Workshop Manual

Jetta Hybrid 2013 ➢

7-speed dual clutch gearbox 0CG

Edition 08.2012

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Repair Group

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30 - Clutch
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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 Identification

(VRL004662; Edition 08.2012)

⇒ “1.1 Gearbox identification”, page 1

1.1 Gearbox identification

The “7-speed dual clutch gearbox 0CG” is installed in the Jetta models 2011 ▸. Allocation ⇒ page 2 .

NDR - Gearbox code letters

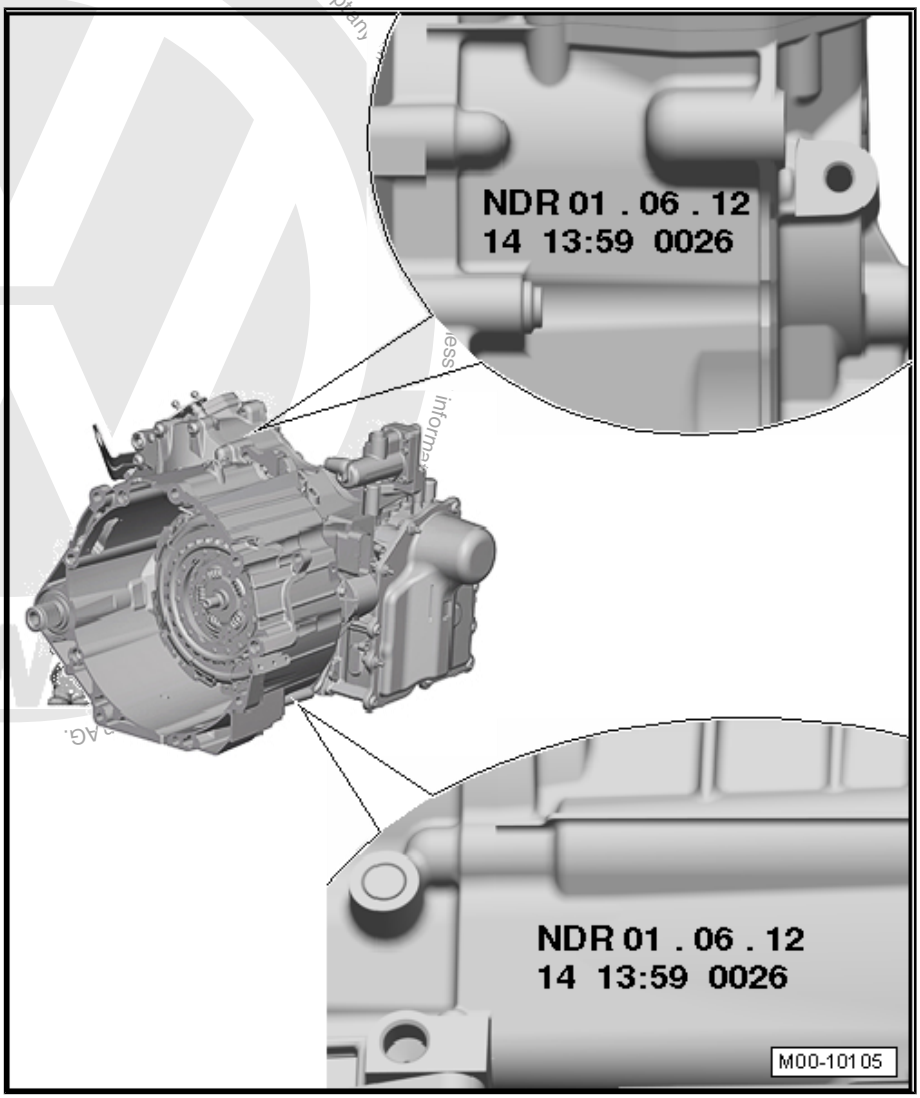
⇒ page 2

01. 06.12 - Production date: 1 June 2012

14 - Factory code

13:59 - Time

0026 - Serial number



2 Technical data

2.1 Allocation gearbox - engine

Dual clutch gearbox		0CG		
Gearbox	Identification code	NDR		
Allocation	Model	Jetta 2011 ▸		
	Engine	1.4 l TSI - 110 kW		
Ratios	Final drive I for 1st to 4th gear	71 : 16 = 4.438		
$Z_2 : Z_1$	Final drive II for 5th and 6th gear	71 : 22 = 3.227		
$Z_2 : Z_1$	Final drive III for 7th gear and reverse gear	71 : 17 = 4.176		
Take account of the gearbox code if spare parts are required for a repair ⇒ Electronic parts catalogue “ETKA” .				

2.2 Calculation of gear ratios

Example:

	7th gear	Final drive
Drive gear	$ZG_1 = 49$	$ZA_1 = 17$
Driven gear	$ZG_2 = 32$	$ZA_2 = 71$

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

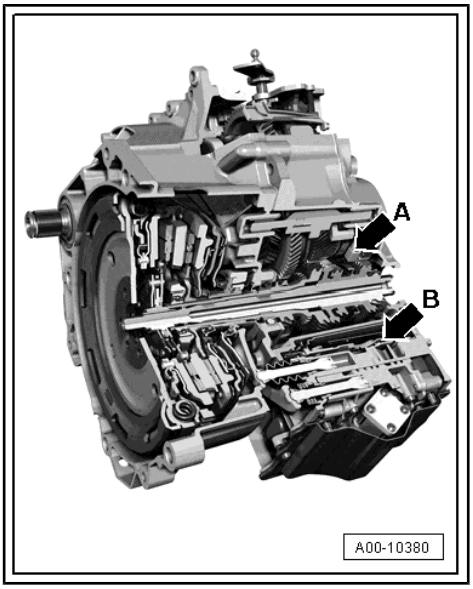
i_G = Gear ratio = $ZG_2 : ZG_1 = 32 : 49 = 0.653$

i_A = Final drive ratio = $ZA_2 : ZA_1 = 71 : 17 = 4.176$

Overall ratio = total ratio = $i_G \times i_A = 0.653 \times 4.176 = 2.730$

2.3 Capacities

The 7-speed dual clutch gearbox has two separate and different oil systems. One for the gearbox oil section -arrow A- and one for the hydraulic fluid section -arrow B-.



Capacities	Gearbox oil section
Initial filling	2.1 litre
Change	No change necessary
Lubricant	Gearbox oil for dual clutch gearbox 0CG Part number ⇒ Electronic parts catalogue “ETKA”

Capacities	Hydraulic fluid section in mechatronic unit for dual clutch gearbox -J743-
Initial filling	1 litre
Change	No change possible It is not possible to check the fill level of the hydraulic fluid section of the mechatronic unit for dual clutch gearbox -J743- [1].
Lubricant	Hydraulic fluid Part number ⇒ Electronic parts catalogue “ETKA”

[1] Hydraulic fluid can be replenished through the breather connection of the mechatronic unit.

Caution

Risk of damage to gearbox.

- *Only the gearbox oil for the 7-speed dual clutch gearbox 0CG, which is available through the replacement parts system, must be used ⇒ Electronic parts catalogue “ETKA” .*
- *Other oils will lead to malfunctions or failure of the gearbox.*
- *It is not possible to check the fill level of the hydraulic fluid section of the mechatronic unit for dual clutch gearbox -J743- . Before repairs, the breather of the mechatronic unit for dual clutch gearbox -J743- must be sealed so that no oil can escape.*
- *If any oil escapes from the hydraulic fluid section of the mechatronic unit for dual clutch gearbox -J743- , the oil must not be filled back into the mechatronic unit!*
- *If the hydraulic line between the valve block of the mechatronic unit for dual clutch gearbox -J743- and the connection for the disengagement clutch of the electric drive motor -V141- is being removed, seal all connections with suitable sealing plugs. After reinstallation of the hydraulic line, hydraulic fluid must be replenished through the breather connection of the mechatronic unit , if necessary. For allocation of the sealing plugs, hydraulic fluid and filling equipment refer to ⇒ Electronic parts catalogue .*
- *If oil escapes from the gearbox oil section, it can only be rectified by changing the gearbox oil. It is not possible to check the fill level.*
- *If the level of oil/fluid is too high or too low in either of the parts, the function of the gearbox will be impaired.*

2.4 Overview - power transmission

⇒ “2.4.1 Overview - power transmission - front-wheel drive”, page 4

2.4.1 Overview - power transmission - front-wheel drive

The 7-speed dual clutch gearbox 0CG is configured as a 5-shaft gearbox. There are two input shafts and three output shafts.

A1 - Input shaft 1

A2 - Input shaft 2

B1 - Output shaft 1

B2 - Output shaft 2

B3 - Output shaft 3

C - Front final drive

K1 - Dual clutch 1

K2 - Dual clutch 2

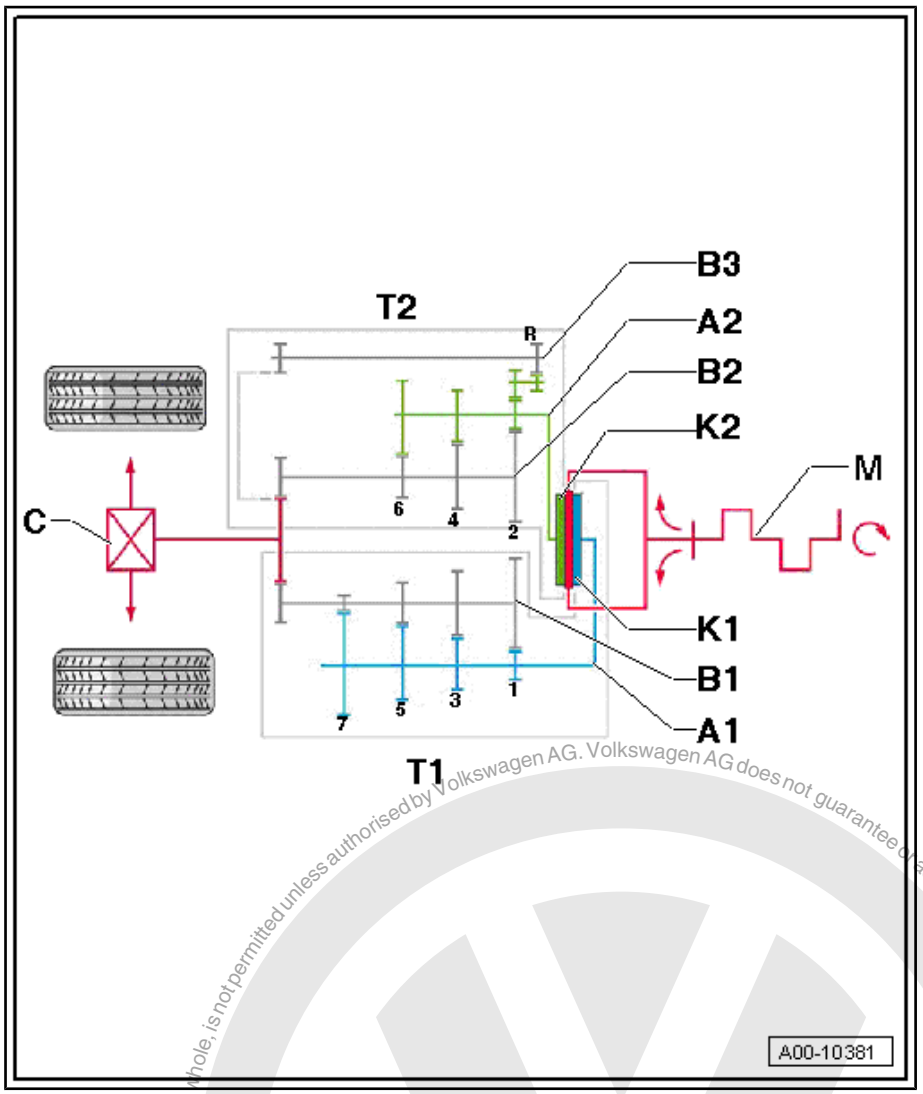
M - Engine

T1 - Sub-gearbox 1

- ❑ with gears 1, 3, 5 and 7

T2 - Sub-gearbox 2

- ❑ with gears 2, 4, 6 and reverse gear R



3 Safety instructions

3.1 General safety regulations

To prevent personal injury and material damage to the vehicle, observe the following:

WARNING

Risk of injury and accident by accidental engagement of gear while engine is running.

- *Before working on vehicle with engine running, shift selector lever into position “P” and apply parking brake.*

Please note the following to avoid personal injury and damage to or destruction of electrical and electronic components:

- Connect and disconnect measuring and testing devices only with the ignition switched off.

Caution

Danger of destruction of electronic components when battery is disconnected.

- *Take the necessary measures when disconnecting the battery.*
- *Disconnect battery only after the ignition has been switched off ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .*

3.2 Safety precautions when working on vehicles with high-voltage system

Note

In the event of queries or uncertainties regarding the terms ""electrically informed person”, “high-voltage technician”, “high-voltage expert”" or the hybrid system, the relevant importer must be contacted prior to the start of all work.

Before work on the high-voltage system is started, a high-voltage technician must de-energise the high-voltage system ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; De-energising high-voltage system .

The types of work for which the high-voltage system has to be de-energised are indicated in the list entitled “Work on the high-

voltage system” ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

You can suffer an electric shock.

An electric shock can be fatal.

Observe general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

- *The system must first be de-energised by a high-voltage technician before any work is done on the high-voltage system and before any repair work is done on the body. The types of work for which this is necessary are indicated in the table “Work for which the high-voltage system must be de-energised:”.*
- *All work on vehicles with a high-voltage system must only be carried out by electrically instructed persons. The work must be supervised by a high-voltage technician.*

WARNING

Handling high-voltage cables:

- *Do not support yourself or your tools on high-voltage cables and their components.*
- *Work involving metal-removing, deforming and sharp-edged tools in the vicinity of high-voltage components and cables is prohibited.*
- *Work involving heat sources such as welding, soldering, hot air and thermal bonding in the vicinity of high-voltage components and cables is prohibited.*
- *High-voltage cables must not be extensively bent or kinked.*
- *In the event of queries or uncertainties, contact your responsible high-voltage technician (HVT).*

3.3 Safety precautions during road tests in which test and measuring equipment is used

Please note the following if test and measuring equipment is required during a road test:

WARNING

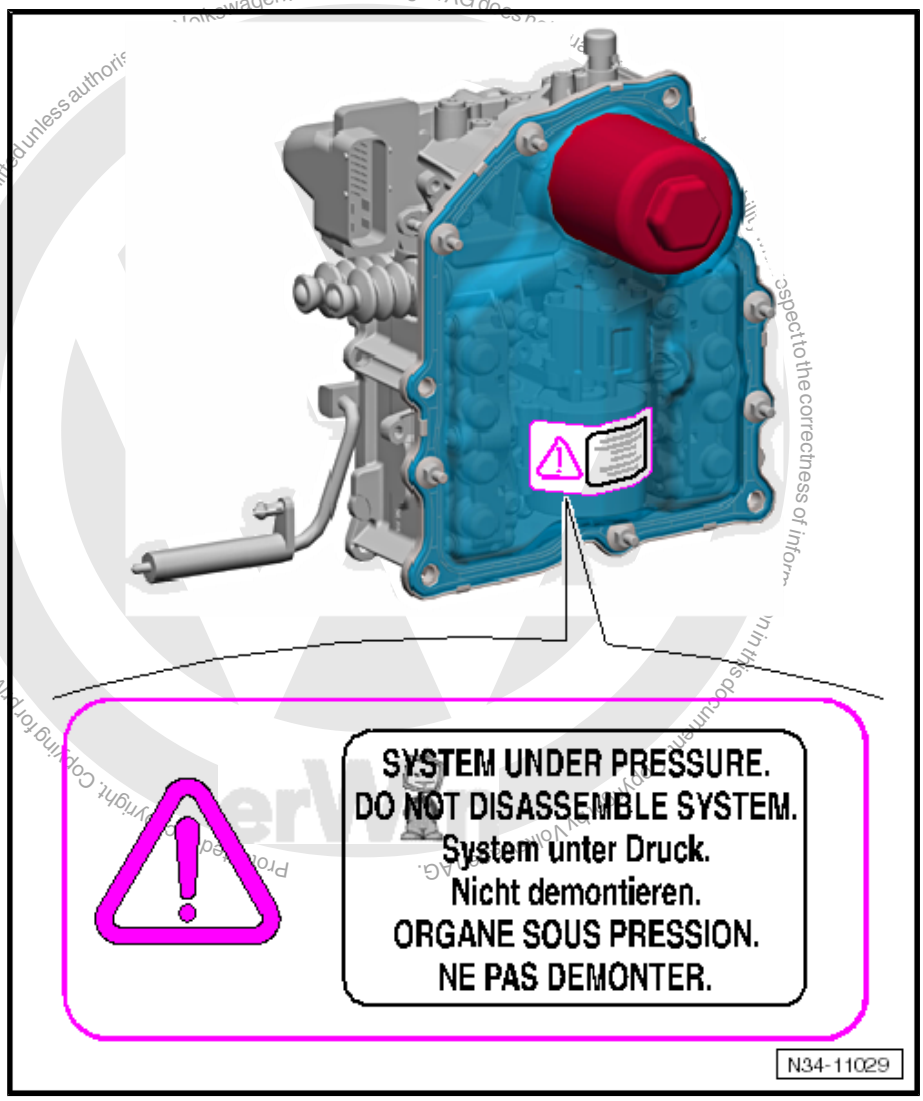
Accident hazard as a result of distraction and inadequate securing of test and measuring equipment.

Danger as a result of activation of front passenger airbag in event of an accident.

- *Operation of test and measuring equipment while driving results in distraction.*
- *Greater injury hazard as a result of unsecured test and measuring equipment.*

◆ *Always strap test and measuring equipment in place on rear seat and have a 2nd person operate them.*

3.4 Safety precautions when working on mechatronic unit for dual clutch gearbox -J743-



WARNING

System is under pressure!

- *The mechatronic unit for dual clutch gearbox -J743- has a pressure accumulator that maintains a system pressure of up to 60 bar.*
- *The cover of the mechatronic unit for dual clutch gearbox -J743- and the pressure accumulator must not be opened.*

Note

The pressure of the pressure accumulator is software-controlled and is set by means of the pump to a nominal pressure of max. 60 bar. At a pressure of 60 bar the pump is switched off. If the pressure drops to 42 bar due to gear shifting operations, the pump is switched on again. In the event of software errors the generated pressure might amount to 75 bar. At 75 bar the pressure relief valve opens automatically.

3.5 Notes on tow-starting/towing

Caution

Danger of irreparable damage to gearbox.

- *If the vehicle has to be towed, the selector lever must be in the "N" position and the vehicle must not be towed at a speed no greater than 50 km/h and for a distance not exceeding 50 km.*

Note

It is not possible to tow-start the engine.

4 Repair instructions

4.1 General notes

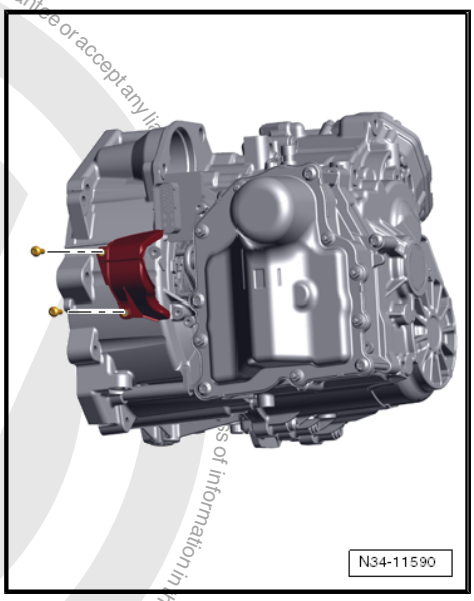
Gearbox

- The torque of the engine is transmitted to the dual clutch via the electric drive motor -V141- . The electric drive motor -V141- and the dual clutch are joined together by a toothed connection. The electric drive motor -V141- is provided with a disengagement clutch. The disengagement clutch in the electric drive motor -V141- separates the combustion engine from the electric drive motor -V141- .
- The gearbox is structured like a 7-speed manual gearbox. Through opposed hydraulic actuation of two multi-plate dry clutches, it is operated like an automatic gearbox. In other words, the gears are engaged automatically or manually via the Tiptronic system. There is no clutch pedal.
- When the ignition is switched off, both clutches are disengaged. In sub-gearbox 1 the 1st gear is engaged. In sub-gearbox 2 the reverse gear is engaged.

In some vehicles, a cover is fitted over the engaging levers.

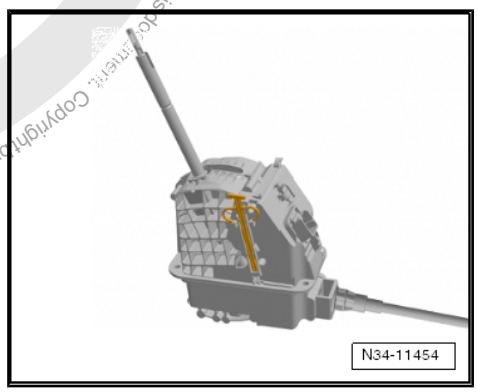
The cover prevents dirt getting in.

Specified torque: 8 Nm



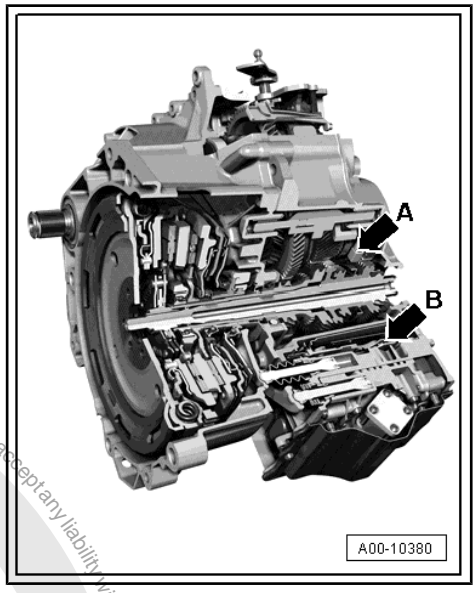
Selector mechanism

The feedback for the gearbox concerning the selector lever position is not transferred by mechanical means via the selector lever cable and the multifunction switch anymore, as is the case for the automatic gearbox. The information concerning selector lever positions or shifting operations are transferred to the gearbox control unit via a separate control unit in the selector mechanism and the CAN data bus. That is, gears are shifted without any mechanical cables being involved. Only for selector lever position “P” the parking lock is engaged mechanically via the selector lever cable.



Gearbox oil

The 7-speed dual clutch gearbox has two separate and different oil systems. One for the gearbox oil section -arrow A- and one for the hydraulic fluid section -arrow B-.



Only the gearbox oils available through the replacement parts system must be used for the dual clutch gearbox 0CG. Other oils will lead to malfunctions or failure of the gearbox, part number ⇒ Electronic parts catalogue “ETKA” .

Do not mix »additives« in oil.

Oil which has been drained out cannot be added again.

The oil level in the gearbox cannot be checked. The oil level can only be adjusted by changing the gearbox oil, e.g. in the event of leaks on the gearbox
⇒ “6.1 Draining and filling gearbox oil”, page 86 .

4.2 Rules for cleanliness

- Carefully clean connection points and the surrounding area with engine cleaner or brake cleaner and dry thoroughly before opening.
- Clean the gearbox and gearbox components using e.g. cleaning solution -D 009 401 04- .
- Use lint-free cloths for cleaning.
- Seal open lines and connections immediately using suitable and only new sealing plugs. Allocate sealing plugs according to ⇒ Electronic parts catalogue “ETKA” .
- Place removed parts on a clean surface and cover them over. Use plastic sheeting and paper. Use lint-free cloths only!
- If repair work cannot be performed immediately, cover new parts which have been removed from their packing.
- Install only clean parts; do not remove new parts from packaging until immediately before installing.
- Protect disconnected electrical connections from dirt and water and only reconnect in dry condition.
- Always make sure that no dirt can enter an »open« gearbox.
- If gearbox covers have been unbolted or gearbox has no fluid, do not run engine. Do not tow vehicle.
- If repair work cannot be performed immediately, cover opened parts carefully.

4.3 General repair notes

- To ensure flawless and successful gearbox repairs, the greatest care and cleanliness as well as the use of good and proper tools are essential. Of course, the basic rules for safety also apply during 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 this workshop manual.

Guided fault finding, vehicle self-diagnosis and testing

- Before performing repairs on the gearbox, determine the cause of the fault as accurately as possible using vehicle di-

agnostic tester in `Guided fault finding`, `Vehicle self-diagnosis` and `Test instruments` modes.

Various functions are available in the operating modes `Guided functions` and `Guided fault finding` ⇒ page 13 .

Special tools

For a complete list of special tools used in this workshop manual, see ⇒ "Workshop equipment and special tools" .

Gearbox

- Do not run engine or tow vehicle with sump removed or when there is no gearbox oil in the gearbox.
- Thoroughly clean all joints and surrounding areas before dismantling.
- When installing, ensure that the dowel sleeves are fitted correctly.

O-rings, seals, gaskets

- Always renew O-rings, seals and gaskets.
- Oil seals are also called radial oil seals.
- After removing gaskets and seals, always inspect contact surface of housing or shaft for burrs resulting from removal or for other signs of damage.
- Thoroughly clean housing joint surfaces before assembly.
- Lightly lubricate outer circumference and sealing lip of oil seals with gearbox oil before installing.
- Coat O-rings with oil to prevent pinching of rings during assembly.
- Never use any other types of lubrication in the gearbox oil section. Otherwise there is a risk of malfunctions in the hydraulic gearbox control.
- The open side of the oil seal faces the side with fluid filling.
- Press in new oil seals so that sealing lip does not contact the shaft in the same place as the old seal (make use of insertion depth tolerances).
- Observe rules for cleanliness ⇒ page 11 .

Locking devices

- Do not overstretch retaining rings.
- Always renew retaining rings which have been damaged or overstretched.
- Retaining rings must locate properly in grooves.

Nuts and bolts

- Loosen bolts in sequence opposite to the tightening sequence.
- Securing bolts and securing nuts which secure covers and housings should be loosened and tightened diagonally in stages if no tightening sequence is specified.
- Renew self-locking nuts.
- Threads of bolts secured with locking fluid must be cleaned with a wire brush. Then insert bolts with locking fluid - AMV 185 101 A1- .
- Specified torques settings are specified for unoiled bolts and nuts.

4.3.1 Working with vehicle diagnostic testers

- Only work with vehicle diagnostic testers from Volkswagen.

Various functions are available in the operating modes `Guided functions` and `Guided fault finding`. The 3 most important functions are:

- Adapting installation information
- Reading measured values for mandatory reporting
- Initiating basic adjustment

Adapting installation information

The mechatronic unit detects other control units in the vehicle by means of signals on the data bus. Pressing the `Adapt installation information` button instructs the mechatronic unit to forget all communication partners.

All »active partners« are detected once again the next time the ignition system is switched on.

You cannot »generate« any faults using this function. Please always perform the `Adapt installation information` function after the following activities:

- Following installation of a gear selector mechanism.
- After another control unit has been installed, e.g. engine, ABS or gateway.
- After work on the steering wheel paddle.

Reading measured values for mandatory reporting

You must read these measured values before contacting your Technical Service Center or your importer.

Save the measured values in the diagnosis log so that all necessary gearbox data will be available for fault analysis.

Initiating basic adjustment

This teaches important settings into the mechatronic unit. Even important adjustments are taught in again, or reset to programmed points. These include, for example, the synchronisation points and »reference points« for the engaging lever and gear actuator.

WARNING

Do not carry out basic adjustment without a reason unless requested to do so!

– Press the button `DSG Mechatronic -J743- performing basic measurement` only:

- if you are prompted to do so in “guided fault finding”
- after you have processed an event memory entry
- after you have installed a dual clutch
- or after you have installed a mechatronic unit

30 – Clutch

1 Clutch

⇒ “1.1 Assembly overview - dual clutch”, page 14

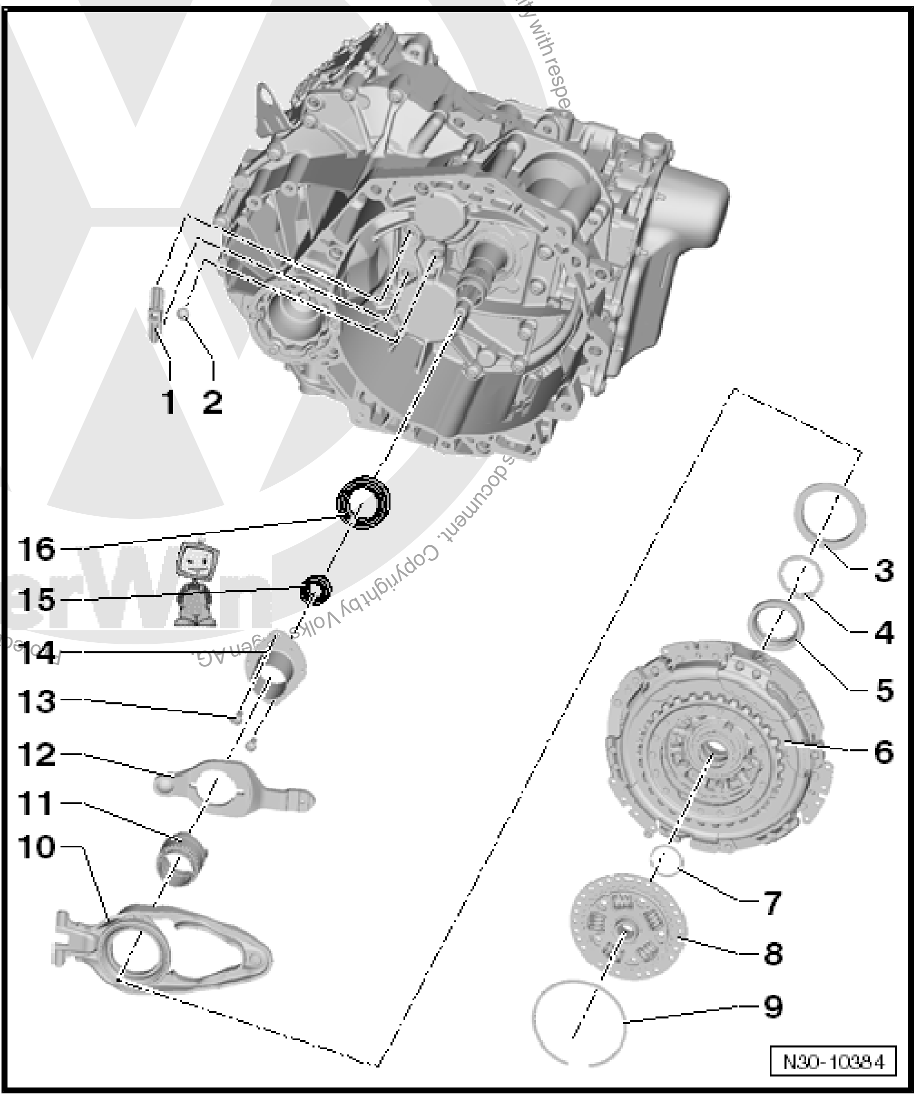
⇒ “1.2 Removing and installing the dual clutch”, page 16

⇒ “1.3 Renewing input shaft seal”, page 23

⇒ “1.4 Renewing seal for inner input shaft”, page 25

1.1 Assembly overview - dual clutch

> ⚠ Caution
>
> *Risk of damage from clutch adjustment device.*
>
> - *The clutch is self-adjusting. Shocks can have an effect on this adjusting device. Do not allow clutch to fall into gearbox during installation.*
> - *A clutch that has fallen onto a hard surface or shows signs of damage must not be reinstalled.*



1 - Hinge mounting

- ❑ For large engaging lever “K 1”
- ❑ Is not renewed

2 - Ball pin

- ❑ Small small engaging lever “K 2”
- ❑ Removing and installing ⇒ page 34 .

3 - Shim “SK 1”

- ❑ Determining thickness ⇒ “2.3 Adjusting clutch engagement mechanism”, page 32

4 - Shim “SK 2”

- ❑ Determining thickness ⇒ “2.3 Adjusting clutch engagement mechanism”, page 32

5 - Small engagement bearings for “K 2”

6 - Dual clutch

- ❑ ⇒ “1.2 Removing and installing the dual clutch”, page 16

7 - Retaining ring

- ❑ Renew.

8 - Hub

9 - Retaining ring

- ❑ Renew.

10 - Large engaging lever for “K 1”

- ❑ With engagement bearing
- ❑ Removing and installing ⇒ “2.2 Removing and installing clutch engagement mechanism”, page 29 .

11 - Upper section of guide sleeve

- ❑ Small small engaging lever “K 2”
- ❑ Is removed and installed together with small engaging lever and lower section of guide sleeve

12 - Small engaging lever for “K 2”

- ❑ Is removed and installed together with upper and lower section of guide sleeve
- ❑ Removing and installing ⇒ “2.2 Removing and installing clutch engagement mechanism”, page 29 .

13 - Bolts

- ❑ Renew after each removal.
- ❑ 8 Nm +90°

14 - Lower section of guide sleeve

- ❑ Small small engaging lever “K 2”
- ❑ Is removed and installed together with small engaging lever and upper section of guide sleeve

15 - Seal

- ❑ For inner input shaft
- ❑ ⇒ “1.4 Renewing seal for inner input shaft”, page 25

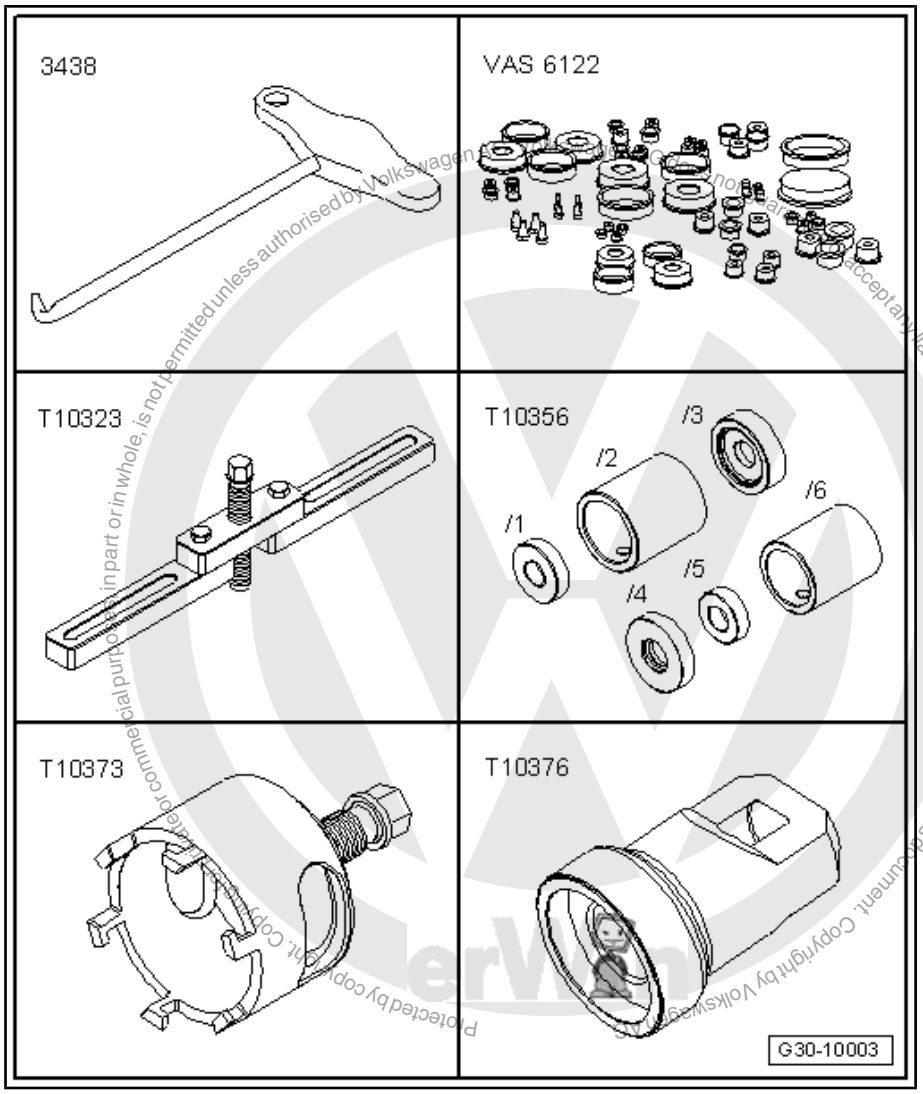
16 - Seal

- ❑ For outer input shaft
- ❑ ⇒ “1.3 Renewing input shaft seal”, page 23

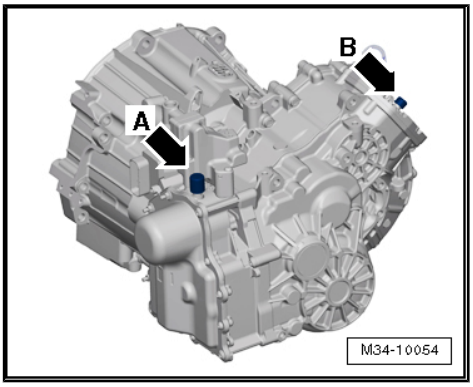
1.2 Removing and installing the dual clutch

Special tools and workshop equipment required

- Hook -3438-
- Engine bung set -VAS 6122-
- Support device -T10323-
- -T10356/5- from assembly tool -T10356-
- Puller -T10373-
- Thrust piece -T10376-
- 1 x sealing cap -0AM 325 120 A- and 1 x sealing cap -02M 409 120- , as an alternative to engine bung set -VAS 6122-



Removing dual clutch



Prerequisites:

- Gearbox removed and secured to engine and gearbox support ⇒ page 76 .
- Mechatronic unit for dual clutch gearbox -J743- built into gearbox.

Caution

Risk of damage to gearbox.

Before repairs, the breather of the mechatronic unit for dual clutch gearbox -J743- (-arrow A-) and the gearbox breather (-arrow B-) must be sealed so that no oil can escape.

- *If any oil escapes from the hydraulic fluid section of the mechatronic unit for dual clutch gearbox -J743- , the oil must not be filled back into the mechatronic unit! It is not possible to check the fill level of the hydraulic fluid section of the mechatronic unit for dual clutch gearbox -J743- .*
- *If hydraulic fluid has escaped, it must be replenished through the breather connection of the mechatronic unit , if necessary. For allocation of the sealing plugs, hydraulic fluid and filling equipment refer to ⇒ Electronic parts catalogue "ETKA" . If possible, replenish the hydraulic fluid after the gearbox has been installed. After the hydraulic fluid has been replenished, dispose of the remaining hydraulic fluid and the sealing plugs.*
- *If oil escapes from the gearbox oil section, it can only be rectified by changing the gearbox oil. It is not possible to check the fill level.*
- *If the level of oil/fluid is too high or too low in either of the parts, the function of the gearbox will be impaired.*
- *The breather cap -arrow A- on the mechatronic unit is destroyed during removal and must be renewed.*

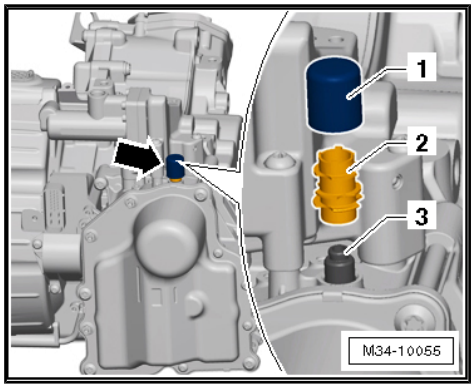
– Pull off both breather caps -arrow A- and -arrow B-.

Note

As an alternative to the engine bung set -VAS 6122- the sealing cap -02M 409 120- can be used to seal the gearbox. The mechatronic unit can be sealed using sealing cap -0AM 325 120 A- as an alternative. Order sealing plugs via the ⇒ Electronic parts catalogue "ETKA" .

– Seal gearbox breather and breather of mechatronic unit for dual clutch gearbox -J743- with clean sealing plugs so that no oil can escape.

– Order a new breather cap -arrow- for mechatronic unit for dual clutch gearbox -J743- , because it must be renewed after the gearbox has been installed ⇒ Electronic parts catalogue “ET-KA” .

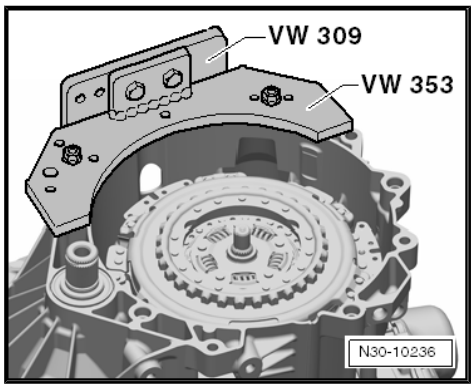


Note

Breather -2- and breather cap -1- form one replacement part and are fitted together onto breather connection -3-.

- Once the gearbox has been installed in the vehicle, the sealing plugs must be removed and the breather caps reinstalled, or new ones must be fitted if necessary.

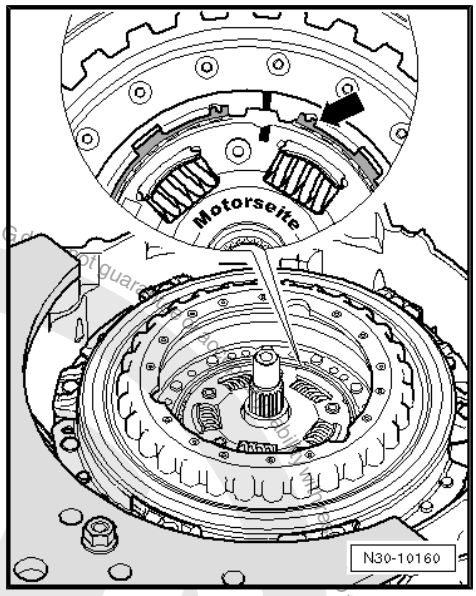
– Turn gearbox on engine and gearbox support upwards together with clutch..



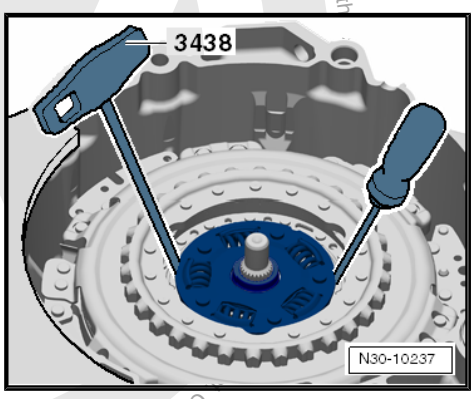
Note

The clutch is pulled off upwards. The mechatronic unit remains on the gearbox.

– Remove retaining ring -arrow- for hub.



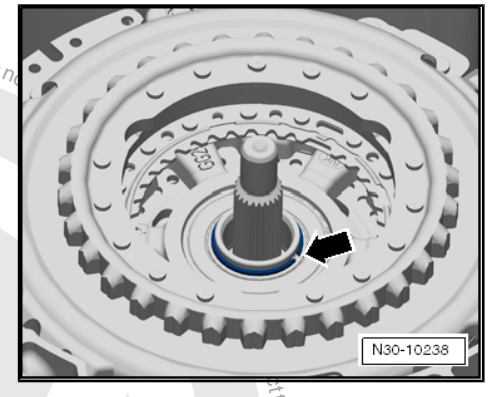
– Remove hub with hook -3438- and a screwdriver.



Note

If parts of clutch are renewed, the position of engagement bearings “K 1” and “K 2” must be set later. It is therefore advisable to determine dimension “B” for the measurements now
⇒ page 32 .

– Remove retaining ring -arrow- for clutch.



If retaining ring cannot be removed:

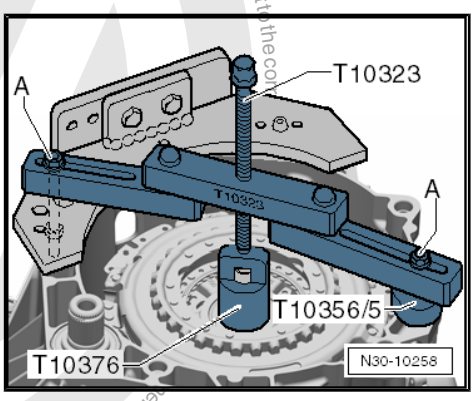
Note

- *If the retaining ring cannot be removed it is because the clutch has »clamped« the retaining ring at the bottom.*
- *In this case, push the clutch down slightly (see following description) and release the load on the retaining ring. Never strike the clutch or shaft with a hammer!*

– Position support bracket -T10323- parallel to gearbox flange as shown in illustration.

– If necessary, balance out gaps using -T10356/5- , for example.

– Screw in bolts -A- hand-tight.



Note

Bolts -A-, secure with nut as required.

Caution

Risk of damage to clutch and other components!

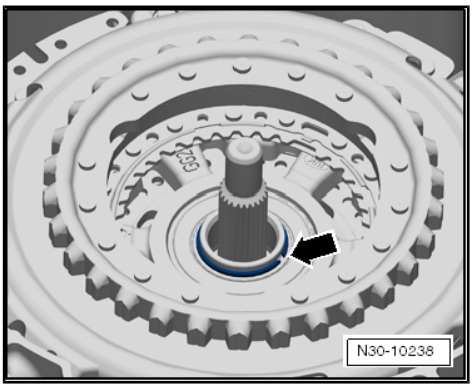
- ***Push down clutch using only very light force.***

– To press down, turn spindle against thrust piece -T10376- .

– Remove retaining ring -arrow- for clutch.

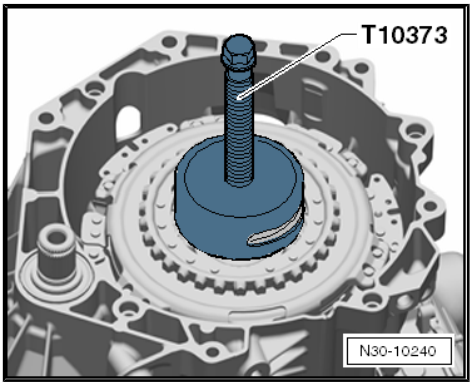
Caution

It is not permissible to reuse the retaining ring.

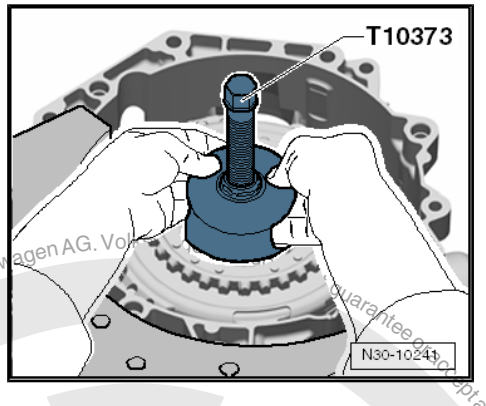


Continuation once retaining ring has been removed:

– Insert puller -T10373- into clutch and bore out clutch.



– Remove clutch together with puller -T10373- .



Installing dual clutch

Caution

Risk of damage to clutch and other components!

- *The positions of the engagement bearings must be set correctly.*

Adjustment can only be carried out before the clutch is installed.

The position of the engagement bearings must be adjusted after the following tasks:

- *Clutch has been renewed.*
- *Engaging levers were renewed.*
- *Small ball pin for engaging lever "K 2" has been renewed.*
- *Engagement bearings were renewed.*

If you have performed any of the above work, you must now adjust the position of engagement bearings "K 1 and K 2" ⇒ page 32 .

Only when the adjustment is correct may assembly work be continued.

If no new parts have been installed, insert removed shims.

Only one shim per engagement bearing may be installed.

- *Clutch parts must be free of oil and grease.*

Risk of damage from clutch adjustment device.

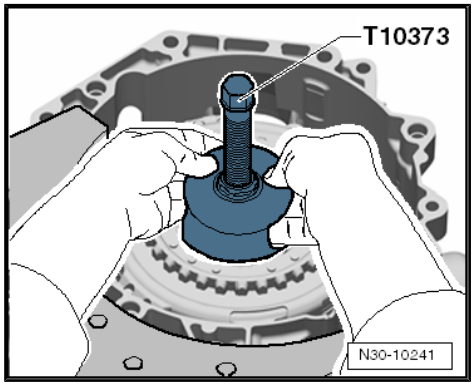
- *The clutch is self-adjusting. Shocks can have an effect on this adjusting device. Do not allow clutch to fall into gearbox during installation.*

Requirement:

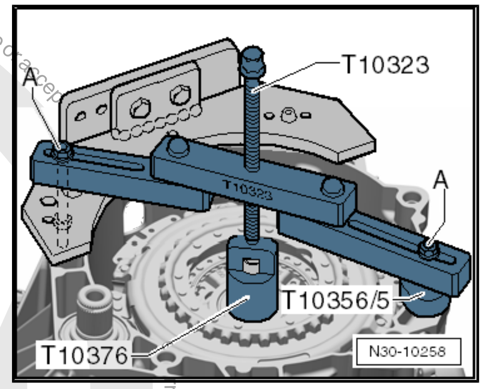
- Clutch engagement mechanism is installed ⇒ page 29 .

– Turn back spindle of puller -T10373- .

– Install clutch with puller -T10373- in gearbox, as shown in diagram.



– Position support bracket -T10323- parallel to gearbox flange as shown in illustration.



– If necessary, balance out gaps using -T10356/5- from assembly tool -T10356- , for example.

– Screw in bolts -A- hand-tight.

Note

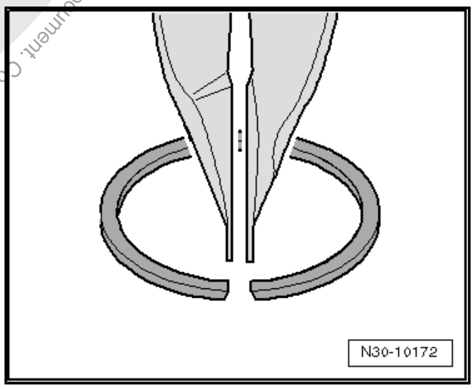
Bolts -A-, secure with nut as required.

– Press on clutch as far as it will go.

Note

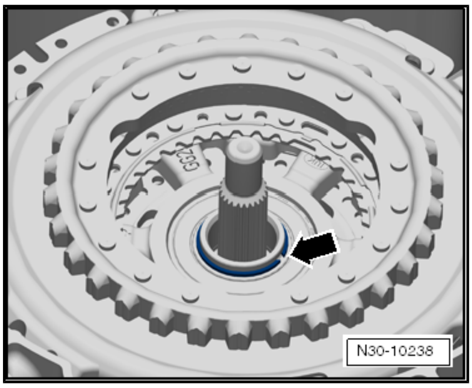
Place a hand on the clutch when pressing it on. A slight »rattling« will be felt. Rattling indicates that the clutch is being pressed onto its press seat. This also enables detection of the limit stop once the clutch has been seated correctly.

– Take hold of new retaining ring with retaining ring pliers, as shown in the illustration.



• Installation position: narrow surface of retaining ring on top.

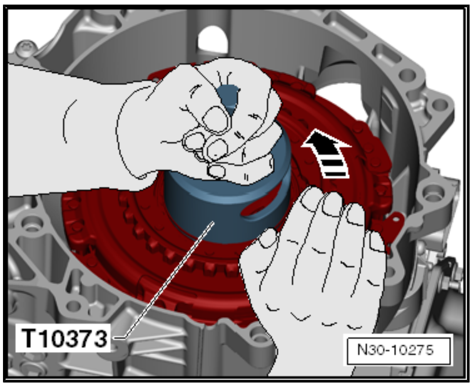
– Inserting retaining ring -arrow-.



Note

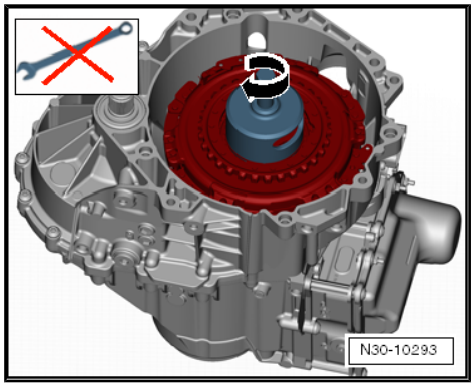
If the retaining ring cannot be inserted, the clutch has not been pressed in onto its limit stop.

– To ensure that the clutch reaches its operating position right from this stage, turn it against puller -T10373- -arrow- by hand without using any other tools.



Note

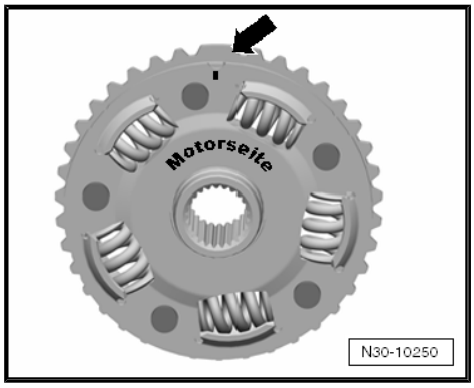
- *By pressing on, the clutch sits at the bottom against the limit stop on the input shaft. This is not the optimum position.*
- *Clutch should only be pulled up far enough for it to contact retaining ring.*
- *Only turn by hand. In this way, clutch slides against retaining ring. Do not use any other tool.*



– Insert hub.

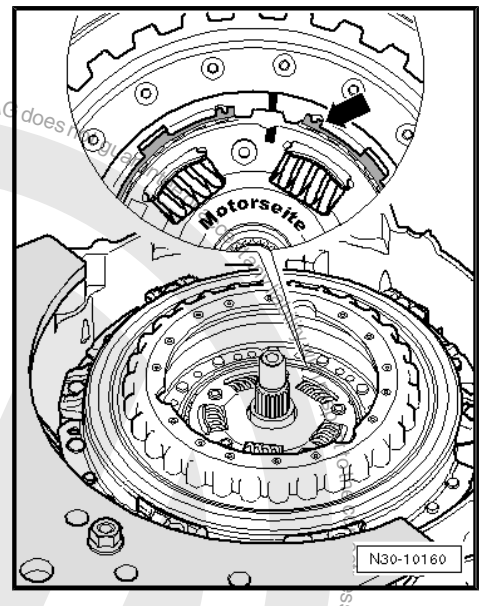
• Hub has »large tooth« -arrow- and only fits in one position.

• »Large tooth« has a mark at engine end.

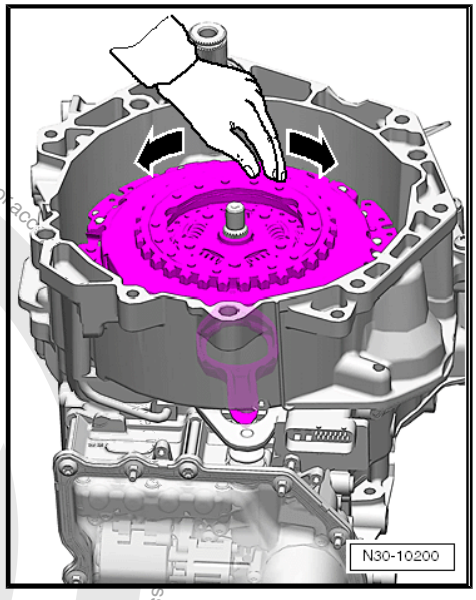


– Insert retaining ring -arrow- of hub.

• Joint of retaining ring must point towards »hub« of clutch.

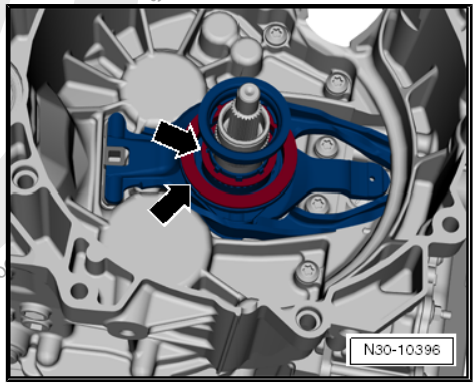


– Turn clutch by hand. It should be possible to turn it without difficulty.

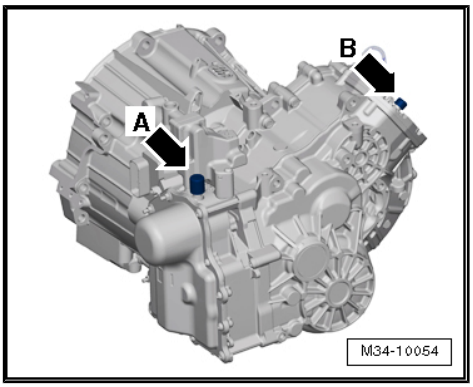


Note

- *If the clutch is difficult to turn or if the clutch lining is being rubbed hard, remove clutch again ⇒ page 16 .*
- *Check installation position of shims -arrows-.*
- *The shims must be properly seated and undamaged ⇒ page 20 .*
- *A mathematical error could have been made. Check measurements again ⇒ page 32*
- *If no fault can be found, the clutch may have been moved out of position due to transport/assembly and a new clutch now has to be installed. The position of the engagement bearings must then be readjusted ⇒ page 32 .*



– Remove both sealing plugs and fit breather caps -arrow A- and -arrow B-.



Note

The breather cap -arrow A- on the mechatronic unit is destroyed during removal and must be renewed.

– Dispose of excess shims.
– After installation of gearbox, perform function `Complete reset` using vehicle diagnosis tester in `Guided functions` mode.

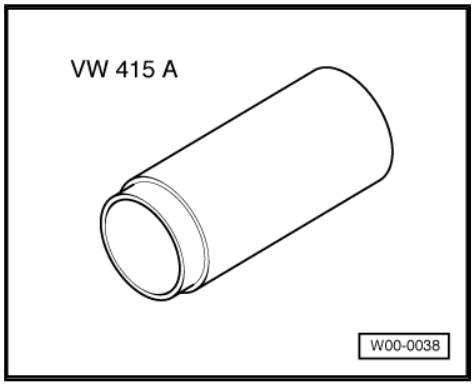
1.3 Renewing input shaft seal

Renewing seal for outer input shaft

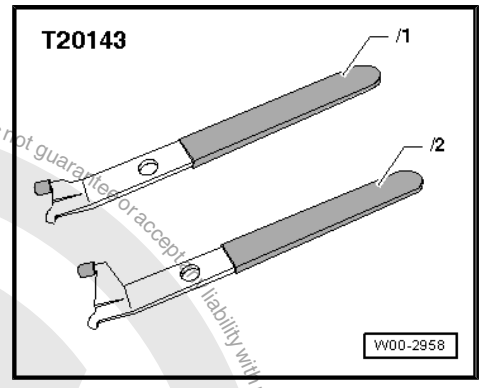
⇒ “1.4 Renewing seal for inner input shaft”, page 25 .

Special tools and workshop equipment required

- Tube -VW 415 A-



- Puller hooks -T20143/2-



- Sealing grease -G 052 128 A1-

Procedure

- Dual clutch is removed ⇒ page 16 .
- Clutch engagement mechanism is removed ⇒ page 29 .

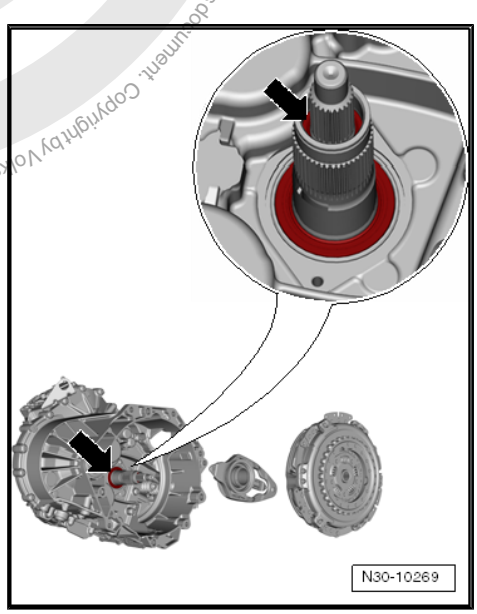
Caution

Risk of damage to clutch and other components!

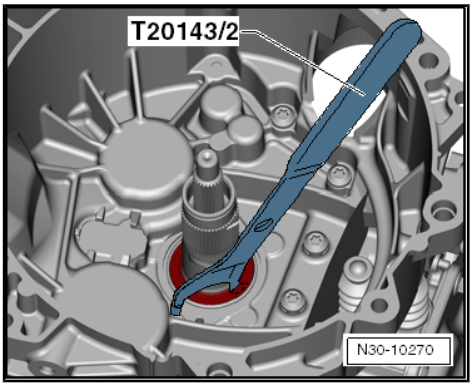
- ***Renew dual clutch if it is oily.***

Note

There are 2 oil seals in gearbox at clutch end. Both oil seals can be renewed without gearbox being dismantled. If only oil seals are renewed, there is no need to adjust the clutch engagement mechanism.



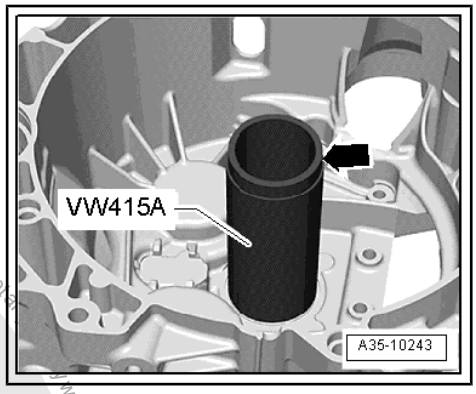
– Lever out outer oil seal.



Caution

Risk of damaging the clutch.

- ***Only drive in oil seal until it is flush, in order to avoid closing off oil drilling located behind it. Otherwise, bearing can no longer be supplied with enough oil.***



– Drive in new oil seal using nylon-faced hammer until it is flush with clutch housing, as shown in illustration.

• Shoulder of pipe section -VW 415 A- points upwards -arrow-.

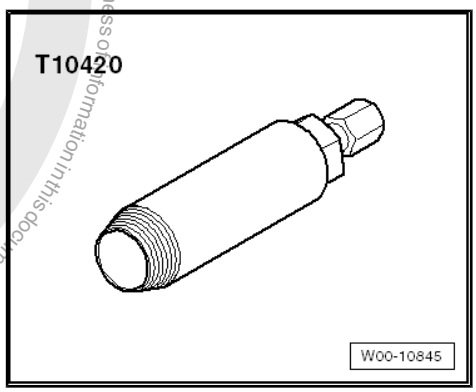
– Install clutch engagement mechanism ⇒ page 29 .

– Install dual clutch ⇒ page 20 .

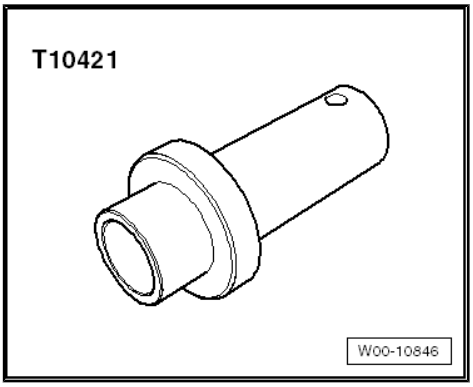
1.4 Renewing seal for inner input shaft

Special tools and workshop equipment required

- Oil seal extractor -T10420-



- Thrust piece -T10421-



Procedure

- Dual clutch is removed ⇒ page 16 .
- Clutch engagement mechanism is removed ⇒ page 29 .

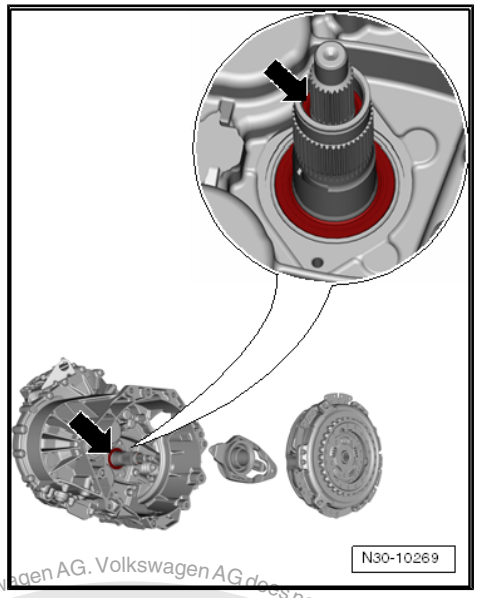
Caution

Risk of damage to clutch and other components!

- ***Renew dual clutch if it is oily.***

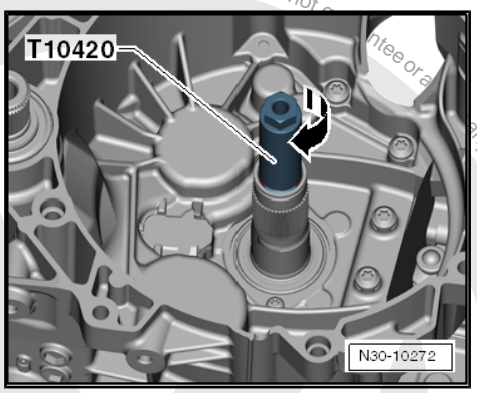
Note

There are 2 oil seals in gearbox at clutch end. Both oil seals can be renewed without gearbox being dismantled. If only oil seals are renewed, there is no need to adjust the clutch engagement mechanism.



– Unscrew spindle of oil seal extractor -T10420- .

– Screw oil seal extractor -T10420- into »small«, inner oil seal. Push on puller when screwing in.



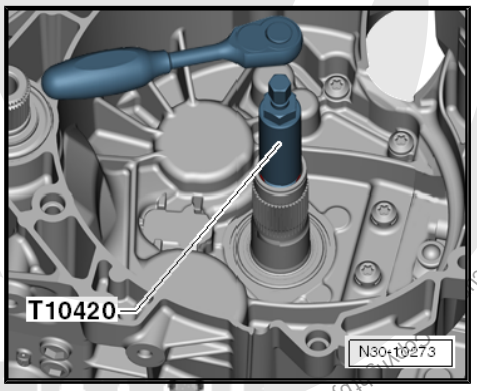
Note

Puller will become very tightly clamped when turning oil seal.

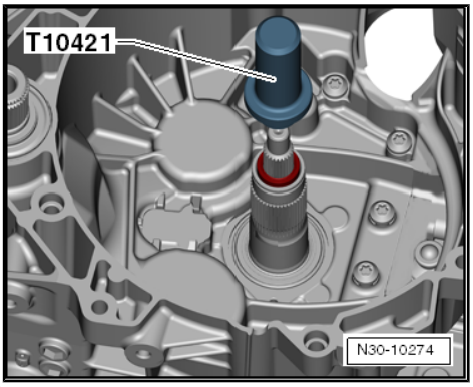
– Screw puller in until the seal begins to turn in its seat.

– Now screw in spindle.

– Pull out oil seal using spindle.



– Drive in new oil seal to stop on tool using thrust piece - T10421- .
– Install clutch engagement mechanism ⇒ page 29 .
– Install dual clutch ⇒ page 20 .



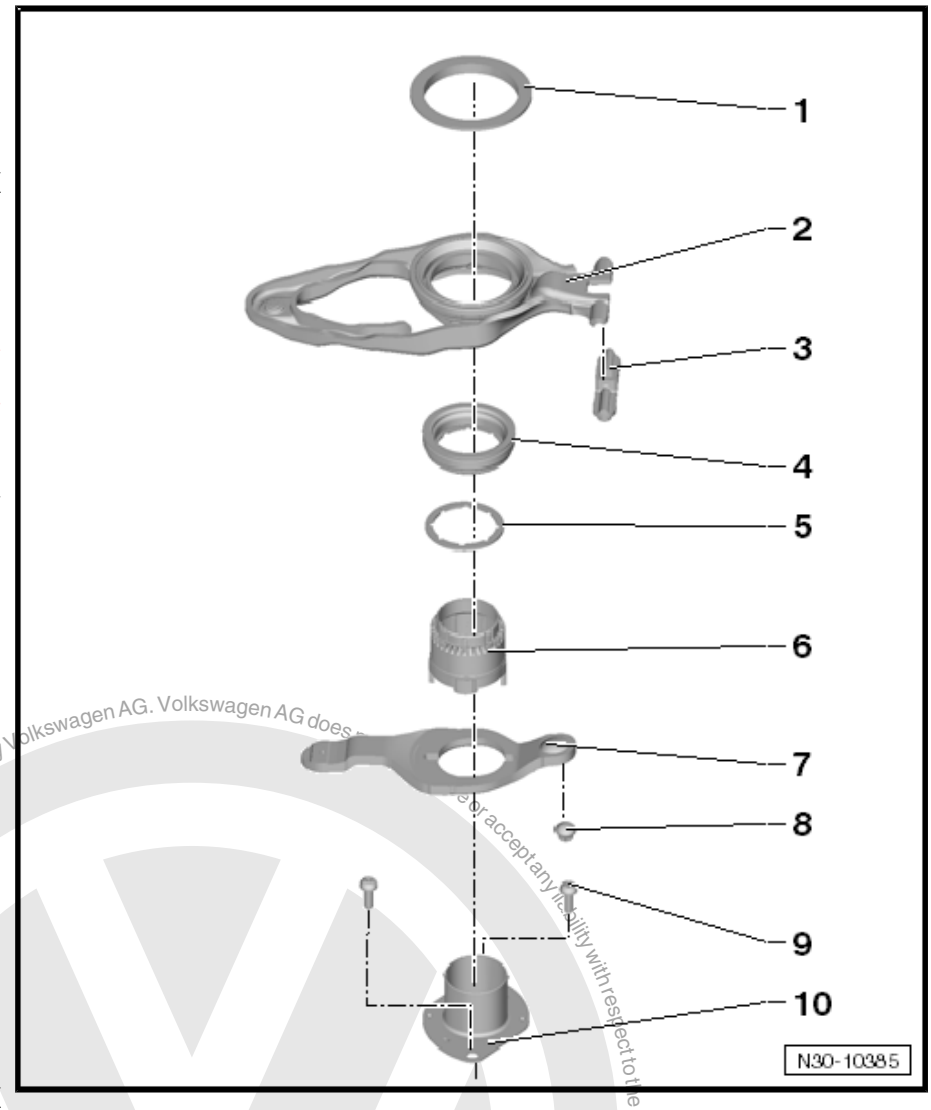
2 Clutch mechanism

⇒ “2.1 Assembly overview - clutch engagement mechanism”, page 28

⇒ “2.2 Removing and installing clutch engagement mechanism”, page 29

⇒ “2.3 Adjusting clutch engagement mechanism”, page 32

2.1 Assembly overview - clutch engagement mechanism



1 - Shim for “K 1”

- ❑ Determining thickness ⇒ “2.3 Adjusting clutch engagement mechanism”, page 32 .

2 - Large engaging lever for “K 1”

- ❑ With engagement bearing
- ❑ Removing and installing ⇒ “2.2 Removing and installing clutch engagement mechanism”, page 29 .

3 - Hinge mounting

- ❑ For large engaging lever “K 1”
- ❑ Is not renewed

4 - Small engagement bearings for “K 2”

5 - Shim for “K 2”

- ❑ Determining thickness ⇒ “2.3 Adjusting clutch engagement mechanism”, page 32 .

6 - Upper section of guide sleeve

- ❑ Small small engaging lever “K 2”
- ❑ Is removed and installed together with small engaging lever and lower section of guide sleeve

7 - Small engaging lever for “K 2”

- ❑ Is removed and installed together with upper and lower section of guide sleeve
- ❑ Removing and installing ⇒ “2.2 Removing and installing clutch engagement mechanism”, page 29 .

8 - Ball pin

- ❑ Small small engaging lever “K 2”
- ❑ Removing and installing ⇒ page 34 .

9 - Bolt

- ❑ Renew after each removal.
- ❑ 8 Nm +90°

10 - Lower section of guide sleeve

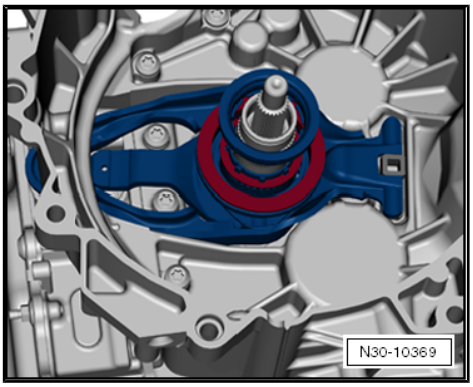
- ❑ Small small engaging lever “K 2”
- ❑ Is removed and installed together with small engaging lever and upper section of guide sleeve

2.2 Removing and installing clutch engagement mechanism

Removing

- Dual clutch is removed ⇒ page 16 .

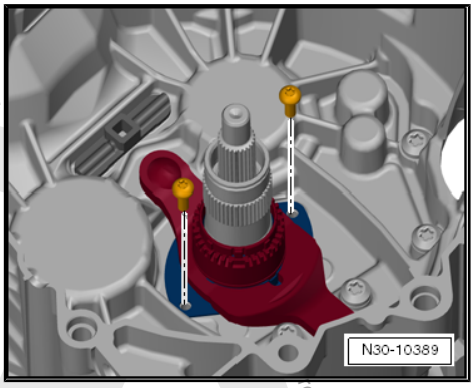
– Remove »large« engaging lever together with »small« engagement bearing.



Note

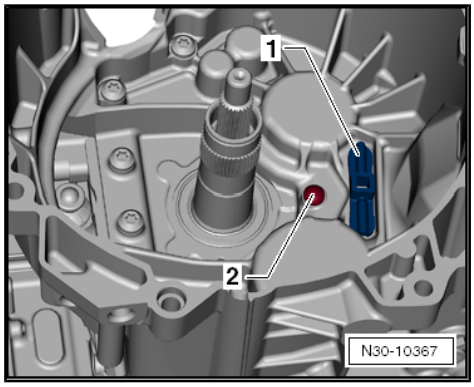
The upper section of the guide sleeve cannot be removed or installed alone. It is always removed or installed together with lower section of guide sleeve and »small« engaging lever.

– Unscrew bolts and remove »small« engaging lever together with upper and lower section of guide sleeve.



Note

- *The hinge mounting -1- is not removed.*
- *Only replace the ball pin -2- when it is worn ⇒ page 34 .*



Installing

Install in reverse order of removal, observing the following:

WARNING

The position of the engagement bearings "K 1" and "K 2" must only be adjusted after the following work:

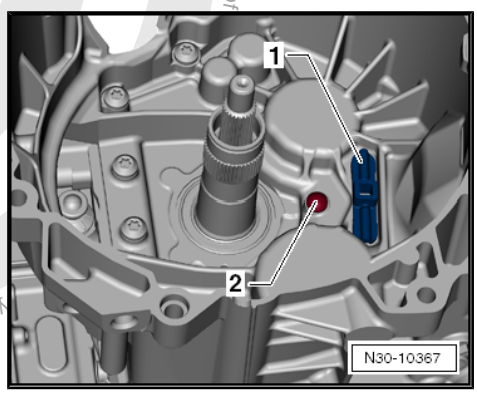
- ***Dual clutch was renewed.***
- ***Engaging levers were renewed.***
- ***Small ball pin for engaging lever "K 2" has been renewed.***
- ***Engagement bearings were renewed.***

If you have performed any of the above work, you must now adjust the position of engagement bearings "K 1 and K 2" ⇒ page 32 .

Note

There is no need to adjust anything if all the named parts have only been removed and reinstalled.

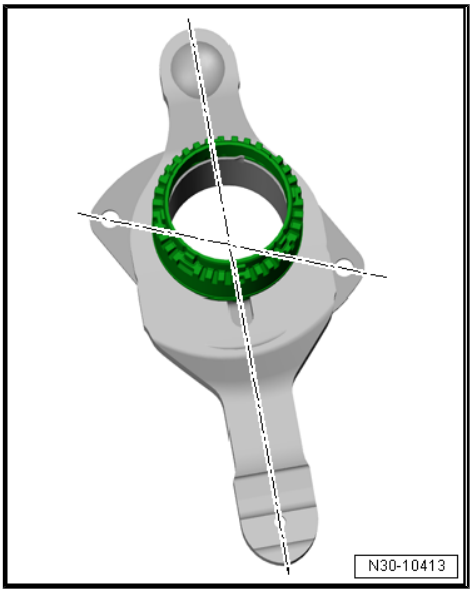
- Hinge mounting -1- and ball pin -2- have been installed.



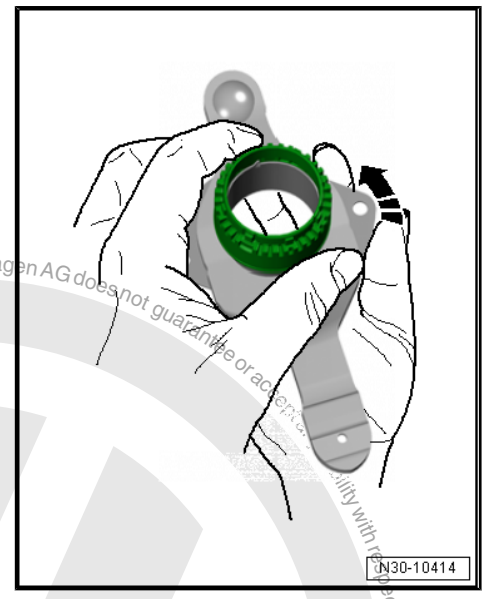
Observe the following when installing a new engaging lever »K 2«:

The new engaging lever »K2« with upper and lower section of guide sleeve will be delivered in transport position -illustration- and must be set to installation position prior to installation.

Setting engaging lever »K2« to installation position:



– Hold upper section of guide sleeve with one hand. With the other hand turn the lower section of guide sleeve in -direction of arrow- until the sleeve moves freely.

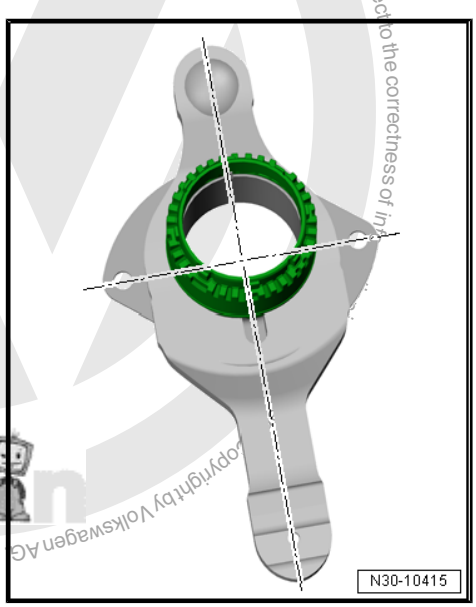


Note

Apply high force to hold both sections, as this is necessary for turning the lower section of the guide sleeve.

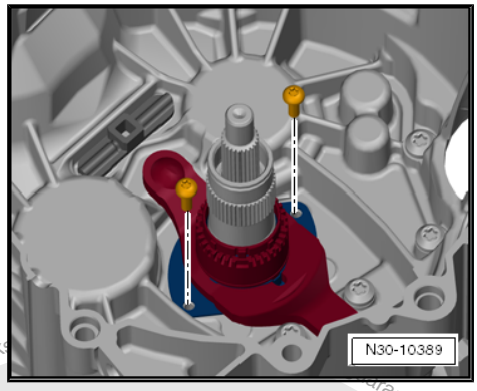
If the engaging lever is in installation position, the holes of the lower section of guide sleeve are at right angles to the engaging lever and the sleeve moves freely.

– When installing a new engaging lever, the position of the engaging bearings “K 1” and “K 2” must be adjusted ⇒ page 32 .

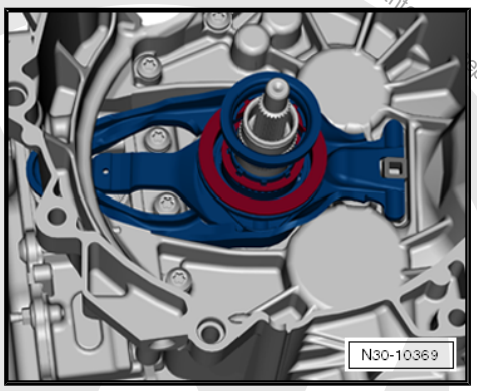


Continuation for all:

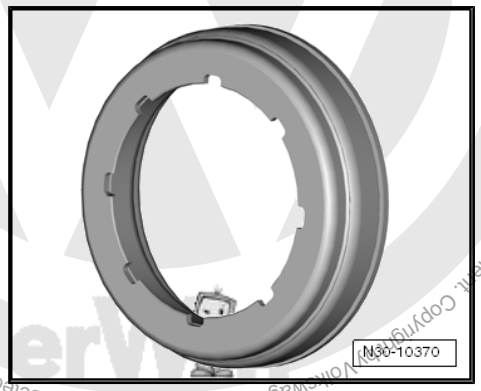
– Install »small« engaging lever together with upper and lower section of guide sleeve. Insert and tighten new bolts.



– Insert »large« engaging lever with measured shims for “K 1” and “K 2” and with small engagement bearing.



- The large shim is inserted into the large engagement bearing, with the hemispherical side of the shim facing downwards.
- The small shim goes under the small engagement bearing. Therefore, insert shim first.
- The shim and the small engagement bearing only fit in one position due to the 8 grooves.



– By turning, check that parts have been installed correctly and that grooves are seated correctly.

– Check both engaging levers are seated correctly.

– Install dual clutch ⇒ page 20 .

Specified torques

♦ Lower section of guide sleeve with small engaging lever to gearbox housing ⇒ Item 9 (page 28) .

2.3 Adjusting clutch engagement mechanism

The position of the engagement bearings “K 1” and “K 2” must only be adjusted after the following work:

♦ Clutch has been renewed.

♦ Engaging levers were renewed.

♦ Small ball pin for engaging lever “K 2” has been renewed.

♦ Engagement bearings were renewed.

Note

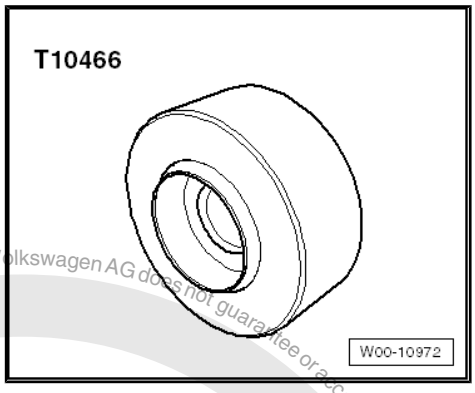
- *There is no need to adjust anything if all the named parts have only been removed and reinstalled.*
- *The retaining ring must be renewed in each case.*

Brief description

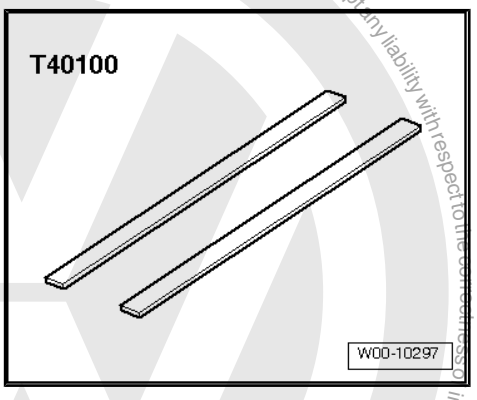
- Position of engagement bearings is comparable with clutch play of a manual gearbox. In the 7-speed dual clutch gearbox 0CG there are tolerances in the engagement system of the gearbox and in the gearbox itself. Even within the dual clutch there are tolerances. These tolerances must be taken into account separately during adjustment.
- The following procedure first describes how to measure all necessary dimensions on the gearbox so that the appropriate shim can be selected. In addition are the tolerances in the clutch that the manufacturer has already calculated. Tolerances on gearbox and tolerances in clutch determine thickness of shim.
- Adhere to the sequence of work steps.

Special tools and workshop equipment required

- Depth gauge, digital 300 mm -VAS 6594-
- Gauge block -T10466-



- Ruler -T40100-



Procedure

- Dual clutch is removed ⇒ page 16.
- The gearbox flange must be level to assure good contact with the ruler.
- Mechatronic unit for dual clutch gearbox -J743- built into gearbox.

- Specified tightening torque
  ⇒ “2.1 Assembly overview - clutch engagement mechanism”, page 28

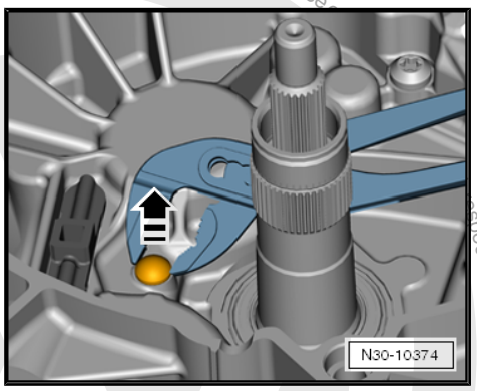
Caution

Risk of damage to clutch and other components!

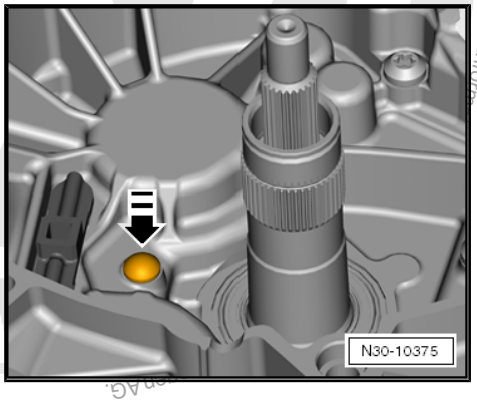
- *Mounting for engaging lever and entire mechanism of engagement bearing must be dry and free of oil or grease.*

If ball pin is worn:

– Remove ball pin using pliers.



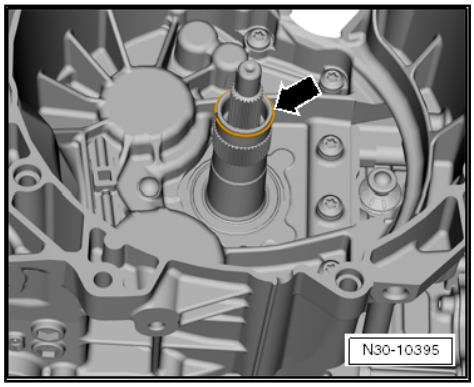
– Push in »new« ball pin by hand, if necessary using a plastic hammer and drift to tap it in.



Note

To avoid damage to ball pin, only tap the drift lightly with the plastic head hammer.

Continuation for all:

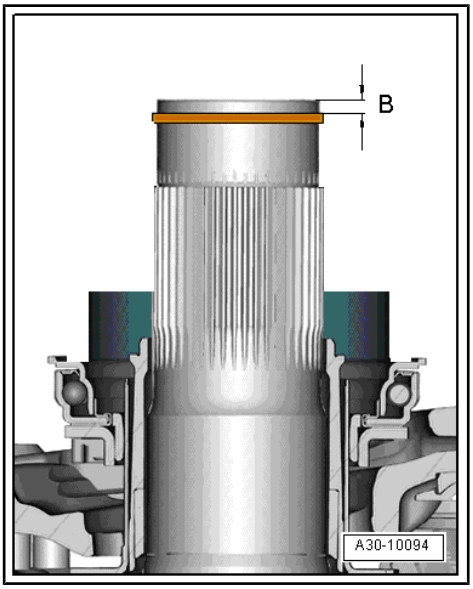


Note

If dimension “B” has already been determined, it is now possible to proceed with step “2” of the measurement ⇒ page 36 .

– Install previously used retaining ring -arrow- of outer input shaft.

1st step: Determine dimension “B” for clutch “K 1” and “K 2”

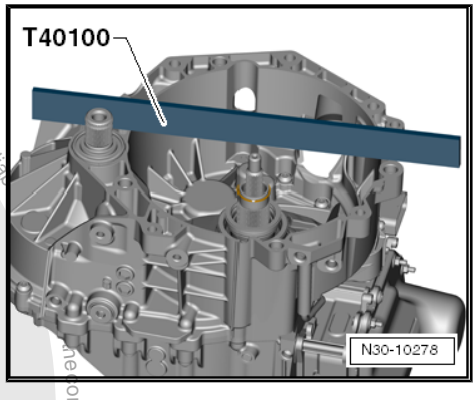


– Place ruler -T40100- upwards across end of shaft onto gearbox flange.

Caution

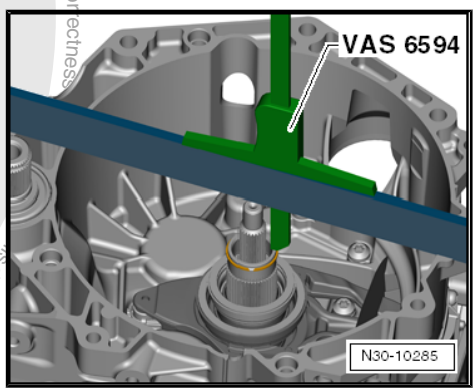
Risk of false measurements.

- ***The ruler -T40100- should remain in this position for the following measurements. Do not turn over, do not remove.***



– Place digital 300 mm depth gauge -VAS 6594- on top of ruler -T40100- and position depth gauge rod on outer input shaft.

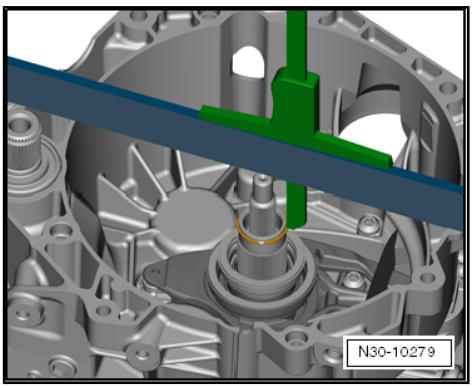
– Set depth gauge to “0”.



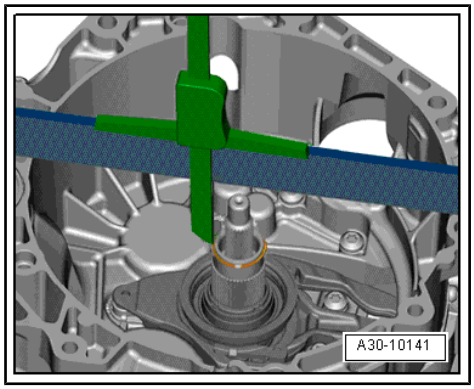
– Position depth gauge rod on retaining ring, as show in diagram.

– In this position, determine dimension “B_1” to retaining ring.

• Example: dimension “B_1” = 2.62 mm



– In the opposite position, determine dimension “B_2” to retaining ring.



Note

Do not measure on retaining ring joint. The retaining ring could be pushed away and falsify the reading.

- Example: dimension “B_2” = 2.58 mm

– Calculate mean value from dimension “B_1” and “B_2”.

Formula: $B_1 + B_2$ 2

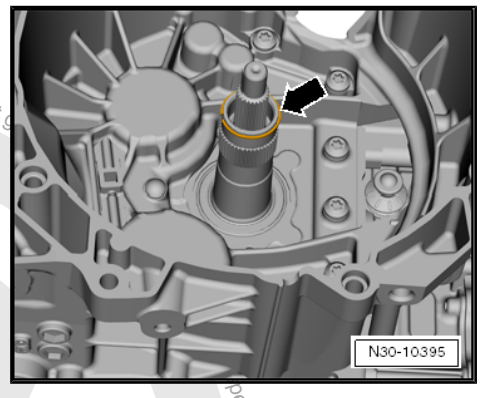
Example:

- 2,62 + 2,582 = 2.60 mm
- Result: Dimension “B” = 2.60 mm

Note

If the dual clutch is still installed after this measurement, it must now be removed ⇒ page 19 .

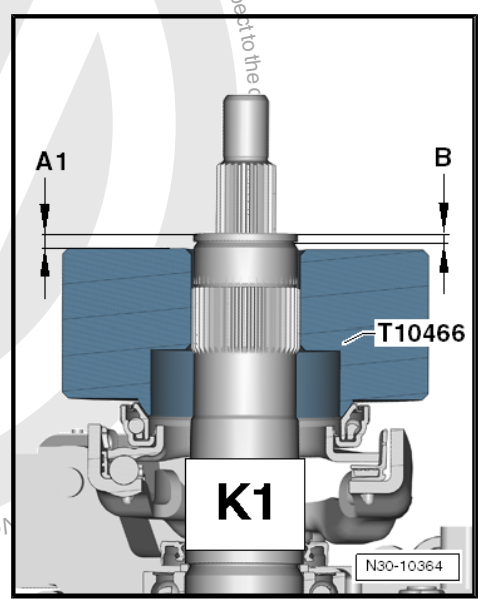
– Remove retaining ring -arrow- of outer input shaft and dispose.



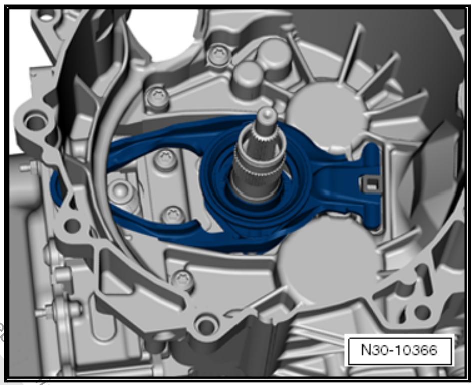
Caution

It is not permissible to reuse the retaining ring.

2nd step: Determine dimension “A 1” for engagement bearing of clutch “K 1”

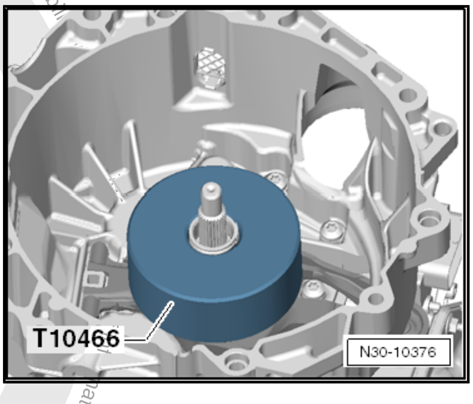


– Insert large engaging lever.



> ⚠ Caution
>
> *Risk of false measurements.*
>
> ♦ *Do not insert any shim!*

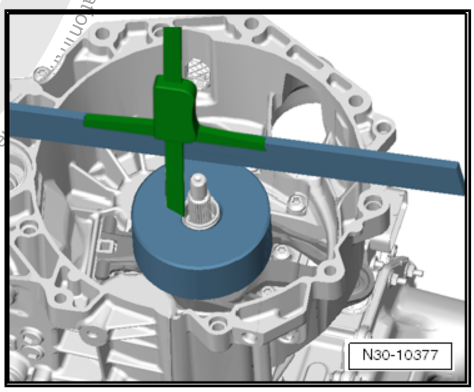
– Check that engaging lever is seated correctly.



– Place gauge block -T10466- on large engagement bearing. Flat side faces upwards.

– To ensure that gauge block -T10466- sits properly on engagement bearing, press down and turn gauge block.

• Engagement bearing will turn with gauge block -T10466- .

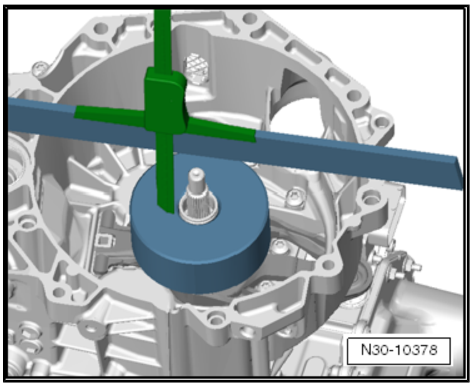


– Place digital 300 mm depth gauge -VAS 6594- on top of ruler and position depth gauge rod on outer input shaft.

• Ruler -T40100- is lying upwards across end of shaft on gearbox flange.

> ⚠ Caution
>
> *Risk of false measurements.*
>
> ♦ *The ruler -T40100- should remain in this position for the following measurements. Do not turn over, do not remove.*

– Set depth gauge to “0”.



– Position depth gauge rod on gauge block -T10466- , as show in diagram.

– In this position, determine dimension “A 1_a” to gauge block -T10466- .

• Example: Dimension “A 1_a” = 5.03 mm

– In the opposite position, determine dimension “A 1_b” to gauge block -T10466- .

• Example: Dimension “A 1_b” = 5.01 mm

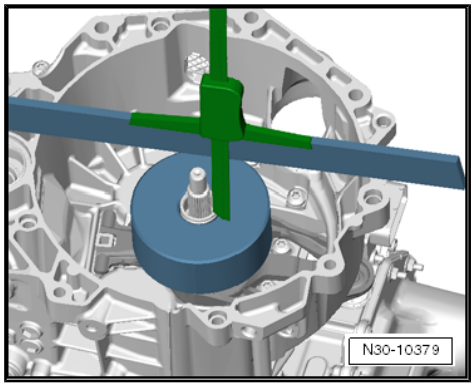
– Calculate mean value from dimension “A 1_a” and “A 1_b”.

Formula: A 1_a + A 1_b 2

Example:

• 5,03 + 5,012 = 5.02 mm

• Result: Dimension “A 1” = 5.02 mm



3rd step: Calculate height tolerance of clutch engagement bearing “K 1”

Note

On the basis of dimension “A 1” and dimension “B”, the height tolerance of the engagement bearing for clutch “K 1” is now calculated according to the following calculus.

	Dimension “A 1”
–	Dimension “B”
=	Actual height tolerance of clutch engagement bearing “K 1”

Example:

• 5.02 mm - 2.60 mm = 2.42 mm

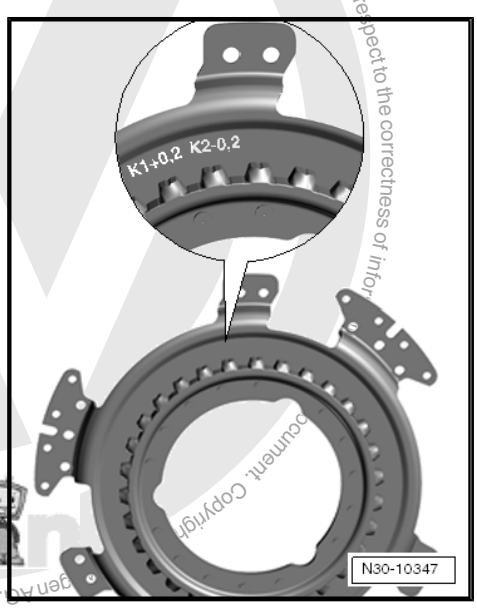
• Result: Height tolerance of clutch engagement bearing “K 1” = 2.42 mm

4th step: Calculate clutch tolerance of clutch “K 1”.

– Read clutch tolerance value from new clutch.

• Example: Read off clutch tolerance value on clutch “K 1 = +0.2”, as shown in diagram.

• Result: Clutch tolerance of clutch “K 1” = + 0.20 mm.



5th step: Determine thickness of shim “SK 1”

Note

On the basis of the clutch tolerance “K 1”, the thickness of shim “SK 1” is now calculated according to the following calculus.

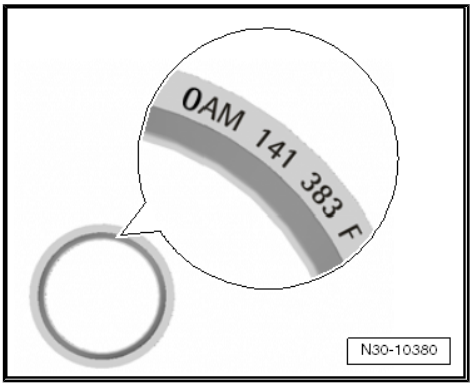
	Height tolerance of engagement bearing “K 1”
–/+	Clutch tolerance of clutch “K 1”
=	Calculated thickness of shim “SK 1”

Example:

• 2.42 mm + 0.20 mm = 2.62 mm

• Result: Calculated thickness of shim “SK 1” = 2.62 mm

– Select required shim from the table with the help of the part number -magnifying glass- and have it ready for installation.



Calculated thickness of shim mm	Available shims Thickness in mm	Part number of shim
1.21 … 1.60	1.50	0AM 141 383
1.61 … 1.80	1.70	0AM 141 383 A
1.81 … 2.00	1.90	0AM 141 383 B
2.01 … 2.20	2.10	0AM 141 383 C
2.21 … 2.40	2.30	0AM 141 383 D
2.41 … 2.60	2.50	0AM 141 383 E
2.61 … 2.80	2.70	0AM 141 383 F
2.81 … 3.00	2.90	0AM 141 383 G
3.01 … 3.20	3.10	0AM 141 383 H
3.21 … 3.40	3.30	0AM 141 383 J
3.41 … 3.80	3.50	0AM 141 383 K

Example:

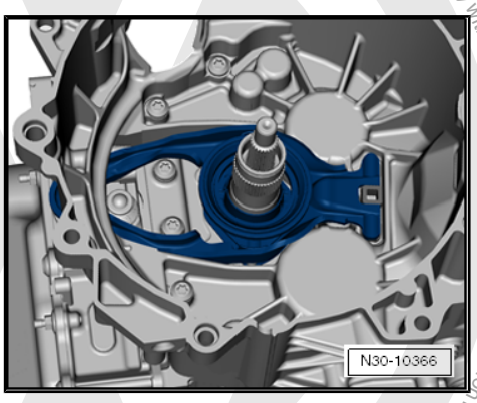
- Result: Calculated thickness of shim “SK 1” = 2.62 mm
- Chosen shim thickness = 2.70 mm = part number 0AM 141 383 F

Caution

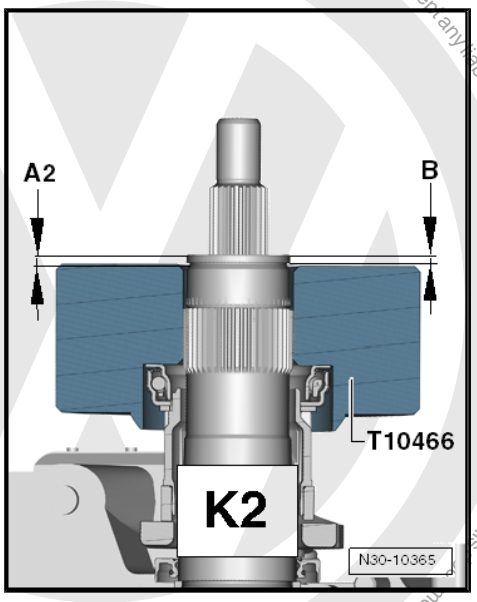
Risk of damaging the clutch!

- *Only use this shim when installing.*

– Remove gauge block -T10466- and large engaging lever again.



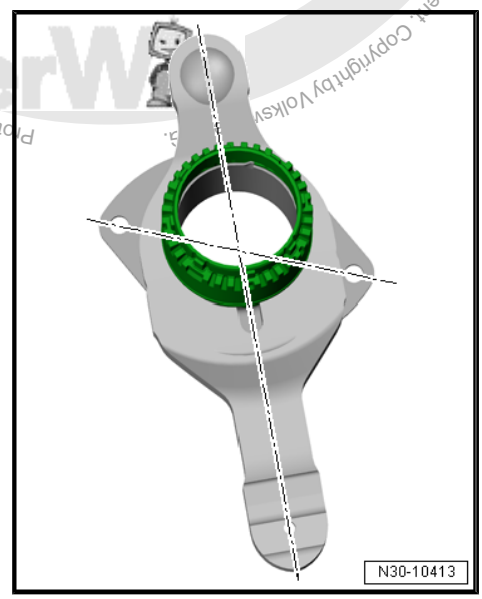
6th step: Determine dimension “A 2” for clutch engaging lever “K 2”



Note

The upper section of the guide sleeve cannot be removed or installed alone. It is always removed or installed together with lower section of guide sleeve and »small« engaging lever.

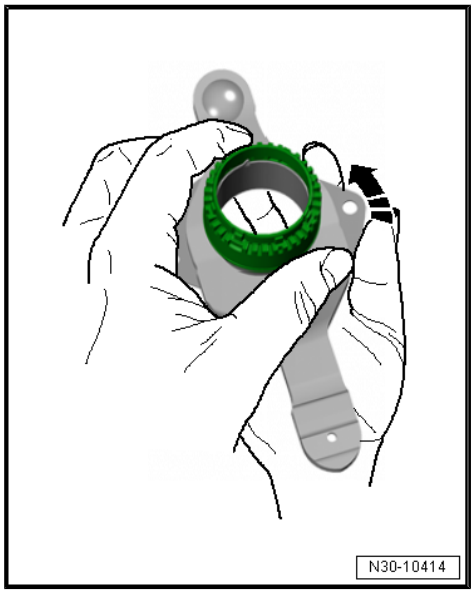
Observe the following when installing a new engaging lever »K 2«:



The new engaging lever »K2« with upper and lower section of guide sleeve will be delivered in transport position -illustration- and must be set to installation position prior to installation.

Setting engaging lever »K2« to installation position:

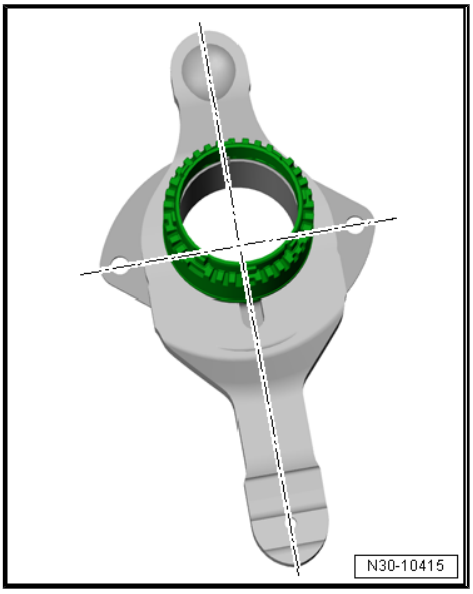
– Hold upper section of guide sleeve with one hand. With the other hand turn the lower section of guide sleeve in -direction of arrow- until the sleeve moves freely.



Note

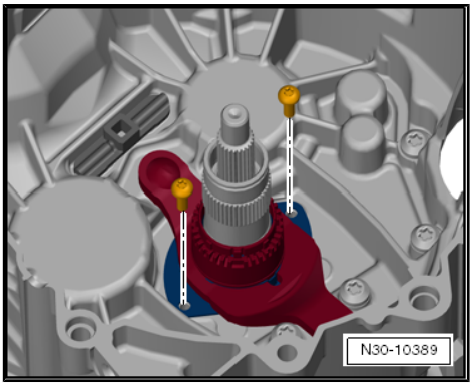
Apply high force to hold both sections, as this is necessary for turning the lower section of the guide sleeve.

If the engaging lever is in installation position, the holes of the lower section of guide sleeve are at right angles to the engaging lever and the sleeve moves freely.



Continuation for all:

– Install »small« engaging lever together with upper and lower section of guide sleeve. Insert and tighten new bolts.

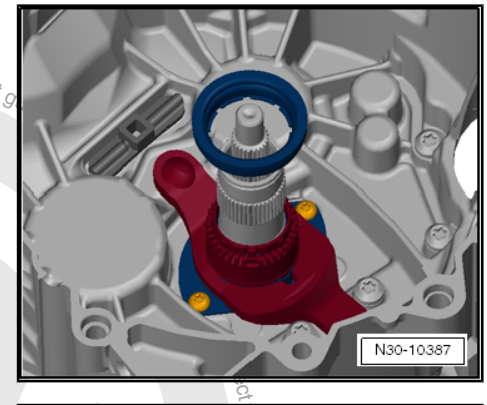


– Insert »small« engagement bearing without shim.

Caution

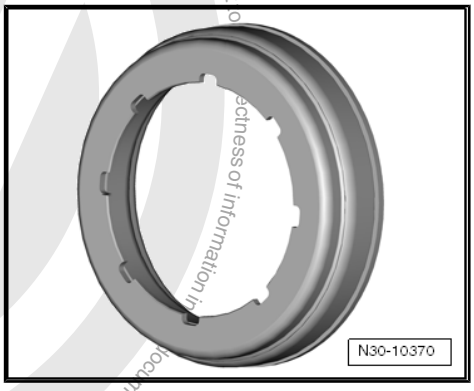
Risk of false measurements.

- ***Do not insert any shim!***

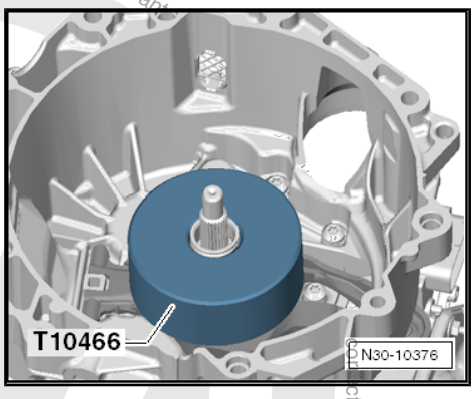


- Small engagement bearing only fits in one position due to 8 grooves.

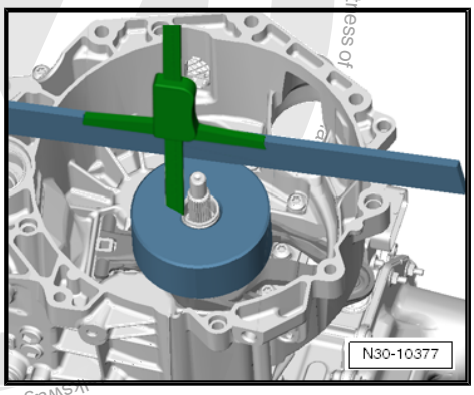
– By turning, check whether small engagement bearing has been installed correctly and that grooves are seated correctly.



– Place gauge block -T10466- on small engagement bearing. Flat side faces upwards.
– To ensure that gauge block -T10466- sits properly on engagement bearing, press down and turn gauge block.
• Engagement bearing will turn with gauge block -T10466- .



– Place digital 300 mm depth gauge -VAS 6594- on top of ruler and position depth gauge rod on outer input shaft.
• Ruler -T40100- is lying upwards across end of shaft on gearbox flange.



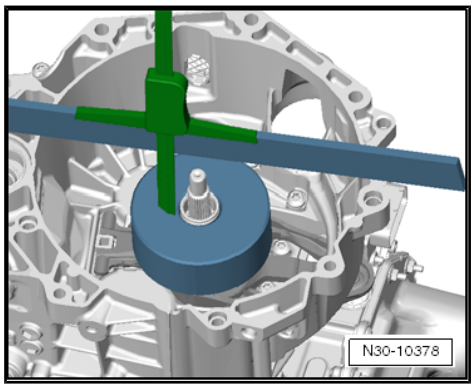
Caution

Risk of false measurements.

- ***The ruler -T40100- should remain in this position for the following measurements. Do not turn over, do not remove.***

– Set depth gauge to “0”.

– Position depth gauge rod on gauge block -T10466- , as show in diagram.
– In this position, determine dimension “A 2_a” to gauge block -T10466- .
• Example: Dimension “A 2_a” = 4.79 mm



– In the opposite position, determine dimension “A 2_b” to gauge block -T10466- .

• Example: Dimension “A 2_b” = 4.75 mm

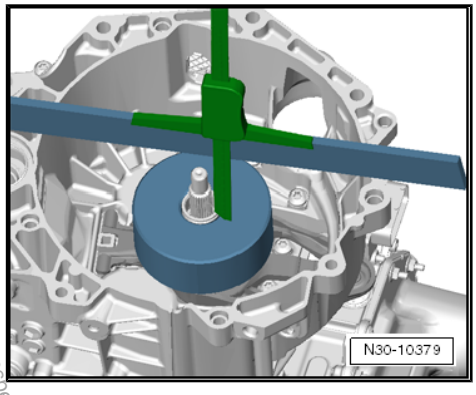
– Calculate mean value from dimension “A 2_a” and “A 2_b”.

Formula: A 2_a + A 2_b 2

Example:

• 4,79 + 4,752 = 4.77 mm

• Result: Dimension “A 2” = 4.77 mm



7th step: Calculate height tolerance of clutch engagement bearing “K 2”

Note

On the basis of dimension “A 2” and dimension “B”, the height tolerance of the engagement bearing for clutch “K 2” is now calculated according to the following calculus.

	Dimension “A 2”
–	Dimension “B”
=	Actual height tolerance of clutch engagement bearing “K 2”

Example:

• 4.77 mm - 2.60 mm = 2.17 mm

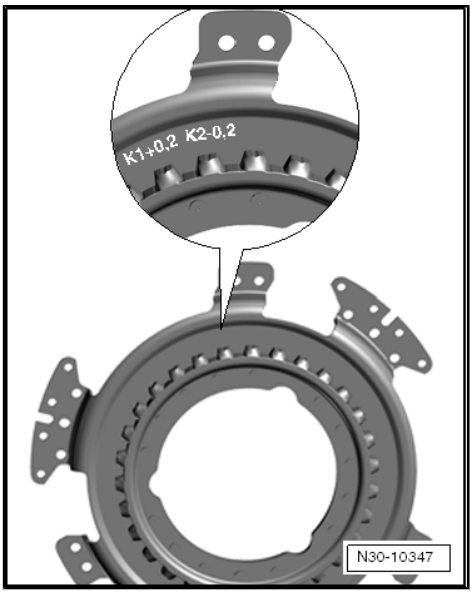
• Result: Height tolerance of clutch engagement bearing “K 2” = 2.17 mm

8th step: Calculate clutch tolerance of clutch “K 2”

– Read clutch tolerance value from new clutch.

• Example: Read off clutch tolerance value on clutch “K 2 = – 0.2”, as shown in illustration.

• Result: Clutch tolerance of clutch “K 2” = – 0.20 mm.



9th step: Determine thickness of shim “SK 2”

Note

On the basis of the clutch tolerance “K 2”, the thickness of shim “SK 2” is now calculated according to the following calculus.

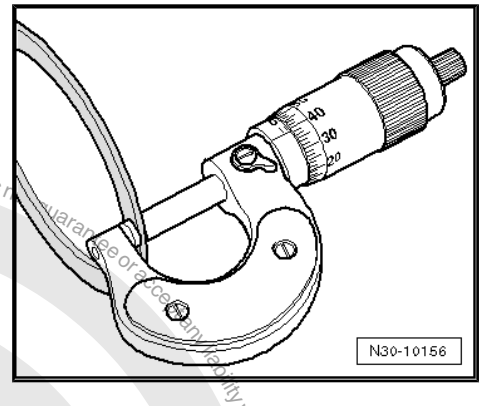
	Height tolerance of engagement bearing “K 2”
–/+	Clutch tolerance of clutch “K 2”
=	Calculated thickness of shim “SK 2”

Example:

• 2.17 mm – 0.20 mm = 1.97 mm

• Result: Calculated thickness of shim “SK 2” = 1.97 mm

– From the shims supplied, measure the required shim and have it ready for installation.



Calculated thickness of shim mm	Available shims Thickness in mm
0.31 … 0.90	0.80
0.91 … 1.10	1.00
1.11 … 1.30	1.20
1.31 … 1.50	1.40
1.51 … 1.70	1.60
1.71 … 1.90	1.80
1.91 … 2.10	2.00
2.11 … 2.30	2.20
2.31 … 2.50	2.40
2.51 … 2.70	2.60
2.71 … 3.30	2.80

Example:

- Result: Calculated thickness of shim “SK 2” = 1.97 mm
- Chosen shim thickness = 2.00 mm

Caution

Risk of damaging the clutch!

- ***Only use this shim when installing.***

The adjusting work has now been completed and the »small« engaging lever has already been installed.

– Install dual clutch ⇒ page 20 .

- Lower section of guide sleeve with small engaging lever to gearbox housing ⇒ Item 9 (page 28) .

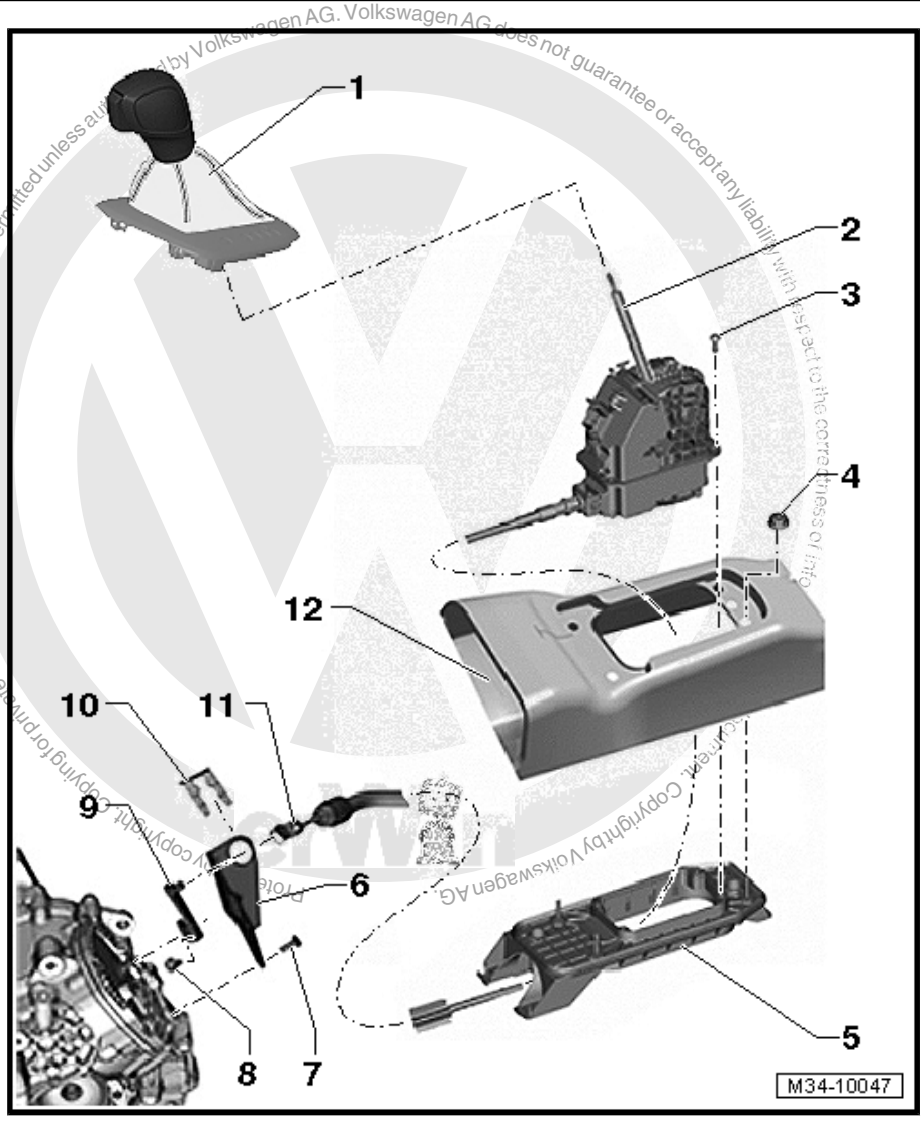
34 – Controls, housing

1 Selector mechanism

1.1 Assembly overview - selector mechanism

WARNING

Before working on vehicle with engine running, move selector lever into position “P” and apply handbrake.



1 - Selector lever handle

- With gaiter and cover.
- Do not remove handle without reason.
- For emergency release, only the cover needs to be unclipped ⇒ page 47 .
- Removing and installing ⇒ page 48 .
- ⇒ “1.4 Moving push-button to installation position in the handle”, page 49

2 - Selector mechanism with gear selector cable

- With firmly integrated printed circuit board for selector mechanism.
- With integrated selector lever -E313- with selector lever sensors control unit -J587- , Tiptronic switch -F189- , selector lever locked in position P switch -F319- and selector lever lock solenoid -N110- .
- Testing is carried out via ⇒ Vehicle diagnostic tester in `Guided fault finding` mode.
- Selector lever -E313- with selector lever sensors control unit -J587- , Tiptronic switch -F189- , selector lever locked in position P switch -F319- and selector lever lock solenoid -N110- can only be renewed as a unit together with selector mechanism ⇒ page 51 .
- Selector lever cable can only be renewed together with selector mechanism ⇒ page 51 .
- Carrying out emergency release of selector mechanism ⇒ page 47 .
- Removing and installing ⇒ page 51 .
- Do not grease selector lever cable.

3 - Bolt

- For selector mechanism to selector housing.
- Qty. 4
- 4 Nm

4 - Nut

- For selector mechanism to body.
- Qty. 4
- 8 Nm

5 - Selector housing

6 - Cable support bracket

- For selector lever cable

7 - Bolt

- For selector cable support bracket to gearbox

- ❑ Qty. 3
- ❑ Renew after each removal.
- ❑ 8 Nm +90°

8 - Bolt

- ❑ For gearbox selector lever.
- ❑ Renew after each removal.
- ❑ 10 Nm +90°

9 - Gearbox selector lever

10 - Securing clip

- ❑ For selector lever cable to cable support bracket.
- ❑ Renew.

Note

11 - Bolt

- ❑ Adjustment screw for selector lever cable.
- ❑ 13 Nm

12 - Tunnel/body

1.2 Emergency release from position P

Do not remove handle.

- The selector lever lock solenoid -N110- locks the selector lever in position “P”. The selector lever can only be shifted out of position “P” with ignition switched on/engine running, with brake pedal depressed and with selector lever button pressed ⇒ page 59 .
- If the power supply for the selector lever lock solenoid -N110- fails (battery discharged or fuse defective) or if the solenoid is defective, the selector lever cannot be shifted out of position “P”. Hence, the vehicle cannot be moved because the parking lock is engaged.

If this is the case:

– Check fuses ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Check battery voltage ⇒ Electrical system; Rep. gr. 27 ; Battery; Checking battery .

Note

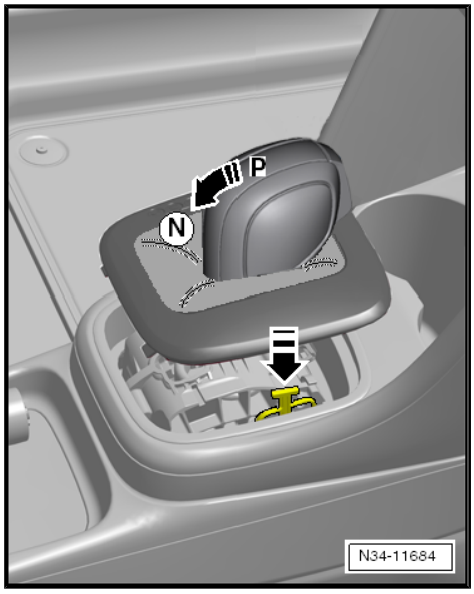
If the fault finding is completed and the selector lever still can't be shifted out of position “P”, an emergency release of the solenoid must be carried out. If the selector lever is shifted back into position “P” after the emergency release, the selector lever will be locked again in position “P”.

Procedure

– Unclip selector lever cover and push it aside.

– Depress brake pedal or set handbrake.

– Press onto yellow plastic part -arrow-.



Caution

Risk of damage to selector mechanism.

- *If parts of the selector mechanism are damaged, the selector mechanism must be renewed completely.*

• The solenoid releases the selector lever.

– With solenoid released press button on selector lever handle and shift selector lever out of position “P”.

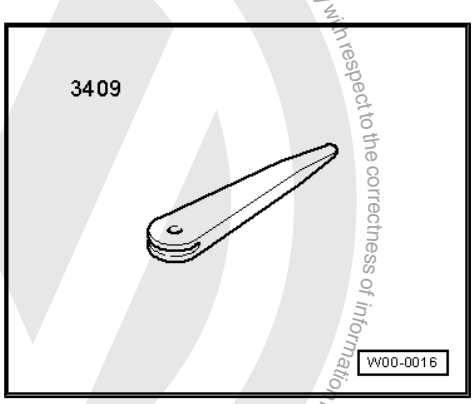
Note

If the selector lever is now moved back into position “P”, the selector lever will be mechanically locked in position “P” again by the solenoid. Then, the emergency release must be carried out again.

1.3 Removing and installing selector lever handle

Special tools and workshop equipment required

- Removal wedge -3409-

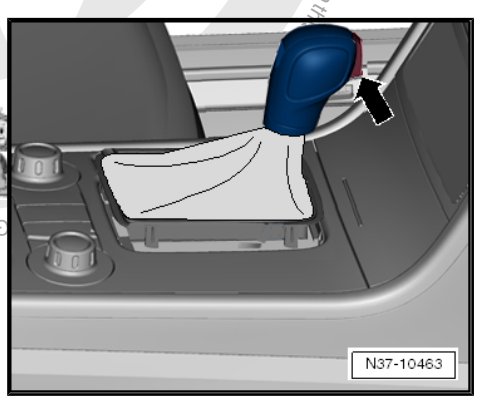


Removing

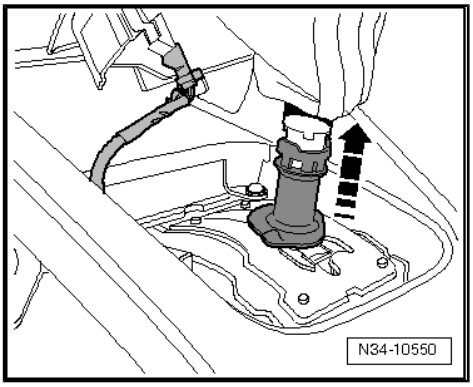
The selector lever handle is removed together with the selector lever cover.

– Shift selector lever to position “D”.

– Switch off ignition.



– Unclip cover on both sides using removing wedge -3409- and pull gaiter inside out over selector lever handle.
– Disconnect connector from selector lever cover.
– Push sleeve upwards in -direction of arrow- to release knob.
– Pull selector lever handle together with cover upwards, without pressing the push-button.



Installing

Install in reverse order of removal, observing the following:

- Selector lever is in position “D”.

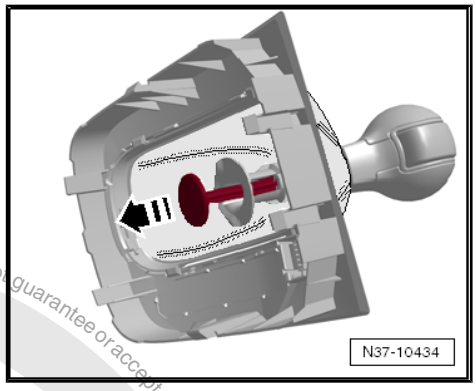
Caution

Risk of damage to selector mechanism.

- ***When installing, the push-button on the selector lever handle must not be pressed in. If the push-button was pressed by mistake, the installation position must be restored ⇒ page 49 .***
- ***If the selector lever handle is installed with push-button pressed, the selector lever handle and the tie rod -3- of the selector mechanism will be destroyed.***

Note

- *New handles are supplied with installation guard. Do not remove guard until just before installing. To remove, pull out in direction of -arrow-.*
- *If an installation guard is installed, the installation position can also be restored ⇒ page 49 .*



– Press selector lever handle -1- onto selector lever to stop, without pressing the push-button while doing so.
– Lock knob again after installing. Press sleeve under handle back down towards selector mechanism.
– Push push-button after installing.

Note

If not installed correctly, push button remains inserted in handle after being pressed. If this happens, remove handle again and move push button to installation position again ⇒ page 49 . The handle can then be installed again.

– Pull gaiter back down and engage cover.
– Check selector mechanism ⇒ page 59 .

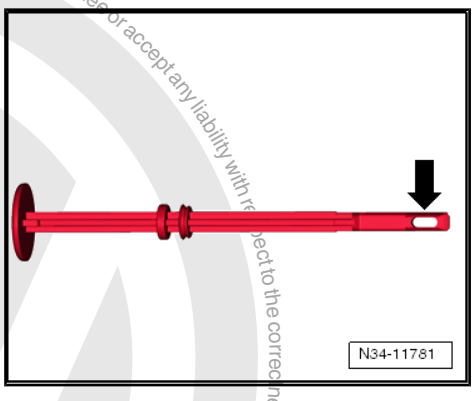
1.4 Moving push-button to installation position in the handle

If the push-button was pressed by mistake, the installation position can be restored.

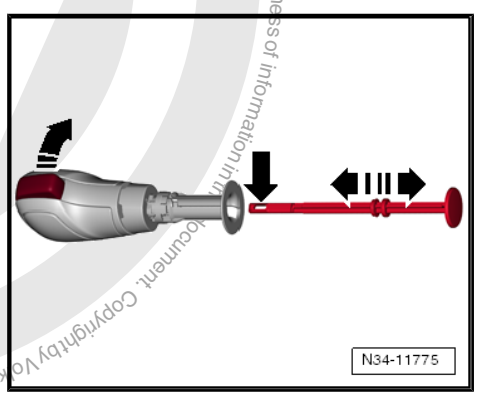
There are 2 ways of moving the push button into the installation position, »with« and »without« installation guard. Both of them are described here.

Place handle »with« installation guard in installation position:

When using the installation guard, make sure that it has an eyelet -arrow- at the front. Other types of installation guard are not suitable.

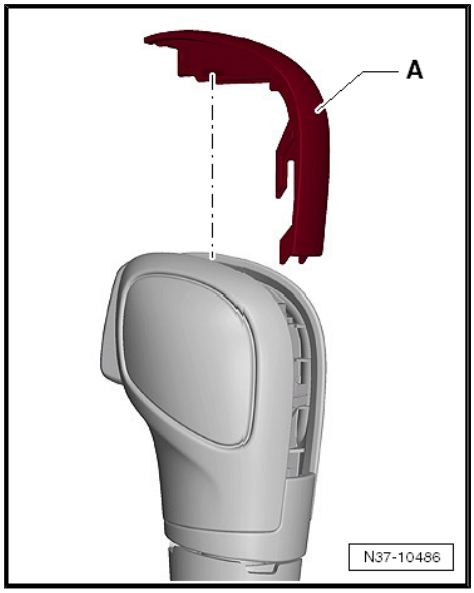


– Holding down push button, completely push in installation guard with eyelet -arrow- until installation guard engages, then release push button. When the installation guard is pulled out, the push button engages in the installation position.



Place handle »without« installation guard in installation position:

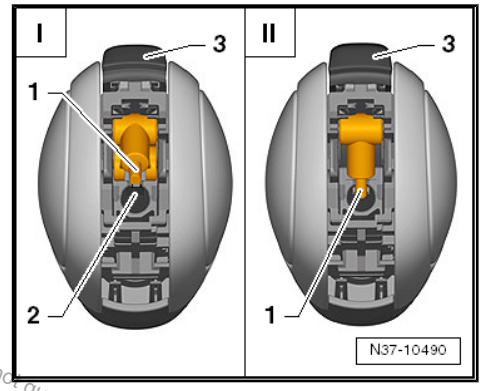
– Carefully unclip trim of handle -A- upwards.



– Using a screwdriver, for example, press small lever -1- for tie rod into groove -2-. When doing this, push-button -3- is pushed back into installation position.

  -I- Push button in pressed position

  -II- Push button in installation position



Note

- *Only press the lever into the groove and no further.*
- *Do not clip the trim of the handle onto the selector mechanism until the handle has been fitted. This makes it possible to check whether the small lever engages in the tie rod when the push button is pressed.*

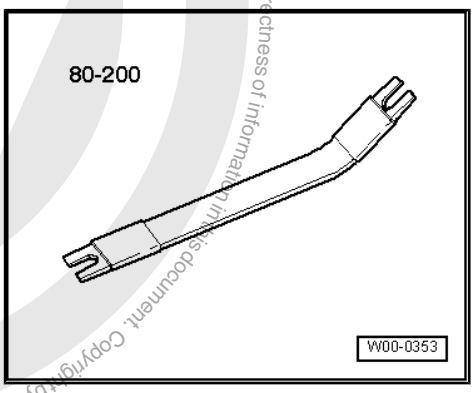
1.5 Removing and installing selector mechanism

⇒ "1.5.1 Removing and installing selector mechanism with selector housing", page 51

⇒ "1.5.2 Removing and installing selector mechanism without selector housing", page 55

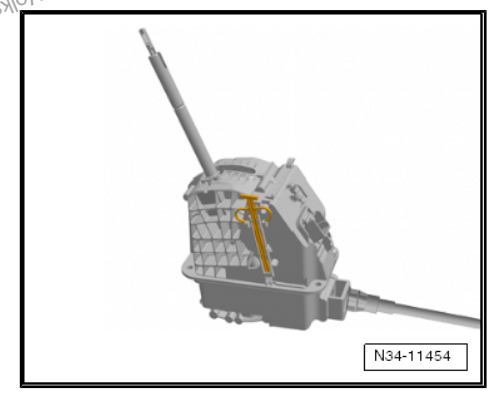
Special tools and workshop equipment required

- Removal lever -80 - 200-



Note

- *Selector mechanism and selector lever cable are not allowed to be separated from one another. Both are removed together.*
- *Following installation, selector lever cable must be checked for ease of movement and be adjusted.*

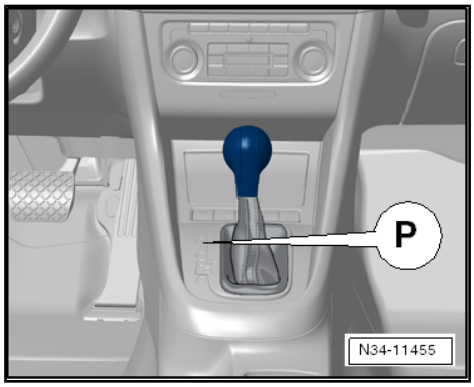


1.5.1 Removing and installing selector mechanism with selector housing

The selector mechanism with selector lever cable can be removed and installed separately without removing and installing the selector housing ⇒ page 55 .

Removing

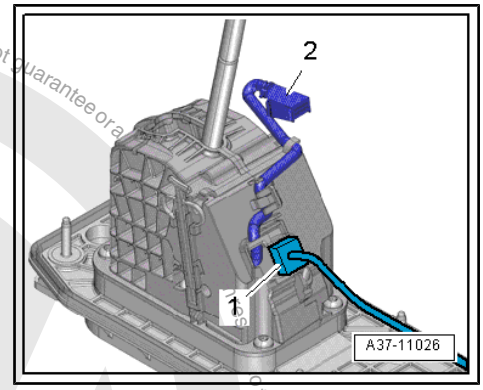
– Move selector lever to position “P” position.



– Remove selector lever handle ⇒ page 48 , pulling off connector -2- from cover in process.

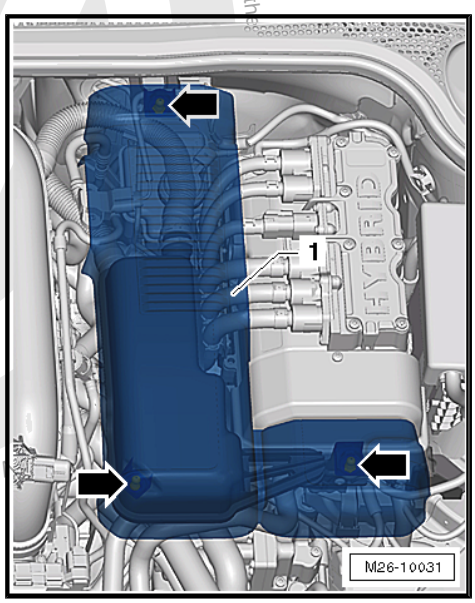
– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .

– Separate electrical connector for vehicle wiring harness -1- from selector mechanism.

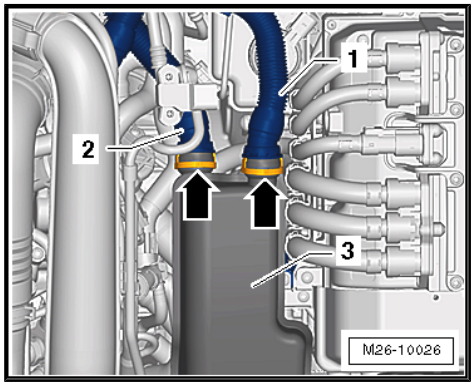


Vehicles with secondary air system

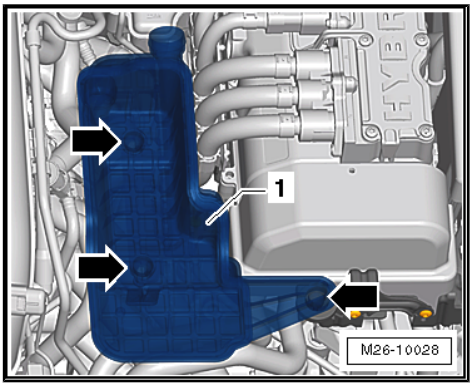
– Unclip cover for air damper -1- upwards from mountings -arrows- and remove it.



– Disconnect air hoses -1- and -2- from air damper -3-. To do this, press retaining ring -arrow- together on both sides and pull hoses off.



– Pull air damper -1- upwards out of rubber bushes -arrows-.



Continuation for all vehicles

WARNING

You can suffer an electric shock.

An electric shock can be fatal.

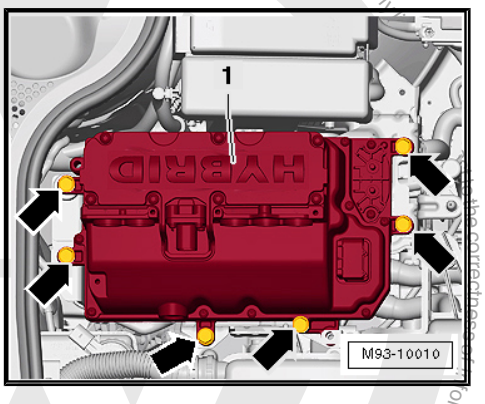
Observe general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

- *The system must first be de-energised by a high-voltage technician before any work is done on the high-voltage system and before any repair work is done on the body.*
- *All work on vehicles with a high-voltage system must only be carried out by electrically instructed persons. The work must be supervised by a high-voltage technician.*

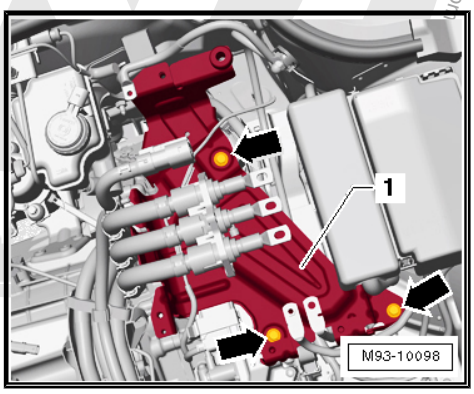
WARNING

High voltage on high-voltage system of hybrid vehicle. Danger of electric shock! Following procedure also requires work on high-voltage system. De-energise high-voltage system now ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; De-energising high-voltage system .

– Remove power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .



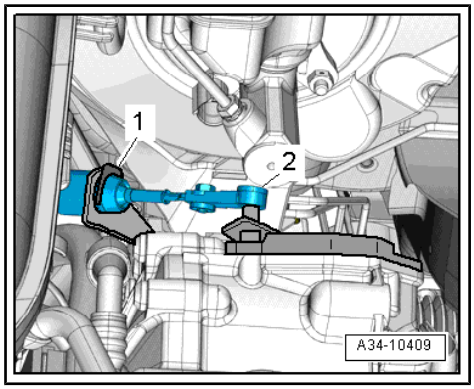
– Remove bracket for power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; High-voltage cables; Removing and installing high-voltage wiring harness for hybrid battery -PX1- .



– Pull off securing clip -1- for selector lever cable.

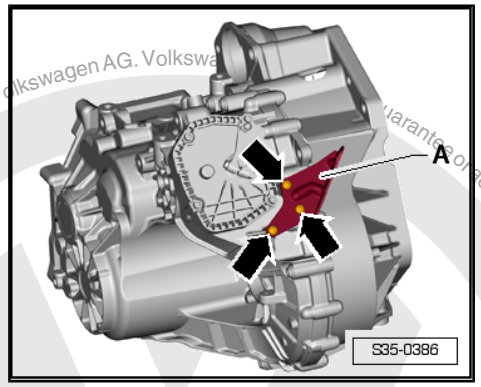
Securing clips for selector lever cable must always be renewed.

– Remove selector lever cable -2- from gearbox selector lever, e.g. using removal lever -80 - 200- .



Note

- *Use pliers to remove the securing clip -1- on the cable support bracket. Do not use a sharp-edged lever. The selector lever cable could otherwise be damaged.*
- *If necessary, remove the cable support bracket -A- with the selector lever cable from the gearbox. To do so, remove bolts -arrows-. These bolts must be renewed.*
- *Specified torque of bolts -arrows- ⇒ Item 7 (page 46) .*



Caution

Risk of damage to selector lever cable.

- ***Do not push selector lever cable backwards out of cable support bracket. The selector lever cable is not detached from the cable support bracket until the selector mechanism is removed.***

– Raise vehicle.

– Remove tunnel bridge at front and rear from body ⇒ General body repairs, exterior; Rep. gr. 50 ; Tunnel bridge .

– Remove exhaust pipe beneath heat shield for middle tunnel ⇒ Rep. gr. 26 ; Cleansing exhaust emissions; Assembly overview - cleansing exhaust emissions .

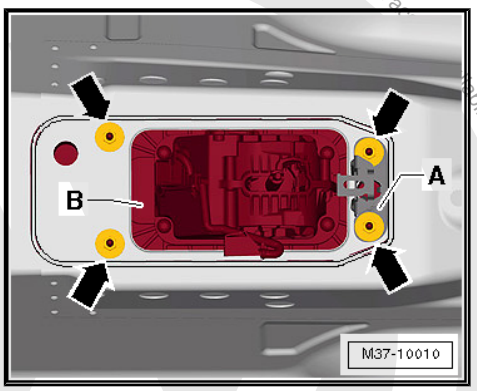
– Unhook centre and rear silencer from retaining straps and tie up to body using wire ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Assembly overview - silencer .

– Remove heat shield for centre tunnel beneath selector mechanism.

Note

To remove selector mechanism, a 2nd mechanic is required under the vehicle.

– Remove nuts -arrows- inside vehicle.
– If fitted, remove bracket -A-.
– Remove selector mechanism -B- together with selector lever cable and selector housing downwards. Thread selector lever cable out of cable support bracket while doing so.



Caution

Risk of damage to selector lever cable.

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

Installing

Install in reverse order of removal, observing the following:

Note

Do not grease selector lever cable.

Caution

Risk of damage to selector lever cable.

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

– Install heat shield beneath selector mechanism.
– Install exhaust system and align it free of stress ⇒ Rep. gr. 26 ; Cleansing exhaust emissions; Assembly overview - cleansing exhaust emissions .
– Attach tunnel bridges at front and rear of body ⇒ General body repairs, exterior; Rep. gr. 50 ; Tunnel bridge .
– Install centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
– Install selector lever handle ⇒ page 48 .
– Adjust selector lever cable ⇒ page 60 .
– Check selector mechanism ⇒ page 59 .
– Install power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .
– Re-energise high-voltage system and carry out documentation ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Re-energising high-voltage system .

Specified torques

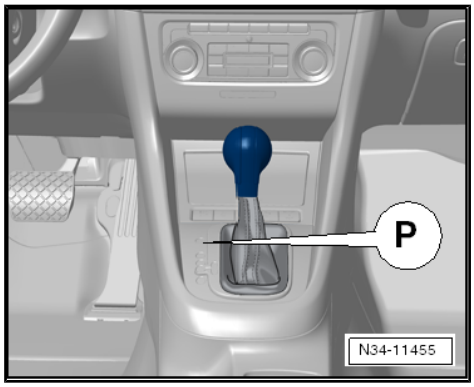
- ⇒ “1.1 Assembly overview - selector mechanism”, page 45

1.5.2 Removing and installing selector mechanism without selector housing

The selector mechanism with selector lever cable can also be removed and installed with the selector housing ⇒ page 51 .

Removing

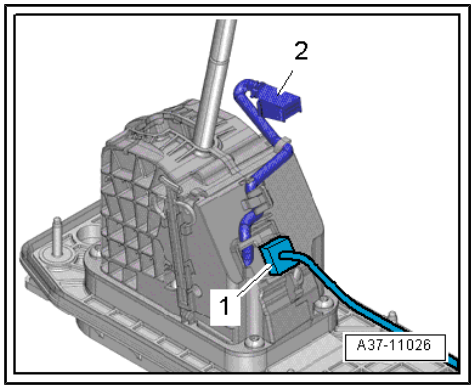
– Move selector lever to position “P” position.



– Remove selector lever handle ⇒ page 48 , pulling off connector -2- from cover in process.

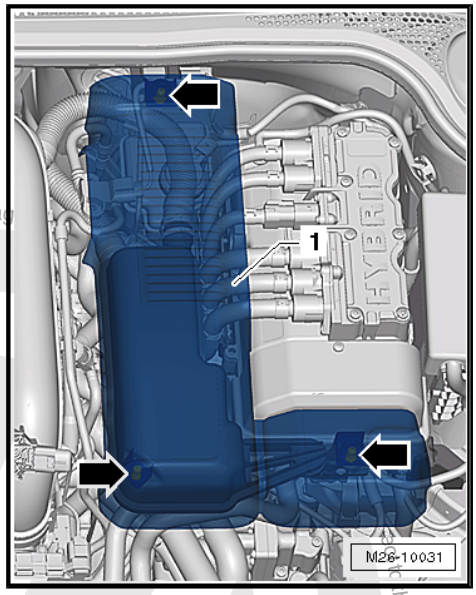
– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .

– Separate electrical connector for vehicle wiring harness -1- from selector mechanism.

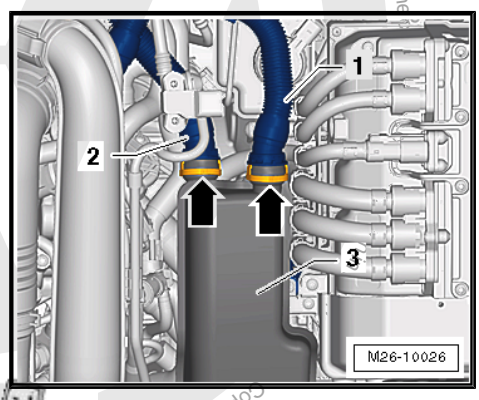


Vehicles with secondary air system

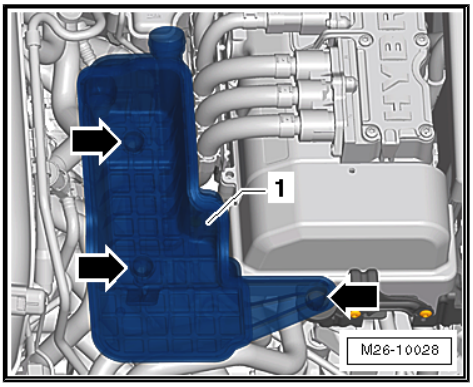
– Unclip cover for air damper -1- upwards from mountings -arrows- and remove it.



– Disconnect air hoses -1- and -2- from air damper -3-. To do this, press retaining ring -arrow- together on both sides and pull hoses off.



– Pull air damper -1- upwards out of rubber bushes -arrows-.



Continuation for all vehicles

WARNING

You can suffer an electric shock.

An electric shock can be fatal.

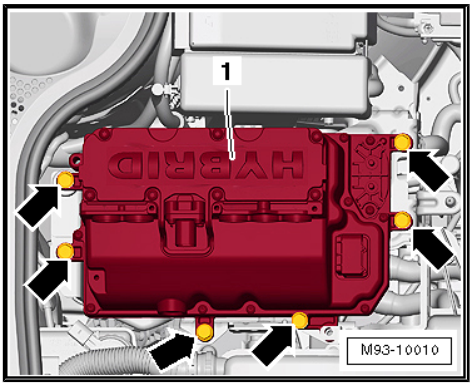
Observe general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

- *The system must first be de-energised by a high-voltage technician before any work is done on the high-voltage system and before any repair work is done on the body.*
- *All work on vehicles with a high-voltage system must only be carried out by electrically instructed persons. The work must be supervised by a high-voltage technician.*

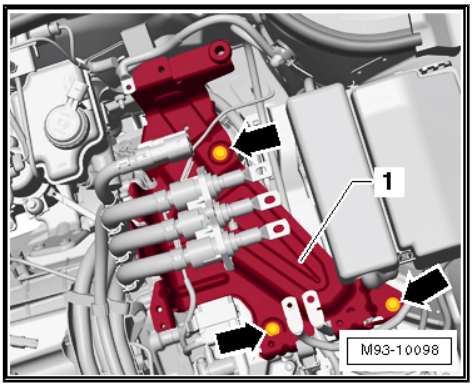
WARNING

High voltage on high-voltage system of hybrid vehicle. Danger of electric shock! Following procedure also requires work on high-voltage system. De-energise high-voltage system now ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; De-energising high-voltage system .

– Remove power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .



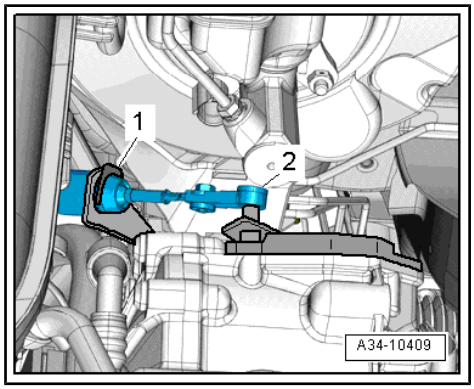
– Remove bracket for power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; High-voltage cables; Removing and installing high-voltage wiring harness for hybrid battery -PX1- .



– Pull off securing clip -1- for selector lever cable.

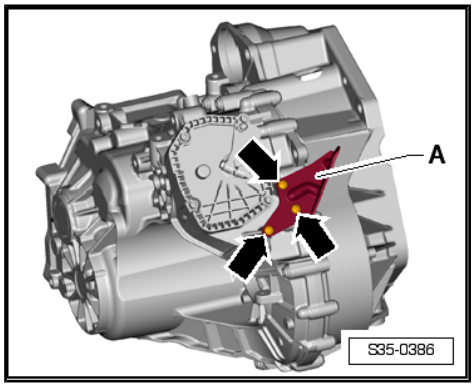
Securing clips for selector lever cable must always be renewed.

– Remove selector lever cable -2- from lever/selector shaft, e.g. using removal lever -80 - 200- .



Note

- *Use pliers to remove the securing clip -1- on the cable support bracket. Do not use a sharp-edged lever. The selector lever cable could otherwise be damaged.*
- *If necessary, remove the cable support bracket -A- with the selector lever cable from the gearbox. To do so, remove bolts -arrows-. These bolts must be renewed.*
- *Specified torque of bolts -arrows-* *⇒ Item 7 (page 46)* *.*



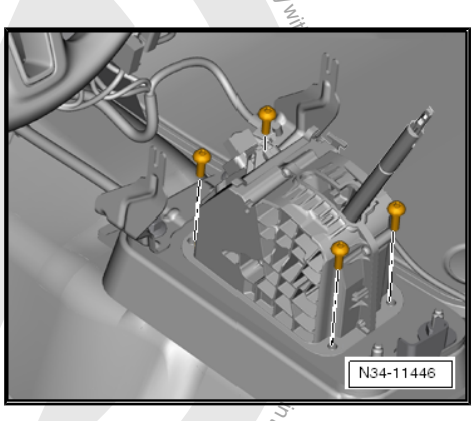
Caution

Risk of damage to selector lever cable.

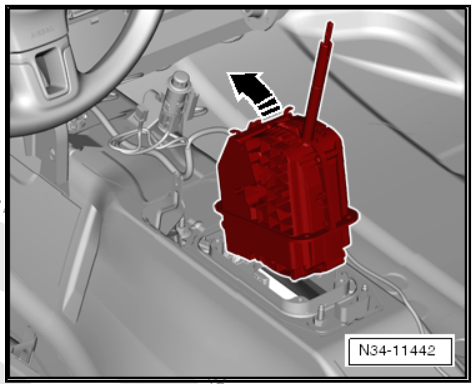
- ***Do not push selector lever cable backwards out of cable support bracket. The selector lever cable is not detached from the cable support bracket until the selector mechanism is removed.***

– Then a long cord must be attached to the end of the Bowden cable. The cord is needed to guide the Bowden cable between the tunnel and heat shield during installation.

– Unscrew the four bolts securing selector mechanism to selector housing.



– Carefully pull selector mechanism with Bowden cable out of the centre tunnel. Ensure that the cord remains accessible from the engine compartment after being pulled by the Bowden cable.



– Remove cord from Bowden cable.

Installing

Install in reverse order of removal, observing the following:

Note

- *A second mechanic is needed to guide Bowden cable from passenger compartment into engine compartment.*
- *Do not grease selector lever cable.*

> **Caution**
>
> *Risk of damage to selector lever cable.*
>
> - *Do not bend or kink selector lever cable.*

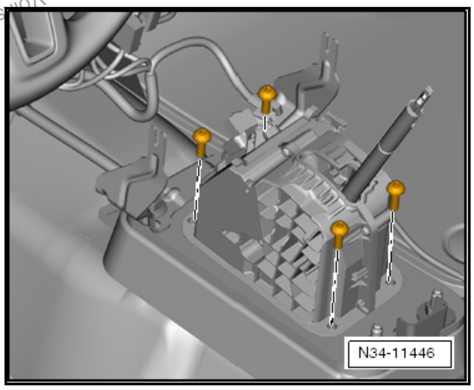
– Attach Bowden cable to cord which was drawn into the passenger compartment during removal.

– Carefully guide selector mechanism with Bowden cable through opening in centre tunnel.

– Have the second mechanic pull cord with Bowden cable through tunnel from engine compartment until Bowden cable can be attached to cable support bracket.

– Remove cord from Bowden cable.

– Secure selector mechanism to selector housing using 4 bolts.



– Install centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .

– Install selector lever handle ⇒ page 48 .

– Adjust selector lever cable ⇒ page 60 .

– Check selector mechanism ⇒ page 59 .

– Install power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .

– Re-energise high-voltage system and carry out documentation ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Re-energising high-voltage system .

Specified torques

- ⇒ "1.1 Assembly overview - selector mechanism", page 45

1.6 Checking selector mechanism

Faults which can be detected electrically can be determined with guided fault finding. In the case of mechanical faults, skill is required to localise and repair a faulty system or defective »part«.

The engine must not be able to start in the selector lever positions "R", "D", "S" or the Tiptronic position.

When selector lever is shifted to position “N” at speeds above 5 km/h, solenoid for selector lever lock must not engage and block selector lever. Selector lever can be shifted into a driving range.

When travelling at speeds below 5 km/h (almost stationary) and shifting into selector lever position “N”, solenoid for selector lever lock should only engage after about 1 second. Selector lever cannot be shifted out of “N” position until brake pedal is depressed.

Selector lever in “P” position and ignition switched on

- Brake pedal not depressed:

Selector lever is locked and cannot be shifted out of “P” position when the button is pressed. Solenoid for selector lever lock blocks selector lever.

- Brake pedal is depressed:

Solenoid for selector lever lock releases selector lever. It is possible to shift into a driving gear. Slowly shift selector lever from “P” through to “S”, checking whether selector lever position in dash panel insert corresponds to selector lever position.

Selector lever in “N” position and ignition switched on

- Brake pedal not depressed:

Selector lever is locked and cannot be shifted out of “N” position with the push button pressed. Solenoid for selector lever lock blocks selector lever.

- Brake pedal is depressed:

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

Selector lever in position “Tiptronic”

– Shift selector lever into Tiptronic gate.

Symbols must change from “P R N D S” to “7 6 5 4 3 2 1”.

Ignition and light switched on

The respective symbol in the shift mechanism cover lights up.

Selector lever position display

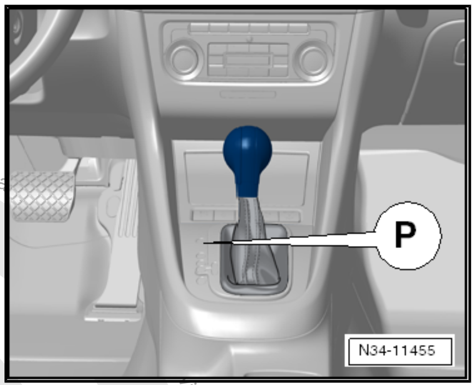
Simultaneous illumination of all selector lever position display segments indicates gearbox emergency running mode.

1.7 Checking and adjusting selector lever cable

The selector lever cable must be adjusted if

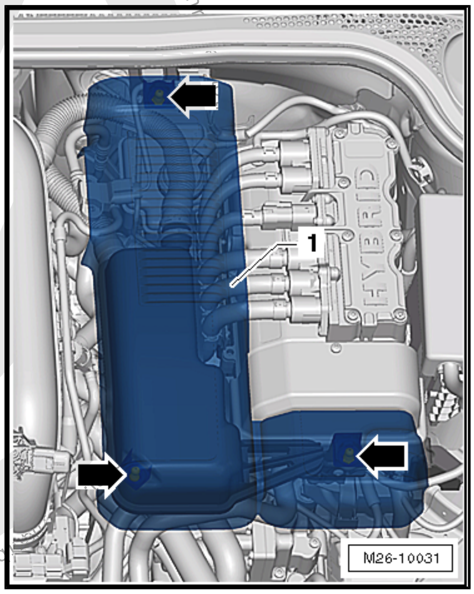
- The selector lever cable has been removed from the gearbox.
- The engine and/or gearbox has been removed and installed.
- Selector lever cable with selector mechanism has been removed and installed.
- The position of the engine and gearbox is shifted, for example to install it free of tension.

– Move selector lever to position “P” position.

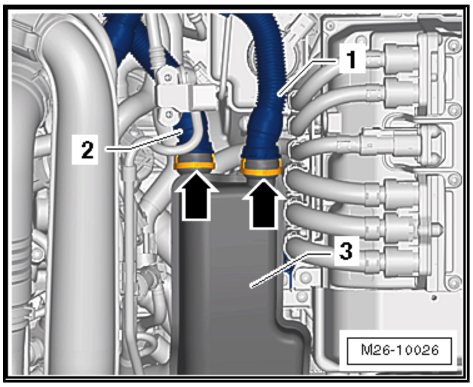


Vehicles with secondary air system

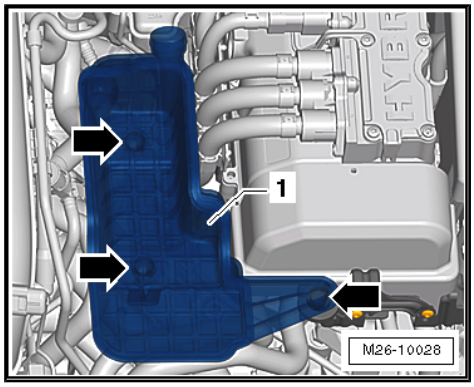
– Unclip cover for air damper -1- upwards from mountings -arrows- and remove it.



– Disconnect air hoses -1- and -2- from air damper -3-. To do this, press retaining ring -arrow- together on both sides and pull hoses off.



– Pull air damper -1- upwards out of rubber bushes -arrows-.



Continuation for all vehicles

WARNING

You can suffer an electric shock.

An electric shock can be fatal.

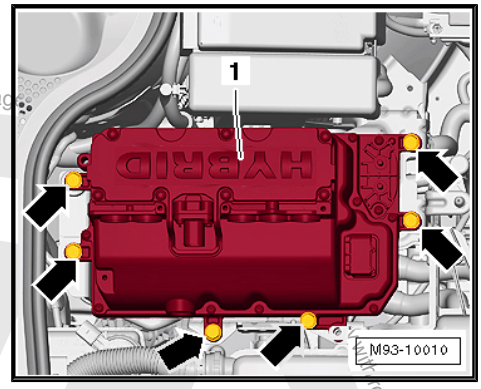
Observe general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

- *The system must first be de-energised by a high-voltage technician before any work is done on the high-voltage system and before any repair work is done on the body.*
- *All work on vehicles with a high-voltage system must only be carried out by electrically instructed persons. The work must be supervised by a high-voltage technician.*

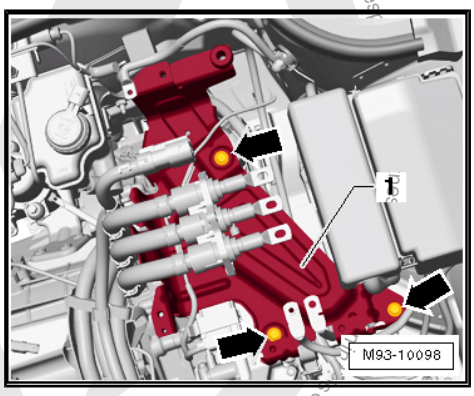
WARNING

High voltage on high-voltage system of hybrid vehicle. Danger of electric shock! Following procedure also requires work on high-voltage system. De-energise high-voltage system now ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; De-energising high-voltage system .

– Remove power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .



– Remove bracket for power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; High-voltage cables; Removing and installing high-voltage wiring harness for hybrid battery -PX1- .



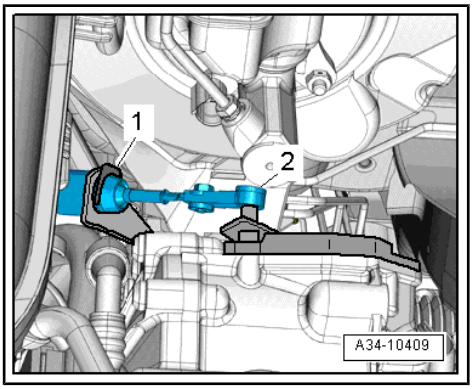
Checking selector lever cable

– Using removal lever -80 - 200- lever selector lever cable -2- off gearbox selector lever.
– If necessary, pull off securing clip -1- for selector lever cable.

Securing clips for selector lever cable must always be renewed.

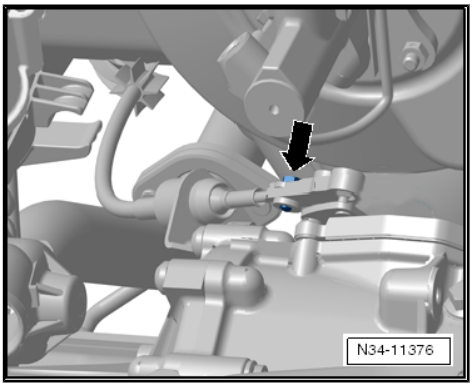
– Move selector lever repeatedly from »P« to »S« and back to »P«.

- Selector mechanism and selector lever cable glide easily when changing gear.
- Selector lever cable not damaged.

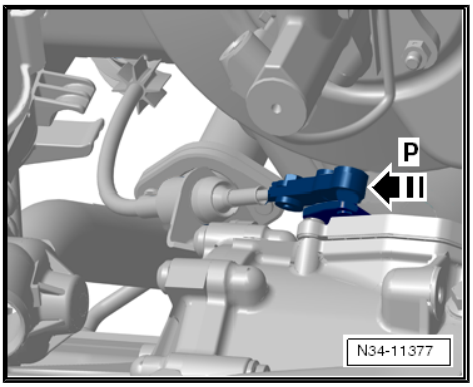


Adjusting selector lever cable

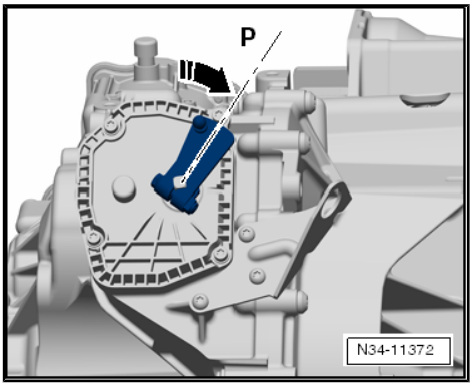
– Loosen adjustment screw -arrow- for selector lever cable.
– Shift gearbox selector lever to position “P”.



The gearbox selector lever must be pressed »completely to right side of vehicle« in the direction of cable support bracket for selector lever cable.



This figure shows you the view of gearbox from »behind«. -P- in direction of cable support bracket.



WARNING

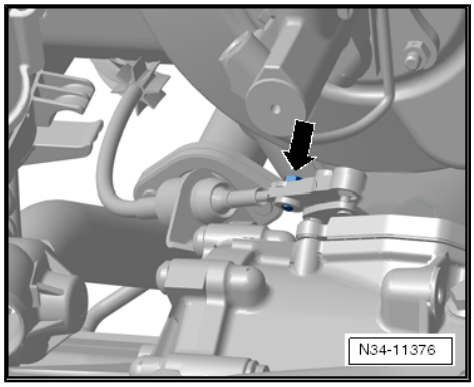
The parking lock must be engaged.

Note

Raise vehicle, to be sure that the gearbox is in “P” (parking lock engaged). It should not be possible to turn both front wheels together in the same direction.

– To release tension from selector lever cable move selector lever slightly forwards and backwards, but do not shift it to another selector lever position.

– Tighten adjustment screw -arrow-. The position of the selector lever cable must not change while doing so.



This completes the adjustment.

– Continue installation in reverse order of removal. Install power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .

– Re-energise high-voltage system and carry out documentation ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Re-energising high-voltage system .

Specified torques

◆ Adjustment screw for selector lever cable
⇒ “1.1 Assembly overview - selector mechanism”, page 45

1.8 Renewing oil seal for selector shaft

Currently the oil seal for the selector shaft can only be renewed together with the parking lock cover
⇒ “1.1 Removing and installing parking lock cover”, page 110 .

2 Removing and installing gearbox

⇒ “2.1 Removing gearbox”, page 65

⇒ “2.2 Installing gearbox”, page 69

⇒ “2.3 Specified torques for gearbox”, page 72

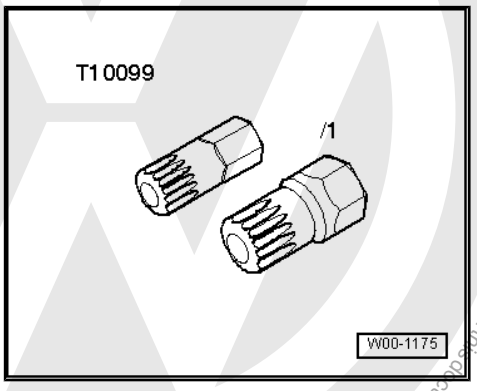
2.1 Removing gearbox

– The gearbox is removed together with the engine ⇒ Rep. gr. 10 ; Removing and installing engine; Removing engine .

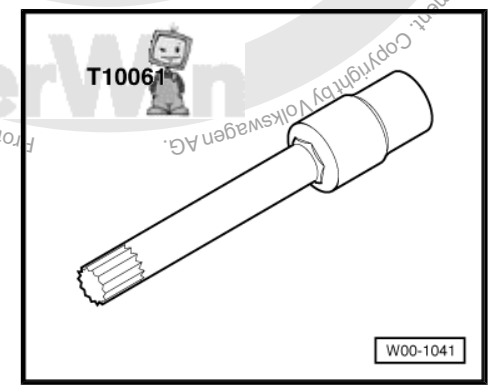
Remove gearbox from engine as follows:

Special tools and workshop equipment required

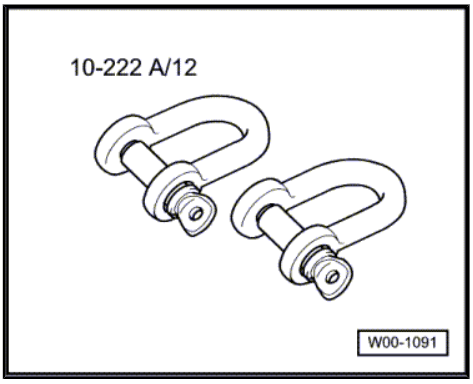
♦ Bits XZN 12 -T10099-



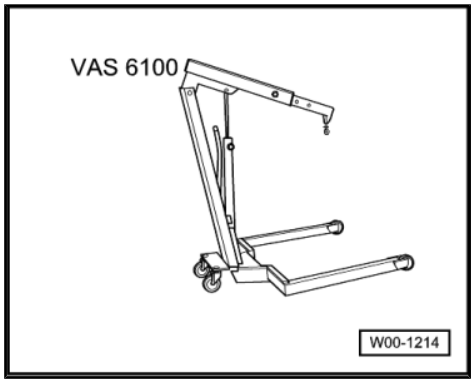
♦ Socket -T10061-



♦ Shackle -10 - 222 A /12-

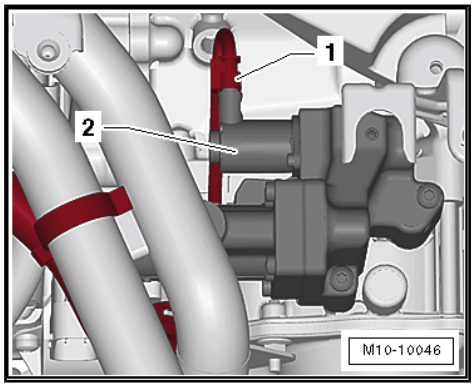


♦ Workshop hoist -VAS 6100-

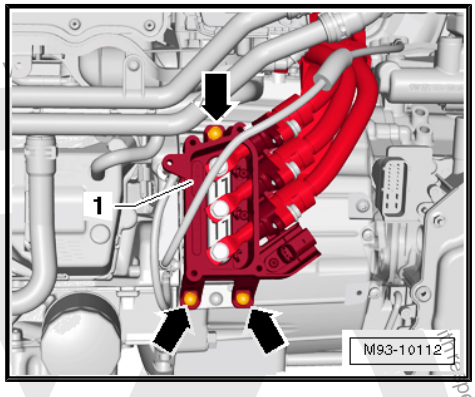


- Engine/gearbox assembly has been removed and attached to scissor-type assembly platform -VAS 6131- .

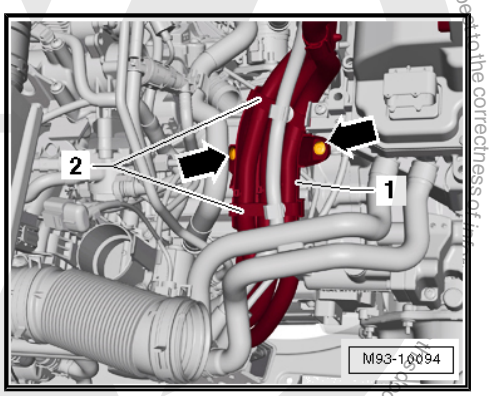
– Disconnect connector -1- from selector valve -2- of mechatronic unit and pull wiring harness off retainer on front of gearbox.



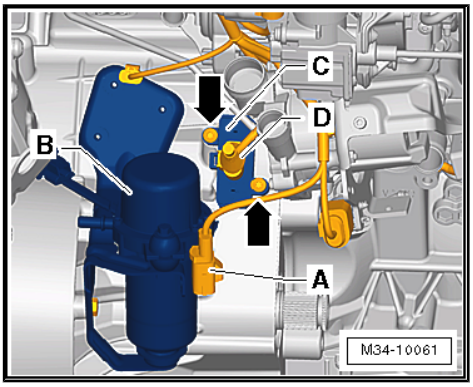
– Remove high-voltage wiring harness for drive motor -PX2- together with terminal box -1- from gearbox ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; High-voltage cables; Removing and installing high-voltage wiring harness for drive motor -PX2- .



– Also remove cable retainer -1- for high-voltage wiring harness for drive motor -PX2- from gearbox -arrows- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; High-voltage cables; Removing and installing high-voltage wiring harness for drive motor -PX2- .



– Release and disconnect connector -A- from vacuum pump for brakes -V192- -B-.
– Remove vacuum pump for brakes -V192- -B- together with bracket from gearbox and tie it up to side of engine.
– Release and disconnect connector -D- from drive motor rotor position sender 1 -G713- -C-.
– Unscrew bolts -arrows- and pull out drive motor rotor position sender 1 -G713- .



WARNING

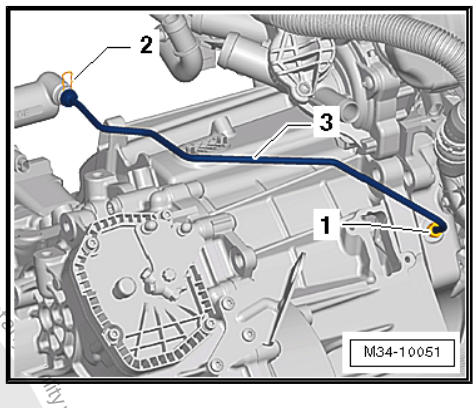
Risk of soiling.

Thoroughly clean all joints and surrounding areas before dismantling.

In the procedure below the hydraulic system of the mechatronic unit will be opened. Soiling will cause the system to fail!

– Unscrew union nut -1- for hydraulic line -3- from engine.
– Then, pull retaining clip -2- out of valve block/mechatronic unit.
– Pull hydraulic line -3- simultaneously out of engine and valve block/mechatronic unit.

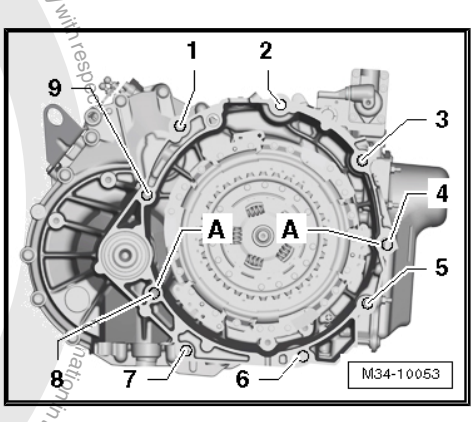
• Seal hydraulic line connections immediately with suitable sealing plugs to ensure that as much hydraulic fluid as possible remains in the hydraulic line.
• Also seal the connections on engine and valve block/mechatronic unit with suitable sealing plugs.
• For allocation of sealing plugs and hydraulic fluid refer to ⇒ Electronic parts catalogue “ETKA” .



– Unscrew bolts -1 ... 7- securing gearbox on engine.

Note

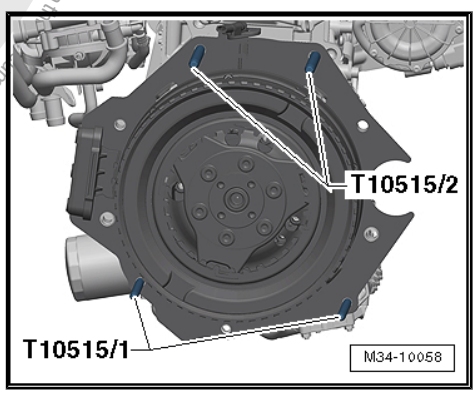
◆ *For unscrewing bolts -3- and -4- bits XZN 12 -T10099/1- can be used.*
◆ *Bolts -8- and -9- are left screwed in.*



– Screw guide pins -T10515- into engine as shown in illustration.

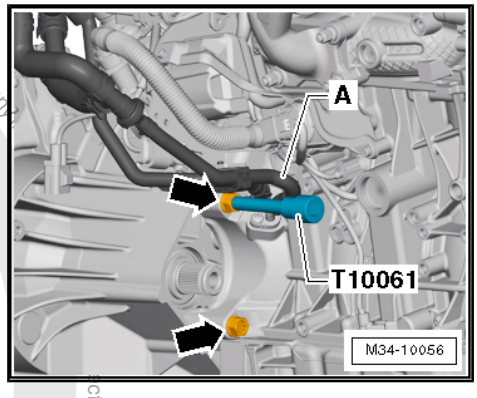
Note

For reasons of clarity, the gearbox is removed in the illustration.

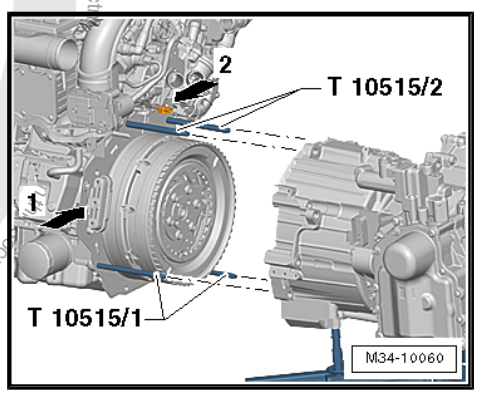


– Unscrew engine/gearbox connecting bolts -arrows- working from engine side and using e.g. socket, multi-point bit XZN 14 -T10061- . Note coolant line -A- while doing so.

– Press gearbox off dowel sleeves in engine.

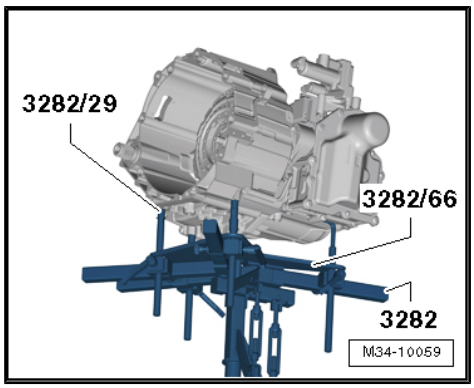


– Carefully pull gearbox off engine. Ensure to not damage connections -arrow 1- on electric drive motor -V141- and the drive motor temperature sender -G712- -arrow 2- while doing so.



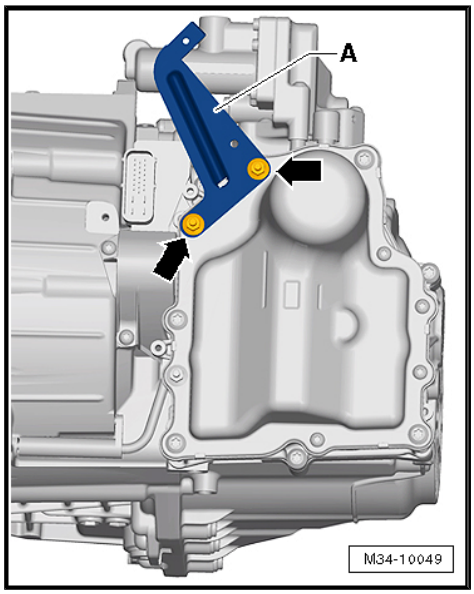
Note

If necessary, change position of gearbox using spindles of gearbox support -3282- while pulling gearbox off engine.

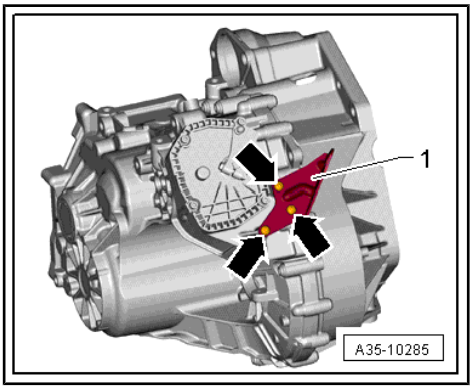


If gearbox is to be sent:

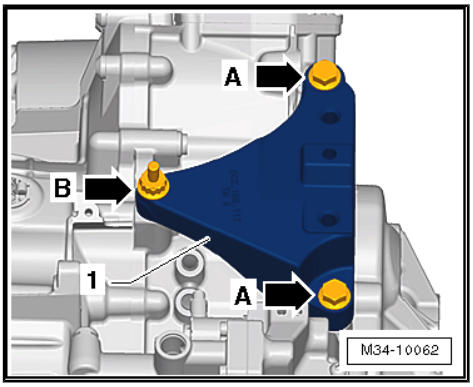
– Remove bracket -A- at front of gearbox -arrows-.



– Unbolt cable support bracket -1- from gearbox -arrows-, specified torque ⇒ page 45 .



– Remove gearbox bracket -1- from gearbox -arrows A and B-, specified torque ⇒ “5.1 Assembly overview - assembly mountings”, page 78 .



Transporting gearbox ⇒ page 73 .

Secure gearbox to assembly stand ⇒ page 76 .

Installing gearbox ⇒ page 69 .

2.2 Installing gearbox

– The gearbox is installed together with the engine ⇒ Rep. gr. 10 ; Removing and installing engine; Installing engine .

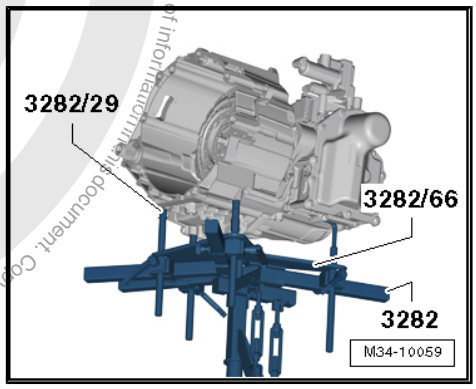
Install gearbox to engine as follows:

- Electric drive motor -V141- is installed to engine.
- Gearbox support -3282- is inserted into support set -VAS 6131/2- of scissor-type assembly platform -VAS 6131- .
- Observe repair instructions ⇒ page 10 .
- ⇒ “2.3 Specified torques for gearbox”, page 72

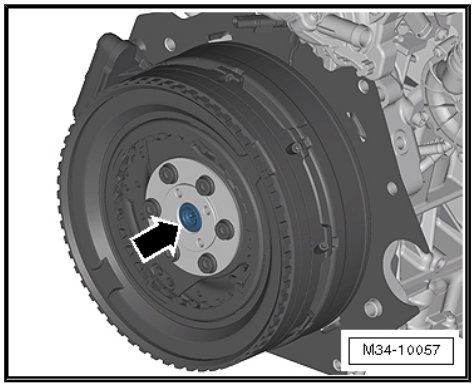
Refer to procedure “Removing gearbox” for required special tools ⇒ page 65 .

– Fit gearbox onto gearbox support -3282- and secure it in place.

– Check that there are dowel sleeves for centring engine and gearbox in the cylinder block. Insert any missing dowel sleeves.



– Inspect needle bearing -arrow- in electric drive motor -V141- and renew it if necessary ⇒ Rep. gr. 10 ; Separating electric drive motor -V141- and engine and ⇒ Rep. gr. 10 ; Connecting electric drive motor -V141- and engine .

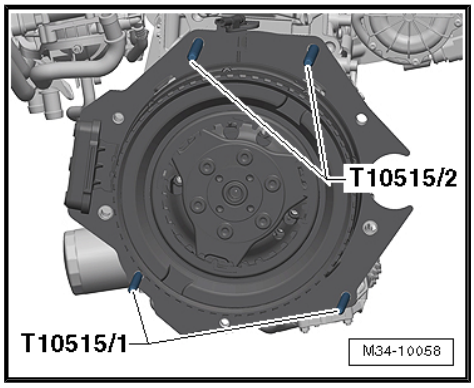


Note

If the needle bearing in the electric drive motor -V141- is damaged, the gears cannot be selected properly anymore.

– Screw guide pins -T10515- into engine as shown in illustration.

– Align gearbox with engine and push it carefully towards engine. Adjust position of gearbox using spindles of gearbox support -3282- while doing so.

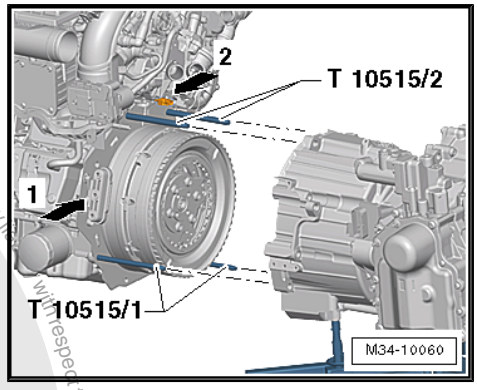


- Ensure to not damage connections -arrow 1- on electric drive motor -V141- and the drive motor temperature sender -G712- -arrow 2-.
- It must be possible to guide the engine and gearbox together by hand until the engine flange and gearbox flange make contact all around.

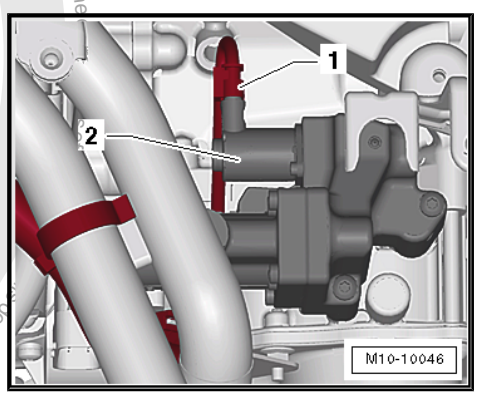
Turn crankshaft slightly if necessary.

– Bolt gearbox to engine and remove guide pins -T10515- from engine.

– If a new gearbox is installed: Install cable support bracket, gearbox bracket und remaining bracket to gearbox ⇒ page 68 .

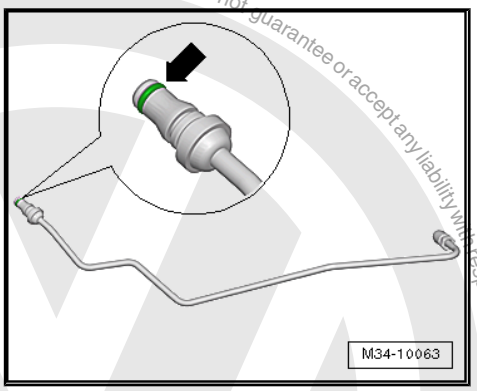


– Connect connector -1- to selector valve -2- of mechatronic unit and install wiring harness to retainer at front of gearbox.

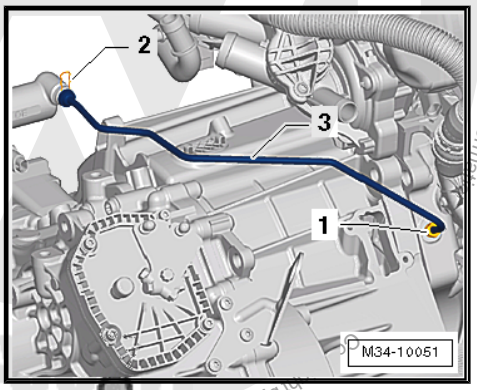


Note

- *Check the O-ring -arrow- on the hydraulic line for damage and renew it if necessary. Refer to ⇒ Electronic parts catalogue "ETKA" .*
- *The O-ring must be green. It is suitable for use with hydraulic fluids. Do not use any other O-ring.*
- *Only remove the sealing plugs on hydraulic line, engine and valve block/mechatronic unit immediately before installation.*



– Insert hydraulic line -3- into engine and valve block/mechatronic unit.
– Then, press retaining clip -2- into valve block/mechatronic unit.
– Check proper seating of hydraulic line -3- by pulling on it.
– Screw union nut -1- for hydraulic line on engine and tighten it to specified torque ⇒ Item 6 (page 92) .

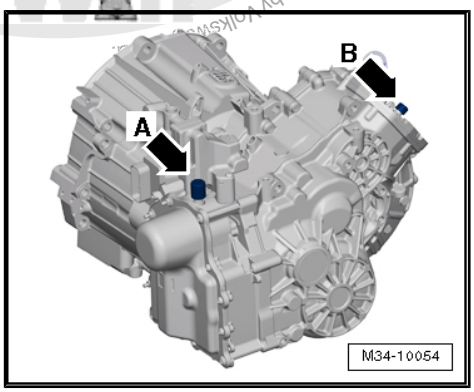


If the gearbox has been sealed so that no oil can escape, e.g. after a gearbox repair or after gearbox has been renewed:

– Remove plug -arrow B- from gearbox breather and install breather cap.

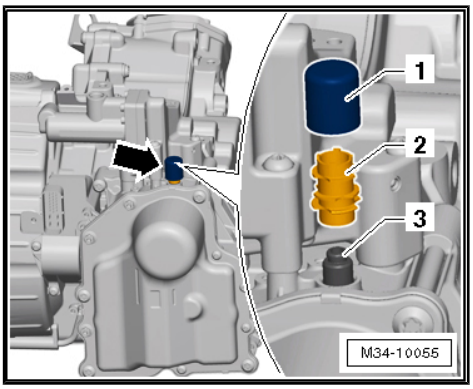
If the gearbox oil has been drained off, the gearbox oil must now be filled through the breather connection ⇒ page 86 .

– Remove plug -arrow A- from breather connection of mechatronic unit for dual clutch gearbox -J743- .



- If a large quantity of hydraulic fluid (more than 20 ml) has escaped, e.g. when removing and installing the mechatronic unit for dual clutch gearbox -J743- or when removing and installing the electric drive motor -V141- , approx. 30 ml of hydraulic fluid must be replenished through breather connection -3- at this point.
- For allocation of hydraulic fluid and filling equipment refer to ⇒ Electronic parts catalogue "ETKA" .

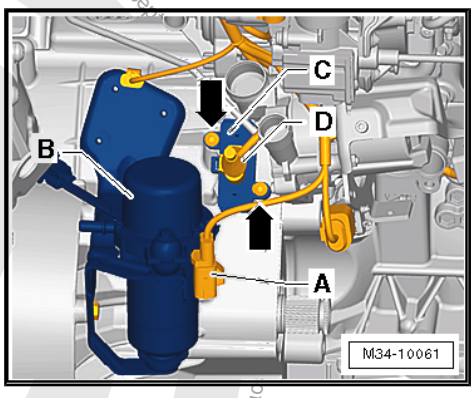
– Fit breather cap -1- (is one replacement part together with breather -2-) onto breather connection -3-.



– Install drive motor rotor position sender 1 -G713- -C- to gearbox -arrows- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Electric drive motor; Removing and installing drive motor rotor position sender 1 -G713- .

– Bolt vacuum pump for brakes -V192- -B- together with bracket to gearbox ⇒ Brake systems; Rep. gr. 47 ; Vacuum system; Assembly overview - electric vacuum pump .

– Install high-voltage wiring harness for drive motor -PX2- to gearbox ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; High-voltage cables; Removing and installing high-voltage wiring harness for drive motor -PX2- .



The gearbox is installed together with engine during continued work procedure ⇒ Rep. gr. 10 ; Removing and installing engine; Installing engine .

- After the high-voltage system has been re-energised, bleed hydraulic clutch mechanism of disengagement clutch using ⇒ Vehicle diagnostic tester in Guided functions mode.

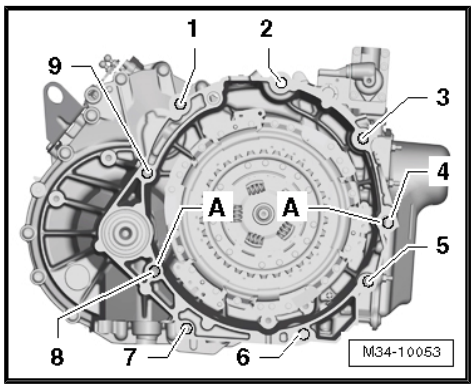
Note

The disengagement clutch in the electric drive motor -V141- separates the combustion engine from the electric drive motor -V141- .

2.3 Specified torques for gearbox

Dual clutch gearbox to engine:

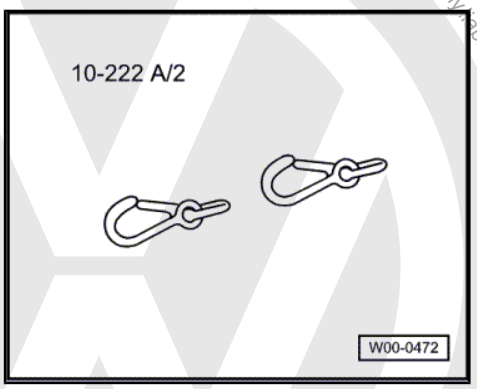
Item	Bolt	Nm
1, 2	M12 x 50	80
3, 4	M12 x 105	80
5, 6, 7	M10 x 50	40
8, 9[1)]	M12 x 70	80
A	Dowel sleeve for centring	
• Screwed in from engine side.		



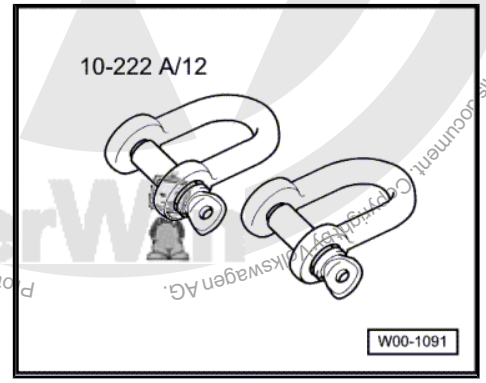
3 Transporting gearbox

Special tools and workshop equipment required

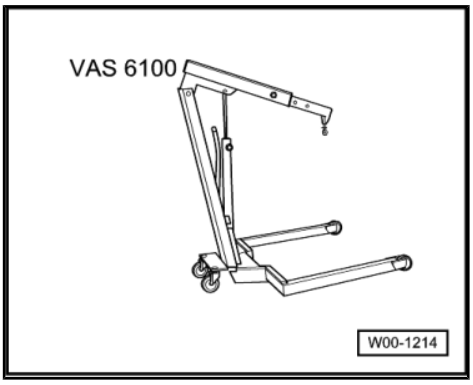
- Hook -10 - 222 A /2-



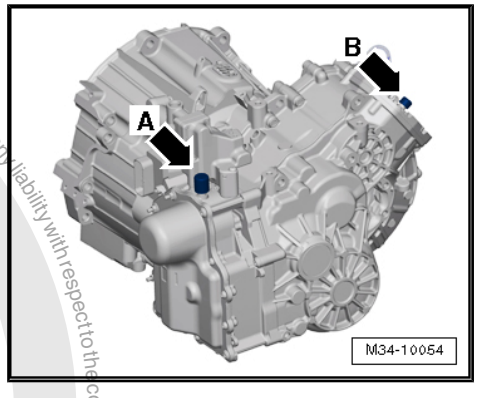
- Shackle -10 - 222 A /12-



- Workshop hoist -VAS 6100-



Seal gearbox so that it is oil-tight.



Caution

Risk of damage to gearbox.

Before repairs, the breather of the mechatronic unit for dual clutch gearbox -J743- (-arrow A-) and the gearbox breather (-arrow B-) must be sealed so that no oil can escape.

- ***It is not possible to check the fill level of the hydraulic fluid section of the mechatronic unit for dual clutch gearbox -J743- . Before repairs, the breather of the mechatronic unit for dual clutch gearbox -J743- must be sealed so that no oil can escape.***
- ***If any oil escapes from the hydraulic fluid section of the mechatronic unit for dual clutch gearbox -J743- , the oil must not be filled back into the mechatronic unit!***
- ***If hydraulic fluid has escaped, it must be replenished through the breather connection of the mechatronic unit , if necessary. For allocation of the sealing plugs, hydraulic fluid and filling equipment refer to ⇒ Electronic parts catalogue "ETKA" . If possible, replenish the hydraulic fluid after the gearbox has been installed. After the hydraulic fluid has been replenished, dispose of the remaining hydraulic fluid and the sealing plugs.***
- ***If oil escapes from the gearbox oil section, it can only be rectified by changing the gearbox oil. It is not possible to check the fill level.***
- ***If the level of oil/fluid is too high or too low in either of the parts, the function of the gearbox will be impaired.***

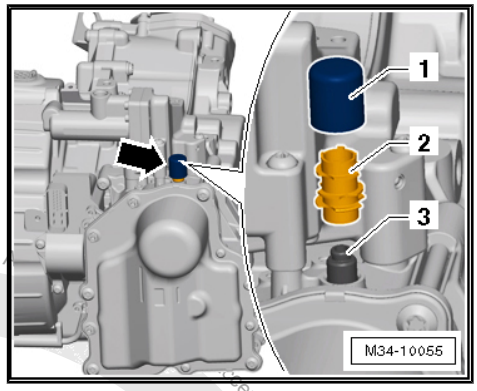
– Pull off both breather caps -arrow A- and -arrow B-.

Note

- *The breather cap -arrow A- on the mechatronic unit is destroyed during removal and must be renewed.*
- *As an alternative to the engine bung set -VAS 6122- the sealing cap -02M 409 120- can be used to seal the gearbox. The mechatronic unit can be sealed using sealing cap -0AM 325 120 A- as an alternative. Order sealing plugs via the ⇒ Electronic parts catalogue "ETKA" .*

– Seal gearbox breather and breather of mechatronic unit for dual clutch gearbox -J743- with clean sealing plugs so that no oil can escape.

– Order a new breather cap -arrow- for mechatronic unit for dual clutch gearbox -J743- , because it must be renewed after the gearbox has been installed ⇒ Electronic parts catalogue “ET-KA” .



Note

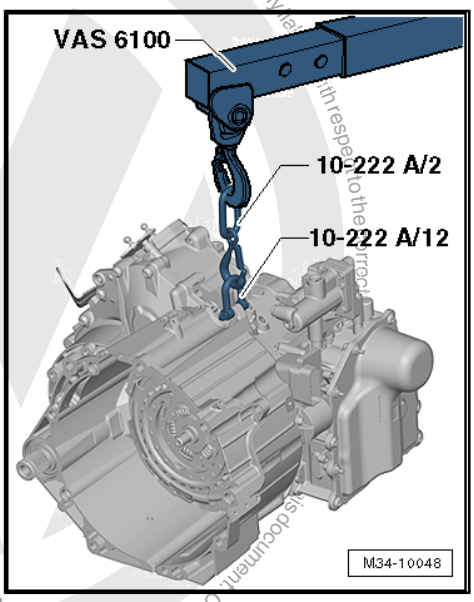
Breather -2- and breather cap -1- form one replacement part and are fitted together onto breather connection -3-.

- Once the gearbox has been installed in the vehicle, the sealing plugs must be removed and the breather caps reinstalled, or new ones must be fitted if necessary.

Transporting gearbox

Requirement:

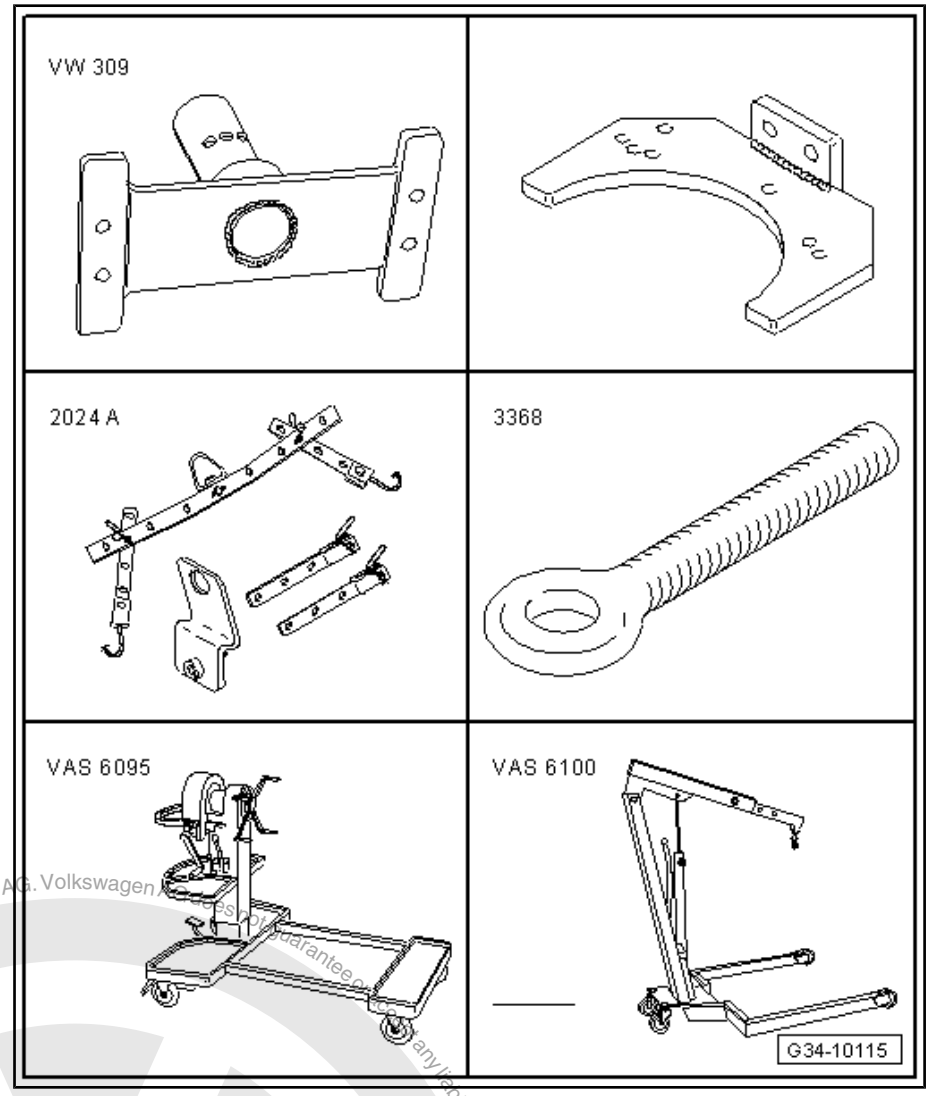
- Gearbox is oil-tight ⇒ page 74 .



4 Installing to engine and gearbox support

Special tools and workshop equipment required

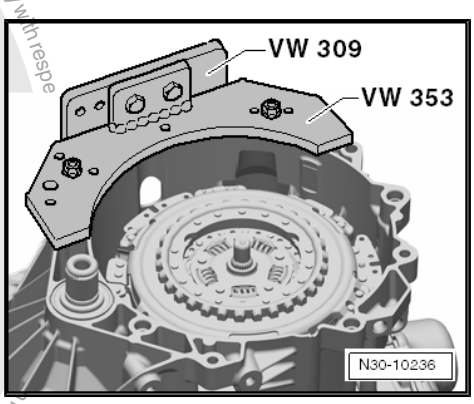
- Support plate -VW 309-
- Gearbox support -VW 353-
- Lifting tackle -2024 A-
- Eye bolt -3368-
- Engine and gearbox support -VAS 6095-
- Workshop hoist -VAS 6100-



Secure gearbox on gearbox support -VW 353- .

Requirement:

- Gearbox is oil-tight ⇒ page 74 .

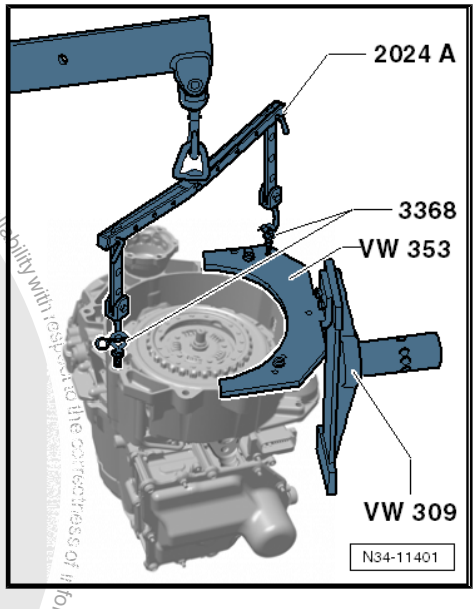


Lifting gearbox into engine and gearbox support

Requirement:

- Gearbox is oil-tight ⇒ page 74 .

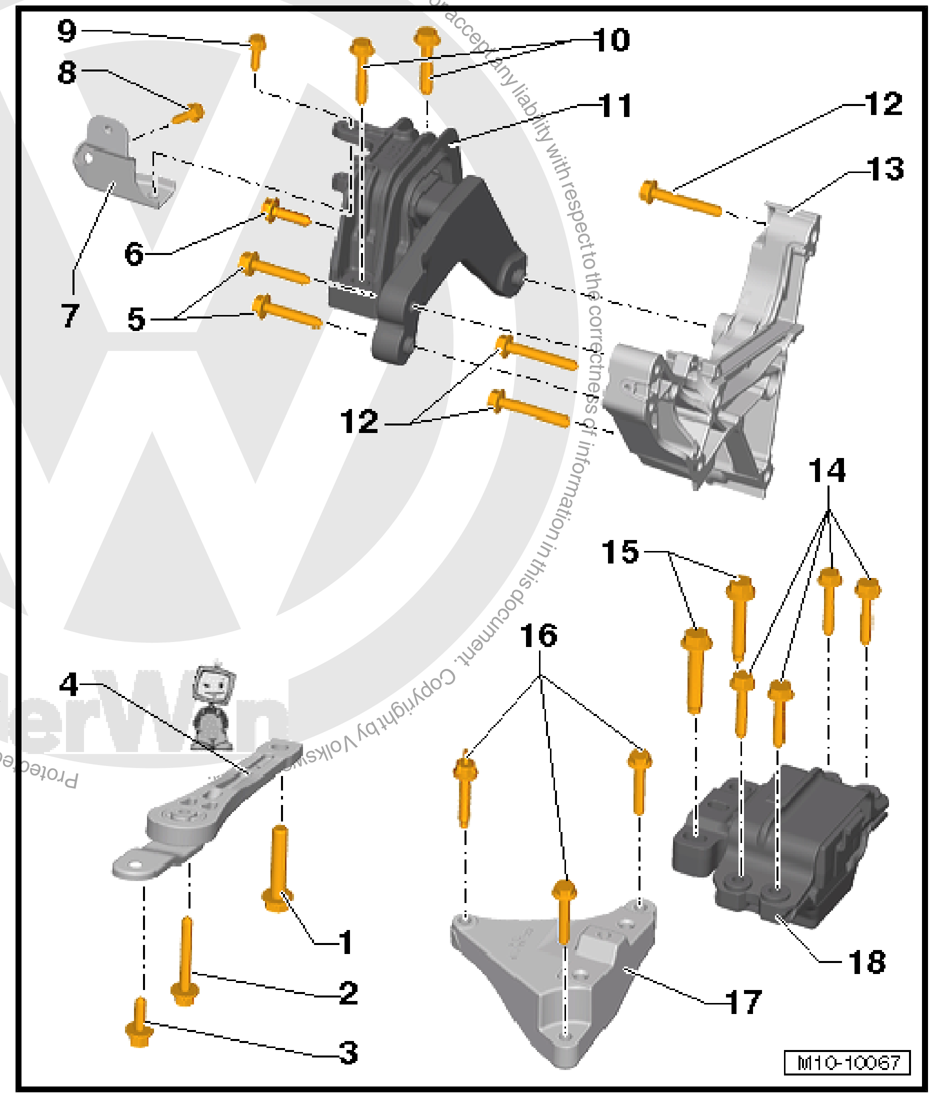
The gearbox and gearbox support -VAS 6100- are lifted into engine and gearbox support -VAS 6095- using workshop hoist -VW 353- .



5 Assembly mountings

⇒ “5.1 Assembly overview - assembly mountings”, page 78

5.1 Assembly overview - assembly mountings



1 - Bolt

- ❑ Specified torque ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

2 - Bolt

- ❑ Specified torque ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

3 - Bolt

- ❑ Specified torque ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

4 - Pendulum support

- ❑ Removing and installing ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

5 - Bolt

- ❑ Specified torque ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

6 - Bolt

- ❑ Specified torque ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

7 - Bracket

8 - Bolt

- ❑ Specified torque ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

9 - Bolt

- ❑ Specified torque ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

10 - Bolt

- ❑ Specified torque ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

11 - Engine mounting

- ❑ With support arm.
- ❑ Removing and installing ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

12 - Bolt

- ❑ Specified torque ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

13 - Engine support

- ❑ Removing and installing ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

14 - Bolt

- ❑ Specified torque ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

15 - Bolt

- ❑ Renew after each removal.
- ❑ 60 Nm +90°

16 - Bolt

- ❑ Renew after each removal.
- ❑ 40 Nm +90°

17 - Gearbox bracket

- ❑ Removing and installing ⇒ page 79 .

18 - Gearbox mounting

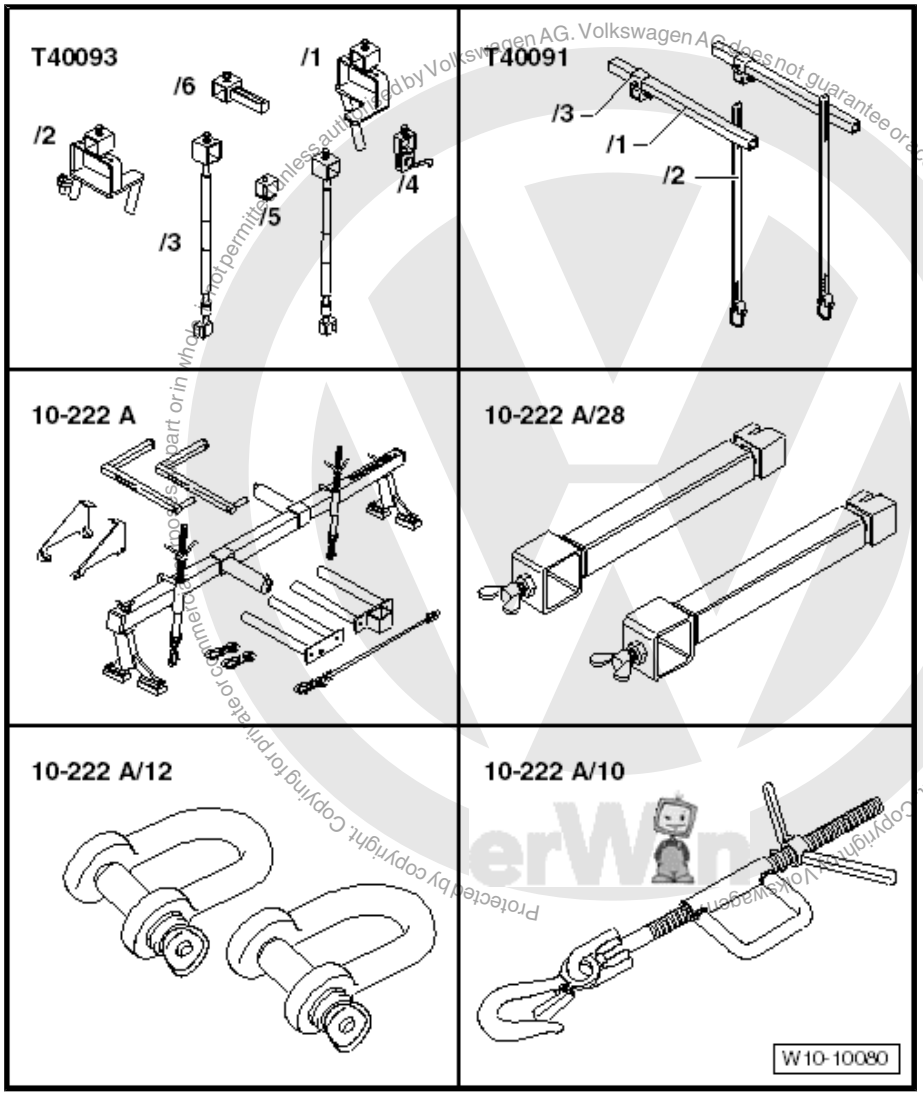
- ❑ With support arm.
- ❑ Removing and installing ⇒ Rep. gr. 10 ; Assembly mountings; Assembly overview - assembly mountings

5.1.1 Removing and installing gearbox bracket

Gearbox is installed.

Special tools and workshop equipment required

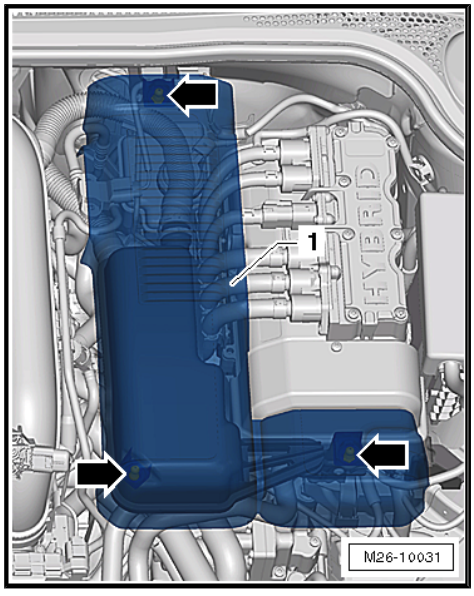
- Support bracket -10 - 222 A-
- 2 x spindle -10 - 222 A /11-
- 2 x adapters -10 - 222 A / 28-
- 2 x adapters -10 - 222 A / 28-2-
- Adapter -10 - 222 A /31-
- Hook rail -T40091/2- from engine support basic set -T40091-
- Mounting -T40093/5- from engine support supplementary set -T40093-
- 2 x square section tubes -T40091/1- from engine support basic set -T40091-
- 2 x rotary joint -T40091/3- from engine support basic set -T40091-
- 2 x rotary joint -T40093/4- from engine support supplementary set -T40093-



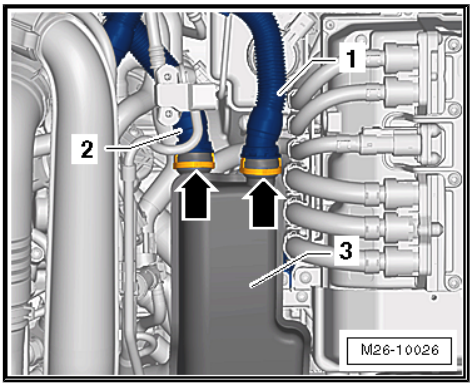
Removing gearbox bracket

Vehicles with secondary air system

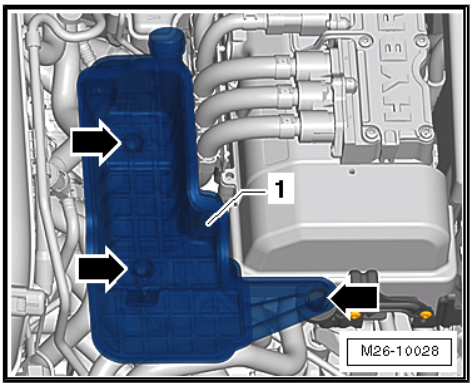
– Unclip cover for air damper -1- upwards from mountings -arrows- and remove it.



– Disconnect air hoses -1- and -2- from air damper -3-. To do this, press retaining ring -arrow- together on both sides and pull hoses off.



– Pull air damper -1- upwards out of rubber bushes -arrows-.



Continuation for all vehicles

WARNING

You can suffer an electric shock.

An electric shock can be fatal.

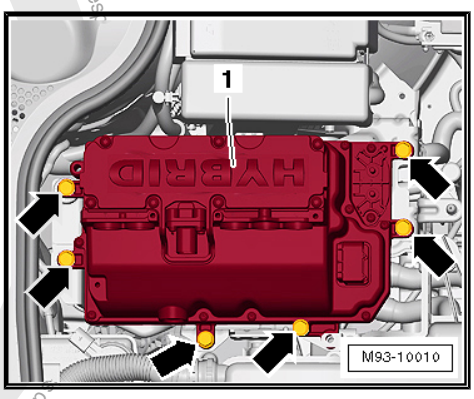
Observe general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

- *The system must first be de-energised by a high-voltage technician before any work is done on the high-voltage system and before any repair work is done on the body.*
- *All work on vehicles with a high-voltage system must only be carried out by electrically instructed persons. The work must be supervised by a high-voltage technician.*

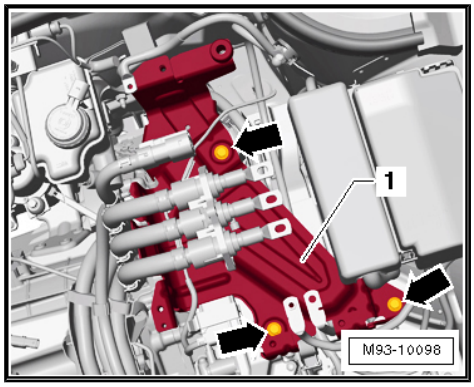
WARNING

High voltage on high-voltage system of hybrid vehicle. Danger of electric shock! Following procedure also requires work on high-voltage system. De-energise high-voltage system now ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; De-energising high-voltage system .

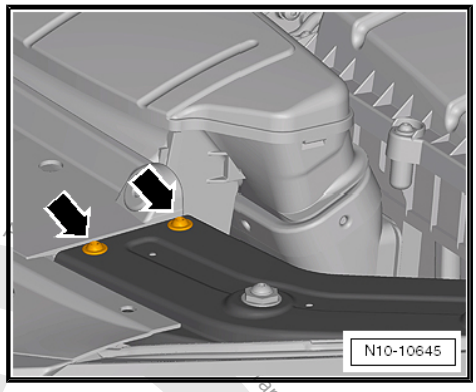
– Remove power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .



– Remove bracket for power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; High-voltage cables; Removing and installing high-voltage wiring harness for hybrid battery -PX1- .



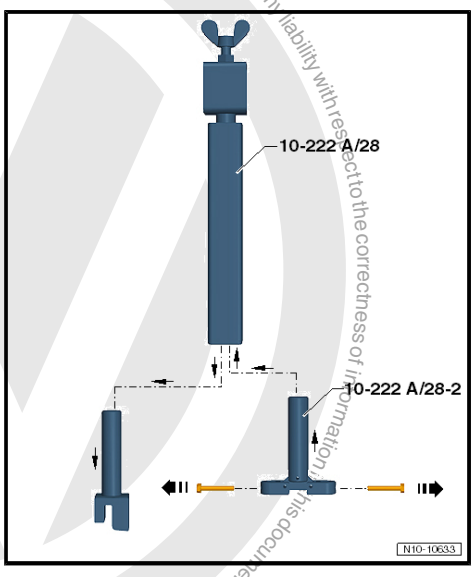
– Unscrew bolts -arrows- for lock carrier bracket on left and right.



– Unscrew lower mounts from adapter -10 - 222 A /28- and replace with adapters -10 - 222 A /28-2- .

– Unscrew bolts -arrows- for attaching engine support on lock carrier from adapter -10-222 A /28-2- .

• Use bolts from adapters -10-222 A /28-2- to attach adapters -10 - 222 A /28- . Do not use securing bolts for brackets, because they are too short.

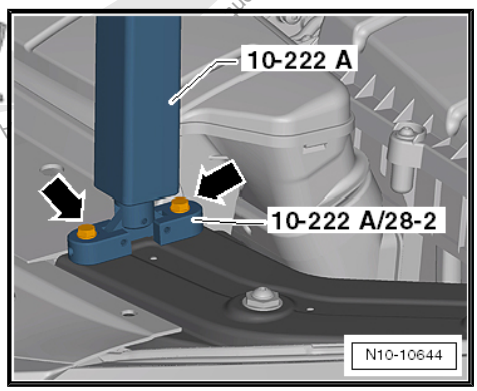


– Fit adapter -10 - 222 A /28- and tighten the bolts -arrows-.

• Specified torque of bolts -arrows-: 8 Nm.

Caution

A 2nd mechanic is needed to place support bracket on the vehicle in order to prevent the support bracket from tipping.



To take the weight of the engine/gearbox assembly, fit the support bracket as follows:

1 - Adapter -10 - 222 A /31-2-

2 - Swivel joint -T40091/3-

3 - Adapter -10 - 222 A /31-1-

4 - Swivel joint -T40093/4-

5 - Square tube -T40091/1-

6 - Adapter -10 - 222 A /28- with -10-222 A /28-2-

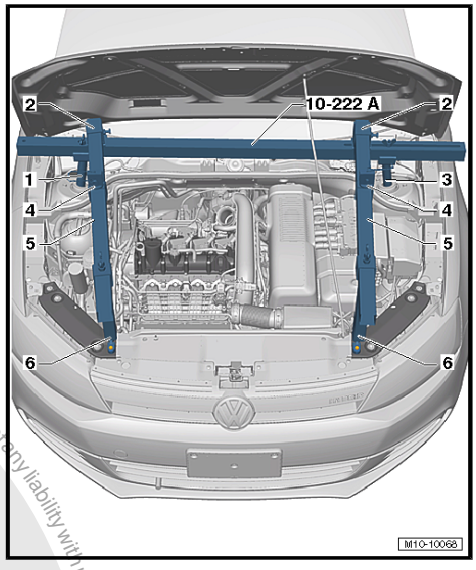
– First push rotary joints -item 2- onto square tube of engine support bracket -10 - 222 A- .

• Securing bolts securing rotary joints -T40091/3- -item 2- to engine support bracket -10-222 A- must face in direction of travel.

– Place engine support bracket -10-222 A- on suspension strut turrets and, with the aid of a 2nd mechanic, prevent it from tipping.

– -T40091/1- Push -item 5- on left and right from front through adapter -10-222 A /28- -item 6- and fit rotary joints -T40093/4- -item 4- on each side.

– Push hook rail -T40091/2- -item 8- with supports -T40093/5- -item 7- in rotary joints -T40093/4- -item 4-.



1 - Adapter -10 - 222 A /31-2-

2 - Rotary joint -T40091/3-

3 - Adapter -10 - 222 A /31-1-

4 - Rotary joint -T40093/4-

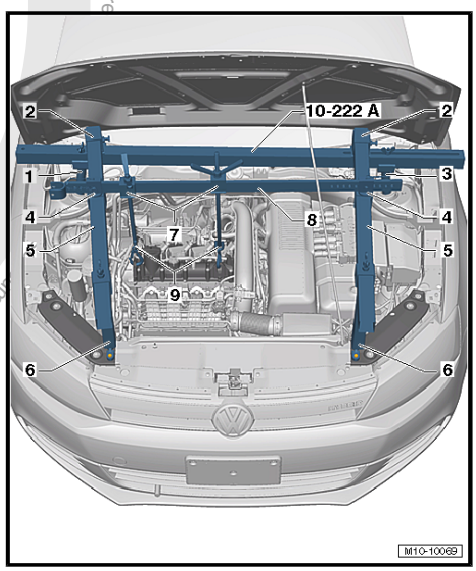
5 - Square tube -T40091/1-

6 - Adapter -10 - 222 A /28- with -10-222 A /28-2-

7 - Mounting -T40093/5-

8 - Hook rail -T40091/2-

9 - Spindle -10 - 222 A /11-



– Insert locking pin in hole rail -T40091/2- -item 8- and secure with split pins.

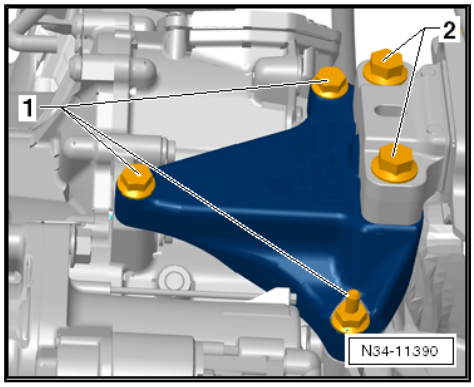
– Tighten all threaded connections of support bracket by hand. When doing this, adjust support bracket via adapters -10 - 222 A /28- so it is parallel in height.

– Take up weight of engine/gearbox assembly on spindles -10 - 222 A /11- -item 9-, do not lift.

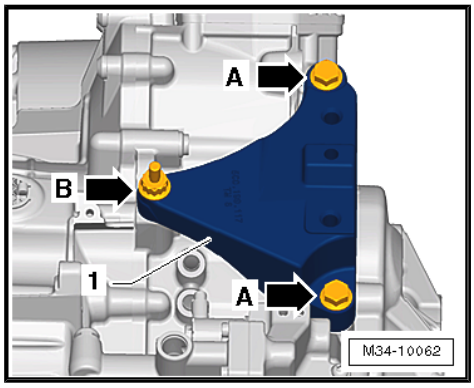
– Remove earth strap from centre hex stud ⇒ page 84 securing gearbox bracket on gearbox.

– Loosen bolts -1- for gearbox bracket by approx. one turn and unscrew bolts -2-.
– Then lower engine and gearbox slightly using the spindles of engine support bracket -10 - 222 A- .

• At most, 4 turns are sufficient to remove the gearbox console.
• Do not lower further. For lowering the assembly further the pendulum support has to be removed first.



– Unscrew bolts -arrows A- and -arrows B-. Remove gearbox bracket -1-.



Note

An earth strap is attached to the centre hex stud -arrows B-
.

Installing gearbox bracket

Install in reverse order of removal, observing the following:

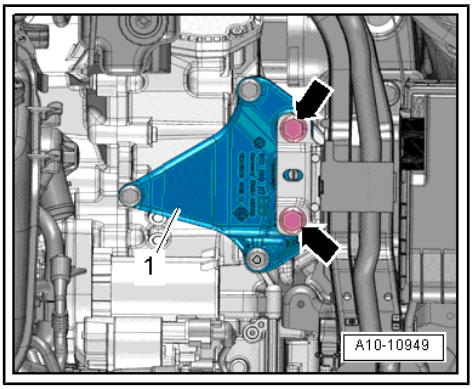
Note

Always renew bolts that are tightened with specified tightening angle.

Caution

Risk of damaging thread in gearbox bracket if bolts are started at an angle.

- *Before starting the bolts -arrows-, gearbox bracket -1- and support arm of gearbox mounting must be perfectly aligned parallel to each other. If necessary slightly raise gearbox at rear using a trolley jack or gearbox jack.*
- *Do not remove support bracket -10 - 222 A- until the bolts securing the assembly mounting have been tightened to specified torque.*



– Pull gearbox upwards using spindle of engine support bracket until the gearbox bracket makes contact with support arm of gearbox mounting.

– Check adjustment of assembly mountings ⇒ Rep. gr. 10 ; Assembly mountings; Checking adjustment of assembly mountings .

– Remove support bracket -10 - 222 A- from engine.

Install power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .

– Re-energise high-voltage system and carry out documentation ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Re-energising high-voltage system .

Specified torques

- ⇒ “5.1 Assembly overview - assembly mountings”, page 78

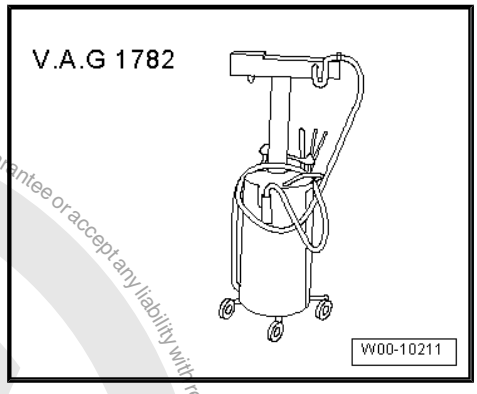
6 Gearbox oil

⇒ “6.1 Draining and filling gearbox oil”, page 86

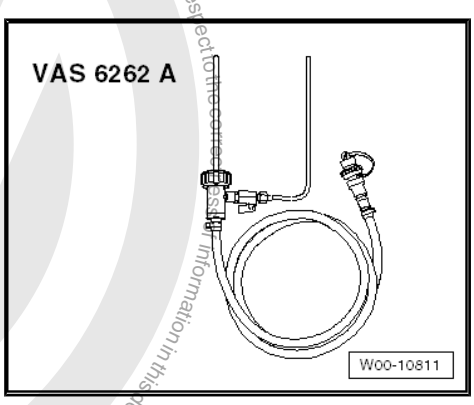
6.1 Draining and filling gearbox oil

Special tools and workshop equipment required

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



- Adapter for filling oil -VAS 6262 A- with -VAS 6262/4-



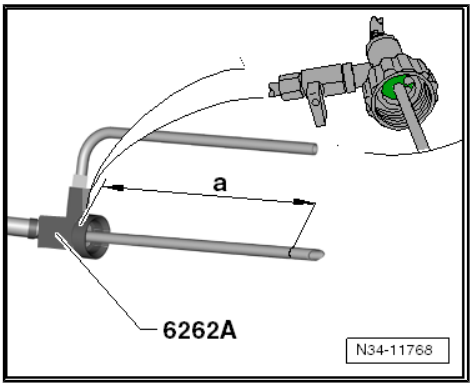
- In the case of some oil bottles, the adapter -VAS 6262/6- must be used as well.

- Breather pipe of adapter for oil filling -VAS 6262 A- may need to be shortened ⇒ page 87 .
- Bottle of gearbox oil for 7-speed dual clutch gearbox 0CW; For part number refer to ⇒ Electronic parts catalogue “ETKA” .

Measure length of breather pipe attached to adapter for oil filling -VAS 6262 A- and, if necessary, shorten it.

In order to ensure that the breather pipe of the adapter for oil filling -VAS 6262 A- does not contact the bottom of some oil bottles, the pipe must be shortened to the length -a-.

- Dimension -a- = 210 mm



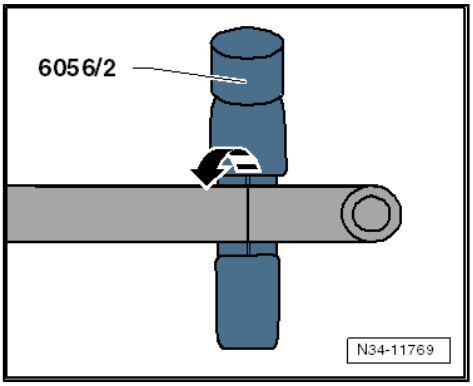
Note

The dimension -a- is measured from the shaft (green area in the magnifying glass) of the adapter for oil filling -VAS 6262 A- .

If dimension -a- is greater than 210 mm:

– Mark dimension -a- on the breather pipe and shorten pipe, e.g. with pipe cutter -VAS 6056/2- .

– Clean adapter for filling oil -VAS 6262 A- .



Procedure

Note

- *Observe ⇒ “4 Repair instructions”, page 10 .*
- *The gearbox is filled for life.*
- *The oil level in the gearbox cannot be checked.*
- *In the event of leaks on the gearbox the cause for the leak must be located and rectified.*
- *After this, the gearbox oil must be drained off completely and gearbox filled with new oil.*

- Engine is not running.

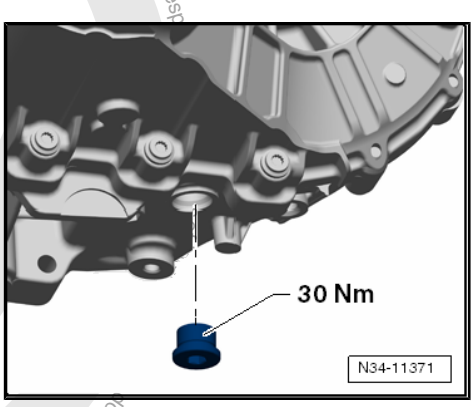
– Move selector lever to “P” position.

– Remove noise insulation beneath engine/gearbox ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .

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

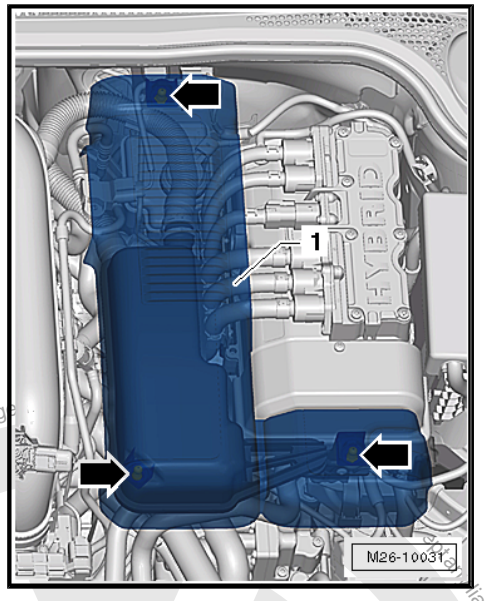
– Unscrew oil drain plug of gearbox.

– Allow oil to drain off, then screw in oil drain plug firmly again.

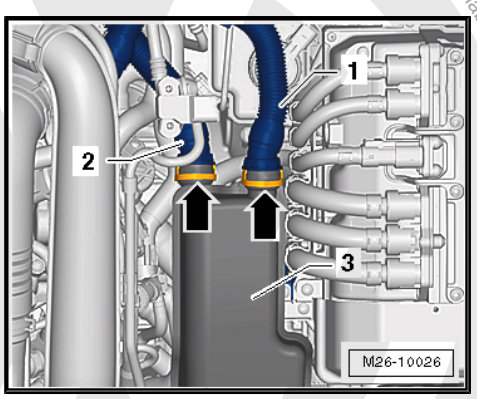


Vehicles with secondary air system

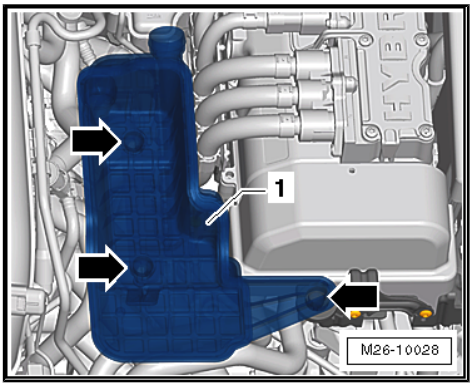
– Unclip cover for air damper -1- upwards from mountings -arrows- and remove it.



– Disconnect air hoses -1- and -2- from air damper -3-. To do this, press retaining ring -arrow- together on both sides and pull hoses off.



– Pull air damper -1- upwards out of rubber bushes -arrows-.



Continuation for all vehicles

WARNING

You can suffer an electric shock.

An electric shock can be fatal.

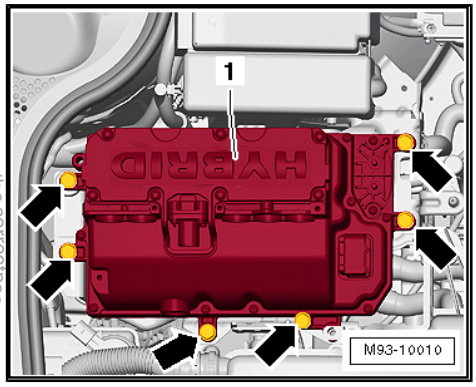
Observe general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

- *The system must first be de-energised by a high-voltage technician before any work is done on the high-voltage system and before any repair work is done on the body.*
- *All work on vehicles with a high-voltage system must only be carried out by electrically instructed persons. The work must be supervised by a high-voltage technician.*

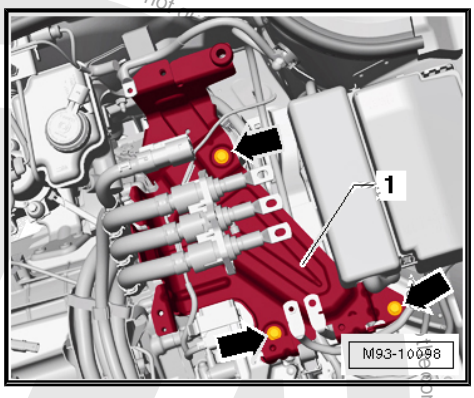
WARNING

High voltage on high-voltage system of hybrid vehicle. Danger of electric shock! Following procedure also requires work on high-voltage system. De-energise high-voltage system now ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; De-energising high-voltage system .

– Remove power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .



– Remove bracket for power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; High-voltage cables; Removing and installing high-voltage wiring harness for hybrid battery -PX1- .



Note

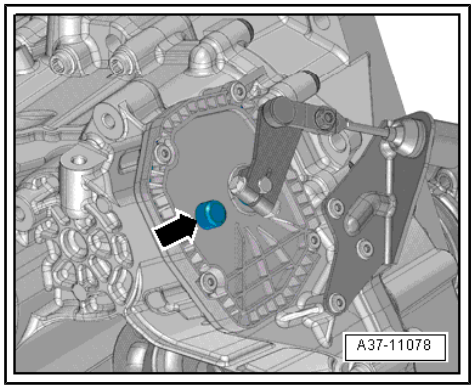
- *The oil level in the gearbox cannot be checked.*
- *The prescribed amount to be put in the gearbox must be adhered to exactly.*
- *Only in this way is the gearbox correctly filled.*
- *If too little or too much oil is put in the gearbox, the latter will not function correctly.*

Caution

Risk of damage to gearbox.

- ***Only the gearbox oil for the 7-speed dual clutch gearbox 0CG, which is available through the replacement parts system, must be used ⇒ Electronic parts catalogue "ETKA" .***
- ***Other oils will lead to malfunctions or failure of the gearbox.***

– Pull off breather cap -arrow- next to gearbox selector lever.



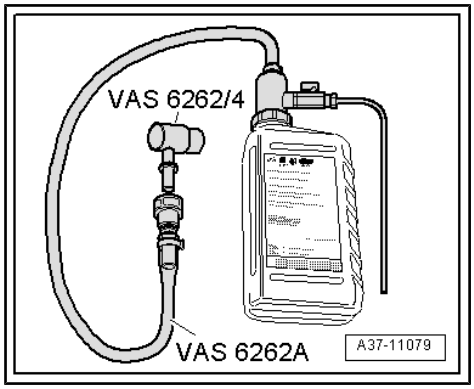
Caution

Risk of damage to gearbox.

- ***The adapter for oil filling -VAS 6262 A- with -VAS 6262/4- must be clean and it must be ensured that the gearbox oil is not mixed with any other oils!***

– Shake bottle before opening.

– Screw bottle of gearbox oil for 7-speed dual clutch gearbox 0CG onto adapter for oil filling -VAS 6262 A- ; For part number refer to ⇒ Electronic parts catalogue "ETKA" .

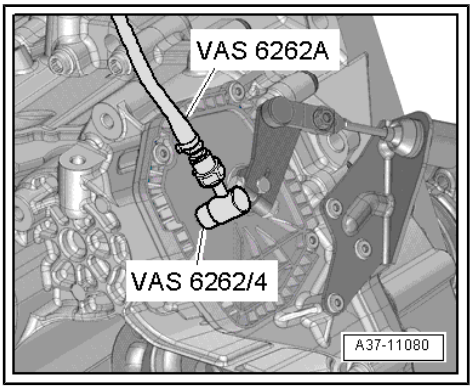


Note

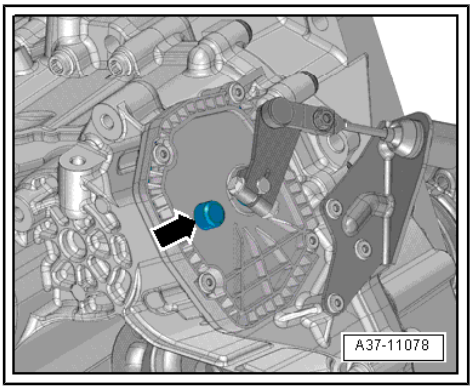
If the thread of the bottle does not fit onto the oil filling adapter -VAS 6262 A- , use adapter -VAS 6262/6- .

– Position bottle in such a way that oil does not run into the filling hose.

– Connect adapter -VAS 6262/4- to filling hose and attach to bleeder hole in gearbox.
– Flip bottle over and fill the exact required oil capacity; For oil capacities refer to ⇒ page 3 .

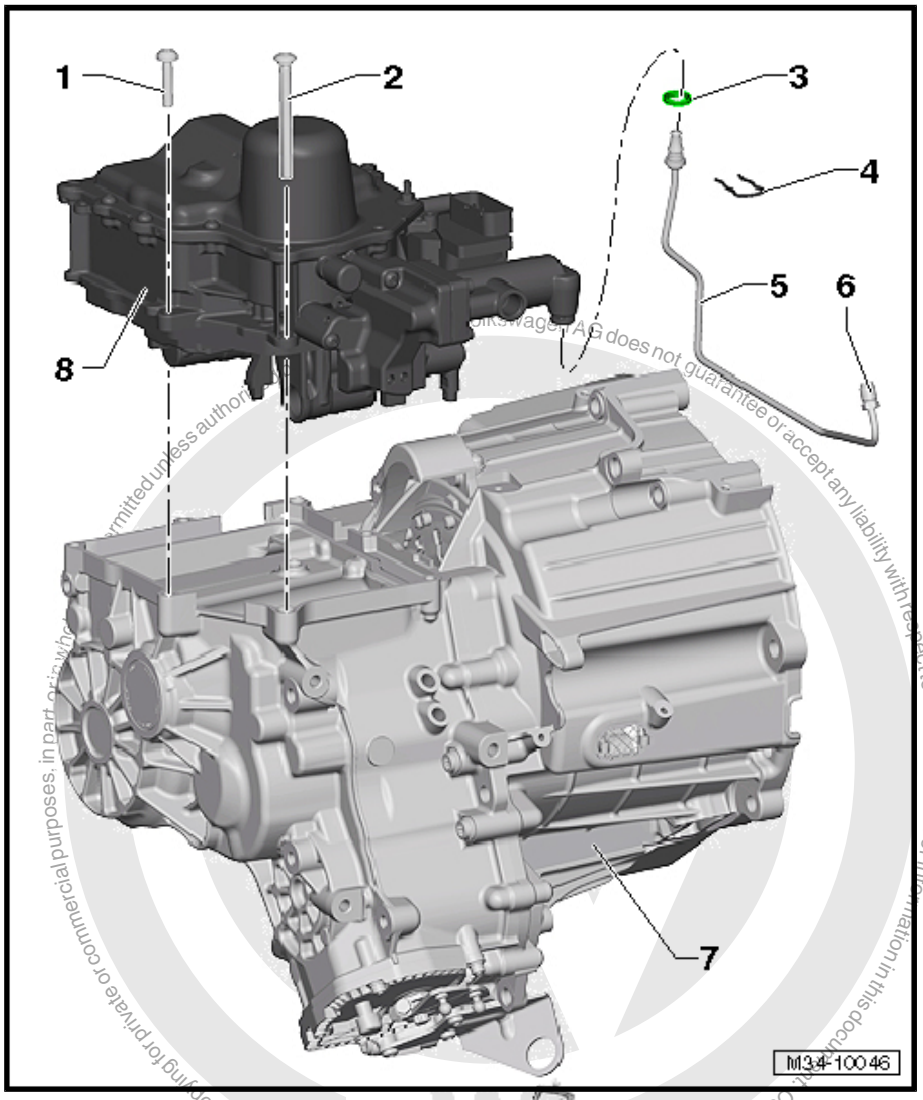


– After filling, remove oil filling adapter -VAS 6262 A- . Clean area around breather hole with a cloth and fit breather cap -arrow-.
– Continue installation in reverse order of removal. Install power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .
– Re-energise high-voltage system and carry out documentation ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Re-energising high-voltage system .



7 Mechatronic unit

7.1 Overview - mechatronic unit



1 - Bolt

- For securing mechatronic unit for dual clutch gearbox -J743- on gearbox housing.
- Qty 3, M8 x 35
- Renew after each removal.
- Specified torque and tightening sequence ⇒ page 94

2 - Bolt

- For securing mechatronic unit for dual clutch gearbox -J743- on gearbox housing.
- Qty 4, M8 x 90
- Renew after each removal.
- Specified torque and tightening sequence ⇒ page 94

3 - O-ring

- Identification: colour »green« ⇒ page 93 .
- Renew if damaged
- Allocate according to ⇒ Electronic parts catalogue “ETKA” .
- Fit onto connection for hydraulic line ⇒ page 93 .
- Moisten with hydraulic fluid when installing.

4 - Clip

- Pull out clip for removing and installing hydraulic line.

5 - Hydraulic line

- Seal connections with new sealing plugs.
- Allocate sealing plugs according to ⇒ Electronic parts catalogue “ETKA” .

6 - Union nut

- 18 Nm

7 - Gearbox

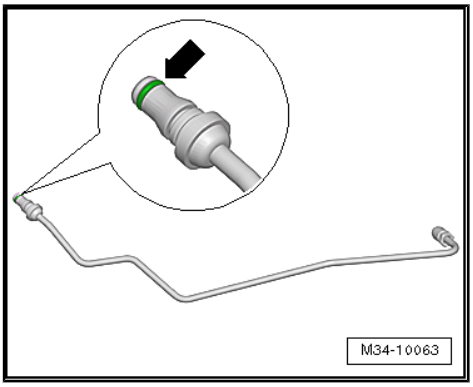
8 - Mechatronic unit for dual clutch gearbox -J743-

- With valve block.

- ❑ Do not remove valve block from mechatronic unit ⇒ page 93 .
- ❑ ⇒ “3.4 Safety precautions when working on mechatronic unit for dual clutch gearbox J743 ”, page 8
- ❑ ⇒ “7.2 Removing and installing mechatronic unit”, page 94
- ❑ ⇒ “7.3 Setting mechatronic unit to removal position by hand”, page 108

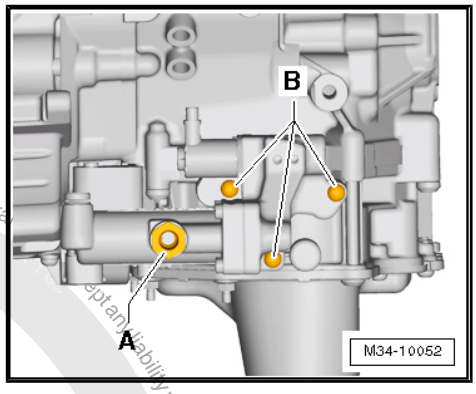
Installation position and colour of O-ring on hydraulic line

- The O-ring -arrow- must be green. It is suitable for use with hydraulic fluids. Do not use any other O-ring.



Valve block on mechatronic unit

- Do not unscrew plug -A- and securing bolts -B- of valve block on mechatronic unit!

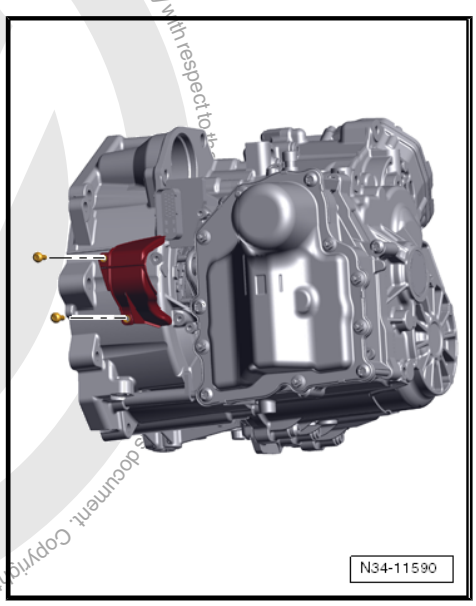


Cover on engaging levers of clutch mechanism - specified torque

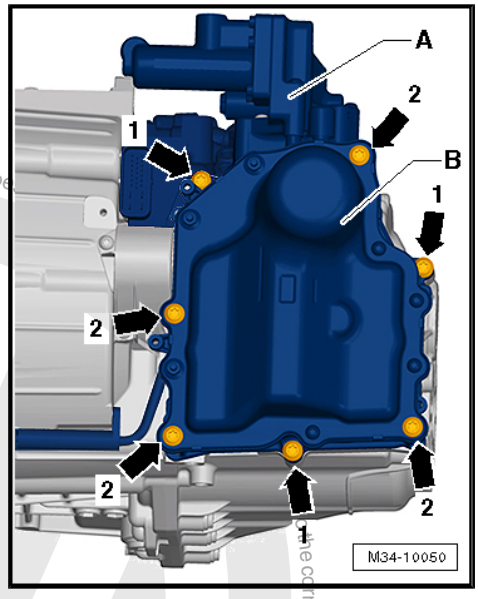
Note

The cover is installed depending on version.

– Tighten bolt to 8 Nm.



Mechatronic unit for dual clutch gearbox -J743- - specified torque and tightening sequence



Note

Renew bolts -arrows 1- and -arrows 2-.

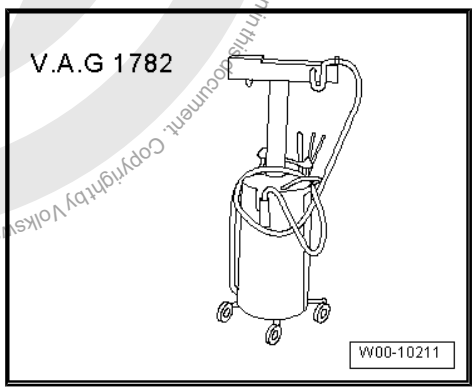
– Tighten bolts in 4 stages as follows:

Stage	Bolts	Specified torque
1	-Arrows 1-	Screw in to contact by hand.
2	Remove guide bolts -T10406-.	
3	-Arrows 2-	Screw in to contact by hand.
4.	-Arrows 1 and 2-	Diagonally to 10 Nm.

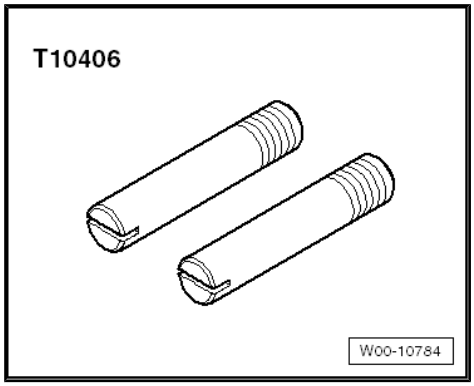
7.2 Removing and installing mechatronic unit

Special tools and workshop equipment required

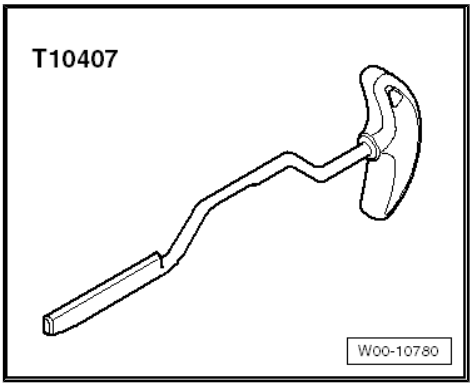
- Vehicle diagnostic tester
- Used oil collection and extraction unit -V.A.G 1782-



- Guide pin -T10406-



- Assembly lever -T10407-



- Allocate engine bung set according to ⇒ Electronic parts catalogue “ETKA” .
- Allocate sealing cap -0AM 325 120 A- according to ⇒ Electronic parts catalogue “ETKA” .

Removing

- Gearbox is installed.

Caution

Danger of irreparable damage to gearbox.

- ***Do not run engine or tow vehicle with mechatronic unit for dual clutch gearbox -J743- removed or when there is no gearbox oil in the gearbox.***

Note

- *Observe ⇒ “4 Repair instructions”, page 10 .*
- *The clutch is self-adjusting. Shocks can have an effect on this adjusting device. Even if the mechatronic unit has been removed, suddenly pulling out the assembly lever -T10407- under the engaging levers can have a negative effect on the adjusting device.*
- *A new mechatronic unit is correctly filled with oil. Do not drain oil.*
- *A removed mechatronic unit is sent back with its oil in. Mechatronic unit remains filled with oil.*

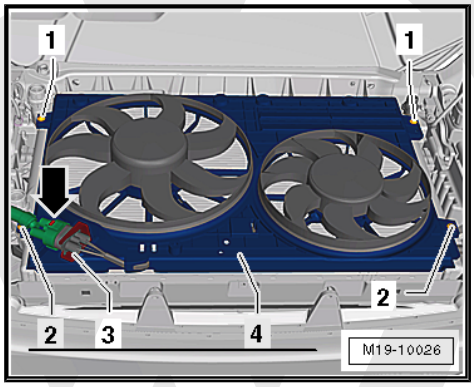
– Move selector lever to position »P« position.
– Connect vehicle diagnostic tester and switch on ignition.
– Select `Guided functions`.
– Under “7-speed dual clutch gearbox”, select `Moving gear actuator into -neutral- position`.
– Switch off ignition.
– Raise vehicle.
– Remove noise insulation beneath engine/gearbox ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .

– Remove radiator cowling ⇒ Rep. gr. 19 ; Radiator/radiator fan; Removing and installing radiator cowling .

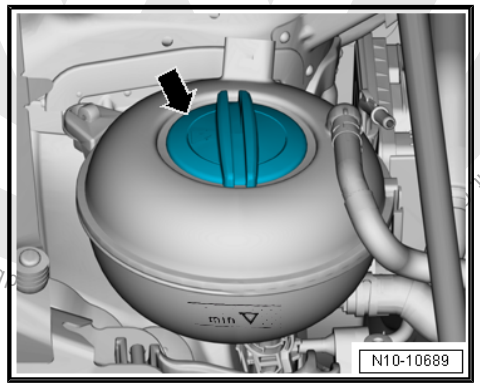
WARNING

Hot steam/hot coolant can escape - risk of scalding.

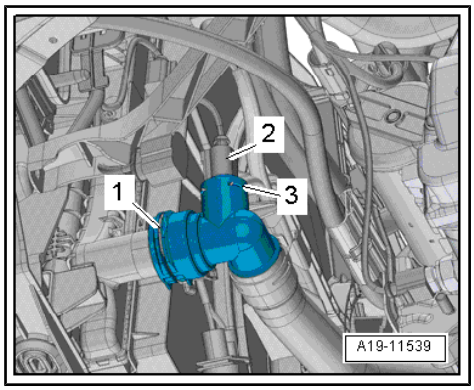
- ***On a warm engine, the cooling system is under high pressure.***
- ***Cover filler cap on expansion tank with a cloth and open it carefully to release pressure.***



– Open filler cap -arrow- on expansion tank.
– Set drip tray for workshop hoist -VAS 6208- underneath.

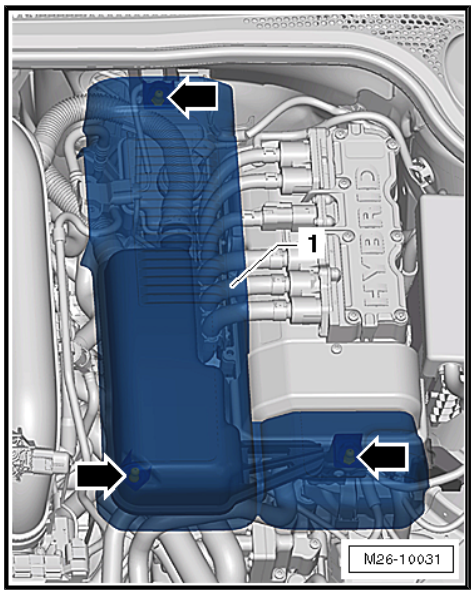


– Disconnect connector -2- on radiator outlet coolant temperature sender -G83- .
– Pull out retaining clip -1-. Remove lower left coolant hose from radiator and drain off coolant.
– Move lock carrier to service position ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Moving to and back from service position .

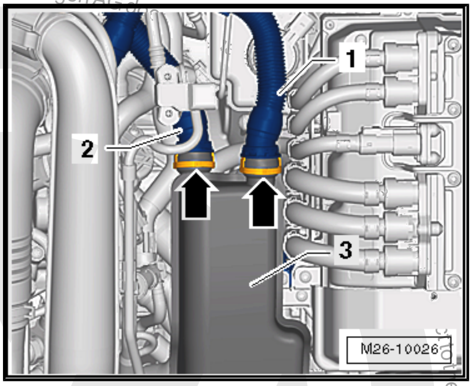


Vehicles with secondary air system

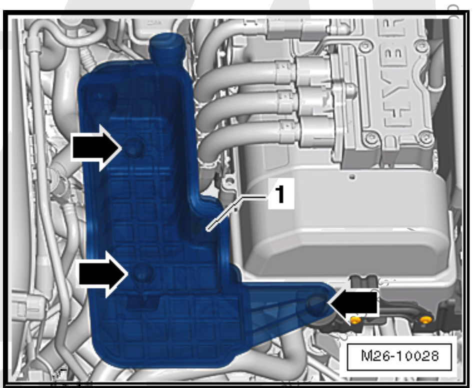
– Unclip cover for air damper -1- upwards from mountings -arrows- and remove it.



– Disconnect air hoses -1- and -2- from air damper -3-. To do this, press retaining ring -arrow- together on both sides and pull hoses off.



– Pull air damper -1- upwards out of rubber bushes -arrows-.

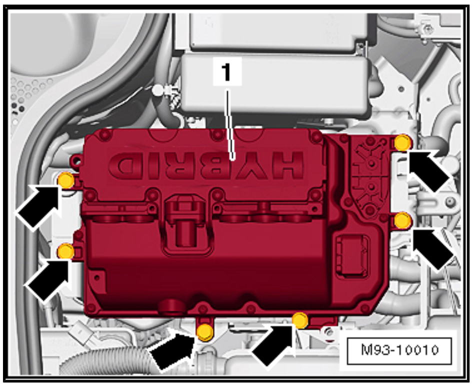


Continuation for all vehicles

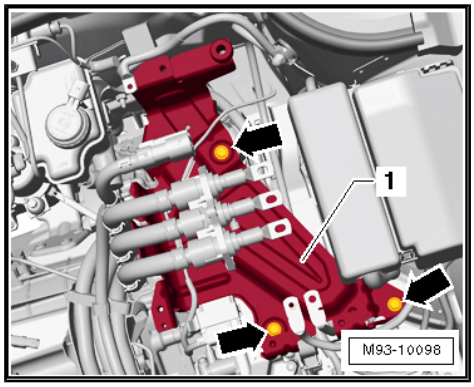
> ⚠ WARNING
>
> *You can suffer an electric shock.*
>
> *An electric shock can be fatal.*
>
> *Observe general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .*
>
> - *The system must first be de-energised by a high-voltage technician before any work is done on the high-voltage system and before any repair work is done on the body.*
> - *All work on vehicles with a high-voltage system must only be carried out by electrically instructed persons. The work must be supervised by a high-voltage technician.*

> ⚠ WARNING
>
> *High voltage on high-voltage system of hybrid vehicle. Danger of electric shock! Following procedure also requires work on high-voltage system. De-energise high-voltage system now ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; De-energising high-voltage system .*

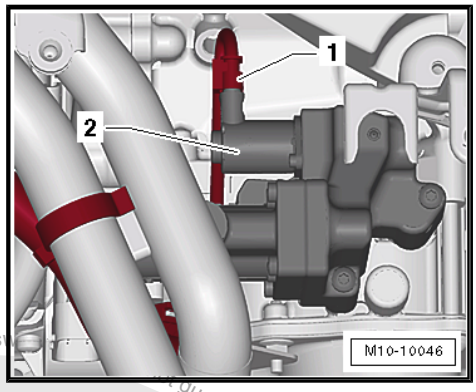
– Remove power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .



– Remove bracket for power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; High-voltage cables; Removing and installing high-voltage wiring harness for hybrid battery -PX1- .



– Disconnect connector -1- from selector valve -2- of mechatronic unit and pull wiring harness off retainer on front of gearbox.



WARNING

Risk of soiling.

Thoroughly clean all joints and surrounding areas before dismantling.

In the procedure below the hydraulic system of the mechatronic unit will be opened. Soiling will cause the system to fail!

– Unscrew union nut -1- for hydraulic line -3- from engine.

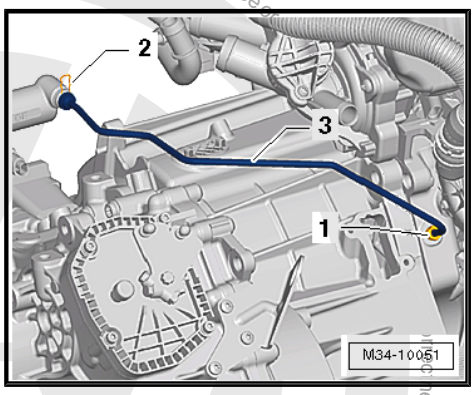
– Then, pull retaining clip -2- out of valve block/mechatronic unit.

– Pull hydraulic line -3- simultaneously out of engine and valve block/mechatronic unit.

• Seal hydraulic line connections immediately with suitable sealing plugs to ensure that as much hydraulic fluid as possible remains in the hydraulic line.

• Also seal the connections on engine and valve block/mechatronic unit with suitable sealing plugs.

• For allocation of sealing plugs and hydraulic fluid refer to ⇒ Electronic parts catalogue “ETKA” .



Note

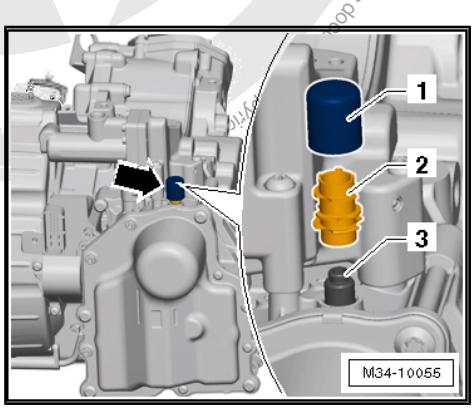
For reasons of clarity, the engine/gearbox assembly is removed in illustration.

– Pull breather cap -1- off mechatronic unit. Breather -2- remains attached to breather connection -3- for this.

• Breather -2- must be removed to prevent that hydraulic fluid escapes from the mechatronic unit.

• The breather will be damaged during removal and must be renewed.

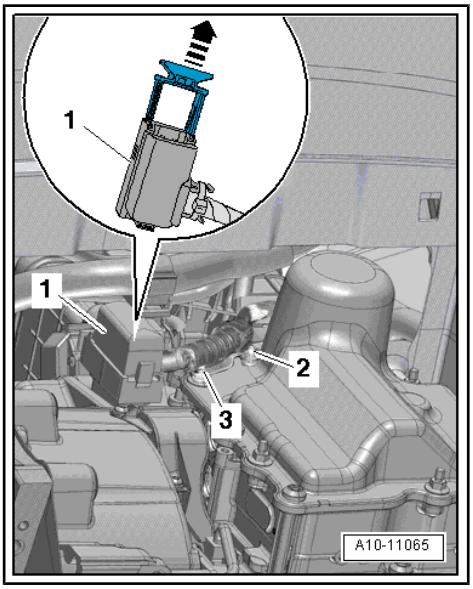
• Breather connection -3- must now be sealed with a sealing plug or sealing cap -0AM 325 120 A- so that no oil can escape. Order sealing plugs via the ⇒ Electronic parts catalogue “ETKA” .



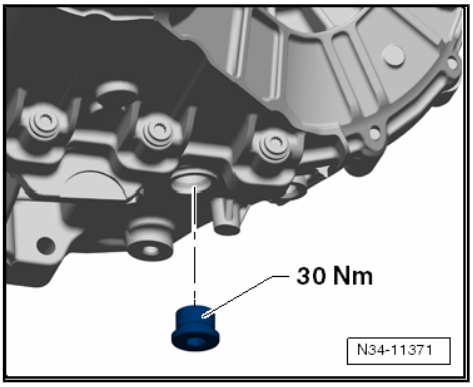
Caution

Risk of damaging gearbox components beyond repair.

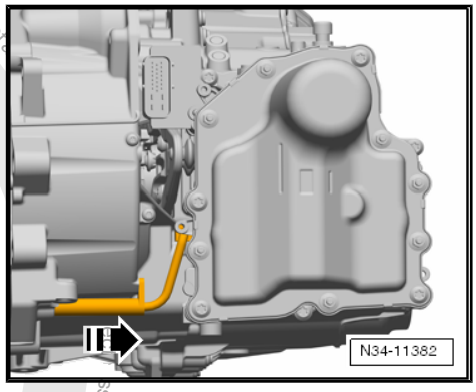
- *Do not under any circumstances touch the contacts in the gearbox connector by hand. The resulting static discharge could destroy the control unit and, consequently, the mechatronic unit.*



– Touch earth connection (without gloves) in order to discharge yourself.
– Disconnect connector -1- for mechatronic unit for dual clutch gearbox -J743- . To do this, pull locking mechanism upwards -arrow-.
– Unscrew nuts -2- and -3- from centre hex studs.
– Remove wire retainer from gearbox.



– Put used oil collection and extraction unit -V.A.G 1782- underneath.
– Unscrew oil drain plug of gearbox.
– Allow oil to drain off, then screw in oil drain plug firmly again.

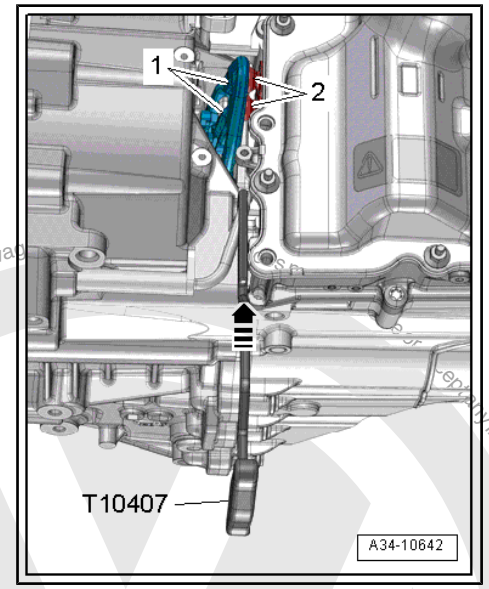


– Using a screwdriver, carefully unclip gearbox input speed sender 3 -G641- from housing in -direction of arrow-.

Note

The following work step serves to lift off both engaging levers of the dual clutch from the plungers of the mechatronic unit. If this is not done, the engaging levers will jam the mechatronic unit at the plungers and prevent the mechatronic unit from being removed.

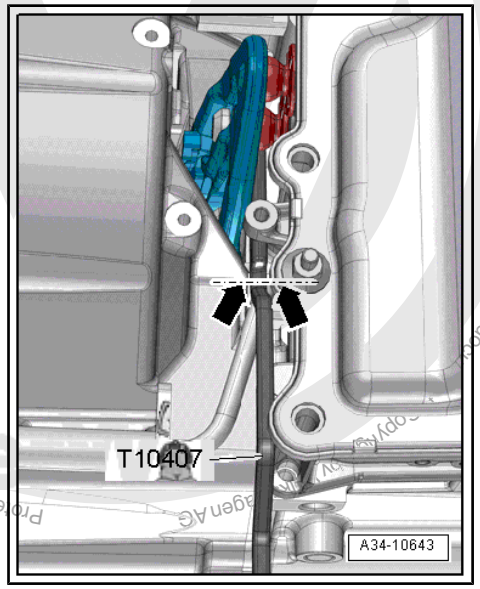
– Insert assembly lever -T10407- under plunger -2- between gearbox housing and both engaging levers -1- -arrow-, as shown in diagram.



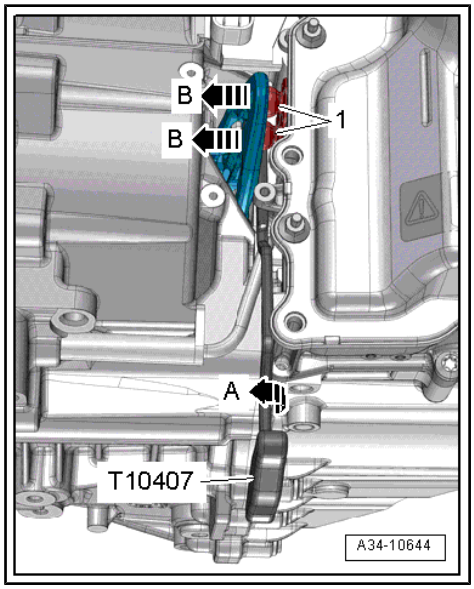
– Insert assembly lever -T10407- just enough until groove is flush with housing rib -arrows-, as shown in diagram. Do not insert onto stop.

Note

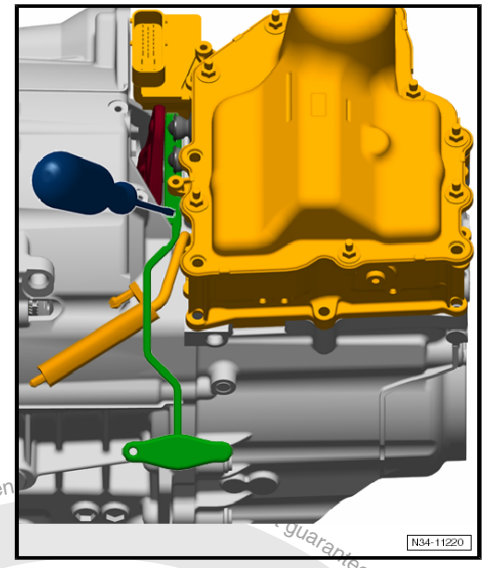
The back of the assembly lever must rest against the gearbox housing when doing this.



– Turn assembly lever -T10407- about its axis 90° in anti-clockwise direction -arrow A- to lift off engaging lever from plungers -1- -arrow B-.



– To prevent assembly lever -T10407- from slipping out while it is being turned, press it against gearbox housing if necessary using a screwdriver.



Note

- *The assembly lever -T10407- remains inserted between the engaging levers and the gearbox housing during removal and installation of the mechatronic unit.*
- *If necessary, press the assembly lever -T10407- against the gearbox housing.*

Caution

Risk of damaging gearbox components beyond repair.

- ***Do not touch or remove the mechatronic unit for dual clutch gearbox -J743- until you have electrostatically discharged yourself by touching an earthed object, e.g. skin contact with earth.***
- ***Do not under any circumstances touch the contacts in the gearbox connector by hand. The resulting static discharge could destroy the control unit and, consequently, the mechatronic unit.***

– Touch earth connection (without gloves) in order to discharge yourself.

Caution

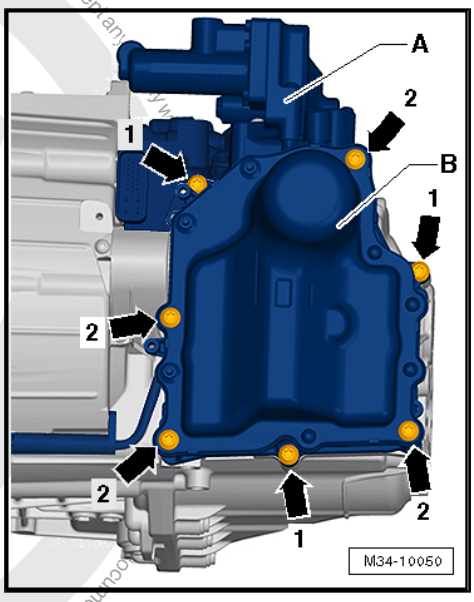
Risk of damaging mechatronic unit for dual clutch gearbox -J743- .

- ***Do not loosen the bolts for cover of the mechatronic unit for dual clutch gearbox -J743- .***
- ***Place the removed mechatronic unit for dual clutch gearbox -J743- down in such a way that no oil can escape through the breather.***
- ***Do not remove valve block from mechatronic unit .***

Note

Mechatronic unit is to be sent for reconditioning with its oil in.

– Unscrew bolts -arrows 2- diagonally.
– Unscrew bolts -arrows 1-.
– Pull mechatronic unit -B- together with valve block -A- off gearbox.



Caution

Risk of damaging mechatronic unit for dual clutch gearbox -J743- .

- ***Sometimes, the mechatronic unit cannot be removed.***
- ***In this case, the gear actuator is caught at the top left of the mechatronic unit.***
- ***The mechatronic unit must not be pulled out using excess force.***
- ***In this case, the mechatronic unit should first be brought into the installation position by hand ⇒ page 108 .***

Installing

- The breather connection of the mechatronic unit is sealed with a sealing plug or sealing cap -0AM 325 120 A- so that no oil can escape. Order sealing plugs via the ⇒ Electronic parts catalogue “ETKA” .

Note

- *A new mechatronic unit is correctly filled with oil.*
- *An ordered mechatronic unit comes sealed with sealing cap -0AM 325 120 A- .*
- *Before installing the mechatronic unit for dual clutch gearbox -J743- , ensure that all selector forks are in »centre position«.*
- *The »centre position« is illustrated as position -N- (neutral) in the illustration below.*
- *In this position no gear is engaged. That is, the neutral position is set.*

– First, check each of the 4 selector forks by hand.

Each selector fork has 3 positions:

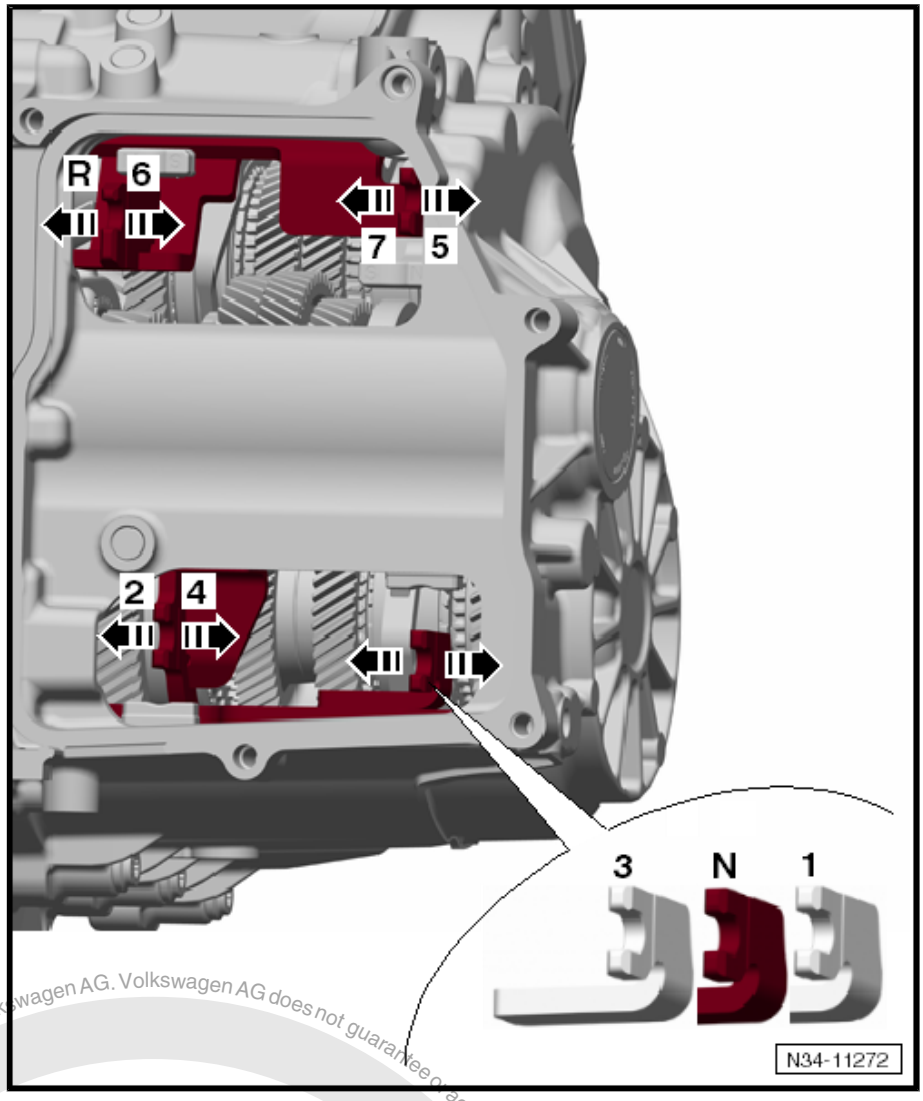
- Gear engaged
- Neutral position -N-
- Gear engaged

– Move each of the 4 selector forks one after the other into each position -arrows-.
– Then move all selector forks back to »centre position« (position -N-).

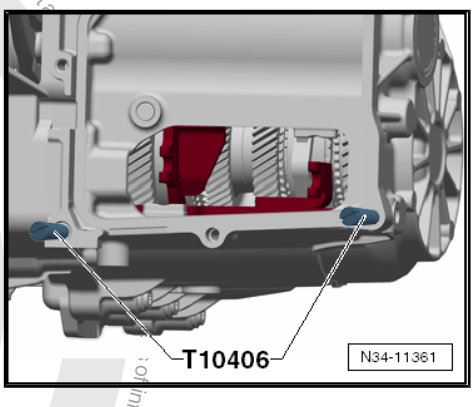
Note

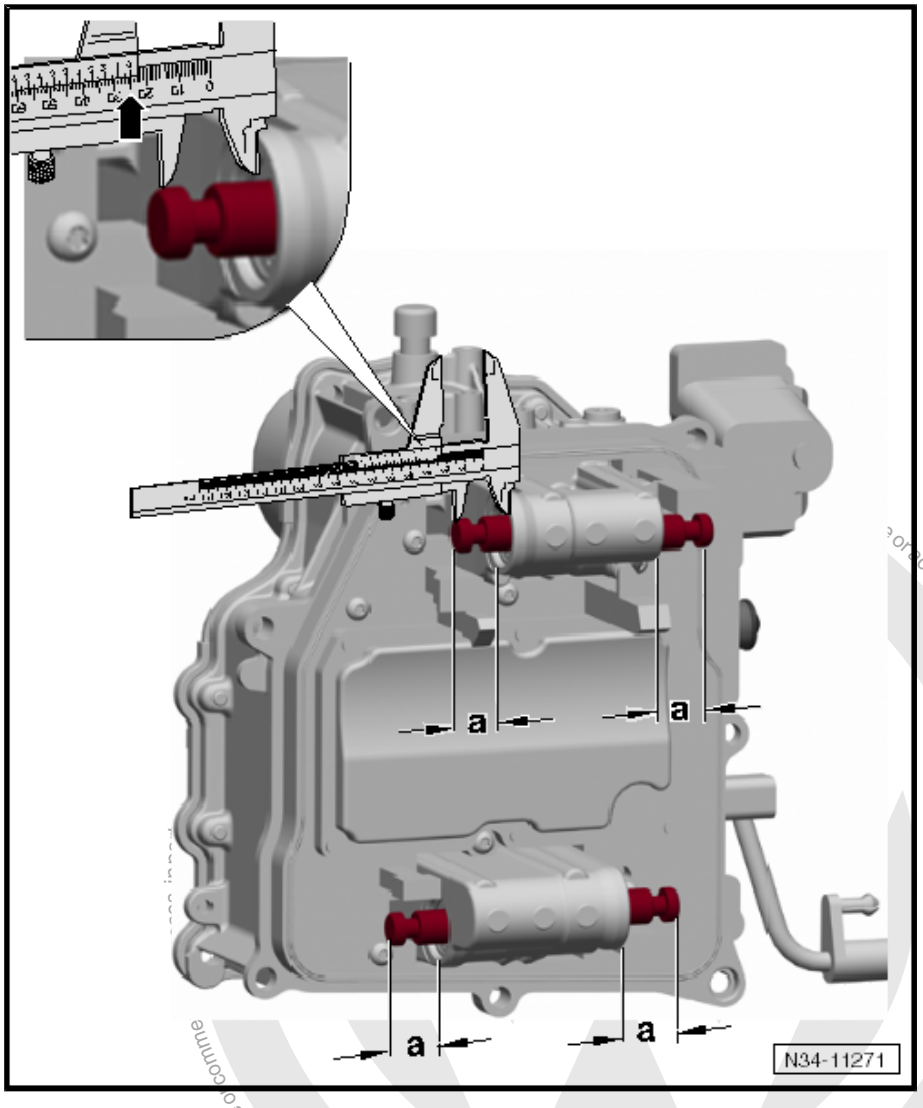
Slightly turn one front wheel to ease the movement of the selector forks.

N - Neutral position
R - Reverse gear
1 - First gear
2 - Second gear
3 - Third gear
4 - Fourth gear
5 - Fifth gear
6 - Sixth gear
7 - Seventh gear



– Clean sealing surface where mechatronic unit will make contact later on.
– Screw in guide bolts -T10406- by hand.





Adjusting gear actuator:

Caution

Risk of damaging mechatronic unit for dual clutch gearbox -J743- .

When levering out the plungers, do not use the sensors as an anchor point.

– Move the 4 gear actuators at the back of the mechatronic unit for dual clutch gearbox -J743- to the specified position.

• Specified position: -a- = 25 mm.

– Clean sealing surface of mechatronic unit.

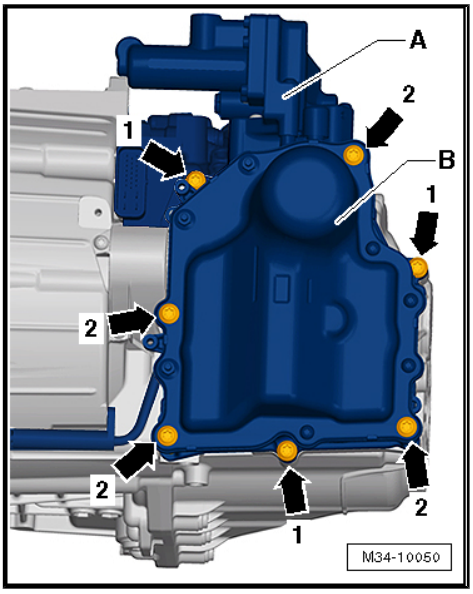
• The seal around mechatronic unit for dual clutch gearbox -J743- must be fully and properly inserted in the groove.

– Fit mechatronic unit together with valve block to gearbox.
– Tighten bolts for mechatronic unit ⇒ page 94 .

Caution

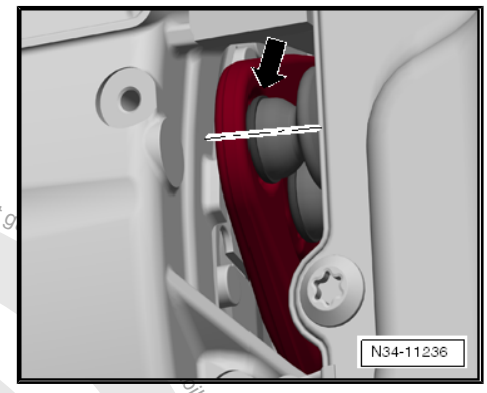
Risk of damaging clutches.

- ***If the engaging levers strike the clutch actuators of the mechatronic unit hard, these will be placed under excess pressure and the self-adjusting device of the clutch will become active. Self-adjustment cannot be reversed.***

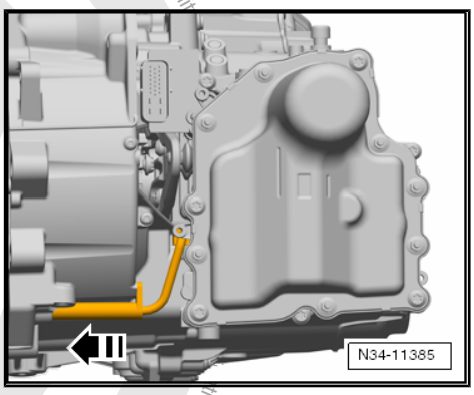


- Both clutch actuators must be engaged correctly in retainers of clutch engaging levers.
- Do not damage rubber grommets of clutch actuators when doing this.
- Rubber grommets must seal properly against mechatronic unit.

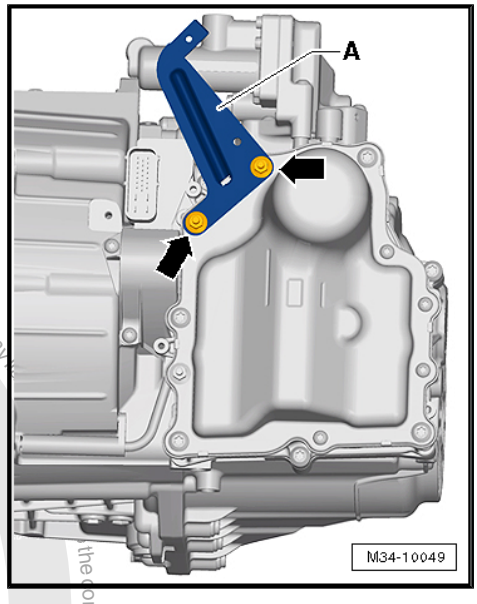
– Carefully and slowly turn assembly lever -T10407- in clockwise direction and remove it.
- The plungers must slide slowly into the mountings.
– Pull out plungers by hand until they are properly seated in mountings.



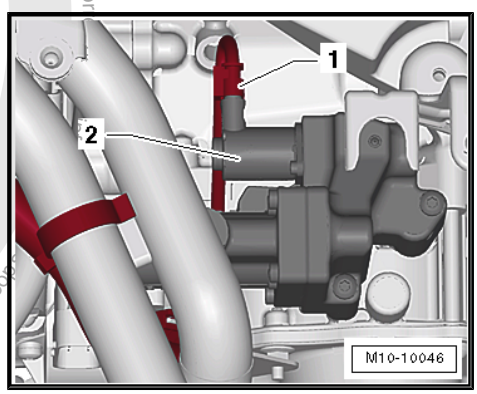
– Install gearbox input speed sender 3 -G641- .
– Pay attention to sender. Clip must not be damaged.
- Sender lug must be fully and firmly in contact with gearbox housing. If sender is »loose« because the clip is broken, renew mechatronic unit.
– Connect mechatronic unit connector.



– Install bracket -A- at front of gearbox -arrows-.

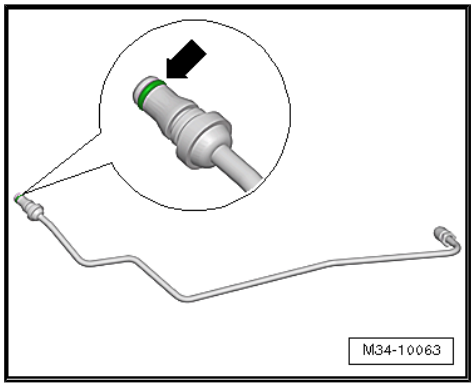


– Connect connector -1- to selector valve -2- of mechatronic unit and install wiring harness to retainer at front of gearbox.

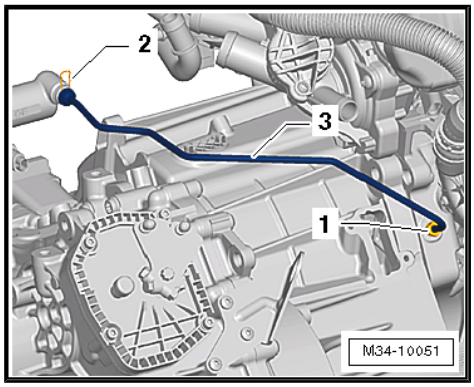


Note

- *Check the O-ring -arrow- on the hydraulic line for damage and renew it if necessary. Refer to ⇒ Electronic parts catalogue "ETKA".*
- *The O-ring must be green. It is suitable for use with hydraulic fluids. Do not use any other O-ring.*
- *Only remove the sealing plugs on hydraulic line, engine and valve block/mechatronic unit immediately before installation.*



– Insert hydraulic line -3- into engine and valve block/mechatronic unit.
– Then, press retaining clip -2- into valve block/mechatronic unit.
– Check proper seating of hydraulic line -3- by pulling on it.
– Screw union nut -1- for hydraulic line on engine and tighten it to specified torque ⇒ Item 6 (page 92) .

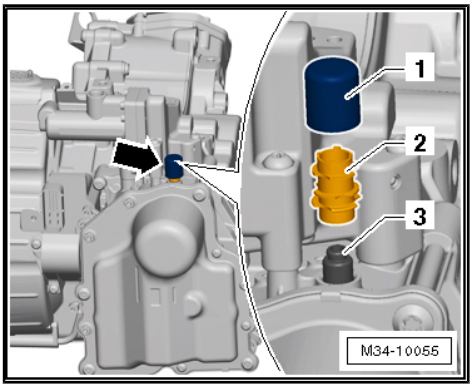


– Remove sealing cap -arrow- from breather connection of mechatronic unit for dual clutch gearbox -J743- .

• If a large quantity of hydraulic fluid (more than 20 ml) has escaped, hydraulic fluid must be replenished through breather connection -3- at this point.

• For allocation of hydraulic fluid and filling equipment refer to ⇒ Electronic parts catalogue “ETKA” .

– Fit breather cap -1- (is one replacement part together with breather -2-) onto breather connection -3-.



Note

♦ *If the mechatronic unit is removed, fit sealing plugs onto the old mechatronic unit so that no oil can escape when it is sent for reconditioning.*

♦ *The oil in the old mechatronic unit must not be drained off.*

Further installation is carried out in reverse order of removal. Observe the following when installing:

– Fill gearbox oil ⇒ page 86 .

– Check selector lever cable adjustment and adjust it if necessary ⇒ page 60 .

Install power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .

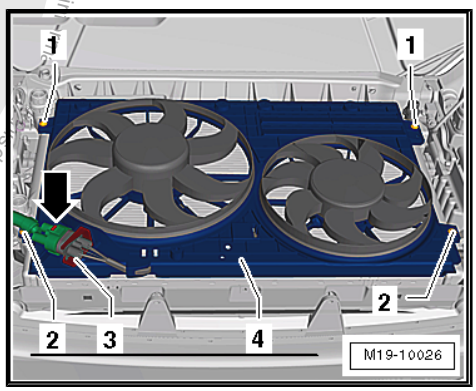
– Re-energise high-voltage system and carry out documentation ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Re-energising high-voltage system .

– Move lock carrier back from service position ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Moving to and back from service position .

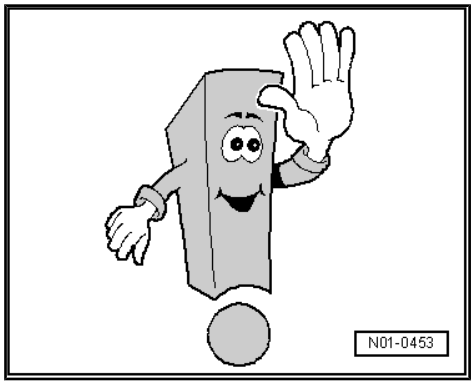
– Install radiator cowling ⇒ Rep. gr. 19 ; Radiator/radiator fan; Removing and installing radiator cowling .

– Top up coolant ⇒ Rep. gr. 19 ; Cooling system, coolant; Draining and filling coolant .

– Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .



- After the high-voltage system has been re-energised, bleed hydraulic clutch mechanism of disengagement clutch using ⇒ Vehicle diagnostic tester in Guided functions mode.



Note

The disengagement clutch in the electric drive motor -V141- separates the combustion engine from the electric drive motor -V141- .

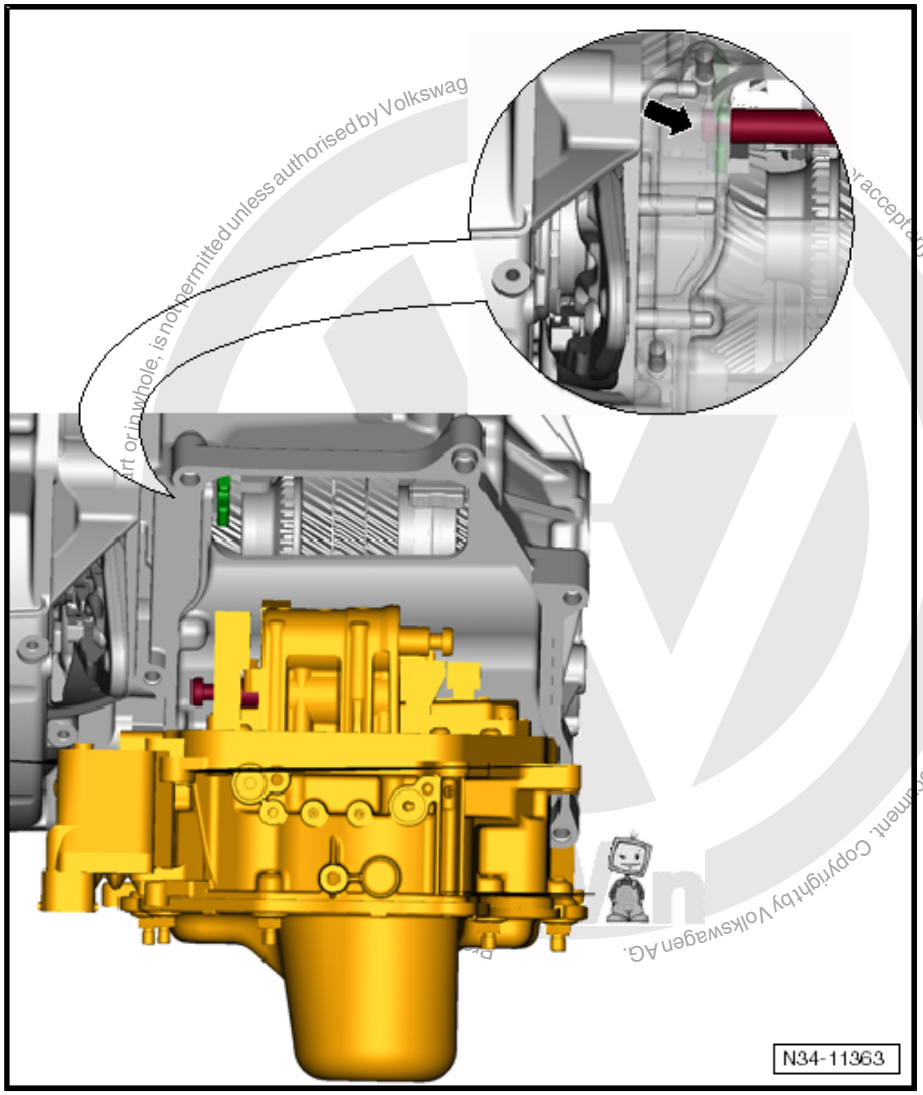
– Initiate basic adjustment ⇒ page 13 .

Specified torques

◆ ⇒ Fig. “” Mechatronic unit for dual clutch gearbox -J743- - specified torque and tightening sequence”“ , page 94

7.3 Setting mechatronic unit to removal position by hand

- Only if you cannot set the mechatronic unit to removal position with the vehicle diagnostic tester , you must set the unit by hand to this position.



Procedure

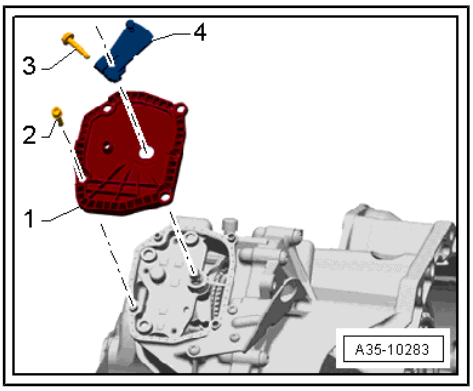
Sometimes, the mechatronic unit cannot be removed. In this case, the gear actuator is »caught« at the »top left« of the gearbox housing -arrow-.

The »sticking« gear actuator must now be pressed by hand into a »removal position«. The cover on the selector shaft must be removed for this.

– Reinsert mechatronic unit completely into gearbox and secure it with a bolt.

– Move selector lever to “P” position.

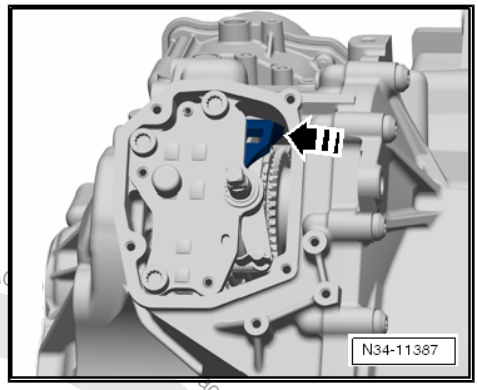
– Remove parking lock cover -1- ⇒ page 110 .



Caution

Risk of causing permanent damage by mechatronic unit falling out.

- ***After the next work step, the mechatronic unit is free and could fall out. If it has not already been done, secure mechatronic unit on gearbox with 1 bolt to prevent it from falling down.***

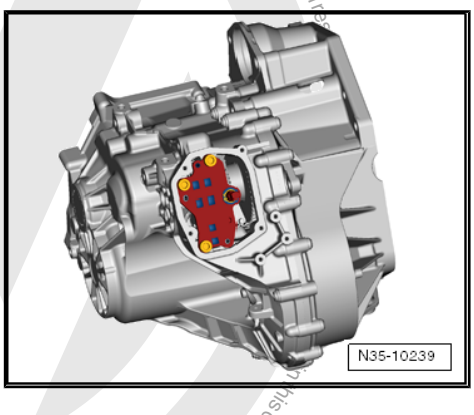


– Working through opening, push selector fork to side -direction of arrow-.

This presses back the »sticking« gear actuator and the mechatronic unit can be removed.

– Install mechatronic unit.

– After work on mechatronic unit has been completed and mechatronic unit is installed, fill gearbox oil through the parking lock ⇒ page 86 .



Note

- *The breather cap on the parking lock cover must not be removed for filling the gearbox with gearbox oil through the parking lock. The gearbox oil can be filled through the parking lock from the side.*
- *For procedure, oil capacities and oil type refer to ⇒ “6.1 Draining and filling gearbox oil”, page 86 .*

– Install parking lock cover -1- ⇒ page 110 .

35 – Gears, shafts

1 Parking lock

⇒ “1.1 Removing and installing parking lock cover”, page 110

⇒ “1.2 Removing and installing parking lock”, page 112

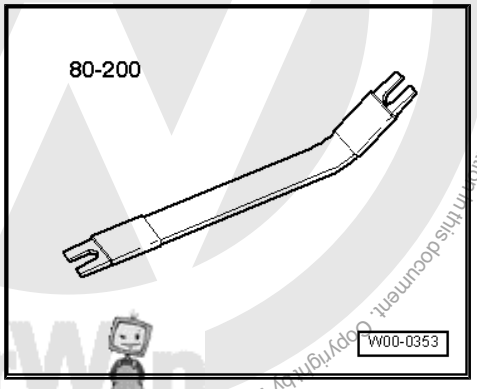
1.1 Removing and installing parking lock cover

Note

Only if you cannot set the mechatronic unit to removal position with the vehicle diagnostic tester , you must set the unit by hand to this position ⇒ page 108 .

Special tools and workshop equipment required

- Removal lever -80 - 200-

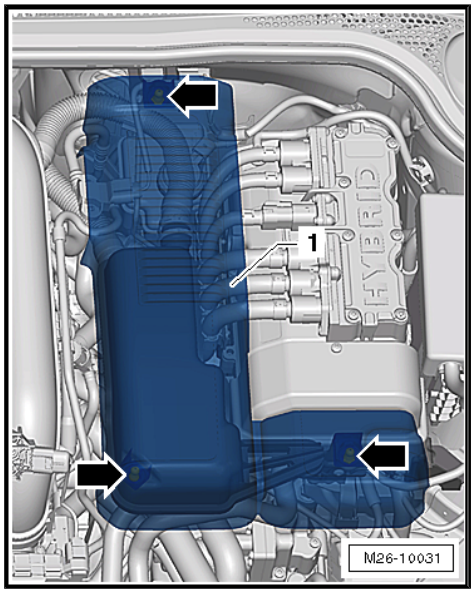


Removing

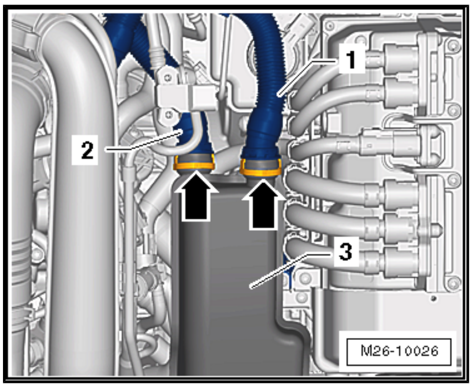
- Gearbox is installed.
- Selector lever positioned in »P«.

Vehicles with secondary air system

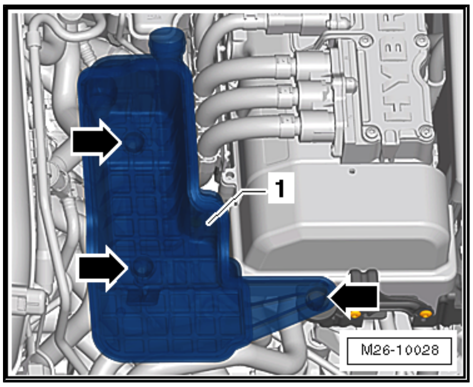
– Unclip cover for air damper -1- upwards from mountings -arrows- and remove it.



– Disconnect air hoses -1- and -2- from air damper -3-. To do this, press retaining ring -arrow- together on both sides and pull hoses off.



– Pull air damper -1- upwards out of rubber bushes -arrows-.

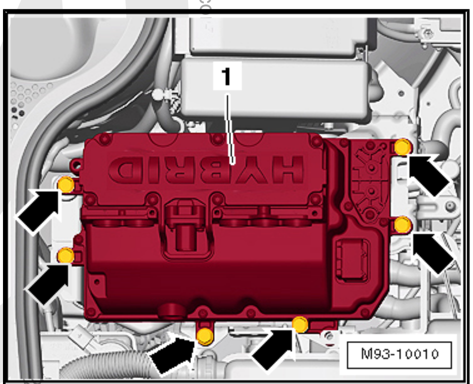


Continuation for all vehicles

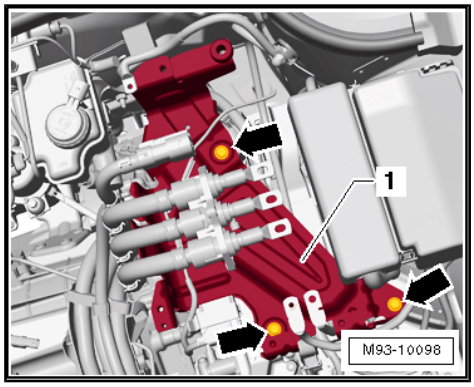
> ⚠ WARNING
>
> *You can suffer an electric shock.*
>
> *An electric shock can be fatal.*
>
> *Observe general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .*
>
> - *The system must first be de-energised by a high-voltage technician before any work is done on the high-voltage system and before any repair work is done on the body.*
> - *All work on vehicles with a high-voltage system must only be carried out by electrically instructed persons. The work must be supervised by a high-voltage technician.*

> ⚠ WARNING
>
> *High voltage on high-voltage system of hybrid vehicle. Danger of electric shock! Following procedure also requires work on high-voltage system. De-energise high-voltage system now ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; De-energising high-voltage system .*

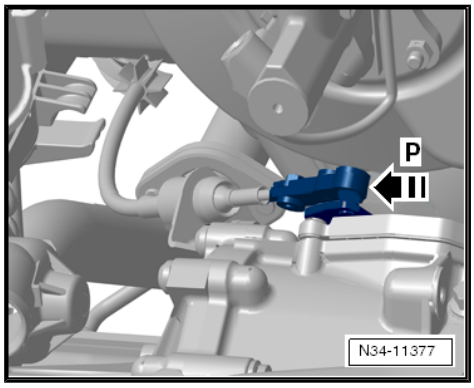
– Remove power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .



– Remove bracket for power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; High-voltage cables; Removing and installing high-voltage wiring harness for hybrid battery -PX1- .



– Using removal lever -80 - 200- lever selector lever cable off gearbox selector lever.

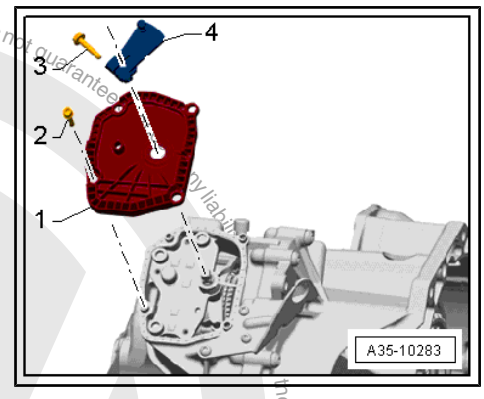


Note

- *Verify again that the gearbox selector lever is set to position "P".*
- *Use your hand to press gearbox selector lever to stop in -direction of arrow- towards cable support bracket.*

– Unscrew bolt -3- and remove gearbox selector lever -4-.

– Unscrew bolts -2- and remove parking lock cover -1-.



Installing

In the event of leaks on the oil seal for the selector shaft or on the parking lock cover, the parking lock cover must be renewed.

– Clean sealing surface and parking lock cover -1-.

– Fit parking lock cover -1- and screw in bolts -2-.

– Fit gearbox selector lever -4- and screw in bolt -3-.

– Adjust selector lever cable ⇒ page 60 .

– Continue installation in reverse order of removal. Install power and control electronics for electric drive -JX1- ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Power and control electronics for electric drive -JX1- .

– Re-energise high-voltage system and carry out documentation ⇒ Electrical system, hybrid vehicles; Rep. gr. 93 ; Re-energising high-voltage system .

Specified torques

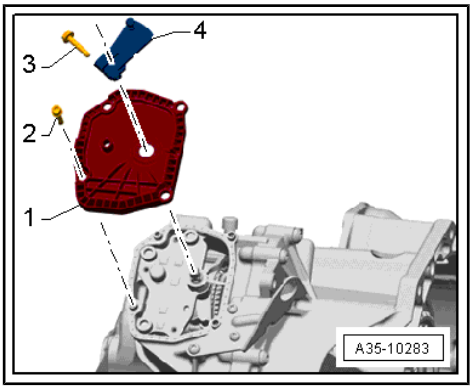
Component	Specified torque
Parking lock cover to gearbox housing	8 Nm
Gearbox selector lever to selector shaft	15 Nm

1.2 Removing and installing parking lock

Removing

- Gearbox is installed.

– Remove parking lock cover -1- ⇒ page 110 .

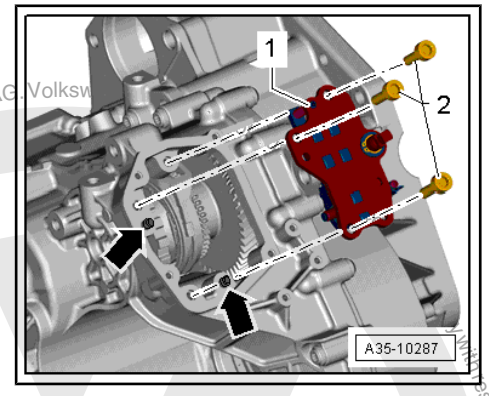


– Unscrew bolts -2- and pull parking lock -1- off dowel sleeves -arrows-.

If the parking lock cannot be pulled off by hand:

– Fit multipurpose tool -VW 771- with extractor hook -VW 771/37- behind parking lock and remove parking lock by alternately pulling it out.

– Renew bolts -2-.



Installing

– Fit parking lock -1- onto dowel sleeves -arrows-.

– Screw in new bolts -2-.

– Install parking lock cover -1- ⇒ page 110 .

Specified torques

Component	Specified torque
Parking lock to gearbox housing • Renew bolts after each removal.	20 Nm + 90° further

39 – Final drive - differential

1 Oil seals

1.1 Fitting location overview - seals

1 - Renewing input shaft seal
- ❑ Renewing ⇒ page 23

2 - Seal for inner input shaft
- ❑ Renewing ⇒ page 25

3 - Right intermediate shaft

4 - Bolt
- ❑ 30 Nm

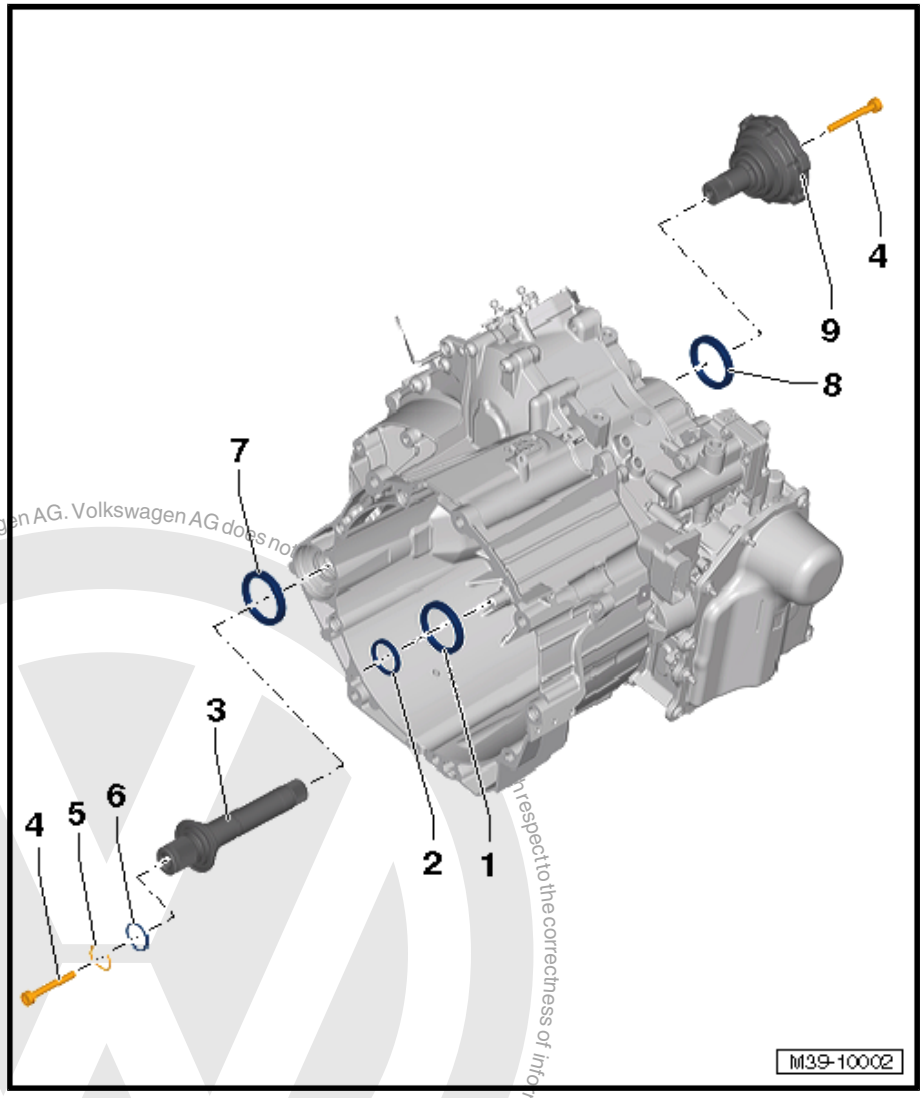
5 - Retaining ring
- ❑ Renew.

6 - O-ring
- ❑ Renew.

7 - Seal, right
- ❑ For right intermediate shaft.
- ❑ Renewing ⇒ page 118

8 - Seal, left
- ❑ For left flange shaft
- ❑ Renewing ⇒ page 114

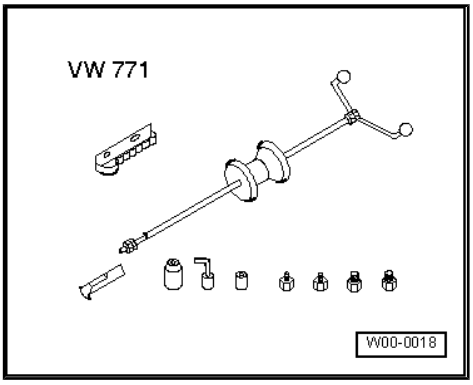
9 - Left flange shaft



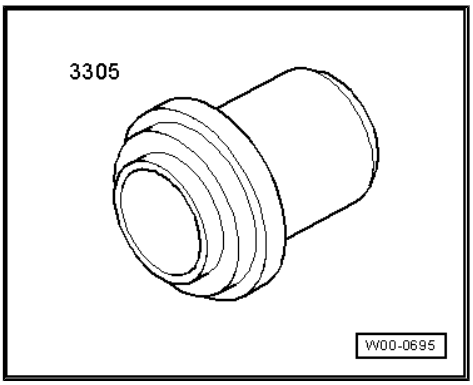
1.2 Renewing left oil seal

Special tools and workshop equipment required

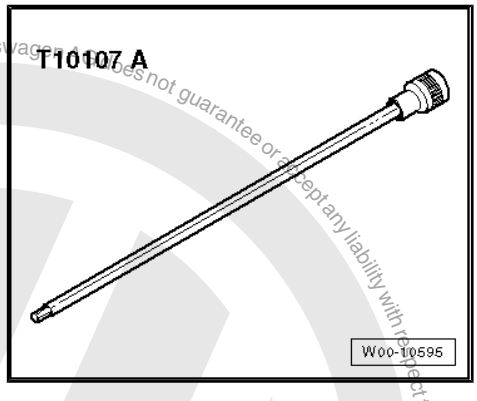
- Multipurpose tool -VW 771-



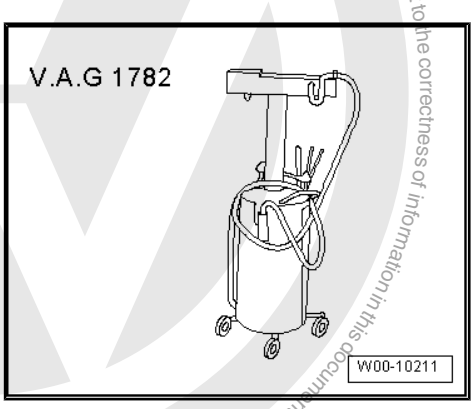
- Thrust piece -3305-



- Socket -T10107 A-



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



- Sealing grease -G 052 128 A1-

Removing

Note

- *Observe ⇒ “4 Repair instructions”, page 10 .*
- *Do not loosen the centre bolt of the drive shaft.*

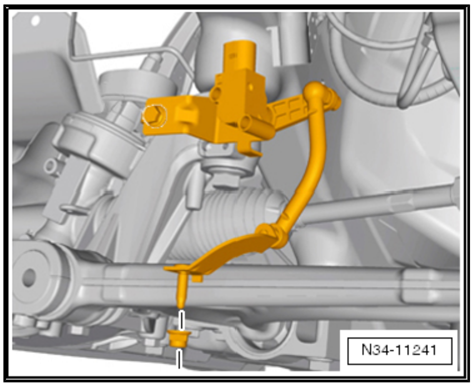
– Remove front left wheel.

– Remove noise insulation beneath engine/gearbox ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .

– Remove front left wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Removing and installing wheel housing liner .

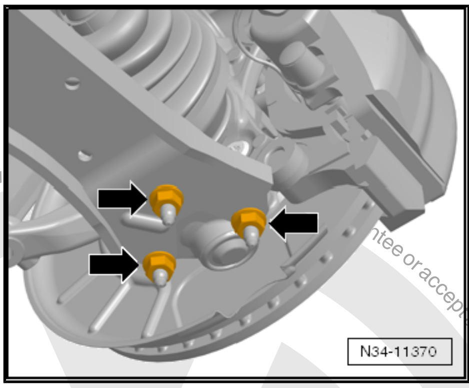
– If present, undo bolts securing front left vehicle level sender -G78- and remove sender from suspension link.

– Turn steering wheel to left lock and remove left drive shaft from flange shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .



– Only unscrew left suspension link from swivel joint.

– Detach left swivel joint from wishbone.



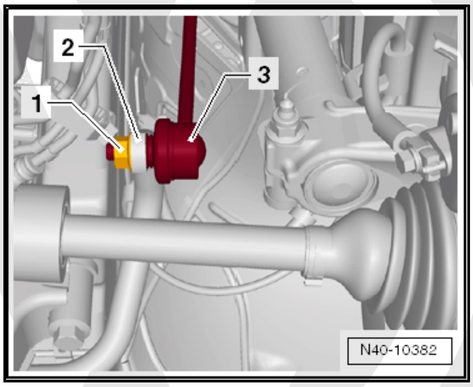
– Unscrew nut -1- from coupling rod -3- ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing anti-roll bar .

– Pull off coupling rod and turn anti-roll bar -2- upwards slightly.

– Swing left drive shaft into wheel housing.

– Raise drive shaft as high as possible and secure. Take care not to damage paint on drive shaft in the process.

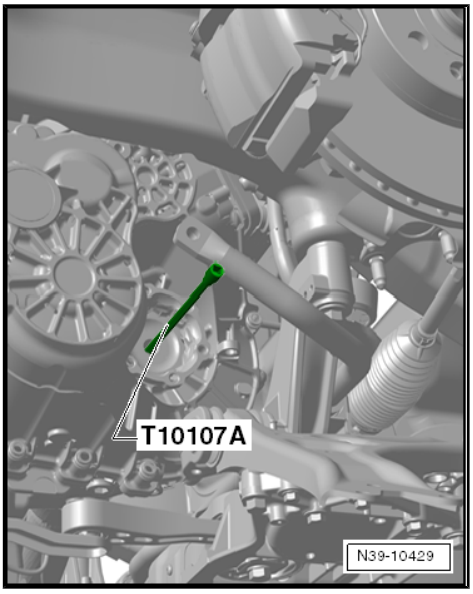
– Position used oil collection and extraction unit -V.A.G 1782- under gearbox.



– Remove bolt for left flange shaft by screwing 2 bolts into flange and counterholding flange shaft with a lever.

Bolt has a 6 mm hexagon socket. The bolt can also be removed and installed with a commercially available 6 mm socket.

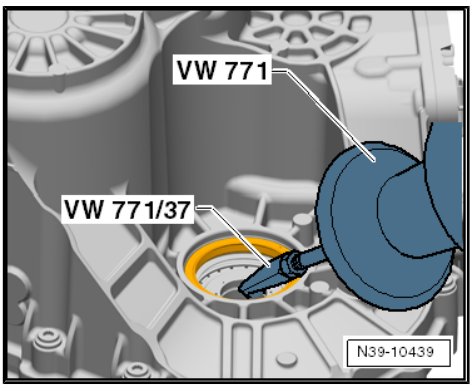
– Remove flange shaft along with spring, thrust washer and tapered ring.



– Pull out oil seal using multipurpose tool -VW 771- and extractor hook -VW 771/37- .

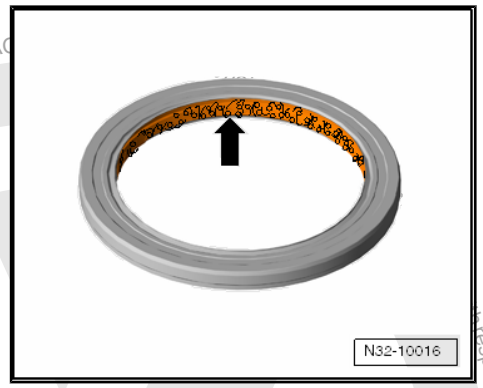
Installing

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

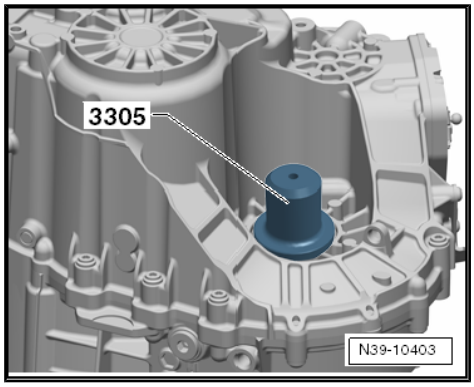


– Lightly coat outer circumference of new oil seal with gearbox oil.

– Fill space between sealing lip and dust lip -arrow- with sealing grease -G 052 128 A1- .



– Drive in new oil seal to stop, being careful not to cant oil seal.
– Insert flange shaft.
– Tighten securing bolt for flange shaft to specified torque. When doing this, press flange shaft against gearbox so that bolt engages in thread.
– Install drive shaft to flange shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
– Install coupling rod and wishbone ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing anti-roll bar .
– If gearbox oil has escaped when removing the oil seal, change gearbox oil ⇒ page 86 .



Note

The gearbox oil must be changed as only in this way can the correct gearbox oil level be assured.

– Install front left wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Removing and installing wheel housing liner .
– Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .
– Install wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Specified torques for wheel bolts .

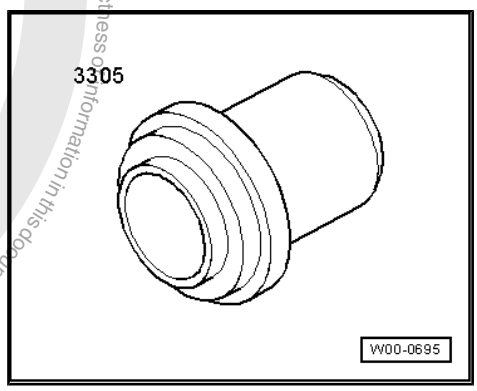
Specified torque

♦ Flange shaft to gearbox ⇒ Item 4 (page 114)

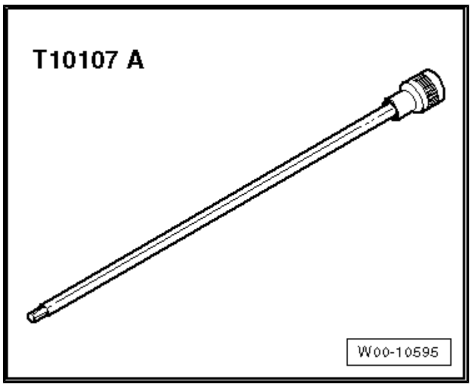
1.3 Renewing right oil seal

Special tools and workshop equipment required

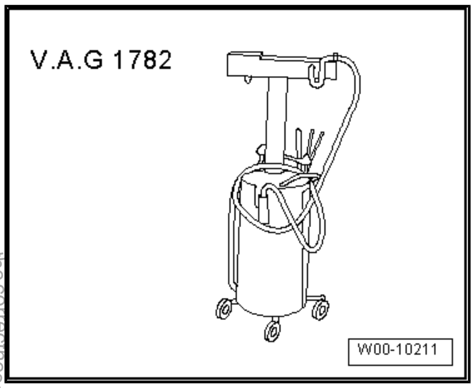
♦ Thrust piece -3305-



- ♦ Socket -T10107 A-



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



- ♦ Sealing grease -G 052 128 A1-

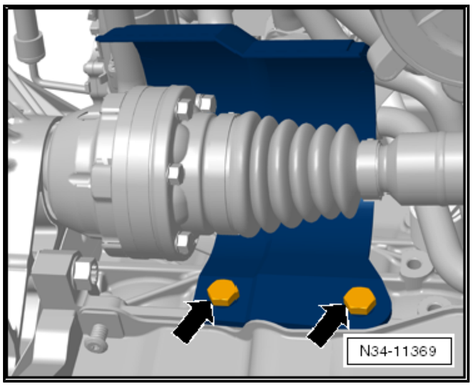
Removing

Note

Observe ⇒ “4 Repair instructions”, page 10 .

– Remove noise insulation beneath engine/gearbox ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .

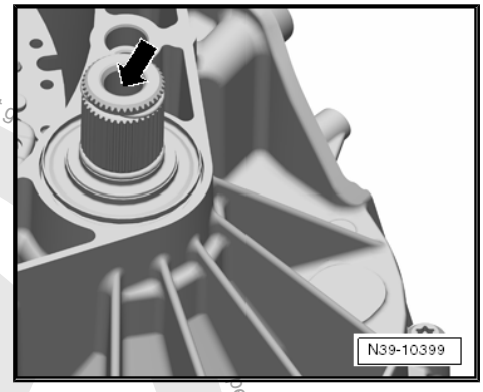
– Remove right drive shaft heat shield from engine -arrows-.



– Remove right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .

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

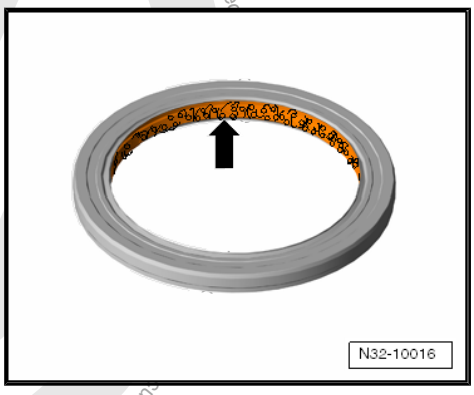
– Unscrew bolt in intermediate shaft using socket and extended bit 6 mm -T10107 A- or a commercially available 6 mm socket.
– Pull out intermediate shaft.
– Pry seal out using assembly lever.



Installing

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

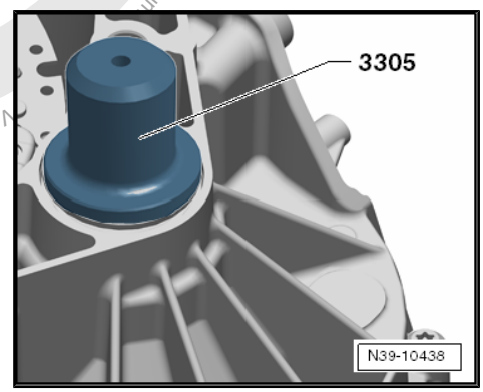
– Lightly coat outer circumference of new oil seal with gearbox oil.
– Fill space between sealing lip and dust lip -arrow- with sealing grease -G 052 128 A1- .



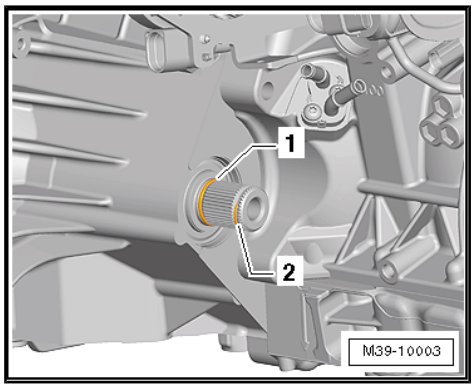
– Drive in new seal to stop, being careful not to cant seal.

If necessary, it is possible to press a new dust ring onto the intermediate shaft using tube -2010- . Do not use a hammer.

– Insert intermediate shaft.
– Tighten securing bolt for intermediate shaft to specified torque ⇒ Item 4 (page 114) . When doing this, press intermediate shaft against gearbox so that bolt engages in thread.



– Renew O-ring -1- and retaining ring -2- on intermediate shaft.
– Install right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
– Install heat shield above right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .
– If gearbox oil has escaped when removing the oil seal, change gearbox oil ⇒ page 86 .



Note

The gearbox oil must be changed as only in this way can the correct gearbox oil level be assured.

– Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .

Specified torque

♦ Intermediate shaft to gearbox ⇒ Item 4 (page 114)