



Audi

Workshop Manual

Audi A6 2005 ➤

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Automatic gearbox 09E, four-wheel drive

Edition 11.2016

List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

32 - Torque converter

37 - Controls, housing

38 - Gears, control

39 - Final drive - front 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

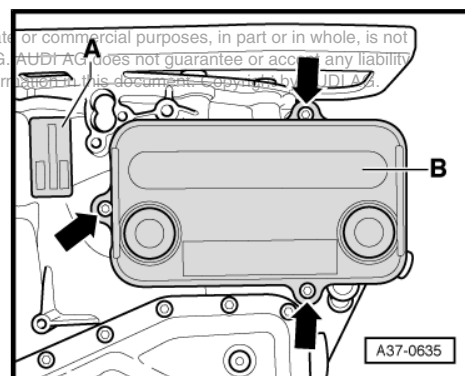
(ARL005013; Edition 11.2016)

The “6-speed automatic gearbox 09E” is installed in the Audi A6 2005 ► in combination with very high-powered engines. Allocation
⇒ [page 5](#).

Location of code letters on gearbox

- ◆ The gearbox code letters are located on the identification plate on bottom of gearbox -A-.
- ◆ Another identification plate (identical to the first one) can be found on the left side of the gearbox. This is not accessible when the gearbox is in its installed position.

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Code letters and gearbox serial number

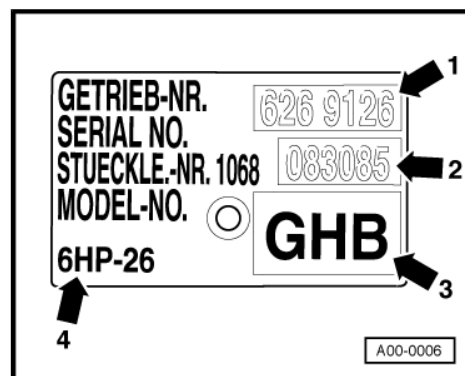
Example:

- ◆ Gearbox serial number -arrow 1-
- ◆ Model number -arrow 2-
- ◆ Code letters (GHB in this example) -arrow 3-
- ◆ Gearbox designation (6HP26 in this example) -arrow 4-



Note

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



2 Notes on “6-speed automatic gearbox 09E”

For more comprehensive information about this gearbox, see
⇒ Self-study programme No. 283 ; 6-speed automatic gearbox 09E in the Audi A8 2003, Part 1 and ⇒ Self-study programme No. 284 ; 6-speed automatic gearbox 09E in the Audi A8 2003, Part 2 . You will also find information about the gearbox and the gearbox adaption in ⇒ Self-study programme No. 385 ; 6-speed automatic gearbox 09L / 0AT / 0B6 / 0BQ / 09E .

Gearbox

- ◆ The 6-speed automatic gearbox 09E, four-wheel drive, has six hydraulically actuated forward gears. When the lock-up clutch is closed these forward gears become mechanically driven gears by cutting out the torque converter slip.
- ◆ A special feature of the 09E gearbox is the location of the front final drive (front differential with flange shafts) in front of the torque converter. This allows for a more even weight distribution between the front and rear axles on the vehicle.

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Torque converter

The torque converter is equipped with a slip-controlled lock-up clutch. Due to the new construction in this gearbox the torque converter is located behind the front final drive.

Mechatronic unit

The mechatronic unit incorporates the hydraulic control system, the automatic gearbox control unit - J217- , the multi-function switch - F125- and the sensors and actuators as a complete synchronised unit. The mechatronic unit is installed in the gearbox within the oil pan.

Automatic gearbox control unit - J217-

The control unit is part of the mechatronic unit in the gearbox.

The gear change points are calculated automatically (depending on the driving situation and the resistance to motion).

Advantages:

- ◆ Gear changes are consumption-orientated
- ◆ Maximum engine output is always available
- ◆ Gear-change points are adapted individually in all driving situations
- ◆ Gear-change points are infinitely variable

Self-diagnosis

Before performing repairs to the automatic gearbox, determine the cause of the fault as precisely as possible using “Guided Fault Finding”.

To perform “Guided Fault Finding”, use ⇒ Vehicle diagnostic tester.

Variation of gear-change points for gradients

An additional gear change map automatically selects gear changes for gradients depending on accelerator pedal position and driving speed.

- ◆ Gear change map for extreme uphill gradients is matched to engine output.

- ◆ Gear change map for extreme downhill gradients is matched to the braking effect of the engine.
- ◆ Increased engine braking effect can also be obtained by directly selecting a specific gear via the tiptronic function, e.g. when towing a trailer on downhill gradients.



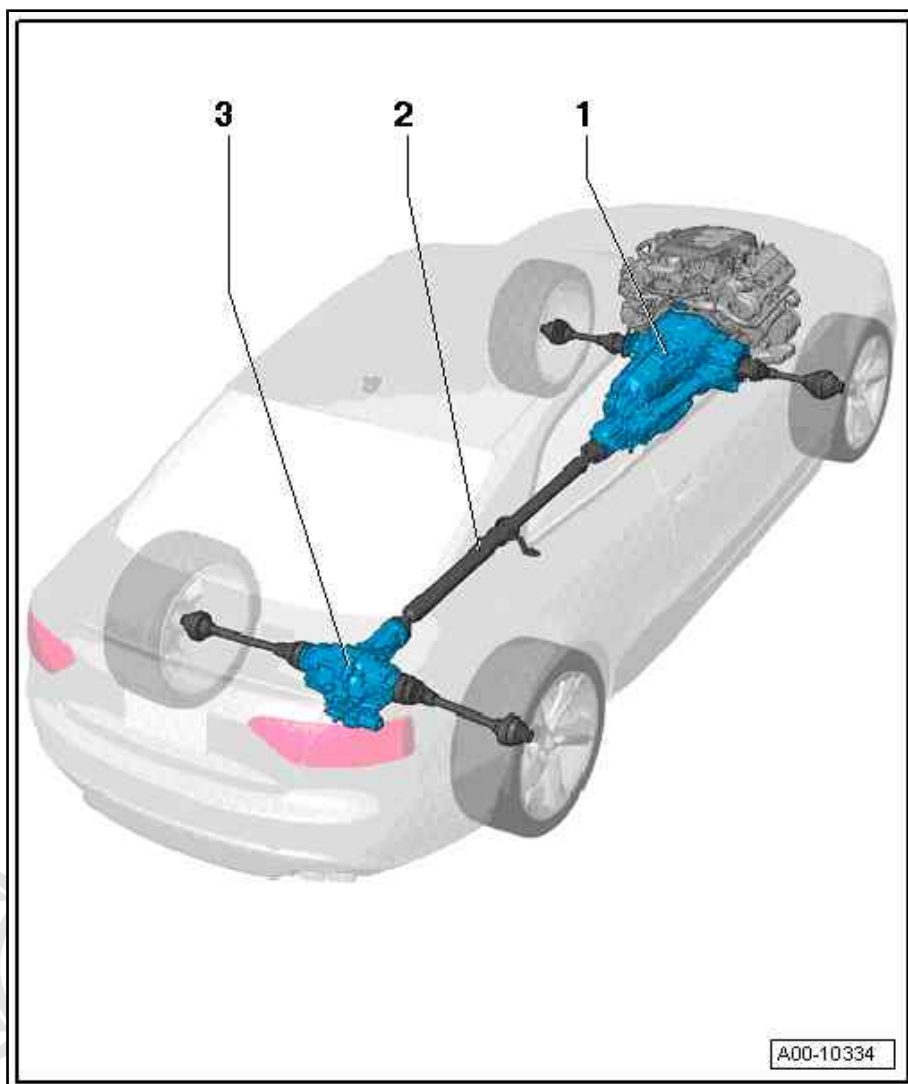
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3 Transmission layout

1 - Automatic gearbox 09E
(four-wheel drive)

2 - Propshaft

3 - Rear final drive



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4 Code letters, gearbox allocation, transmission ratios, equipment

Automatic gearbox		09E.G	09E.G	09E.G
Gearbox	Code letters	JBW	JLL	JMS
	Manufac- tured	from to	03.06 05.06	08.07 08.08
Torque converter	Code letters	Q94	Q94	Q94
Allocation	Model	Audi A6 2005 ▶ (Audi S6)	Audi A6 2005 ▶ (Audi S6)	Audi A6 2005 ▶ (Audi S6)
	Engine	V10 5.2 ltr. FSI 320 kW	V10 5.2 ltr. FSI 320 kW	V10 5.2 ltr. FSI 320 kW
Primary drive		32 : 30 = 1.067	32 : 30 = 1.067	32 : 30 = 1.067
Spur gear drive to front axle		31 : 29 = 1.069	31 : 29 = 1.069	31 : 29 = 1.069
Front axle bevel gearing		30 : 9 = 3.333	30 : 9 = 3.333	30 : 9 = 3.333
Overall front drive ratio = Primary drive x spur gear drive x bevel gearing		3.801	3.801	3.801
Rear axle bevel gearing		32 : 9 = 3.556	32 : 9 = 3.556	32 : 9 = 3.556
Overall rear drive ratio		3.793	3.793	3.793

Select correct version of mechatronic unit according to gearbox
code letters ⇒ Electronic parts catalogue

Automatic gearbox		09E.G	09E.G	09E.A
Gearbox	Code letters	KHD	KKX	KZH
	Manufac- tured	from to	05.07 08.07	09.08 05.09
Torque converter	Code letters	U102	Q94	K110
Allocation	Model	Audi A6 2005 ▶ (Audi S6)	Audi A6 2005 ▶ (Audi S6)	Audi A6 2005 ▶ (Audi RS 6)
	Engine	V10 5.2 ltr. FSI 320 kW	V10 5.2 ltr. FSI 320 kW	V10 5.0 ltr. TFSI 426 kW
Primary drive		32 : 30 = 1.067	32 : 30 = 1.067	32 : 30 = 1.067
Spur gear drive to front axle		31 : 29 = 1.069	31 : 29 = 1.069	31 : 29 = 1.069
Front axle bevel gearing		30 : 9 = 3.333	30 : 9 = 3.333	32 : 11 = 2.909
Overall front drive ratio = Primary drive x spur gear drive x bevel gearing		3.801	3.801	3.317
Rear axle bevel gearing		32 : 9 = 3.556	32 : 9 = 3.556	31 : 10 = 3.100
Overall rear drive ratio		3.793	3.793	3.307

Select correct version of mechatronic unit according to gearbox
code letters ⇒ Electronic parts catalogue

Automatic gearbox			09E.A	09E.A	09E.G
Gearbox	Code letters		KZQ	LLJ	MCG
	Manufac- tured	from to	11.07 04.08	09.08	05.09
Torque converter	Code letters		K110	K110	Q94
Allocation	Model		Audi A6 2005 ► (Audi RS 6)	Audi A6 2005 ► (Audi RS 6)	Audi A6 2005 ► (Audi S6)



Automatic gearbox	09E.A	09E.A	09E.G
Engine	V10 5.0 ltr. TFSI 426 kW	V10 5.0 ltr. TFSI 426 kW	V10 5.2 ltr. FSI 320 kW
Primary drive	32 : 30 = 1.067	32 : 30 = 1.067	32 : 30 = 1.067
Spur gear drive to front axle	31 : 29 = 1.069	31 : 29 = 1.069	31 : 29 = 1.069
Front axle bevel gearing	32 : 11 = 2.909	32 : 11 = 2.909	30 : 9 = 3.333
Overall front drive ratio = Primary drive x spur gear drive x bevel gear- ing	3.317	3.317	3.801
Rear axle bevel gearing	31 : 10 = 3.100	31 : 10 = 3.100	32 : 9 = 3.556
Overall rear drive ratio	3.307	3.307	3.793

Select correct version of mechatronic unit according to gearbox
code letters ⇒ Electronic parts catalogue

Automatic gearbox	09E.A		
Gearbox	Code letters	MKT	
	Manufac- tured from to	09.09	
Torque converter	Code letters	K110	
Allocation	Model	Audi A6 2005 ► (Audi RS 6)	
	Engine	V10 5.0 ltr. TFSI 426 kW	
Primary drive		32 : 30 = 1.067	
Spur gear drive to front axle		31 : 29 = 1.069	
Front axle bevel gearing		32 : 11 = 2.909	
Overall front drive ratio = Primary drive x spur gear drive x bevel gear- ing		3.317	
Rear axle bevel gearing		31 : 10 = 3.100	
Overall rear drive ratio		3.307	

Select correct version of mechatronic unit according to gearbox
code letters ⇒ Electronic parts catalogue



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5 Capacities

ATF section in gearbox

Capacities	Automatic gearbox 09E
Initial filling	10.4 ltr.
Fluid change	Change only after repair, approx. 10 litres if oil pan has been removed
Lubricant	ATF Select correct type

Selecting correct ATF part numbers for the corresponding gearbox code letters:

 **Caution**
Risk of malfunction or gearbox failure.

- ◆ *Different types of ATF are available for this gearbox. The correct type must be determined according to the gearbox code in the ⇒ **Electronic parts catalogue**.*
- ◆ *Use only the correct type of ATF (available as a replacement part) for the planetary gearing in automatic gearbox 09E.*
- ◆ *Other types of oil cause malfunctions and/or failure of the gearbox.*
- ◆ *For the correct type, refer to ⇒ **Electronic parts catalogue**.*

Checking ATF level and topping up ⇒ [page 80](#)

Front final drive

Capacities	Front final drive, for automatic gearbox 09E
Initial filling	1.2 ltr.
Oil change	◆ No change required ◆ Lifetime filling: change only after repairs, up to 1.2 litres if cover for front final drive has been removed ◆ Follow exact instructions carefully when checking oil level on gearboxes with common oil system for transfer box and front final drive
Lubricant	Gear oil Select correct type

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Selecting correct gear oil part numbers for the corresponding gearbox code letters:



Caution

Risk of malfunction or gearbox failure.

- ◆ ***Different types of gear oil are available for this gearbox. The correct type must be determined according to the gearbox code in the ⇒ Electronic parts catalogue .***
- ◆ ***Other types of oil cause malfunctions and/or failure of the gearbox.***
- ◆ ***For the correct type, refer to ⇒ Electronic parts catalogue .***

Checking oil level in front final drive and topping up ⇒ [page 111](#)

Transfer box

Capacities	Transfer box, for automatic gearbox 09E
Initial filling	1.1 ltr.
Oil change	◆ No change required ◆ Lifetime filling: change only after repairs, up to 1.1 litres if centre differential housing has been removed ◆ Follow exact instructions carefully when checking oil level on gearboxes with common oil system for transfer box and front final drive
Lubricant	Gear oil Select correct type

Selecting correct gear oil part numbers for the corresponding gearbox code letters:



Caution

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Risk of malfunction or gearbox failure.

- ◆ ***Different types of gear oil are available for this gearbox. The correct type must be determined according to the gearbox code in the ⇒ Electronic parts catalogue .***
- ◆ ***Other types of oil cause malfunctions and/or failure of the gearbox.***
- ◆ ***For the correct type, refer to ⇒ Electronic parts catalogue .***

Checking gear oil level in transfer box and topping up
⇒ [page 111](#) .

6 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.

- ◆ *Prior to performing work with engine running, move selector lever to position "P" and pull up parking brake button to apply the electromechanical parking brake.*

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 irreparable damage to electronic components.

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

– Disconnect battery ⇒ 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 test equipment to the rear seat with a strap and have it operated from there by a second person.*

7 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" and the vehicle must not be towed for a distance of more than 50 km or at a speed in excess of 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.

If the battery has been removed or is fully discharged and you need to tow or push the vehicle, please note that you will have to manually release the selector mechanism from position "P" in order to be able to move it to "N" [⇒ page 30](#) .



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8 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.

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Guided Fault Finding, Vehicle self-diagnosis and Test Instruments

- ◆ Before servicing the gearbox, the exact cause of the failure must be determined using the Guided Fault Finding, Vehicle Self-diagnosis and Test Instruments ⇒ vehicle diagnostic tester .

Guided Functions, adaption values and adaption drive

- ◆ A gearbox adaption should be performed after certain servicing work on the gearbox: connect up ⇒ Vehicle diagnostic tester, select "Guided Functions" and run function "J217 - Adaption values, checking / adaption drive (Rep.Gr.38)"
⇒ [page 17](#) .

Environmental and waste disposal regulations for oil



Caution

Risk of damage to the gearbox.

- ◆ *All equipment used for filling must be clean.*
- ◆ *Different types of lubricant must not be mixed together.*
- ◆ *Use only the approved types of oil and ATF that are available as replacement parts.*
- ◆ *Other types of oil cause malfunctions and/or failure of the gearbox.*
- ◆ *For the correct type, refer to ⇒ [Electronic parts catalogue](#) .*

- ◆ ATF, gear oil 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

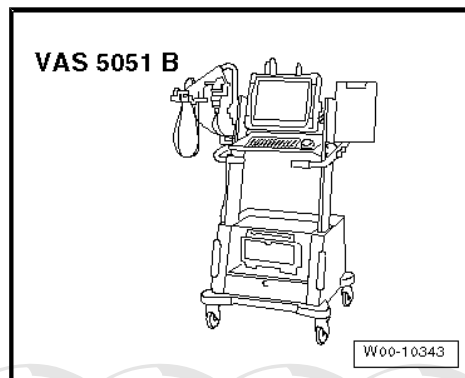
For a complete list of special tools used in this Workshop Manual
⇒ "Special tools, Workshop equipment"

Manual release of the selector mechanism

If the battery has been removed or is fully discharged and you need to tow or push the vehicle, please note that you will have to manually release the selector mechanism from position "P" in order to be able to move it to "N" ⇒ [page 30](#) .

Gearbox

- ◆ Rules for cleanliness when working on the automatic gearbox
⇒ [page 15](#)
- ◆ Do not run engine or tow vehicle with oil pan removed or when there is no ATF in the gearbox.
- ◆ If flange shaft (left-side) has been removed, secure torque converter to prevent it from falling out.
- ◆ Check position of torque converter when installing
⇒ [page 21](#) .
- ◆ When installing gearbox ensure dowel sleeves are correctly seated.



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- ◆ When installing gearbox, check the following fluid levels and top up if necessary: ATF in the planetary gearbox, the gear oil in the front final drive and the gear oil in the transfer box. Capacities and specifications ⇒ [page 7](#)

O-rings, oil seals, seals and gaskets

- ◆ Always renew O-rings, oil seals, seals and gaskets after removal.
- ◆ 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.
- ◆ The open side of the oil seal should face the side containing the fluid.
- ◆ Before installing, lightly lubricate outer circumference and sealing lips of oil seals with ATF or gear oil, depending on fitting location.
- ◆ Lightly lubricate O-rings with ATF before installation to prevent them from being crushed during assembly.
- ◆ Use only ATF for parts running in ATF. Other lubricants will cause malfunction of the gearbox hydraulics.
- ◆ When installing a new oil seal, position the seal such that the sealing lip does not contact the shaft in the same place as the old seal (make use of installation depth tolerances).
- ◆ Renew paper gaskets, clean all sealing surfaces thoroughly and remove previous gaskets completely.
- ◆ After installing, check the relevant fluid levels and top up if necessary: ATF in planetary gearbox, gear oil in front final drive and gear oil in transfer box. Capacities and specifications ⇒ [page 7](#)

Nuts, bolts

- ◆ Slacken bolts in reverse sequence to the specified tightening sequence.
- ◆ Bolts and nuts used to secure covers and housings must be tightened in steps according to the specified tightening sequence and method.
- ◆ 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.
- ◆ Always renew self-locking bolts and 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](#)
- ◆ Threaded holes which take self-locking bolts or bolts coated with locking fluid must be cleaned using a thread tap or similar. Otherwise there is a danger of the bolts shearing off the next time they are removed.
- ◆ The tightening torques stated apply to non-oiled nuts and bolts.

Locking elements

- ◆ Do not over-stretch circlips.
- ◆ Always renew circlips which have been damaged or over-stretched.
- ◆ Circlips must be properly seated in the base of the groove.
- ◆ Renew spring pins. Installation position: slot must be in line with direction of force.

Bearings

- ◆ Install needle bearings so the lettering (side with thicker metal) faces towards the installing tool.
- ◆ Lubricate bearings with gear oil or ATF, depending on fitting location.
- ◆ Do not interchange inner or outer races of bearings of the same size.
- ◆ Always renew the tapered roller bearings on one shaft together and use new bearings from a single manufacturer.

Shims

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

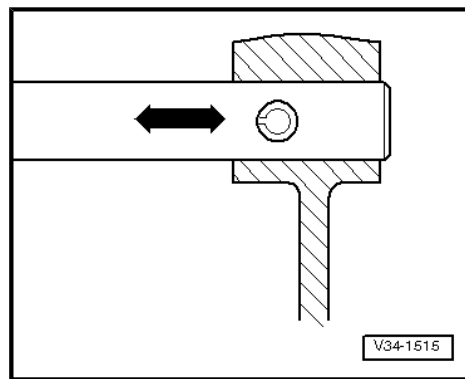
Mechatronic unit



Caution

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

- ◆ ***Before handling the electrical connector or mechatronic unit, the mechanic must discharge static. To do so, touch vehicle earth, heater radiator, or lifting platform, with your hand.***
- ◆ ***Do not touch contact pins in gearbox connector with bare hands.***



- ◆ Select correct version of mechatronic unit according to gearbox code letters ⇒ Electronic parts catalogue

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9 Rules for cleanliness when working on the gearbox

- Refer to repair instructions ⇒ [page 11](#) .
- ◆ Thoroughly clean all joints and connections and the surrounding areas before disconnecting.
- ◆ Use cleaning fluid - D 009 401 04- to clean the gearbox and its components.
- ◆ Use lint-free cloths for cleaning; Audi recommends the “WY-PALL 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- .
- ◆ After removal, place parts on a clean surface and cover them. Use sheeting or lint-free cloths.
- ◆ Carefully cover or seal open components if repairs cannot be carried out immediately.
- ◆ Only install clean components; replacement parts should only be unpacked immediately prior to installation.

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10 Contact corrosion

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

For this reason the manufacturer installs only fasteners which are matched for use with the other components and which are given a special surface coating if necessary.

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

These approved components are sold as replacement parts ⇒ Electronic parts catalogue .

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

Please note:

- ◆ We recommend only genuine spare parts: these have been fully tested.
- ◆ We recommend the use of accessories approved by Audi.
- ◆ Damage caused by contact corrosion is not covered by warranty.



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11 Gearbox adaption for vehicles from model year 2006 onwards



This gearbox adaption is not possible on vehicles before model year 2006. The software of the automatic gearbox control unit - J217- in these vehicles does not support this function.

One of the essentials for optimum and consistent gear shifting, apart from favourable design parameters, is the accurate control of the selector elements. In order to keep the gear shift quality at a consistently high level throughout the service life of the gearbox, it is necessary to continuously adapt various open and closed-loop control parameters and to store the calculated adaption values. This process of adaptation or learning is referred to as adaption.

The objective of gearbox adaption is to compensate for variations in gearbox components during manufacture (i.e. tolerances) and throughout their service life. The adaption values take the form of offsets which can be added to or subtracted from the applied values permanently stored in the gearbox control unit.

For a detailed description of adaption, please refer to ⇒ Self-study programme No. 385 ; 6-speed automatic gearbox 09L / 0AT / 0B6 / 0BQ / 09E .

When should the adaption values be read / assessed / deleted and when should an adaption drive be performed?

- ◆ Customer complains that gear shifts are rough
- ◆ After an ATF change
- ◆ After repairs to the clutches
- ◆ After installing a replacement mechatronic unit or gearbox
- ◆ After a software update
- ◆ After certain repairs to the engine, e.g. after renewing the air mass meter.
- It is important to follow closely all the instructions, work procedures and conditions in the “Guided Functions”.
- Connect up ⇒ Vehicle diagnostic tester, select “Guided Functions” and run function “J217 - Adaption values, checking / adaption drive (Rep.Gr.38)”.

**Note**

- ◆ *Before deleting any adaption values, always make an assessment and keep a record of the existing adaption values. Previous adaption values can be an invaluable aid in establishing the condition of the individual clutches and determining how to proceed. It will be easier to establish the cause of the complaint if proper records of the adaption values are kept.*
- ◆ *After deleting the adaption values, an adaption drive must be performed using the "Guided Functions" or "Guided Fault Finding" function. If the adaption drive is not possible, for whatever reason, an extensive road test must be performed. The conditions for the adaption should be met as far as possible, and the quality of every gear shift should be assessed. If certain gear shifts come to notice, the relevant selector elements can be adapted individually.*

General adaption conditions

Various driving modes and operating conditions are required to prevail, depending on the type of adaption and which selector element is to be adapted. Consequently, "adaption conditions" are defined for each adaption process.

An adaption can be performed only if the defined adaption conditions have been met.

The criteria below apply during the adaption:

- ◆ The ATF temperature must be within a defined range.
- ◆ Defined gear or gear shift.
- ◆ The engine load must be within a defined range. A very low engine load or a light throttle application is usually required.
- ◆ **No fault memory entries in the gearbox control unit!**
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- ◆ **A particular driving condition must prevail (e.g. throttle applied or overrun mode, constant driving mode, vehicle stopped with engine idling, etc.).**
- ◆ Good road conditions, best possible road surface, no steep uphill or downhill gradients, flat stretch of road.

32 – Torque converter

1 Exploded view - torque converter

1 - Bolt

- ☐ Renew
- ☐ For tightening torque and sequence refer to "Installing gearbox" for relevant engine
⇒ [page 63](#)

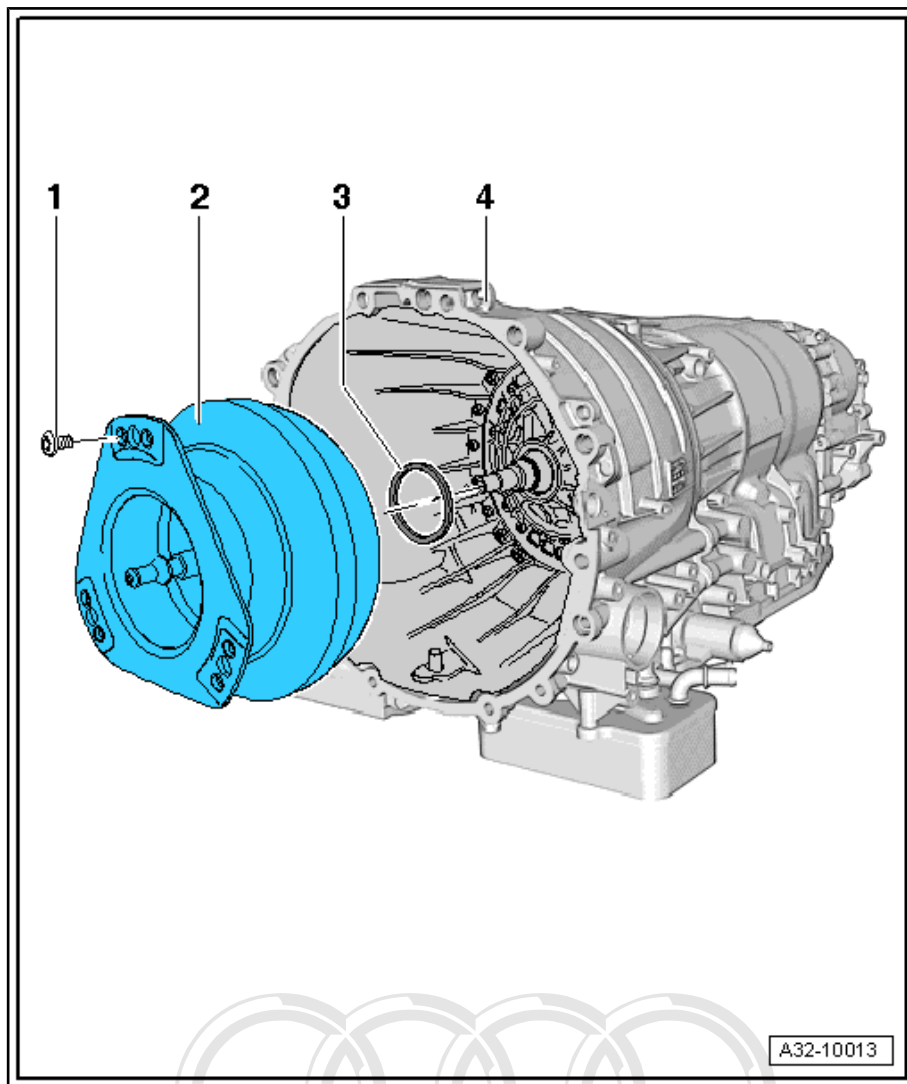
2 - Torque converter

- ☐ Removing and installing
⇒ [page 20](#)

3 - Oil seal

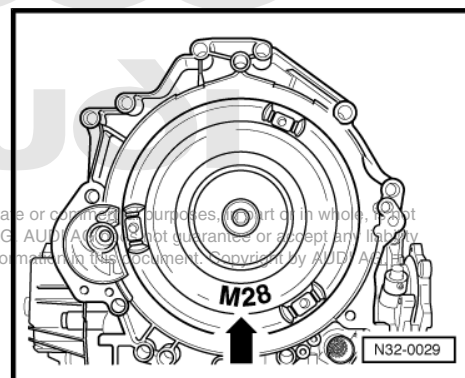
- ☐ ⇒ "1.4 Renewing oil seal for torque converter",
[page 22](#)

4 - Gearbox housing



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](#).

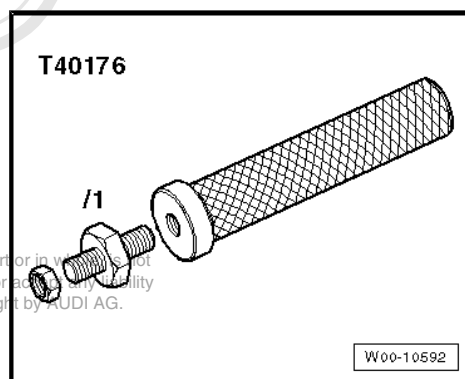


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1.2 Removing and installing torque converter

Special tools and workshop equipment required

- ◆ Extractor - T40176-



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- ◆ Depth gauge

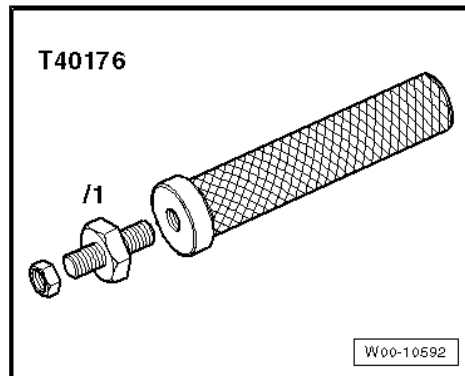


Note

- ◆ *Rules for cleanliness when working on the automatic gearbox*
⇒ [page 15](#)
- ◆ *General repair instructions* ⇒ [page 11](#) .
- ◆ *Apply thin coat of ATF to oil seals. Other types of lubricant will cause the gearbox hydraulics to malfunction.*

Removing

- Gearbox removed
- Secure gearbox to assembly stand ⇒ [page 71](#) .
- Remove flange shaft (left-side) ⇒ [page 124](#) .
- Unscrew -nut- from extractor - T40176- .
- Screw extractor - T40176- with attachment - T40176/1- hand-tight into one of threaded openings on torque converter.
- Carefully pull out torque converter, keeping it straight.



Installing

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

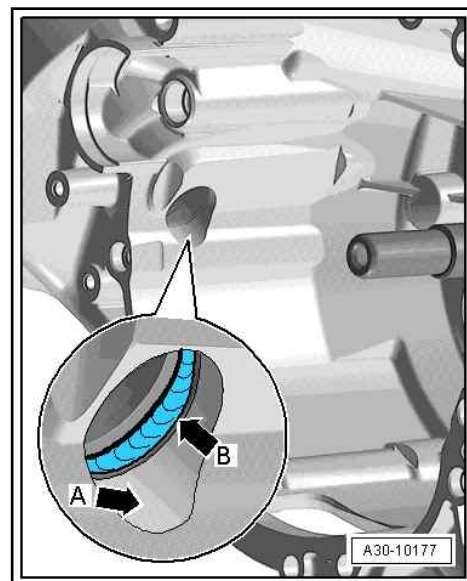
- Thoroughly clean area of torque converter bellhousing leading to differential -arrow A-, and oil seal -arrow B-.



Note

If oil seal between differential and gearbox housing -arrow B- is damaged, it must be renewed ⇒ [page 127](#).

- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .
- Clean torque converter hub and oil seal.
- Check oil seal for torque converter and renew if damaged ⇒ [page 22](#) .
- Check torque converter ⇒ [page 23](#) .
- Apply thin coat of ATF to oil seals.
- Press torque converter hub through oil seal as far as first stop.
- Turn the torque converter, at the same time pressing it inwards lightly until the slots on the torque converter hub engage in the drive lugs on the ATF pump gear and the torque converter slides in a noticeable distance.

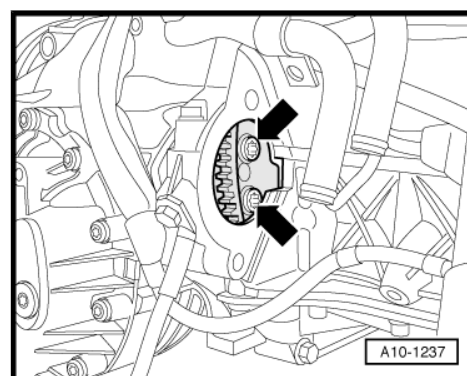
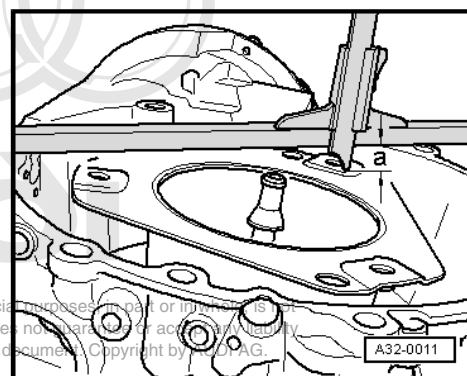


Installed depth

If the torque converter has been correctly installed, the distance -a- between the surface of the mounting holes and the contact surface of the torque converter bellhousing should be:

- at least 18.9 mm on vehicles with 10-cylinder petrol engines
- at least 5.9 mm on vehicles with 8 or 12-cylinder petrol engines
- at least 18.9 mm on vehicles with 8-cylinder TDI engines
- Unscrew extractor - T40176- with attachment - T40176/1- from torque converter.
- Install flange shaft (left-side) ⇒ [page 124](#) .
- Always use new genuine bolts to secure the torque converter to the drive plate when installing the gearbox.

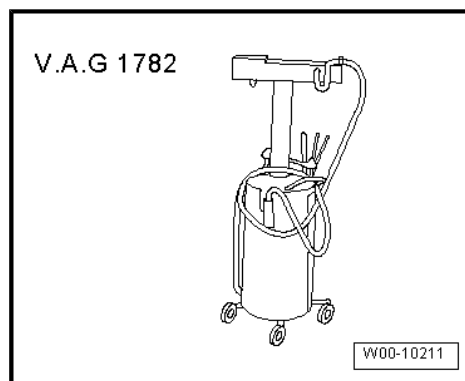
For tightening torque for torque converter to drive plate, see chapter: Installing gearbox ⇒ [page 63](#)



1.3 Draining torque converter

Special tools and workshop equipment required

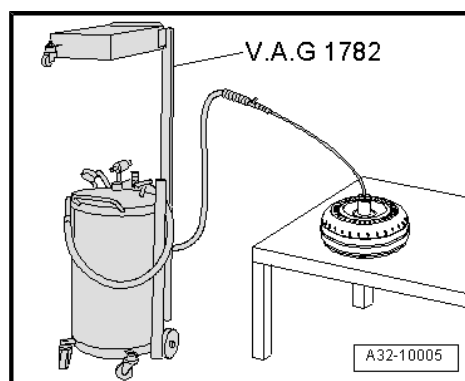
- ◆ Used oil collection and extraction unit - V.A.G 1782-



Procedure

Drain the torque converter as follows if the ATF is very dirty due to component wear, or when performing a major gearbox overhaul:

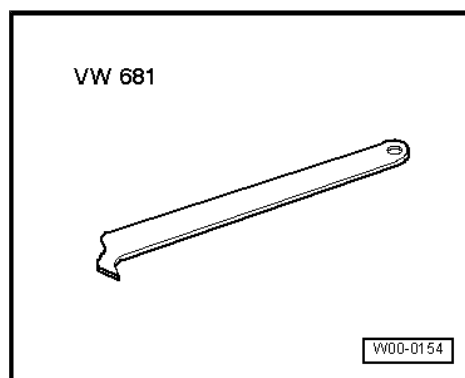
- Extract ATF from torque converter with used oil collection and extraction unit - V.A.G 1782- .



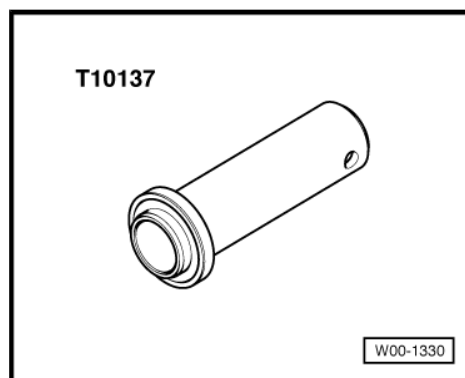
1.4 Renewing oil seal for torque converter

Special tools and workshop equipment required

- ◆ Extractor lever - VW 681-



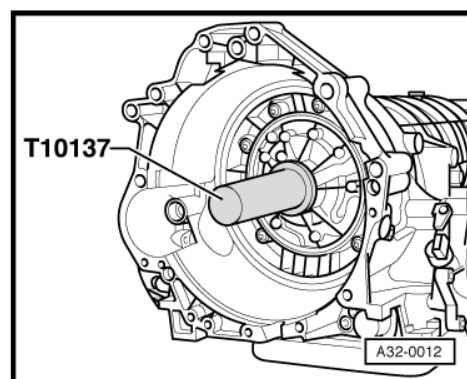
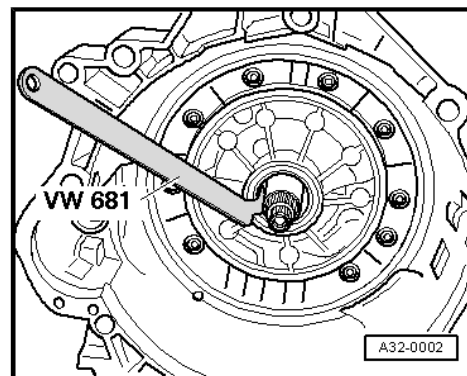
- ◆ Thrust piece - T10137-



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Procedure

- Remove torque converter ⇒ [page 20](#) .
 - Pry out oil seal using oil seal extractor lever - VW 681- .
 - Lightly lubricate outer circumference and sealing lips of oil seal with ATF.
 - Installation position: open side of oil seal points towards gear-box
-
- Drive in torque converter oil seal with thrust piece - T10137- until thrust piece reaches stop.



1.5 Checking torque converter

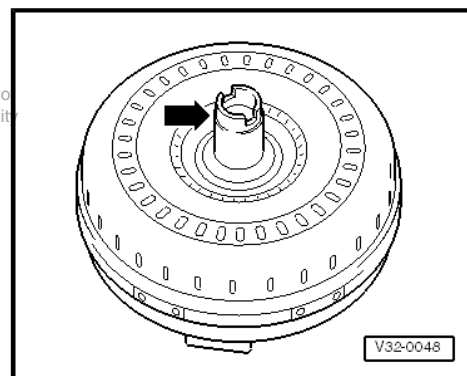
- Check hub -arrow- of torque converter for scoring.



Note

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The torque converter is a welded assembly and must be renewed as a complete unit in the event of any damage or defects.



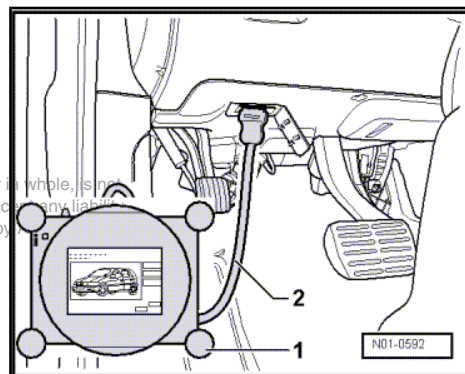
37 – Controls, housing

1 Electrical/electronic components and fitting locations

Diagnostic connection

Fitting location: the diagnostic connection for the vehicle diagnostic tester is located in the driver's footwell.

The components listed below can be tested via the **Guided Fault Finding** function with the vehicle diagnostic tester.



Mechatronic unit, automatic gearbox control unit - J217- , multifunction switch - F125- , gearbox input speed sender - G182- and gearbox output speed sender - G195-

Fitting location: the mechatronic unit is bolted to the underside of the gearbox housing and covered by the gearbox oil pan.

The mechatronic unit incorporates the hydraulic control system, the electronic control unit and the sensors and actuators as a complete synchronised unit. This includes:

- ◆ Automatic gearbox control unit - J217-
- ◆ Multifunction switch - F125-
- ◆ Gearbox input speed sender - G182-
- ◆ Gearbox output speed sender - G195-

The mechatronic unit can only be replaced as a complete unit.



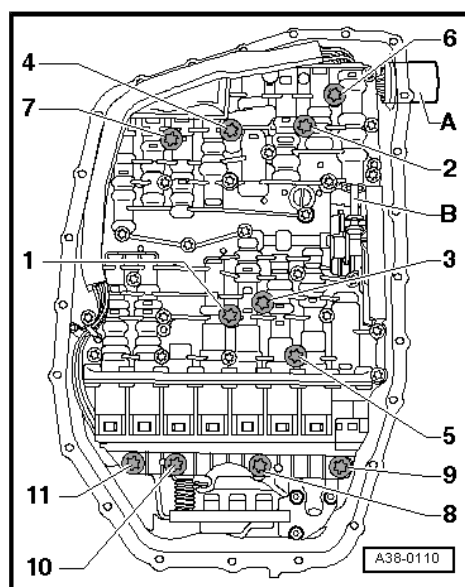
Note

- ◆ All components mentioned are tested via self-diagnosis.
- ◆ One of two different mechatronic units may be installed, depending on the gearbox version. Please note the different descriptions and refer to the ⇒ *Electronic parts catalogue for the correct version.*
- A gearbox adaption ⇒ [page 17](#) must be performed after updating the software for the automatic gearbox control unit - J217- .
- A gearbox adaption must be performed after changing the mechatronic unit or gearbox ⇒ [page 17](#) .

Various versions apply, depending on the gearbox code letters:

– Removing and installing mechatronic unit:

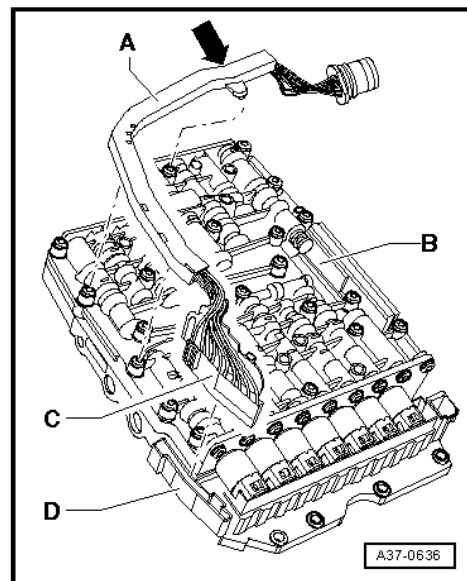
- ◆ ⇒ [“1.3 Removing and installing mechatronic unit - gearbox with 24 bolts on oil pan”, page 102](#)
- ◆ ⇒ [“1.4 Removing and installing mechatronic unit - gearbox with 13 bolts on oil pan”, page 105](#)



Wiring harness in gearbox

Fitting location: the wiring harness -A- with connector -C- is attached to the mechatronic unit -B-.

- Removing and installing wiring harness in gearbox
⇒ [page 108](#).



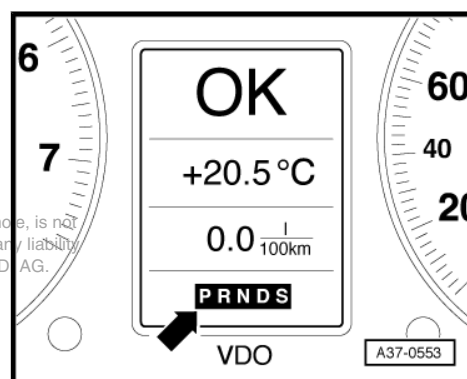
Selector lever position display - Y6-

Fitting location: integrated into instrument cluster



Note

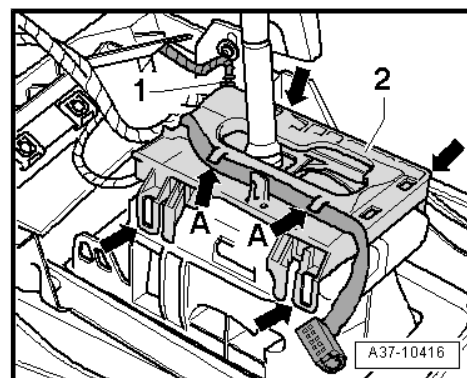
The selector lever position display - Y6- can only be renewed together with the instrument cluster.



Selector lever sensors control unit - J587- and tiptronic switch - F189-

- ◆ Fitting location: the selector lever sensors control unit - J587- and the tiptronic switch - F189- are combined in a single component -2- which is clipped onto the shift unit -arrows-.

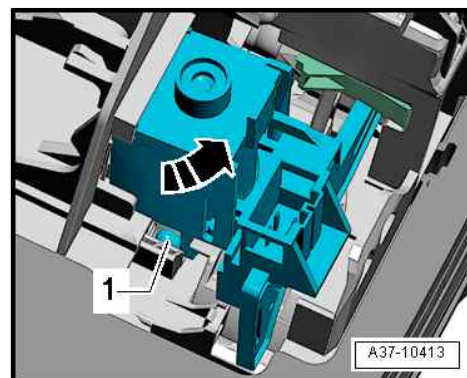
⇒ ["2.4 Removing and installing selector lever sensors control unit J587 and tiptronic switch F189", page 32](#)



Selector lever lock solenoid - N110-

- ◆ Fitting location: the selector lever lock solenoid - N110- -item 1- is clipped onto the selector mechanism.

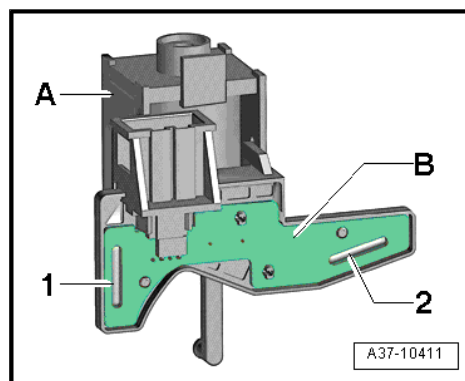
⇒ ["2.3 Removing and installing selector lever lock solenoid N110", page 31](#)



Gear selector position P switch - F305-

- ◆ Fitting location: Gear selector position P switch - F305- consists of two microswitches -1- and -2- installed on printed circuit board -B- in selector lever lock solenoid - N110- -A-.

Installing: Gear selector position P switch - F305- can only be renewed together with selector lever lock solenoid - N110-
⇒ [“2.3 Removing and installing selector lever lock solenoid N110”](#), page 31



Kickdown switch - F8-

Fitting location:

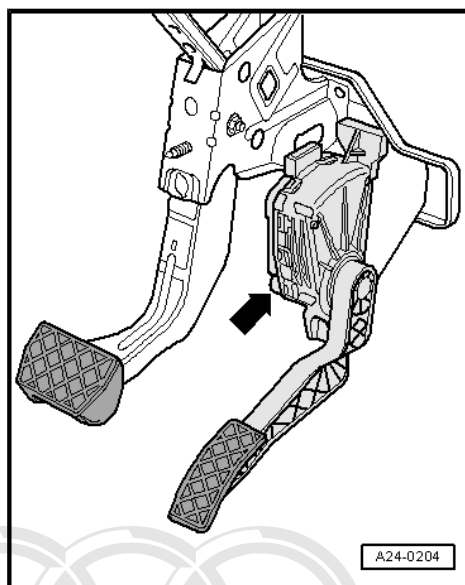
- ◆ On vehicles with diesel engine the kick-down switch is incorporated in accelerator pedal position sender - G79- .
- ◆ On vehicles with petrol engine, the engine control unit stores a specific value obtained from the accelerator position sender - G79- and the accelerator pedal position sender 2- - G185- instead.

The accelerator pedal position senders are integrated in the accelerator pedal module -arrow-.



Note

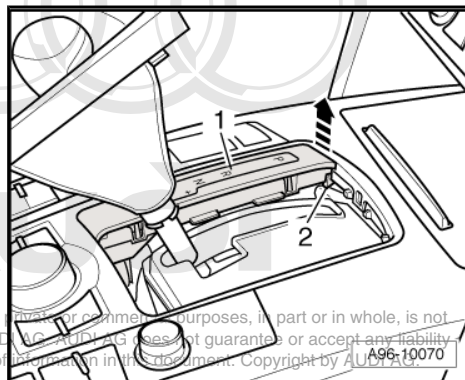
Renew the accelerator pedal module if the accelerator pedal position sender is defective ⇒ Fuel supply system, petrol engines; Rep. gr. 20 or ⇒ Fuel supply system, diesel engines; Rep. gr. 20.



Selector lever position display - Y26-

- ◆ The selector lever position display - Y26- -item 1- is clipped into the centre console.

⇒ [“3.3 Removing and installing selector lever position display Y26”](#), page 42



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2 Servicing selector mechanism - exploded view



WARNING

Prior to performing work with engine running, move selector lever to position "P" and operate parking brake button to apply the electronic parking brake.

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Check selector mechanism before dismantling ➔ [page 28](#).

1 - Selector lever handle

- ☐ ➔ ["3 Selector lever handle, selector lever position display Y26 - exploded view", page 39](#)

2 - Trim ring

- ☐ Removing and installing
➔ [page 39](#)

3 - Selector lever boot

- ☐ Removing and installing
➔ [page 39](#)

4 - Clamp

- ☐ Secures selector lever handle to selector lever
- ☐ Removing and installing
➔ [page 39](#)

5 - Selector lever position display - Y26-

- ☐ ➔ ["3.3 Removing and installing selector lever position display Y26", page 42](#)

6 - Nut

- ☐ 10 Nm
- ☐ 4 x, for securing selector mechanism to body

7 - Rubber seal

8 - Selector lever sensors control unit - J587- and tiptronic switch - F189-

- ☐ ➔ ["2.4 Removing and installing selector lever sensors control unit J587 and tiptronic switch F189", page 32](#)

9 - Shift unit

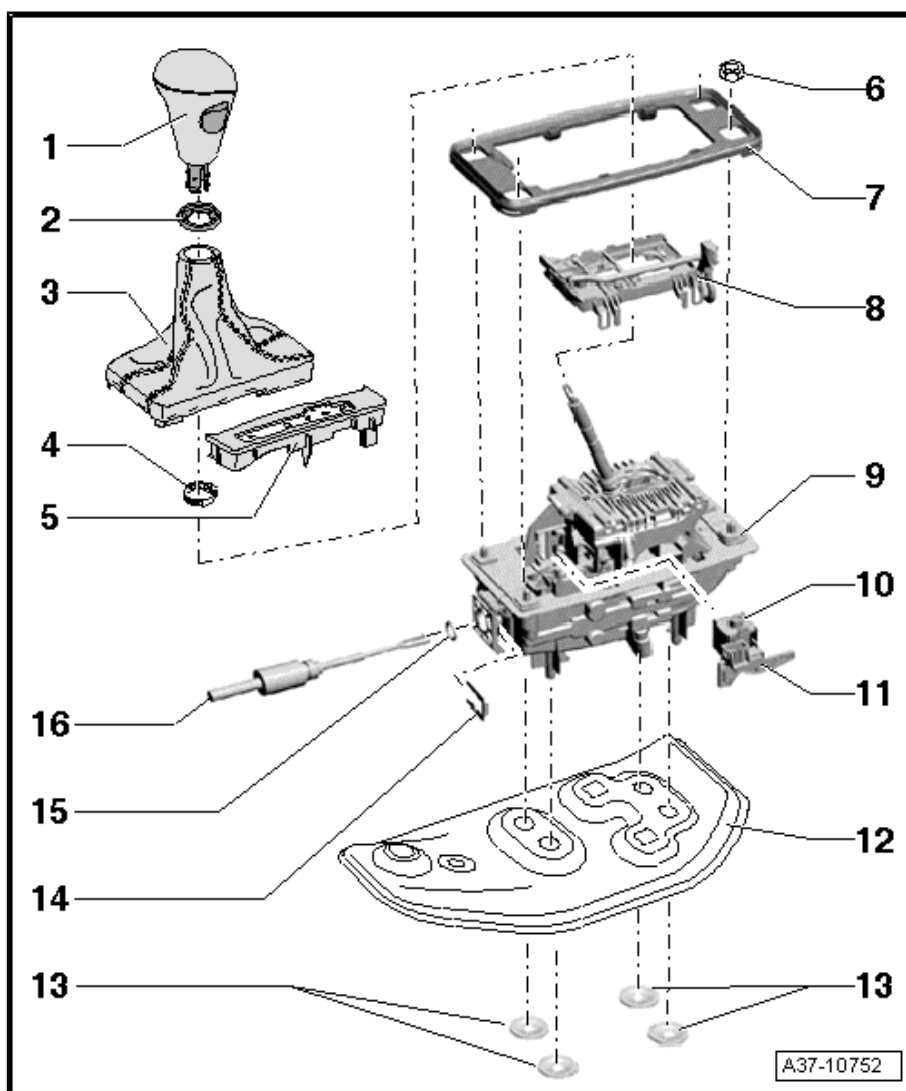
- ☐ Can only be renewed as a complete unit
- ☐ ➔ ["2.6 Removing and installing shift unit", page 33](#)

10 - Selector lever lock solenoid - N110-

- ☐ ➔ ["2.3 Removing and installing selector lever lock solenoid N110", page 31](#)

11 - Gear selector position P switch - F305-

- ☐ Consists of two microswitches on printed circuit board in selector lever lock solenoid - N110-



- ☐ Can only be renewed together with selector lever lock solenoid - N110- ,
⇒ ["2.3 Removing and installing selector lever lock solenoid N110 ", page 31](#)

12 - Noise/heat insulation

- ☐ Different types and part numbers fitted; select correct type ⇒ Electronic parts catalogue
- ☐ Not fitted on all vehicles

13 - Retaining washers

- ☐ 4x, always renew
- ☐ For securing noise insulation to shift unit

14 - Retaining clip

- ☐ Secures selector lever cable to shift unit

15 - O-ring

- ☐ Always renew

16 - Selector lever cable

- ☐ Do not bend or kink
- ☐ ⇒ ["4 Selector lever cable - exploded view", page 43](#)
- ☐ Before installing, lightly lubricate ball socket with polycarbamide grease - G 052 142 A2- .

2.1 Checking selector mechanism

Overview:

- ◆ 1. Checking operation of selector mechanism ⇒ [page 28](#)
- ◆ 2. Checking ignition key removal lock ⇒ [page 29](#)
- ◆ 3. Checking interlock button on selector lever handle
⇒ [page 29](#)

1. Checking operation of selector mechanism

- It should not be possible to operate the starter while the selector lever is in position "S", "D", "R" or in the "tiptronic gate".
- 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 2 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 "N" position until brake pedal is depressed.

Selector lever in "P" position and ignition switched on:

- Do not depress brake pedal.
- The selector lever is locked and cannot be shifted out of "P" position, even when the interlock button on the handle is pressed in. Selector lever lock solenoid - N110- blocks selector lever.
- Press and hold brake pedal.
- Selector lever lock solenoid - N110- releases selector lever. It is possible to shift into a driving gear. With interlock button on selector lever handle pressed, shift selector lever slowly from "P" position through "R, N, D and S" and check whether the selector lever position display - Y6- in the instrument cluster shows the correct selector lever position in each case.

Selector lever in position "N" and ignition switched on:

- Do not depress brake pedal.

- After a short delay: Selector lever is locked and cannot be shifted out of “N” position even when pressing the interlock button on the selector lever handle. Selector lever lock solenoid - N110- blocks selector lever.
- Depress brake pedal.
- Selector lever lock solenoid - N110- releases selector lever. Shifting into position “D” is possible.

Selector lever in position “D”, ignition switched on:

- Shift selector lever into “tiptronic gate”.
- The illuminated “D” symbol in the selector lever position display - Y26- should go out and the “+” and “-” symbols should light up.
- The selector lever position display - Y6- in the instrument cluster should change from “PRNDS” to “654321” when the selector lever is moved into the “tiptronic gate”.

If results do not match specifications:

- Perform Guided Fault Finding routine using ⇒ vehicle diagnostic tester .
- Adjust selector lever cable ⇒ [page 53](#) .
- Check interlock button on selector lever handle ⇒ [page 29](#) .
- Check ignition key removal lock.

2. Checking ignition key removal lock

- Turn the ignition key slightly clockwise to the “ignition on” position.
- 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 to position “P”.
- Remove 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, check the vehicle via the Guided Fault Finding function using the ⇒ vehicle diagnostic tester .

3. Checking interlock button on selector lever handle

Check that interlock button moves freely:

- Interlock button should move easily when pressed without force.
- Interlock button should spring back fully on its own when released.

If results do not match specifications:

- Make sure that selector lever handle is correctly installed ⇒ [page 39](#)

- Check whether selector rod or selector lever is bent.

Function test:

- Ignition switched on

Press the interlock button on the selector lever handle to move the handle into the positions listed below; it should not be possible to move the selector lever into these positions unless the interlock button is pressed.

- ◆ “P” to “R” (also depress brake pedal)
- ◆ “D” to “S”
- ◆ “N” to “R” (brake pedal also has to be depressed after a short delay when vehicle is stationary)
- ◆ “R” to “P”

If results do not match specifications:

- Make sure that selector lever handle is correctly installed
⇒ [page 39](#)
- Perform **Guided Fault Finding** using the ⇒ vehicle diagnostic tester and check selector lever lock solenoid - N110- .
- Adjust selector lever cable ⇒ [page 53](#) .

2.2 Manual release of selector mechanism from position “P”



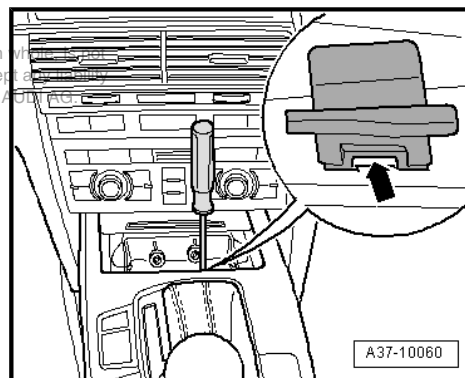
Note

- ◆ *If the battery is disconnected or discharged, the selector lever cannot be shifted from position “P”. In this case, the vehicle cannot be pushed or towed.*
- ◆ *When you operate the manual release mechanism the selector lever lock solenoid - N110- will release the lock without current supply.*
- Remove insert for front ashtray.
- Use screwdriver to pry off the cover cap in the ashtray housing -arrow-.



Note

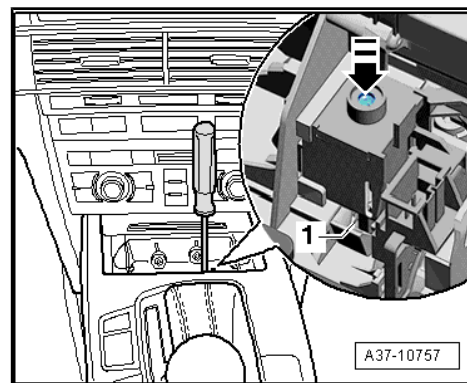
The shape of the cover cap may differ from the illustration.



- Insert tool (e.g. screwdriver) through centre opening in ashtray housing and into cylinder -arrow- on selector lever lock solenoid - N110- and at the same time press and hold button and move selector lever out of position "P".

 Note

- ◆ *This releases the selector lever lock in position "P" by way of the locking lever -1-.*
- ◆ *Cylinder -arrow- on selector lever lock solenoid - N110- may be partially concealed by noise insulation or wiring (move clear to one side).*



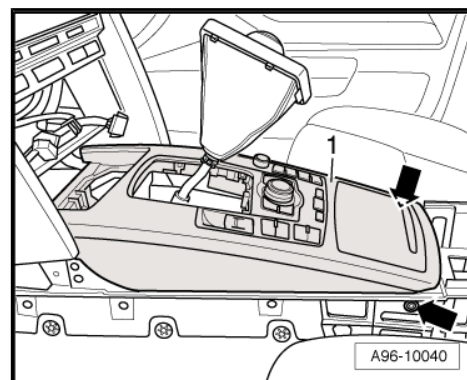
2.3 Removing and installing selector lever lock solenoid - N110-

Removing

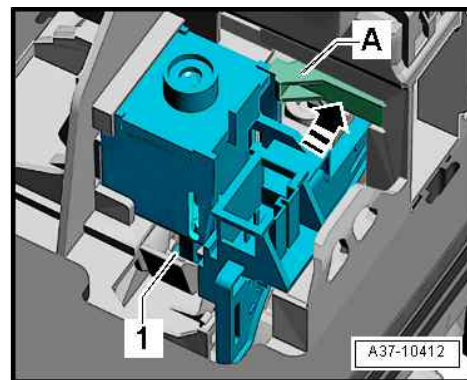
- Shift selector lever to position "P".
- Remove centre console (front) -1- ⇒ Rep. gr. 68 .



- Unplug electrical connector at selector lever lock solenoid - N110-.



- Press retaining hook -A- into selector mechanism -arrow- and hold in.



 Note

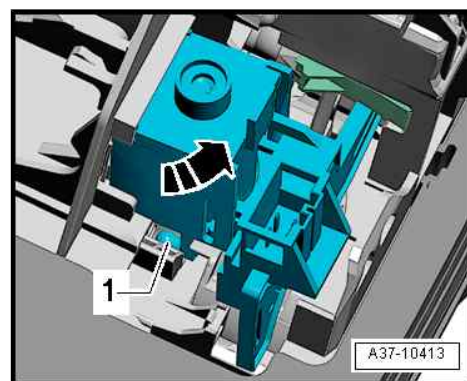
The shift unit must be renewed if the retaining hook -A- breaks off.

- Tilt bottom part of selector lever lock solenoid - N110- out in direction of -arrow- so that ball head -1- disengages from operating lever on selector mechanism.
- Detach selector lever lock solenoid - N110- .

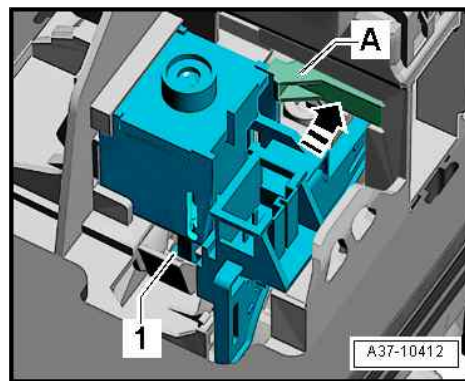
Installing

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

- Turn ball head -1- into correct installation position.
- Insert selector lever lock solenoid - N110- into selector mechanism at an angle from above.
- Tilt bottom part of selector lever lock solenoid - N110- in opposite direction of -arrow-.



- Ball head -1- must engage fully in operating lever on selector mechanism; press home with a small screwdriver if necessary.
- Secure selector lever lock solenoid - N110- to retaining hook -A-.
- Attach electrical connector to selector lever lock solenoid - N110- .
- Attach all electrical connectors.
- Check function of selector mechanism before carrying out remaining steps for installation ⇒ [page 28](#)



2.4 Removing and installing selector lever sensors control unit - J587- and tiptronic switch - F189-

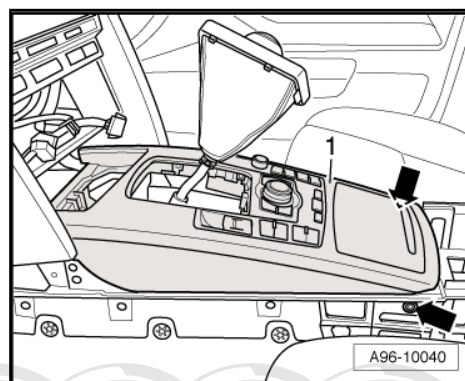


Note

- ♦ *Selector lever sensors control unit - J587- and tiptronic switch - F189- are integrated in one unit.*
- ♦ *The magnets for the tiptronic switch - F189- are secured on the cover.*

Removing

- Remove selector lever handle ⇒ [page 39](#) .
- Remove centre console (front) -1- ⇒ Rep. gr. 68 .

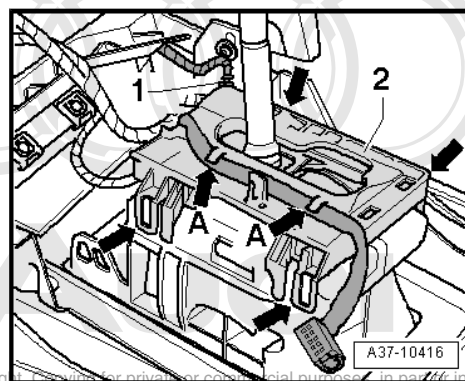


- Unplug electrical connector -1-.
- Release four retaining lugs -arrows- and lift out selector lever sensors control unit - J587- with tiptronic switch - F189- .

Installing

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

- Make sure selector lever sensors control unit - J587- with tiptronic switch - F189- clicks in place with four retaining lugs -arrows-.
- Secure wiring for selector lever position display - Y26- -arrows-.
- Install centre console (front) ⇒ Rep. gr. 68
- Install selector lever handle ⇒ [page 39](#) .



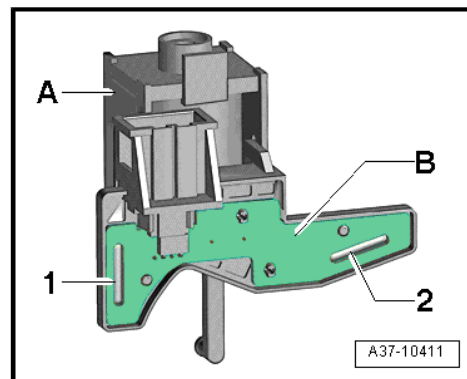
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2.5 Removing and installing gear selector position P switch - F305-

Gear selector position P switch - F305-

- ◆ Fitting location: Gear selector position P switch - F305- consists of two microswitches -1- and -2- installed on printed circuit board -B- in selector lever lock solenoid - N110- -A-.

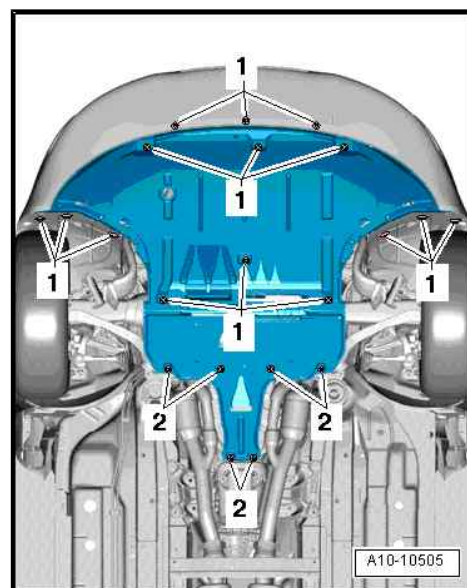
Installing: Gear selector position P switch - F305- can only be renewed together with selector lever lock solenoid - N110- ➔ [“2.3 Removing and installing selector lever lock solenoid N110”](#), page 31



2.6 Removing and installing shift unit

Removing

- Open quick release fasteners -2- and take off rear noise insulation.

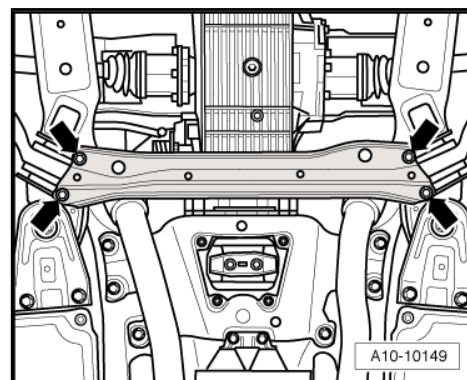


- Unbolt cross piece from subframe -arrows-.

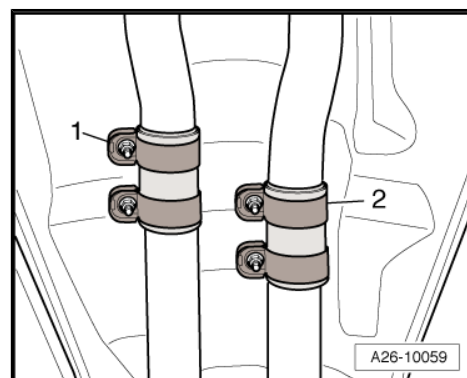
 **Caution**

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

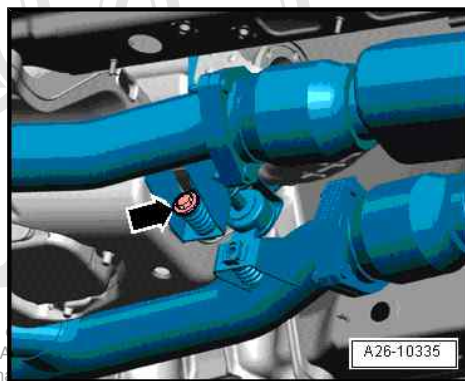
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- Unfasten clamps -1- and -2- and slide forwards.

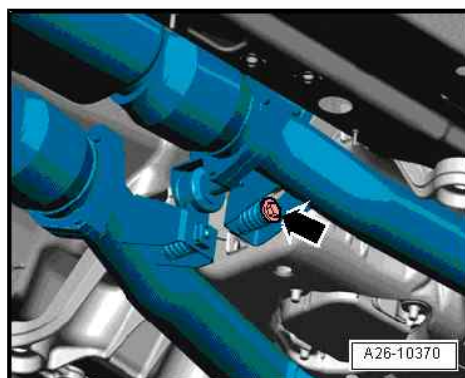


- Remove bolt -arrow- from bracket for exhaust system (left-side).

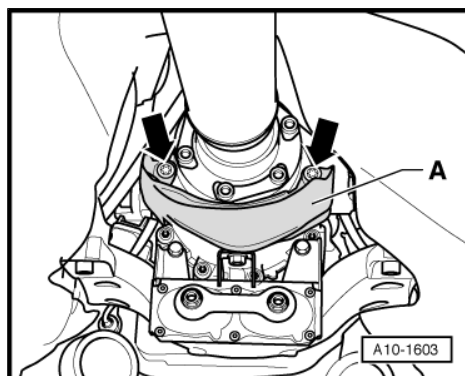


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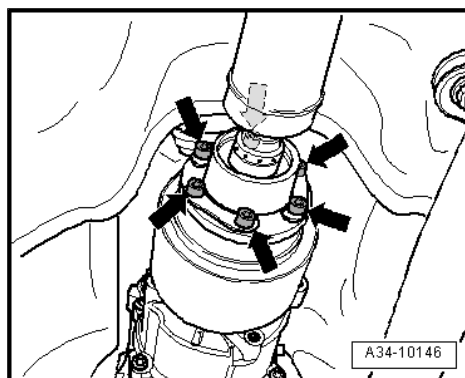
- Remove bolt -arrow- from bracket for exhaust system (right-side).



- Remove bolts -arrows- and detach heat shield -A- for propshaft.



- Remove bolts -arrows- from connection between gearbox and propshaft (front end).

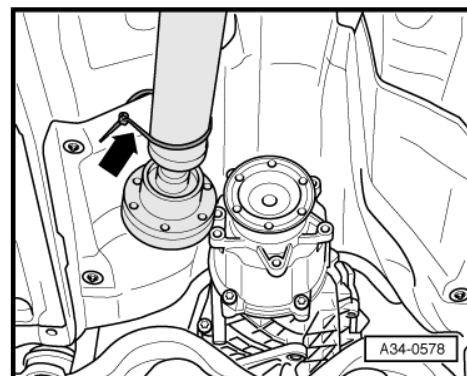


- Slide propshaft together towards rear final drive and tie up.

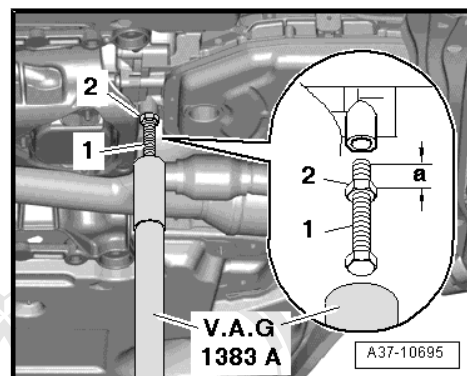


Caution

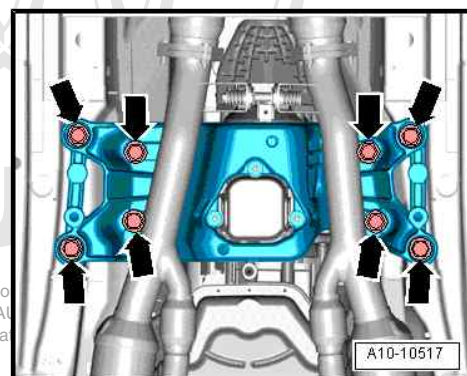
*When performing the steps below, please note the following:
Do not support the gearbox under the oil pan - risk of damage.*



- Insert a bolt M12x100 -item 1- with attached nut -2- into the mounting hole behind the oil pan on the gearbox.
- Dimension -a- = 13 mm
- Apply lifting column of engine and gearbox jack - V.A.G 1383 A- to bolt head as illustrated.



- Remove bolts -arrows- at tunnel cross member.

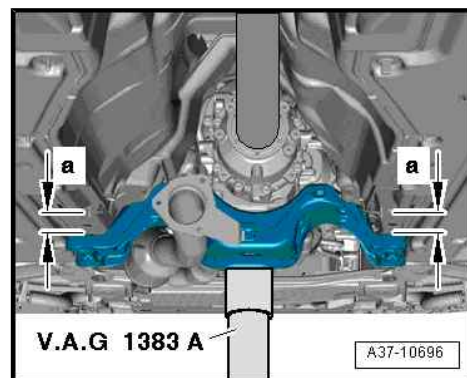


- Lower tunnel cross member and gearbox slightly using engine and gearbox jack - V.A.G 1383 A- .
- Dimension -a- = max. 40 mm.



Note

Front exhaust pipe (right-side) is not shown in illustration, however it does not have to be removed.

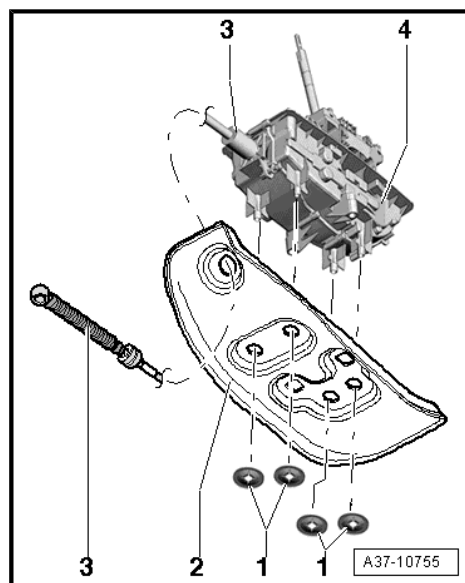


- Remove the four retaining washers -1-.

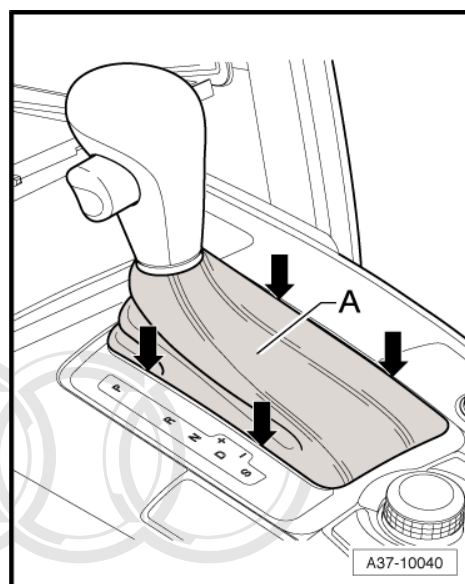


Note

- ◆ Always renew retaining washers
- ◆ Different types of noise/heat insulation -2- are fitted, depending on the vehicle model.
- Pull off noise insulation -2- and slide forwards or remove completely.



- Unclip retaining frame for selector lever boot -1- from centre console and lift off -arrows-.

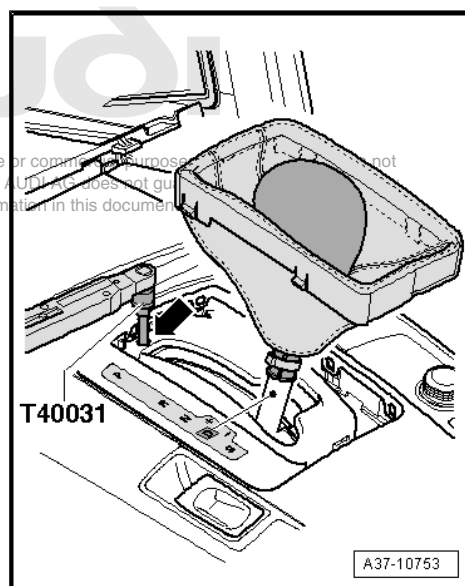


- Shift selector lever to position “D”.
- Insert socket - T40031- through access hole -arrow- in selector mechanism and slacken bolt on selector lever cable approx. one turn.



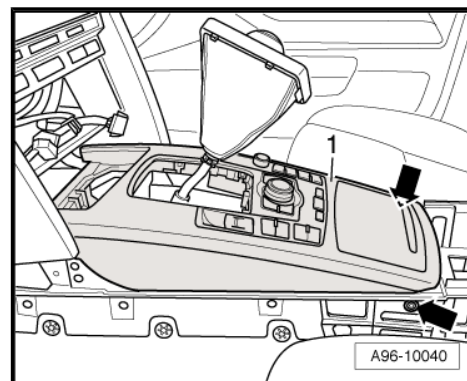
Note

- ◆ Only loosen clamping bolt – do not remove.
- ◆ Clamping bolt can only be accessed with selector lever in position “D”.
- ◆ With clamping bolt loosened, selector lever must remain in position “D”.



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- Remove centre console (front) -1- ⇒ Rep. gr. 68 .

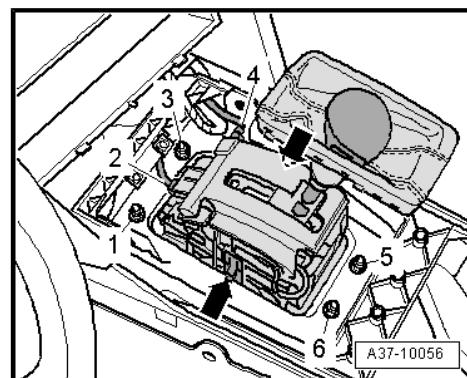


- Unplug electrical connectors -2- and -4-.
- Remove bolts -1-, -3-, -5- and -6-.

 Note

The assistance of a second mechanic is required in order to remove the shift unit from below.

- Press in retaining clips -arrows- and lower shift unit.



- Pull off retaining clip -1- for selector lever cable from the side.
- Remove shift unit from below (pull out selector lever cable -2- at the same time).

Installing

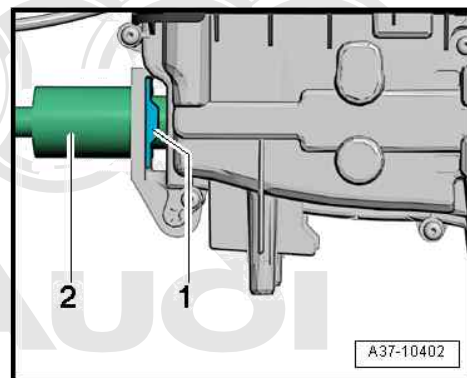
Installation is carried out in reverse sequence; note the following:

Tightening torques ⇒ [page 27](#)

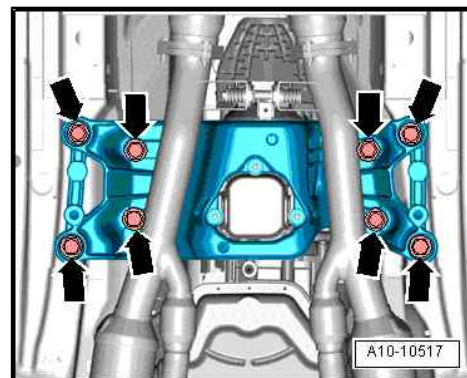
 Note

- ◆ *Before installing, lightly lubricate ball socket on selector lever cable with polycarbamide grease - G 052 142 A2-.*

- ◆ *Do not bend or kink the selector lever cable.*

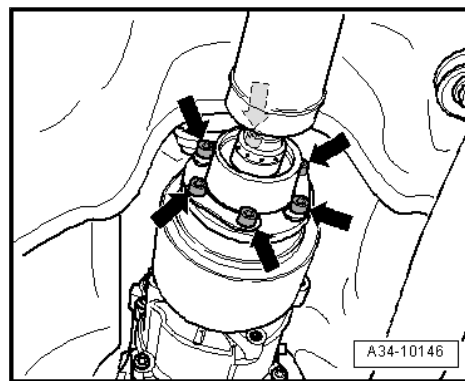


- Install tunnel cross member ⇒ [page 73](#) .
- Adjust selector lever cable ⇒ [page 53](#) .





- Attach propshaft to gearbox ⇒ Rear final drive 0AR; Rep. gr. 39 .
- Install exhaust system and perform stress-free alignment ⇒ Rep. gr. 26. .
- Install front cross piece ⇒ General body repairs, exterior; Rep. gr. 50 .
- Install centre console (front) ⇒ General body repairs, interior; Rep. gr. 68 .



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3 Selector lever handle, selector lever position display - Y26- - exploded view

1 - Clamp

- ❑ To secure selector lever handle to selector lever
- ❑ Removing and installing
⇒ [page 39](#)

2 - Trim ring

- ❑ Removing and installing
⇒ [page 42](#)

3 - Selector lever handle

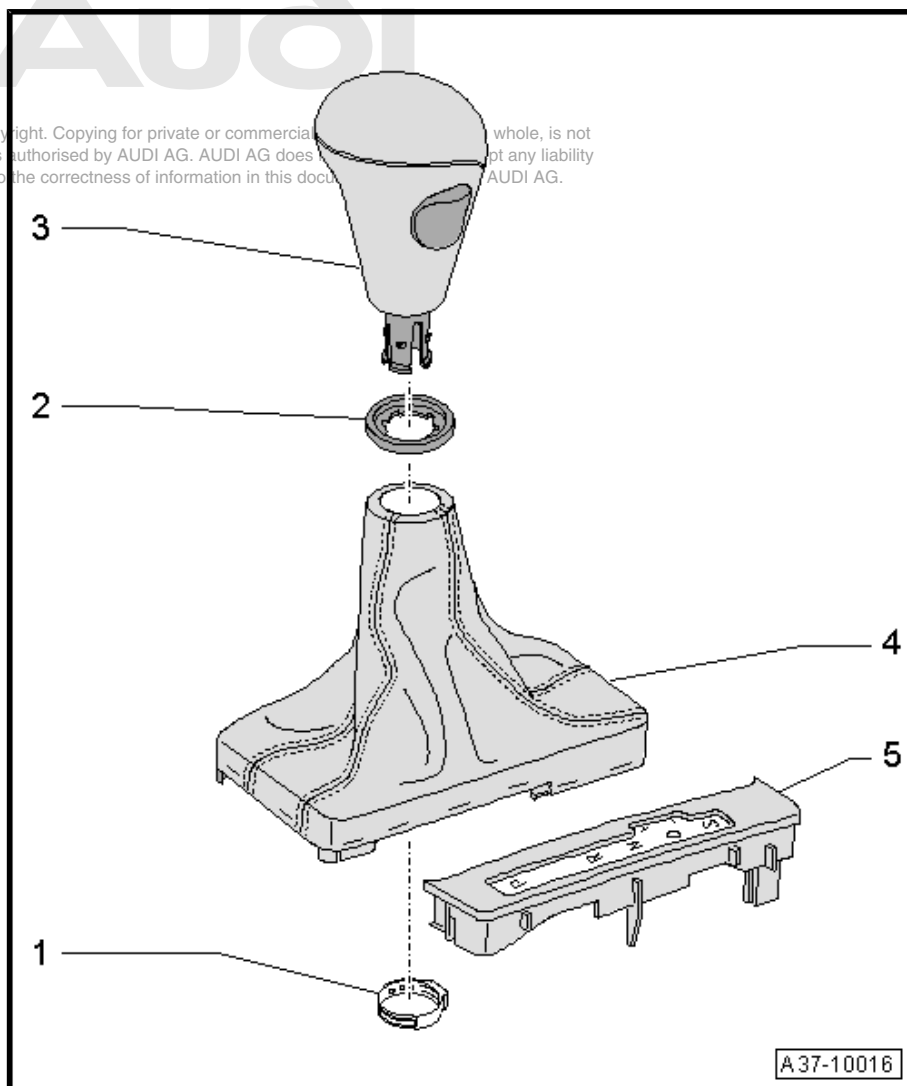
- ❑ ⇒ ["3.1 Removing and installing selector lever handle"](#), [page 39](#)

4 - Selector lever boot

- ❑ ⇒ ["3.2 Detaching selector lever boot from selector lever handle"](#), [page 42](#)

5 - Selector lever position display - Y26-

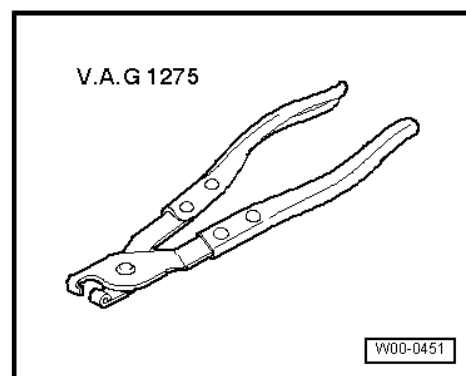
- ❑ ⇒ ["3.3 Removing and installing selector lever position display Y26"](#), [page 42](#)



3.1 Removing and installing selector lever handle

Special tools and workshop equipment required

- ◆ Hose clip pliers - V.A.G 1275-



Removing

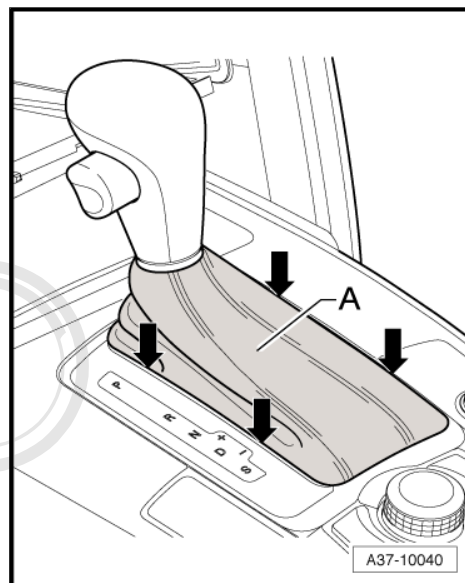
- Shift selector lever to position “N”.



Note

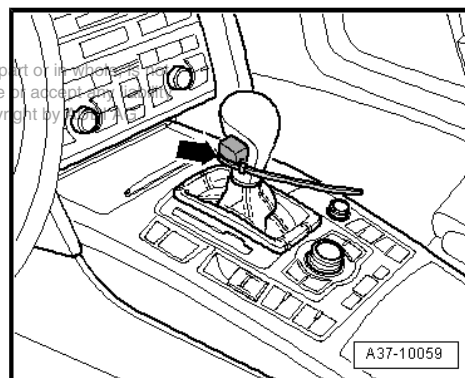
The selector lever handle is removed together with the selector lever boot.

- Unclip retaining frame for selector lever boot -1- from centre console and lift off -arrows-.

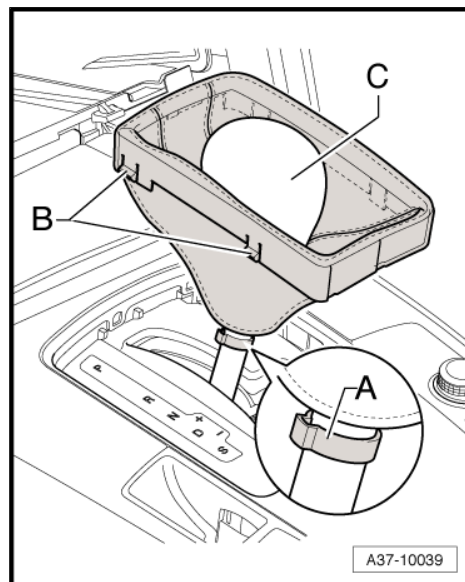


- Use a cable tie to secure the interlock button in pulled-out position -arrow-, as shown in the illustration.

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- Turn up selector lever boot -1- over selector lever handle -2-.
- Release clamp -arrow- and detach selector lever handle together with selector lever boot. Avoid touching the interlock button.

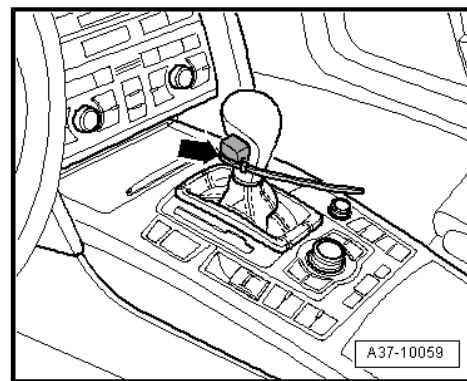


Installing

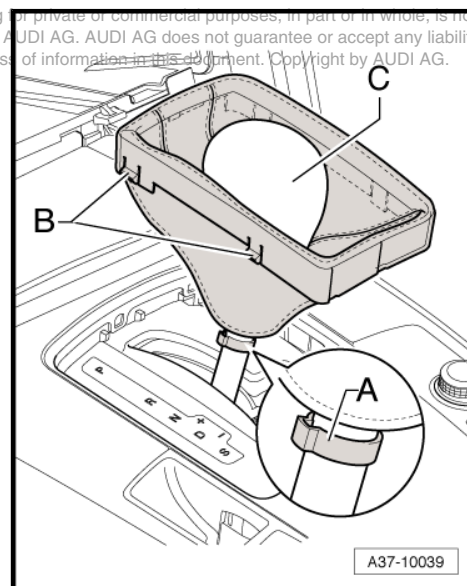


Note

- ◆ *To install the selector lever handle the interlock button has to be pulled out to the stop and must be secured with either a cable tie -arrow- or with the assembly aid supplied together with the new handle.*
- ◆ *If, by mistake, the interlock button has not been secured, it must not be pulled out of the selector lever handle by means of mechanical tools. Apply a compressed-air gun at the bottom of the handle and press the interlock button out with compressed air.*



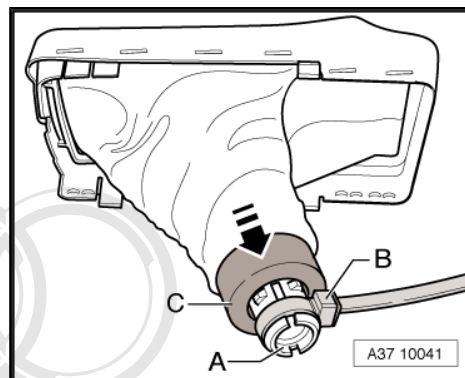
- Place selector lever handle fully on selector lever - interlock button points towards the driver.
- The handle must engage in the annular groove on the selector lever.
- Remove the cable tie or assembly aid, allowing the interlock button mechanism to engage in the vertical groove on the selector lever. If necessary, press the interlock button into the selector lever handle.
- Move selector lever to positions “R” and “S” to check button mechanism.
- If selector lever cannot be moved into above positions, handle must be removed again ➔ [page 39](#) .
- Secure selector lever handle -2- onto selector lever with clamp -arrow-. Use hose clip pliers - V.A.G 1275- for this purpose
- Clip retaining frame for selector lever boot -1- onto centre console.



3.2 Detaching selector lever boot from selector lever handle

Removing

- Remove selector lever handle ⇒ [page 39](#) .
- Tie together spring tips -1- of selector lever handle using cable tie -3- as shown in illustration.
- Slide sleeve -2- of selector lever boot past retaining tabs on spring tips -arrow-.
- Remove cable tie and detach sleeve with selector lever boot from selector lever.



Installing

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

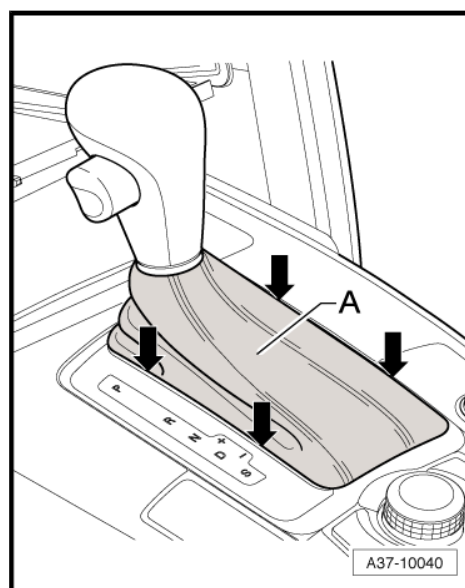
Fitting position of selector lever boot:

- The longer side of the retaining frame for the selector lever boot faces the driver's side.
- Install selector lever handle ⇒ [page 39](#) .

3.3 Removing and installing selector lever position display -Y26-

Removing

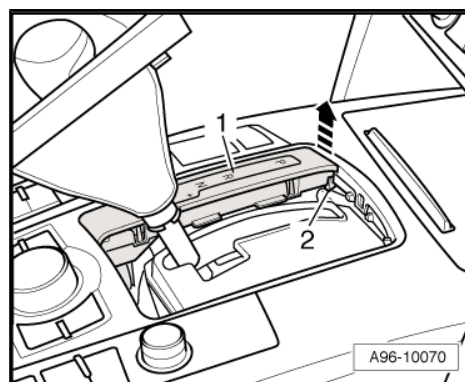
- Shift selector lever to position "N".
- Unclip retaining frame for selector lever boot -1- from centre console and lift off -arrows-.
- Turn up selector lever boot.



- Release retaining spring -2- and detach selector lever position display - Y26- -item 1- -arrow-.
- Unplug electrical connector.

Installing

Install in reverse sequence.



4 Selector lever cable - exploded view

1 - Support bracket for selector lever cable

2 - Bolt

- ☐ 8 Nm

3 - Bolt

- ☐ 8 Nm

4 - Heat shield

- ☐ For selector lever cable

5 - Retaining clip

- ☐ Secures selector lever cable to support bracket

6 - Selector lever cable

- ☐ Do not bend or kink
- ☐ Removing and installing
⇒ [page 43](#)
- ☐ Selector lever cable must be renewed if rubber sleeve is damaged
- ☐ Before installing, lightly lubricate ball socket with polycarbamide grease - G 052 142 A2- .
- ☐ When installing, make sure that rubber sleeve on gearbox end is not twisted
- ☐ Adjusting ⇒ [page 53](#)

7 - Selector shaft lever

8 - Bolt

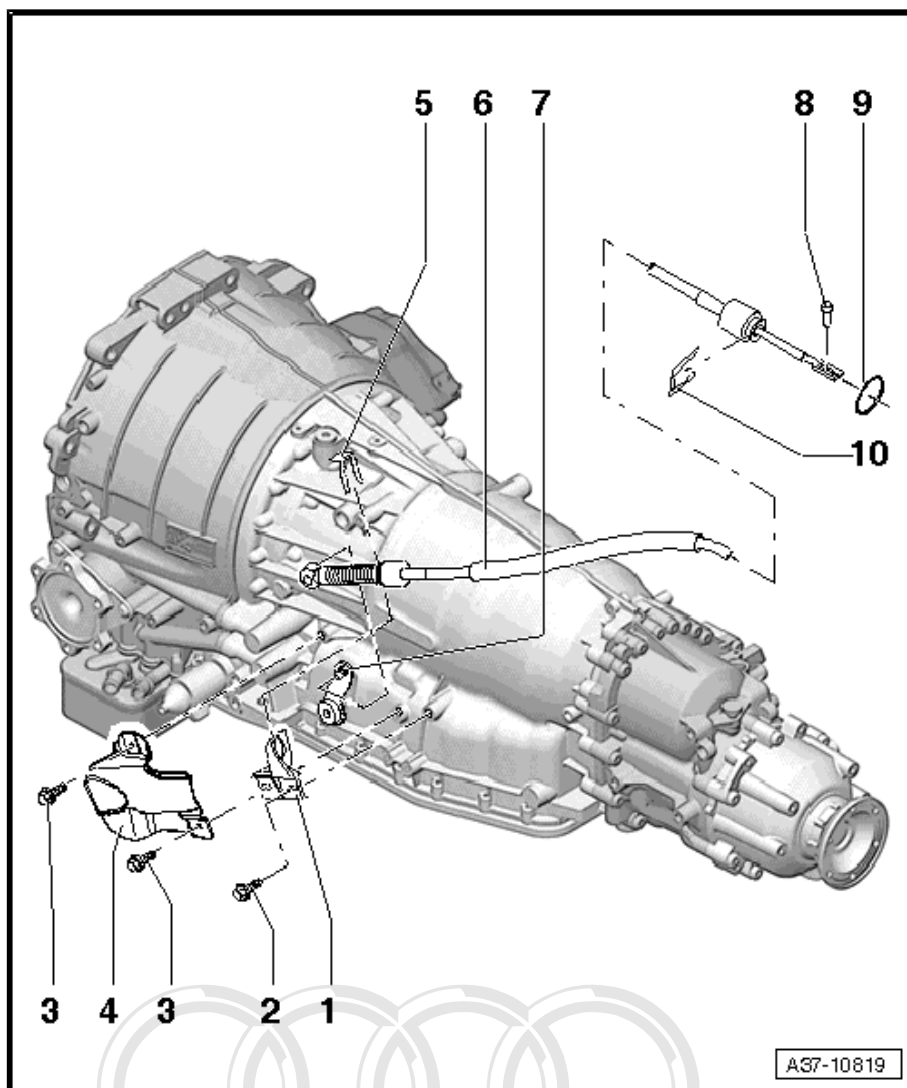
- ☐ 13 Nm
- ☐ For adjusting selector lever cable

9 - O-ring

- ☐ Always renew

10 - Retaining clip

- ☐ For securing selector lever cable to shift unit

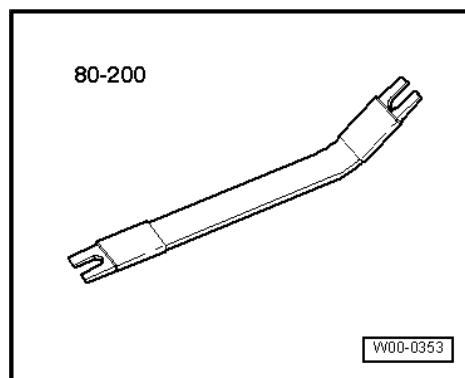


4.1 Removing and installing selector lever cable

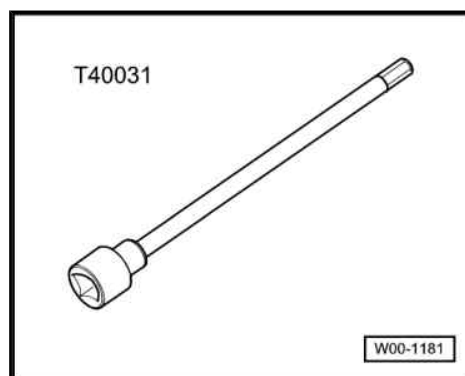
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Special tools and workshop equipment required

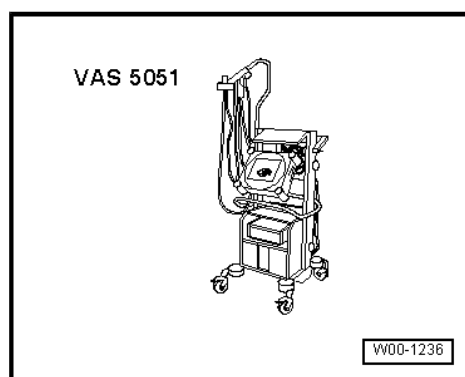
◆ Removal lever - 80-200-



◆ Socket - T40031-



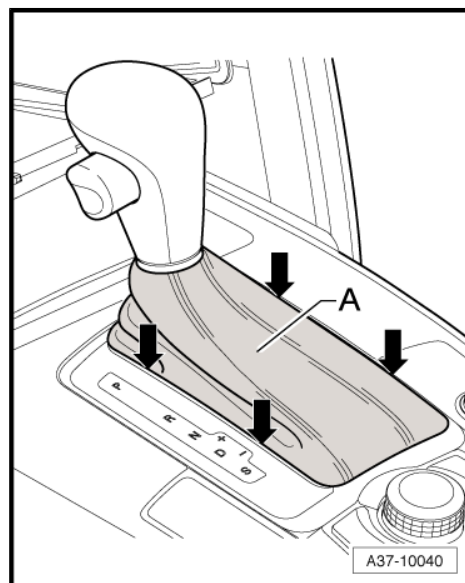
◆ Vehicle diagnostic tester



Removing

- Unclip retaining frame for selector lever boot -1- from centre console and lift off -arrows-.
- Shift selector lever to position "D".

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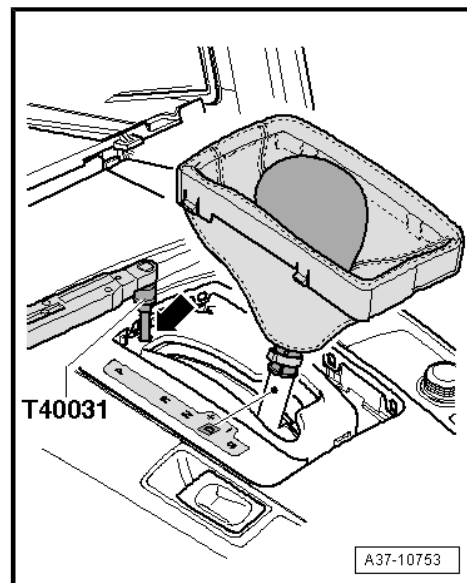


- Insert socket - T40031- through access hole -arrow- in selector mechanism and slacken bolt on selector lever cable approx. one turn.



Note

- ◆ *Only loosen clamping bolt – do not remove.*
- ◆ *Clamping bolt can only be accessed with selector lever in position "D".*
- ◆ *With clamping bolt loosened, selector lever must remain in position "D".*
- Detach torque wrench from socket - T40031- .
- Leave socket - T40031- attached to clamping bolt in selector mechanism -arrow-.



- Open quick release fasteners -2- and take off rear noise insulation.



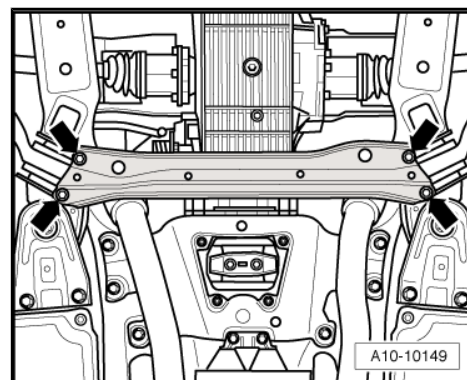
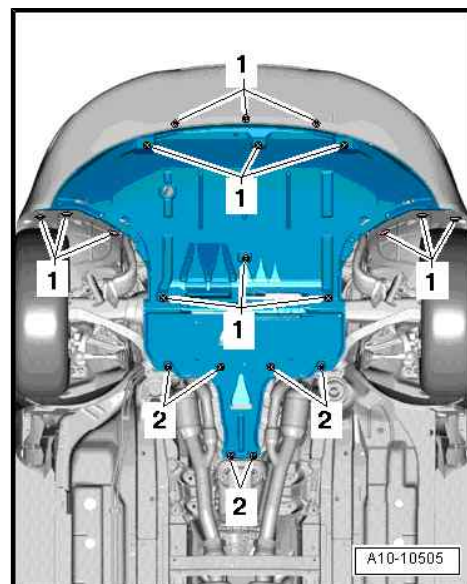
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- Unbolt cross piece from subframe -arrows-.

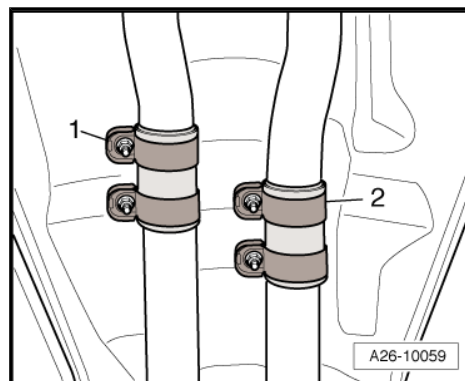


Caution

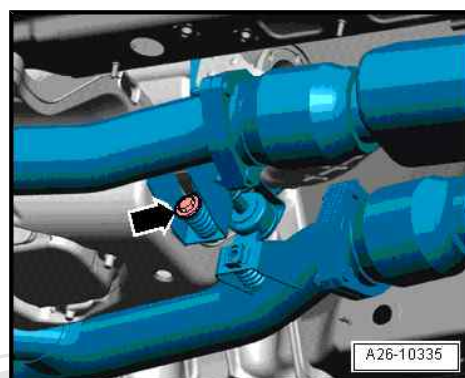
The flexible pipe connection (de-coupling element) on the front exhaust pipe must not be bent more than 10° – otherwise it can be damaged.



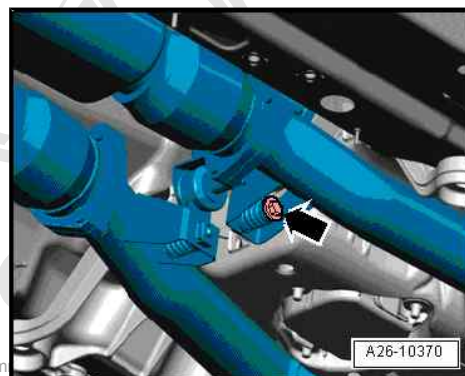
- Unfasten clamps -1- and -2- and slide forwards.



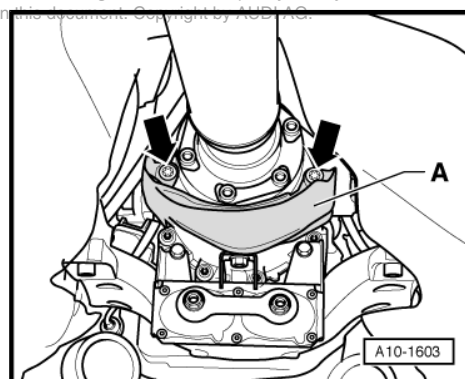
- Remove bolt -arrow- from bracket for exhaust system (left-side).



- Remove bolt -arrow- from bracket for exhaust system (right-side).



- Remove bolts -arrows- and detach heat shield -A- for prop-shaft.



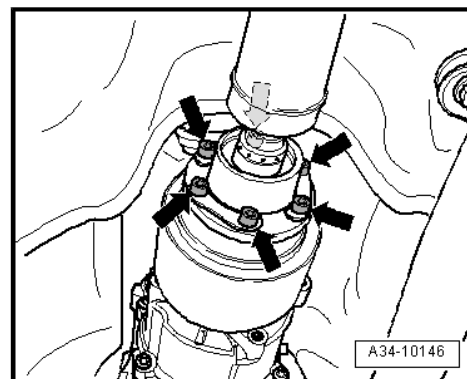
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- Remove bolts -arrows- from connection between gearbox and propshaft (front end).
- Slide propshaft together towards rear final drive and tie up.

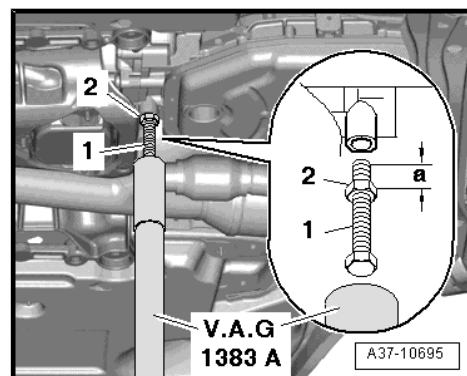


Caution

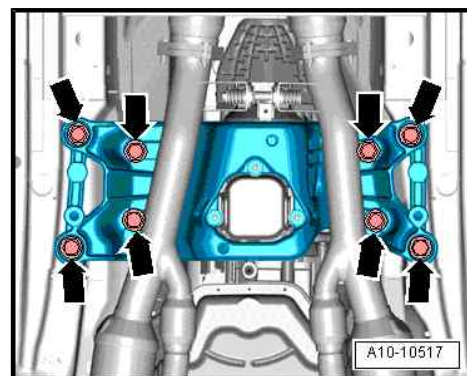
*When performing the steps below, please note the following:
Do not support the gearbox under the oil pan - risk of damage.*



- Insert a bolt M12x100 -item 1- with attached nut -2- into the mounting hole behind the oil pan on the gearbox.
- Dimension -a- = 13 mm
- Apply lifting column of engine and gearbox jack - V.A.G 1383 A- to bolt head as illustrated.



- Remove bolts -arrows- at tunnel cross member.

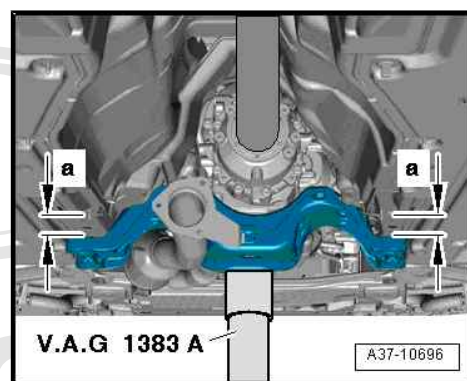


- Lower tunnel cross member and gearbox slightly using engine and gearbox jack - V.A.G 1383 A- .
- Dimension -a- = max. 40 mm.



Note

Front exhaust pipe (right-side) is not shown in illustration, however it does not have to be removed.



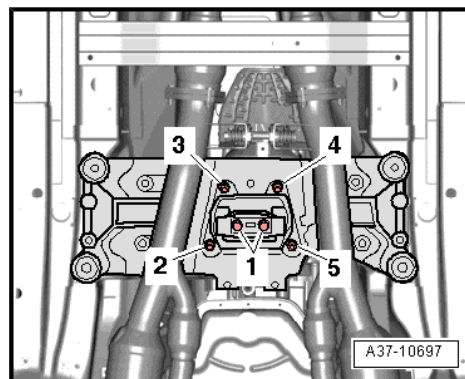
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- Remove bolts -1- and rest tunnel cross member and gearbox mounting on exhaust system.

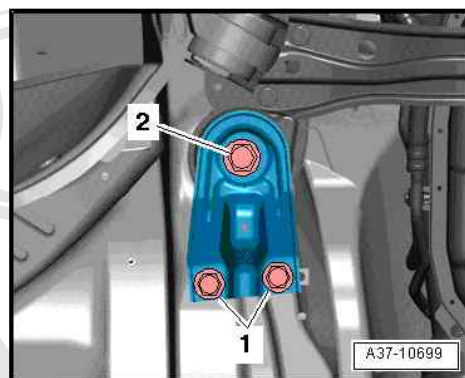


Note

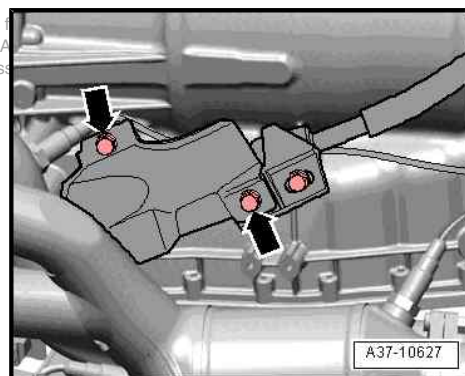
Disregard -items 2 ... 5-.



- Remove bolts -1- and -2- and detach subframe support (rear left).



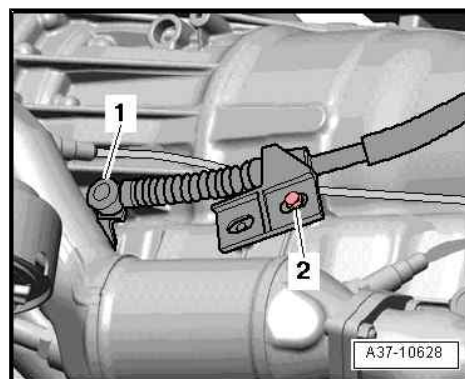
- Remove bolts -arrows- and detach heat shield for selector lever cable.



Note

Mark installation position of support bracket for selector lever cable with a felt-tip pen in preparation for re-installation.

- Use removal lever - 80-200- to pry ball socket -1- on selector lever cable off selector shaft lever.
- Unbolt support bracket -2- and detach from gearbox.



Note

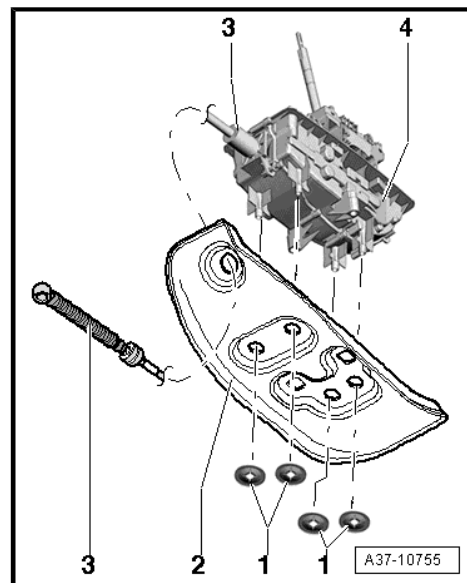
Do not bend or kink the selector lever cable.

- Remove four retaining washers -1-.

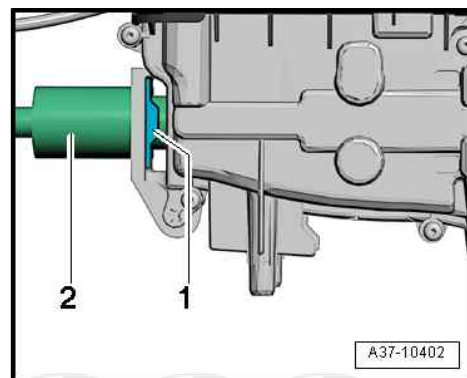


Note

- ◆ *Always renew retaining washers*
- ◆ *Different types of noise/heat insulation -2- are fitted, depending on the vehicle model.*
- Pull off noise insulation -2- and slide forwards or remove completely.



- Pull off retaining clip -1- for selector lever cable from the side.
- Pull selector lever cable -2- out of selector mechanism.



Installing

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

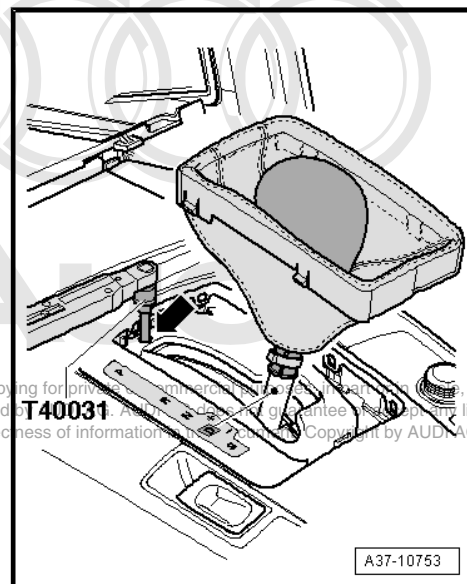
Tightening torques [⇒ page 43](#)

- Selector lever in position -D-.
- Socket - T40031- attached to clamping bolt in selector mechanism -arrow-.



Note

- ◆ *Clamping bolt can only be accessed with selector lever in position "D".*
- ◆ *Before installing, lightly grease cable eye and ball socket on selector lever cable with polycarbamide grease - G 052 142 A2- .*

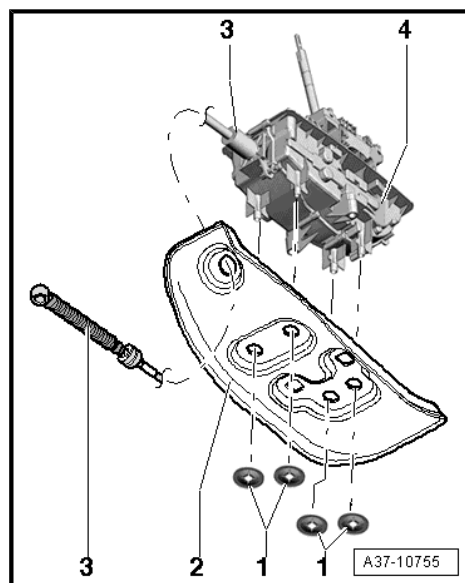


- Slide selector lever cable -3- through hole on noise insulation -2-.

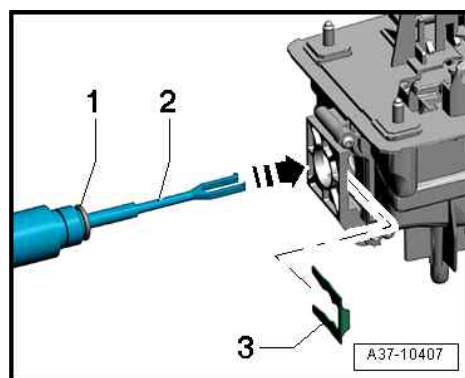


Note

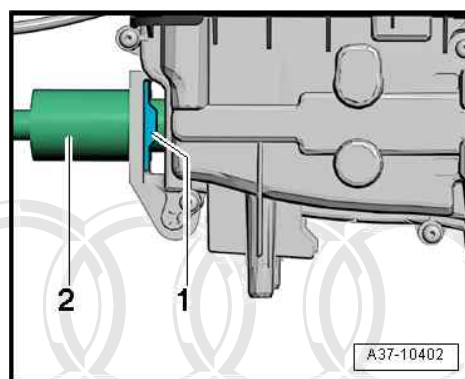
Different types of noise/heat insulation -2- are fitted, depending on the vehicle model.



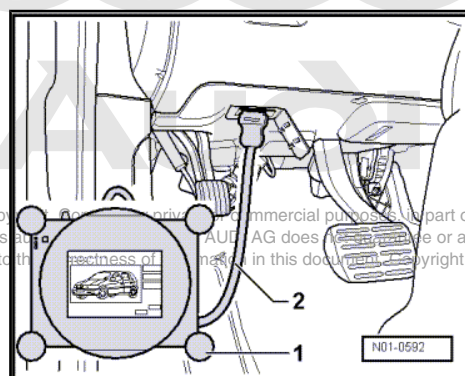
- Renew O-ring -1- on selector lever cable.
- Insert selector lever cable -2- into shift unit -arrow-.
- Secure selector lever cable -2- with retaining clip -3-.



- Installation position: angled end of retaining clip -1- must point towards selector mechanism.



- Connect vehicle diagnostic tester.
- Switch on ignition, select **Vehicle self-diagnosis** and vehicle system **02 - Gearbox electronics** ⇒ vehicle diagnostic tester.



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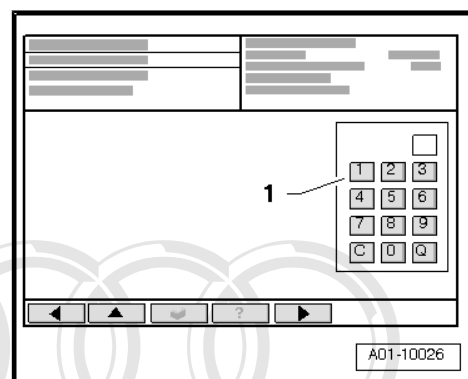
Compare position of selector lever with position of multi-function switch - F125- in gearbox:

- From list -1- select diagnostic function 08 - Read measured value block.



Display on diagnostic tester:

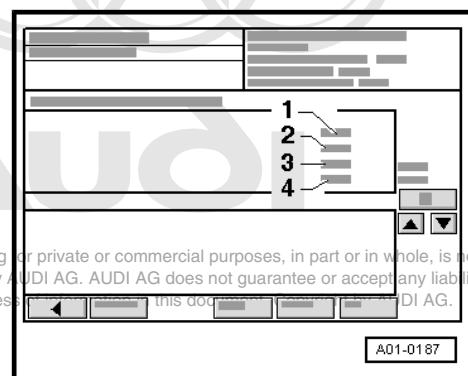
- Using keypad -1-, press button 4 for "Display group 4" and confirm entry by pressing Q button.



- Compare display in zone -2- with position of selector lever, with selector lever position display - Y26- (on selector mechanism) and with selector lever position display - Y6- (in instrument cluster).

- The displays should all show position "D".

If the displays do not match:



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- Move selector shaft lever until position “D” is shown on vehicle diagnostic tester.

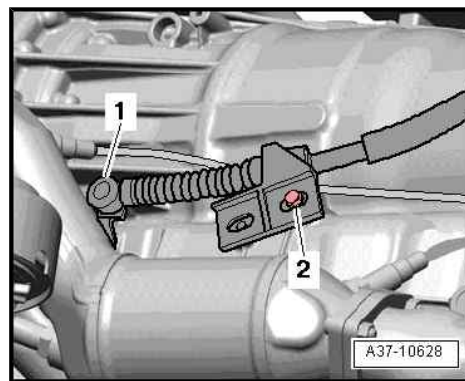
If the displays match:

- Carefully press ball socket -1- of selector lever cable onto selector shaft lever in this position.



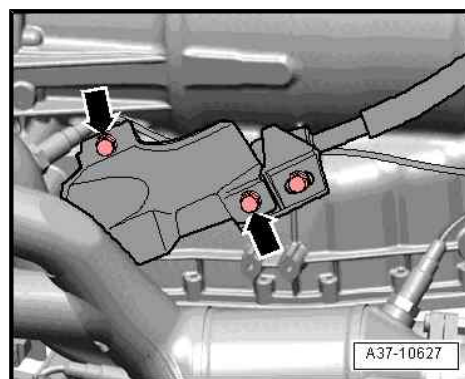
Note

Take care not to bend selector shaft lever when pressing on cable; support lever if necessary, as otherwise selector mechanism can no longer be adjusted accurately.



Note

- ◆ Note installation position for selector lever cable support bracket (felt-tip pen marking).
- ◆ Do not bend or kink the selector lever cable.
- Align support bracket -2- with marking and bolt onto gearbox.
- Fit heat shield for selector lever cable and secure with bolts -arrows-.



Note

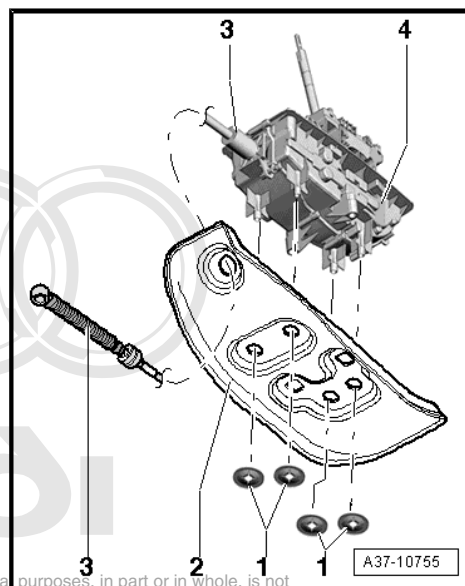
- Secure noise insulation to selector mechanism using four new retaining washers -1-.



Note

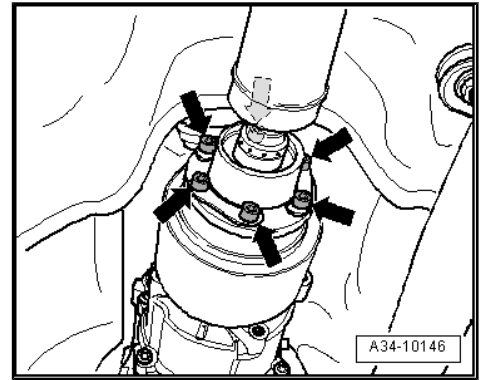
Different types of noise/heat insulation -2- are fitted, depending on the vehicle model.

- Install gearbox mounting and tunnel cross member
⇒ [page 73](#).



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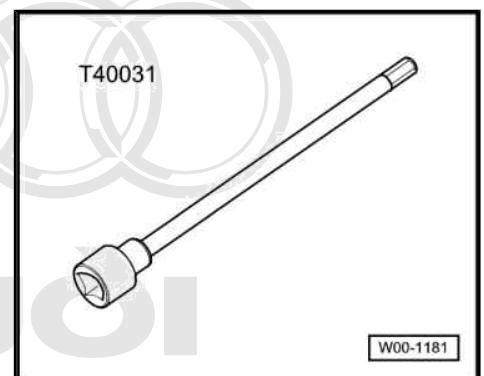
- Attach propshaft to gearbox ⇒ Rear final drive 0AR; Rep. gr. 39 .
- Adjust selector lever cable ⇒ [page 53](#) .
- Check selector mechanism ⇒ [page 28](#) .
- Install exhaust system and perform stress-free alignment ⇒ Rep. gr. 26. .
- Install cross piece for subframe ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 .



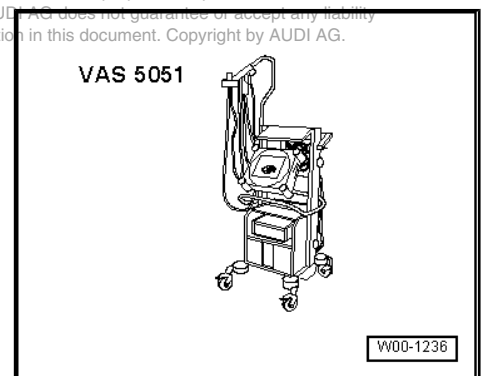
4.2 Adjusting selector lever cable

Special tools and workshop equipment required

- ◆ Socket - T40031-



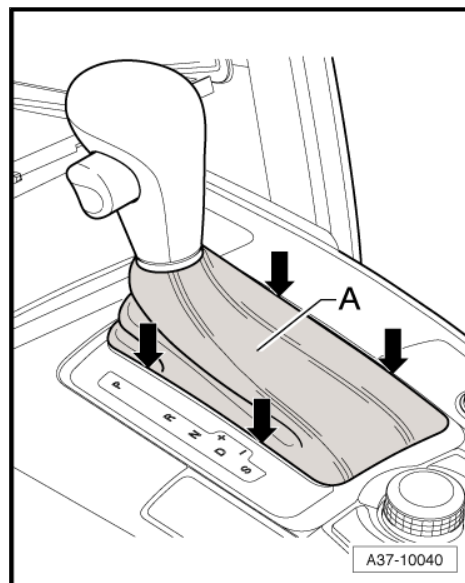
- ◆ Vehicle diagnostic tester



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Procedure

- Unclip retaining frame for selector lever boot -1- from centre console and lift off -arrows-.

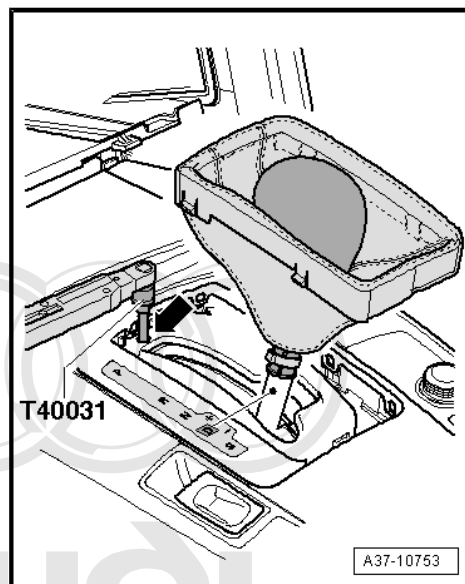


- Shift selector lever to position "D".
- Insert socket - T40031- through access hole -arrow- in selector mechanism and slacken bolt on selector lever cable approx. one turn.



Note

- ◆ Only loosen clamping bolt approx. one turn - do not remove.
- ◆ Clamping bolt can only be accessed with selector lever in position "D".
- ◆ With clamping bolt loosened, selector lever must remain in position "D".
- Detach torque wrench from socket - T40031- .
- Leave socket - T40031- attached to clamping bolt in selector mechanism -arrow-.
- Carefully move selector lever slightly forwards and backwards, without shifting lever into a different selector lever position. The selector lever cable is thereby slackened.
- Check that selector lever is set accurately in position "D". To do so, push selector lever slightly towards driver's seat.



Note

Do not touch selector lever again during adjustment process.

- Use socket - T40031- to tighten clamping bolt in this position, making sure not to touch selector lever; tightening torque ⇒ [page 43](#)
- Check selector mechanism ⇒ [page 28](#) .

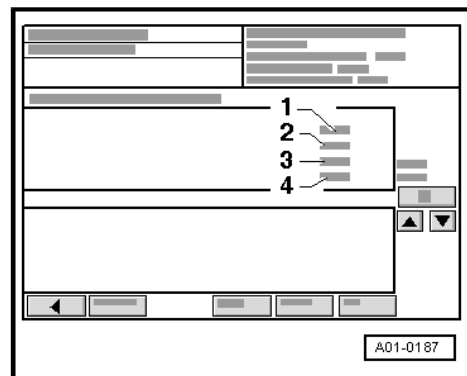


Note

Use the vehicle diagnostic tester to compare the position of the multi-function switch - F125- with the position of the selector lever: Vehicle self-diagnosis, 02 - Gearbox electronics, 08 - Read measured value block, display group 4, display zone -2-.

If selector mechanism is not functioning correctly after adjusting selector lever cable, proceed as follows:

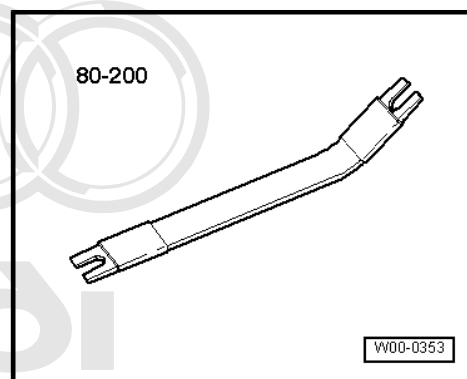
- Adjust selector lever cable to basic setting ➔ [page 55](#) .



4.3 Adjusting selector lever cable to basic setting

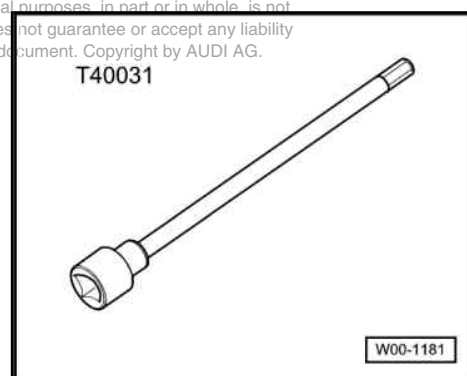
Special tools and workshop equipment required

- ◆ Removal lever - 80-200-

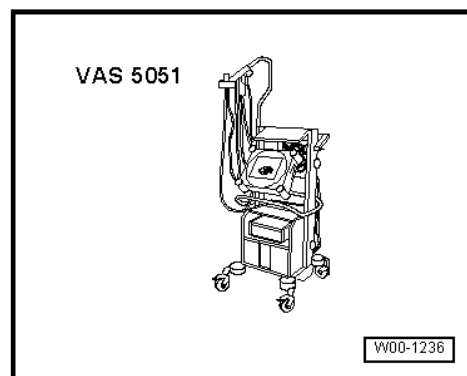


- ◆ Socket - T40031-

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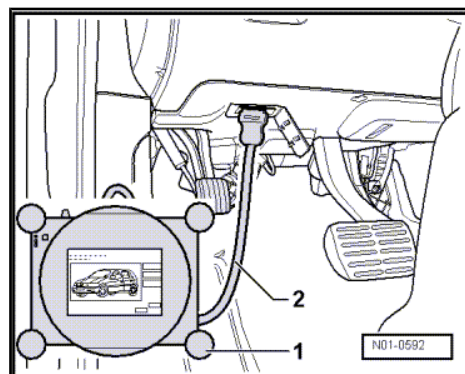


- ◆ Vehicle diagnostic tester



Procedure

- Guided Fault Finding using the ⇒ vehicle diagnostic tester has been completed.
- Switch on ignition, select Vehicle self-diagnosis and vehicle system 02 - Gearbox electronics ⇒ vehicle diagnostic tester.



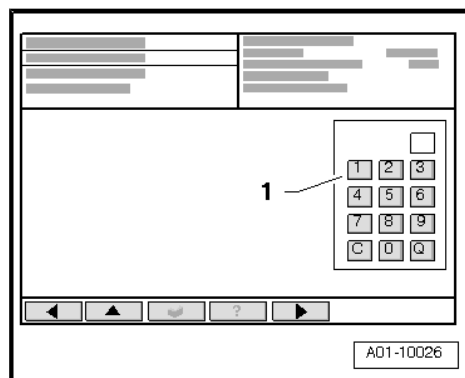
Compare position of selector lever with position of multi-function switch - F125- in gearbox:

- From list -1- select diagnostic function 08 - Read measured value block.



Display on diagnostic tester:

- Using keypad -1-, press button 4 for “Display group 4” and confirm entry by pressing Q button.



- Compare display in zone -2- with position of selector lever, with selector lever position display - Y26- (on selector mechanism) and with selector lever position display - Y6- (in instrument cluster).

- The displays should match

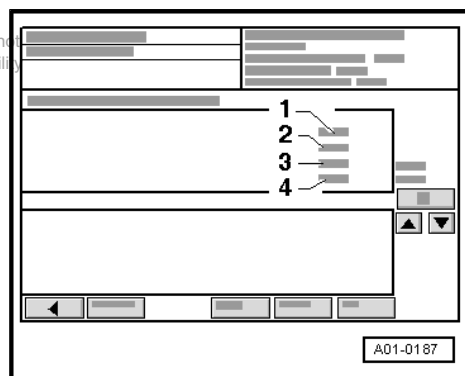
If the displays do not match:

- Adjust selector lever cable ⇒ [page 53](#).

If the displays cannot be matched by adjusting the selector lever cable ⇒ [page 56](#)

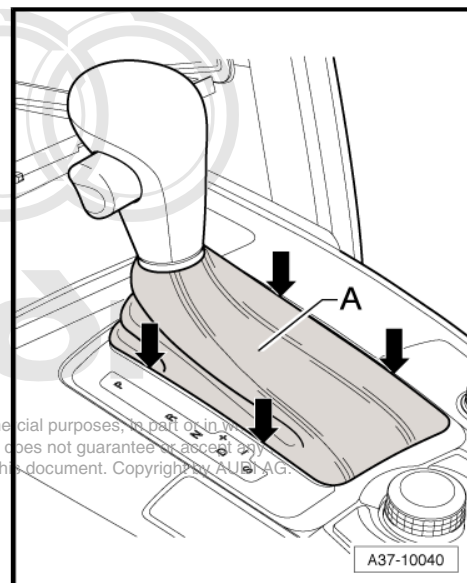
Adjusting selector lever cable to basic setting:

Tightening torques ⇒ [page 43](#)



- Unclip retaining frame for selector lever boot -1- from centre console and lift off -arrows-.
- Shift selector lever to position "D".

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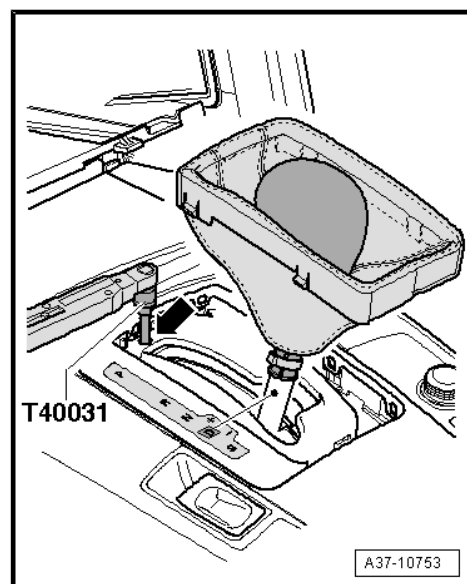


- Insert socket - T40031- through access hole -arrow- in selector mechanism and slacken bolt on selector lever cable approx. one turn.

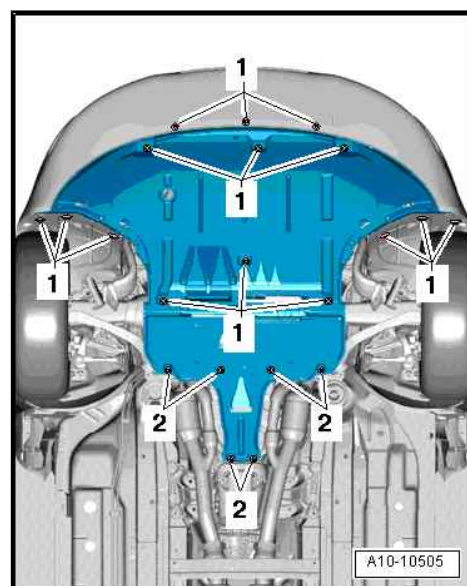


Note

- ◆ *Only loosen clamping bolt – do not remove.*
- ◆ *Clamping bolt can only be accessed with selector lever in position "D".*
- ◆ *With clamping bolt loosened, selector lever must remain in position "D".*
- Detach torque wrench from socket - T40031- .
- Leave socket - T40031- attached to clamping bolt in selector mechanism -arrow-.



- Open quick release fasteners -2- and take off rear noise insulation.

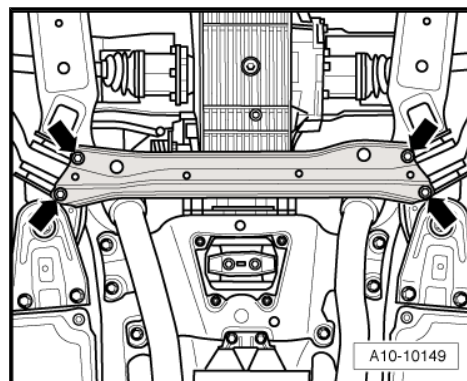


- Unbolt cross piece from subframe -arrows-.

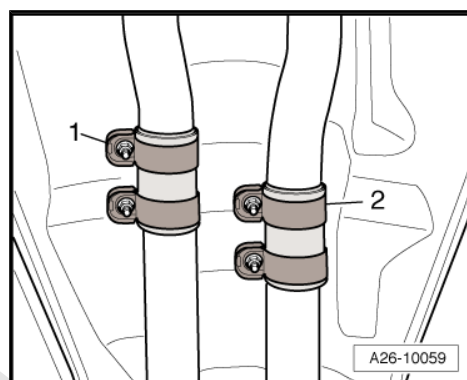


Caution

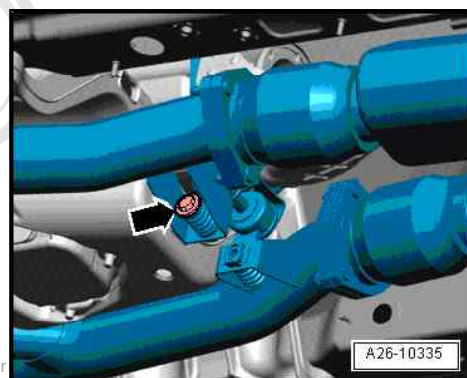
The flexible pipe connection (de-coupling element) on the front exhaust pipe must not be bent more than 10° – otherwise it can be damaged.



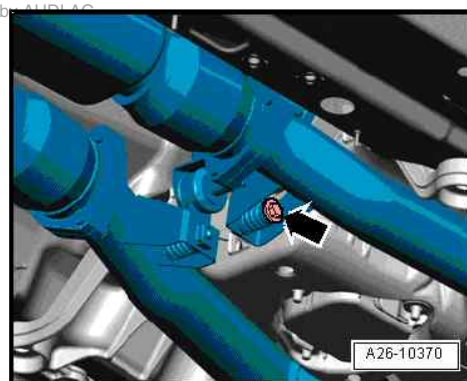
- Unfasten clamps -1- and -2- and slide forwards.



- Remove bolt -arrow- from bracket for exhaust system (left-side).

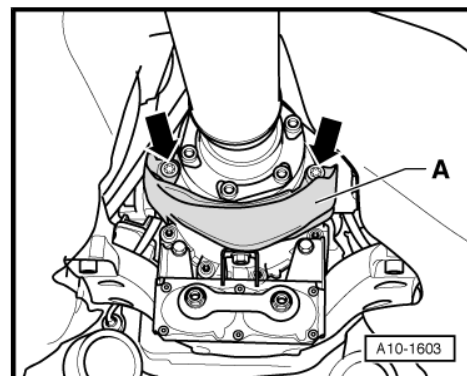


- Remove bolt -arrow- from bracket for exhaust system (right-side).

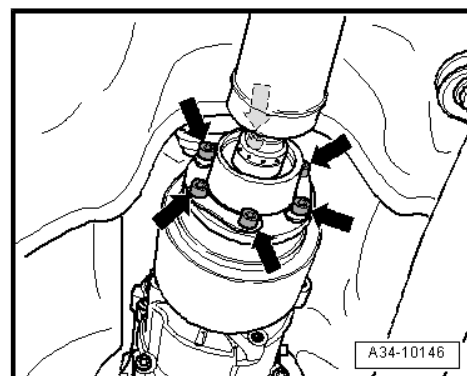


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- Remove bolts -arrows- and detach heat shield -A- for propshaft.



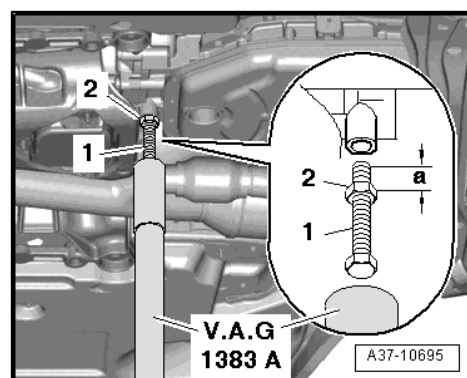
- Remove bolts -arrows- from connection between gearbox and propshaft (front end).
- Slide propshaft together towards rear final drive and tie up.



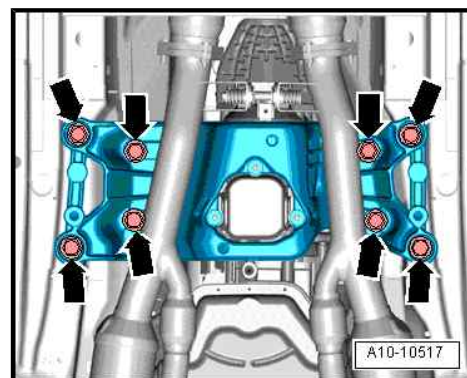
Caution

*When performing the steps below, please note the following:
Do not support the gearbox under the oil pan - risk of damage.*

- Insert a bolt M12x100 -item 1- with attached nut -2- into the mounting hole behind the oil pan on the gearbox.
- Dimension -a- = 13 mm
- Apply lifting column of engine and gearbox jack - V.A.G 1383 A- to bolt head as illustrated.



- Remove bolts -arrows- at tunnel cross member.



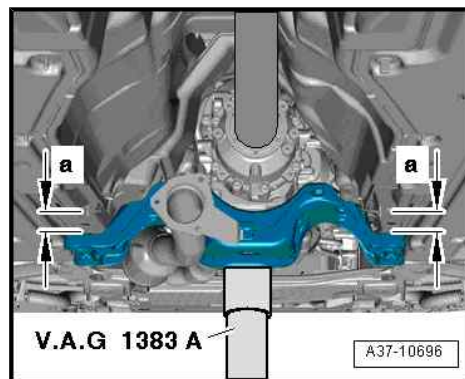
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- Lower tunnel cross member and gearbox slightly using engine and gearbox jack - V.A.G 1383 A- .
- Dimension -a- = max. 40 mm.



Note

Front exhaust pipe (right-side) is not shown in illustration, however it does not have to be removed.

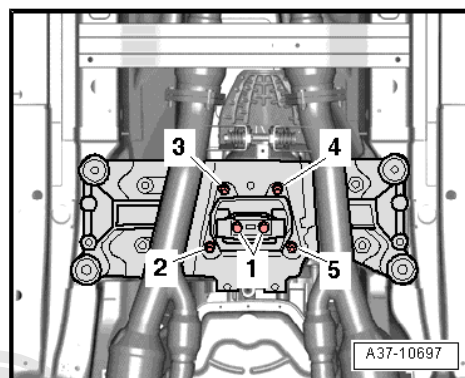


- Remove bolts -1- and rest tunnel cross member and gearbox mounting on exhaust system.

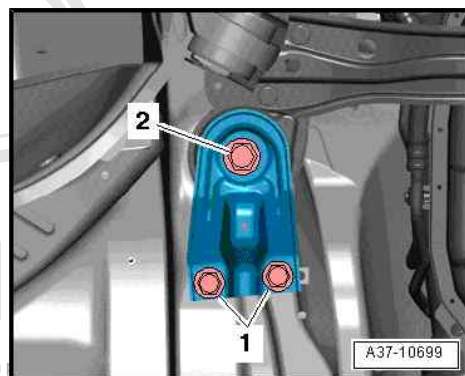


Note

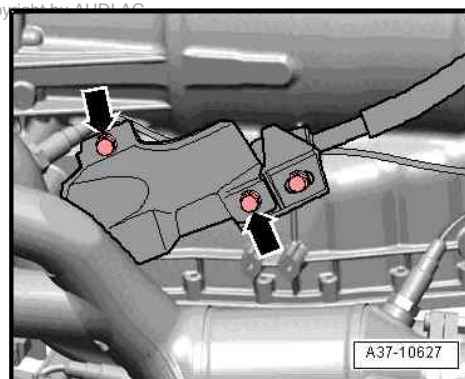
Disregard -items 2 ... 5-.



- Remove bolts -1- and -2- and detach subframe support (rear left).



- Remove bolts -arrows- and detach heat shield for selector lever cable.

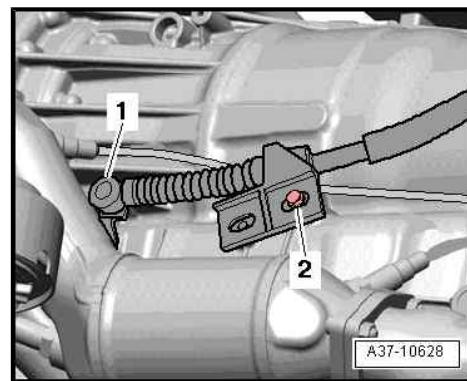


- Unbolt support bracket -2- and detach from gearbox.
- Use removal lever - 80-200- to pry ball socket -1- on selector lever cable off selector shaft lever.

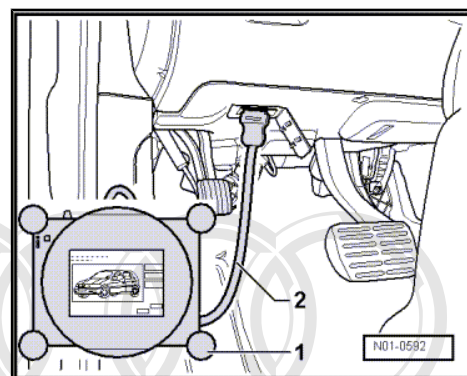


Note

Do not bend or kink the selector lever cable.

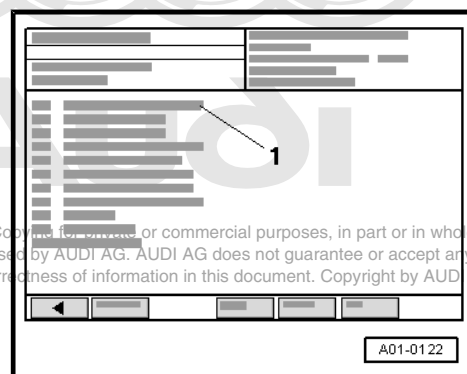


- Connect vehicle diagnostic tester.
- Switch on ignition, select Vehicle self-diagnosis and vehicle system 02 - Gearbox electronics → vehicle diagnostic tester.



Compare position of selector lever with position of multi-function switch - F125- in gearbox:

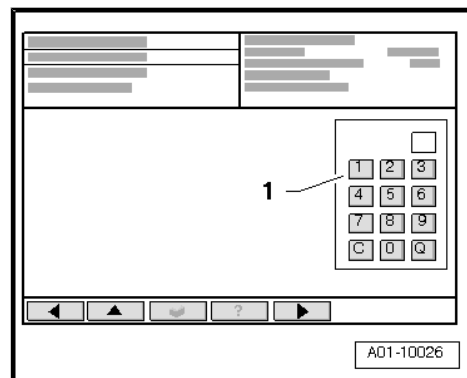
- From list -1- select diagnostic function 08 - Read measured value block.



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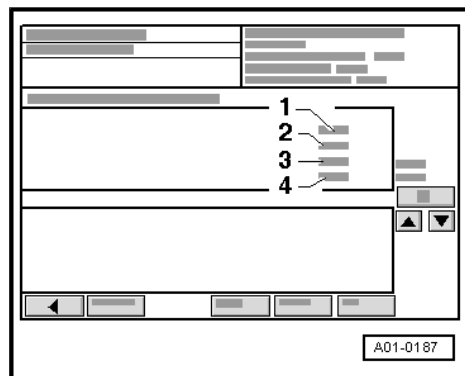
Display on diagnostic tester:

- Using keypad -1-, press button 4 for “Display group 4” and confirm entry by pressing Q button.



- Display zone -2- should show position “D”.

If position “D” is not indicated:

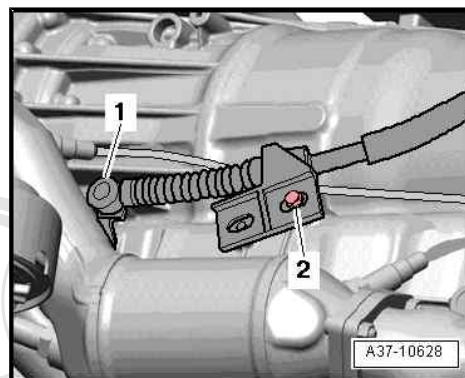


- Move selector shaft lever -1- until position “D” is shown on vehicle diagnostic tester.
- Check that selector lever is also in position “D” inside the vehicle.
- Carefully press ball socket -1- of selector lever cable onto selector shaft lever in this position.

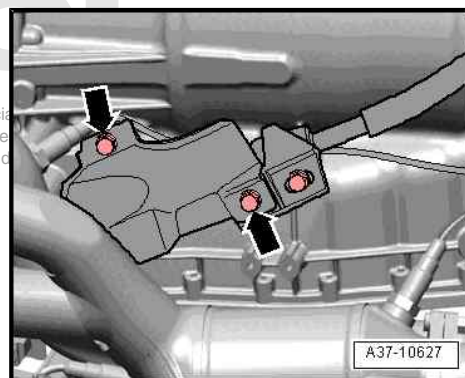


Note

Take care not to bend selector shaft lever when pressing on cable; support lever if necessary, as otherwise selector mechanism can no longer be adjusted accurately.



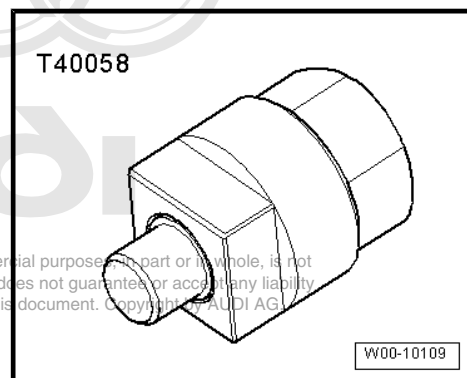
- Bolt support bracket onto gearbox -2-.
- Fit heat shield for selector lever cable and secure with bolts -arrows-.
- Install gearbox mounting and tunnel cross member ⇒ [page 76](#) .
- Adjust selector lever cable ⇒ [page 53](#) .
- Check selector mechanism ⇒ [page 28](#) .
- Install subframe ⇒ Rep. gr. 40 .
- Install exhaust system and perform stress-free alignment ⇒ Rep. gr. 26. .
- Install cross piece for subframe ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 .



5 Removing and installing gearbox

Special tools and workshop equipment required

- ◆ Adapter - T40058-



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Note

- ◆ *Rules for cleanliness when working on the automatic gearbox*
⇒ [page 15](#)
- ◆ *General repair instructions* ⇒ [page 11](#).

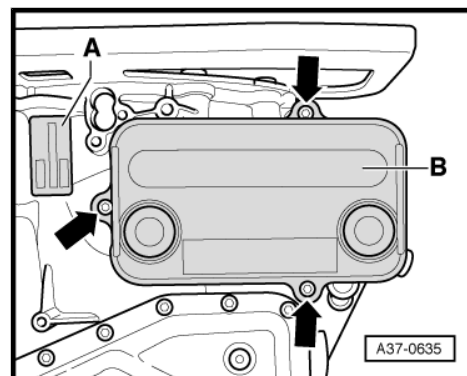
Removing

Automatic gearbox 09E is removed together with engine from below and is then detached from engine. For description refer to ⇒ Rep. gr. 10.



Caution

- ◆ *Components may be damaged if the gearbox is not supported correctly when removed.*
- ◆ *The gearbox must not be rested on the ATF cooler -B- or on the gearbox oil pan.*



Note

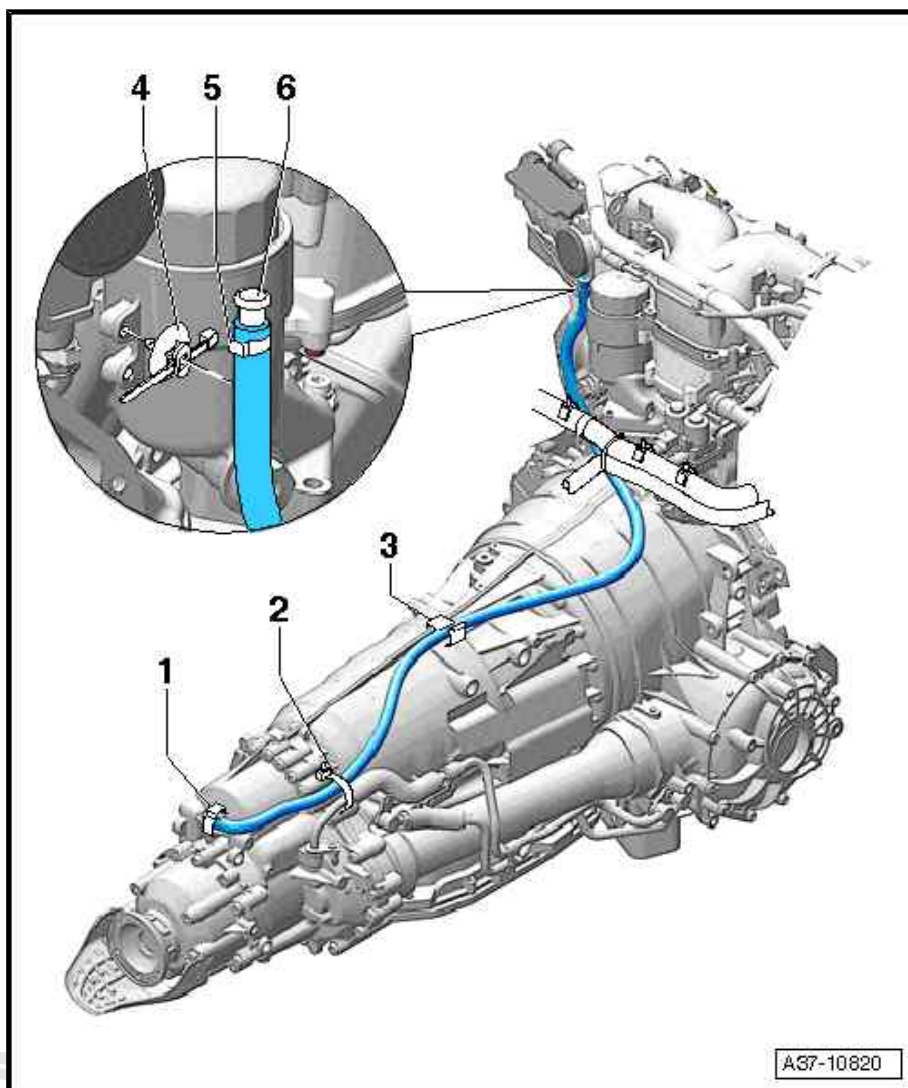
All cable ties which are released or cut open when removing the gearbox must be fitted in the same position when installing.

Installing

You must also perform and observe the following checks.

- Tightening torques ⇒ [page 67](#)
- Route and secure gearbox breather hose as shown in illustration.

- 1 - Clip
- 2 - Cable tie
- 3 - Retaining bracket
- 4 - Retaining clip with cable tie
 - Press in retaining clip and secure breather hose with cable tie
- 5 - Clip
- 6 - Breather valve

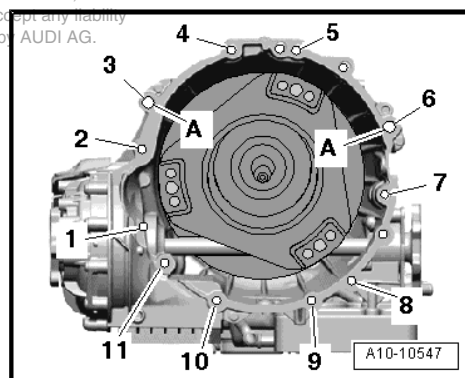


Note

- ◆ Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .
- ◆ Re-attach all heat insulation sleeves and heat shields at the same locations when re-installing.
- ◆ Re-attach all cable ties at the same locations when re-installing.

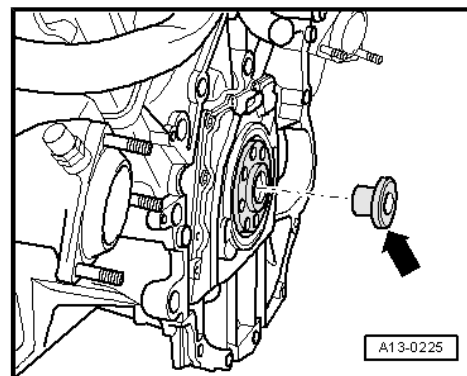
- Check that dowel sleeves -A- for centralising engine/gearbox are in the cylinder block; install if necessary.

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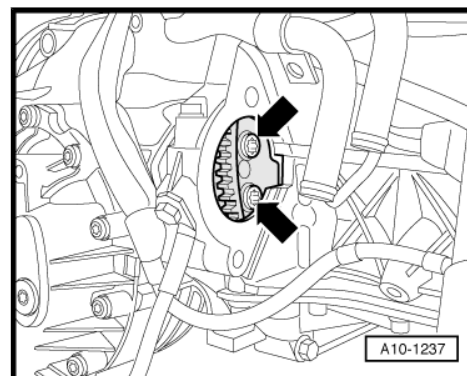
Bearing bush for torque converter

- Check whether bearing bush -arrow- is fitted in rear end of crankshaft (if not: drive in bearing bush).



Vehicles with V10 5.2 ltr. FSI engine (Audi S6)

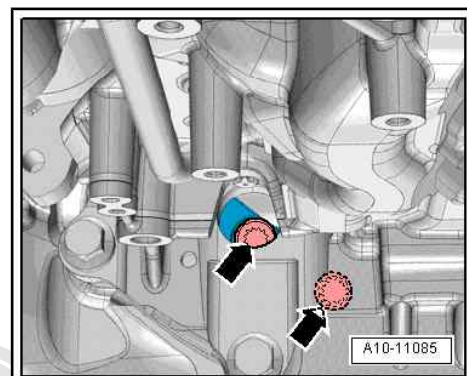
- Before joining engine and gearbox, turn torque converter and drive plate (on engine) until the holes and tapped holes are in line with the opening for the removed starter -arrows-.



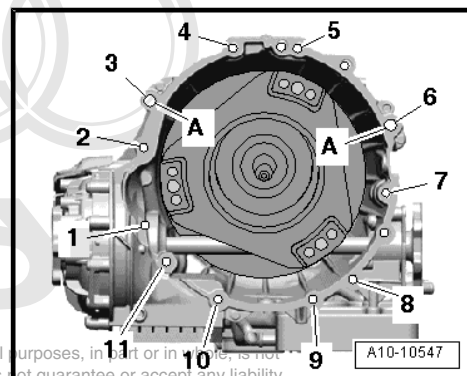
Vehicles with V10 5.0 ltr. TFSI engine (Audi RS 6)

- Before joining engine and gearbox, turn torque converter and drive plate (on engine) until the holes and tapped holes are in line with opening in intake module -arrows-.

All vehicles

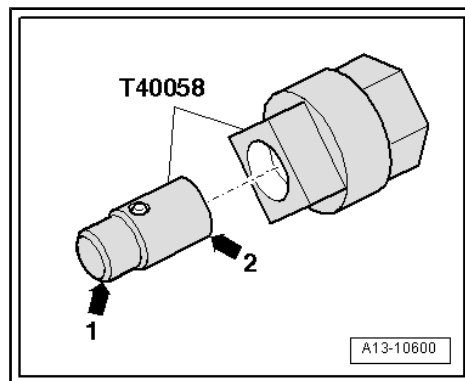


- Secure gearbox to engine.



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- Insert guide stud of adapter -T40058- as follows:
- The smaller diameter -arrow 1- faces engine.
- The larger diameter -arrow 2- faces adapter.



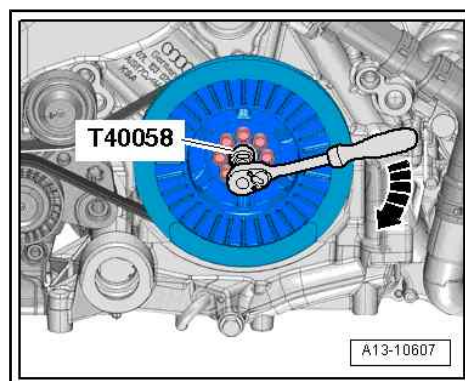
- To tighten bolts for torque converter, counterhold crankshaft with adapter - T40058- .



Note

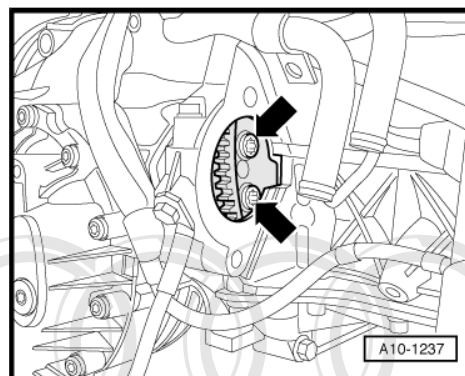
When you then turn the crankshaft, only turn crankshaft in direction of engine rotation -arrow-.

- Use new bolts (genuine Audi parts) to secure torque converter to drive plate ⇒ Electronic parts catalogue .



Vehicles with V10 5.2 ltr. FSI engine (Audi S6)

- Screw in 6 bolts -arrows- for torque converter hand-tight through opening for removed starter (turning crankshaft $\frac{1}{3}$ turn each time).
- Then tighten torque converter bolts to torque (turning the crankshaft $\frac{1}{3}$ turn each time).

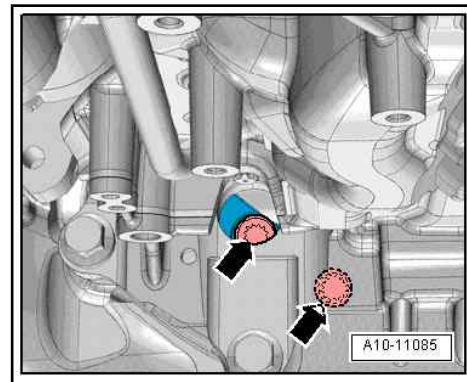


Audi

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Vehicles with V10 5.0 ltr. TFSI engine (Audi RS 6)

- Working through opening in intake module, screw in and hand-tighten 2 bolts -arrows- for torque converter (bolts are located immediately adjacent to one other).
- Then, turning crankshaft $\frac{1}{3}$ turn further each time, screw in and hand-tighten bolts until all 6 bolts are fitted hand-tight.
- Then tighten torque converter bolts to torque (turning the crankshaft $\frac{1}{3}$ turn each time).



All vehicles

- Connect ATF cooler to coolant hoses
⇒ [“10 Exploded view - gearbox cooling for Audi S6”, page 87](#) .
- Install gearbox support, gearbox mounting and tunnel cross member
⇒ [“8 Exploded view - tunnel cross member, gearbox mounting and gearbox support”, page 73](#) .
- Adjust selector lever cable ⇒ [page 53](#) .
- Check oil level in gearbox ⇒ [page 111](#) .
- Check ATF level ⇒ [page 80](#) .
- If gearbox was renewed:
- Perform gearbox adaption ⇒ [page 17](#) .

5.1 Tightening torques for installing gearbox



Note

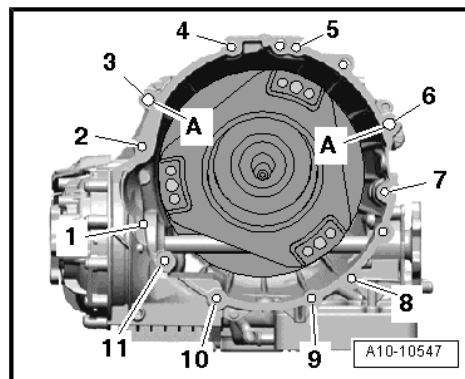
- ◆ *Tightening torques apply only to lightly greased, oiled, phosphated or black-finished nuts and bolts.*
- ◆ *Additional lubricant such as engine or gearbox oil may be used, but do not use graphite lubricant.*
- ◆ *Do not use parts which have been degreased.*
- ◆ *Tolerance for tightening torques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

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Tightening torques for V10 5.2 ltr. FSI engine (Audi S6)

Item	Bolt	Nm
1	M10x40 ¹⁾	45
2	M10x135 ^{2); 3)}	65
3	M12x105	65
4, 5	M12x100	65
6, 8, 9, 10, 11	M12x75	65
7	M12x155	65
A	Dowel sleeves for centralising	

- ¹⁾ For securing starter
- ²⁾ Property class 10.9.
- ³⁾ Also secures starter

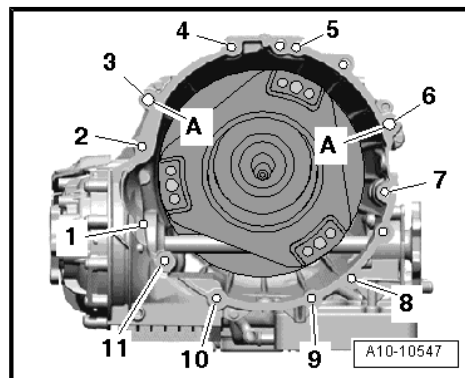


Component	Nm
Heat shield for propshaft to gearbox	24
Torque converter to drive plate, note tightening specifications ⇒ "5 Removing and installing gearbox", page 63	85 ¹⁾
• ¹⁾ Renew bolts.	

Tightening torques for V10 5.0 ltr. TFSI engine (Audi RS 6)

Item	Bolt	Nm
1	M10x40 ¹⁾	45
2	M12x135 ^{2); 3)}	65
3	M12x105	65
4, 5	M12x100	65
6, 8	M12x75	65
7	M12x155	65
9, 10, 11	M12x67	65
A	Dowel sleeves for centralising	

- ¹⁾ For securing starter
- ²⁾ Property class 10.9.
- ³⁾ Also secures starter



Component	Nm
Heat shield for propshaft to gearbox	24
Torque converter to drive plate, note tightening specifications ⇒ "5 Removing and installing gearbox", page 63	85 ¹⁾
• ¹⁾ Renew bolts.	

6 Transporting gearbox

Special tools and workshop equipment required

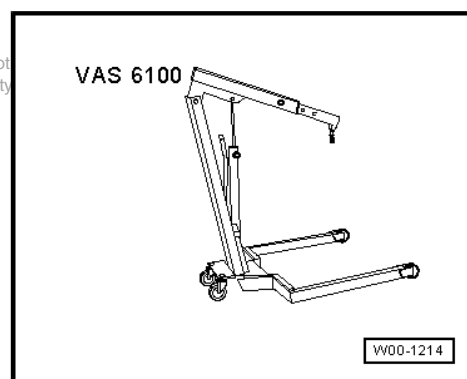
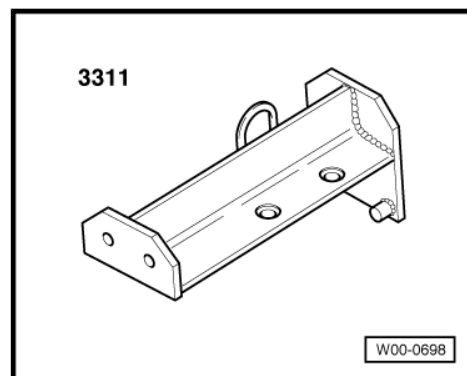
- ◆ Hook and support tool - 3311- with bolt -3311/1-



Audi

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

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Procedure



Caution

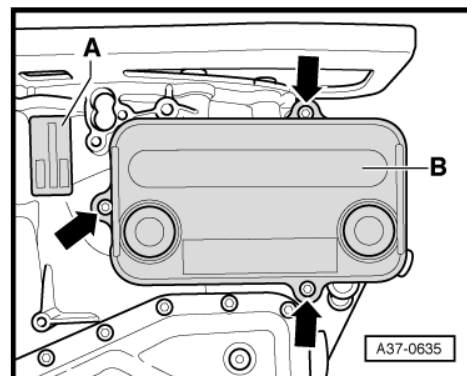
- ◆ *Components may be damaged if the gearbox is not supported correctly when removed.*
- ◆ *The gearbox must not be rested on the ATF cooler -B- or on the gearbox oil pan.*

- Gearbox removed



WARNING

- ◆ *Replace bolt of hook and support tool - 3311- with new, longer bolt -3311/1- .*
- ◆ *The new bolt -3311/1- is longer than the previous bolt. Otherwise the gearbox is not secured properly.*



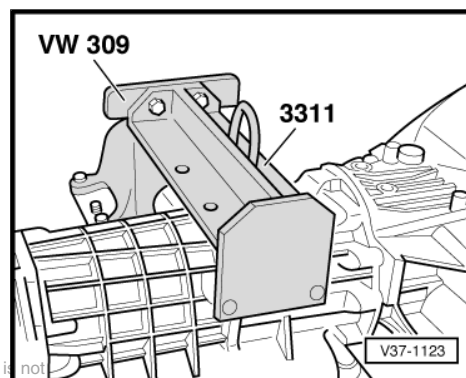


- Secure gearbox to hook and support tool - 3311- (using new, longer bolt -3311/1-).
- The workshop hoist can be used to lift and move the gearbox.



Note

Support plate - VW 309- can be disregarded.

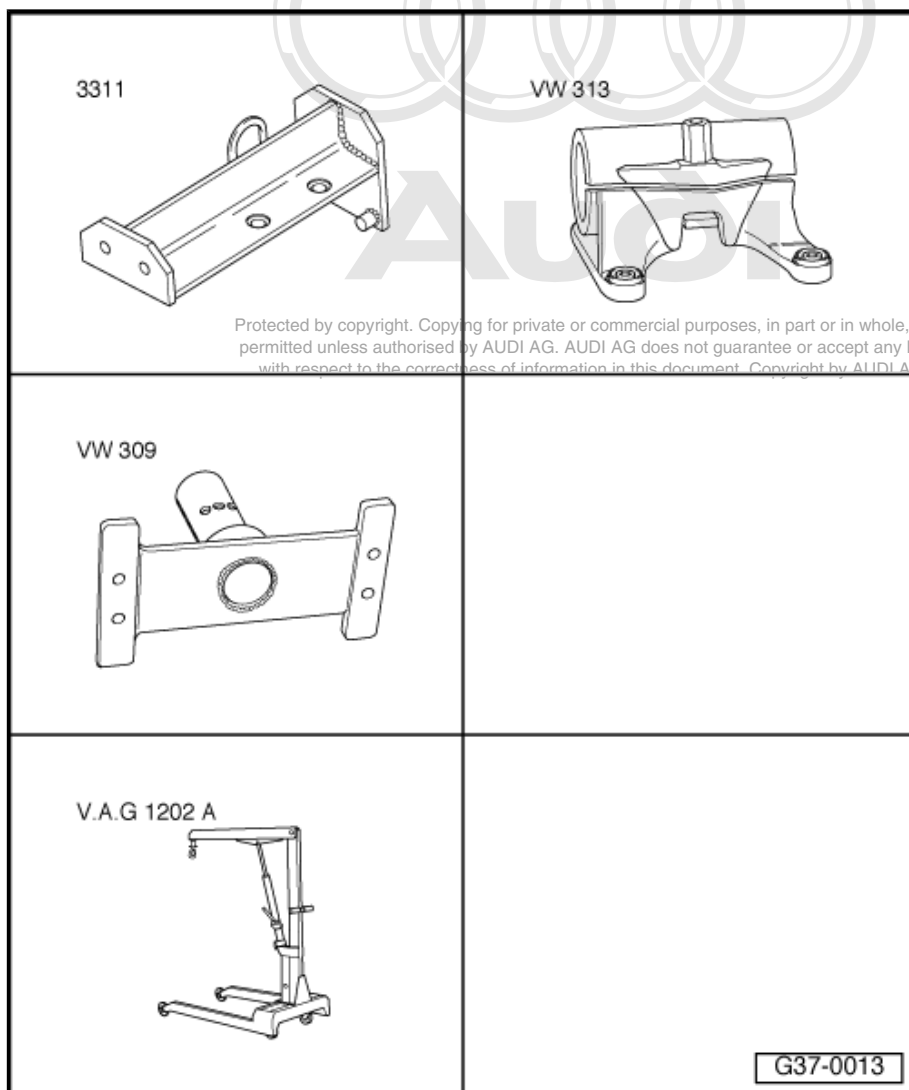


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7 Securing gearbox to assembly stand

Special tools and workshop equipment required

- ◆ Hook and support tool - 3311- with bolt -3311/1-
- ◆ Support clamp - VW 313-
- ◆ Retaining plate - VW 309-
- ◆ Workshop hoist - VAS 6100- or -V.A.G 1202 A-



Procedure

- Gearbox removed



WARNING

- ◆ *Replace bolt of hook and support tool - 3311- with new, longer bolt -3311/1-.*
- ◆ *The new bolt -3311/1- is longer than the previous bolt. Otherwise the gearbox is not secured properly.*

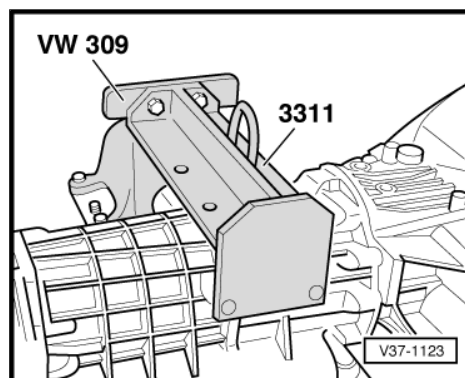


- Secure gearbox to hook and support tool - 3311- (using new, longer bolt -3311/1-) and then secure to support plate - VW 309- .
- Using a workshop crane, insert in support clamp - VW 313- .



Note

If the gearbox is full and it is to be tilted in the assembly stand with the oil pan pointing upwards, the vent holes for the gearbox housing and final drive must be sealed.



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8 Exploded view - tunnel cross member, gearbox mounting and gearbox support

1 - Gearbox

2 - Bolt

□ 40 Nm

3 - Gearbox support

□ ⇒ "8.2 Removing and installing gearbox mounting and gearbox support", page 76

4 - Gearbox mounting

□ ⇒ "8.2 Removing and installing gearbox mounting and gearbox support", page 76

5 - Bolt

□ 20 Nm

6 - Tunnel cross member

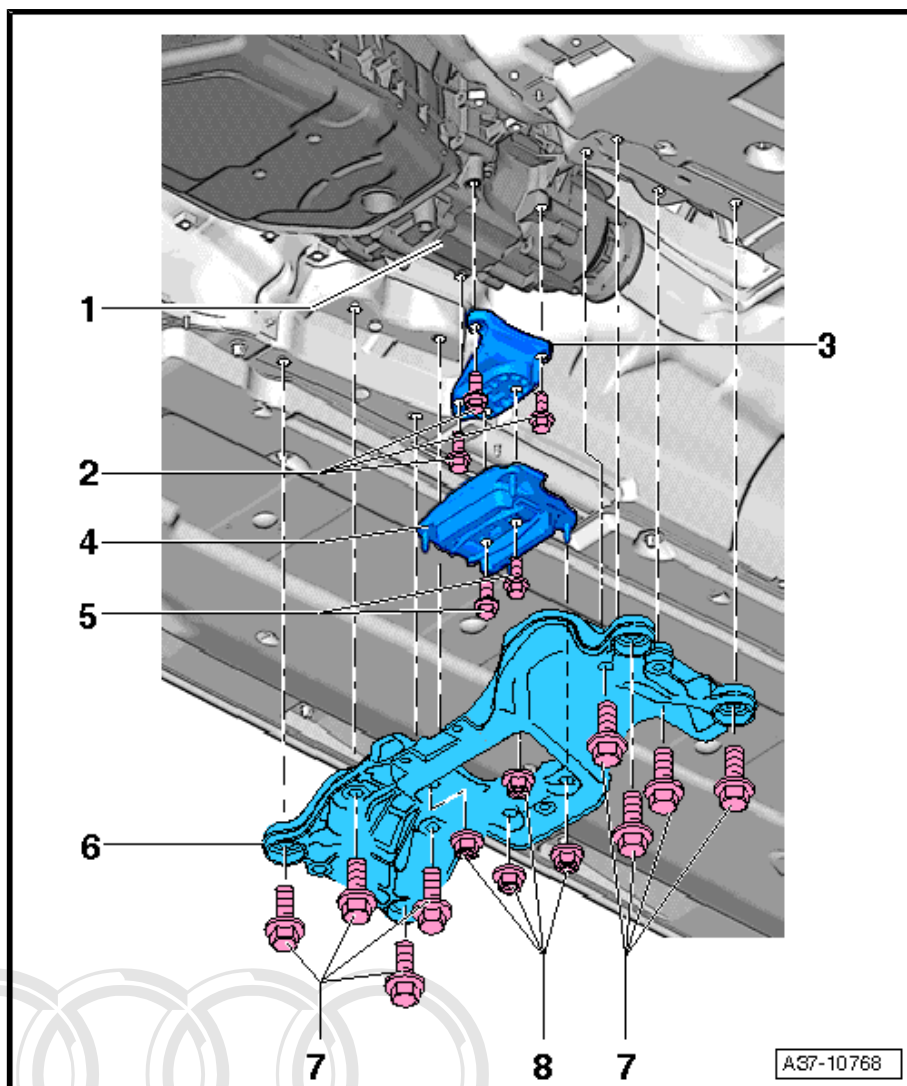
□ ⇒ "8.1 Removing and installing tunnel cross member", page 73

7 - Bolt

□ 50 Nm

8 - Nut

□ 20 Nm

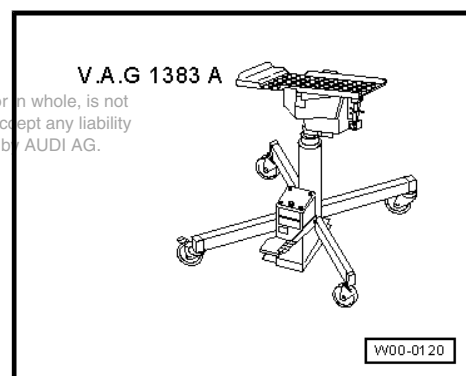


8.1 Removing and installing tunnel cross member

Special tools and workshop equipment required

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

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- ◆ Bolt M12x100 with nut

Removing



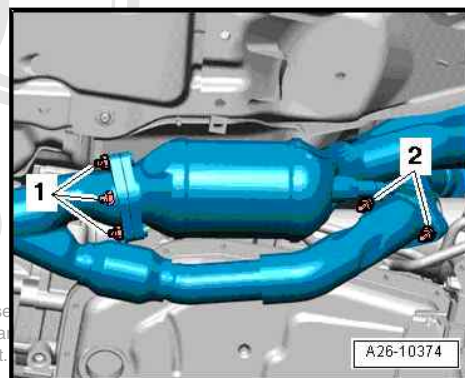
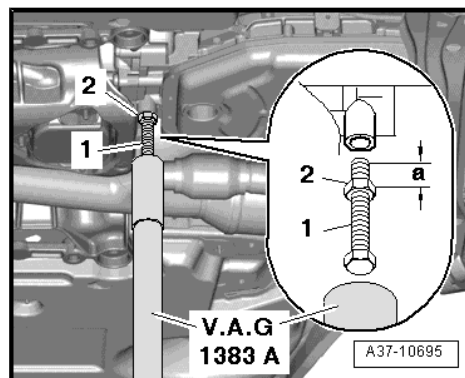
Caution

There is a risk of damage to the gearbox oil pan.

Carefully follow the exact instructions for removing the gearbox mounting.

Do not support the gearbox under the oil pan.

- Insert a bolt M12x100 -item 1- with attached nut -2- into the mounting hole behind the oil pan on the gearbox.
- Dimension -a- = 13 mm
- Apply lifting column of engine and gearbox jack - V.A.G 1383 A- to bolt head as illustrated and raise gearbox slightly.
- Remove gearbox mounting ⇒ [page 76](#) .
- Remove nuts -1- and -2- and detach Y pipe (right-side) together with front silencer.



- Slacken but do not remove bolts -1- on Y pipe (left-side).



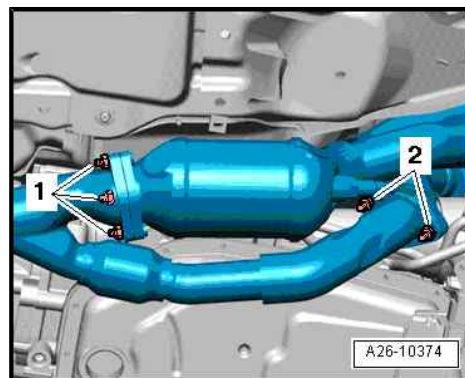
Note

This is necessary in order to leave a little more room between the body and the Y pipe (left-side) for the removal of the tunnel cross member.

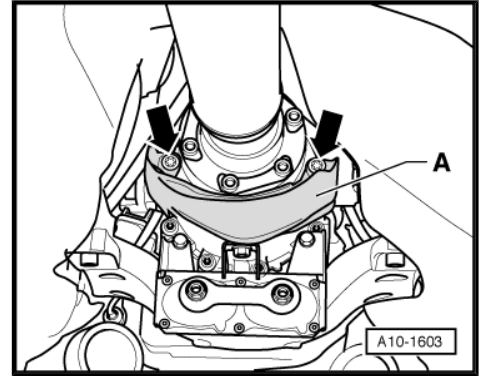


Caution

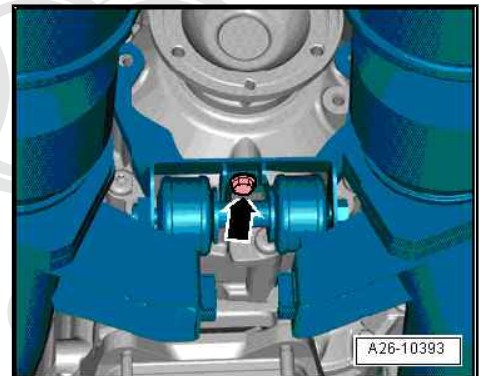
The flexible joint (de-coupling element) on the Y pipe must not be bent more than 10° – otherwise it can be damaged.



- Unbolt heat shield -A- for propshaft -arrows-.



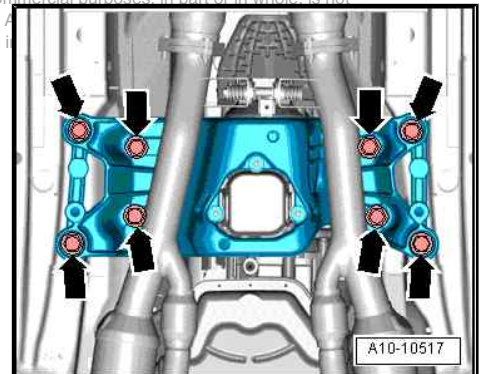
- Remove bolt -arrow- and detach bracket for Y pipes.



Note

The bolts -arrows- on the tunnel cross member were removed earlier when removing the gearbox mounting.

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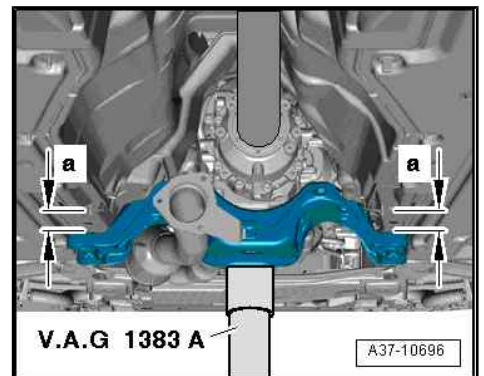
- Lower tunnel cross member and gearbox slightly using engine and gearbox jack - V.A.G 1383 A - .
- Dimension -a- = max. 40 mm.
- Remove tunnel cross member.

Installing

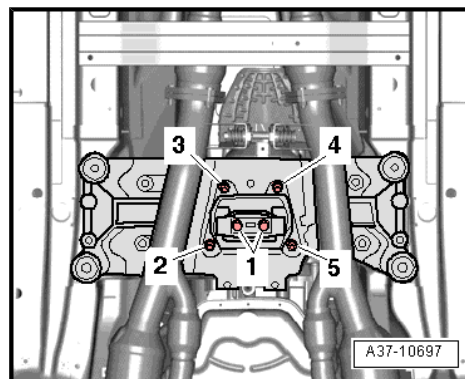
Install in reverse sequence.

Tightening torques ➔ [page 73](#)

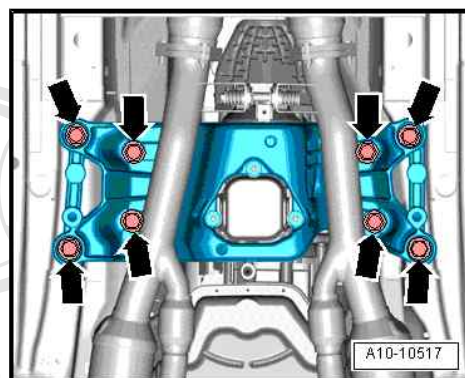
- Install tunnel cross member.



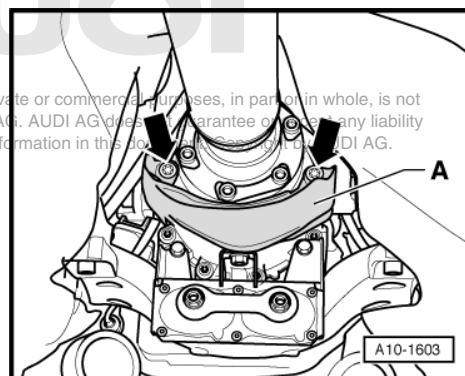
- Fit gearbox mounting and bolt onto gearbox support -1-.
- Secure tunnel cross member to gearbox mounting -2 to 5-.



- Bolt tunnel cross member to body -arrows-.



- Bolt on heat shield -A- for propshaft -arrows-.
- Install exhaust system so it is free of stress ⇒ Rep. gr. 26.
- Install cross piece for subframe ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 .

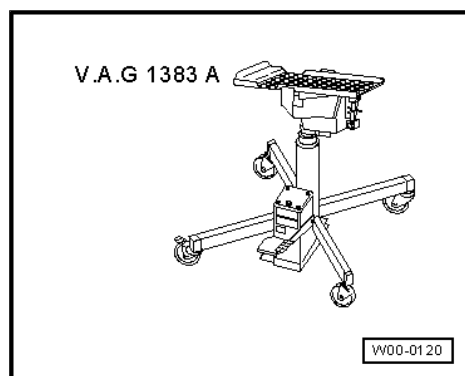


Component	Nm
Heat shield for propshaft to gearbox	24

8.2 Removing and installing gearbox mounting and gearbox support

Special tools and workshop equipment required

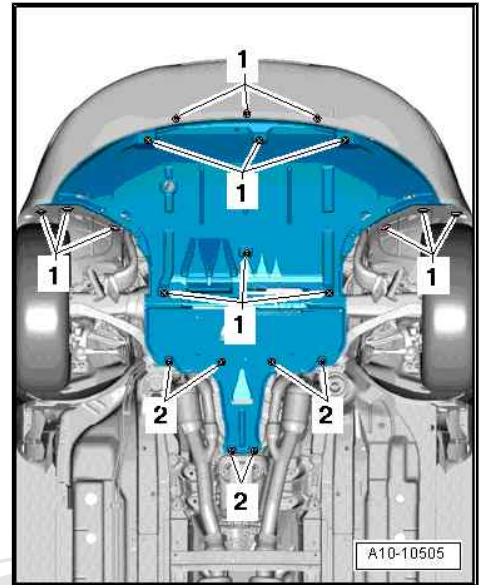
- ◆ Engine and gearbox jack - V.A.G 1383 A-



- ◆ Bolt M12x100 with nut

Removing

- Open quick release fasteners -2- and take off rear noise insulation.

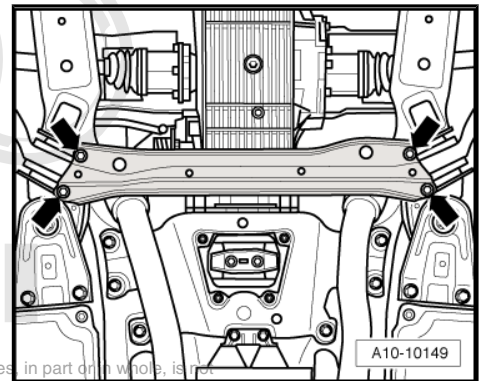


- Unbolt cross piece from subframe -arrows-.

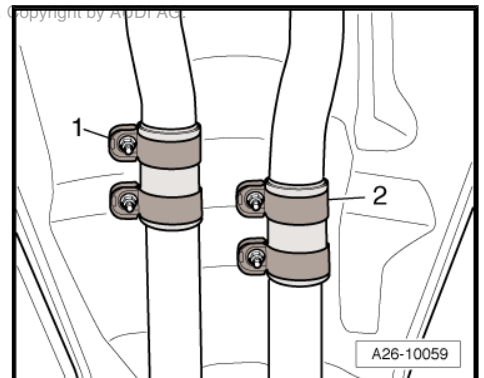


Caution

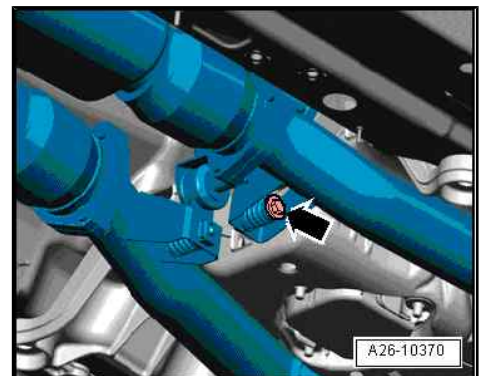
The flexible pipe connection (de-coupling element) on the front exhaust pipe must not be bent more than 10° – otherwise it can be damaged.



- Unfasten clamps -1- and -2- and slide forwards.



- Remove bolt -arrow- from bracket for exhaust system (right-side).



- Remove bolt -arrow- from bracket for exhaust system (left-side).

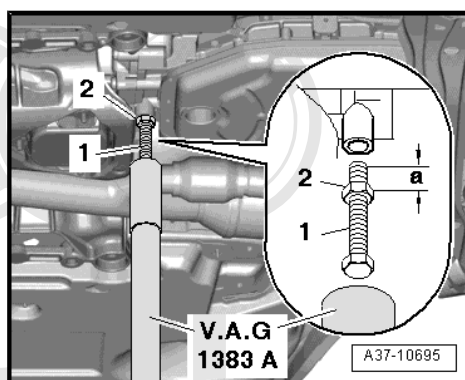
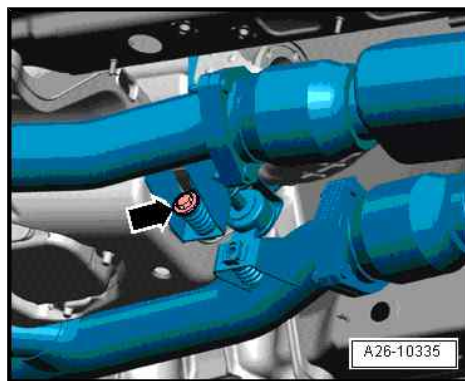


Caution

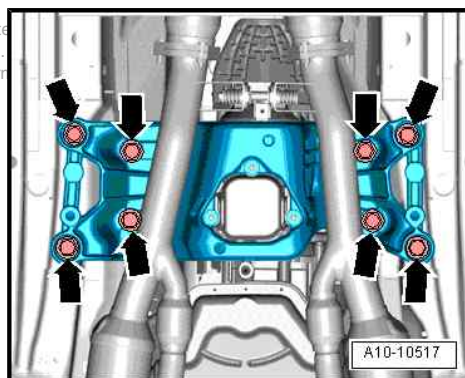
When performing the steps below, please note the following:

Do not support the gearbox under the oil pan - risk of damage.

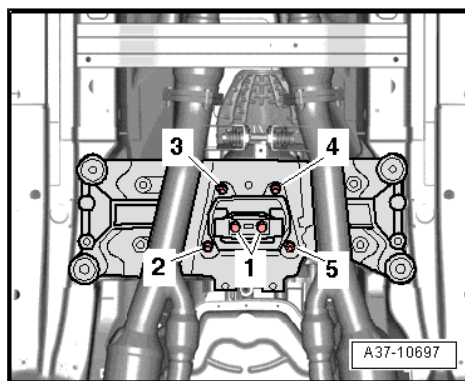
- Insert a bolt M12x100 -item 1- with attached nut -2- into the mounting hole behind the oil pan on the gearbox.
- Dimension -a- = 13 mm
- Apply lifting column of engine and gearbox jack - V.A.G 1383 A- to bolt head as illustrated and raise gearbox slightly.



- Remove bolts -arrows- at tunnel cross member



- Remove nuts -2 to 5- and rest tunnel cross member on exhaust system.
- Remove bolts -1- and detach gearbox mounting.



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



Note

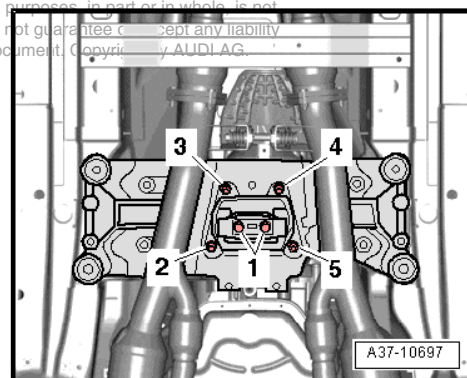
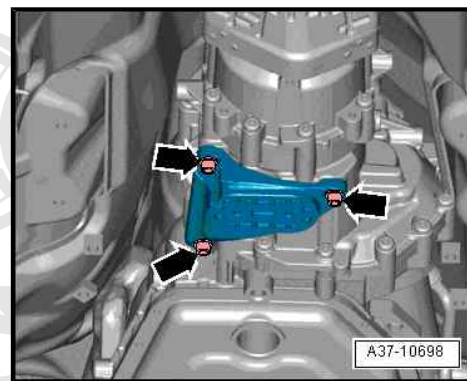
For illustration purposes, tunnel cross member is not shown.

Installing

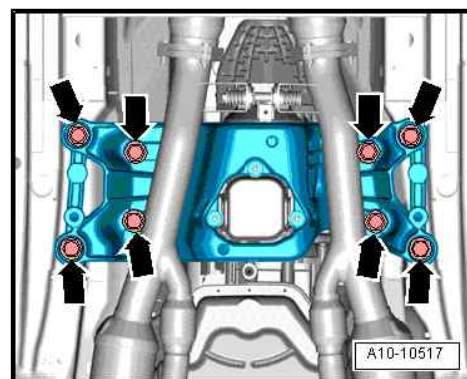
Install in reverse sequence.

Tightening torques ⇒ [page 73](#)

- Bolt gearbox support to gearbox -arrows-.
- Bolt gearbox mounting to gearbox support -1-.
- Secure tunnel cross member to gearbox mounting -2 to 5-.



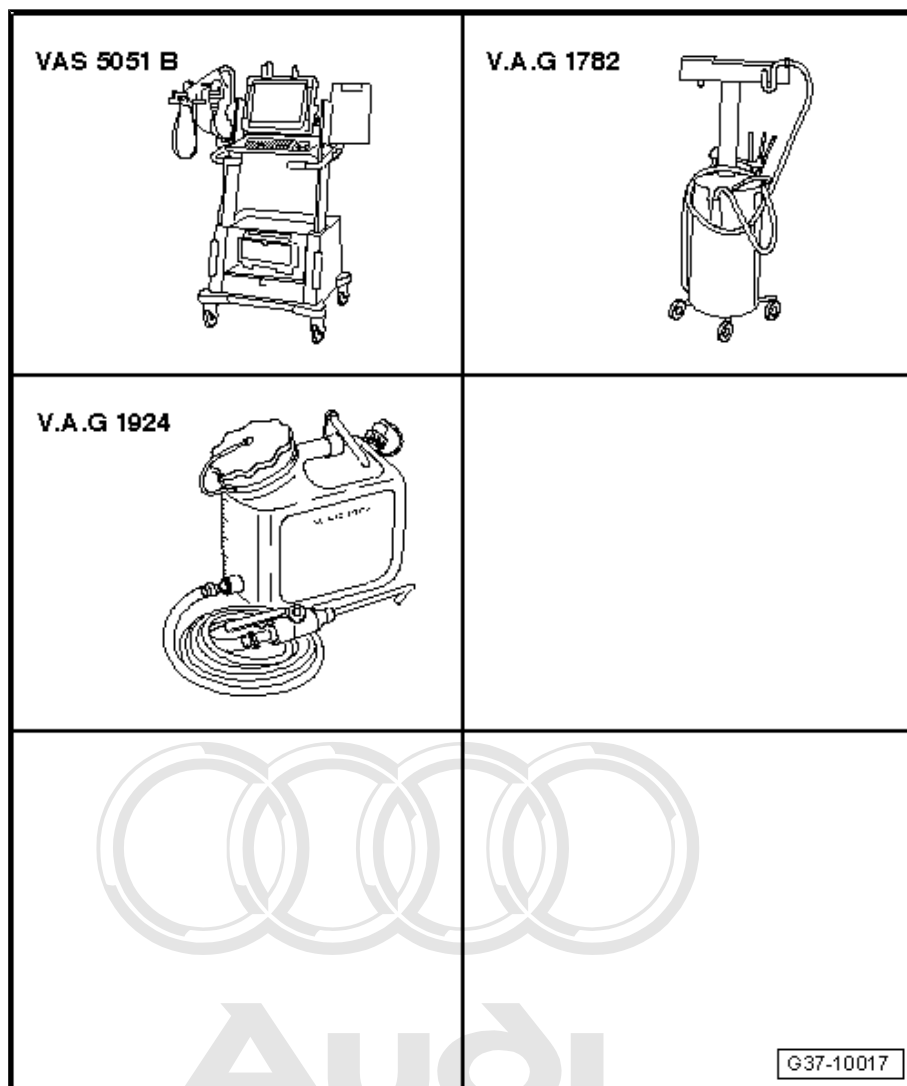
- Bolt tunnel cross member to body -arrows-.
- Install exhaust system so it is free of stress ⇒ Rep. gr. 26.
- Install cross piece for subframe ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 .



9 ATF in planetary gearbox

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester
- ◆ Used oil collection and extraction unit - V.A.G 1782-
- ◆ ATF filling unit - V.A.G 1924-
- ◆ Safety goggles



Overview:

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- ◆ ⇒ ["9.1 Checking ATF level", page 80](#)
- ◆ ⇒ ["9.2 Draining ATF and filling up after repairs", page 84](#)
- ◆

9.1 Checking ATF level

Test conditions

- Gearbox must not be in emergency running (backup) mode.
- Vehicle must be level (horizontal).
- Selector lever in "P", engine idling.
- Air conditioner and heating switched off.
- Diagnostic tester connected up; Vehicle self-diagnosis and vehicle system 02 - Gearbox electronics selected ⇒ vehicle diagnostic tester .

- The ATF temperature at the beginning of the test must not be higher than 30°C. If necessary, first allow the gearbox to cool down.

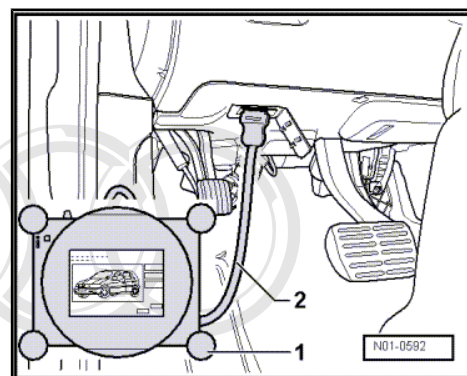


Note

- ◆ The ATF temperature is taken from the reading on the vehicle diagnostic tester.
- ◆ ATF level will change depending on ATF temperature.
- ◆ If ATF level is checked when ATF temperature is too low, this will lead to overfilling.
- ◆ If ATF level is checked when ATF temperature is too high, this will lead to underfilling.
- ◆ Underfilling or overfilling is detrimental to the function of the gearbox.
- ◆ Use only the correct type of ATF (available as a replacement part) for the planetary gearing in automatic gearbox 09E. Other types of oil cause faults and/or failure of the gearbox; note the ATF specification for the different gearbox types (gearbox code) and refer to the ⇒ *Electronic parts catalogue*.

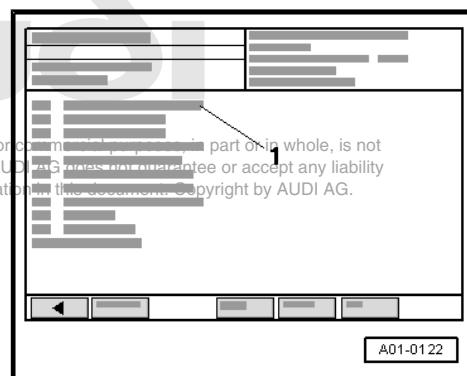
Checking ATF temperature

- Connect vehicle diagnostic tester.
- Switch on ignition, select **Vehicle self-diagnosis** and vehicle system **02 - Gearbox electronics** ⇒ vehicle diagnostic tester.



Compare position of selector lever with position of multi-function switch - F125- in gearbox:

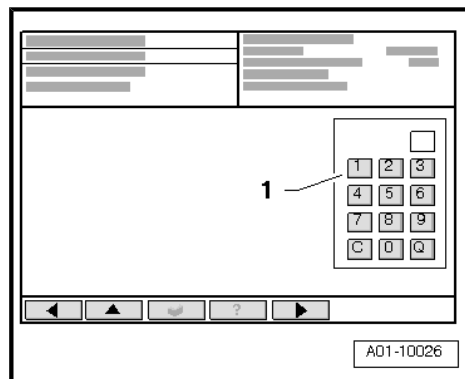
- From list -1- select diagnostic function **08 - Read measured value block**.



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Display on diagnostic tester:

- Using keypad -1-, press button **4** for “Display group 4” and confirm entry by pressing **Q** button.



Display on diagnostic tester:

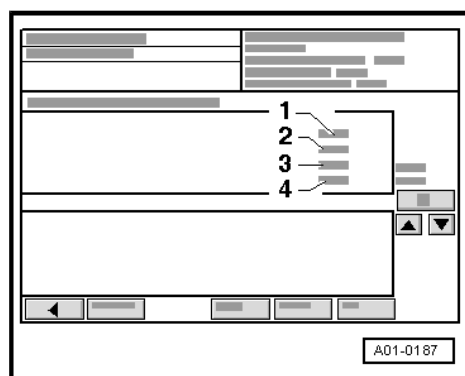
- Reading for ATF temperature is shown in display zone -1-.

Checking and correcting ATF level



Note

- ◆ The ATF level can be checked at the ATF inspection plug.
- ◆ 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).

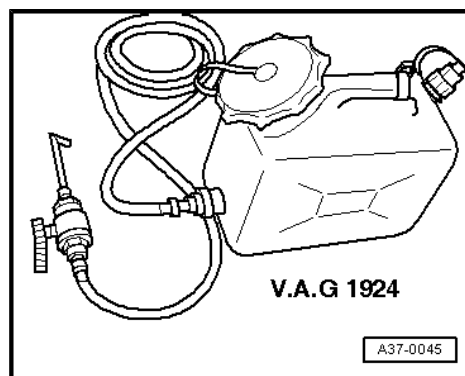


Caution

- ◆ Different types of ATF are available for this gearbox. The correct type must be determined according to the gearbox code in the ⇒ *Electronic parts catalogue*.
- ◆ Use only the correct type of ATF (available as a replacement part) for the planetary gearing in automatic gearbox 09E.
- ◆ Other types of oil cause malfunctions and/or failure of the gearbox.
- ◆ For the correct type, refer to ⇒ *Electronic parts catalogue*.
- ◆ The ATF filling unit must be clean and the ATF must not be mixed with other types of ATF!

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- Fill reservoir of ATF filling unit -V.A.G 1924- with ATF for automatic gearbox 09E. For ATF specification refer to ⇒ *Electronic parts catalogue*.
- Secure reservoir for ATF filling unit -V.A.G 1924- as high as possible on vehicle.
- Start engine and run at idling speed.

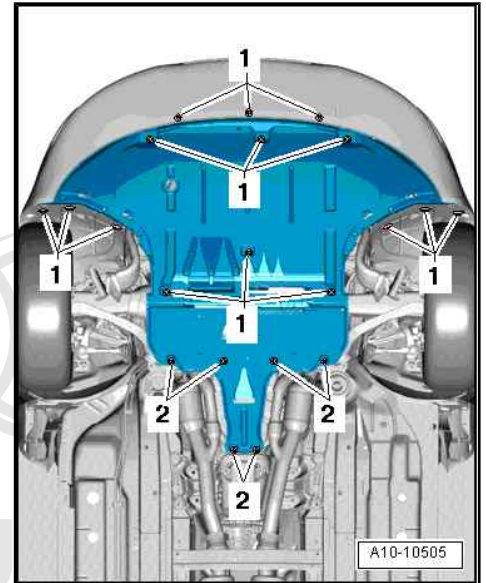


- Open quick release fasteners -2- and take off rear noise insulation.
- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.

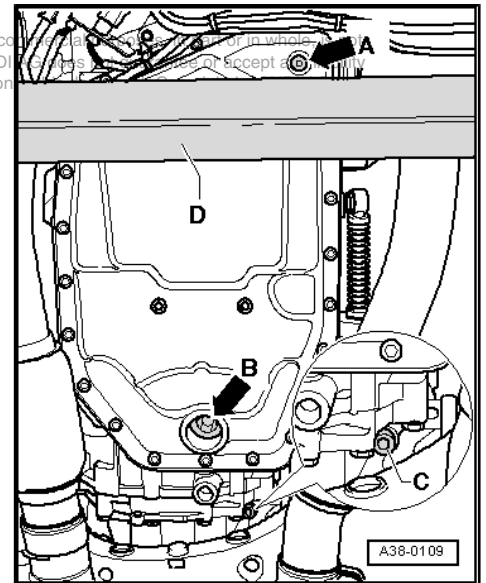


WARNING

Put on safety goggles.



- When an ATF temperature of 35 °C is reached, unscrew the ATF inspection plug -arrow B- and drain off any surplus ATF.

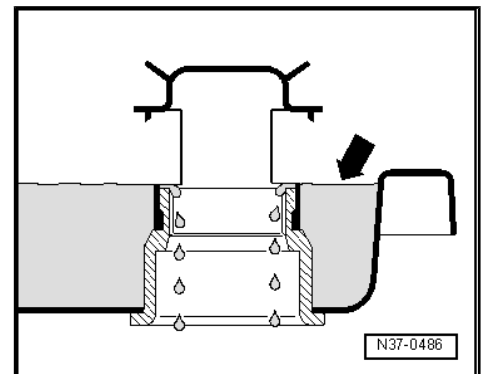


If ATF comes out of the inspection hole before the ATF has reached 40°C the ATF level -arrow- is OK.



Note

The ATF inspection plug must be screwed in again at the latest when ATF reaches a temperature of 45°C (or 50°C in hot climates).



- Tighten ATF inspection plug with new seal -arrow-. The ATF check is now completed.
- Tightening torque
⇒ ["1 Oil pan, ATF strainer and mechatronic unit - exploded view", page 93](#)

If no ATF emerges from ATF inspection hole when ATF has reached 40 °C:

Filling up ATF



Note

The ATF inspection plug must be screwed in again at the latest when ATF temperature reaches 45°C (or 50°C in hot climates). If necessary, switch off engine, allow gearbox to cool down and repeat the test.

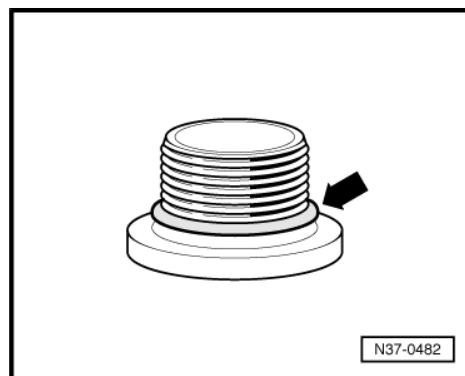
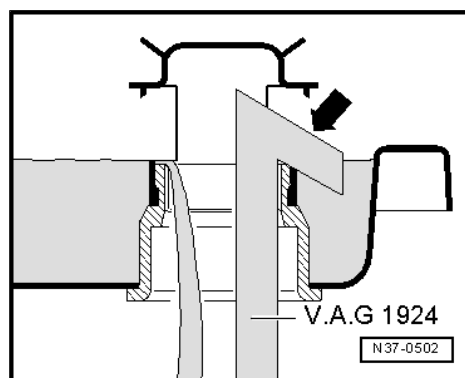
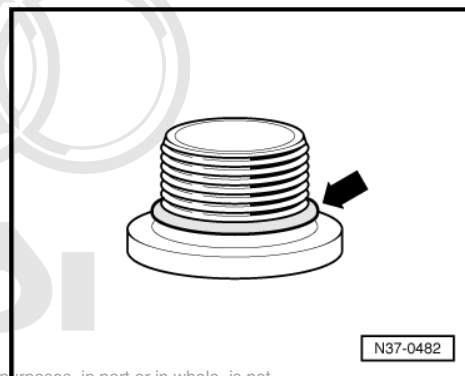
- Guide filler nozzle of ATF filling unit -V.A.G 1924- in from below through an opening in the deflector cap -arrow-, taking care not to push the deflector cap upwards out of position.
- Fill with ATF using ATF filling unit - V.A.G 1924- until ATF comes out of inspection hole.



Note

If the ATF level is too low or too high this will cause gearbox malfunctions.

- Tighten ATF inspection plug with new seal -arrow-. The ATF check is now completed.
- Tightening torque
⇒ ["1 Oil pan, ATF strainer and mechatronic unit - exploded view", page 93](#)



9.2 Draining ATF and filling up after repairs

Procedure

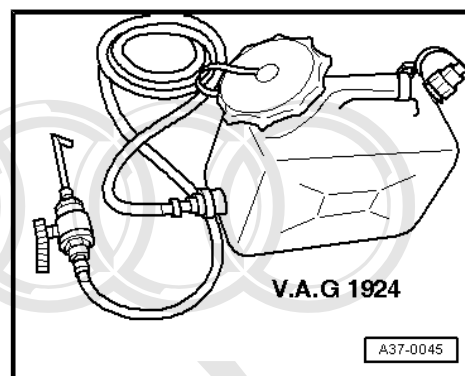
- Engine not running.
- Vehicle must be level (horizontal).



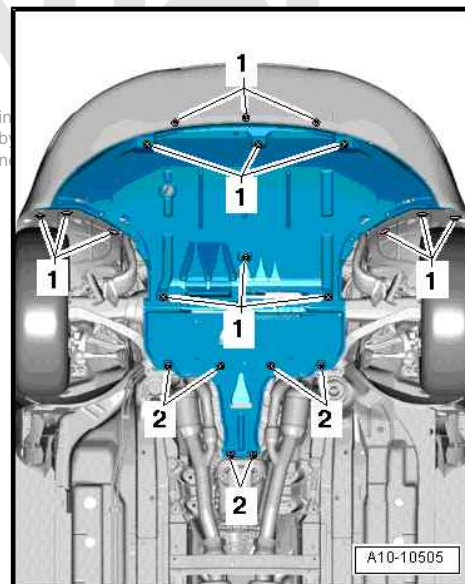
Caution

- ◆ *Different types of ATF are available for this gearbox. The correct type must be determined according to the gearbox code in the ⇒ Electronic parts catalogue .*
- ◆ *Use only the correct type of ATF (available as a replacement part) for the planetary gearing in automatic gearbox 09E.*
- ◆ *Other types of oil cause malfunctions and/or failure of the gearbox.*
- ◆ *For the correct type, refer to ⇒ Electronic parts catalogue .*
- ◆ *The ATF filling unit must be clean and the ATF must not be mixed with other types of ATF!*

- Fill reservoir of ATF filling unit -V.A.G 1924- with ATF for automatic gearbox 09E. For ATF specification refer to ⇒ Electronic parts catalogue .
- Secure reservoir for ATF filling unit -V.A.G 1924- as high as possible on vehicle.



- Open quick release fasteners -2- and take off rear noise insulation.



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



WARNING

Put on safety goggles.

- Remove ATF drain plug -arrow A-.
- Drain ATF.



Note

- ◆ *Always observe the relevant environmental regulations for disposal.*
- ◆ *The engine must not be started and vehicle must not be towed without ATF in gearbox.*
- ◆ *The drain plug with seal must be renewed.*

- Tighten new drain plug -arrow A- to 12 Nm.

Filling gearbox with ATF

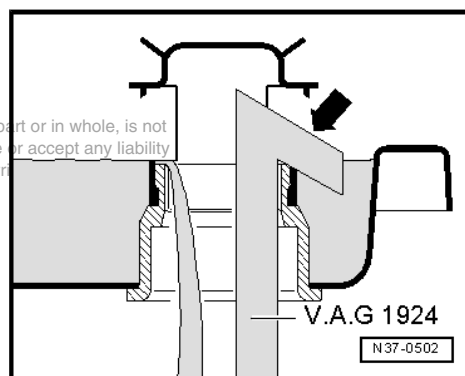
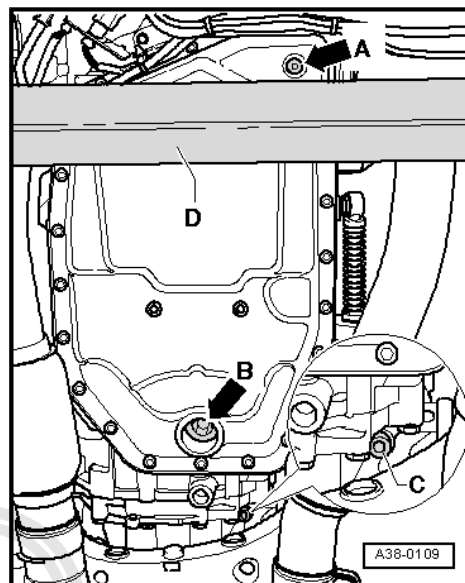
- Remove ATF inspection plug -arrow B-.
- Guide filler nozzle of ATF filling unit -V.A.G 1924- in from below through an opening in the deflector cap -arrow-, taking care not to push the deflector cap upwards out of position.
- Fill with ATF using ATF filling unit - V.A.G 1924- until ATF comes out of inspection hole.
- Move selector lever to position “P”.
- Start engine and turn off after 20 seconds.
- Continue filling with ATF using ATF filling unit - V.A.G 1924- until ATF comes out of inspection hole.
- Start engine.
- Continue filling with ATF using ATF filling unit - V.A.G 1924- until ATF comes out of inspection hole again.
- Tighten ATF inspection plug.
- With the engine idling, press the brake pedal and shift the selector lever through all the selector lever positions leaving the selector lever at least 10 seconds in each position.
- Shift selector lever into position “N”.
- Increase engine speed to 2000 rpm for at least 60 seconds.
- Move selector lever to position “P”.
- Check ATF level and top up as required ⇒ [page 80](#) .



Note

Observe all notes and test requirements which are listed under “Checking ATF level”.

- After an ATF change:
- Perform gearbox adaption ⇒ [page 17](#) .



10 Exploded view - gearbox cooling for Audi S6

Vehicles without gear oil cooler

A connecting pipe -3- is installed on the gearbox instead of the gear oil cooler.

The ATF cooler is connected to the engine cooling circuit. To shorten the warm-up phase after a cold engine start, the return line contains a thermostat which starts to open at a coolant temperature of approx. 80°C.

1 - ATF cooler

- ☐ Removing and installing
⇒ [page 91](#)
- ☐ Make sure to fit both
ATF seals when secur-
ing to gearbox
- ☐ Always fit new ATF
seals

2 - Gear oil pipe

- ☐ ⇒ "1 Exploded view -
gear oil cooler and
pipes", page 110

3 - Connecting pipe

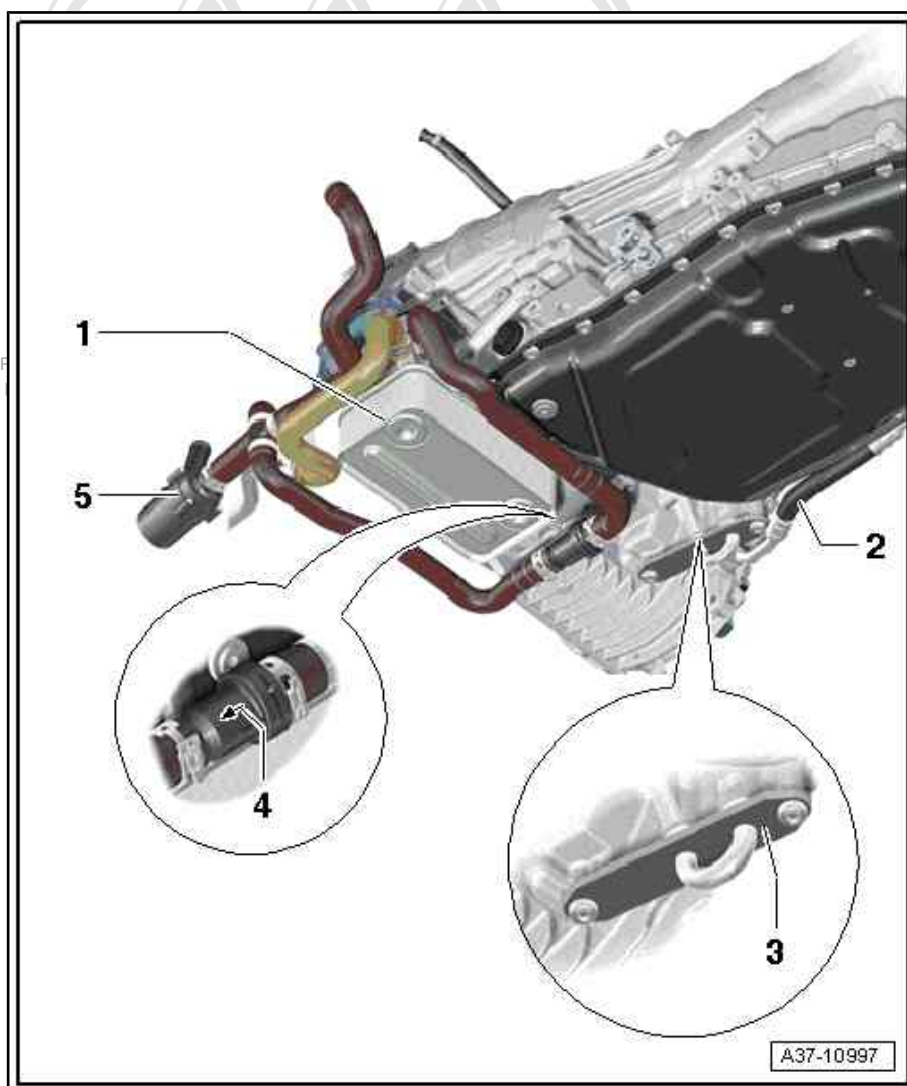
- ☐ The gear oil is pumped
via the connecting pipe
in a circuit between the
front final drive and
transfer box only
- ☐ The use of combined oil
systems and the flow of
oil through the circuit are
sufficient to reduce the
gear oil temperature to
an adequate level

4 - Thermostat

- ☐ Install in correct direc-
tion
- ☐ Starts to open at approx.
80°C
- ☐ Installed in coolant re-
turn line of ATF cooler

5 - Continued coolant circula- tion pump - V51-

- ☐ For increasing cooling
power of gearbox in addition to engine cooling
- ☐ In addition to responding to general cut-in conditions for cooling from the engine control unit, the con-
tinued coolant circulation pump - V51- cuts in at ATF temperatures of approx. 120°C or above



Vehicles with gear oil cooler

The ATF cooler and gear oil cooler are both connected to the engine cooling circuit in parallel. To shorten the warm-up phase after a cold engine start, the common return line contains a thermostat which starts to open at a coolant temperature of approx. 80°C.

1 - Continued coolant circulation pump - V51-

- ❑ For increasing cooling power of gearbox in addition to engine cooling
- ❑ In addition to responding to general cut-in conditions for cooling from the engine control unit, the continued coolant circulation pump - V51- cuts in at ATF temperatures of approx. 120°C or above

2 - Gear oil pipe

- ❑ ⇒ ["1 Exploded view - gear oil cooler and pipes", page 110](#)

3 - Gear oil cooler

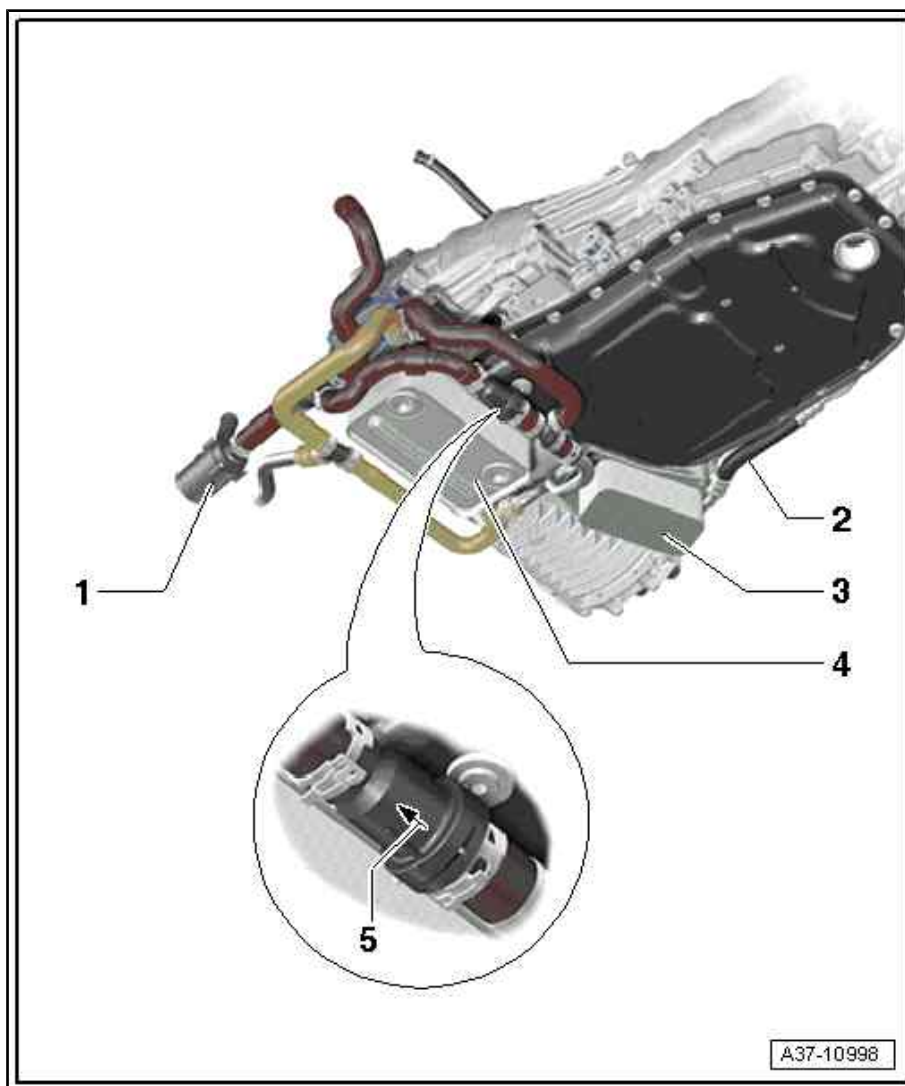
- ❑ Cools front final drive and cools transfer box via external and internal return lines (external return pipe and closed protective tube for side shaft)
- ❑ ⇒ ["1 Exploded view - gear oil cooler and pipes", page 110](#)

4 - ATF cooler

- ❑ Removing and installing ⇒ [page 91](#)
- ❑ Make sure to fit both ATF seals when securing to gearbox
- ❑ Always fit new ATF seals

5 - Thermostat

- ❑ Install in correct direction
- ❑ Starts to open at approx. 80°C
- ❑ Installed in coolant return line of ATF cooler



Audi

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11 Exploded view - gearbox cooling for Audi RS 6

Illustration shows gearbox from above. The gear oil coolers and pipes are located underneath the gearbox and are shown looking through the gearbox in the illustration.

The gear oil and ATF are cooled additionally via a dedicated cooling circuit with a separate cooler for the gearbox and an electric circulation pump 2 - V403- .

The gearbox cooling circuit is connected in parallel with the engine cooling circuit. The ATF cooler and gear oil cooler are arranged in series. To shorten the warm-up phase after a cold engine start, the return line contains a thermostat which starts to open at a coolant temperature of approx. 80°C.

1 - Cooler

- ☐ For gearbox
- ☐ Removing and installing
⇒ Rep. gr. 19

2 - Radiator

- ☐ For engine
- ☐ Removing and installing
⇒ Rep. gr. 19

3 - Thermostat

- ☐ Install in correct direction
- ☐ Starts to open at approx. 80°C
- ☐ Installed in coolant return line of ATF cooler

4 - Gearbox

5 - Gear oil pipe

- ☐ Supply pipe for gear oil
- ☐ ⇒ ["1 Exploded view - gear oil cooler and pipes", page 110](#)

6 - Gear oil pipe

- ☐ Return pipe for gear oil
- ☐ ⇒ ["1 Exploded view - gear oil cooler and pipes", page 110](#)

7 - Gear oil cooler

- ☐ Cools front final drive and cools transfer box via external and internal return lines (external return pipe and closed protective tube for side shaft)

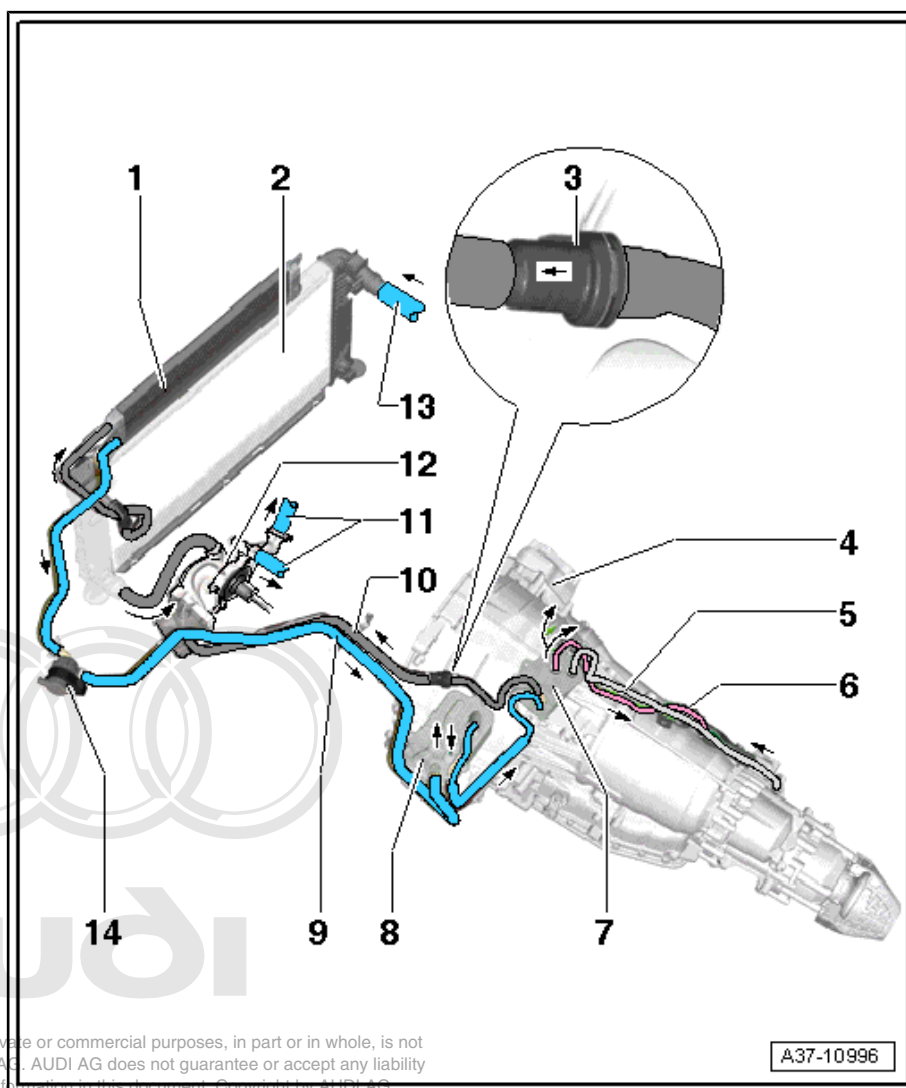
- ☐ ⇒ ["1 Exploded view - gear oil cooler and pipes", page 110](#)

8 - ATF cooler

- ☐ Removing and installing ⇒ [page 91](#)
- ☐ Make sure to fit both ATF seals when securing to gearbox
- ☐ Always fit new ATF seals

9 - Supply pipe

- ☐ From cooler for gearbox





10 - Return pipe

- ☐ From gear oil cooler to coolant pump for engine
- ☐ With integrated thermostat

11 - Coolant flow

- ☐ To engine

12 - Coolant pump for engine

13 - Coolant flow

- ☐ From engine

14 - Circulation pump 2 - V403-

- ☐ Activated at an ATF temperature of approx. 110°C
- ☐ Assists coolant pump for engine and increases coolant throughput

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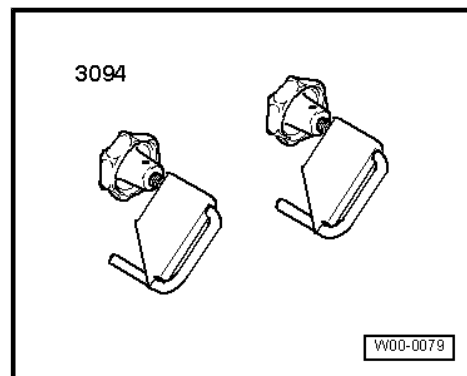
12 Removing and installing ATF cooler

Note

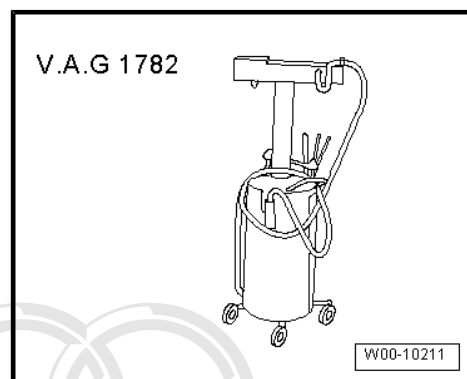
- ◆ *Rules for cleanliness when working on the automatic gearbox*
⇒ [page 15](#)
- ◆ *General repair instructions* ⇒ [page 11](#).

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



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



- ◆ Safety goggles

Removing

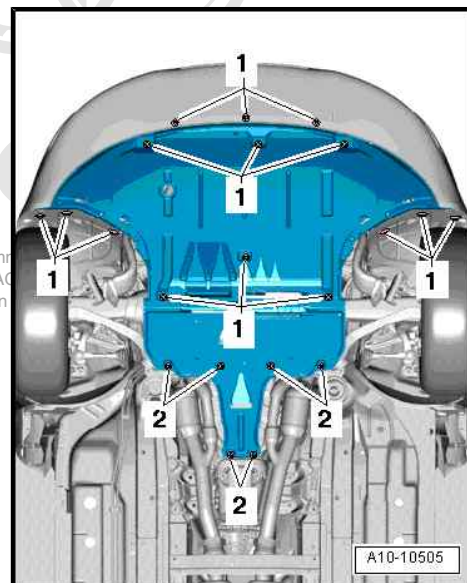
- Undo quick release fasteners -1- and -2- and remove noise insulation panels.
- Mark position of all ATF cooling hoses on ATF cooler with different colours to avoid confusion.
- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.



WARNING

Put on safety goggles.

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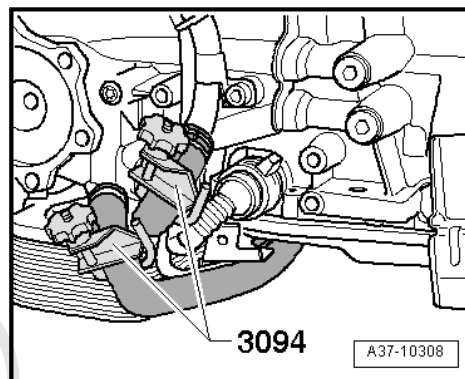


- Clamp off ATF cooling hoses going to ATF cooler using hose clamps up to 25 mm - 3094- .
- Open hose clips on ATF cooler and detach both coolant hoses.
- Plug both ATF coolant hoses with clean sealing plugs.



Note

Plug pipe and hose openings quickly to prevent unnecessary drainage of coolant from cooling system.



- Remove the three bolts -arrows- and take off ATF cooler -B-.



Note

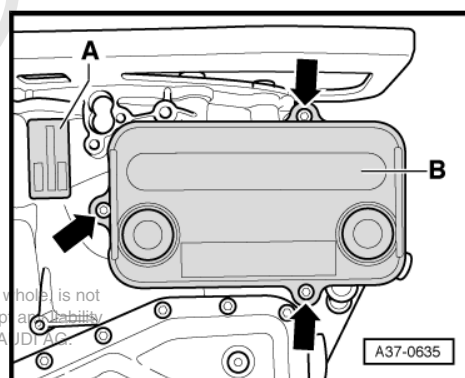
Both ATF seals between ATF cooler and gearbox must always be renewed.

- Plug both openings on gearbox with clean sealing plugs.

Installing

Installation is carried out in the reverse order, note the following.

- Renew both ATF seals between ATF cooler and gearbox.
- Lubricate both new ATF seals with ATF and attach to ATF cooler.
- Attach ATF cooler -B- to gearbox and tighten bolts -arrows- to 10 Nm.
- Attach ATF cooling hoses to ATF cooler.
- Check coolant level in cooling system ⇒ Rep. gr. 19 .
- Check and top up ATF level ⇒ [page 80](#) .



38 – Gears, control

1 Oil pan, ATF strainer and mechatronic unit - exploded view



Caution

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



Note

- ◆ *Always renew mechatronic unit if contaminated or defective.*
- ◆ *Rules for cleanliness when working on the automatic gearbox
⇒ [page 15](#)*
- ◆ *General repair instructions ⇒ [page 11](#).*
- ◆ *Coat O-rings and seals with ATF. Other types of lubricant will cause the gearbox hydraulics to malfunction.*



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1 - Bolt

- ☐ Secures oil pan to gearbox

Various versions apply, depending on the gearbox code letters:

- ☐ Select correct type ⇒ Electronic parts catalogue
- ☐ Note tightening specifications and sequence ⇒ ["1.1 Removing and installing oil pan", page 95](#)

Versions with 24 bolts:

- ☐ 11 Nm

Versions with 13 bolts:

- ☐ Renew all bolts
- ☐ 2.5 Nm + 90°

2 - ATF drain plug

- ☐ 12 Nm
- ☐ Always renew plug

3 - ATF inspection plug

Different versions possible

Steel ATF inspection plug with steel oil pan:

- ☐ 80 Nm

Plastic ATF inspection plug with aluminium oil pan:

- ☐ 8 Nm

4 - O-ring

- ☐ Always renew

5 - Oil pan

- ☐ ⇒ ["1.1 Removing and installing oil pan", page 95](#)

6 - Magnet

- ☐ Ensure full contact
- ☐ Clean before installing

7 - Deflector cap

- ☐ Plugged into opening on oil pan

8 - Magnet

- ☐ Ensure full contact
- ☐ Clean before installing

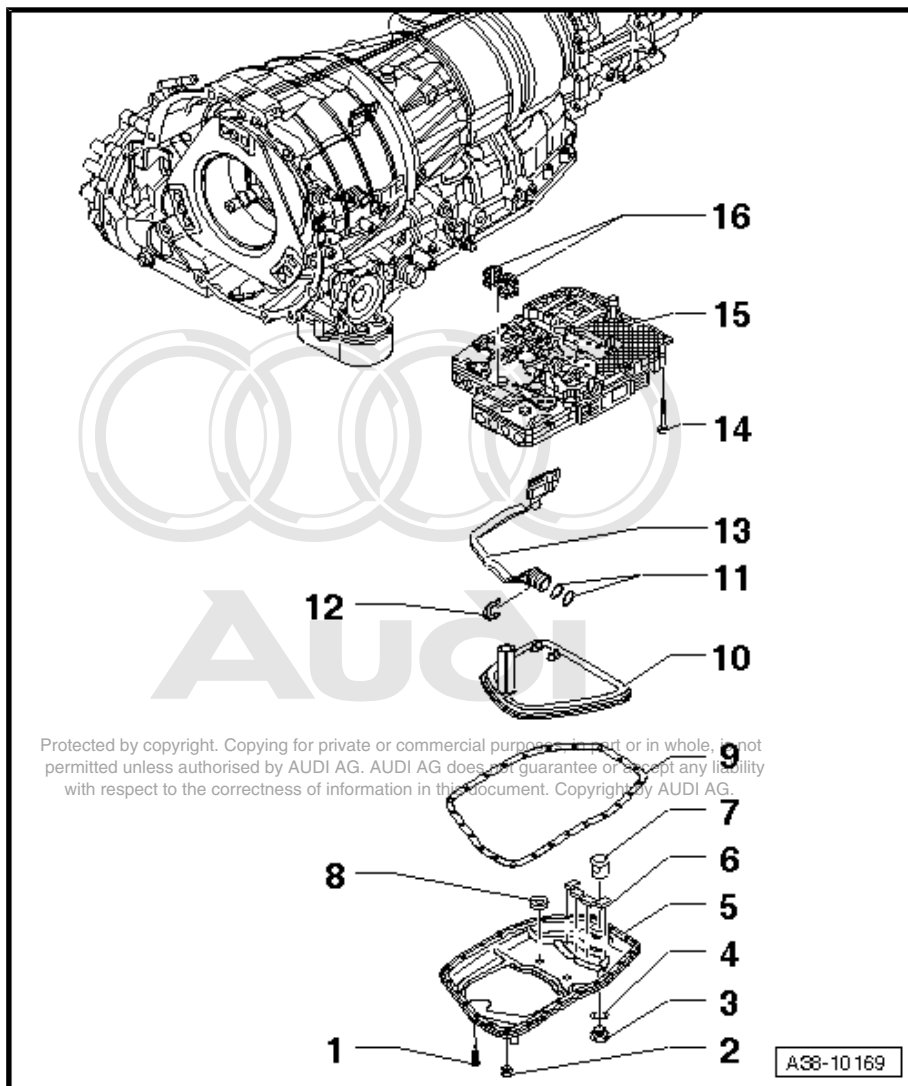
9 - Oil pan gasket

Versions with 24 bolts on oil pan:

- ☐ Always renew

Versions with 13 bolts on oil pan:

- ☐ Check for damage and renew if necessary
- ☐ Sealing surfaces on gearbox and oil pan must be dry and free of oil and grease



10 - ATF strainer

- ❑ ➔ [“1.2 Removing and installing ATF strainer”, page 100](#)

11 - O-ring

- ❑ Always renew

12 - Retaining clip for wiring harness connector

13 - Wiring harness in gearbox

- ❑ ➔ [“1.5 Removing and installing wiring harness in gearbox”, page 108](#)

14 - Bolt

- ❑ Secures mechatronic unit to gearbox
- ❑ 8 Nm

Different numbers and versions of bolts depending on gearbox code letters:

Follow removal and installation instructions and select correct type from ➔ Electronic parts catalogue

- ❑ ➔ [“1.4 Removing and installing mechatronic unit - gearbox with 13 bolts on oil pan”, page 105](#)
- ❑ ➔ [“1.3 Removing and installing mechatronic unit - gearbox with 24 bolts on oil pan”, page 102](#)

15 - Mechatronic unit

Various versions apply, depending on the gearbox code letters:

Follow removal and installation instructions and select correct type from ➔ Electronic parts catalogue

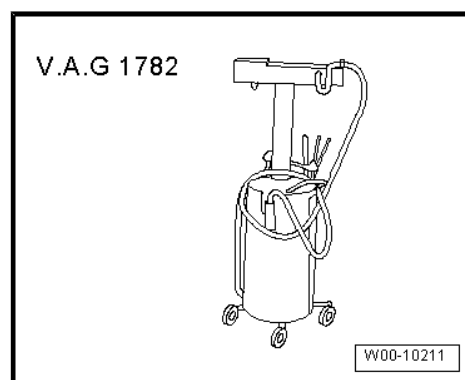
- ❑ ➔ [“1.4 Removing and installing mechatronic unit - gearbox with 13 bolts on oil pan”, page 105](#)
- ❑ ➔ [“1.3 Removing and installing mechatronic unit - gearbox with 24 bolts on oil pan”, page 102](#)

16 - Seal

1.1 Removing and installing oil pan

Special tools and workshop equipment required

- ◆ Guide pins (4x) -T40199-
- ◆ Used oil collection and extraction unit - V.A.G 1782-



- ◆ Safety goggles



Note

- ◆ *Rules for cleanliness when working on the automatic gearbox*
➔ [page 15](#)
- ◆ *General repair instructions* ➔ [page 11](#).

Removing

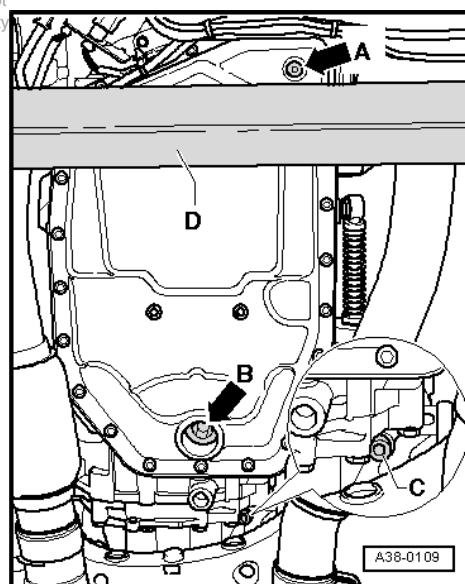
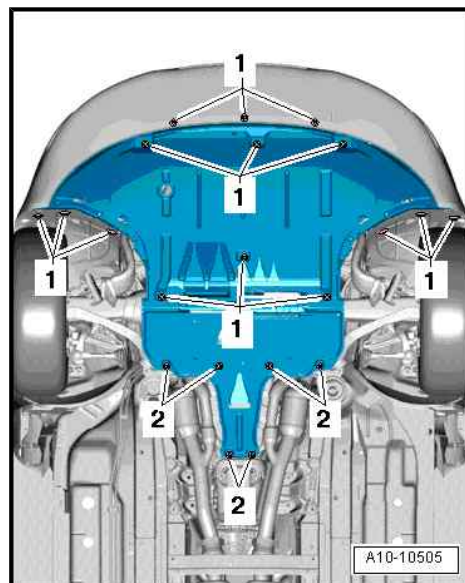
- Switch off ignition and remove ignition key.

- Open quick release fasteners -2- and take off rear noise insulation.

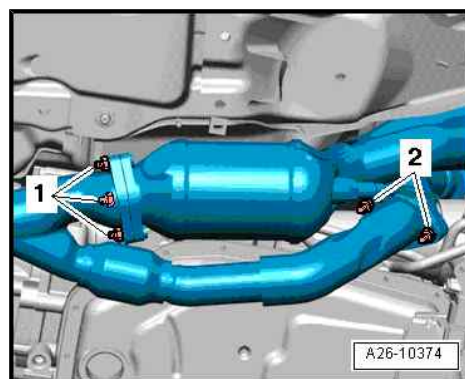


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- Remove cross piece D ⇒ Rep. gr. 40.



- Remove Y-pipe (left and right) ⇒ Rep. gr. 26. .



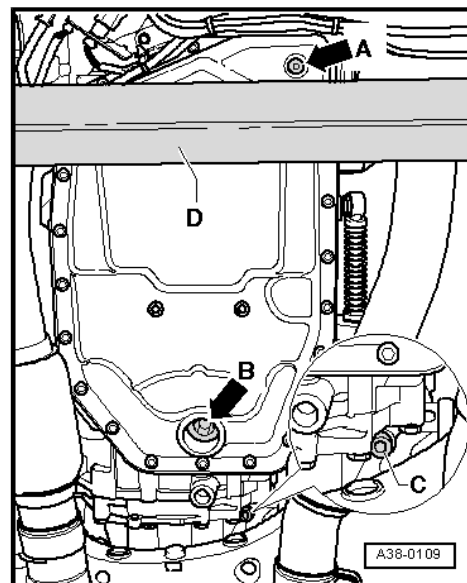
- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.



WARNING

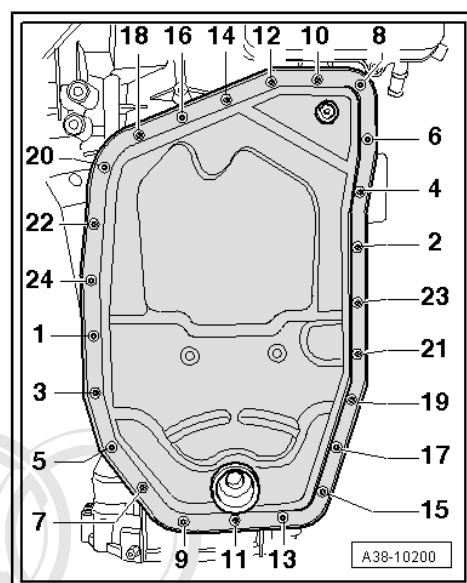
Put on safety goggles.

- Remove ATF drain plug -arrow A- and drain off ATF.



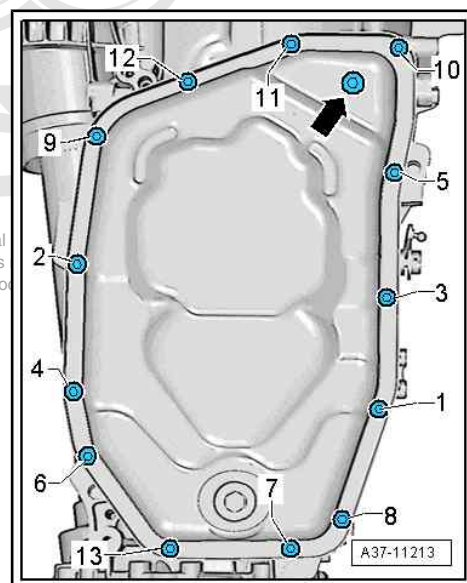
Gearbox with 24 bolts on oil pan

- Remove oil pan bolts in sequence -24 to 1- (opposite to tightening sequence).
- Remove oil pan.



Gearbox with 13 bolts on oil pan

- Remove oil pan bolts in sequence -13 to 1- (opposite to tightening sequence).
- Remove oil pan.



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Installing oil pan

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



Caution

Risk of damage to the gearbox housing.

- ◆ **Different tightening torques are specified for the oil pan bolts, depending on the version.**
- ◆ **Observe exact tightening torques and adhere to specified sequence.**

Tightening torques ⇒ [page 93](#)



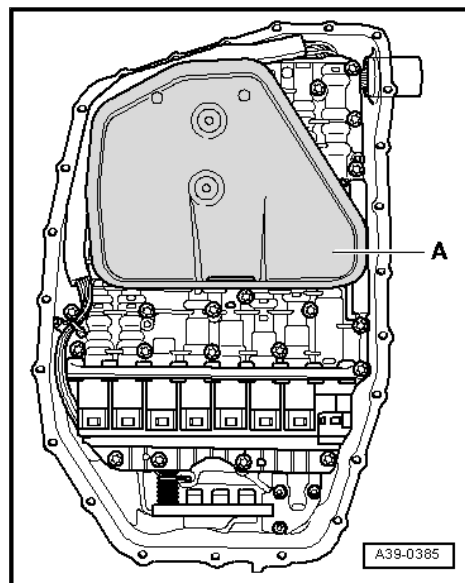
Note

- ◆ **Renew seals and gaskets.**
- ◆ **The drain plug with seal must be renewed.**
- ◆ **If vehicle mileage is high, it is recommended to renew the ATF strainer -A- when removing the oil pan ⇒ [page 100](#). Otherwise the ATF strainer only has to be renewed if it has been damaged.**
- Clean all magnets in recesses on oil pan. Ensure that magnets make full contact with oil pan.
- Clean sealing surface on gearbox and on oil pan.
- Sealing surfaces must be dry and free of oil and grease.
- Remaining material from the old gasket must be removed completely.
- Check that ATF strainer -A- is correctly seated; press into position if necessary.



Note

- ◆ **Gearbox malfunctions will occur when the vehicle is driven if the ATF strainer -A- is not correctly installed.**
- ◆ **If the ATF strainer -A- cannot be seated properly (i.e. if the strainer drops down at the rear), it must be renewed ⇒ [page 100](#).**



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Gearbox with 24 bolts on oil pan

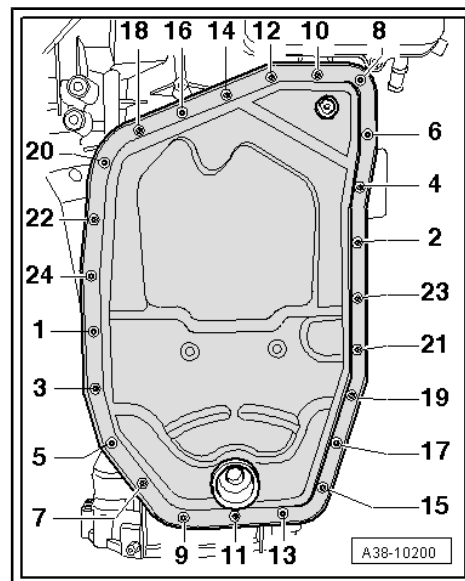
- Screw four guide pins -T40199- into positions -11, 12, 23, and 24- with oil pan removed.



Note

The guide pins -T40199- hold the gasket and oil pan in position. Without them the oil pan will not be sealed off properly.

- Guide new gasket and oil pan over guide pins -T40199- .
- Tighten oil pan bolts in the sequence -1 to 10-.
- Remove the four guide pins -T40199- .
- Screw in remaining bolts in the sequence -11 to 24-.



Gearbox with 13 bolts on oil pan

- Screw four guide pins -T40199- into positions -10, 11, 12, and 13- with oil pan removed.

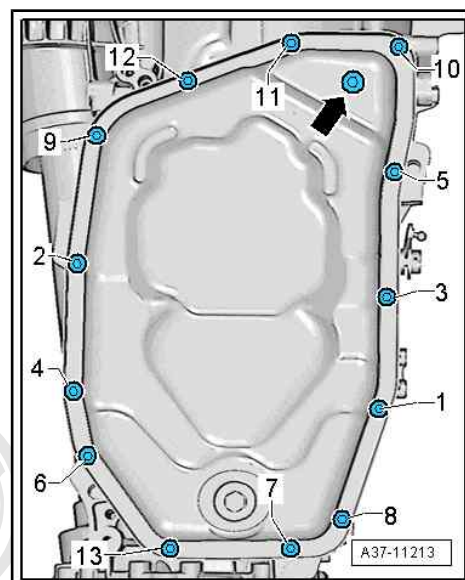


Note

◆ *The guide pins -T40199- hold the gasket and oil pan in position. Without them the oil pan will not be sealed off properly.*

◆ *Renew aluminium bolts for oil pan.*

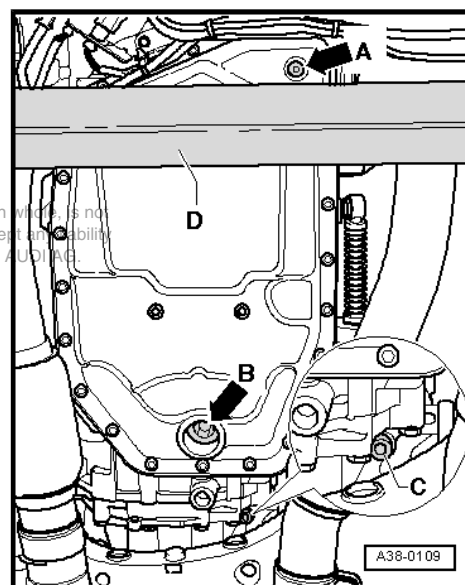
- Check gasket for damage and renew if necessary.
- Guide gasket and oil pan over guide pins -T40199- .
- Tighten new oil pan bolts in the sequence -1 to 9-.
- Remove the four guide pins -T40199- .
- Fit remaining bolts -10, 11, 12 and 13- one by one.



Both versions:

- Install cross piece -D- ⇒ Rep. gr. 40 .
- Fill up with ATF ⇒ [page 84](#) .
- Install exhaust system so it is free of stress ⇒ Rep. gr. 26.

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1.2 Removing and installing ATF strainer



Note

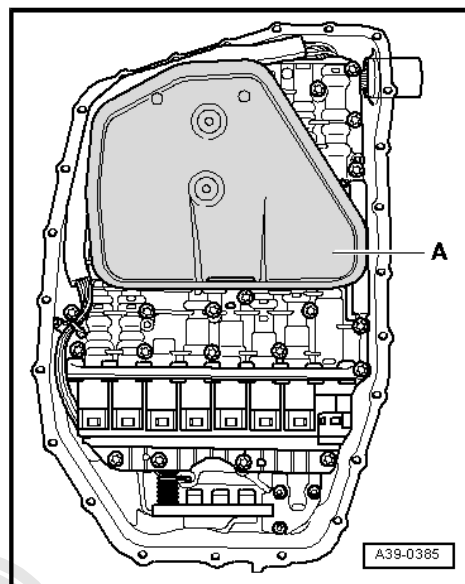
- ◆ *Rules for cleanliness when working on the automatic gearbox*
⇒ [page 15](#)
- ◆ *General repair instructions* ⇒ [page 11](#).

Removing

- Remove oil pan ⇒ [page 95](#).
- Carefully remove ATF strainer -A- from gearbox.

Installing

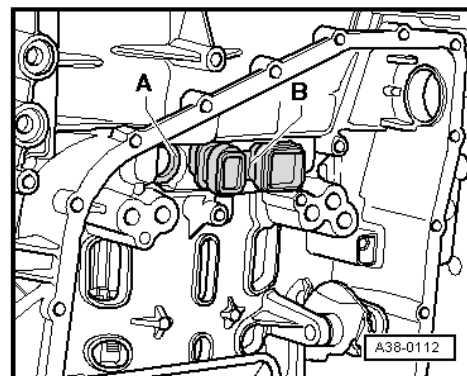
Installation is carried out in the reverse order; note the following:



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 Note

- ◆ The ATF strainer -A- only has to be renewed if it is damaged.
- ◆ If vehicle mileage is high, it is recommended to renew the ATF strainer when removing the oil pan.
- ◆ Gearbox malfunctions will occur when the vehicle is driven if the ATF strainer -A- is not correctly installed.
- ◆ If the ATF strainer -A- cannot be seated properly (i.e. if the strainer drops down at the rear), it must be renewed.
- ◆ In most cases, ATF strainer seal -A- will remain in place in the gearbox when the ATF strainer is removed. The illustration shows seal with mechatronic unit removed.
- ◆ If the ATF strainer is to be renewed, the seal must first be removed.
- ◆ The seal can be reused if the old ATF strainer is reinstalled.



Note the following when replacing with a new ATF strainer:

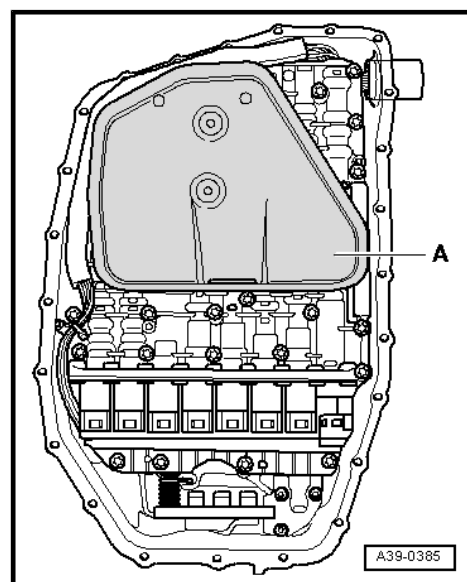
- Carefully remove seal for ATF strainer -A- from gearbox using a screwdriver or similar.

 Note

- ◆ Take care not to damage sealing surface.
- ◆ The new ATF strainer is supplied with oil seal fitted.
- ◆ When replacing with new ATF strainer, it is pressed in with seal already attached.

Continuation for new and old ATF strainer:

- Press intake neck of ATF strainer -A- carefully onto stop into mounting hole in gearbox.
- Install oil pan ➔ [page 95](#) .
- Fill up with ATF ➔ [page 84](#) .



1.3 Removing and installing mechatronic unit - gearbox with 24 bolts on oil pan



Note

- ◆ Always renew mechatronic unit if contaminated or defective.
- ◆ Rules for cleanliness when working on the automatic gearbox ⇒ [page 15](#)
- ◆ General repair instructions ⇒ [page 11](#) .

Removing

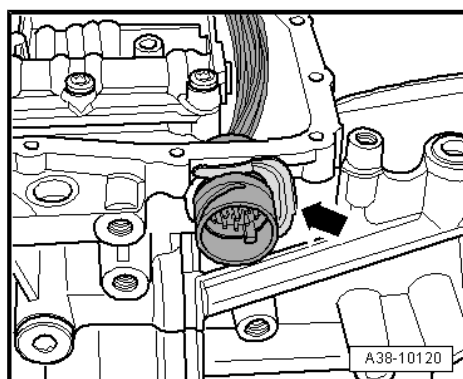
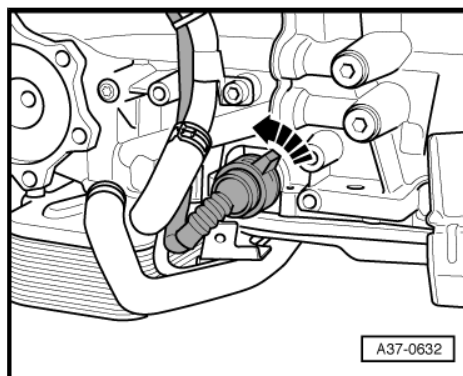
- Switch off ignition and remove ignition key.
- Remove oil pan ⇒ [page 95](#) .
- Remove ATF strainer ⇒ [page 100](#) .



Caution

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

- ◆ Before touching or removing the mechatronic unit, always discharge any static electricity by touching vehicle earth or other earthed object with your hand.
 - ◆ DO NOT touch contacts in 16-pin connector with your hands, as static discharge can seriously damage the control unit and mechatronic unit.
- Touch vehicle earth with your hand (without gloves) to discharge any static electricity.
 - Turn electrical connector on left side of gearbox anti-clockwise -arrow- and unplug.
- Detach retaining clip -arrow- for wiring harness connector and push connector inwards.

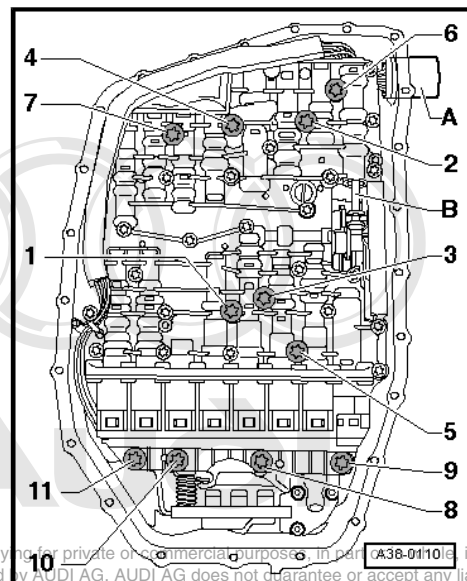


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- Unscrew securing bolts for mechatronic unit in reverse order (i.e. first bolt -11-, then -10-, ... etc. until -1-).

 Note

- ◆ *Loosen only the securing bolts indicated in the illustration -1 ... 11-.*
- ◆ *If other bolts are loosened, this may affect the operation of the mechatronic unit or the mechatronic unit could come apart.*
- Remove mechatronic unit together with wiring harness from gearbox, at the same time guide out connector for wiring harness.



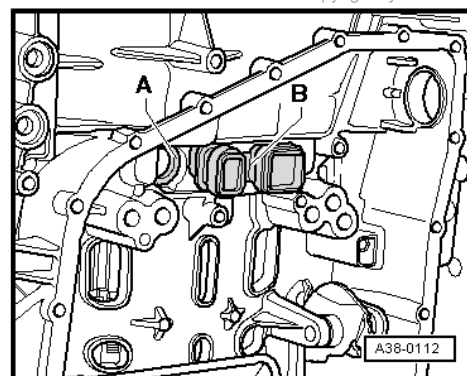
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Installing

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

Tightening torques ➔ [page 93](#)

- Make sure that seal -B- is properly inserted and secured.
- Renew O-rings on connector for wiring harness and lightly lubricate with ATF.

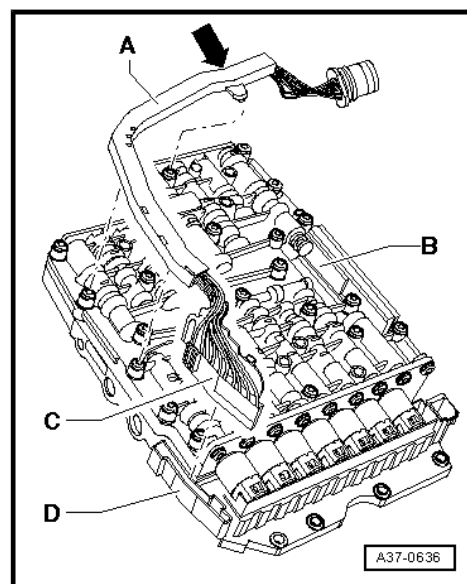


- Clip wiring harness -A- onto mechatronic unit -B-. To do so, first attach tab -arrow- on reverse side of wiring harness to mechatronic unit.

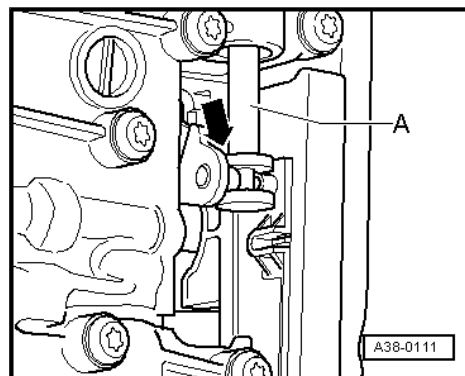
 Note

If the tab on the reverse side of the wiring harness breaks off, the wiring harness must be renewed.

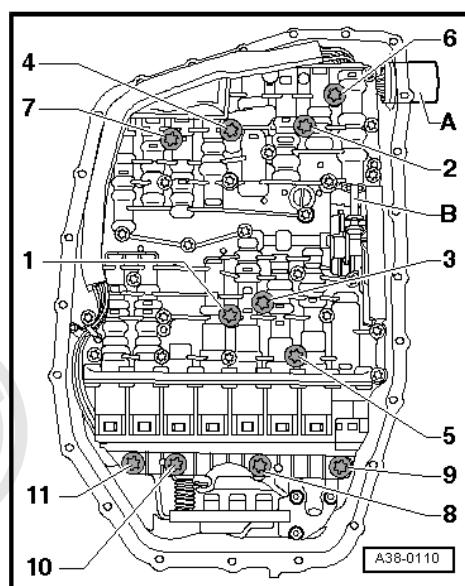
- Install wiring harness connector in gearbox housing.
- Installation position: flat part of rear shoulder faces downwards, the lugs at shoulder are horizontal



- Install mechatronic unit without using force, and at the same time fit pin on gearbox selector lever -arrow- into slot on selector slide -A- (move selector slide backwards and forwards if necessary).

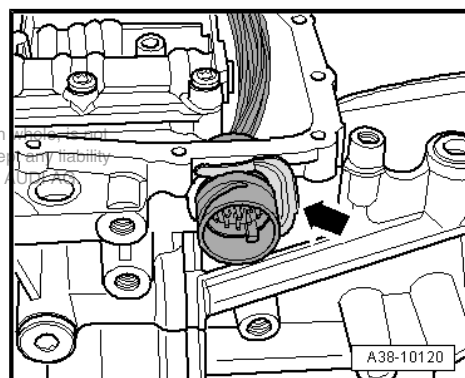


- Tighten securing bolts -1- and -2- for mechatronic unit to 2 Nm.
- Tighten securing bolts for mechatronic unit in specified order to specified torque (i.e. first bolt -1-, then -2-, ... etc. until -11-).

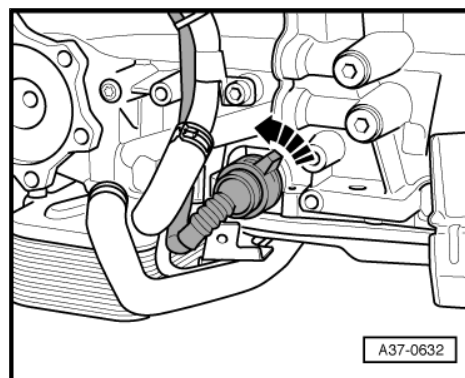


- Push retainer clip -arrow- onto wiring harness connector.
- Install ATF strainer ⇒ [page 100](#).
- Install oil pan ⇒ [page 95](#).

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- Plug in electrical connector on left side of gearbox and turn clockwise (in opposite direction of -arrow-).
- Connect battery ⇒ Rep. gr. 27.
- Fill up with ATF ⇒ [page 84](#).
- If mechatronic unit was renewed:
- Perform gearbox adaption ⇒ [page 17](#).



1.4 Removing and installing mechatronic unit - gearbox with 13 bolts on oil pan

Removing



Note

- ◆ *Rules for cleanliness when working on the automatic gearbox*
⇒ [page 15](#)
- ◆ *General repair instructions* ⇒ [page 11](#).
- ◆ *Always renew mechatronic unit if contaminated or defective.*
- Switch off ignition and remove ignition key.
- Remove oil pan ⇒ [page 95](#).
- Remove ATF strainer ⇒ [page 100](#).



Caution

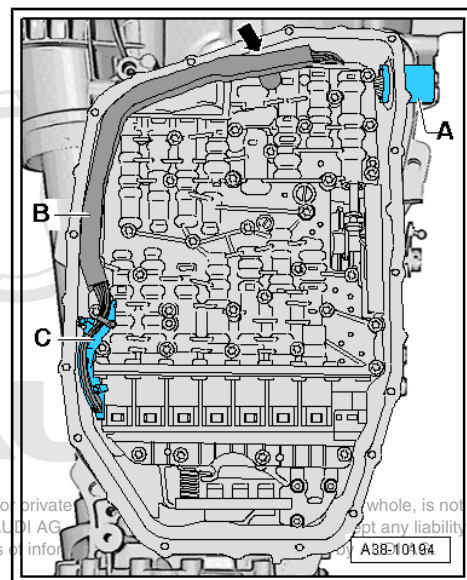
The gearbox control unit (mechatronic unit) can be irreparably damaged by electrostatic discharge.

- ◆ *Before touching or removing the mechatronic unit, always discharge any static electricity by touching vehicle earth or other earthed object with your hand.*
- ◆ *DO NOT touch contacts in 16-pin connector with your hands, as static discharge can seriously damage the control unit and mechatronic unit.*
- Touch vehicle earth with your hand (without gloves) to discharge any static electricity.



Note

Wiring harness -B- with connector -C- must be disconnected from the mechatronic unit before removing the mechatronic unit. The wiring harness connector remains in the gearbox housing.



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Note

The following illustrations show the mechatronic unit removed from the gearbox. The wiring harness connector remains in the gearbox housing.

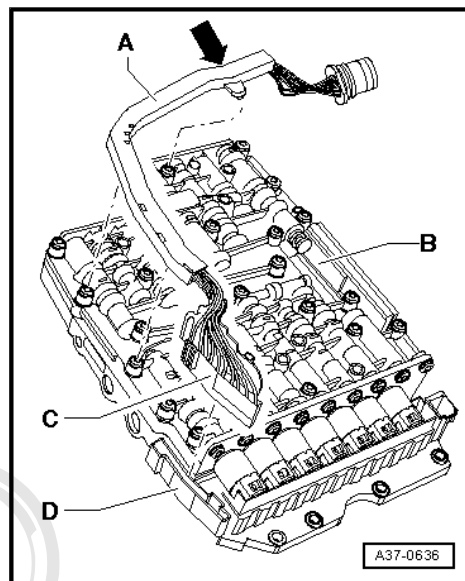
- Carefully detach wiring harness -A- from mechatronic unit -B-. At the same time, detach tab -arrow- on reverse side of wiring harness from mechatronic unit.



Note

If the tab -arrow- on the reverse side of the wiring harness breaks off, the wiring harness must be renewed.

- Carefully detach connector -C- from socket -D- of mechatronic unit.
- Carefully move wiring harness clear to one side.



Note

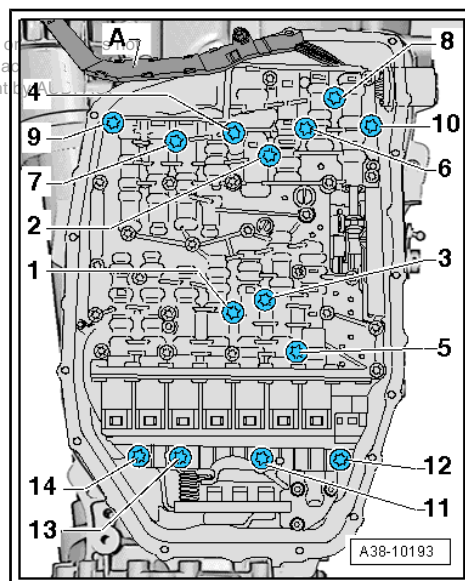
The wiring harness connector remains in the gearbox housing, so the attached harness cannot be removed.

- Unscrew securing bolts for mechatronic unit in reverse order (i.e. first bolt -14-, then -13-, ... etc. until -1-).



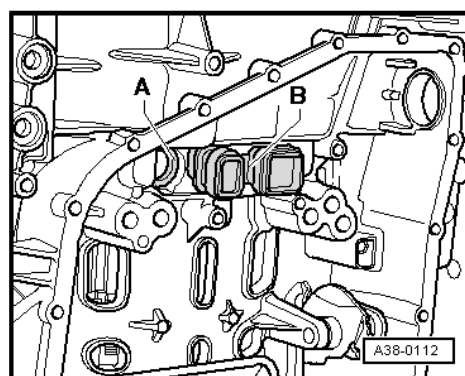
Note

- ♦ Loosen only the securing bolts indicated in the illustration -14 ... 1-.
- ♦ If other bolts are loosened, this may affect the operation of the mechatronic unit or the mechatronic unit could come apart.
- Detach mechatronic unit from gearbox.

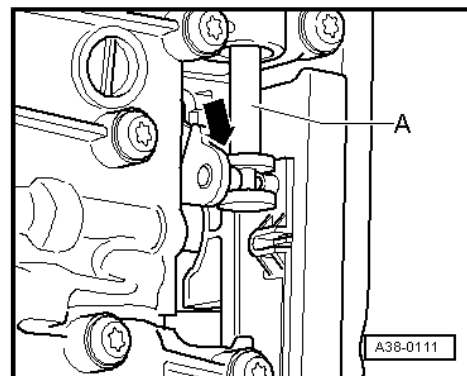


Installing

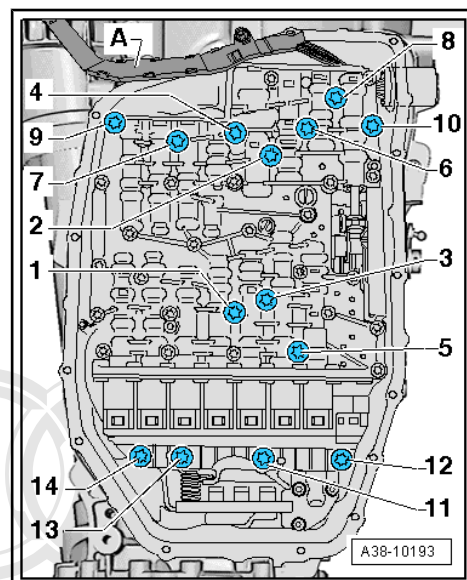
- Tightening torques ⇒ [page 93](#)
- Make sure that seal -B- is properly inserted and secured.



- Install mechatronic unit without using force, and at the same time fit pin on gearbox selector lever -arrow- into slot on selector slide -A- (move selector slide backwards and forwards if necessary).



- Tighten securing bolts -1- and -2- for mechatronic unit to 2 Nm.
- Tighten securing bolts for mechatronic unit in specified order to specified torque (i.e. first bolt -1-, then -2-, ... etc. until -14-).



- Clip wiring harness -B- onto mechatronic unit. To do so, first attach tab -arrow- on reverse side of wiring harness to mechatronic unit.



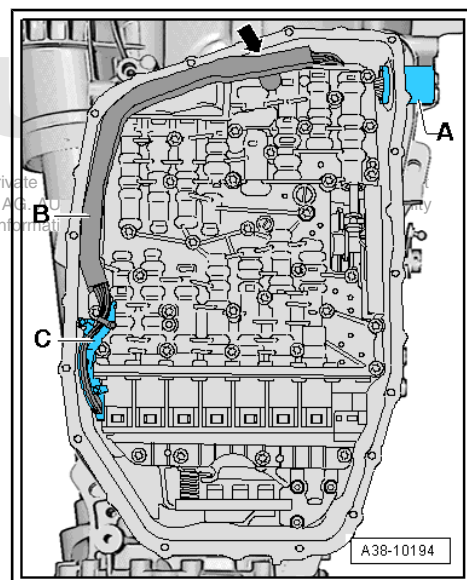
Note

If the tab on the reverse side of the wiring harness breaks off, the wiring harness must be renewed.

- Carefully insert connector -C- in connector socket on mechatronic unit.

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

- Install ATF strainer ⇒ [page 100](#) .
- Install oil pan ⇒ [page 95](#) .
- Fill up with ATF ⇒ [page 84](#) .
- If mechatronic unit was renewed:
- Perform gearbox adaption ⇒ [page 17](#) .



1.5 Removing and installing wiring harness in gearbox

Removing



Caution

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

- ◆ *Before touching or removing the mechatronic unit, always discharge any static electricity by touching vehicle earth or other earthed object with your hand.*
- ◆ *DO NOT touch contacts in 16-pin connector with your hands, as static discharge can seriously damage the control unit and mechatronic unit.*

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

Gearbox with 24 bolts on oil pan



Note

On gearboxes with 24 bolts on oil pan, the wiring harness is removed together with the mechatronic unit.

- Remove mechatronic unit
⇒ [“1.3 Removing and installing mechatronic unit - gearbox with 24 bolts on oil pan”, page 102](#).
- Carefully detach wiring harness -A- from mechatronic unit -B-. At the same time, detach tab -arrow- on reverse side of wiring harness from mechatronic unit.



Note

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If the tab -arrow- on the reverse side of the wiring harness breaks off, the wiring harness must be renewed.

- Carefully detach connector -C- from socket -D- of mechatronic unit.

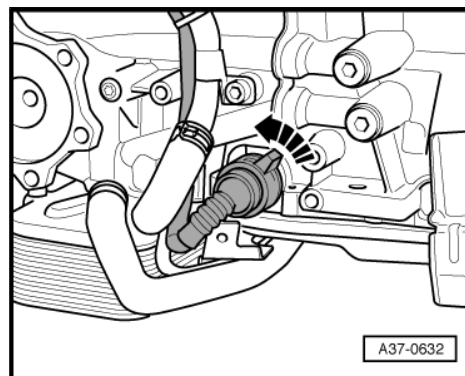
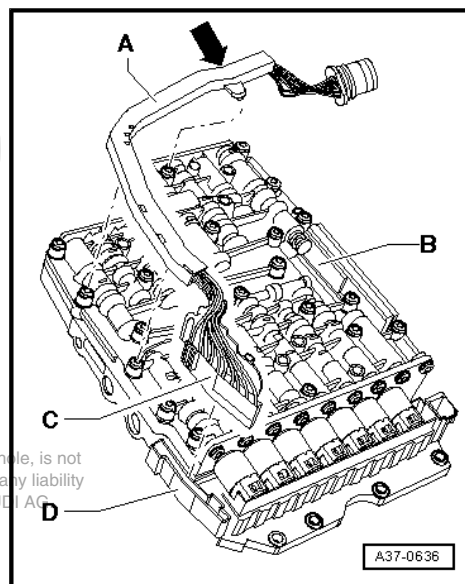
Gearbox with 13 bolts on oil pan



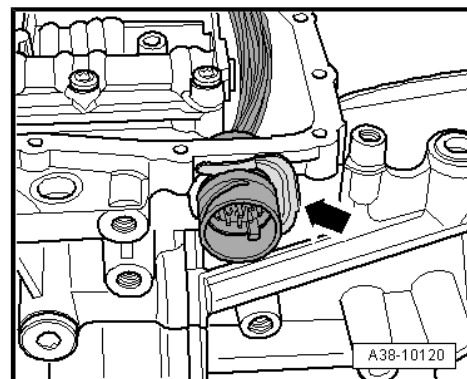
Note

On gearboxes with 13 bolts on oil pan, the mechatronic unit must be removed before the wiring harness can be removed.

- Remove mechatronic unit
⇒ [“1.4 Removing and installing mechatronic unit - gearbox with 13 bolts on oil pan”, page 105](#).
- Turn electrical connector on left side of gearbox anti-clockwise -arrow- and unplug.



- Detach retaining clip -arrow- for wiring harness connector and push connector inwards.
- Remove wiring harness.

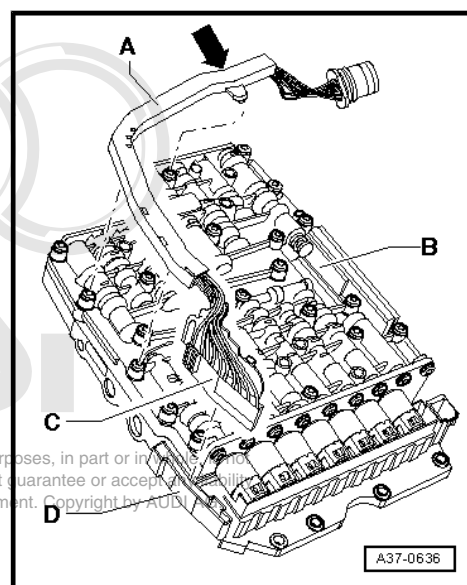


Installing

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

Gearbox with 24 bolts on oil pan

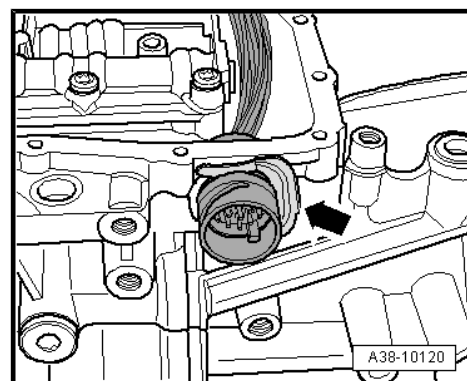
- Carefully attach connector -C- to socket -D- on mechatronic unit.
- Clip wiring harness -A- onto mechatronic unit -B-. To do so, first attach tab -arrow- on reverse side of wiring harness to mechatronic unit.
- Install mechatronic unit
⇒ [“1.3 Removing and installing mechatronic unit - gearbox with 24 bolts on oil pan”, page 102](#).



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Gearbox with 13 bolts on oil pan

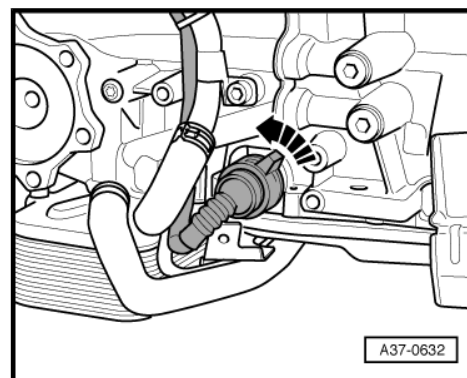
- Renew O-rings on connector for wiring harness and lightly lubricate with ATF.
- Install wiring harness connector in gearbox housing. Note correct position.
- Push retainer clip -arrow- onto wiring harness connector.
- Install mechatronic unit
⇒ [“1.4 Removing and installing mechatronic unit - gearbox with 13 bolts on oil pan”, page 105](#).



- Plug in electrical connector on left side of gearbox and turn clockwise (in opposite direction of -arrow-).

Both versions:

- Fill up with ATF ⇒ [page 84](#).



39 – Final drive - front differential

1 Exploded view - gear oil cooler and pipes

1 - Bolt

- ☐ 10 Nm

2 - Gear oil cooler

- ☐ Top up gear oil in gear-box after removing gear oil cooler ⇒ [page 115](#)
- ☐ Only a connecting pipe is installed instead of the gear oil cooler on some versions ⇒ [page 87](#)

3 - O-ring

- ☐ Always renew

4 - O-ring

- ☐ Always renew

5 - Bolt

- ☐ 8 Nm

6 - Bolt

- ☐ 8 Nm

7 - Bracket

8 - Pipe

- ☐ Return pipe to transfer box
- ☐ Top up gear oil in gear-box after removing pipe ⇒ [page 115](#)

9 - Bolt

- ☐ 8 Nm

10 - Bolt

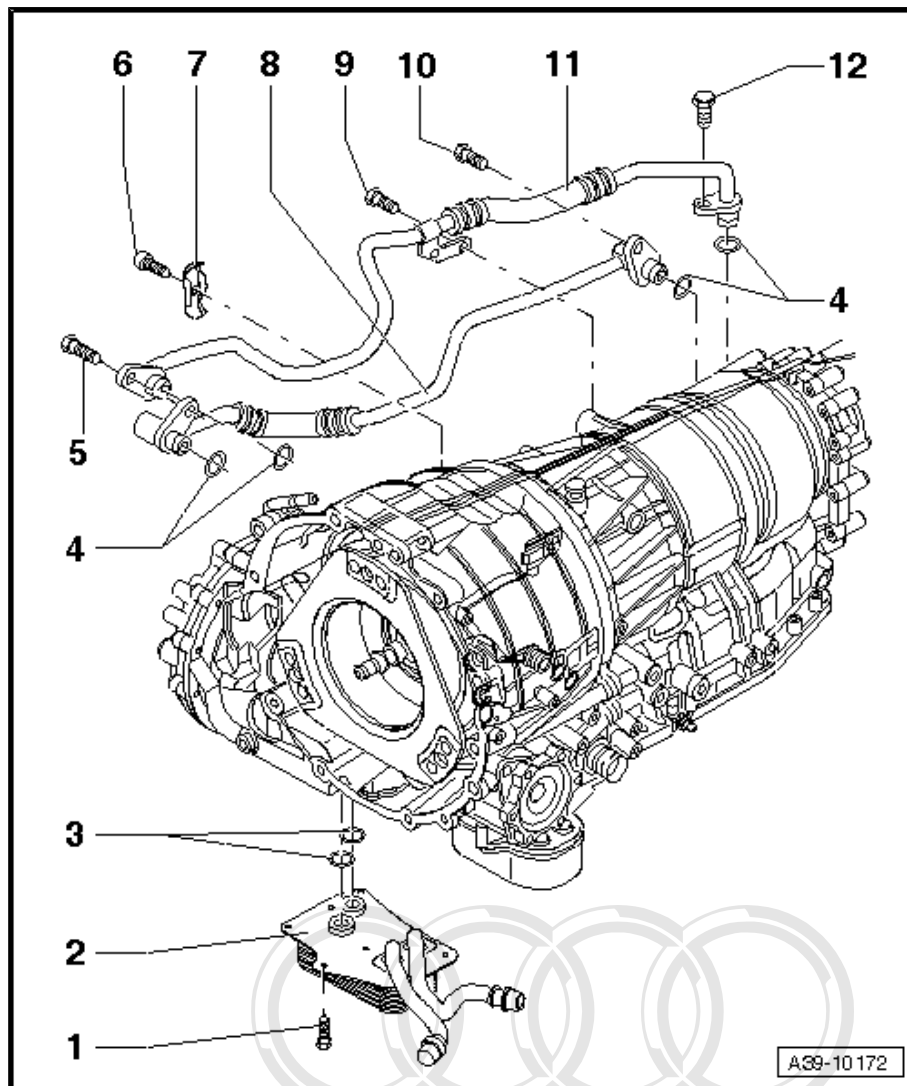
- ☐ 8 Nm

11 - Pipe

- ☐ From transfer box to gear oil cooler
- ☐ Top up gear oil in gearbox after removing pipe ⇒ [page 115](#)

12 - Bolt

- ☐ 8 Nm



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2 Checking gear oil in gearbox and filling after repairs



Note

- ◆ Always observe the relevant environmental regulations for disposal.
- ◆ Rules for cleanliness when working on the automatic gearbox
⇒ [page 15](#)
- ◆ General repair instructions ⇒ [page 11](#).

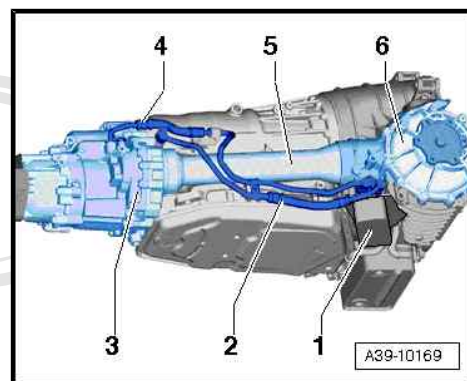
Overview:

- ◆ ⇒ [“2.1 Checking gear oil level in gearbox and topping up”, page 111](#)
- ◆ ⇒ [“2.2 Filling up gear oil in gearbox after repairs”, page 115](#)

On gearboxes with a common oil system, the oil chambers in the front final drive -6- and transfer box -3- are joined and must therefore always be checked and topped up together.

The total capacity of gear oil in the gearbox, including oil lines and gear oil cooler, is 2.4 ltr.

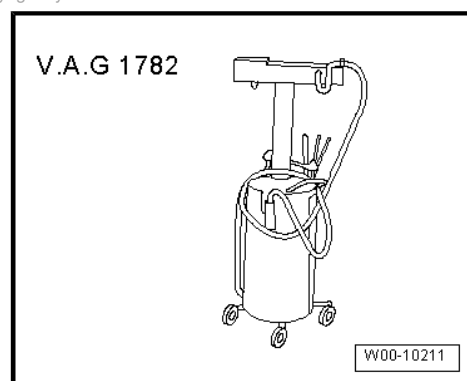
Gear oil specifications ⇒ Electronic parts catalogue



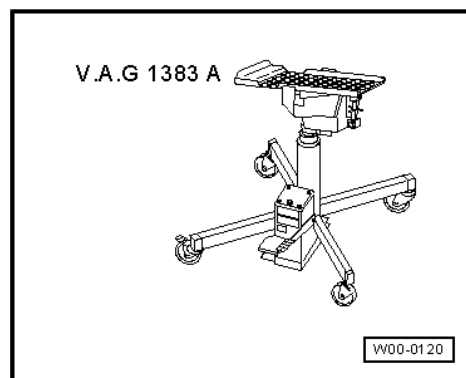
2.1 Checking gear oil level in gearbox and topping up

Special tools and workshop equipment required

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



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



- ◆ Hand pump for gear oil - VAS 6617-
- ◆ Safety goggles

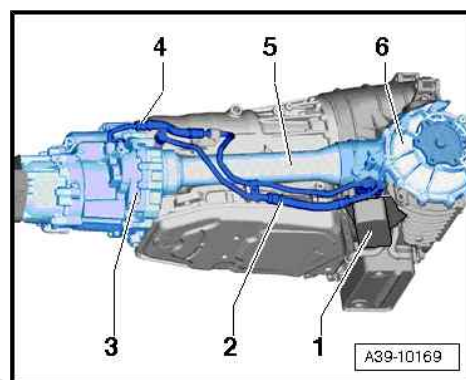
Requirements

- Gear oil temperature approx. 20 °C (room temperature) to max. 50 °C.
- Vehicle must be level (horizontal).
- The vehicle must not be started or towed without gear oil.



Note

- ◆ *The oil chambers in the front final drive -6- and transfer box -3- are joined and must therefore always be checked and topped up together.*
- ◆ *Both overfilling and underfilling impair the function of the gearbox.*
- ◆ *Always observe the relevant environmental regulations for disposal.*
- ◆ *Rules for cleanliness when working on the automatic gearbox ⇒ [page 15](#)*
- ◆ *General repair instructions ⇒ [page 11](#) .*



Procedure

- Remove gearbox mounting and gearbox support ⇒ [page 76](#) .



Note

Gearbox support must be removed in order to access oil filler/ inspection plug for transfer box.



Caution

***When performing the steps below, please note the following:
Do not support the gearbox under the oil pan - risk of damage.***

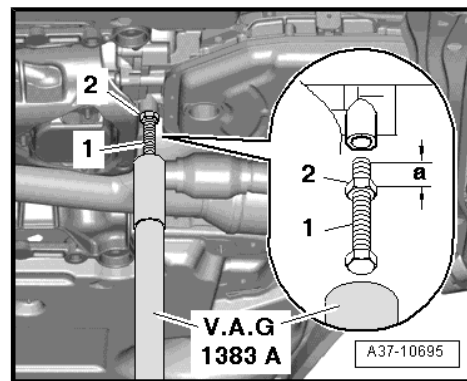
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- Insert a bolt M12x100 -item 1- with attached nut -2- into the mounting hole behind the oil pan on the gearbox.
- Dimension -a- = 13 mm
- Apply lifting column of engine and gearbox jack - V.A.G 1383 A- to bolt head and raise gearbox until it is in horizontal installation position again.



Note

- ◆ *Gearbox must be in horizontal installation position when checking gear oil.*
- ◆ *It must be raised or lowered accordingly using engine and gearbox jack - V.A.G 1383 A- after removing tunnel cross member.*
- Place used oil collection and extraction unit - V.A.G 1782- under gearbox.



Note

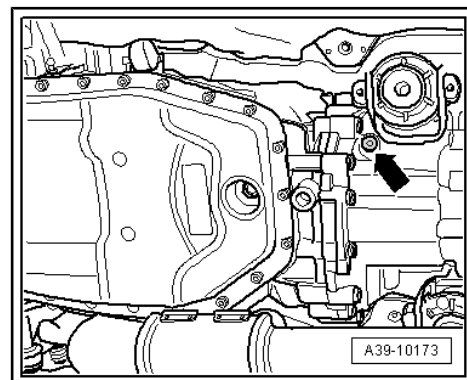
Always observe the relevant environmental regulations for disposal.



WARNING

Put on safety goggles.

- Remove oil filler/inspection plug -arrow- for transfer box.

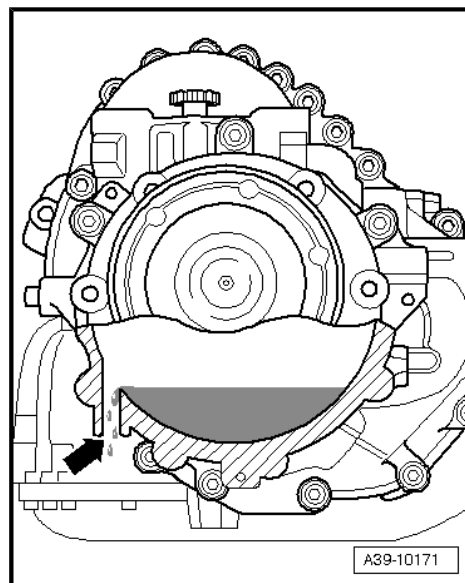


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Note

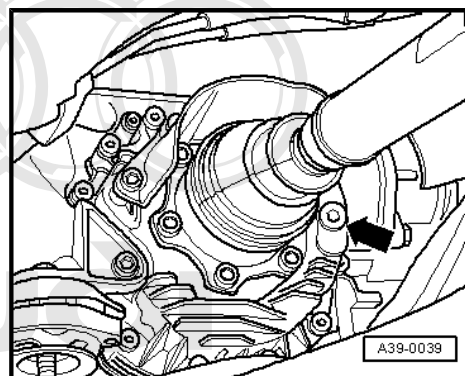
- ◆ Oil filler/inspection plug for transfer box is located on side of transfer box housing and is inserted from below -arrow-.
- ◆ Illustration shows sectional view of transfer box from rear side with gear oil level and filler opening.



- Remove oil filler/inspection plug -arrow- for front final drive.

Gear oil specifications and capacities ⇒ [page 7](#)

- Using hand pump for gear oil - VAS 6617- , slowly fill front final drive until gear oil emerges at bottom lip of oil filler hole -arrow-.
- Wait for 5 minutes and repeat procedure.



Note

It is important to wait for 5 minutes so that the internal oil level in the system has time to equalise.

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- Using hand pump for gear oil - VAS 6617- , fill gear oil slowly into transfer box housing through oil filler hole on transfer box -arrow- until oil comes out at filler hole.
- Wait for 5 minutes and repeat procedure.

 Note

It is important to wait for 5 minutes so that the internal oil level in the system has time to equalise.

A small quantity of gear oil always emerges initially from the oil channel above the plug when the hose is disconnected.

If gear oil subsequently emerges slowly from the opening, the oil level in the transfer box is correct.

If no gear oil emerges:

- Top up gear oil again until oil level is correct.
- Allow excess gear oil to drain out of opening until oil level in transfer box is correct.

 Note

The level does not need to be re-checked after this step.

- Always renew oil filler/inspection plugs.

Install all components in reverse order, paying attention to the following:

- Install gearbox support, gearbox mounting and tunnel cross member ⇒ [page 73](#) .
- Assemble exhaust system so it is free of stress ⇒ Rep. gr. 26 .

Tightening torque

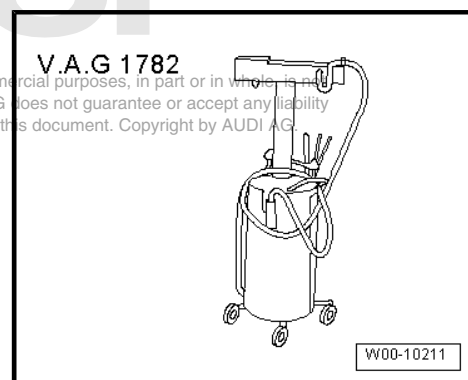
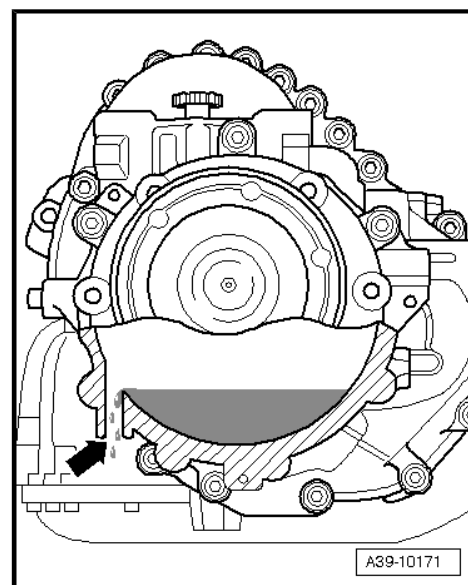
Component	Nm
Oil filler/inspection plug for transfer box	⇒ page 137
Oil filler/inspection plug for front final drive	⇒ page 121

2.2 Filling up gear oil in gearbox after repairs

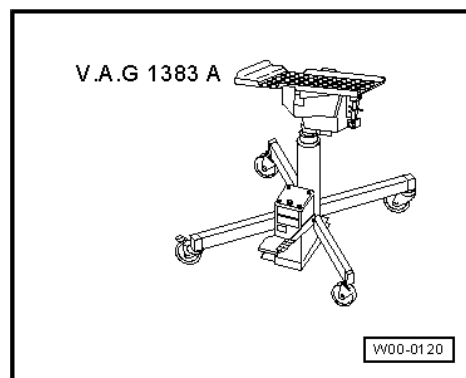
Special tools and workshop equipment required

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

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



- ◆ Hand pump for gear oil - VAS 6617-
- ◆ Safety goggles

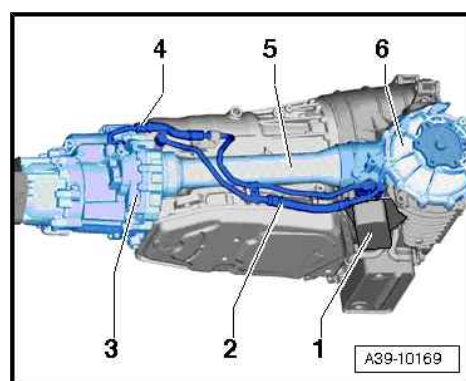
After carrying out servicing or repair work, always fill gearbox with oil in following cases:

- ◆ Centre differential housing -3- was removed, causing all the gear oil to drain off.
- ◆ Cover for front final drive -6- was removed, causing all the gear oil to drain off.
- ◆ Gear oil cooler -1- was removed.



Note

- ◆ *The oil chambers in the front final drive and transfer box are joined and must therefore always be checked and topped up together.*
- ◆ *Both overfilling and underfilling impair the function of the gearbox.*
- ◆ *Always observe the relevant environmental regulations for disposal.*
- ◆ *Rules for cleanliness when working on the automatic gearbox*
⇒ [page 15](#)
- ◆ *General repair instructions* ⇒ [page 11](#).



Procedure

Although the transfer box and front final drive have a common oil system, they have to be pre-filled and checked separately due to the different oil levels.

- Remove gearbox mounting and gearbox support ⇒ [page 76](#).



Note

Gearbox support must be removed in order to access oil filler/ inspection plug for transfer box.



Caution

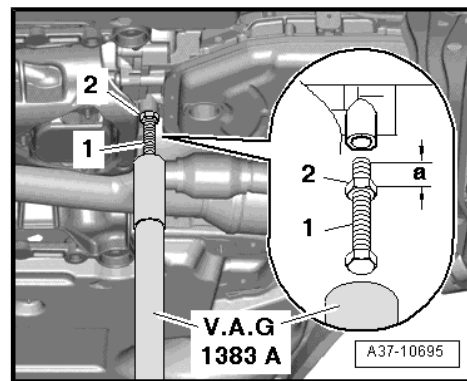
*When performing the steps below, please note the following:
Do not support the gearbox under the oil pan - risk of damage.*

- Insert a bolt M12x100 -item 1- with attached nut -2- into the mounting hole behind the oil pan on the gearbox.
- Dimension -a- = 13 mm
- Apply lifting column of engine and gearbox jack - V.A.G 1383 A- to bolt head and raise gearbox until it is in horizontal installation position again.



Note

- ◆ *Gearbox must be in horizontal installation position when checking gear oil.*
- ◆ *It must be raised or lowered accordingly using engine and gearbox jack - V.A.G 1383 A- after removing tunnel cross member.*
- Place used oil collection and extraction unit - V.A.G 1782- under gearbox.



Note

Always observe the relevant environmental regulations for disposal.

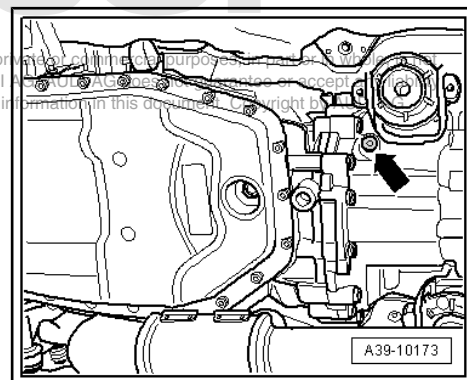


WARNING

Put on safety goggles.

- Remove oil filler/inspection plug -arrow- for transfer box.

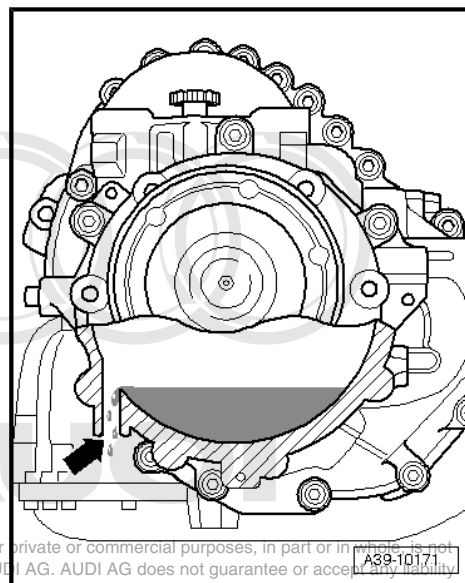
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Note

- ◆ Oil filler/inspection plug for transfer box is located on side of transfer box housing and is inserted from below -arrow-.
- ◆ Illustration shows sectional view of transfer box from rear side with gear oil level and filler opening.



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- Remove oil filler/inspection plug -arrow- for front final drive.

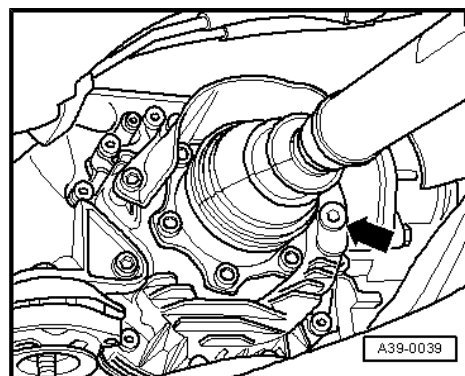
Gear oil specifications ⇒ Electronic parts catalogue ; capacities ⇒ [page 7](#)

- Using hand pump for gear oil - VAS 6617- , fill front final drive slowly and evenly until gear oil emerges at bottom lip of oil filler hole (allow a filling period of at least 5 minutes).



Note

The filling period of at least 5 minutes is necessary so that the internal oil level in the system has time to equalise.



- Using hand pump for gear oil - VAS 6617- , fill gear oil into transfer box housing through oil filler hole on transfer box -arrow- (allow a filling period of at least 5 minutes).

Gear oil specifications ⇒ Electronic parts catalogue ; capacities
⇒ [page 7](#)

 Note

The filling period of at least 5 minutes is necessary so that the internal oil level in the system has time to equalise.

A small quantity of gear oil always emerges initially from the oil channel above the plug when the hose is disconnected.

If gear oil subsequently emerges slowly from the opening, the oil level in the transfer box has been pre-filled correctly.

If no gear oil emerges:

- Top up gear oil again until oil level is correct.
- Allow excess gear oil to emerge from oil filler hole.
- Screw the old oil filler/inspection plugs back in.
- Install gearbox support ⇒ [page 73](#) .
- Install tunnel cross member ⇒ [page 73](#) .
- Assemble exhaust system so it is free of stress ⇒ Rep. gr. 26 .

Performing road test



Caution

The gearbox will be damaged if the gear oil level is too high or too low.

Follow all specified procedures exactly.

Before checking the oil level, it is necessary to test drive the vehicle briefly to allow air to escape from the oil system.

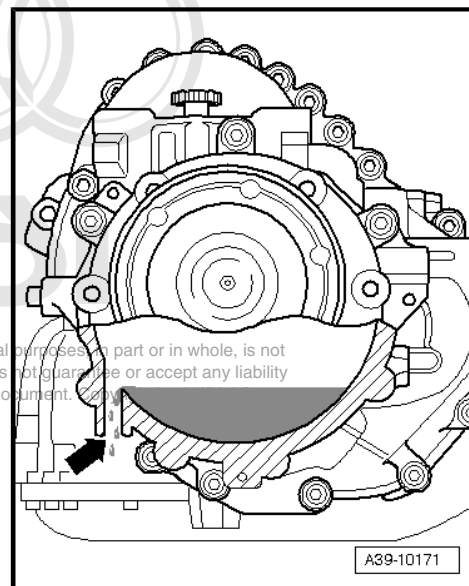
- Drive vehicle for 5 minutes at approx. 40 km/h over a distance of at least 4 km.

 Note

Make sure that gear oil cooler is filled with gear oil. Similarly, the centre differential must fill up internally with gear oil after it has been removed. A short test drive is necessary because the oil pump for the transfer box is operated only when the vehicle is driven.

After test drive:

- Check gear oil and top up if necessary
⇒ [“2.1 Checking gear oil level in gearbox and topping up”, page 111](#)





Tightening torque

Component	Nm
Oil filler/inspection plug for transfer box	⇒ page 137
Oil filler/inspection plug for front final drive	⇒ page 121



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3 Exploded view - front final drive



Note

- ◆ Rules for cleanliness when working on the automatic gearbox ⇒ [page 15](#)
- ◆ General repair instructions ⇒ [page 11](#).

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

- ☐ Between final drive and gearbox housing
- ☐ Renewing ⇒ [page 127](#)

2 - Shim

- ☐ Behind tapered roller bearing outer race

3 - Tapered roller bearing outer race

4 - O-ring

- ☐ Renew together with screw plug

5 - Plug

- ☐ Renew
- ☐ 35 Nm

6 - Flange shaft (right-side)

- ☐ Removing and installing ⇒ [page 122](#)

7 - Circlip

- ☐ Renew

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

- ☐ Renewing ⇒ [page 126](#)

9 - Bolt

- ☐ Follow correct tightening sequence ⇒ [page 130](#)
- ☐ 23 Nm

10 - Cover for front final drive

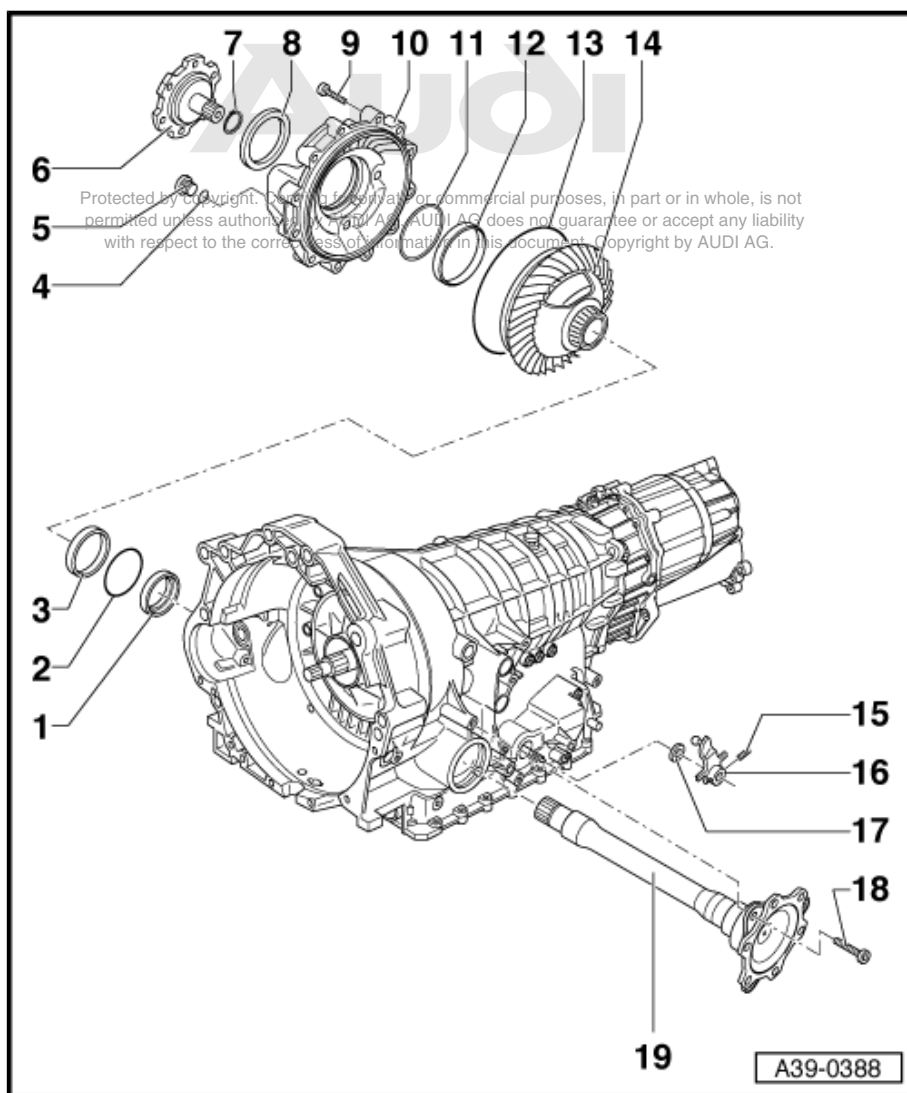
11 - Shim

- ☐ Behind tapered roller bearing outer race

12 - Tapered roller bearing outer race

13 - O-ring

- ☐ On cover for front final drive
- ☐ Renewing ⇒ [page 130](#)



14 - Differential**15 - Roll pin****16 - Selector shaft lever****17 - Oil seal for selector shaft**

- ❑ Renewing ⇒ [page 131](#)

18 - Bolt

- ❑ 23 Nm

19 - Flange shaft (left-side)

- ❑ Removing and installing ⇒ [page 124](#)

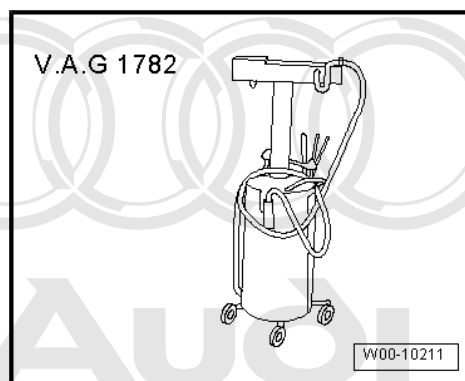
3.1 Removing and installing flange shaft (right-side)

**Note**

- ◆ *Rules for cleanliness when working on the automatic gearbox*
⇒ [page 15](#)
- ◆ *General repair instructions* ⇒ [page 11](#) .

Special tools and workshop equipment required

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

**Removing**

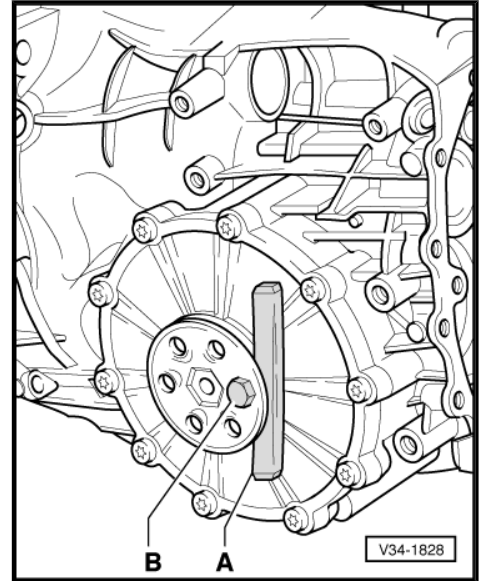
- Gearbox in vehicle
- Remove heat shield for drive shaft (right-side).
- Unbolt drive shaft (right-side) from flange on gearbox and tie up ⇒ Rep. gr. 40 .

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- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.
- Remove flange shaft: Place a chisel or suitable spacer -A- under the flange shaft and pull flange shaft out by turning bolt -B-.

i Note

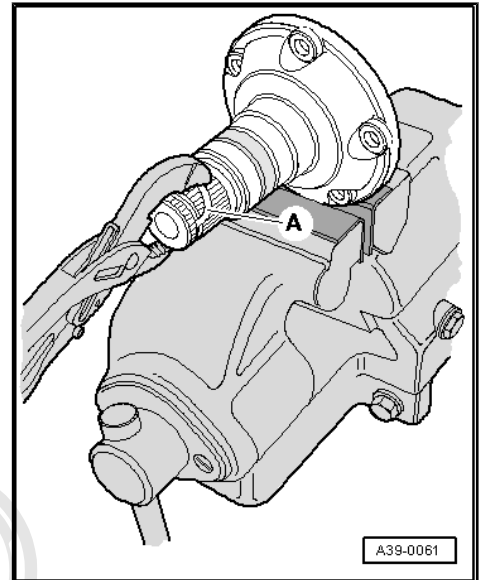
If the flange shaft does not come out easily, turn the shaft and insert the bolt in the opposite tapped hole to assist removal.



- Always renew circlip for flange shaft.
- Clamp flange shaft in vice, using jaw protectors. Use new circlip -A- to press old circlip out of groove in flange shaft.

Installing

- Clean flange shaft and oil seal.
- If oil seal is damaged, it must be renewed
⇒ [“3.3 Renewing oil seal for flange shaft \(right-side\)”](#),
[page 126](#) .
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .
- Insert flange shaft by hand into splines of front final drive until splines lock properly into place.
- Press flange shaft in by hand or with mandrel - VW 295- as far as the stop.



i Note

The circlip on the flange shaft should click into place.

- Install drive shaft (right-side) ⇒ Rep. gr. 40 .
- Fit drive shaft heat shields.
- Check gear oil level in gearbox and top up if necessary
⇒ [page 111](#) .

Tightening torque

Component	Nm
Heat shield for drive shaft to gearbox	23

3.2 Removing and installing flange shaft (left-side)



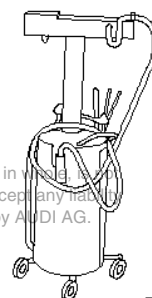
Note

- ◆ *Rules for cleanliness when working on the automatic gearbox*
⇒ [page 15](#)
- ◆ *General repair instructions* ⇒ [page 11](#) .

Special tools and workshop equipment required

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

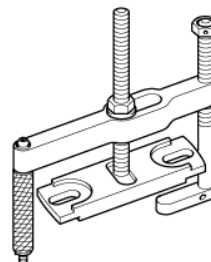
V.A.G 1782



W00-10211

- ◆ Puller - T10037-

T10037



W00-0976

Removing

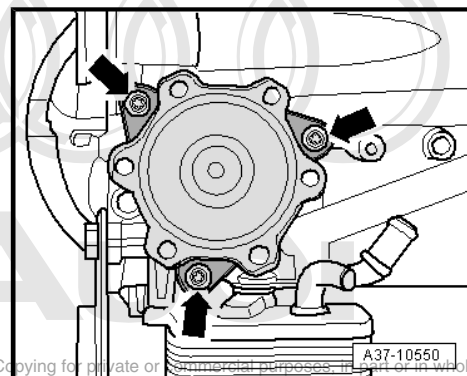
- Gearbox removed
- Gearbox mounted on assembly stand ⇒ [page 71](#) .



Caution

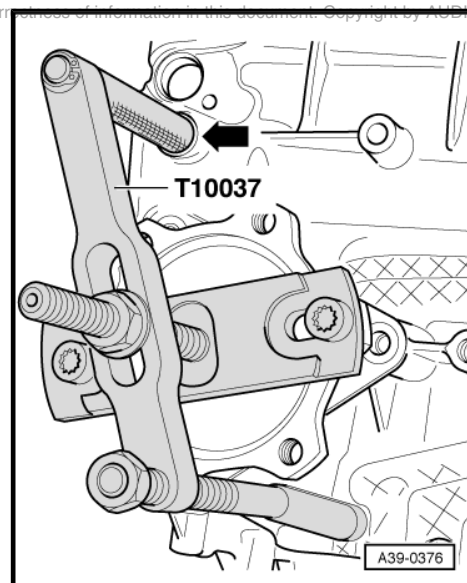
The gearbox must not be placed down on ATF cooler or oil pan.

- Unscrew bolts -arrows- on mounting bracket for flange shaft (left-side).



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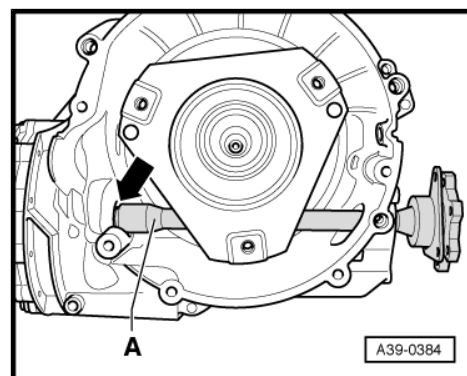
- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.
- Remove flange shaft (left-side); to do so, secure puller - T10037- to gearbox housing -arrow-.
- Pull out flange shaft using puller - T10037- only until bearing on shaft is removed from gearbox housing.



Note

If you do not keep the shaft centered when pulling it out further -arrow-, the splines of the shaft will fall against the oil seal for the flange shaft (left-side). The oil seal will be damaged and will have to be renewed ⇒ [page 127](#) .

- Pull flange shaft -A- out of gearbox making sure that the shaft remains centered in the opening on the front final drive -arrow-.



Installing

- Install in the reverse order.

You must also perform and observe the following checks.

- Clean flange shaft and oil seal.
- If oil seal between final drive and gearbox housing is damaged, it must be renewed ⇒ [page 127](#) .
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .

- Insert flange shaft -A- into gearbox and guide shaft into oil seal on front final drive -arrow-, keeping it centered.

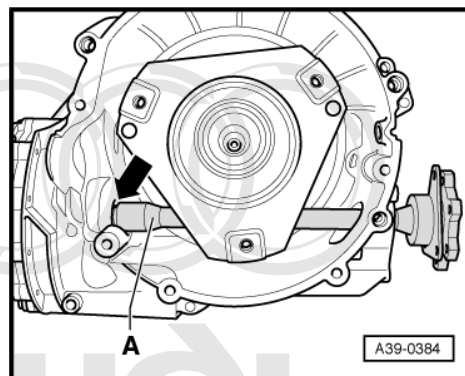


Note

If you do not keep the shaft centered, the splines of the shaft will damage the oil seal between final drive and gearbox housing. In this case, the oil seal will have to be renewed ⇒ [page 127](#).

Tightening torque

Component	Nm
Retaining bracket for left flange shaft to gearbox	23



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

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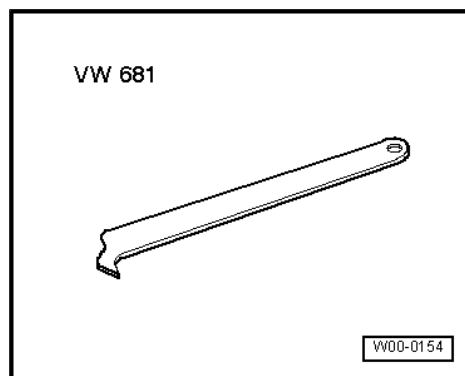


Note

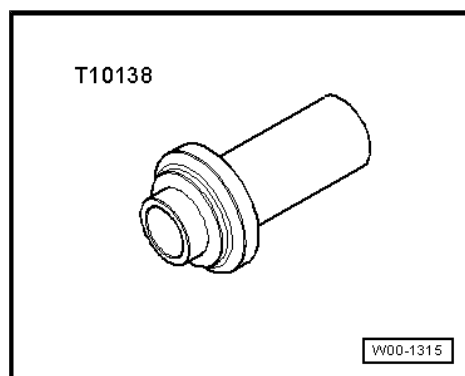
- ◆ Rules for cleanliness when working on the automatic gearbox ⇒ [page 15](#)
- ◆ General repair instructions ⇒ [page 11](#).

Special tools and workshop equipment required

- ◆ Extractor lever - VW 681-

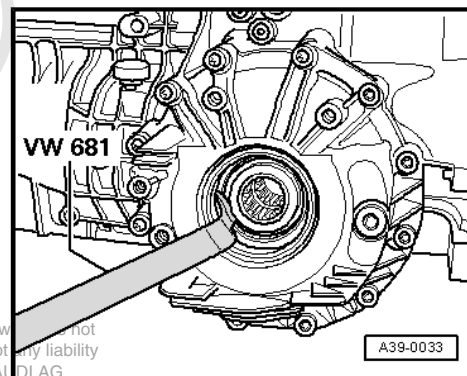


- ◆ Thrust piece - T10138-



Removing

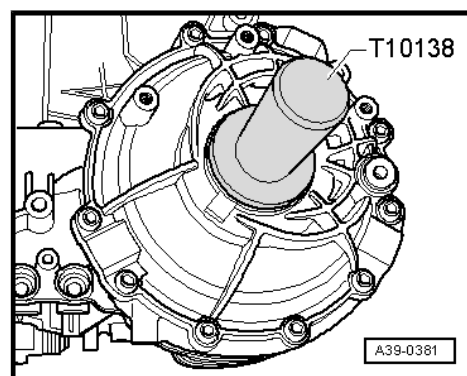
- Remove flange shaft (right-side) ⇒ [page 122](#) .
- Pull out flange shaft oil seal.



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Installing

- Lightly lubricate outer circumference of oil seal with gear oil.
- Drive in new oil seal onto stop (take care to keep oil seal straight).
- Installation position: the open side of the oil seal should face the gearbox.
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1- .
- Install flange shaft (right-side) ⇒ [page 122](#) .
- Check gear oil level in gearbox and top up if necessary ⇒ [page 111](#) .



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

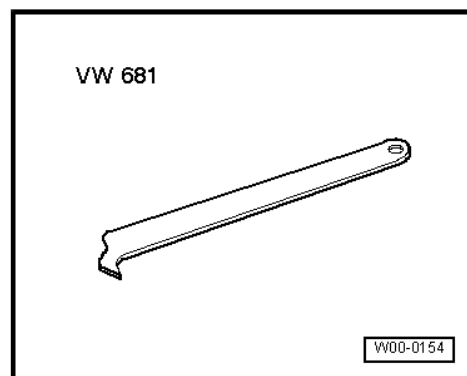


Note

- ◆ A defective oil seal allows gear oil to enter the torque converter bellhousing.
- ◆ Rules for cleanliness when working on the automatic gearbox ⇒ [page 15](#)
- ◆ General repair instructions ⇒ [page 11](#) .

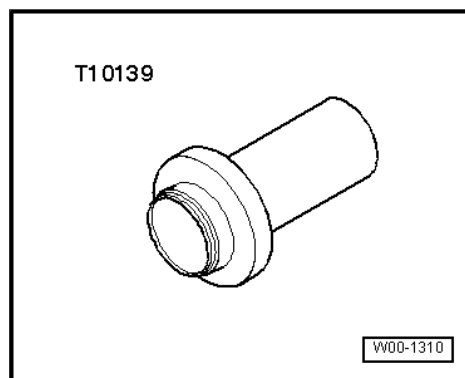
Special tools and workshop equipment required

- ◆ Extractor lever - VW 681-





◆ Thrust piece - T10139-



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Removing

- Gearbox removed
- Gearbox mounted on assembly stand ⇒ [page 71](#) .



WARNING

The gearbox must not be placed down on ATF cooler or oil pan.

- Remove flange shaft (right-side) ⇒ [page 122](#) .
- Unscrew bolts on cover for final drive in the reverse sequence to the tightening sequence shown and remove cover together with outer race for tapered roller bearing and shim.



Note

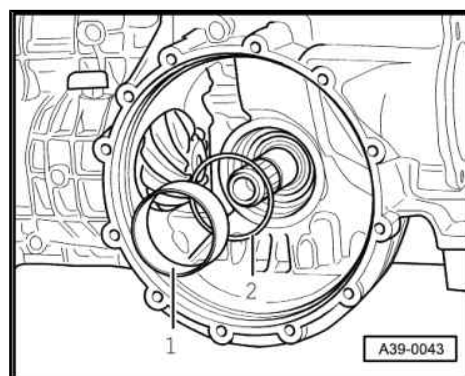
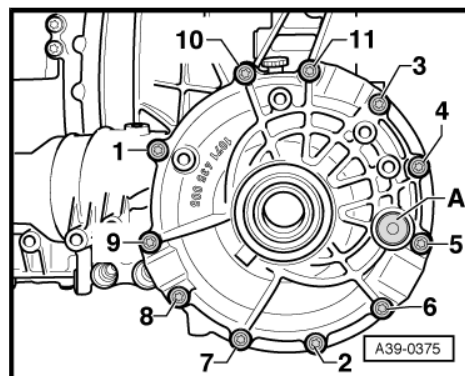
Thickness of shim has been measured to fit; the shim must not be replaced with another shim of different thickness.

- Remove differential.
- Remove tapered roller bearing outer race -1- for differential and shim -2- (behind outer race) from gearbox housing by hand.



Note

Thickness of shim has been measured to fit; the shim must not be replaced with another shim of different thickness.

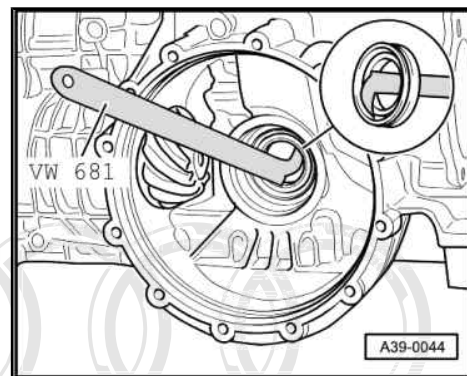


- Remove flange shaft (left-side) ➔ [page 124](#) .
- Pull out oil seal.



Note

The oil seal extractor lever must be applied behind the two sealing lips of the oil seal. Do not position at outer circumference of oil seal as the contact surface in the gearbox housing could be damaged. Guide the lever carefully when removing the seal.



Installing

- Examine oil seal seat in gearbox housing for damage; reface surface if necessary.
- Lightly lubricate outer circumference and sealing lip of oil seal with gear oil.

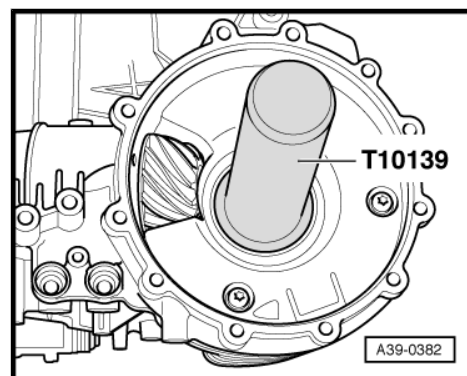


Note

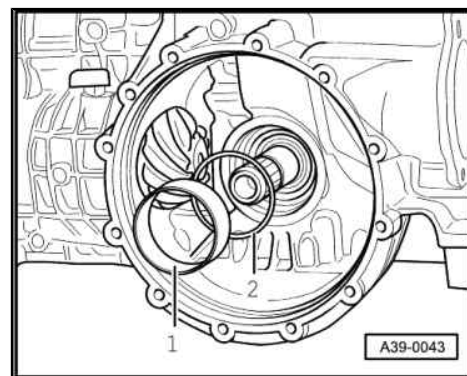
Push oil seal onto thrust piece with the protruding sealing lip on the oil seal facing towards the tool.

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- Drive in new oil seal as far as stop.



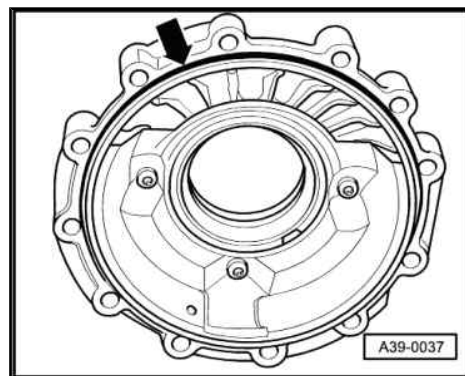
- Insert shim -2- and tapered roller bearing outer race -1- for differential onto stop in gearbox housing by hand.



- Renew O-ring -arrow-.
- Install differential in gearbox housing.

Note the following if the outer race for tapered roller bearing and the shim have dropped out of the front final drive cover:

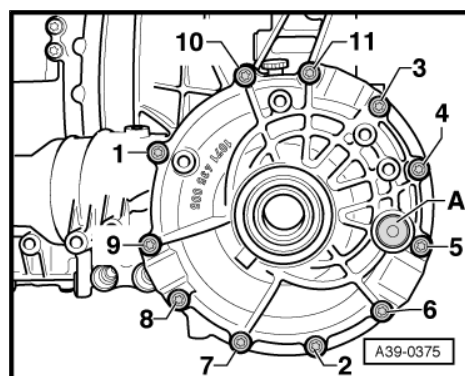
- Lubricate shim and outer race for tapered roller bearing with gear oil and insert in front final drive cover as far as the stop.



- Install cover for front final drive.

Tightening sequence:

1. Tighten bolts -1- and -2- to 3 Nm.
 2. Tighten bolts -1 ... 11- to specified torque in the sequence indicated.
- Install flange shaft (left-side) ⇒ [page 124](#) .
 - Install flange shaft (right-side) ⇒ [page 122](#) .
 - Fill up gear oil in gearbox after repairs ⇒ [page 115](#) .



Tightening torque

Component	Nm
Cover for front final drive to gearbox housing	23

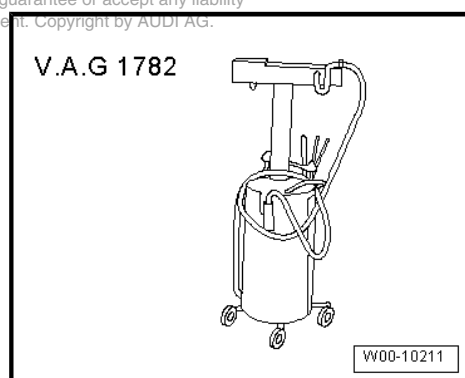
3.5 Renewing O-ring on cover for front final drive

Note

- ♦ *Rules for cleanliness when working on the automatic gearbox* ⇒ [page 15](#)
- ♦ *General repair instructions* ⇒ [page 11](#) .

Special tools and workshop equipment required

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



Removing

- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.
- Remove flange shaft (right-side) ⇒ [page 122](#) .

- Unscrew bolts on cover for final drive in the reverse sequence to the tightening sequence shown and remove cover together with outer race for tapered roller bearing and shim.



Note

Thickness of shim has been measured to fit; the shim must not be replaced with another shim of different thickness.

Installing

- Renew O-ring -arrow-.
- Install differential in gearbox housing.

Note the following if the outer race for tapered roller bearing and the shim have dropped out of the front final drive cover:

- Lubricate shim and outer race for tapered roller bearing with gear oil and insert in front final drive cover as far as the stop.

- Install cover for front final drive.

Tightening sequence:

1. Tighten bolts -1- and -2- to 3 Nm.
 2. Tighten bolts -1 ... 11- to specified torque in the sequence indicated.
- Install flange shaft (right-side) ⇒ [page 122](#) .
 - Fill up gear oil in gearbox after repairs ⇒ [page 115](#) .

Tightening torque

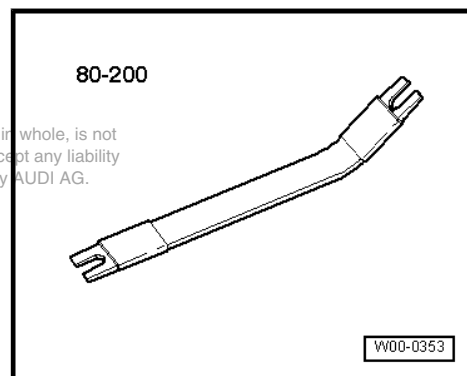
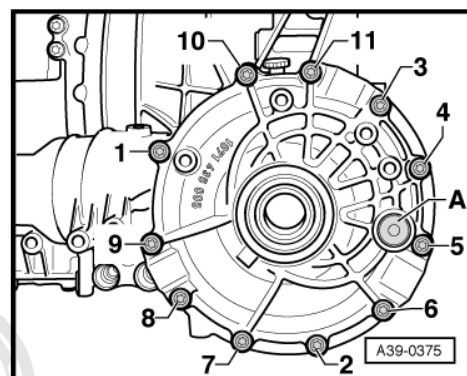
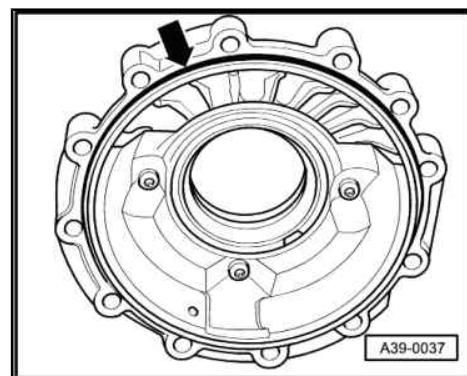
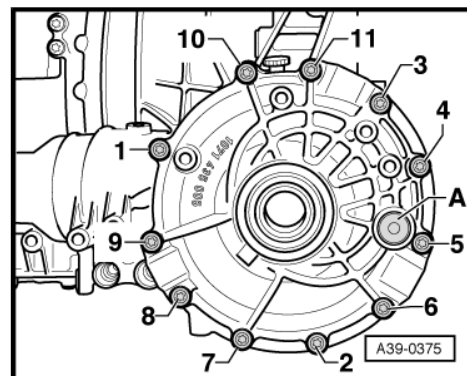
Component	Nm
Cover for front final drive to gearbox housing	23

3.6 Renewing oil seal for selector shaft

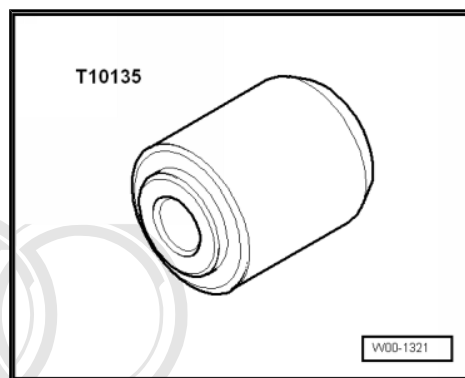
Special tools and workshop equipment required

- ◆ Removal lever - 80 - 200-

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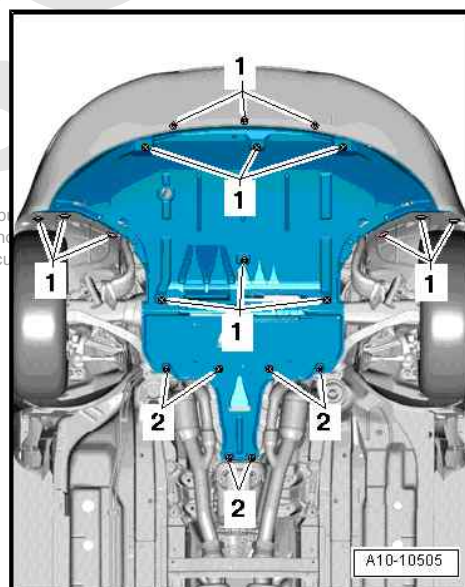
◆ Thrust piece - T10135-



Removing

- Move selector lever to position “P”.
- Open quick-release fasteners -2- and remove noise insulation (rear).

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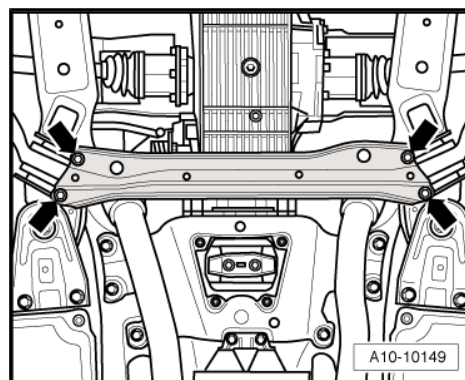


- Unbolt cross piece from subframe -arrows-.

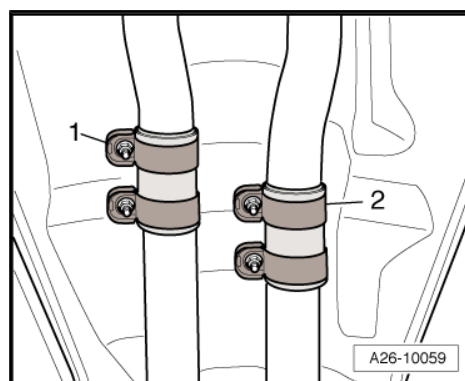


Caution

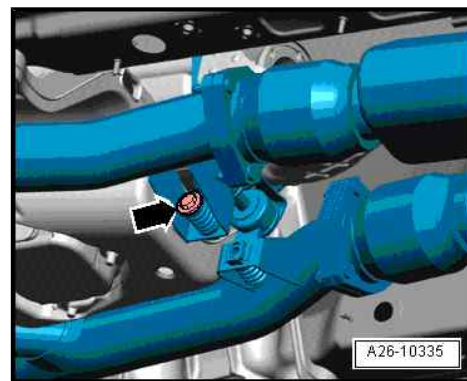
The flexible pipe connection (de-coupling element) on the front exhaust pipe must not be bent more than 10° – otherwise it can be damaged.



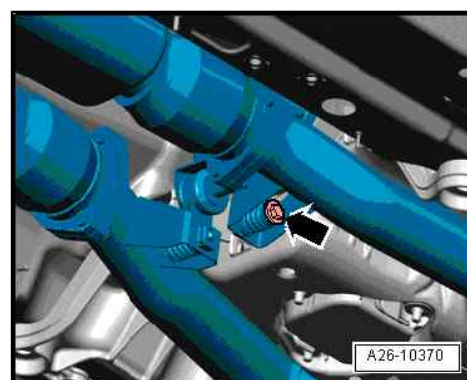
- Unfasten clamps -1- and -2- and slide forwards.



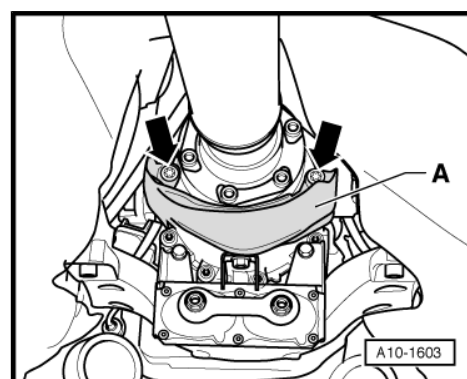
- Remove bolt -arrow- from bracket for exhaust system (left-side).



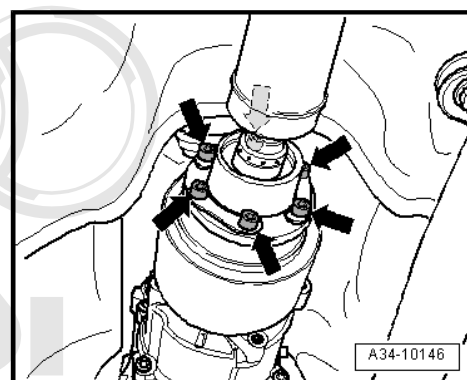
- Remove bolt -arrow- from bracket for exhaust system (right-side).



- Remove bolts -arrows- and detach heat shield -A- for propshaft.



- Remove bolts -arrows- from connection between gearbox and propshaft (front end).



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- Slide propshaft together towards rear final drive and tie up.

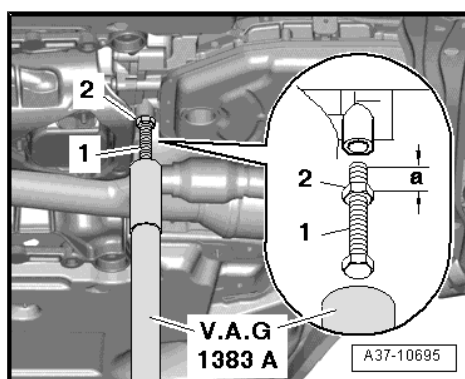
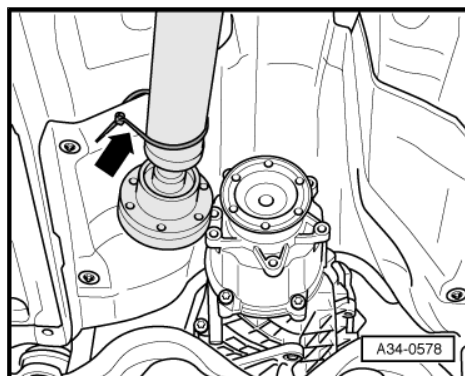


Caution

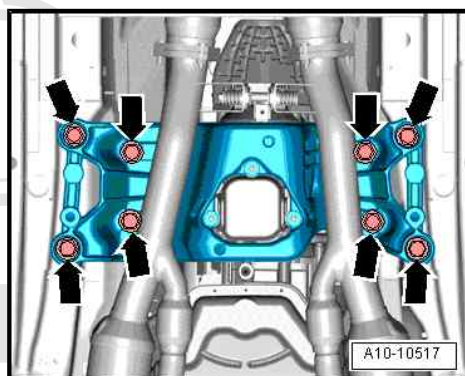
When performing the steps below, please note the following:

Do not support the gearbox under the oil pan - risk of damage.

- Insert a bolt M12x100 -item 1- with attached nut -2- into the mounting hole behind the oil pan on the gearbox.
- Dimension -a- = 13 mm
- Apply lifting column of engine and gearbox jack - V.A.G 1383 A- to bolt head as illustrated.



- Remove bolts -arrows- at tunnel cross member.



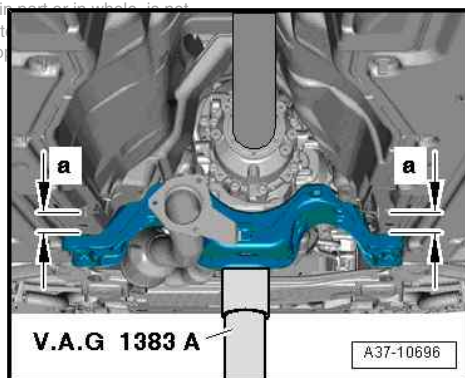
- Lower tunnel cross member and gearbox slightly using engine and gearbox jack - V.A.G 1383 A-

- Dimension -a- = max. 40 mm.



Note

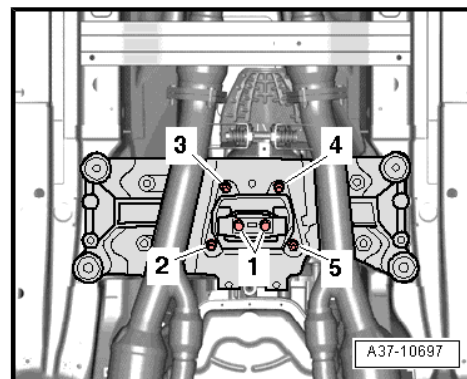
Front exhaust pipe (right-side) is not shown in illustration, however it does not have to be removed.



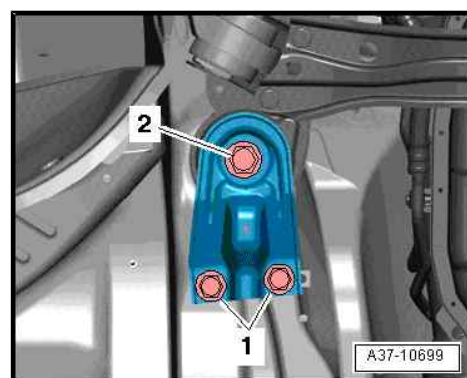
- Remove bolts -1- and rest tunnel cross member and gearbox mounting on exhaust system.

 Note

Disregard -items 2 ... 5-.

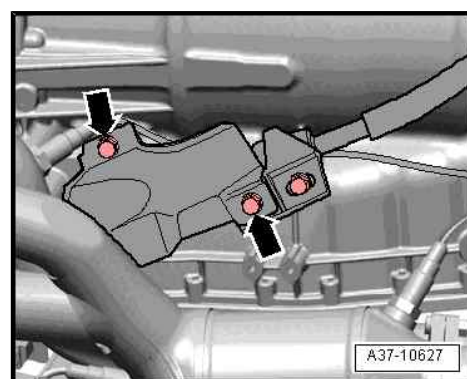


- Remove bolts -1- and -2- and detach subframe support (rear left).



- Remove bolts -arrows- and detach heat shield for selector lever cable.

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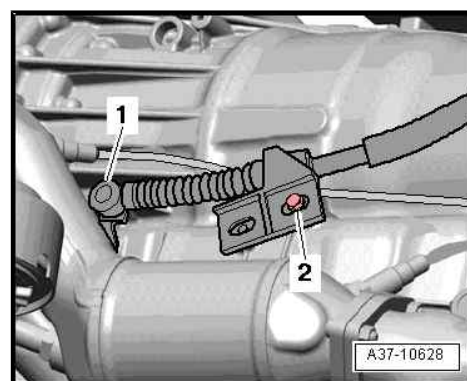
 Note

Mark installation position of support bracket for selector lever cable with a felt-tip pen in preparation for re-installation.

- Use removal lever - 80-200- to pry ball socket -1- on selector lever cable off selector shaft lever.
- Unbolt support bracket -2- and detach from gearbox.

 Note

Do not bend or kink the selector lever cable.

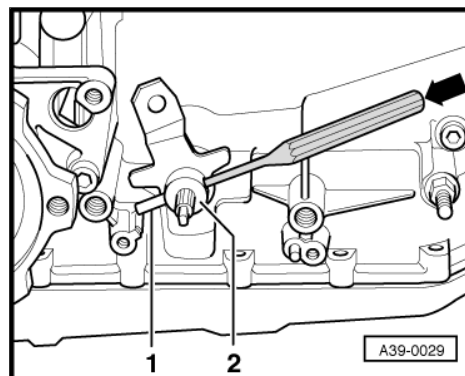


- Drive out locking pin -1- at selector shaft lever -2- -arrow- until it is possible to detach selector shaft lever from selector shaft.



Caution

Contact surface of selector shaft must not be damaged or scratched.

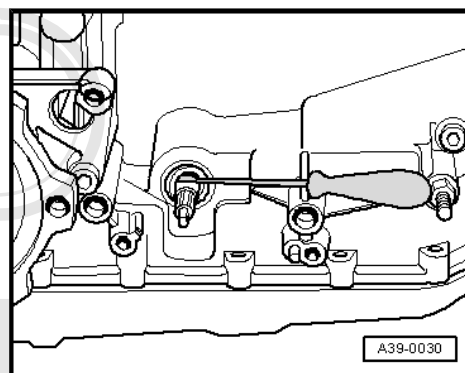


- Push a small screwdriver through the oil seal and pull it out.

Installing

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

- Lubricate the outer circumference and the space between sealing lips with ATF.
- ◆ Installation position: open side of oil seal points towards gear-box
- Fit new oil seal onto selector shaft.

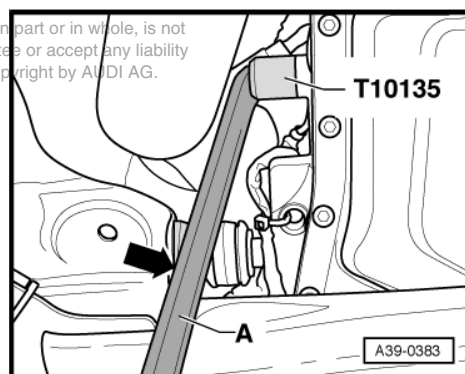


- Press on new oil seal using thrust piece -T10135- and as assembly lever -A- as far as the stop; make sure that oil seal remains straight.

- Before installing gearbox selector lever, knock back roll pin through lever in opposite direction.
- Push gearbox selector lever onto selector shaft and knock in roll pin.

For remaining installation steps refer to
⇒ ["4.1 Removing and installing selector lever cable", page 43](#).

- Check ATF level ⇒ [page 80](#).



4 Exploded view - centre differential



Caution

Risk of damage to gearbox

1 - Circlip

- ☐ For ball bearing for flange shaft

2 - Circlip

- ☐ For flange shaft

3 - Ball bearing

- ☐ For flange shaft (rear)
- ☐ ➔ ["4.4 Renewing ball bearing for flange shaft \(rear\)", page 147](#)

4 - O-ring

- ☐ Renew
- ☐ Lubricate with gear oil
- ☐ On centre differential housing

5 - Centre differential housing

- ☐ ➔ ["4.1 Removing and installing centre differential housing", page 138](#)

6 - Oil seal for flange shaft (rear)

- ☐ ➔ [page 143](#)

7 - Flange shaft (rear)

- ☐ Removing and installing ➔ [page 143](#)
- ☐ Renew oil seal when renewing flange shaft (rear)
- ☐ Select correct components from ➔ Electronic parts catalogue

8 - Bolt

- ☐ Tightening torque and sequence ➔ [page 138](#)
- ☐ Renew

9 - Ball bearing

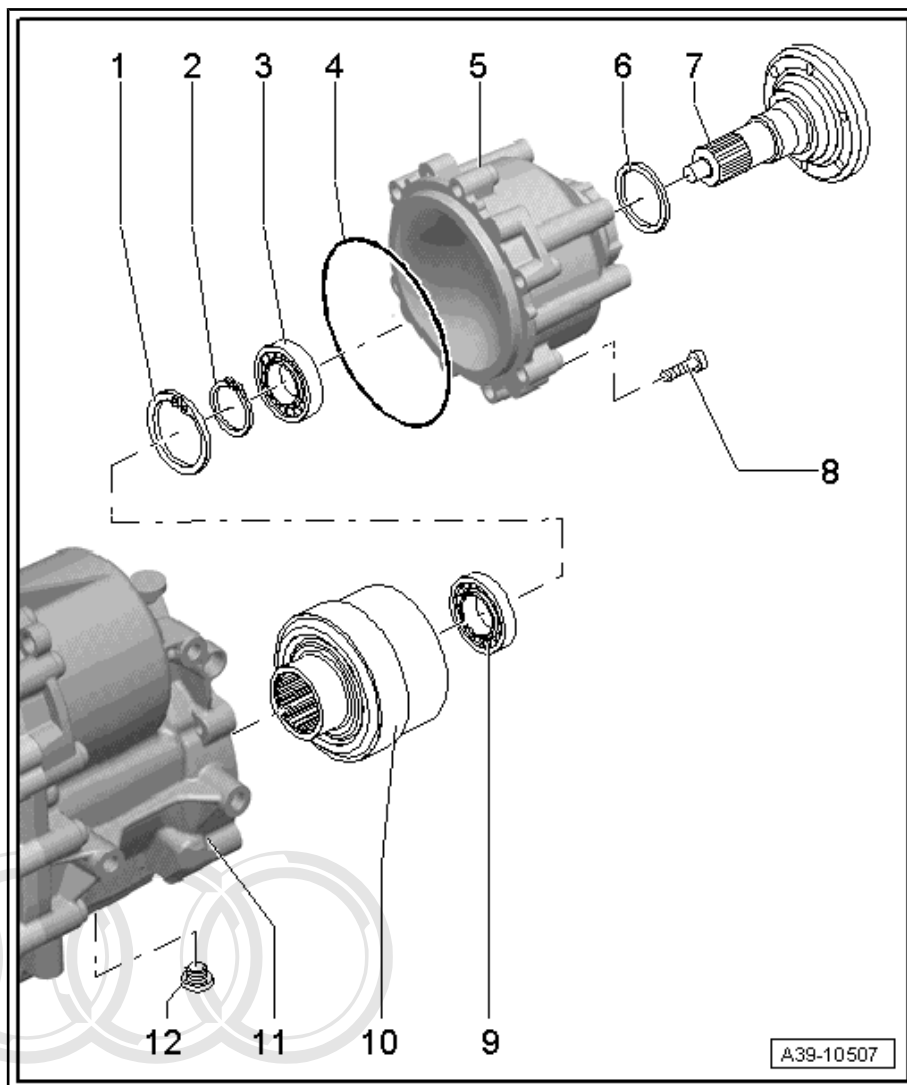
- ☐ For centre differential
- ☐ ➔ ["4.5 Renewing ball bearing for centre differential", page 149](#)

10 - Centre differential

11 - Gearbox

12 - Plug

- ☐ For oil filler hole on transfer box
- ☐ 20 Nm
- ☐ Renew

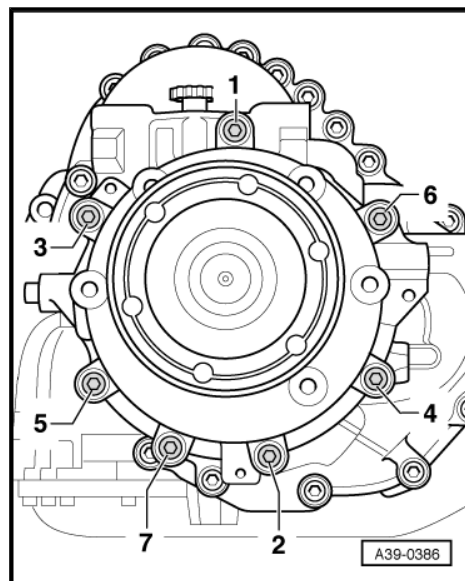


A39-10507

Centre differential housing - tightening torque and sequence

– Tighten bolts for centre differential housing in two stages as follows:

1. Tighten bolts -1- and -2- initially to 3 Nm.
2. Tighten bolts to 16 Nm in sequence -1 ... 7-.



4.1 Removing and installing centre differential housing



Note

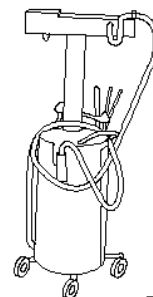
- ◆ Rules for cleanliness when working on the automatic gearbox ⇒ [page 15](#)
- ◆ General repair instructions ⇒ [page 11](#).

Special tools and workshop equipment required

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

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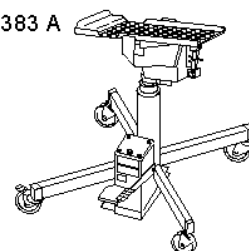
V.A.G 1782



W00-10211

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

V.A.G 1383 A



W00-0120

- ◆ Safety goggles

- ◆ Bolt M12x100 with nut

Removing

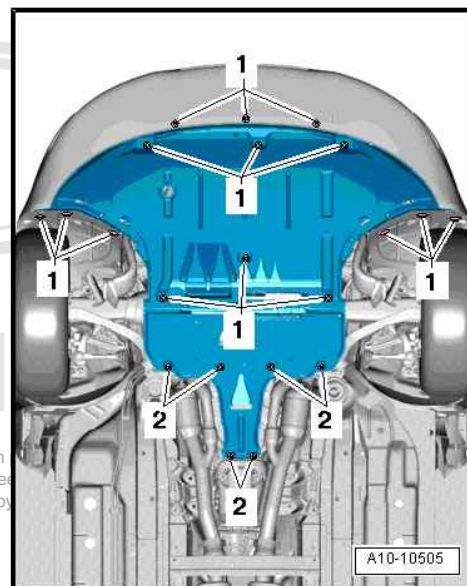


Caution

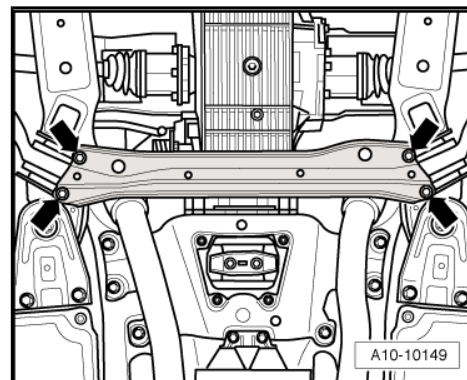
Do not run the engine or tow the vehicle if the self-locking centre differential is removed or if the gear oil has been drained from the gearbox.

- Open quick release fasteners -2- and take off rear noise insulation.

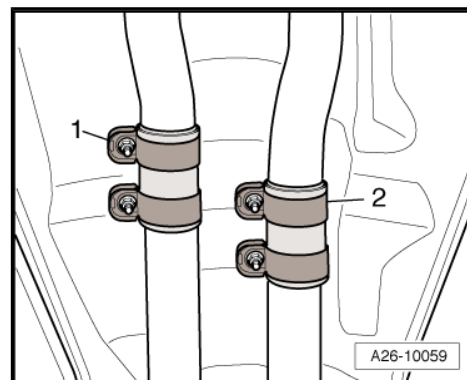
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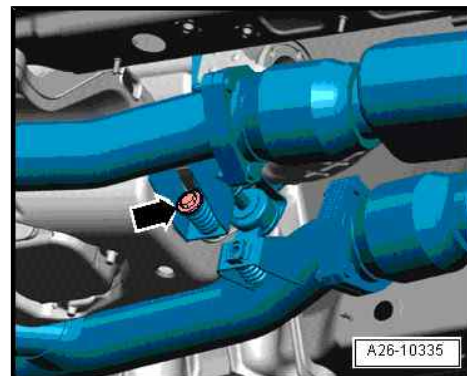
- Unbolt cross piece from subframe -arrows-.



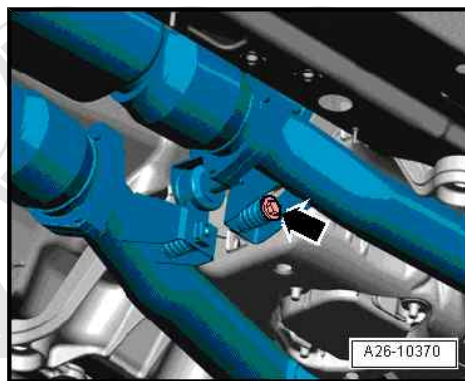
- Unfasten clamps -1- and -2- and slide forwards.



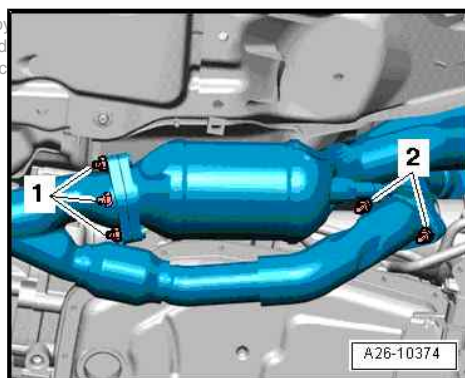
- Remove bolt -arrow- from bracket for exhaust system (left-side).



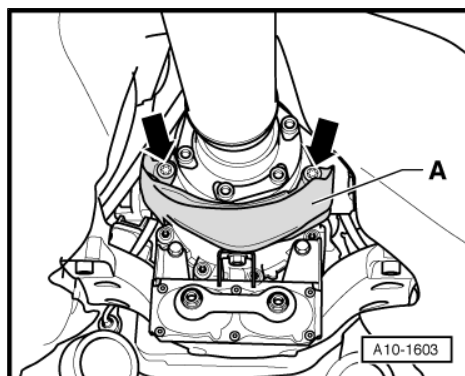
- Remove bolt -arrow- from bracket for exhaust system (right-side).



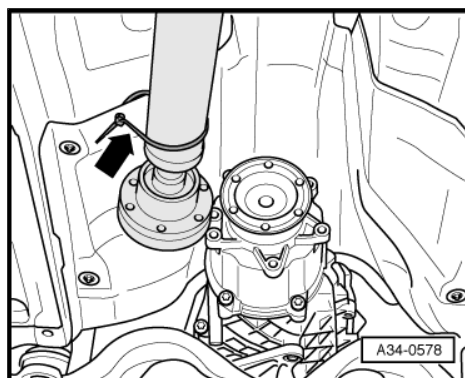
- Remove nuts -1- and -2- and detach Y pipe (right-side) together with front silencer.



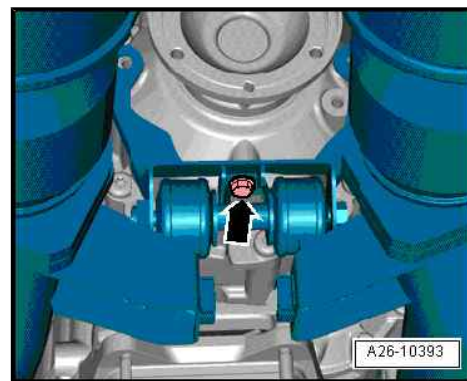
- Unbolt heat shield -A- for propshaft -arrows-.
- Remove bolts at connection between gearbox and propshaft.
- Slide propshaft together towards rear final drive. The constant velocity joints can be moved axially.



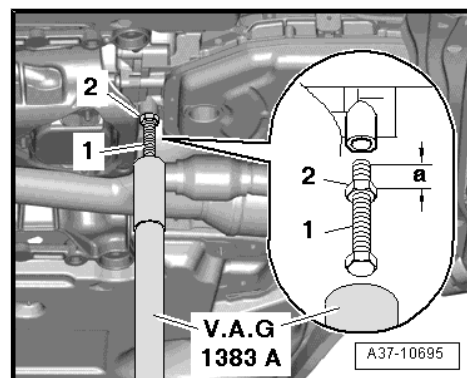
- Tie propshaft up to side onto heat shield -arrow-.



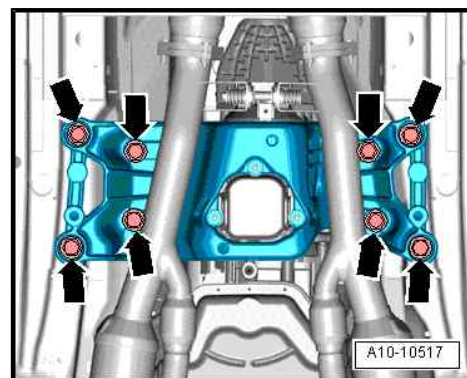
- Remove bolt -arrow- and detach bracket for Y pipes.



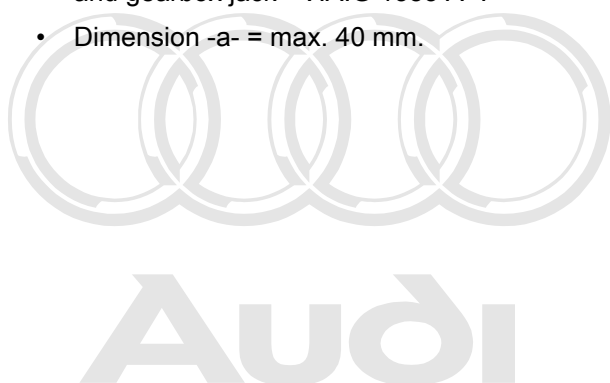
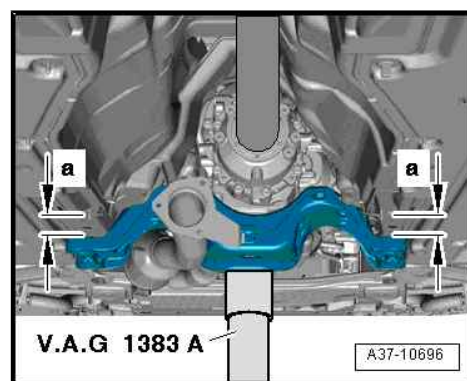
- Insert a bolt M12x100 -item 1- with attached nut -2- into the mounting hole behind the oil pan on the gearbox.
- Dimension -a- = 13 mm
- Apply lifting column of engine and gearbox jack - V.A.G 1383 A- to bolt head as illustrated.



- Remove bolts -arrows- at tunnel cross member.



- Lower tunnel cross member and gearbox slightly using engine and gearbox jack - V.A.G 1383 A- .
- Dimension -a- = max. 40 mm.



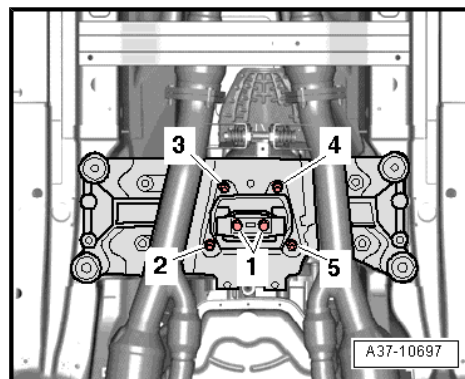
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- Remove bolts -1 ... 5- and detach gearbox mounting (rear).



Note

The tunnel cross member remains on the vehicle.

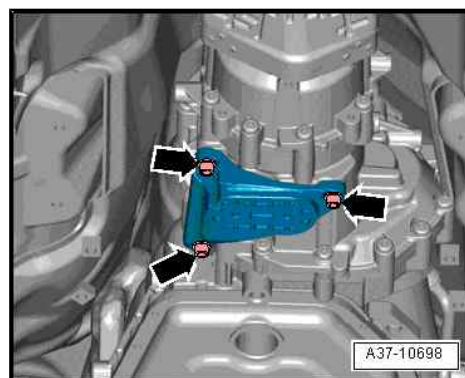


- Remove bolts -arrows- and detach gearbox support.



Note

The centre differential housing is not equipped with a drain plug; drain gear oil by removing the housing.

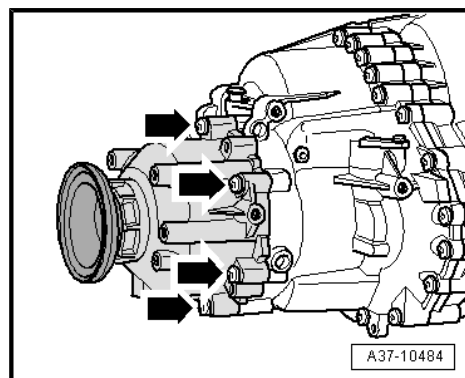


- Place used oil collection and extraction unit - V.A.G 1782- below gearbox.



Caution

The centre differential can drop out of the gearbox when the housing for the centre differential is removed.



- Slacken bolts -arrows- on centre differential housing in diagonal sequence and remove bolts.
- Catch escaping gear oil using used oil collection and extraction unit - V.A.G 1782- .
- Slowly and carefully pull housing together with centre differential off gearbox.

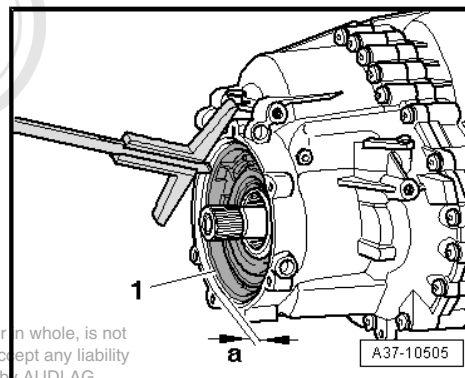
Installing

- Press bearing race -1- into intermediate flange for front axle drive as far as stop.
- Check installation depth of bearing race using a depth gauge.
- Dimension -a- = approx. 9 mm

If dimension -a- is significantly smaller, the bearing race has become displaced.

- Remove bearing race and check that installation position is correct.

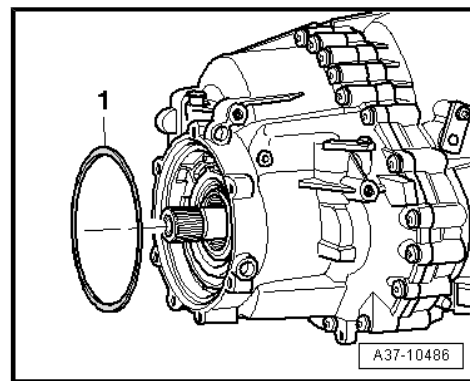
- Lugs on rear side of bearing race should engage in corresponding recesses on intermediate flange for front axle drive.



- Check that shim -1- is still fitted.
- If necessary, renew oil seal for flange shaft (rear)
⇒ [page 143](#) .
- Renew O-ring on centre differential housing.
- Fit housing together with centre differential onto splines on input shaft (turn flange shaft slightly at the same time).
- Tighten bolts on centre differential housing in specified sequence to final torque ⇒ [page 138](#) .

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

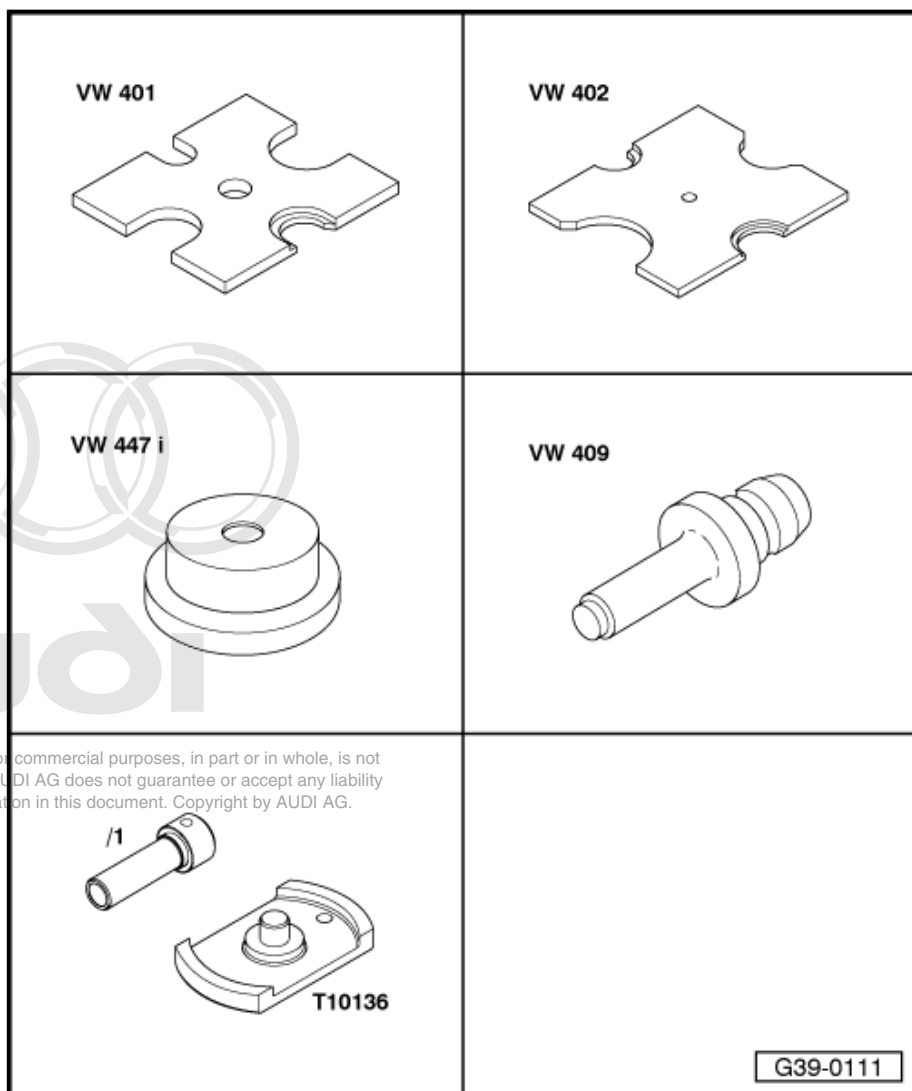
- Fill up gear oil in gearbox after repairs ⇒ [page 115](#) .
- Install gearbox support, gearbox mounting and tunnel cross member ⇒ [page 73](#) .
- Install propshaft ⇒ Rear final drive 0AR; Rep. gr. 39 .
- Install exhaust system and align it so it is stress-free ⇒ Rep. gr. 26 .
- Install cross piece for subframe ⇒ Rep. gr. 40 .



4.2 Renewing oil seal for flange shaft (rear)

Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Thrust pad - VW 447 i-
- ◆ Press tool - VW 409-
- ◆ Fitting tool - T10136-



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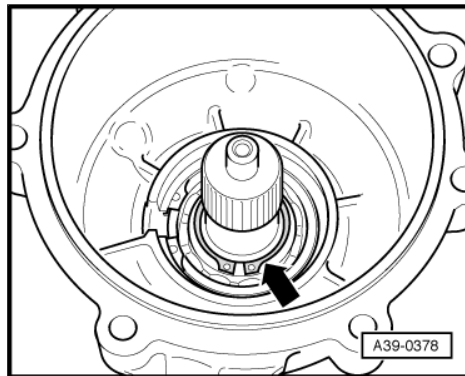
Removing

- Remove centre differential housing ⇒ [page 138](#) .
- Remove circlip -arrow- on inner side of cover.



Note

The circlip locates the flange shaft on the bearing in the housing.

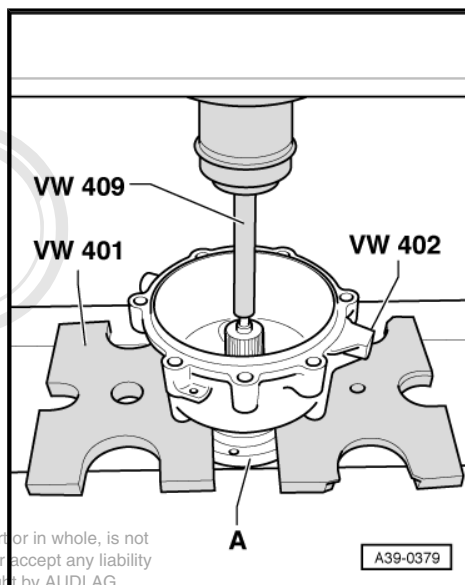


- Press flange shaft out of centre differential housing using press tool - VW 409- .
- For this purpose, place housing onto thrust plates -VW 401- and -VW 402- .



Note

Hold the flange shaft -A- with one hand to prevent it from falling through.



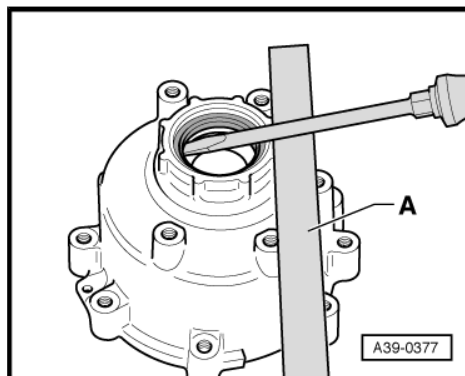
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- Remove oil seal.



Note

To do so, place a metal bar -A- or similar underneath to prevent damage to housing.



Installing

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

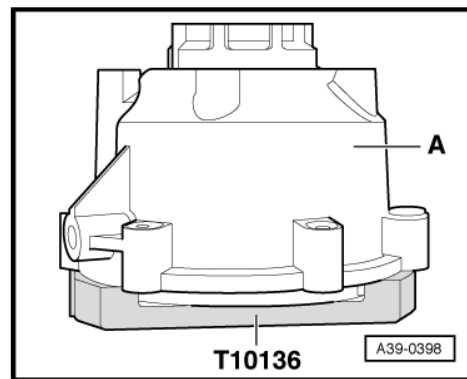
Fitting oil seal:



Note

A special two-piece fitting tool - T10136- is used for installing oil seal.

- Place centre differential housing -A- on thrust plate of fitting tool -T10136-.



Note

The peg in the middle of the tool is centered and faces upwards in the housing. It serves as a guide and stop for the thrust piece -T10136/1-.

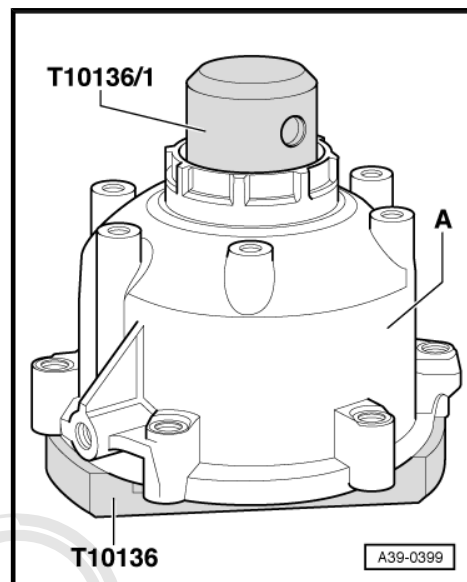
- Lightly lubricate outer circumference of oil seal with gear oil.
- Push new oil seal onto thrust piece -T10136/1-.
- Installation position: open side of oil seal points towards housing.
- Insert thrust piece -T10136/1- with oil seal into housing from above.



Note

The peg of the thrust plate of fitting tool -T10136- serves as a guide from below and also as a stop for the thrust piece -T10136/1-.

- Drive in new oil seal onto stop (take care to keep oil seal straight).
- Pack space between sealing lip and dust lip half-full with sealing grease - G 052 128 A1-.



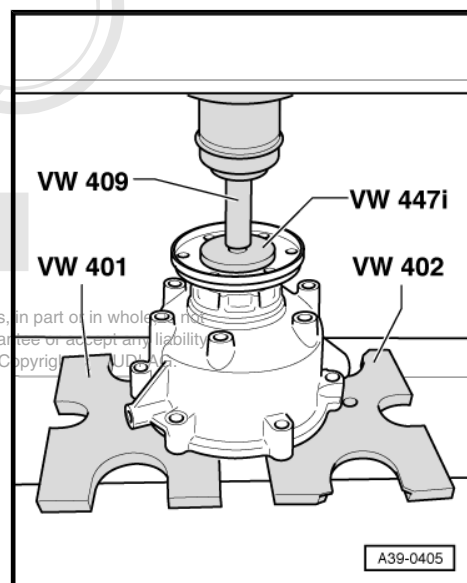
Installing flange shaft (rear):

- Press in flange shaft using press tool - VW 409- and thrust plate - VW 447 i-.
- For this purpose, place housing onto thrust plates -VW 401- and -VW 402-.

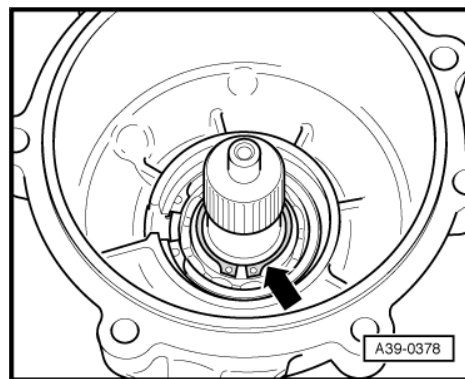


Note

Only insert flange shaft as far as necessary to install circlip.



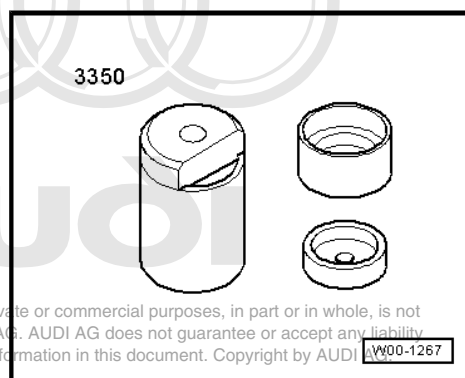
- Install circlip -arrow- in groove of flange shaft on inner side of cover.
- Install centre differential housing ⇒ [page 138](#) .
- Fill up gear oil in gearbox after repairs ⇒ [page 115](#) .



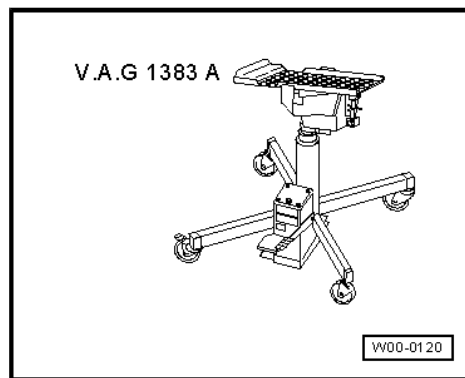
4.3 Removing and installing centre differential

Special tools and workshop equipment required

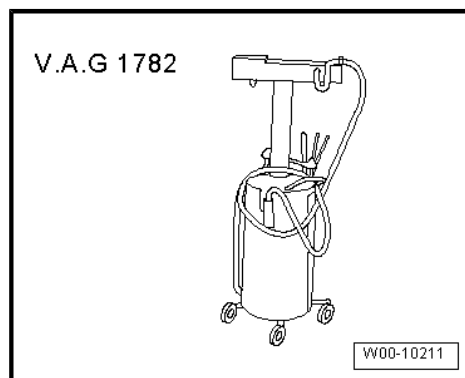
- ◆ Assembly tool - 3350-



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



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



- ◆ Safety goggles
- ◆ Bolt M12x100 with nut

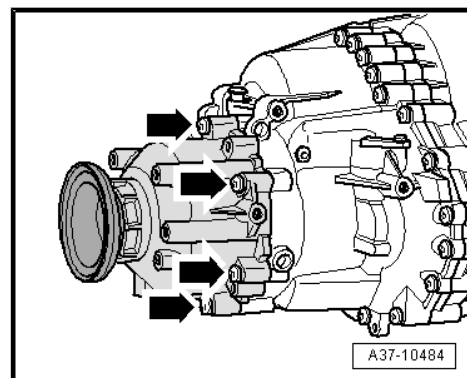
Removing

- Remove centre differential housing together with centre differential ⇒ [page 138](#).



Caution

The centre differential can drop out of the gearbox when the housing for the centre differential is removed.



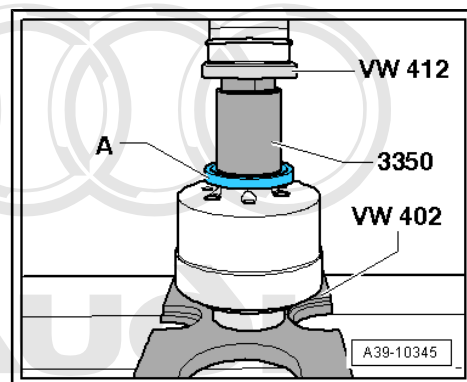
Installing



Note

When renewing centre differential, a new ball bearing must be pressed onto the new centre differential.

- Press ball bearing -A- onto centre differential as far as stop using workshop press in conjunction with assembly tool - 3350-.



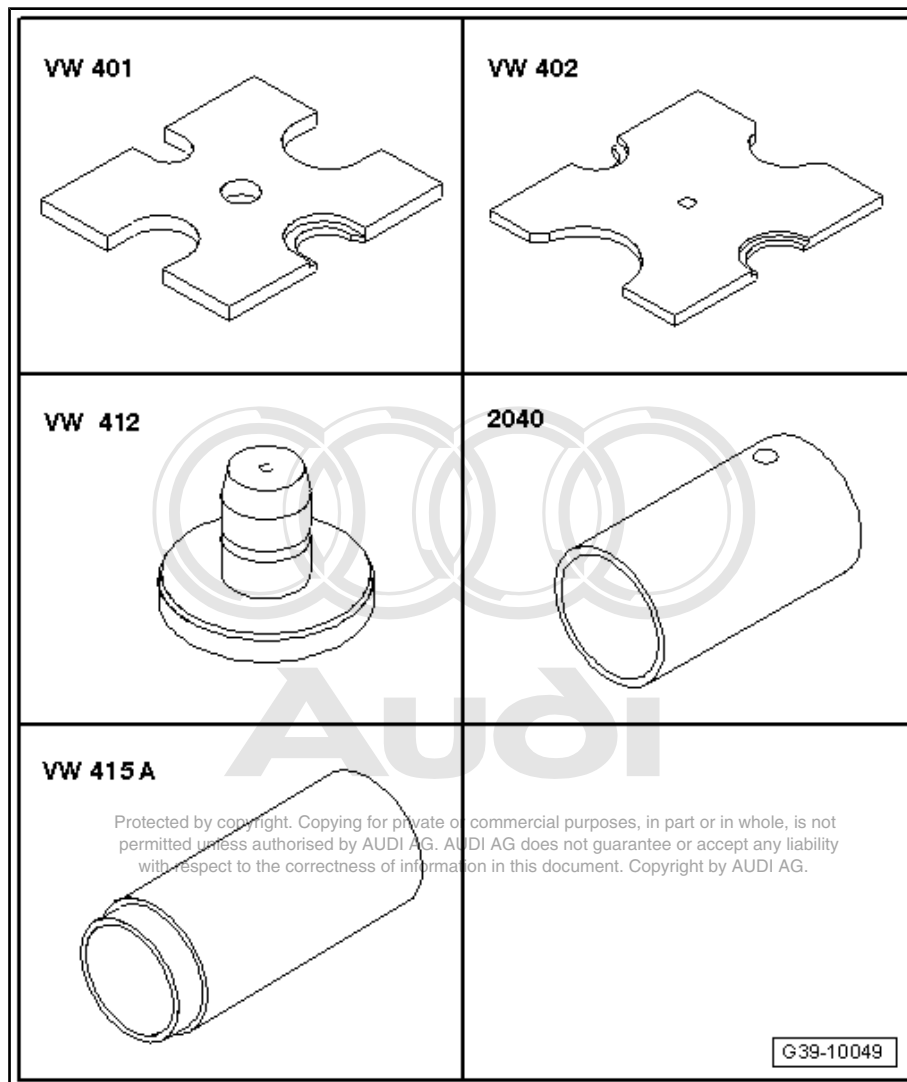
Remaining installation steps are carried out in reverse sequence; note the following:

- Install centre differential together with centre differential housing ⇒ [page 138](#).
- Fill up gear oil in gearbox after repairs ⇒ [page 115](#).
- Install gearbox support, gearbox mounting and tunnel cross member ⇒ [page 73](#).
- Install propshaft ⇒ Rear final drive 0AR; Rep. gr. 39.
- Install exhaust system and align it so it is stress-free ⇒ Rep. gr. 26.
- Install cross piece for subframe ⇒ Rep. gr. 40.

4.4 Renewing ball bearing for flange shaft (rear)

Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 412-
- ◆ Tube - 2040-
- ◆ Tube - VW 415 A-



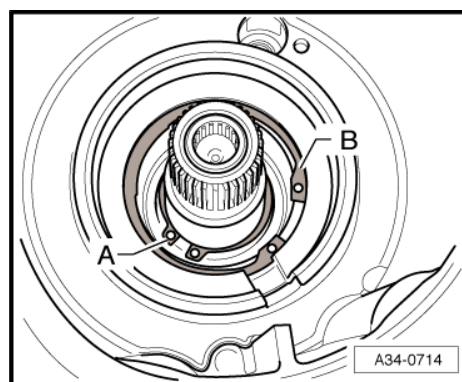
Procedure

- Remove centre differential housing ⇒ [page 138](#) .
- Remove circlip -A- for flange shaft (rear), flange shaft (rear) and oil seal for flange shaft (rear) ⇒ [page 143](#) .
- Remove circlip -B- for ball bearing.

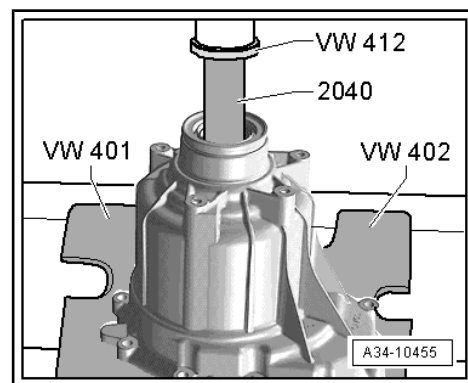


Note

Shown in illustration with flange shaft (rear) and circlip for flange shaft (rear) -A- still installed.

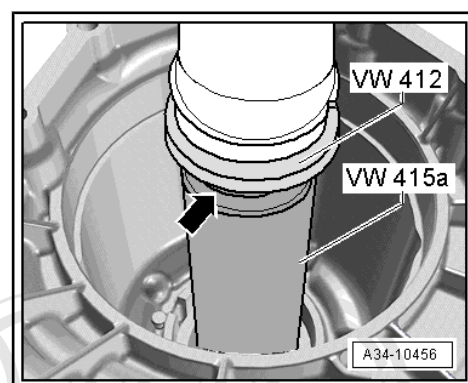


Pressing out ball bearing for flange shaft



Pressing in ball bearing for flange shaft

- Collar of tube - VW 415 A- -arrow- faces press tool - VW 412- .



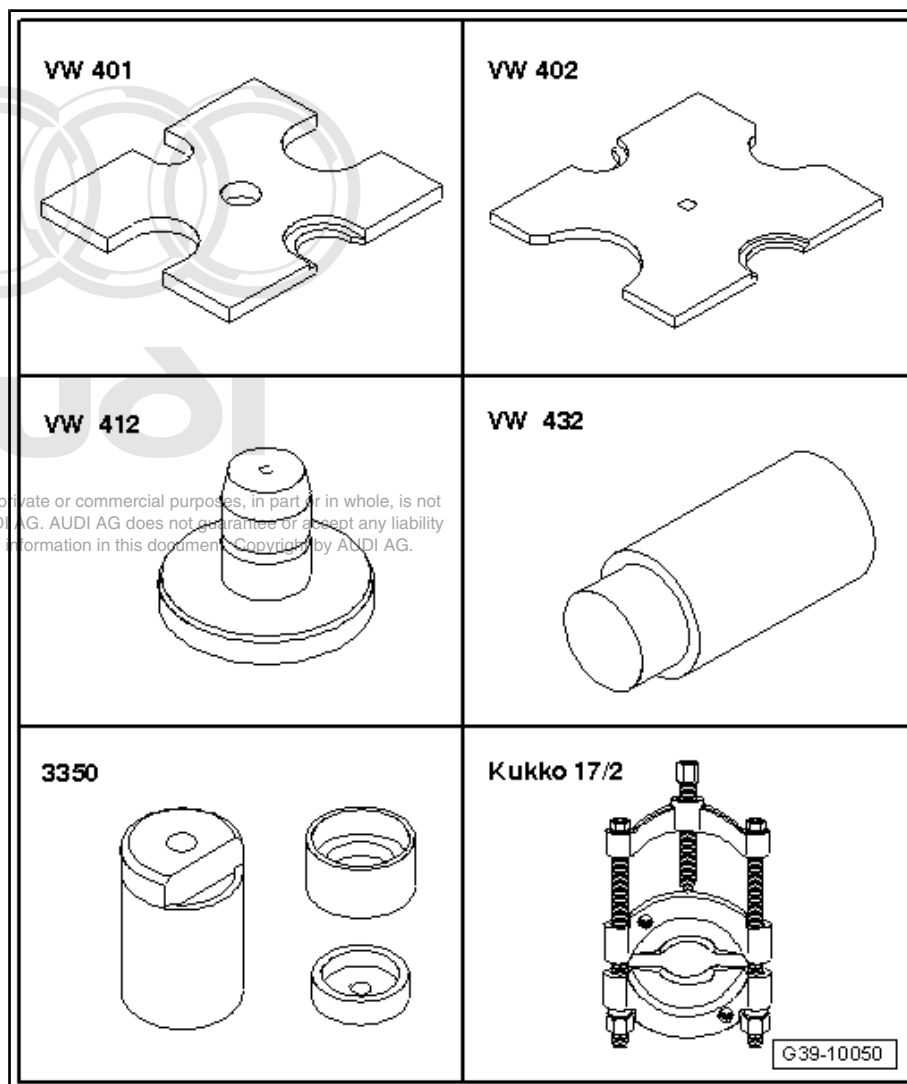
4.5 Renewing ball bearing for centre differential

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Special tools and workshop equipment required

- ◆ Thrust plate - VW 401-
- ◆ Thrust plate - VW 402-
- ◆ Press tool - VW 412-
- ◆ Thrust piece - VW 432-
- ◆ Assembly tool - 3350-
- ◆ Splitter (22 ... 115 mm) - Kukko 17/2-

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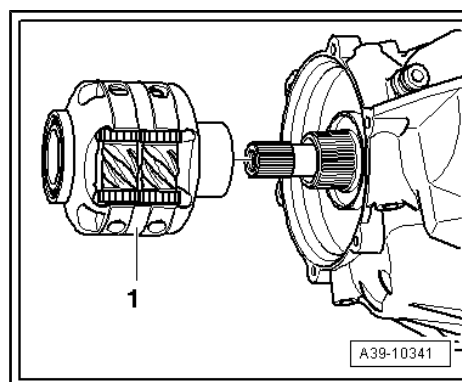
Procedure

- Remove centre differential housing ⇒ [page 138](#).
- Pull centre differential -1- off output shaft towards the rear.



Note

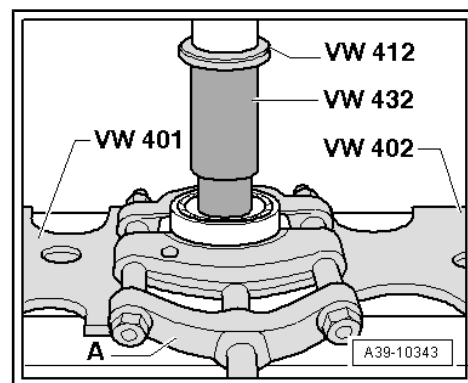
Different versions of centre differential -1- depending on equipment version.



Pressing ball bearing off centre differential

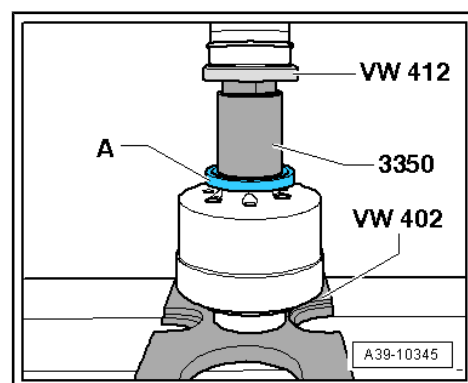
A - Splitter (22 ... 115 mm) - Kukko 17/2-

The collar of press tool - VW 432- points towards ball bearing.



Pressing ball bearing onto centre differential

- Press ball bearing -A- onto centre differential as far as stop using workshop press in conjunction with assembly tool - 3350- .



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