 222 A- together with adapters -10 - 222 A /3- and adapters -10 - 222 A /8- .
- Take up weight of engine/gearbox assembly via the spindles, but do not raise.



- Remove hexagon bolts -arrows- for assembly mounting (left-side) -2- from gearbox bracket -1- and gearbox.



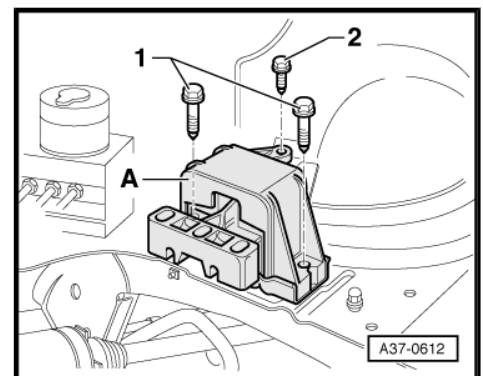
- Remove bolts -1- and -2- and detach gearbox mounting -A-.

Installing



Note

Renew bolts which are tightened by turning through a specified angle.



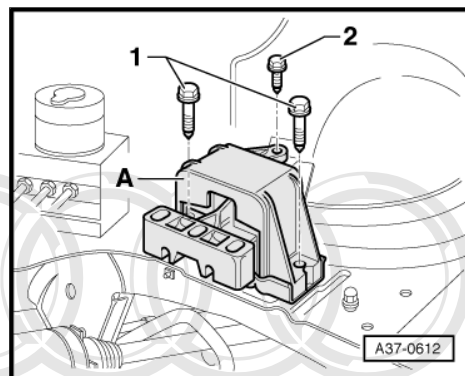
- Bolt gearbox mounting -A- to body with bolts -1- and -2-.
- Renew bolts -1-.

Bolts -1-

40 Nm and then
turn 90° further

Bolts -2-

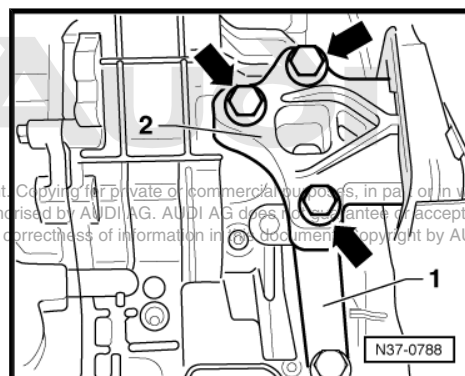
25 Nm



- Initially hand-tighten new bolts -arrows- securing gearbox mounting -2- to gearbox bracket -1- and gearbox.
- Adjust assembly mountings ⇒ Engine, mechanics; Rep. gr. 10 .
- Tighten bolts -arrows- to 50 Nm and then turn 90° further.

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

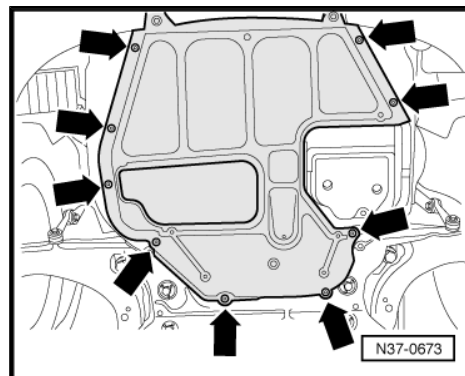
- Detach support bracket -10 - 222 A- from engine.
- Install battery tray and battery ⇒ Electrical system; Rep. gr. 27 .
- Install air cleaner housing ⇒ Rep. gr. 23 or ⇒ Rep. gr. 24 .



4.5 Removing and installing pendulum support

Removing

- Remove centre noise insulation (loosen fasteners -arrows-).

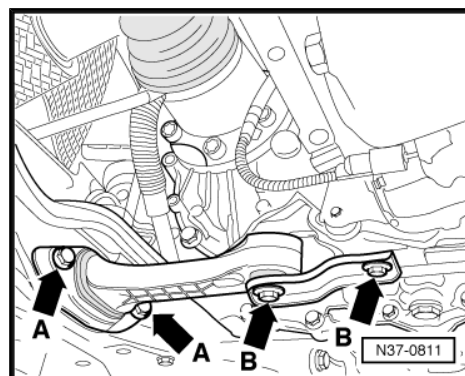


- First remove bolts -A-, then bolts -B- and detach pendulum support.

Installing

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

- Renew bolts -arrows A- and -arrows B-.



- First secure pendulum support to gearbox -arrows B-, then on subframe -arrows A-.

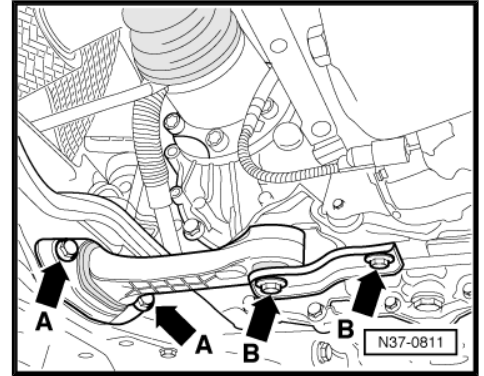
Bolts -arrows A-

20 Nm and then
turn 90° further

Bolts -arrows B-

40 Nm and then
turn 45° further

- Install noise insulation ⇒ Rep. gr. 50 .

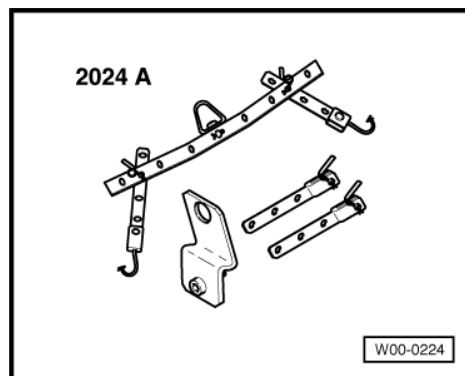


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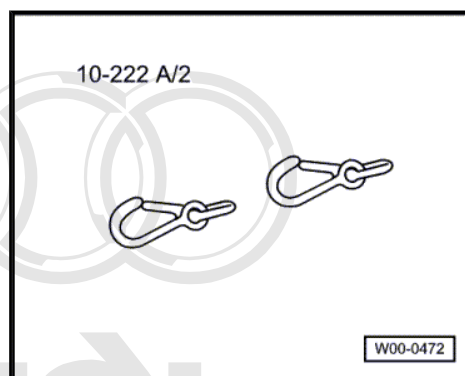
5 Securing gearbox to engine and gearbox support -VAS 6095- or support clamp -VW 313-

Special tools and workshop equipment required

- ◆ Lifting tackle -2024 A-

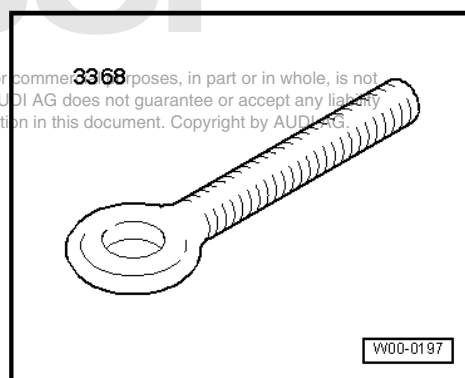


- ◆ Hook -10 - 222 A /2-

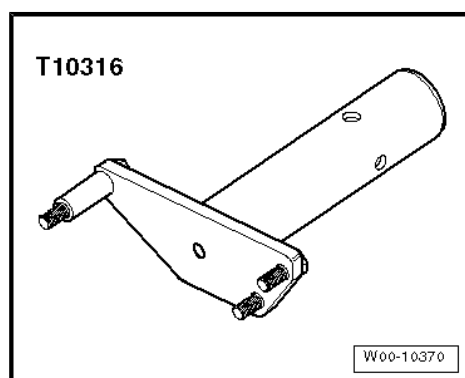


- ◆ Eye-head bolts -3368-

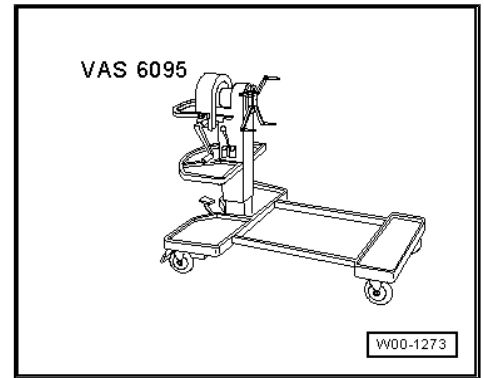
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- ◆ Gearbox support -T10316-

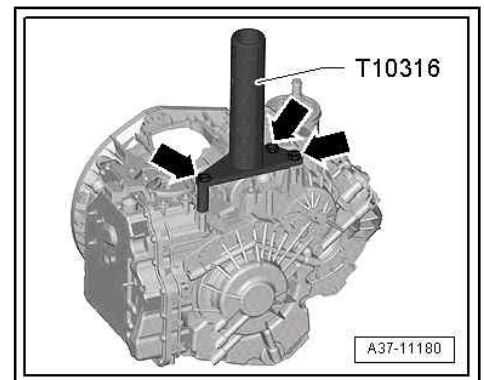


◆ Engine and gearbox support -VAS 6095-



Procedure

- ATF drained ⇒ [page 44](#) .
- If necessary, clean outside of gearbox.
- Bolt gearbox support -T10316- to gearbox -arrows-.
- Turn gearbox so that torque converter housing faces upwards.



- Screw eye-head bolts -3368- into torque converter housing.

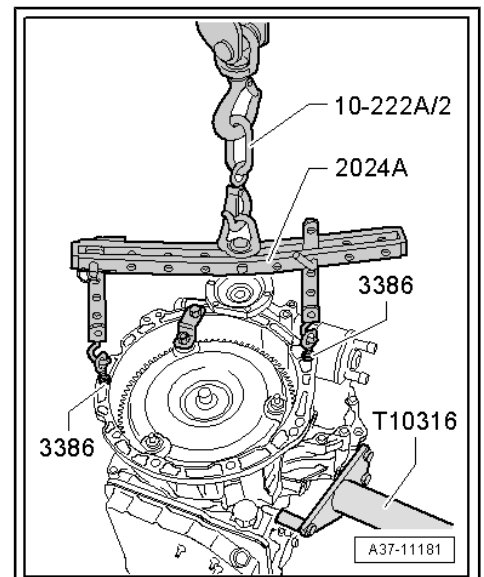
Caution

Risk of damage to the torque converter.

• ***Secure the torque converter to prevent it from falling out.***

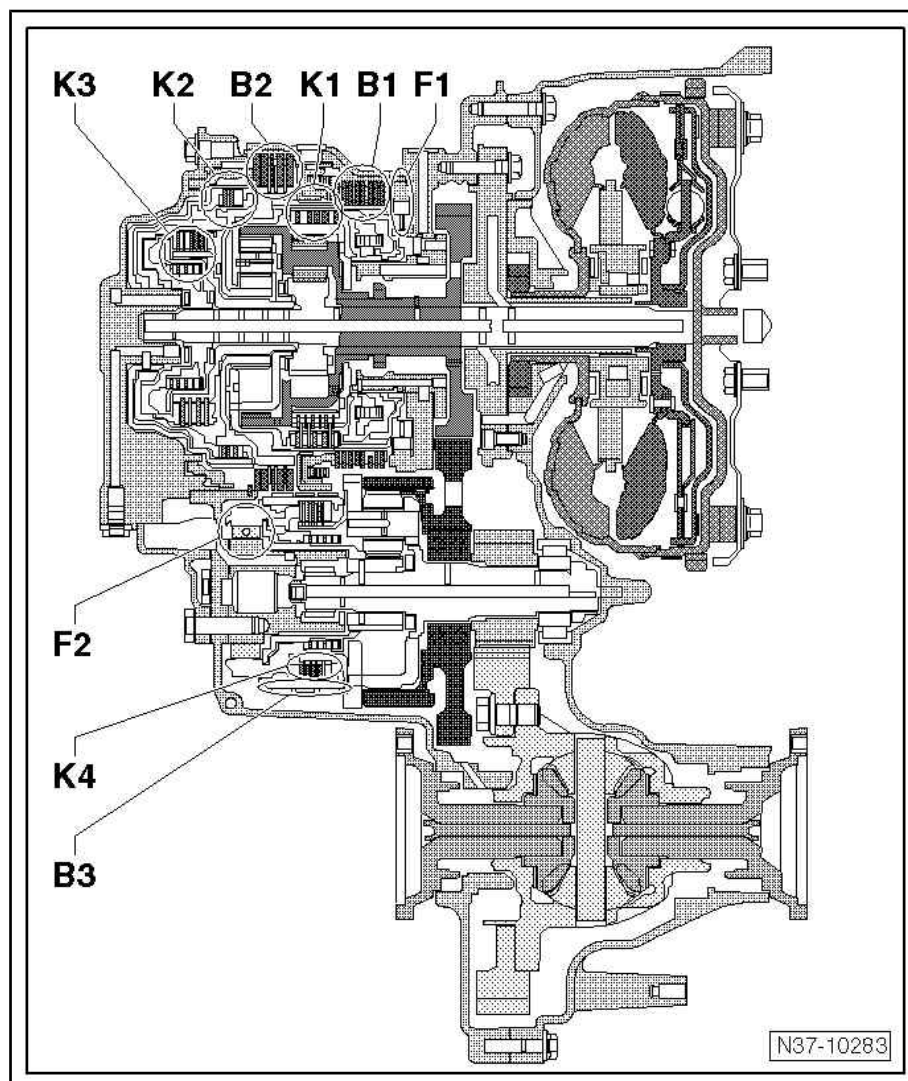
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- Lift gearbox with lifting tackle -2024 A- and secure to engine and gearbox support -VAS 6095- or support clamp -VW 313- .



6 Gearbox with selector elements

Position of selector elements



Actuation of selector elements

Note

- ◆ *In the event of problems with poor acceleration and performance or other transmission faults, the following table shows which selector elements are operated in the individual gears. In this way it is possible to establish which selector elements are not functioning correctly.*
- ◆ *Before starting repairs to the gearbox, first carry out the self-diagnosis ⇒ Automatic gearbox 09A, self-diagnosis; Rep. gr. 01.*

	Clutches and brakes						
	Clutch				Brake		
Position / gear	K1	K2	K3	K4	B1	B2	B3
D, 1st gear	X				(X)		(X)

	Clutches and brakes						
D, 2nd gear	X					X	(X)
D, 3rd gear	X		X				(X)
D, 4th gear			X			X	(X)
D, 5th gear			X	X		X	
R = Reverse		X			X		X

(X) = Component is actuated only on overrun

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7 Exploded view - gearbox

The complete valve body and all clutches and brakes are available as replacement parts for gearbox repair. Likewise, all gaskets, seals and O-rings required for this repair are available in a set of seals ⇒ Electronic parts catalogue .



Note

- ◆ *It is important to renew the valve body, the ATF strainer and the ATF cooler in all cases in addition to the defective selector element.*
- ◆ *This prevents contaminated ATF from these parts from re-entering the gearbox.*
- ◆ *The pressure accumulators should also be cleaned ⇒ [page 89](#) .*

-B1 - Reverse gear and 1st gear brake

- ☐ Multi-plate brake

-B2 - 2nd, 4th and 5th gear brake

- ☐ Multi-plate brake
- ☐ Observe assembly instructions ⇒ [page 89](#)

-B3 - 1st - 4th gear and reverse gear brake

- ☐ With brake band

-K1 - 1st - 3rd gear clutch

-K2 - Reverse gear clutch

This clutch is only available as a replacement part together with K3

-K3 - 3rd - 5th gear clutch

This clutch is only available as a replacement part together with K2

-K4 - 5th gear clutch

- ☐ With freewheel 2 for 1st to 4th gears

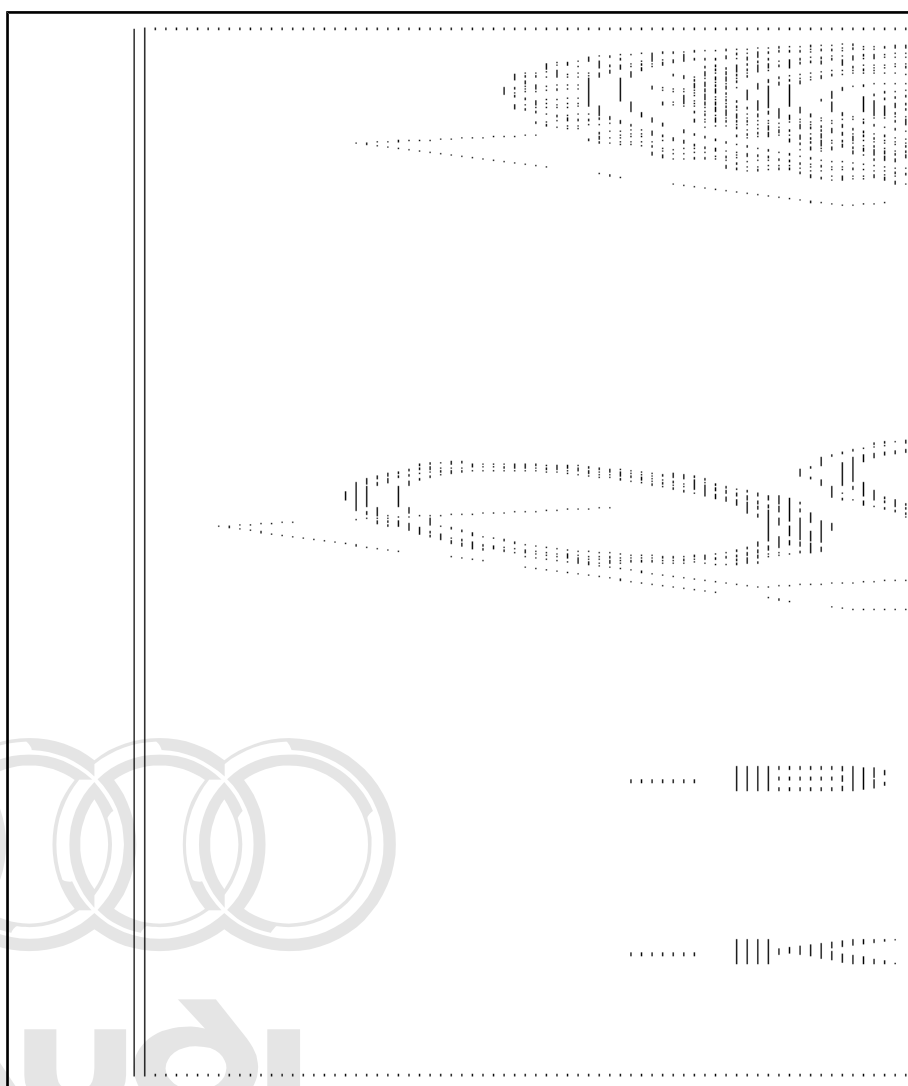
1 - Valve body

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

2 - ATF strainer

3 - ATF cooler

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

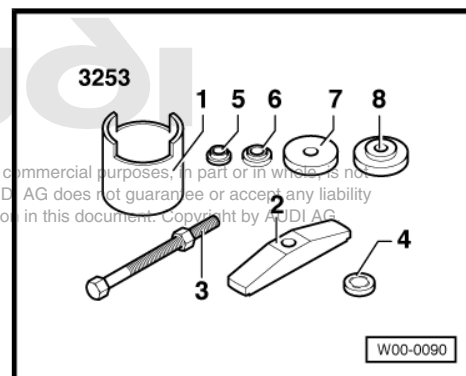


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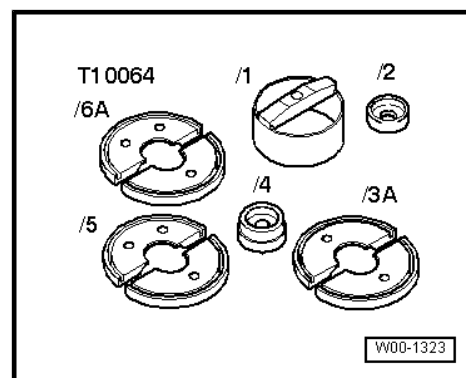
8 Assembly sequence - dismantling and assembling gearbox

Special tools and workshop equipment required

- ◆ Spindle -3253/3- from assembly tool -3253-



- ◆ Cylinder -T10064/1- and thrust pieces -T10064/6A- from assembly tool -T10064-



Brief description

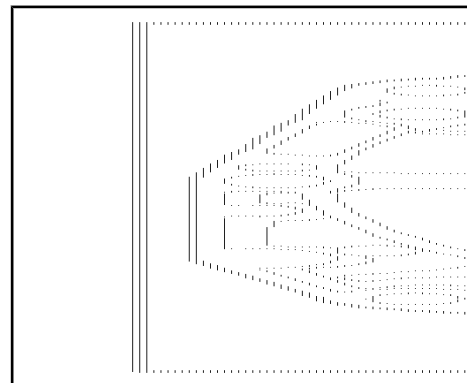
The two sections of the housing have to be separated before starting the gearbox repair. Then the differential, the ATF pump, planetary gear set III and clutch „K4“ must be removed.

- ◆ Gearbox is mounted on assembly stand ⇒ [page 62](#)
- ◆ Torque converter is removed
- ◆ Valve body is removed ⇒ [page 103](#)
- ◆ Flange shafts are removed ⇒ [page 115](#)

8.1 Dismantling gearbox

First the two sections of the gearbox housing must be separated.

- Remove bolts (21x).
- If it does not come loose, separate torque converter housing from gearbox housing using a plastic hammer.
- Lift off torque converter housing, keeping it straight.

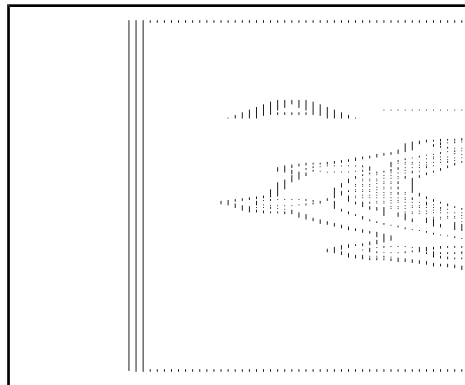


- Take out axial needle bearing -B- and differential -A-.

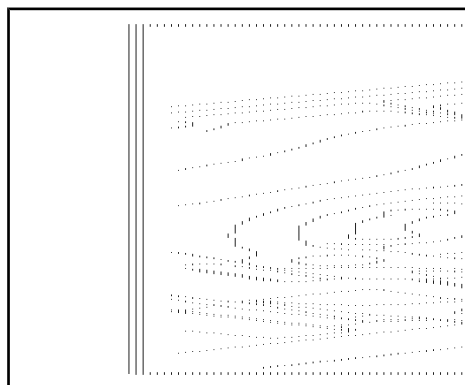


Note

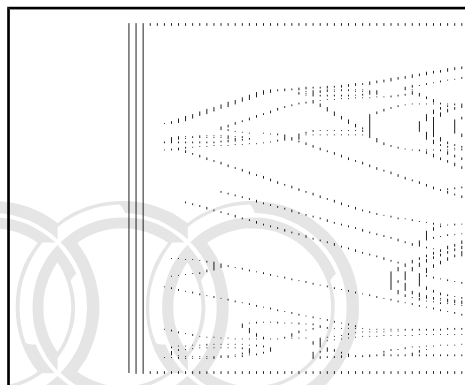
-Items 1 and C- can be disregarded.



- Unbolt and take out ATF pump -A- and ATF strainer -B-.



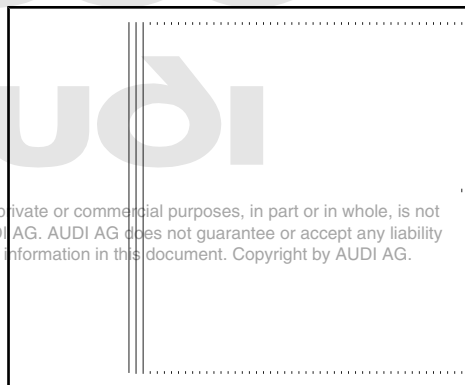
- Take out turbine shaft -A- with seal -1-.
- Detach gasket -B- for ATF pump from pump flange.



- Now take out planetary gear set III and set it down so it cannot be damaged.
- Take out clutch „K4“.
- Take out brake band for brake „B3“.
- Turn gearbox so that housing cover faces upwards.

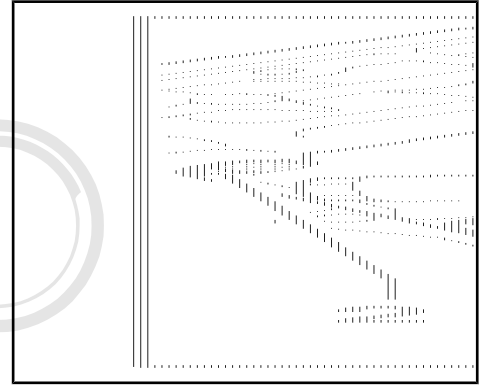
Now the housing cover must be detached and some of the selector elements taken out.

- Slacken off all bolts.

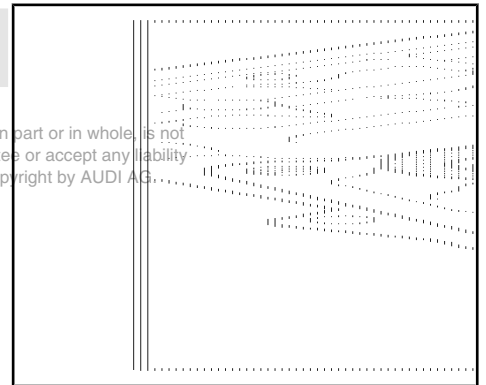


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- Remove all bolts except bolts -1- and -2-.
- If it does not come loose, separate housing cover from gearbox housing using a plastic hammer.
- Take off housing cover.

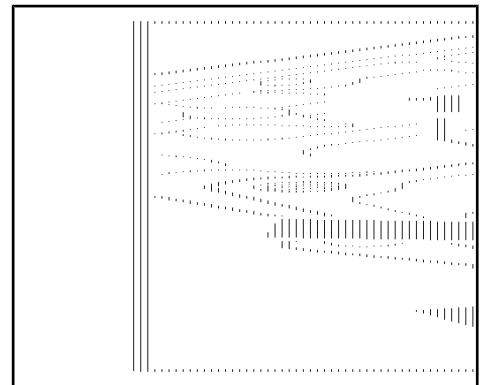


- Carefully lever off ATF lines -2- and -3- with a plastic wedge. Take care to keep the lines straight, otherwise they will be damaged.

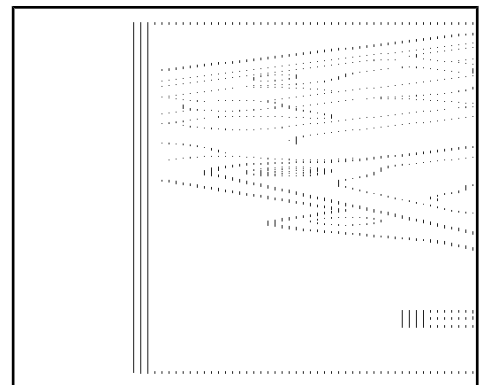


- Then remove ATF line -1- with retainer clips -A-.

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- Remove gearbox input speed sender -G182- -1-.
- Take out spring -2-.



- Take out clutch „K2/K3“ -A-.

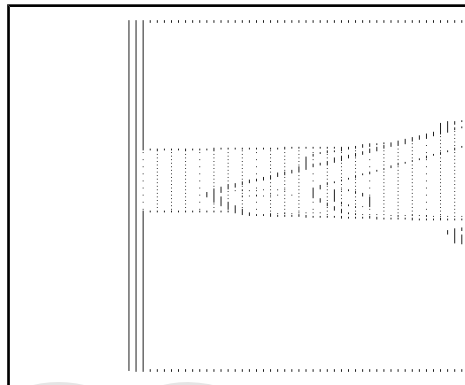
The O-ring -B- has to be renewed at a later stage.

- Remove large circlip for brake „B2“.

Now remove all parts which can be reached by hand. Put them down on a clean surface.

- Remove planetary gear set I and plates of brake „B2“.
- Then remove planetary gear set II and clutch „K1“.

- Carefully guide spindle -3253/3- from assembly tool -3253- through spur gear; the bush on the lower end must not be damaged.
- Using assembly tool -T10064/1- , -T10064/6A- and spindle -3253/3- , press down piston as far as stop.



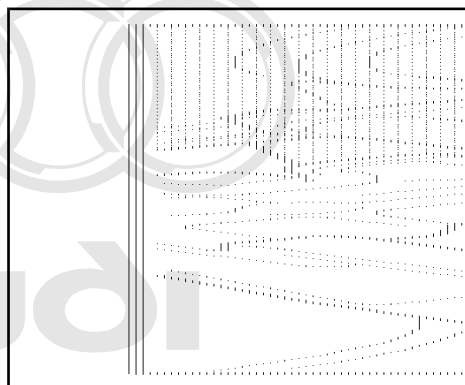
- Remove circlip -arrows-.



Note

The special tools are omitted from the illustration to show the location of the circlip more clearly.

- Remove assembly tool again.
- Then remove brake „B1“.



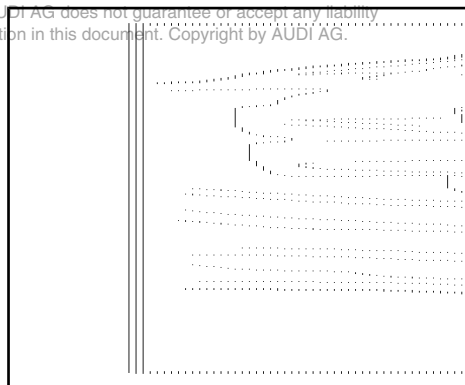
- Remove circlip and freewheel.

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Note

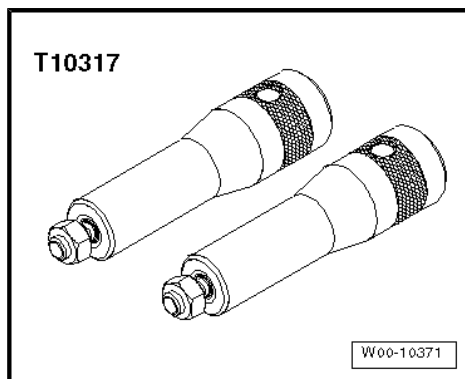
- ◆ *The gearbox is not dismantled further.*
- ◆ *The individual selector elements and gearbox components must be cleaned.*



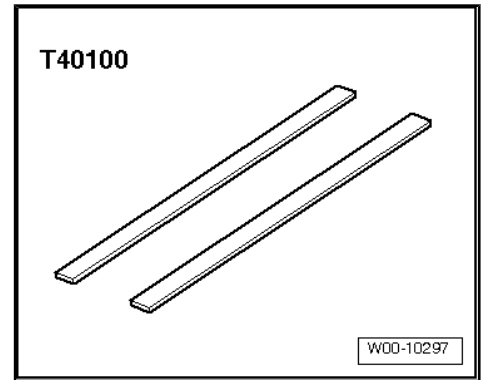
8.2 Assembling gearbox

Special tools and workshop equipment required

- ◆ Spacer pin -T10317-



◆ Straightededge -T40100-



◆ Cleaning fluid -D 009 401 04-

◆ Sealant -D 176 404 A2-

- Install freewheel.

Note the position of the smallest lug -arrow-. The freewheel can only be fitted in one position.

All the components referred to below have a similar small lug. The lugs must always be aligned one above the other.



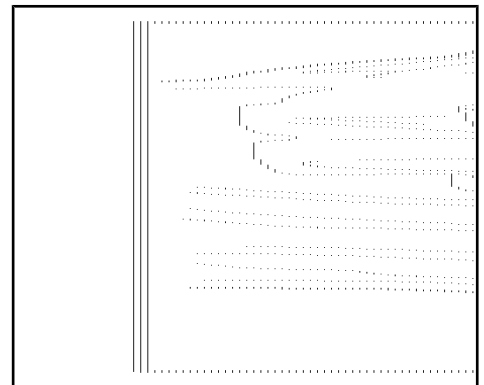
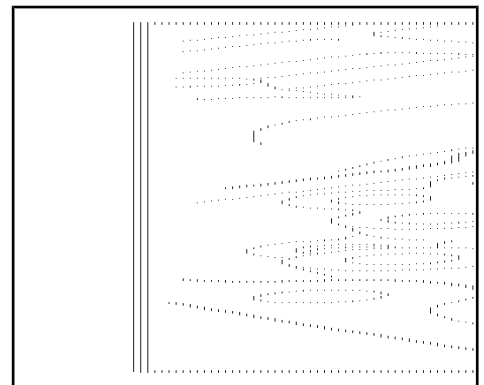
Note

In the following description the parts are shown in a cut-away section of the gearbox for more clarity.

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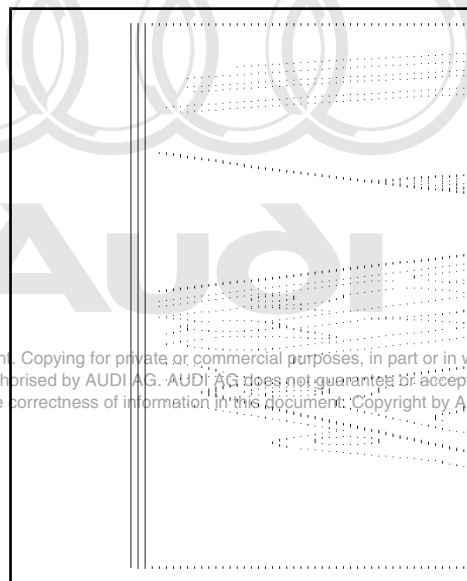
The cutaway view shows the position of the freewheel when installed in the gearbox.

The freewheel is secured with a circlip.



- Install circlip -arrows-.

The open part of the circlip faces towards the selector shaft -1-. It is important to position the ends of the circlip as shown in this illustration.



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- Fit first outer plate of brake „B1“ with smooth side facing upwards.

There is a shoulder on the underside, which is provided for the circlip securing the freewheel.

Once again, note the position of the smallest lug; the outer plates also fit in one position only.

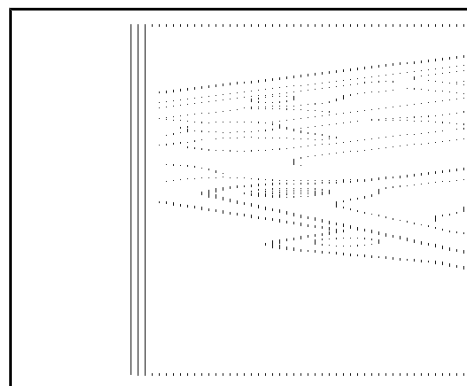
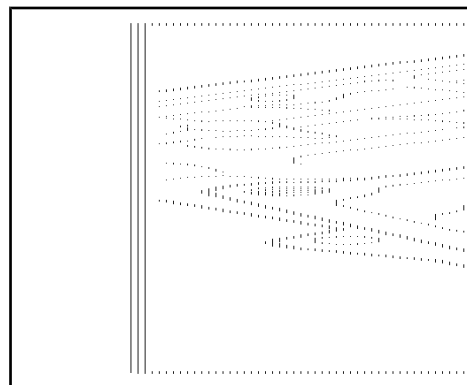
- Fit first inner plate of „B1“.
- Install all remaining plates alternately.

Fit last outer plate with a thickness of approx. 2.5 mm.

- Position splines of inner plates so they are in line.

Doing this now will facilitate the installation of clutch „K1“ at a later stage.

- Fit dished spring -A- with convex side facing upwards.



The outer edge of the dished spring -A- will then lie on the last outer plate.

- Fit spring seat.



- Fit spring.



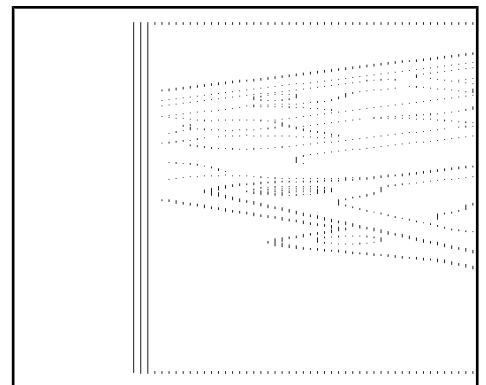
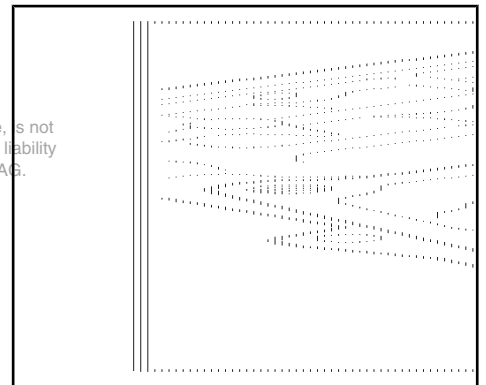
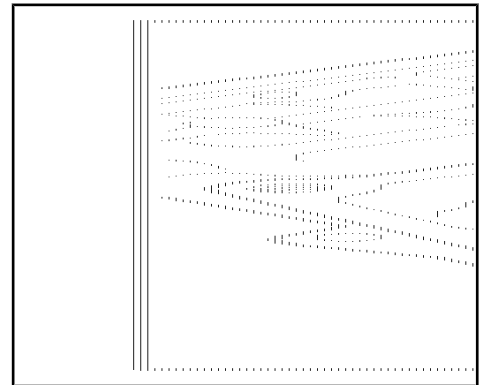
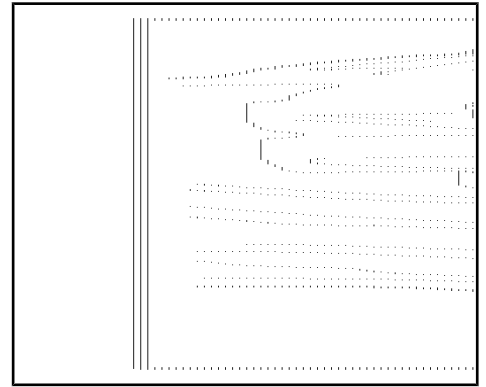
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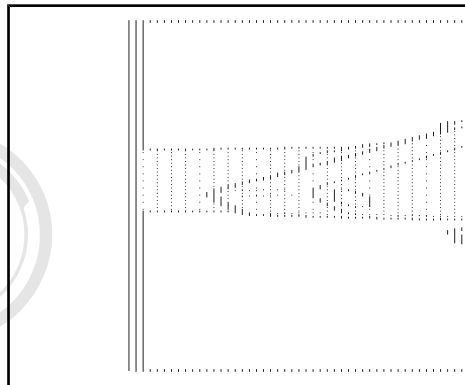
Now inspect the „B1“ piston; there are a lug and a drilling on the outer circumference.

- The „B1“ piston must not be inserted while the valve body is installed.

- Fit „B1“ piston as shown in illustration.



- Carefully guide spindle -3253/3- from assembly tool -3253- through spur gear; the bush on the lower end must not be damaged.
- Using assembly tool -T10064/1- , -T10064/6A- and spindle -3253/3- , press down piston as far as stop.



- Install circlip -arrows-.

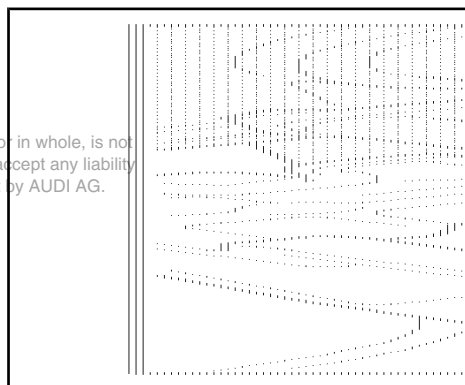


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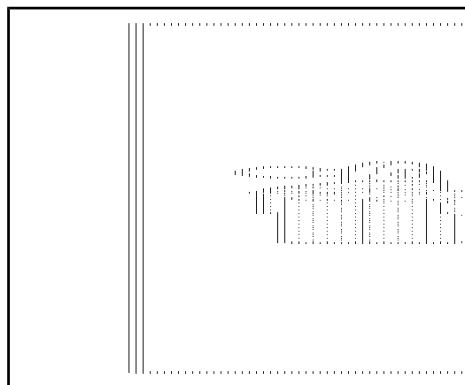
The special tools are omitted from the illustration to show the location of the circlip more clearly.

The open section of the circlip faces towards the aperture for the brake with brake band. As before, it is important to position the ends of the circlip as shown in this illustration.

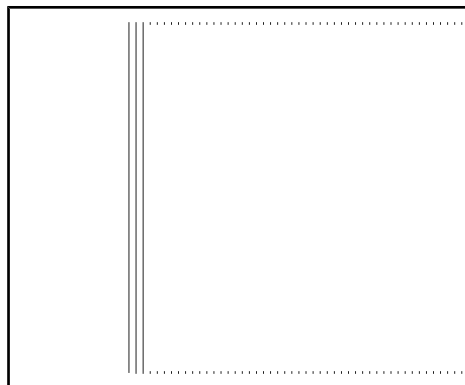


Now check position of piston.

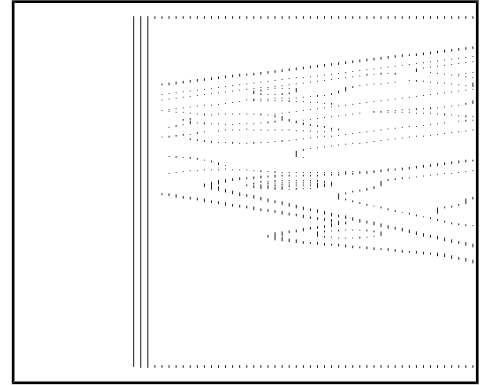
- The -drilling- -arrow- in the piston must be visible in the aperture for the valve body.
- Remove assembly tool again.



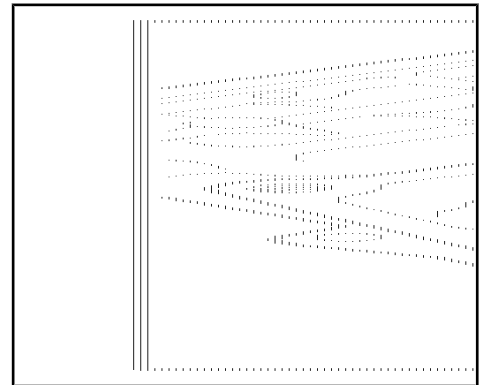
- Stick needle bearing to clutch „K1“ with vaseline
- The dark side of the needle bearing faces towards the gearbox.
- Carefully insert clutch „K1“.



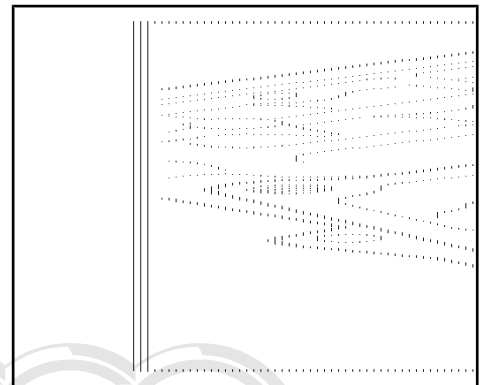
- Turn clutch anti-clockwise in direction of -arrow- so it slides into freewheel.



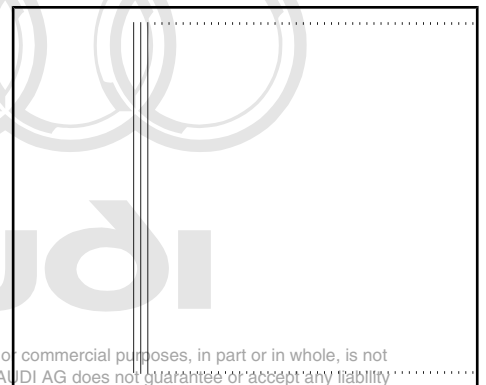
If the clutch is correctly installed, the edges -A- of the bearing seat will be level with the edges -B- of the clutch.



- Fit needle bearing for annulus.

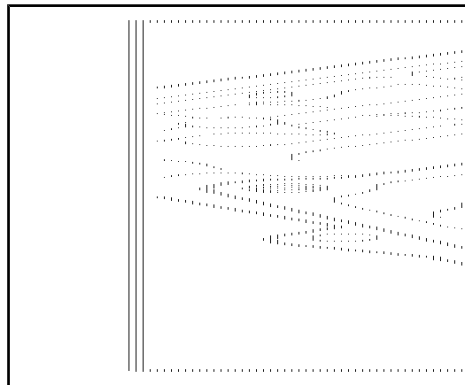


- Stick thrust washer to annulus with vaseline.
The washer can only be fitted in one position.

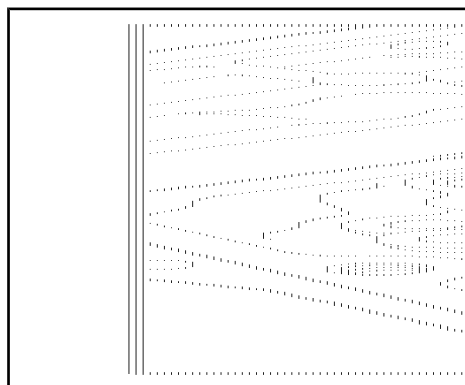


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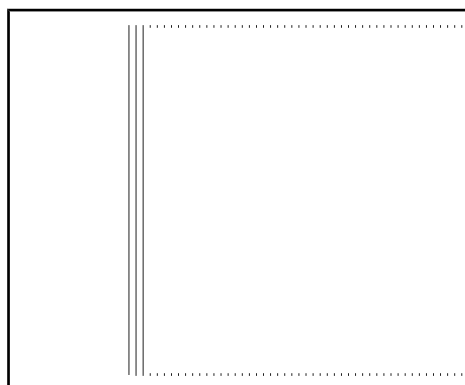
- Turn annulus in both directions when installing.



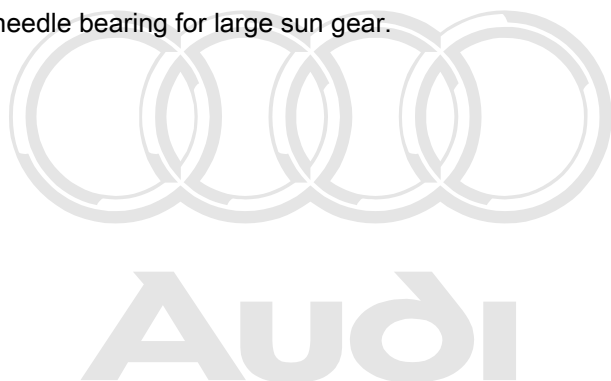
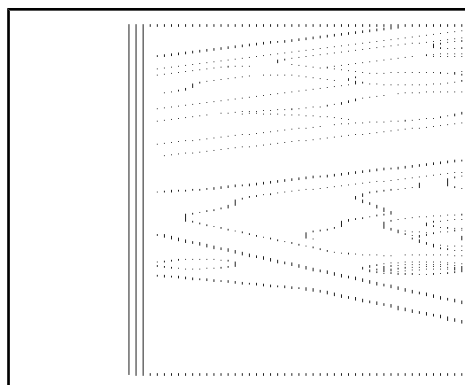
- Fit needle bearing for planet carrier.



- Stick thrust washer to planet carrier with vaseline.
- Turn planet carrier in both directions when installing.

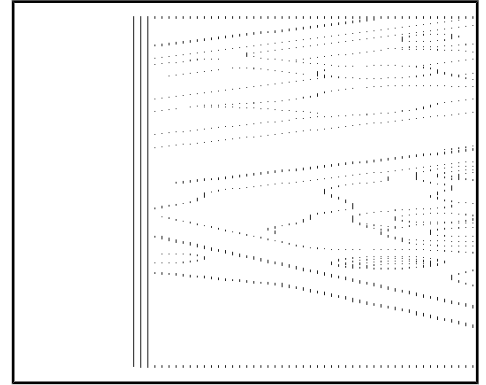


- Insert axial needle bearing for large sun gear.

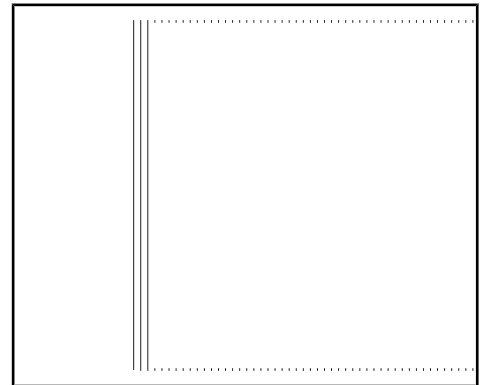


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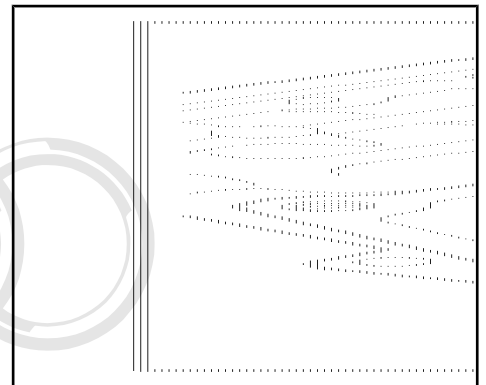
- Install large sun gear.



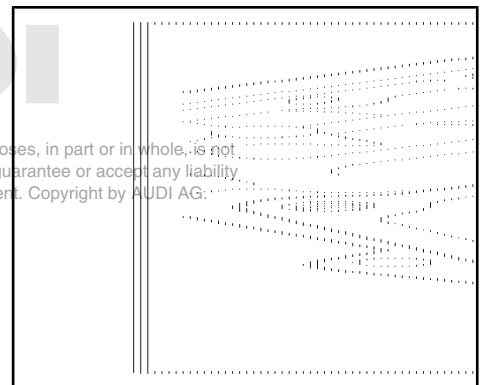
- Stick axial needle bearing to planet carrier with vaseline.
The dark side of the axial needle bearing faces towards the planet carrier.



- Turn planet carrier in both directions when installing.

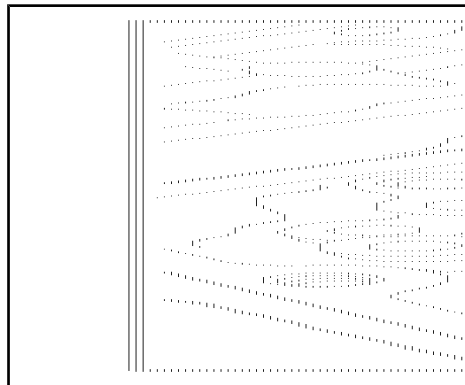


When the planet carrier is correctly installed, the splines on the outside circumference engage in the clutch cage of „K1“.

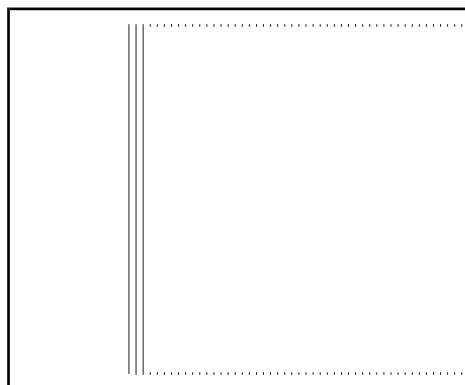


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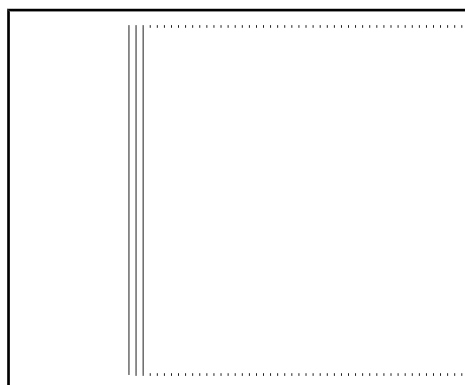
- Fit axial needle bearing for annulus.



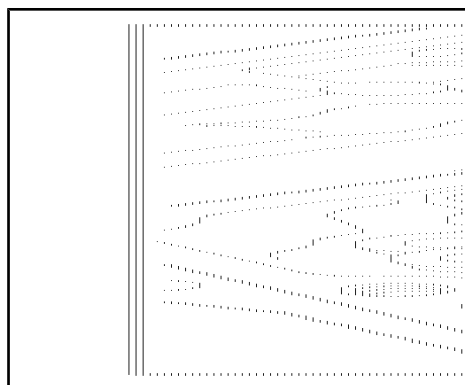
- Stick thrust washer in annulus with vaseline.
The washer can only be fitted in one position.
- Turn annulus in both directions when installing.



- Stick axial needle bearing to annulus with vaseline.



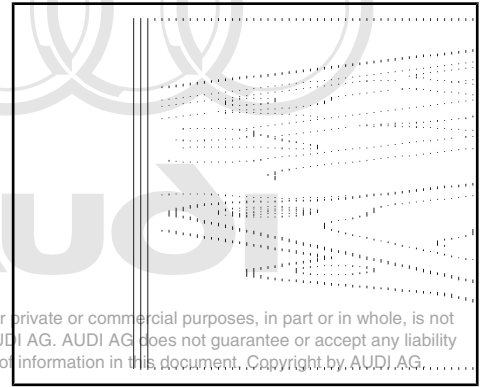
- Install annulus.



- Fit first outer plate of brake „B2“.

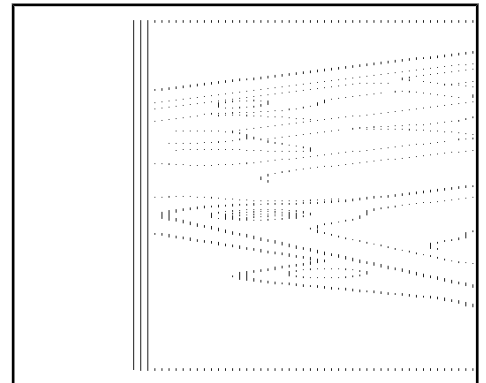
It is approx. 4.2 mm thick.

The outer plates only fit in one position.



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- Fit first inner plate of „B2“.
- Then fit all remaining plates; the two outer plates are approx 3 mm thick.



There are two different versions of the last outer plate for „B2“:

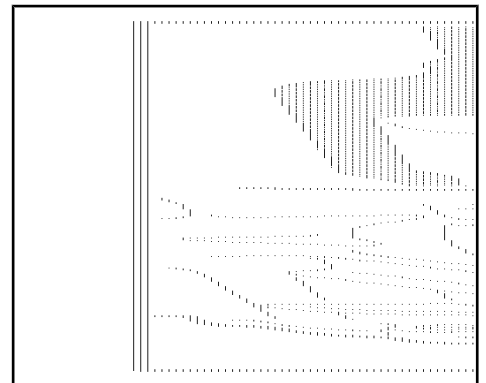
-1- On later gearboxes, one outer plate with a thickness of approx. 7.5 mm is fitted last.

-2- On earlier gearboxes, two outer plates with a thickness of approx. 3.8 mm each are fitted last.

- Fit circlip.

Before continuing assembly, check clearance of „B2“.

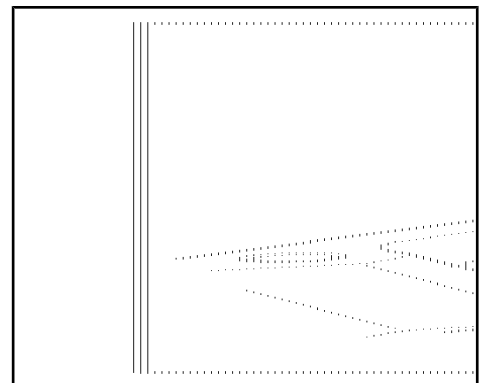
Checking clearance of 2nd, 4th and 5th gear brake „B2“



- Measure down to last outer plate of „B2“ and note value.

Example: 26.15 mm

- Press piston of „B2“ into cover as far as stop.



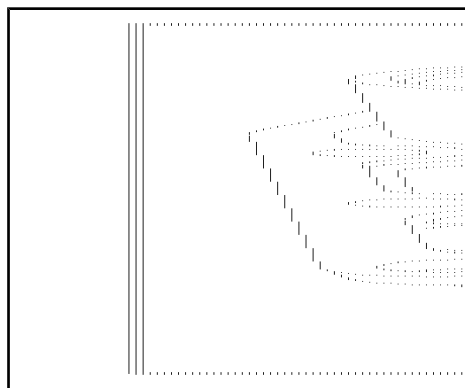
- Measure down from two lugs of „B2“ piston to sealing surface of cover and note value.

Example: 25.37 mm

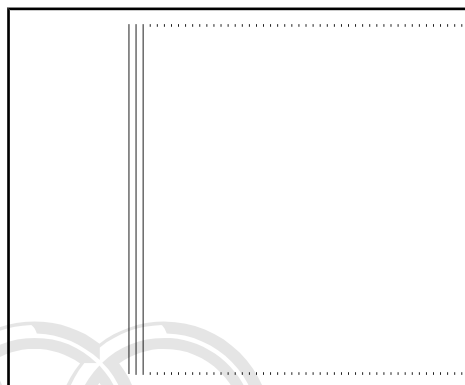
- Subtract the two measurements.

Example: 26.15 mm – 25.37 mm = 0.78 mm

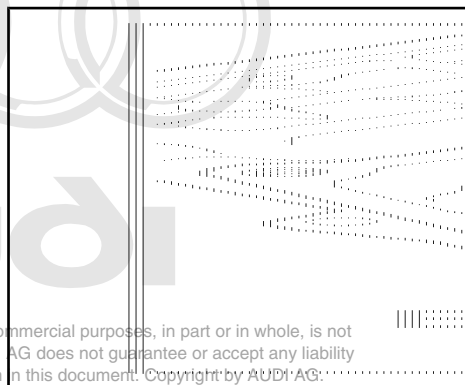
Specification: 0.60 ... 0.90 mm



- Stick axial needle bearing with vaseline into „K2/K3“.
- Turn „K2/K3“ in both directions when installing.



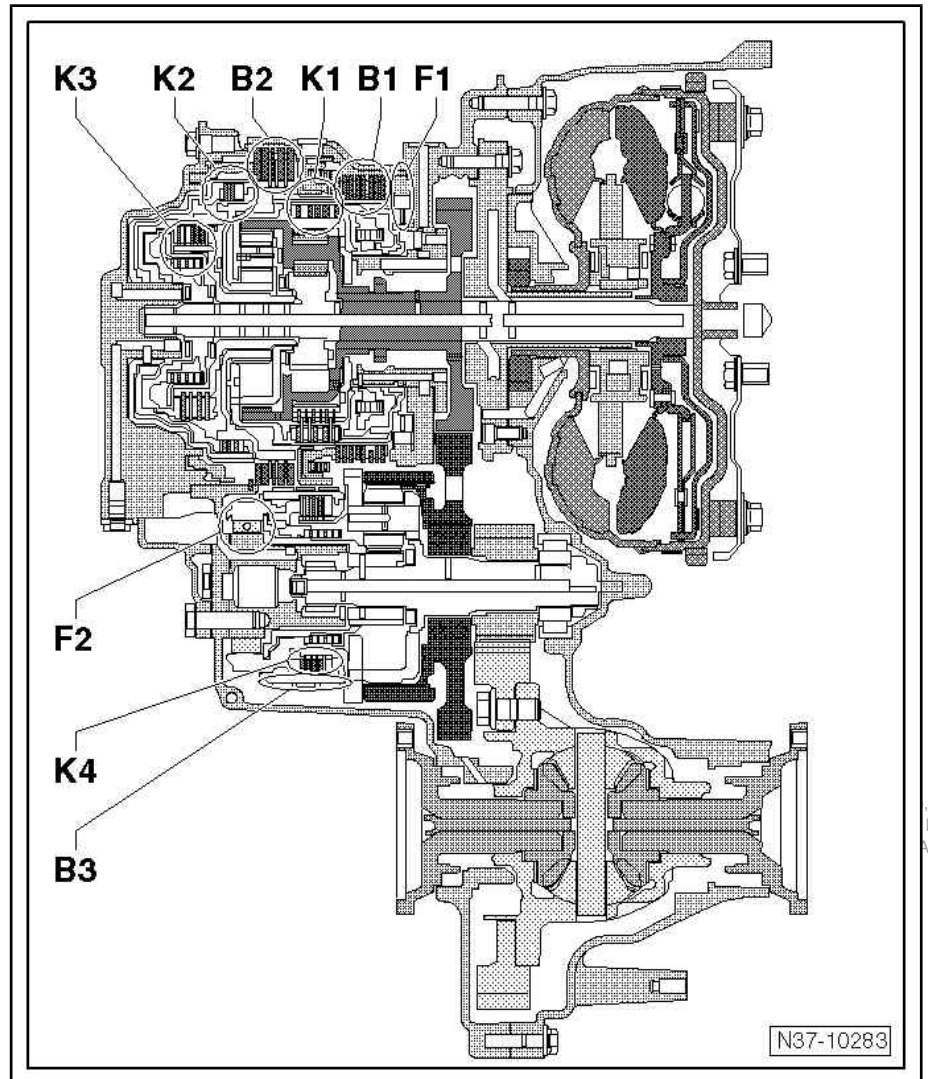
- Fit axial needle bearing -A-.
- Fit thrust washer on bearing (it is stuck in cover).
- Before continuing assembly, first check axial clearance of complete planetary gear set.



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Checking axial clearance of planetary gear set

The following measurements are required in order to check the axial clearance. Before taking these measurements it may be helpful to refer to this illustration, which shows where the axial clearance exists.



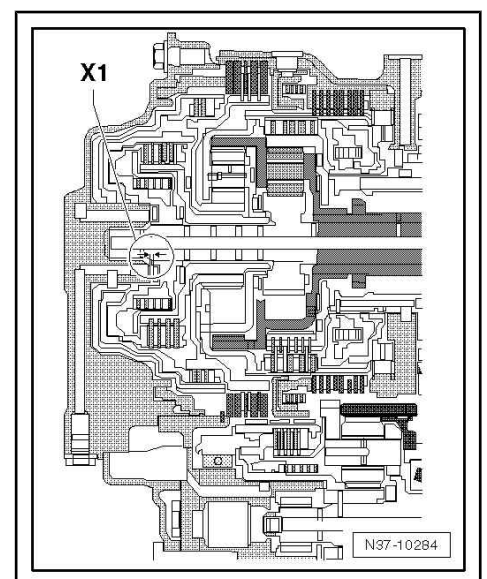
This is an overall view of the gearbox.

- The first clearance to be measured is at the location marked -x1-.

Determining x1

Three measurements are now required in order to obtain the two values „a“ and „b“.

Determining dimension »a«:

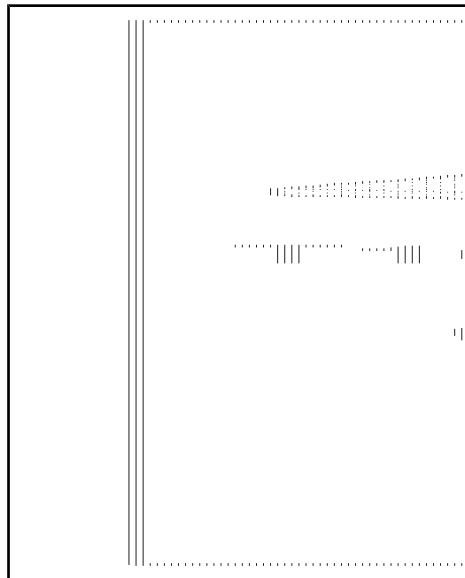


- Attach spacer pins -T10317- to cover with nuts.

Hand-tight is sufficient.

- Measure down to seat of thrust washer and note value.

Example: 125.30 mm



- Measure down to surface of cover and note value.

Example: 107.75 mm

This value represents the height of the measuring tools comprising spacer pins and straight-edge. It will be required again later; note down the value so you do not have to repeat the measurement.

- Subtract the two measurements.

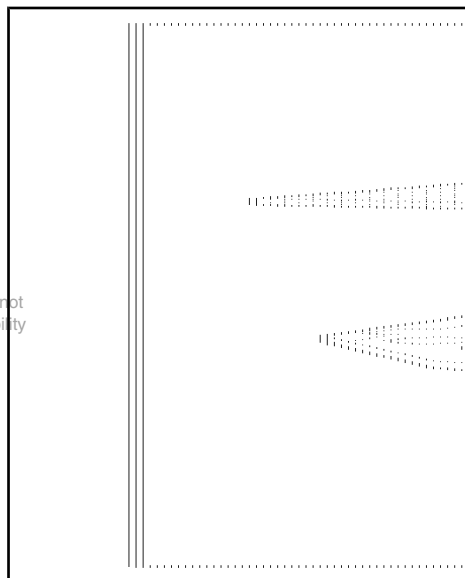
In our example the values are subtracted as follows: 125.30 mm

– 107.75 mm = 17.55 mm = „a“.

- (Substitute the values you have measured for the figures in the example.)

The result is dimension „a“. Note down this value.

Determining dimension »b«:



- Screw spacer pins -T10317- hand-tight into gearbox.
- Measure down to thrust washer and note measured value.

Example: 90.70 mm

Once again two values have to be subtracted. You have already measured one of the values (107.75 mm in the example) on the contact surface of the cover.

Example: 107.75 mm – 90.70 mm = 17.05 mm = „b“

- (Substitute the values you have measured for the figures in the example.)

(The value of 107.75 mm in the example comes from the first measurement.)

The result is dimension „b“. Note down this value.

Calculating x1

$x1 = »a« - »b«$

Example: 17.55 mm – 17.05 mm = 0.50 mm



Note

The resulting value must be within the specification.

Specification: 0.25 ... 0.55 mm

Do not continue assembly unless the specification is obtained. If you have not obtained the specification the assembly is not correct. This must be rectified before proceeding further.

Assembling gearbox (continued)

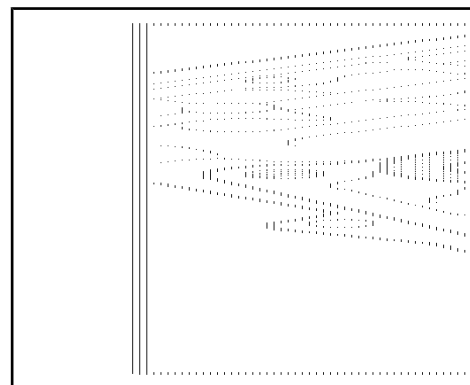
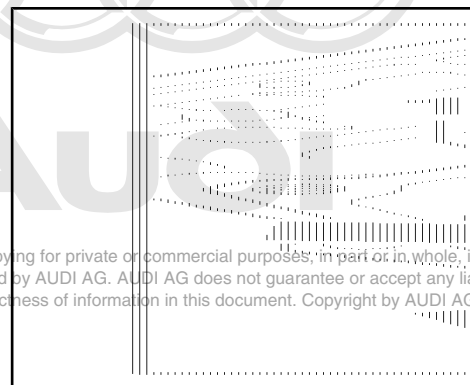
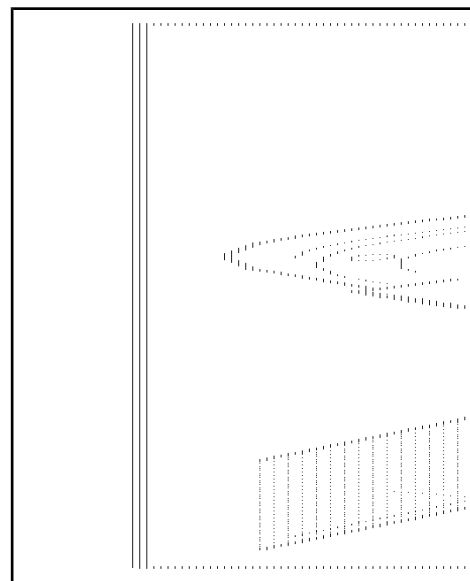
- Remove thrust washer again from „K2“ and stick it into cover with vaseline.
- Install spring -2-.

The spring can only be fitted in one position.

- Install gearbox input speed sender -G182- -1-.

The ATF lines are installed next. Take care to keep the lines straight when installing and push both ends evenly into the gearbox housing as far as the stop.

- First install ATF lines -1- and -2-.
- Then install ATF line -3- with retainer clips -A-.



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- Fit new O-ring -B- in gearbox housing.

Installing housing cover for planetary gearing

- Clean sealing surfaces with cleaning fluid -D 009 401 04- .



Note

The sealing surfaces must be absolutely free of oil and grease, otherwise leakage can occur.

- Stick thrust washer in housing cover with vaseline.

The joint between the housing cover and the gearbox is sealed with sealant -D 176 404 A2- .

- Apply a thin 3 mm wide bead of sealant to gearbox housing as shown in illustration.

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Note

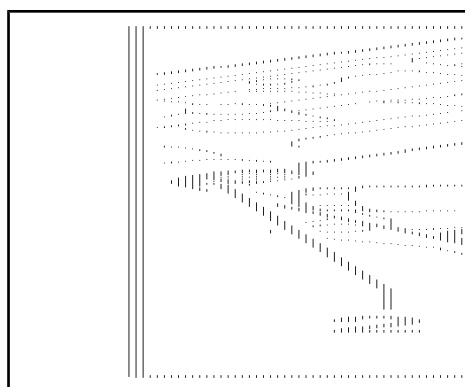
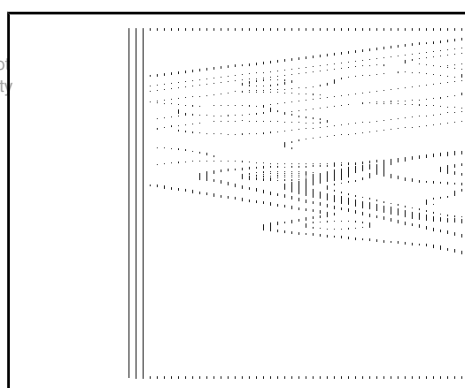
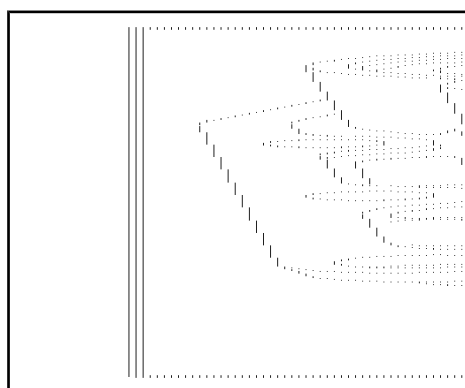
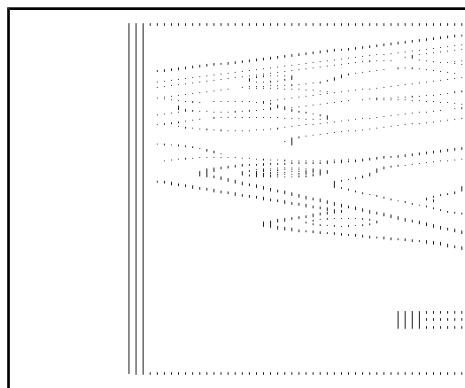
A thicker bead of sealant does not give a better seal and may cause malfunctions.

- Fit housing cover.

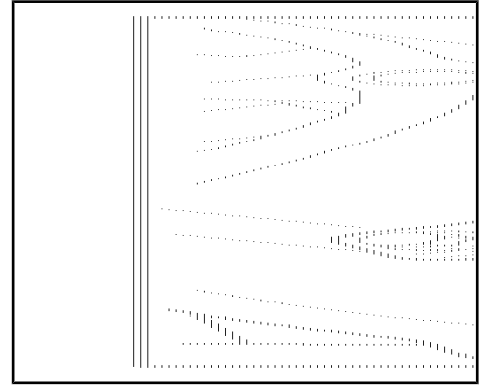
- First fit bolts -1- and -2- only and screw in by hand.

In this way the O-rings under bolts -1- will be seated properly in the cover.

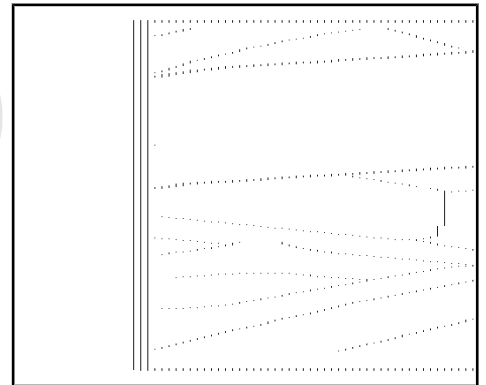
- Fit all remaining bolts and screw in by hand.
- Tighten the two bolts -1- to 35 Nm.
- Then tighten bolts -2- to 20 Nm.
- Finally, tighten remaining bolts to 20 Nm.
- Turn gearbox so that housing cover faces downwards.



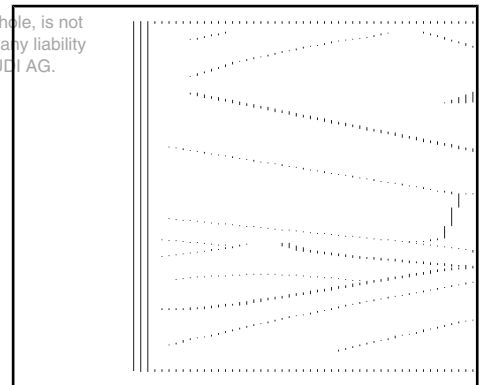
- Install brake band „B3“.
- Ensure correct seating in retainer -1- and plunger -2-.



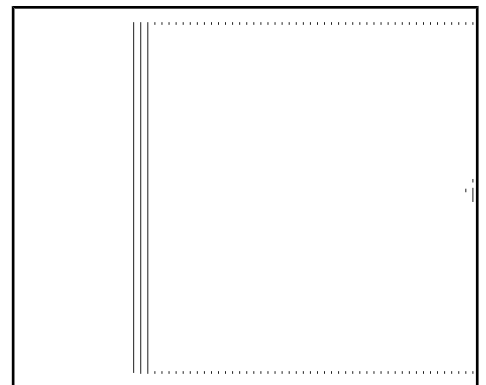
- When installing clutch „K4“, lift brake band slightly with a piece of wire.
- Fit axial needle bearing -1-.



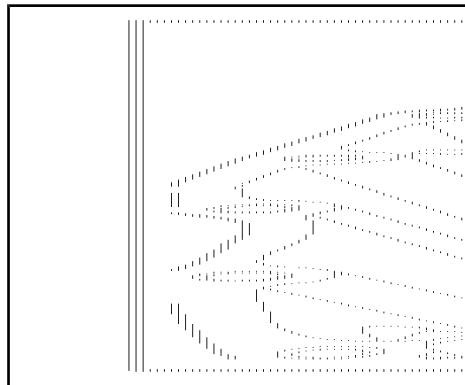
- Install gear A with circlip facing downwards.
- Align inner plates of „K4“.



- Now pick up planetary gear set III.



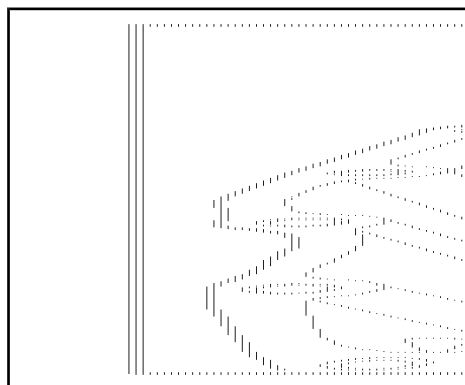
- Insert it so that the spur gears come into mesh -arrow-.



- Turn backwards and forwards until the two spur gears are level in the same plane -arrow A-.

Turning the gears backwards and forwards enables the plates to engage in the plate carrier.

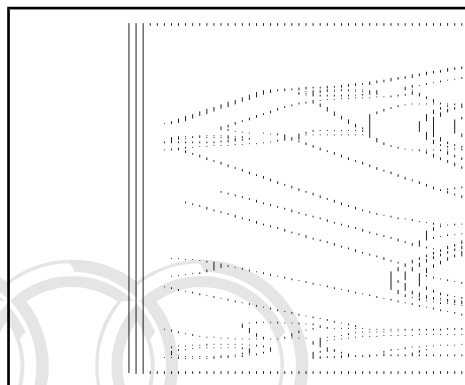
This can best be done using a 32 mm socket with a suitable handle.



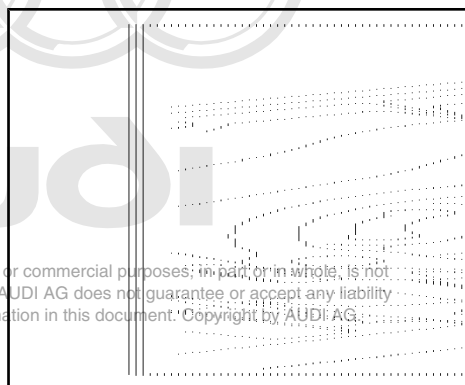
- Fit turbine shaft -A-, turning in both directions, and insert into gearbox as far as stop.

When the shaft is correctly installed, the lower shoulder -arrow- on the shaft contacts the spur gear.

- When the ATF pump is being installed, there must be no seal in the groove -1- on the turbine shaft. Remove before installation.
- Fit gasket -B- for ATF pump on pump flange.



- Install ATF pump -A- and ATF strainer -B- and tighten to 20 Nm.
- Remove O-ring if still fitted in groove -1-.



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- Then fit differential -A- and axial needle bearing -B-.

There are two different versions of gasket -C-:

- Measure thickness of carrier plate.

The repair component includes two gaskets of different thicknesses.

- Install gasket -C- corresponding to thickness of original gasket.
- Install new O-ring -1- for ATF pump.

The torque converter housing must now be cleaned:

- Clean sealing surfaces with cleaning fluid -D 009 401 04- .



Note

The sealing surfaces must be absolutely free of oil and grease, otherwise leakage can occur.

The torque converter housing can be installed after it has been cleaned.

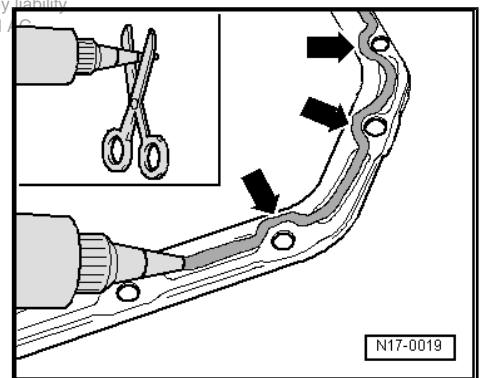
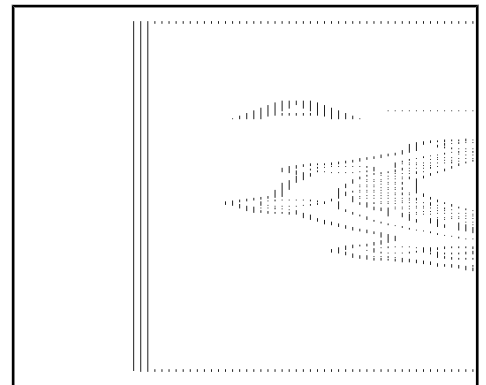
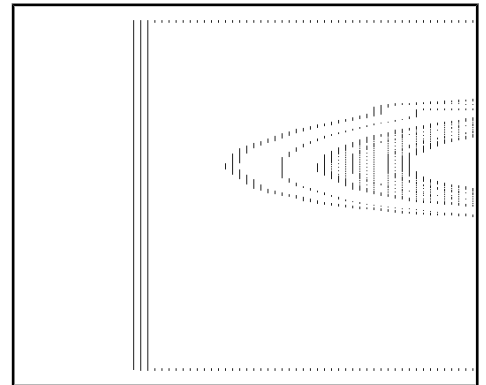
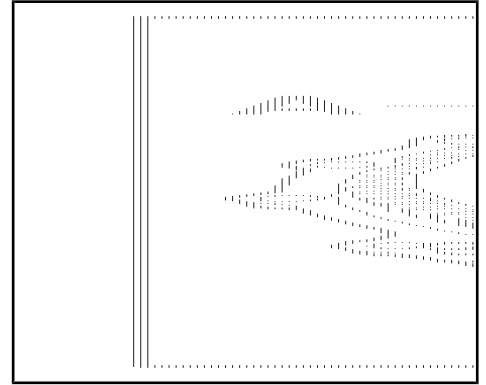
The torque converter housing is sealed with sealant -D 176 404 A2- .

- Apply sealant to gearbox housing in a 3 mm wide bead as shown in illustration.



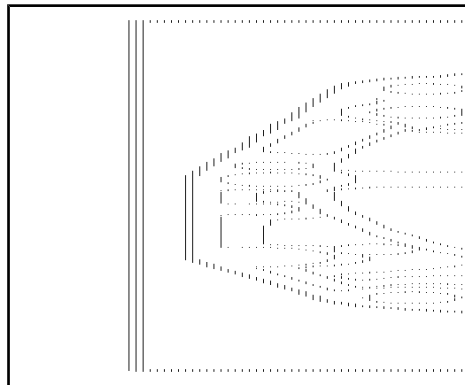
Note

A thicker bead of sealant does not give a better seal and may cause malfunctions.





- Fit torque converter housing.
- Screw in all 21 bolts by hand.
- Tighten bolts in diagonal sequence to 28 Nm.



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38 – Gears, control

1 Housing cover for planetary gearing

Modifications to piston for brake „B2“ ⇒ [page 90](#) .

1.1 Exploded view

1 - Housing cover

- ☐ For planetary gearing
- ☐ Modification and identification features
⇒ [page 89](#)

2 - Piston

- ☐ For pressure accumulator of brake „B2“
- ☐ Open side faces towards cover -item 4-

3 - Spring

4 - Cover

5 - O-ring

- ☐ Lubricate with ATF when fitting

6 - Circlip

7 - Thrust washer

- ☐ Stick in housing cover with vaseline

8 - Outer O-ring

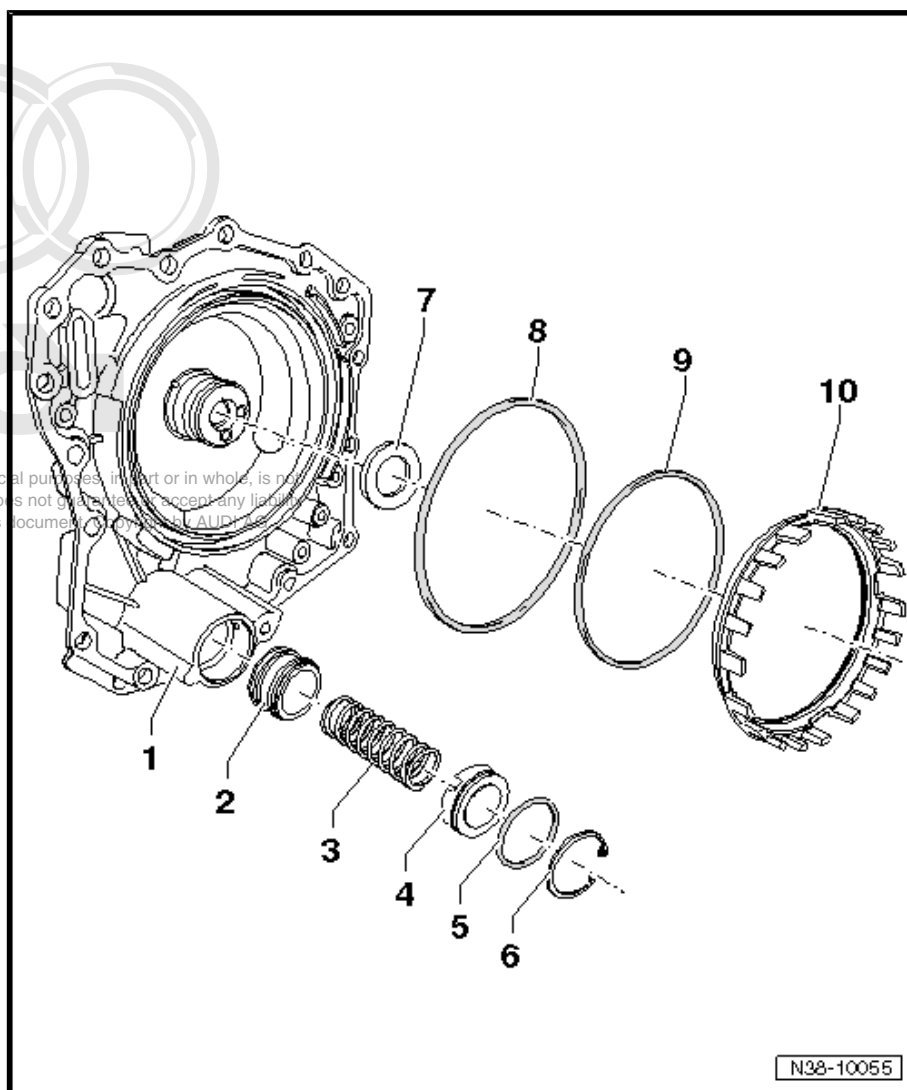
- ☐ For „B2“ piston
- ☐ Lubricate with ATF when fitting
- ☐ 2x with different diameters are included in clutch plate repair kit for brake „B2“
- ☐ Installation position
⇒ [page 90](#)

9 - Inner O-ring

- ☐ For „B2“ piston
- ☐ Lubricate with ATF when fitting
- ☐ 2x included in clutch plate repair kit for brake „B2“
- ☐ Installation position ⇒ [page 90](#)

10 - B2 piston

- ☐ Piston diameter changed ⇒ [page 89](#)
- ☐ Remove from and insert in housing cover by hand



Housing cover and seals for piston of „B2“ brake

The clutch plate repair kit for the „B2“ brake ⇒ Electronic parts catalogue contains two pairs of O-rings for the „B2“ piston.

The two pairs of O-rings are colour-coded for identification.

Each pair consists of an inner and an outer O-ring.

The identification on the gearbox cover -arrow- indicates which pair is to be installed.

- If the identification on the gearbox cover is „PW001“ -arrow-, install O-rings with white colour coding.
- If there is no identification on the gearbox cover, install O-rings with yellow colour coding.

Installation position of O-rings ➔ [page 90](#)

Installation position of O-rings for piston „B2“

Having selected the pair of O-rings to be installed, lay them flat, one on top of the other, on a clean surface. They must not be twisted.

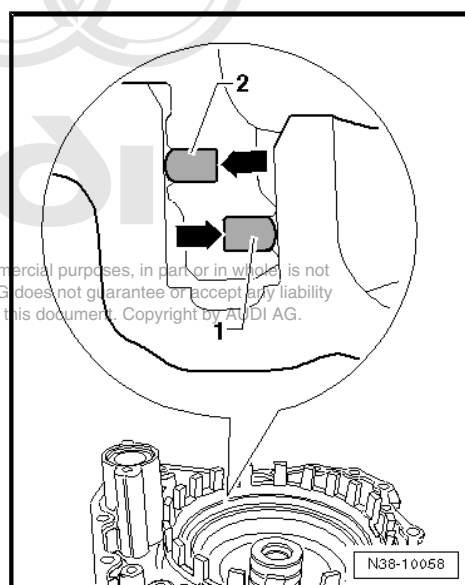
- Lubricate O-rings with ATF before fitting.
- Fit smaller O-ring -1- on inside of piston and larger O-ring -2- on outside.

When fitted correctly, the square side of each O-ring -arrows- is located in the groove in the piston. The rounded side is visible on the outside.

Install piston as follows:

- Carefully press piston into cover as far as stop, taking care to keep it straight.
- When installing, make sure that O-rings remain in grooves in piston.
- Turning as required, push piston further into cover until it engages positively in one of four possible positions.

The housing cover may now be installed ➔ [page 84](#) .



1.2 Pressure accumulator for brake „B4“

The pressure accumulator is located in the gearbox housing and should be opened only for cleaning.

1 - Gearbox housing

2 - O-ring

- ☐ Lubricate with ATF when fitting

3 - Piston

- ☐ For pressure accumulator of brake „B4“
- ☐ Open side faces towards cover -item 7-

4 - Spring

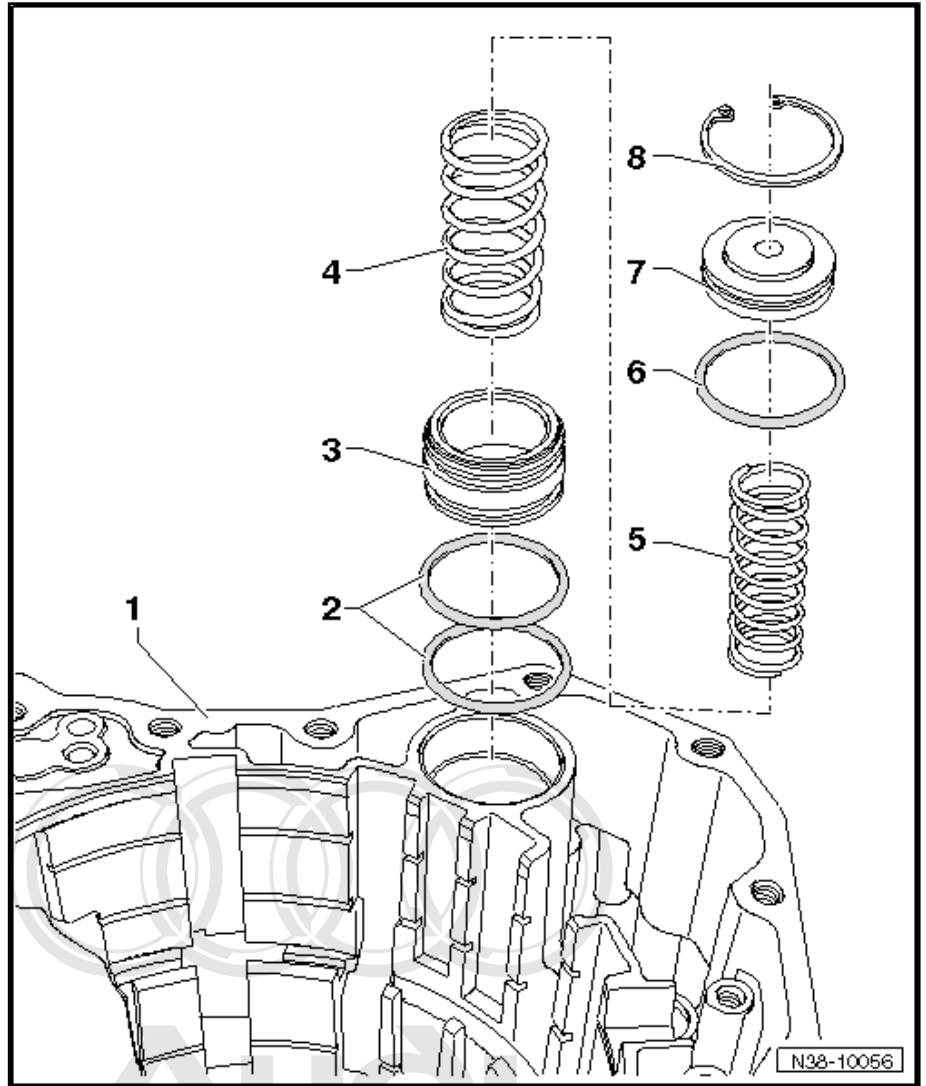
5 - Spring

6 - O-ring

- ☐ Lubricate with ATF when fitting

7 - Cover

8 - Circlip



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2 1st to 3rd gear clutch „K1“

The clutch should be dismantled only for cleaning. There is no provision for repairs.

Removing and installing „K1“ clutch plates ⇒ [page 92](#)

Dismantling and assembling „K1“ clutch housing ⇒ [page 92](#)

2.1 Exploded view of „K1“ components

1 - Clutch housing

2 - Piston

- ☐ Take care not to damage the two O-rings on the piston

3 - Spring

4 - Piston cap

5 - Circlip

- ☐ For piston

6 - Dished spring

- ☐ Convex side faces towards piston cap

7 - Outer plate

- ☐ Illustration shows 7 plates. Fewer may be installed in some gearbox versions.

8 - Inner plate

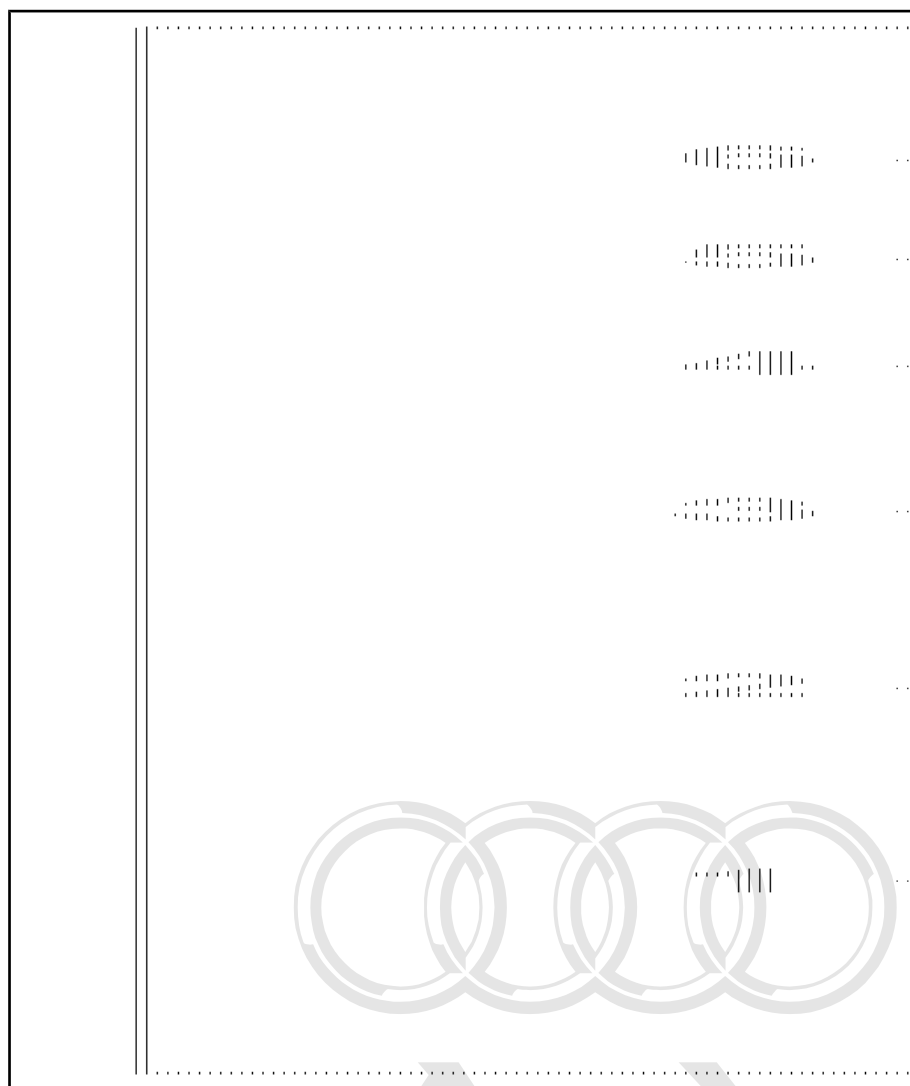
- ☐ Illustration shows 7 plates. Fewer may be installed in some gearbox versions.

9 - Last outer plate (= pressure plate)

- ☐ This plate is thicker than the other outer plates

10 - Circlip

- ☐ For clutch plates
- ☐ The circlip is not renewed, so take care when removing and installing and do not overstretch

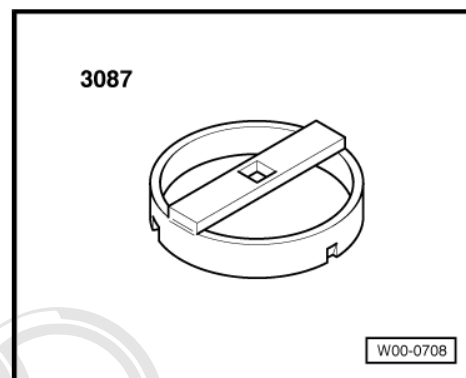


2.2 Dismantling and assembling „K1“ clutch housing

Special tools and workshop equipment required

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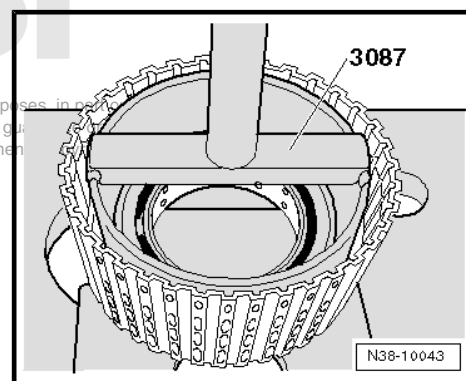
◆ Fuel tank sender unit tool -3087-



The clutch should be dismantled only for cleaning. There is no provision for repairs.

Dismantling „K1“ clutch housing

- Remove circlip for plates.
- Remove plates.
- Slowly and carefully press down piston cap just far enough so that the circlip can be removed.
- Remove circlip.
- Remove piston cap and spring.
- Drive piston out of clutch housing.
- To do this, gently strike the upper edge of the clutch housing with a plastic hammer.



Assembling „K1“ clutch housing

- Carefully press piston by hand into clutch housing as far as stop.
- Fit spring, piston cap and circlip in clutch housing.
- Carefully centre piston cap before pressing it down.
- Slowly and carefully press down piston cap just far enough so that the circlip can be installed.
- Fit circlip.
- Install plates.
- Install circlip for plates.

To illustrate the work on this component more clearly, the material is divided into the following three sections:

-

This diagram illustrates the assembly of a planetary gear set. The components are numbered as follows:

- 1**: Planetary gear carrier (the central hub with multiple mounting points for planet gears).
- 2**: Planet gear (the small gears mounted on the carrier).
- 3**: Planet gear (another view of the planet gear).
- 4**: Planet gear (another view of the planet gear).
- 5**: Planet gear (another view of the planet gear).

A detail view on the right shows a close-up of the planet gear teeth, highlighting the specific profile and the meshing area.

3.2 Exploded view of „K3“ plates

The clutch should be dismantled only for cleaning. There is no provision for repairs.

1 - „K2/K3“ clutch housing

- ☐ Only the parts of the „K3“ are shown here
- ☐ The plates of „K2“ are already removed
- ☐ Dismantling and assembling clutch housing
⇒ [page 95](#)

2 - Outer plate

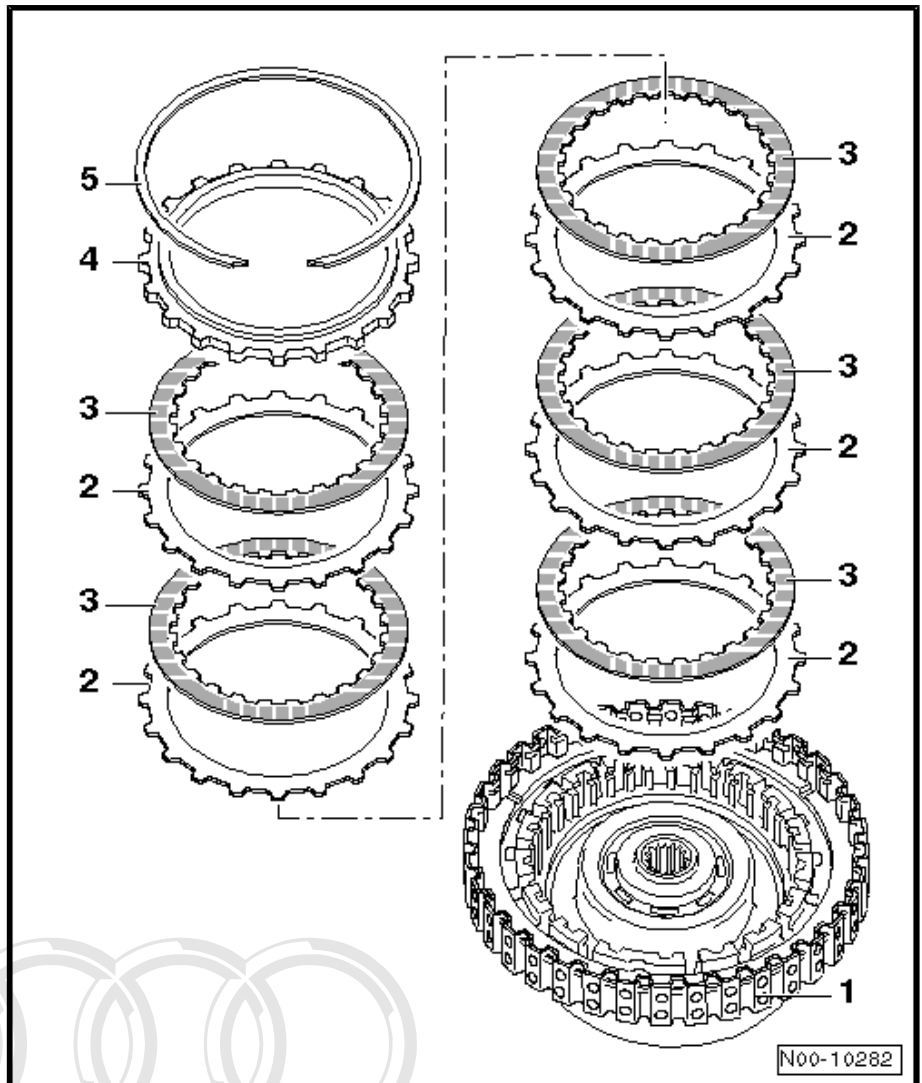
3 - Inner plate

4 - Last outer plate (= pressure plate)

- ☐ This plate is thicker than the other outer plates
- ☐ The »smooth« side faces the plates

5 - Circlip

- ☐ The circlip is not renewed, so take care when removing and installing and do not overstretch

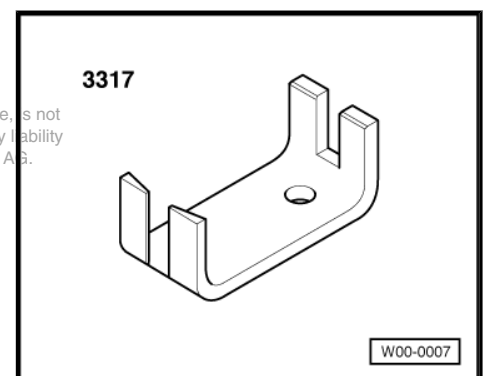


3.3 Exploded view of „K2/K3“ clutch housing

Special tools and workshop equipment required

- ◆ Assembly clip -3317-

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1 - „K2/K3“ clutch housing

2 - „K2“ piston

- ❑ Take care not to damage the two O-rings on the piston

3 - „K3“ piston

- ❑ Take care not to damage the two O-rings on the piston

4 - Spring

5 - Piston cap

- ❑ The sealing lip on the outer edge is vulcanised and must not be damaged

6 - Circlip

- ❑ The circlip is not renewed, so take care when removing and installing and do not overstretch

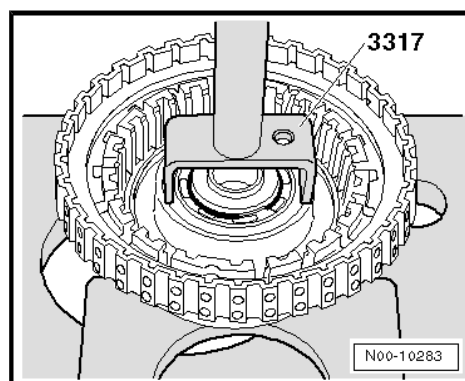
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Dismantling „K2/K3“ clutch housing

- Slowly and carefully press down piston cap just far enough so that the circlip can be removed.
- Remove circlip.
- Remove piston cap and spring.
- Drive the two nesting pistons out of clutch housing.
- To do this, gently strike the upper edge of the clutch housing with a plastic hammer.

Assembling „K2/K3“ clutch housing

- Carefully press „K2“ piston by hand into clutch housing as far as stop.
- Carefully press „K3“ piston by hand into „K2“ as far as stop.
- Fit spring, piston cap and circlip in clutch housing.
- Carefully centre piston cap before pressing it down.
- Slowly and carefully press down piston cap just far enough so that circlip can be installed.
- Fit circlip.



4 5th gear clutch „K4“

If the clutch is defective, the freewheel ⇒ [Item 3 \(page 99\)](#) must be transferred. In this case, of course, the clutch does not need to be dismantled and washed.

Dismantling the clutch „K4“ requires operations performed from above and from below.

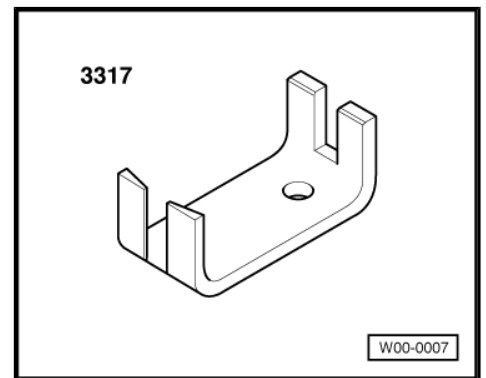
To illustrate these operations more clearly, the material is divided into the following two sections:

- ◆ „K4“ from above ⇒ [page 97](#) .
- ◆ „K4“ from below ⇒ [page 99](#) .

4.1 Exploded view of „K4“ components (for work from above)

Special tools and workshop equipment required

- ◆ Assembly clip -3317-



The clutch should be dismantled only for cleaning. There is no provision for repairs.



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1 - Clutch housing „K4“

2 - Piston

3 - Spring

4 - Spring plate

5 - Circlip

- ❑ The circlip is not renewed, so take care when removing and installing and do not overstretch

6 - Outer plate

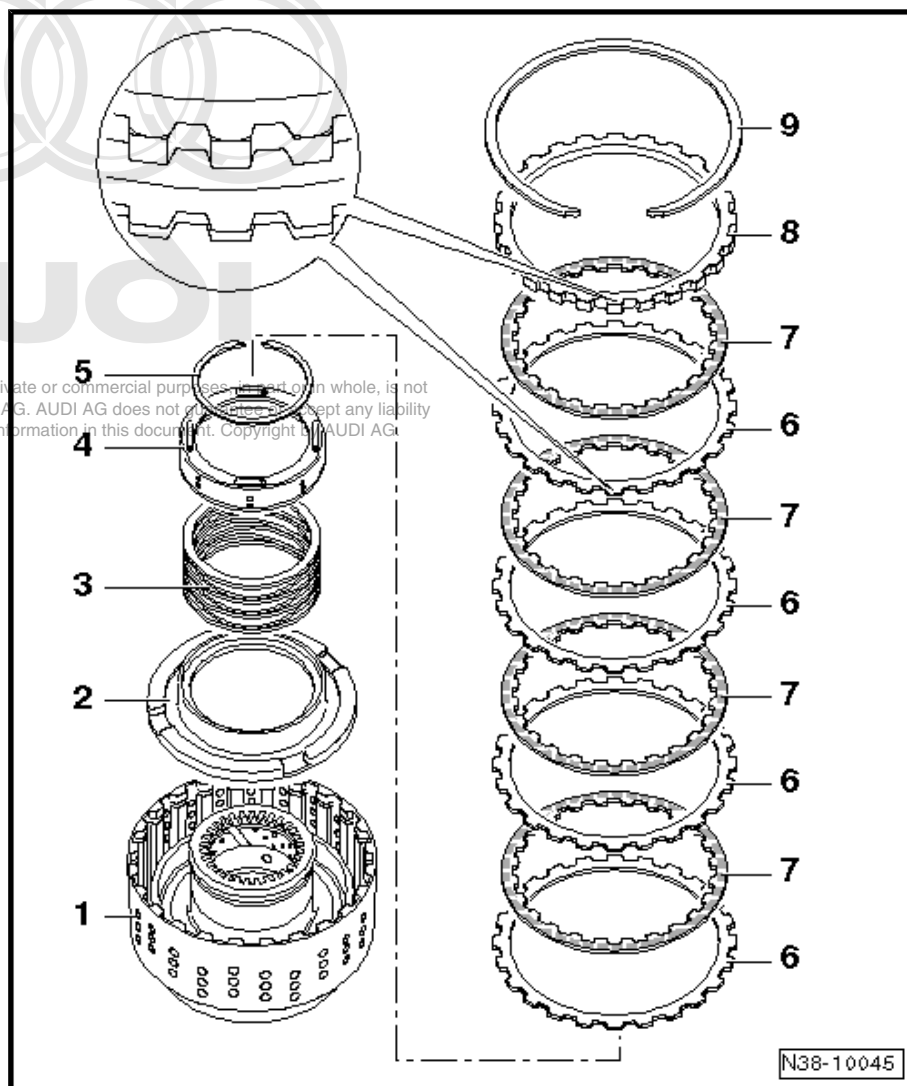
7 - Inner plate

8 - Last outer plate

- ❑ This plate is thicker than the other outer plates

9 - Circlip

- ❑ The circlip is not renewed, so take care when removing and installing and do not overstretch

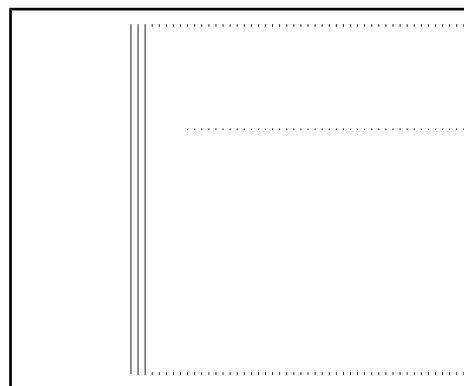


Dismantling „K4“ clutch housing from above

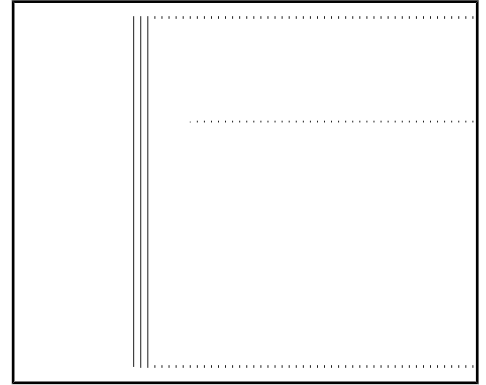
- Remove circlip for plates.
- Remove plates.
- Slowly and carefully press down spring plate just far enough so that the circlip can be removed.
- Remove circlip.
- Take out spring and spring seat.
- Drive piston out of clutch housing.
- To do this, gently strike the upper edge of the clutch housing with a plastic hammer.

Assembling „K4“ clutch housing from above

- Carefully press piston by hand into clutch housing as far as stop.
- Fit spring, spring seat and circlip in clutch housing.



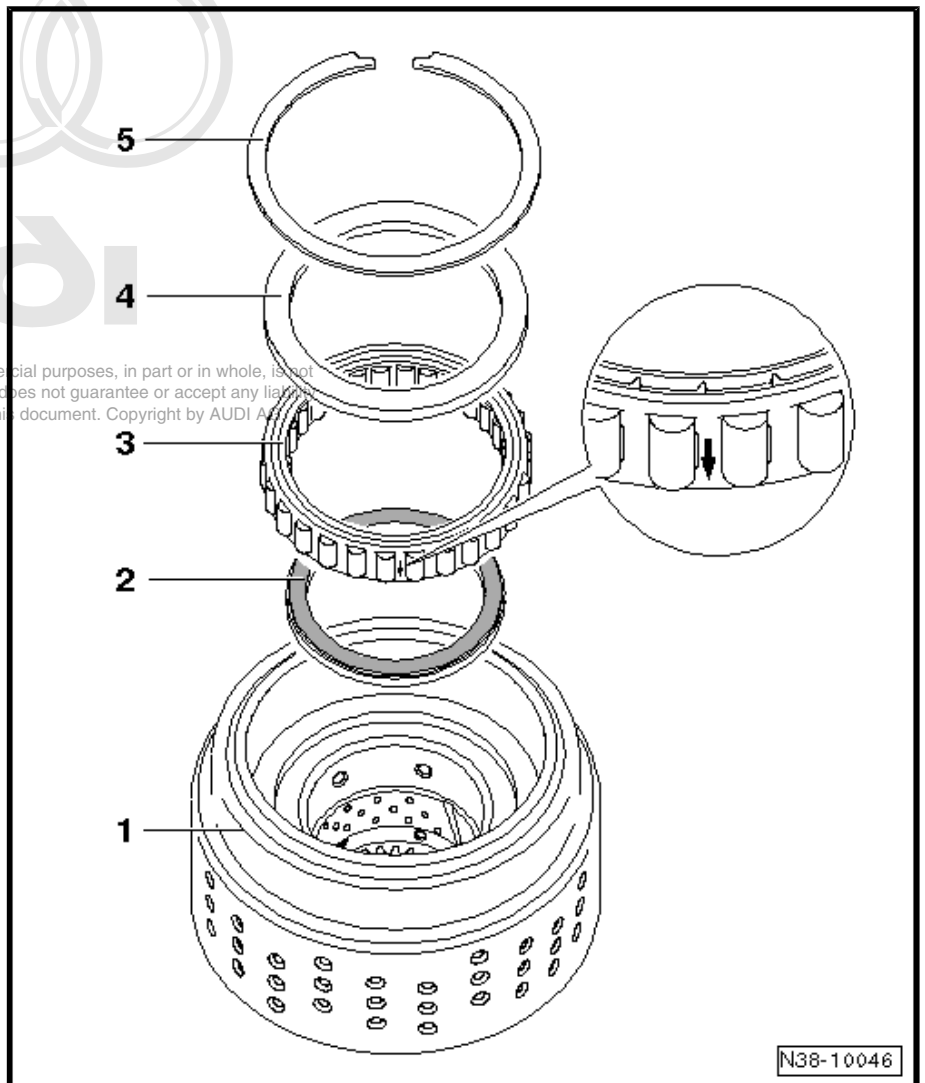
- Slowly and carefully press down spring plate just far enough so that the circlip can be installed.
- Fit circlip.



4.2 Exploded view of „K4“ components (for work from below)

The clutch should be dismantled only for cleaning. There is no provision for further repairs.

- 1 - Clutch housing „K4“
- 2 - Axial needle bearing
 - ☐ Dark side faces up-wards
- 3 - Freewheel
 - ☐ -Arrow- points inwards
- 4 - Ring
 - ☐ Groove faces freewheel
- 5 - Circlip
 - ☐ The circlip is not renewed, so take care when removing and installing and do not over-stretch



Dismantling „K4“ clutch housing from below

- Remove circlip.
- Take out ring, freewheel and axial bearing.



Assembling „K4“ clutch housing from below

- Fit axial needle bearing in clutch housing. Installation position [⇒ Item 2 \(page 99\)](#) .
- Install freewheel. Installation position [⇒ Item 3 \(page 99\)](#) .
- Insert ring with groove facing freewheel.
- Fit circlip.



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5 Removing and installing valve body

⇒ „5.1 Exploded view - valve body“, page 101

⇒ „5.2 Assembly sequence - removing and installing valve body“, page 103



Caution

Do not run the engine or tow the vehicle with the valve body cover removed or when there is no ATF in the gearbox.

- ◆ The valve body and the wiring harness for the solenoid valves can also be removed when the gearbox is installed in the vehicle.
- ◆ After re-installing the valve body, check the ATF level and top up as required ⇒ [page 38](#).
- ◆ Always renew valve body if it has collected dirt or if it is defective.

5.1 Exploded view - valve body

1 - Screw plug

- ☐ 15 Nm
- ☐ Always renew seal
⇒ [page 102](#)
- ☐ Checking ATF level and topping up ⇒ [page 38](#)

2 - Overflow pipe

- ☐ 2 Nm

3 - Drain plug

- ☐ 45 Nm
- ☐ Remove only in order to drain ATF
- ☐ Removing ⇒ [page 103](#)

4 - Seal

- ☐ Always renew

5 - Gearbox housing

6 - Nut

- ☐ 20 Nm

7 - Securing clip

8 - Lever

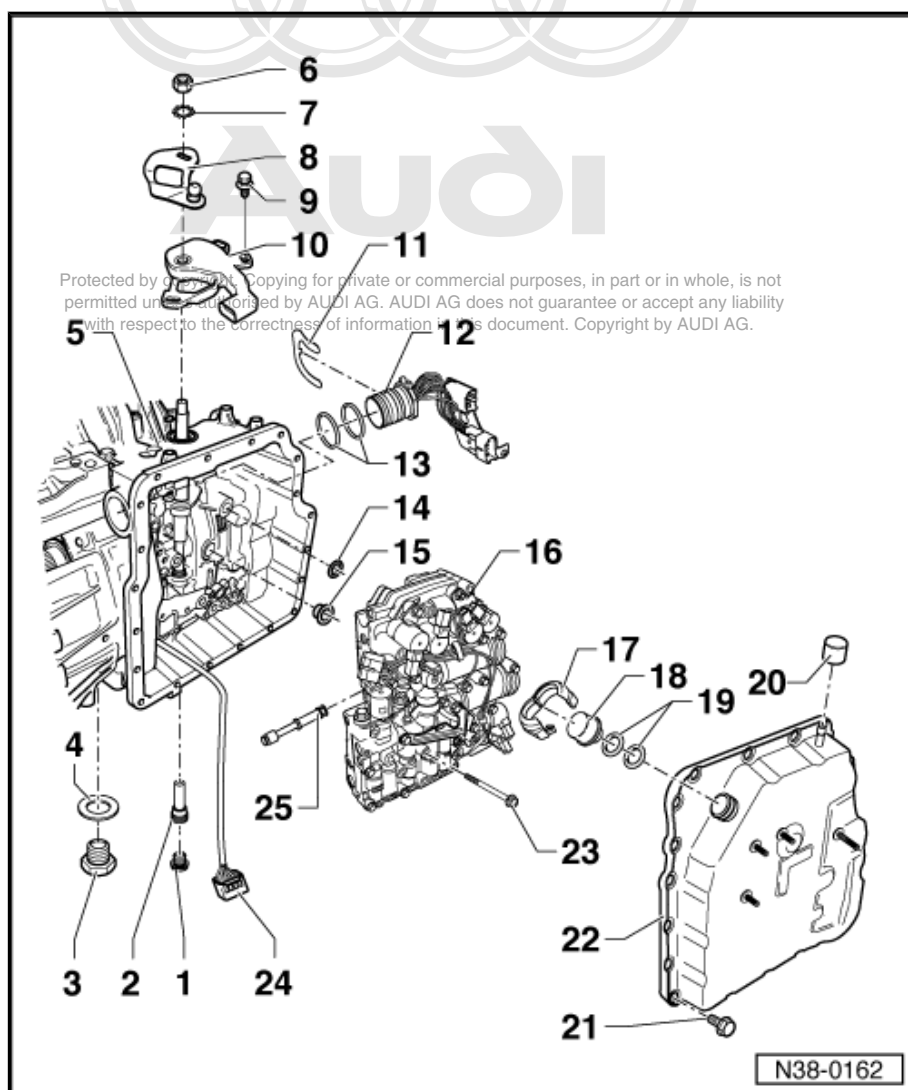
- ☐ For selector shaft

9 - Bolt

- ☐ 6 Nm

10 - Multifunction switch - F125-

- ☐ Removing, installing and adjusting
⇒ [page 113](#)
- ☐ Is checked in vehicle via self-diagnosis ⇒ Automatic gearbox 09A, self-diagnosis; Rep. gr. 01.



11 - Corrugated retaining element

- ☐ For wiring harness on gearbox housing

12 - Wiring harness

- ☐ For solenoid valves and gearbox sensors

13 - O-ring

- ☐ Always renew
- ☐ For connector/wiring harness

14 - O-ring

- ☐ Always renew
- ☐ Removing and installing ⇒ [page 103](#)

15 - O-ring

- ☐ Always renew
- ☐ Removing and installing ⇒ [page 103](#)

16 - Valve body

- ☐ Removing and installing ⇒ [page 103](#)
- ☐ Identification of solenoid valves ⇒ [page 103](#)

17 - Cap

- ☐ Secures sealing plug
- ☐ Always renew

18 - Sealing plug

19 - O-ring

- ☐ Always renew

20 - Breather cap

21 - Bolt

- ☐ 8 Nm

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22 - Valve body cover

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

23 - Bolt

- ☐ 8 Nm
- ☐ Note assembly sequence ⇒ [page 103](#)

24 - Wiring harness

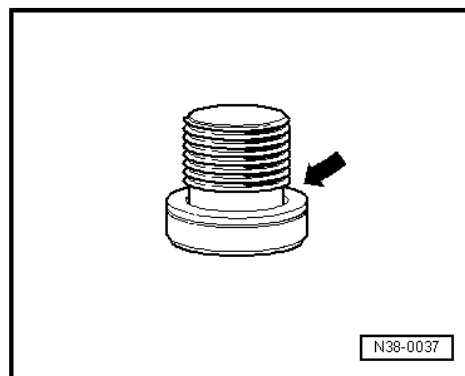
- ☐ For gearbox sensors

25 - Manual selector valve

- ☐ Secure to prevent it falling out before removing valve body

Renewing seal for screw plug

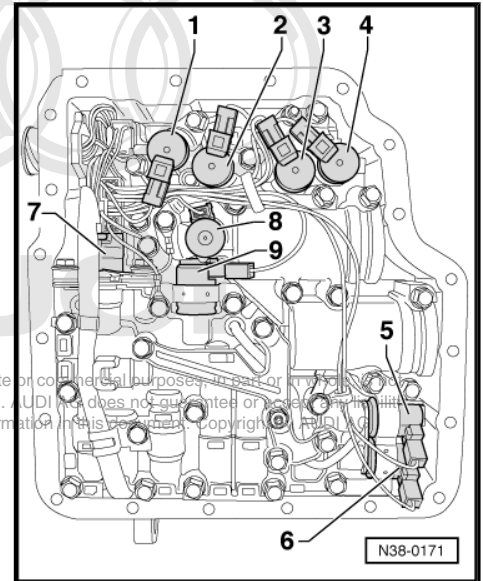
- Cut open seal -arrow- with side cutting pliers; always renew seal.
- After repairs, fit new seal to screw plug and screw in hand-tight before filling with ATF.
- Fill up with ATF; check ATF level and top up ⇒ [page 38](#).



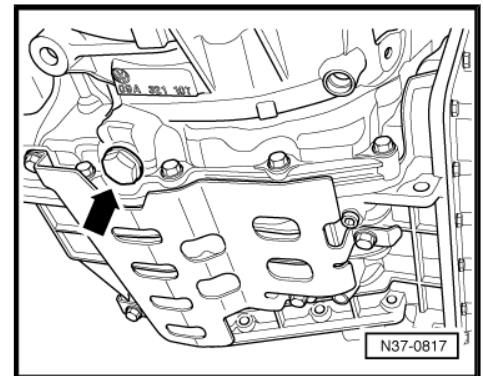
Identification of solenoid valves

- 1 - N88
- 2 - N281
- 3 - N89
- 4 - N92
- 5 - N283
- 6 - N282
- 7 - N93
- 8 - N91
- 9 - N90

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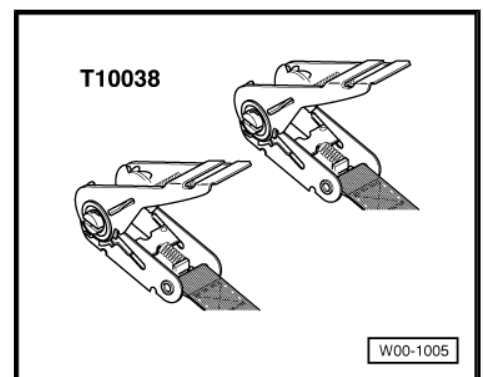
Removing drain plug -arrow-



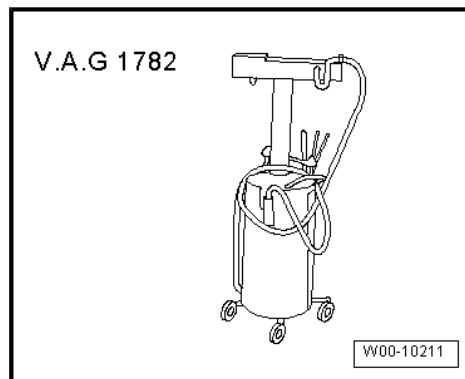
5.2 Assembly sequence - removing and installing valve body

Special tools and workshop equipment required

- ◆ Tensioning strap -T10038-



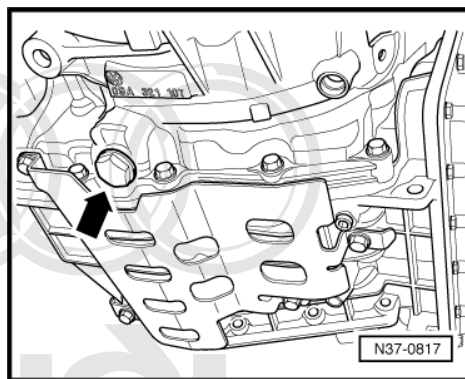
- ◆ Used oil collection and extraction unit -V.A.G 1782-



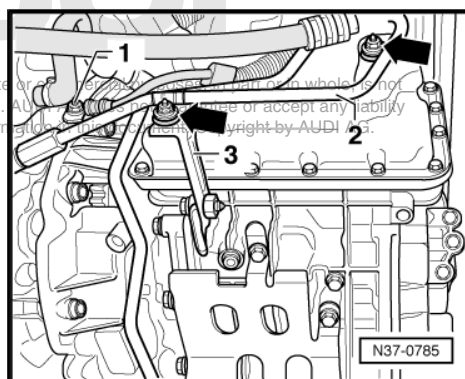
- ◆ Sealant -D 176 404 A2-
- ◆ Cleaning fluid -D 009 401 04-

Removing valve body

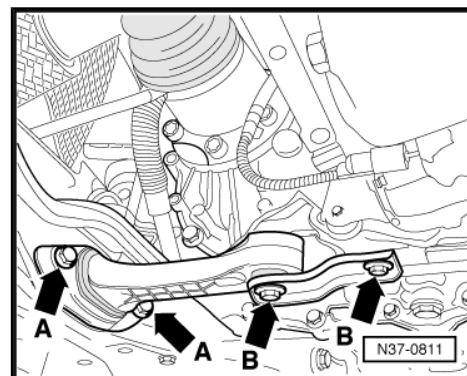
- Remove multifunction switch -F125- ⇒ [page 113](#) .
- Raise vehicle.
- Detach noise insulation.
- Place used oil collection and extraction unit -V.A.G 1782- below gearbox.
- Remove drain plug -arrow-.
- Drain ATF.



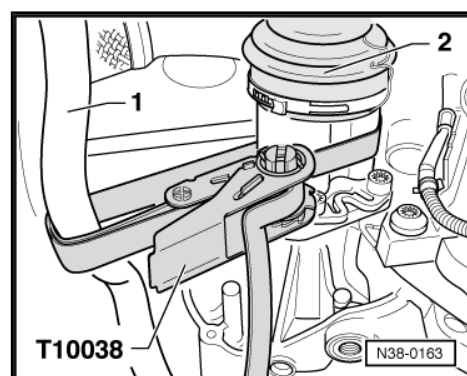
- Detach earth strap -1- from bracket on gearbox.
- Detach power steering line -2- from front of gearbox -arrows-.
- Detach bracket -3-.
- Then detach power steering line from rear of gearbox (near pendulum support) and tie up to one side.
- Detach bracket from cover of valve body.



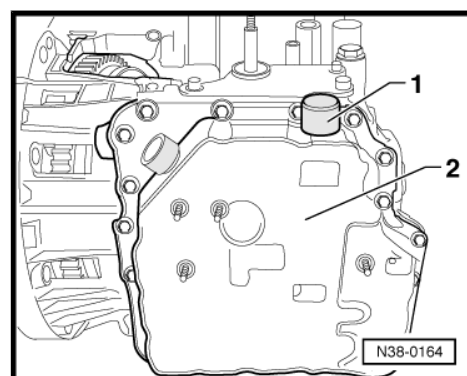
- Remove pendulum support (-arrows A and B-).



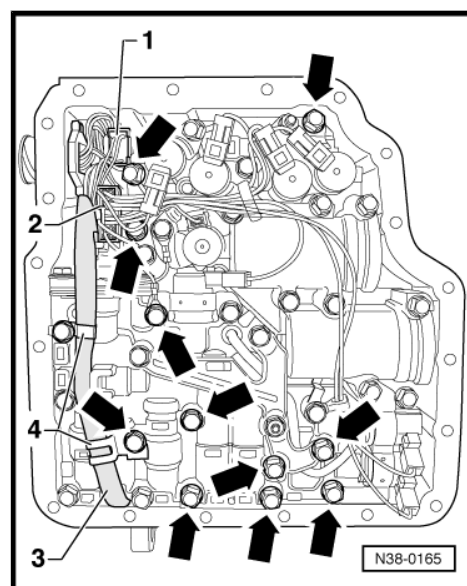
- Attach tensioning strap -T10038- around anti-roll bar -1- and drive shaft (right-side) -2-.
- Pull engine/gearbox assembly towards anti-roll bar -1- until it makes contact.



- Carefully lever off breather cap -1-.
- Unscrew bolts of valve body cover -2-.
- Carefully press valve body cover off gearbox housing using a screwdriver or similar.



- Unplug connectors -1- and -2-.
- Detach wiring harness -3- for gearbox sensors from side retaining tabs -4- on valve body.
- To remove the valve body, unscrew only the bolts marked by the -arrows- (silver-coloured) approx. two turns.



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- Secure manual selector valve -A- with a rubber band or similar to prevent it falling out.



Note

Even the slightest damage will lead to malfunctions, in which case the valve body has to be renewed.

- Remove securing bolts ➔ [page 105](#) and detach valve body.
- Use a flat scraper to remove sealant residue from gearbox housing.
- Use a rotating brush, e.g. a drill with a plastic bristle attachment, to remove residual sealant from oil pan.



Caution

- ◆ **Wear eye protection.**

- Clean sealing surfaces with cleaning fluid -D 009 401 04- . They must be free of oil and grease.



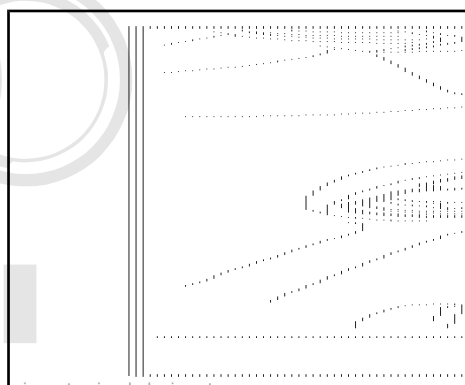
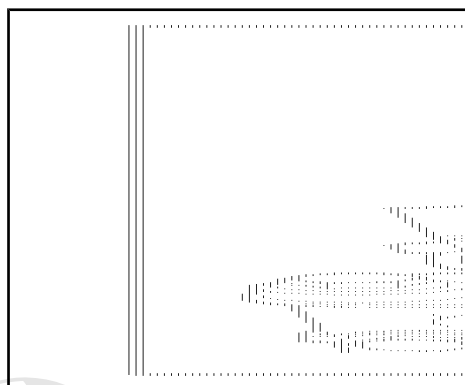
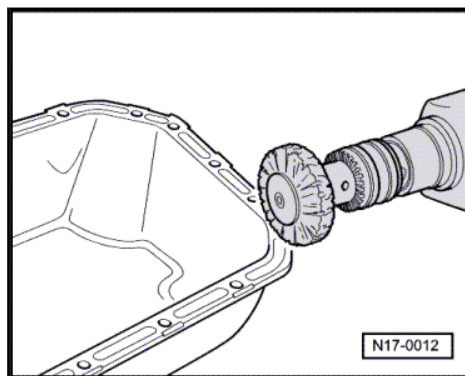
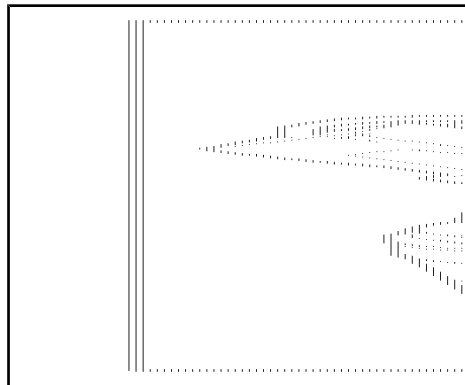
Note

- ◆ *Make sure no sealant or brush residue remains in valve body cover. Even very slight contamination will lead to malfunctions.*
- ◆ *An oil deflector -A- is installed in some gearboxes. If valve body is renewed, transfer oil deflector.*

Installing valve body

Tightening torques ➔ [page 101](#)

- If not already done, move detent segment -A- to this position.

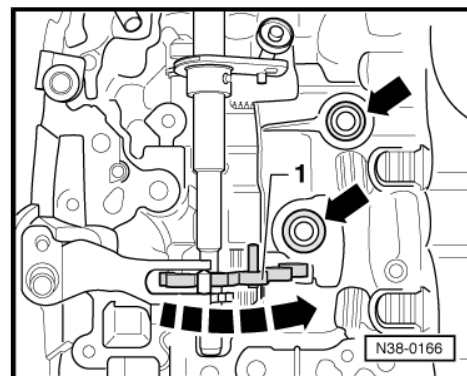


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This corresponds to selector lever position „2“ at detent segment -1-.

- Fit new O-rings -arrows- in gearbox housing.

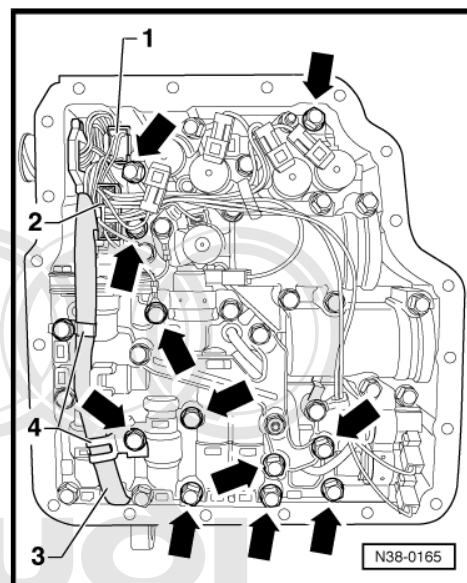
Make sure that these O-rings do not slip when the valve body is fitted.



- Fit valve body, at the same time engaging pin of detent segment in groove of manual selector valve.
- Secure valve body with 2 bolts.
- Remove rubber band from manual selector valve.

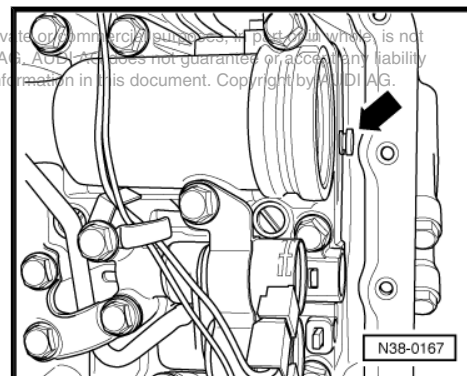
The operation of the manual selector valve must be checked now.

- Shift selector shaft from position 2 to 3 and back.



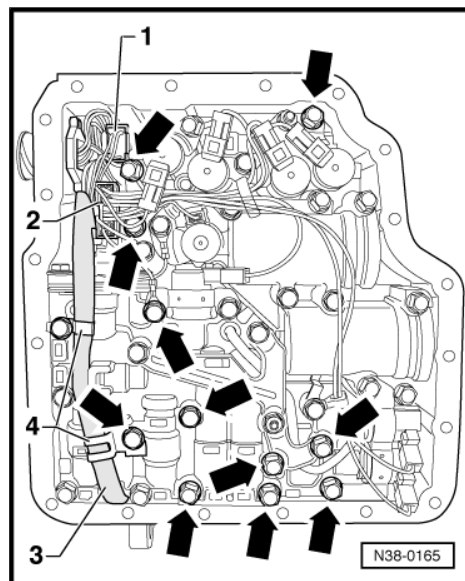
You can continue with assembly if the manual selector valve -arrow- moves as well.

- If the manual selector valve -arrow- does not move, the valve body must be removed again and the manual selector valve repositioned ⇒ [page 106](#).



- Tighten bolts securing valve body -arrows- hand-tight.
- Tighten bolts to specified torque, working from the inside outwards.
- Clip wiring harness for gearbox sensors -3- into retaining tabs -4- provided.
- Attach connectors -1- and -2-.

Apply sealant -D 176 404 A2- to valve body cover as follows:



- Apply sealant to clean sealing surface of valve body cover as shown.

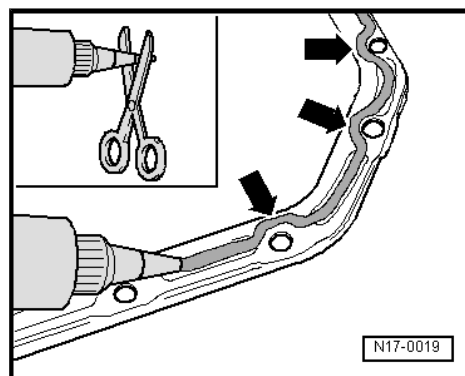
The sealant bead must

- ♦ be 3...4 mm thick
- ♦ pass round bolt holes on inside -arrows-



Note

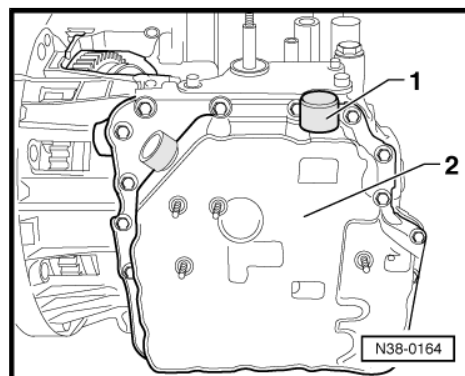
A thicker bead of sealant does not give a better seal and may cause malfunctions.



- Install valve body cover -2-.
- Tighten valve body bolts in several stages and in diagonal sequence.
- Push breather cap -1- onto valve body cover.
- Install and adjust multifunction switch -F125- ➔ [page 113](#) .

Perform remaining installation operations in reverse order of removal.

- Install pendulum support ➔ [page 60](#) .
- Secure bracket for power steering line to gearbox ➔ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 48 .
- Check adjustment of selector lever cable ➔ [page 18](#) .
- Fill up with ATF; check ATF level and top up ➔ [page 38](#) .
- Install noise insulation ➔ General body repairs, exterior; Rep. gr. 50 .
- Perform self-diagnosis and initiate basic setting ➔ Automatic gearbox 09A; self-diagnosis; Rep. gr. 01



6 Removing and installing senders in gearbox

General notes

Four senders are installed in the gearbox.

- ◆ Vehicle speed sender -G68-
- ◆ Gearbox oil temperature sender (ATF) -G93-
- ◆ Gearbox input speed sender -G182-
- ◆ Intermediate shaft speed sender -G265-

To renew these senders, the gearbox must be removed and partially dismantled.

Removing and installing gearbox ⇒ [page 46](#)

Gearbox is mounted on assembly stand ⇒ [page 62](#) .

Dismantling gearbox ⇒ [page 67](#)

6.1 Removing and installing gearbox input speed sender -G182-

Removing

- Unbolt housing cover for planetary gearing ⇒ [page 67](#) .

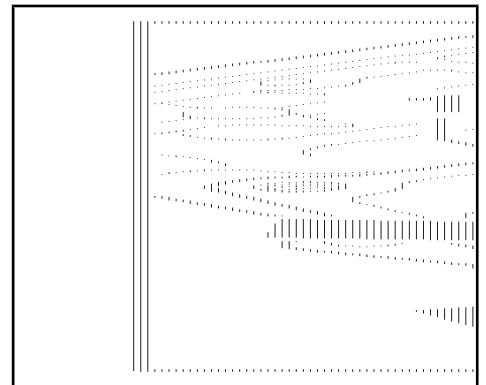
Unplug connector from gearbox input speed sender -G182- -1-.

- Unbolt gearbox input speed sender -arrows- and remove.

Installing

- Fit new gearbox input speed sender and tighten bolts -arrows- to 8 Nm.

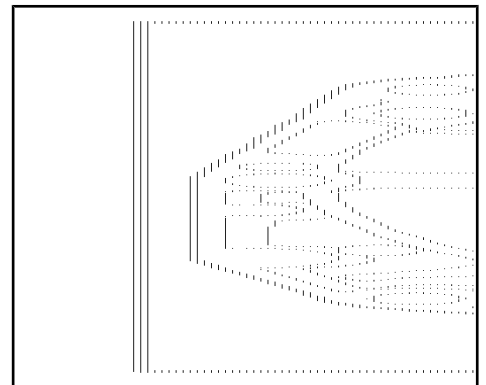
Assembling gearbox ⇒ [page 70](#)



6.2 Removing and installing vehicle speed sender -G68- and intermediate shaft speed sender -G265-

Removing

- Unbolt torque converter housing ⇒ [page 67](#) .



- Take out axial needle bearing -B- and differential -A-.



Note

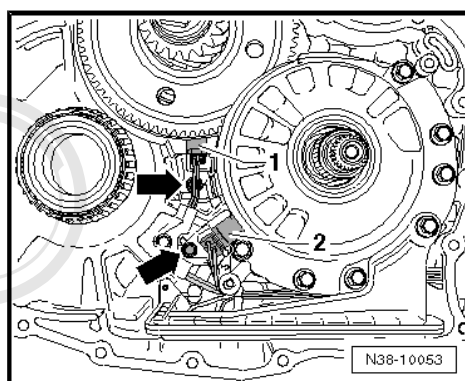
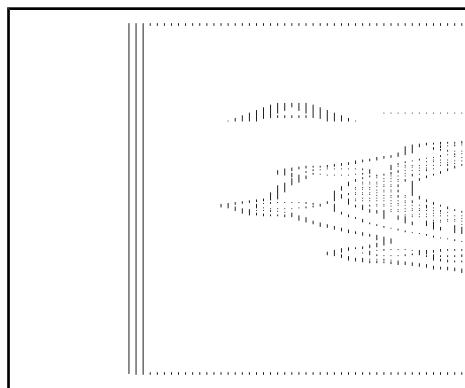
-Items 1 and C- can be disregarded.

- Unplug connector from sender.
- 1- Vehicle speed sender -G68-
- 2- Intermediate shaft speed sender -G265-
- Unbolt sender -arrows- and remove.

Installing

- Fit new sender and tighten bolts to 8 Nm.

Assembling gearbox ⇒ [page 70](#)

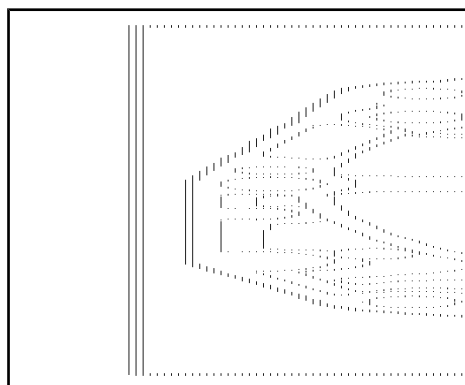


6.3 Removing and installing gearbox oil temperature sender (ATF) -G93- with wiring harness

The gearbox oil temperature sender -G93- cannot be separated from the wiring harness.

Removing

- Remove valve body ⇒ [page 103](#) .
- Unbolt torque converter housing ⇒ [page 67](#) .



- Take out axial needle bearing -B- and differential -A-.



Note

-Items 1 and C- can be disregarded.

- Remove ATF strainer.

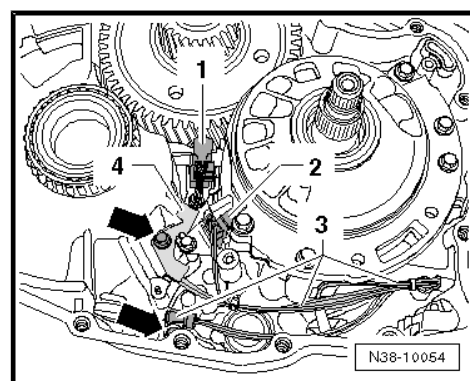
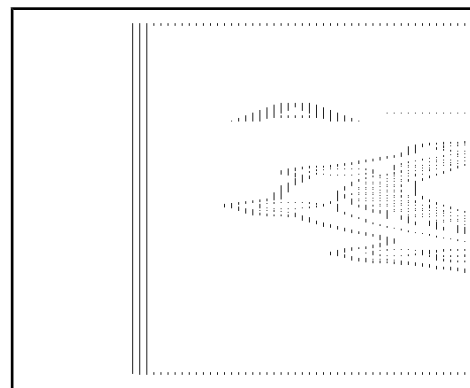
- Unplug connectors from senders -1- and -2-.
- Unbolt retainer -4- -top arrow-.
- Unbolt gearbox oil temperature sender -G93- -3- -bottom arrow-.
- Turn gearbox so that housing cover for planetary gearing faces upwards.
- Unbolt housing cover ➔ [page 67](#) .



Caution

Risk of damage to gearbox components.

- ***Do not turn back gearbox before housing cover has been reinstalled. Otherwise, clutch „K2/K3“ and other components will fall out.***



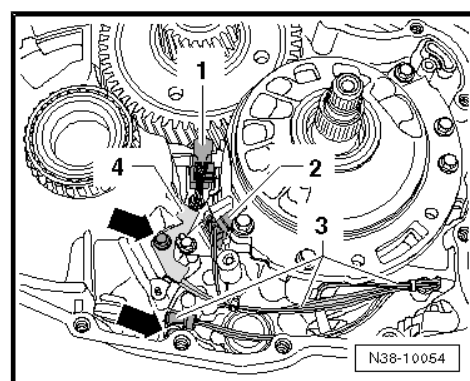
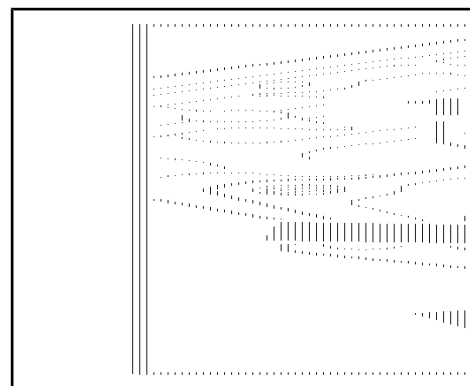
Unplug connector from gearbox input speed sender -G182- -1-.

- Unbolt gearbox input speed sender -arrows- and remove.
- Remove gearbox oil temperature sender -G93- with wiring harness downwards.

Installing

- Guide wiring harness for gearbox input speed sender -G182- through gearbox housing from below.
- Attach connector to gearbox input speed sender and install sender. Tighten bolts to 8 Nm.
- Install housing cover for planetary gearing ➔ [page 84](#) .
- Turn gearbox so that housing cover faces downwards.
- Install gearbox oil temperature sender -G93- -3- and tighten bolt -bottom arrow- to 8 Nm.
- Attach connectors for vehicle speed sender -G68- -1- and intermediate shaft speed sender -G265- -2-.
- Install wiring harness retainer -4- and tighten bolt -top arrow- to 8 Nm.
- Guide wiring harness into aperture for valve body.
- Install ATF strainer.
- Install valve body ➔ [page 103](#) .

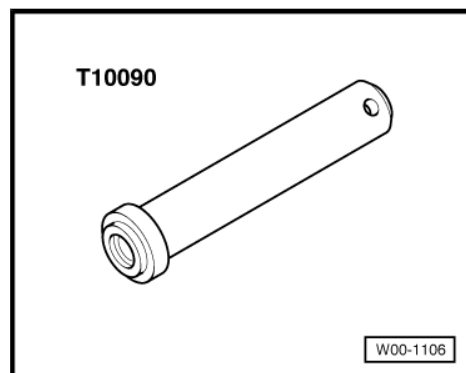
Assembling gearbox ➔ [page 70](#)



7 Renewing oil seal for selector shaft

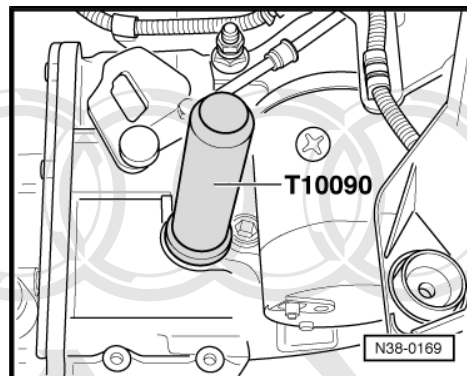
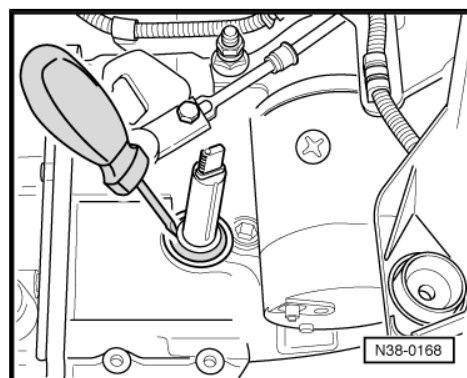
Special tools and workshop equipment required

- ◆ Thrust piece -T10090-



Procedure

- Remove multifunction switch -F125- ➔ [page 113](#) .
- Remove oil seal with screwdriver, taking care not to damage selector shaft.
- Drive in new oil seal until thrust piece contacts stop, ensuring that seal remains straight.
- Install and adjust multifunction switch -F125- ➔ [page 113](#) .

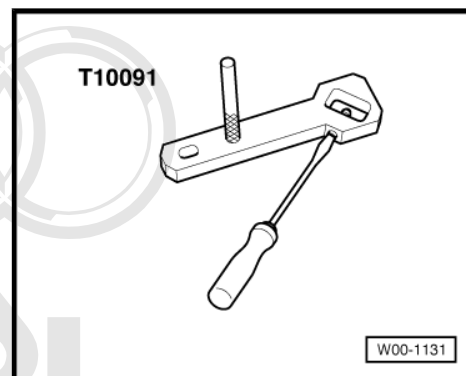


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8 Removing, installing and adjusting multifunction switch -F125-

Special tools and workshop equipment required

- ◆ Adjusting tool -T10091-



Removing multifunction switch -F125-

- Move selector lever to position „P“



Caution

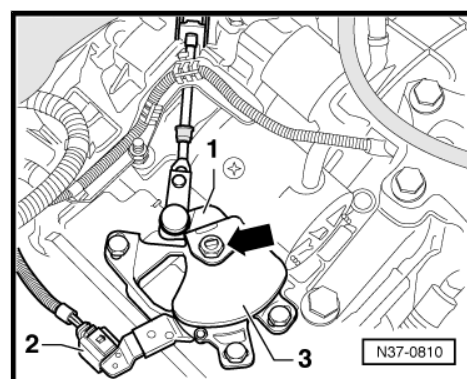
Follow steps required when disconnecting battery ⇒ Electrical system; Rep. gr. 27 .



Note

Before continuing the procedure, the battery earth strap must be disconnected. First check whether a coded radio is fitted and obtain anti-theft coding if necessary.

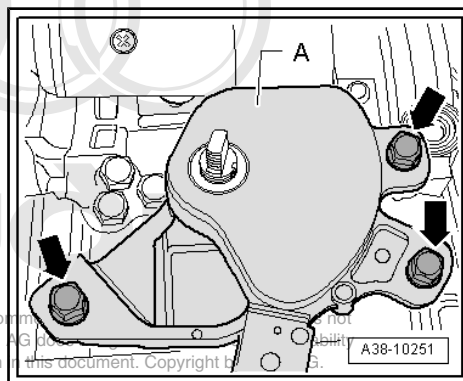
- With the ignition switched off, disconnect battery earth strap.
- Remove battery and battery tray ⇒ Electrical system; Rep. gr. 27 .
- Remove nut -arrow-.
- Pull lever -1- off selector shaft.
- Unplug connector -2- on wiring for multifunction switch -3-.



- Remove bolts -arrows- and detach multifunction switch -A-.

Installing and adjusting multifunction switch -F125-

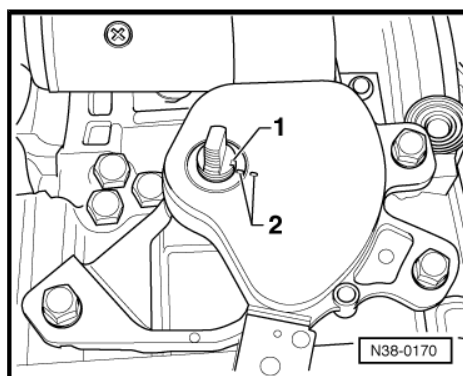
Tightening torques ⇒ [page 101](#)



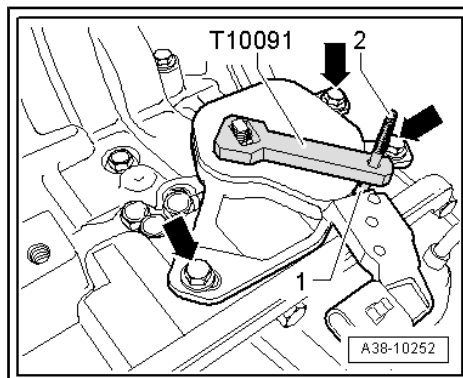
- Fit multifunction switch -F125- onto selector shaft.

Installation position:

Groove -1- in selector shaft must be in line with marking -2- on multifunction switch -F125-.



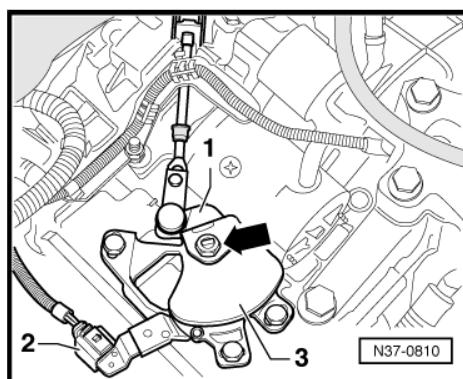
- Tighten securing bolts -arrows- for multifunction switch -F125- hand-tight.
- Fit adjusting tool -T10091- onto selector shaft and secure with screwdriver.
- Move selector shaft lever on gearbox to position „N“.
- Turn switch so that locating hole in switch housing -1- lines up with hole in adjusting tool.
- Push in dowel pin -2- of adjusting tool.
- Tighten securing bolts -arrows- for multifunction switch -F125- to specified torque ⇒ [Item 9 \(page 101\)](#).



- Fit lever -1- onto selector shaft.
- Tighten nut -arrow- to specified torque ⇒ [Item 6 \(page 101\)](#).
- Attach connector -2- on wiring for multifunction switch -3-.

The remaining installation steps are performed in reverse order.

- Install battery tray and battery ⇒ Electrical system; Rep. gr. 27.
- Connect earth strap to battery. Observe steps required after connecting battery ⇒ Electrical system; Rep. gr. 27.
- Check adjustment of selector lever cable ⇒ [page 18](#).



39 – Final drive - differential

1 Renewing oil seals for flange shafts

1.1 Exploded view - flange shafts

(Gearbox fitted in vehicle)

1 - Countersunk bolt

- ☐ 25 Nm
- ☐ Press against spring
-item 4- when installing

2 - Flange shaft

- ☐ Right-side
- ☐ Removing and installing
⇒ [page 118](#)

3 - Oil seal

- ☐ For flange shaft
- ☐ Removing and installing
(left-side) ⇒ [page 115](#)
- ☐ Removing and installing
(right-side) ⇒ [page 118](#)
- ☐ Lubricate sealing lips
lightly with ATF

4 - Spring

5 - Thrust washer

- ☐ Fit over spring -item 4-

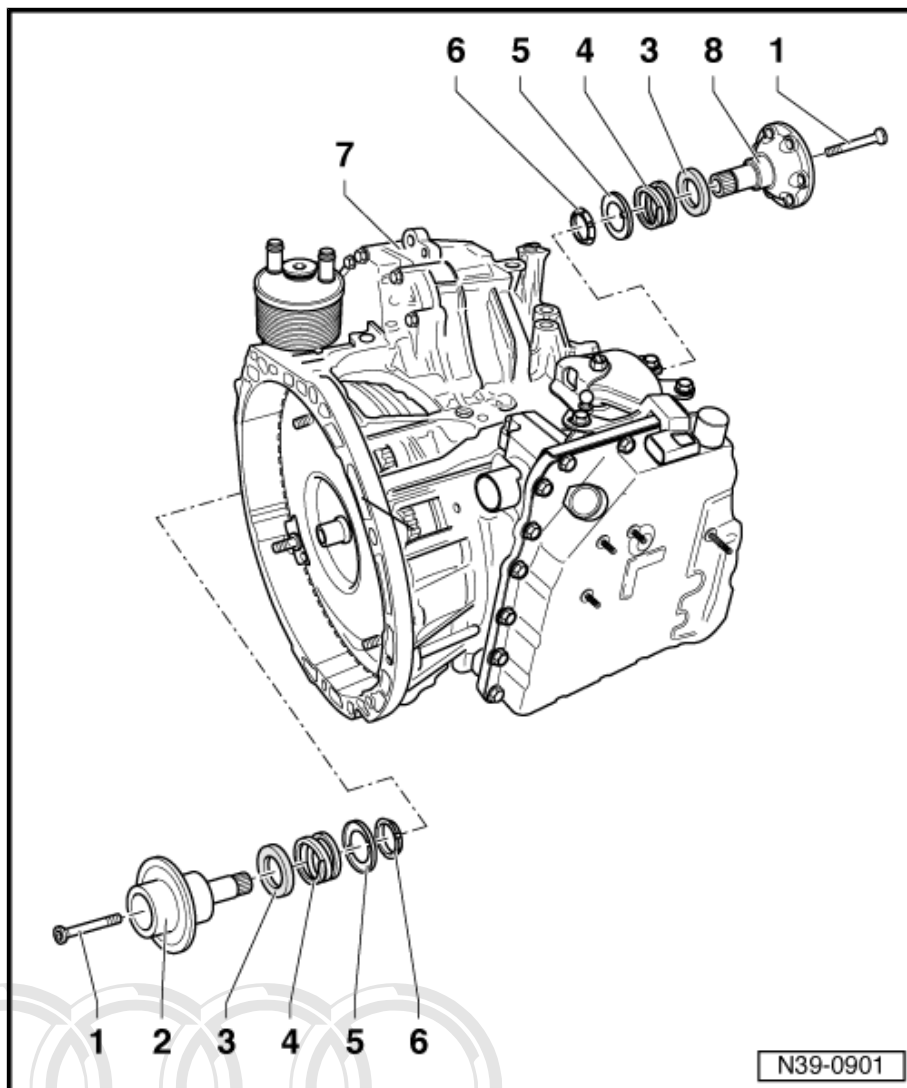
6 - Tapered ring

- ☐ Installation position:
taper towards differen-
tial

7 - Gearbox

8 - Flange shaft

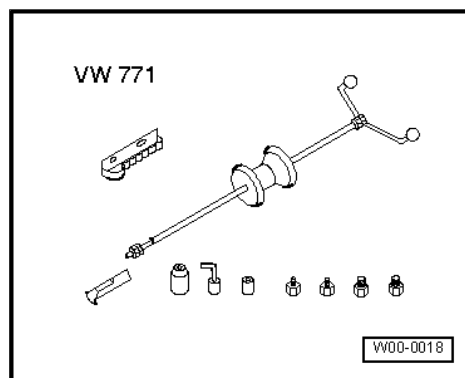
- ☐ Left-side
- ☐ Removing and installing
⇒ [page 115](#)



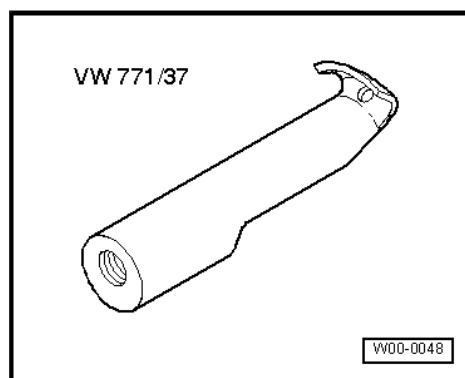
1.2 Renewing oil seal for flange shaft (left-side)

Special tools and workshop equipment required

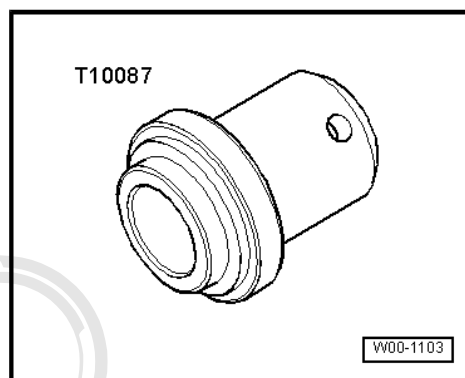
◆ Multi-purpose tool -VW 771-



◆ Extractor hook -VW 771/37-



◆ Thrust piece -T10087-



◆ Sealant -D 176 404 A2-



Note

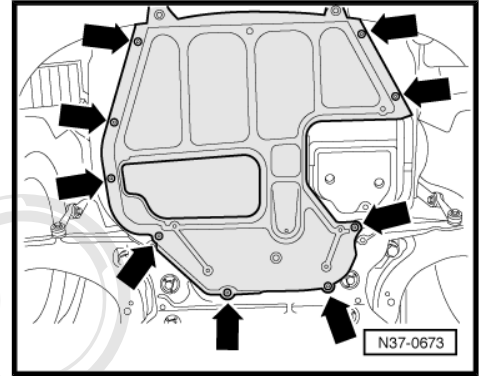
- ◆ Observe the general repair instructions ⇒ [page 10](#).
- ◆ Observe rules for cleanliness when working on the gearbox ⇒ [page 13](#).

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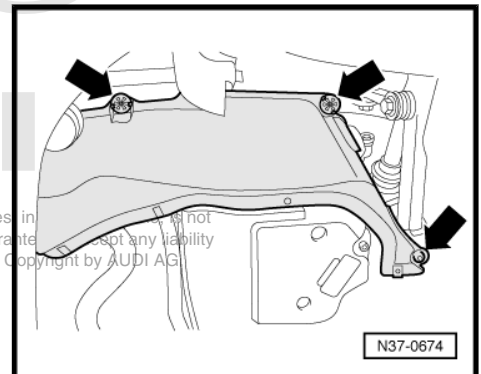
Removing oil seal for flange shaft (left-side)

- Loosen bolts for left front wheel.
- Raise vehicle.
- Remove left wheel.

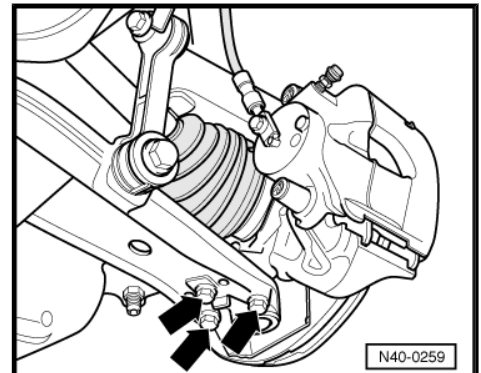
- Detach noise insulation below engine/gearbox -arrows-.



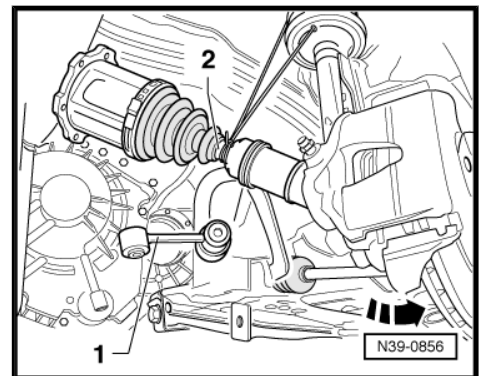
- Remove left noise insulation -arrows-.
- Turn steering to the left.
- Unbolt drive shaft from flange shaft.



- Mark positions of bolts -arrows- securing swivel joint to wishbone (left-side), otherwise wheel alignment will have to be checked.
- Remove bolts -arrows-.

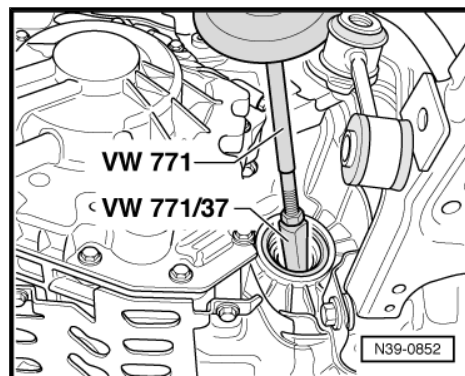


- Detach coupling rod (left-side) -1- from wishbone and turn coupling rod upwards.
- Swivel wheel bearing housing outwards.
- Guide drive shaft -2- (left-side) out between subframe and gearbox.
- Lift drive shaft and secure to suspension strut with wire.
- Unscrew countersunk bolt ⇒ [Item 1 \(page 115\)](#) .
- Place drip tray under the gearbox.
- Carefully pull out flange shaft with spring. Make sure that tapered ring, thrust washer and spring do not drop out.

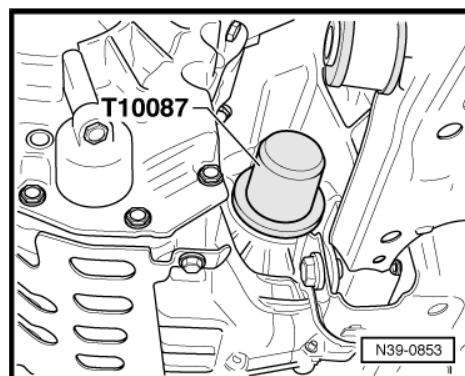


- Pull out flange shaft oil seal using -VW 771- and -VW 771/37- .

Installing oil seal for flange shaft (left-side)



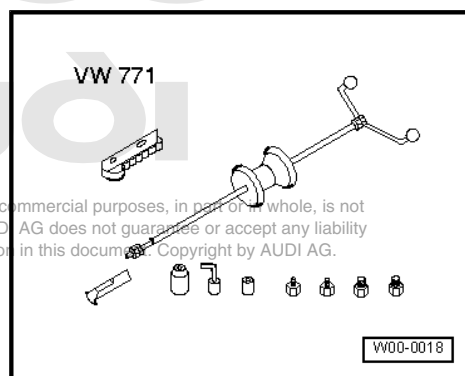
- Drive in new oil seal until thrust piece contacts stop, ensuring that seal remains straight.
- Lightly lubricate sealing lips of oil seal with ATF.
- Install flange shaft.
- Apply sealant -D 176 404 A2- to tapered section of countersunk bolt.
- Tighten countersunk bolt. Tightening torque
⇒ [Item 1 \(page 115\)](#)
- Bolt swivel joint to wishbone in original position and attach coupling rod to wishbone ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 .
- Bolt drive shaft to gearbox ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 .
- Then check and top up ATF level ⇒ [page 38](#) .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .
- Fit wheel ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 44 .



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

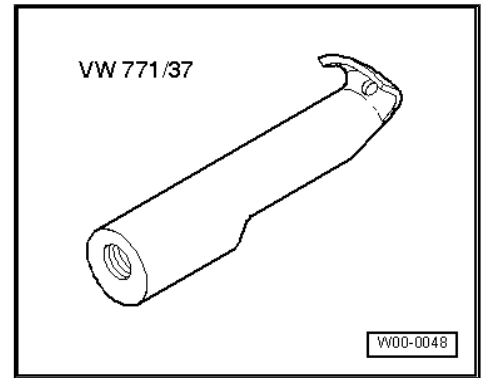
Special tools and workshop equipment required

- ◆ Multi-purpose tool -VW 771-

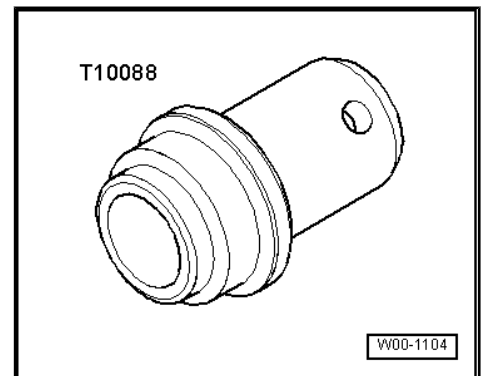


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◆ Extractor hook -VW 771/37-



◆ Thrust piece -T10088-



◆ Sealant -D 176 404 A2-

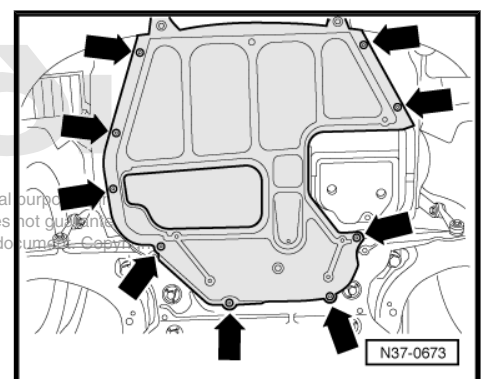


Note

- ◆ Observe the general repair instructions ⇒ [page 10](#).
- ◆ Observe rules for cleanliness when working on the gearbox ⇒ [page 13](#).

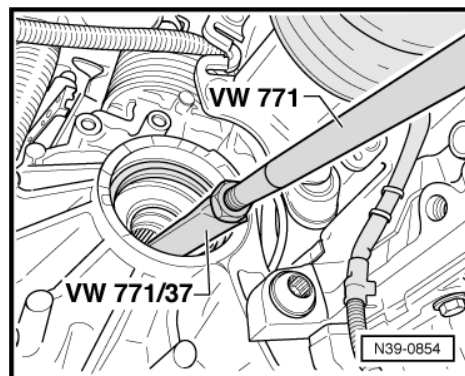
Removing flange shaft oil seal (right-side)

- Detach noise insulation below engine/gearbox -arrows-.
- Turn steering to full right lock.
- Unbolt drive shaft from flange shaft.
- Lift drive shaft (right-side) up and secure.
- Unscrew countersunk bolt ⇒ [Item 1 \(page 115\)](#).
- Place drip tray under the gearbox.
- Carefully pull out flange shaft with spring. Make sure that tapered ring, thrust washer and spring do not drop out.

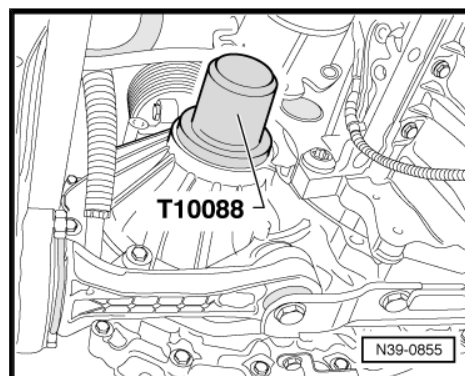


- Pull out flange shaft oil seal using -VW 771- and -VW 771/37- .

Installing flange shaft oil seal (right-side)



- Drive in new oil seal until thrust piece contacts stop, ensuring that seal remains straight.
- Lightly lubricate sealing lips of oil seal with ATF.
- Install flange shaft.
- Apply sealant -D 176 404 A2- to tapered section of countersunk bolt.
- Tighten countersunk bolt. Tightening torque
⇒ [Item 1 \(page 115\)](#)
- Bolt drive shaft to gearbox ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 .
- Then check and top up ATF level ⇒ [page 38](#) .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .



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