Workshop Manual

Audi A4 2001 ➤ ,
Audi A4 Cabriolet 2003 ➤ ,
Audi A6 1998 ➤ , Audi A6 2005 ➤ ,
Audi A8 2003 ➤

Servicing multitronic 01J and 0AN

Edition 12.2009

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Repair Group

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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.

Contents

00 – Technical data

1 Repair instructions

1.1 General repair instructions

The maximum possible care and cleanliness and proper tools are essential to ensure satisfactory and successful gearbox repairs. The usual basic safety precautions also naturally apply when carrying out repair work.

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

Gearbox

- Observe rules for cleanliness when working on gearbox ⇒ page 4 .
- Clean ATF pipes and ATF cooler after performing repairs on the gearbox ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37 .
- Components to be re-used must be cleaned, checked and if necessary renewed prior to installation ⇒ “2 Assessment of wear on gearbox components”, page 138 .

After fitting the gearbox, check the following fluid levels and top up if necessary:

- ATF level ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37
- Gear oil in front final drive ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39
- Capacities and specifications ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 00 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 00

O-rings, oil seals and gaskets

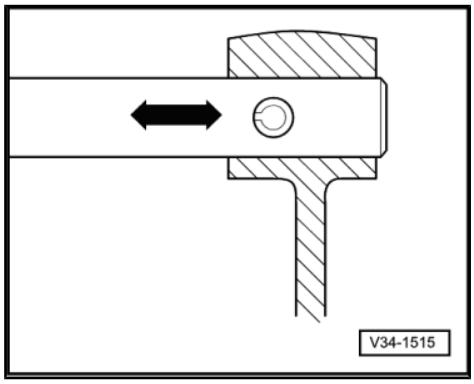
- Always renew O-rings, oil seals and gaskets.
- After removing gaskets and seals, always inspect the contact surface on the housing or shaft for burrs resulting from removal or for other signs of damage.
- The open side of the oil seals faces toward the side with fluid filling.
- Lightly lubricate the outer circumference and sealing lip of seals with ATF before installing.
- Lightly lubricate O-rings with ATF or vaseline before installation to prevent them getting crushed during assembly.
- Use only ATF or vaseline on all parts running in ATF. Other lubricants will cause malfunction of the gearbox hydraulics.
- When installing a new oil seal, position the seal in the housing so that sealing lip does not contact the shaft in the same place as the old seal (make use of insertion depth tolerances).
- Renew paper gaskets, clean all sealing surfaces thoroughly and remove previous gaskets completely.

Nuts, bolts

- Slacken bolts in reverse sequence to the specified tightening sequence.
- Nuts and bolts which secure covers and housings should be loosened and tightened in diagonal sequence and in stages if no tightening sequence is specified.
- The tightening torques stated apply to non-oiled nuts and bolts.
- Always renew self-locking bolts and nuts.

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

- Lightly lubricate bearings with ATF before inserting.
- Fit bearings and shims loosely with vaseline only. Other types of lubricant will cause the gearbox hydraulics to malfunction.

1.2 Contact corrosion!

General information:

- Contact corrosion can occur if use is made of unsuitable connecting elements (bolts, nuts, packing plate, ...).
- For this reason, only fasteners with a special surface coating are fitted.
- Rubber or plastic parts and adhesives also consist of non-conductive materials.
- In cases of doubt about suitability, always use new parts ⇒ Electronic parts catalogue .

The following applies in particular to gearboxes:

- The housing of the multitronic gearbox 01J/0AN is made of a magnesium alloy (up to approx. 2004) or of aluminium (2005 onwards).
- The surface of bolts and other components which come into direct contact with the gearbox is compatible with the gearbox housing.
- With magnesium gearboxes, the bolts at the following bolted joints must always be replaced: Gearbox cover to gearbox housing, cover for final drive to gearbox housing and the bolted joint between the engine and the gearbox.
- The use of incorrect components (bolts, nuts, packing plate ...) will cause contact corrosion. The gearbox housing will be damaged.
- The gearbox housing, gearbox cover and cover for final drive must also all be made of the same material.
- In cases of doubt about suitability, always use new parts ⇒ Electronic parts catalogue .

Please note:

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

2 Rules for cleanliness when working on the gearbox

- Thoroughly clean all joints and surrounding areas before dismantling.
- Clean the gearbox and gearbox components with cleaning fluid -D 009 401 04- .
- Onlly use lint-free cloths for cleaning, e.g. a “WYPALL X70 / WORKHORSE” cloth from Kimberly-Clark Professional.
- Place removed parts on a clean surface and cover them over. Use sheeting or lint-free cloths.
- Carefully cover or seal open components if repairs cannot be carried out immediately.
- Only install clean components: do not remove replacement parts from packaging until just before installation.

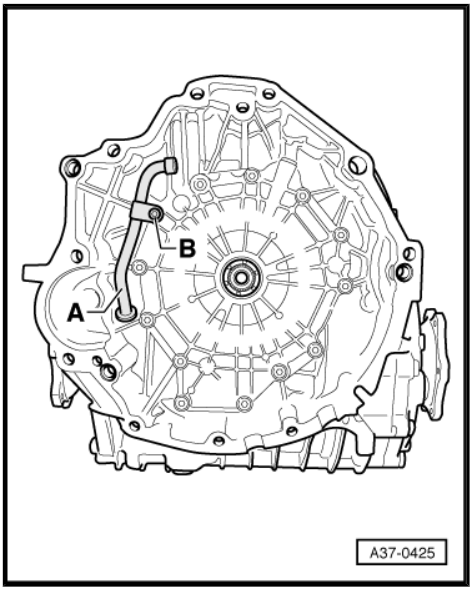
3 Frequently occurring faults

Note

- *Prior to the start of fault-finding, interrogate the event recorder of the automatic gearbox control unit -J217- ⇒ Vehicle diagnosis, testing and information system VAS 5051.*
- *Also interrogate the event recorder of the engine control unit, as engine control unit fault messages can lead to malfunctioning of the gearbox ⇒ Vehicle diagnosis, testing and information system VAS 5051.*
- *Before commencing fault-finding, check ATF level ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37 .*
- *Use the "Guided Fault Finding" mode ⇒ Vehicle diagnosis, testing and information system VAS 5051.*
- *Also make use of all the appropriate "Technical product information TPI" ⇒ Technical Service Handbook*
- *When assessing complaints and abnormal wear, refer to the training documentation ⇒ EX 335 "multitronic", Part 2 .*

Escape of ATF in area of bell housing

ATF escaping at the underside of the bell housing may be an indication of leakage at the input shaft oil seal and/or the ATF breather pipe. The actual cause is to be established before replacing components ⇒ page 19 .



Note

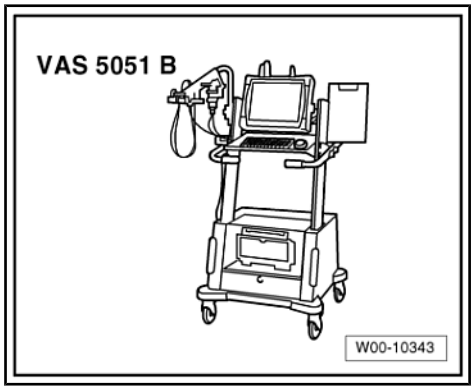
If ATF is found to be escaping from the inspection hole behind the ATF breather pipe -A- on a level with the screw -B-, the gearbox is defective and must be replaced.

37 – Controls, housing

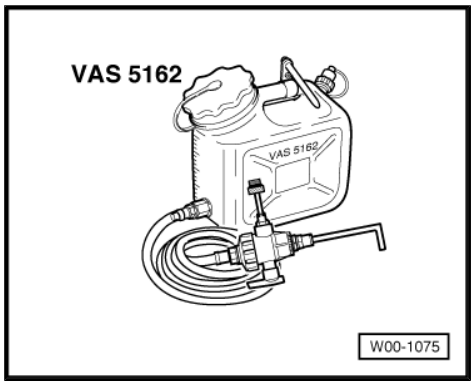
1 ATF purging

Special tools and workshop equipment required

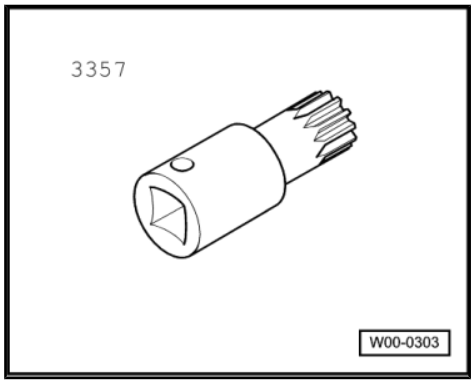
- Vehicle diagnostic, testing and information system -VAS 5051B- with diagnosis lead



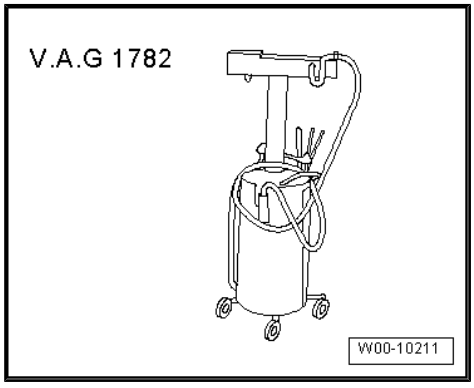
- ATF charging device for CVT gearboxes -VAS 5162-



- Multi-point bit -3357-



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



- Safety goggles

Procedure

- Gearbox in vehicle

The procedure for the standard ATF change only involves replacing approx. 55 ... 60 % of the total ATF in the gearbox.

The “ATF purging procedure” has to be employed if all the old ATF in the gearbox is to be removed.

ATF purging is always necessary when performing the following work:

- Renewing the input shaft
- Servicing the input shaft

This involves performing the test procedure twice, as described below, and then changing the ATF.

This is the only way to ensure complete renewal of the ATF in the gearbox.

Caution

Components in the gearbox will be damaged if the steps are not carried out exactly as described.

– Following gearbox installation: Replenish ATF
⇒ “1.2 Replenishing ATF for ATF purging”, page 9 .

Caution

- *After fitting the gearbox with a new clutch pack or a new input shaft, the vehicle diagnostic, testing and information system -VAS 5051B- must be used before driving the vehicle to check whether update programming is required in the automatic gearbox control unit -J217- .*
- *Gearbox components will be damaged if update programming is necessary but is not carried out.*
- *Gearbox components will be damaged if update programming is not necessary but is carried out nevertheless.*

Checking whether update programming is required in the automatic gearbox control unit -J217- :

- Vehicle diagnostic, testing and information system -VAS 5051B- must be connected.

– On the vehicle diagnostic, testing and information system -VAS 5051B- , access the vehicle-specific `Guided functions`.

– Select the vehicle.

– Select the following in the functions:

Message line to be selected
`02 - Gearbox electronics 01J` or `02 - Gearbox electronics 0AN`
`J217 - Gearbox control unit for multitronic, functions`
`J217 - multitronic, update programming`

Note

This vehicle diagnostic, testing and information system -VAS 5051B- procedure ensures that update programming in the automatic gearbox control unit -J217- is only implemented when required.

– If necessary, perform update programming in the automatic gearbox control unit -J217- .

Purging ATF

1. ⇒ “1.3 Test procedure for purging ATF”, page 12 .
2. ⇒ “1.1 Draining ATF for ATF purging”, page 8 .
3. ⇒ “1.2 Replenishing ATF for ATF purging”, page 9 .
4. ⇒ “1.3 Test procedure for purging ATF”, page 12 .
5. ⇒ “1.1 Draining ATF for ATF purging”, page 8 .
6. ⇒ “1.2 Replenishing ATF for ATF purging”, page 9 .
7. Checking and correcting ATF level ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37

Note

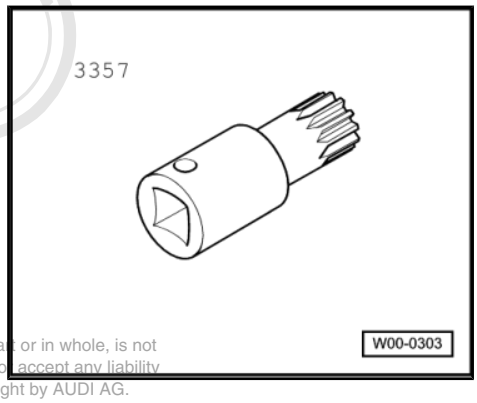
Observe all notes and test requirements for “Checking and correcting ATF level”.

Checking the ATF level completes the purging procedure.

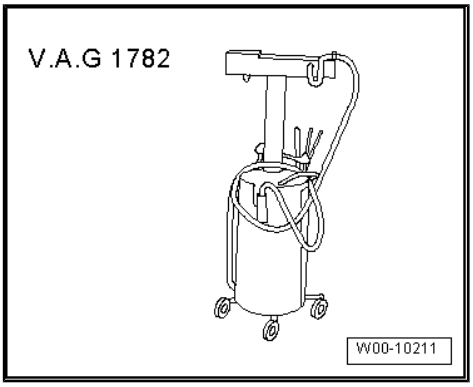
1.1 Draining ATF for ATF purging

Special tools and workshop equipment required

- Multi-point bit -3357-



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



Caution

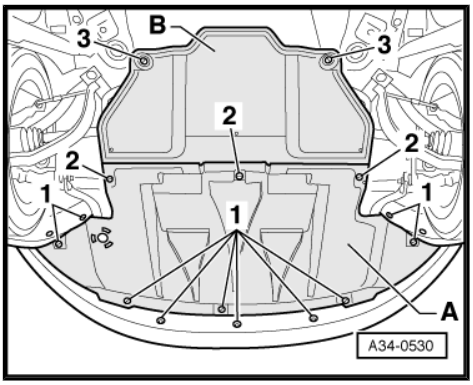
Do not run engine or tow vehicle when there is no ATF in the gearbox.

- Vehicle must be level (horizontal).

Note

Please observe requirements for disposal.

– Release the fastening elements -2- and -3- and detach the rear noise insulation -B-.



Note

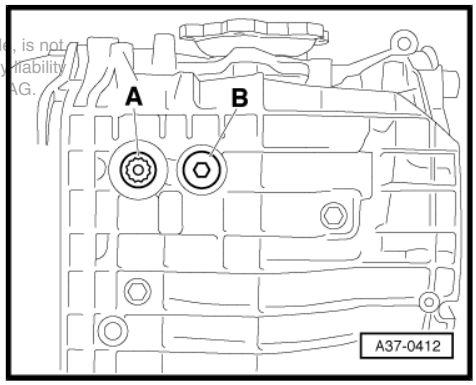
There are different types of noise insulation for the various vehicle models.

– Place the used oil collection and extraction unit -V.A.G 1782- under the gearbox.

– Unscrew ATF drain plug -A- with multi-point bit -3357- and drain off ATF.

– Re-tighten ATF drain plug.

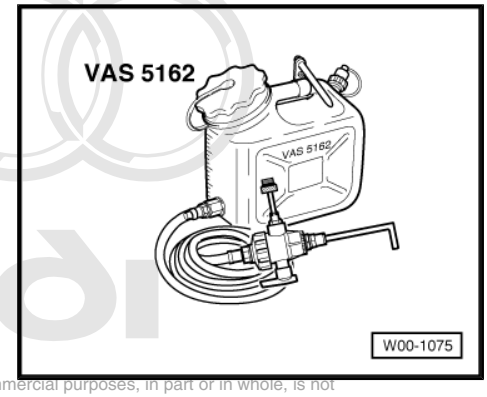
- Tightening torque: 24 Nm



1.2 Replenishing ATF for ATF purging

Special tools and workshop equipment required

- ATF charging device for CVT gearboxes -VAS 5162-



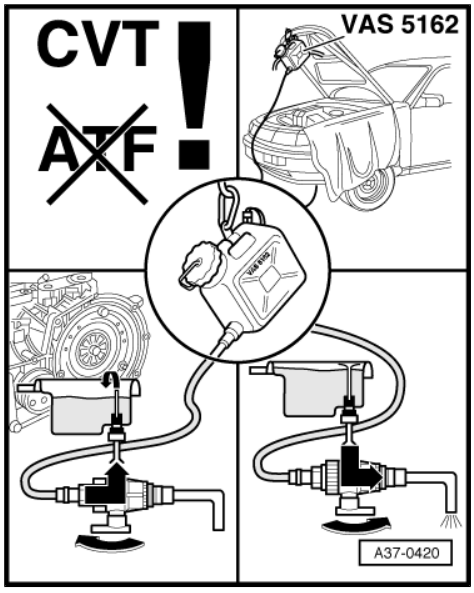
Caution

The gearbox will be damaged if an unapproved type of ATF is used.

The ATF required for the multitronic 01J/0AN gearbox is different from the fluid used in fixed-ratio automatic gearboxes. Exclusive use is to be made of the ATF for CVT gearboxes available from the parts range; ATF specifications ⇒ Electronic parts catalogue .

Note

- *The illustration on the reservoir of the ATF charging device for CVT gearboxes -VAS 5162- displays a warning in the top left corner to use ONLY the ATF specially formulated for CVT gearboxes.*
- *The illustration also shows the steps to follow when filling up; these are also described below.*

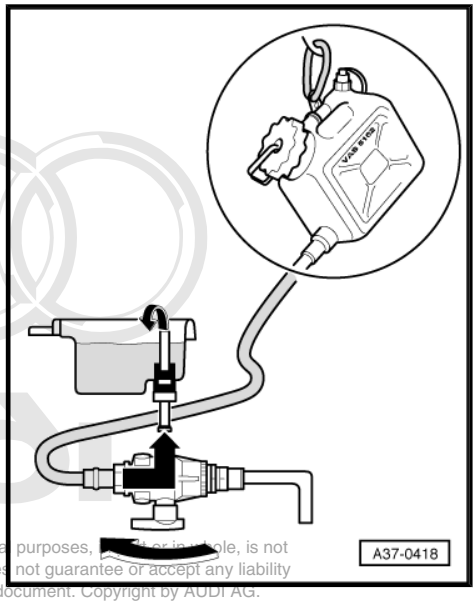


– Attach filled reservoir of ATF charging device for CVT gearboxes -VAS 5162- at the highest possible point on the vehicle.

• The stopcock on ATF charging device for CVT gearboxes -VAS 5162- must be closed.

Caution

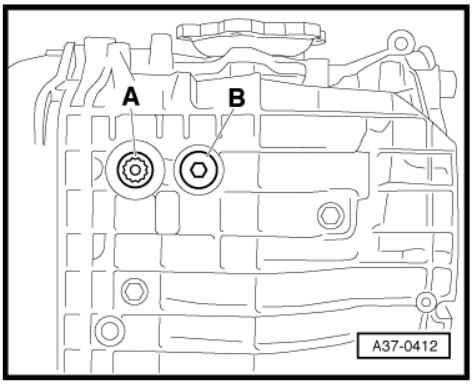
- *The engine must not be started if only a little or no ATF remains in gearbox after repair work or after excessive ATF leakage.*
- *In this case you need to fill the gearbox first with 4.5 ... 5 litres of ATF.*



– Place the used oil collection and extraction unit -V.A.G 1782- under the gearbox.

– Unscrew ATF inspection plug -B-.

– Screw connecting piece on stopcock of ATF charging device for CVT gearboxes -VAS 5162- into threaded hole for ATF inspection plug -B-.



– Turn stopcock in direction of filling hose -lower arrow-. ATF flows into gearbox.

– Fill gearbox with 5 litres of ATF.

– Move selector lever to position “P”, start engine and allow to run at idling speed.

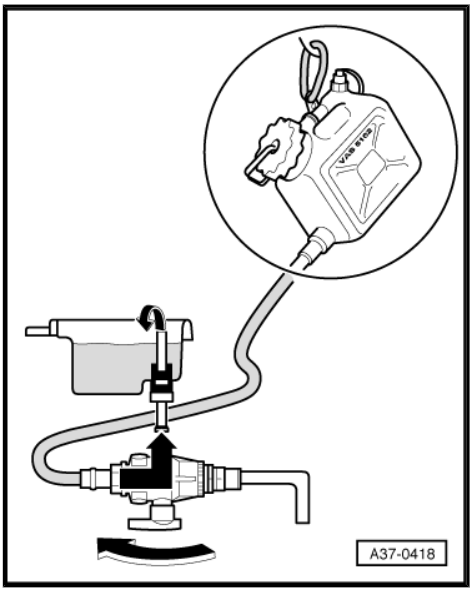
Vehicles from model year 2005 onwards:

• Selector lever in position “P”.

– Press accelerator pedal to briefly rev engine up to at least 2500 rpm.

Caution

The engine has to be revved up in order to bleed air out of the ATF pump after carrying out repairs on the gearbox.



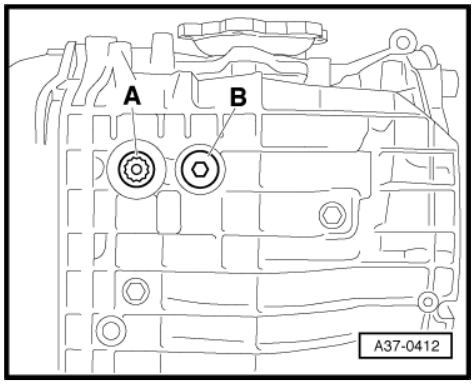
All model years:

– Press and hold brake pedal.

– Shift through all selector lever positions “P, R, N, D, S” and leave for approx. two seconds in each position with engine running at idling speed.

– Move selector lever to position “P” and allow engine to continue running at idling speed.

– Unscrew connecting piece on stopcock of ATF charging device for CVT gearboxes -VAS 5162- from opening for ATF inspection plug -B-.
– Allow surplus ATF to drain off.
– Screw in the ATF inspection plug -B-.



Tightening torque

Component	Nm
ATF inspection plug	30

1.3 Test procedure for purging ATF

• ATF topped up ⇒ page 9 .
– Implement the specified test procedure for purging ATF on multitronic gearboxes ⇒ Technical solution no. 2004856 (EL-SA).

Caution

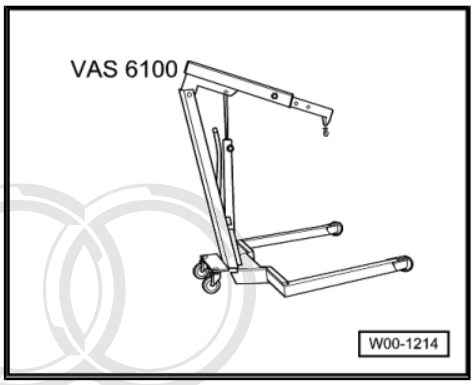
Risk of damaging the gearbox.

- *ATF replenishment in the ATF purging operation is not a substitute for checking of the ATF level.*
- *On completion of ATF purging, the ATF level must be checked and adjusted ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 or ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37 .*

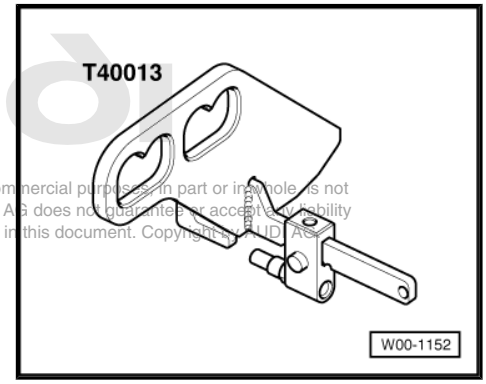
2 Gearbox transportation

Special tools and workshop equipment required

- Workshop hoist -VAS 6100-



- Lifting aid -T40013-

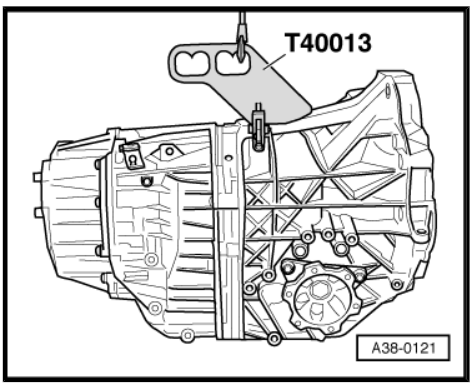


Procedure

– Attach the lifting aid -T40013- to the upper web of the gearbox housing and secure.

– Engage the hook of the workshop hoist -VAS 6100- in the mount of the lifting aid as shown.

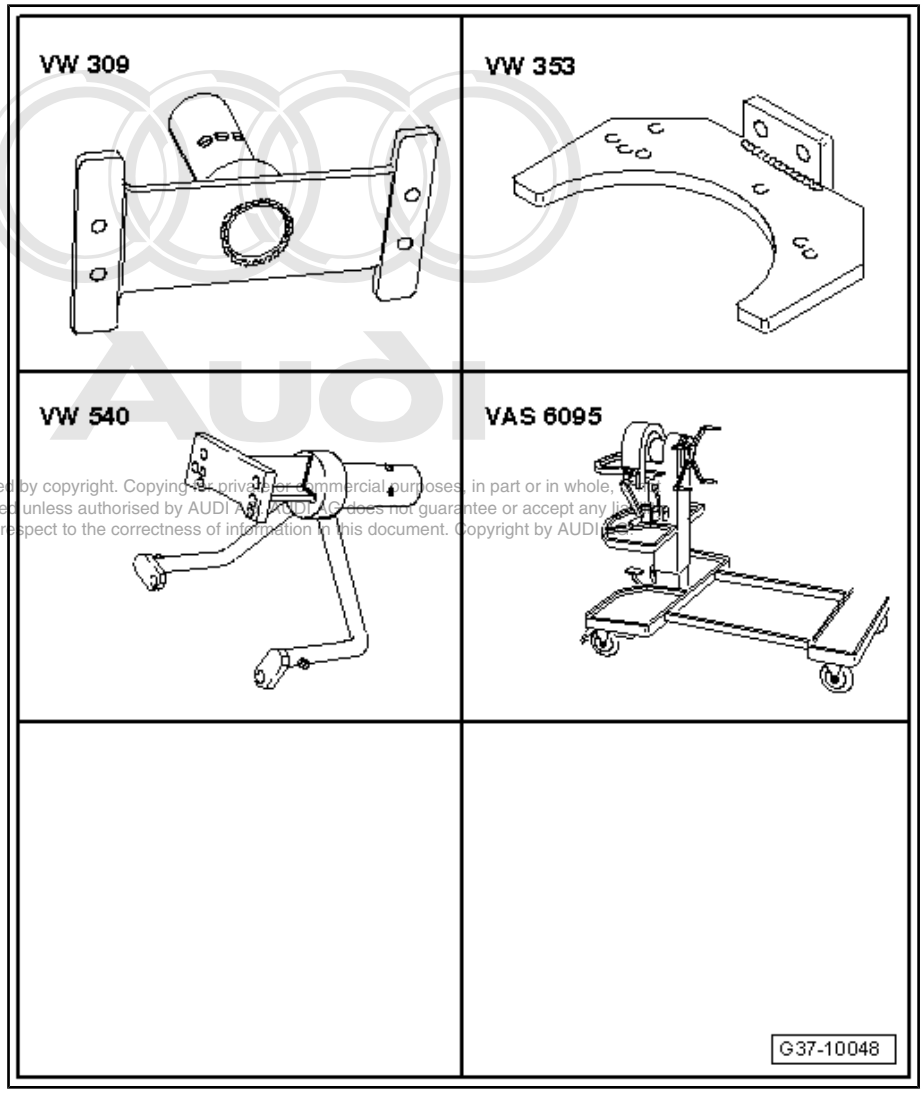
– Lift the gearbox with the workshop hoist -VAS 6100- and lifting aid -T40013- .



3 Attaching gearbox to engine/gearbox support

Special tools and workshop equipment required

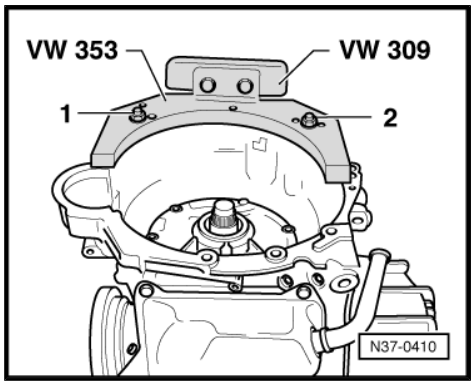
- Support plate -VW 309-
- Gearbox support -VW 353-
- Engine/gearbox support -VW 540-
- Engine/gearbox support -VAS 6095-



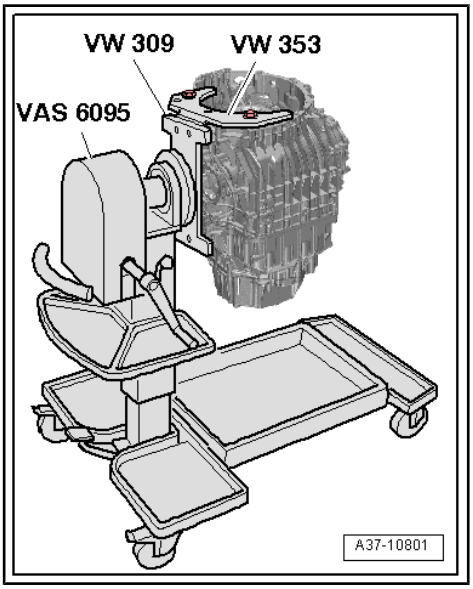
Securing gearbox in vertical position

– Screw the gearbox support -VW 353- to the gearbox using the bolts -1- and -2-.

– Screw the support plate -VW 309- to the gearbox support -VW 353- .



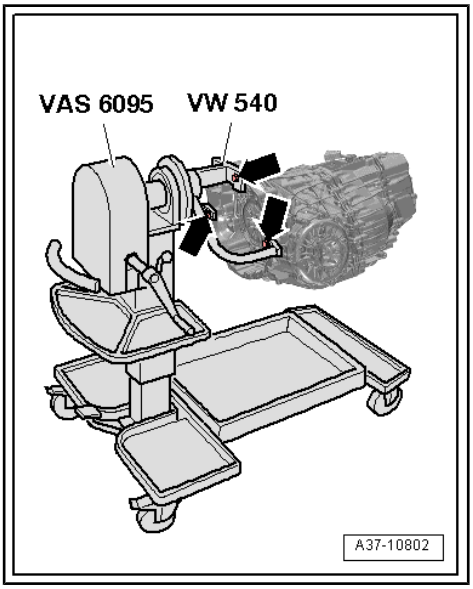
– Insert the gearbox with the workshop hoist -VAS 6100- in the engine/gearbox support -VAS 6095- .



Securing gearbox in horizontal position

– Screw the engine/gearbox support -VW 540- to the gearbox -arrows-.

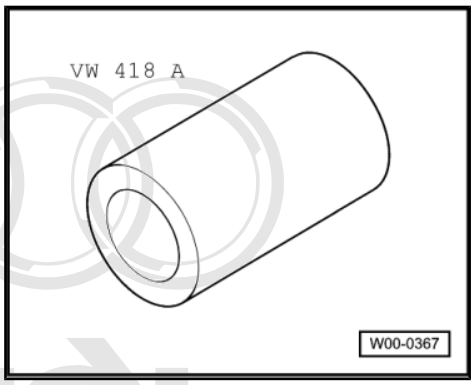
– Insert the gearbox with the workshop hoist -VAS 6100- in the engine/gearbox support -VAS 6095- .



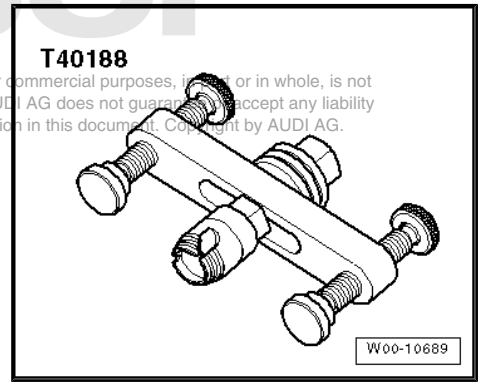
4 Renewing oil seal for selector shaft

Special tools and workshop equipment required

- Tube -VW 418 A-



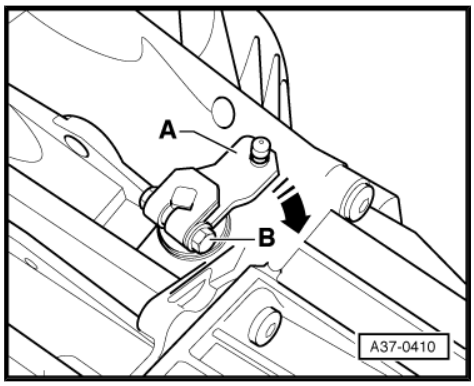
- Oil seal extractor -T40188-



Removing

- Gearbox removed

– Mark the installation position of the selector lever on the gearbox -A- with respect to the selector shaft in waterproof ink.



Note

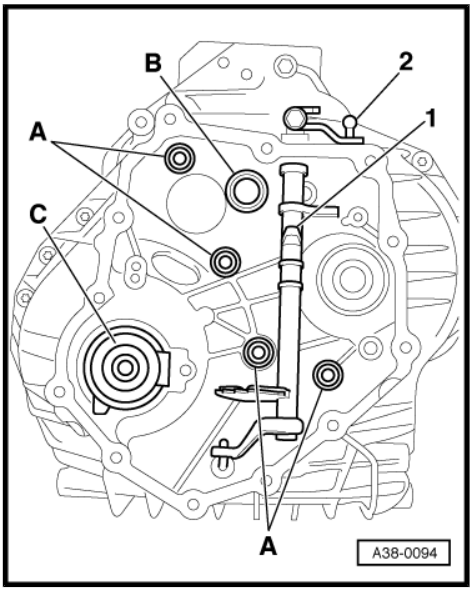
- *Marking is essential, as the selector lever on the gearbox -A- is mounted with a 180° offset on certain models such as the Audi A8.*
- *The marking is to ensure that installation is performed correctly.*

– Screw out the bolt -B- and lift off the selector lever on the gearbox -A-.

Caution

Risk of damage to selector shaft (shown here with hydraulic control assembly removed).

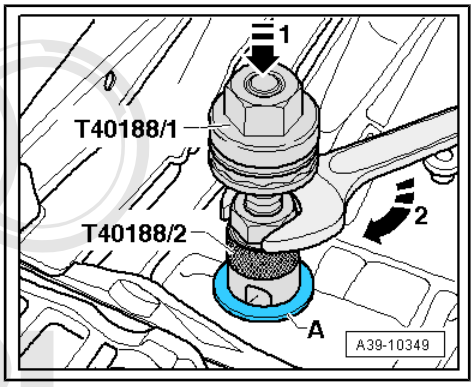
- *The selector shaft is not to be pressed into or pulled out of the gearbox.*
- *The shifting cam -1- at the selector shaft will break off if a load is applied to the selector shaft at the top or bottom.*
- *The gearbox must be replaced if the shifting cam is damaged.*



– Screw the nut -T40188/1- onto the extractor -T40188/2- .

– Fit the extractor -T40188/2- over the selector shaft.

– At the same time, press the extractor -T40188/2- firmly into the oil seal -A- -arrow 1- and screw in -arrow 2-.



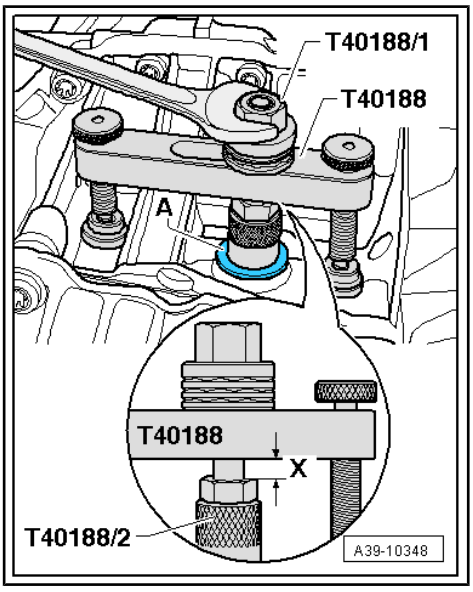
Note

- *Greater force can be exerted by hand in the direction of -arrow 1-, as the nut -T40188/1- has been screwed onto the extractor -T40188/2- .*
- *The extractor -T40188/2- cuts into the oil seal -A-.*
- *Take care not to damage the sealing surface at the gearbox and the selector shaft.*

- The extractor -T40188/2- must be seated extremely firmly in the oil seal. If necessary, press in the extractor -T40188/2- several times and screw in again.

– Fit the cross-piece -T40188- and align horizontally with the screw feet on the side.

- The cross-piece -T40188- must be aligned such that the nut -T40188/1- can rest flat.
- It is essential to maintain the distance -x- of approx. 8 mm between the bottom edge of the cross-piece and the extractor -T40188/2- . If necessary, fit packing plates as spacers between the gearbox and screw feet.



Note

The spacing is necessary to enable the oil seal to be pulled up to the cross-piece. The extractor -T40188/2- will be damaged if it already makes contact with the cross-piece prior to full extraction of the oil seal.

– Screw on the nut -T40188/1- and extract the oil seal for the selector shaft -A-.

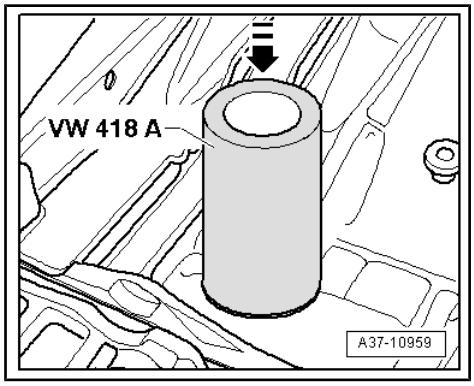
– Clean the opening and extract any swarf.

Installing

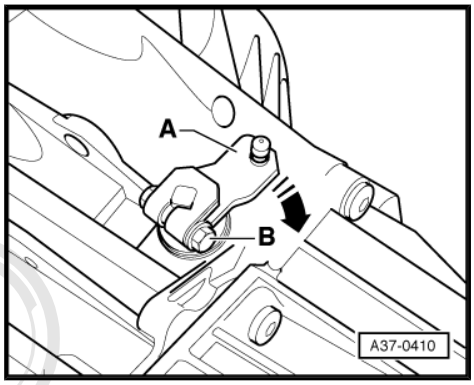
– Lightly lubricate outer circumference of new oil seal with ATF.

– Slip new oil seal over selector shaft and press in.

– Use tube -VW 418 A- to drive home oil seal.



– Attach the selector lever on the gearbox -A- to the selector shaft in line with the mark and tighten the bolt -B-.



Tightening torque

Component	Nm
Selector lever on gearbox to selector shaft	10

5 Removing and installing ATF breather pipe

ATF escaping at the underside of the bell housing may be an indication of leakage at the input shaft oil seal and/or the ATF breather pipe. The actual cause of the leak must be determined before renewing any components.

- The input shaft oil seal must be renewed if leaking ⇒ page 33 .
- The ATF breather pipe must be renewed if leaking.

Removing

Note

- *Observe the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on the automatic gearbox ⇒ page 4 .*

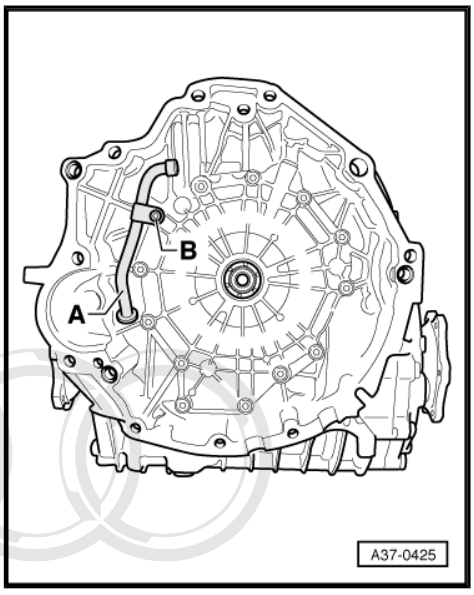
- Gearbox removed

Depending on the version, different ATF breather pipes can be fitted.

Version 1

– Unscrew bolt -B-.

– Pull ATF breather pipe -A- out of opening in gearbox.



Installing

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

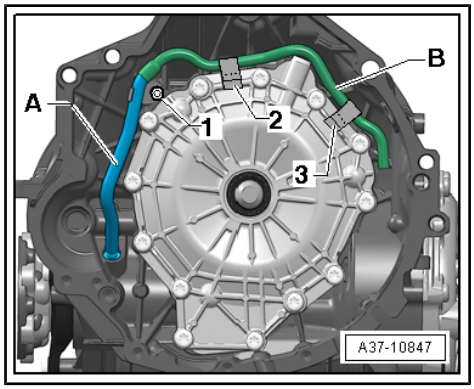
– Push in new ATF breather pipe -A- as far as stop.

– Secure ATF breather pipe to gearbox housing with retainer and bolt -B-.

Tightening torque

Component	Nm
ATF breather pipe to gearbox housing	25

Version 2



Note

This version has been installed or retrofitted in certain countries.

– Remove bolt -1-.
– Pull retaining clips -2- and -3- off gearbox.
– Pull ATF breather pipe -A- and breather pipe -B- out of opening in gearbox.

Installing

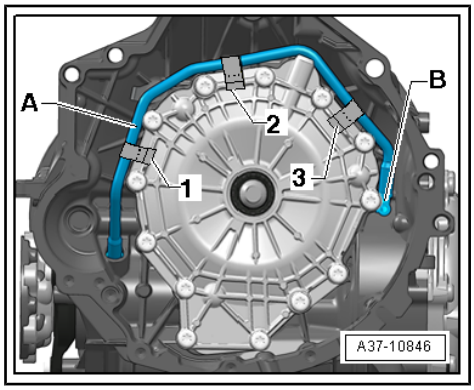
Installation is carried out in reverse sequence; note the following:

– Push in new ATF breather pipe -A- as far as stop.
• The breather pipe -B- must be pushed onto the ATF breather pipe -A- as far as it will go.
– Secure ATF breather pipe to gearbox housing with retainer and bolt -1-.
– Push retaining clips -2- and -3- all the way onto ribs on gearbox housing cover.
– Press breather pipe -B- inwards by hand in area between bolt -1- and retaining clip -2- to relieve tension on retaining clip -2-.

Tightening torque

Component	Nm
ATF breather pipe to gearbox housing	25

Version 3



– Pull retaining clips -1 to 3- off gearbox.
– Pull ATF breather pipe -A- out of opening in gearbox.

Installing

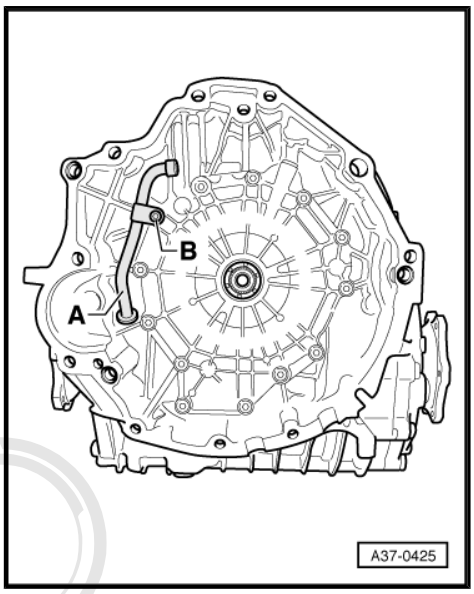
Installation is carried out in reverse sequence; note the following:

• The breather piece -B- must be inserted as far as it will go.
– Push in new ATF breather pipe -A- and breather piece -B- as far as stop.
– Push retaining clips -1 to 3- all the way onto ribs on gearbox housing cover.
– Press breather pipe -A- inwards by hand in area between retaining clips to relieve tension on retaining clips.

6 Escape of ATF in area of gearbox housing, input shaft

Note

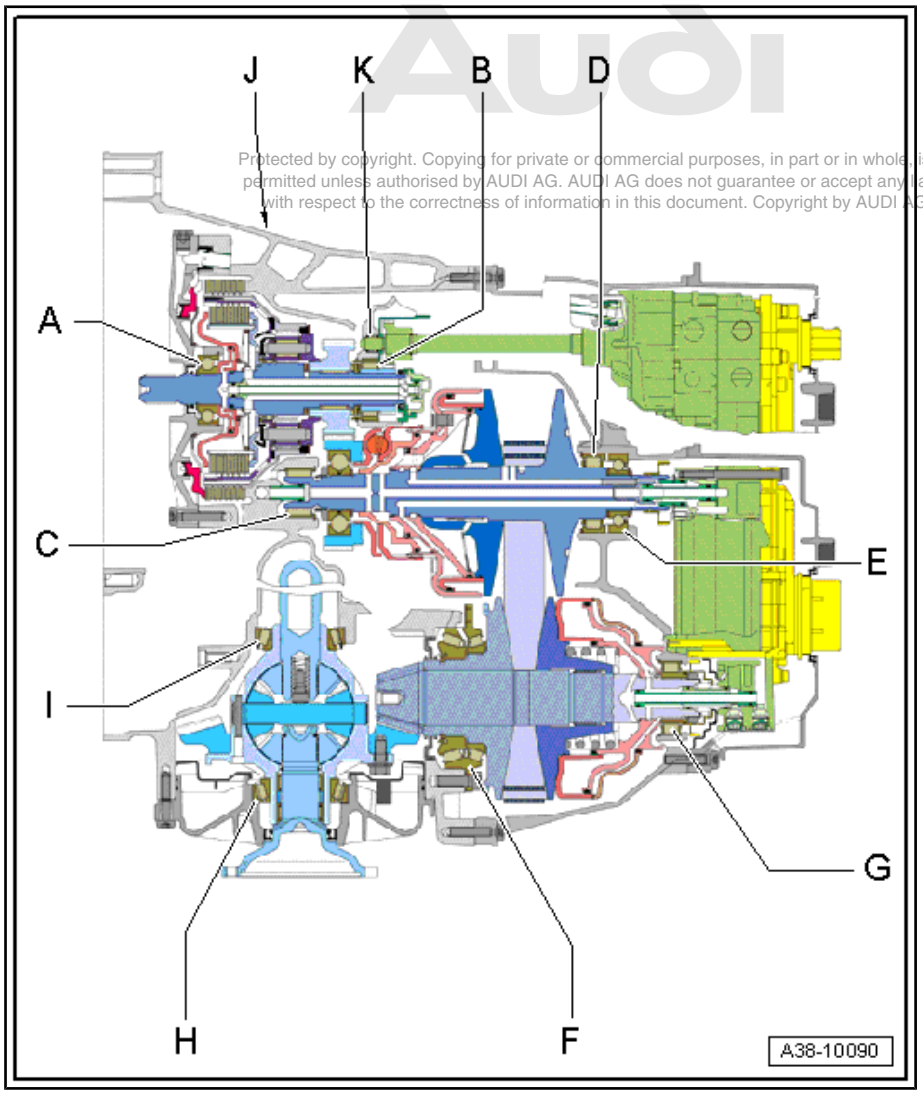
If ATF is found to be escaping from the inspection hole behind the ATF breather pipe -A- on a level with the screw -B-, the gearbox is defective and must be replaced.



38 – Gears, control

1 Dismantling and assembling gearbox

1.1 Gearbox bearings and their designation - overview



A - Bearing “A”

- ❑ Ball bearing for input shaft
- ❑ Removing and installing ⇒ page 44

B - Bearing “B”

- ❑ Roller bearing for input shaft
- ❑ Can only be renewed together with input shaft

C - Bearing “C”

- ❑ Roller bearing for pulley set “I”
- ❑ Removing and installing ⇒ page 106

D - Bearing “D”

- ❑ Roller bearing for pulley set “I”
- ❑ Different versions: with or without inner race
- ❑ Removing and installing ⇒ page 110

E - Bearing “E”

- ❑ Ball bearing for pulley set “I”
- ❑ Removing and installing ⇒ page 110

F - Bearing “F”

- ❑ Tapered roller bearing for pinion shaft/pulley set “II”

G - Bearing “G”

- ❑ Roller bearing for pulley set “II”
- ❑ Cannot be renewed individually

H - Bearing “H”

- ❑ Bearing for differential
- ❑ Cannot be renewed individually

I - Bearing “I”

- ❑ Bearing for differential
- ❑ Cannot be renewed individually

J - Bearing “J”

- ❑ Ball bearing for flange shaft (right-side)
- ❑ Removing and installing ⇒ page 123

K - Bearing “K”

- ❑ Bearing for ATF pump shaft
- ❑ Cannot be renewed individually

1.2 Removing and installing automatic gearbox control unit -J217-

Note

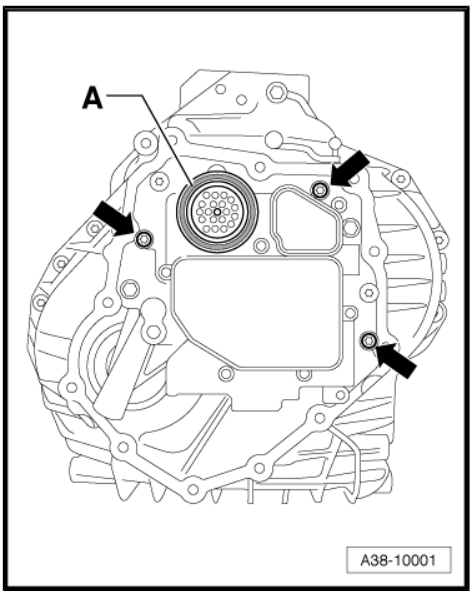
- ♦ *Observe the general repair instructions ⇒ page 1 .*
- ♦ *Rules for cleanliness when working on the automatic gearbox ⇒ page 4 .*

Removing

– Remove end cover ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 38 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 38 .

– Unscrew bolts -arrows- and pull out automatic gearbox control unit -J217- , taking care not to tilt it.

– Take twin-lip seal -A- off automatic gearbox control unit -J217-.



Note

Take care not to damage the sender on the control unit when setting down the automatic gearbox control unit -J217- .

Installing

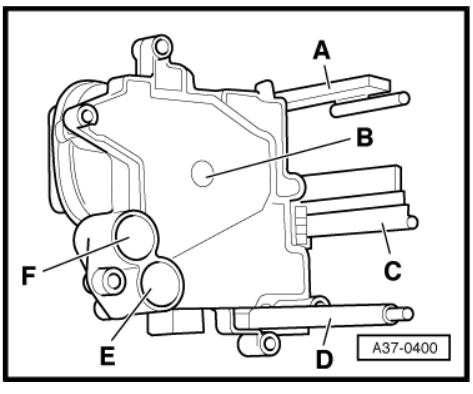
Installation is carried out in reverse sequence; note the following:

Note

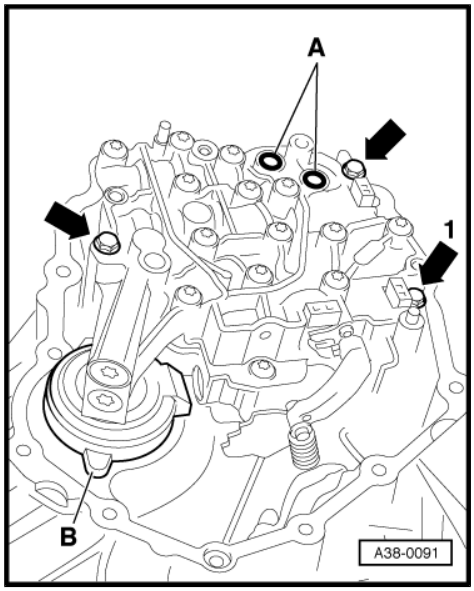
Renew gaskets and O-rings.

– Clean senders -A-, -C- and -D- to remove dirt and metal particles if necessary.

– Clean selector shaft ⇒ page 26 .

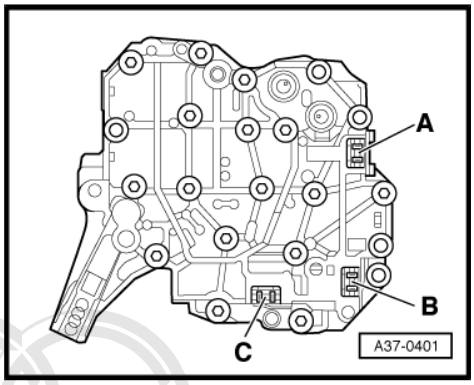


– Before fitting the automatic gearbox control unit -J217- , coat the new O-rings -A- on the hydraulic control unit with ATF.



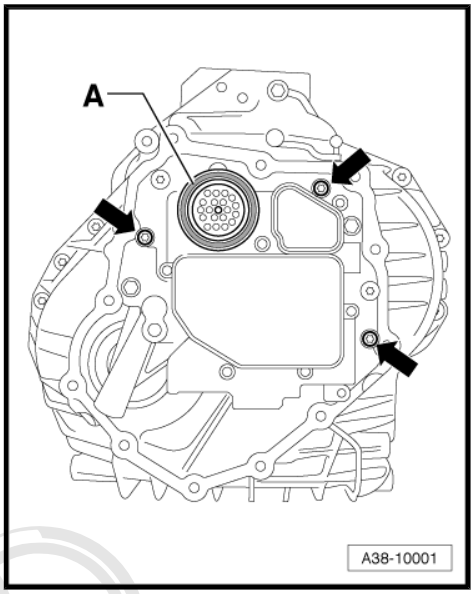
– Bring automatic gearbox control unit -J217- into position, taking care not to tilt it.

• When doing so, the connectors -A-, -B- and -C- on the back of the control unit must engage on the hydraulic control unit.



– Tighten bolts -arrows-.

– Install end cover ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 38 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 38 .



Tightening torque

Component	Nm
Automatic gearbox control unit -J217- to hydraulic control unit	10

After connecting the automatic gearbox control unit -J217- you must carry out the following steps:

- Encode the new automatic gearbox control unit -J217- .
- Adapt the automatic gearbox control unit -J217- .

To do so, use vehicle diagnostic, testing and information system -VAS 5051B- .

Caution

Before driving the vehicle, check the following points after renewing the automatic gearbox control unit -J217- to prevent damage to the gearbox:

- *Check the repair history of the vehicle to see whether the number of friction plates on the gearbox input shaft was changed from 6 to 7.*
- *If this is the case, use the vehicle diagnostic, testing and information system -VAS 5051B- to check whether update programming needs to be performed on the automatic gearbox control unit -J217- .*
- *Gearbox components will be damaged if update programming is necessary but is not carried out.*
- *Gearbox components will be damaged if update programming is not necessary but is carried out nevertheless.*

Checking whether update programming is required in the automatic gearbox control unit -J217- :

- Vehicle diagnostic, testing and information system -VAS 5051B- connected.

– On the vehicle diagnostic, testing and information system -VAS 5051B- , access the vehicle-specific `Guided functions`.

– Select the vehicle.

– Select the following in the functions:

Message line to be selected
`02 - Gearbox electronics 01J` or `02 - Gearbox electronics 0AN`
`J217 - Gearbox control unit for multitronic, functions`
`J217 - multitronic, update programming`

Note

This vehicle diagnostic, testing and information system -VAS 5051B- procedure ensures that update programming in the automatic gearbox control unit -J217- is only implemented when required.

– If necessary, perform update programming in the automatic gearbox control unit -J217- .

1.3 Cleaning selector shaft

Note

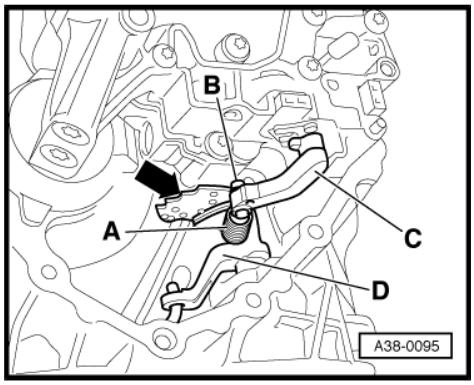
- *Observe the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on the automatic gearbox ⇒ page 4 .*

Procedure

– Remove end cover ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 38 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 38 .

– Remove automatic gearbox control unit -J217- ⇒ page 23 .

– Clean selector shaft detent -arrow-. Use lint-free cloths. When doing so, take particular care to remove metal swarf or the like from the contact surfaces of the magnets.



Note

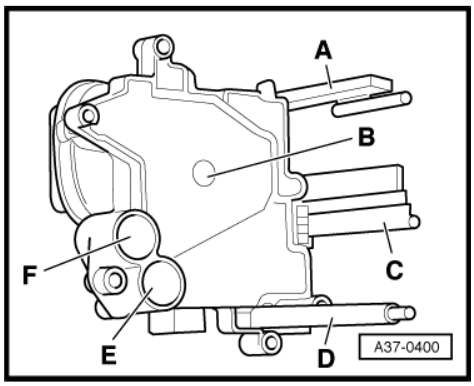
Make sure that spring -A- and roller -B- are properly secured.

– Check roller -B- and spring -A- for damage; renew if necessary.

– Clean senders -A-, -C- and -D- to remove dirt and metal particles if necessary.

– Install automatic gearbox control unit -J217- ⇒ page 23 .

– Install end cover ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 38 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 38 .



1.4 Removing and installing hydraulic control unit

Note

- *Observe the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on the automatic gearbox ⇒ page 4 .*
- *Always replace a dirty or defective hydraulic control unit.*

Removing

– Remove end cover ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 38 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 38 .

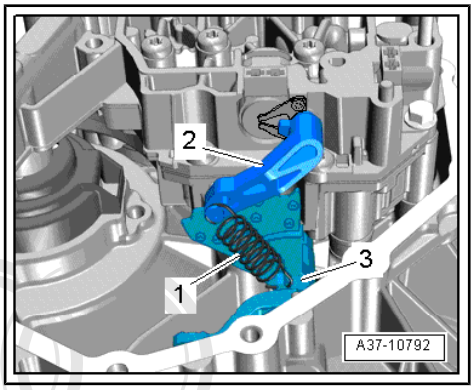
– Remove automatic gearbox control unit -J217- ⇒ page 23 .

Caution

There is a risk of damage to the spring.

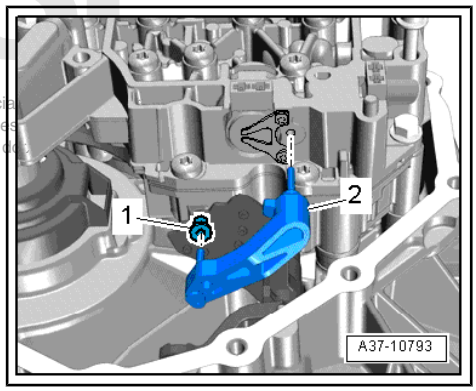
Do not use sharp-edged pliers or the like for disengaging/engaging the spring.

The detent for the selector shaft will no longer function properly if the wire of the spring is damaged by incision or kinking.

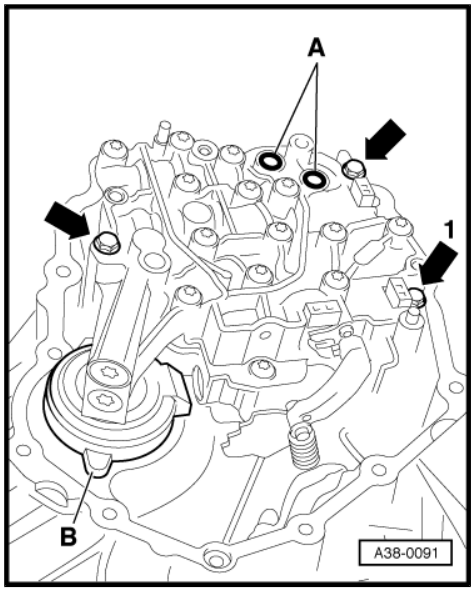


– Unhook spring -1- from lever for selector shaft detent -2- and from selector shaft -3-.

– Pull the lever for selector shaft detent -2- downwards out of the hydraulic control unit drilling. Pay attention to the roller -1- when doing this.



– Screw out the bolts -arrows- and detach the hydraulic control unit.



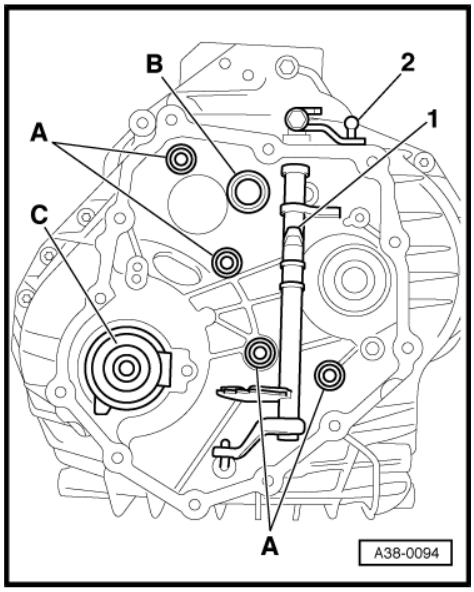
Caution

The hydraulic control unit is never to be carried or lifted by way of the long pump shaft on the back of the hydraulic control unit, as this would crush the vanes inside the vane pump and thus damage the pump.

Note

Items -A and B- can be disregarded.

– Remove axial sealing elements -A- and -B- from gearbox.



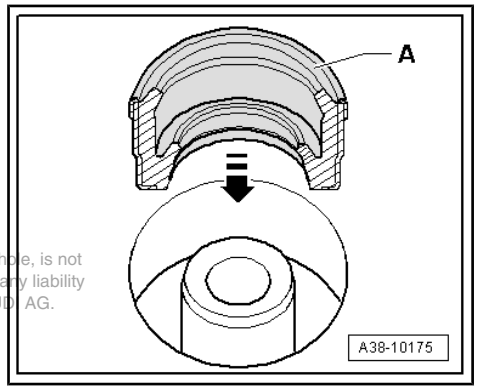
Installing

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

– Renew gaskets and O-rings.

– Renew axial sealing elements -A- (4x) and -B-.

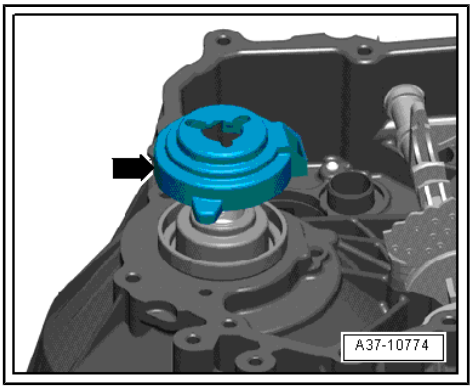
• Installation position: axial sealing elements -A- must be inserted with sealing lips facing upwards, as shown in sectional illustration.



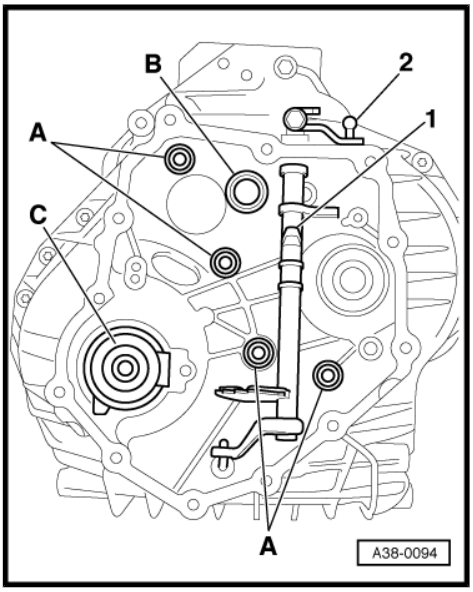
– Coat axial sealing elements with ATF and insert in direction of -arrow-.

– Fit cover -arrow- on sender wheel “II”.

• The locking element on the back of the cover must be inserted in the small hole on the surface of the gearbox.

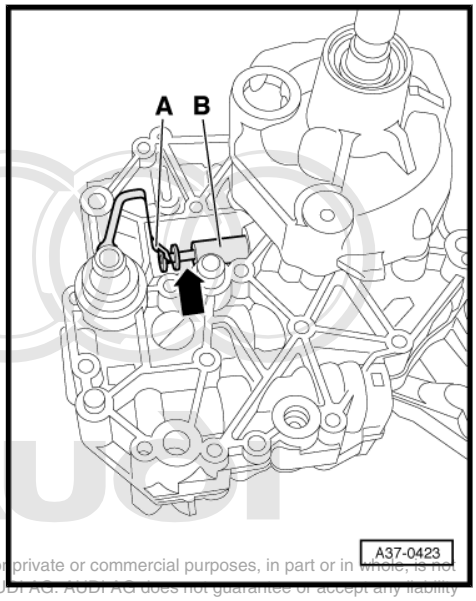


– Press the selector lever on the gearbox -2- anti-clockwise as far as it will go so that the shifting cam -1- is more or less vertical (with a slight tilt to the right).



– On the back of the hydraulic control unit, press the control piston -B- fully inwards (to the left), until it engages in the assembly spring -A-.

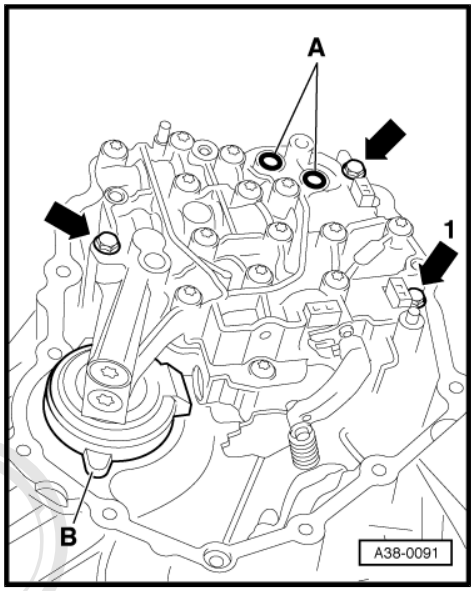
– Insert the hydraulic control unit in the gearbox, taking care to keep it straight.



Note

When fitting the hydraulic control unit, make sure the shifting cam (-Item 1- in Fig. A38-0094 ⇒ page 29) engages in the vacant groove -arrow- at the control piston -B-.

– Screw in bolts -arrows- hand-tight. One bolt -arrow 1- is shorter than the other two.
– Check that cover is correctly seated.
• The locking element -B- must be inserted in the hole provided on the gearbox.

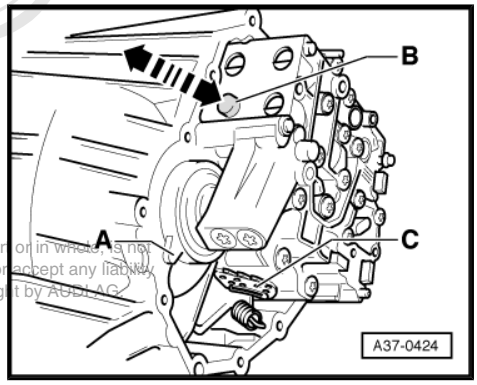


Note

-Item B- can be disregarded.

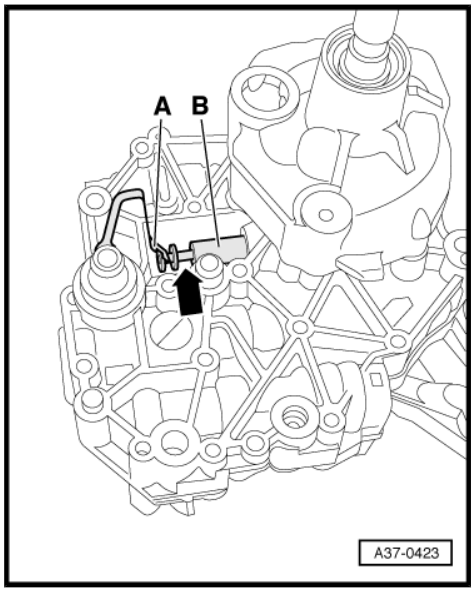
Checking operation of control piston

– Move the selector shaft several times to the left and right at the detent plate -C- or at the selector lever on the gearbox.
• The control piston -B- should travel in and out accordingly -arrow-.

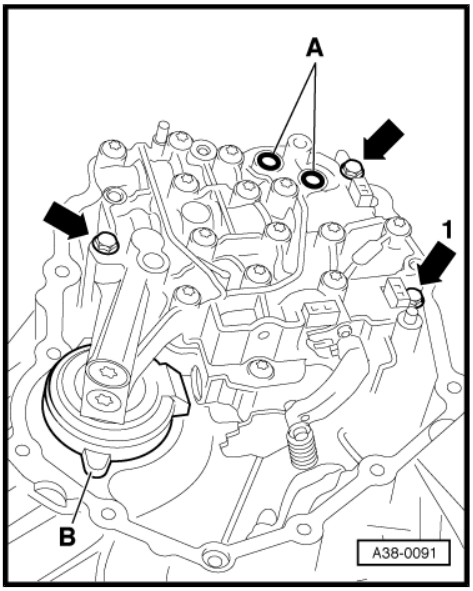


If the control piston does not move, the shifting cam has not engaged in the groove -arrow- at the control piston on the back of the hydraulic control unit. In that case:

– Detach hydraulic control unit again and re-install.



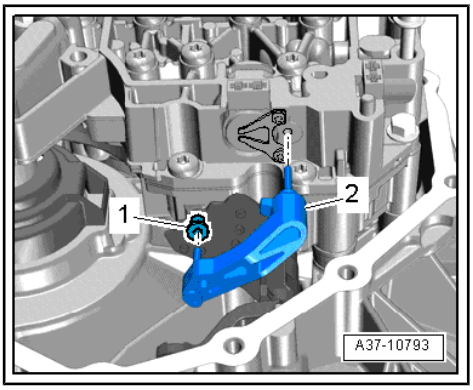
– Tighten bolts -arrows-.



Installing lever for selector shaft detent

– Push roller -1- onto lever for selector shaft detent (with collar facing lever for selector shaft detent).

– Insert the lever for selector shaft detent in the drilling in the housing of the hydraulic control unit.



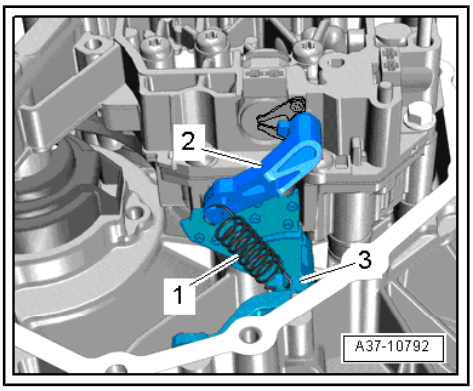
Caution

There is a risk of damage to the spring.

Do not use sharp-edged pliers or the like for disengaging/engaging the spring.

The detent for the selector shaft will no longer function properly if the wire of the spring is damaged by incision or kinking.

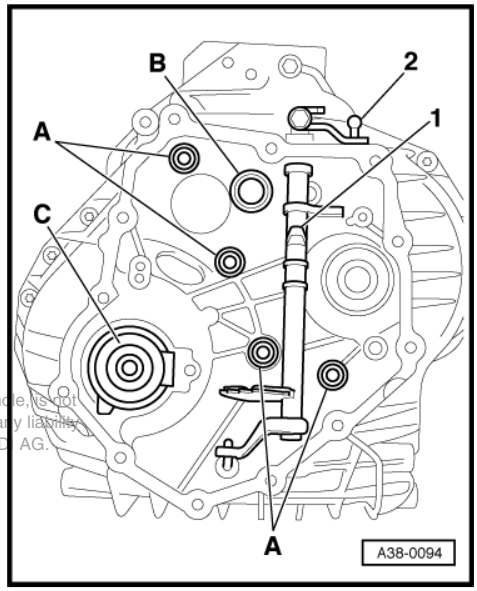
– Hook spring -1- into selector shaft -3- and lever for selector shaft detent -2-.



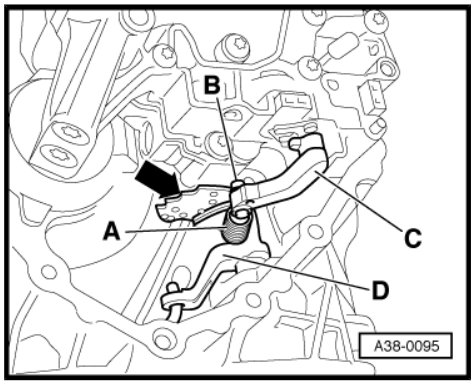
Note

For ease of illustration, the gearbox is shown without the hydraulic control unit.

– Move the selector lever on the gearbox -2- as far as it will go to the front and rear:



- The detent plate -arrow- moves backward and forward.
- As it moves, the roller -B- should be able to engage in the individual notches one-by-one.
- Lever for selector shaft detent -C- should follow the step movement backwards and forwards.
- Roller must be installed with the collar pointing downward, so that it cannot be pulled off upwards.



– Clean selector shaft ⇒ page 26 .

– Install automatic gearbox control unit -J217- with new O-rings ⇒ page 23 .

– Install end cover ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 38 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 38 .

– Fill up with ATF ⇒ page 9 .

– After installing gearbox, check and correct ATF level ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37 .

The following additional operations are required if the hydraulic control unit has been replaced:

- Adapt the automatic gearbox control unit -J217- .
- Road-test vehicle.

To do so, use vehicle diagnostic, testing and information system -VAS 5051B- .

- Vehicle diagnostic, testing and information system -VAS 5051B- must be connected to vehicle.

– On the vehicle diagnostic, testing and information system -VAS 5051B- , access the vehicle-specific `Guided functions`.

– Under `02 - Gearbox electronics`, select the test routine `02 - Hydraulic control unit replacement`.

Tightening torque

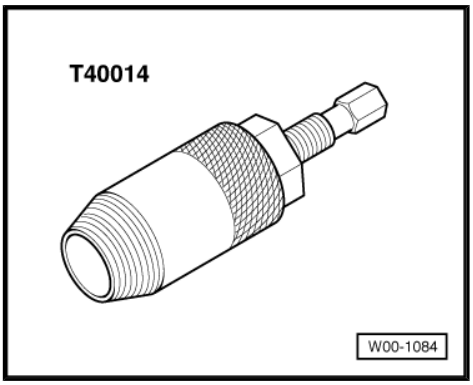
Component	Nm
Hydraulic control unit to gearbox housing	10

1.5 Renewing oil seal for input shaft

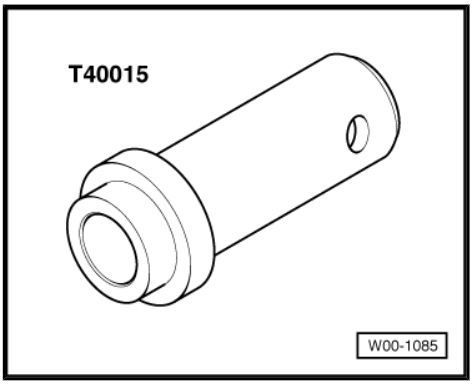
- ATF escaping at the underside of the bell housing may be an indication of leakage at the input shaft oil seal and/or the ATF breather pipe. The actual cause of the leak must be determined before renewing any components.
- If leaking, the input shaft oil seal must be renewed.
- The ATF breather pipe must be renewed if leaking ⇒ page 19 .

Special tools and workshop equipment required

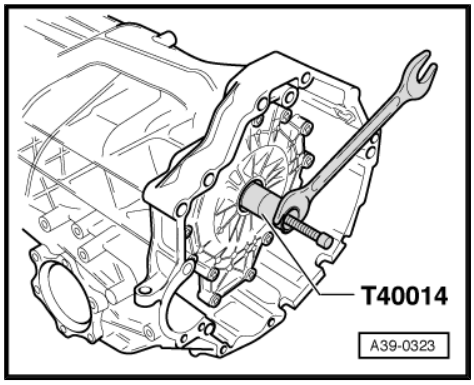
- Oil seal extractor -T40014-



- Thrust piece -T40015-



Procedure



Note

- *Observe the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on the automatic gearbox ⇒ page 4 .*

- Gearbox removed

– Screw oil seal extractor -T40014- into oil seal by hand until tool grips securely in seal. Then tighten the tool using an open-ended wrench.

– Screwing in the rear bolt of the oil seal extractor will allow you to pull the oil seal out a little.

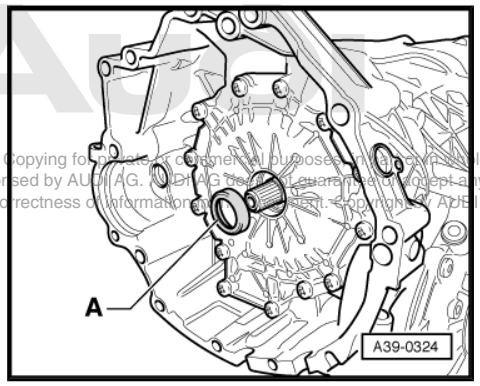
– Then re-apply the open-ended wrench so that the oil seal extractor -T40014- firmly engages in the oil seal again and screw in the bolt to further extract the seal.

– Repeat procedure until oil seal is pulled out all the way.

- The input shaft must have been installed before the oil seal can be fitted.

– Lubricate new oil seal -A- with ATF.

– Carefully slide oil seal onto input shaft with open side facing gearbox (do not touch splines on shaft).



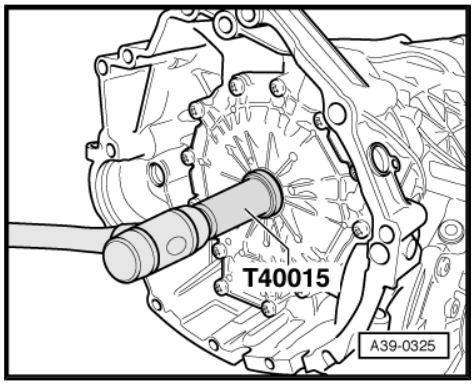
Note

- *Oil seal can be damaged if it touches splines on input shaft.*
- *Push oil seal as far as possible into cover to ensure that it remains straight when driving in.*

– Use thrust piece -T40015- to drive home oil seal.

– Fill up with ATF ⇒ page 9 .

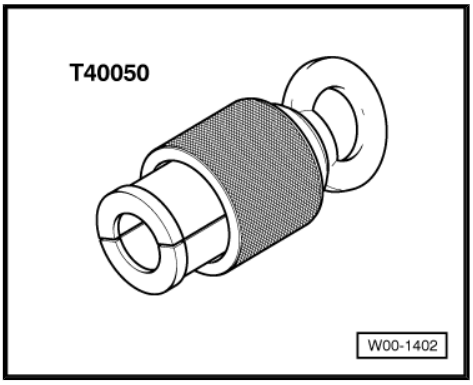
– After installing gearbox, check and correct ATF level ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37 .



1.6 Removing and installing input shaft

Special tools and workshop equipment required

♦ Puller -T40050-



Removing

Note

♦ *Observe the general repair instructions* ⇒ page 1 .

♦ *Rules for cleanliness when working on the automatic gearbox* ⇒ page 4 .

- Gearbox removed and mounted on assembly stand in vertical position ⇒ page 14 .

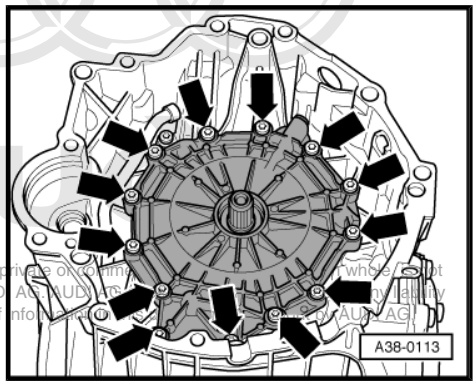
– Drain ATF ⇒ page 8 . To do so, swivel gearbox into installation position (horizontal).

Note

Gearbox must not be turned such that flange points downwards.

– Remove bolts -arrows-.

– Using a plastic hammer, carefully knock cover for input shaft to separate it from gasket.

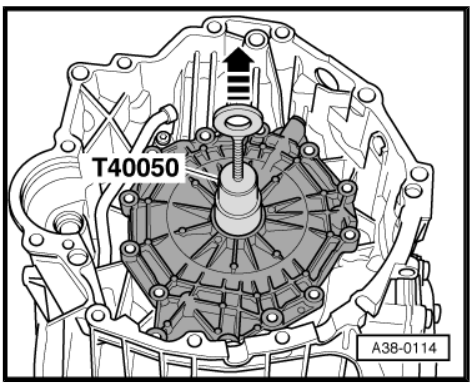


– Apply the puller -T40050- to the input shaft.

– Check that puller -T40050- is positioned securely on input shaft.

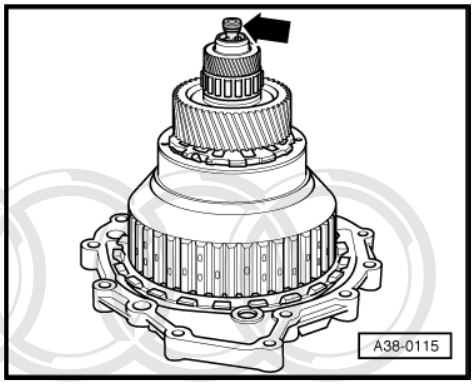
- Retaining ring must be pushed all the way down.

– Pull input shaft together with cover and forward clutch out of gearbox housing -arrow- using puller -T40050- .



Caution

- *Do not put down input shaft on the protruding oil pipe -arrow-, as oil pipe would then become damaged.*
- *A damaged oil pipe will cause drive-away problems or complete gearbox failure.*



– Remove the reverse gear clutch -A- ⇒ page 49 .

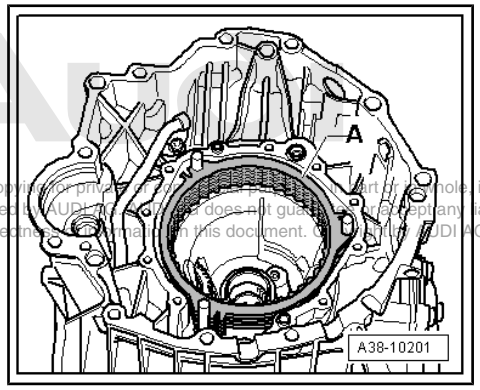
Installing

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

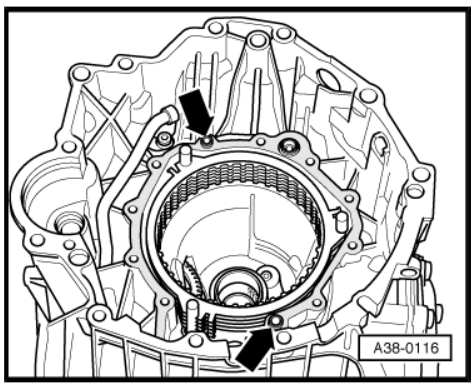
– Assess wear on gearbox components ⇒ page 138 .

– Clean sealing surfaces on gearbox housing and input shaft cover.

– Set and install the reverse gear clutch -A- ⇒ page 49 .



– Check whether the dowel sleeves -arrows- for centring the input shaft cover at the gearbox housing have been fitted and are firmly in position.



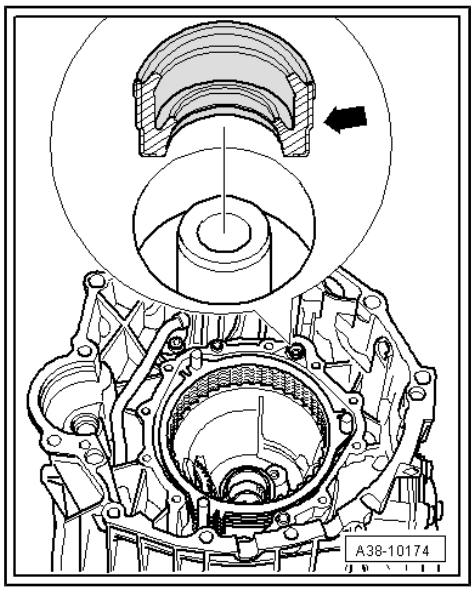
– Renew axial sealing element -arrow-.

Note

A sectional view of the axial sealing element is shown in order to illustrate the installation position.

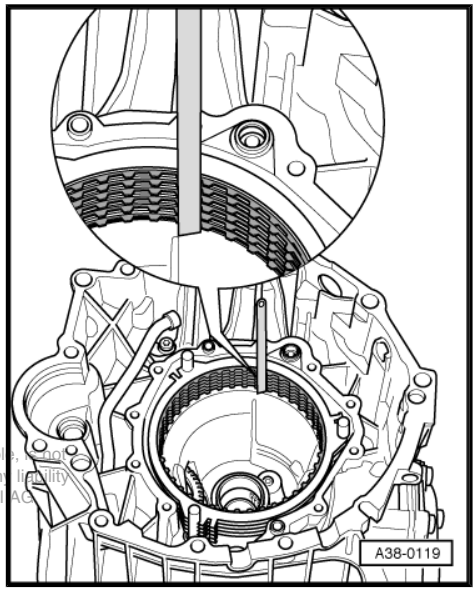
- Installation position of axial sealing element: sealing lips face upwards towards input shaft cover.

– Place new paper gasket in position.



– Align plates of reverse gear clutch using a straight-edge or similar.

• The teeth must be set exactly in line.

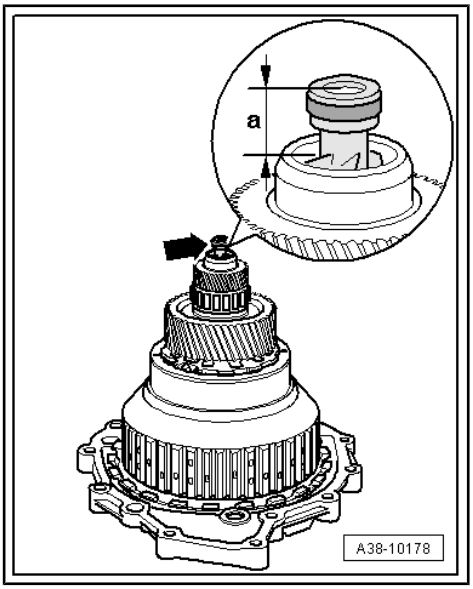


– Check position of oil pipe -arrow- :

• With oil pipe fully inserted, distance -a- from end of oil pipe to input shaft should be 11.5 mm.

If the distance is less, the oil pipe may be damaged (the end could have broken off if the oil pipe was pushed in too far).

If the distance is larger, the oil pipe is not pushed in far enough.



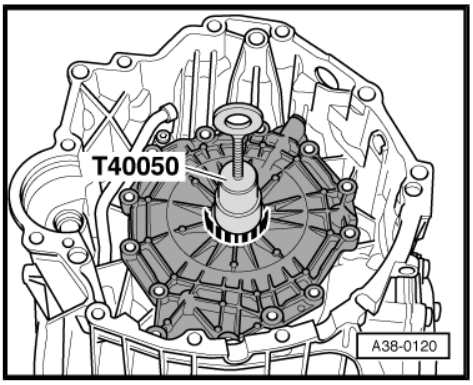
Caution

- ***Do not put down input shaft on the protruding oil pipe -arrow-, as oil pipe would then become damaged.***
- ***A damaged oil pipe will cause drive-away problems or complete gearbox failure.***

– Insert complete input shaft assembly in gearbox housing.

– When doing this, rotate input shaft slightly in both directions -arrow- until all clutch plates have engaged. Also lift input shaft slightly at the same time.

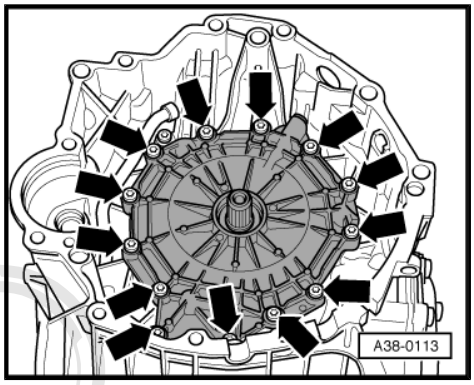
– Just before the input shaft is fully in position, rotate it anti-clockwise over the last few millimetres so that it engages in the teeth of the helical intermediate gearing.



– Tighten new bolts -arrows- diagonally in stages.

– Fill up with ATF ⇒ page 9 .

– After installing gearbox, check and correct ATF level ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37 .



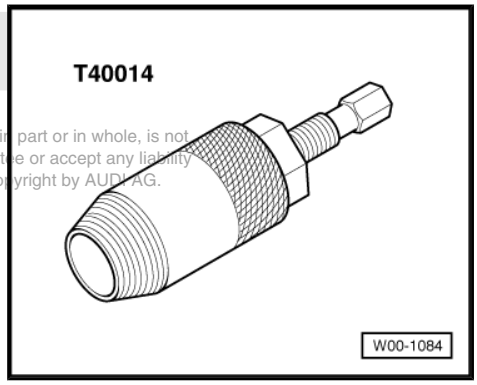
Tightening torque

Component	Nm
Input shaft cover to gearbox housing • Renew bolts	25

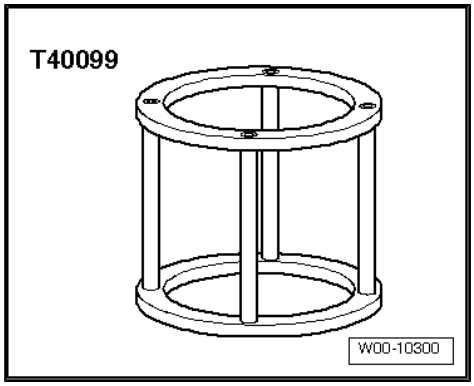
1.7 Removing and installing input shaft cover

Special tools and workshop equipment required

♦ Oil seal extractor -T40014-



♦ Thrust piece -T40099-



♦ Ice spray

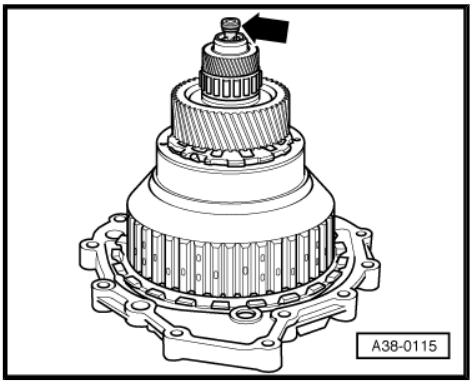
♦ Protective gloves

♦ Safety goggles

Removing

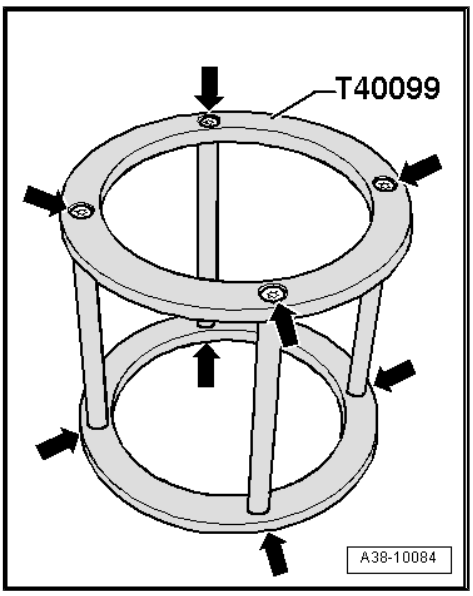
- Input shaft is removed ⇒ page 34

– Pull out oil pipe -arrow- upwards so as to avoid damage.



– Check all 8 bolts -arrows- of thrust piece -T40099- .

- Bolts should have been screwed in flush to 25 Nm ⇒ Assembly instructions for thrust piece -T40099- .



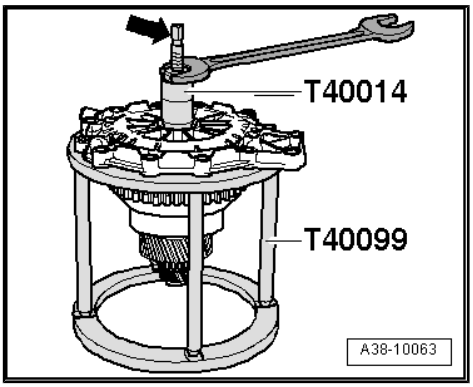
– Place input shaft in thrust piece -T40099- .

– Screw oil seal extractor -T40014- into oil seal by hand until tool grips securely in seal. Then tighten the tool using an open-ended wrench.

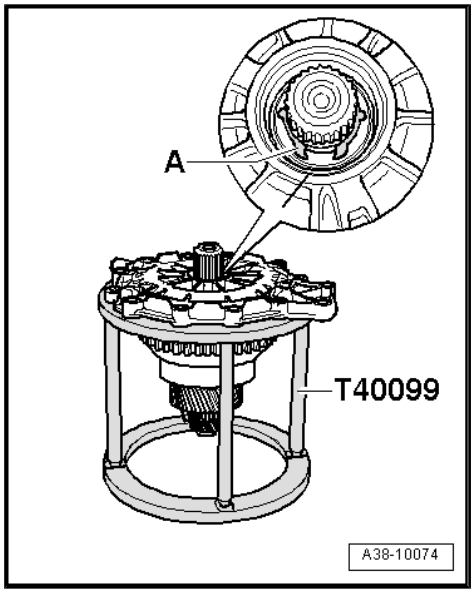
– Screwing in the rear bolt -arrow- will allow you to pull the oil seal out a little.

– Then re-apply the open-ended wrench so that the oil seal extractor -T40014- firmly engages in the oil seal again and screw in the bolt to further extract the seal.

– Repeat procedure until oil seal is pulled out all the way.



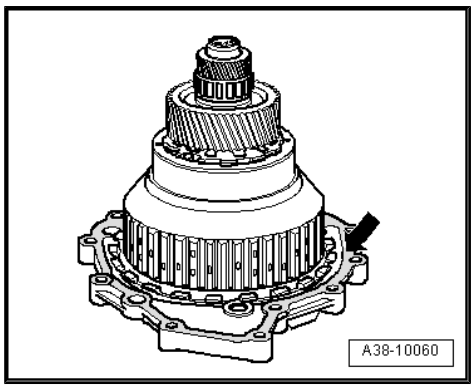
– Remove retaining ring from input shaft cover -A-.
– Measure and note down thickness of retaining ring once removed.



Note

When installing ball bearing, replace circlip with a new one of the same thickness.

– Clean sealing surface -arrow- of cover.

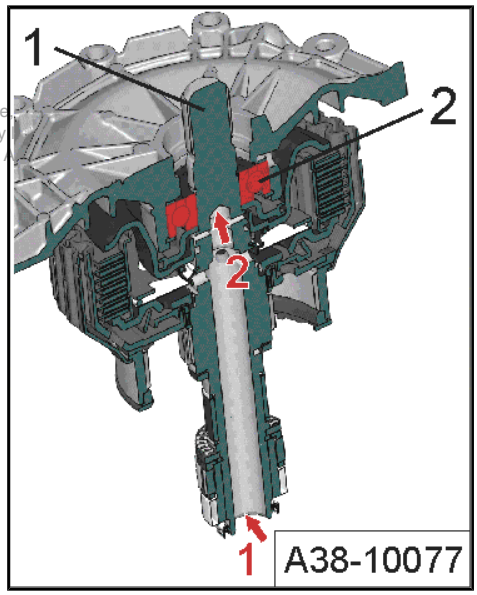


WARNING

Risk of burns

Wear protective gloves and safety goggles!

– Apply ice spray for example by way of the opening -arrow 1- for the oil pipe removed to cool the hollow shaft -1- on the inside at the seat -arrow 2- of the bearing “A” -Item 2- (ball bearing for input shaft).



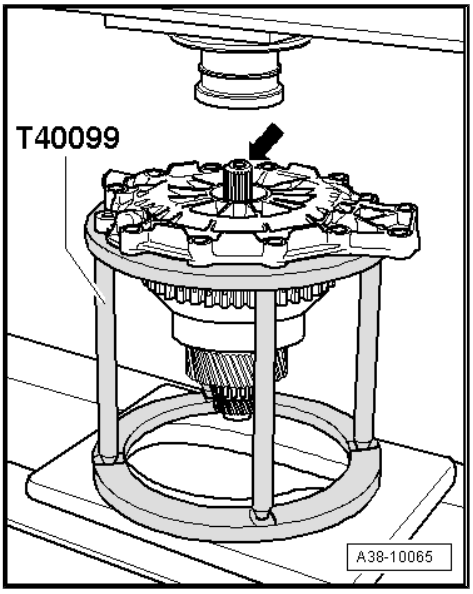
Note

- *The illustration shows a sectional view of the shaft.*
- *The shaft must be cooled to facilitate pressing off of the cover with bearing “A” -Item 2- (ball bearing for input shaft) and to prevent damage.*

– Clean surface of thrust piece -T40099- .

– Place input shaft in thrust piece -T40099- .

- Sealing surface of input shaft should be seated flush on the thrust piece.
- Make sure no objects (such as cable ties or dirt) are trapped between sealing surface of input shaft and surface of thrust piece -T40099- .



Caution

Metal particles or dirt will damage the sealing surface of the cover when pressing off and the cover will then have to be renewed.

– In addition, cool the shaft from the outside -arrow- e.g. with ice spray.

Note

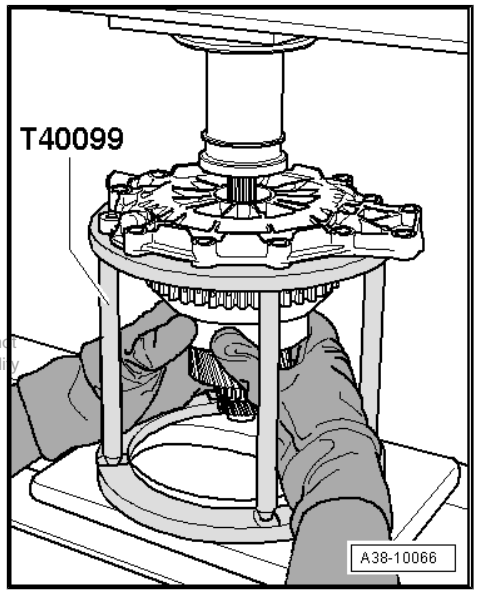
The shaft must be cooled to facilitate pressing off of the cover with bearing "A" (ball bearing for input shaft) and to prevent damage.

– Place input shaft together with thrust piece -T40099- on thrust plate of hydraulic press.

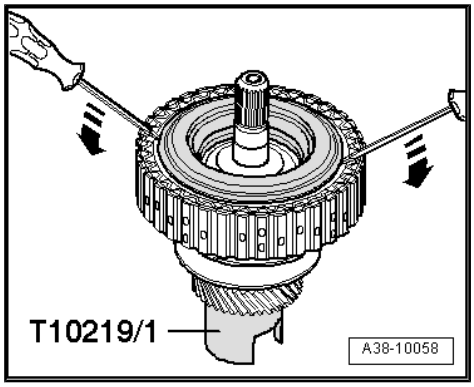
Note

The thrust piece -T40099- should rest as firmly as possible on the hydraulic press.

– Hold shaft from underneath and at the same time use hydraulic press to press shaft out of cover.



– Set down input shaft on assembly tool -T10219/1- .



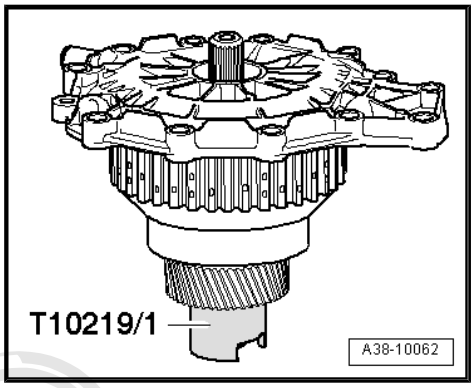
Note

Screwdriver and arrows can be disregarded.

Installing

– Replace the bearing “A” (ball bearing for input shaft) in the input shaft cover ⇒ page 44 .

– Place input shaft cover on input shaft and press on as far as possible by hand.

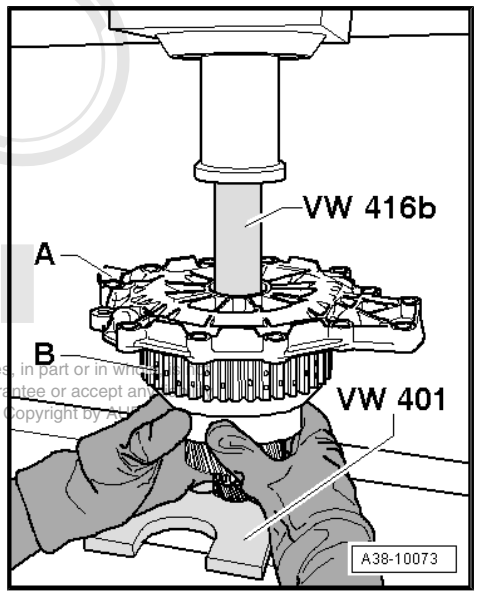


– Place input shaft -B- on thrust plate -VW 401- .

Caution

Take care to keep the input shaft straight and aligned centrally when positioning it beneath the press tool of the hydraulic press, as the input shaft may otherwise tilt to one side when pressure is applied to the cover.

– Use hydraulic press and tube -VW 416 B- to press input shaft cover -A- all the way home on the input shaft.

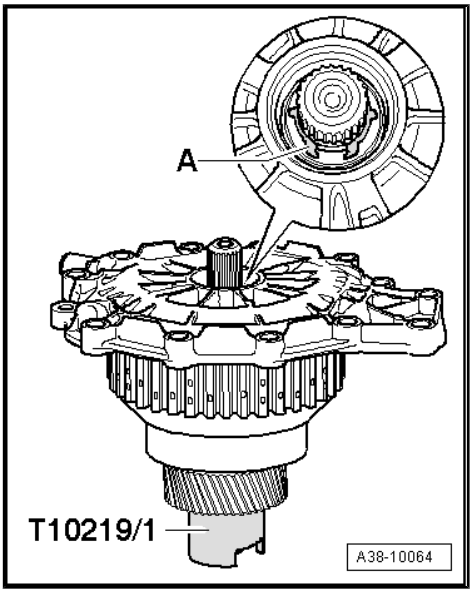


Fitting retaining ring for input shaft cover

– Replace retaining ring -A- with a new one of the same thickness when installing.

Note

Check that retaining ring is seated properly.



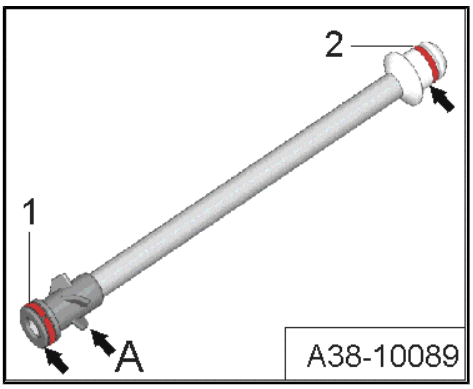
Installing oil pipe

– Assess wear on gearbox components ⇒ page 138 .

– Renew O-ring -2- on oil pipe.

• The oil pipe is pressed into the input shaft with the O-ring -2- first.

• You should feel oil pipe engage. Rotor vanes -arrow A- on oil pipe should be completely inside input shaft.

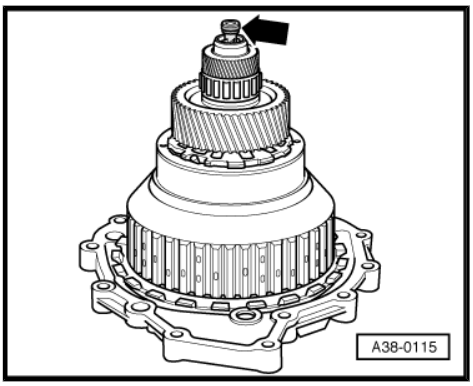


– Press oil pipe -arrow- down into input shaft as far as stop.

• With oil pipe fully inserted, distance from end of oil pipe to input shaft should be approx. 11.5 mm.

If the distance is less, the oil pipe may be damaged (the end could have broken off if the oil pipe was pushed in too far).

If the distance is larger, the oil pipe is not pushed in far enough.

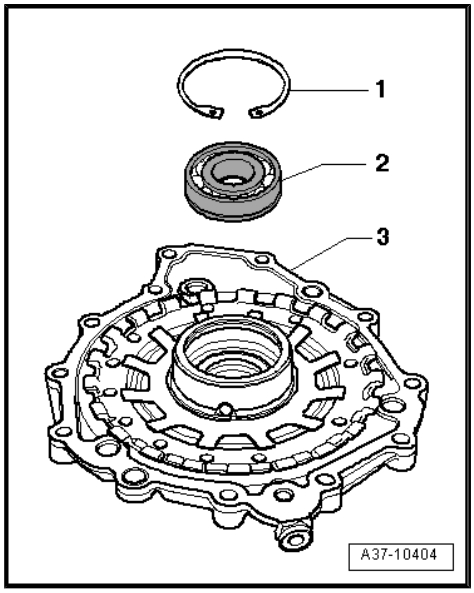


Caution

- ***Do not put down input shaft on the protruding oil pipe -arrow-, as oil pipe would then become damaged.***
- ***A damaged oil pipe will cause drive-away problems or complete gearbox failure.***

1.8 Renewing bearing “A” in input shaft cover

- Cover for input shaft is removed ⇒ page 38 .



Exploded view

1 - Circlip; always measure and renew

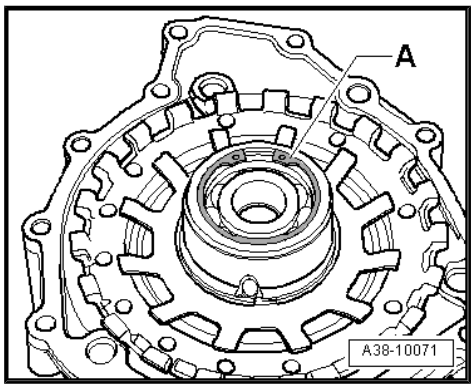
2 - Bearing “A” (ball bearing for input shaft), always replace

3 - Input shaft cover

Removing

– Remove circlip -A-.

– Measure and note down thickness of circlip once removed.

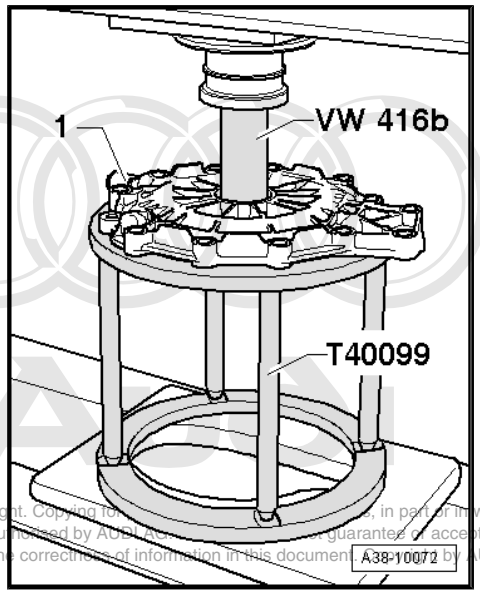


Note

When installing ball bearing, replace circlip with a new one of the same thickness.

– Place input shaft cover -1- on thrust piece -T40099- and align underneath hydraulic press.

– Press the bearing “A” (ball bearing for input shaft) with the tube -VW 416 B- out of the input shaft cover.



Note

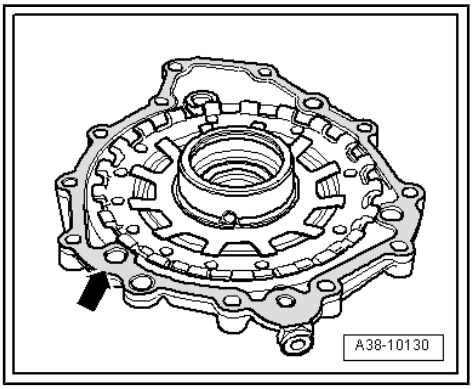
- *In some cases, the bearing “A” (ball bearing for input shaft) can also be pressed out by hand without the need for a hydraulic press.*
- *The ball bearing must be renewed.*

Installing

Caution

Check the input shaft cover ⇒ page 141 .

– If sealing surface or cover is damaged, renew input shaft cover.



Note

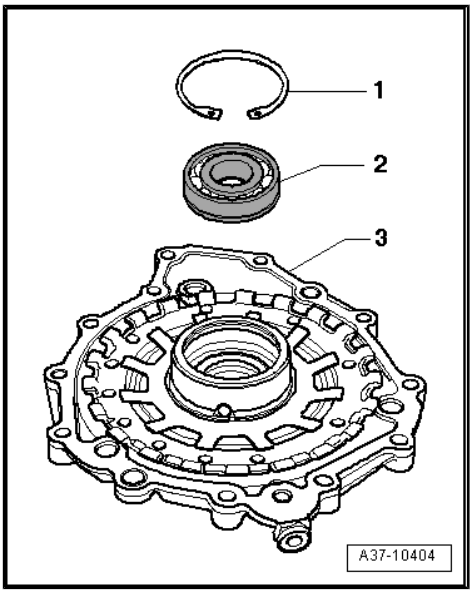
New input shaft covers are fitted with a new bearing "A" (ball bearing for input shaft).

– If the sealing surface and cover are intact, replace the bearing "A" -Item 2- (ball bearing for input shaft).

– Clean ball bearing seat in cover.

Caution

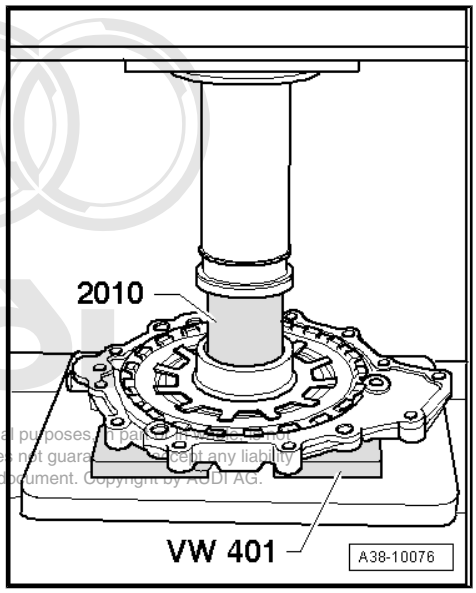
- *Heed the position of the bearing "A" -Item 2- (ball bearing for input shaft): The ball bearing cage must face downwards into the cover. The open side of the ball bearing must face upwards, i.e. the balls in the bearing must be visible on insertion.*



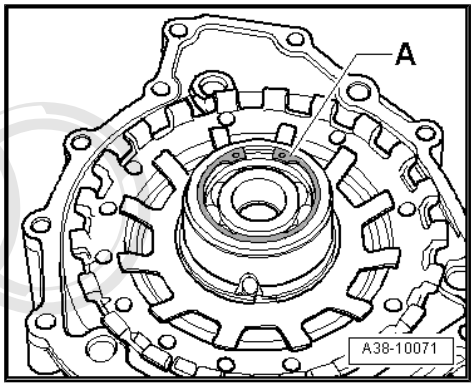
– Fit ball bearing so that it is seated flush and then press in by hand straight and as far as possible.

– Place input shaft cover on thrust plate -VW 401- .

– Press home using tube -2010- .



– Replace circlip -A- with a new one of the same thickness when installing.
– Check correct positioning of the circlip. If necessary, press in the ball bearing further or use the next thinnest circlip.



2 Servicing reverse gear clutch

1 - Corrugated washer

- ❑ Replace in the event of problems with the reverse gear clutch or damage

2 - Lower shim

- ❑ Determining thickness "E_1" ⇒ page 49
- ❑ The thickness of the lower shim "E_1" must be at least 2,15 mm
- ❑ Replace in the event of problems with the reverse gear clutch or damage

3 - Friction plate

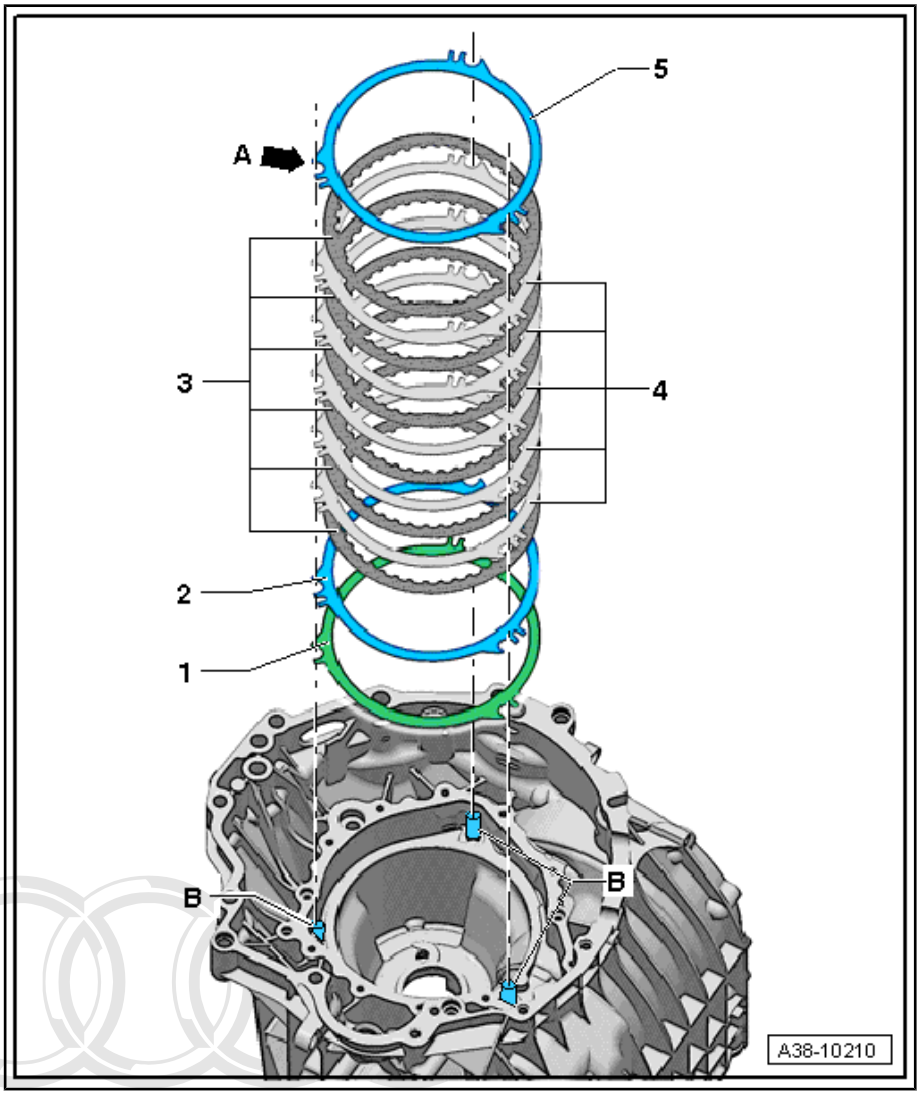
- ❑ 6x
- ❑ Replace in the event of problems with the reverse gear clutch or damage

4 - Outer plate

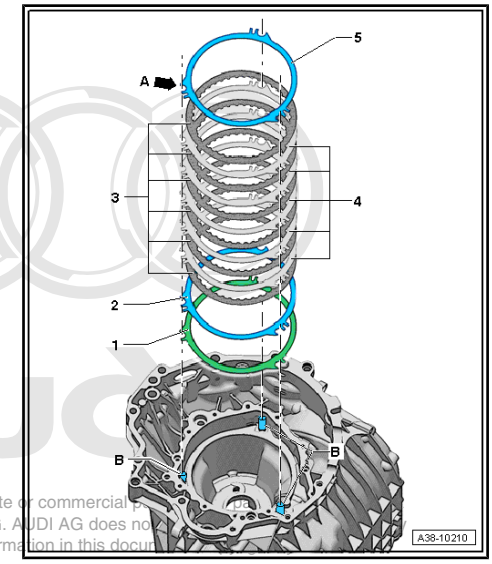
- ❑ 5x
- ❑ Replace in the event of problems with the reverse gear clutch or damage

5 - Upper shim

- ❑ Determining thickness "E_2" ⇒ page 49
- ❑ Replace in the event of problems with the reverse gear clutch or damage



2.1 Removing and installing reverse gear clutch



Removing

Note

- *Heed the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on automatic gearbox ⇒ page 4*

- Thoroughly clean all components prior to insertion.
- Gearbox removed and attached in vertical position to repair stand ⇒ page 14 .

– Remove the input shaft ⇒ page 34 .

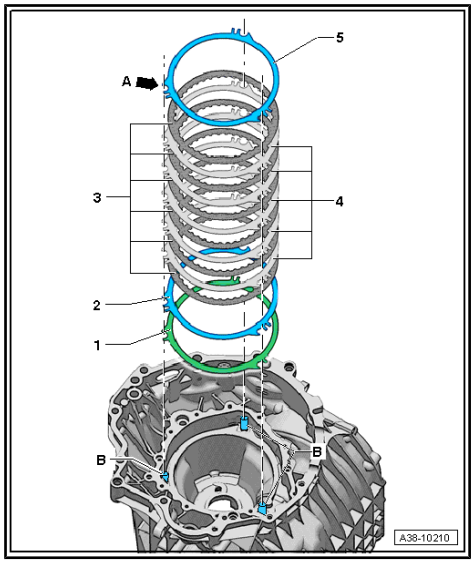
– Take the reverse gear clutch with corrugated washer -Items 1 to 5- out of the gearbox.

– Measure the upper shim -5- and the lower shim -2- and note down the values.

Note

The purpose of noting down the values for the old upper -5- and lower -2- shims fitted is to provide a check or comparison with the newly determined shims.

Installing



- Thoroughly clean all components prior to insertion.

– Determine the lower shim -2- and upper shim -5- ⇒ page 49 .

– Insert the corrugated washer -1- over the guides -B-.

– Insert the lower shim -2- determined (thickness “E_1”) over the guides -B-.

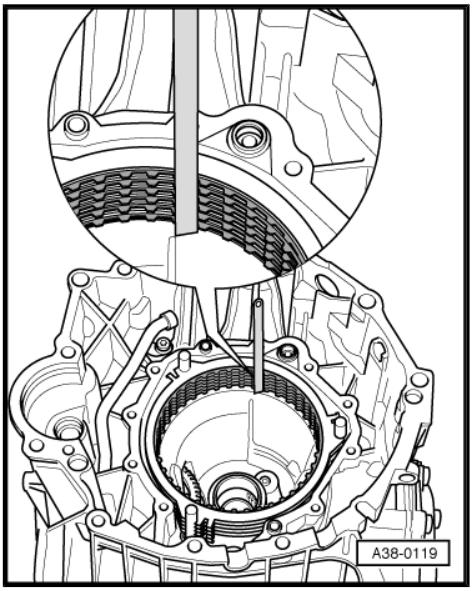
– Alternately insert first a friction plate -3- and then an outer plate -4- over the guides -B-.

– Insert the upper shim -5- determined (thickness “E_2”) over the guides -B-.

– Use a rule, for example, to align the plates of the reverse gear clutch.

• The splines must be precisely aligned.

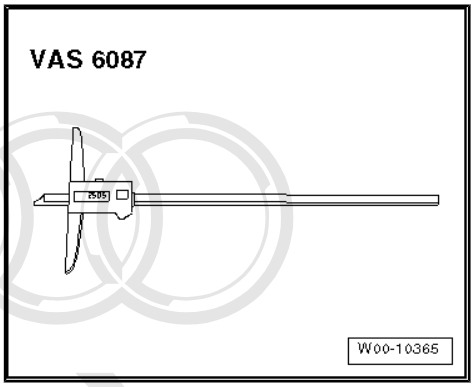
– Install the input shaft ⇒ page 34 .



2.2 Setting reverse gear clutch

Special tools and workshop equipment required

♦ Digital depth gauge -VAS 6087-

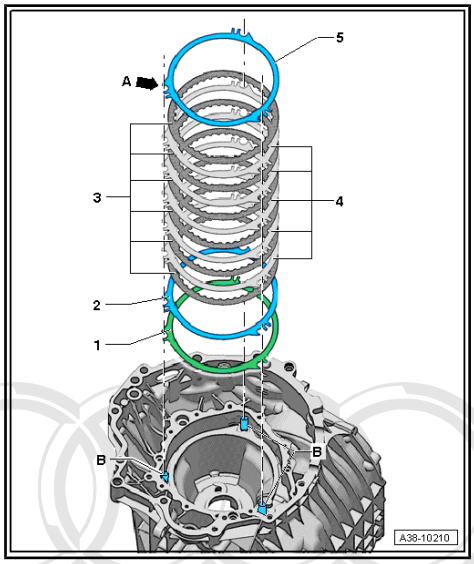


♦ Digital caliper, 150 mm -VAS 6335-

♦ 2 rulers -T40100-

♦ Clean, flat measurement surface, e.g. compressor tool -T10285-

Setting of reverse gear clutch by determining shims:



Note

- *Heed the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on automatic gearbox ⇒ page 4 .*

Conditions:

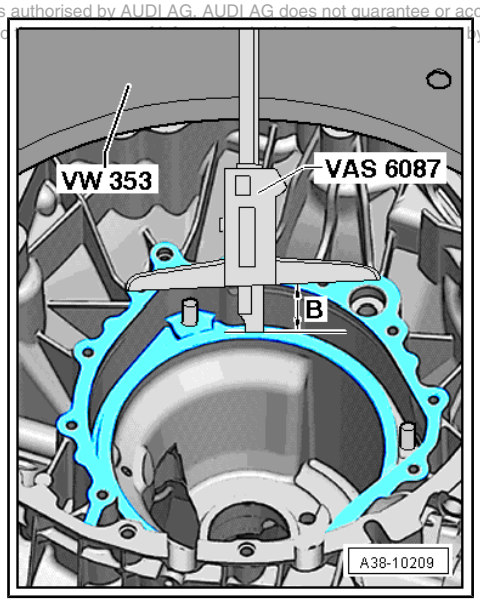
- Thoroughly clean all components prior to insertion.
- Gearbox removed and attached in vertical position to repair stand ⇒ page 14 .
- Reverse gear clutch with corrugated washer removed ⇒ page 48 .

Note

The purpose of the following measurements is to determine the upper -5- and lower -2- shims for setting the reverse gear clutch.

- To ensure accuracy, all tool and component surfaces must be absolutely clean when performing the following measurements.

1. Measurement from sealing surface of input shaft to contact surface of corrugated washer, determination of dimension -B-:



– Clean the contact and sealing surfaces at the gearbox housing. Completely remove any seal remnants.

– Use the digital depth gauge -VAS 6087- to take measurement from the sealing surface of the input shaft to the contact surface of the corrugated washer in the gearbox housing.

– Note down the measured value -B-.

– Repeat the measurement at two other offset points and note down the measured values.

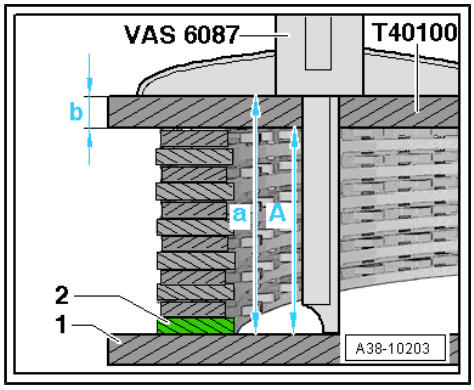
– Determine the mean value M_B from the 3 measured values and note down.

Mean value M_B = Messwert B1 + B2 + B33

Example:

Mean value
M_B = 38,15 mm + 38,14 mm + 38,14 mm3 = 38.143 mm

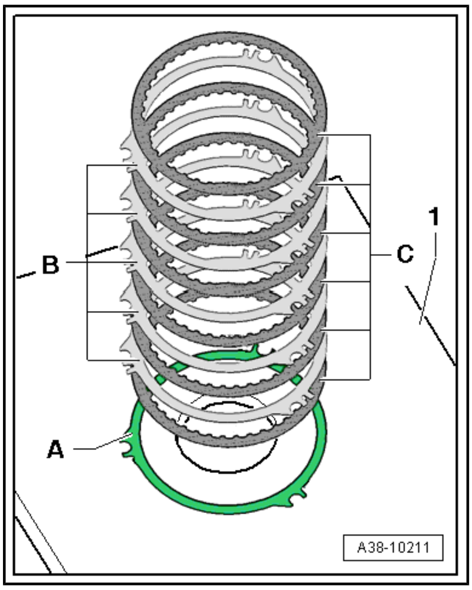
2. Measurement of compressed clutch assembly, determination of dimension -A-:



Note

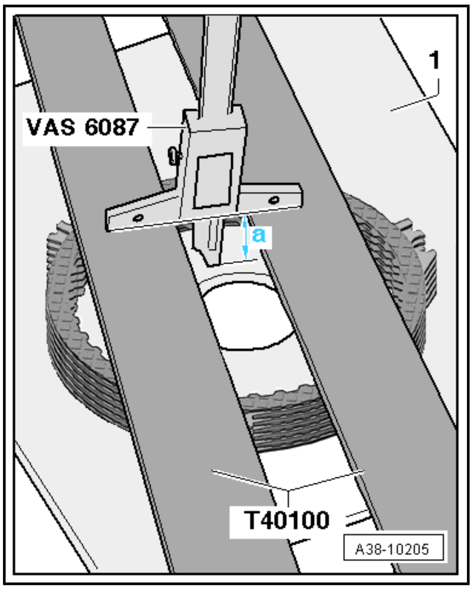
For measurement, the corrugated washer -2- is inserted beneath the clutch pack.

- Use a clean, flat measurement surface -1- as a base. The following description is based on use of the compressor tool -T10285- .



– Start by placing the corrugated washer -A- on the measurement surface -1-.

– Then alternately fit the friction plates -C- (6x) and the outer plates -B- (5x) one at a time on the corrugated washer (always facing in the same direction).



– Precisely align all the plates on top of one another.

– Place the two rulers -T40100- over the clutch pack.

Note

The weight of the rulers -T40100- presses the air out of the plates and exerts the specified 2.5 kg load on (compresses) the corrugated washer.

– Use the digital depth gauge -VAS 6087- to take measurement to the working surface -1- and note down the measured value -a-.

• When taking measurements, the digital depth gauge -VAS 6087- must make flush contact with both rulers -T40100- .

– Repeat the measurement on the opposite side of the clutch pack and note down measured value 2.

– Move the 2 rulers -T40100- by 90°.

– Repeat the measurements and note down measured values 3 and 4.

– Determine the mean value M_a from the 4 measured values and note down.

Mean value M_a = Messwert a1 + a2 + a3 + a44

Determination of dimension -A-:

– Measure and note down the thickness -b- of the rulers -T40100- .

Derermination of height of compressed clutch assembly:

Dimension -A- = Mean value M_a - -b-

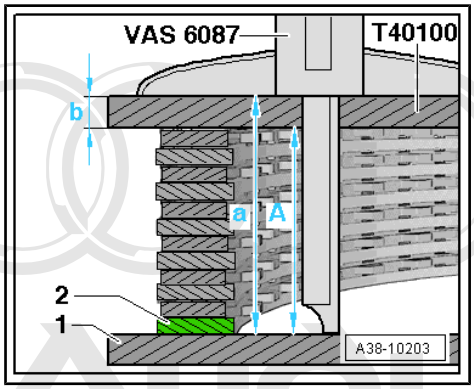
– Note down dimension -A- of the compressed clutch assembly.

Example:

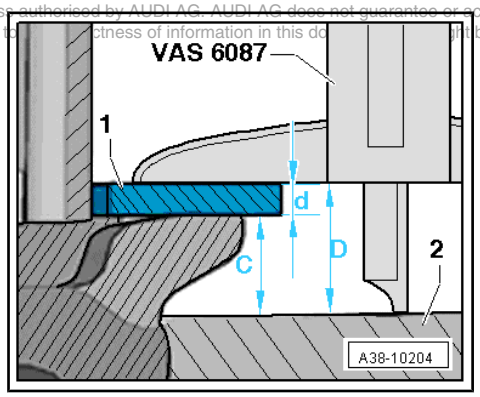
Already determined: Mean value M_B = 38.143 mm

Thickness -b- of rulers -T40100- = 7.47 mm

Dimension -A- = Mean value M_B - -b- = 38.143 mm - 7.47 mm = 27.98 mm



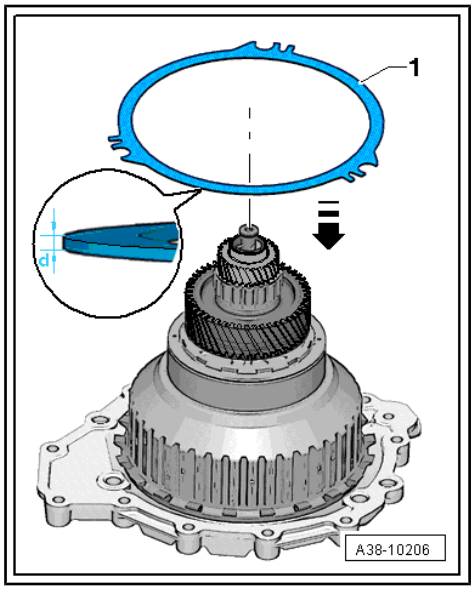
3. Measurement from sealing surface of input shaft to piston of reverse gear clutch, determination of dimension -C-:



– Place a clean outer plate -1- on the input shaft removed.

Note

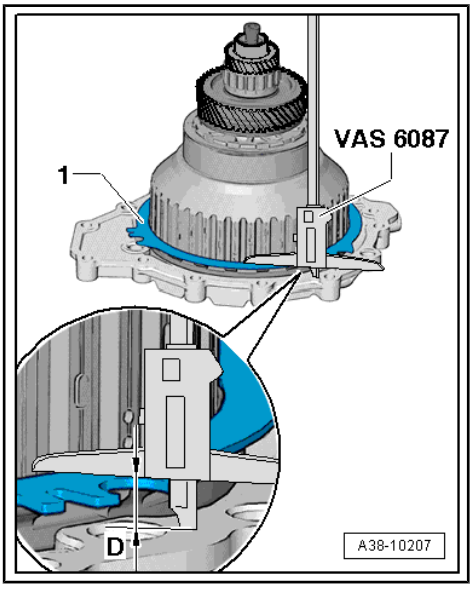
The causes the outer plate -1- to come to rest on the piston of the reverse gear clutch. Correct measurement to the highest point of the piston can be performed by way of the flat outer plate. The thickness -d- of the outer plate -1- is subsequently subtracted again for determination of the height of the piston.



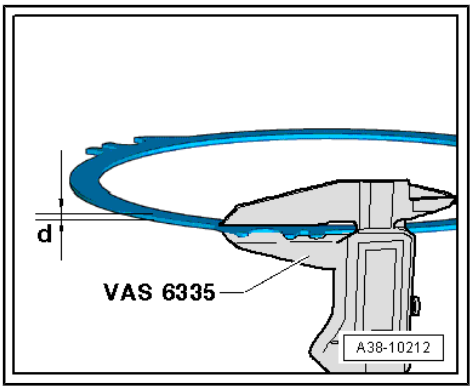
– Use the digital depth gauge -VAS 6087- to take measurement to the sealing surface of the input shaft and note down the measured value -D-.
– Repeat the measurement at 2 other offset points and note down the measured values.
– Determine the mean value M_D from the 3 measured values and note down.

Mean value:

Mean value M_D = Messwert D1 + D2 + D33



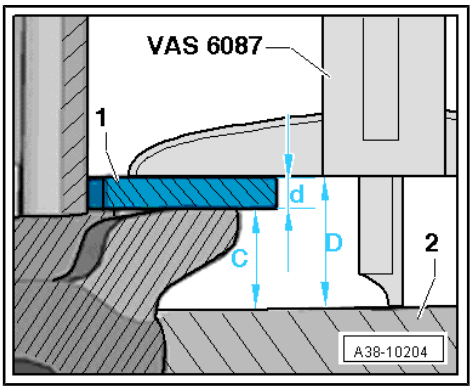
– Remove the outer plate fitted from the input shaft and measure and note down the thickness -d-.



Calculation of dimension -C- from sealing surface of input shaft to piston of reverse gear clutch:

-C- = Mean value M_D - Thickness -d- of outer plate fitted -1-

– Note down dimension -C-.



Example

Mean value M_D = 5,11 mm + 5,10 mm + 5,12 mm3	5.11 mm
- Thickness -d- of outer plate -1- fitted	– 2.13 mm
= Dimension -C- from sealing surface of input shaft to piston of reverse gear clutch	= 2.98 mm

4. Determination of thickness “E” of both shims:

– Use the following calculation method to determine the thickness of the shims:

Determination of shims for reverse gear clutch Clearance at least 3.0 +- 0.2 mm with 2.5 kg load (⇒ page 54)		Determined and fixed measured values
Measurement from sealing surface of input shaft to contact surface of corrugated washer in gearbox		Mean value M_B
Thickness of input shaft seal at gearbox housing	+	0.27 mm

Determination of shims for reverse gear clutch Clearance at least 3.0 +- 0.2 mm with 2.5 kg load (⇒ page 54)		Determined and fixed measured values
Measurement from sealing surface of input shaft to piston of reverse gear clutch	-	Dimension “C”
Measurement of compressed clutch assembly	-	Dimension “A”
Minimum clearance	-	3.0 mm
Calculated thickness of both shims	=	“E”
• The weight of the 2 rulers - T40100- when measuring the clutch assembly produces the specified load of 2.5 kg on the clutch assembly. • The thickness of the lower shim “E_1” must be at least 2.15 mm.		

Determination:

“E” = M_B + 0.27 mm - “C” - “A” - 3.0 mm

– On the basis of the calculated value “E”, select the thickness “E_1” of the lower shim as per Table 1 ⇒ page 55 .

– Calculation of dimension “M_2” for determining upper shim:

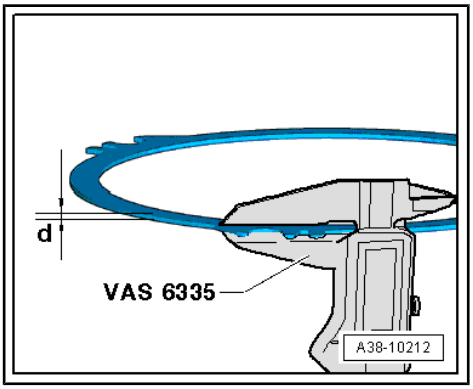
“M_2” = “E” - Thickness “E_1” of lower shim selected

– On the basis of the dimension “M_2”, select the thickness “E_2” of the upper shim as per Table 2 ⇒ page 55 .

Note

Assign the shims by way of the ⇒ Electronic parts catalogue .

– Measure and note down the thicknesses of the two shims selected.



Note

On account of their tolerances, the actual thicknesses of the shims may differ slightly.

– Add together the thicknesses of the two shims measured and note down the value.

  Thickness "E_1 measured" + Thickness "E_2 measured" = Thickness "$E_{measured}$"

Caution

Risk of starting problems after re-installing the gearbox.

The thickness of the two shims selected must be less than the calculated dimension "E".

Calculation check:

- ***(Thickness "E_1 measured" + Thickness "E_2 measured") = Thickness "$E_{measured}$"***
- ***Thickness "$E_{measured}$" must be less than thickness "E"***

– Fit the reverse gear clutch with the shims selected ⇒ page 48 .

Table 1 Determination of lower shim	**Thickness "E_1" of lower shim selected**
"E" Measuring range in (mm)	Thickness (mm) +- 0.03
3,925 ... 4,174	2,15
4,175 ... 4,424	2,15
4,425 ... 4,674	2,65
4,675 ...4,924	2,9
4,925 ... 5,174	3,15
5,175 ...5,424	3,15
5,425 ... 5,674	2,65
5,675 ... 5,924	2,9
5,925 ... 6,174	3,15
6,175 ... 6,400	3,15

Table 2 Determination of upper shim	**Thickness "E_2" of upper shim selected**
Dimension "M2" = "E" - Selected lower shim "E_1" Measuring range in (mm)	Thickness (mm) +- 0.03
1,829 ... 2,024	1,9
2,025 ... 2,324	2,15
2,725 ... 2,774	2,65
2,775 ... 3,024	2,9
3,025 ... 3,120	3,15

Example:

The example is based on the following values:

- Mean value M_B = 38.143 mm
- “A” = 27.98 mm
- “C” = 2.98 mm

  “E” = M_B + 0.27 mm - “C” - “A” - 3.0 mm

  “E” = 38.143 mm + 0.27 mm - 2.98 mm - 27.98 mm - 3.0 mm = 4.453 mm

– Determination of lower shim (thickness “E_1”) from Table 1:

  Thickness “E_1” = 2.65 mm

– Calculation of dimension “M_2” for determining upper shim:

  “M_2” = “E” - Thickness “E_1” of lower shim selected

  “M_2” = 4.453 mm - 2.65 mm = 1.803 mm

– Determination of upper shim (thickness “E_2”) from Table 2:

  Thickness “E_2” = “not possible”

• As the value 1.803 mm in this example is outside the selectable measuring ranges in Table 2 (upper shim ⇒ page 55), the next thinnest lower shim “E_1” must be selected from Table 1 (lower shim ⇒ page 55).

– Selection of thickness “E_1” of next thinnest lower shim from Table 1:

  Thickness “E_1” = 2.15 mm

– Calculation of dimension “M_2” for determining upper shim (thickness “E_2”):

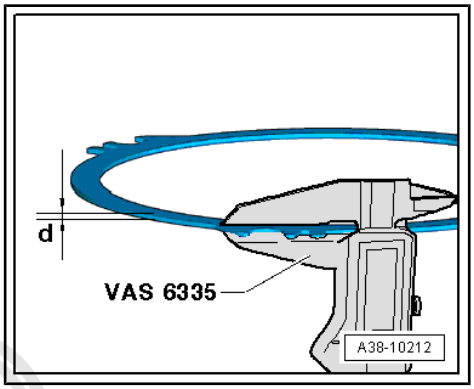
  “M_2” = “E” - Thickness “E_1” of lower shim selected

  “M_2” = 4.453 mm - 2.15 mm = 2.303 mm

– Determination of upper shim (thickness “E_2”) from Table 2:

  “E_2” = 2.15 mm

– Measure and note down the thicknesses of the two shims selected.



Note

On account of their tolerances, the actual thicknesses of the shims may differ slightly.

– Add together and note down the thicknesses of the two measured shims.

"E_1 measured" + "E_2 measured" = "$E_{measured}$"

Caution

Risk of starting problems after re-installing the gearbox.

The thickness of the two shims must be less than the calculated dimension "E".

Calculation check:

- ***(Thickness "E_1 measured" + Thickness "E_2 measured") = Thickness "$E_{measured}$"***
- ***Thickness "$E_{measured}$" must be less than thickness "E"***

The following values were determined in the example:

- "E_1" = 2.15 mm
- "E_2" = 2.15 mm
- "E" = 4.453 mm

("E_1" + "E_2") < "E"

(2.15 mm + 2.15 mm) = 4.3 mm < 4.453 mm

The shims have been correctly selected for this example

– The reverse gear clutch can be fitted.

3 Servicing input shaft with 7 friction plates

Caution

- *If the wrong number of friction plates is installed during servicing, the input shaft will be damaged when the vehicle is re-started.*
- *In such cases, there is a mismatch between the software configuration on the automatic gearbox control unit -J217- and the number of friction plates in the clutch pack.*

There are two types of gearbox. The ⇒ Electronic parts catalogue also distinguishes between these on the basis of the gearbox code letters:

1. Gearboxes which are serviced with 7 friction plates

These gearboxes are installed in vehicles with the following engines:

TDI engines:	4-cyl. 1.9l TDI engine	4-cyl. 2.0l TDI engine	6-cyl. 2.5l TDI engine	6-cyl. 2.7l TDI engine
Petrol engines:	6-cyl. 3.0l MPI petrol engine	6-cyl. 3.2l FSI petrol engine	6-cyl. 2.8l FSI petrol engine	4-cyl. 2.0l TFSI engine

- ⇒ “3.1 Exploded view - input shaft with 7 friction plates”, page 58
- ⇒ “3.2 Dismantling and assembling input shaft with 7 friction plates”, page 59

2. Gearboxes which are serviced with 6 friction plates

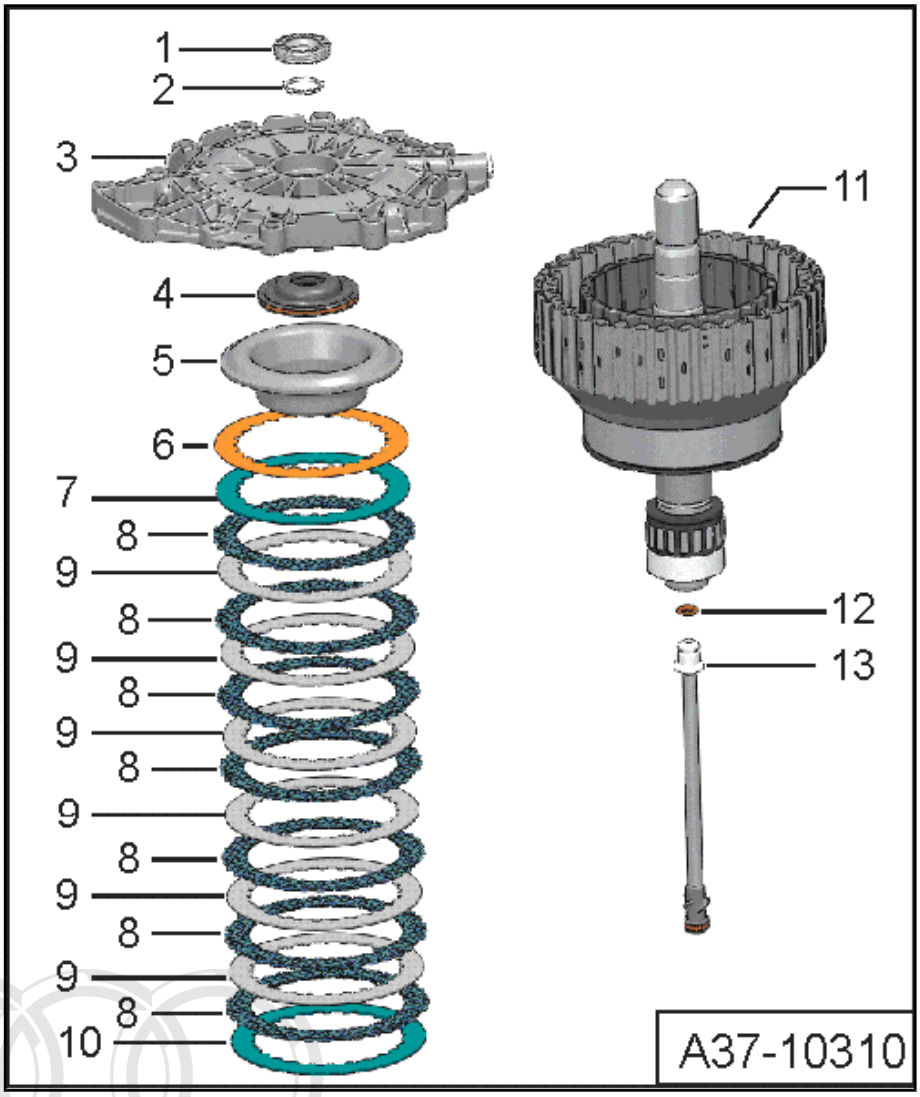
These gearboxes are fitted on vehicles with all other engines (except the engines listed under 1.).

- ⇒ “4.1 Exploded view - input shaft with 6 friction plates”, page 74
- ⇒ “4.2 Dismantling and assembling input shaft with 6 friction plates”, page 75

3.1 Exploded view - input shaft with 7 friction plates

Caution

- *Please note the distinction between input shafts with 6 and 7 friction plates ⇒ page 58 .*



1 - Oil seal for input shaft

- ❑ Renewing ⇒ page 33

2 - Retaining ring for input shaft cover

- ❑ Replace with one of same thickness

3 - Input shaft cover

- ❑ After removing the cover, the bearing “A” (ball bearing for input shaft) for the input shaft cover must be replaced ⇒ page 44

4 - Piston

- ❑ Wear assessment procedure ⇒ page 138

5 - Pressure plate

- ❑ Wear assessment procedure ⇒ page 138

6 - Corrugated washer

7 - Upper shim

- ❑ Determining thickness ⇒ page 67
- ❑ Renew

8 - Friction plate

- ❑ 7x
- ❑ Renew

9 - Outer plate

- ❑ 6x
- ❑ Renew

10 - Lower shim

- ❑ Determining thickness ⇒ page 67
- ❑ Renew

11 - Input shaft cylinder

- ❑ Wear assessment procedure ⇒ page 138

12 - O-ring

- ❑ Renew

13 - Oil pipe

- ❑ Wear assessment procedure ⇒ page 138

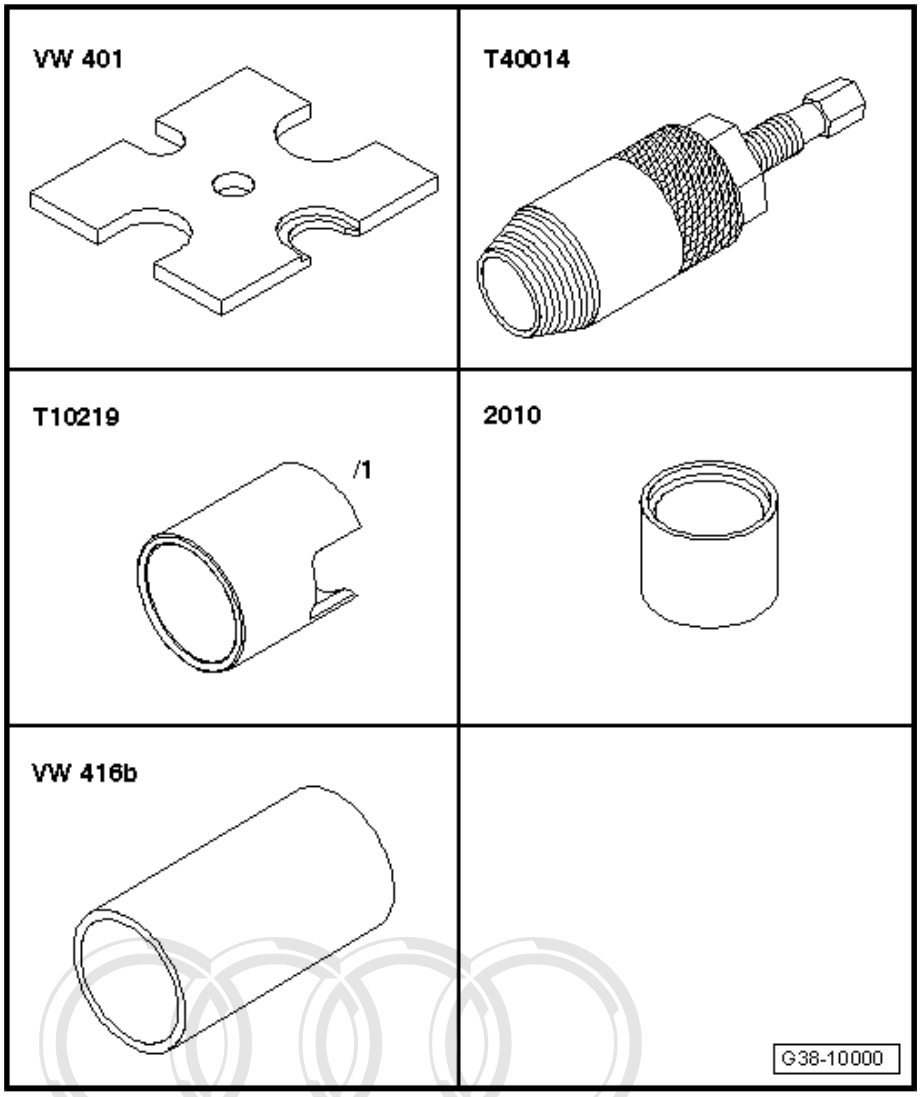
3.2 Dismantling and assembling input shaft with 7 friction plates

Caution

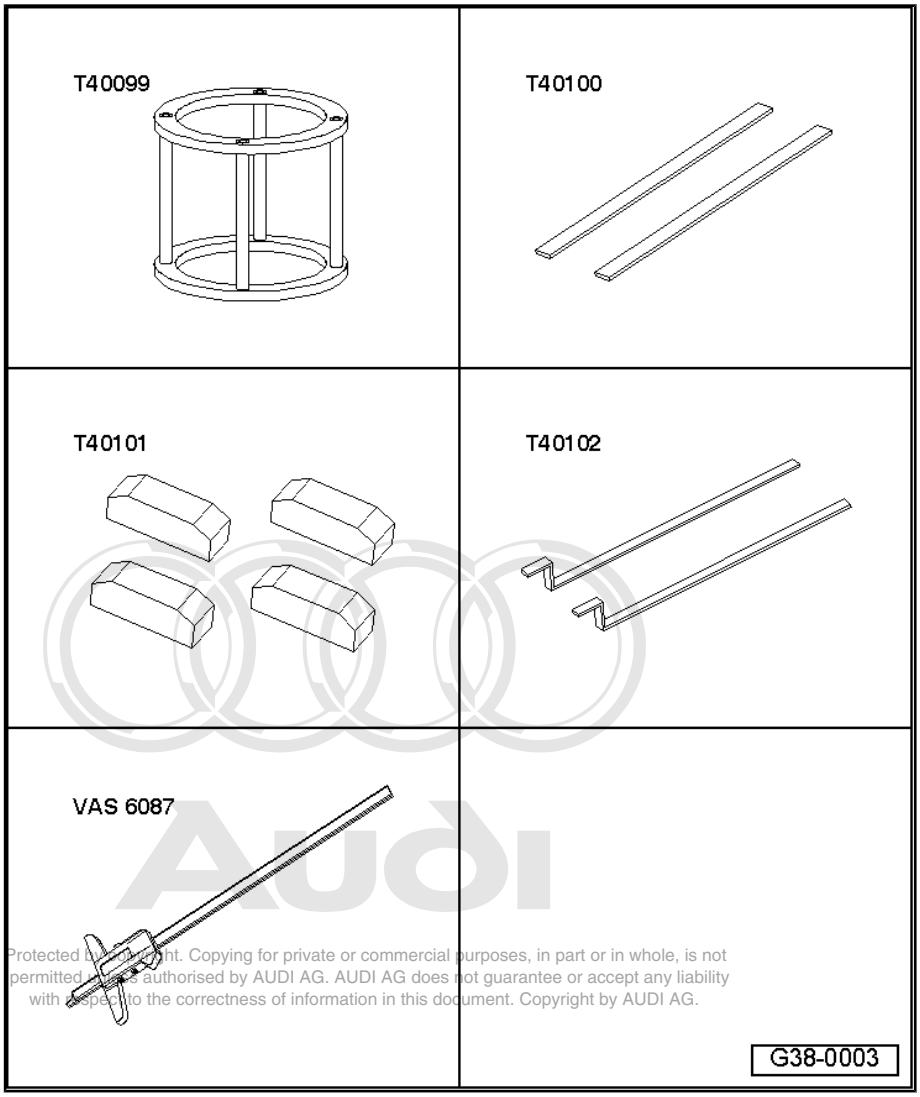
- *Please note the distinction between input shafts with 6 and 7 friction plates ⇒ page 58 .*

Special tools and workshop equipment required

- Thrust plate -VW 401-
- Oil seal extractor -T40014-
- Assembly tool -T10219/1-
- Tube -2010-
- Tube -VW 416 B-



- Thrust piece -T40099-
- 2x ruler -T40100-
- Gauge block (1 set contains 4) -T40101-
- Feeler gauges (1 set contains 2) -T40102-
- Digital depth gauge -VAS 6087-
- Protective gloves
- Ice spray



Dismantling input shaft

- Gearbox removed

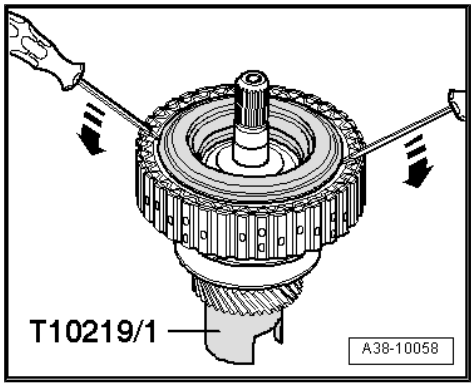
Note

- *Observe the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on the automatic gearbox ⇒ page 4 .*

– Remove input shaft ⇒ page 34 .
– Remove cover from input shaft ⇒ page 38 .

– Set down input shaft on assembly tool -T10219/1- .

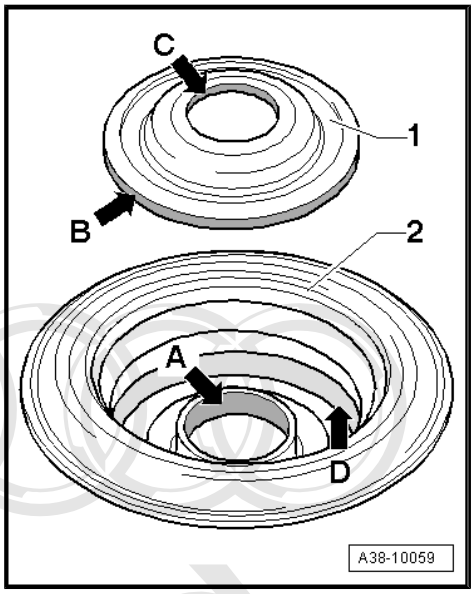
– Use two screwdrivers -arrows- to carefully lift pressure plate with piston.



To prevent damage:

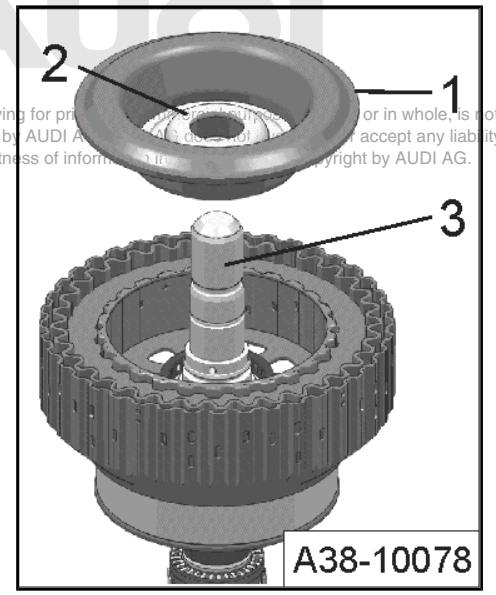
Caution

- *The inner contact and sealing surfaces -arrow A- of the pressure plate and the piston -arrow C- must not be allowed to make contact with the shaft on removal/installation.*
- *The contact and sealing surfaces must not exhibit the slightest signs of damage such as scratches or scoring caused by dismantling/assembly.*
- *In the event of damage, the pressure plate or piston must be renewed.*



– Carefully guide the pressure plate -1- with piston -2- upwards over the shaft -3-.

- When doing so, the inner contact surfaces of the pressure plate -1- and of the piston -2- must not make contact with the shaft.



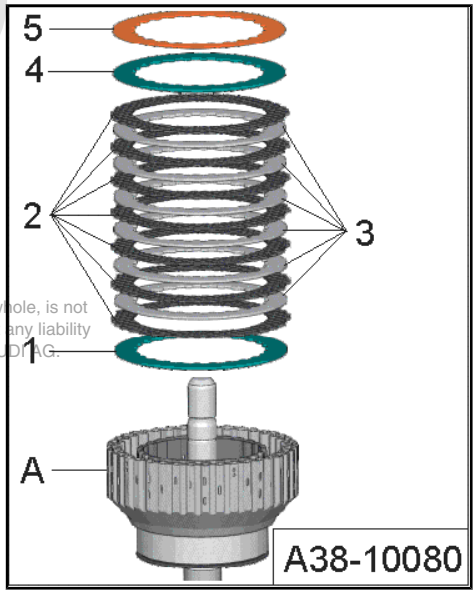
Removing clutch pack

– Remove corrugated washer -5- (washer must be re-used).

– Take upper shim -4- out of input shaft cylinder -A-.

– Measure thickness of shim -4- and note down value.

– Take all friction plates -2- and outer plates -3- out of input shaft cylinder -A-.



Note

Older input shaft versions have only 6 friction plates and 5 outer plates. They must also be replaced by the new clutch pack with 7 friction plates and 6 outer plates ⇒ Electronic parts catalogue .

– Remove bottom shim -1- from input shaft cylinder -A-.

– Measure thickness of shim -1- and note down value.

Assembling input shaft

Caution

Assess wear on gearbox components prior to assembly ***⇒ page 138*** ***.***

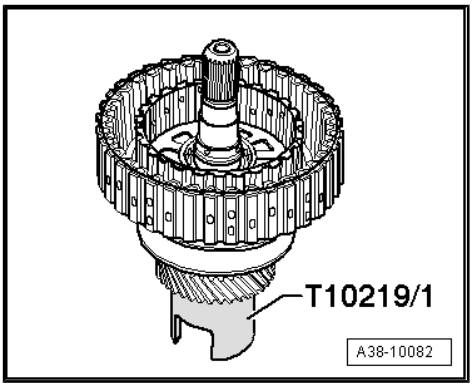
– Replace the bearing “A” (ball bearing for input shaft) in the input shaft cover ⇒ page 44 .

– Adjust input shaft and determine clearance ⇒ page 67 .

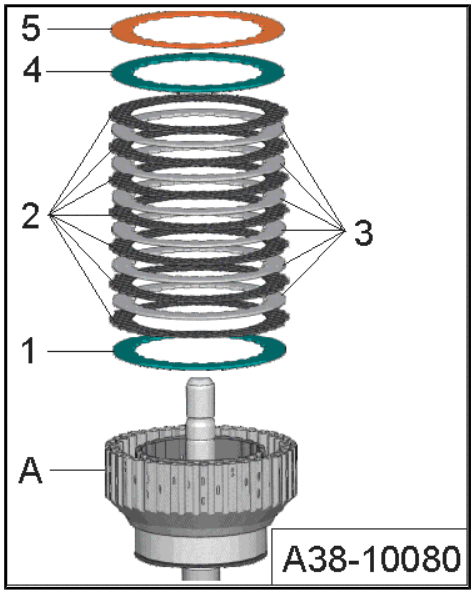
Caution

- ***Always renew old used shims, outer plates and friction plates. They must not be re-installed otherwise proper operation of the input shaft cannot be assured (due to the worn surface).***
- ***The corrugated washer must be re-used.***

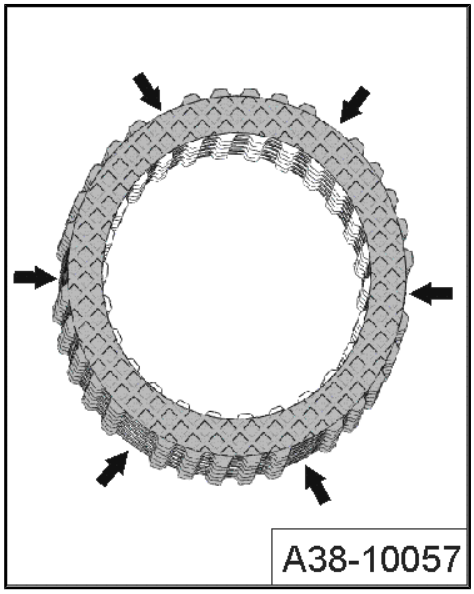
– Set down input shaft on assembly tool -T10219/1- .



– Insert chosen lower shim -1- in input shaft cylinder -A-.
– Now build up the clutch pack by alternately inserting one friction plate -2- (total of 7) followed by one outer plate -3- (total of 6, thickness 1.9 mm), ensuring that they are aligned together.



Alignment of friction plates:



Note

Illustration shows friction plates with old linings.

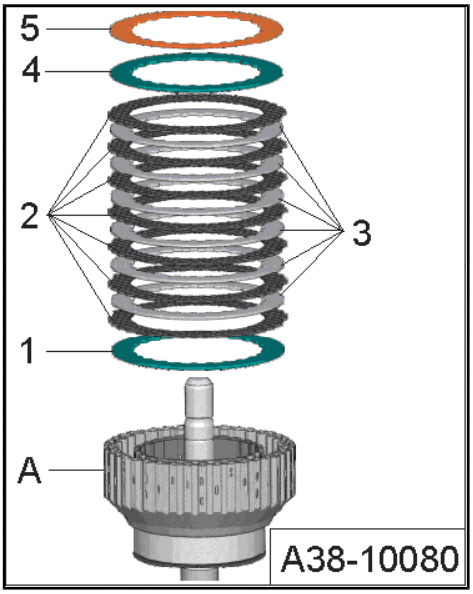
Caution

- ***The friction plates must be mutually aligned on installation, i.e. the areas with no external toothing -arrows- must always coincide. This is the only way to achieve correct setting. If necessary, mark the cylinder of the input shaft to ensure proper alignment on installation.***

Note

Old input shafts only have 6 friction plates and 5 outer plates. They must also be replaced by the new clutch pack with 7 friction plates and 6 outer plates ⇒ Electronic parts catalogue .

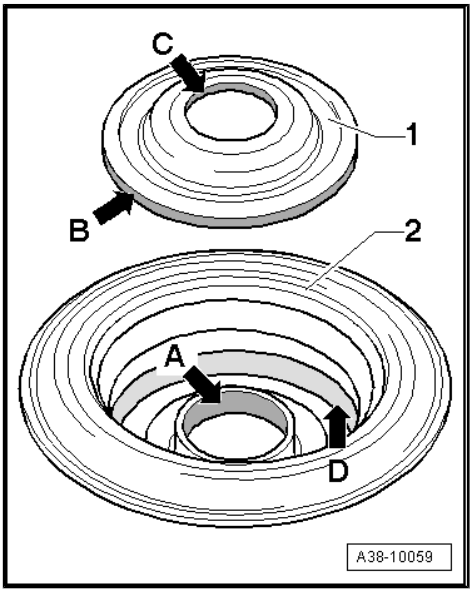
– Insert chosen upper shim -4- in input shaft cylinder -A-.
– As a final step, insert the corrugated washer -5-.



– Press home piston -1- in pressure plate -2-.

Caution

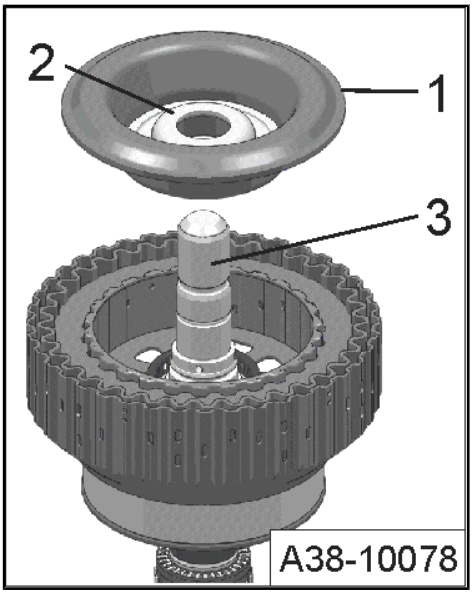
- *The inner contact and sealing surfaces -arrow A- of the pressure plate and the piston -arrow C- must not be allowed to make contact with the shaft on removal/installation.*
- *The contact and sealing surfaces must not exhibit the slightest signs of damage such as scratches or scoring caused by dismantling/assembly.*
- *In the event of damage, the pressure plate or piston must be renewed.*



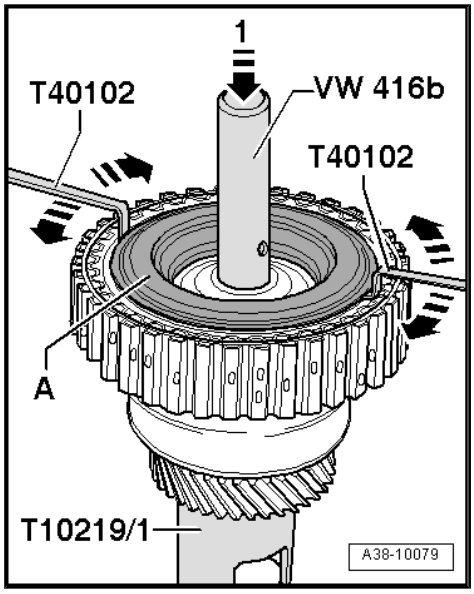
– Carefully guide pressure plate -1- with piston -2- downwards over shaft -3-.

• When doing so, the inner contact surfaces of the pressure plate -1- and of the piston -2- must not make contact with the shaft.

– Evenly press home the pressure plate with piston in the input shaft.



Checking clearance with feeler gauge -T40102-



- Insert the two feeler gauges -T40102- underneath the pressure plate -A-.
- Have a second mechanic use the tube -VW 416 B- to press down the pressure plate -A- as far as it will go -arrow 1-.
- Move the two feeler gauges -T40102- back and forth in a circle beneath the pressure plate in direction of -arrow-.
- Apply the two feeler gauges -T40102- on opposite sides.
- Take care to keep the feeler gauges -T40102- straight.
- The entire circular area must be checked.
- The two feeler gauges -T40102- must always move freely without any resistance whatsoever.

If the feeler gauges -T40102- cannot be moved in direction of -arrow- without becoming blocked:

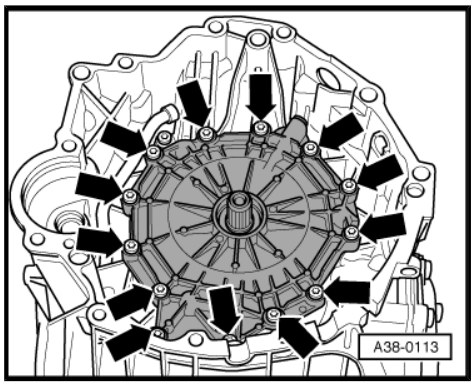
- Repeat the input shaft adjustment procedure ⇒ page 67 .

Caution

It is essential to obtain a successful result when checking the clearance with the feeler gauges -T40102- , as gearbox problems will otherwise be encountered when driving off from a standstill.

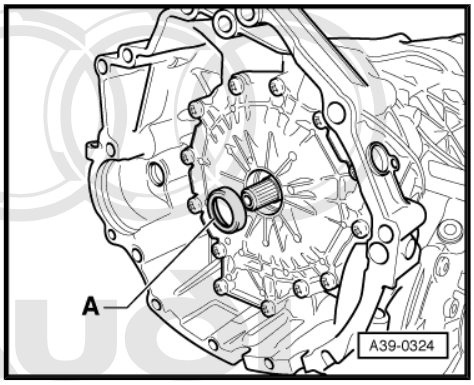
If the feeler gauges -T40102- move freely in direction of -arrow-:

- Fit input shaft cover ⇒ page 38 .
- Install input shaft ⇒ page 34 .



– Fit oil seal for input shaft -A- ⇒ page 33 .

– Fill up with ATF
⇒ “1.2 Replenishing ATF for ATF purging”, page 9 .



Caution

- *The ATF required for the multitronic 01J/0AN gearbox is different from the fluid used in fixed-ratio automatic gearboxes. Only the ATF available as a replacement part for the CVT gearbox may be used in the planetary gearbox; ATF specifications ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 00 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 00 .*
- *After installing gearbox, make sure to perform ATF purging procedure ⇒ “1 ATF purging”, page 6 .*

3.3 Adjusting input shaft with 7 friction plates and determining clearance

Note

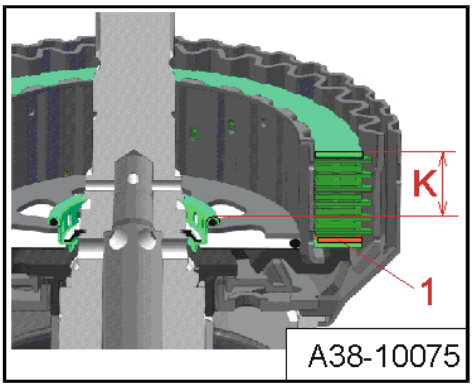
- *Observe the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on the automatic gearbox ⇒ page 4 .*

• Thoroughly clean all components prior to installation.

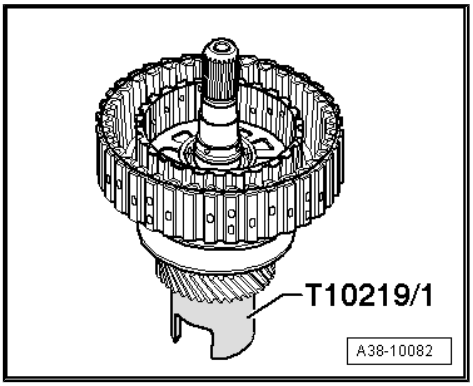
Measuring the clutch

Note

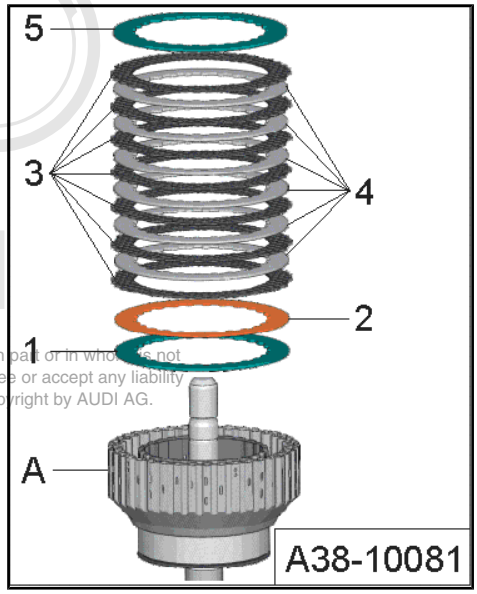
- *This measurement determines the distance -K- on the clutch from the top shim to the contact ring at the shaft (contact surface of pressure plate).*
- *The corrugated washer -1- is fitted beneath the clutch pack for the measurement.*



– Set down input shaft on assembly tool -T10219/1- .



– Insert new lower shim -1- of same thickness as old shim in cylinder of input shaft -A-.
– Then insert corrugated washer -2-.

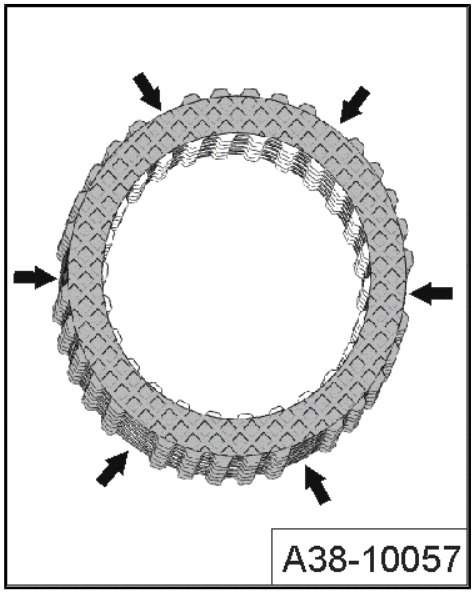


Note

The corrugated washer is only fitted at the bottom for measurement. On assembly it is fitted at the top again.

– Now build up the clutch pack by alternately inserting one friction plate -3- (total of 7) followed by one outer plate -4- (total of 6, thickness 1.9 mm), ensuring that they are aligned together.

Alignment of friction plates:



Note

Illustration shows friction plates with old linings.

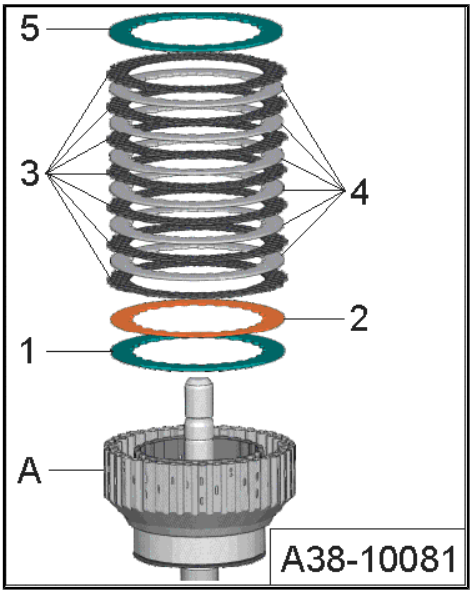
Caution

- ***The friction plates must be mutually aligned on installation, i.e. the areas with no external toothing -arrows- must always coincide. This is the only way to achieve correct setting. If necessary, mark the cylinder of the input shaft to ensure proper alignment on installation.***

Note

Old input shafts only have 6 friction plates and 5 outer plates. They must be replaced by the new clutch pack with 7 friction plates and 6 outer plates ⇒ Electronic parts catalogue .

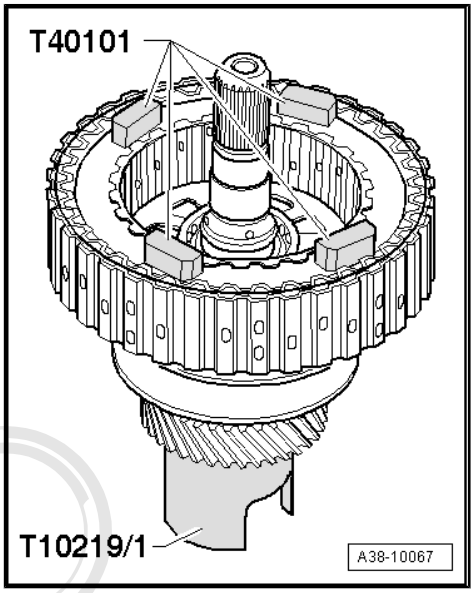
– As a final step, insert the new upper shim -5- of the same thickness as the old shim in the input shaft.



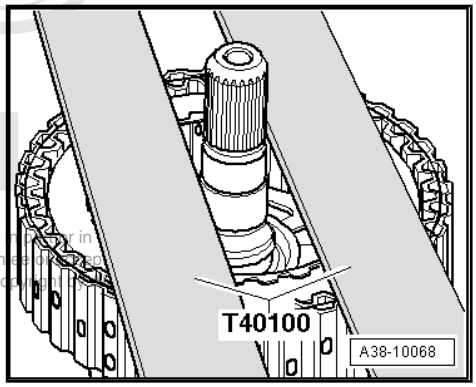
Note

To ensure accuracy, all tool and component surfaces must be absolutely clean when performing the following measurements.

– Place the four gauge blocks -T40101- on the upper shim.

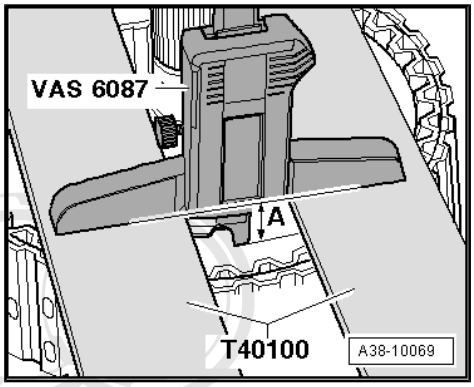


– Place a ruler -T40100- over the centre of each pair of gauge blocks -T40101- .

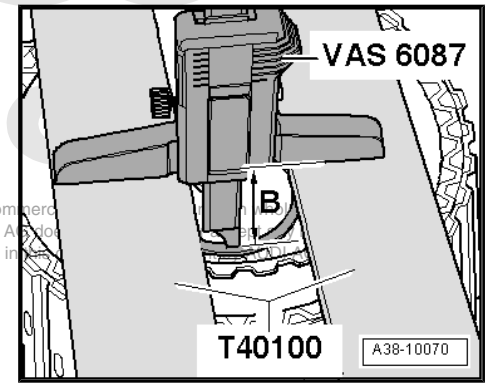


– Use the digital depth gauge -VAS 6087- to take measurement to the shim and note down the measured value -A-.

• When taking measurements, the digital depth gauge -VAS 6087- must make flush contact with both rulers -T40100- .

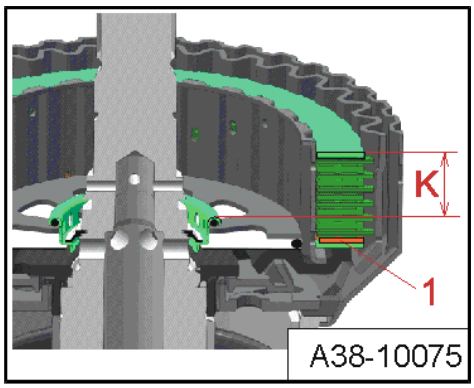


– Then use the digital depth gauge -VAS 6087- to take measurement to the contact ring at the shaft (contact surface of pressure plate) and note down the measured value -B-.



– Subtract the two measured values “B – A” to obtain the distance -K- of the clutch.

Calculation of distance -K- of clutch: “B – A = K”



Note

The corrugated washer -1- is fitted beneath the clutch pack for the measurement.

– Repeat the measurement on the opposite side of the input shaft and again determine the distance -K- of the clutch.

– Move the four gauge blocks -T40101- and the two rulers -T40100- through 90° on the input shaft and repeat the measurements.

– Take the four values determined for the distance -K- of the clutch and calculate the mean value M_K.

Mean value: “(value 1 + value 2 + value 3 + value 4) : 4 = M_K”

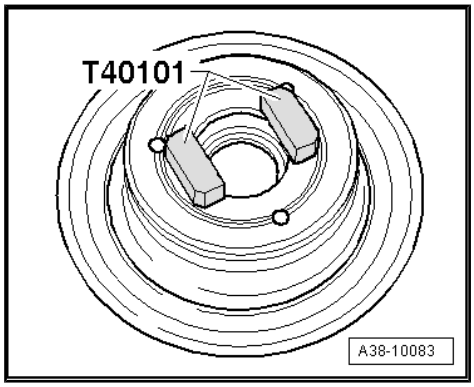
Measuring the pressure plate

– First check for damage and renew if necessary.

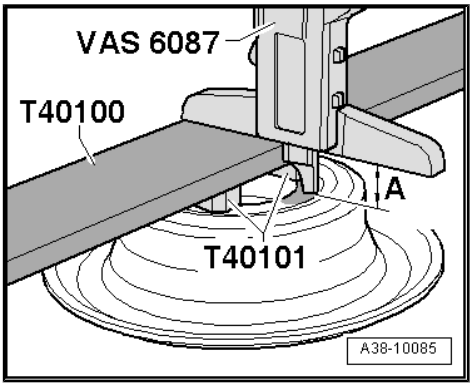
– Turn the pressure plate over and set it down on a flat, clean surface.

– Place the two gauge blocks -T40101- on the cleaned contact surface of the pressure plate.

• The gauge blocks -T40101- must make full contact with the clean contact surface and not rest on the edge.



– Place the rulers -T40100- over the centre of the gauge blocks -T40101- .
– Use the digital depth gauge -VAS 6087- to take measurement to the upper contact surface and note down the measured value -A-.

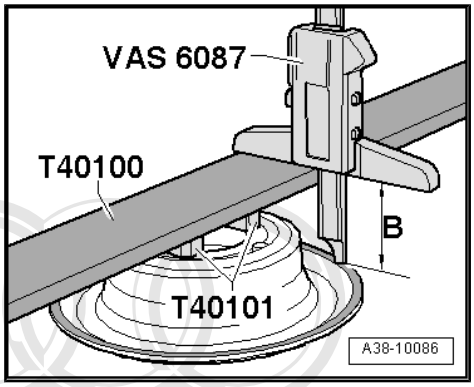


– Use the digital depth gauge -VAS 6087- to take measurement to the lower contact surface and note down the measured value -B-.
– Subtract the two measured values “B – A” to obtain the distance “D” of the two contact surfaces on the pressure plate.

Calculation of distance “D” on pressure plate: “B – A = D”

– Repeat the measurement at 2 further points on the pressure plate, offset by 120° in each case.
– Calculate the mean value for the pressure plate M_D from the three measured values.

Mean value: “(value 1 + value 2 + value 3) : 3 = M_D”



Determining the clearance

– Determine clearance using the following formula:

	Mean value of pressure plate measurements “M_D” (value 1 + value 2 + value 3) : 3
–	Mean value of clutch measurements “M_K” (value 1 + value 2 + value 3 + value 4) : 4
=	Clearance

Clearance = “M_D” – “M_K”

Clearance specification: 1.8 ± 0.2 mm.

If result does not match specification:

A - Measured value too low:

– Insert appropriately thinner shim. It may also be necessary to renew the bottom shim.
– Check clearance again after inserting new shim ⇒ page 67 .

B - Measured value too high:

– Insert appropriately thicker shim. It may also be necessary to renew the bottom shim.
– Check clearance again after inserting new shim ⇒ page 67 .

The following shims are available:

Available shims [thickness in mm]		
1,90	2,15	2,65
2,90	3,15	

Note

The clearance can be adjusted by way of the upper and lower shims.

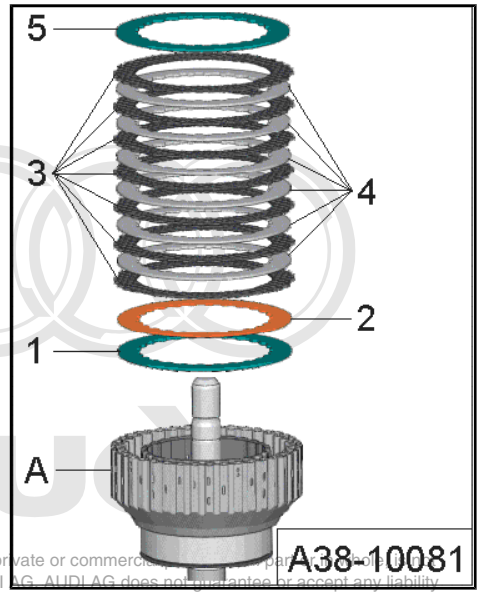
If result matches specification:

– Take all shims, friction plates, outer plates and the corrugated washer -5-, -4-, -3-, -2- and -1- out of input shaft cylinder -A-.

Caution

This step is necessary as the corrugated washer -2- is fitted above the bottom shim -1- only when adjusting the input shaft. When assembling the input shaft, the corrugated washer is fitted at the top.

– Assemble the input shaft ⇒ page 63 .



4 Servicing input shaft with 6 friction plates

Caution

- *If the wrong number of friction plates is installed during servicing, the input shaft will be damaged when the vehicle is re-started.*
- *In such cases, there is a mismatch between the software configuration on the automatic gearbox control unit -J217- and the number of friction plates in the clutch pack.*

There are two types of gearbox. The ⇒ Electronic parts catalogue also distinguishes between these on the basis of the gearbox code letters:

1. Gearboxes which are serviced with 7 friction plates

These gearboxes are installed in vehicles with the following engines:

TDI engines:	4-cyl. 1.9l TDI engine	4-cyl. 2.0l TDI engine	6-cyl. 2.5l TDI engine	6-cyl. 2.7l TDI engine
Petrol engines:	6-cyl. 3.0l MPI petrol engine	6-cyl. 3.2l FSI petrol engine	6-cyl. 2.8l FSI petrol engine	4-cyl. 2.0l TFSI engine

- ⇒ “3.1 Exploded view - input shaft with 7 friction plates”, page 58
- ⇒ “3.2 Dismantling and assembling input shaft with 7 friction plates”, page 59

2. Gearboxes which are serviced with 6 friction plates

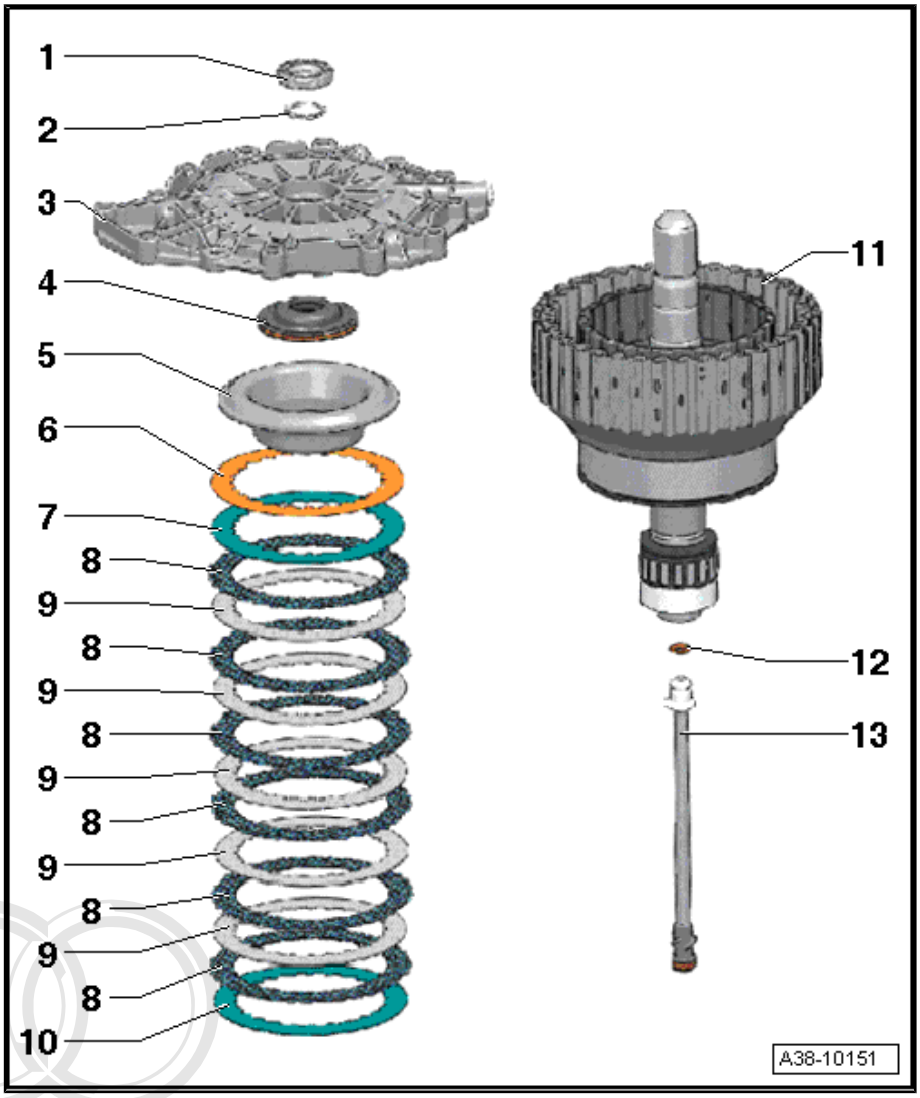
These gearboxes are fitted on vehicles with all other engines (except the engines listed under 1.).

- ⇒ “4.1 Exploded view - input shaft with 6 friction plates”, page 74
- ⇒ “4.2 Dismantling and assembling input shaft with 6 friction plates”, page 75

4.1 Exploded view - input shaft with 6 friction plates

Caution

- *Please note the distinction between input shafts with 6 and 7 friction plates ⇒ page 74 .*



1 - Oil seal for input shaft

- ❑ Renewing ⇒ page 33

2 - Retaining ring for input shaft cover

- ❑ Replace with one of same thickness

3 - Input shaft cover

- ❑ After removing the cover, the bearing “A” (ball bearing for input shaft) in the input shaft cover must be replaced ⇒ page 44

4 - Piston

- ❑ Wear assessment procedure ⇒ page 138

5 - Pressure plate

- ❑ Wear assessment procedure ⇒ page 138

6 - Corrugated washer

7 - Upper shim

- ❑ Determining thickness ⇒ page 83
- ❑ Renew

8 - Friction plate

- ❑ 6x
- ❑ Renew

9 - Outer plate

- ❑ 5x
- ❑ Renew

10 - Lower shim

- ❑ Determining thickness ⇒ page 83
- ❑ Renew

11 - Input shaft cylinder

- ❑ Wear assessment procedure ⇒ page 138

12 - O-ring

- ❑ Renew

13 - Oil pipe

- ❑ Wear assessment procedure ⇒ page 138

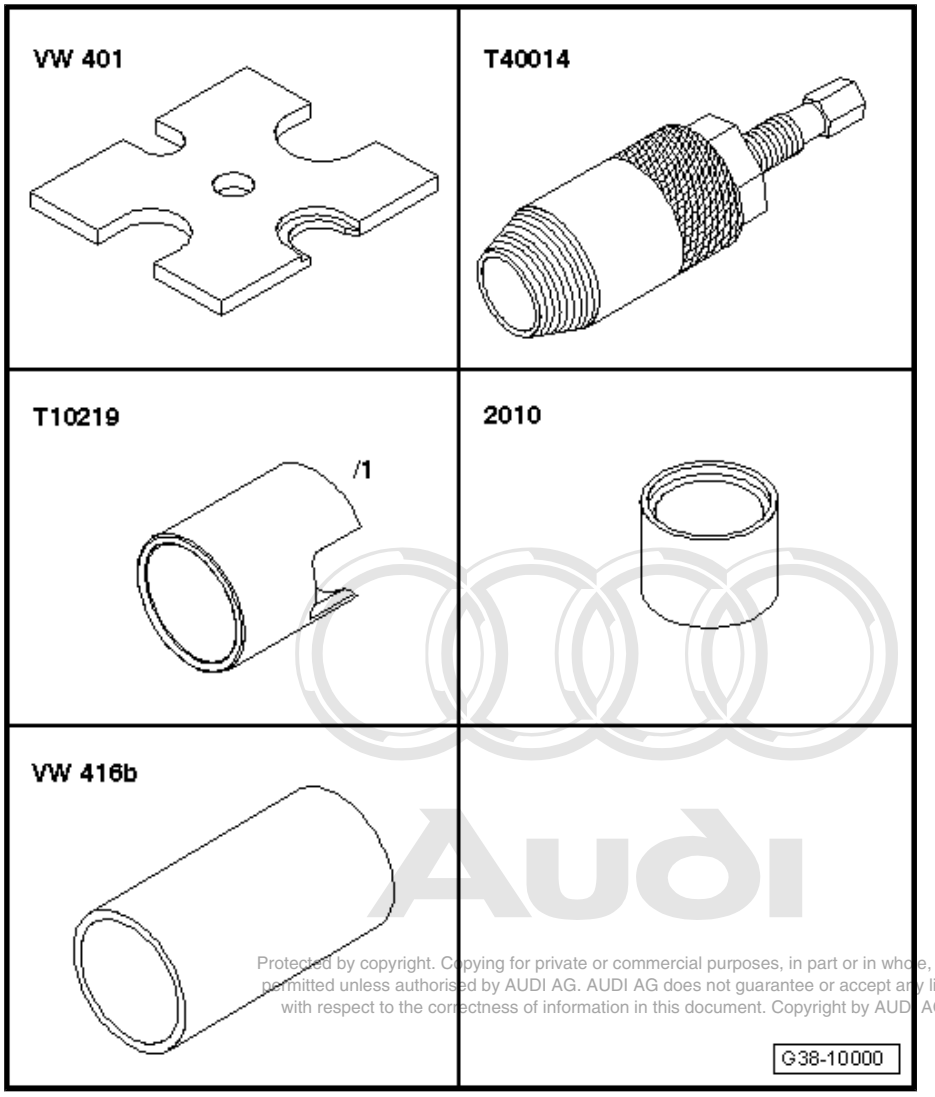
4.2 Dismantling and assembling input shaft with 6 friction plates

Caution

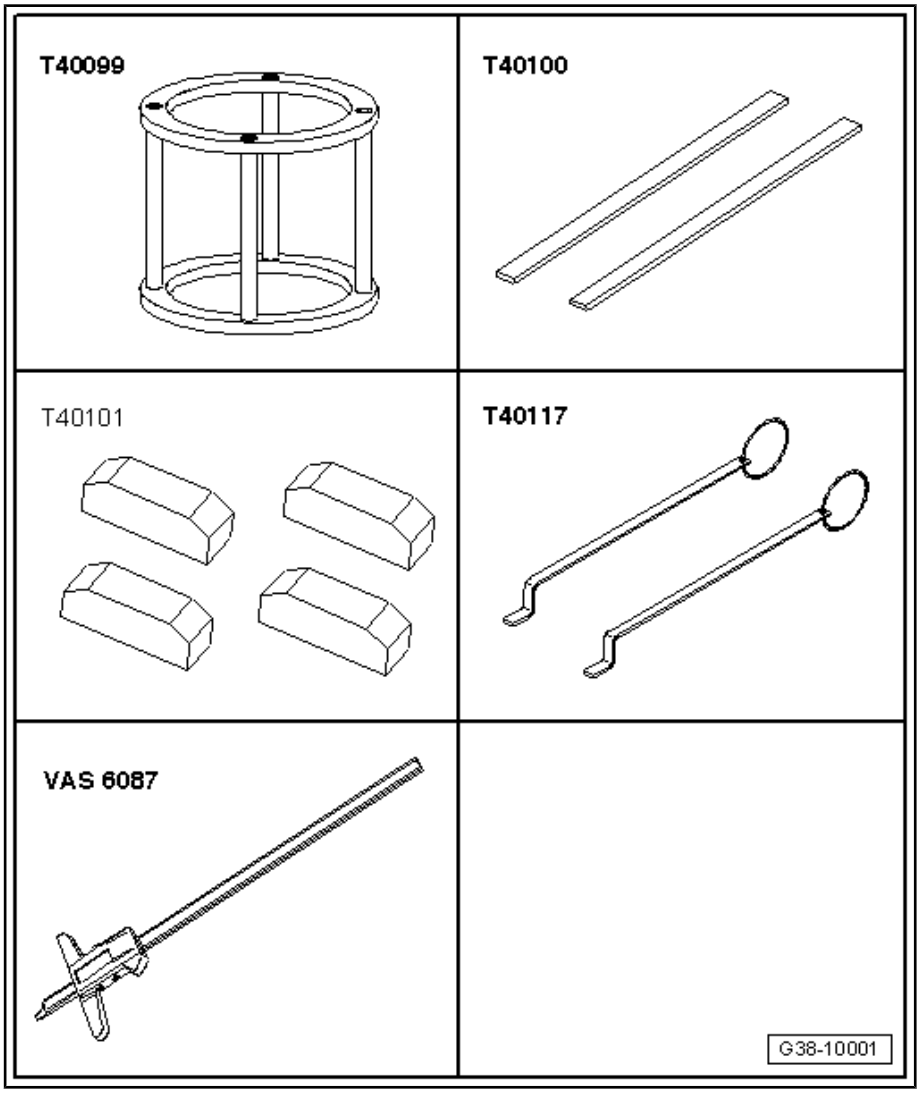
- *Please note the distinction between input shafts with 6 and 7 friction plates ⇒ page 74*

Special tools and workshop equipment required

- Thrust plate -VW 401-
- Oil seal extractor -T40014-
- Assembly tool -T10219/1-
- Tube -2010-
- Tube -VW 416 B-



- Thrust piece -T40099-
- 2x ruler -T40100-
- Gauge block (1 set contains 4) -T40101-
- Feeler gauge (2x) -T40117-
- Digital depth gauge -VAS 6087-
- Protective gloves
- Ice spray



Procedure

- Gearbox removed

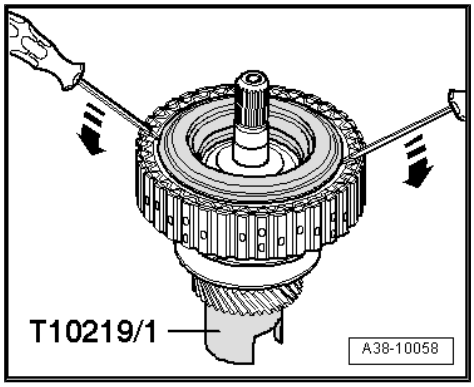
Note

- *Observe the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on the automatic gearbox ⇒ page 4 .*

– Remove input shaft ⇒ page 34 .

– Remove cover from input shaft ⇒ page 38 .

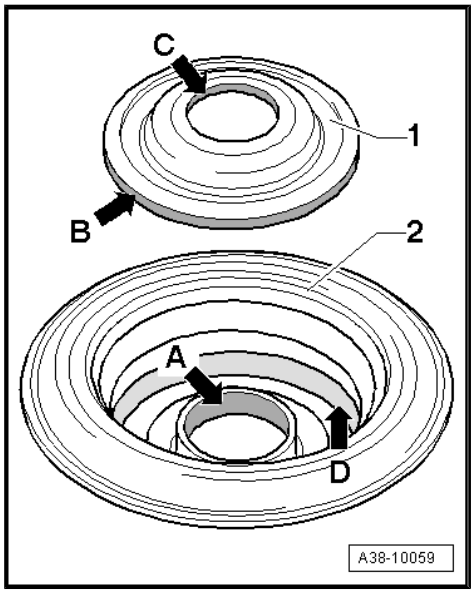
– Set down input shaft on assembly tool -T10219/1- .
– Use two screwdrivers -arrows- to carefully lift pressure plate with piston.



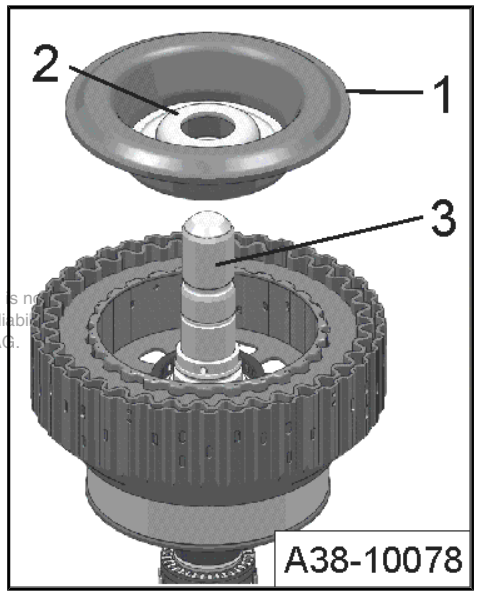
To prevent damage:

Caution

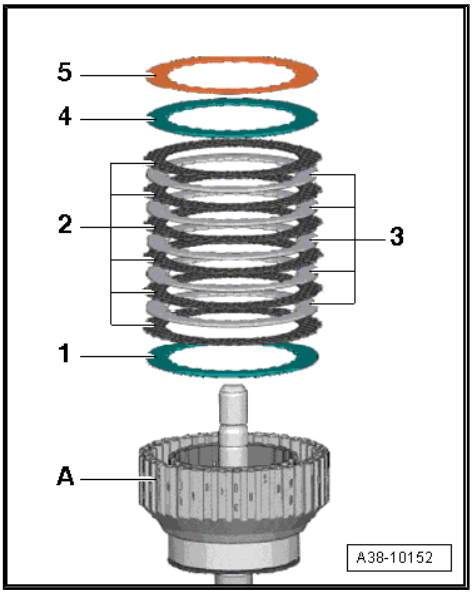
- *The inner contact and sealing surfaces -arrow A- of the pressure plate and the piston -arrow C- must not be allowed to make contact with the shaft on removal/installation.*
- *The contact and sealing surfaces must not exhibit the slightest signs of damage such as scratches or scoring caused by dismantling/assembly.*
- *In the event of damage, the pressure plate or piston must be renewed.*



– Carefully guide the pressure plate -1- with piston -2- upwards over the shaft -3-.
- When doing so, the inner contact surfaces of the pressure plate -1- and of the piston -2- must not make contact with the shaft.



Removing clutch pack



– Remove corrugated washer -5- (washer must be re-used).
– Take upper shim -4- out of input shaft cylinder -A-.
– Measure thickness of shim -4- and note down value.
– Take all friction plates -2- and outer plates -3- out of input shaft cylinder -A-.
– Remove bottom shim -1- from input shaft cylinder -A-.
– Measure bottom shim -1- and note down value.

Caution

- *Always renew old used shims, outer plates and friction plates. They must not be re-installed otherwise proper operation of the input shaft cannot be assured (due to the worn surface).*
- *The corrugated washer must be re-used.*

Assembling input shaft

Caution

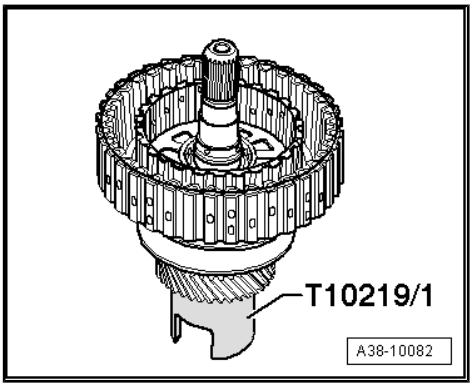
Assess wear on gearbox components prior to assembly ⇒ page 138 .

– Replace the bearing “A” (ball bearing for input shaft) in the input shaft cover ⇒ page 44 .
– Adjust input shaft and determine clearance ⇒ page 83 .

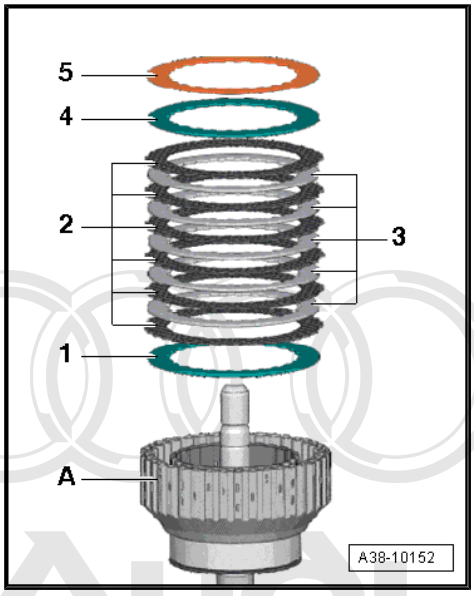
Caution

- *Always renew old used shims, outer plates and friction plates. They must not be re-installed otherwise proper operation of the input shaft cannot be assured (due to the worn surface).*
- *The corrugated washer must be re-used.*

– Set down input shaft on assembly tool -T10219/1- .



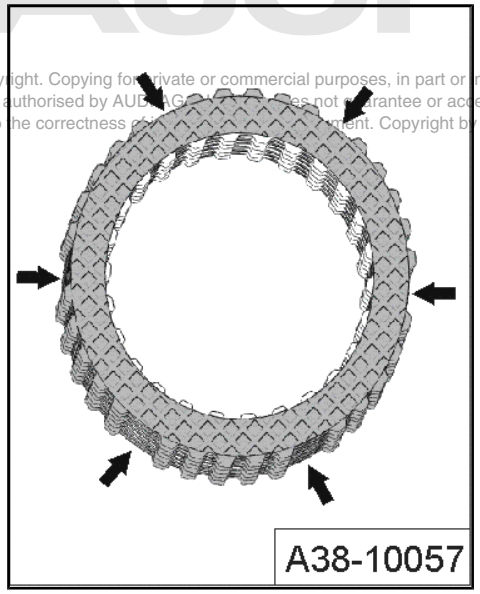
– Insert chosen lower shim -1- in input shaft cylinder -A-.
– Now build up the clutch pack by alternately inserting one friction plate -2- (total of 6) followed by one outer plate -3- (total of 5, thickness 1.9 mm), ensuring that they are aligned together.



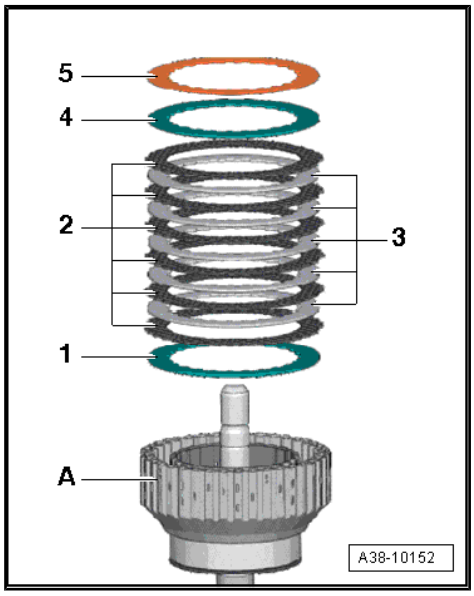
Alignment of friction plates:

Caution

- *The friction plates must be mutually aligned on installation, i.e. the areas with no external toothing -arrows- must always coincide. This is the only way to ensure correct adjustment. If necessary, mark the cylinder to ensure proper alignment on installation.*



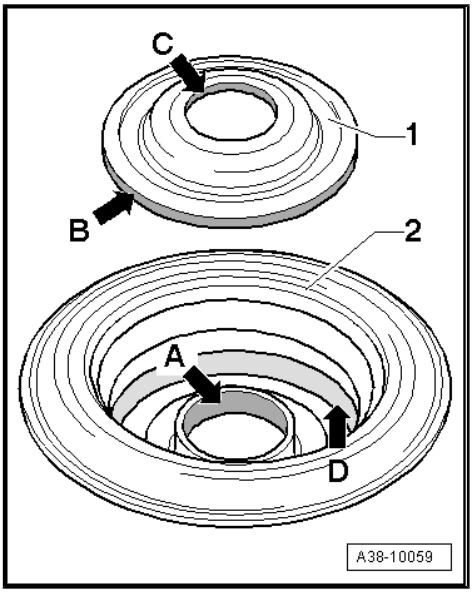
– Insert chosen upper shim -4- in input shaft cylinder -A-.
– As a final step, insert the corrugated washer -5-.



– Press home piston -1- in pressure plate -2-.

Caution

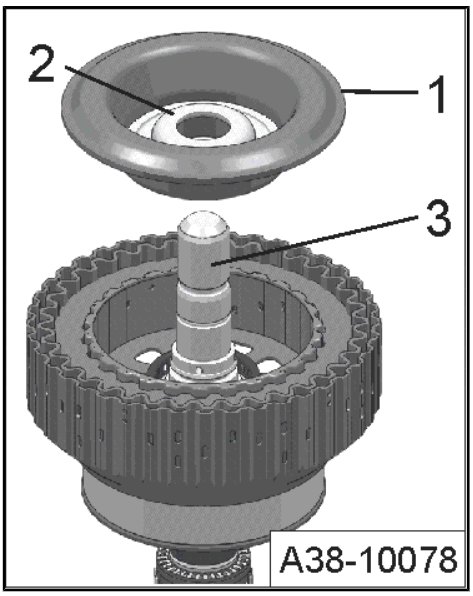
- *The inner contact and sealing surfaces -arrow A- of the pressure plate and the piston -arrow C- must not be allowed to make contact with the shaft on removal/installation.*
- *The contact and sealing surfaces must not exhibit the slightest signs of damage such as scratches or scoring caused by dismantling/assembly.*
- *In the event of damage, the pressure plate or piston must be renewed.*



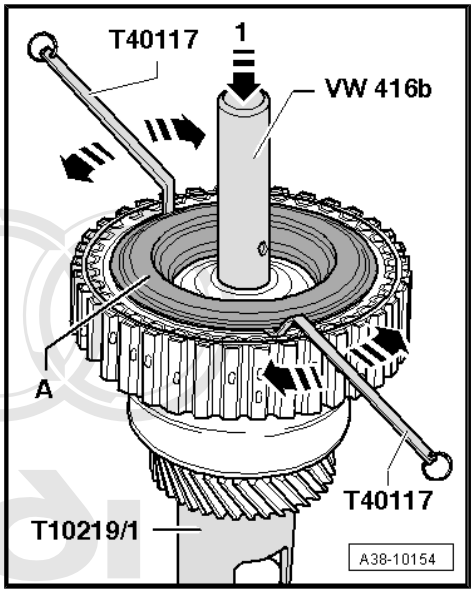
– Carefully guide pressure plate -1- with piston -2- downwards over shaft -3-.

• When doing so, the inner contact surfaces of the pressure plate -1- and of the piston -2- must not make contact with the shaft.

– Evenly press home the pressure plate with piston in the input shaft.



Checking clearance with feeler gauge -T40117-



– Insert the two feeler gauges -T40117- underneath the pressure plate -A-.

– Have a second mechanic use the tube -VW 416 B- to press down the pressure plate -A- as far as it will go -arrow 1-.

– Move the two feeler gauges -T40117- back and forth in a circle beneath the pressure plate in direction of -arrow-.

- Apply the two feeler gauges -T40117- on opposite sides.
- Take care to keep the feeler gauges -T40117- straight.
- The entire circular area must be checked.
- The two feeler gauges -T40117- must always move freely without any resistance whatsoever.

If the feeler gauges -T40117- cannot be moved in direction of -arrow- without becoming blocked:

– Repeat the input shaft adjustment procedure ⇒ page 83 .

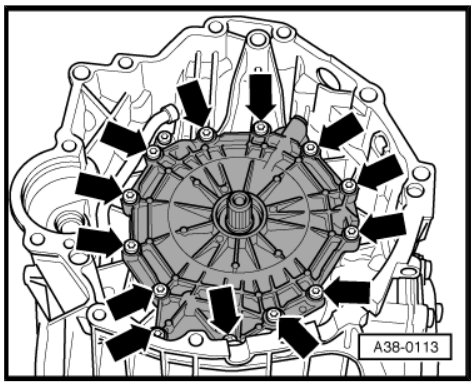
Caution

It is essential to obtain a successful result when checking the clearance with the feeler gauges -T40117- , as gearbox problems will otherwise be encountered when driving off from a standstill.

If the feeler gauges -T40117- move freely in direction of -arrow-:

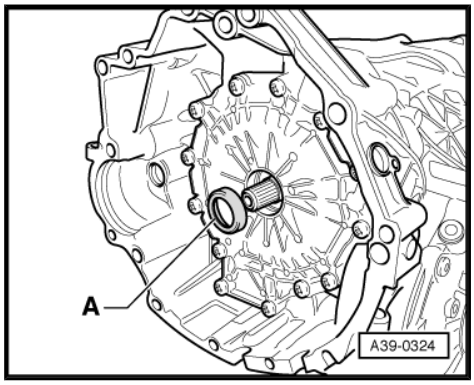
– Fit input shaft cover ⇒ page 38 .

– Install input shaft ⇒ page 34 .



– Fit oil seal for input shaft -A- ⇒ page 33 .

– Fill up with ATF
⇒ “1.2 Replenishing ATF for ATF purging”, page 9 .



Caution

- ***The ATF required by the multitronic 01J and 0AN gearbox is different to that for multi-step automatic gearboxes. Only the ATF available as a replacement part for the CVT gearbox may be used in the planetary gearbox; ATF specifications ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 00 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 00 .***
- ***After installing gearbox, make sure to perform ATF purging procedure ⇒ “1 ATF purging”, page 6 .***

4.3 Adjusting input shaft with 6 friction plates and determining clearance

Note

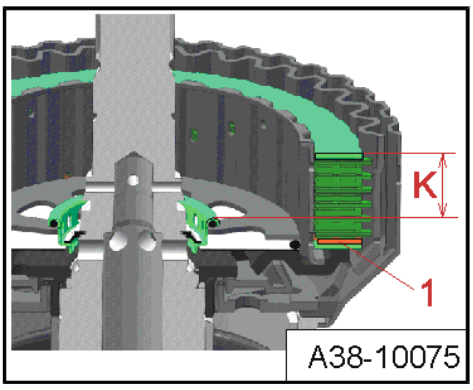
- *Observe the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on the automatic gearbox ⇒ page 4 .*

- Thoroughly clean all components prior to installation.

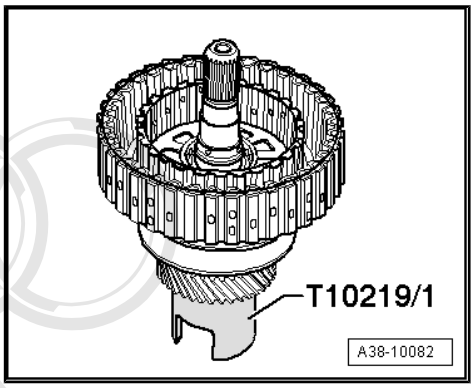
Measuring the clutch

Note

- *This measurement determines the distance -K- on the clutch from the top shim to the contact ring at the shaft (contact surface of pressure plate).*
- *The corrugated washer -1- is fitted beneath the clutch pack for the measurement.*

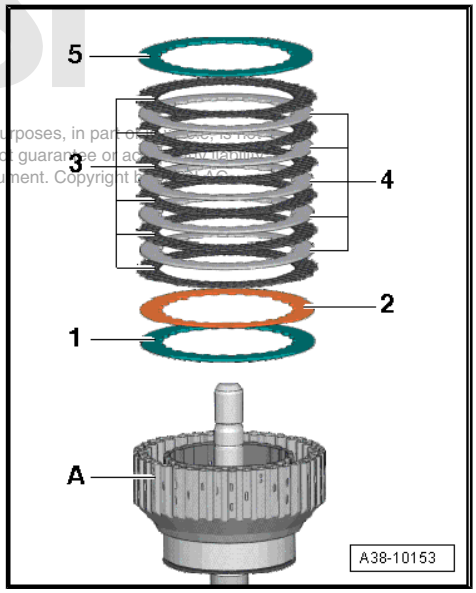


– Set down input shaft on assembly tool -T10219/1- .



– Insert new lower shim -1- of same thickness as old shim in input shaft cylinder -A-.

– Then insert corrugated washer -2-.



Note

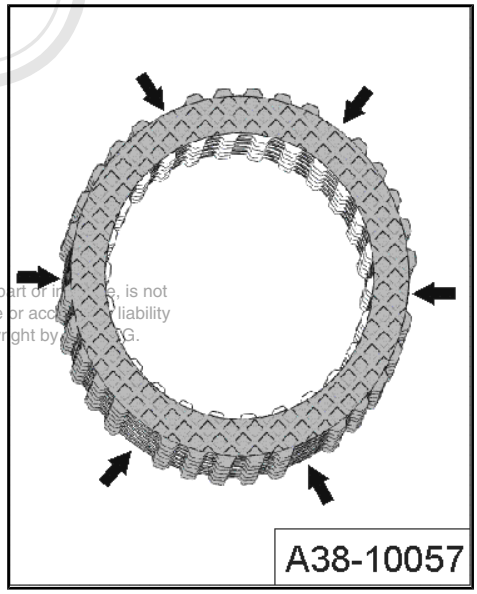
The corrugated washer is only fitted at the bottom for measurement. On assembly it is fitted at the top again.

– Now build up the clutch pack by alternately inserting one friction plate -3- (total of 6) followed by one outer plate -4- (total of 5, thickness 1.9 mm), ensuring that they are aligned together.

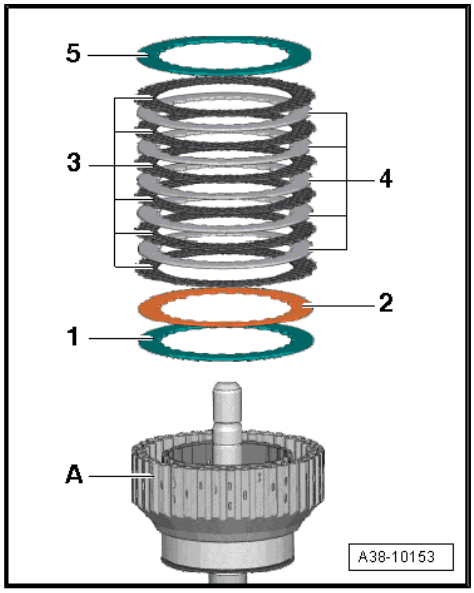
Alignment of friction plates:

Caution

- *The friction plates must be mutually aligned on installation, i.e. the areas with no external toothing -arrows- must always coincide. This is the only way to ensure correct adjustment. If necessary, mark the cylinder to ensure proper alignment on installation.*



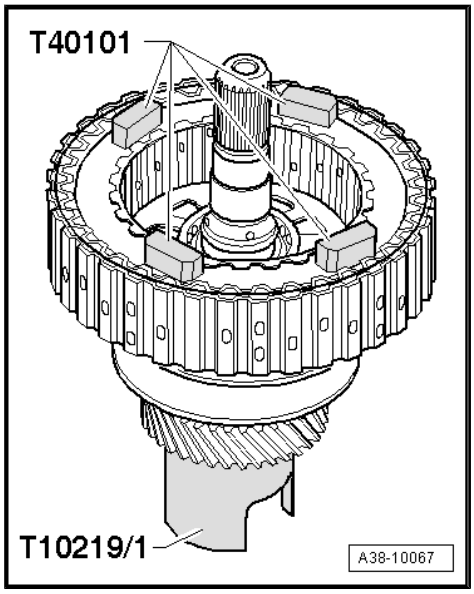
– As a final step, insert the new upper shim -5- of the same thickness as the old shim in the input shaft.



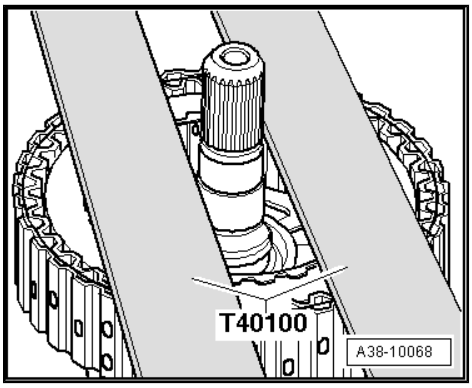
Note

To ensure accuracy, all tool and component surfaces must be absolutely clean when performing the following measurements.

– Place the four gauge blocks -T40101- on the upper shim.

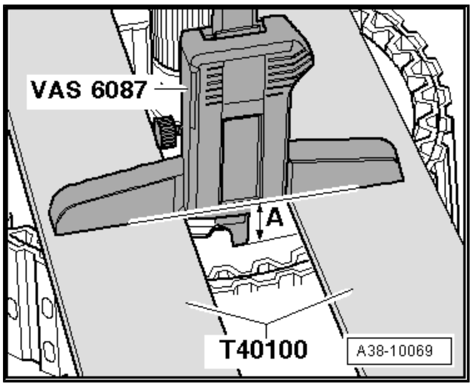


– Place a ruler -T40100- over the centre of each pair of gauge blocks -T40101- .

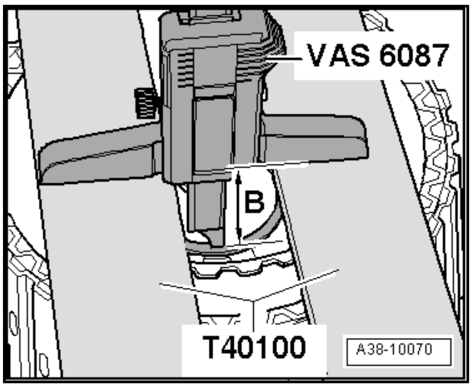


– Use the digital depth gauge -VAS 6087- to take measurement to the shim and note down the measured value -A-.

• When taking measurements, the digital depth gauge -VAS 6087- must make flush contact with both rulers -T40100- .

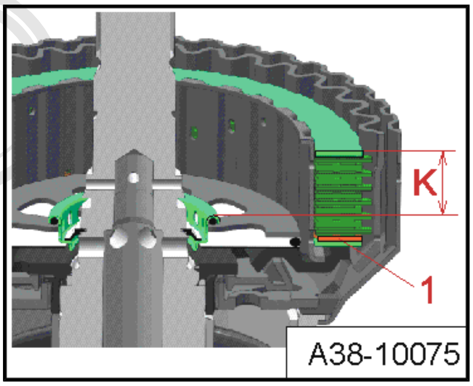


– Then use the digital depth gauge -VAS 6087- to take measurement to the contact ring at the shaft (contact surface of pressure plate) and note down the measured value -B-.



– Subtract the two measured values “B – A” to obtain the distance -K- of the clutch.

Calculation of distance -K- of clutch: “B – A = K”



Note

The corrugated washer -1- is fitted beneath the clutch pack for the measurement.

– Repeat the measurement on the opposite side of the input shaft and again determine the distance -K- of the clutch.

– Move the four gauge blocks -T40101- and the two rulers -T40100- through 90° on the input shaft and repeat the measurements.

– Take the four values determined for the distance -K- of the clutch and calculate the mean value M_K.

Mean value: “(value 1 + value 2 + value 3 + value 4) : 4 = M_K”

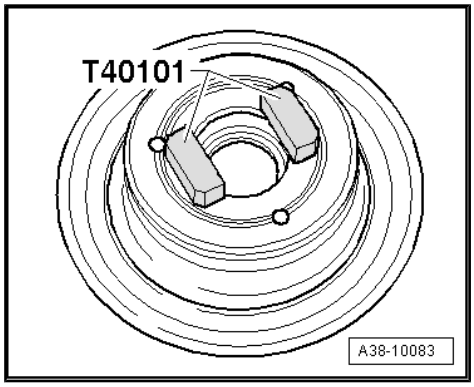
Measuring the pressure plate

– First check for damage and renew if necessary ⇒ Fig. “ Checking piston and pressure plate for wear “ , page 139 .

– Turn the pressure plate over and set it down on a flat, clean surface.

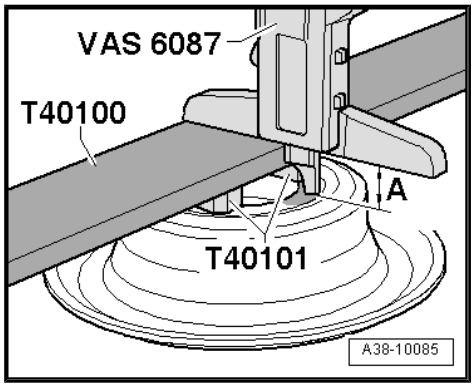
– Place the two gauge blocks -T40101- on the cleaned contact surface of the pressure plate.

• The gauge blocks -T40101- must make full contact with the clean contact surface and not rest on the edge.



– Place the rulers -T40100- over the centre of the gauge blocks -T40101- .

– Use the digital depth gauge -VAS 6087- to take measurement to the upper contact surface and note down the measured value -A-.



– Use the digital depth gauge -VAS 6087- to take measurement to the lower contact surface and note down the measured value -B-.

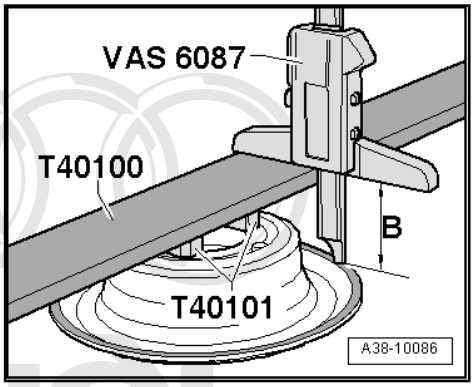
– Subtract the two measured values “B – A” to obtain the distance “D” of the two contact surfaces on the pressure plate.

Calculation of distance “D” on pressure plate: “B – A = D”

– Repeat the measurement at 2 further points on the pressure plate, offset by 120° in each case.

– Calculate the mean value for the pressure plate M_D from the three measured values.

Mean value: “(value 1 + value 2 + value 3) : 3 = M_D”



Determining the clearance

– Determine clearance using the following formula:

	Mean value of pressure plate measurements “M_D” (value 1 + value 2 + value 3) : 3
–	Mean value of clutch measurements “M_K” (value 1 + value 2 + value 3 + value 4) : 4
=	Clearance

Clearance = “M_D” – “M_K”

Clearance specification: 1.4 ± 0.2 mm.

If result does not match specification:

A - Measured value too low:

– Insert appropriately thinner shim. It may also be necessary to renew the bottom shim.

– Check clearance again after inserting new shim ⇒ page 83 .

B - Measured value too high:

– Insert appropriately thicker shim. It may also be necessary to renew the bottom shim.

– Check clearance again after inserting new shim ⇒ page 83 .

The following shims are available:

Available shims [thickness in mm]		
1,90	2,15	2,65
2,90	3,15	

Note

The clearance can be adjusted by way of the upper and lower shims.

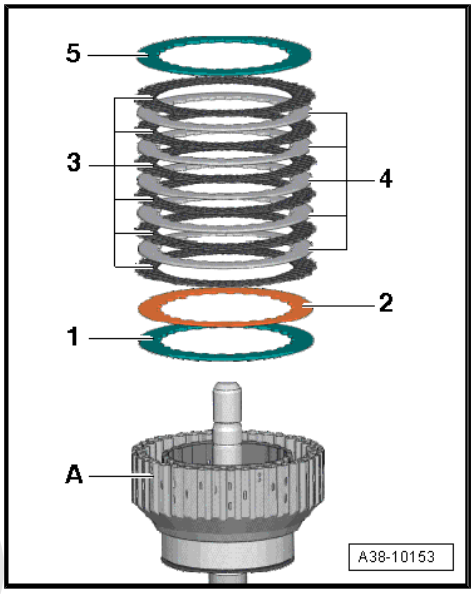
If result matches specification:

– Take all shims, friction plates, outer plates and the corrugated washer -5-, -4-, -3-, -2- and -1- out of input shaft cylinder -A-.

Caution

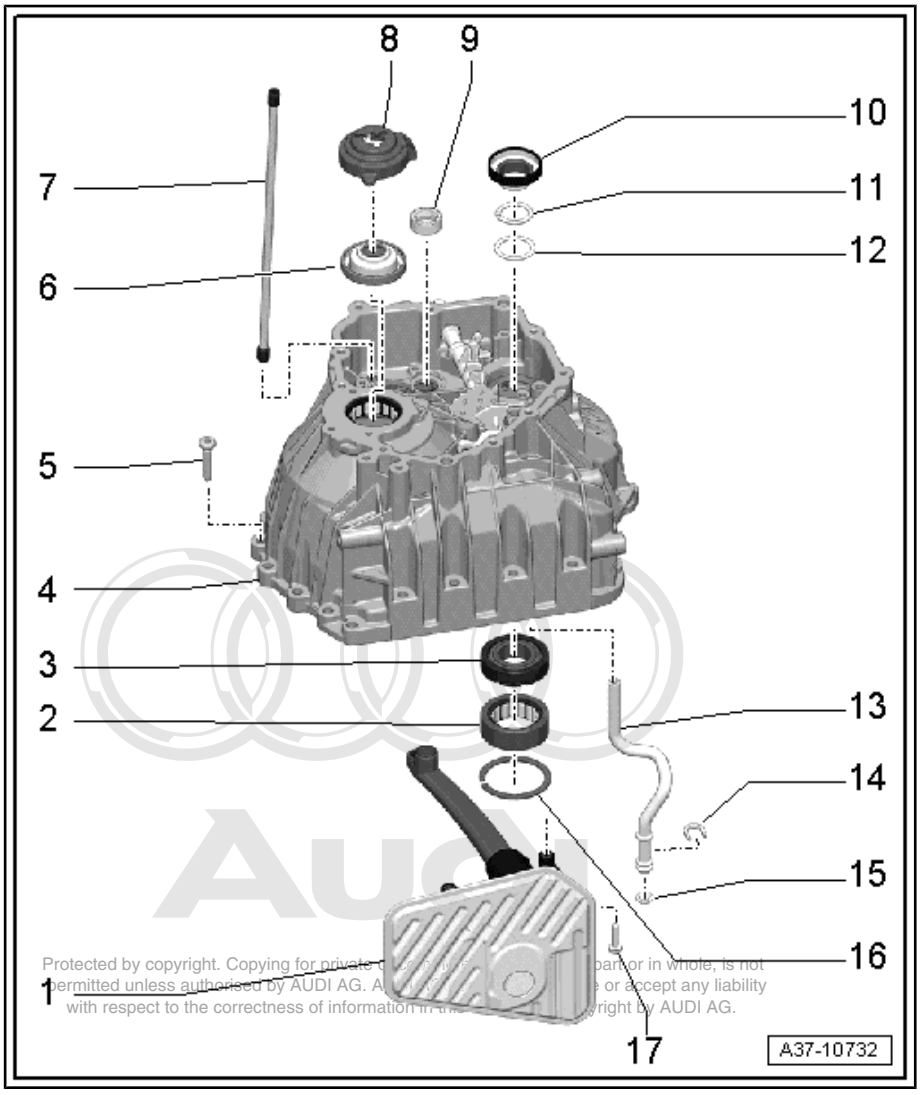
This step is necessary as the corrugated washer -2- is fitted above the bottom shim -1- only when adjusting the input shaft. When assembling the input shaft, the corrugated washer is fitted at the top.

– Assemble the input shaft ⇒ page 79 .



5 Exploded view - chain and pulley set “I”

Part 1



1 - ATF filter

- ❑ Different versions
- ❑ Removing and installing ⇒ page 113

2 - Bearing “D”

- ❑ Roller bearing for pulley set “I”
- ❑ Different versions: with or without inner race
- ❑ Removing and installing ⇒ page 110

3 - Bearing “E”

- ❑ Ball bearing for pulley set “I”
- ❑ Removing and installing ⇒ page 110

4 - Intermediate housing

- ❑ Removing and installing ⇒ “5.1 Removing and installing chain and pulley set I ”, page 91

5 - Bolt

- ❑ Different types and lengths according to version
- ❑ Renew bolts
- ❑ Steel bolt, 25 Nm
- ❑ Aluminium bolt, 10 Nm + tighten 90° ($^1/_4$ turn) further

6 - Sender wheel “II”

- ❑ Always renew after removal
- ❑ Removing and installing ⇒ “5.1 Removing and installing chain and pulley set I ”, page 91

7 - Oil pipe

- ❑ Take care not to damage sealing surfaces
- ❑ Removing and installing ⇒ “5.1 Removing and installing chain and pulley set I ”, page 91

8 - Cover

- ❑ For sender wheel “II”

9 - Axial sealing element

- ❑ For ATF filter
- ❑ Renew

10 - Sender wheel “I”

- ❑ Always renew after removal
- ❑ Removing and installing ⇒ “5.1 Removing and installing chain and pulley set I ”, page 91

11 - Circlip

- ❑ Renew

- ❑ Must be measured again to fit after renewing pulley set “I” ⇒ page 103
- ❑ Must be properly seated in the base of the groove
- ❑ Installation position: The holes in the eyes are conical. The smaller side faces upwards

12 - Shim

- ❑ Must be measured again to fit after renewing pulley set “I” ⇒ page 103

13 - Oil pipe

14 - Retaining clip

- ❑ For oil pipe

15 - O-ring

- ❑ Renew

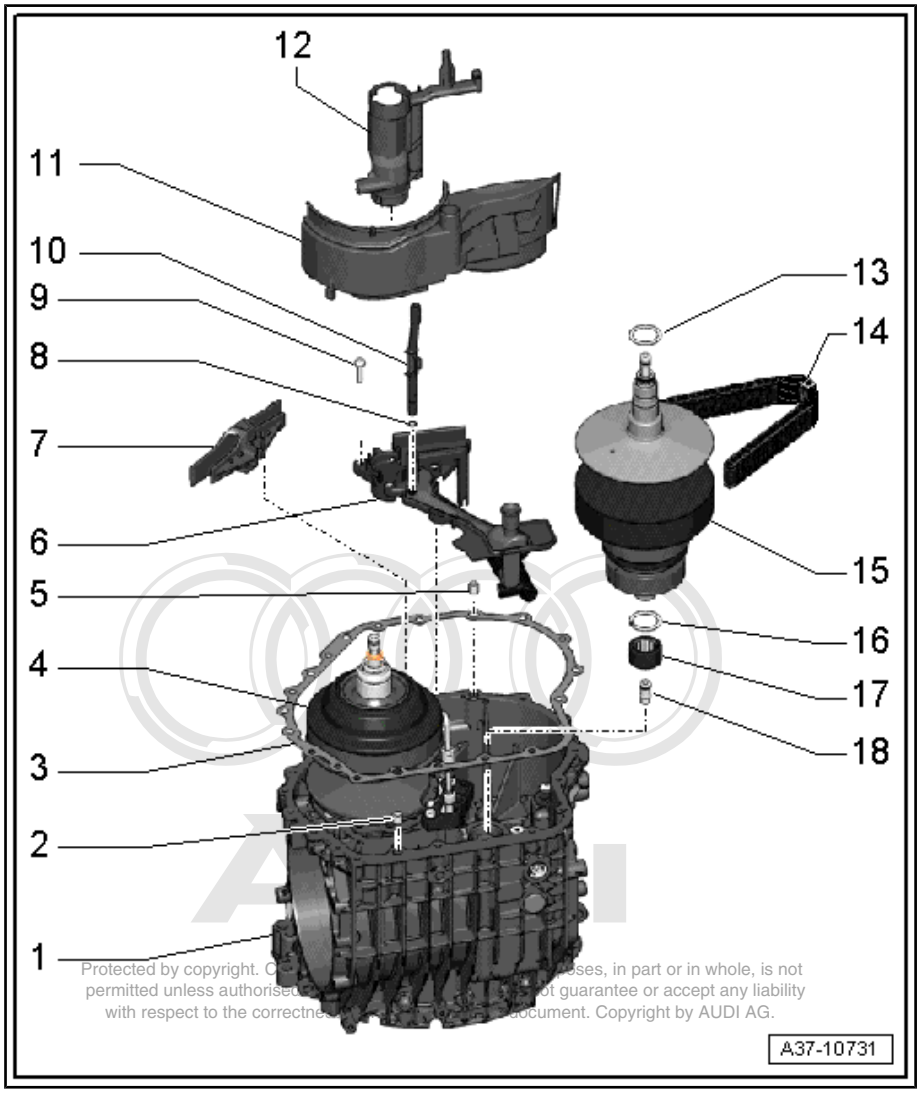
16 - Circlip

- ❑ For ball bearing and roller bearing

17 - Bolt

- ❑ 10 Nm

Part 2



1 - Gearbox housing

- ❑ With pulley set “II”

2 - Dowel sleeve

3 - Gasket

- ❑ Renew

4 - Pulley set “II”

- ❑ Cannot be renewed individually

5 - Dowel sleeve

6 - Suction-jet pump

- ❑ Removing and installing ⇒ page 120

7 - Guide rail

- ❑ Clipped onto oil pipe -item 10-
- ❑ Install with chain inserted

8 - O-ring

- ❑ For oil pipe
- ❑ Renew

9 - Bolt

- ❑ 10 Nm

10 - Oil pipe

11 - Oil guide “I”

12 - Oil guide “II”

13 - Thrust washer

- ❑ Mark with paint
- ❑ Do not interchange with shim ⇒ Item 12 (page 90)

14 - Chain

- ❑ Removing and installing ⇒ page 91

15 - Pulley set “I”

- ❑ Removing and installing ⇒ page 91
- ❑ Renewing ⇒ page 102
- ❑ Following replacement, the circlip ⇒ Item 11 (page 89) and the shim ⇒ Item 12 (page 90) must be re-determined ⇒ “5.2 Renewing pulley set I ”, page 102

16 - Circlip

- ❑ For bearing “C”

17 - Bearing “C”

- ❑ Roller bearing for pulley set “I”
- ❑ Removing and installing ⇒ page 106

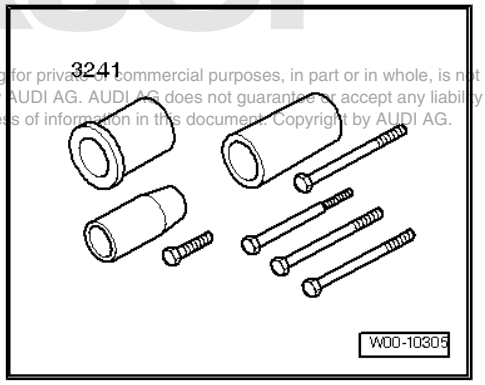
18 - Oil pipe

- ❑ With rectangular section seal
- ❑ Removing and installing ⇒ “5.2 Renewing pulley set I ”, page 102

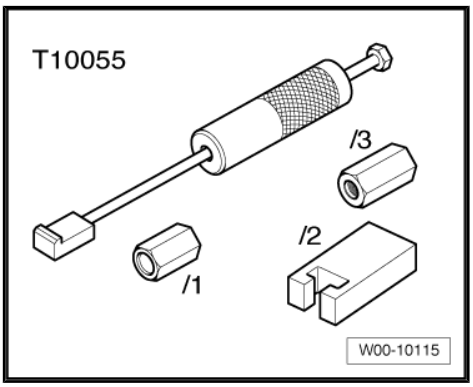
5.1 Removing and installing chain and pulley set “I”

Special tools and workshop equipment required

- ♦ Fitting sleeves -3241-



- ♦ Puller -T10055-

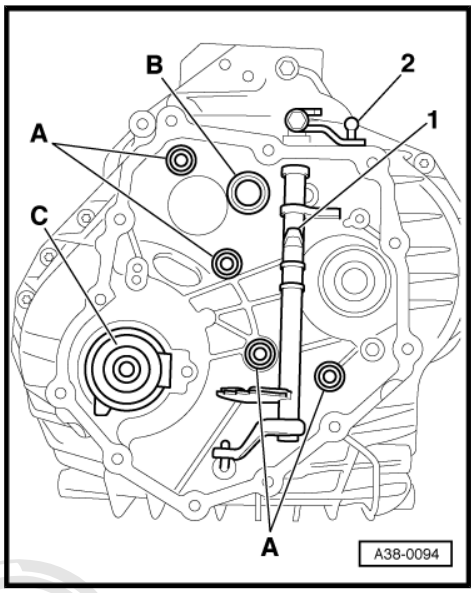


- ♦ Compressor tool -T40130-
- ♦ Press tool -T40131-
- ♦ Puller -T40132-
- ♦ Compressed air hose for tyre valves

Removing

Proceed as follows:

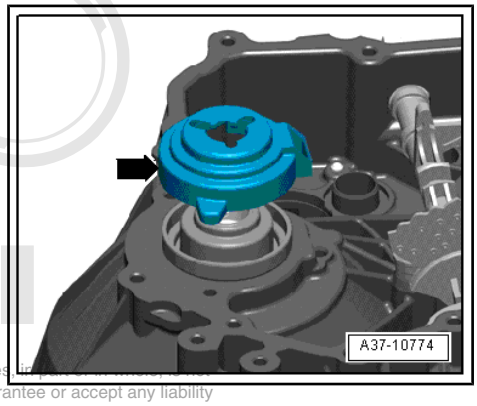
– Remove gearbox ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37 .
– Mount gearbox on assembly stand ⇒ page 14 .
– Remove end cover ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 38 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 38 .
– Remove automatic gearbox control unit -J217- ⇒ page 23 .
– Remove hydraulic control unit ⇒ page 27 .
– Remove axial sealing elements -A- (4x) and -B-.



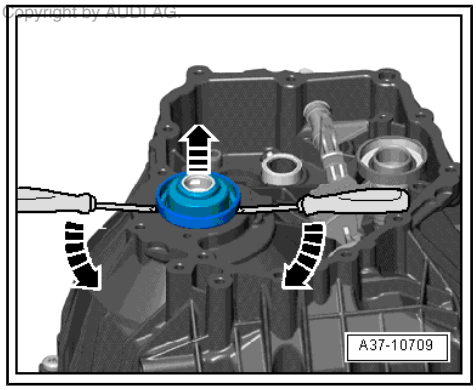
Note

The axial sealing elements must be renewed.

– Remove cover -arrow- from sender wheel “II”.



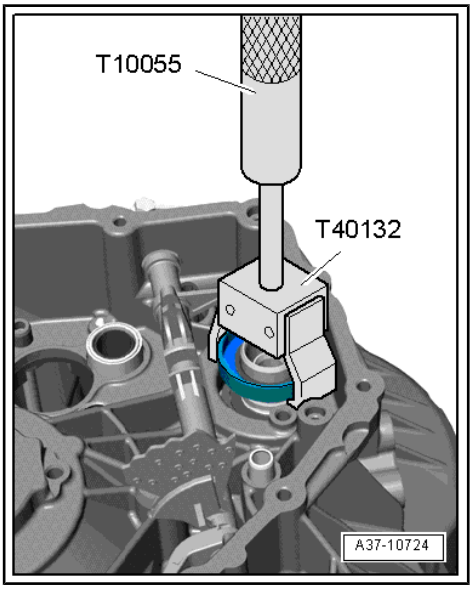
– Use 2 screwdrivers to lever off sender wheel “II” -arrows-.



Note

The sender wheel must be renewed.

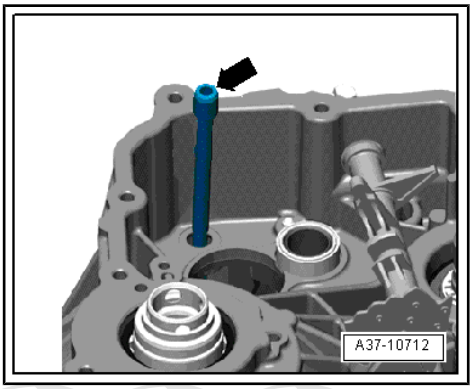
– Use puller -T40132- and puller -T10055- to remove sender wheel “I”.



Note

The sender wheel must be renewed.

– Lift out oil pipe -arrow- by hand.



Note

Do not use a tool to avoid damaging the sealing surfaces.

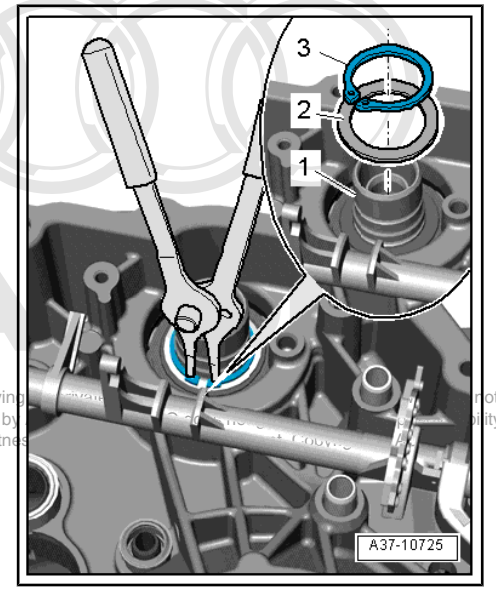
– Remove circlip -3- from shaft -item 1- for pulley set “I”.

– Mark and remove shim -2-.

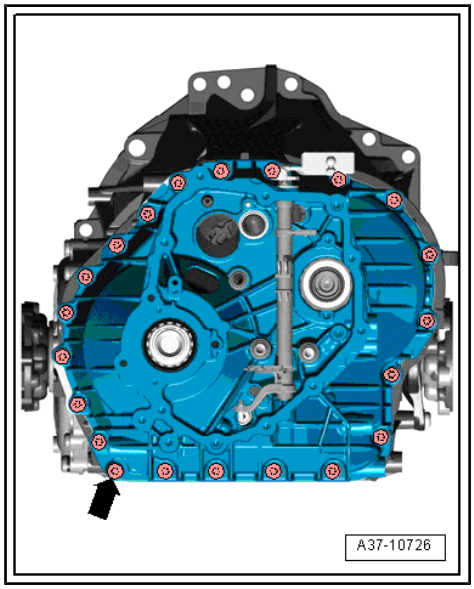
Caution

There is a risk that parts may be interchanged.

- ***Make sure not to interchange thrust washer ⇒ Item 13 (page 90) and shim -2- underneath circlip -3-.***
- ***Attach shim -2- to circlip -3- by means of a cable tie to prevent the parts from being interchanged.***



– Remove bolts for intermediate housing -arrow-; note different lengths and mark installation position of bolts if necessary.
– Detach intermediate housing.

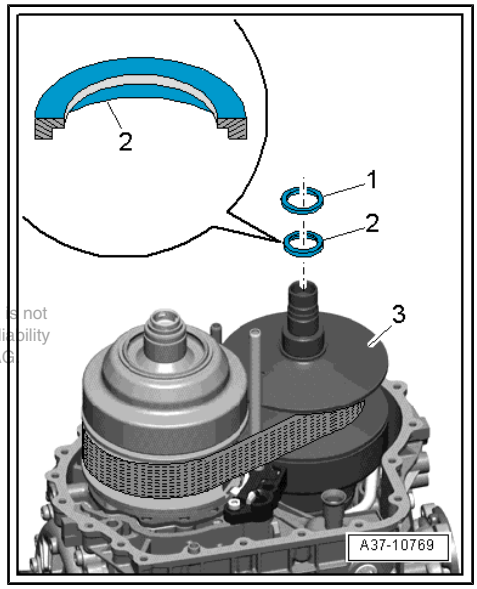


– Mark thrust washer -1- and remove from pulley set “I” -item 3-.
– Remove spacer -2- (only fitted on certain versions!) from pulley set “I”.

Caution

There is a risk that parts may be interchanged.

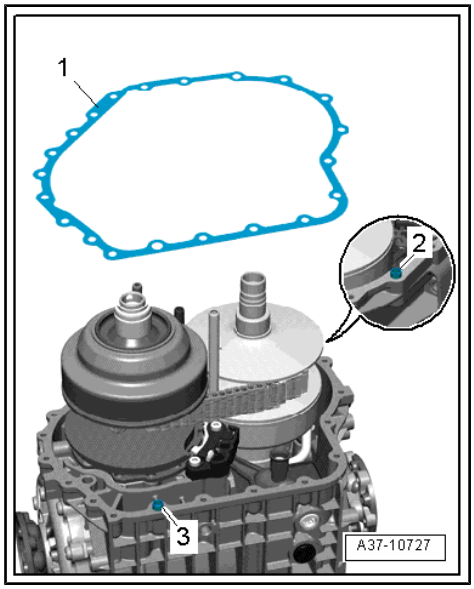
- ***Make sure not to interchange thrust washer -1- and shim ⇒ Item 12 (page 90) underneath circlip.***
- ***Mark thrust washer -1- with paint.***



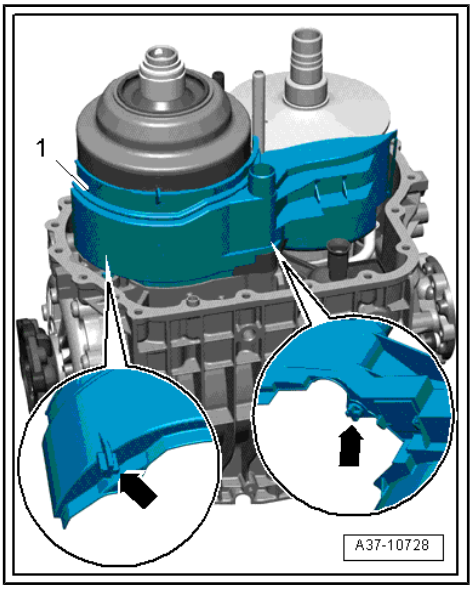
– Remove gasket -1- for intermediate housing.
– Remove dowel sleeve -3-.

Note

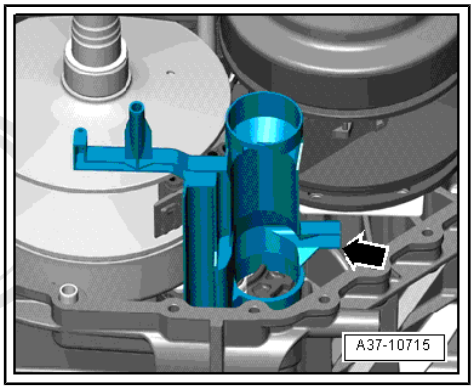
- *Dowel sleeve -3- must be removed so that support bracket -T40130/1- can be attached to gearbox.*
- *Dowel sleeve -2- can remain inserted in gearbox.*



– Carefully disengage retaining pins -arrows- and detach oil guide “I” -item 1-.



– Lift out oil guide “II” -arrow-.

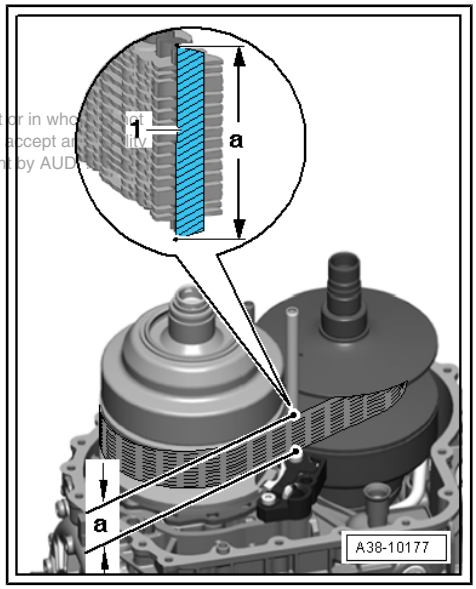


Measure height of chain:

Note

The height of the chain pins is used as a measure of chain height.

– Measure height -a- of chain pin -1-.



Note

- *Illustration shows sectional view of chain and chain pin -1-.*
- *The following two procedures differ according to the chain height.*

Gearboxes with chain height -a- = 34 mm:

– Place adapter -T40130/2- on pulley set “II”.

• Check for correct positioning of the O-rings in the adapter -T40130/2- . Both O-rings must be fitted.

• O-rings in adapter -T40130/2- and sealing surfaces on pulley set must be clean and coated with ATF.

– Align support bracket -T40130/1- centrally on adapter -T40130/2- and bolt support bracket onto gearbox housing -bottom arrows-, as shown in illustration.

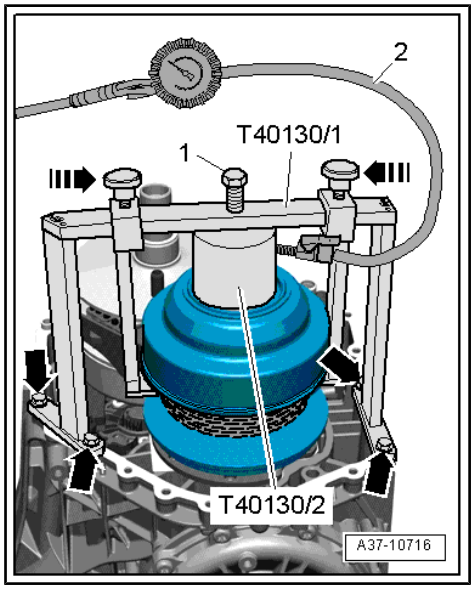
– Screw in bolt -1- until adapter -T40130/2- is pressed against pulley set “II”.

– Connect compressed air hose -2- for tyre valves to adapter -T40130/2- and apply approx. 3 bar.

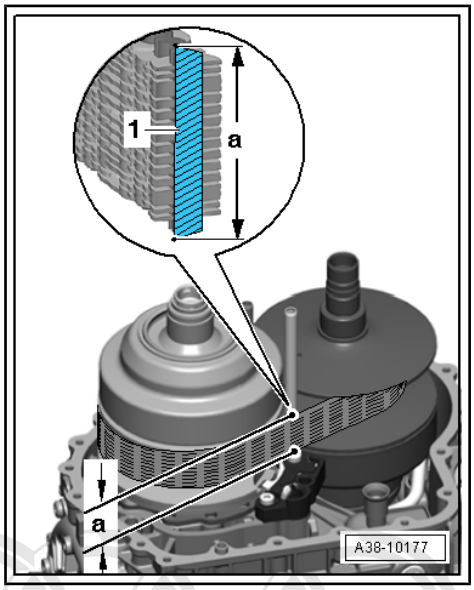
• The pulley set should open and the chain should relax.

– Slide in the two arresters in the direction of the -arrows- to secure the top side of the pulley.

– Lock the arresters in this position using the knurled screws, taking care not to trap the chain.



Gearboxes with chain height -a- = 38 mm:



– Place adapter -T40130/2- on pulley set “II”.

• Check for correct positioning of the O-rings in the adapter -T40130/2- . Both O-rings must be fitted.

• O-rings in adapter -T40130/2- and sealing surfaces on pulley set must be clean and coated with ATF.

– Align support bracket -T40130/1- centrally on adapter -T40130/2- with spacers -T40130/5- and -T40130/6- , and bolt support bracket onto gearbox housing -bottom arrows-, as shown in illustration.

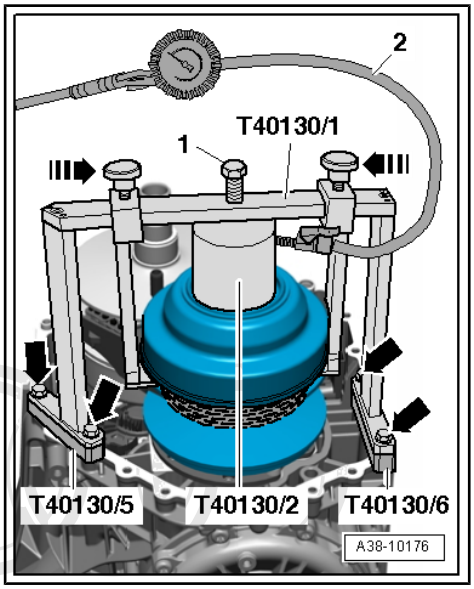
– Screw in bolt -1- until adapter -T40130/2- is pressed against pulley set “II”.

– Connect compressed air hose -2- for tyre valves to adapter -T40130/2- and apply approx. 3 bar.

• The pulley set should open and the chain should relax.

– Slide in the two arresters in the direction of the -arrows- to secure the top side of the pulley.

– Lock the arresters in this position using the knurled screws, taking care not to trap the chain.



Continued for gearboxes with any chain height:

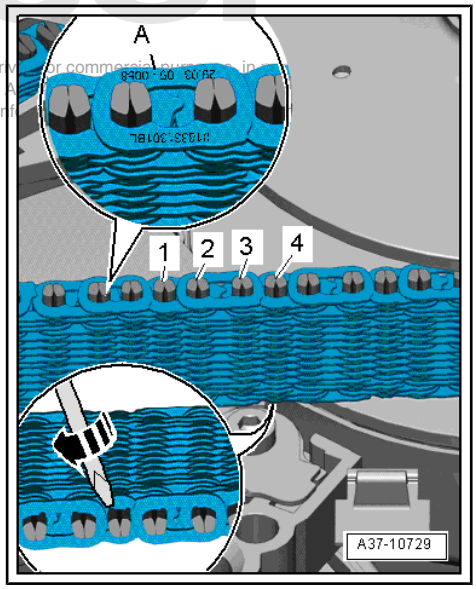
– Turn chain until link with production date stamp -A- is visible.

– Open chain at fourth chain pin away from link with date stamp.

– Place cloth under chain to prevent welding spots from falling into gearbox.

– Break off welding spots on both halves of the fourth chain pin -arrow- on bottom of chain.

– Lift out the two-piece chain pin.

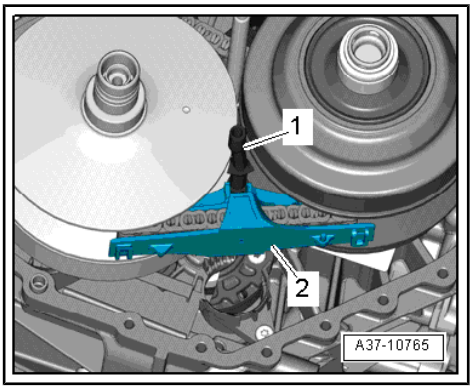


Caution

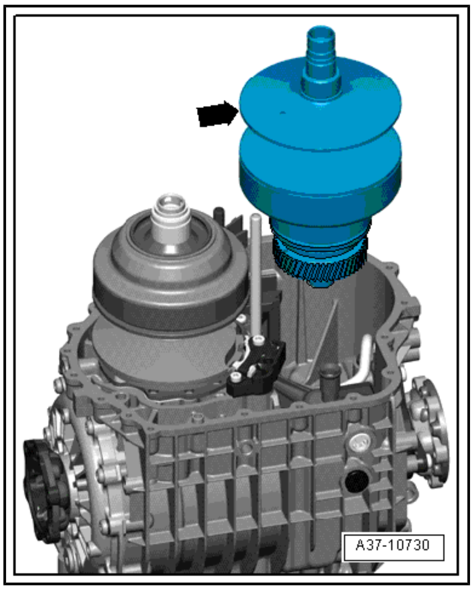
Do not kink the chain (risk of damage).

– Mark installation position of guide rail -2- for refitting.

– Unclip guide rail at oil pipe -1- and detach chain and guide rail.



– Lift out pulley set “I” -arrow-.



Installing

- Tightening torques ⇒ page 89

> **Caution**
>
> ♦ *Assess wear on bearing “D” and bearing “E” ⇒ page 142 .*
>
> ♦ *Assess wear on chain, pulley sets “I” and “II”, bearing “C” and suction-jet pump ⇒ page 144 .*

Note

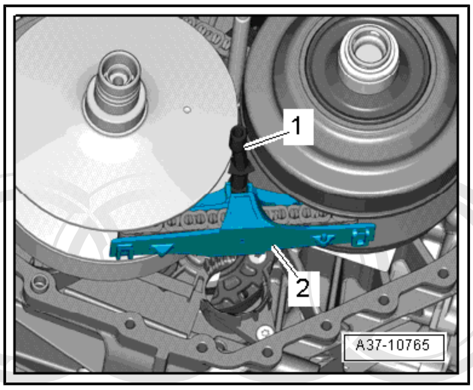
If the pulley set “I” is replaced, the shim and circlip must be re-determined ⇒ page 103 .

– Carefully insert pulley set “I” -arrow- into roller bearing.

- Splines must engage in splines on input shaft.

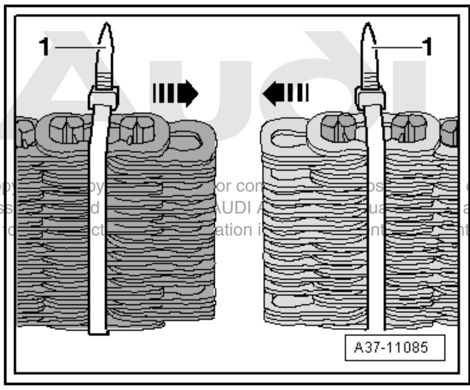
– Clean the chain. Remove any swarf between the links.

– Clip guide rail -2- onto oil pipe -1- with chain inserted (refer to marking made upon removal to facilitate installation).



– Feed chain through until the two open ends meet.

– Tension the open ends of the chain with one cable tie -1- each as shown.

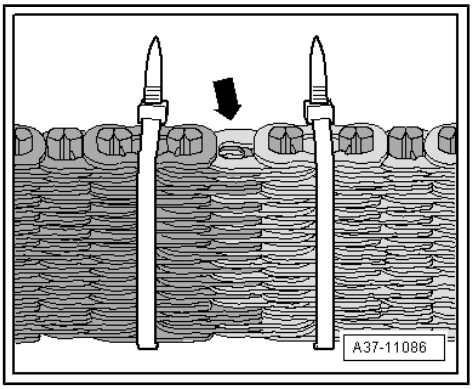


Note

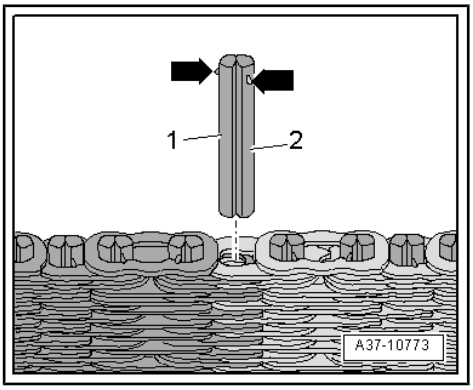
Tensioning with the cable ties keeps the links in parallel and firmly in position and makes sure they are straight on assembly.

– Join chain -arrows- so that all of the links are sitting straight and parallel to each other.

- The distance between the links -arrow- varies for design reasons.

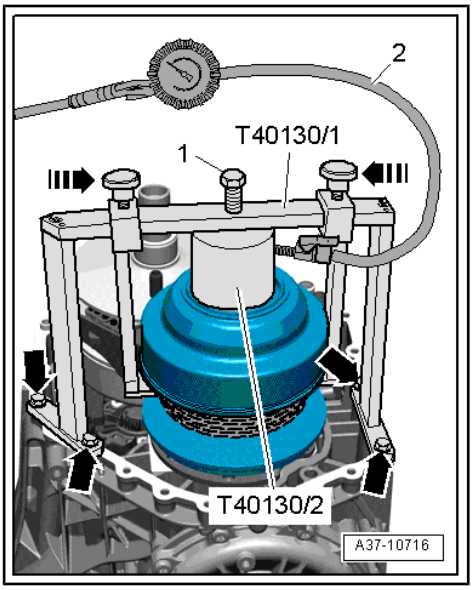


– Insert the two halves of the chain pin -1- and -2- from above, as shown in illustration.
- The welding spots which are still intact -arrows- should be nearest the top.
- The welding spots which were broken off the chain pin should be nearest the bottom.
- The two halves of the chain pin are asymmetrical in shape.

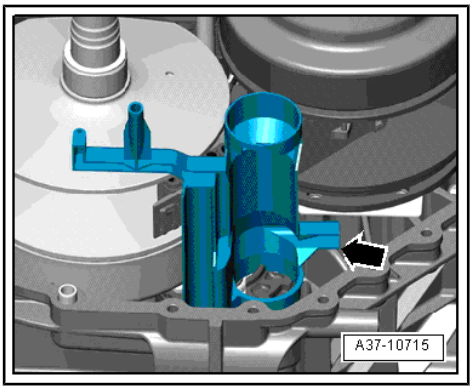


– Remove the cable ties attached from the chain.

– Release knurled screws and slide arresters outwards in opposite direction of -arrows-.
– Disconnect compressed air hose -2- for tyre valves from adapter -T40130/2- .
– Release air from adapter -T40130/2- via compressed air valve.
- This is done by pressing down the valve needle with a small screwdriver.
- The pulley set should close and the chain should tighten.

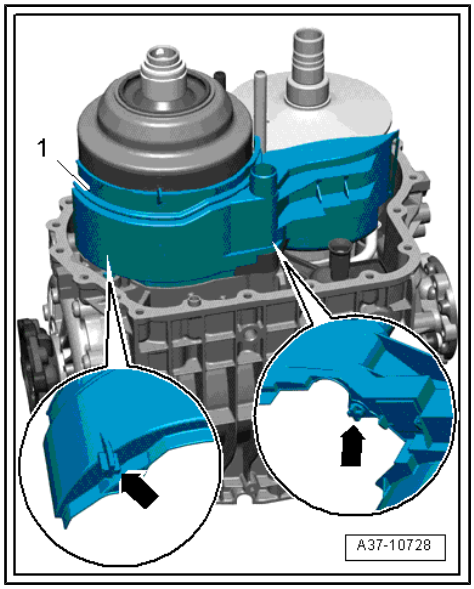


– Insert oil guide “II” -arrow-.



– Insert oil guide “I” -item 1-.

• Retaining pins -arrows- must fit into holes on gearbox housing.



– If applicable, fit the spacer -2-. Heed the installation position as shown in the sectional view.

– Fit spacer -2- (if one was installed). Note installation position, as illustrated in sectional view.

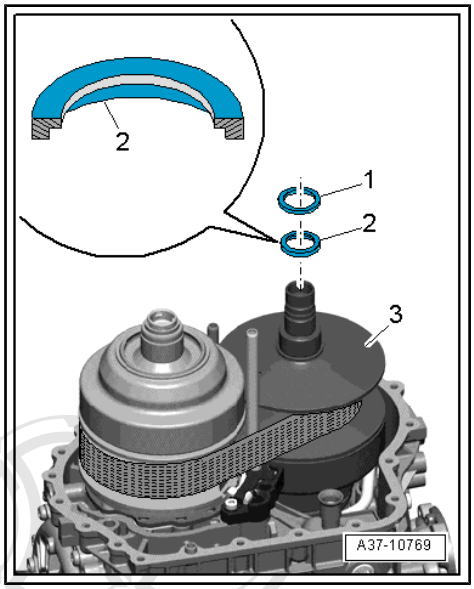
Note

If a spacer -2- was fitted on pulley set “I”, it should only be installed again if the existing bearing “D” (with inner race) has not been renewed. A spacer must not be installed in conjunction with a bearing “D” which does not have an inner race.

Caution

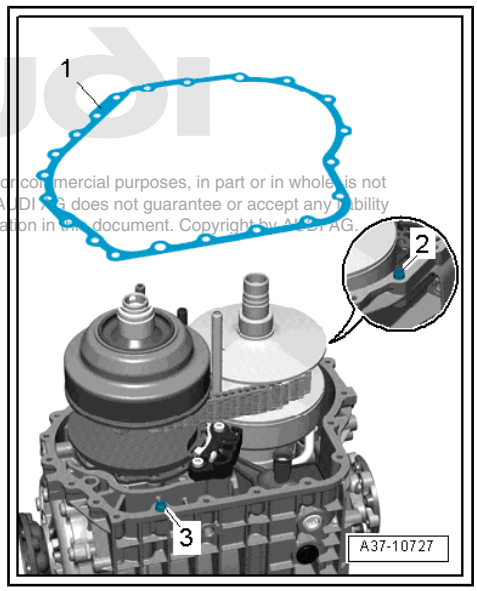
There is a risk that parts may be interchanged.

- ***Make sure not to interchange thrust washer -1- and shim ⇒ Item 12 (page 90) underneath circlip.***



– Fit gasket -1- for intermediate housing.

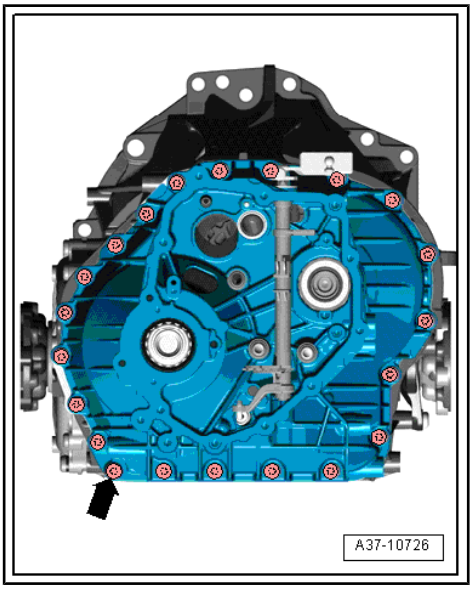
– Check that dowel sleeves -2 and 3- are fitted and insert if necessary.



– Fit intermediate housing.

– Screw in bolts -arrow- for intermediate housing and tighten diagonally in stages.

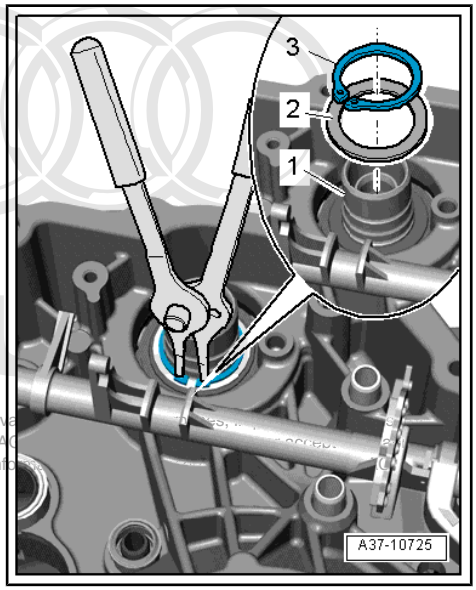
• The bolts can have different lengths, depending on the version.



Note

If the same pulley set "I" has been re-installed, fit the old shim and a new circlip – with the same thickness as the old circlip.

– Turn gearbox housing on assembly stand so that pulley set "I" rests against intermediate housing under its own weight.



Note

This allows the circlip -3- to be inserted in the groove on the shaft and ensures that the bearing is not damaged when the sender wheel "I" is subsequently fitted.

– Fit marked shim -2- onto shaft for pulley set "I" -item 1-.

– Insert new circlip -3- into groove on shaft for pulley set and press home.

• Note installation position: the drillings in the eyes of the circlip are tapered. The smaller side faces upwards.

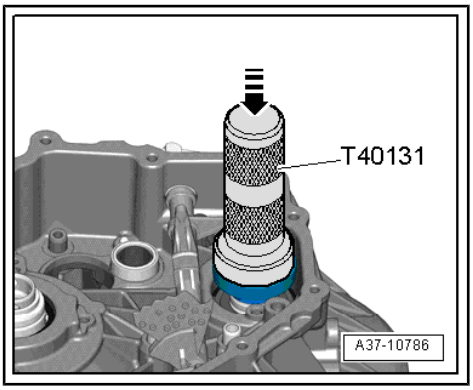
• The circlip must be properly seated in the base of the groove.

Note

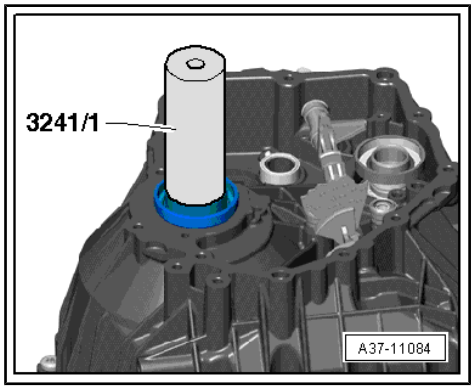
♦ *The following illustration is shown with the intermediate housing on top, contrary to the true gearbox position.*

♦ *Always renew sender wheels "I" and "II".*

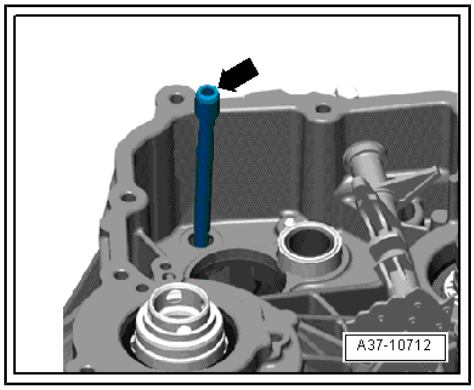
– Using a rubber-headed hammer, carefully knock new sender wheel "I" with press tool -T40131- -arrow- all the way onto shaft.



– Pull the assembly aid -3241/2- out of the fitting sleeve -3241/1- .
– Using a rubber-headed hammer, carefully knock home the new sender wheel “II” with the fitting sleeve -3241/1- .
– Turn gearbox on assembly stand so that intermediate housing is facing upwards again.



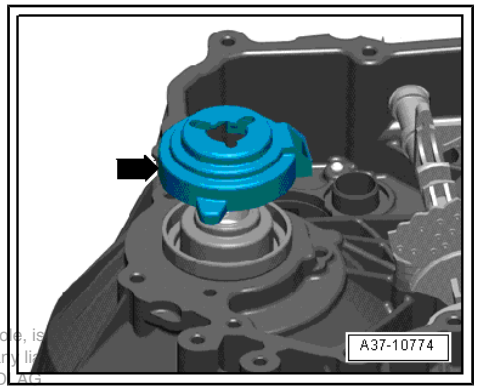
– Insert oil pipe -arrow- by hand.



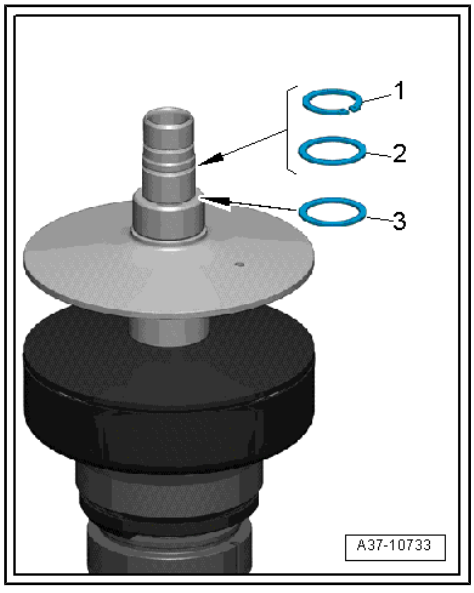
Note

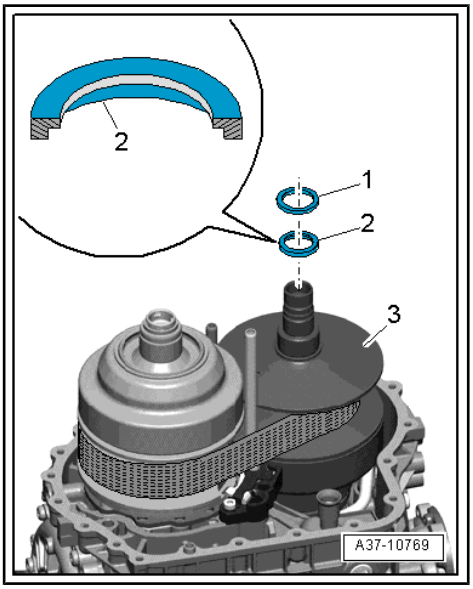
Do not use a tool to avoid damaging the sealing surfaces.

– Fit cover -arrow- on sender wheel “II”.
• The locking element on the back of the cover must be inserted in the small hole on the surface of the gearbox.
– Install hydraulic control unit ⇒ page 27 .
– Install automatic gearbox control unit -J217- ⇒ page 23 .
– Install end cover ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 38 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 38 .
– Install gearbox ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37 .



5.2 Renewing pulley set “I”





Note

- *If pulley set “I” is renewed, the following steps are necessary:*
- *Bearings “D” and “E” for pulley set “I” must be renewed ⇒ page 110 .*
- *Bearing “C” must be checked for wear and renewed if necessary ⇒ page 106 .*
- *Shim -2- and circlip -1- must be measured again to fit ⇒ page 103 .*
- *The existing shim -3- should always be refitted.*
- *If a spacer -2- was fitted on the existing pulley set “I”, the spacer should not be refitted. The spacer is only required for bearing “D” with inner race; this is always replaced by bearing “D” without inner race.*

Procedure

– Remove chain and pulley set “I” ⇒ page 91 .

– Check wear on bearing “C” for pulley set “I” ⇒ page 144 ; if necessary, renew bearing “C” ⇒ page 106 .

– Renew bearings “D” and “E” for pulley set “I” ⇒ page 110 .

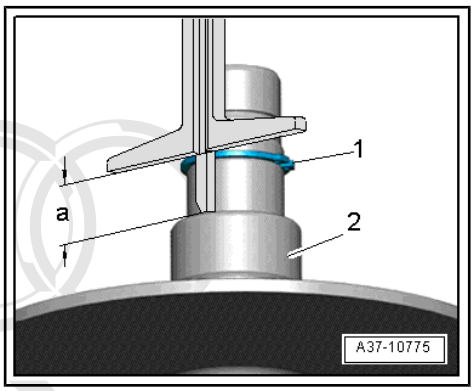
Determining thickness of shim and circlip

– Insert existing (old) circlip -1- for pulley set “I” into groove on existing (old) pulley set “I” -item 2-.

• Note installation position: the drillings in the eyes of the circlip are tapered. The smaller side faces upwards.

• The circlip must be properly seated in the base of the groove.

– Determine and note “dimension -a- (old)” as shown in illustration.



Note

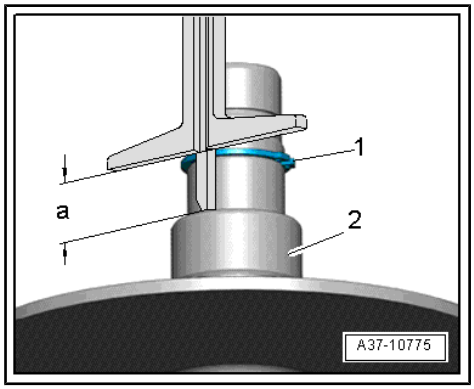
“Dimension -a- (old)” is measured from the top side of the circlip to the contact surface.

– Insert existing (old) circlip for pulley set “I” in groove on new pulley set “I”.

• Note installation position: the drillings in the eyes of the circlip are tapered. The smaller side faces upwards.

• The circlip must be properly seated in the base of the groove.

– Determine and note “dimension -a- (new)” as shown in illustration.



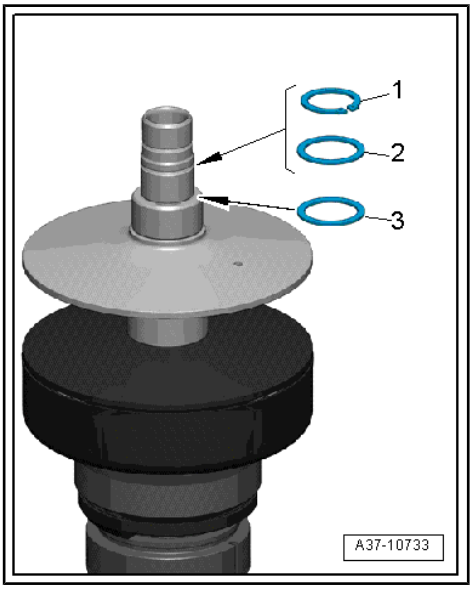
If difference between “dimension -a- (old)” and “dimension -a- (new)” is less than 0.2 mm:

• Re-install a new circlip - with the same thickness as the old circlip - and the old shim with the new pulley set “I”.

If difference between “dimension -a- (old)” and “dimension -a- (new)” is greater than 0.2 mm:

• Determine dimension of new shim as follows:

Example 1: “dimension -a- (new)” is greater than “dimension -a- (old)”	
“Dimension -a- (new)”	34.90 mm
“Dimension -a- (old)”	– 34.55 mm
Difference -a-	= + 0.35 mm



Note

- *Dimension -b- is the total thickness of circlip -1- and shim -2-.*
- *"Dimension -b- (old)" is the previous total thickness; "dimension -b- (new)" is the new total thickness.*

Determining "dimension -b- (old)":	
Existing circlip	1.90 mm
Existing shim	1.60 mm
"Dimension -b- (old)"	= 3.50 mm

Determining "dimension -b- (new)":	
Formula: "dimension -b- (new)" = "dimension -b- (old)" + difference -a-	
"Dimension -b- (old)"	3.50 mm
Difference -a-	+ 0.35 mm
"Dimension -b- (new)"	= 3.85 mm

– From the available shims and circlips, choose the combination that comes nearest to "dimension -b- (new)".

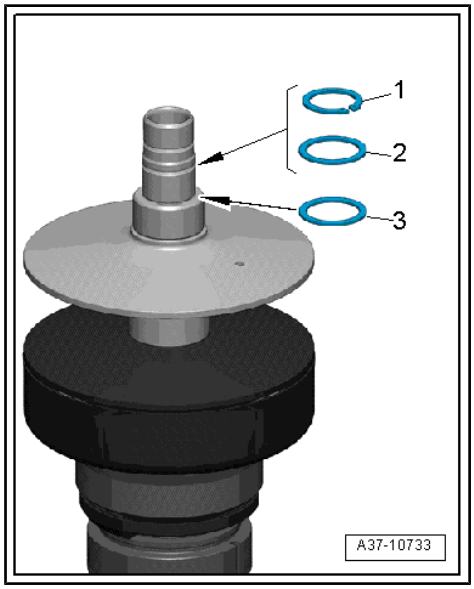
Available shims and circlips [thickness in mm]	
Shims	**Circlips**
1,40	1,80
1,60	1,85
1,80	1,90
2,00	1,95
2,20	

Determining thickness of shim/circlip combination	
New circlip	1.85 mm
New shim	+ 2.00 mm
"Dimension -b- (new)"	= 3.85 mm

Note

The total thickness of the new shim and the new circlip must not exceed "dimension -b- (new)".

Example 2: "dimension -a- (new)" less than "dimension -a- (old)"	
"Dimension -a- (new)"	34.40 mm
"Dimension -a- (old)"	– 34.85 mm
Difference -a-	= – 0.45 mm



Note

- *Dimension -b- is the total thickness of circlip -1- and shim -2-.*
- *"Dimension -b- (old)" is the previous total thickness; "dimension -b- (new)" is the new total thickness.*

Determining "dimension -b- (old)":	
Existing circlip	1.90 mm
Existing shim	2.00 mm
"Dimension -b- (old)"	= 3.90 mm

Determining "dimension -b- (new)":	
Formula: "dimension -b- (new)" = "dimension -b- (old)" – difference -a-	
"Dimension -b- (old)"	3.90 mm
Difference -a-	– 0.45 mm
"Dimension -b- (new)"	= 3.45 mm

– From the available shims and circlips, choose the combination that comes nearest to "dimension -b- (new)".

Available shims and circlips [thickness in mm]	
Shims	**Circlips**
1,40	1,80
1,60	1,85
1,80	1,90
2,00	1,95
2,20	

Determining thickness of shim/circlip combination	
New circlip	1.85 mm
New shim	+ 1.60 mm
"Dimension -b- (new)"	= 3.45 mm

Note

The total thickness of the new shim and the new circlip must not exceed "dimension -b- (new)".

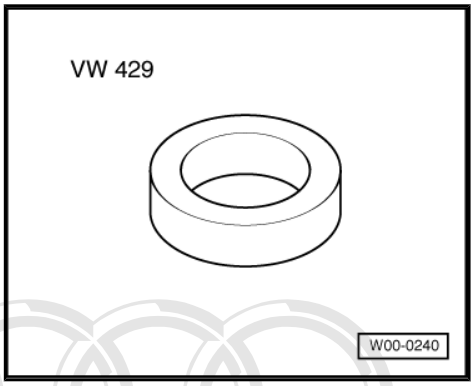
Assembling

– Install new chain and new pulley set "I" ⇒ page 91 .

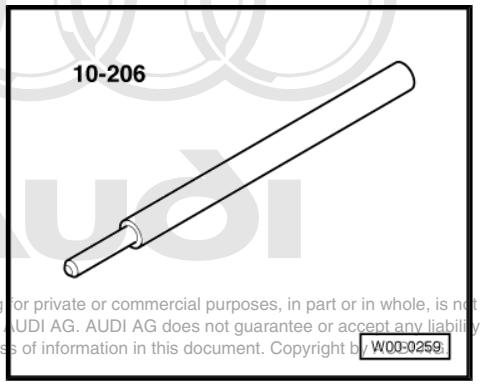
5.3 Removing and installing bearing "C" for pulley set "I"

Special tools and workshop equipment required

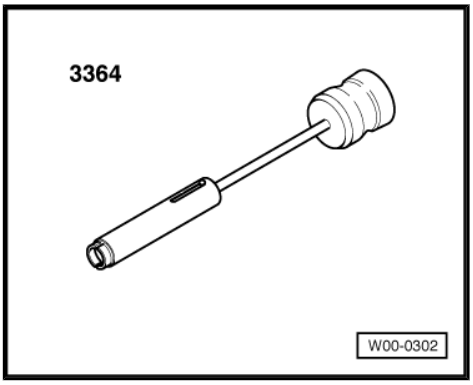
- Thrust ring -VW 429-



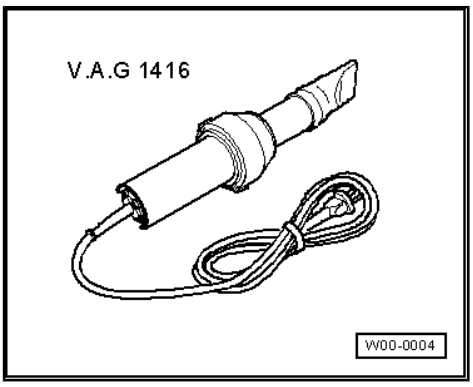
- Drift -10 - 206-



- Valve stem seal puller -3364-

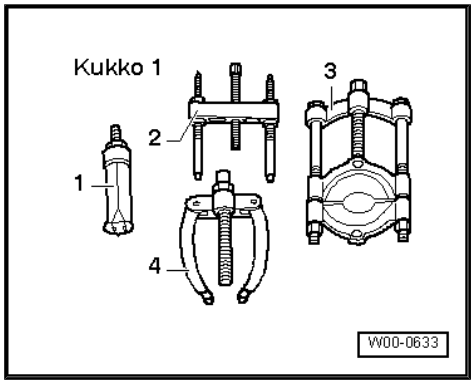


- Hot air blower -V.A.G 1416-



- Thrust piece -T40145-

♦ Support bridge, commercially available, e.g. KUKKO 22-1

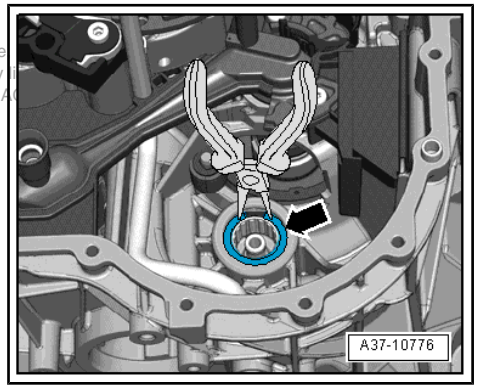


♦ Inner puller, commercially available, e.g. SCHREM 20 ... 29.5

Removing

– Remove chain and pulley set "I" ⇒ page 91 .

– Remove suction-jet pump ⇒ page 120 .



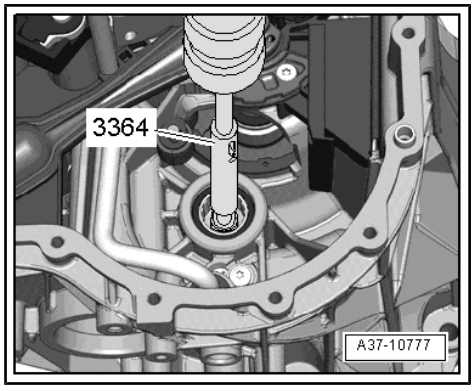
Note

The suction-jet pump must be removed to prevent it from being damaged when heating the gearbox housing.

– Remove circlip -arrow-.

– Attach valve stem seal puller -3364- to oil pipe, as shown in illustration.

– If necessary, carefully tap puller onto oil pipe using a plastic hammer.

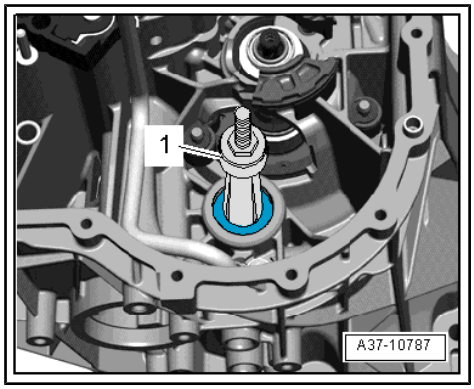


Note

The claws of the valve stem seal puller -3364- cannot be closed completely.

– Carefully pull out oil pipe using valve stem seal puller -3364- .

– Introduce inner puller, commercially available, e.g. SCHREM 20 ... 29.5 -item 1- into bearing "C" and tighten.

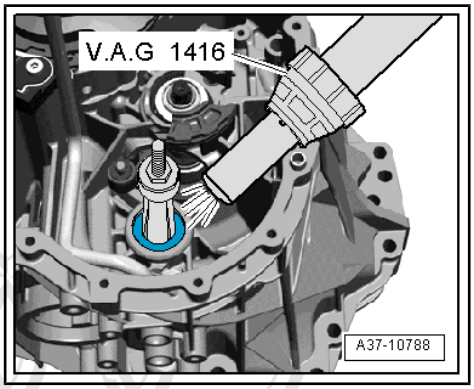


WARNING

Risk of burns!

- *Wear protective gloves.*

– Heat area of gearbox housing around bearing “C” for pulley set “I” to approx. 180 °C using hot air blower -V.A.G 1416- .

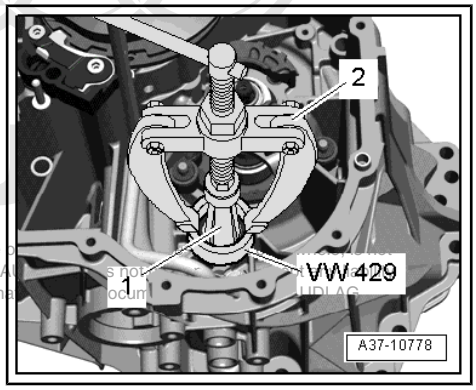


– Place thrust ring -VW 429- onto gearbox housing and align centrally around bearing “C” for pulley set “I”.

– Secure support bridge, commercially available, e.g. KUKKO 22-1 -item 2- to inner puller, commercially available, e.g. SCHREM 20 ... 29.5 -item 1- and support against thrust ring -VW 429- .

– Use chilling spray or similar to cool bearing “C” for pulley set “I” at several points.

– Pull bearing “C” for pulley set “I” out of gearbox housing in a straight line using support bridge, commercially available, e.g. KUKKO 22-1.



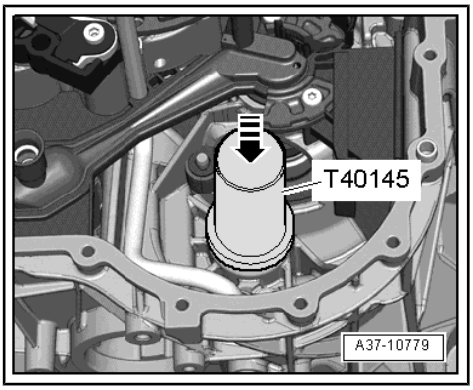
Installing

Caution

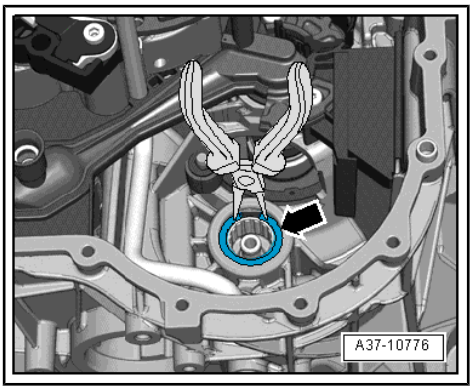
Assess wear on bearing “C” *⇒ page 144* *.*

– Carefully drive in bearing “C” for pulley set “I” -arrow- as far as stop using thrust piece -T40145- .

- Installation position: flat, smooth side with inscription faces upwards towards thrust piece.



– Insert circlip -arrow-.

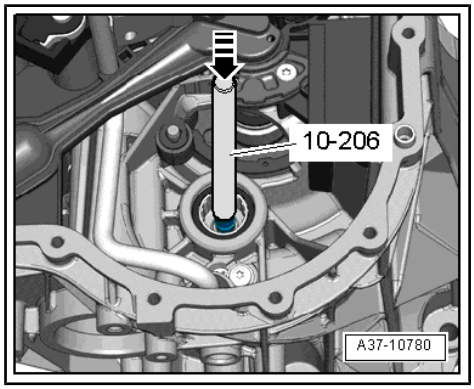


– Carefully drive in oil pipe -arrow- as far as stop using drift -10 - 206- .

• Collar of oil pipe must make contact with gearbox housing all around its circumference.

– Install suction-jet pump ⇒ page 120 .

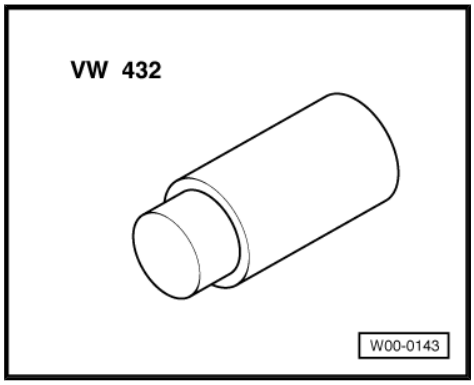
– Install chain and pulley set “I” ⇒ page 91 .



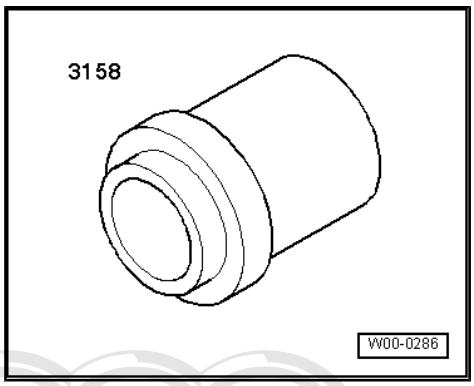
5.4 Renewing bearings “D” and “E” for pulley set “I”

Special tools and workshop equipment required

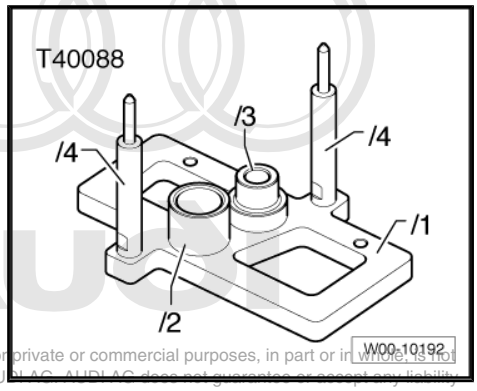
♦ Press tool -VW 432-



♦ Drift sleeve -3158-



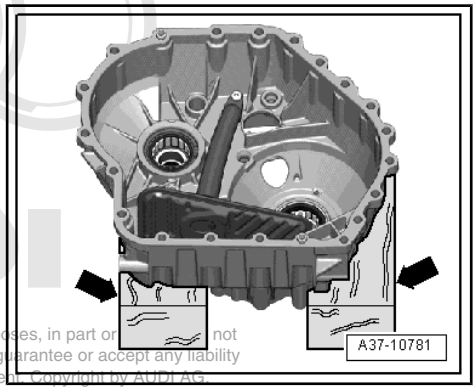
♦ Sleeve -T40088/2- from assembly tool -T40088-



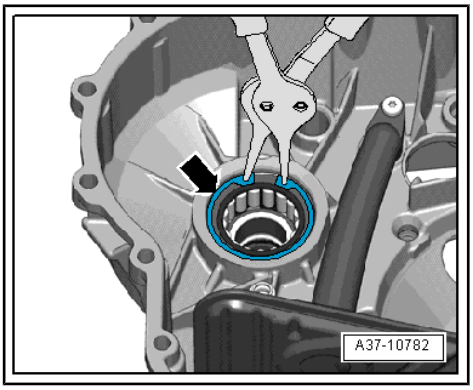
Removing

- Intermediate housing removed ⇒ page 89

– Set down the intermediate housing on two wooden blocks -arrows- to avoid damaging the selector shaft and sealing surface.

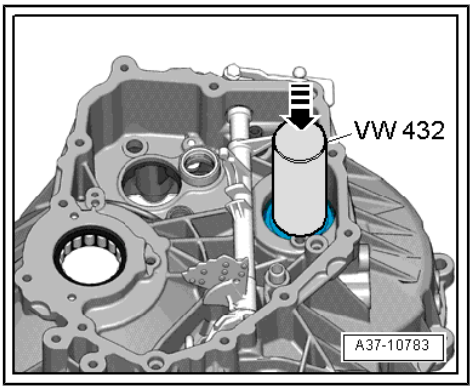


– Remove circlip -arrow-.



– Turn intermediate housing over.

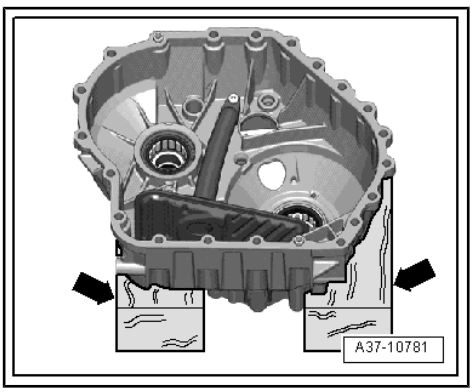
– Drive out bearings “D” and “E” for pulley set “I” in direction of -arrow- using thrust piece -VW 432- .



Installing

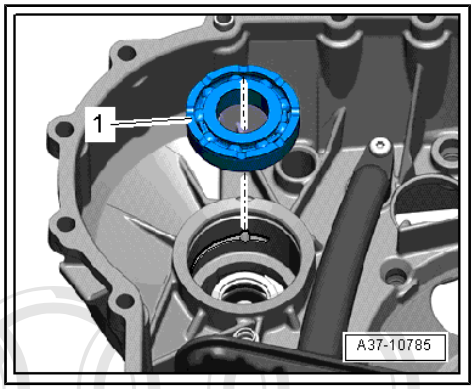
– Set down the intermediate housing on two wooden blocks -arrows- to avoid damaging the selector shaft and sealing surface.

- The bearing “E” must always be replaced following removal

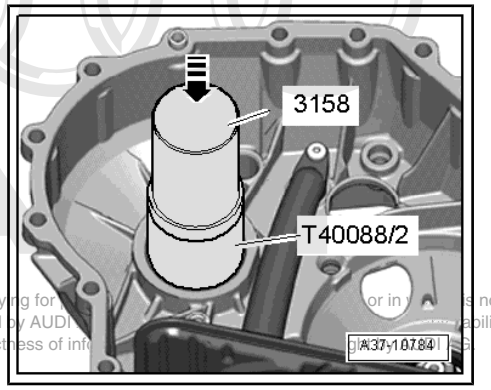


– Fit new bearing “E” (ball bearing for pulley set “I”) -item 1- in intermediate housing.

• Oil grooves in outer bearing race face upwards.

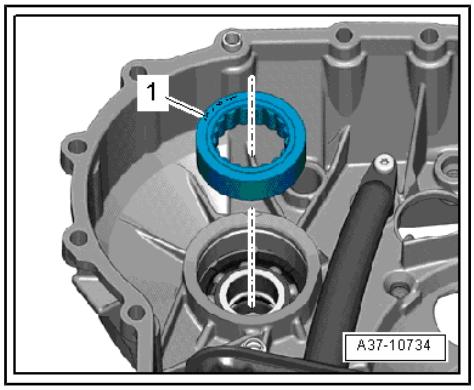


– Drive in bearing “E” (ball bearing for pulley set “I”) in direction of -arrow- as far as stop using -T40088/2- from assembly tool -T40088- and drift sleeve -3158- .



– Fit new bearing “D” (roller bearing for pulley set “I”) -item 1- in intermediate housing.

• Installation position: side with inscription faces upwards.

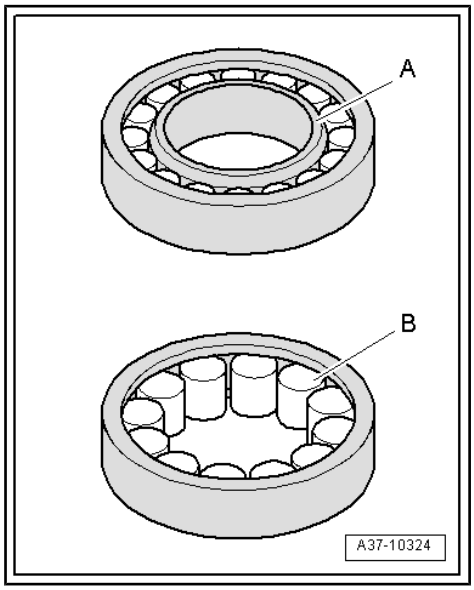


Note

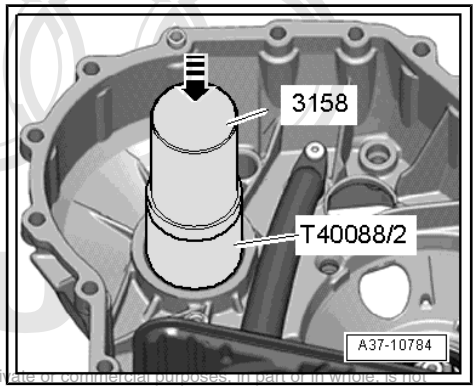
Different bearings are fitted, depending on the version:

A - Bearing “D” with inner race

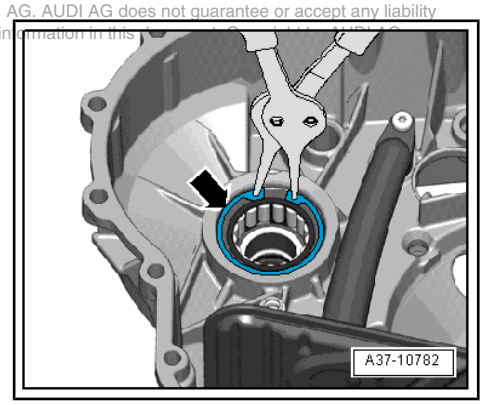
B - Bearing “D” without inner race



– Drive in bearing “D” (roller bearing for pulley set “I”) in direction of -arrow- as far as stop using -T40088/2- from assembly tool -T40088- and drift sleeve -3158- .



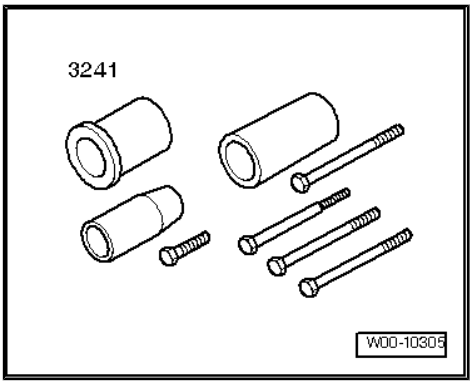
– Fit circlip -arrow- (press home if necessary).



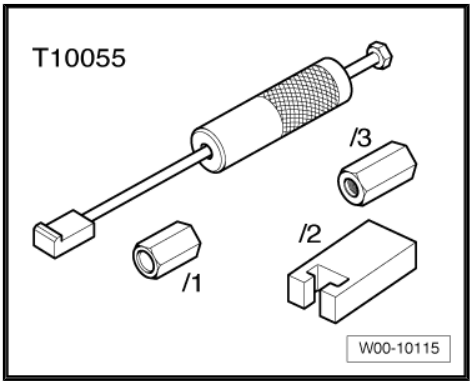
5.5 Removing and installing ATF filter

Special tools and workshop equipment required

♦ Fitting sleeves -3241-



♦ Puller -T10055-



♦ Press tool -T40131-

♦ Puller -T40132-

Removing

Proceed as follows:

– Remove gearbox ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37 .

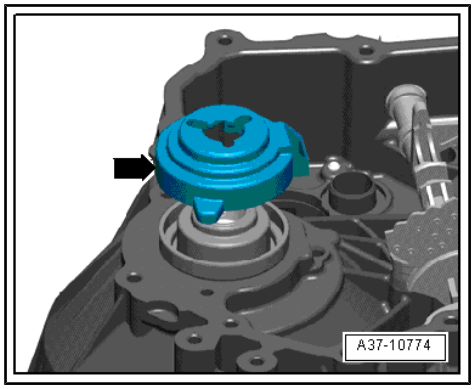
– Mount gearbox on assembly stand ⇒ page 14 .

– Remove end cover ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 38 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 38 .

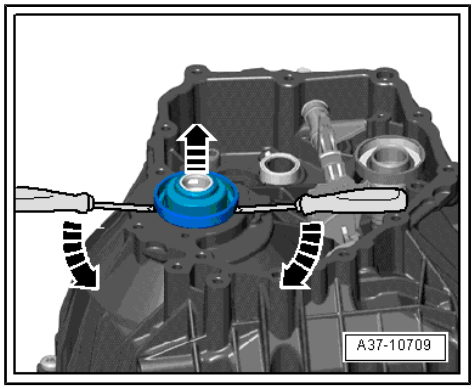
– Remove automatic gearbox control unit -J217- ⇒ page 23 .

– Remove hydraulic control unit ⇒ page 27 .

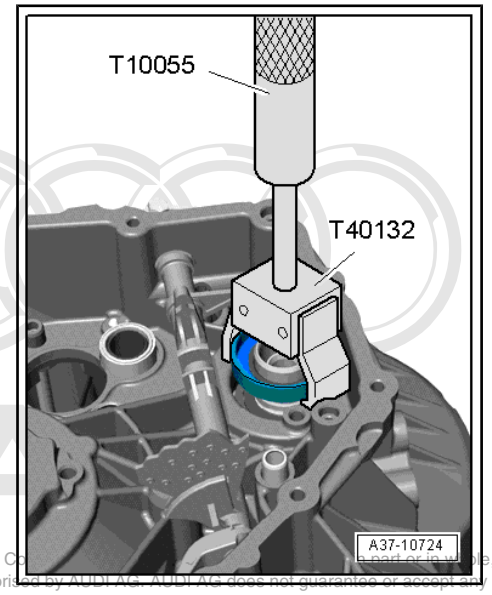
– Remove cover -arrow- from sender wheel “II”.



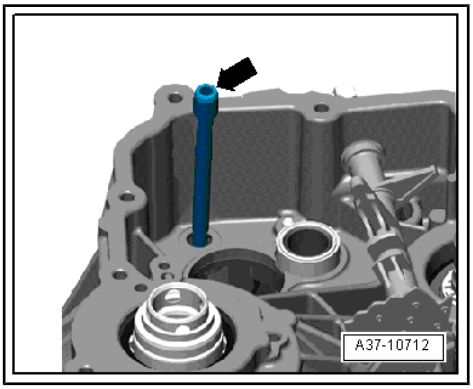
– Use 2 screwdrivers to lever off sender wheel “II” -arrows-.



– Use puller -T40132- and puller -T10055- to remove sender wheel “I”.



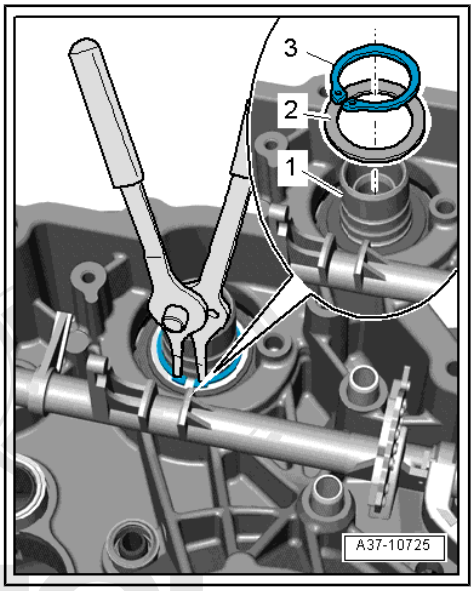
– Lift out oil pipe -arrow- by hand.



Note

Do not use a tool to avoid damaging the sealing surfaces.

– Remove circlip -3- from shaft -item 1- for pulley set “I”.
– Mark and remove shim -2-.

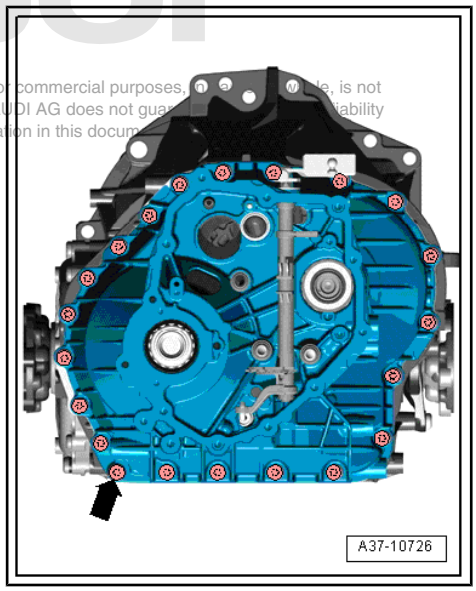


Caution

There is a risk that parts may be interchanged.

- *Make sure not to interchange thrust washer ⇒ Item 13 (page 90) and shim -2- underneath circlip -3-.*
- *Attach shim -2- to circlip -3- by means of a cable tie to prevent the parts from being interchanged.*

– Remove bolts for intermediate housing; note different lengths and mark installation position of bolts if necessary.
– Detach intermediate housing.



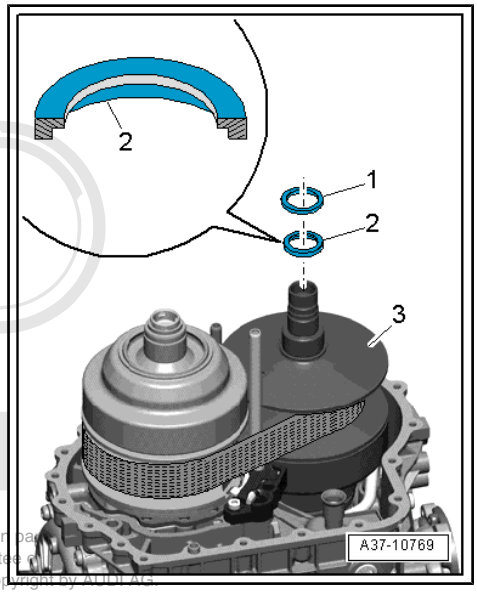
Note

- *Thrust washer -1- remains on pulley set "I" -item 3-.*
- *Spacer -2- (only installed on certain versions) also remains on pulley set "I" -item 3-.*

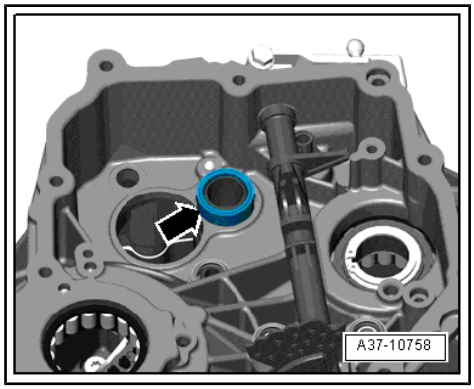
Caution

There is a risk that parts may be interchanged.

- ***Make sure not to interchange thrust washer -1- and shim ⇒ Item 12 (page 90) underneath circlip.***

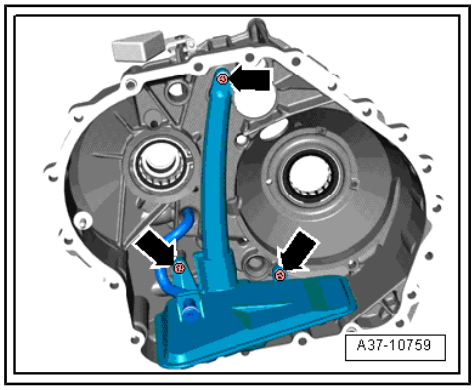


– Remove axial sealing element -arrow- for ATF filter from intermediate housing.



– Turn intermediate housing over.

– Remove bolts -arrows- and detach ATF filter together with oil pipe.

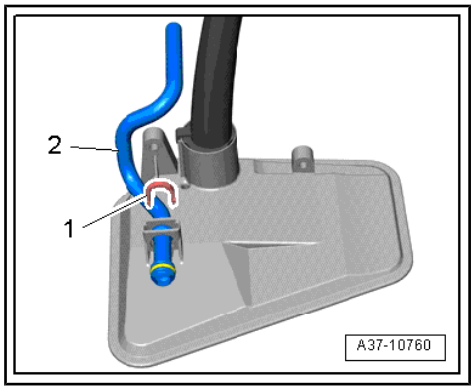


– Unclip retaining clip -1- and guide oil pipe -2- out of filter housing.

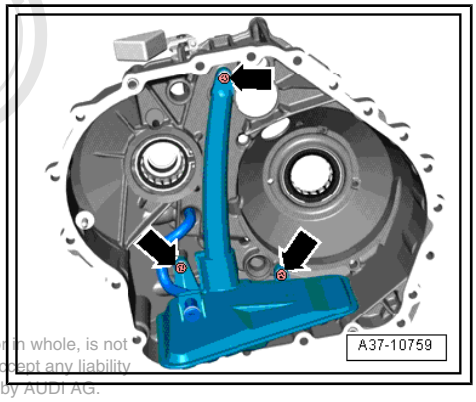
Installing

- Tightening torques ⇒ page 89

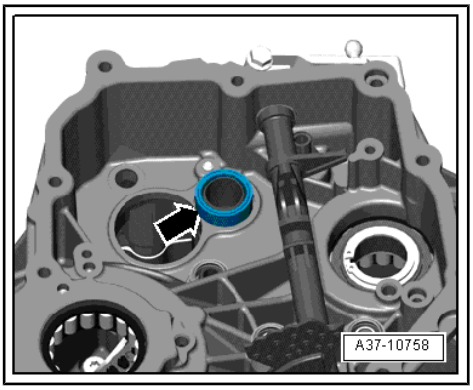
– Insert oil pipe -2- into filter housing, as shown in illustration, and secure with retaining clip -1-.



– Secure ATF filter together with oil pipe -arrows-.



– Turn intermediate housing over.
– Fit axial sealing element -arrow- for ATF filter.

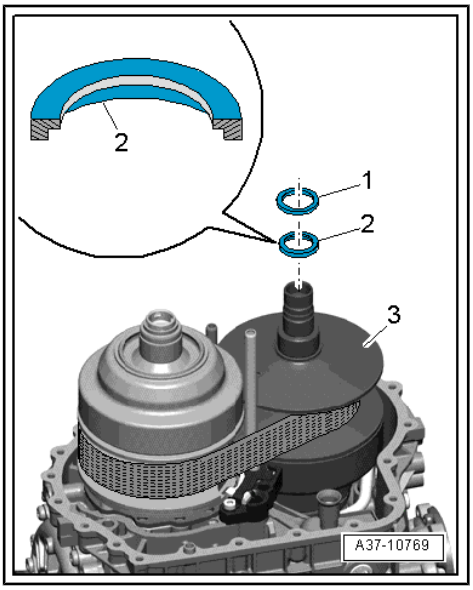


– Check that thrust washer -1- and spacer -2- (only installed on certain versions) are fitted on pulley set “I” -item 3-. Note installation position.

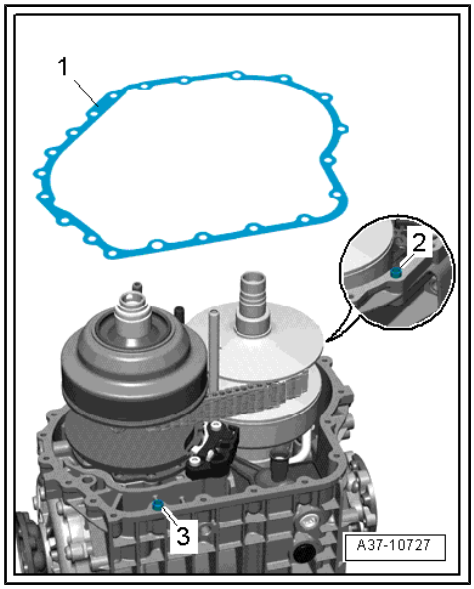
Caution

There is a risk that parts may be interchanged.

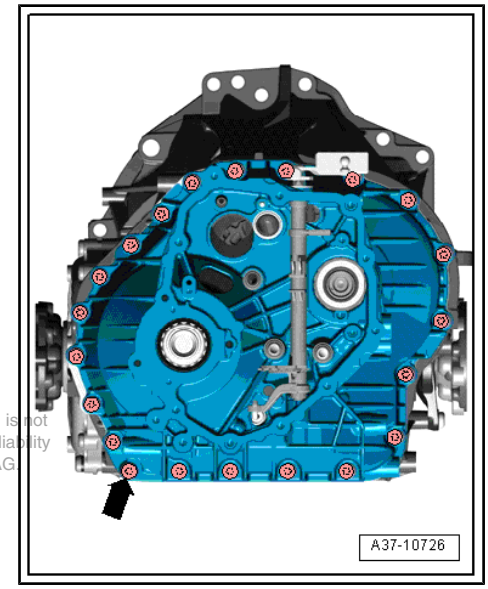
- *Make sure not to interchange thrust washer -1- and shim ⇒ Item 12 (page 90) underneath circlip.*



– Fit gasket -1- for intermediate housing.
– Check that dowel sleeves -2 and 3- are fitted and insert if necessary.



– Fit intermediate housing.
– Screw in bolts -arrow- for intermediate housing and tighten diagonally in stages.
• The bolts can have different lengths, depending on the version.

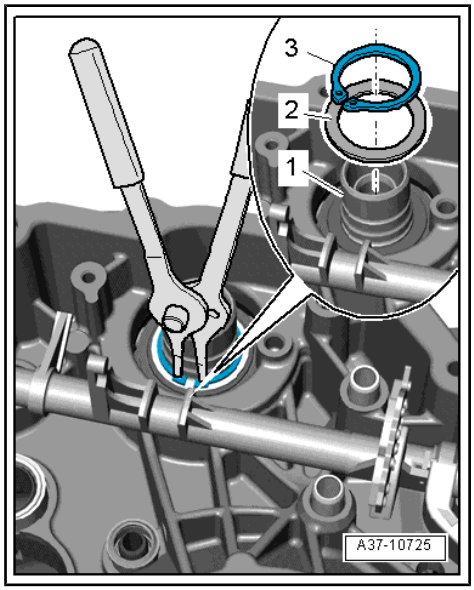


– Turn gearbox housing on assembly stand so that pulley set “I” rests against intermediate housing under its own weight.

Note

This allows the circlip -3- to be inserted in the groove on the shaft and ensures that the bearing is not damaged when the sender wheel “I” is subsequently fitted.

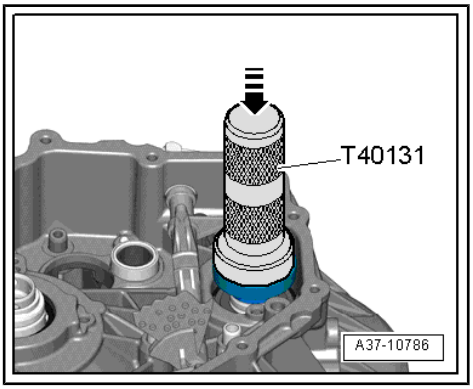
– Fit marked shim -2- onto shaft for pulley set “I” -item 1-.
– Insert new circlip -3- into groove on shaft for pulley set and press home.
• Note installation position: the drillings in the eyes of the circlip are tapered. The smaller side faces upwards.
• The circlip must be properly seated in the base of the groove.



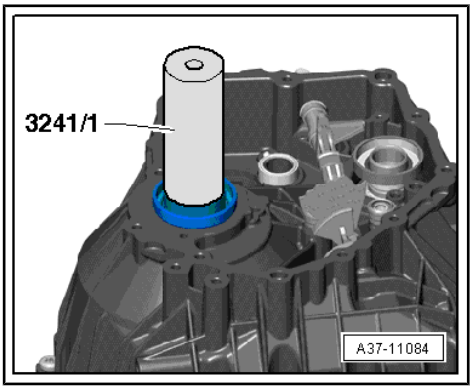
Note

The following illustration is shown with the intermediate housing on top, contrary to the true gearbox position.

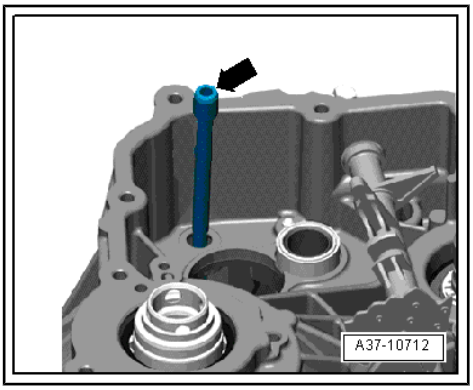
– Using a rubber-headed hammer, carefully knock sender wheel “I” with press tool -T40131- -arrow- all the way onto shaft.



– Pull the assembly aid -3241/2- out of the fitting sleeve -3241/1- .
– Using a rubber-headed hammer, carefully knock home the new sender wheel “II” with the fitting sleeve -3241/1- .
– Turn gearbox on assembly stand so that intermediate housing is facing upwards again.



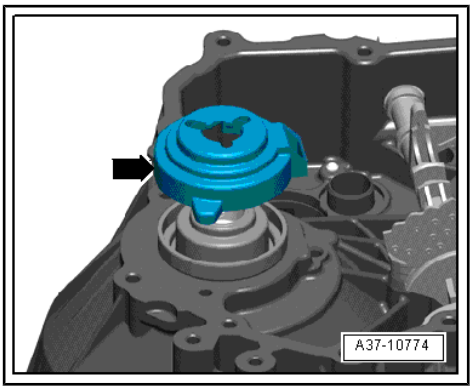
– Insert oil pipe -arrow- by hand.



Note

Do not use a tool to avoid damaging the sealing surfaces.

– Fit cover -arrow- on sender wheel “II”.
– Install hydraulic control unit ⇒ page 27 .
– Install automatic gearbox control unit -J217- ⇒ page 23 .
– Install end cover ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 38 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 38 .
– Install gearbox ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37 .

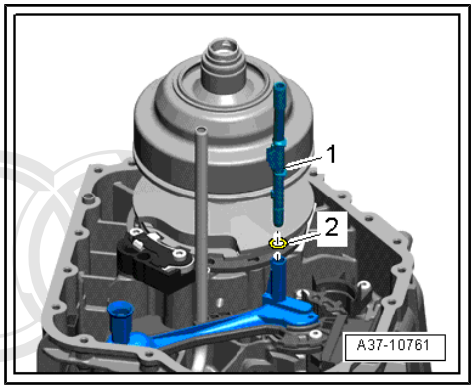


5.6 Removing and installing suction-jet pump

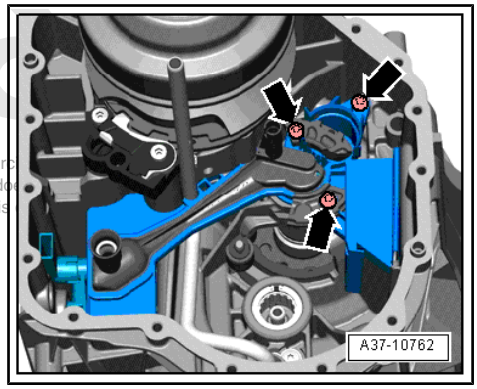
Removing

Proceed as follows:

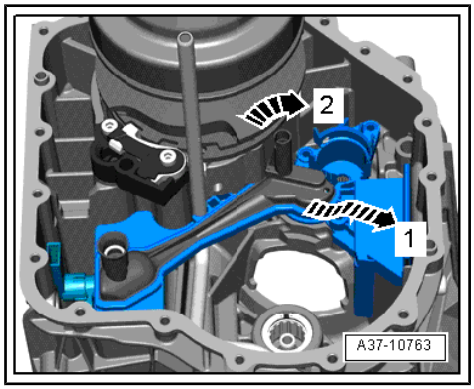
– Remove input shaft ⇒ page 34 .
– Remove chain and pulley set “I” ⇒ page 91 .
– Pull off oil pipe -1-.
– Remove O-ring -2- from oil pipe.



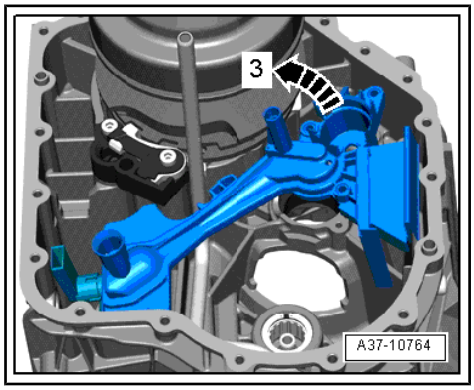
– Remove bolts -arrows-.



– Pull suction-jet pump out of guide and then pull slightly to the side -arrow 1-.
– Tilt suction-jet pump out of retainer -arrow 2-.



– Lift out suction-jet pump -arrow 3-.



Installing

• Tightening torques ⇒ page 89

Perform installation in reverse sequence of removal.

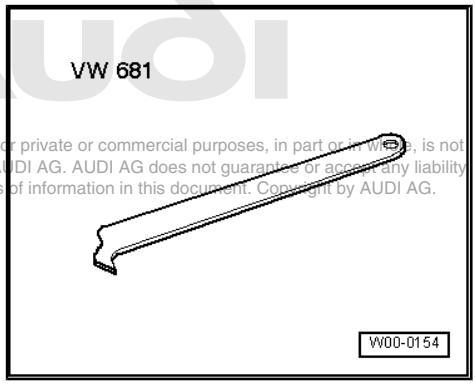
39 – Final drive - differential

1 Servicing front final drive

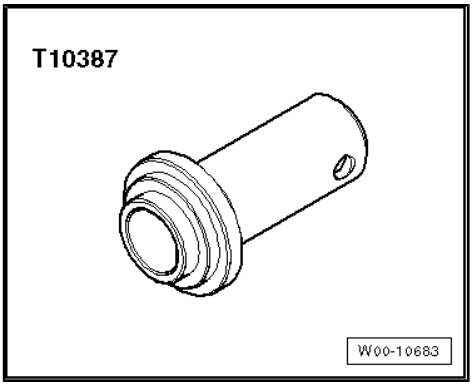
1.1 Renewing oil seal for flange shaft (left-side)

Special tools and workshop equipment required

- Oil seal extractor lever -VW 681-



- Thrust piece -T10387-

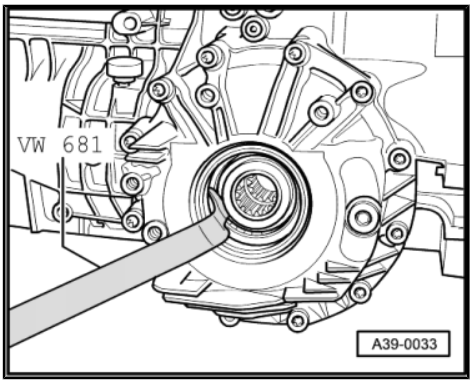


Procedure

- Gearbox installed

– Remove flange shaft (left-side) ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .

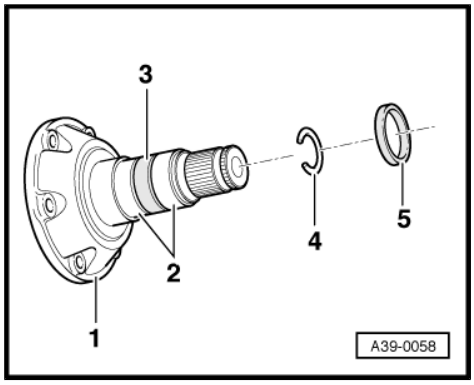
– Pull out flange shaft oil seal using oil seal extractor lever -VW 681- .



Note

Take care not to damage area on seat of oil seal.

Assembling flange shaft with polygon bearing



1 - Flange shaft
2 - Needle bearing (polygon bearing)
3 - Spacer ring
4 - Circlip
5 - Not fitted

Note

- *Uneven running of the polygon bearings with the flange shaft not fitted is not a sign of a problem with the bearings. A test for noisy bearings can only be performed with the bearings installed.*
- *Inspect for signs of damage to polygon bearings (such as cracking in outer race).*
- *Renew flange shaft if polygon bearings are damaged*

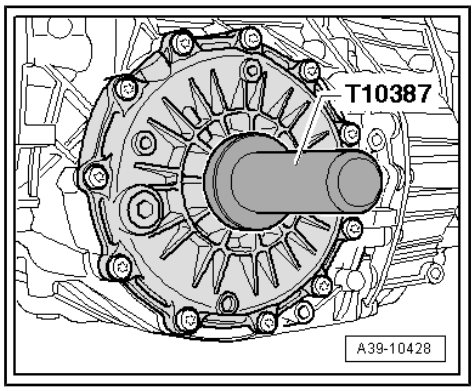
– Lightly lubricate outer circumference and sealing lip of oil seal with gear oil.

• Installation position: open side of oil seal points towards gearbox

Note

Take care to keep the oil seal straight when driving in.

– Use the thrust piece -T10387- to evenly drive in the new oil seal for the left flange shaft as far as the thrust piece will go.



Note

- *Standard driving-in depth: 5.5 mm beneath the surface of the cover*
- *Repair driving-in depth 6.5 mm (when using the thrust piece -T10387-) so that the new oil seal does not provide a seal on the old contact surface of the old flange shaft.*

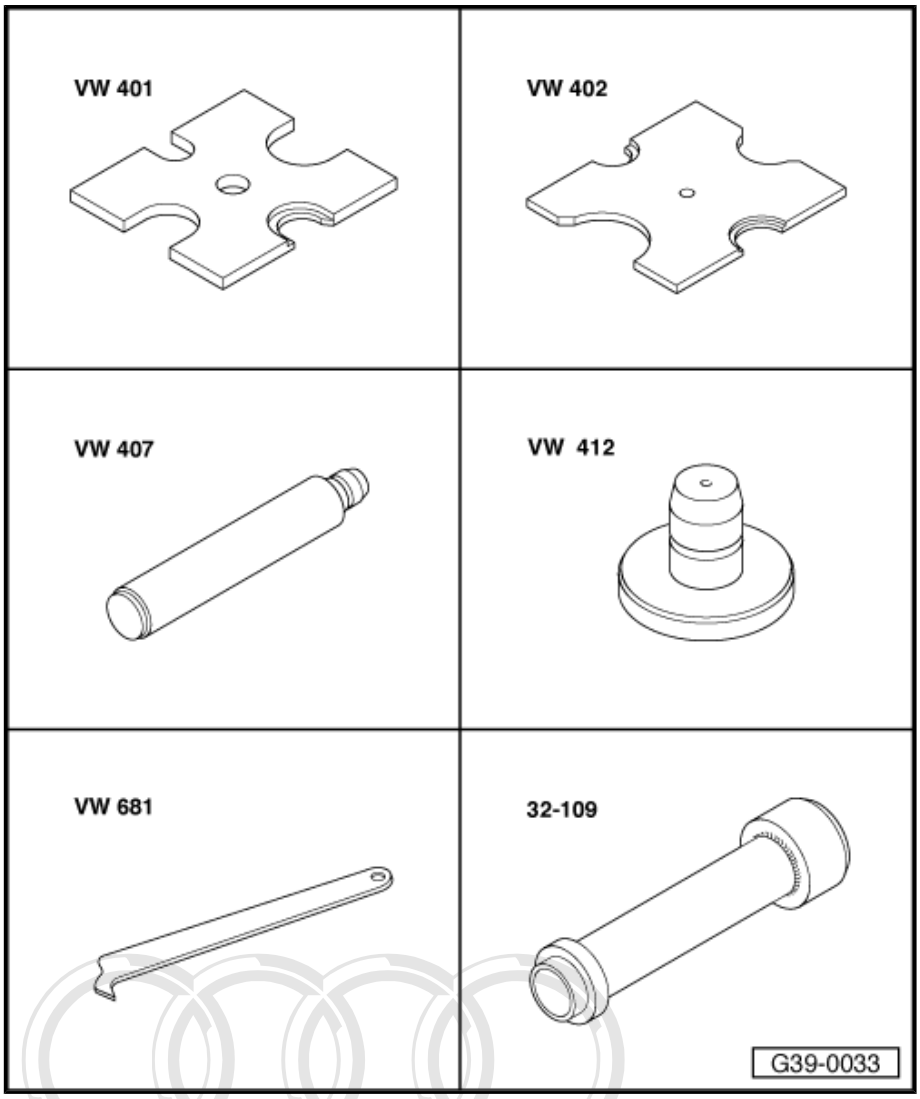
– Install flange shaft (left-side) ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .

– Check gear oil in front final drive ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .

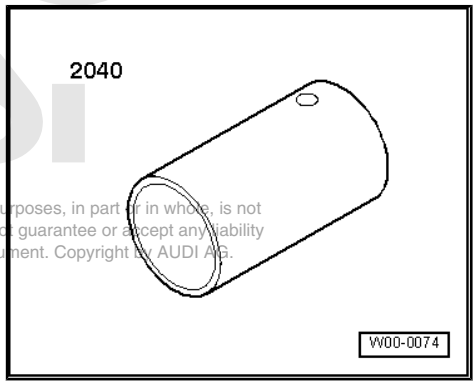
1.2 Renewing oil seal for flange shaft (right-side) and bearing “J”

Special tools and workshop equipment required

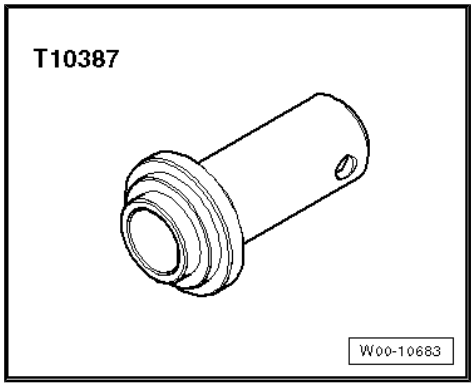
- Thrust plate -VW 401-
- Thrust plate -VW 402-
- Press tool -VW 407-
- Press tool -VW 412-
- Oil seal extractor lever -VW 681-
- Tube -32 - 109-



- Tube -2040-



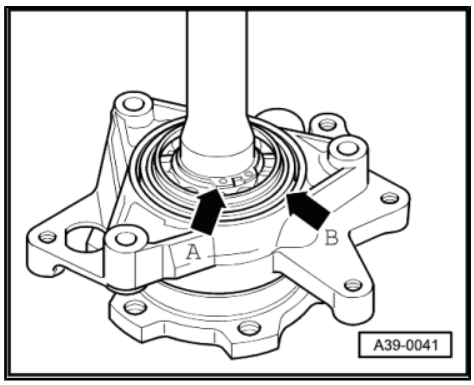
♦ Thrust piece -T10387-



Procedure

– Remove flange shaft (right-side) ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .

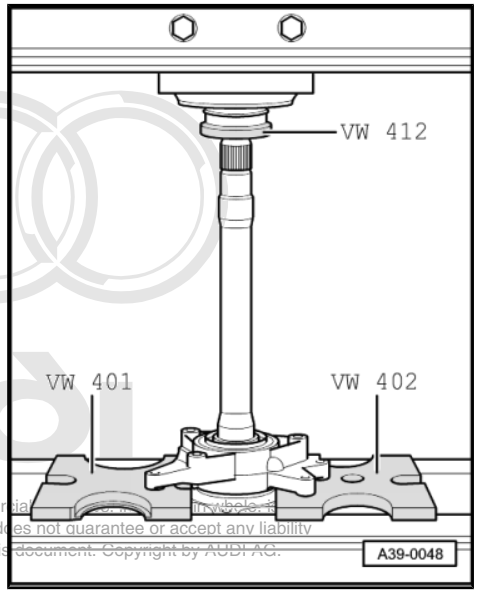
– Remove circlip -arrow A- for ball bearing.



Removing oil seal

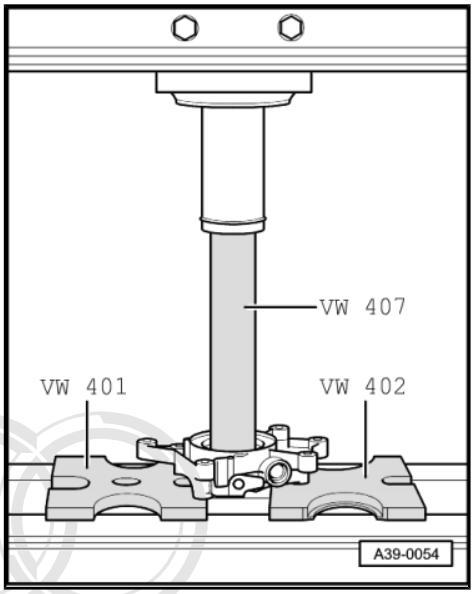
– Press flange shaft out of bearing bracket for flange shaft, as shown in illustration.

– Pull flange shaft oil seal out of bearing bracket using oil seal extractor lever -VW 681- .



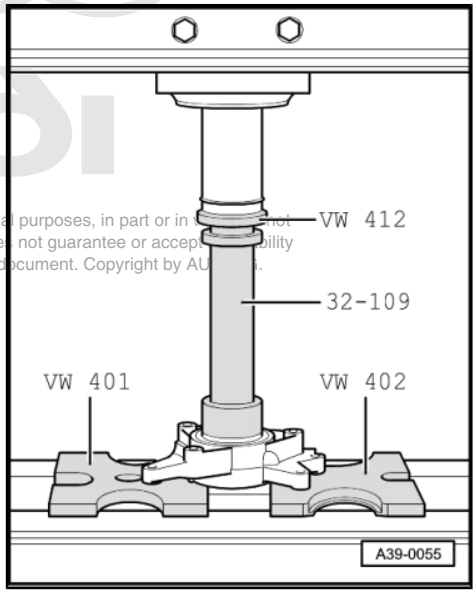
Removing bearing “J” (ball bearing for right flange shaft)

– Press ball bearing out of bearing bracket.



Installing bearing “J” (ball bearing for right flange shaft)

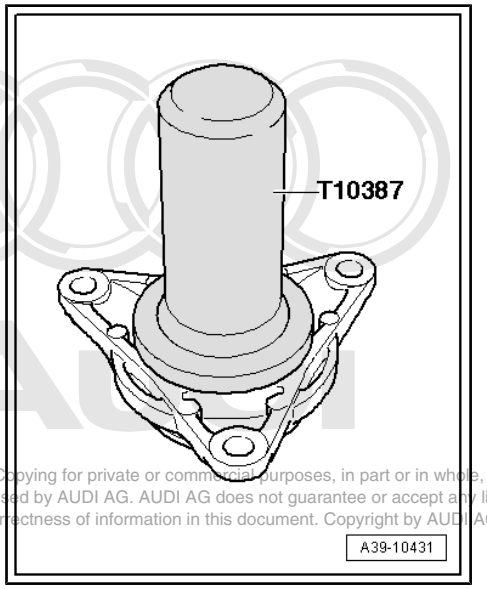
– Press new ball bearing into bearing bracket.



Installing oil seal

– Lightly lubricate outer circumference and sealing lip of oil seal with gear oil.

• Installation position: open side of oil seal points towards gearbox



Note

Take care to keep the oil seal straight when driving in.

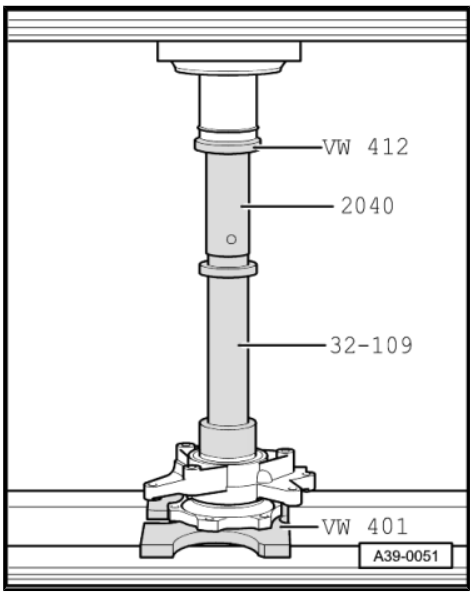
– Use the thrust piece -T10387- to evenly drive in the new oil seal for the right flange shaft as far as the thrust piece will go.

Note

♦ *Standard driving-in depth: 5.5 mm beneath the surface of the cover*

♦ *Repair driving-in depth 6.5 mm (when using the thrust piece -T10387-) so that the new oil seal does not provide a seal on the old contact surface of the old flange shaft.*

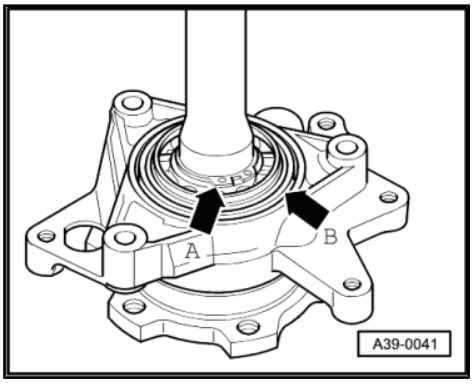
– Press bearing bracket with ball bearing onto flange shaft.



– Insert circlip -arrow A-.

– Install flange shaft (right-side) ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .

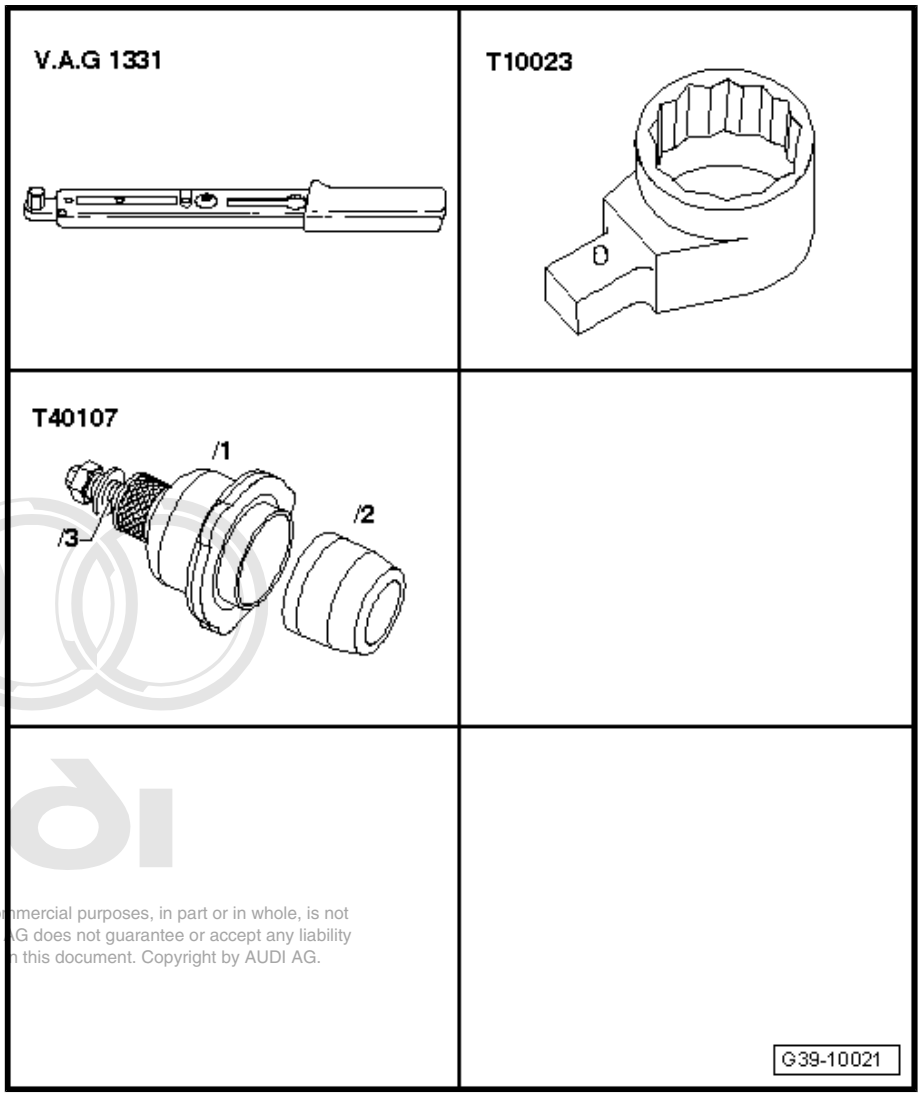
– Check gear oil in front final drive ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .



1.3 Replacing oil seal for pinion shaft

Special tools and workshop equipment required

- Torque wrench -V.A.G 1331-
- Insert tool -T10023-
- Removal and assembly tool -T40107-
- Assembly lever
- Cleaning fluid -D 009 401 04-



Removing

- The pinion shaft oil seal can be replaced with the gearbox in position.

– Drain off ATF ⇒ page 8 .

– Remove differential ⇒ page 137 .

– Remove flange shaft (right-side) ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .

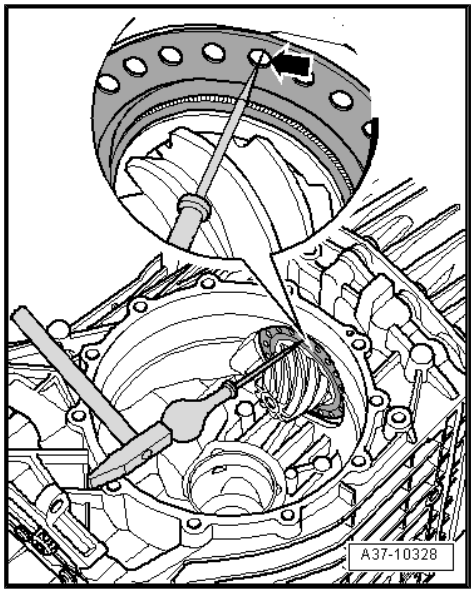
Note

Flange shaft (right-side) does not have to be removed completely if not readily accessible on the vehicle. In this case, it is sufficient to pull it slightly out of the gearbox housing until there is enough room to remove and install the oil seal.

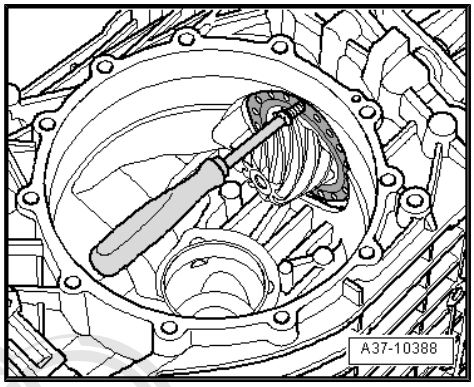
Caution

- *When performing the following operations, the surface of the pinion shaft must not be allowed to come into contact with hard objects. Freedom from leaks can no longer be achieved in the event of even minute scratches or damage at the sealing surface of the pinion shaft and the entire gearbox must be replaced.*

– Position an awl at one of the holes in the side of the pinion shaft oil seal and make a small hole -arrow- for fitting a self-tapping screw in the oil seal.



– Screw a self-tapping screw with a large head into the hole in the oil seal.



– Make a notch -arrow- in the centre of a sturdy assembly lever -1- to hold the self-tapping screw.

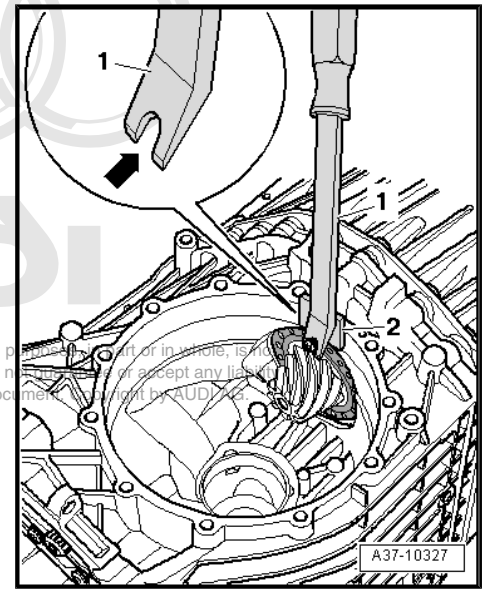
– Apply the assembly lever to the self-tapping screw.

Caution

For protection, insert a suitable piece of wood or plastic -2- between the assembly lever and gearbox housing.

- *Take care not to damage the housing.*

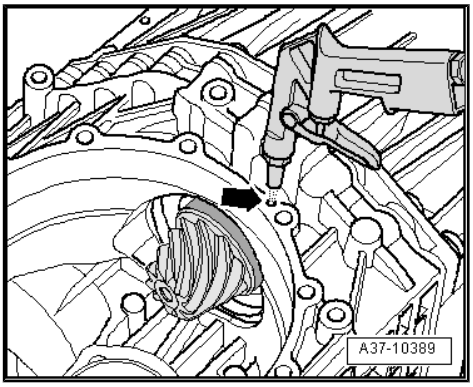
– Pull out the oil seal.



Installing

– Assess the pinion shaft for wear ⇒ page 146 .

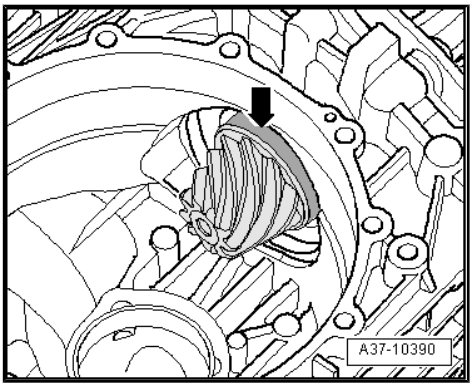
– Use compressed air to clean breather passage -arrow-. When doing so, place a cloth on inside of breather passage.



– Clean the sealing surface -arrow- of the pinion shaft with cleaning fluid -D 009 401 04- and a soft cloth whilst turning the pinion shaft.

• The selector lever on the gearbox must not be in position “P”.

– Remove stubborn deposits with finger nail; never use tools.



Caution

- *The pinion shaft is never to be cleaned mechanically with tools or polishing paste. Freedom from leaks can no longer be achieved in the event of even minute scratches or damage at the sealing surface of the pinion shaft and the entire gearbox must be replaced.*

– Lightly lubricate outer circumference of oil seal with ATF.

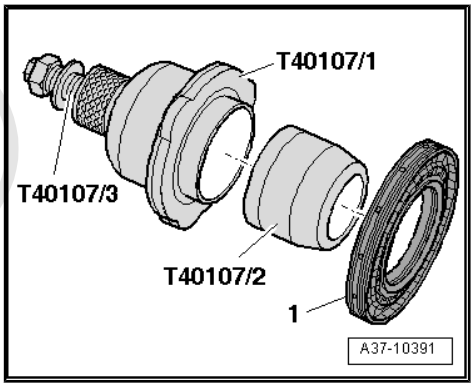
– Check assembly aid -T40107/2- for cracks or burrs. Do not use assembly aid if damaged.

– Attach assembly aid -T40107/2- to thrust sleeve -T40107/1- and slip oil seal -1- onto thrust sleeve.

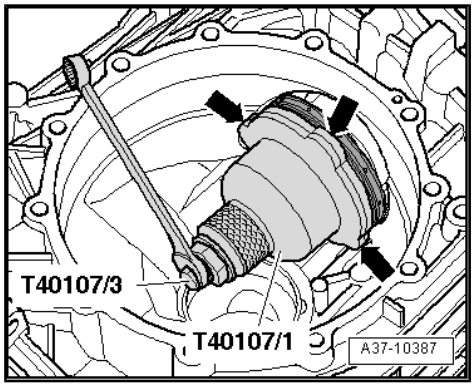
• Closed side of oil seal faces tool.

– Detach assembly aid -T40107/2- .

– Position the thrust sleeve -T40107/1- with the oil seal -1- on the pinion shaft.



– Set the selector lever on the gearbox to position “P” (completely to rear).
– Turn nut on spindle -T40107/3- all the way back.
– Use an open-ended wrench to screw in the spindle -T40107/3- as far as it will go.

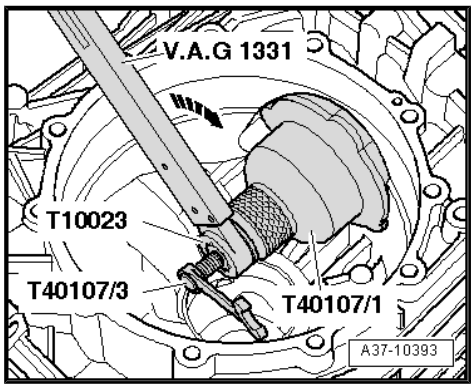


Note

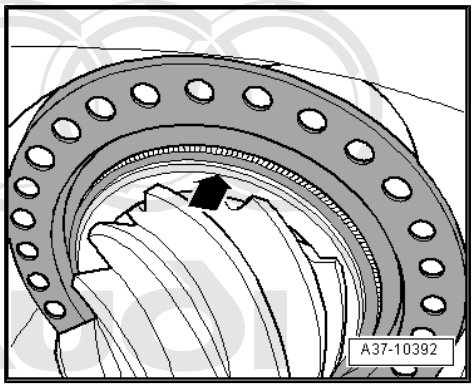
This positions the spindle firmly against the pinion shaft.

– Move thrust sleeve -T40107/1- to correct position.
• Lugs -arrows- on outer edge of thrust sleeve must engage in recesses on gearbox housing.

– Press oil seal with thrust sleeve into gearbox housing. To do so, tighten nut with torque wrench -V.A.G 1331- and insert tool -T10023- to 17 Nm.
• The oil seal must now be allowed to settle for 2 minutes.
– After waiting 2 minutes, unscrew nut and detach thrust sleeve in direction of travel.



– Check that the outwardly visible sealing lip of the oil seal is resting on the cylindrical sealing surface of the pinion shaft and not on the chamfer -arrow-. Press in the oil seal further if necessary.
– Install flange shaft (right-side) ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .
– Fit the differential and the cover for the front final drive ⇒ page 137 .

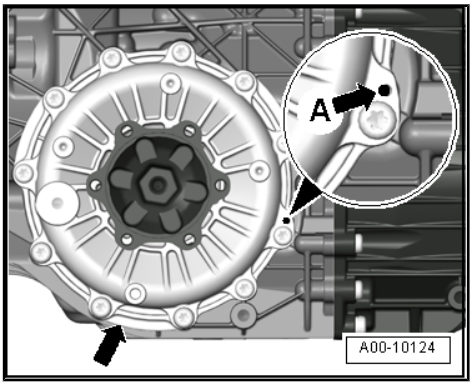


Note

♦ *When gearbox is removed:*
♦ *As it will be necessary to road-test the vehicle, the gearbox must be re-installed for the leak check ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 37 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 37 .*

– Fill up with ATF ⇒ page 9 .

– Perform an extensive road test and then check for freedom from leaks at the breather hole -arrow A- at the cover for the front final drive.



Note

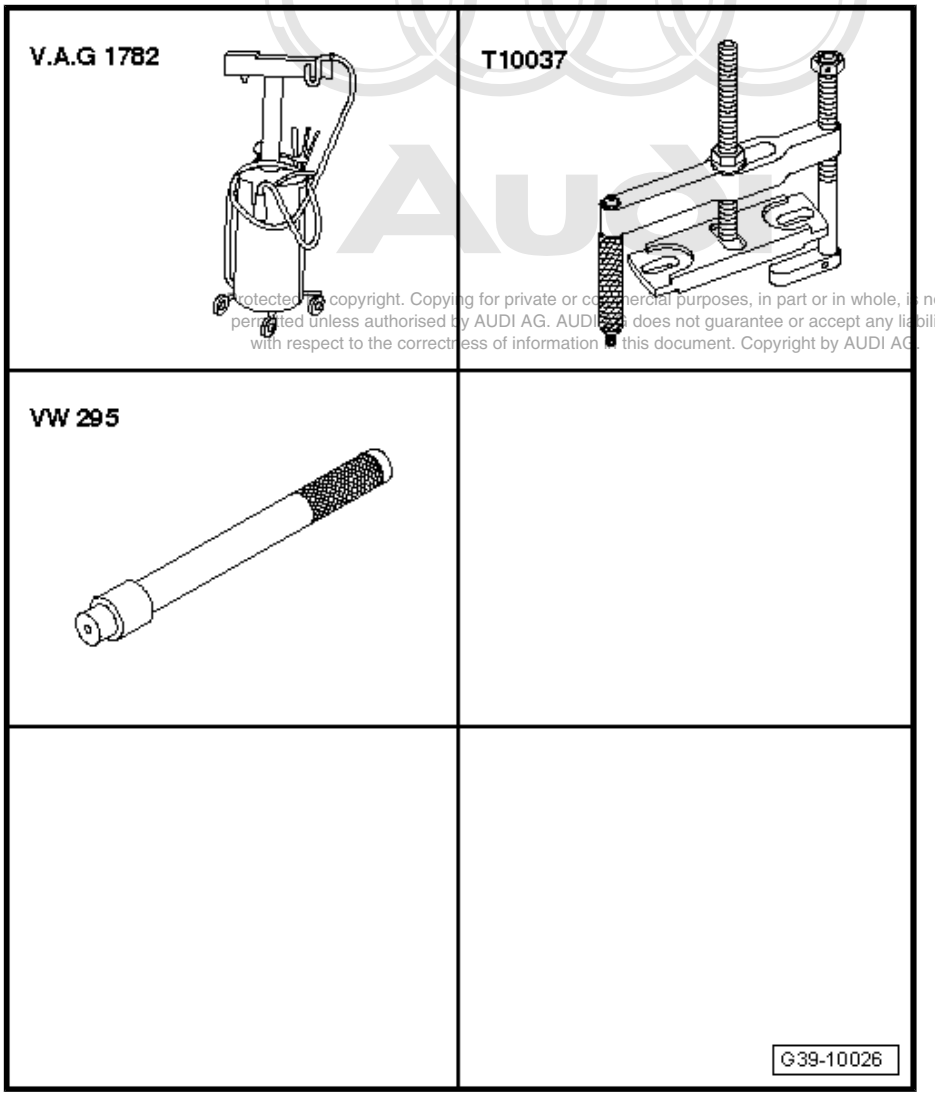
- *On some gearboxes, the breather hole is covered by a guard plate.*
- *On new front final drive covers, the breather hole has been moved to the bottom screw -arrow- (internal oil duct). Leakage is then only visible at the bottom at the cover for the front final drive.*

• Repair work must be repeated if oil emerges at breather hole.

1.4 Removing and installing left flange shaft

Special tools and workshop equipment required

- Used oil collection and extraction unit -V.A.G 1782-
- Puller -T10037-
- Drift -VW 295-



Removing

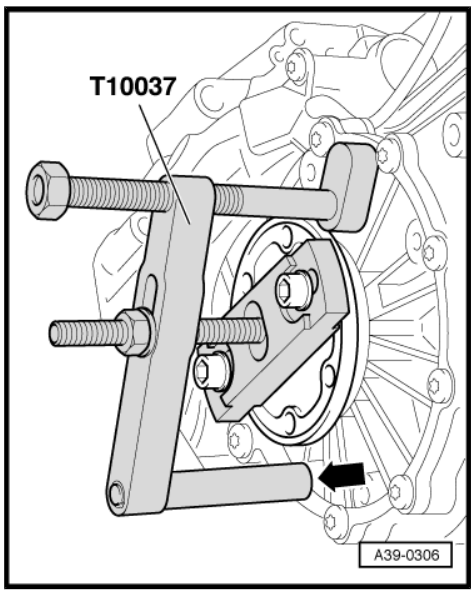
Note

- *Removing and installing left flange shaft with gearbox in position ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 or ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .*
- *Heed the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on automatic gearbox ⇒ page 4 .*

- Gearbox removed and mounted on assembly stand ⇒ page 14 .

– Place the used oil collection and extraction unit -V.A.G 1782- under the gearbox.

– Screw on the lower support of the puller -T10037- at the cover for the front final drive -arrow-.



Note

In order to prevent damage to the needle bearings (polygon bearings) or the differential during removal, the flange shaft must be kept straight when removing (pull out evenly).

– Remove flange shaft (left-side) using puller -T10037- .

Installing

Install in reverse order, paying attention to the following:

- Circlip for flange shaft must always be renewed.

– Clamp the flange shaft in a vice with soft jaws and replace the flange shaft circlip.

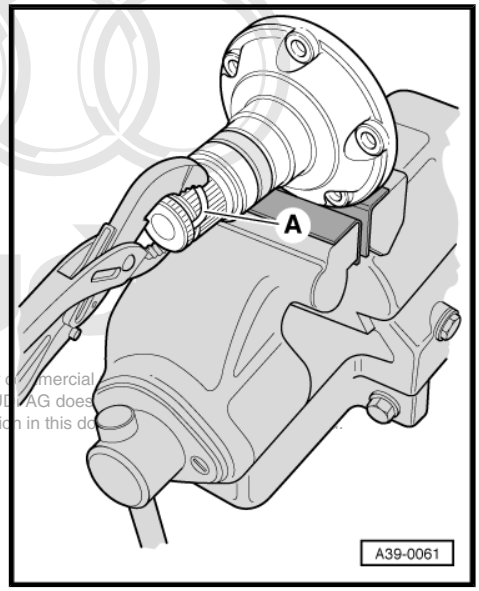
– Use the new circlip -A- to press the old circlip out of the flange shaft groove.

– Clean the flange shaft.

– Check the oil seal for the left flange shaft and replace if necessary ⇒ page 121 .

– Use the drift -VW 295- to drive in the flange shaft.

– Check the gear oil level in the front final drive ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 or ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .



Caution

Risk of damaging the gearbox.

Depending on the design status, the multitronic 01J and 0AN gearboxes require different gear oils. Use is only to be made of the corresponding replacement gear oil in the front final drive ⇒ Electronic parts catalogue .

1.5 Removing and installing cover for front final drive

Removing

Note

- *Removing and installing cover for front final drive with gearbox installed ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39*
- *Observe the general repair instructions ⇒ page 1 .*
- *Rules for cleanliness when working on the automatic gearbox ⇒ page 4 .*

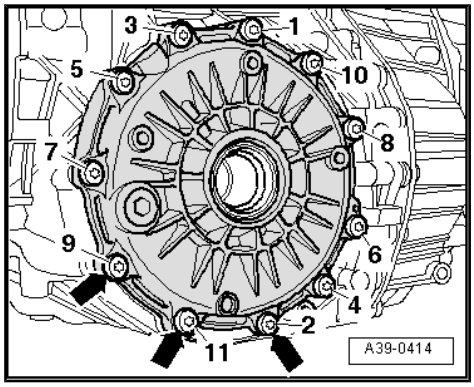
– Remove the left flange shaft ⇒ page 131 .

– Use new circlip -A- to press old circlip out of groove in flange shaft.

Caution

Make sure that flange shaft (right-side) is installed before removing cover for front final drive. Otherwise the differential may fall out of the gearbox housing.

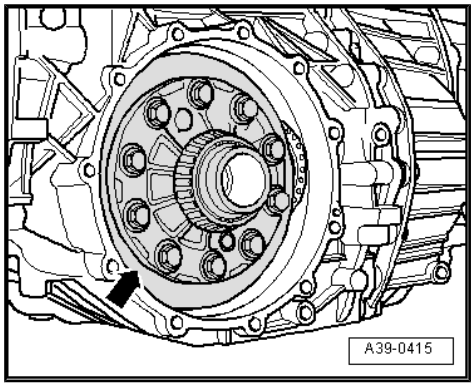
– Unscrew bolts for front final drive cover in sequence -11 ... 1-.



Caution

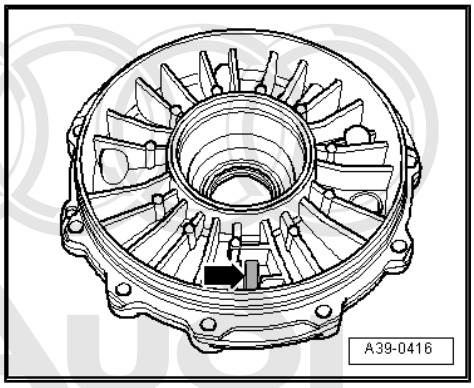
- *Detach cover for front final drive slowly and carefully from gearbox housing. The differential may otherwise fall out of the gearbox.*
- *A differential which has fallen to the ground can no longer be installed. Renew gearbox if differential has fallen to the ground.*
- *Make sure that the bearing races and shims for the differential do not drop out of the gearbox housing and the front final drive cover.*
- *Bearing races and shims cannot be re-allocated to their original positions by the workshop if they have dropped out.*

– Secure differential -arrow- to prevent it falling out.

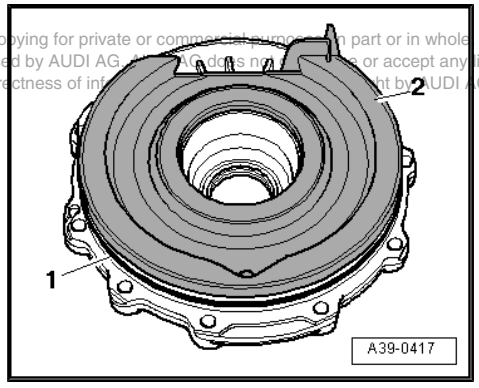


Installing

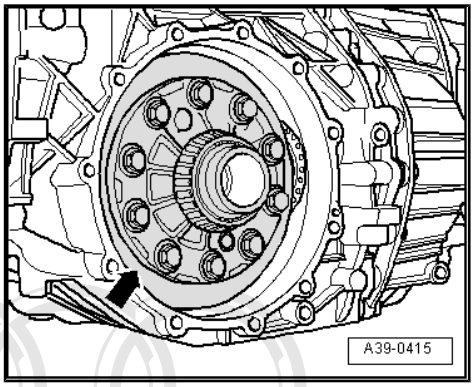
– Check that magnet is fitted under plastic cover in cover for front final drive.



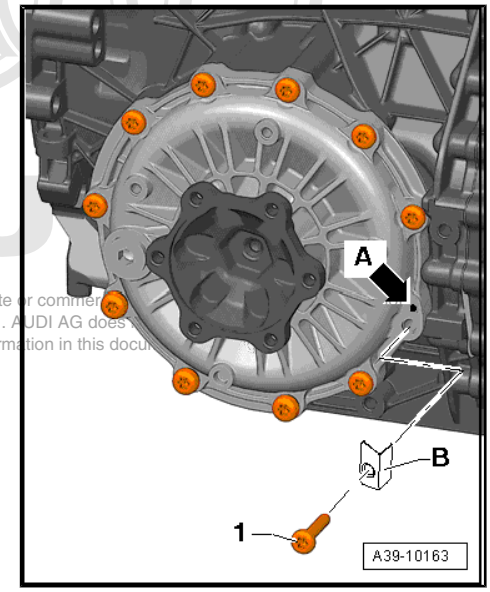
– Renew O-ring -1- in cover for front final drive.
– Make sure cover -2- is securely seated.



– Check that differential -arrow- is correctly seated in gearbox.



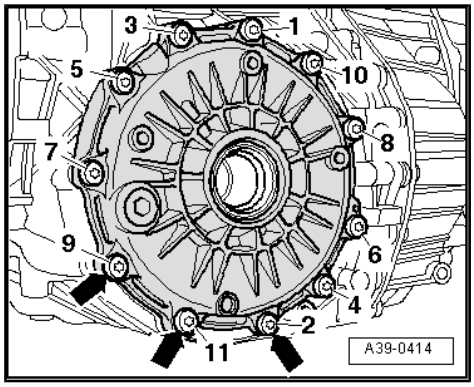
– Fit cover for front final drive onto gearbox housing.
– Renew all bolts in cover for front final drive.
– If fitted, insert guard plate -B- between cover for final drive and bolt -1-.



Note

The guard plate -B- serves to protect the breather hole -arrow A- against the ingress of dirt and water.

Tightening sequence:



Caution

- *Fit the three bolts with spacers at the positions shown -arrows-.*
- *Make exclusive use of genuine bolts ⇒ Electronic parts catalogue .*

Note

On certain gearboxes, spacers are not fitted at the points indicated by the -arrows-; in this case make sure to fit the bolts without spacers.

– Tighten bolts securing cover for front final drive in two stages in the sequence shown:

1. Initially hand-tighten bolts in sequence -1 ... 11-.
2. Tighten bolts in sequence -1 ... 11- in several stages to final torque.

– Check oil seal for flange shaft (left-side) and renew if necessary ⇒ page 121 .

– Fit the left flange shaft ⇒ page 131 .

– Fill up with gear oil and check gear oil level in front final drive ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .

Caution

Risk of damaging the gearbox.

Depending on the design status, the multitronic 01J and 0AN gearboxes require different gear oils. Use is only to be made of the corresponding replacement gear oil in the front final drive ⇒ Electronic parts catalogue .

Tightening torque

Component	Nm
Cover for front final drive to gearbox housing	25 1)
Oil filler plug to cover for front final drive	30 1)

• 1) Renew bolts.

1.6 Removing and installing differential

Removing

Caution

- *Detach cover for front final drive slowly and carefully from gearbox housing. The differential may otherwise fall out of the gearbox.*
- *A differential which has fallen to the ground can no longer be installed. Renew gearbox if differential has fallen to the ground.*
- *Make sure that the bearing races and shims for the differential do not drop out of the gearbox housing and the front final drive cover.*
- *Bearing races and shims cannot be re-allocated to their original positions by the workshop if they have dropped out.*

When gearbox is installed:

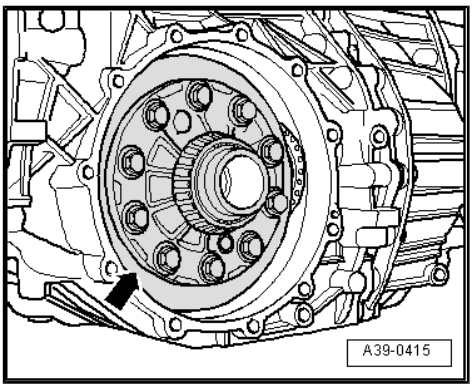
– Remove cover for front final drive ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .

When gearbox is removed:

– Remove cover for front final drive ⇒ page 133 .

Gearbox removed or installed:

– Carefully take out differential -arrow-.



Installing

– Carefully install differential -arrow-.

When gearbox is installed:

– Install cover for front final drive ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39 .

When gearbox is removed:

– Fit cover for front final drive ⇒ page 133 .

2 Assessment of wear on gearbox components

Overview:

2.1 Assessing wear on input shaft

1 - Bearing “A” in input shaft cover

- ❑ Always renew bearing “A” after removing input shaft cover

3 - Input shaft cover

- ❑ Checking ⇒ page 141

4 - Piston

- ❑ Checking for wear ⇒ page 139

5 - Pressure plate

- ❑ Checking for wear ⇒ page 139

8 - Friction plates

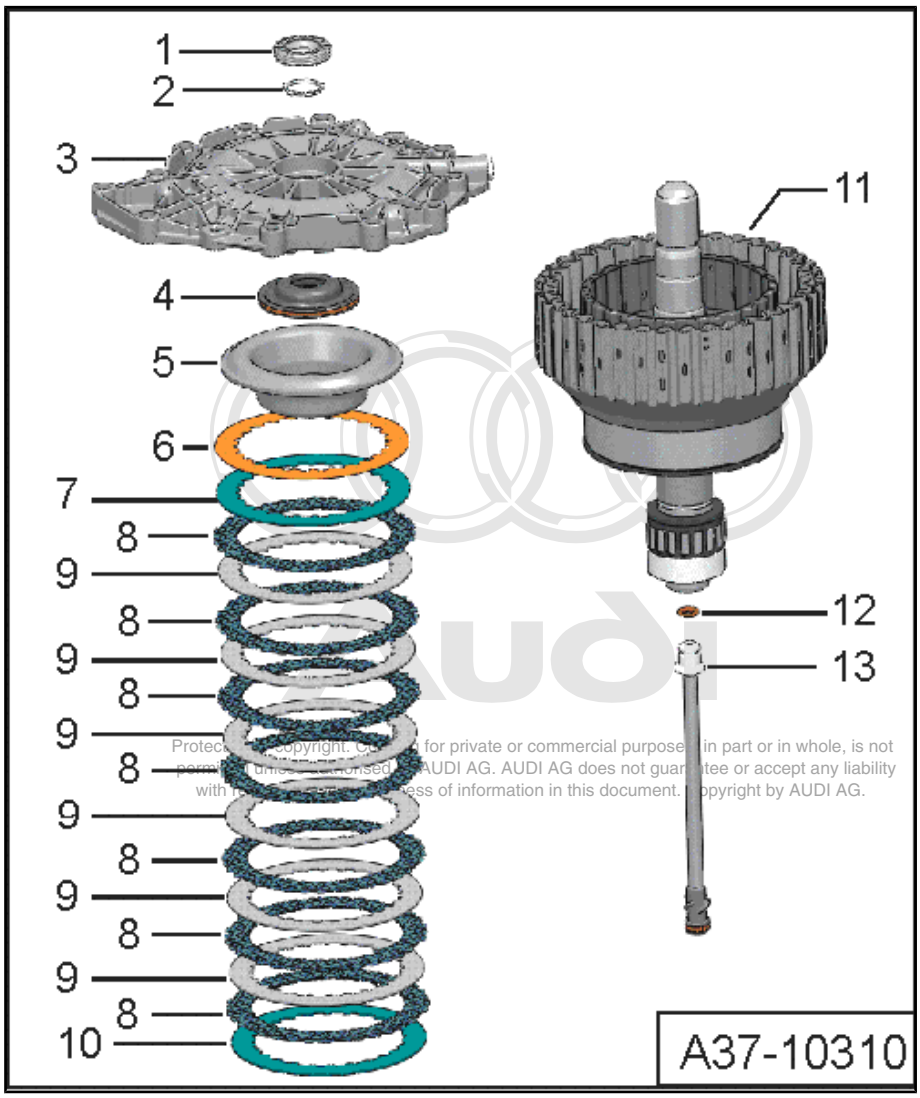
- ❑ Checking version and number ⇒ page 140

11 - Input shaft cylinder

- ❑ Checking contact and sealing surfaces for wear ⇒ page 139
- ❑ Checking for traces of scoring by friction plates ⇒ page 140

13 - Oil pipe

- ❑ Checking for wear ⇒ page 140



Checking piston and pressure plate for wear

– Pull piston -1- out of pressure plate -2-.

Checking pressure plate -2-

– Check contact/sealing surface -arrow A- of pressure plate for wear.

– Check contact/sealing surface -arrow D- of pressure plate for wear.

• If the contact/sealing surface -arrow A- is scored or scratched, the pressure plate -2- must be renewed.

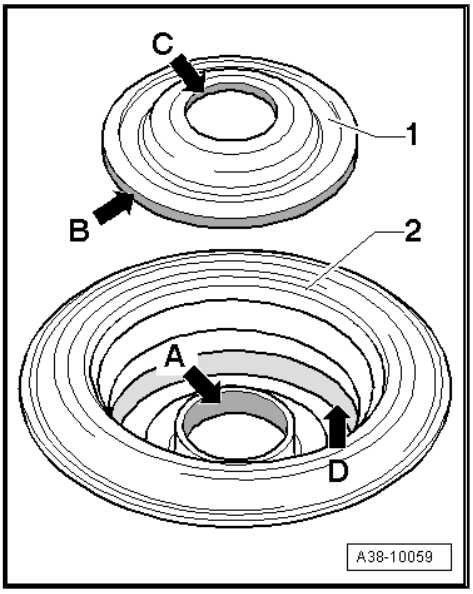
• If the contact/sealing surface -arrow D- is scored or scratched, the pressure plate -2- and the piston -1- must be renewed.

Checking piston -1-

– Check oil seal -arrow B- on outer circumference of piston -1- for damage.

– Check contact surface -arrow C- on inner circumference of piston -1- on shaft.

• If the oil seal -arrow B- is damaged or the contact surface -arrow C- of the piston is scored or scratched or of uneven thickness due to wear, the piston -1- must be replaced.



Checking contact and sealing surfaces of input shaft cylinder for wear

– Check contact/sealing surface -arrow A- of input shaft for wear.

Note

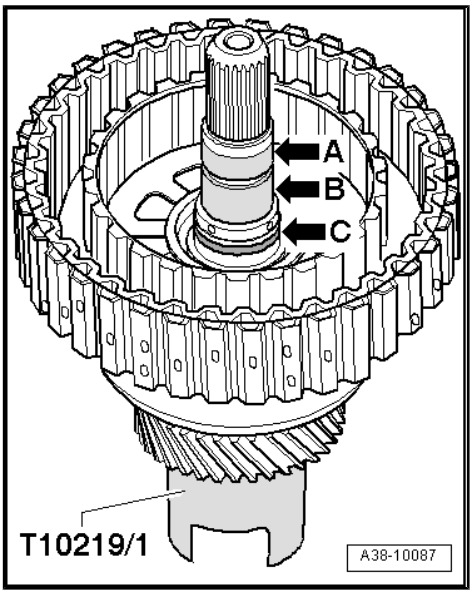
♦ *The oil seal in the input shaft cover provides a seal on this sealing surface -arrow A-.*

♦ *Slight scoring caused by the oil seal is normal.*

– Check the contact surface -arrow B- of the bearing “A” (ball bearing for input shaft) in the input shaft cover for wear.

– Check oil seal -arrow C- on shaft for damage.

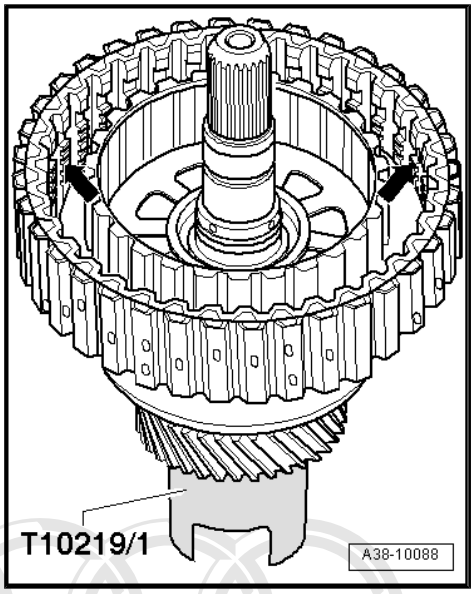
• If oil seal -arrow C- is damaged or contact surfaces -arrow B- or -arrow A- on shaft are severely scored, the entire input shaft must be renewed.



Checking for scoring caused by friction plates on inner circumference of input shaft cylinder

– Check inner circumference of input shaft cylinder for scoring caused by friction plates -arrows-.

• If scoring by friction plates -arrows- is found on inner circumference of input shaft cylinder, the entire input shaft must be renewed.



Assessing wear on oil pipe

– Check oil seal -1- on oil pipe for damage.

• There should be a gap on the seal -arrow B-.

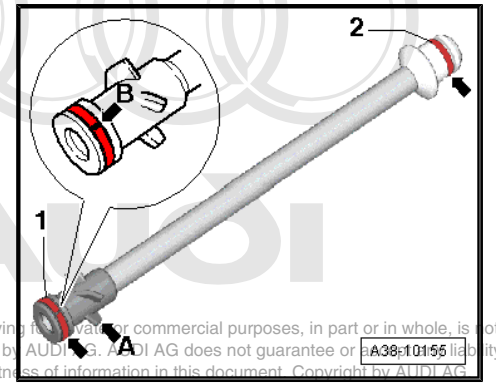
• If gap -arrow B- is completely closed, oil pipe must be renewed.

– Check contact surfaces -arrows- and rotor vanes -arrow A- on oil pipe for wear and damage.

• Oil pipe must be renewed if oil seal -1- or rotor vanes -arrow A- are damaged or if contact surfaces -arrow- are severely scored.

• O-ring -2- must be renewed.

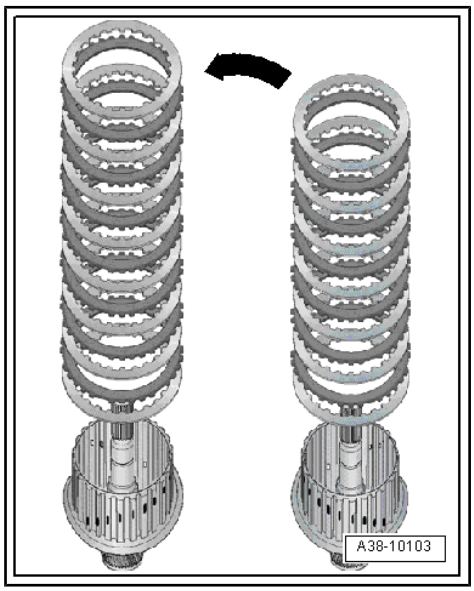
– Check contact surface of oil pipe in suction-jet pump ⇒ page 144 .



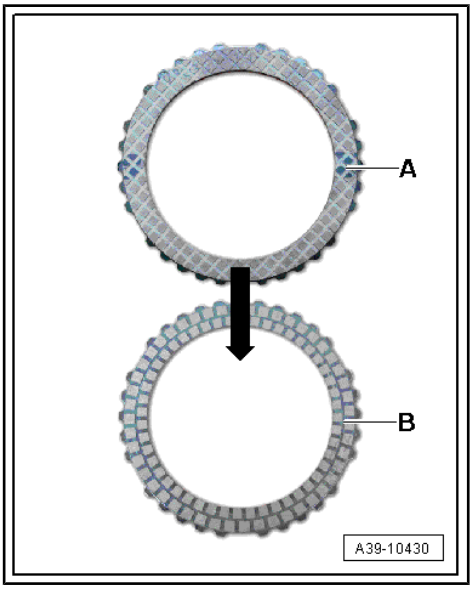
Checking number and version of friction plates

The following modifications can be made depending on the gearbox type and version and on the type of problem:

♦ On input shafts with 6 friction plates: replacement of the friction plates (installation of a newer version with 7 friction plates)



♦ Replacement of the set of plates for the input shaft of square type -A- with the newer version of trapezoidal type -B-.



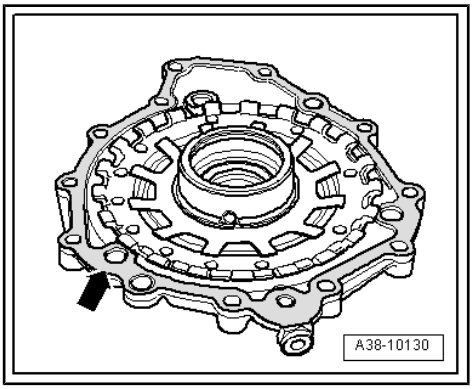
Checking input shaft cover

– Check the sealing surface of the cover -arrow- and the cover itself for damage.

• The sealing surface must not exhibit any signs of damage.

• The input shaft cover must not be broken or cracked.

– If sealing surface or cover is damaged, renew input shaft cover.



2.2 Assessing wear on bearing “D”, bearing “E” and bearing “G”

2 - Bearing “D”

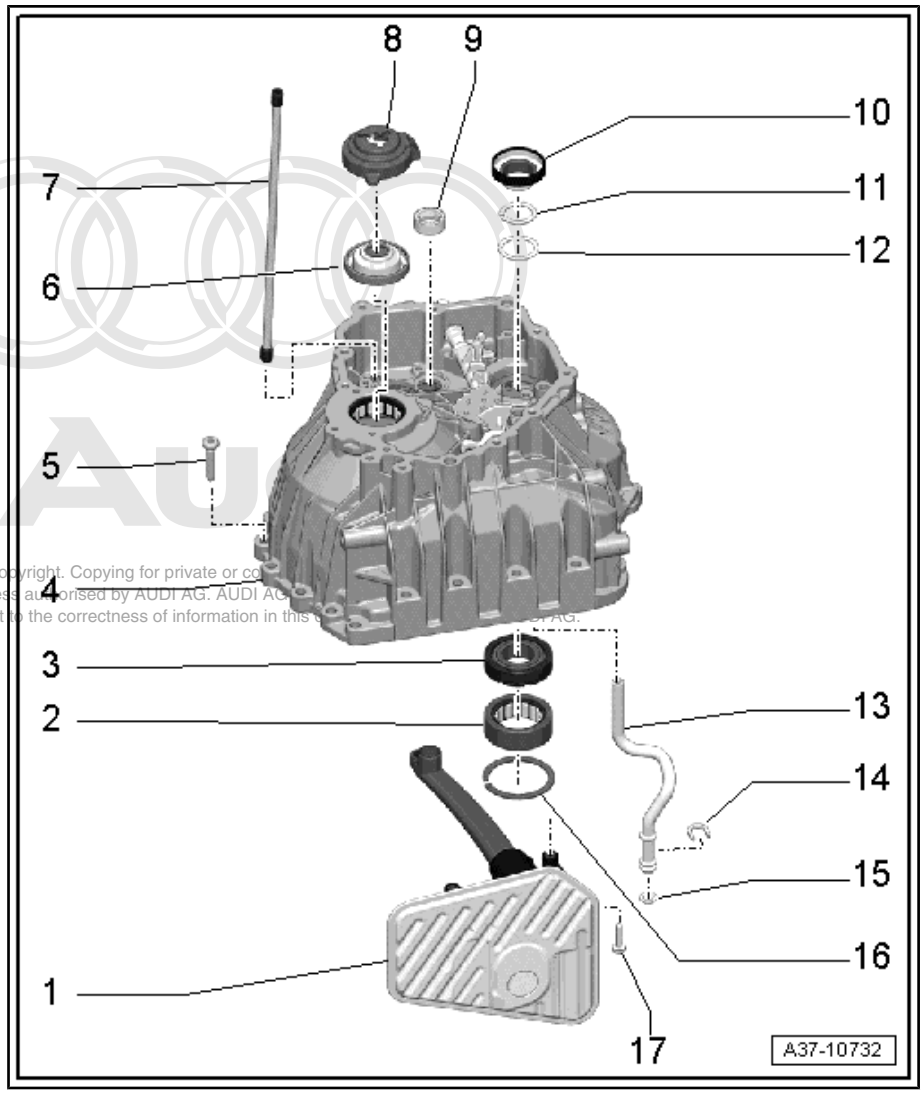
- ❑ Roller bearing for pulley set “I”
- ❑ Different versions: with or without inner race
- ❑ Checking ⇒ page 143

3 - Bearing “E”

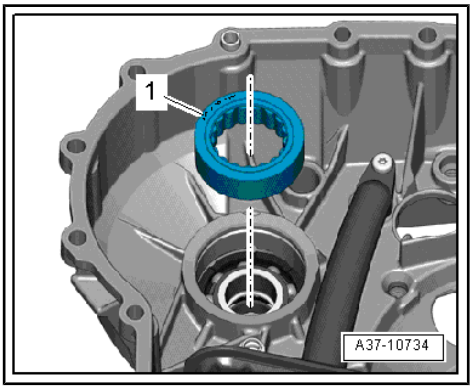
- ❑ Ball bearing for pulley set “I”
- ❑ Checking ⇒ page 143

4 - Intermediate housing

- ❑ With bearing “G” (roller bearing for pulley set “II”)
- ❑ Checking bearing “G” ⇒ page 143
- ❑ Checking running surface for bearing “G” ⇒ page 145



Checking bearing “D” (roller bearing for pulley set “I”)



Note

Bearing “D” is available in two versions: without inner bearing race or with inner bearing race.

– Check bearing “D” -item 1- for damage (illustration shows version without inner race):

• The roller bearings should not exhibit any signs of damage on the surface.

• There must be no cracks or chips on the bearing cage.

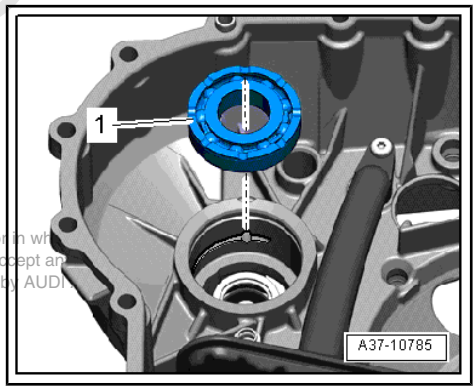
– Run your finger nail over the entire running surface to assess the damage on the roller bearings.

• Any very slight scores or damage that cannot be felt with the finger nail can be disregarded.

• If you feel any scores or damage with your finger nail, or if your nail catches, renew bearing “D”.

– Also check running surface on pulley set “I” ⇒ page 145 .

Checking bearing “E” (ball bearing for pulley set “I”)



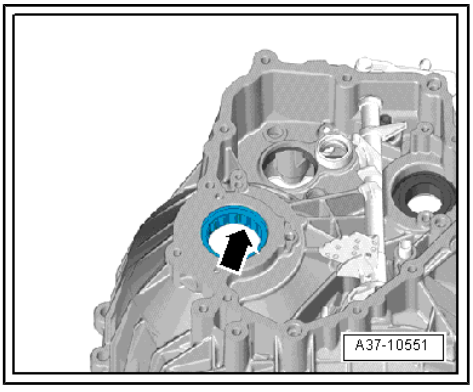
– Check bearing “E” -item 1- for damage:

• The balls and running surfaces should not exhibit any signs of damage.

• The ball bearing must not exhibit “rough” running on turning.

– Also check running surface on pulley set “I” ⇒ page 145 .

Checking bearing “G” (roller bearing for pulley set “II”)



– Check bearing “G” -item 1- for damage:

• The roller bearings should not exhibit any signs of damage on the surface.

• There must be no cracks or chips on the bearing cage.

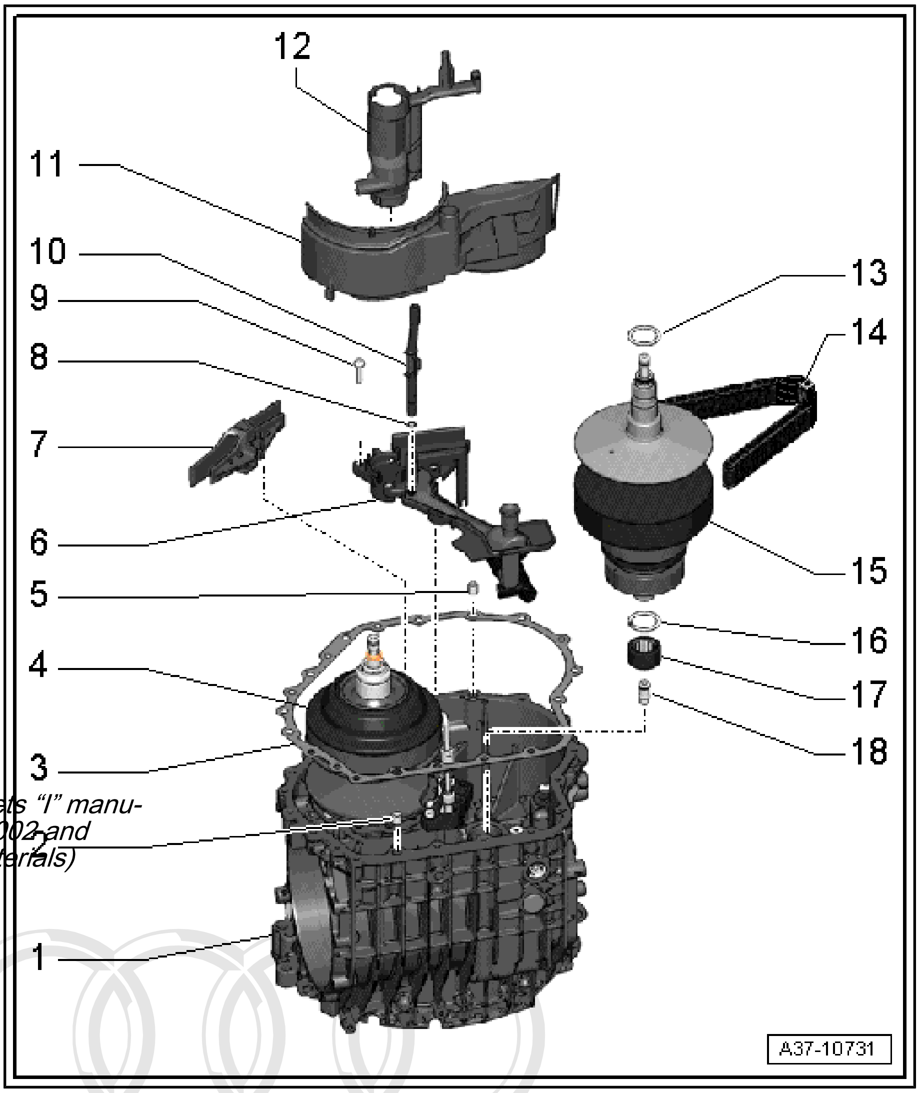
– Run your finger nail over the entire running surface to assess the damage on the roller bearings.

• Any very slight scores or damage that cannot be felt with the finger nail can be disregarded.

• If bearing “G” is damaged, the gearbox must be renewed.

– Also check running surface for bearing “G” on pulley set “II” ⇒ page 145 .

2.3 Assessing wear on chain, pulley sets “I” and “II”, bearing “C” and suction-jet pump



4 - Pulley set “II”

- ❑ Checking tapered pulleys ⇒ page 144
- ❑ Checking running surface for bearing “G” ⇒ page 145
- ❑ Cannot be renewed individually

6 - Suction-jet pump

- ❑ Checking ⇒ page 146

7 - Guide rail

- ❑ Check; renew if scored

14 - Chain

- ❑ Checking ⇒ page 146

15 - Pulley set “I”

- ❑ Checking tapered pulleys ⇒ page 145
- ❑ Checking running surface for bearing “D” ⇒ page 145

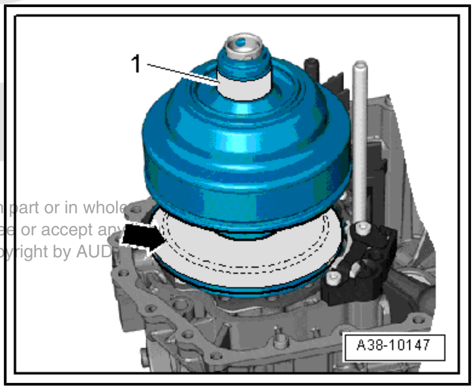
Note

Always renew pulley sets “I” manufactured between 10.2002 and 08.2003 (improved materials)

17 - Bearing “C”

- ❑ Roller bearing for pulley set “I”
- ❑ Checking ⇒ page 146

Checking tapered pulleys for pulley set “II”



– Check that tapered pulleys -arrow- for pulley set “II” are smooth with no traces of scoring.

– Run your finger nail from inside to outside over entire surface of tapered pulley to assess damage on running surface.

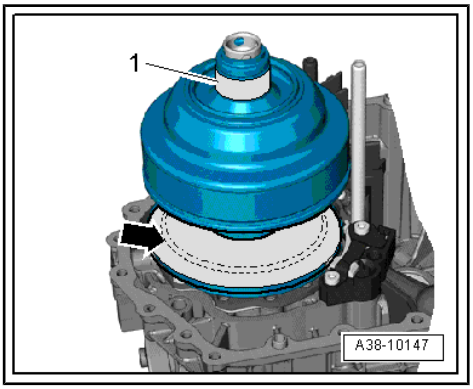
• Any very slight scores or damage that cannot be felt with the finger nail can be disregarded.

• If you feel any scores or damage with your finger nail, or if your nail catches, renew gearbox.

– Perform an additional visual inspection.

• The gearbox must be renewed if there are any individual scores which appear polished (mirrored) with black edges.

Checking running surface for bearing “G” for pulley set “II”



- Running surface -1- for bearing “G” should be in as-new condition.

– Run your finger nail from inside to outside over entire surface to assess damage on running surface.

- Any very slight scores or damage that cannot be felt with the finger nail can be disregarded.
- If you feel any scores or damage with your finger nail, or if your nail catches, renew gearbox.

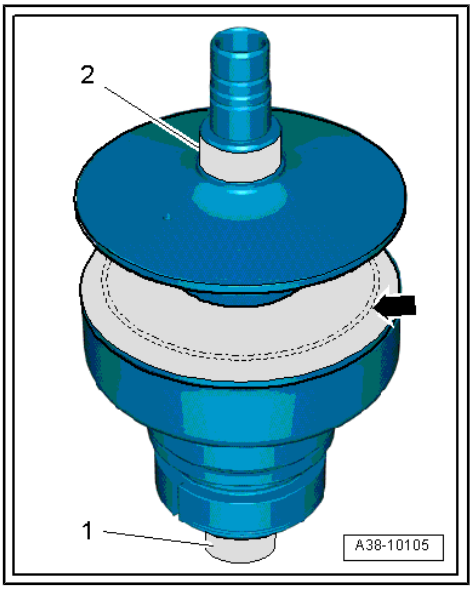
Checking tapered pulleys for pulley set “I”

– Check that tapered pulleys -arrow- for pulley set “I” are smooth with no traces of scoring.

Note

-Items 1 and 2- can be disregarded.

– Run your finger nail from inside to outside over entire surface of tapered pulley to assess damage on running surface.

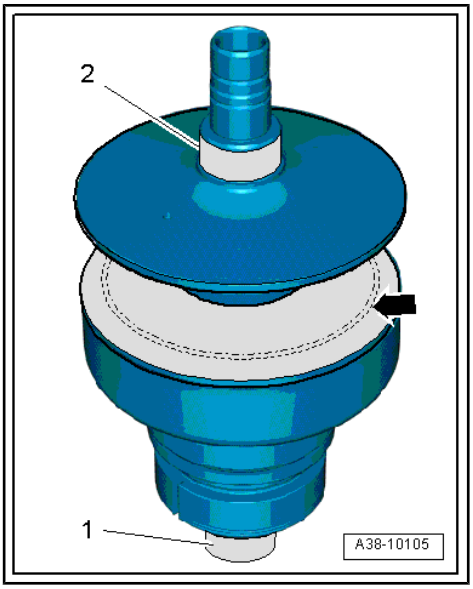


- Any very slight scores or damage that cannot be felt with the finger nail can be disregarded.
- If you feel any scores or damage with your finger nail, or if your nail catches, renew pulley set “I”.

– Perform an additional visual inspection.

- Pulley set “I” must be renewed if there are any individual scores which appear polished (mirrored) with black edges.

Checking running surfaces for bearing “C” and bearing “D” (roller bearings for pulley set “I”)



Note

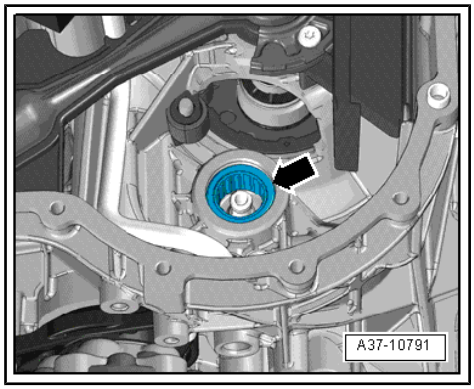
-Arrow- can be disregarded.

- Running surfaces -2- for bearing “C” and -1- for bearing “D” should be in as-new condition.

– Run your finger nail from inside to outside over entire surface to assess damage on running surface.

- Any very slight scores or damage that cannot be felt with the finger nail can be disregarded.
- If you feel any scores or damage with your finger nail, or if your nail catches, renew pulley set “I”.

Checking bearing “C” (roller bearing for pulley set “I”)



– Check bearing “C” -item 1- for damage:

• The roller bearings should not exhibit any signs of damage on the surface.

• There must be no cracks or chips on the bearing cage.

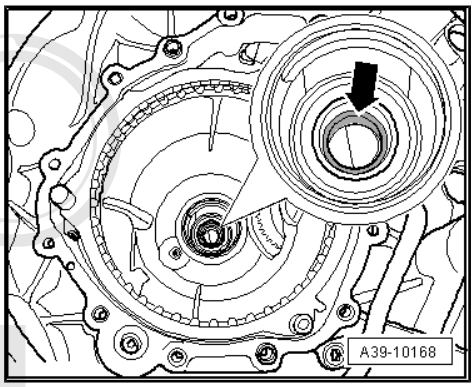
– Run your finger nail over the entire running surface to assess the damage on the roller bearings.

• Any very slight scores or damage that cannot be felt with the finger nail can be disregarded.

• If you feel any scores or damage with your finger nail, or if your nail catches, renew bearing “C”.

– Also check running surface on pulley set “I” ⇒ page 145 .

Checking suction-jet pump



• Input shaft removed ⇒ page 34

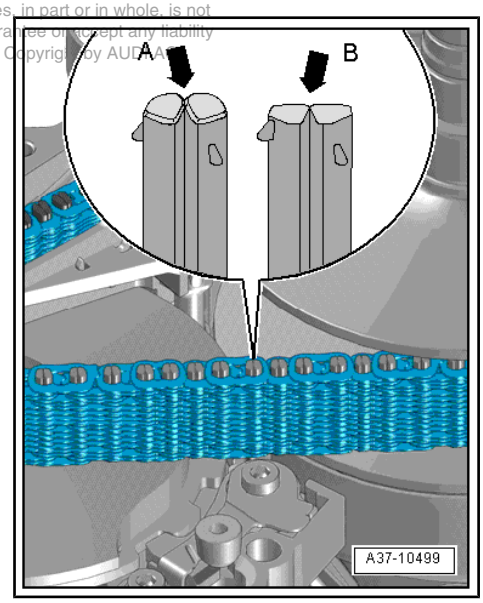
– Check contact surface -arrow- of oil pipe in suction-jet pump through opening in gearbox housing for scoring, scratches or damage.

• The contact surface of the oil pipe in the suction-jet pump -arrow- should not have tangible step-shaped scores or scratches.

• If the oil pipe has caused tangible step-shaped scores or damage to the contact surface, the suction-jet pump must be renewed.

– Check the oil pipe in addition ⇒ page 138 .

Checking chain



– Check that end faces of chain pins are still convex in shape with round edges -arrow A-.

– If edges of chain pins have become abraded or sharp, or if burrs have formed (due to wear or a slipping chain) -arrow B-, chain must be renewed.

– Also check running surface on pulley set “I” ⇒ page 145 and pulley set “II” ⇒ page 144 .

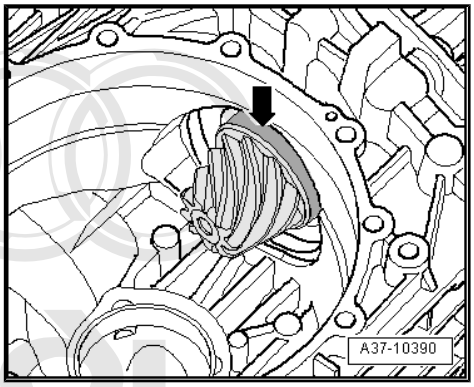
2.4 Pinion shaft wear assessment

• Differential removed ⇒ multitronic 01J, front-wheel drive; Rep. Gr. 39 , ⇒ multitronic 0AN, front-wheel drive; Rep. Gr. 39

• Oil seal removed ⇒ page 127

– Check the sealing surface of the pinion shaft for scratches, traces of rust or other signs of damage.

• The sealing surface of the pinion shaft must not be scratched or exhibit signs of wear.



Note

Freedom from leaks can no longer be obtained even with a new oil seal if the sealing surface of the pinion shaft exhibits any scratches or damage whatsoever.