



Repair Manual

Golf 2013 ➤
Golf 2015 ➤
Golf Variant 2014 ➤

Manual Transmission									
Engine ID	CYF B								

Edition 03.2015





List of Workshop Manual Repair Groups

Repair Group

- 00 - General, Technical Data
- 30 - Clutch
- 34 - Controls, Housing
- 35 - Gears, Shafts
- 39 - Final Drive, Differential

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



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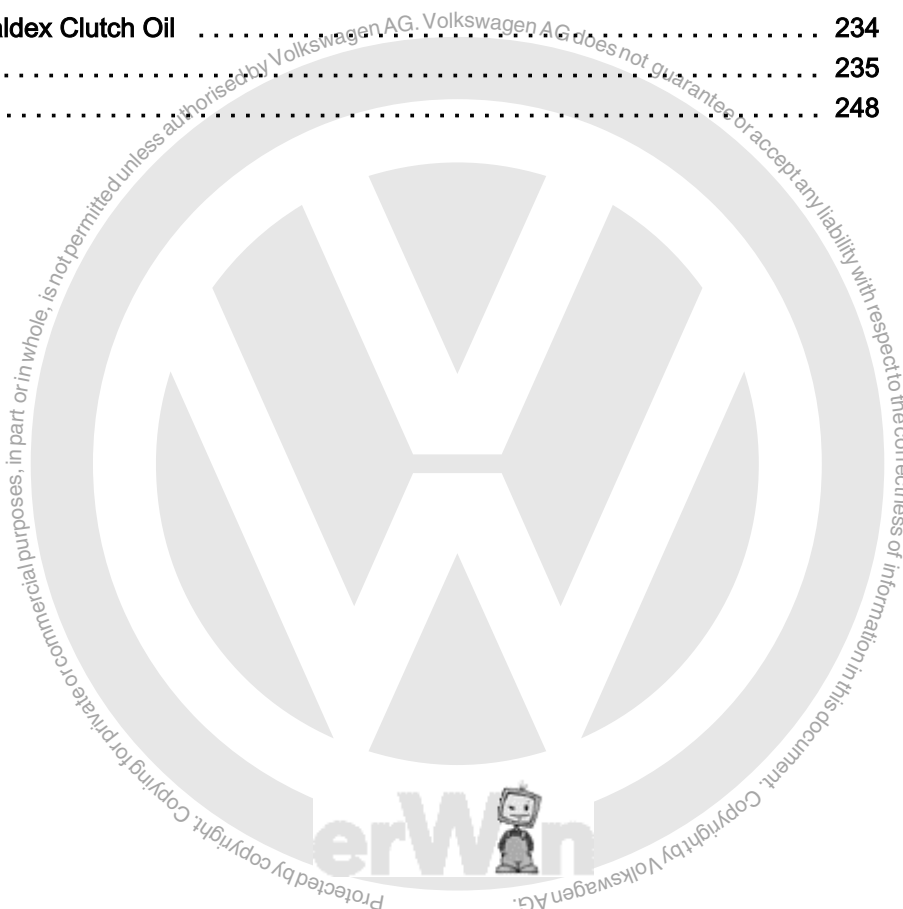
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00 – General, Technical Data

1 Safety Precautions

(Edition 03.2015)

⇒ **"1.1 Road Test with Testing Equipment Safety Precautions", page 1**

⇒ **"1.2 Start/Stop System Safety Precautions", page 2**

⇒ **"1.3 Notes on Performance Test, AWD", page 2**

1.1 Road Test with Testing Equipment Safety Precautions

If Testers and Measuring Equipment Must Be Used During a Test Drive, Follow the Points Below:



WARNING

Distraction and testing equipment that is not secured properly can cause accidents.

The passenger airbag could pose a risk if it deploys in a collision.

- *Operating testing equipment while driving is a distraction.*
- *Testing equipment that is not secured probably increases the risk of injury.*
- ◆ *Always secure testing equipment on the rear seat using a strap and have a second person in the rear seat operate it.*

Observe the Following to Prevent Personal Injury and Damage to the Electrical/Electronic Components:

- ◆ Connect and disconnect test equipment only when the ignition is off.



Caution

There is a risk of destroying the electronic components when disconnecting the battery.

- ◆ *Complete the steps for disconnecting the battery.*
- ◆ *Always turn off the ignition before disconnecting the battery.*

- Disconnect the battery. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .



1.2 Start/Stop System Safety Precautions



WARNING

There is a risk of injury if the engine starts automatically in vehicles with the Start/Stop System.

- ◆ *Deactivate the Start-Stop system when working on the vehicle. Turn off the ignition.*
- ◆ *Only switch the ignition on briefly when necessary.*

1.3 Notes on Performance Test, AWD

- Only test stands with 4 braked rollers should be used for the performance test.

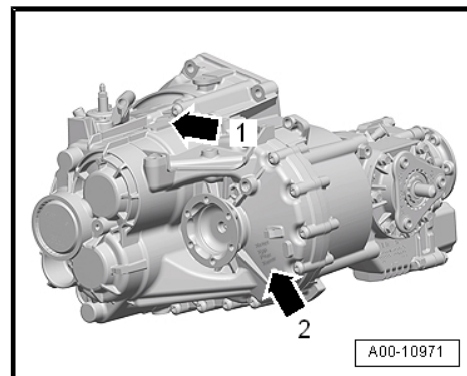


2 Identification

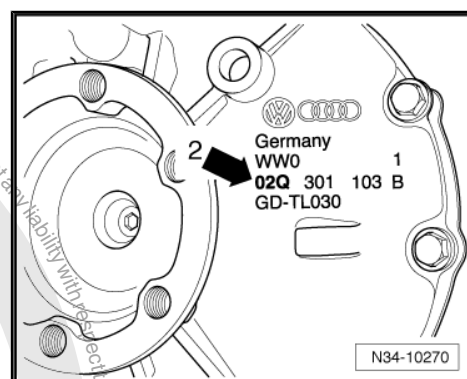
⇒ **"2.1 Transmission Identification", page 3**

2.1 Transmission Identification

Code Letters and Build Date -arrow 1- Manual Transmission 0FB,
AWD-arrow 2-



Manual Transmission 0FB AWD-arrow 2-



Engine Code and Build Date-arrow-

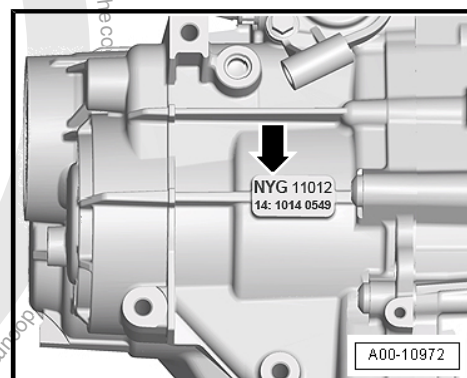
Example:	NYG	11	01	2
	Codes	Day	Month	Year (2012) of manufacture

For additional data and information contact the factory.



Note

The transmission code is also listed in the vehicle data plates





3 Repair Information

⇒ **"3.1 General Repair Information", page 4**

3.1 General Repair Information

Carefulness, cleanliness and the correct tools are required for transmission repairs to be successful. The usual basic safety precautions also apply when carrying out vehicle repairs.

Some general repair information that applies to several procedures throughout this manual is summarized. They apply to this repair manual.

Special Tools and Equipment

For a complete list of special tools used in the Repair Manual. Refer to Workshop Equipment and Special Tools.

Transmission

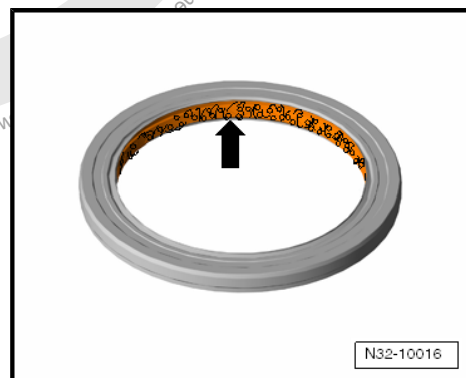
- ◆ Make sure that the alignment sleeves between the engine and transmission are positioned correctly when installing the transmission.
- ◆ Clean the contact surfaces when installing brackets as well as parts that have been waxed. Contact surfaces must be free of wax and grease.
- ◆ Allocate the bolts and other components. Refer to the Parts Catalog.
- ◆ Fill the transmission fluid when repairing the manual transmission.

Seals, Sealing Rings

- ◆ Thoroughly clean the separating surfaces and then apply Sealant - AMV 188 200 03- .
- ◆ Fill the space between the sealing lips -arrow- on the radial shaft seal halfway with Sealing Grease - G 052 128 A1- .
- ◆ The open side of the seals point toward the fluid to be sealed in.
- ◆ Lightly lubricate O-rings before installing to prevent them from being crushed when inserting.

Sealant

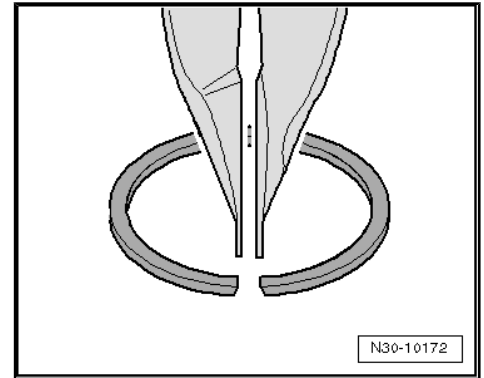
- ◆ Always thoroughly clean the separating surfaces on the housing before applying the sealant.
- ◆ Apply the Sealing Compound - AMV 188 200 03- evenly and not too thick.
- ◆ Do not allow any sealing compound to get into the ventilation holes.





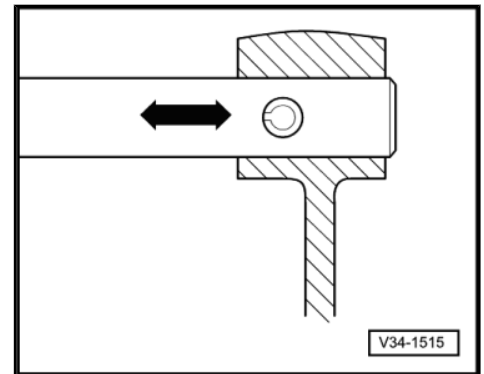
Fasteners

- ◆ Replace the circlips.
- ◆ Do not overstretch the circlips.
- ◆ The circlips must fit completely inside the groove.
- ◆ Replace the adapter sleeves. Installed position: slot is lengthwise to line of force.



Bolts and Nuts

- ◆ Always loosen or tighten bolts and nuts on covers and housings diagonally.
- ◆ Especially delicate parts, such as clutch pressure plates, must not be distorted. Loosen and tighten bolts and nuts in stages in a diagonal sequence.
- ◆ The tightening specifications stated apply to non-oiled nuts and bolts.
- ◆ Replace self-locking screws and nuts after removing them.
- ◆ Make sure the contact surfaces and visible surfaces on the nuts and bolts are waxed after assembling.
- ◆ Use a thread cutter to clean all threaded holes containing self-locking bolts to remove any locking compound residue. Otherwise the bolts could shear the next time they are removed.
- ◆ Please make sure that the thread pitch is correct so that the proper thread cutter is used during cleaning, and the thread does not get damaged.



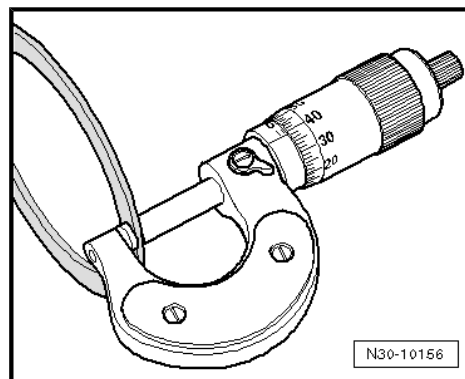
Bearings

- ◆ Insert the bearings with transmission fluid.
- ◆ Install the new tapered roller bearings. It is not necessary to oil them.
- ◆ Install needle bearings with lettered side (thicker metal) racing the fitting tool.
- ◆ Replace all the tapered roller bearings that are on the same shaft. Use tapered roller bearings from the same manufacturer.
- ◆ To install, heat the bearing inner races to approximately 100 °C (212 °F) with Inductive Heater - VAS6414- .
- ◆ Do not interchange inner and outer bearing races with those from other bearings of the same size, bearings are paired.



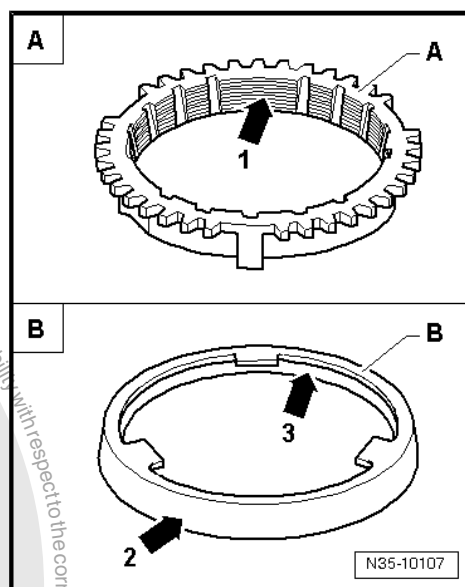
Adjusting Shims

- ◆ Measure the shims at several locations with a micrometer caliper. It is possible to measure the necessary shim thickness by the different tolerances.
- ◆ Check for burrs and damage.
- ◆ Only install perfect shims.



Synchronizer Rings

- ◆ Do not interchange them. When reusing synchronizer rings, always install to the same gear wheel.
- ◆ Check for wear and replace if necessary.
- ◆ Check the grooves -arrow 1- on the synchronizer ring -A- and the inner race for flat areas (grooves are worn).
- ◆ The coating on the synchronizer rings must not be damaged.
- ◆ If an intermediate ring -B- is installed, check this intermediate ring on the outer friction surface -arrow 2- and inner friction surface -arrow 3- for »grooves«, »wear grooves« and »blue coloring (from overheating)«.
- ◆ Check taper of drive gear for »grooves« and »scoring«.
- ◆ Coat the synchronizing with transmission fluid and then install.



Toothed Gears, Synchronizer Hubs

- ◆ Clean before installing. Warm using the Inductive Heater - VAS6414- to a maximum 100 °C (212 °F).
- ◆ Pay attention to the installed location.

Selector Gears

- ◆ After assembling, check the selector gears for minimum axial clearance and ease of movement.

Clutch

- ◆ Do not tilt the clutch pressure plate. Loosen and tighten it diagonally and in small steps.
- ◆ To reduce odor caused by a burnt clutch, thoroughly clean the clutch housing and the flywheel running surface with a clean cloth.



4 Technical Data

⇒ ["4.1 Transmission/Engine Allocation", page 7](#)

⇒ ["4.2 Capacities", page 7](#)

⇒ ["4.3 Gear Ratio Calculation", page 7](#)

4.1 Transmission/Engine Allocation

Manual Transmission		6 speed 0FB	
Codes		PDV	
Manufactured	from	11/2013	
	through		
Allocation	Engine	2.0L - 221 KW	
Ratio	Final drive I	72 : 17 = 4.235	
Z1 : Z2	Final drive II	72 : 22 = 3.273	
Drive Axle flange diameter		107 mm	

- Final drive I for 1st to 4th gear
- Final drive II for 5th/6th and reverse gears

Refer to the Parts Catalog for the following information.

- ◆ The individual gear ratios
- ◆ Transmission fluid
- ◆ Bevel box axle oil
- ◆ Clutch allocation
- ◆ Rear final drive allocation

4.2 Capacities

⇒ ["4.2.1 Manual Transmission Capacity", page 7](#)

⇒ ["4.2.2 Bevel Box Capacity", page 7](#)

4.2.1 Manual Transmission Capacity

Refer to ⇒ Fluid Capacity Tables; Rep. Gr. 03

4.2.2 Bevel Box Capacity

Refer to ⇒ Fluid Capacity Tables; Rep. Gr. 03

4.3 Gear Ratio Calculation

Example

	6th Gear	Final Drive
Drive gear	ZG ₁ = 46	ZA ₁ = 24
Driven gear	ZG ₂ = 33	ZA ₂ = 70

$i = ZG_2 : ZG_1$. Refer to ¹⁾.

$i_G = \text{gear ratio} = ZG_2 : ZG_1 = 33 : 46 = 0.717$

$i_A = \text{axle ratio} = ZA_2 : ZA_1 = 70 : 24 = 2.917$



$$i_{\text{total}} = \text{total ratio} = i_G \times i_A = 0.717 \times 2.917 = 2.091$$

1) Z_1 = Number of teeth on the drive gear, Z_2 = Number of teeth on the driven gear





5 Overview - Powertrain

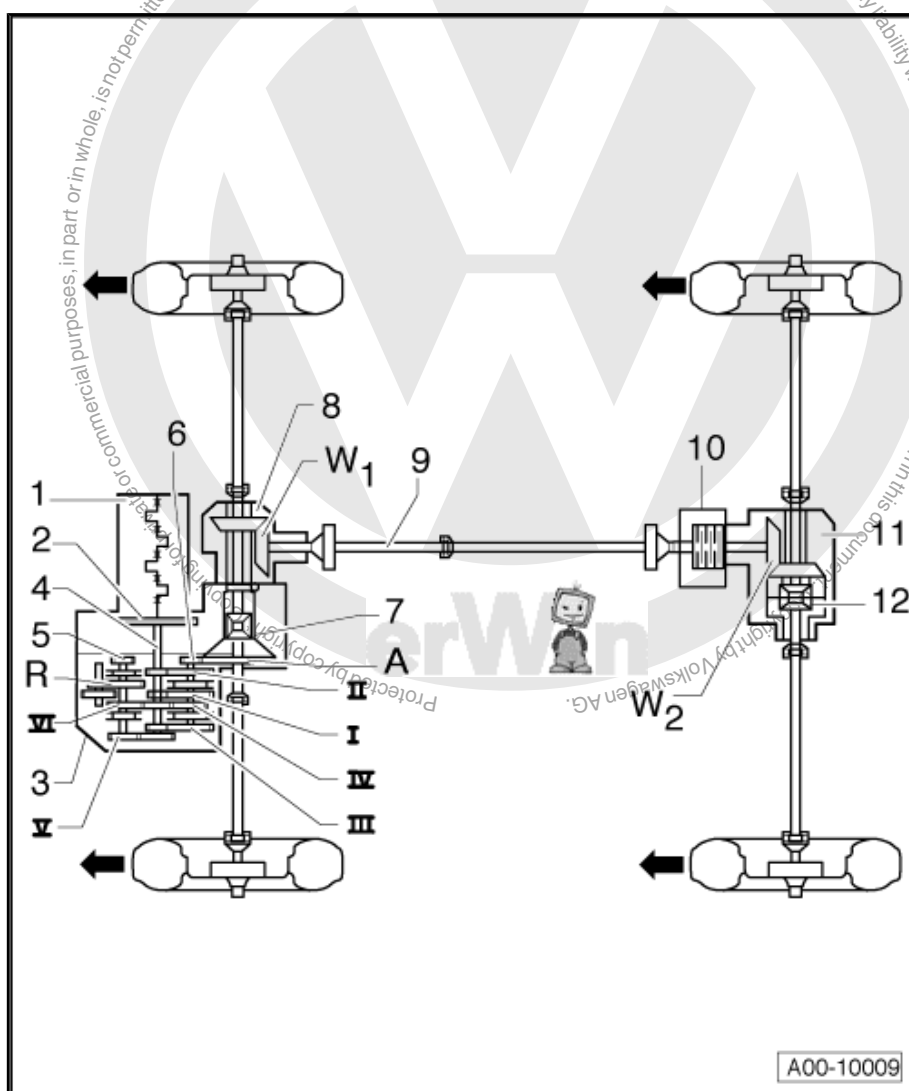
⇒ ["5.1 Overview - Powertrain, AWD", page 9](#)

5.1 Overview - Powertrain, AWD

Name

The -arrows- point in the direction of travel.

- 1 - Engine
- 2 - Clutch
- 3 - Manual Transmission
- 4 - Input Shaft
- 5 - Output Shaft for 5th, 6th and Reverse Gears (Output Shaft II)
- 6 - Output Shaft for 1st through 4th Gear (Output Shaft I)
- 7 - Differential
- 8 - Bevel Box
- 9 - Driveshaft
- 10 - Haldex Clutch
- 11 - Rear Final Drive
- 12 - Differential



Ratio

The -arrows- point in the direction of travel.



I - 1st Gear

II - 2nd Gear

III - 3rd Gear

IV - 4th Gear

V - 5th Gear

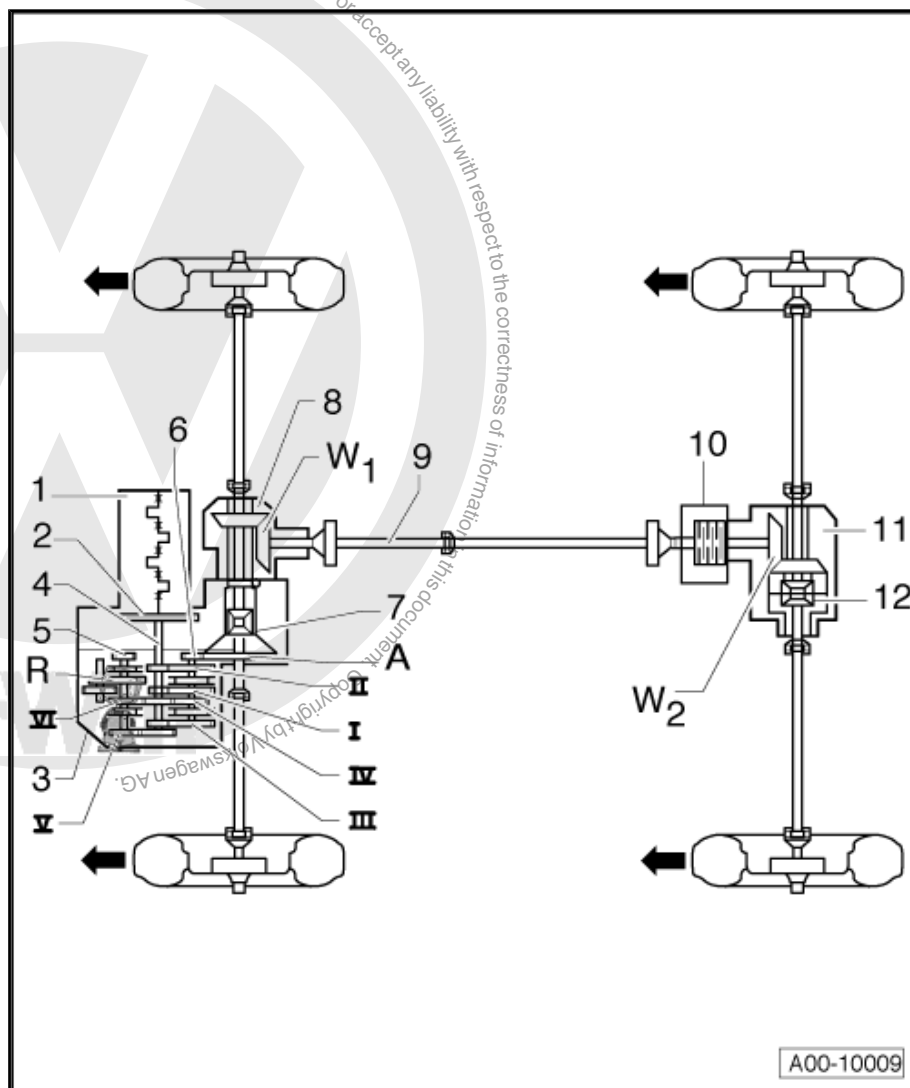
VI - 6th Gear

R - Reverse Gear

A - Final Drive

W1 - Front Bevel Box

W2 - Rear Bevel Box





6 Electrical Components

⇒ [“6.1 Overview - Electrical Components”, page 11](#)

6.1 Overview - Electrical Components

⇒ [“6.1.1 Overview - Electrical Components, Manual Transmission”, page 11](#)

⇒ [“6.1.2 Overview - Electrical Components, Clutch Mechanism”, page 11](#)

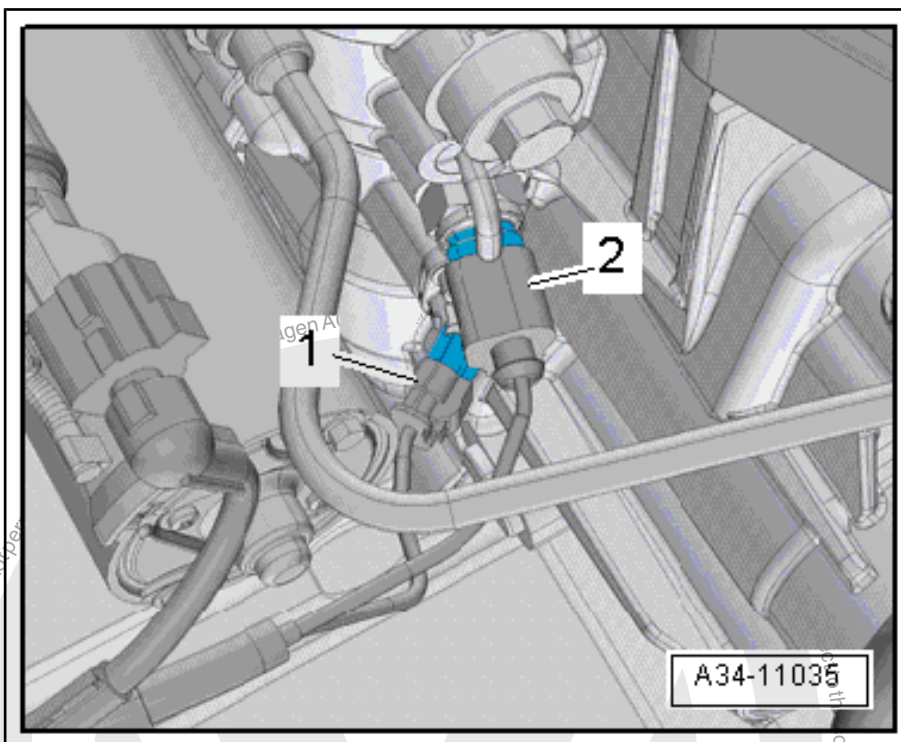
6.1.1 Overview - Electrical Components, Manual Transmission

1 - Transmission Neutral Position Sensor - G701-

- ❑ Installed location: in the area of the shift unit under the selector shaft bracket.
- ❑ Removing and installing. Refer to
⇒ [“8.3 Overview - Transmission Housing and Selector Mechanism”, page 108](#).

2 - Back-Up Lamp Switch - F4-

- ❑ Installed location: in the area of the shift unit under the selector shaft bracket.
- ❑ Removing and installing. Refer to
⇒ [“8.3 Overview - Transmission Housing and Selector Mechanism”, page 108](#).

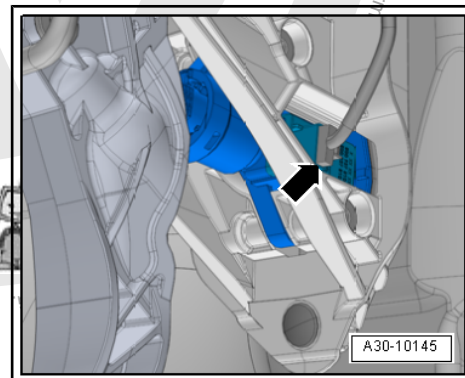


6.1.2 Overview - Electrical Components, Clutch Mechanism

Clutch Position Sensor - G476- -arrow-

Installed location: in the passenger compartment on the clutch master cylinder.

Clutch Position Sensor - G476- , Removing and installing. Refer to
⇒ [“1.7 Clutch Position Sensor G476 , Removing and Installing”, page 20](#).





30 – Clutch

1 Clutch Mechanism

- ⇒ [“1.1 Overview - Clutch Mechanism”, page 12](#)
- ⇒ [“1.2 Overview - Pedal Assembly”, page 14](#)
- ⇒ [“1.3 Overview - Clutch Hydraulics”, page 16](#)
- ⇒ [“1.4 Overview - Clutch Release Mechanism”, page 18](#)
- ⇒ [“1.5 Bearing Bushing, Removing and Installing”, page 19](#)
- ⇒ [“1.6 Clutch Master and Clutch Slave Cylinder, Checking”, page 20](#)
- ⇒ [“1.7 Clutch Position Sensor G476 , Removing and Installing”, page 20](#)
- ⇒ [“1.8 Return Spring, Removing and Installing”, page 20](#)
- ⇒ [“1.9 Over-Center Spring, Removing and Installing”, page 23](#)
- ⇒ [“1.10 Clutch Pedal, Removing and Installing”, page 25](#)
- ⇒ [“1.11 Mounting Bracket, Removing and Installing”, page 26](#)
- ⇒ [“1.12 Clutch Master Cylinder, Removing and Installing”, page 30](#)
- ⇒ [“1.13 Bleeder, Removing and Installing”, page 31](#)
- ⇒ [“1.14 Clutch Mechanism Lines, Removing and Installing”, page 31](#)
- ⇒ [“1.15 Clutch Slave Cylinder with Release Bearing, Removing and Installing”, page 33](#)
- ⇒ [“1.16 Clutch Mechanism, Bleeding”, page 34](#)
- ⇒ [“1.17 Clutch Release Mechanism, Servicing”, page 35](#)

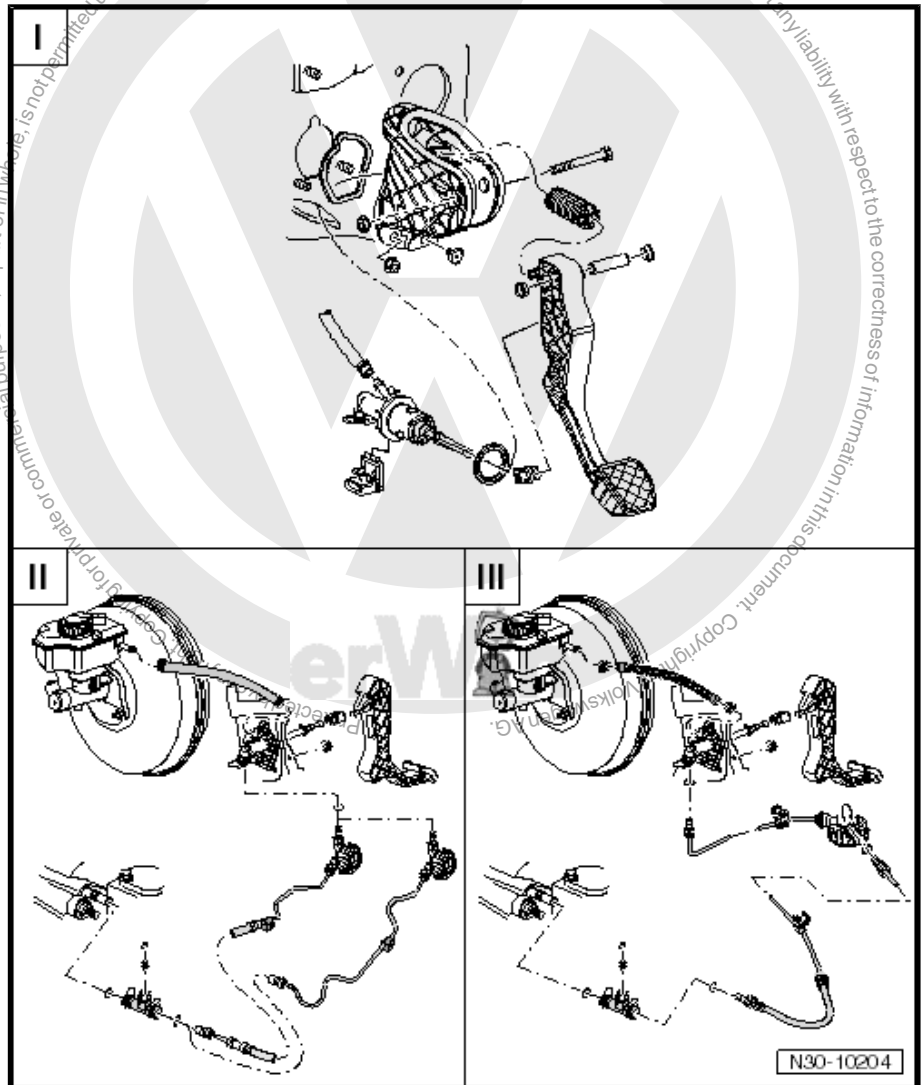
1.1 Overview - Clutch Mechanism



I -
⇒ "1.2 Overview - Pedal Assembly", page 14

II -
⇒ "1.3 Overview - Clutch Hydraulics", page 16

III - For RHD





1.2 Overview - Pedal Assembly

1 - Clutch Master Cylinder

- ❑ Removing and installing. Refer to
⇒ ["1.12 Clutch Master Cylinder, Removing and Installing", page 30](#).

2 - Bearing Bushing

- ❑ Removing and installing. Refer to
⇒ ["1.5 Bearing Bushing, Removing and Installing", page 19](#).
- ❑ Do not lubricate

3 - Clamp

- ❑ The clamp must be removed in order to remove/install the hose/line assembly

4 - Seal

- ❑ Self-adhesive
- ❑ Replace after removing the clutch master cylinder
- ❑ Glue to clutch master cylinder

5 - Clutch Position Sensor - G476-

- ❑ Can be checked in [Guided Fault Finding](#) using the Vehicle Diagnostic Tester.
- ❑ Allocation. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to ⇒ ["1.7 Clutch Position Sensor G476, Removing and Installing", page 20](#).

6 - Bearing Axle

- ❑ Replace after removing
- ❑ Do not lubricate

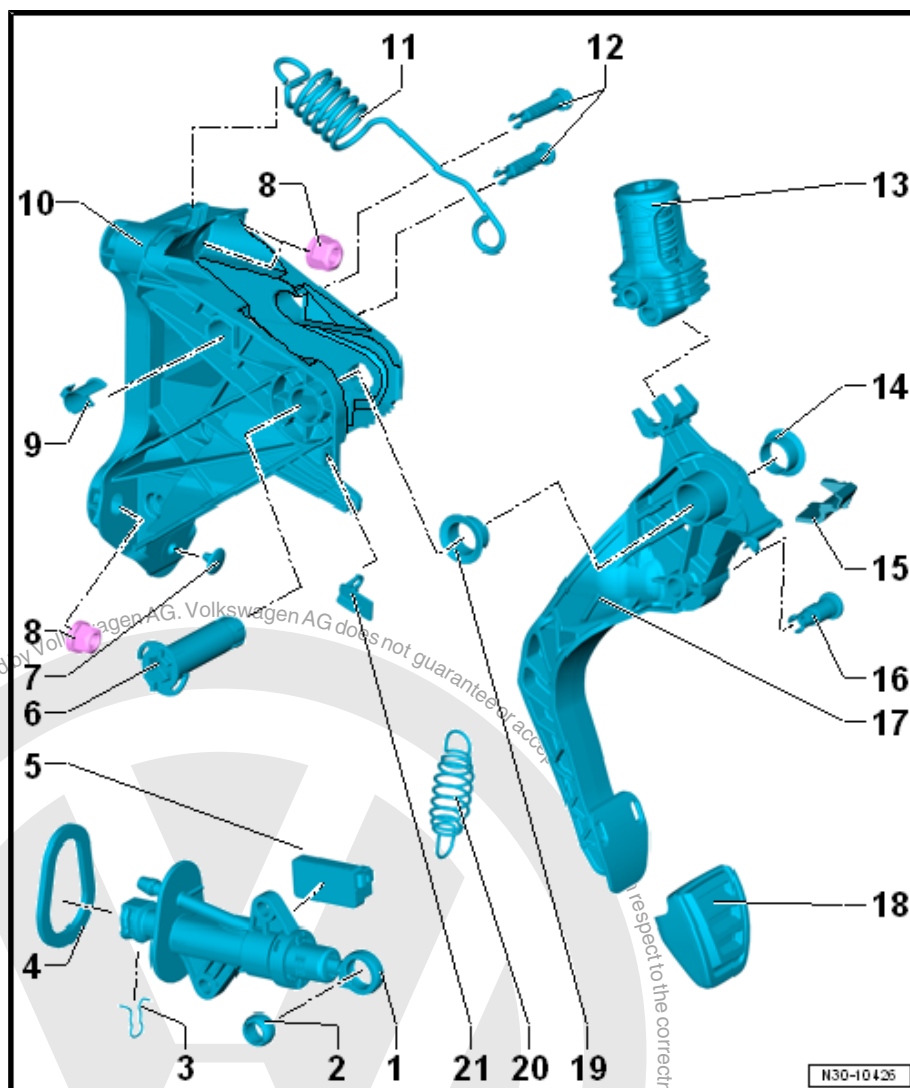
7 - Rubber Stop

8 - Nut

- ❑ 25 Nm
- ❑ Replace after removing
- ❑ For the bracket to the bulkhead
- ❑ Quantity: 3
- ❑ Self-locking

9 - Bearing Shell

- ❑ Quantity: 2
- ❑ Installed on both sides
- ❑ Installed in connection with over-center spring only
- ❑ Do not lubricate





10 - Bracket

- ☐ For the clutch pedal
- ☐ Removing and installing. Refer to ⇒ [“1.11 Mounting Bracket, Removing and Installing”, page 26](#) .
- ☐ Use a Piston Pin Drift - VW207- to drive sockets into the holes for the bracket mounting pins on the bulkhead.

11 - Return Spring

- ☐ Installed depending on the date of manufacture
- ☐ Removing and installing. Refer to ⇒ [“1.8 Return Spring, Removing and Installing”, page 20](#) .
- ☐ Do not grease the mount on the bracket.

12 - Mounting Pin

- ☐ For the clutch master cylinder
- ☐ Replace after removing
- ☐ Do not lubricate

13 - Over-Center Spring

- ☐ Installed depending on the date of manufacture
- ☐ There are different versions. For the correct allocation, refer to the Parts Catalog.
- ☐ Removing and installing. Refer to ⇒ [“1.9 Over-Center Spring, Removing and Installing”, page 23](#) .
- ☐ Do not lubricate

14 - Bearing Bushing

- ☐ Do not lubricate

15 - Slide Bushing

- ☐ Installed depending on the date of manufacture
- ☐ For return spring mounting
- ☐ Install on clutch pedal
- ☐ Lubricate to the return spring mount
- ☐ Grease. Refer to the Parts Catalog.

16 - Mounting Pin

- ☐ For plunger/clutch master cylinder
- ☐ Replace after removing
- ☐ Do not lubricate

17 - Clutch Pedal

- ☐ Removing and installing. Refer to ⇒ [“1.10 Clutch Pedal, Removing and Installing”, page 25](#) .
- ☐ Do not lubricate

18 - Pedal Rubber

19 - Bearing Bushing

- ☐ Do not lubricate

20 - Tension Spring

- ☐ For the clutch pedal
- ☐ Installed depending on the date of manufacture
- ☐ Removing and installing. Refer to ⇒ [“1.9 Over-Center Spring, Removing and Installing”, page 23](#) .

21 - Damping Element

- ☐ Installed in connection with tension spring only
- ☐ Do not lubricate



1.3 Overview - Clutch Hydraulics

1 - Clutch Slave Cylinder

- ☐ The gasket can only be replaced when the transmission is removed.
- ☐ Removing and installing. Refer to
⇒ ["1.15 Clutch Slave Cylinder with Release Bearing, Removing and Installing", page 33](#).

2 - Bleeder

3 - Seal/O-Ring

- ☐ Replace if damaged
- ☐ Install on the line connection
- ☐ Install with brake fluid
- ☐ Seals/O-rings suitable for the line connection material. Refer to
⇒ [Fig. "Sealing Rings/O-Rings for Hose/Line Assembly or Pipe", page 17](#)
- ☐ Allocation. Refer to the Parts Catalog.

4 - Clamp

- ☐ The clamp must be removed in order to remove/install the bleeder

5 - Bleed Valve

- ☐ Hex collar bolt; 4.5 Nm
- ☐ Bleed clutch mechanism. Refer to
⇒ ["1.16 Clutch Mechanism, Bleeding", page 34](#).
- ☐ Flat on both sides: seal off to stop.

6 - Dust Cap

7 - Clamp

- ☐ The clamp must be removed in order to remove/install the hose/line assembly

8 - Supply Hose

9 - Brake Fluid Reservoir

10 - Seals

- ☐ Must be located inside the supply hose.

11 - Clutch Master Cylinder

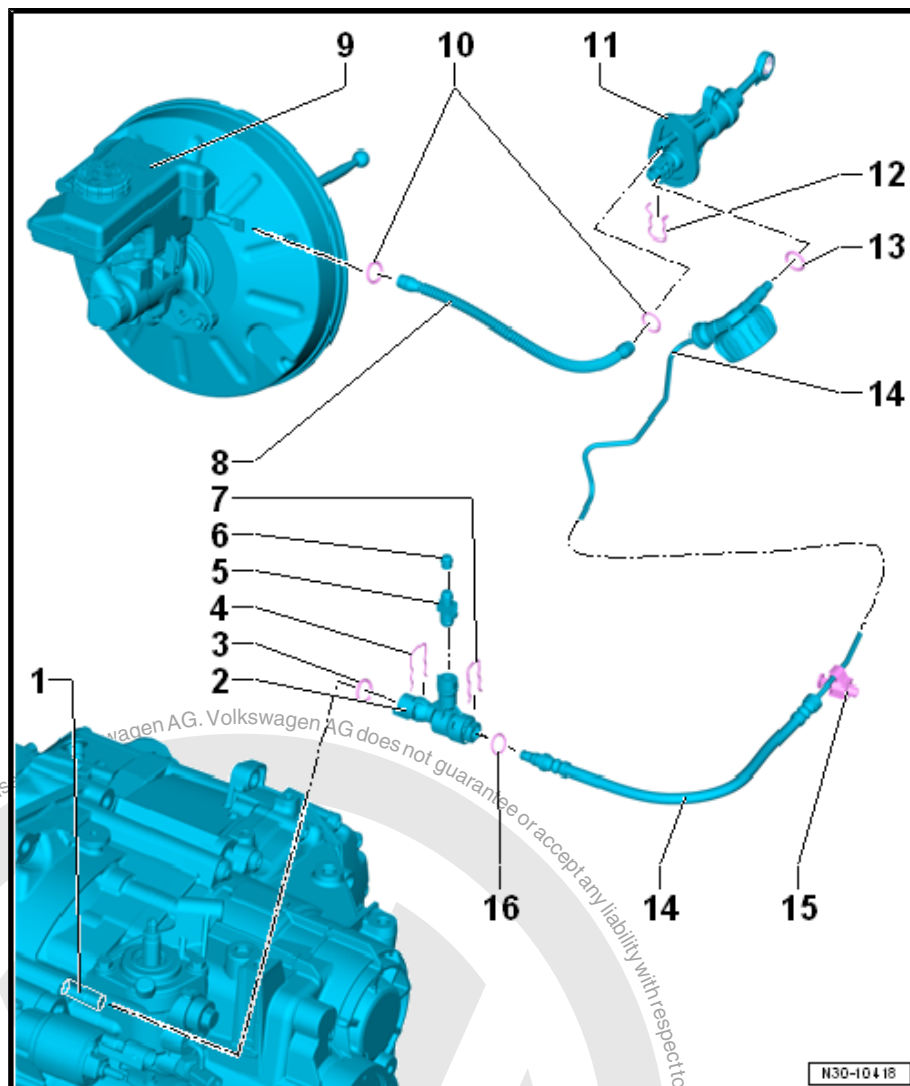
- ☐ Removing and installing. Refer to
⇒ ["1.12 Clutch Master Cylinder, Removing and Installing", page 30](#).

12 - Clamp

- ☐ The clamp must be removed in order to remove/install the hose/line assembly

13 - Seal/O-Ring

- ☐ Replace if damaged





- ☐ Install on the line connection
- ☐ Install with brake fluid
- ☐ Seals/O-rings suitable for the line connection material. Refer to
⇒ Fig. [“Sealing Rings/O-Rings for Hose/Line Assembly or Pipe”](#), page 17
- ☐ Allocation. Refer to the Parts Catalog.

14 - Hose/Line Assembly

- ☐ With frequency modulator
- ☐ Not on all vehicles
- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Removing and installing. Refer to
⇒ [“1.14 Clutch Mechanism Lines, Removing and Installing”](#), page 31 .

15 - Bracket

- ☐ For hose/line assembly

16 - Seal/O-Ring

- ☐ Replace if damaged
- ☐ Install on the line connection
- ☐ Install with brake fluid
- ☐ Seals/O-rings suitable for the line connection material. Refer to
⇒ Fig. [“Sealing Rings/O-Rings for Hose/Line Assembly or Pipe”](#), page 17
- ☐ Allocation. Refer to the Parts Catalog.

Disconnect and Connect Clutch Mechanism Wires

Separating

- Open the clip -3- with a screwdriver and remove the hose/line assembly -1- from the connection -4-.

Connecting



Note

- ♦ An O-ring can also be installed instead of a seal -2-. Refer to
⇒ Fig. [“Sealing Rings/O-Rings for Hose/Line Assembly or Pipe”](#), page 17 .
- ♦ Replace the damaged seal -2-.

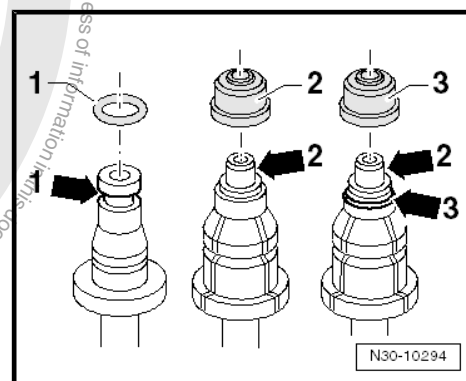
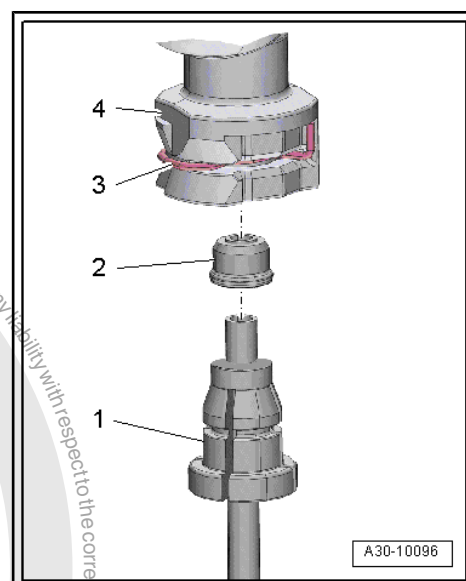
Press in the hose/line assembly -1- at the connection -4- until the clip -3- engages audibly.

Pull on the hose/line assembly to make sure it is secure.

Sealing Rings/O-Rings for Hose/Line Assembly or Pipe

Item	Line Connection Version
1	Line connection with a groove all the way around -arrow 1-
2	Line connection with a shoulder -arrow 2-
3	Line connection with a shoulder -arrow 2- and with a groove all the way around -arrow 3-

- The seal / O-ring must be installed in the groove -arrow 1- and -arrow 3-.



1.4 Overview - Clutch Release Mechanism

1 - Clutch Slave Cylinder with Release Bearing

- ☐ Must be replaced together because they are a single unit
- ☐ Do not wash the bearing, just wipe it off.
- ☐ Replace a loud bearing together with the clutch slave cylinder
- ☐ Removing and installing. Refer to
⇒ ["1.15 Clutch Slave Cylinder with Release Bearing, Removing and Installing", page 33](#).
- ☐ For release bearing with additional plastic washer. Refer to
⇒ [Fig. "Release Bearing with Additional Plastic Washer", page 19](#), pressure plate allocation. Refer to
⇒ [Fig. "Only for Release Bearing with Additional Plastic Washer: Pressure Plate Diaphragm Spring \(-arrows-\) with a Slightly Lower Installation Height.", page 19](#)
- ☐ Allocation. Refer to the Parts Catalog.

2 - Bolt

- ☐ 12 Nm for metal clutch slave cylinder (without locking fluid)
- ☐ 15 Nm for plastic clutch slave cylinder (with locking fluid)
- ☐ Replace after removing
- ☐ Quantity: 3
- ☐ Pay attention to the thread pitch on the bolt when cleaning the threaded hole in the clutch housing.
- ☐ Carefully tighten diagonally and in step so that the tabs on the clutch slave cylinder do not break

3 - Clamp

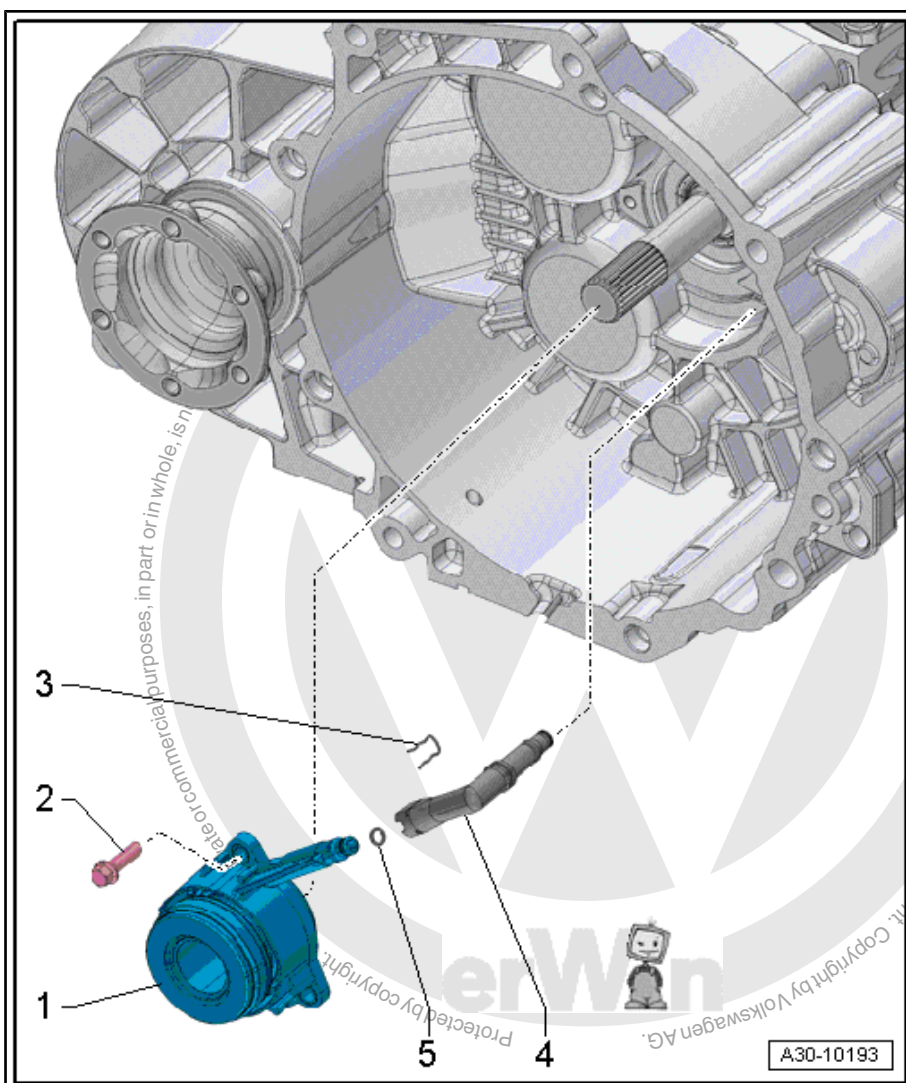
- ☐ To remove and install the line, remove the clip up to the stop
- ☐ Install until the clip engages audibly

4 - Line

- ☐ To the clutch master cylinder

5 - O-Ring

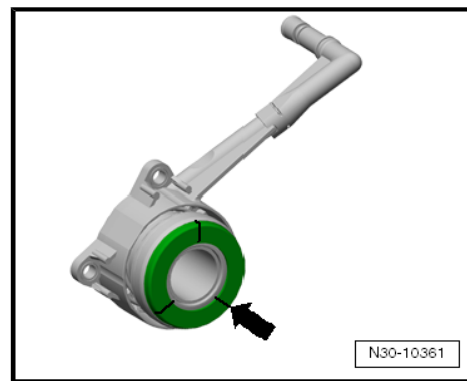
- ☐ Replace if damaged
- ☐ Install on the line connection
- ☐ Install with brake fluid
- ☐ Allocation. Refer to the Parts Catalog.





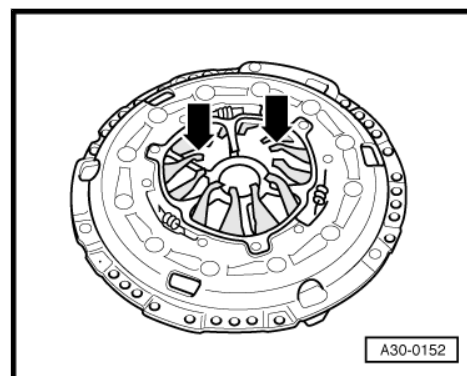
Release Bearing with Additional Plastic Washer

Identified by: tabs -arrow- on the plastic washer.



Only for Release Bearing with Additional Plastic Washer: Pressure Plate Diaphragm Spring (-arrows-) with a Slightly Lower Installation Height.

- Install the release bearing with additional plastic washer and the pressure plate diaphragm spring with a slightly lower installation height.

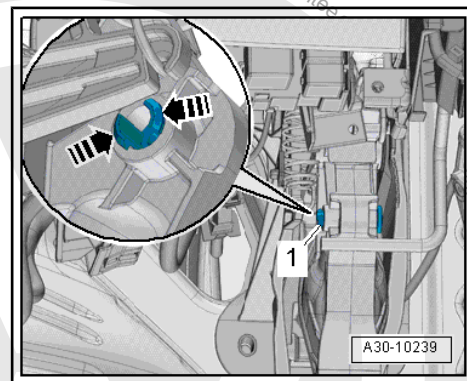


1.5 Bearing Bushing, Removing and Installing

Removing

Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .

- Press together the retainers -arrows- and remove the studs -1- to the right side.

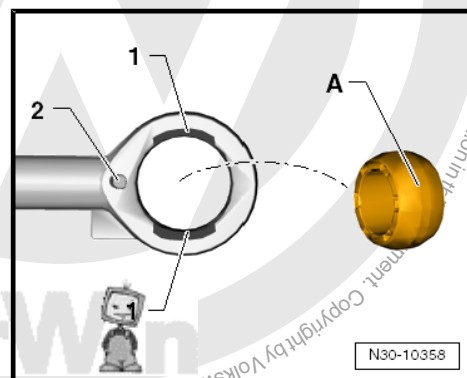


- Turn the valve fitter such that the openings -1- or pin -2- are visible.

The openings -1- and the pin -2- face in the same direction.

- Remove the bearing bushing -A- from the openings -1-.

Installing



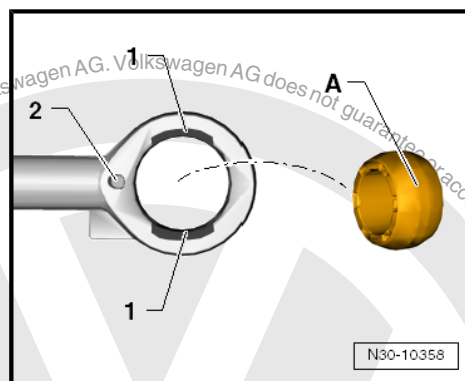


Install in reverse order of removal. Note the following:

- Turn the valve fitter such that the openings -1- or pin -2- are visible.

The openings -1- and the pin -2- face in the same direction.

- Fit the bearing bushing -A- in the openings -1- and rotate into place.
- Use a new mounting pin to connect the valve fitter/clutch master cylinder to the clutch pedal.
- Connect the battery. Refer to ➔ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .



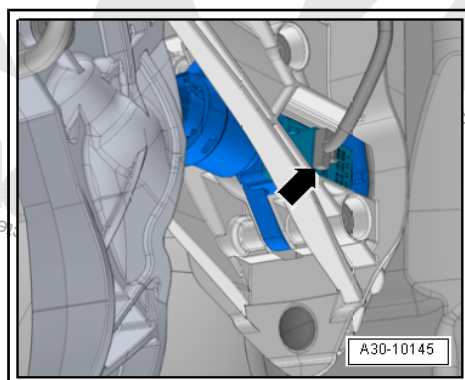
1.6 Clutch Master and Clutch Slave Cylinder, Checking

Before replacing the clutch master cylinder due to an assumed defect, perform the Guided Fault Finding with the Vehicle Diagnostic Tester first.

1.7 Clutch Position Sensor - G476- , Removing and Installing

Removing

- Move the driver seat as far back as possible.
- Disconnect the connector -arrow- from the Clutch Position Sensor - G476- .

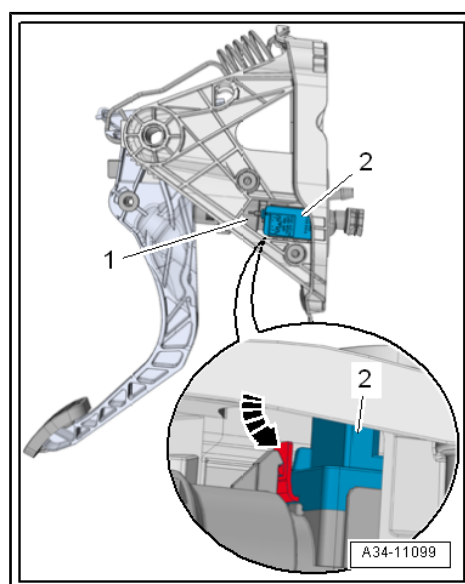


- Release the Clutch Position Sensor - G476- -2- on the clutch master cylinder in direction of -1- -arrow- and remove it.

Installing

Install in reverse order of removal. Note the following:

- The tab -arrow- on the Clutch Position Sensor - G476- must remain intact.
- The Clutch Position Sensor - G476- must engage audibly.



1.8 Return Spring, Removing and Installing

Removing

- Move the driver seat as far back as possible.



- Move the steering wheel upward as far as possible. Use the entire steering column adjustment range.

Vehicles with a Knee Airbag

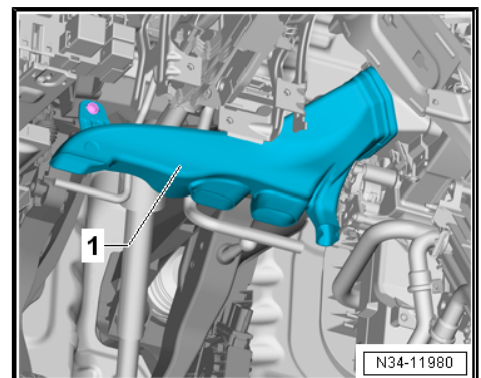
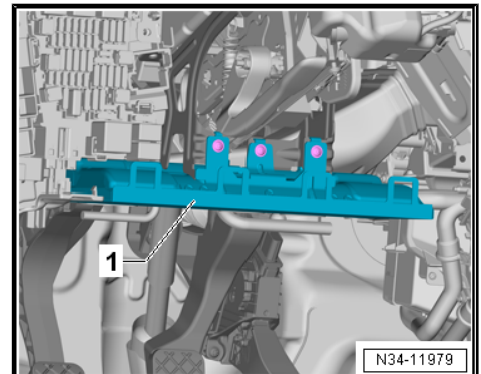
- Remove the driver side knee airbag -1-. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .

Vehicles Without Knee Airbag

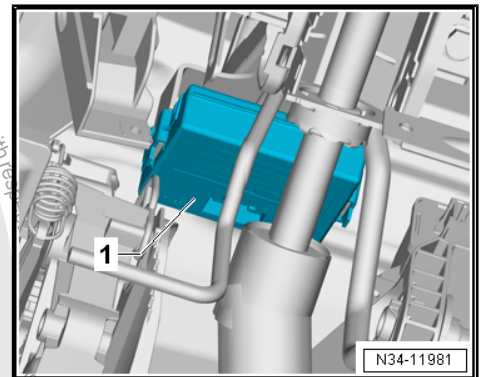
Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .

Continuation for All

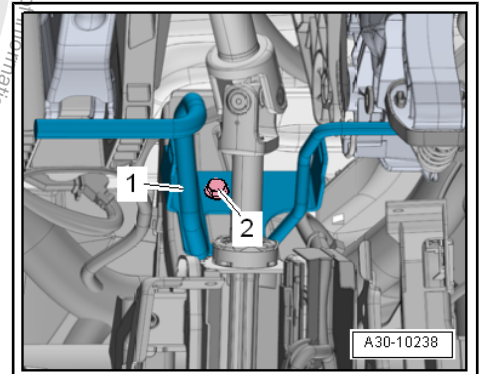
- Remove driver side footwell vent -1-. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Air Routing; Rear Footwell Vent, Removing and Installing .



- Remove the Data Bus on Board Diagnostic Interface - J533-1- from the bracket. Refer to ⇒ Electrical Equipment; Rep. Gr. 97 ; Control Modules; Component Location Overview - Control Modules and push it aside.

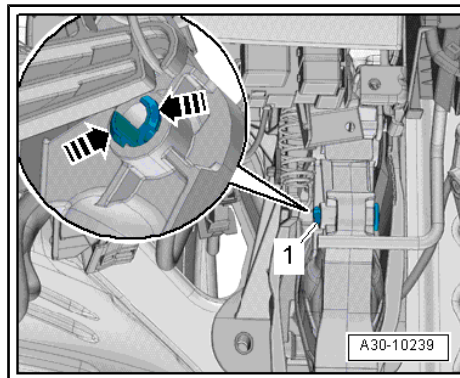


- Remove bolt -2-, unclip the crash bolster -1- and push aside.





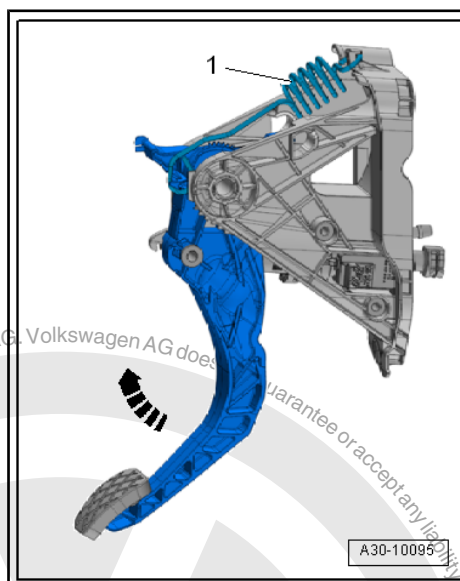
- Press the retainers together in direction of -arrows- and remove the mounting pin -1- for the valve lifter/clutch master cylinder to the right.



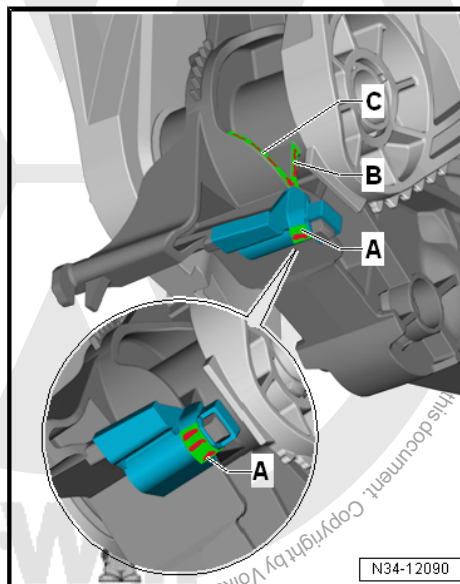
- Move the clutch pedal in direction of -arrow-, unclip the return spring -1- and remove.

Installing

Install in reverse order of removal. Note the following:



- for the return spring -1- (see previous illustration) grease the following areas on the clutch pedal:
- Slide bushing on the return spring mounting area -A-:
- Ridge -B-
- Ridge -C-
- Grease. Refer to the Parts Catalog.
- Move the clutch pedal in direction of -arrow-, engage the return spring -1- (see previous illustration).
- Use a new mounting pin to connect the valve lifter/clutch master cylinder to the clutch pedal.





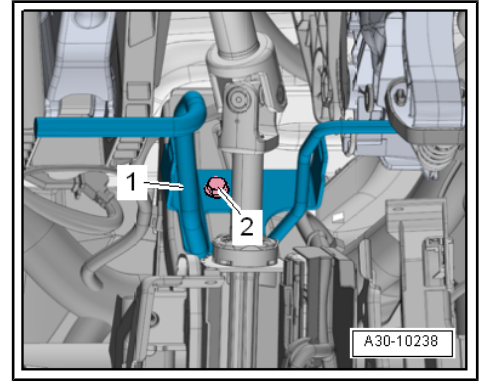
- Insert the crash bolster -1- and tighten the bolt -2-. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Overview - Instrument Panel Central Tube .
- Install the Data Bus on Board Diagnostic Interface - J533- . Refer to ⇒ Electrical Equipment; Rep. Gr. 97 ; Control Modules; Component Location Overview - Control Modules .
- Install the driver side footwell vent. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Air Routing; Rear Footwell Vent, Removing and Installing .

Vehicles with a Knee Airbag

- Install the driver side knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .

Vehicles without Knee Airbag

- Connect the battery. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .



1.9 Over-Center Spring, Removing and Installing

Removing

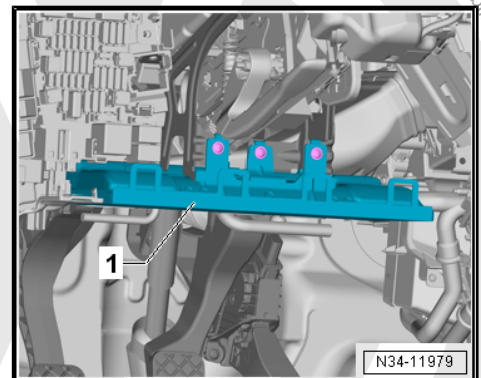
- Move the driver seat as far back as possible.
- Move the steering wheel upward as far as possible. Use the entire steering column adjustment range.

Vehicles with a Knee Airbag

- Remove the driver side knee airbag -1-. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .

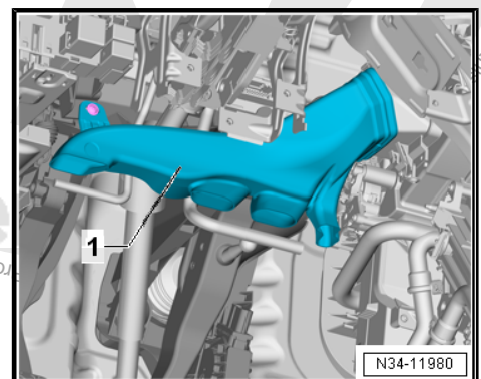
Vehicles without Knee Airbag

Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .



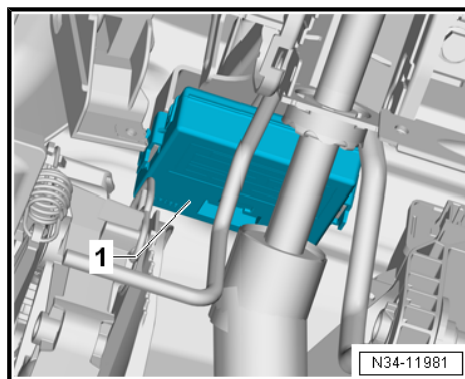
Continuation for All

- Remove driver side footwell vent -1-. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Air Routing; Rear Footwell Vent, Removing and Installing.

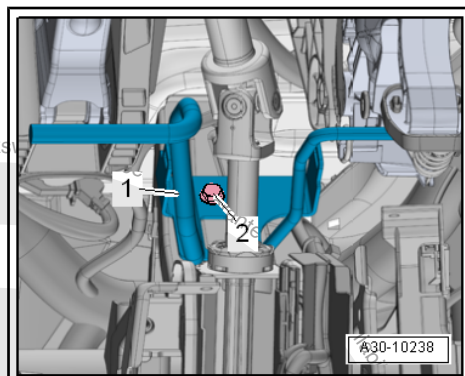




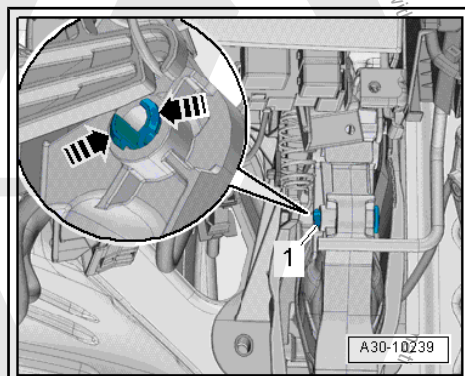
- Remove the Data Bus on Board Diagnostic Interface - J533-1- from the bracket. Refer to ➔ Electrical Equipment; Rep. Gr. 97 ; Control Modules; Component Location Overview - Control Modules and push it aside.



- Remove bolt -2-, unclip the crash bolster -1- and push aside.

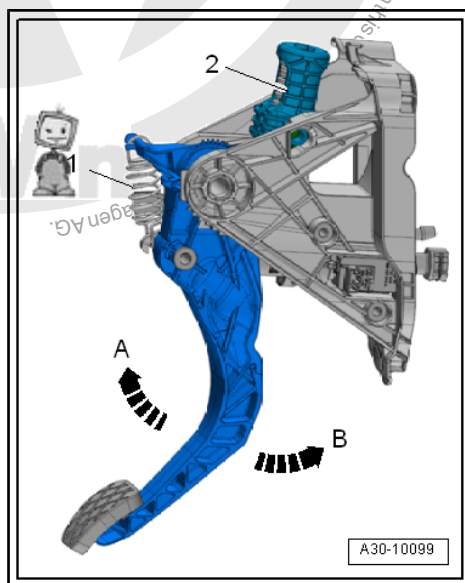


- Press the retainers together in direction of -arrows- and remove the mounting pin -1- for the valve lifter/clutch master cylinder to the right.



- If present, push the clutch pedal in direction of -arrow B- to disengage and remove the tension spring -1-.
- Bring clutch pedal to the rest position.
- Pull the clutch pedal in direction of -arrow A- and disengage and remove the over-center spring -2-.

Installing

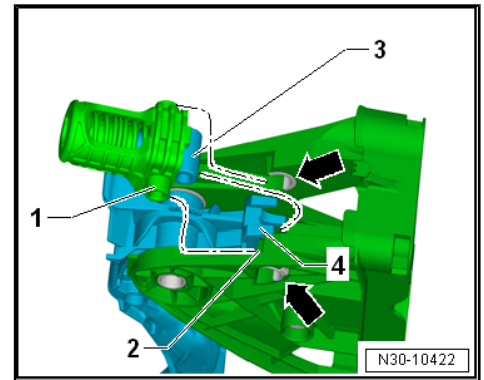




Install in reverse order of removal. Note the following:

Install in reverse order of removal. Note the following:

- The bearing shells -arrows- for the pins -1- are installed.
- Pull the clutch pedal into the passenger compartment (in direction of -arrow A- in the previous illustration).
- Fit the pins -1- into the bracket mounts -2-.
- Fit the mounting -3- into the clutch pedal mount -4-.
- If the clutch pedal is pushed in direction of -arrow B- (see previous illustration), the over-center spring will fold in the direction of the bracket.



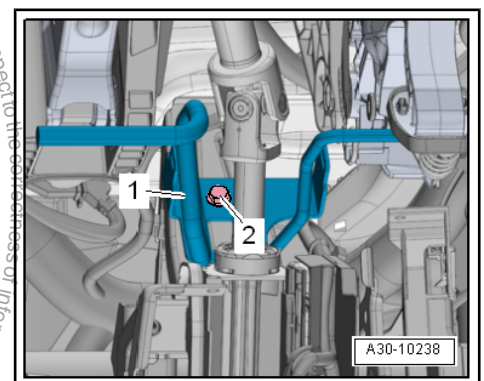
- Use a new mounting pin to connect the valve fitter/clutch master cylinder to the clutch pedal.
- Insert the crash bolster -1- and tighten the bolt -2-. Refer to ➔ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Overview - Instrument Panel Central Tube .
- Install the Data Bus on Board Diagnostic Interface - J533- . Refer to ➔ Electrical Equipment; Rep. Gr. 97 ; Control Modules; Component Location Overview - Control Modules .
- Install the driver side footwell vent. Refer to ➔ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Air Routing; Overview - Air Routing and Air Distribution in Passenger Compartment .

Vehicles with a Knee Airbag

- Install the driver side knee airbag. Refer to ➔ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .

Vehicles without Knee Airbag

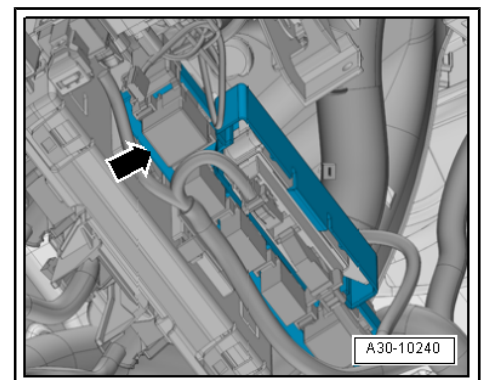
- Connect the battery. Refer to ➔ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .



1.10 Clutch Pedal, Removing and Installing

Removing

- Move the driver seat as far back as possible.
- Move the steering wheel upward as far as possible. Use the entire steering column adjustment range.
- If installed near bracket: remove the bracket -arrow- with the Parking Aid Control Module - J446- . Refer to ➔ Electrical Equipment; Rep. Gr. 94 ; Parking Aid; Overview - Parking Aid and push aside.
- Remove return spring from bracket. Refer to ➔ ["1.8 Return Spring, Removing and Installing", page 20](#) or over-center spring from bracket. Refer to ➔ ["1.9 Over-Center Spring, Removing and Installing", page 23](#) .





Remove the Clutch Pedal Bearing Axle as Follows

-1- = internal socket wrench, 14 mm.

A 14 mm hex socket wrench can also be used instead of a 14 mm internal socket wrench.

- The clutch pedal bearing axle needs to be turned all the way to the left, direction of -arrow-.



Note

The retainers -A- will be damaged.

- Move the clutch pedal a little so that the bearing axle can be removed.

Installing

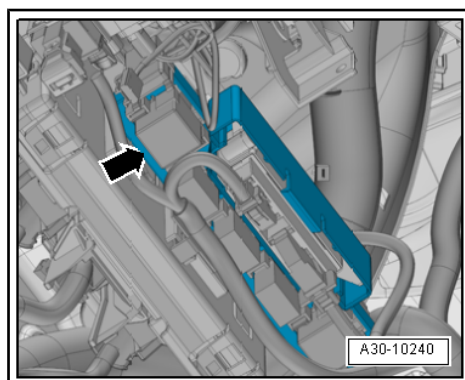
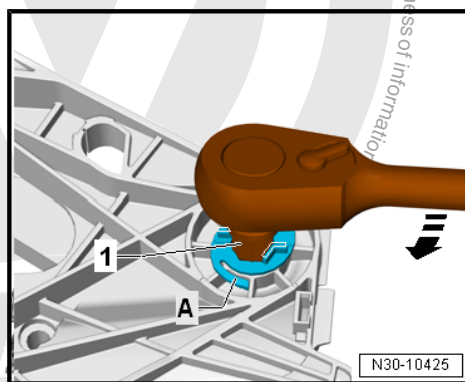
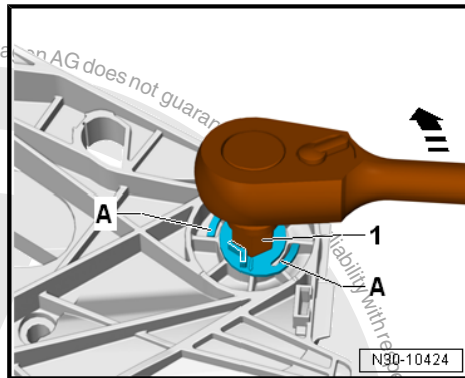
Install in reverse order of removal. Note the following:

Install in reverse order of removal. Note the following:

-1- = internal socket wrench, 14 mm.

A 14 mm hex socket wrench can also be used instead of a 14 mm internal socket wrench.

- Replace bearing axle after removing.
- Press on the clutch pedal a little and push the new bearing axle through all the way.
- Turn the bearing axle all the way to the right, direction of -arrow-.
- The retainers -A- must engage audibly.
- Install return spring in bracket. Refer to [⇒ "1.8 Return Spring, Removing and Installing", page 20](#) , or over-center spring in bracket. Refer to [⇒ "1.9 Over-Center Spring, Removing and Installing", page 23](#) .
- Install bracket -arrow- with Parking Aid Control Module - J446- . Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Parking Aid; Overview - Parking Aid .



1.11 Mounting Bracket, Removing and Installing

Special tools and workshop equipment required

- ◆ Hose Clamps - Up To 25 mm - 3094-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Sealing Tool - T10249-



Removing

- Move the driver seat as far back as possible.
- Move the steering wheel upward as far as possible. Use the entire steering column adjustment range.

Vehicles with a Knee Airbag

- Remove the driver side knee airbag -1-. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag

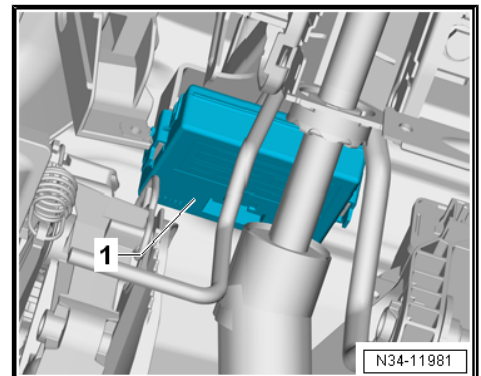
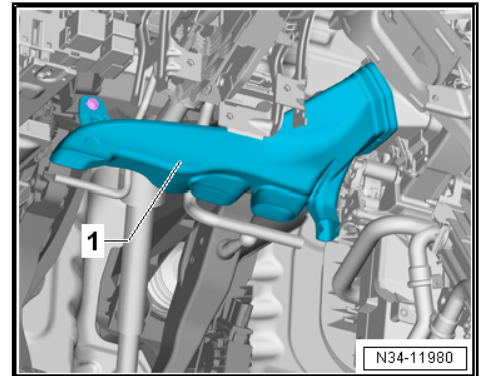
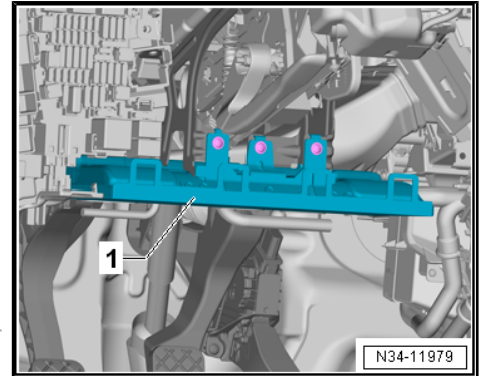
Vehicles without Knee Airbag

Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .

Continuation for All

- Remove driver side footwell vent -1-. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Air Routing; Rear Footwell Vent, Removing and Installing .

- Remove the Data Bus on Board Diagnostic Interface - J533-1- from the bracket. Refer to ⇒ Electrical Equipment; Rep. Gr. 97 ; Control Modules; Component Location Overview - Control Modules and push it aside.





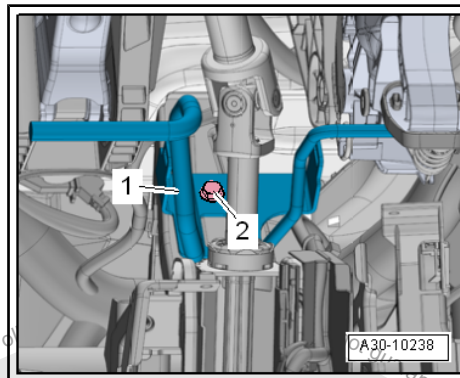
- Remove bolt -2-, unclip the crash bolster -1- and push aside.
- Remove the entire air filter housing if the clutch mechanism lines are not accessible. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- Remove the battery. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Removing and Installing .



Caution

Danger of leaking brake fluid.

- ◆ ***Be careful not to get any brake fluid on the longitudinal member or on the transmission when performing the following work. If it does, clean the area thoroughly.***
- ◆ ***Place a lint-free cloth under the clutch master cylinder.***

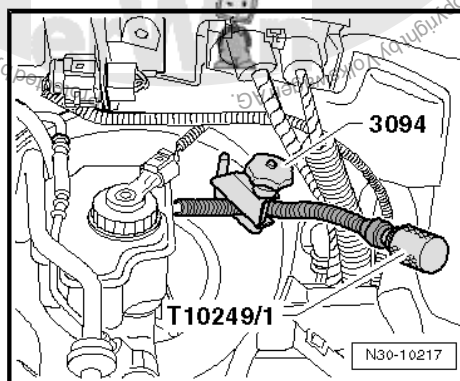
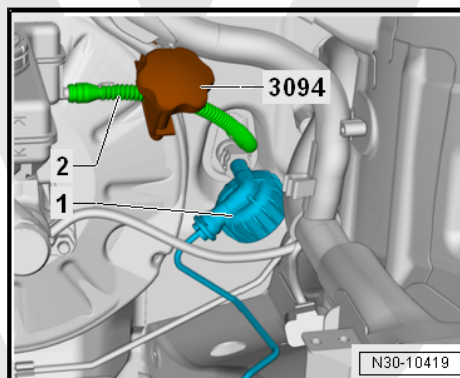


- Unclamp the supply hose -2- to the clutch master cylinder with a Hose Clamps - Up To 25mm - 3094- .



Note

- ◆ *A slight deformation of the supply hose remains after the Hose Clamps - Up To 25mm - 3094- have been unclamped.*
- ◆ *The supply hose is therefore not defective.*
- ◆ *After removing the Hose Clamp Up To 25 mm - 3094- , the supply hose must be formed back into its original shape.*
- Remove clip for hose/line assembly -1- all the way and remove hose/line assembly.
- Seal off openings.
- Remove the clutch master cylinder return hose and seal with the Sealing Tool - T10249/1- .





Note

When working inside the footwell, cover the carpet with cloths to protect it from leaking brake fluid.

- Disconnect the connector -2- from the Clutch Position Sensor - G476- .
- Remove nuts -arrows- and bracket -1-.

Installing

Install in reverse order of removal. Note the following:

Install in reverse order of removal. Note the following:

- Replace self-locking nuts and clutch master cylinder seals after removing them.
- Insert the crash bolster -1- and tighten the bolt -2-. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Overview - Instrument Panel Central Tube .
- Install the Data Bus on Board Diagnostic Interface - J533- . Refer to ⇒ Electrical Equipment; Rep. Gr. 97 ; Control Modules; Component Location Overview - Control Modules .
- Install the driver side footwell vent. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Air Routing; Overview - Air Routing and Air Distribution in Passenger Compartment .

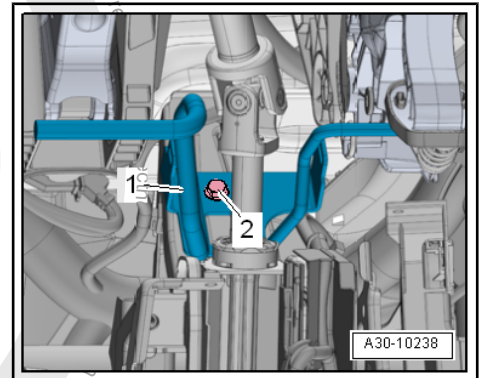
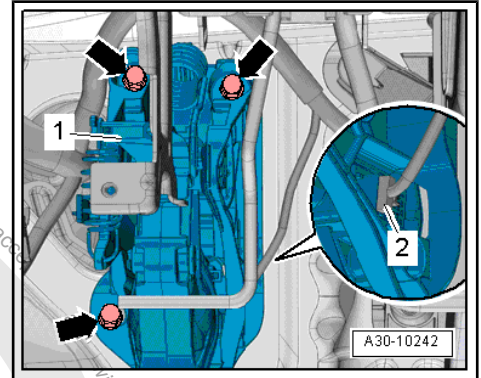
Vehicles with a Knee Airbag

- Install the driver side knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .



Note

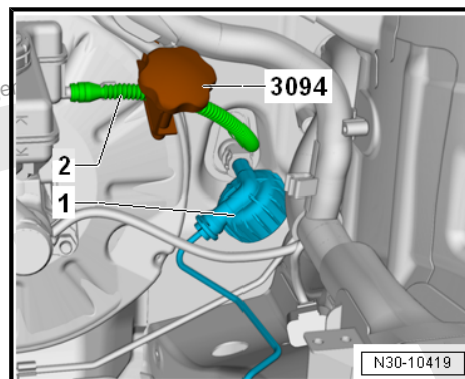
The battery will be installed and connected later.





Continuation for All

- Connect hose/line assembly -1- with connection. Refer to ➔ [Fig. “Disconnect and Connect Clutch Mechanism Wires”](#), [page 17](#) .
- Connect the supply hose -2- to the clutch master cylinder.
- After removing the Hose Clamp up to 25 mm -3094- , the supply hose must be formed back into its original shape.
- Bleed the clutch mechanism. Refer to ➔ [“1.16 Clutch Mechanism, Bleeding”](#), [page 34](#) .



Vehicles with a Knee Airbag

- Install and connect the battery. Refer to ➔ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag and ➔ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .

Vehicles without Knee Airbag

- Install and connect the battery. Refer to ➔ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .

Tightening Specifications

- ♦ Mounting bracket to bulkhead. Refer to ➔ [“1.2 Overview - Pedal Assembly”](#), [page 14](#) .

1.12 Clutch Master Cylinder, Removing and Installing

Removing



Note

- ♦ *Before replacing the clutch master cylinder due to an assumed defect, perform the [Guided Fault Finding](#) Vehicle Diagnostic Tester first.*
- ♦ *When working inside the footwell, cover the carpet with cloths to protect it from leaking brake fluid.*
- Remove the bracket. Refer to ➔ [“1.11 Mounting Bracket, Removing and Installing”](#), [page 26](#) .
- Remove the Clutch Position Sensor - G476- . Refer to ➔ [“1.7 Clutch Position Sensor G476 , Removing and Installing”](#), [page 20](#) .
- Release retainers in direction of -arrows- and remove mounting pin -2-.



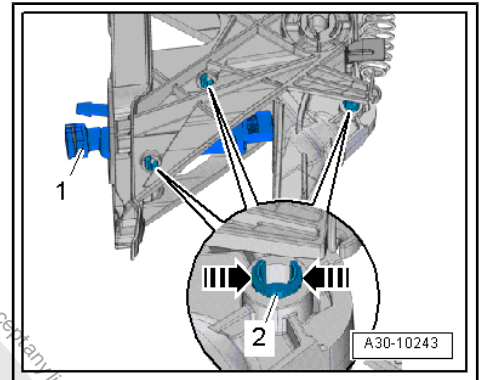
- Remove clutch master cylinder -1-.

Installing

Install in reverse order of removal. Note the following:

Replace mounting pin after removing.

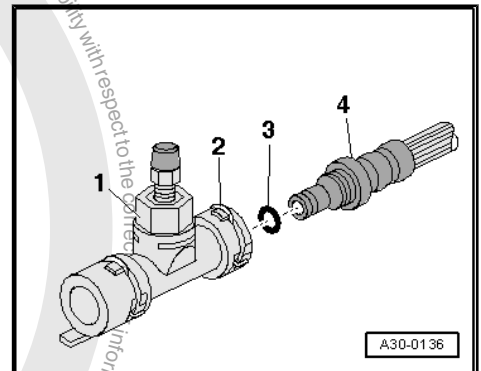
- Install the bracket. Refer to
⇒ [“1.11 Mounting Bracket, Removing and Installing”, page 26](#) .
- Install the Clutch Position Sensor - G476- . Refer to
⇒ [“1.7 Clutch Position Sensor G476 , Removing and Installing”, page 20](#) .



1.13 Bleeder, Removing and Installing

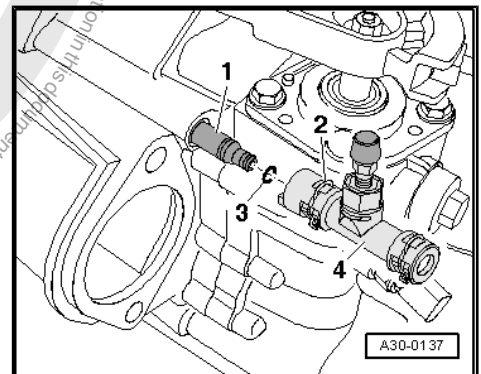
Hose/Line Assembly or Pipe -4- on Bleeder -1-, Removing and Installing

- To remove, open the clip -2- with a screwdriver or a pointed tool and pull off hose/line assembly or pipe -4- at bleeder -1-.
- To install, press hose/line assembly or pipe with new O-ring -3- onto the bleeder connection, until clip audibly engages.
- Pull on the line to make sure it is secure.



Removing and Installing the Bleeder -4- from the Clutch Slave Cylinder

- To remove, open the clip -2- with a screwdriver or a pointed tool and remove bleeder -4- from clutch slave cylinder -1-.
- To install, check the O-ring -3- on the clutch slave cylinder. Press in the bleeder at the clutch slave cylinder connector until the clip -2- engages audibly.
- To check, pull on the bleeder.
- Bleed the clutch mechanism. Refer to
⇒ [“1.16 Clutch Mechanism, Bleeding”, page 34](#) .



1.14 Clutch Mechanism Lines, Removing and Installing

Special tools and workshop equipment required

- ◆ Hose Clamps - Up To 25 mm - 3094-

Removing

- Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .
- Remove the air filter housing if the lines are not accessible.
- Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- Remove the battery and the battery tray. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Removing and Installing .



Caution

Danger of leaking brake fluid.

- ◆ *Be careful not to get any brake fluid on the longitudinal member or on the transmission when performing the following work. If it does, clean the area thoroughly.*
- ◆ *Place a lint-free cloth under the clutch master cylinder.*

- Unclamp the supply hose -2- to the clutch master cylinder with a Hose Clamps - Up To 25mm - 3094-



Note

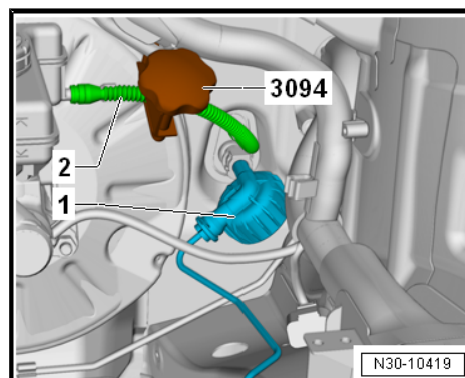
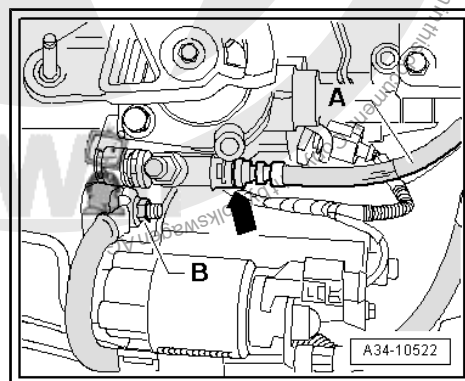
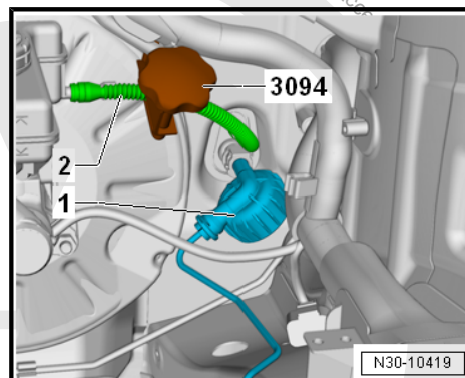
- ◆ *A slight deformation of the supply hose remains after the Hose Clamps - Up To 25mm - 3094- have been unclamped.*
- ◆ *The supply hose is therefore not defective.*
- ◆ *After removing the Hose Clamp up to 25 mm - 3094- , the supply hose must be formed back into its original shape.*
- Remove clip for hose/line assembly -1- all the way and remove hose/line assembly.
- Seal off openings.
- Remove the clip -arrow- all the way and then remove the hose/line assembly -A- from the bleeder.
- Ignore -B-.
- Seal the open lines and connections with clean plugs if necessary from the Engine Bung Set - VAS6122-.
- Free up the hose/line assembly and remove it.

Installing

Install in reverse order of removal. Note the following:

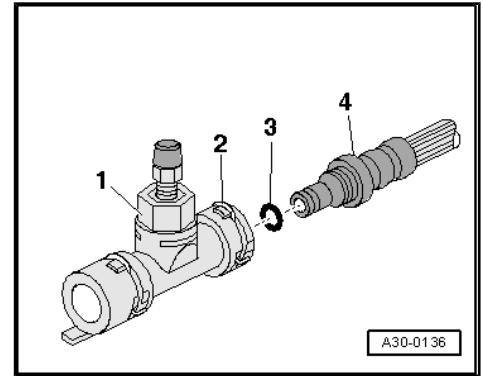
Install in reverse order of removal. Note the following:

- Connect hose/line assembly -1- with clutch master cylinder.
- Pull on the line to make sure it is secure.





- Push the hose/line assembly -4- with the O-ring -3- onto the bleeder connection -1- until the clip -2- audibly locks into place.
- Pull on the line to make sure it is secure.
- After removing the Hose Clamp up to 25 mm - 3094- , the return hose -2- (see previous illustration) must be formed back into its original shape.
- Bleed the clutch mechanism. Refer to
⇒ [“1.16 Clutch Mechanism, Bleeding”, page 34](#) .
- Install the air filter housing.
- Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition;
Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- Install the battery tray, battery and the battery cover. Refer to
⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Removing and Installing .



1.15 Clutch Slave Cylinder with Release Bearing, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331-

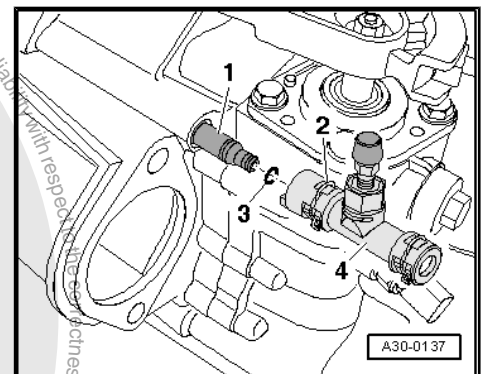


Note

- ◆ *The clutch slave cylinder and the release bearing are a single unit and are replaced together.*
- ◆ *Pay attention to the thread pitch on the bolts when cleaning the threaded hole in the clutch housing.*

Removing

- Transmission is removed.
- Open the clip -2- with a screwdriver or a pointed tool and remove bleeder -4- from clutch slave cylinder -1-.





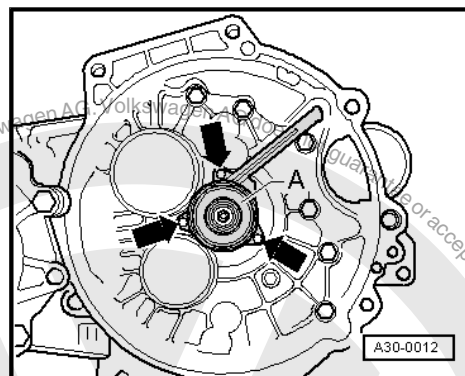
- Remove the bolts -arrows-.
- Remove the clutch slave cylinder together with the release bearing -A-.

Installing

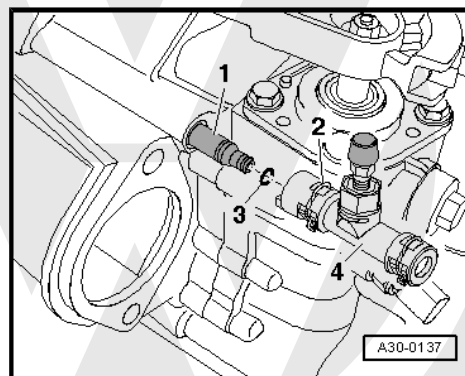
Install in reverse order of removal. Note the following:

- Tighten the slave cylinder bolts in small increments only.

Otherwise, there is the danger that the tabs with the fastening holes could break off.



- Check the O-ring -3- on the clutch slave cylinder for damage.
- Push the bleeder -4- onto the clutch slave cylinder connection -1- until the clip -2- clicks into place.
- To check, pull on the bleeder.
- Install the transmission. Refer to [⇒ "2.2 Transmission, Installing", page 85](#).
- Bleed the clutch mechanism. Refer to [⇒ "1.16 Clutch Mechanism, Bleeding", page 34](#).



Tightening Specifications

- ◆ Clutch slave cylinder with release bearing to transmission. Refer to [⇒ "1.4 Overview - Clutch Release Mechanism", page 18](#).

1.16 Clutch Mechanism, Bleeding

Special tools and workshop equipment required

- ◆ Brake Charger/Bleeder Unit - VAS5234- or
- ◆ Brake Charger/Bleeder Unit - VAG1869-



Note

- ◆ *Bleed the system after working on the hydraulic clutch mechanism.*
- ◆ *Make sure no brake fluid gets on the transmission when performing the following work.*
- ◆ *It is not necessary to pre-fill the system.*
- ◆ *Before bleeding, fill the brake fluid reservoir to the "Max" marking with brake fluid.*
- ◆ *The clutch pedal is in the neutral position and is not pressed.*
- ◆ *Brake fluid: allocation, refer to the Parts Catalog.*
- Remove the air filter housing if it makes the bleeder inaccessible.

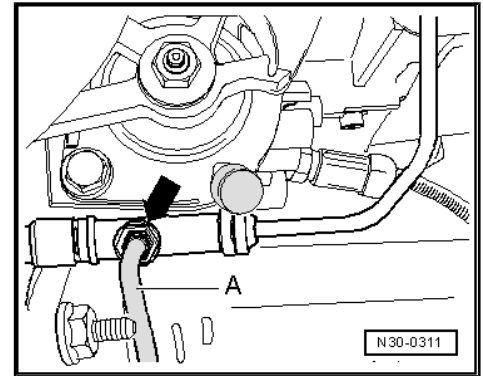


Refer to ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .

- Return clutch pedal to the rest position.
- Remove cap from the bleed valve -arrow-.
- Connect the Brake Charger/Bleeder Unit - VAS5234- .

If necessary use the Bleeder Hose (670 mm) - VAG1238/B3- .

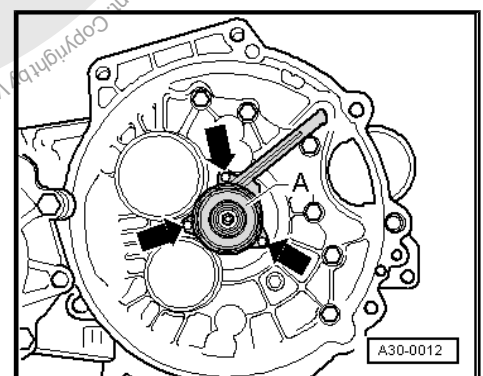
- Connect the bleed hose -A- with the collector bottle pressure hose.
- Turn on the Brake Charger/Bleeding Unit .
- Working pressure 2.0 bar (29 psi).
- Open the bleed valve approximately $\frac{1}{4}$ turn.
- Move the clutch pedal manually 15 to 20 time very quickly from stop to stop.
- Close the bleed valve and turn off the bleed unit.
- After completing the bleeding procedure, and the pressure has dropped from 2-bar (29 psi), operate the clutch pedal an additional 10 times by foot.
- Install the air filter housing.
- Refer to ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- ◆ Close the bleed valve. Refer to
⇒ ["1.3 Overview - Clutch Hydraulics", page 16](#) .



1.17 Clutch Release Mechanism, Servicing

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Grease for Clutch Disc Shaft Splines - G 000 100-
- The transmission is removed.
- Remove and attach the clutch slave cylinder with the release bearing -arrows-.

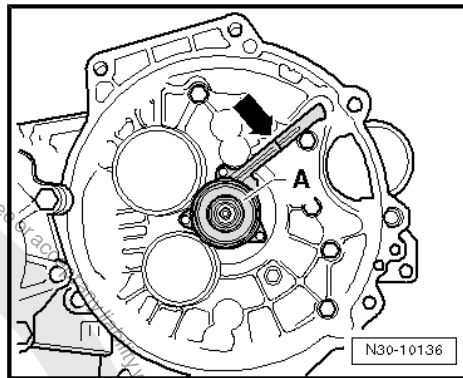




Clutch Slave Cylinder -A- with Divided Supply Line

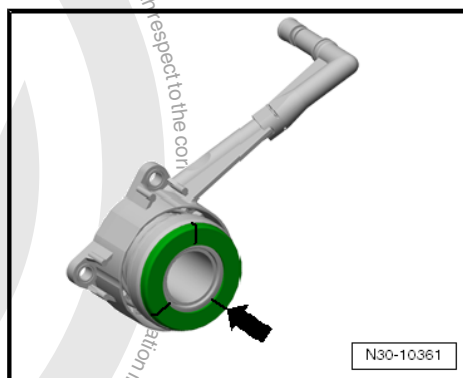
The supply line is divided in area with -arrows- on some clutch slave cylinders

Allocation. Refer to the Parts Catalog.



Release Bearing with Additional Plastic Washer

Identified by: tabs -arrow- on the plastic washer.

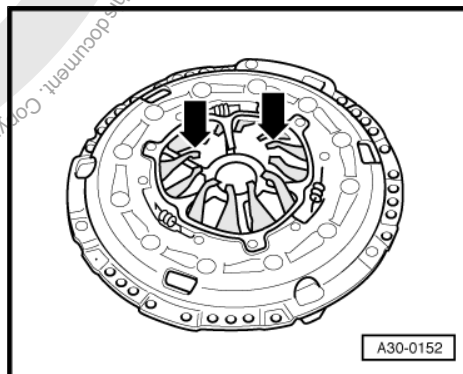


Only for Release Bearing with Additional Plastic Washer: Pressure Plate Diaphragm Spring (-arrows-) with a Slightly Lower Installation Height.

- Install the release bearing with additional plastic washer and the pressure plate diaphragm spring with a slightly lower installation height.

Allocation. Refer to the Parts Catalog.

- Install the transmission. Refer to
⇒ ["2.2 Transmission, Installing", page 85](#) .
- Bleed the clutch mechanism. Refer to
⇒ ["1.16 Clutch Mechanism, Bleeding", page 34](#) .



Tightening Specifications

- ◆ Clutch slave cylinder with release bearing to transmission.
Refer to
⇒ ["1.4 Overview - Clutch Release Mechanism", page 18](#) .



2 Clutch

⇒ [“2.1 Overview - Clutch”, page 37](#)

⇒ [“2.2 Clutch, Removing and Installing”, page 40](#)

2.1 Overview - Clutch

⇒ [“2.1.1 Overview - Clutch, with Dual Mass Flywheel, Sachs”, page 37](#)

⇒ [“2.1.2 Overview - Clutch, with Dual Mass Flywheel, LuK”, page 38](#)

⇒ [“2.1.3 Overview - Clutch, with Single Flywheel”, page 39](#)

2.1.1 Overview - Clutch, with Dual Mass Flywheel, Sachs

1 - Dual Mass Flywheel

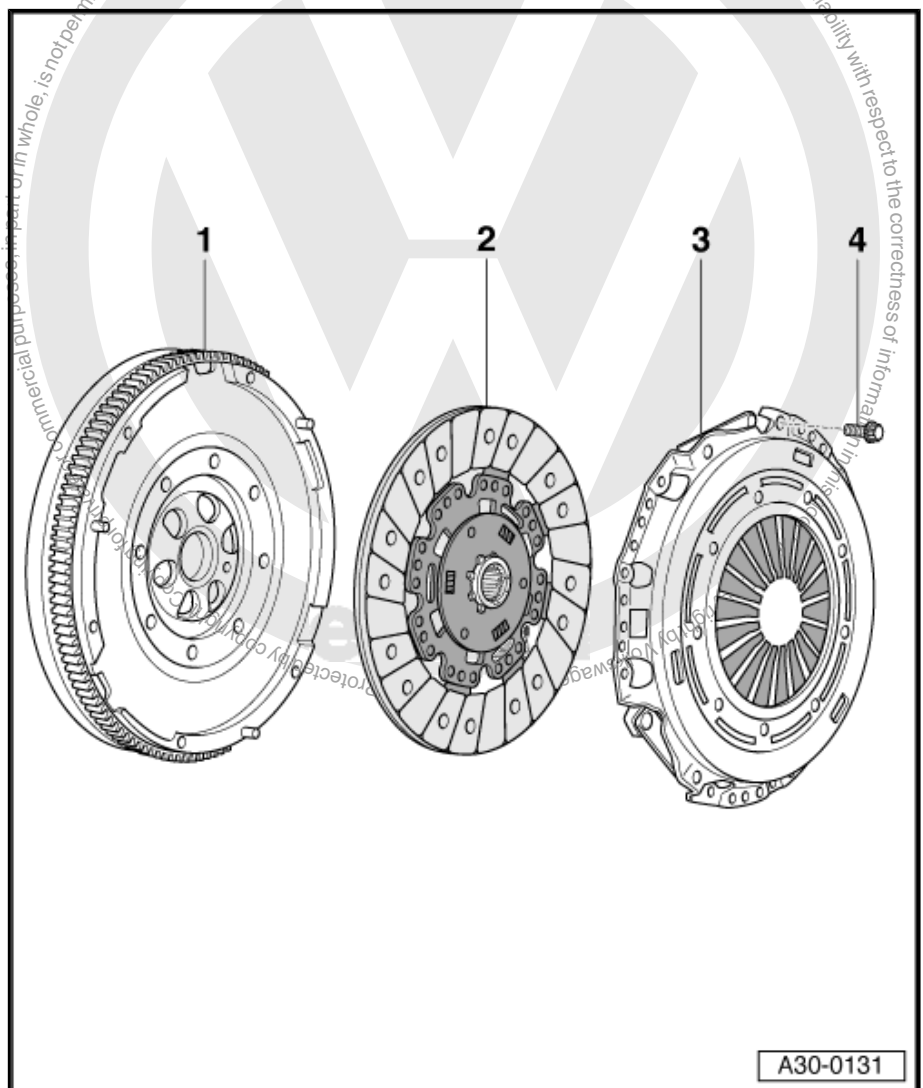
- ☐ Removing and installing. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 13 ; Cylinder Block, Transmission Side; Flywheel, Removing and Installing .
- ☐ Make sure it fits securely on the centering pins
- ☐ Keep the clutch lining contact surface free of grooves, oil and grease.

2 - Clutch Plate

- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Only replace together with the pressure plate
- ☐ Removing and installing. Refer to
⇒ [“2.2.1 Clutch, Removing and Installing, with Dual Mass Flywheel, Sachs”, page 40](#) .
- ☐ Installation position. Refer to
⇒ [Fig. “Clutch Plate Installed Position”](#), page 42

3 - Pressure Plate

- ☐ With adjustment mechanism
- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Only replace together with the clutch plate
- ☐ Removing and installing. Refer to
⇒ [“2.2.1 Clutch, Removing and Installing, with Dual Mass Flywheel, Sachs”, page 40](#) .
- ☐ Check the ends of the diaphragm spring. Refer to
⇒ [Fig. “Check the Ends of the Diaphragm Spring”](#), page 42
- ☐ Checking the spring connections and rivet connections. Refer to
⇒ [Fig. “Checking the Spring Connections and Rivet Connections”](#), page 42





- ❑ Approximately from 05/2011: release bearing with an additional plastic washer. Refer to ➔ [Fig. "Release Bearing with Additional Plastic Washer"](#), page 19 , pressure plate is adapted. Refer to ➔ [Fig. "Only for Release Bearing with Additional Plastic Washer: Pressure Plate Diaphragm Spring \(-arrows-\) with a Slightly Lower Installation Height."](#), page 19

4 - Bolt

- ❑ M 6: 13 Nm
- ❑ M 7: 20 Nm
- ❑ Loosen and tighten in small steps and in diagonal sequence
- ❑ Allocation. Refer to the Parts Catalog.

2.1.2 Overview - Clutch, with Dual Mass Flywheel, LuK

1 - Dual Mass Flywheel

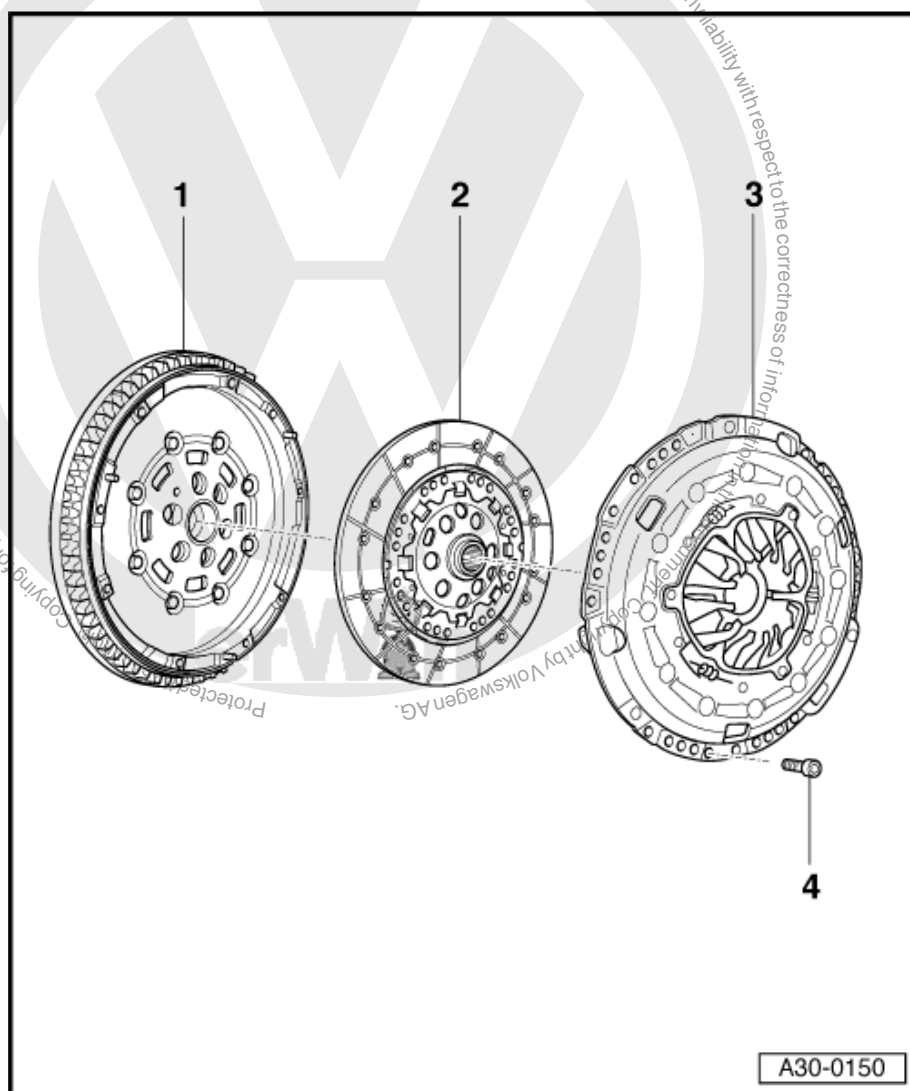
- ❑ Removing and installing. Refer to ➔ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 13 ; Cylinder Block, Transmission Side; Flywheel, Removing and Installing .
- ❑ Make sure it fits securely on the centering pins
- ❑ Keep the clutch lining contact surface free of grooves, oil and grease.

2 - Clutch Plate

- ❑ Allocation. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to ➔ ["2.2.2 Clutch, Removing and Installing, with Dual Mass Flywheel, LuK"](#), page 44 .
- ❑ Only replace together with the SAC pressure plate
- ❑ Installed position: Refer to ➔ [Fig. "Clutch Plate Installed Position"](#), page 45

3 - SAC Pressure Plate

- ❑ SAC = "Self Adjusting Clutch"
- ❑ Only replace together with the clutch plate
- ❑ Allocation. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to ➔ ["2.2.2 Clutch, Removing and Installing, with Dual Mass Flywheel, LuK"](#), page 44 .
- ❑ Check the ends of the diaphragm spring. Refer to ➔ [Fig. "Check the Ends of the Diaphragm Spring"](#), page 45
- ❑ Checking the spring connections and rivet connections. Refer to ➔ [Fig. "Checking the Spring Connections and Rivet Connections"](#), page 46
- ❑ Approximately from 05/2011: release bearing with an additional plastic washer. Refer to ➔ [Fig. "Release Bearing with Additional Plastic Washer"](#), page 19 , pressure plate is adapted. Refer





to

⇒ Fig. [“Only for Release Bearing with Additional Plastic Washer, Pressure Plate Diaphragm Spring \(-arrows-\) with a Slightly Lower Installation Height.”](#), page 19

4 - Bolt

- ☐ M 6: 13 Nm
- ☐ M 7: 20 Nm
- ☐ Loosen and tighten in small steps and in diagonal sequence
- ☐ Allocation. Refer to the Parts Catalog.

2.1.3 Overview - Clutch, with Single Flywheel

1 - Flywheel

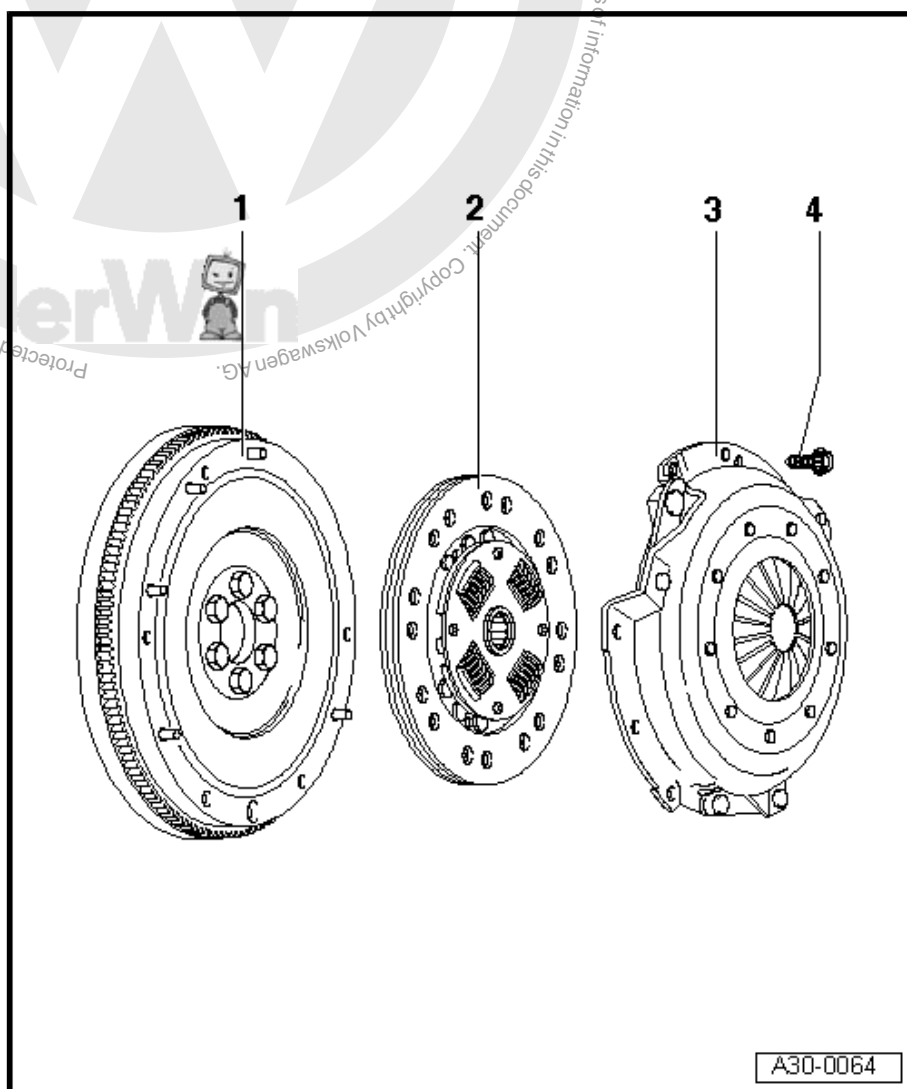
- ☐ Removing and installing. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 13; Cylinder Block, Transmission Side; Flywheel, Removing and Installing.
- ☐ Make sure it fits securely on the centering pins
- ☐ Keep the clutch lining contact surface free of grooves, oil and grease

2 - Clutch Plate

- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Centering. Refer to ⇒ [“2.2.3 Clutch, Removing and Installing, with Single Flywheel”](#), page 47

3 - Pressure Plate

- ☐ Removing and installing. Refer to ⇒ [“2.2.3 Clutch, Removing and Installing, with Single Flywheel”](#), page 47.
- ☐ Check the ends of the diaphragm spring. Refer to ⇒ Fig. [“Check the Ends of the Diaphragm Spring”](#), page 49
- ☐ Checking the spring connections and rivet connections. Refer to ⇒ Fig. [“Check the Spring Connection and Rivet Connections”](#), page 49



4 - Bolt

- ☐ M 6: 13 Nm
- ☐ M 7: 20 Nm
- ☐ Loosen and tighten in small steps and in diagonal sequence
- ☐ Allocation. Refer to the Parts Catalog.



2.2 Clutch, Removing and Installing

⇒ [“2.2.1 Clutch, Removing and Installing, with Dual Mass Flywheel, Sachs”, page 40](#)

⇒ [“2.2.2 Clutch, Removing and Installing, with Dual Mass Flywheel, LuK”, page 44](#)

⇒ [“2.2.3 Clutch, Removing and Installing, with Single Flywheel”, page 47](#)

2.2.1 Clutch, Removing and Installing, with Dual Mass Flywheel, Sachs

Special tools and workshop equipment required

- ◆ Flywheel Retainer - 3067-
- ◆ Alignment Tool - Clutch Plate - T10097-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Grease for Clutch Disc Shaft Splines - G 000 100-
- ◆ On engines which have a crankshaft with a smaller diameter, or engines with a needle bearing in the crankshaft. Refer to [⇒ Fig. “Centering the Clutch Disc, Removing and Installing the Pressure Plate on Engines with A Crankshaft with a Smaller Diameter, or Engines with A Needle Bearing in the Crankshaft.”, page 43](#) Centering Pin - 3176- .



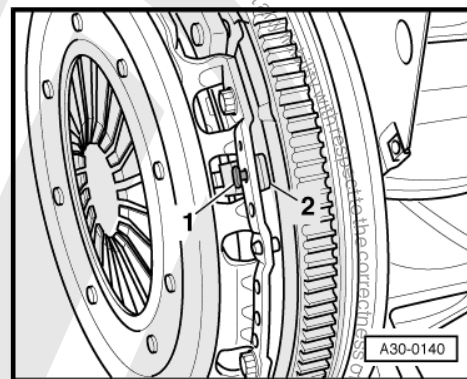


Removing

- The transmission is removed.
- Insert the Flywheel Retainer - 3067- to loosen the bolts.

When Removing, Loosen the Bolts as Follows so That the Clutch Pressure Plate Does Not Distort (Causing Shuddering on Acceleration):

- Loosen the bolt diagonally in small steps.
- When loosening, the stop -2- and the bolt -1- must loosen up together.
- If the stop does not loosen: push the bolt toward the dual mass flywheel.
- Remove the pressure plate and the clutch plate.



Installing

Install in reverse order of removal. Note the following:



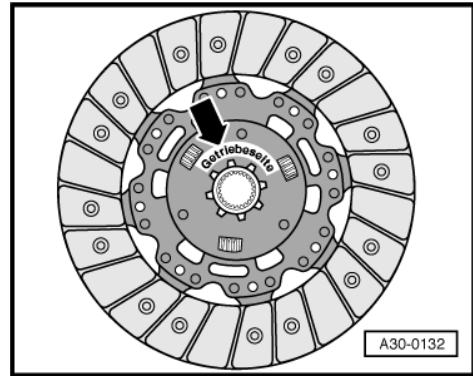
Note

- ◆ *Allocate clutch pressure plate and clutch plate according to the engine code. Refer to the Parts Catalog.*
- ◆ *Clean the input shaft splines and (on used clutch plates) the hub splines. Remove any corrosion and then apply a very thin coat of Grease for Clutch Disc Shaft Splines - G 000 100- on the splines. Then move the clutch plate back and forth on the input shaft until the hub moves freely on the shaft. Remove any excess grease.*
- ◆ *The clutch pressure plates are corrosion-protected and greased. With the exception of the friction surface on the clutch plate, do not clean the clutch pressure plate. This will shorten the service life of the clutch considerably.*
- ◆ *The friction surfaces on the clutch pressure plate and on the flywheel must be cleaned thoroughly (degreased).*
- ◆ *To reduce odor caused by a burnt clutch, thoroughly clean the transmission housing around the clutch as well as the engine on the transmission side.*
- ◆ *Only use compressed air to clean the dual mass flywheel.*
- ◆ *The clutch plate linings must sit completely on the flywheel and on the clutch pressure plate friction surface. Install the bolts.*
- ◆ *Tighten the bolts diagonally in small steps so as to not damage the centering holes in the pressure plate and the centering pins on the flywheel.*
- ◆ *Make sure the alignment sleeves for centering the engine/ transmission are installed inside the cylinder block. Install them if necessary.*
- ◆ *If the alignment sleeves are missing, it will be difficult to shift, there will be clutch problems and the transmission may make noises (loose rattling).*



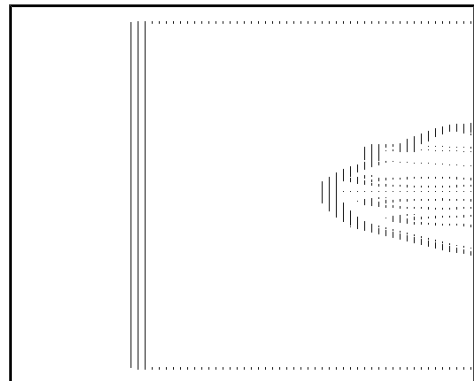
Clutch Plate Installed Position

- “Transmission side” label and the spring cage face the transmission.



Check the Ends of the Diaphragm Spring

- Wear up to half the thickness of the diaphragm spring -arrows- is permitted.



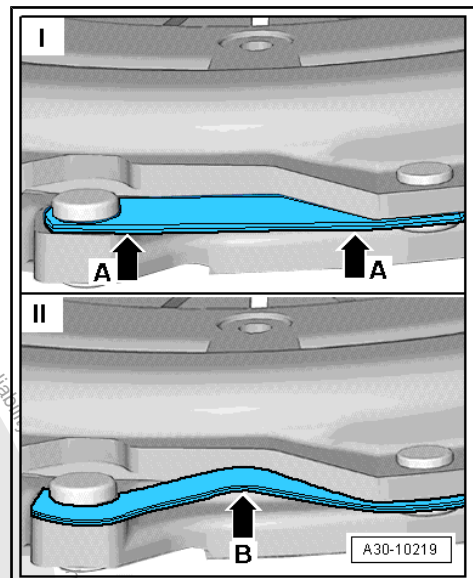
Checking the Spring Connections and Rivet Connections

I - Pull-spring OK

- Slight offset in the outer area -arrows A-.

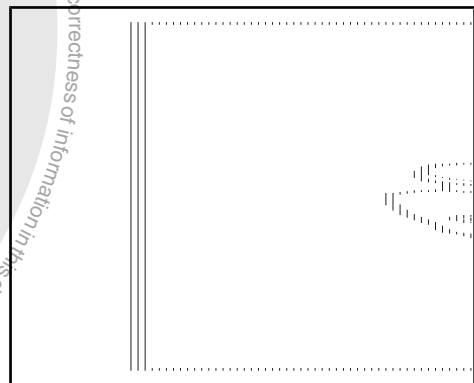
II - Pull-springs damaged

- The clutch pressure plates must be replaced if the pull-spring is bent or broken off -arrow B-.



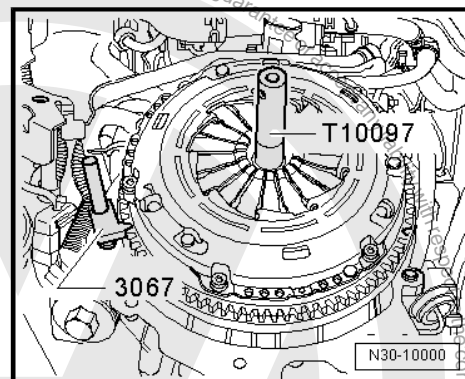
Checking the Spring Connections and Rivet Connections

- Check the spring connections between the pressure plate and the cover for cracks and make sure the rivet connections are tight.
- Replace the pressure plate if the spring connections are damaged or if the rivet connections -arrows- are loose.

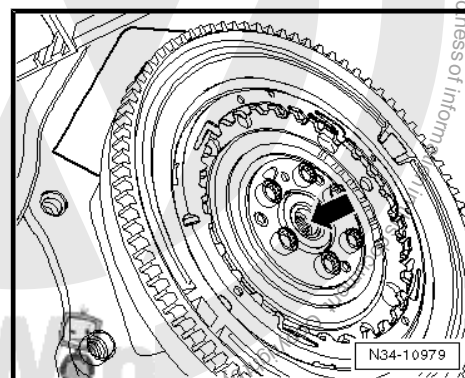




- Use the Flywheel Retainer - 3067- when installing.



Engines Having a Crankshaft With a Smaller Diameter -arrow-, or Engines Having a Needle Bearing -arrow- in the Crankshaft



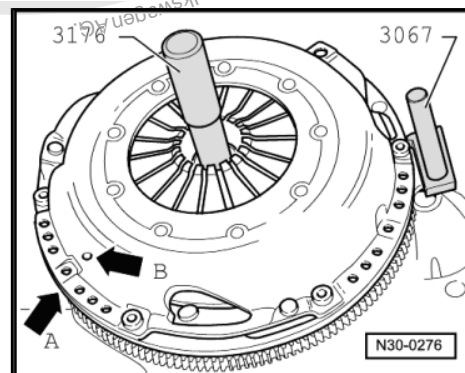
Centering the Clutch Disc, Removing and Installing the Pressure Plate on Engines with A Crankshaft with a Smaller Diameter, or Engines with A Needle Bearing in the Crankshaft.



Note

Ignore arrows -A and B-.

Continuation for All

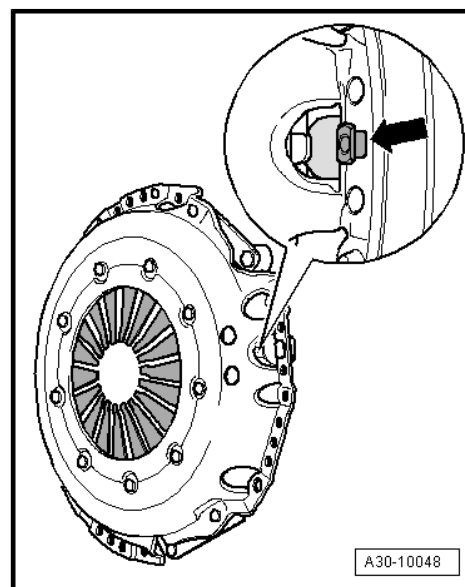


When Installing, Tighten Bolts as Follows So Pressure Plate Does Not Distort (Causing Shuddering on Acceleration):

- Make sure the stop pin (position sensor) -arrow- moves easily.
- Install the pressure plate on the centering pins.
- Install all bolts evenly, by hand, until the bolt heads touch the pressure plate.
- Tighten the bolt diagonally in small steps.
- When doing this, the stop pin -arrow- must lift off from the pressure plate.
- Install the transmission. Refer to [⇒ "2.2 Transmission, Installing", page 85](#).

Tightening Specifications

- ◆ Refer to [⇒ "2.1.1 Overview - Clutch, with Dual Mass Flywheel, Sachs", page 37](#).





2.2.2 Clutch, Removing and Installing, with Dual Mass Flywheel, LuK

Special tools and workshop equipment required

- ◆ Flywheel Retainer - 3067-
- ◆ Alignment Tool - Clutch Plate - T10097-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Grease for Clutch Disc Shaft Splines - G 000 100-
- ◆ On engines which have a crankshaft with a smaller diameter, or engines with a needle bearing in the crankshaft. Refer to ⇒ [Fig. "Centering the Clutch Disc, Removing and Installing the Pressure Plate on Engines with A Crankshaft with a Smaller Diameter, or Engines with A Needle Bearing in the Crankshaft."](#), [page 43](#) Centering Pin - 3176- .

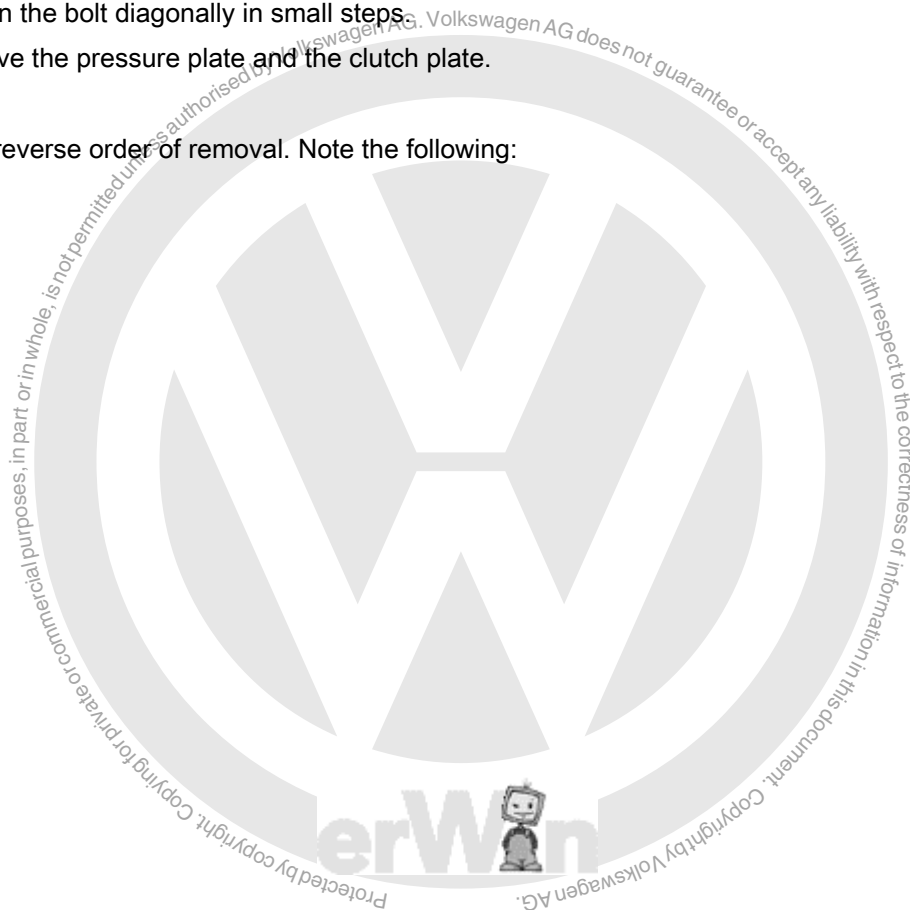
Removing

The transmission is removed.

- Insert the Flywheel Retainer - 3067- to loosen the bolts.
- Loosen the bolt diagonally in small steps.
- Remove the pressure plate and the clutch plate.

Installing

Install in reverse order of removal. Note the following:





Note

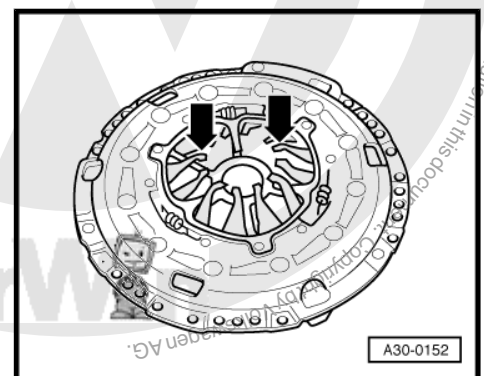
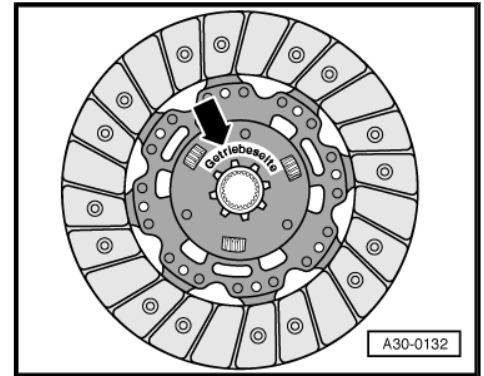
- ◆ Allocate clutch pressure plate and clutch plate according to the engine code. Refer to the Parts Catalog.
- ◆ Clean the input shaft splines and (on used clutch plates) the hub splines. Remove any corrosion and then apply a very thin coat of Grease for Clutch Disc Shaft Splines - G 000 100- on the splines. Then move the clutch plate back and forth on the input shaft until the hub moves freely on the shaft. Remove any excess grease.
- ◆ The clutch pressure plates are corrosion-protected and greased. With the exception of the friction surface on the clutch plate, do not clean the clutch pressure plate. This will shorten the service life of the clutch considerably.
- ◆ The friction surfaces on the clutch pressure plate and on the flywheel must be cleaned thoroughly (degreased).
- ◆ To reduce odor caused by a burnt clutch, thoroughly clean the transmission housing around the clutch as well as the engine on the transmission side.
- ◆ Only use compressed air to clean the dual mass flywheel.
- ◆ The clutch plate linings must sit completely on the flywheel and on the clutch pressure plate friction surface. Install the bolts.
- ◆ Tighten the bolts diagonally in small steps so as to not damage the centering holes in the pressure plate and the centering pins on the flywheel.
- ◆ Make sure the alignment sleeves for centering the engine/transmission are installed inside the cylinder block. Install them if necessary.
- ◆ If the alignment sleeves are missing, it will be difficult to shift, there will be clutch problems and the transmission may make noises (loose rattling).

Clutch Plate Installed Position

- "Transmission side" label faces the transmission.

Check the Ends of the Diaphragm Spring

- Wear up to half the thickness of the diaphragm spring -arrows- is permitted.





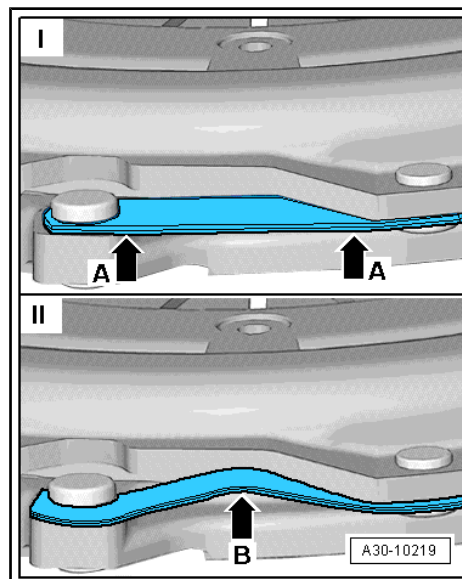
Checking the Pull-Springs and Rivet Connection

I - Pull-spring OK

- Slight offset in the outer area -arrows A-.

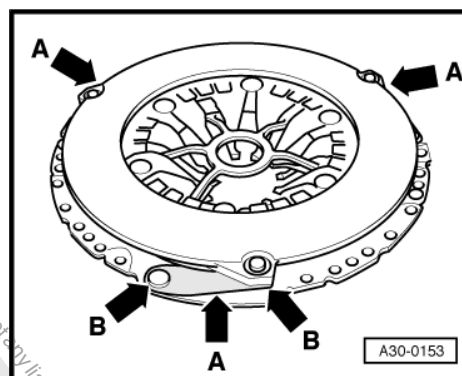
II - Pull-springs damaged

- The clutch pressure plates must be replaced if the pull-spring is bent or broken off -arrow B-.



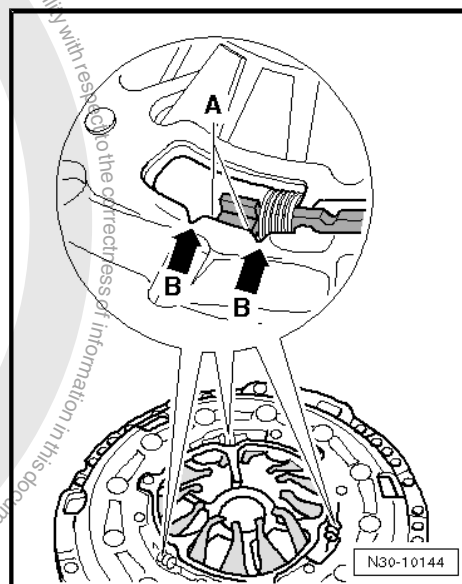
Checking the Spring Connections and Rivet Connections

- Make sure the rivet connections -arrows B- fit correctly on all pull-springs -arrows A-.
- Replace any clutch pressure plates that have loose rivet connections -arrows B-.



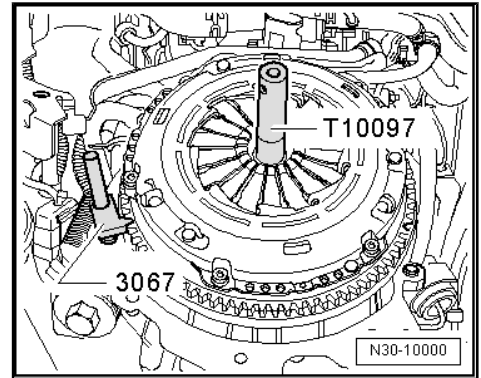
Only Check Position of Adjustment Mechanism with New Pressure Plates

- Both edges -A- of the adjusting ring must be located between both notches -arrows B-.
- If the adjusting ring takes on a different position with new pressure plates, pressure plate and clutch plate must not be installed.
- With used clutches, the adjusting ring may take on a position outside of the notches.

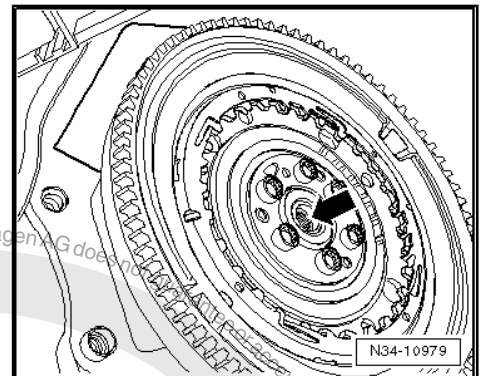




- Use the Flywheel Retainer - 3067- when installing.



Engines Having a Crankshaft With a Smaller Diameter -arrow-, or Engines Having a Needle Bearing -arrow- in the Crankshaft



Centering the Clutch Disc, Removing and Installing the Pressure Plate on Engines with a Crankshaft with a Smaller Diameter, or Engines with A Needle Bearing in the Crankshaft.



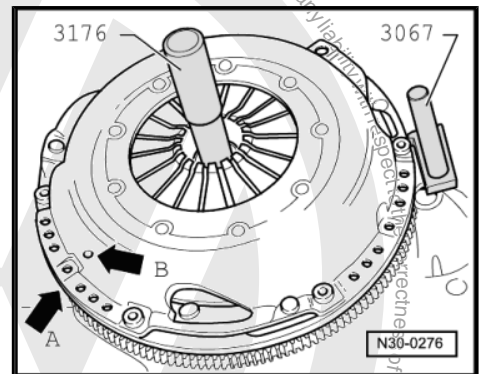
Note

Ignore arrows -A and B-.

Continuation for All

When Installing, Tighten Bolts as Follows So Pressure Plate Does Not Distort (Causing Shuddering On Acceleration):

- Install the pressure plate on the centering pins.
- Install all bolts evenly, by hand, until the bolt heads touch the clutch pressure plate.
- Tighten the bolt diagonally in small steps.
- Install the transmission. Refer to ["2.2 Transmission, Installing", page 85](#).



Tightening Specifications

- ◆ Refer to ["2.1.2 Overview - Clutch, with Dual Mass Flywheel, LuK", page 38](#).

2.2.3 Clutch, Removing and Installing, with Single Flywheel

Special tools and workshop equipment required

- ◆ Flywheel Retainer - 3067-
- ◆ Alignment Tool - Clutch Plate - T10097-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-



- ◆ Grease for Clutch Disc Shaft Splines - G 000 100-

Removing

- Transmission is removed.
- Insert the Flywheel Retainer - 3067- to loosen the bolts.

When Removing, Loosen the Bolts as Follows So That the Clutch Pressure Plate Does Not Distort (Causing Shuddering On Acceleration):

- Loosen all bolts clockwise one after the other in stages of 90° until clutch pressure plate is free.
- Remove the pressure plate and the clutch plate.

Installing

Install in reverse order of removal. Note the following:

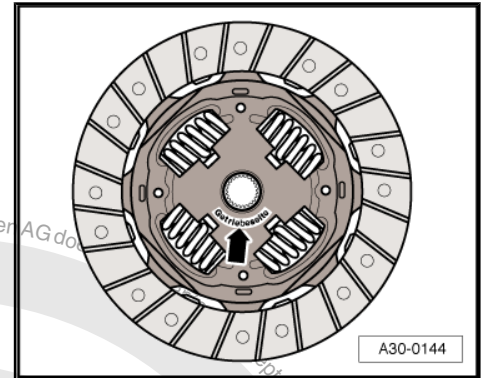


Note

- ◆ *Allocate clutch pressure plate and clutch plate according to the engine code. Refer to the Parts Catalog.*
- ◆ *Clean the input shaft splines and (on used clutch plates) the hub splines. Remove any corrosion and then apply a very thin coat of Grease for Clutch Disc Shaft Splines - G 000 100- on the splines. Then move the clutch plate back and forth on the input shaft until the hub moves freely on the shaft. Remove any excess grease.*
- ◆ *The clutch pressure plates are corrosion-protected and greased. With the exception of the friction surface on the clutch plate, do not clean the clutch pressure plate. This will shorten the service life of the clutch considerably.*
- ◆ *The friction surfaces on the clutch pressure plate and on the flywheel must be cleaned thoroughly (degreased).*
- ◆ *To reduce odor caused by a burnt clutch, thoroughly clean the transmission housing around the clutch as well as the engine on the transmission side.*
- ◆ *The clutch plate linings must sit completely on the flywheel and on the clutch pressure plate friction surface. Install the bolts.*
- ◆ *Tighten the bolts diagonally in small steps so as to not damage the centering holes in the pressure plate and the centering pins on the flywheel.*
- ◆ *Make sure the alignment sleeves for centering the engine/transmission are installed inside the cylinder block. Install them if necessary.*
- ◆ *If the alignment sleeves are missing, it will be difficult to shift, there will be clutch problems and the transmission may make noises (loose rattling).*

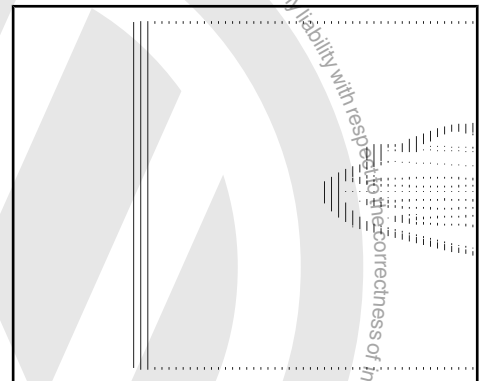


- Clutch plate installed location: The labeling "Getriebeseite" (transmission side) or the shorter end of the hub with the spring cage faces the pressure plate.



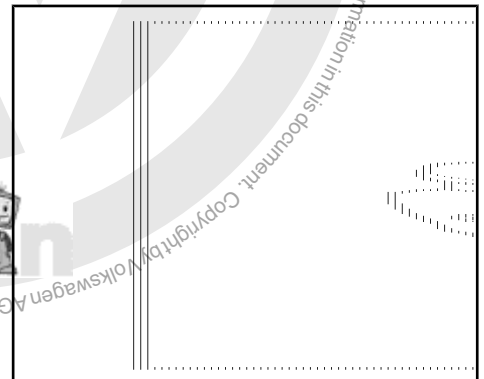
Check the Ends of the Diaphragm Spring

- Wear up to half the thickness of the diaphragm spring -arrows- is permitted.



Check the Spring Connection and Rivet Connections

- Check the spring connection between the pressure plate and the cover for cracks and make sure the rivet connections are tight.
- Replace the pressure plate if the springs are damaged or if the rivet connections -arrows- are loose.



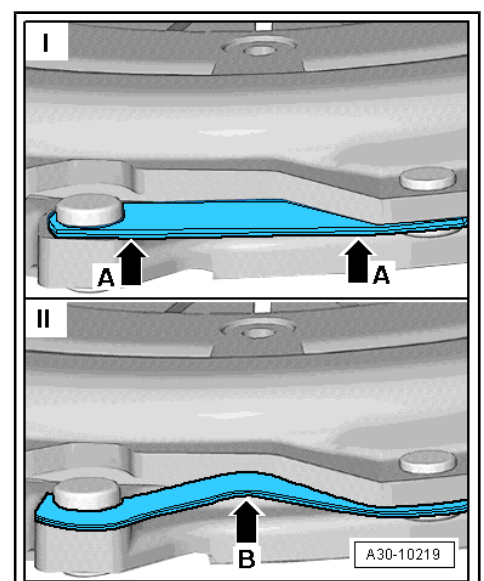
Checking the Pull-Springs and Rivet Connection

I - Pull-spring OK

- Slight offset in the outer area -arrows A-.

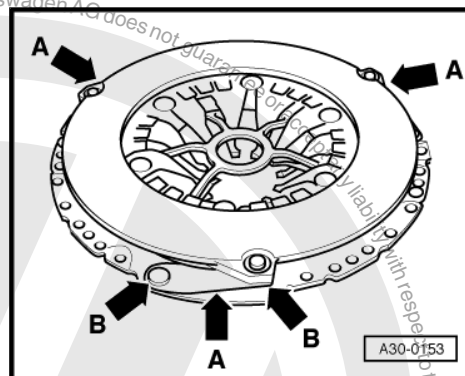
II - Pull-springs damaged

- The clutch pressure plates must be replaced if the pull-spring is bent or broken off -arrow B-.
- Check the spring connections -arrows A- for damage and make sure the rivet connections -arrows B- are tight.
- Replace a clutch pressure plate with severely kinked or broken spring connections and loose rivet connections.



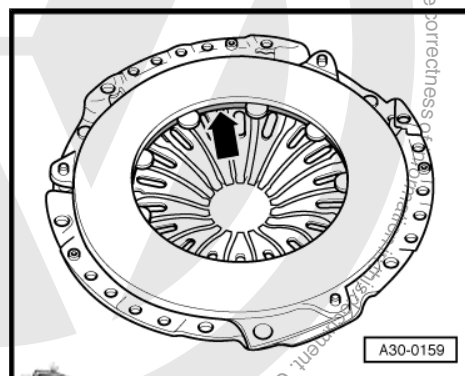


- Make sure the rivet connections -arrows B- fit correctly on all pull-springs -arrows A-.
- Tighten all bolts clockwise to the final tightening specification.
- Replace any clutch pressure plates that have loose rivet connections -arrow B-.



Checking the Metal Ring

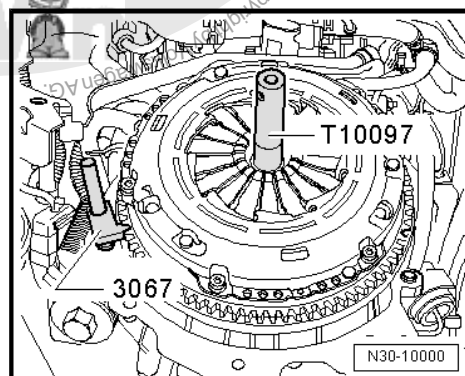
- Check the metal ring in the clutch pressure plate -arrow- for damage.
- Replace any clutch pressure plates that have a broken metal ring.



- Use the Flywheel Retainer - 3067- when installing.
- Tighten the bolt diagonally in small steps.
- Install the transmission. Refer to
⇒ [“2.2 Transmission, Installing”, page 85](#) .

Tightening Specifications

- ◆ Pressure plate on the flywheel. Refer to
⇒ [“2.1.3 Overview - Clutch, with Single Flywheel”, page 39](#) .

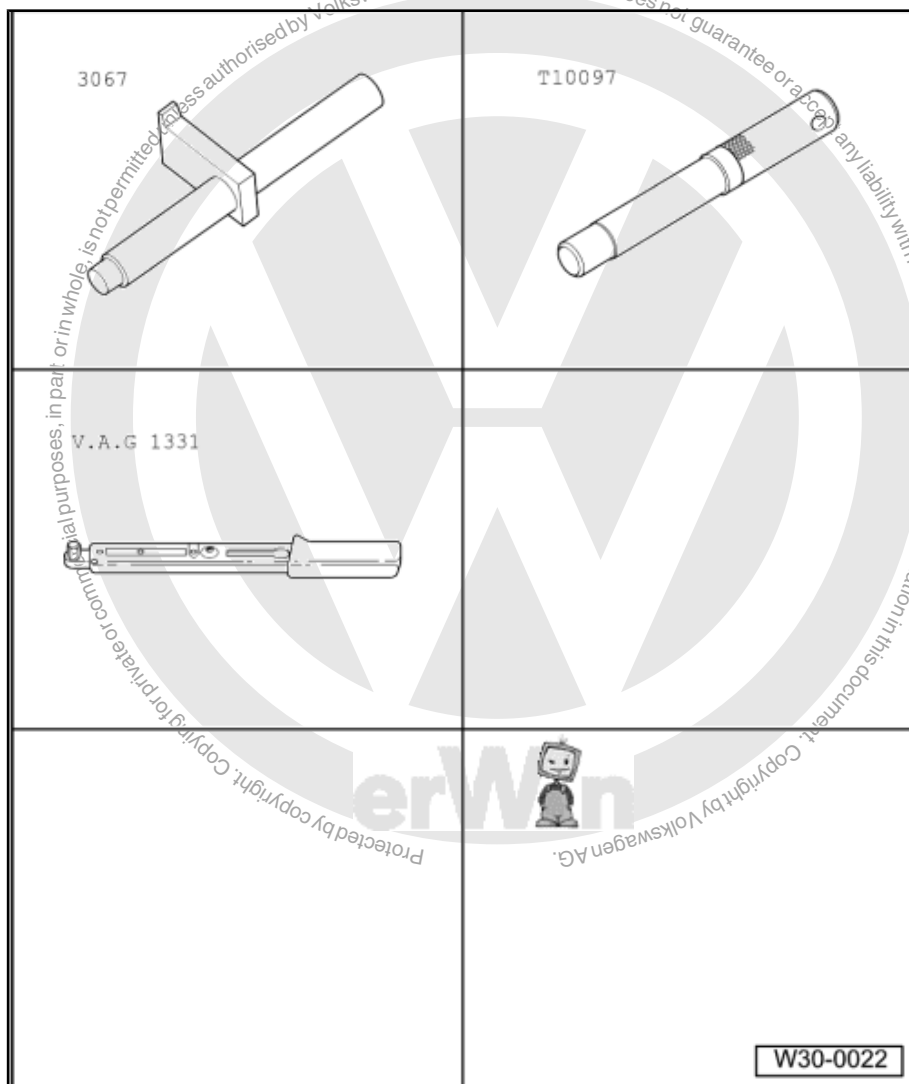




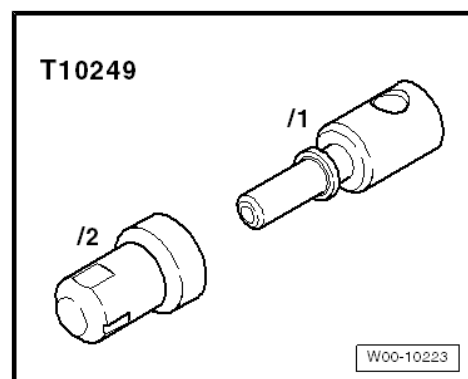
3 Special Tools

Special tools and workshop equipment required

- ◆ Flywheel Retainer - 3067-
- ◆ Alignment Tool - Clutch Plate - T10097-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Grease for Clutch Disc Shaft Splines - G 000 100-

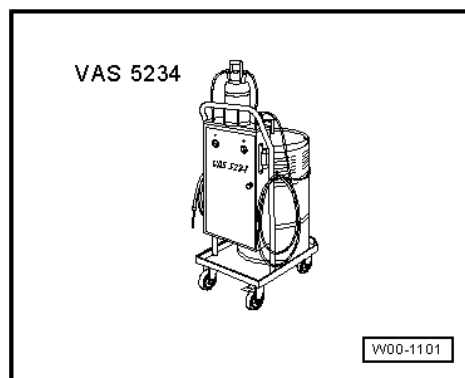


- ◆ Sealing Tool - T10249-

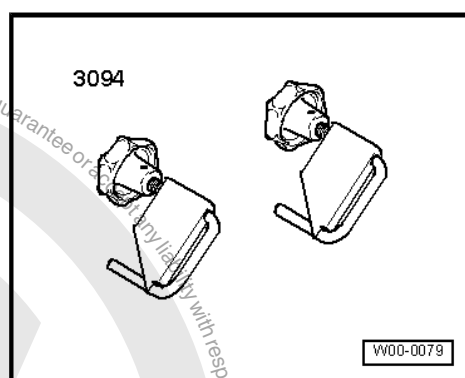




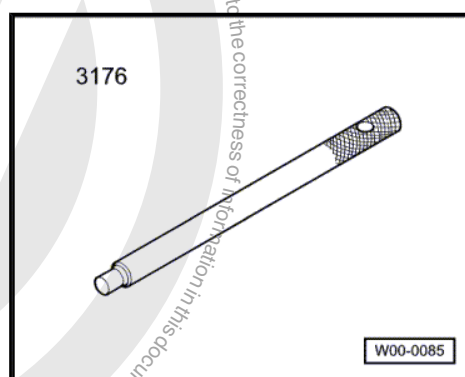
- ◆ Brake Charger/Bleeder Unit - VAS5234- or



- ◆ Hose Clamps - Up To 25 mm - 3094-



- ◆ Centering Pin - 3176- .





34 – Controls, Housing

1 Selector Mechanism

- ⇒ [“1.1 Selector Mechanism Installation Position”, page 53](#)
- ⇒ [“1.2 Overview - Gearshift Mechanism”, page 55](#)
- ⇒ [“1.3 Overview - Gearshift Knob and Cover”, page 56](#)
- ⇒ [“1.4 Overview - Gearshift Lever and Gearshift Housing”, page 57](#)
- ⇒ [“1.5 Overview - Operating Cables”, page 59](#)
- ⇒ [“1.6 Overview - Selector Mechanism”, page 61](#)
- ⇒ [“1.7 Gearshift Knob, Removing and Installing”, page 63](#)
- ⇒ [“1.8 Selector Mechanism, Disassembling and Assembling”, page 63](#)
- ⇒ [“1.9 Selector Mechanism, Removing and Installing”, page 68](#)
- ⇒ [“1.10 Gearshift Cable and Selector Cable, Removing and Installing”, page 74](#)
- ⇒ [“1.11 Selector Mechanism, Adjusting”, page 76](#)
- ⇒ [“1.12 Selector Mechanism, Checking”, page 78](#)
- ⇒ [“8.7 Selector Shaft Seal, Replacing”, page 114](#)

1.1 Selector Mechanism Installation Position

- Arrow A- Gearshift Lever Movement
- Arrow B- Selector Lever Movement



A - Gearshift Lever Cable

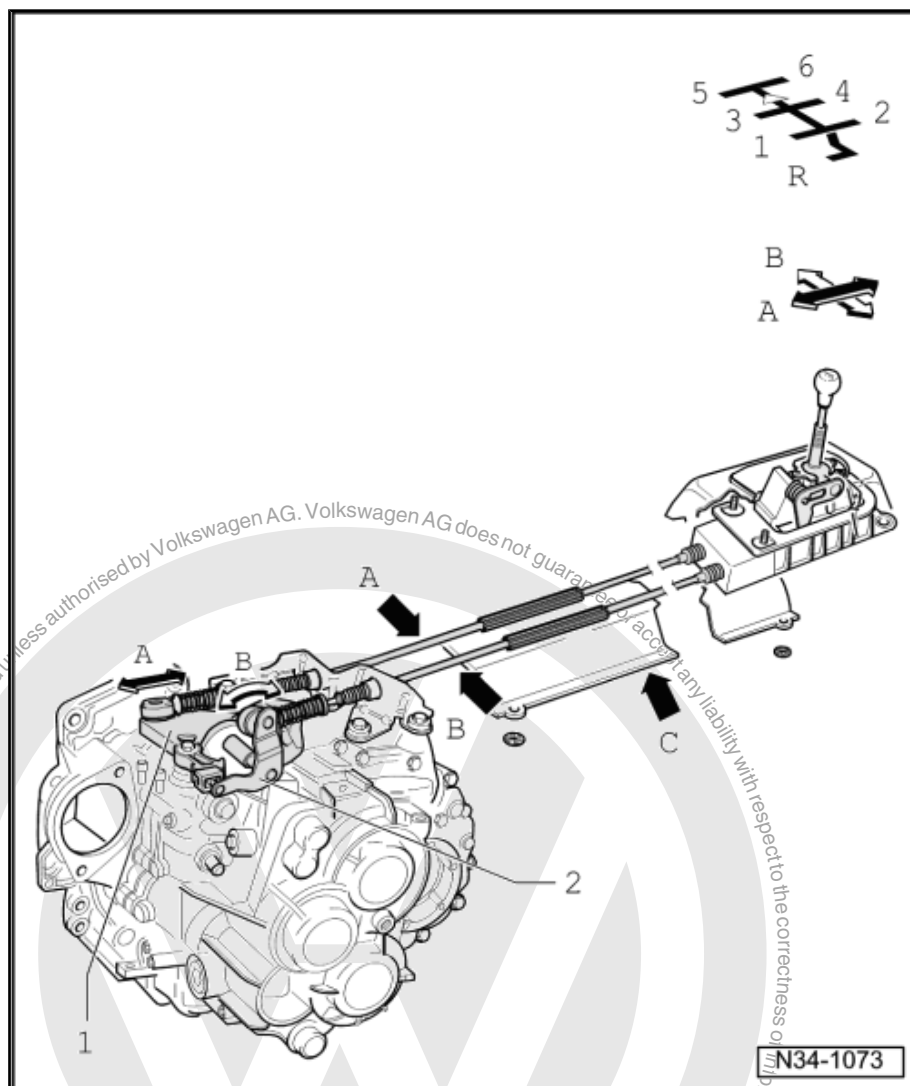
B - Selector Cable

C - Heat Shield

- ☐ Remove the gearshift mechanism before removal

1 - Gearshift Lever

2 - Selector Relay Lever





1.2 Overview - Gearshift Mechanism



Note

- ◆ Disconnect the battery ground cable when working on the gearshift mechanism inside the engine compartment. Refer to ⇒ *Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting* .
- ◆ Gearshift mechanism, removing and installing. Refer to ⇒ *"1.9 Selector Mechanism, Removing and Installing", page 68* .

I - Refer to

⇒ *"1.3 Overview - Gearshift Knob and Cover", page 56*

II - Refer to

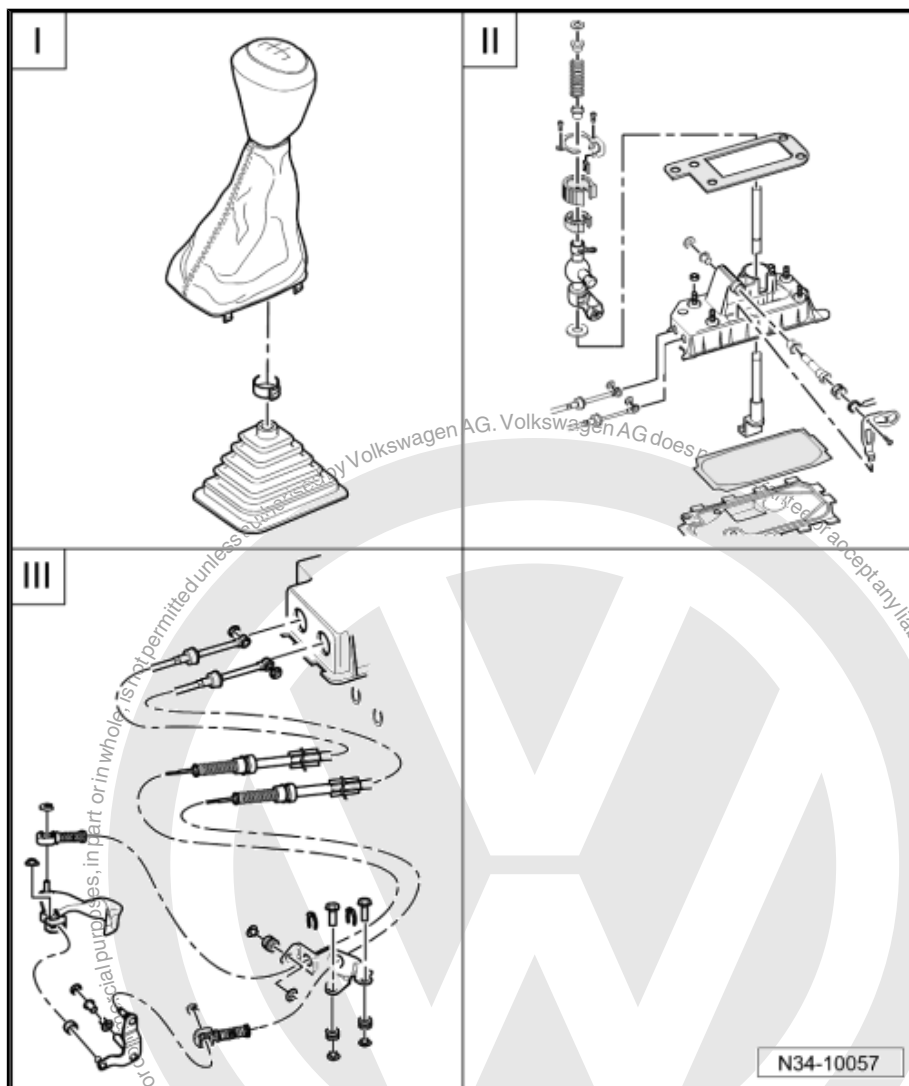
⇒ *"1.4 Overview - Gearshift Lever and Gearshift Housing", page 57*

III - Refer to

⇒ *"1.5 Overview - Operating Cables", page 59*

Refer to

⇒ *"1.6 Overview - Selector Mechanism", page 61*





1.3 Overview - Gearshift Knob and Cover

1 - Gearshift Housing with Gearshift Lever

2 - Nut

- ❑ M 6: 8 Nm
- ❑ M 8: 25 Nm

3 - Bracket

- ❑ For the center console
- ❑ Overview. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .

4 - Bracket

- ❑ for the center console
- ❑ Overview. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .

5 - Noise Insulation

6 - Badge

- ❑ Can be carefully pried off the plastic or leather gearshift knob using Trim Removal Wedge - 3409- .

7 - Gearshift Knob

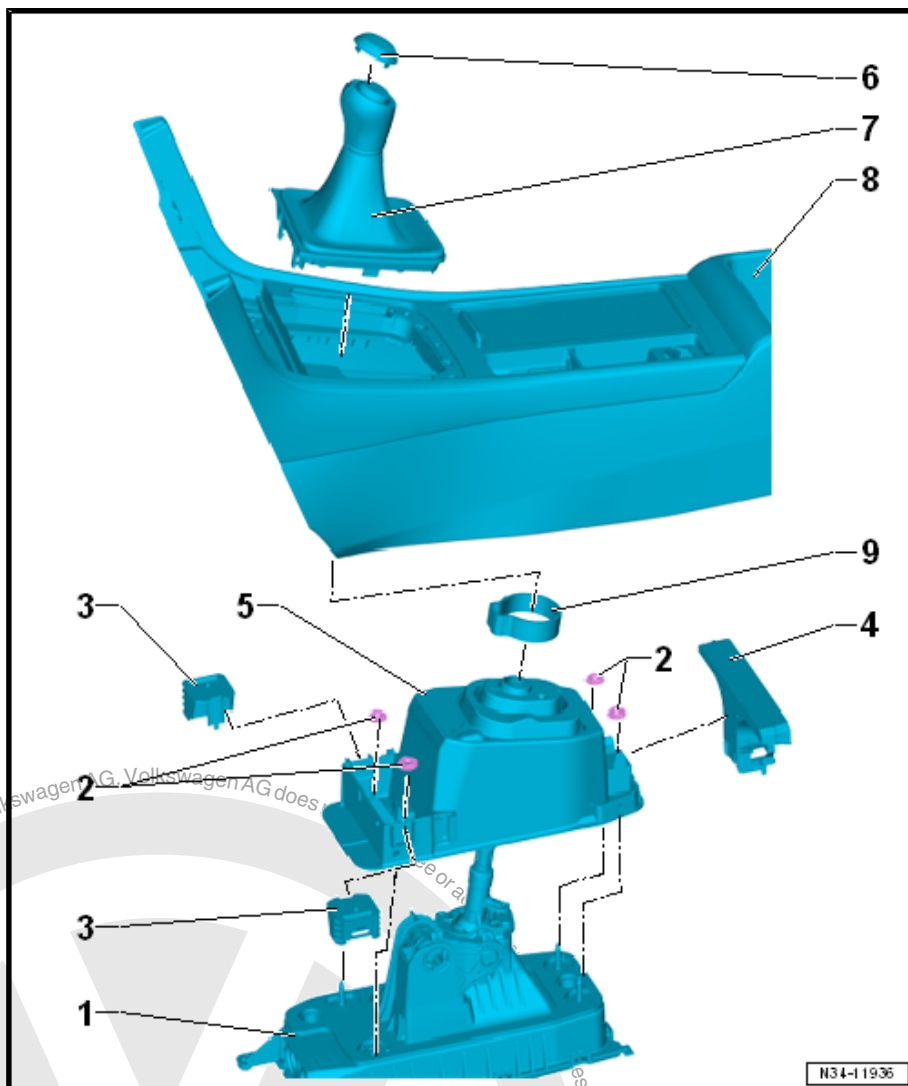
- ❑ With boot
- ❑ The shift knob and boot cannot be separated from each other.
- ❑ Always replace together
- ❑ Removing and installing. Refer to ⇒ ["1.7 Gearshift Knob, Removing and Installing", page 63](#) .

8 - Center Console

- ❑ Overview. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .

9 - Clamp

- ❑ For securing the shift knob to the shift lever
- ❑ Replace after removing
- ❑ Secure on the gearshift knob using Hose Clamp Pliers - VAG1275- .





1.4 Overview - Gearshift Lever and Gearshift Housing



Note

- ◆ Lubricate the bearing areas and the sliding surfaces.
- ◆ Grease allocation. Refer to the Parts Catalog.

1 - Base Plate

- ☐ Bend the tabs in order to remove
- ☐ Replace after removing
- ☐ Attached to the gearshift housing. Refer to [⇒ Fig. "Base Plate, Attaching to Gearshift Housing", page 67](#)

2 - Seal

- ☐ Replace after removing

3 - Gearshift Lever

- ☐ Can be removed and installed with the shift lever guide installed

4 - Washer

- ☐ Slide out of shift lever as far as stop -arrow-.

5 - Lock Washer

- ☐ Be careful not to damage the cables when removing them
- ☐ Replace after removing

6 - Selector Cable

- ☐ Pry off of selector bracket
- ☐ Press onto selector bracket inside the shift mechanism
- ☐ Installation position. Refer to [⇒ "1.1 Selector Mechanism Installation Position", page 53](#)

7 - Bushing

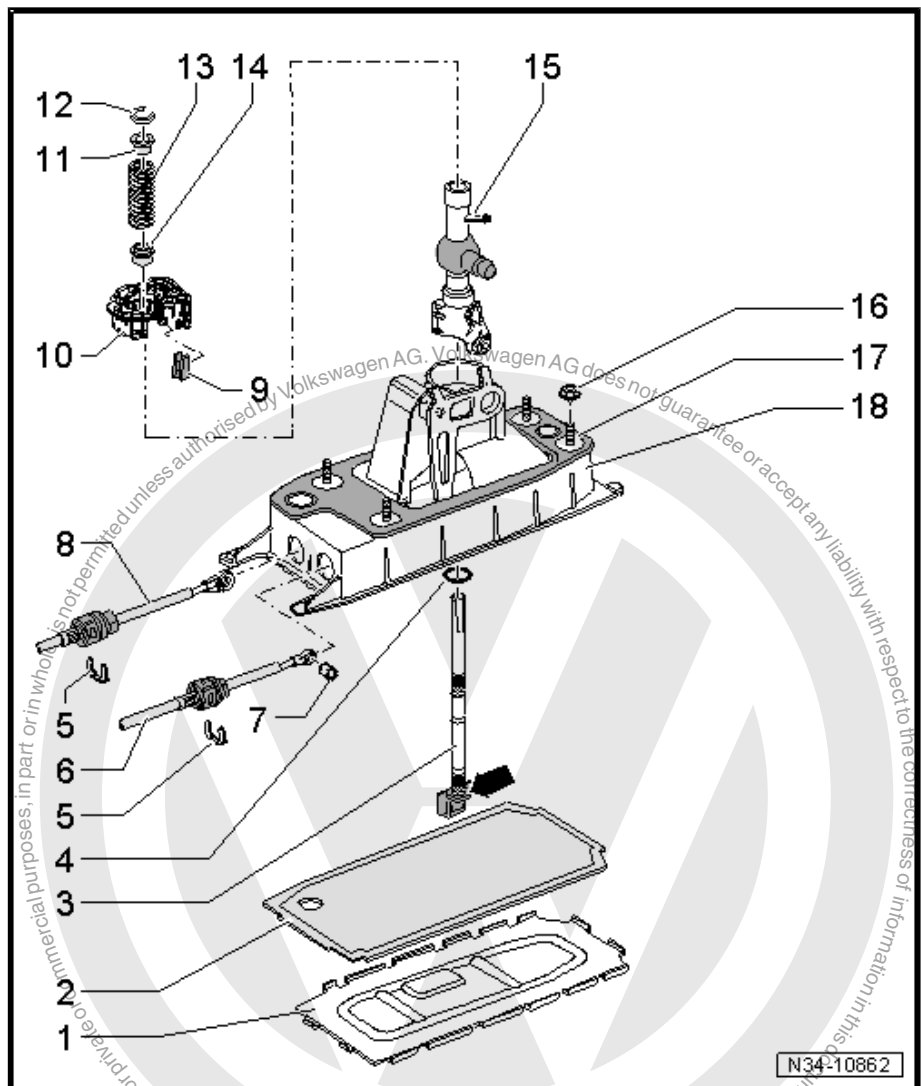
8 - Gearshift Cable

- ☐ Pry off of shift lever guide
- ☐ Press onto shift lever guide inside the shift mechanism
- ☐ Installation position. Refer to [⇒ "1.1 Selector Mechanism Installation Position", page 53](#)

9 - Insulation

10 - Bearing Shell

- ☐ Will get damaged when being removed
- ☐ Replace after removing





11 - Bushing

12 - Lock Washer

- ☐ Removing and installing. Refer to ➤ [Fig. "Removing and Installing the Lock Washer"](#), page 58 .

13 - Pressure Spring

14 - Bushing

15 - Gearshift Lever Guide

16 - Nut

- ☐ M 6: 8 Nm
- ☐ M8: 25 Nm
- ☐ Quantity: 4

17 - Seal

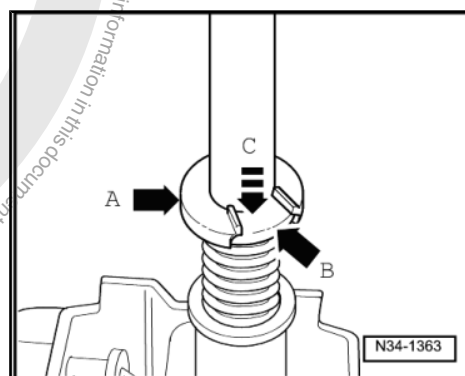
- ☐ Between the gearshift housing and the underbody
- ☐ Replace after removing the gearshift housing
- ☐ Self-adhesive
- ☐ Affix to the gearshift housing

18 - Selector Housing

- ☐ With spring and selector bracket
- ☐ Spring and selector bracket cannot be removed

Removing and Installing the Lock Washer

- Push the spacer bushing -arrow B- all the way in direction of -arrow C- and remove or install the lock washer -arrow A-.
- Do not tilt the bushing when pushing it down.
- The slot in the lever for the circlip must be visible.
- Carefully release the tension on the spring.





1.5 Overview - Operating Cables



Note

- ◆ Lubricate the bearing areas and the sliding surfaces.
- ◆ Grease allocation. Refer to the Parts Catalog.

1 - Gearshift Cable

- ☐ Attach to the cable retainer
- ☐ Installation position. Refer to
⇒ ["1.1 Selector Mechanism Installation Position", page 53](#)

2 - Selector Cable

- ☐ Attach to the cable retainer
- ☐ Installation position. Refer to
⇒ ["1.1 Selector Mechanism Installation Position", page 53](#)

3 - Selector Housing

4 - Lock Washer

- ☐ Replace after removing
- ☐ Be careful not to damage the cables when removing them

5 - Cable Mounting Bracket

- ☐ Adjust after installing the selector mechanism. Refer to
⇒ ["1.11 Selector Mechanism, Adjusting", page 76](#).

6 - Grommet

- ☐ Cable mounting bracket to transmission

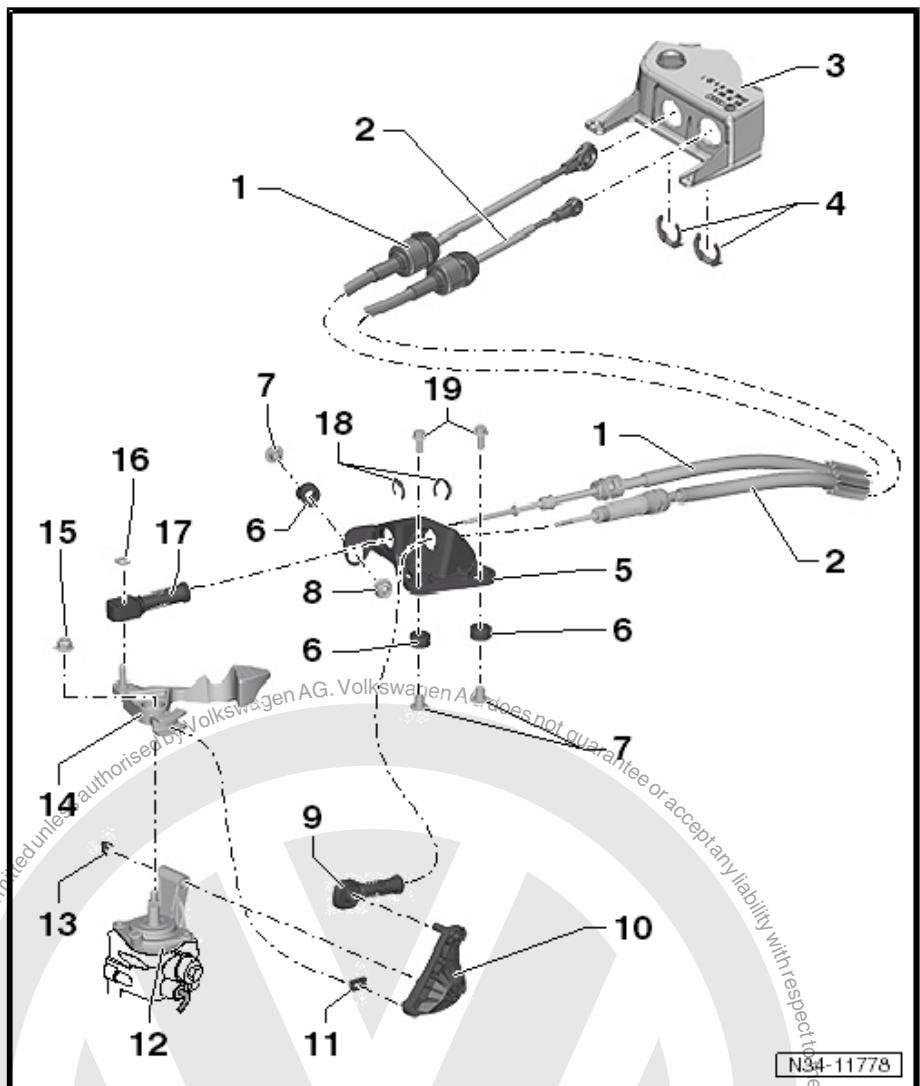
7 - Spacer

8 - Nut

- ☐ 20 Nm
- ☐ For the cable bracket

9 - Cable Retainer

- ☐ For attaching the selector cable to the selector relay lever
- ☐ Adjust the gearshift mechanism after installing. Refer to
⇒ ["1.11 Selector Mechanism, Adjusting", page 76](#).
- ☐ Do not interchange, cable locking mechanisms for selector cable on selector relay lever and for shift cable on transmission shift lever are different
- ☐ Allocation. Refer to ⇒ [Fig. "Cable Retainer Allocation", page 71](#).
- ☐ Remove from the selector relay lever. Refer to
⇒ [Fig. "Prying the Selector Cable Retainer Out of the Selector Relay Lever", page 70](#)





- ☐ Press onto selector relay lever. Refer to
⇒ [Fig. "Installing the Selector Cable Retainer on the Selector Relay Lever"](#) , page 71

10 - Selector Relay Lever

- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Installation position. Refer to
⇒ [Fig. "Selector Lever/Selector Relay Lever Installed Position"](#) , page 71
- ☐ Adjust the gearshift mechanism after installing. Refer to
⇒ ["1.11 Selector Mechanism, Adjusting"](#) , page 76 .
- ☐ Remove and install selector relay lever and cable retainer. Refer to
⇒ [Fig. "Remove and Install the Selector Relay Lever Together with the Cable Retainer"](#) , page 70

11 - Sliding Shoe

12 - Gearshift Shaft with Gearshift Cover

- ☐ (Shift unit)
- ☐ Selector shaft seal, removing and installing. Refer to
⇒ ["8.7 Selector Shaft Seal, Replacing"](#) , page 114 .

13 - Clip

- ☐ For the selector relay lever

14 - Gearshift Lever

- ☐ Installing. Refer to ⇒ [Fig. "Installing the Transmission Shift Lever"](#) , page 72 .
- ☐ Installation position. Refer to
⇒ [Fig. "Selector Lever/Selector Relay Lever Installed Position"](#) , page 71
- ☐ Adjust the gearshift mechanism after installing. Refer to
⇒ ["1.11 Selector Mechanism, Adjusting"](#) , page 76 .

15 - Nut

- ☐ 25 Nm
- ☐ Replace after removing
- ☐ Self-locking

16 - Lock Washer

- ☐ Replace after removing
- ☐ Removing. Refer to ⇒ [Fig. "Remove Shift Cable from Transmission Gearshift Lever"](#) , page 69 .

17 - Cable Retainer

- ☐ For attaching the shift cable to the transmission shift lever
- ☐ Adjust the gearshift mechanism after installing. Refer to
⇒ ["1.11 Selector Mechanism, Adjusting"](#) , page 76 .
- ☐ Do not interchange, cable locking mechanisms for selector cable on selector relay lever and for shift cable on transmission shift lever are different. Refer to ⇒ [Fig. "Cable Retainer Allocation"](#) , page 71

18 - Lock Washer

- ☐ Replace after removing
- ☐ Be careful not to damage the cables when removing them

19 - Bolt

- ☐ 20 Nm
- ☐ For the cable bracket
- ☐ Quantity: 2



1.6 Overview - Selector Mechanism



Note

- ◆ Lubricate the bearing areas and the sliding surfaces.
- ◆ Grease allocation. Refer to the Parts Catalog.

1 - Gearshift Shaft with Gearshift Cover

2 - Clip

- ☐ For the selector relay lever

3 - Seal

- ☐ Replacing. Refer to
⇒ ["8.7 Selector Shaft Seal, Replacing"](#),
page 114.

4 - Gearshift Lever

- ☐ Insert so that master spline aligns with shift rod. Refer to
⇒ [Fig. "Installing the Transmission Shift Lever"](#), page 72
- ☐ To install, lubricate
- ☐ Adjust the gearshift mechanism after installing. Refer to
⇒ ["1.11 Selector Mechanism, Adjusting"](#),
page 76.
- ☐ Installation position. Refer to
⇒ [Fig. "Selector Lever/Selector Relay Lever Installed Position"](#),
page 71

5 - Nut

- ☐ 25 Nm
- ☐ Replace after removing
- ☐ Self-locking

6 - Cable Retainer

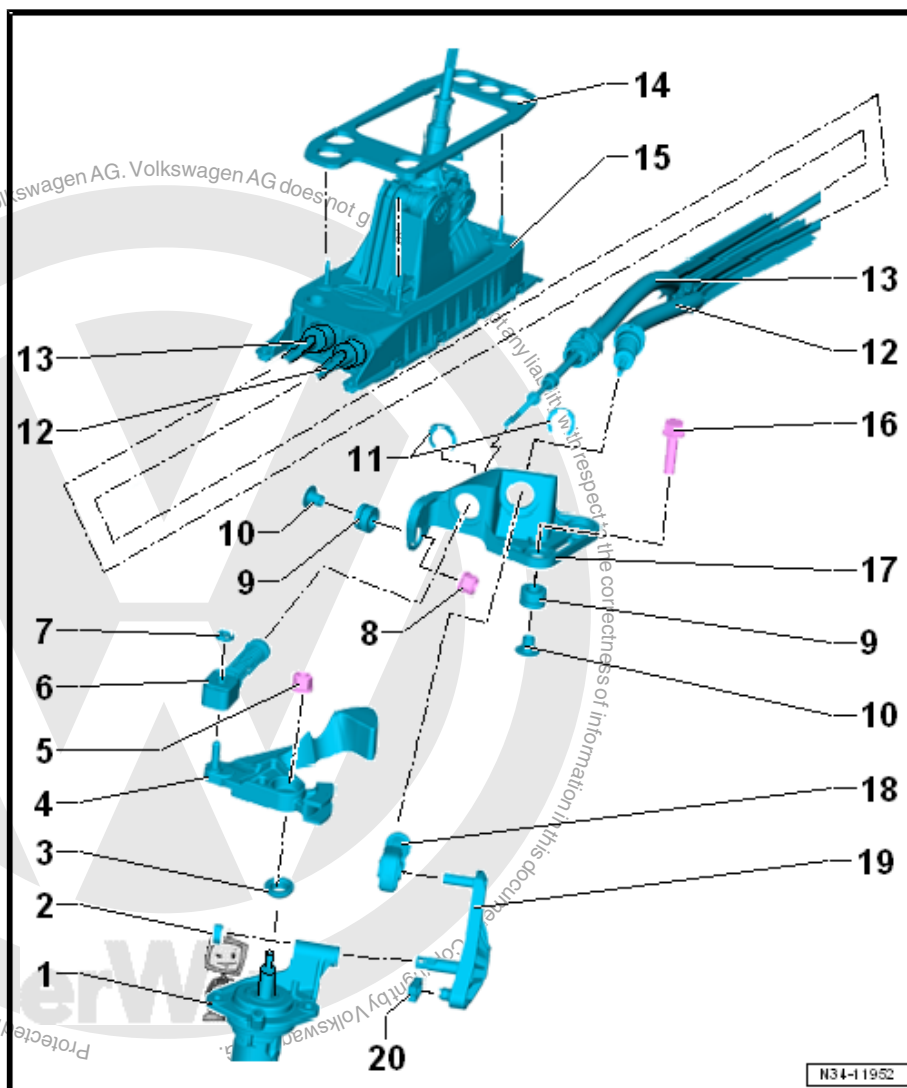
- ☐ For attaching the shift cable to the transmission shift lever
- ☐ Adjust the gearshift mechanism after installing. Refer to
⇒ ["1.11 Selector Mechanism, Adjusting"](#), page 76.
- ☐ Do not interchange, cable locking mechanisms for selector cable on selector relay lever and for shift cable on transmission shift lever are different
- ☐ Allocation. Refer to ⇒ [Fig. "Cable Retainer Allocation"](#), page 71.

7 - Lock Washer

- ☐ Replace after removing

8 - Nut

- ☐ 20 Nm
- ☐ For the cable bracket





9 - Grommet

- ☐ Quantity: 3
- ☐ Cable mounting bracket to transmission

10 - Spacer

- ☐ Quantity: 3

11 - Lock Washer

- ☐ Replace after removing
- ☐ Be careful not to damage the cables when removing them

12 - Selector Cable

- ☐ Attach to the cable retainer
- ☐ Installation position. Refer to [⇒ "1.1 Selector Mechanism Installation Position", page 53](#)

13 - Gearshift Cable

- ☐ Attach to the cable retainer
- ☐ Installation position. Refer to [⇒ "1.1 Selector Mechanism Installation Position", page 53](#)

14 - Seal

- ☐ Between the gearshift housing and the underbody
- ☐ Replace after removing the gearshift housing
- ☐ Self-adhesive
- ☐ Affix to the gearshift housing

15 - Selector Housing

16 - Hex Bolt

- ☐ 20 Nm
- ☐ For the cable bracket
- ☐ Quantity: 2

17 - Cable Mounting Bracket

- ☐ Adjust after installing the selector mechanism. Refer to [⇒ "1.11 Selector Mechanism, Adjusting", page 76](#).

18 - Cable Retainer

- ☐ For attaching the selector cable to the selector relay lever
- ☐ Adjust the gearshift mechanism after installing. Refer to [⇒ "1.11 Selector Mechanism, Adjusting", page 76](#).
- ☐ Do not interchange, cable locking mechanisms for selector cable on selector relay lever and for shift cable on transmission shift lever are different
- ☐ Allocation. Refer to [⇒ Fig. "Cable Retainer Allocation", page 71](#).
- ☐ Remove from the selector relay lever. Refer to [⇒ Fig. "Prying the Selector Cable Retainer Out of the Selector Relay Lever", page 70](#)
- ☐ Press onto selector relay lever. Refer to [⇒ Fig. "Installing the Selector Cable Retainer on the Selector Relay Lever", page 71](#)

19 - Selector Relay Lever

- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Installation position. Refer to [⇒ Fig. "Selector Lever/Selector Relay Lever Installed Position", page 71](#)
- ☐ Adjust the gearshift mechanism after installing. Refer to [⇒ "1.11 Selector Mechanism, Adjusting", page 76](#).
- ☐ Remove and install selector relay lever and cable retainer. Refer to [⇒ Fig. "Remove and Install the Selector Relay Lever Together with the Cable Retainer", page 70](#)



1.7 Gearshift Knob, Removing and Installing

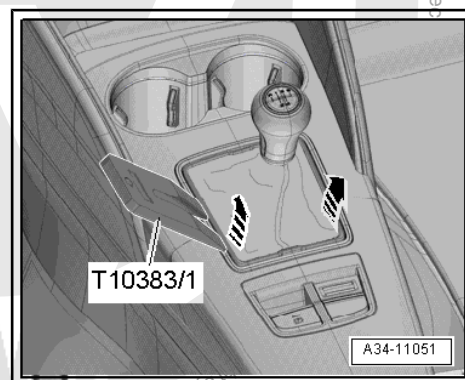
Special tools and workshop equipment required

- ◆ Hose Clip Pliers - VAG1275A-
- ◆ Wedge Set - T10383-
- ◆ or the equivalent equipment, Backrest Panel Tool - 3370-

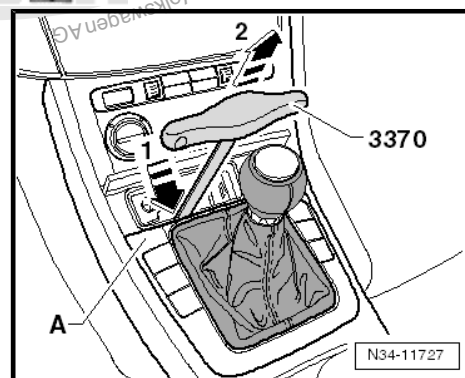
Removing

- Use the Wedge Set - Wedge 1 - T10383/1- to carefully pry out the selector lever boot from the center console insert in direction of -arrows-.

or



- Open the ashtray.
- Push the Backrest Panel Tool - 3370- as illustrated, under the plastic frame for the boot -arrow 1- until stop.
- Remove boot with plastic frame from center console frame -A- -arrow 2-
- Roll the selector lever boot up over the gearshift knob.

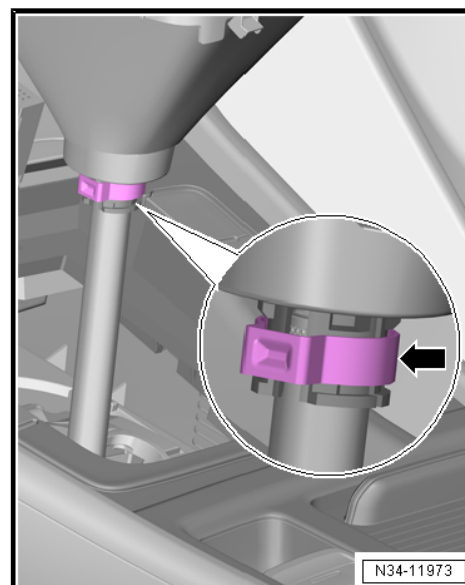


- Open the clamp -arrow- and remove the gearshift lever knob with the shift lever boot.

Installing

Install in reverse order of removal. Note the following:

- Press the gearshift knob and the selector lever boot all the way up on the gearshift lever.
- Secure the gearshift knob with clamp -arrow- on the shift lever (see previous illustration). Use the Hose Clamp Pliers - VAG1275- to do this.



1.8 Selector Mechanism, Disassembling and Assembling

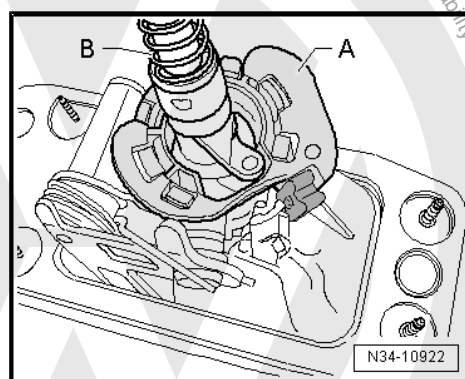
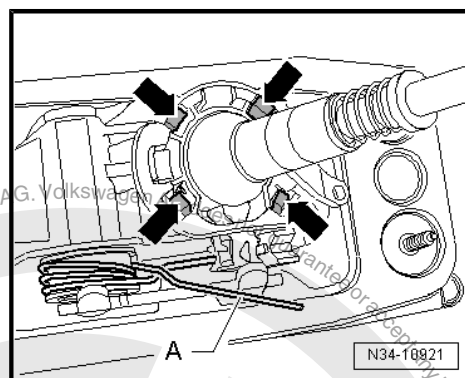
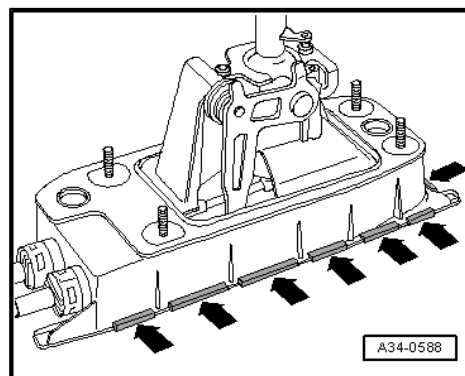
Special tools and workshop equipment required



- ◆ Window Release Tool - T10236-
- ◆ Press Piece - Multiple Use - VW412-
- ◆ Over-Center Spring Assembly Tool - T10178-
- ◆ Engine Support Bridge - Engine Support 25 - 10-222A/25-
- ◆ 2 = Counter-Support for example, from -Kukko- model line 16
- ◆ Wedge - T10357-
- ◆ Press Piece - Block - T10083-

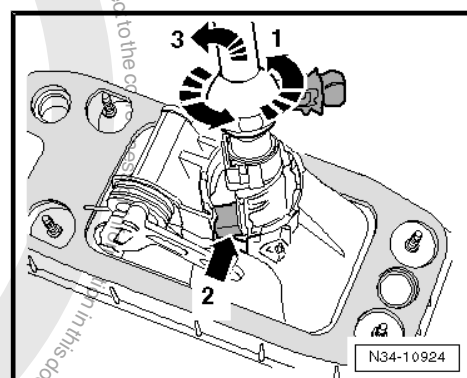
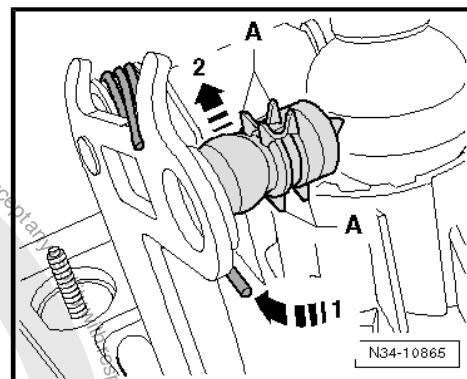
Disassembling

- Remove the gearshift mechanism. Refer to
⇒ ["1.9 Selector Mechanism, Removing and Installing",
page 68](#) .
- Remove the seal from the gearshift housing.
- Bend open the tabs -arrows- on the base plate with a screwdriver. (Only the tabs on the left side of the base plate are shown in the illustration).
- Remove the base plate.
- Remove the shift cable and the selector cable from the shift housing. Refer to
⇒ ["1.10 Gearshift Cable and Selector Cable, Removing and Installing", page 74](#) .
- Lift the upper end -A- of the pressure spring over the tab on the selector bracket.
- Using a screwdriver, press bearing shell notches -arrows- in direction of shift lever guide bearing; break of notches if necessary.
- Pry out bearing shell -A- with shift lever guide -B- from selector housing.
- Then press bearing shell off shift lever guide bearing and remove.





- Pay attention to the guides -A- in the next work procedure.
- The guides must not break off.
- Lift the bottom end in direction of -arrow 1- of the pressure spring onto shoulder on selector bracket.
- Now raise shift lever guide up as far as stop and remove ball studs from selector bracket in direction of -arrow 2-.
- Turn the shift lever guide in direction of -arrow 1-.
- The pins -arrow 2- must be in the shift housing opening.
- Move the gearshift lever guide and the gearshift lever in the direction of -arrow 3-.



Assembling



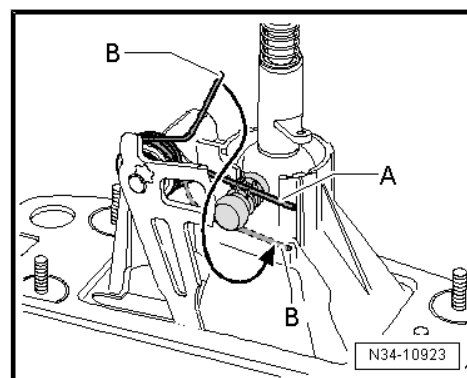
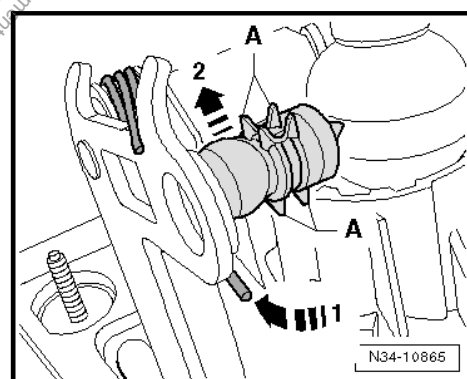
Caution

The lower side of the spring in direction of -arrow 1- can spring down uncontrolled from the selector bracket shoulder during subsequent handling.

- Push the lower end carefully from the selector bracket shoulder.

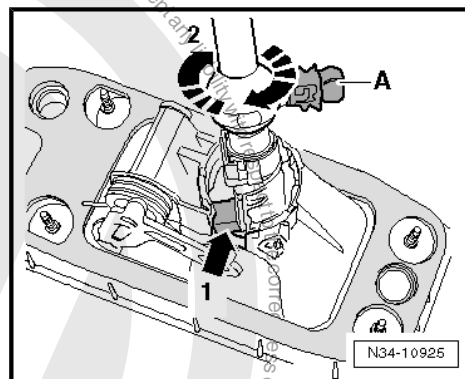
The spring sides then twist “diagonally” with a loud noise.

- Release the tension on the ends -A and B- by turning both ends to the right.
- The ends -A and B- must face in the opposite direction.

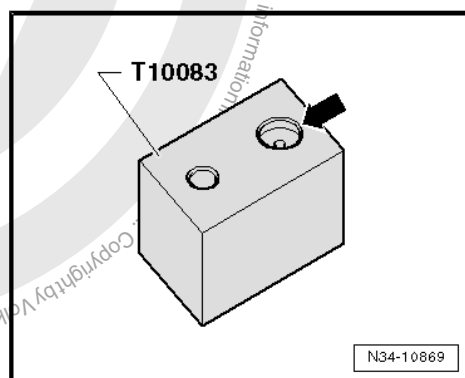




- Install the shift lever guide into the shift housing.
- The pins -arrow 1- are still located in the shift housing opening.
- Turn the shift lever guide in direction of -arrow 2- until the ball stud -A- is above the opening in the shift housing.



- Place the shift housing with the shift lever guide into the larger cavity -arrow- in the Press Piece - Block - T10083- .



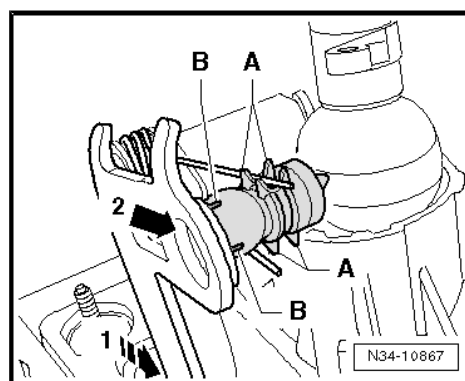
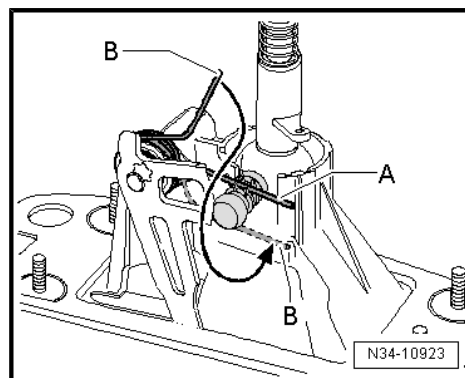
- The shift lever guide must project out of selector housing as far as stop.



Note

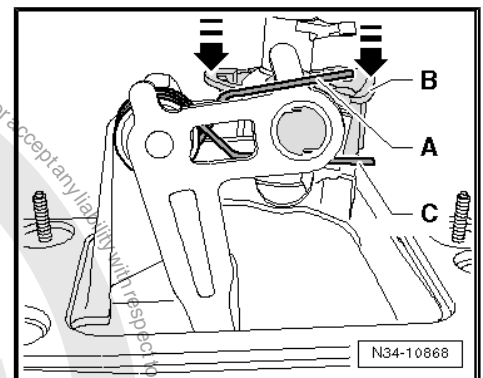
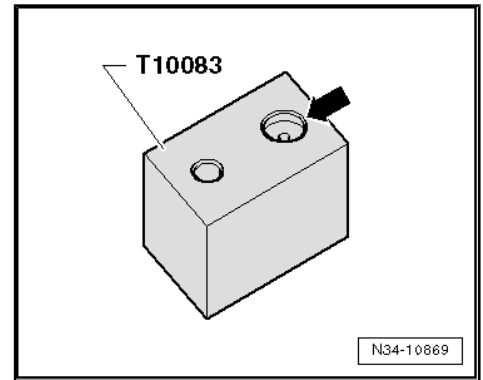
The selector bracket is only partially shown to provide a better illustration.

- Insert the end -A- of the pressure spring into the guide from the top.
- Pull the end -B- of the pressure spring downward and insert it next to the guide (toward the ball head).
- Carefully remove the shift housing and shift lever guide from the Press Piece - Block - T10083- .
- Move the selector bracket all the way to the rear opposite mounting holes for shift and selector cable in direction of -arrow 1-.
- Grease the ball stud.
- Press the ball stud into the selector bracket -arrow 2-.
- The guides -A- and the tabs -B- must not be damaged.





- Place the shift housing with the shift lever guide into the larger cavity -arrow- in the Press Piece - Block - T10083- .
- The shift lever guide must project out of selector housing as far as stop.
- Pry the upper end -A- of the pressure spring over the pin on the selector bracket.
- Use a new bearing shell -B-.
- Grease the bearing shell and the shift lever guide bearing.
- Press the bearing shell all the way onto the shift lever guide bearing.
- Remove the shift housing from the Press Piece - Block - T10083- .
- Insert the bottom end -C- of the pressure spring into the guide.
- Pry the upper end -A- of the pressure spring over the pin on the selector bracket.
- Push the bearing shell into the shift housing in direction of -arrows-.
- All retaining tabs must engage.
- Install the shift cable and selector cable. Refer to [⇒ “1.4 Overview - Gearshift Lever and Gearshift Housing”, page 57](#).



Base Plate, Attaching to Gearshift Housing

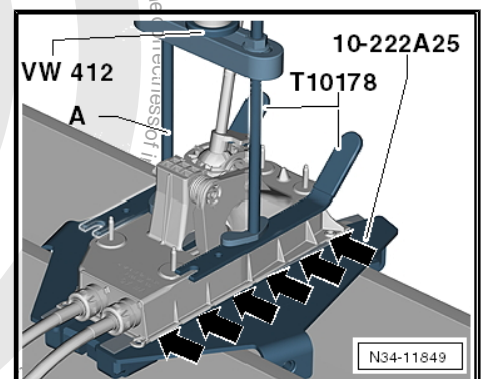
- Install a new seal on the base plate.



Caution

There is a danger of causing damage to the gearshift housing and base plate.

Tension the gearshift housing only slightly.



- Bend the tabs -arrow- back over all around the base plate to secure it (only the tabs on the left side of the base plate are shown in the illustration).
- The tabs can be bent back over using the Wedge - T10357- .
- A- = Counter-Support for example, from -Kukko- model line 16
- Glue a new seal on the gearshift housing. Refer to [⇒ “1.4 Overview - Gearshift Lever and Gearshift Housing”, page 57](#) .
- Install the gearshift mechanism. Refer to [⇒ “1.9 Selector Mechanism, Removing and Installing”, page 68](#) .
- Adjust the gearshift mechanism. Refer to [⇒ “1.11 Selector Mechanism, Adjusting”, page 76](#) .



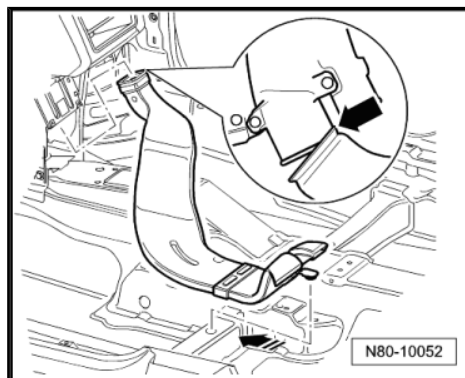
1.9 Selector Mechanism, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331-

Removing

- Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .
- Remove the boot and the gearshift knob and, if necessary, remove the noise insulation from the center console frame as well. Refer to
⇒ ["1.7 Gearshift Knob, Removing and Installing", page 63](#) .
- Remove the center console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Center Console, Removing and Installing .
- Remove rear channel footwell. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Air Routing; Overview - Air Routing and Air Distribution in Passenger Compartment .
- Remove center console mounting bracket nuts. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Center Console Bracket, Removing and Installing .
- Remove the nuts from the gearshift housing. Refer to
⇒ [Fig. "Installed Position of Gearshift Housing Nuts -arrows-"](#), [page 68](#) .
- Lower the gearshift housing.
- If it is not possible to lower the gearshift housing, then the nuts on the gearshift housing are located under the bracket on the center console.
- Then remove the center console mounting bracket. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Center Console Bracket, Removing and Installing .

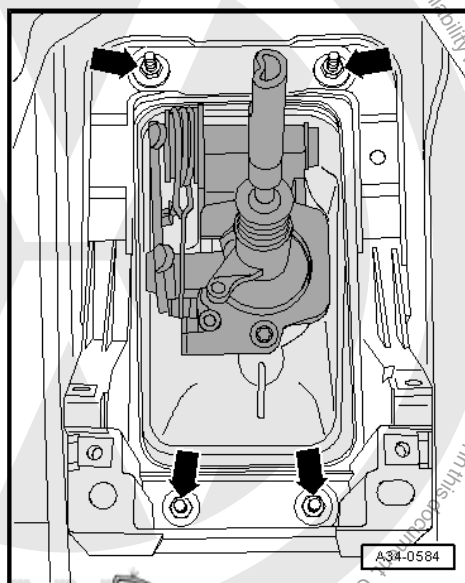


If the Center Console Bracket Cannot be Removed Separately:

- Remove the center console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Center Console, Removing and Installing .

Installed Position of Gearshift Housing Nuts -arrows-.

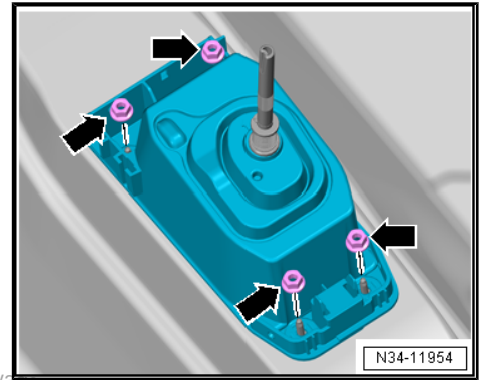
- Remove the nuts -arrows-.
- Remove center console and center console mounting bracket. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- Remove rear channel footwell. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Air Routing; Overview - Air Routing and Air Distribution in Passenger Compartment .





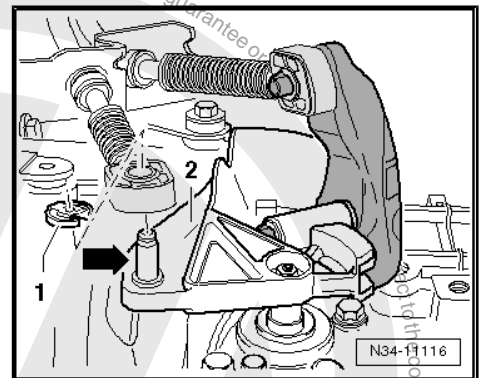
Installed Position of Noise Insulation and Gearshift Housing Nuts -arrows-.

- Remove noise insulation and gearshift housing nuts -arrows-.
- Remove noise insulation from the gearshift housing. Refer to ➔ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- Remove the entire air filter housing if it is located above the gearshift mechanism.
- Refer to ➔ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .



Remove Shift Cable from Transmission Gearshift Lever

- Lift the clamp and remove the lock washer -1- for the shift cable from the gearshift lever -2-.
- Remove the shift cable from the pin -arrow- from the gearshift lever -2-.



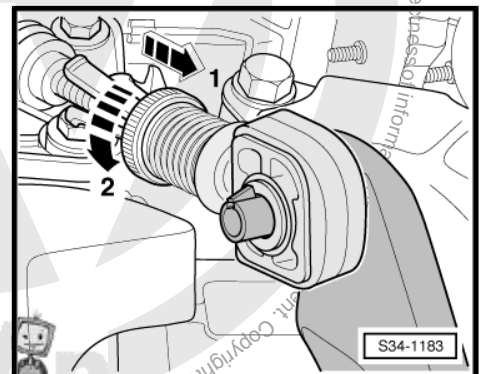
Disconnecting the Cable Retainer from the Selector Cable

- Pull the securing mechanism all the way forward in direction of -arrow 1- and then unlock to the left in direction of -arrow 2-.
- Push the selector relay lever forward and guide the selector cable out of the cable retainer.



Note

The cable retainer may be removed only when the selector relay lever is removed. Refer to
➔ Fig. "Prying the Selector Cable Retainer Out of the Selector Relay Lever", page 70 .





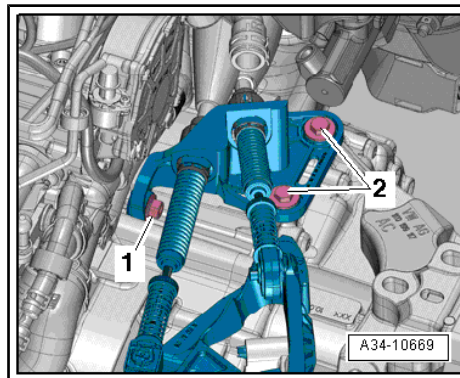
- Remove cable bracket from transmission (nut -1- and bolts -2-).



Caution

There is a risk of damaging the exhaust pipe decoupling element.

- ♦ **Pay attention. Refer to ➔ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 ; Emissions Control; Overview - Emissions Control .**



- Remove the exhaust pipe under the gearshift mechanism. Refer to ➔ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 ; Exhaust Pipes/Mufflers .
- Remove the heat shield under the gearshift mechanism. Refer to ➔ Body Exterior; Rep. Gr. 66 ; Molding/Trim/Extensions/Trim Panels; Floor Heat Shield, Removing and Installing .
- Pivot shift housing downward and remove with cables.

Remove and Install the Selector Relay Lever Together with the Cable Retainer

Removing

- Remove the clip -arrow 1- and then remove the selector relay lever together with the cable retainer -arrow 2-.

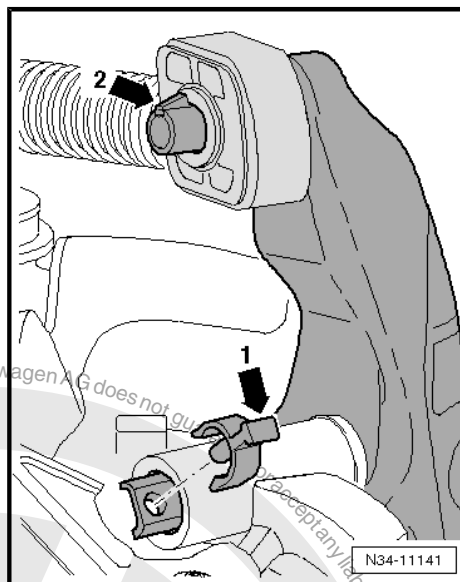
Installing



Note

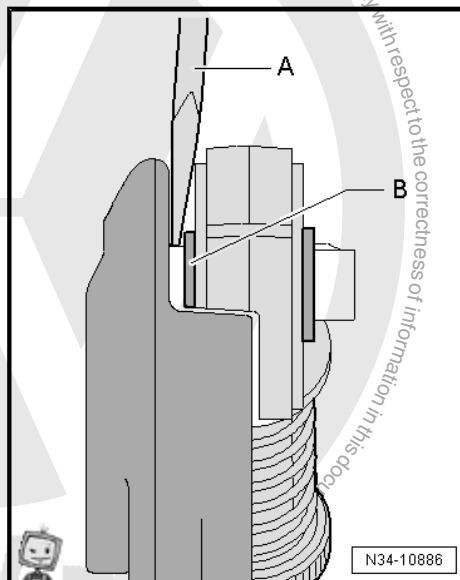
Lubricate the bearing areas and the sliding surfaces. Grease allocation. Refer to the Parts Catalog.

- Install the selector relay lever and cable retainer -arrow 2- all the way into the gearshift cover.
- Install the clip -arrow 1- and make sure it is locked into place.



Prying the Selector Cable Retainer Out of the Selector Relay Lever

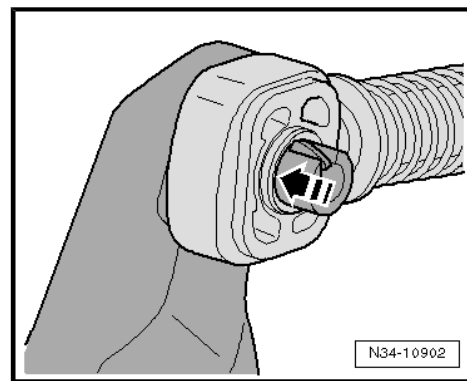
- The selector relay lever is removed.
- Insert a screwdriver -A- between the bushing -B- and the selector relay lever.





Installing the Selector Cable Retainer on the Selector Relay Lever

- The selector relay lever is removed.
- Lubricate cable retainer locating bore
- Grease allocation. Refer to the Parts Catalog.
- The cable retainer may only be installed at the bushing -arrow-.
- The cable retainer must move freely on the selector relay lever.
- The cable retainer must be behind the tab.
- Make sure it engages securely.

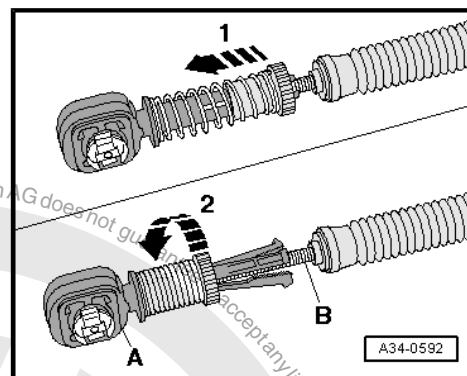


Removing the Cable Retainer from the Gearshift Cable and Selector Cable

- Pull the safety mechanism all the way forward in direction of -arrow 1- and lock it in direction of -arrow 2-.
- Remove the cable -B- from the cable retainer -A-.

Shift Mechanism, Installing

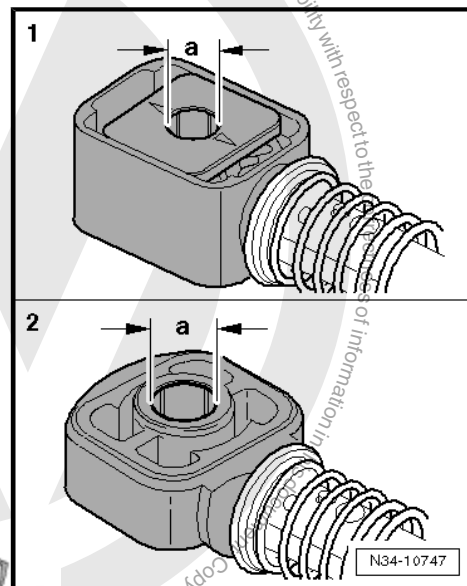
Install in reverse order of removal. Note the following:



Cable Retainer Allocation

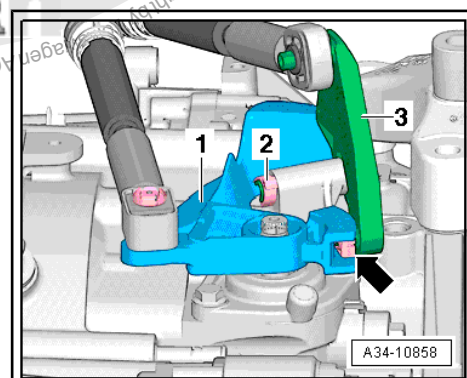
These holes have different diameters.

Cable Retainer for:	Dimension "a"
-1- Shift cable to gearshift lever	8.5 mm
-2- selector cable to selector relay lever	10 mm



Selector Lever/Selector Relay Lever Installed Position

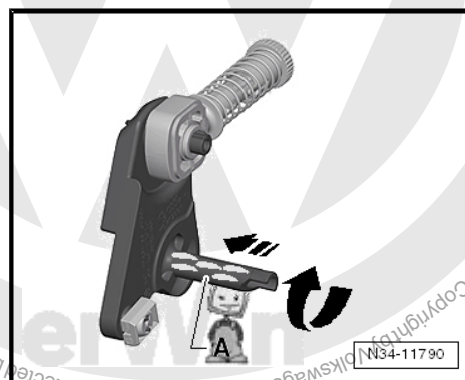
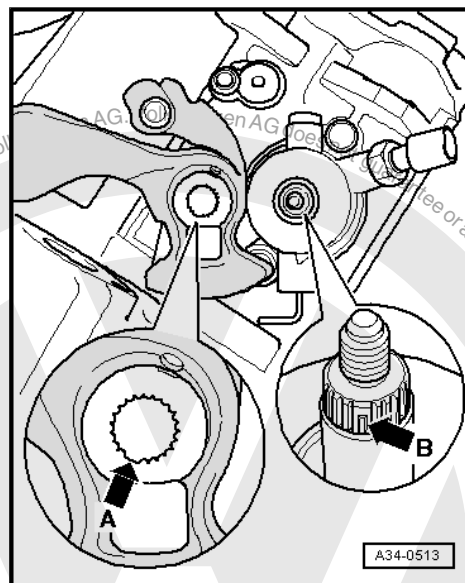
- 1 - Gearshift lever
- 2 - Clip
- 3 - The selector relay lever fits into the sliding rail on the transmission selector lever via the sliding shoe -arrow-.



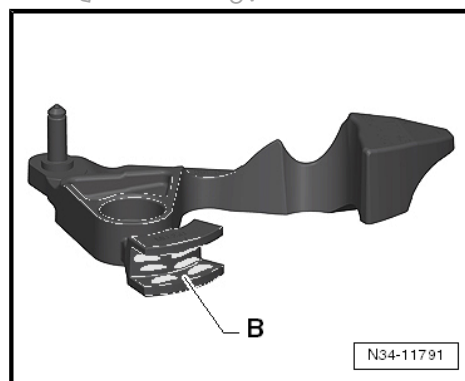


Installing the Transmission Shift Lever

- When positioning the transmission shift lever, make sure the tooth gap -arrow A- is placed over the missing selector shaft teeth -arrow B-.



- Lubricate the following areas very carefully when installing.
- Selector relay lever shaft -A- in direction of -arrows-.
- Gearshift lever glide track -B-, fits into the selector relay lever.
- Cable retainer locating bore.
- Grease allocation. Refer to the Parts Catalog.
- The selector relay lever and gearshift lever in the illustration may differ from the Original Part.
- Replace the gasket on the gearshift housing.
- Align the shift housing so that it is parallel to the body.
- The distance on both sides to the body must be equal.
- Install the gearshift housing.

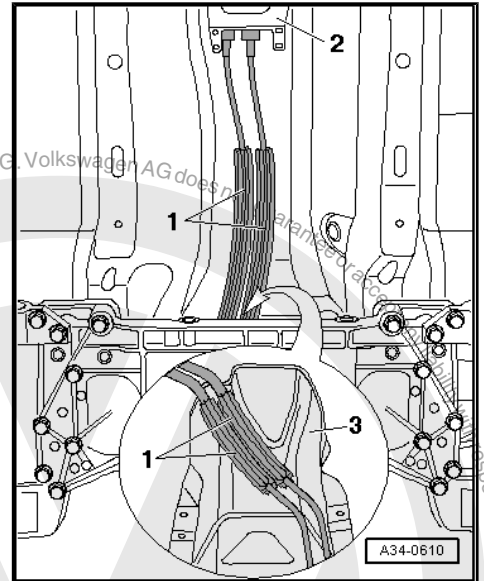




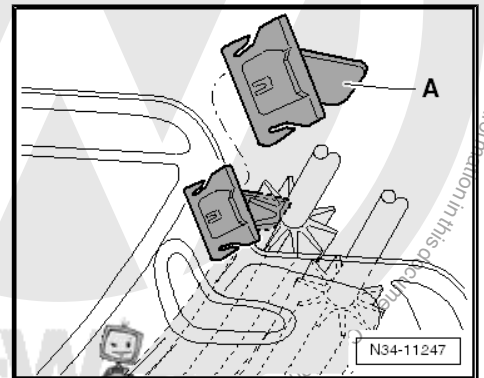
- Route the cables -1- from the gearshift mechanism -2- to the transmission as follows:
- The cables must run parallel to each other and must not cross each other.
- The cables must be routed inside the depression in the heat shield -3-.

i Note

The heat shield from above is shown in the magnified view.

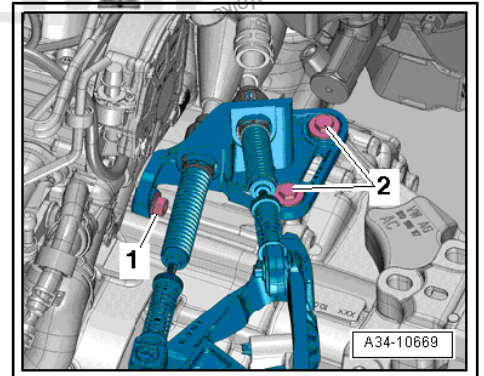


A clip -A- holds the cables and heat shield to each other in place.

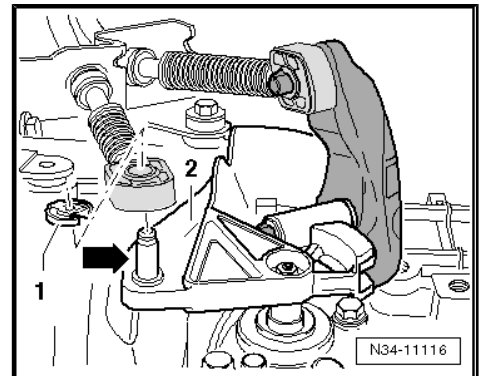


- Mount the cable bracket on the transmission and tighten the bolts -2- and nuts -1-.

These holes have different diameters.



- Apply a small amount of Grease on the pin -arrow- on the gearshift lever -1-.
- Grease allocation. Refer to the Parts Catalog.
- Secure the shift cable with new lock washers -1- to the gearshift lever -2-.
- Install the selector cable into the cable retainer on the selector relay lever.
- Install center console mounting bracket and center console. Refer to ➔ Body Interior; Rep. Gr. 68 ; Center Console; Center Console Bracket, Removing and Installing .



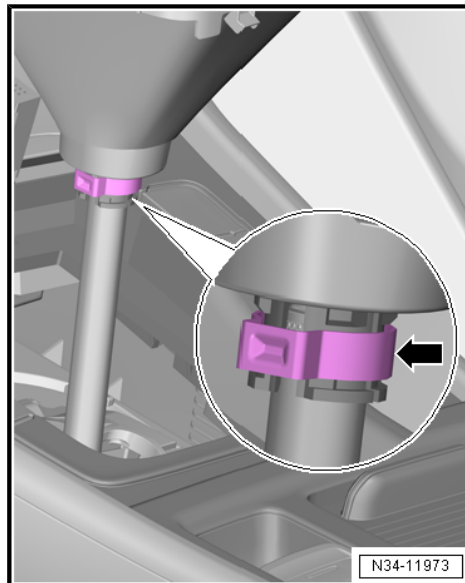


- Replace the clamp -arrow-.
- Adjust the gearshift mechanism. Refer to
⇒ [“1.11 Selector Mechanism, Adjusting”, page 76](#) .
- Install the boot with the selector knob and, if necessary, the noise insulation. Refer to
⇒ [“1.7 Gearshift Knob, Removing and Installing”, page 63](#) .

- Install the heat shield under the gearshift mechanism.

Installing the heat shield. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Molding/Trim/Extensions/Trim Panels; Floor Heat Shield, Removing and Installing .

- Assemble the exhaust system free of tension. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 ; Exhaust Pipes/Mufflers .
- Install the air filter housing.
- Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- Install the battery tray, battery and the battery cover. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Removing and Installing .



Tightening Specifications

- ◆ Selector housing to body. Refer to
⇒ [“8.3 Overview - Transmission Housing and Selector Mechanism”, page 108](#)
- ◆ Cable mounting bracket to transmission. Refer to
⇒ [“1.6 Overview - Selector Mechanism”, page 61](#) .

1.10 Gearshift Cable and Selector Cable, Removing and Installing

Special tools and workshop equipment required

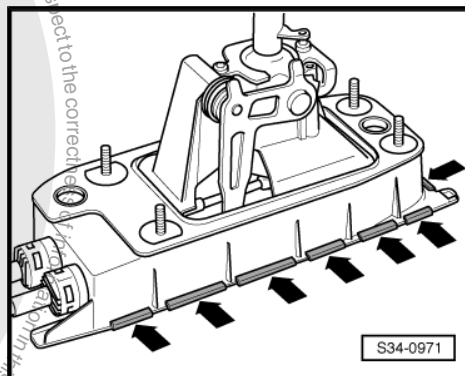
- ◆ Window Release Tool - T10236-

Removing

- Remove the gearshift mechanism. Refer to
⇒ [“1.9 Selector Mechanism, Removing and Installing”, page 68](#) .

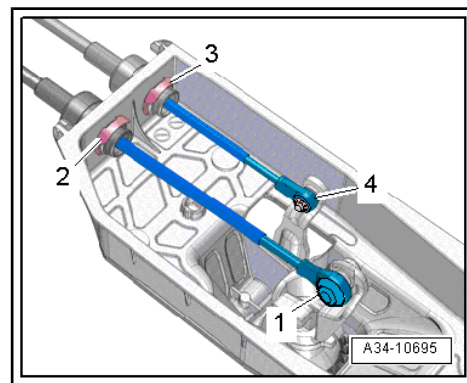
Bend open the tabs -arrows- on the base plate with a screwdriver. (Only the tabs on the left side of the base plate are shown in the illustration).

Remove the base plate.



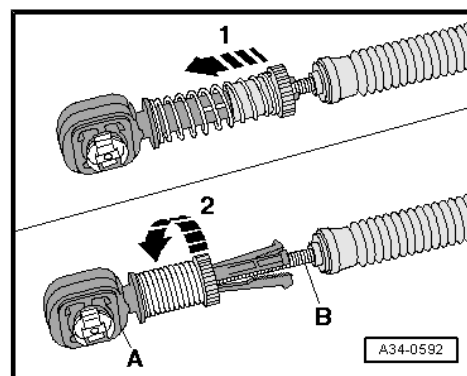


- Remove the lock washers -2 and 3-.
- Remove the shift cable -1- and selector cable -4- from the gearshift lever and selector lever, for example, using the Window Release Tool - T10236- or a screwdriver.
- Remove the shift cable and selector cable from the shift housing.



Release the retainer -A- for the cable -B- as follows:

- ◆ Push the sleeve forward as far as it will go -arrow 1-.
- ◆ Turn the sleeve to the right as far as it will go -arrow 2- until it engages.
- Remove the retainer.



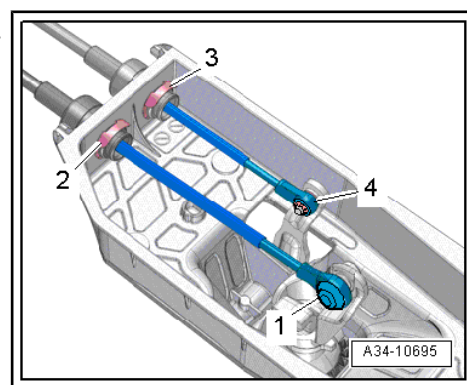
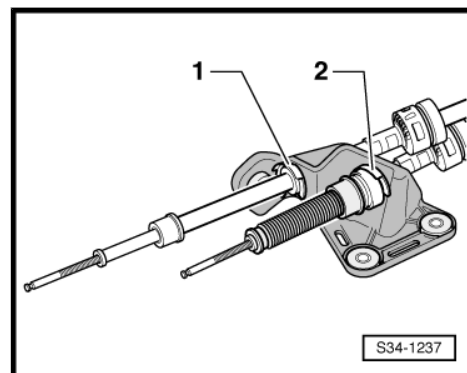
- Remove the lock washers -1 and 2-.
- Remove the cable bracket from the cables.

Installing

Install in reverse order of removal. Note the following:

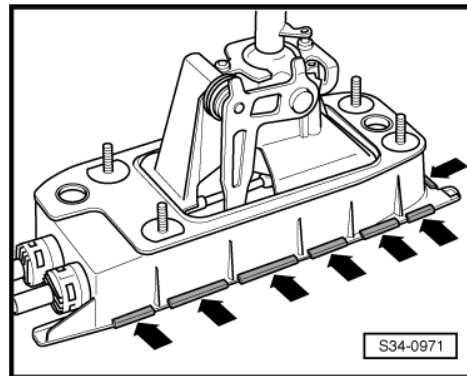
Install in reverse order of removal. Note the following:

- Secure the shift cable and selector cable on the shift housing with lock washers -2 and 3-.
- Install the shift cable -1- on the gearshift lever and selector cable -4- on the selector lever inside the shift housing.





- Remove base plate -arrows-. Refer to
⇒ [“1.8 Selector Mechanism, Disassembling and Assembling”,
page 63](#) .
- Install the gearshift mechanism. Refer to
⇒ [“1.9 Selector Mechanism, Removing and Installing”,
page 68](#) .
- Adjust the gearshift mechanism. Refer to
⇒ [“1.11 Selector Mechanism, Adjusting”, page 76](#) .



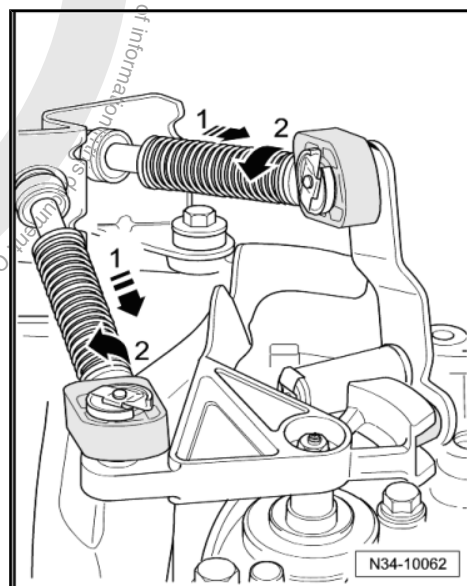
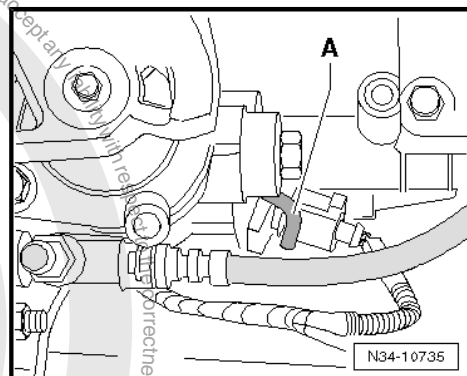
1.11 Selector Mechanism, Adjusting

Special tools and workshop equipment required

- ◆ Connecting Pin - T10027A-

Adjusting Requirements

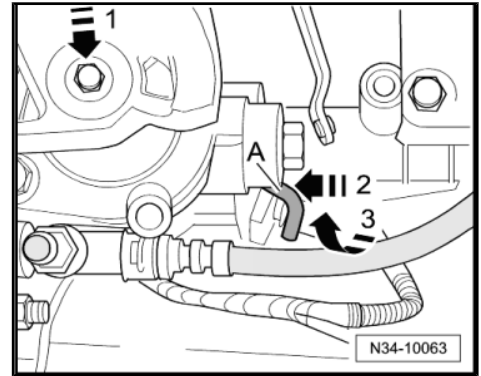
- The gearshift mechanism operating and transfer elements must work properly.
- Shift mechanism must move freely.
- The transmission, clutch and clutch mechanism must also be in proper condition.
- Transmission in neutral.
- Remove the air filter housing if the bracket -A- for the selector shaft and the securing mechanism for the shift and selector cables are not accessible. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- Pull the safety mechanism on the cable retainer for the shift cable and the selector cable all the way forward in direction of -arrow 1- and then lock it to the left in direction of -arrow 2-.





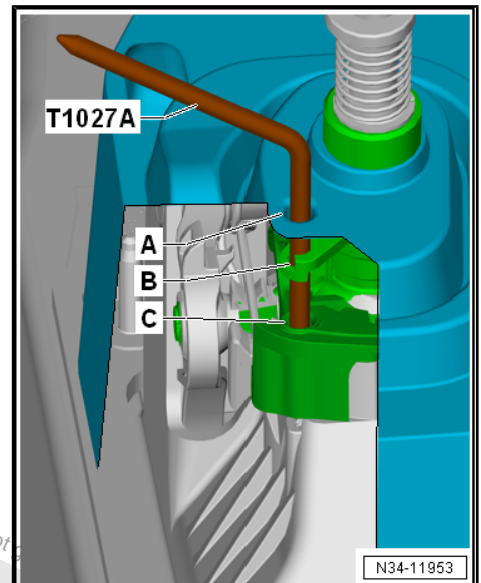
Secure the gearshift shaft as follows:

- Push the gearshift shaft down in the direction of -arrow 1-.
- While press the gearshift shaft down, rotate the bracket -A- in direction of -arrow 3- upward and simultaneously in direction of -arrow 2- press it in until it engages in the gearshift shaft.
- Remove the boot and, if possible, the noise insulation from the center console. Refer to
⇒ [“1.7 Gearshift Knob, Removing and Installing”, page 63](#) .



Secure the gearshift shaft as follows:

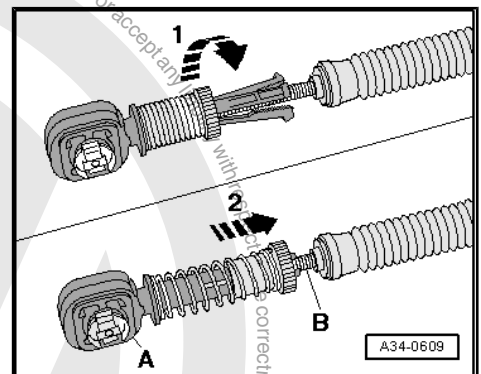
- Install the gearshift lever in neutral and, if necessary, press the gearshift lever to the left and hold.
- Guide the Connecting Pin - T10027A- through the noise insulation -A-, hole -B- and into hole -C-.



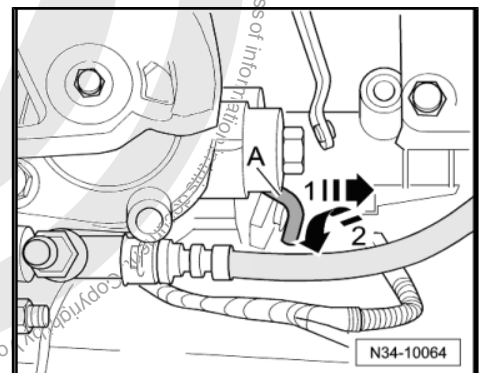
Continuation for All

- It must be possible to move the selector and shift cable -B- in the cable retainers -A-.
- Turn the safety mechanism on the cable retainer for the shift cable and selector cable all the way to the right in direction of -arrow 1-.

The spring will push the safety mechanism into the starting position in direction of -arrow 2-.

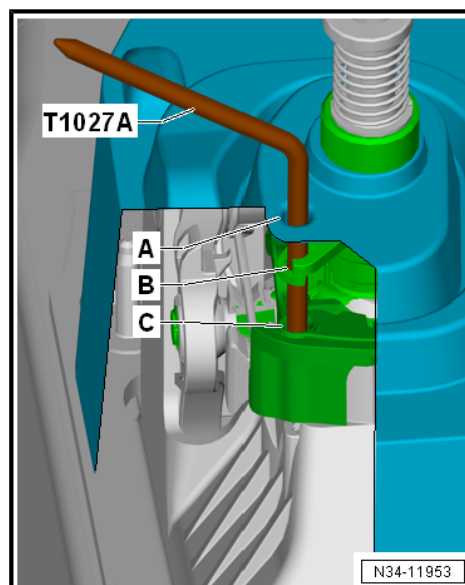


- Then turn the bracket -A- in the direction of -arrow 2- back into its starting position.
- The bracket -A- must get pushed out of the transmission in direction of -arrow 1-.





- Remove the Connecting Pin - T10027A- from the noise insulation -A- and the holes -B- and -C-.
- Install the boot and the noise insulation (if equipped). Refer to ⇒ [“1.3 Overview - Gearshift Knob and Cover”, page 56](#) .
- Make sure the gearshift shaft moves easily.
- Install the air filter housing. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .



1.12 Selector Mechanism, Checking

- The shift lever must rest in the 3rd/4th gear selector lever gate when the transmission is in neutral.
- Operate the clutch.
- Move the gearshift lever (selector lever) several times through all the gears. Make sure the reverse gear lock is working correctly.
- Should a gear fail to engage smoothly after repeated selection, adjust gearshift mechanism again. Refer to ⇒ [“1.11 Selector Mechanism, Adjusting”, page 76](#) .



2 Transmission, Removing and Installing

⇒ [“2.1 Transmission, Removing”, page 79](#)

⇒ [“2.2 Transmission, Installing”, page 85](#)

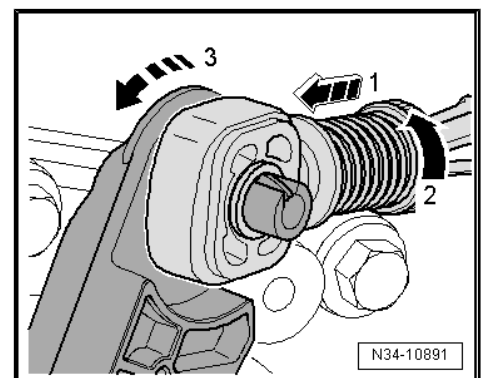
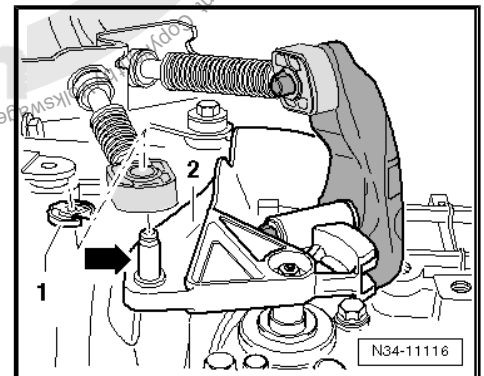
⇒ [“2.3 Transmission Tightening Specifications”, page 91](#)

2.1 Transmission, Removing

2.1.1 Transmission, Removing, AWD

Special tools and workshop equipment required

- ◆ Hose Clamps - Up To 25 mm - 3094-
- ◆ Engine Bung Set - VAS6122-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Torque Wrench 1332 40-200Nm - VAG1332-
- ◆ Grease for Clutch Disc Shaft Splines . Refer to the Parts Catalog
- ◆ Allocate the grease for gearshift mechanism. Refer to the Parts Catalog.
- Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .
- Remove the engine cover. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Engine Cover; Engine Cover, Removing and Installing .
- Remove the air filter housing. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- Remove the battery and the battery tray. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Removing and Installing .
- Remove the shift cable lock washer -1- from the transmission selector lever -2-. Remove the cable from the pin -arrow-.
- Remove the cable retainer from the selector cable.
- To avoid damage to the selector cable, the cable retainer must be disconnected from the selector lever before removal.
- Pull the safety mechanism all the way forward in direction of -arrow 1-. Then lock it to the left in direction of -arrow 2-.
- Then push the selector relay lever forward in direction of (-arrow 3-).



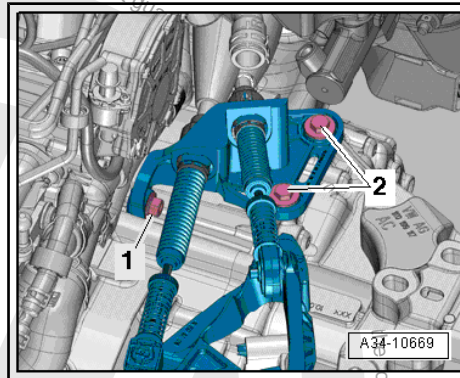
Note

Remove cable retainer only if selector relay lever is removed.
Refer to

⇒ [Fig. “Prying the Selector Cable Retainer Out of the Selector Relay Lever”, page 70](#) .



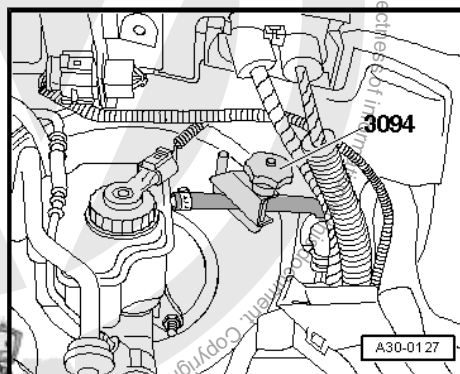
- Remove nut -1- and bolts -2- and set the cable bracket and cables off to the side.
- Remove the washer fluid reservoir. Refer to ⇒ Electrical Equipment; Rep. Gr. 92 ; Windshield Washer System; Windshield Washer Fluid Reservoir; Removing and Installing .



Note

Brake fluid must not come into contact with the longitudinal member or transmission. If it does, clean the area thoroughly.

- Clamp off the clutch master cylinder supply hose using Hose Clamps - Up To 25mm - 3094- .



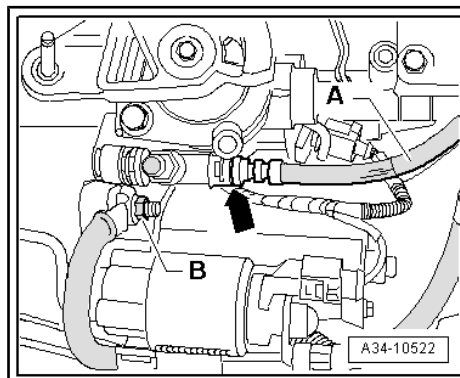
Note

- ◆ *A slight deformation stays on the supply hose after the Hose Clamps - Up To 25mm - 3094- has been removed.*
- ◆ *The supply hose is therefore not defective.*
- ◆ *After removing the Hose Clamps - Up To 25mm - 3094- , the supply hose must be formed back into its original shape.*

- Place a lint-free cloth under the bleeder.
- Remove the clip -arrow- all the way and then remove the hose/line assembly -A- from the bleeder.
- Tie up wire.

The ground cable -B-, if present, is installed later in the procedure.

- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .



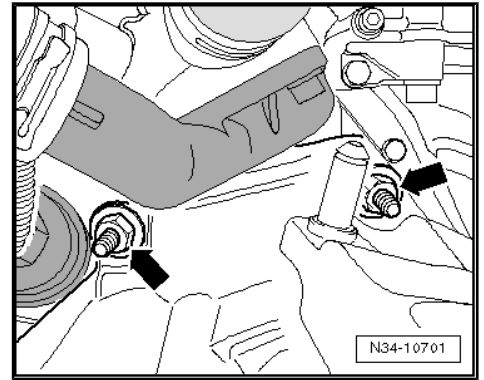
Caution

There is a risk of contamination from the leaking brake fluid.

- ◆ *Do not use the clutch pedal if the hose/line assembly from the clutch slave cylinder bleeder is disconnected.*



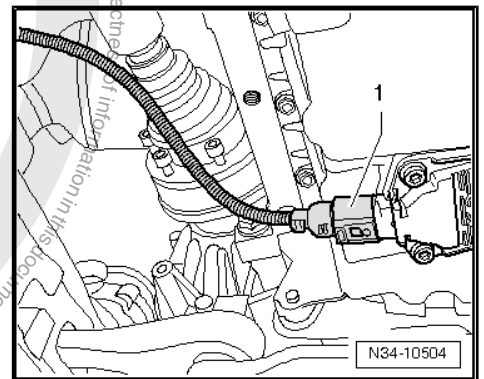
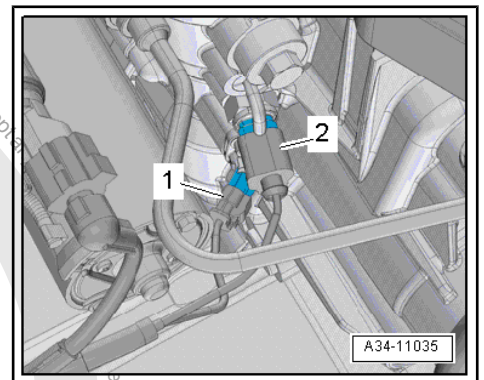
- Remove the upper engine/transmission connecting bolts -arrows-.
- Remove windshield wiper arms. Refer to ➤ Electrical Equipment; Rep. Gr. 92 ; Windshield Wiper System; Windshield Wiper Arms, Removing and Installing .
- Remove the plenum chamber cover. Refer to ➤ Body Exterior; Rep. Gr. 50 ; Bulkhead; Plenum Chamber Cover, Removing and Installing .
- Mount the Engine Support Bridge - 10-222 A- as follows. Refer to ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Subframe Mount; Engine in Installation Position, Supporting .



i Note

Disconnect any hose- and cable connections near the engine lifting eyes for the Engine Support Bridge - 10-222A- .

- Disconnect the front left connectors from the transmission:
 - 1 - Transmission for vehicles with start/stop system: Transmission Neutral Position Sensor - G701-
 - 2 - Back-Up Lamp Switch - F4-
- Remove the noise insulation. Refer to ➤ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .
- Remove the lower section of the left front wheel housing liner. Refer to ➤ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Overview - Front Wheel Housing Liner .
- Remove the starter. Refer to ➤ Electrical Equipment; Rep. Gr. 27 ; Starter; Starter, Removing and Installing .
- Disconnect the connector -1- from the Oil Level Thermal Sensor - G266- .
- Remove the subframe without the steering gear. Refer to ➤ Suspension, Wheels, Steering; Rep. Gr. 40 ; Subframe; Subframe without Steering Gear, Removing and Installing .





- Remove the drive axle heat shield, if equipped, from the bevel box (-arrows-). Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .
- Remove the drive axles from the flange shafts and tie them up as high as possible. Be careful not to damage the surface protection. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .

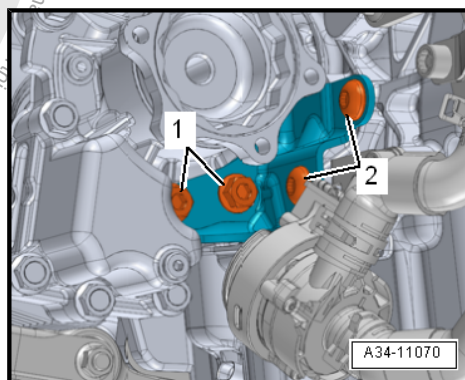
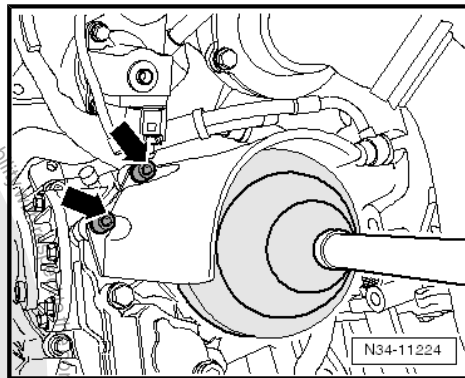


Caution

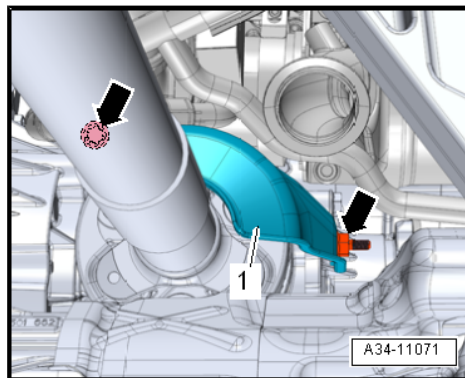
Risk of damaging the decoupling element

- ♦ **Pay attention. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 ; Emissions Control; Overview - Emissions Control .**

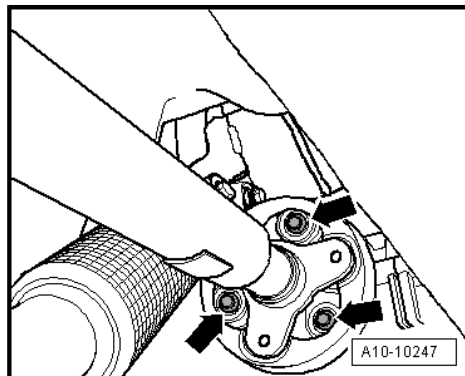
- Remove bolts -1 and 2- and transmission support.



- Remove the bolts -arrows- and remove the heat shield -1-.

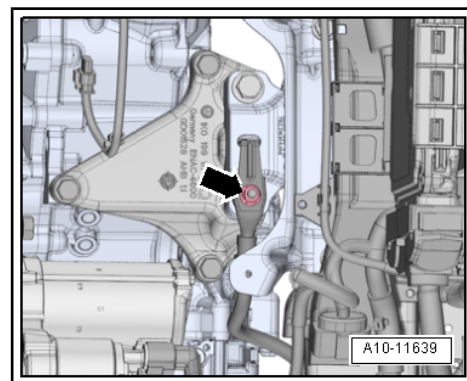


- Mark the position of the driveshaft with the flexible disk with respect to the bevel gear flange with paint.
- Remove the driveshaft from the bevel box -arrows-. Refer to ⇒ Rep. Gr. 39 .
- Push the front driveshaft all the way back and tie it up.

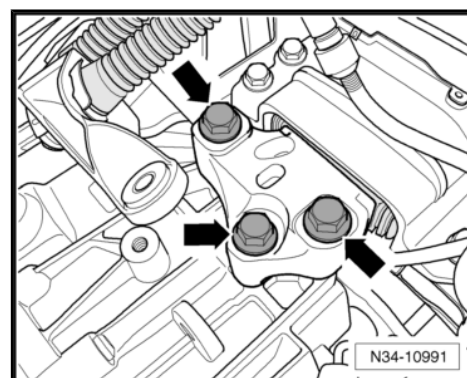




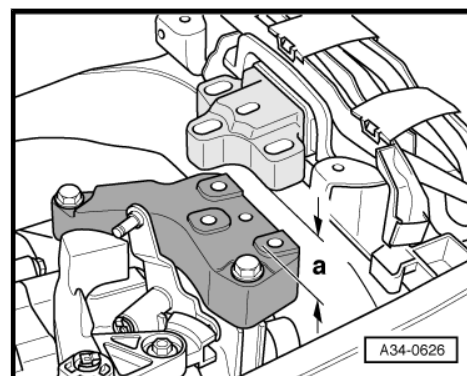
- If present, remove nut -arrow- and ground cable.



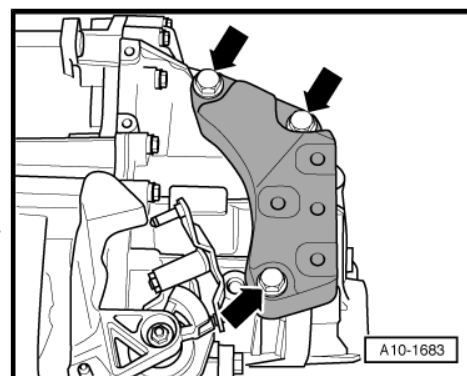
- Remove the bolts -arrows- from the transmission mount.



- Turn the spindles on the Engine Support Bridge - 10-222A- and lower the transmission to dimension -a-.
- Dimension -a- = 60 mm



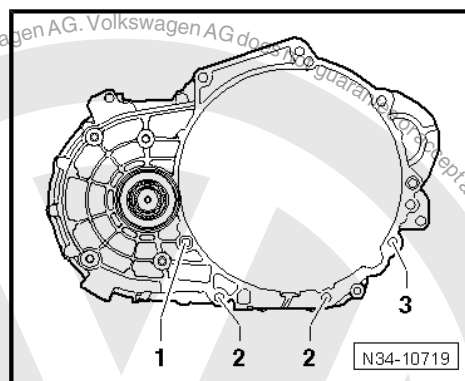
- Remove bolts -arrows- and transmission support from transmission.





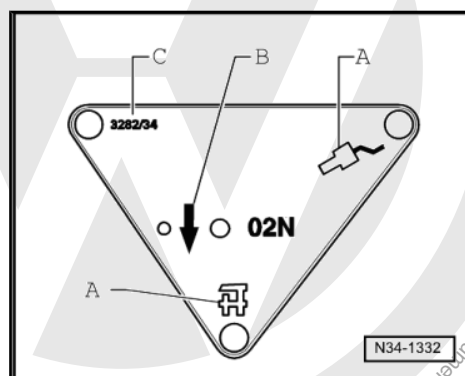
- Remove the bolts -2- from the transmission/engine connection.

The transmission to engine connection bolts -1- and -3- will be removed later in the procedure.

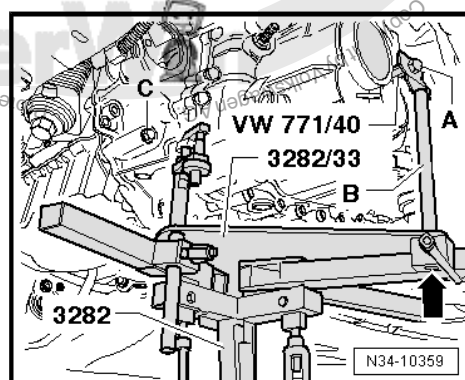


Align the Transmission Support - 3282- with the Transmission Support - Mounting Plate 33 - 3282/33- in order to install the transmission.

- Align the arms of the Transmission Support so that they match up with the holes in the Adjustment Plate .
- Install the Support Elements -A- as illustrated on the Adjustment Plate .
- Install the Mounting Element -C- instead of the Transmission Support - Pins 29 - 3282/29- .

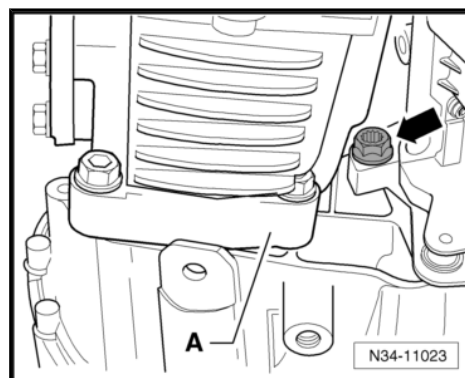


- Align the Adjustment Plate so that it is parallel to the transmission.
- Install the Transmission Support - Pins 29 - 3282/29- into the rear hole for the pendulum support bolt on the transmission.
- Secure the Slide Hammer Set - Adapter 40 - VW771/40- inside the threaded hole in the transmission housing as illustrated.
- Secure the transmission on the Transmission Support - 3282- with an M10 x 20 bolt -A-.



The needle bearing drift -B- must be flush with the guide on the Transmission Support - 3282- -arrow-.

- Position the Engine and Gearbox Jack - VAS6931- under the vehicle. The arrow on the adjusting plate points in direction of travel.
- Remove the engine/transmission connecting bolt -C-.
- Remove the engine/transmission connecting bolt -arrow- next to the bevel gear -A-.
- Separate the transmission from the engine (alignment sleeves).





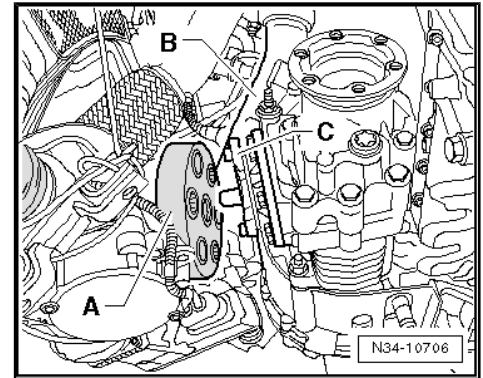
- Guide the bevel box and flange -C- past the driveshaft -A- and exhaust system -B-.



Note

Pay attention to the lines when lowering the transmission.

Install the transmission. Refer to
⇒ [“2.2 Transmission, Installing”, page 85](#) .



2.2 Transmission, Installing

Installing

- Install the manual transmission together with the bevel box.



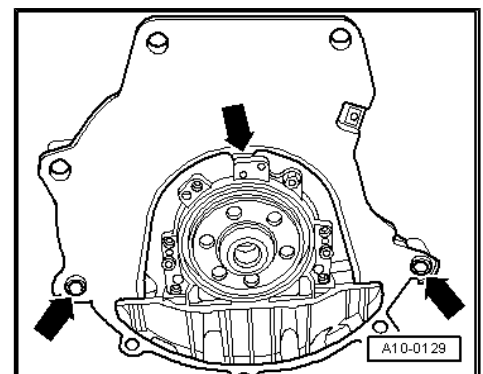
Note

- ◆ Refer to “Transmission, Removing” to get a list of the special tools needed. Refer to
⇒ [“2.1.1 Transmission, Removing, AWD”, page 79](#).
- ◆ Replace self-locking screws and nuts after removing them.
- ◆ Replace bolts that were tightened with an additional turn after removing them.
- ◆ Install any cable ties that were loosened or cut off during removal at their same location.
- ◆ Clean the input shaft splines and (on used clutch plates) the hub splines. Remove any corrosion and then apply a very thin coat of Grease for Clutch Disc Shaft Splines - G 000 100- on the splines. Then move the clutch plate back and forth on the input shaft until the hub moves freely on the shaft. Excess grease must be removed.
- If the transmission is replaced, transfer the transmission shift lever and the selector relay lever.
- Clean all threaded holes for self-locking bolts with a thread tap to remove any locking fluid residue.
- The alignment sleeves for centering the engine/transmission must be present inside the cylinder block. Install them if they are missing.

If the alignment sleeves are missing, it will be difficult to shift, there will be clutch problems and the transmission may make noises (loose rattling).

Engage the intermediate plate on the sealing flange and push it onto the alignment sleeves -arrows-.

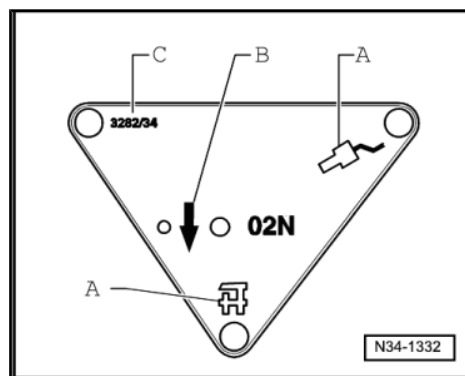
- Check the release bearing for wear. Replace the clutch slave cylinder with release bearing if necessary. Refer to
⇒ [“1.15 Clutch Slave Cylinder with Release Bearing, Removing and Installing”, page 33](#) .





Align the Transmission Support - 3282- with the Transmission Support - Mounting Plate 33 - 3282/33- in order to install the transmission.

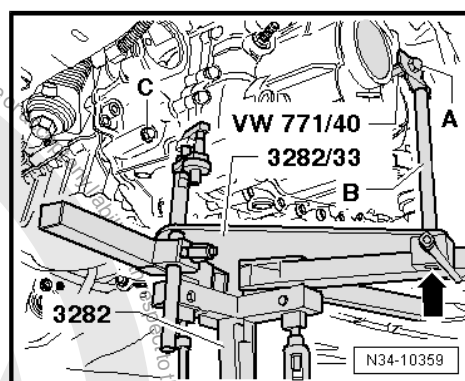
- Align the arms of the Transmission Support so that they match up with the holes in the Adjustment Plate .
- Install the Support Elements -A- as illustrated on the Adjustment Plate .
- Install the Mounting Element -C- instead of the Transmission Support - Pins 29 - 3282/29- .
- Place the transmission on the Engine and Gearbox Jack - VAS6931- .
- Align the Adjustment Plate so that it is parallel to the transmission.



- Install the Transmission Support - Pins 29 - 3282/29- into the rear hole for the pendulum support bolt on the transmission.
- Secure the Slide Hammer Set - Adapter 40 - VW771/40- inside the threaded hole in the transmission housing as illustrated.
- Secure the transmission on the Transmission Support - 3282- with an M10 x 20 bolt -A-.

The needle bearing drift -B- must be flush with the guide on the Transmission Support - 3282- -arrow-.

- Position the Engine and Gearbox Jack - VAS6931- under the vehicle. The arrow on the adjusting plate points in direction of travel.



Note

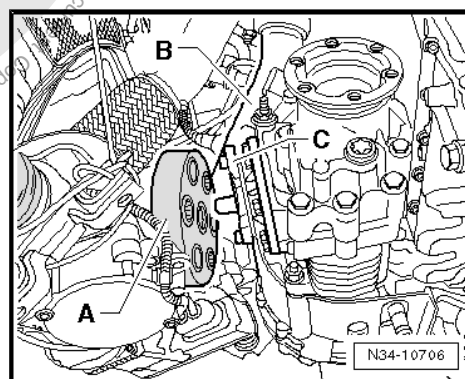
Pay attention to the lines when installing the transmission.

- Using the spindles on the Transmission Support - 3282- , position the transmission slightly upward in the area of the differential/bevel box.
- Lift the transmission carefully.
- Guide the bevel box and flange -C- past the driveshaft -A- and exhaust system -B-.
- Turn the transmission into its installed position using the spindles on the Transmission Support - 3282- .
- Line up the transmission and the engine and install it.



Caution

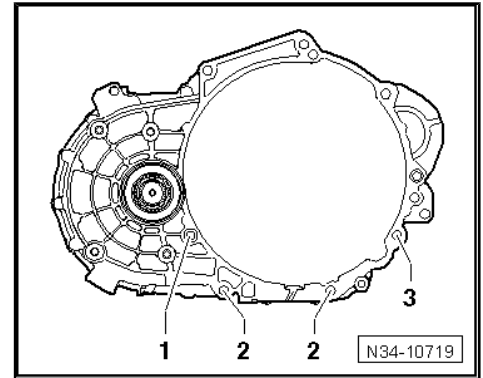
- ◆ **Brake fluid can escape from the bleeder on the transmission.**



- Install the engine/transmission connecting bolt -C- (⇒ illustration above) and tighten. Refer to [⇒ "2.3 Transmission Tightening Specifications", page 91](#) .



- Install the engine/transmission connecting bolts -1- and -2- tighten them. Refer to
⇒ [“2.3 Transmission Tightening Specifications”, page 91](#) .
- Install all engine/transmission connecting bolts and tighten them. Refer to
⇒ [“2.3 Transmission Tightening Specifications”, page 91](#) .
- After transmission is bolted to engine at bottom, remove the Transmission Support - 3282- from transmission.
- Install all upper engine/transmission connecting bolts and tighten. Refer to
⇒ [“2.3 Transmission Tightening Specifications”, page 91](#) .
- Attach the gearshift lever to the transmission gearshift shaft. Refer to
⇒ [Fig. ““Installing the Transmission Shift Lever””, page 72](#) and tighten the nut. Refer to
⇒ [“1.6 Overview - Selector Mechanism”, page 61](#) .
- Install the selector relay lever together with the cable retainer. Refer to
⇒ [Fig. ““Remove and Install the Selector Relay Lever Together with the Cable Retainer””, page 70](#) .

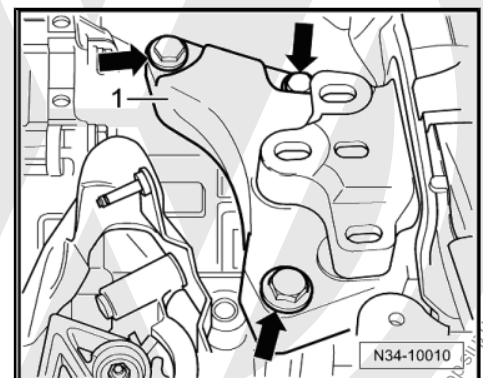


Caution

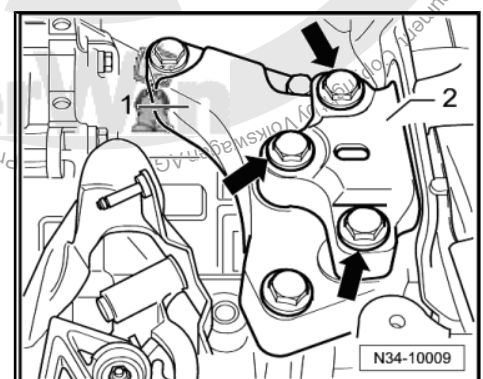
Risk of damaging the threads in the transmission support by inserting bolts crooked.

- ◆ **The transmission mount and bracket must be parallel to each other in order to prevent the transmission support thread does not become damaged.**

- Install transmission bracket -1- with new bolts -arrows-. Refer to
⇒ [“3.1 Overview - Subframe Mount”, page 92](#) .



- Tighten the Engine Support Bridge - 10-222A- spindles until the transmission support -1- touches the transmission mount -2- to align the engine/transmission sub-assembly in installed position.
- Install new bolts -arrows- and tighten. Refer to
⇒ [“3.1 Overview - Subframe Mount”, page 92](#) .



Note

Install the engine/transmission mount free of tension. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10; Engine, Removing and Installing; Engine, Installing .



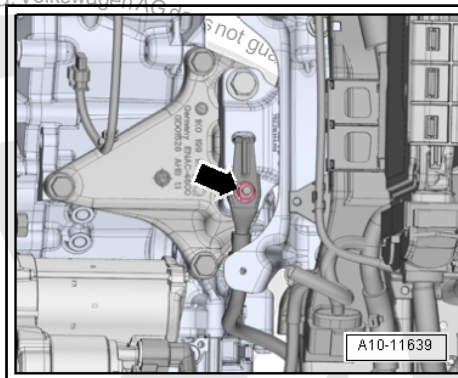
- If present, connect ground cable -arrow-.



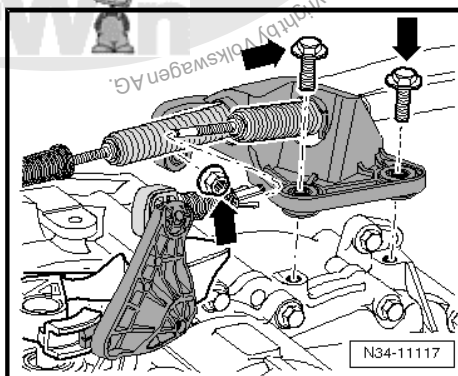
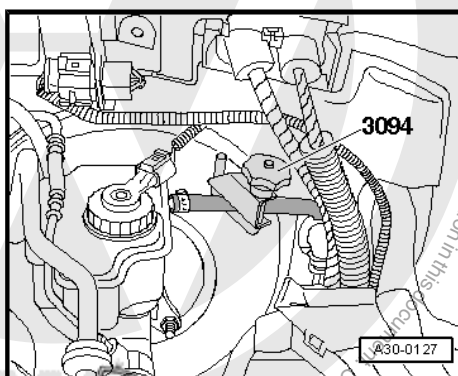
Caution

Risk of accident!

- **Only remove Engine Support Bridge - 10-222A- when all subframe mount bolts are tightened to the tightening specification.**



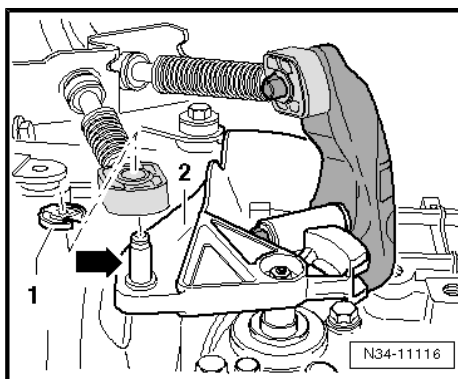
- Connect hose/line assembly with bleeder. Refer to ⇒ [Fig. "Disconnect and Connect Clutch Mechanism Wires"](#), [page 17](#) .
- After removing the Hose Clamp up to 25 mm - 3094- , the supply hose must be formed back into its original shape.
- Bleed the clutch system. Refer to ⇒ ["1.16 Clutch Mechanism, Bleeding"](#), [page 34](#) .
- Make sure the vacuum hose for the brake system is installed correctly. Install a vacuum hose, if necessary. Refer to ⇒ Brake System; Rep. Gr. 47 ; Brake Booster/Master Brake Cylinder .
- Mount the cable bracket on the transmission and tighten the bolts and nuts -arrows-. Refer to ⇒ ["1.6 Overview - Selector Mechanism"](#), [page 61](#) .



- Install the selector cable in the cable retainer.
- Apply a small amount of grease on the pins -arrow- for the gearshift lever -2-.

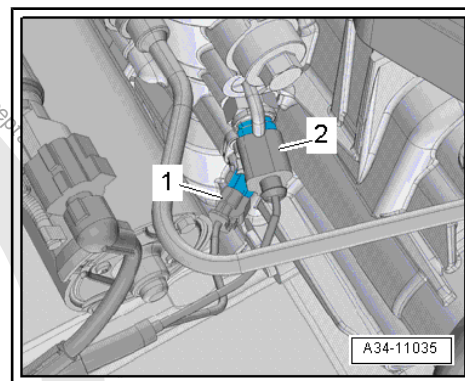
Grease allocation. Refer to the Parts Catalog.

- Replace the lock washer -1- each time it is removed.
- Adjust the gearshift mechanism. Refer to ⇒ ["1.11 Selector Mechanism, Adjusting"](#), [page 76](#) .
- Install the starter. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Starter; Starter, Removing and Installing .

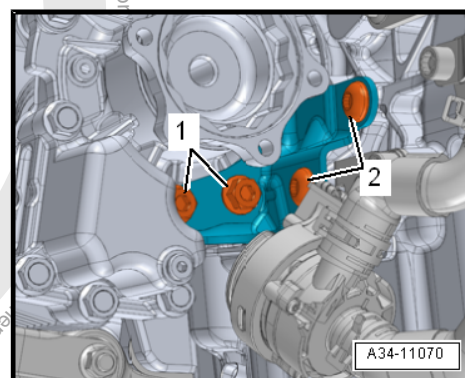




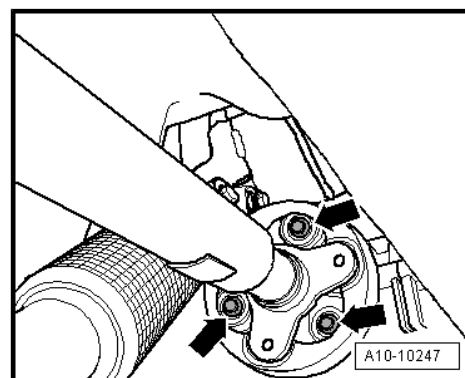
- Connect the front left connectors to the transmission:
- 1 - Transmission for vehicles with start/stop system: Transmission Neutral Position Sensor - G701-
- 2 - Back-Up Lamp Switch - F4-



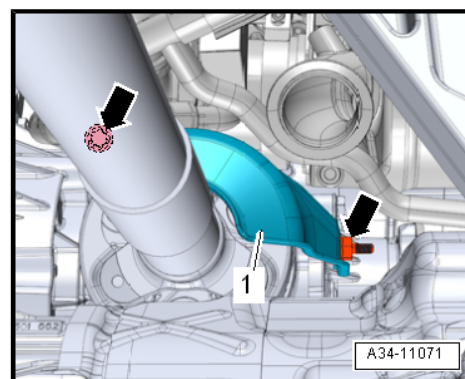
- Attach the transmission support while paying attention to the tightening sequence of bolts -1 and 2-. Refer to [Fig. "Tightening Specification and Sequence for Bevel Box OCN Transmission Support"](#), page 102 .



- Attach the driveshaft with the flexible disc to the bevel box flange -arrows-. Refer to ➤ Rear Final Drive; Rep. Gr. 39 ; Driveshaft; Driveshaft, Removing and Installing .



- Attach heat shield -1- -arrows-. Refer to ➤ Rear Final Drive; Rep. Gr. 39 ; Driveshaft; Driveshaft, Removing and Installing .
- Assemble the exhaust system. Refer to ➤ Rep. Gr. 26 ; Exhaust Pipes/Mufflers; Overview - Muffler .





- Install the subframe together with pendulum support. Refer to
⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Subframe;
Overview - Subframe .



Note

Threaded inserts (for example, "Heli Coil") are found in the pendulum support fastening holes on some transmissions. Refer to ⇒ Fig. "Transmission with Threaded Insert (for Example Heli Coil) for Attaching the Pendulum Support" , page 93 .

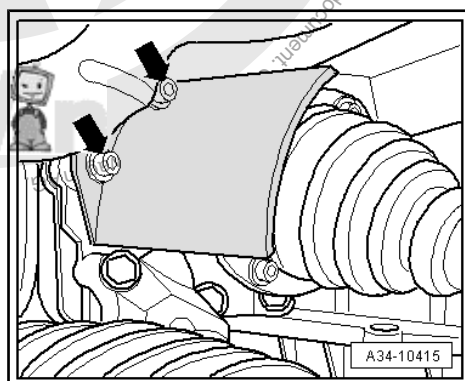
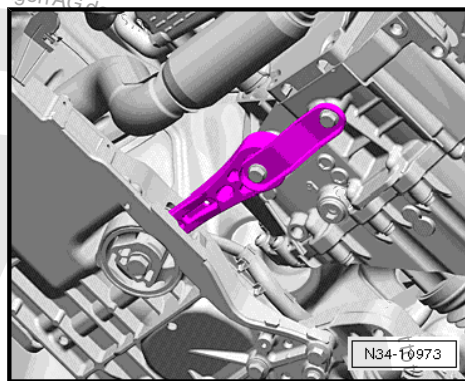
- Install pendulum support with new bolts. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .



Note

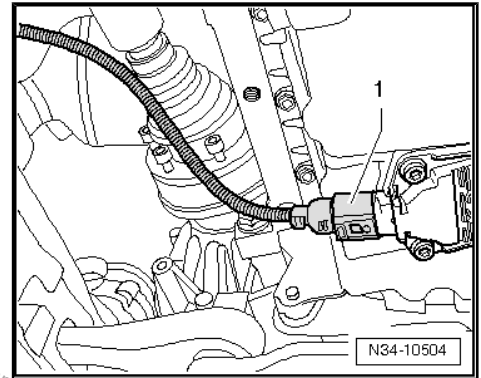
Install the engine/transmission mount free of tension. Refer to ⇒ Rep. Gr. 10 ; Engine, Removing and Installing .

- Check gear oil in the bevel box. Refer to
⇒ "6.1.2 Gear Oil in Bevel Box, Filling" , page 231 .
- Install the drive axles. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .
- Install the drive axle heat shield, if equipped. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .



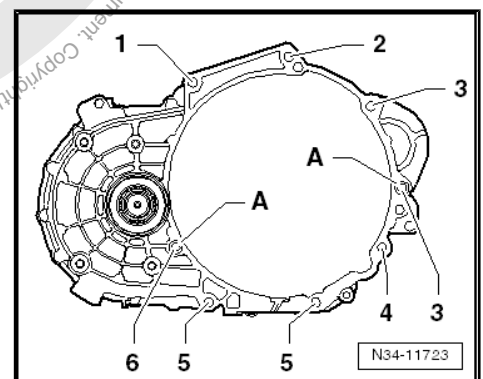


- Connect the connector -1- to the Oil Level Thermal Sensor - G266- .
- Check the transmission fluid level in the manual transmission. Refer to
⇒ ["6.1 Transmission Fluid Level, Checking", page 104](#) .
- If unclipped, carefully clip in the A/C system pipe and do not disconnect the line system. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Refrigerant Circuit; System Overview - Refrigerant Circuit .
- Install fuel filter. Do not open the line system. Refer to ⇒ Fuel Supply System; Rep. Gr. 20 ; Fuel Delivery Unit/Fuel Level Sensor; Overview - Fuel Delivery Unit/Fuel Level Sensor .
- Install the battery tray, battery and the battery cover. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Removing and Installing .
- Install the air filter housing. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- Install the engine cover. Refer to ⇒ Rep. Gr. 10 ; Engine Cover; Engine Cover, Removing and Installing .
- Install the plenum chamber cover. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Bulkhead; Plenum Chamber Cover, Removing and Installing .
- Install the windshield wiper arms. Refer to ⇒ Electrical Equipment; Rep. Gr. 92 ; Windshield Wiper System; Windshield Wiper Arms, Removing and Installing .
- Install the lower section of the left front wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Overview - Front Wheel Housing Liner .
- Install the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .



2.3 Transmission Tightening Specifications

Item	Bolt	Quantity	Nm
1	M12 x 55 ♦ With a long M8 threaded pin	1	80
2	M12 x 55 ♦ With a short M8 threaded pin or M12 x 50 ♦ Without threaded pin	1	80
3	M12 x 165 ♦ With an M8 threaded pin ♦ Also starter to transmission	2	80
4	M10 x 105	1	40
5	M10 x 50	2	40
6	M12 x 70 or M12 x 65	1	80
-	M6 x 8 ♦ Small flywheel cover plate (not present on all engines)	1	10



-A- alignment sleeves for centering



3 Subframe Mount

⇒ **"3.1 Overview - Subframe Mount", page 92**

3.1 Overview - Subframe Mount

1 - Bolt

- ❑ Tightening specification. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

2 - Engine Support

- ❑ Refer to ⇒ Rep. Gr. 10 ; Subframe Mount .

3 - Engine Mount

- ❑ Refer to ⇒ Rep. Gr. 10 ; Subframe Mount .

4 - Bolt

- ❑ Tightening specification. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

5 - Bolt

- ❑ Tightening specification. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

6 - Bolt

- ❑ Tightening specification. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

7 - Bolt

- ❑ Tightening specification. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

8 - Pendulum Support

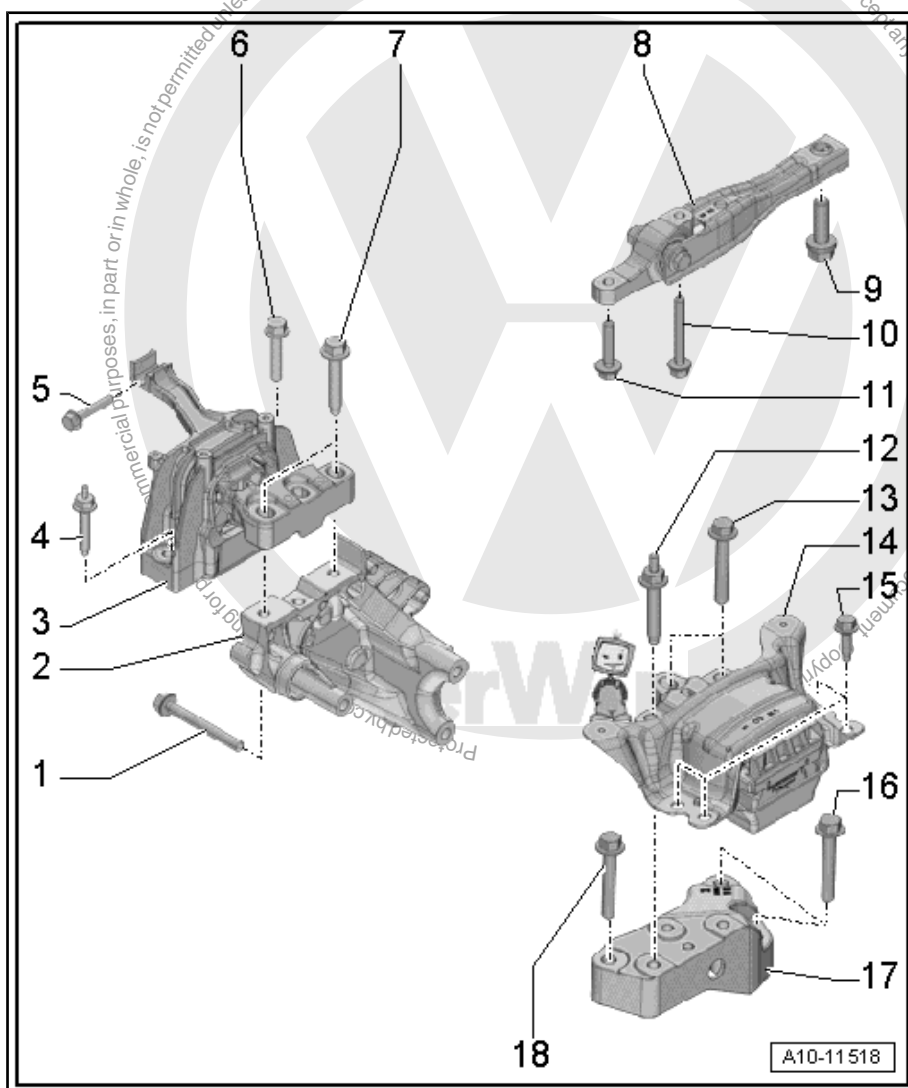
- ❑ Refer to ⇒ Rep. Gr. 10 ; Subframe Mount or ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 .

9 - Bolt

- ❑ For pendulum support to subframe
- ❑ Refer to ⇒ Rep. Gr. 10 ; Subframe Mount or ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Subframe; Overview - Subframe .

10 - Bolt

- ❑ For pendulum support to transmission
- ❑ Refer to ⇒ Rep. Gr. 10 ; Subframe Mount or ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Subframe; Overview - Subframe .
- ❑ Transmission with threaded insert. Refer to ⇒ **"Transmission with Threaded Insert (for Example Heli Coil) for Attaching the Pendulum Support"**, page 93





11 - Bolt

- ☐ For pendulum support to transmission
- ☐ Refer to ➤ Rep. Gr. 10 ; Subframe Mount or ➤ Suspension, Wheels, Steering; Rep. Gr. 40 ; Subframe; Overview - Subframe .
- ☐ Transmission with threaded insert. Refer to
➤ [Fig. "Transmission with Threaded Insert \(for Example Heli Coil\) for Attaching the Pendulum Support" , page 93](#)

12 - Bolt

- ☐ 60 Nm + 90° turn
- ☐ Replace after removing
- ☐ Tightening sequence. Refer to
➤ [Fig. "Attaching the Transmission Mount -2- to the Transmission Bracket -1- " , page 94](#)
- ☐ For transmission mount to transmission bracket

13 - Bolt

- ☐ 60 Nm + 90° turn
- ☐ Replace after removing
- ☐ Tightening sequence. Refer to
➤ [Fig. "Attaching the Transmission Mount -2- to the Transmission Bracket -1- " , page 94](#)
- ☐ For transmission mount to transmission bracket
- ☐ Quantity: 2

14 - Transmission Mount

- ☐ Refer to ➤ Rep. Gr. 10 ; Subframe Mount .

15 - Bolt

- ☐ Tightening specification. Refer to ➤ Rep. Gr. 10 ; Subframe Mount .

16 - Bolt

- ☐ 60 Nm + 90° turn
- ☐ Tightening sequence. Refer to ➤ [Fig. "Transmission Bracket -1- to Transmission." , page 94](#)
- ☐ For transmission bracket to transmission
- ☐ Quantity: 2
- ☐ Replace after removing

17 - Transmission Bracket

18 - Bolt

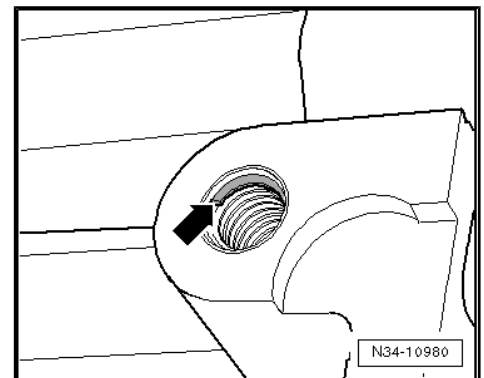
- ☐ 60 Nm + 90° turn
- ☐ Replace after removing
- ☐ Tightening sequence. Refer to ➤ [Fig. "Transmission Bracket -1- to Transmission." , page 94](#)
- ☐ For transmission bracket to transmission

Transmission with Threaded Insert (for Example "Heli Coil") for Attaching the Pendulum Support



Note

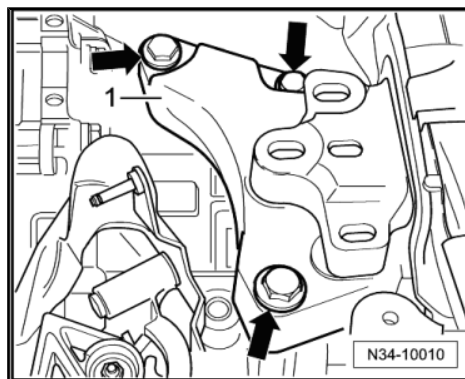
- ◆ There are threaded inserts (for example "Heli Coil") in the pendulum support fastening holes.
- ◆ How to recognize: there is a collar on the first thread -arrow-.
- ◆ Please pay attention to the corresponding bolts and the tightening specification. Refer to ➤ Suspension, Wheels, Steering; Rep. Gr. 40 ; Subframe; Subframe without Steering Gear, Removing and Installing or ➤ Rep. Gr. 10 ; Subframe Mount .





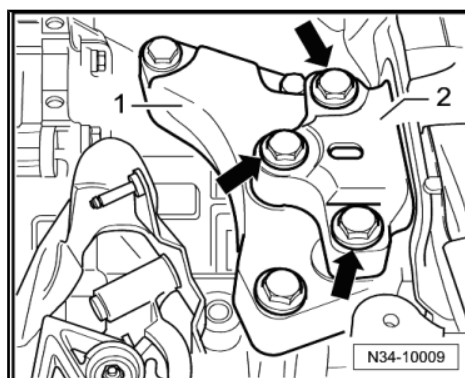
Transmission Bracket -1- to Transmission.

- Replace the bolts -arrows-.
- Tighten the bolts -arrows- hand-tight.
- Tighten the bolts -arrows-.



Attaching the Transmission Mount -2- to the Transmission Bracket -1-

- Replace the bolts -arrows-.
- Tighten the bolts -arrows- hand-tight.
- Tighten the bolts -arrows-.





4 Bevel Box

⇒ ["4.1 Bevel Box, Removing", page 95](#)

⇒ ["4.2 Bevel Box, Installing", page 99](#)

4.1 Bevel Box, Removing

1 - Bolt

- ☐ Tightening specification. Refer to
⇒ ["2.1 Overview - Differential", page 206](#) .

2 - Heat Shield

- ☐ For drive axle

3 - Nut

- ☐ Quantity: 2 or 3
- ☐ Tightening specification. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Overview - Drive Axle .

4 - Bolt

- ☐ only on bevel box "OCN" for the heat shield at the bevel box
- ☐ Tightening specification. Refer to ⇒ Rear Final Drive; Rep. Gr. 39 ; Driveshaft; Driveshaft, Removing and Installing .

5 - Heat Shield

- ☐ For driveshaft
- ☐ Only on bevel box "OCN"

6 - Bolt

- ☐ Only on bevel box "OCN" for the heat shield at the bevel box
- ☐ Tightening specification. Refer to ⇒ Rear Final Drive; Rep. Gr. 39 ; Driveshaft; Driveshaft, Removing and Installing .

7 - Bevel Box

- ☐ Removing. Refer to ⇒ ["4.1 Bevel Box, Removing", page 95](#) .
- ☐ Installing. Refer to ⇒ ["4.2 Bevel Box, Installing", page 99](#) .

8 - Bolt

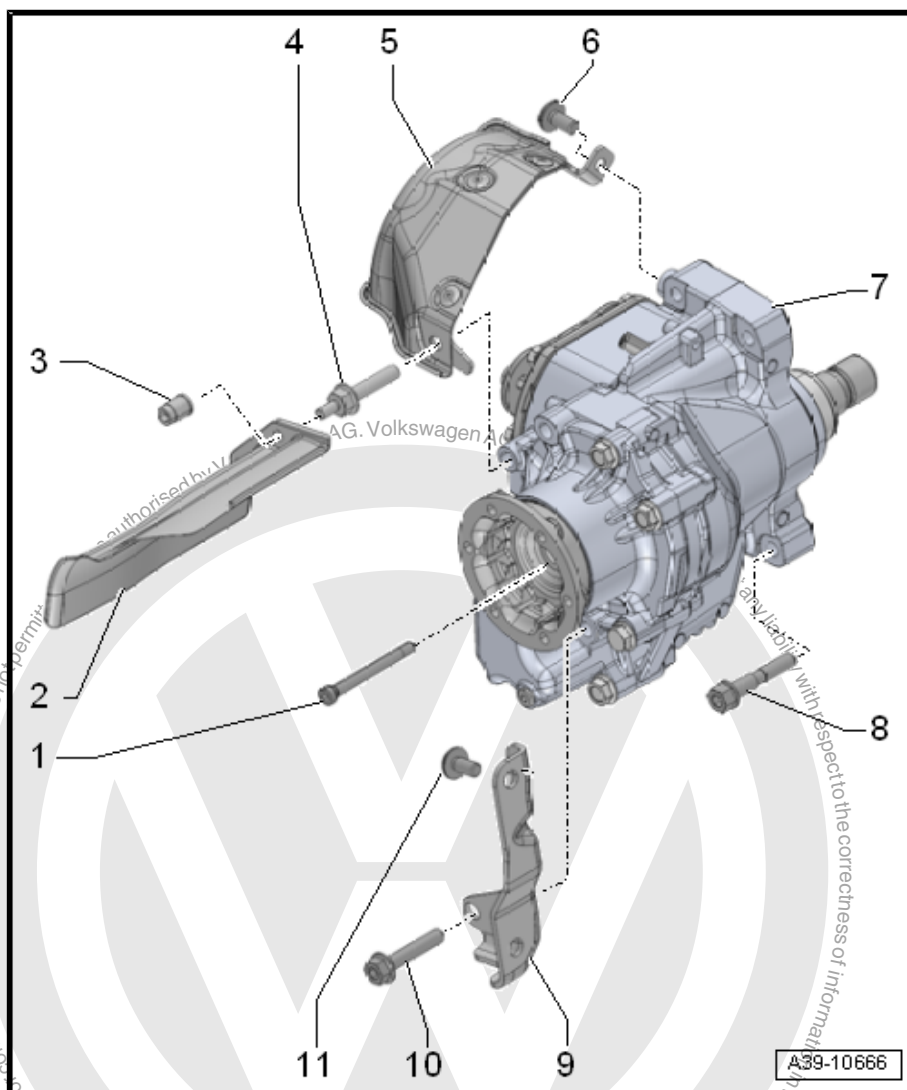
- ☐ Quantity: 4
- ☐ Replace after removing
- ☐ Tightening specification. Refer to ⇒ ["2.1 Overview - Differential", page 206](#) .

9 - Transmission Carrier

- ☐ There are different versions. For the correct allocation, refer to the Parts Catalog.

10 - Bolt

- ☐ Quantity: 2





- ☐ Transmission support to bevel box
- ☐ Tightening specification and sequence:
- ☐ Bevel box "0CN". Refer to
⇒ Fig. "Tightening Specification and Sequence for Bevel Box 0CN Transmission Support",
page 102

11 - Bolt

- ☐ Transmission support to engine
- ☐ Tightening specification and sequence:
- ☐ Bevel box "0CN". Refer to
⇒ Fig. "Tightening Specification and Sequence for Bevel Box 0CN Transmission Support",
page 102
- ☐ Quantity: 2

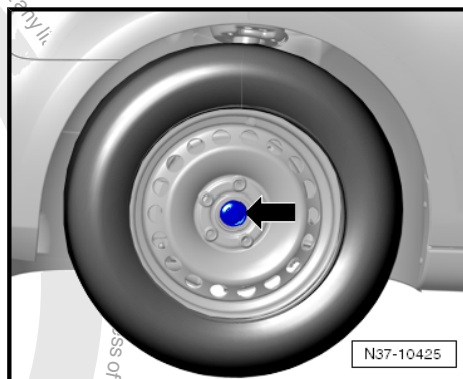
4.1.1 Bevel Box 0CN, Removing

Special tools and workshop equipment required

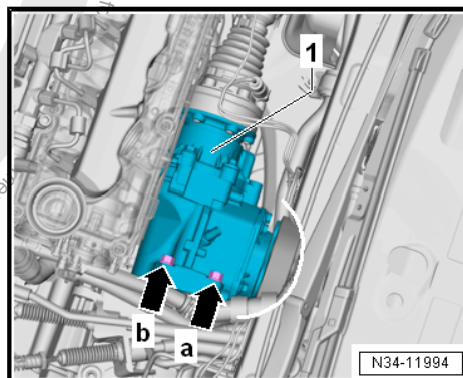
- ◆ Socket And Extended Bit - T10107-
- ◆ or Socket And Extended Bit - T10107A-
- ◆ Rear Wheel Bearing Kit - Piece 5 - 3253/5-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-

The right drive axle must be removed later in the procedure.

- With the vehicle still standing on its wheels, loosen the right front collar bolt -arrow- a maximum of 90°. Otherwise the wheel bearing will get damaged. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .

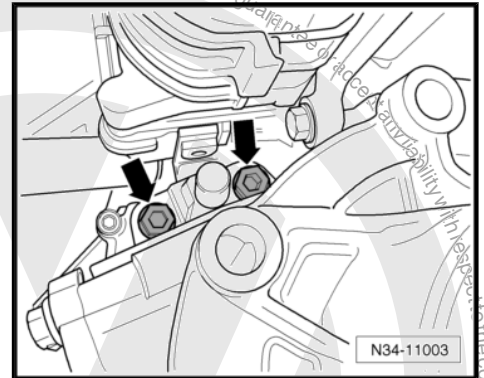


The bevel box upper bolts -arrow a- and -arrow b- to the manual transmission -1- are accessible from the engine compartment.

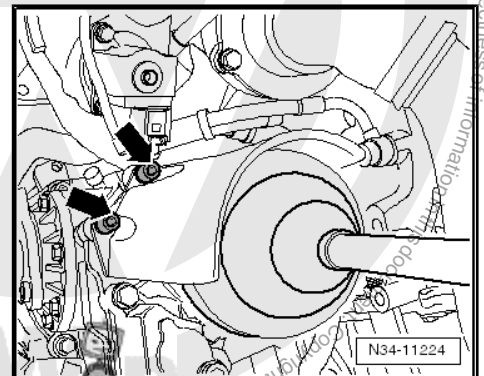




- Remove the upper bolts -arrows- that attach the bevel box to the manual transmission.



- If available, remove drive axle heat shield -arrows-. Refer to ➤ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .
- Remove the right drive axle. Refer to ➤ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .

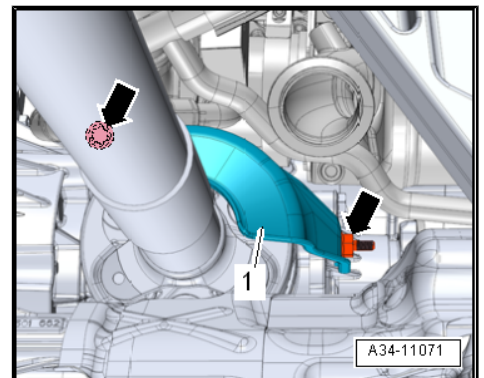


Caution

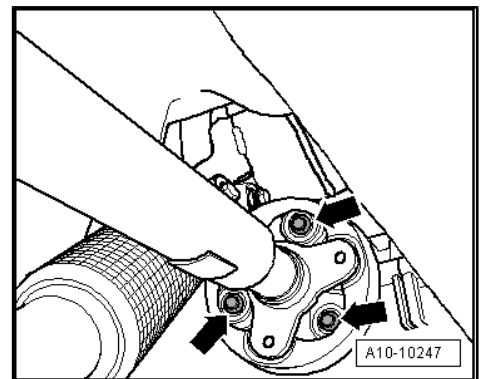
Risk of damaging the decoupling element

- ◆ **Pay attention. Refer to ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 ; Emissions Control; Overview - Emissions Control .**

- Remove the front exhaust pipe. Refer to ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 ; Exhaust Pipes/Mufflers; Overview - Muffler .
- Remove the bolts -arrows- and remove the heat shield -1-.

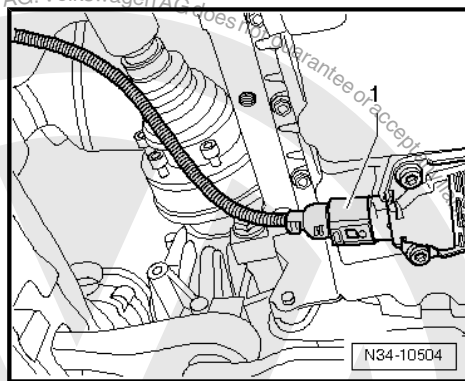


- Mark the position of the driveshaft with the flexible disk with respect to the bevel gear flange with paint.
- Remove the driveshaft from the bevel box -arrows-. Refer to ➤ Rear Final Drive; Rep. Gr. 39 ; Driveshaft; Driveshaft, Removing and Installing .
- Push the front driveshaft all the way back.
- Place a cloth on the subframe to prevent damaging the paint on the driveshaft.
- Lay the driveshaft on the subframe.

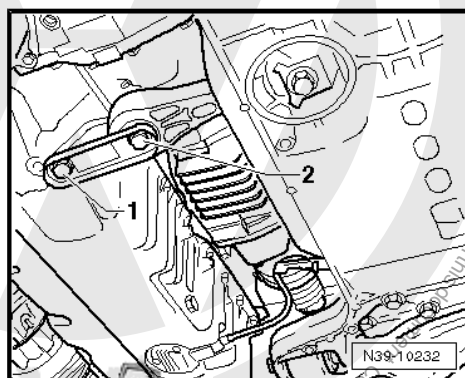




- Disconnect the connector -1- from the Oil Level Thermal Sensor - G266- .

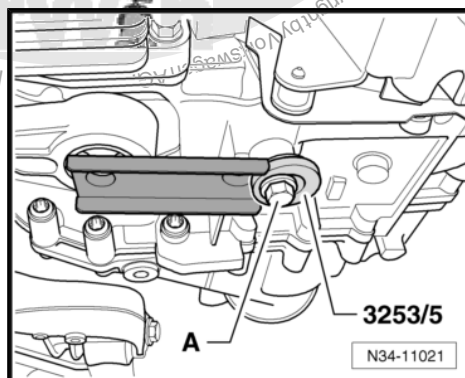


- Remove the pendulum support from the transmission, bolt -1- and bolt -2-.

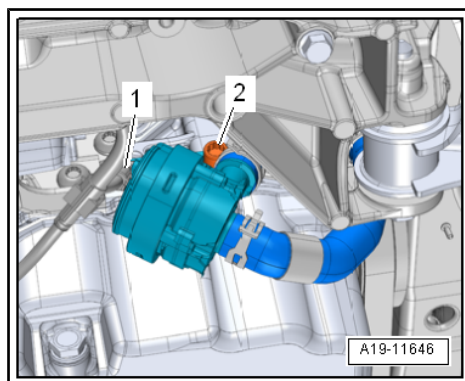


- Push the engine/transmission toward the front and support the pendulum support as illustrated.

-A- = M10 x 35 collar bolt

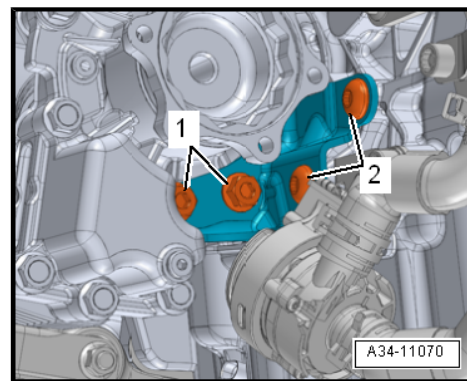


- Disconnect the connector -1-.
- Remove the bolt -2- and push the Heater Support Pump - V488- to the right. Do not open the system while doing this. Refer to ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 19 ; Coolant Pump/Thermostat; Overview - Electric Coolant Pump .

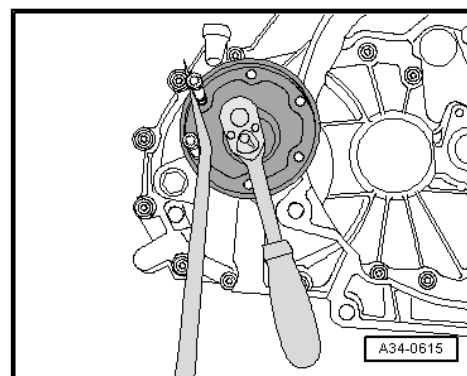




- Remove bolts -1 and 2- and bevel box transmission support.

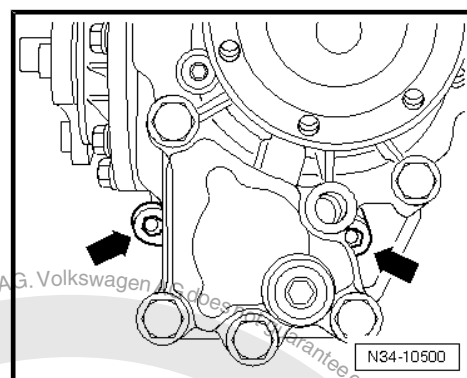


- Install 2 bolts into the flange, then counterhold the flange shaft with a pry bar and remove the bolt for the right flange shaft using a Socket .



- Remove the lower bolt -arrows- that attach the bevel box to the manual transmission.
- Carefully push the bevel box off the manual transmission and remove it.

⇒ ["4.2.1 Bevel Box 0CN, Installing", page 99](#)



4.2 Bevel Box, Installing

⇒ ["4.2.1 Bevel Box 0CN, Installing", page 99](#)

4.2.1 Bevel Box 0CN, Installing



Note

- ◆ Refer to "Bevel Box, Removing" to get a list of the special tools needed. Refer to ["4.1.1 Bevel Box 0CN, Removing", page 96](#).
- ◆ Replace self-locking screws and nuts after removing them.
- ◆ Replace bolts that were tightened with an additional turn after removing them.
- ◆ Install any cable ties that were loosened or cut off during removal at their same location.

Install in reverse order of removal. Note the following:





Push the engine/transmission toward the front and support the pendulum support as illustrated.

-A- = M10 x 35 collar bolt

- Coat the splines on the manual transmission differential with Grease For Clutch Disc Shaft Splines - G 000 100- .
- Slide bevel box completely onto transmission. While doing this, join splines of input shaft/bevel box centrally with differential. If necessary, turn on the flange shaft.
- With proper tooth position and central guiding, bevel box slips up to stop against manual transmission.



Note

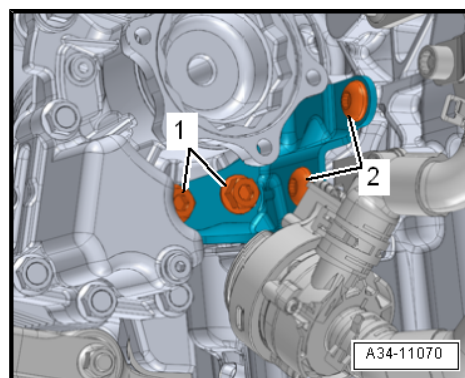
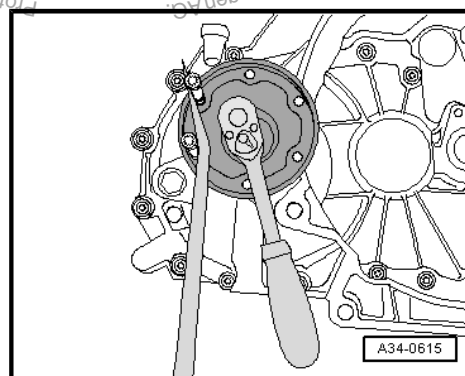
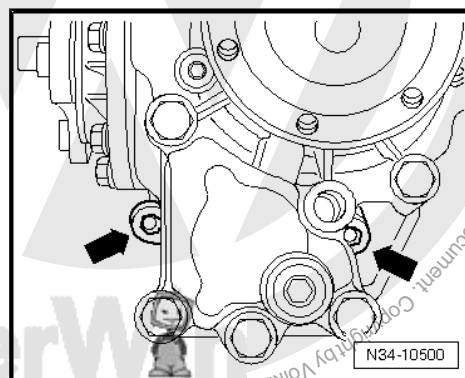
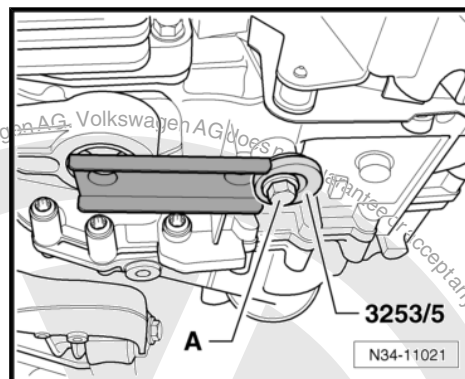
Do not pull bevel box with mounting bolts against manual transmission, otherwise bevel box can be tilted and mounting eyelets can break off.

- Install the lower bolts (-arrows-) that attach the bevel box to the manual transmission and tighten to the specification -item 12- ➔ [Item 12 \(page 207\)](#) .

- Tighten the flange shaft -item 13- ➔ [Item 13 \(page 207\)](#) .

- Attach the transmission support while paying attention to the tightening sequence of bolts -1 and 2-. Refer to ➔ [Fig. "Tightening Specification and Sequence for Bevel Box OCN Transmission Support"](#) , page 102 .

- Tighten the Heater Support Pump - V488- . Do not open the system. Connect the connectors. Refer to ➔ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 19 ; Coolant Pump/Thermostat; Overview - Electric Coolant Pump .

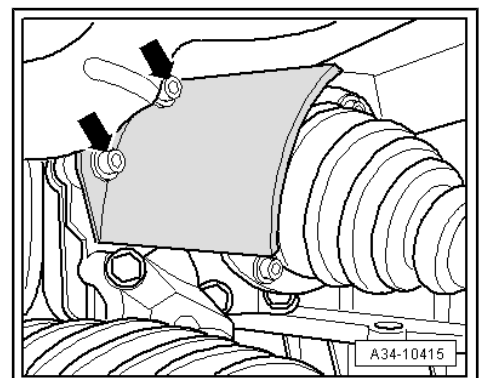
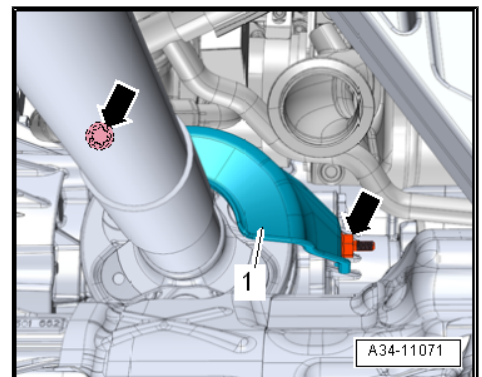
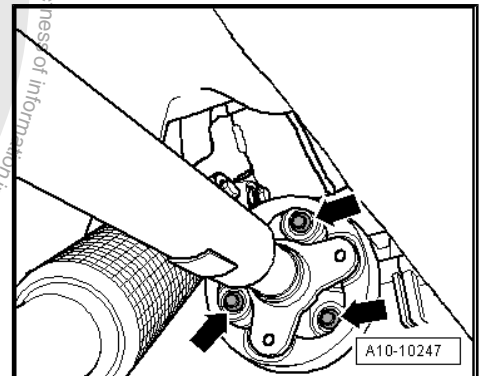
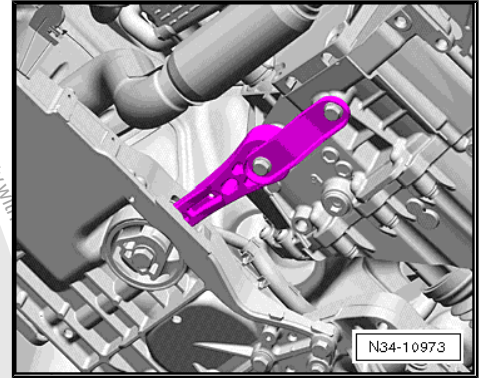




Note

Threaded inserts (for example, "Heli Coil") are found in the pendulum support fastening holes on some transmissions. Refer to ⇒ Fig. "Transmission with Threaded Insert (for Example Heli Coil) for Attaching the Pendulum Support", page 93 .

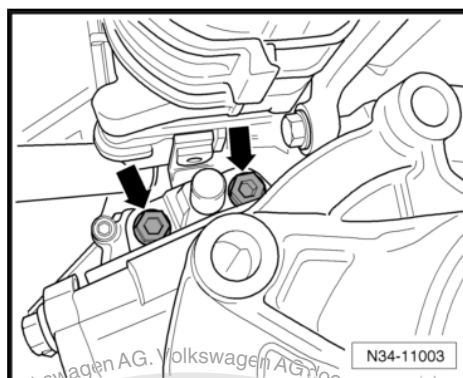
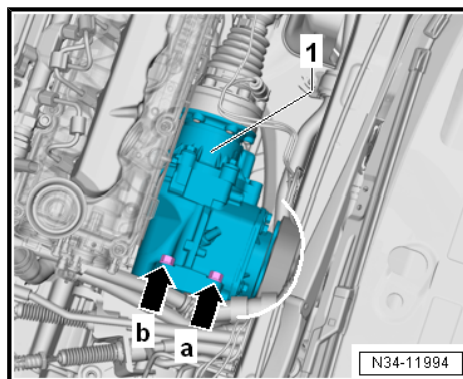
- Install pendulum support with new bolts. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .
- Fill the bevel box with gear oil. Refer to ⇒ "6.1.2 Gear Oil in Bevel Box, Filling", page 231 .
- Attach the driveshaft with the flexible disc to the bevel box flange -arrows-. Refer to ⇒ Rear Final Drive; Rep. Gr. 39 ; Driveshaft; Driveshaft, Removing and Installing .
- Attach heat shield -1- -arrows-. Refer to ⇒ Rear Final Drive; Rep. Gr. 39 ; Driveshaft; Driveshaft, Removing and Installing .
- Install the right drive axle. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .
- If removed, install the drive axle heat shield -arrows-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .





The bevel box upper bolts -arrow a- and -arrow b- to the manual transmission -1- are accessible from the engine compartment.

- Install the upper bolts (-arrows-) that attach the bevel box to the manual transmission and tighten to the specification -item 12- ➔ [Item 12 \(page 207\)](#) .
- Install EGR cooler. Refer to ➔ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 .
- Assemble the exhaust system. Refer to ➔ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 ; Exhaust Pipes/Mufflers; Overview - Muffler .
- Install the noise insulation. Refer to ➔ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .



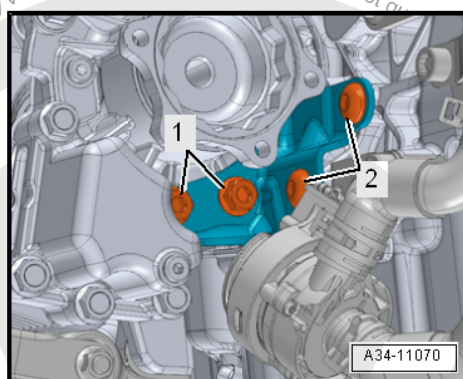
Tightening Specification and Sequence for Bevel Box "0CN" Transmission Support

Allocation of bolts.

Item	Bolt	Quantity
1	M10 x 55	2
2	M10 x 20	2

- Tighten the bolts in steps as follows:

Step	Bolts	Tightening Specification
1.	All	Install the bolt hand-tight.
2.	-1-	40 Nm
3.	-2-	40 Nm





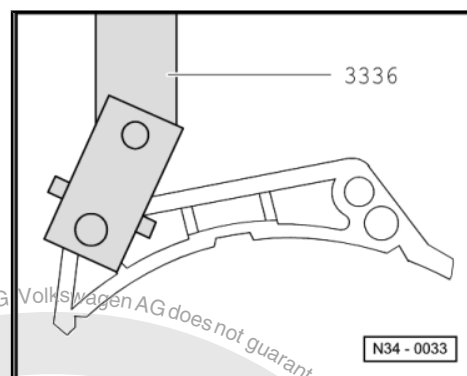
5 Transmission, Transporting

⇒ **"5.1 Transmission, Transporting", page 103**

5.1 Transmission, Transporting

Special tools and workshop equipment required

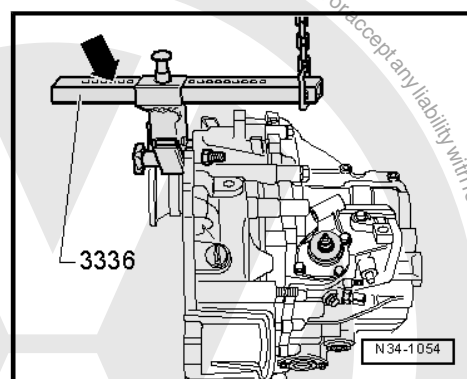
- ◆ Transmission Support Jig - 3336-
- ◆ Shop Crane - VAS6100-
- Attach the Transmission Support Jig - 3336- to the clutch housing.



- Move the support arm on the sliding bar using the locking bolt -arrow-.

Number of visible holes = 6.

- Lift the transmission with a workshop crane and the Transmission Support Jig - 3336- .
- Set the transmission down, for example, into the transport container.





6 Transmission Fluid

⇒ ["6.1 Transmission Fluid Level, Checking", page 104](#)

6.1 Transmission Fluid Level, Checking

Special tools and workshop equipment required

- ♦ For oil filler plug with multi-point fitting Triple Square Socket Driver - 3357- .
- ♦ Torque Wrench 1331 5-50Nm - VAG1331-

Transmission fluid. Refer to the Parts Catalog.

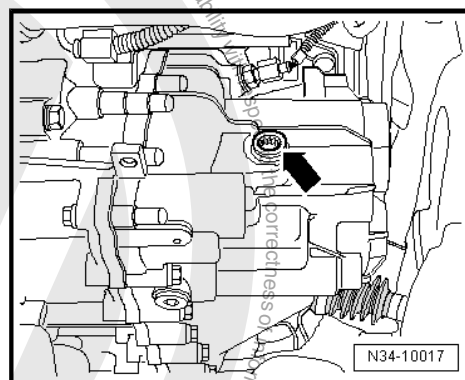
- Remove the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .
- Remove the gear oil check plug -arrow-.



Note

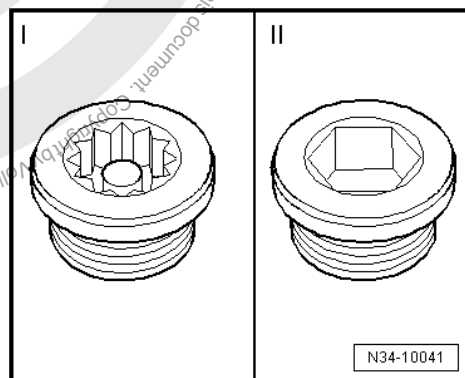
The level is correct when the transmission fluid comes up to the bottom edge of oil filler hole.

- Add transmission fluid, if necessary, until it reaches the lower edge of the filler hole.
- If present with new seal, install bolt -arrow-.
- Tighten the bolt -arrow-. Refer to
⇒ [Fig. "Different Versions of the Oil Fill and Drain Plugs", page 104](#) .



Different Versions of the Oil Fill and Drain Plugs

- I - Oil filler or drain plug with multi-point socket head, 45 Nm
- II - Oil filler or drain plug with hex socket head, 30 Nm
- Install the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .





7 Securing on Engine and Transmission Holder

⇒ ["7.1 Manual Transmission, Securing on Engine and Transmission Holder", page 105](#)

⇒ ["7.2 Bevel Box Securing on Engine and Transmission Holder", page 105](#)

7.1 Manual Transmission, Securing on Engine and Transmission Holder

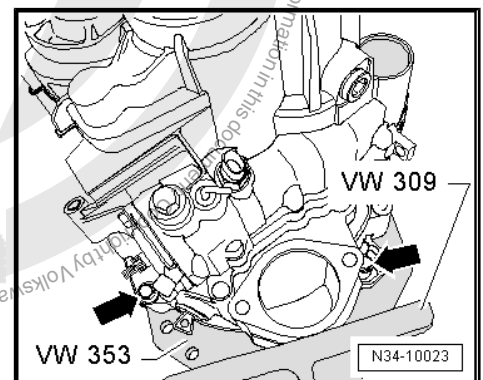
Special tools and workshop equipment required

- ◆ Holding Plate - VW309A-
- ◆ Transmission Support - VW353-
- Secure the transmission on the Transmission Support - VW353- -arrows-.
- Place the Drip Tray for VAG1202A - VAS6208- underneath.



Note

If one of the fastening holes does not touch the Transmission Support, place washers between the fastening hole and the Transmission Support.



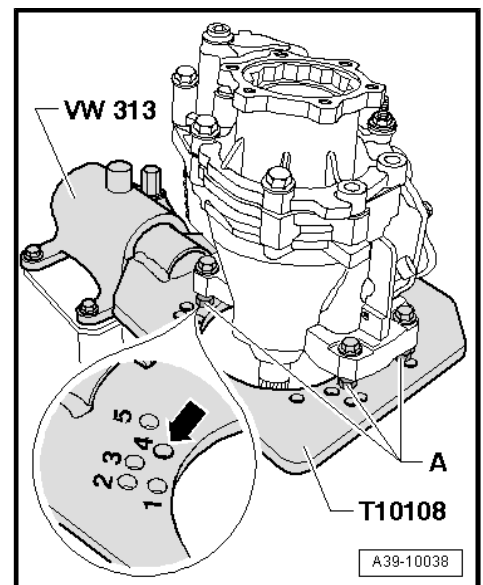
7.2 Bevel Box Securing on Engine and Transmission Holder

Special tools and workshop equipment required

- ◆ Holding Fixture - VW313-
- ◆ Gearbox Support - T10108-
- Mount the bevel gear on the hole marked with the number 4- -arrow- in the Gearbox Support - T10108- .

A - Insert nut M 12 x 10 (quantity: 4) between bevel box and Transmission Holder .

- Then align bevel box to the remaining three holes and secure.





8 Transmission, Disassembling and Assembling

⇒ ["8.1 Overview - Transmission Schematic", page 106](#)

⇒ ["8.2 Overview - Transmission", page 107](#)

⇒ ["8.3 Overview - Transmission Housing and Selector Mechanism", page 108](#)

⇒ ["8.4 Overview - Shift Unit", page 110](#)

⇒ ["8.5 Overview - Input Shaft, Output Shafts, Differential, Gear-shift Rods", page 111](#)

⇒ ["8.6 Overview - Shift Forks", page 113](#)

⇒ ["8.7 Selector Shaft Seal, Replacing", page 114](#)

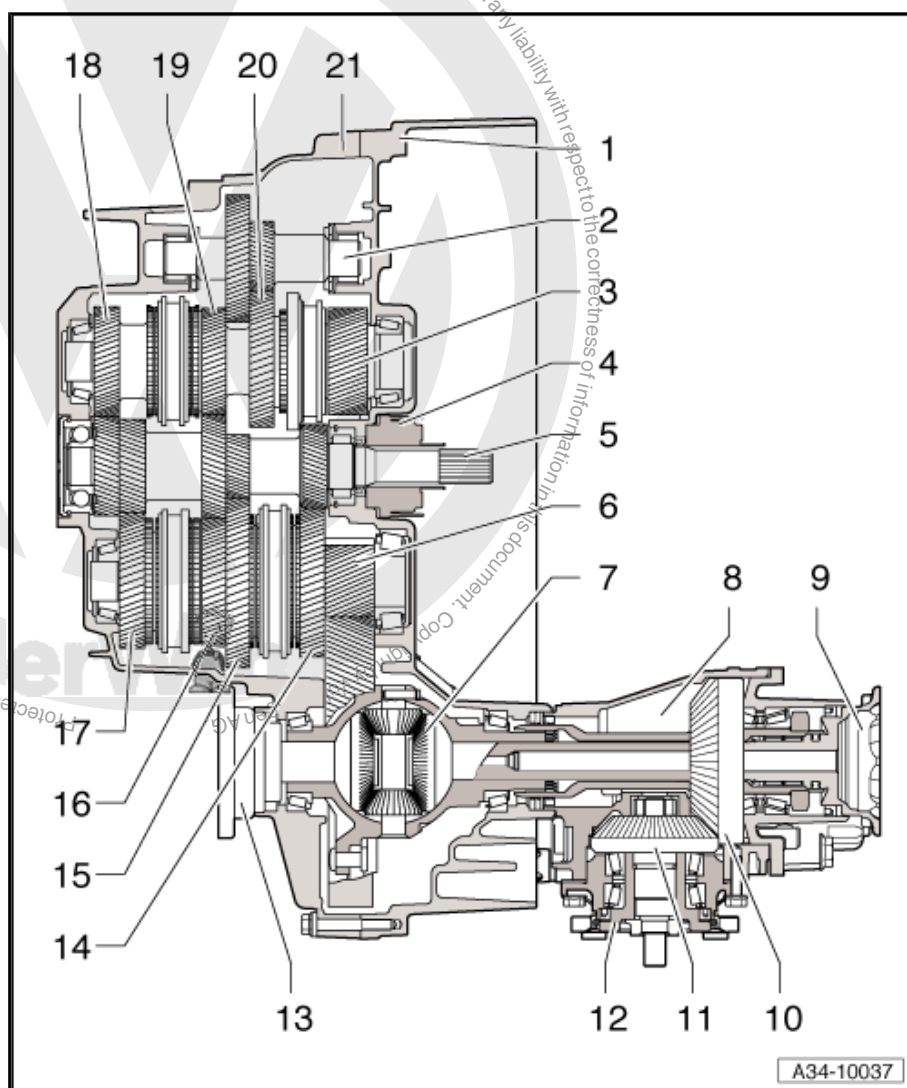
⇒ ["8.8 Transmission, Disassembling and Assembling", page 115](#)

8.1 Overview - Transmission Schematic

⇒ ["8.1.1 Overview - Transmission Schematic, All Wheel Drive", page 106](#)

8.1.1 Overview - Transmission Schematic, All Wheel Drive

- 1 - Clutch Housing
- 2 - Reverse Shaft
- 3 - 5th, 6th and Reverse Gear Output Shaft
- 4 - Clutch Slave Cylinder with Release Bearing
- 5 - Input Shaft
- 6 - Output Shaft 1st through 4th Gear
- 7 - Differential
- 8 - Bevel Box
- 9 - Right Flange Shaft
- 10 - Head Bevel Gear With Input Shaft
- 11 - Shaft Bevel Gear
- 12 - Output Flange
- 13 - Left Flange Shaft
- 14 - 2nd Gear Wheel
- 15 - 1st Gear Wheel
- 16 - 4th Gear Wheel
- 17 - 3rd Gear Wheel
- 18 - 5th Gear Wheel
- 19 - 6th Gear Wheel
- 20 - Reverse Gear Wheel





21 - Transmission Housing

8.2 Overview - Transmission

⇒ ["8.2.1 Transmission Overview, AWD", page 107](#)

8.2.1 Transmission Overview, AWD

I -

⇒ ["8.3 Overview - Transmission Housing and Selector Mechanism", page 108](#)

I -

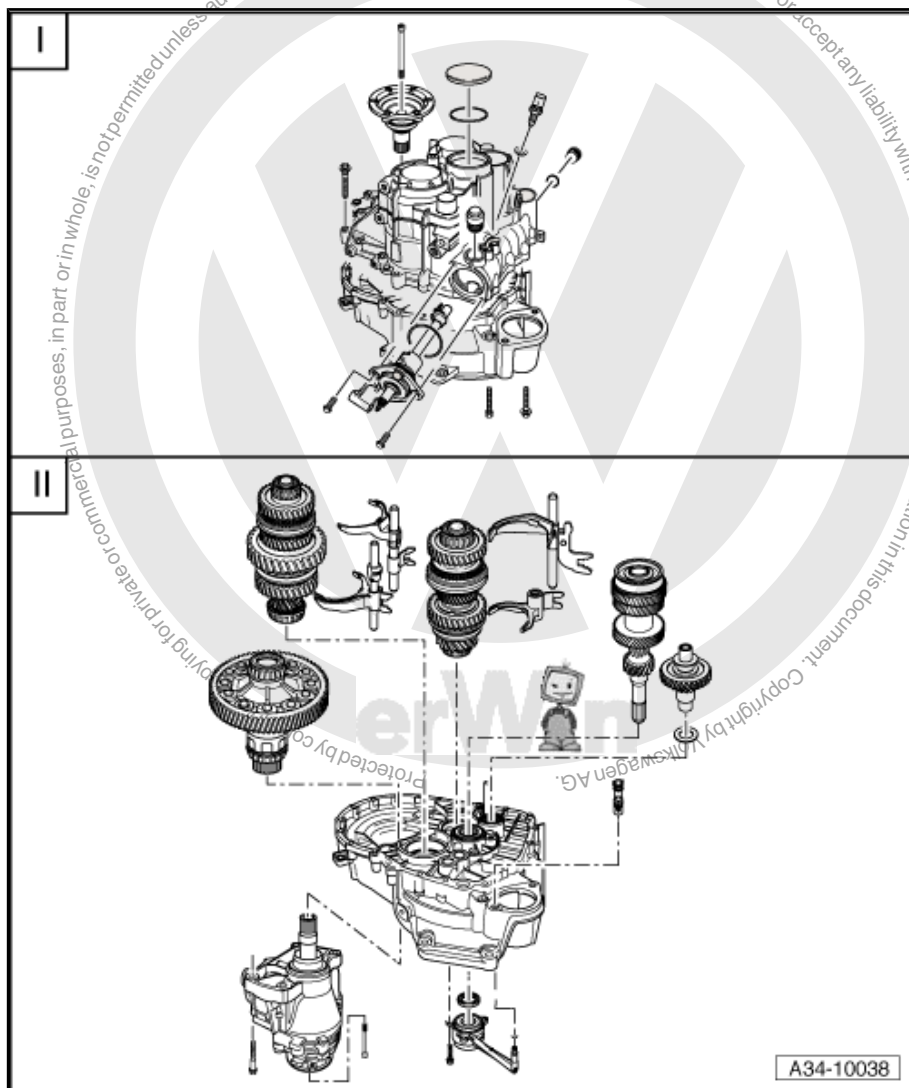
⇒ ["8.4 Overview - Shift Unit", page 110](#)

II -

⇒ ["8.5.1 Overview - Drive Axle, Output Shafts, Differential, Gearshift Rods, AWD", page 111](#)

II -

⇒ ["8.6 Overview - Shift Forks", page 113](#)



8.3 Overview - Transmission Housing and Selector Mechanism

1 - Bolt

- ☐ Removing and installing. Refer to
⇒ [“2.1 Overview - Differential”, page 206](#).

2 - Left Flange Shaft

- ☐ With pressure spring and tapered ring
- ☐ Removing and installing. Refer to
⇒ [“1.2 Left Seal, Replacing”, page 201](#).
- ☐ AWD, Assembling. Refer to
⇒ [“2.1 Overview - Differential”, page 206](#).

3 - Circlip

- ☐ For the metal cover
- ☐ Not used in plastic covers

4 - Cap

- ☐ Made of metal or plastic. Refer to ⇒ [page 118](#)
- ☐ Secured with metal locking ring
- ☐ Without plastic locking ring
- ☐ Allocate the components using the Parts Catalog.

5 - Circlip

- ☐ For the grooved ball bearing/input shaft. Refer to
⇒ [“1.1 Overview Input Shaft”, page 151](#)
- ☐ On transmissions with reinforcement frame the thickness must be redetermined. Refer to
⇒ [Fig. “Transmission with Reinforcement Measures \(Manual Transmission 0FB\)”, page 123](#)

6 - Back-Up Lamp Switch - F4-

- ☐ 20 Nm
- ☐ With permanent seal

7 - Seal

- ☐ Not installed on all transmissions
- ☐ If present, replace after removing

8 - Oil Drain Plug

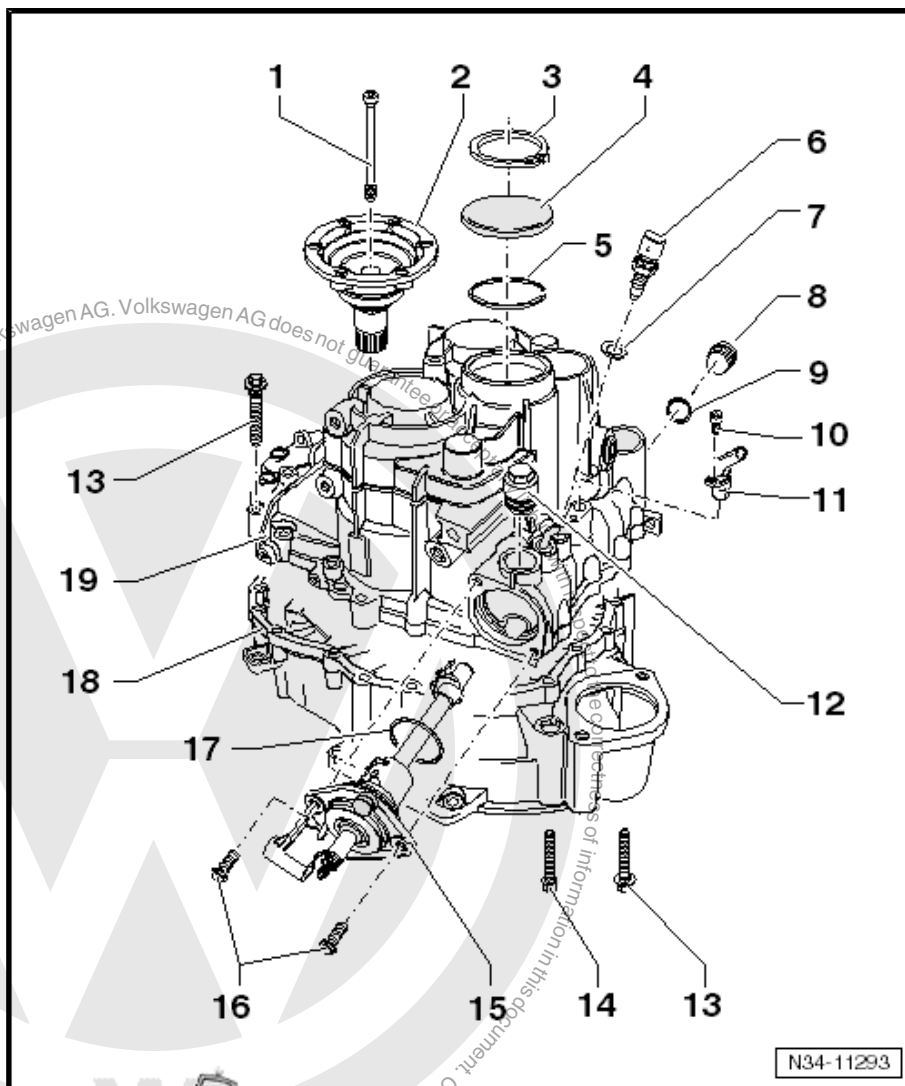
- ☐ Tightening specification. Refer to
⇒ [Fig. “Different Versions of the Oil Fill and Drain Plugs”, page 104](#).

9 - Seal

- ☐ Replace after removing

10 - Bolt

- ☐ 6 Nm





11 - Transmission Neutral Position Sensor - G701-

- ☐ For vehicles with the Start/Stop System

12 - Locking Bolt

- ☐ Metal locking screw 45 Nm
- ☐ Plastic locking screw 30 Nm
- ☐ For the selector shaft
- ☐ Replace locking screw after removing
- ☐ Metal or plastic locking screw

13 - Bolt

- ☐ 15 Nm and turn an additional 180°
- ☐ Replace after removing
- ☐ M9 aluminum bolt

14 - Bolt

- ☐ 15 Nm and turn an additional 180°
- ☐ Replace after removing
- ☐ M9 aluminum bolt

15 - Gearshift Unit

- ☐ (Gearshift shaft with gearshift cover). Refer to ➤ [“8.4 Overview - Shift Unit”, page 110](#) .
- ☐ Removing and installing with the transmission installed:
- ◆ Remove the air filter housing. Refer to ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- ◆ Remove the battery and the battery tray if necessary. Refer to ➤ Electrical Equipment; Rep. Gr. 27 Battery; Battery, Removing and Installing .
- ◆ The locking elbow -item 6- ➤ [Item 6 \(page 128\)](#) for adjusting the shift mechanism must not be engaged
- ◆ Remove the cables and gearshift lever. Refer to ➤ [“1.5 Overview - Operating Cables”, page 59](#) .
- ◆ Remove the locking screw.
- ◆ If equipped, remove the Transmission Neutral Position Sensor - G701- .
- ◆ Remove bolts and shift unit
- ◆ Install in reverse order of removal. Replace the O-ring and bolts

16 - Bolt

- ☐ 20 Nm
- ☐ Replace after removing

17 - O-Ring

- ☐ Replace after removing

18 - Clutch Housing

- ☐ Servicing. Refer to ➤ [“9 Transmission Housing and Clutch Housing”, page 128](#) .

19 - Transmission Housing

- ☐ Servicing. Refer to ➤ [“9 Transmission Housing and Clutch Housing”, page 128](#) .



8.4 Overview - Shift Unit

1 - Bearing Bushing

- ❑ For the selector shaft
- ❑ Removing and installing. Refer to
⇒ ["9.1 Overview - Transmission Housing", page 128](#) .

2 - Gearshift Unit

- ❑ Consisting of the gearshift shaft and the gearshift cover
- ❑ The components cannot be separated from each other
- ❑ Can be removed and installed with the transmission installed, refer to
⇒ ["8.3 Overview - Transmission Housing and Selector Mechanism", page 108](#)

3 - O-Ring

- ❑ Insert in the groove in the shift cover
- ❑ Install with transmission fluid
- ❑ Replace after removing

4 - Cap

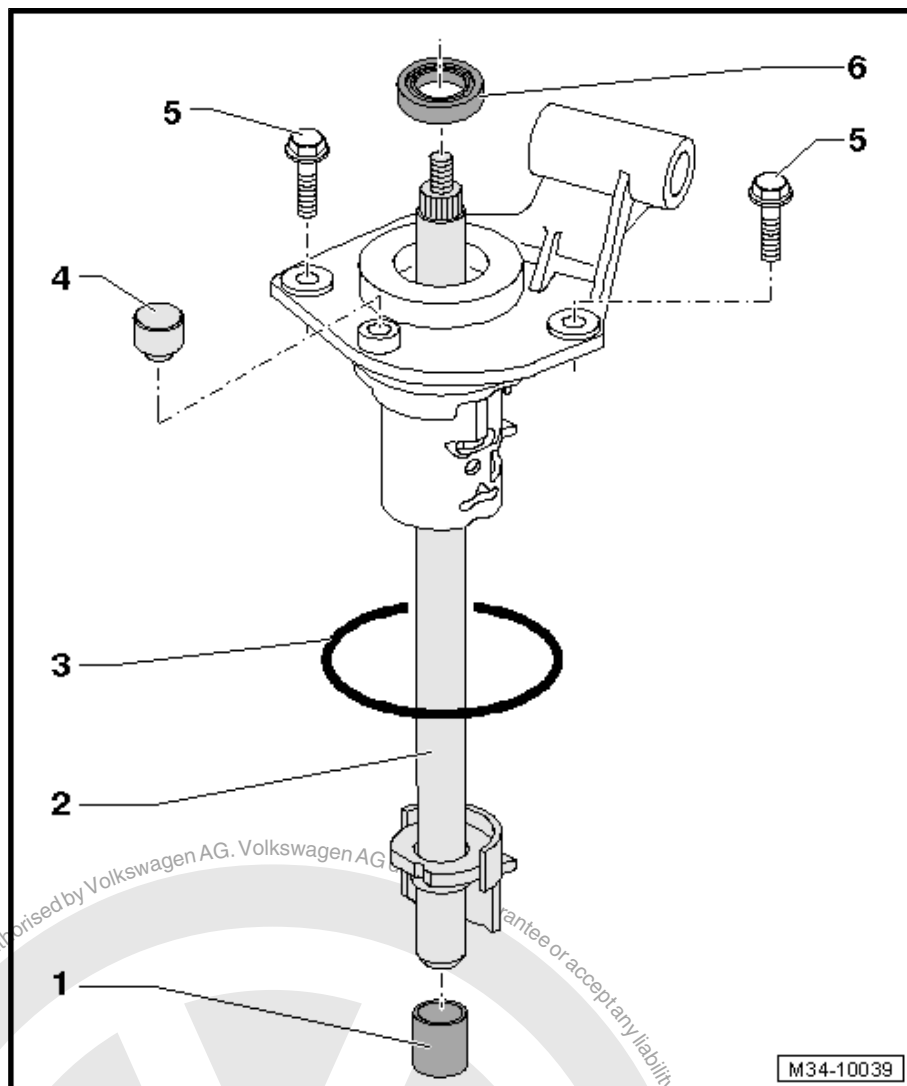
- ❑ For the transmission ventilation

5 - Bolt

- ❑ For the shift unit to the transmission housing
- ❑ Tightening specification. Refer to
⇒ ["8.3 Overview - Transmission Housing and Selector Mechanism", page 108](#) .
- ❑ Replace after removing

6 - Gearshift Shaft Seal

- ❑ Replacing. Refer to ⇒ ["8.7 Selector Shaft Seal, Replacing", page 114](#) .





8.5 Overview - Input Shaft, Output Shafts, Differential, Gearshift Rods

⇒ [“8.5.1 Overview - Drive Axle, Output Shafts, Differential, Gearshift Rods, AWD”, page 111](#)

8.5.1 Overview - Drive Axle, Output Shafts, Differential, Gearshift Rods, AWD

1 - Output Shaft 1st through 4th Gear

- ❑ Disassembling and Assembling. Refer to ⇒ [“2.2.1 Output Shaft, 1st to 4th Gears, Disassembling and Assembling”, page 166](#).
- ❑ Installation position. Refer to ⇒ [Fig. “Installation Location of Shafts and Gearshift Rods in Transmission””, page 113](#).

2 - Gearshift Rod with Shift Fork for 1st Gear and 2nd Gear

- ❑ Installation position. Refer to ⇒ [Fig. “Installation Location of Shafts and Gearshift Rods in Transmission””, page 113](#).

3 - Gearshift Rod with Shift Fork for 3rd Gear and 4th Gear

- ❑ Installation position. Refer to ⇒ [Fig. “Installation Location of Shafts and Gearshift Rods in Transmission””, page 113](#).

4 - 5th, 6th and Reverse Gear Output Shaft

- ❑ Disassembling and assembling. Refer to ⇒ [“2.2.2 Output Shaft, 5th, 6th and Reverse Gears, Disassembling and Assembling”, page 176](#).
- ❑ Installation position. Refer to ⇒ [Fig. “Installation Location of Shafts and Gearshift Rods in Transmission””, page 113](#).

5 - Gearshift Rod with Shift Fork for 5th Gear and 6th Gear

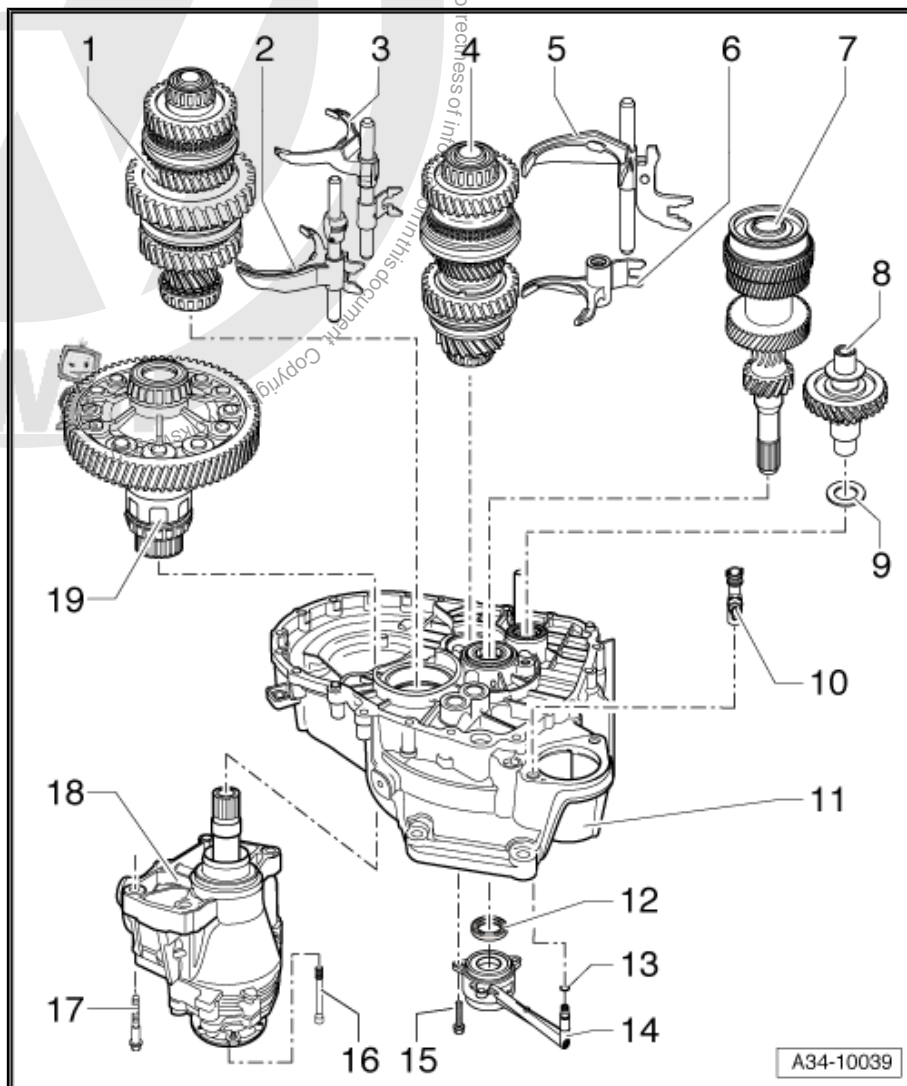
- ❑ Installation position. Refer to ⇒ [Fig. “Installation Location of Shafts and Gearshift Rods in Transmission””, page 113](#).

6 - Reverse Gear Shift Fork

- ❑ Installation position. Refer to ⇒ [Fig. “Installation Location of Shafts and Gearshift Rods in Transmission””, page 113](#).

7 - Input Shaft

- ❑ Installed position. Refer to ⇒ [Fig. “Installation Location of Shafts and Gearshift Rods in Transmission””, page 113](#).
- ❑ Disassembling and assembling. Refer to ⇒ [“1.1 Overview - Input Shaft”, page 151](#).





- ☐ Replace grooved ball bearing on drive axle after removing. Refer to [⇒ "1.1 Overview - Input Shaft", page 151](#) .

8 - Reverse Shaft

- ☐ With a thrust washer

9 - Thrust Washer

10 - Bleeder

- ☐ Connect with clutch slave cylinder

11 - Clutch Housing

- ☐ Servicing. Refer to [⇒ "9.2 Overview - Clutch Housing", page 130](#) .

12 - Input Shaft Seal

- ☐ Replacing. Refer to [⇒ "1.3 Input Shaft Seal, Replacing", page 155](#) .

13 - O-Ring

- ☐ Install on the line connection
- ☐ Coat with brake fluid before installing

14 - Clutch Slave Cylinder with Release Bearing

15 - Bolt

- ☐ Quantity: 3
- ☐ Replace after removing
- ☐ Removing and installing. Refer to [⇒ "1.4 Overview - Clutch Release Mechanism", page 18](#) .

16 - Bolt

- ☐ Tightening specification. Refer to [⇒ "2.1 Overview - Differential", page 206](#) .

17 - Bolt

- ☐ Quantity: 4
- ☐ Replace after removing
- ☐ Tightening specification. Refer to [⇒ "2.1 Overview - Differential", page 206](#) .

18 - AWD Bevel Box

- ☐ Bevel box, flange shaft bearing and output flange bearing. Refer to [⇒ "4.1 Overview - Bevel Box", page 216](#)

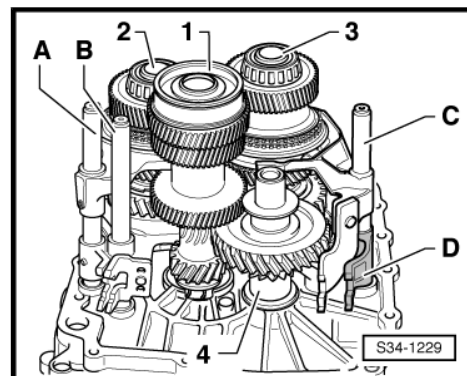
19 - Differential

- ☐ Disassembling and assembling. Refer to [⇒ "2.2 Differential, Disassembling and Assembling", page 209](#) .



Installation Location of Shafts and Gearshift Rods in Transmission

- 1 - Input shaft
- 2 - Output shaft 1st through 4th gear
- 3 - Output shaft for 5th/6th and reverse gears
- 4 - Reverse Shaft
- A - 3rd and 4th gear gearshift rod
- B - 1st and 2nd gear gearshift rod
- C - 5th and 6th gear gearshift rod
- D - Reverse gear shift fork



Note

The reverse gear shift fork -D- is mounted on the 5th and 6th gear gearshift rod -C-.

8.6 Overview - Shift Forks

1 - Insulation Mat

- ☐ Remove from the gearshift rod by hand and install.

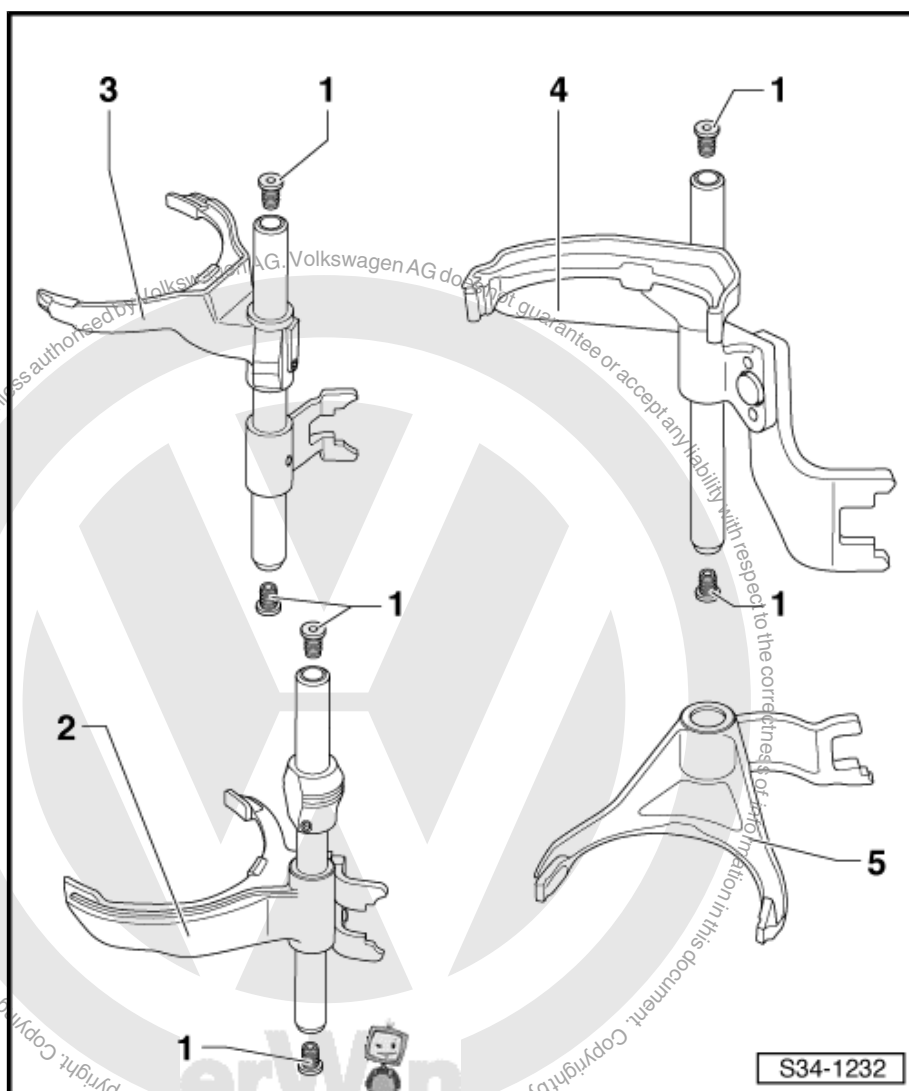
2 - Gearshift Rod with Shift Fork for 1st Gear and 2nd Gear

3 - Gearshift Rod with Shift Fork for 3rd Gear and 4th Gear

4 - Gearshift Rod with Shift Fork for 5th Gear and 6th Gear

5 - Reverse Gear Shift Fork

- ☐ Is secured on the gearshift rod with 5th and 6th gear shift fork. Refer to ➔ [Fig. "Installation Location of Shafts and Gearshift Rods in Transmission" page 113](#)





8.7 Selector Shaft Seal, Replacing

Special tools and workshop equipment required

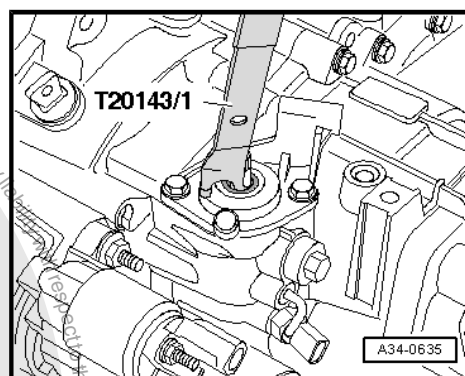
- ◆ Press Piece - Shift Rod/Alternator - VW423-
- ◆ Puller - Crankshaft/Power Steering Seal - T20143/1-
- ◆ Sealing Grease . Refer to the Parts Catalog.
- Remove gearshift lever and selector relay lever. Refer to
⇒ ["1.5 Overview - Operating Cables", page 59](#) or
⇒ ["1.6 Overview - Selector Mechanism", page 61](#) .



Note

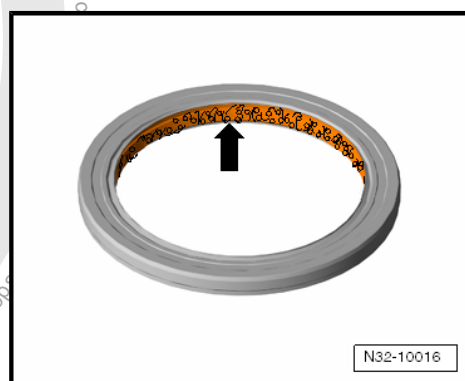
If it is not possible to remove the selector relay lever through the transmission bracket, then remove the sliding shoe from the gearshift lever.

- Remove the gearshift lever from the gearshift shaft.
- Remove the seal using the Puller - Crankshaft/Power Steering Seal - T20143/1-

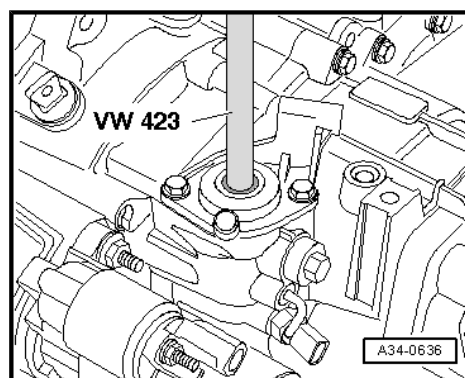


Lightly oil new seal on outer circumference.

Fill the space between the sealing and dust lip -arrow- halfway with Sealing Grease - G 052 128 A1- .



- Drive in the seal using the Press Piece - Shift Rod/Alternator - VW423- .
- Install gearshift lever and selector relay lever. Refer to
⇒ ["1.5 Overview - Operating Cables", page 59](#) or
⇒ ["1.6 Overview - Selector Mechanism", page 61](#) .





8.8 Transmission, Disassembling and Assembling

Remove and Install Transmission Housing, Gearshift Mechanism, Input Shaft, Output Shafts, Differential, Selector Rods and Bevel Box, if Necessary.

Special tools and workshop equipment required

- ◆ Holding Plate - VW309A-
- ◆ Holding Fixture - VW313-
- ◆ Transmission Support - VW353-
- ◆ Press Piece - Multiple Use - VW455- or Press Piece - Front Wishbone - 3160-
- ◆ Slide Hammer Set - VW771-
- ◆ -1- Puller - Kukko Internal - 12-16mm - Kukko 21/01-
- ◆ -3- Puller - Kukko Quick Action Separating Tool - 5-60mm - Kukko 17/0-
- ◆ -4- Puller - Kukko Counterstay - Kukko 22/1-
- ◆ Bracket - Multiple Use - 30-211A-
- ◆ Seal Installer - Drive Flange - T10143- or Seal Installer - Output Shaft Oil Seal - T10180-
- ◆ Locking Sleeve Drift - T10169-
- ◆ or Locking Sleeve Drift - T10362- . Refer to [⇒ Fig. ""Lock Sleeve Differentiation"" , page 134](#)
- ◆ Seal Installer - Drive Axle - T40008-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Hot Air Blower - VAG1416-
- ◆ Pry Lever - 80-200-
- ◆ Shop Crane - Drip Tray - VAS6208-
- ◆ Sealing Compound - AMV 188 200 03-

Transmission, Disassembling

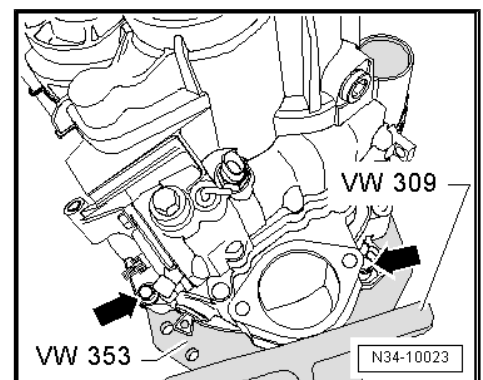
- Secure the transmission on the Transmission Support - VW353- -arrows-.



Note

If one of the fastening holes does not touch the Transmission Support , place washers between the fastening hole and the Transmission Support .

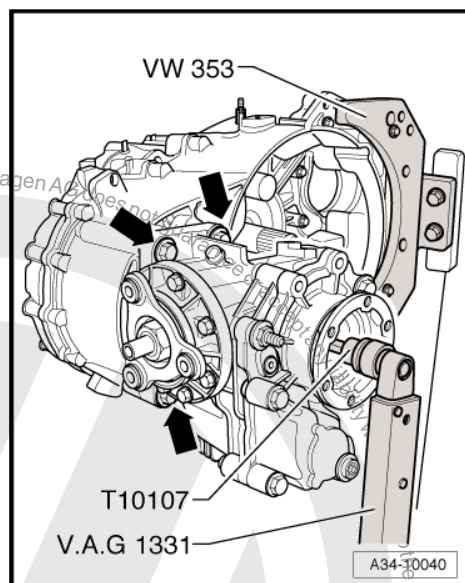
- Turn the transmission the assembly stand with the oil drain plug facing down.
- Place the Drip Tray underneath.
- Drain gear oil from manual transmission.



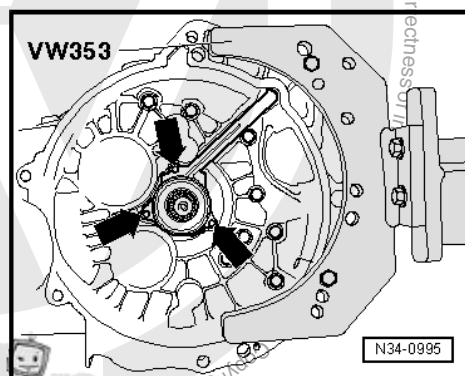


AWD Transmission

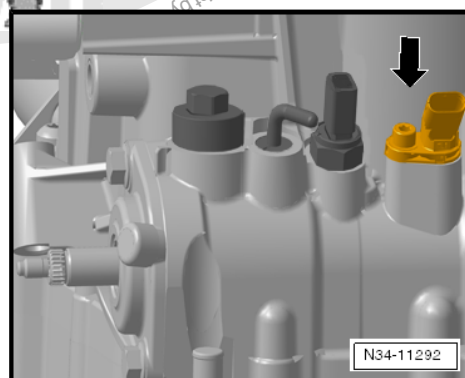
- Remove right flange shaft countersunk screw with Socket And Key .
- Remove the 4 bolts -arrows- attaching the bevel box to the manual transmission (only 3 bolts are shown in the illustration).



- Carefully press bevel box or front axle differential lock off manual transmission while protecting it against falling through.
- Remove the clutch slave cylinder with the release bearing -arrows-.

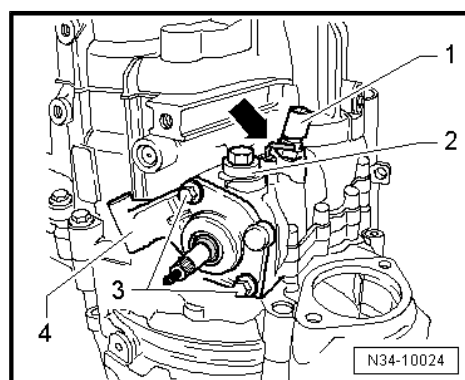


- Transmission on vehicles with Stop/Start system: remove the Transmission Neutral Position Sensor - G701- -arrow-.



Make Sure the Gearshift Shaft is Not Blocked By the Lock Elbow -arrow-.

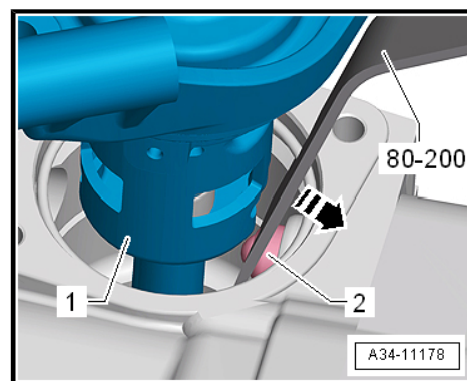
- Move the gearshift shaft into neutral.
- Remove the Back-Up Lamp Switch - F4- -1-.
- Remove the locking bolt -2-.
- Then remove the bolts -3-.
- Remove selector shaft with shift cover -4- from transmission housing.



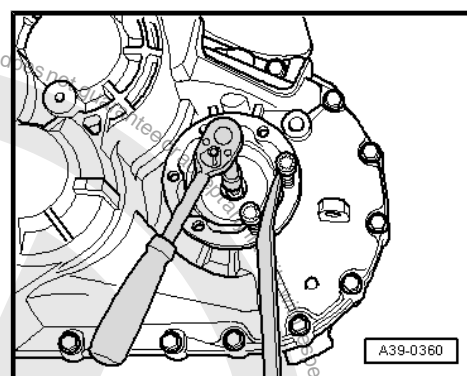


Note

Use the Pry Lever - 80-200- to press against the spring force of the securing bushing direction of -arrow- so that the gearshift shaft -1- does not touch the securing bushing -2- when removing.



- Remove the left flange shaft bolt. To do this, install two bolts in the flange and counterhold it using a tire iron.
- Remove the flange shaft and the pressure spring.

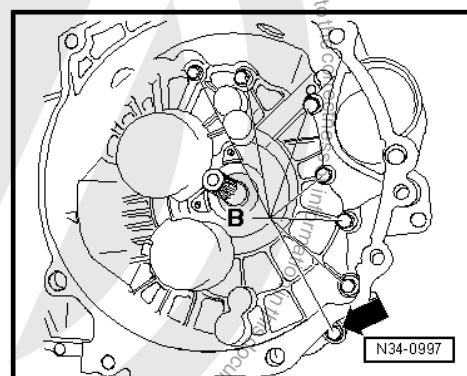


- Remove the bolts -B- that connect the clutch housing to the transmission housing.



Note

One bolt -arrow- is located outside of the bolting flange.



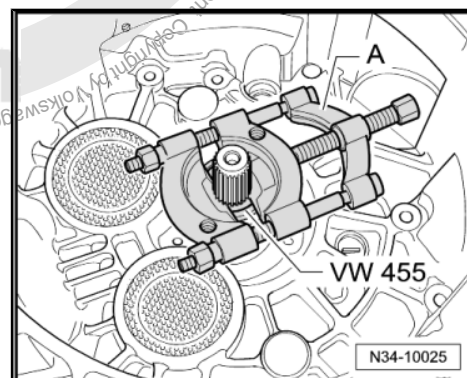
- Lock the input shaft as follows:



Note

The stub shaft splines on the input shaft has different lengths on the transmission.

- Either place the Press Piece - Multiple Use - VW455- over the input shaft on the clutch housing.





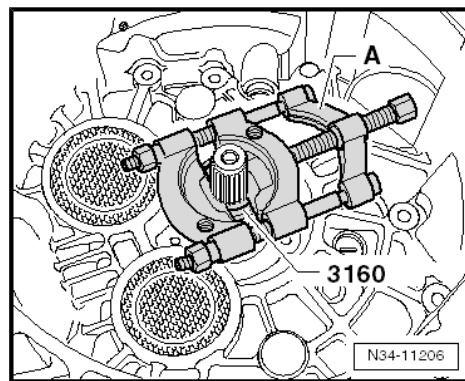
- Or place the Press Piece - Front Wishbone - 3160- over the input shaft on the clutch housing.
- Tension the Separating Tool - 5-60mm -A-, for example Puller - Kukko Quick Action Separating Tool - 5-60mm - Kukko 17/0-, tightly behind the splines on the input shaft.

The back of the Separating Tool - 5-60mm must touch the Press Piece - Multiple Use - VW455- or the Press Piece - Front Wishbone - 3160- free-of-play.



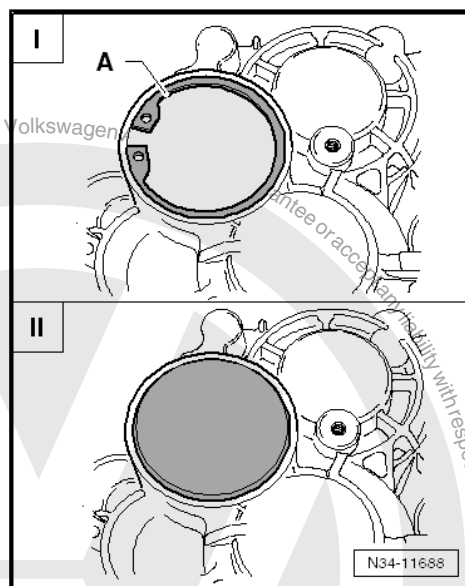
Note

Metal and plastic covers are installed for the input shaft.



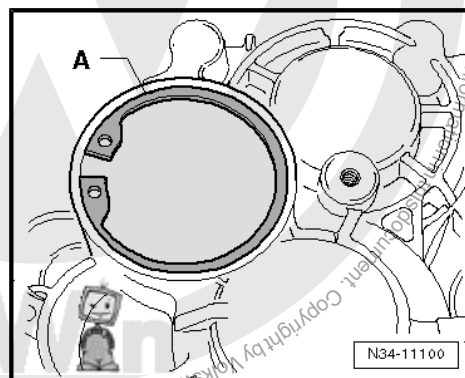
The Locking Ring -A- Has Been Discontinued Together with the Plastic Cover for the Input Shaft.

- ♦ -I- = Steel cover for the input shaft with locking ring -A-
- ♦ -II- = Plastic cover for the input shaft without locking ring



Metal Cover

- Remove the cap/input shaft circlip -A-.



- Pierce the rubber piece in the center of the cover -C- using a Screwdriver .



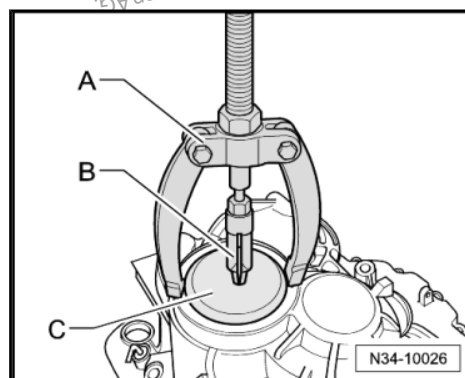
Caution

There is a risk of damaging the components under the cap.

- Remove the cover from the transmission housing.

A - Counter Support , for example Puller - Kukko Counterstay - 22/1-

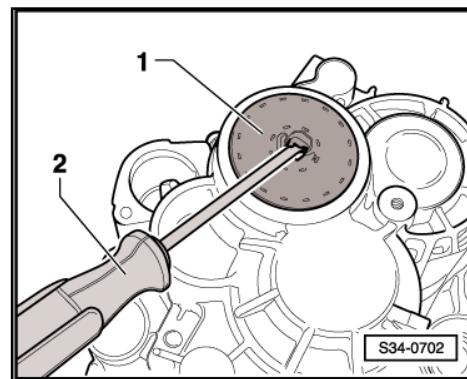
B - Internal Puller 8 to 12 mm , for example -21/01-





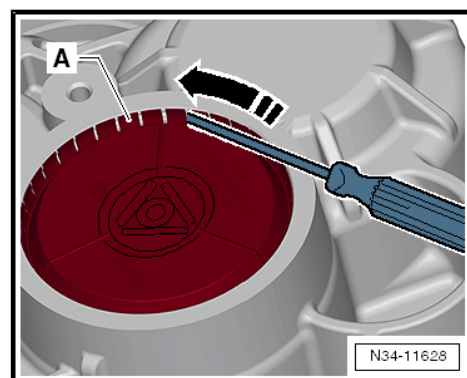
Note

Pry the cap -1- off with a screwdriver -2-.

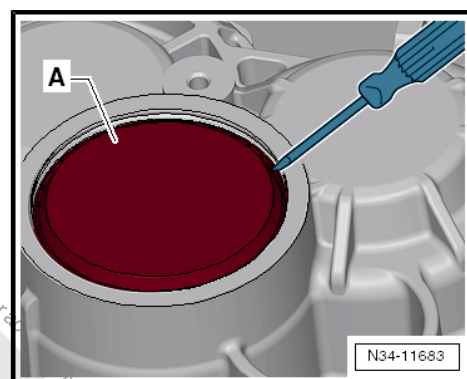


Plastic Cover

Carefully remove all tabs -A-. Do not damage the transmission housing when doing so.



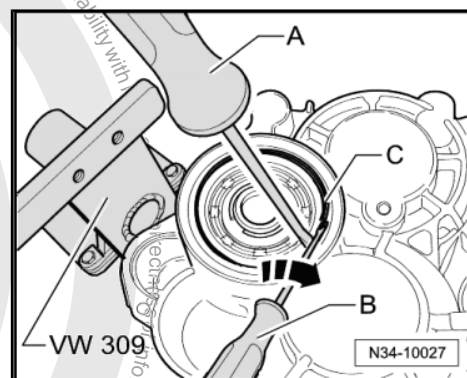
- Remove the cap -A-.
- Make sure the individual parts of the cover are removed, if necessary.



Continuation for All

Remove the locking ring -C- from the grooved ball bearing on the input shaft/transmission housing as follows:

- Hold one end of the locking ring secure with the Screwdriver -A-.
- Pry the other end out of the groove in the grooved ball bearing in direction of -arrow- using the Screwdriver -B-.
- Pry out the rest of the locking ring using the Screwdriver -B-.





- Remove the bolts -A- that attach the transmission housing to the clutch housing.
- Install Slide Hammer Set - Adapter 40 - VW771/40- into the threaded hole in the transmission housing.
- Heat the transmission housing in the area near the bearing seat for the grooved ball bearing/input shaft to approximately 100 °C (212 °F) for approximately 10 minutes using a Hot Air Blower , for example, -VAG1416- .



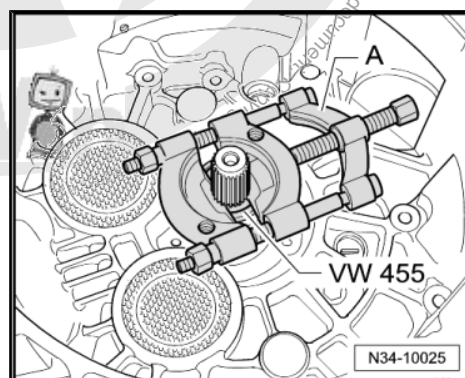
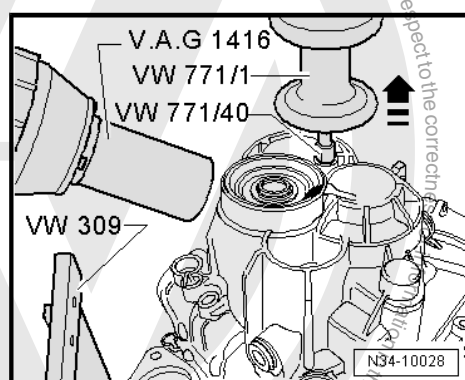
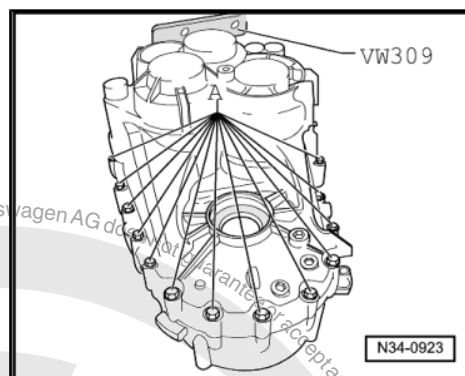
Note

Pry off the transmission housing carefully at the protruding braces using a pry lever and alternating from side to side. Do not damage sealing surface.

- Remove the transmission housing from the clutch housing in direction of -arrow- using Slide Hammer Set - Adapter 40 - VW771/40- .

- Remove the Separating Tool -A- and the Press Piece - Multiple Use VW455 or the Press Piece - Front Wishbone - 3160- from the input shaft.

A second technician is needed to help remove the shafts from the clutch housing.



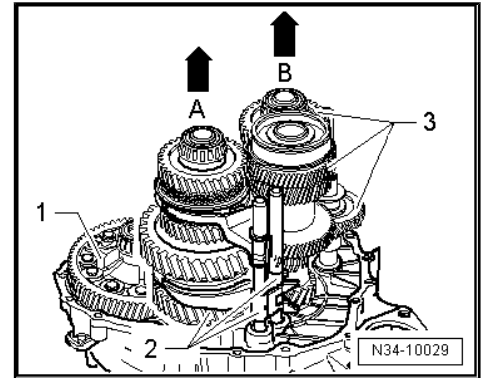


- Lift the differential -1- with the left hand. With the right hand, lift the output shaft for 1st to 4th gear together with the gearshift rods -2- -arrow A-.
- At the same time, the second technician lifts the input - reverse- and output shafts for 5th/6th gear and reverse gear -3- together with the gearshift rod out of the clutch housing -arrow B-.



Note

If necessary, differential can be shifted again in clutch housing after lifting shafts.



- Remove the input shaft seal.

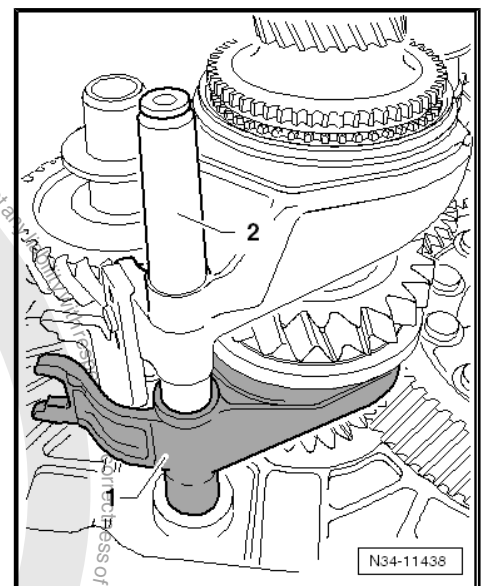


Note

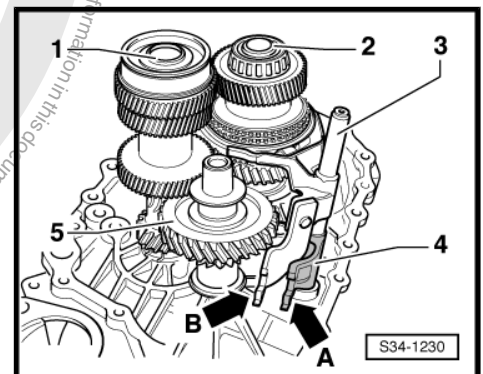
Replace grooved ball bearing on drive axle after removing. Refer to ➤ [“1.1 Overview - Input Shaft”, page 151](#) .

Assembling the Transmission

- A new grooved ball bearing is pressed onto the input shaft. Refer to ➤ [“1.1 Overview - Input Shaft”, page 151](#) .
- The reverse gear shift fork -1- is placed on the 5th and 6th gear gearshift rod -2-. Refer to ➤ [page 121](#) .



- Install the input shaft -1-, the 5th/6th gear output shaft -2- and the 5th/6th gear gearshift rod -3-, the reverse gear shift fork -4- and reverse shaft -5-.
- The shift jaw -arrow A- on the reverse gear shift fork faces the outside of the transmission. The shift jaw -arrow B- on the 5th/6th gear gearshift rod must face toward the inside of the transmission.





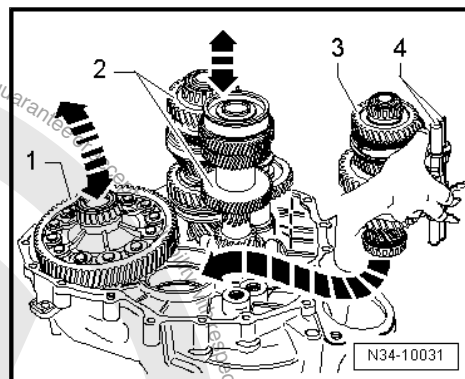
- Then install the differential -1-.



Note

A second technician is needed to help install the shafts into the clutch housing.

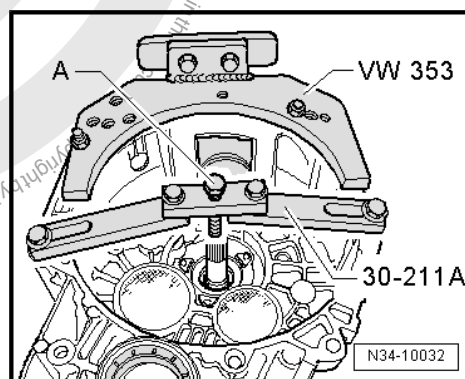
- Hold the 1st through 4th gear output shaft -3- with the gearshift rods -4- in the right hand as illustrated.
- Lift the differential slightly with your left hand.
- Have the second technician lift the input shaft, the 5th/6th gear output shaft -2- together with the reverse shaft slightly at the same time.
- Install the 1st through 4th gear output shaft in direction of -arrow-.
- Places of input shaft, output shafts and final drive gear/differential must engage.
- Place the shafts and the differential in their bearing seats with a second technician.
- Secure the Bracket - Multiple Use - 30-211A- for the input shaft to the clutch housing.



Note

The clutch housing is shown in the illustration rotated 180°.

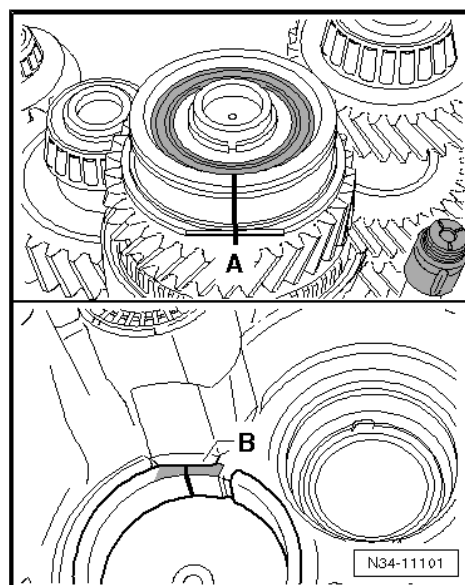
- Install the bolt -A- just far enough until the input shaft starts to lift.



The Grooved Ball Bearing/Input Shaft Only Fits in One Position in the Transmission Housing.

There is a flattened area on the grooved ball bearing and the bearing mount.

- The flattened sides -A- on the grooved ball bearing and on the bearing mount -B- must align in the transmission housing.
- Mark this flat side with color.
- Transfer the markings to the upper area of the grooved ball bearing and to the upper area of the transmission housing bearing mount (see next figure).
- Heat the transmission housing in the area near the bearing seat for the grooved ball bearing/input shaft to approximately 100 °C (212 °F) for approximately 10 minutes using a -Hot Air Blower- , for example, -VAG1416- .

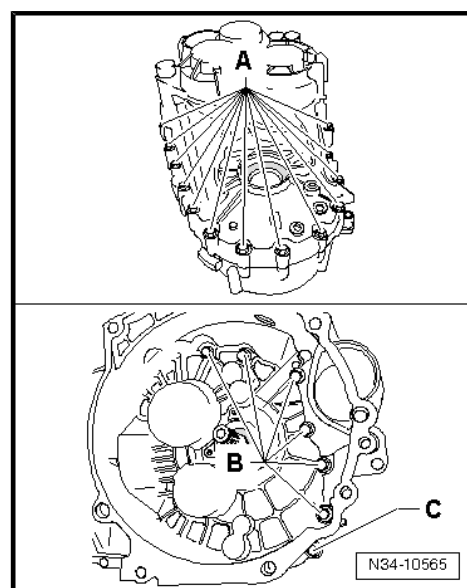
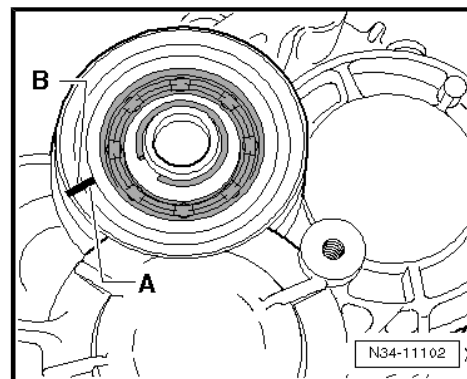




Note

- ◆ It is necessary to heat the transmission housing so that the grooved ball bearing is not damaged when the housing is being installed.
- ◆ Apply Sealing Paste - AMV 188 200 03- evenly onto the sealing surface of the clutch housing.
- ◆ Align the marking on the grooved ball bearing -A- with the marking on the transmission housing -B- and mount the transmission housing.

- Install the transmission housing and tighten the new bolts -A, B and C-.



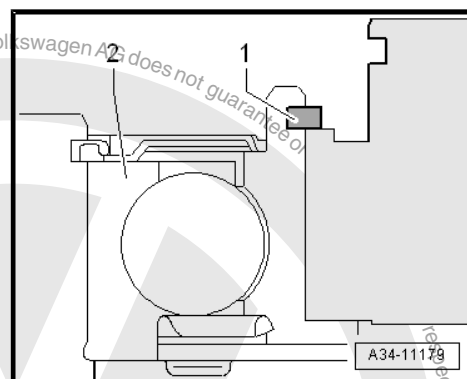
Transmission with Reinforcement Measures (Manual Transmission 0FB)

- Redetermine the locking ring -1- for the grooved ball bearing/ input shaft -2-:
- Check that the input shaft with the Bracket - Multiple Use - 30-211A- is pressed up against the transmission housing.
- Determine the thickest locking ring that has not yet been used and install it in the grooved ball bearing/drive axle, starting with the thickest locking ring.

The following locking rings are available. For the part number, refer to Parts Catalog.

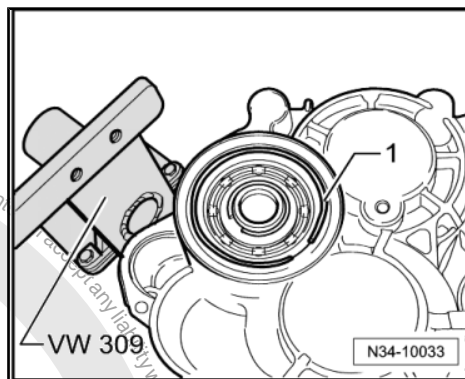
Circlip Thickness (mm)		
2.03	2.09	2.15
2.21	2.27	

Continuation for All



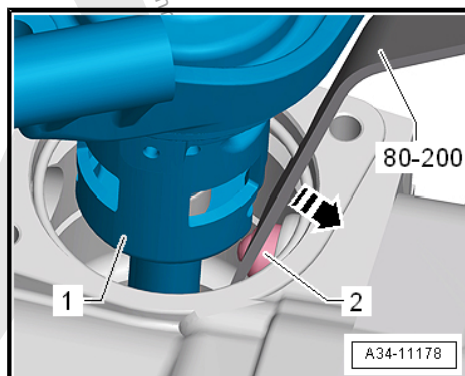


- Install the grooved ball bearing/input shaft locking ring -1-.
- Remove the Bracket - Multiple Use - 30-211A- for the input shaft.
- If the retaining sleeve for the gearshift shaft was removed, then install it now all the way onto the tool. Refer to [⇒ Fig. "Lock Sleeve Differentiation", page 134](#).
- Turn the transmission so that the opening for the gearshift shaft faces up in the assembly stand.



Note

Use the Pry Lever - 80-200- to press against the spring force of the securing bushing in direction of -arrow- when installing so that the gearshift shaft -1- does not touch the securing bushing -2- when removing.

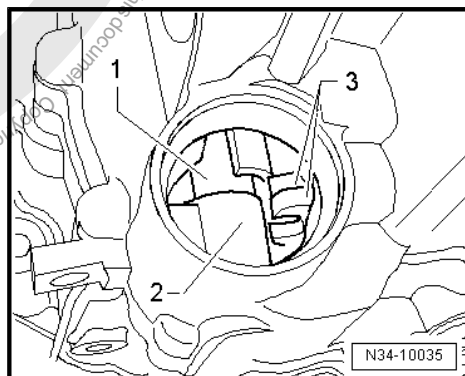


- Install the gearshift shaft -1- into the lower bearing -2- and into the shift forks -3-.



Note

The cover is not shown in the illustration. Refer to [⇒ "9.1 Overview - Transmission Housing", page 128](#).

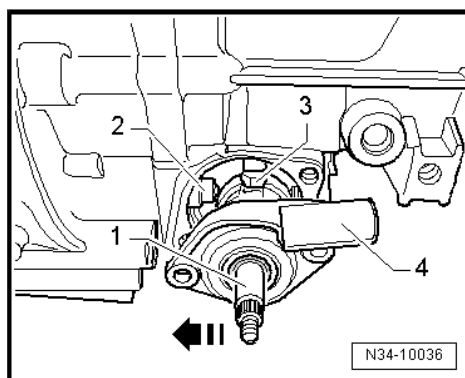


- Push the gearshift shaft -1- against the retaining sleeve -2- in direction of -arrow- and guide it through the shift fork all the way down using the shift finger -3-.
- The gearshift cover -4- must stand parallel to the bolting surface on the transmission housing.
- It must be possible to move the gearshift shaft easily (forward and backward).



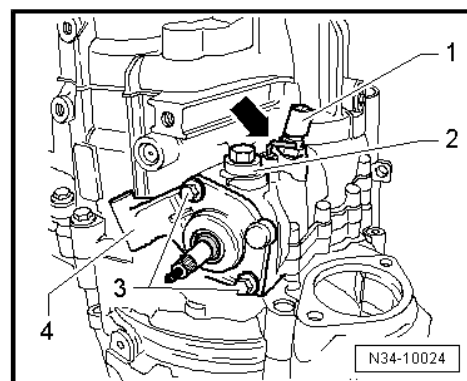
Note

If the gearshift cover is at an angle to the bolting surface, then the gearshift shaft is not installed into the lower bearing.

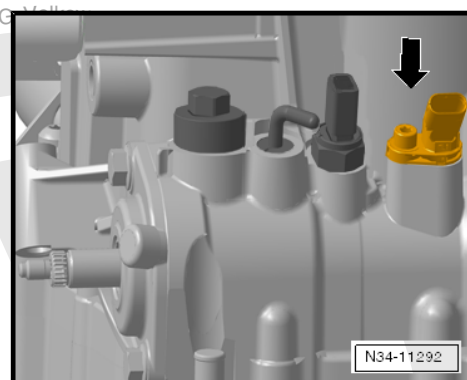




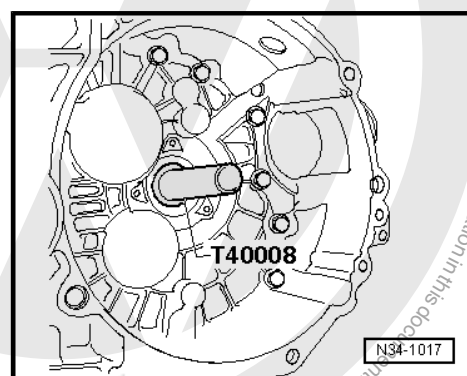
- Tighten the bolts -3- for the gearshift cover -4-.
- Install the locking screw -2-, lock elbow -arrow- must not be installed when doing so.
- Install the Back-Up Lamp Switch - F4- -1-.



- Transmission on vehicles with Stop/Start system: install the Transmission Neutral Position Sensor - G701- -arrow- and tighten the screw.

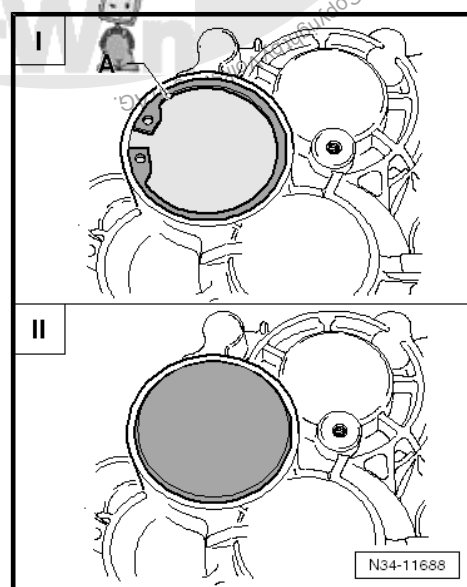


- Install the input shaft seal so that it is flush.
- Install the clutch slave cylinder with release bearing. Refer to [⇒ "1.15 Clutch Slave Cylinder with Release Bearing, Removing and Installing", page 33](#).
- Move the gearshift lever (selector lever) through all the gears.
- Install the cover as follows:



Cover Differentiation

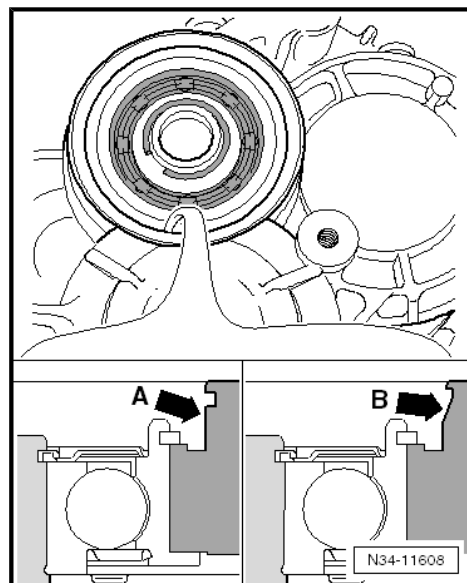
- I- = metal cover; secured with securing ring -A-.
- II- = plastic cover; without securing ring.





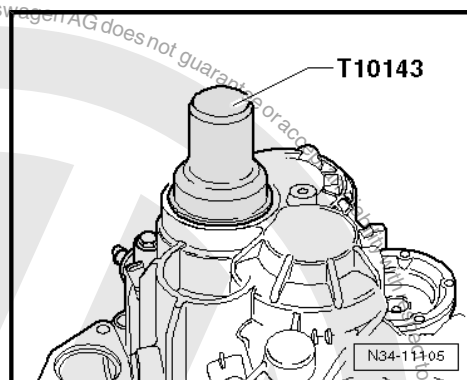
Allocation

Mounting Area for the Cover	Cap	Installation
-Arrow A- = vertical	Made of metal	Refer to ⇒ Fig. "Metal Cover", page 126
-Arrow B- = at an angle	Plastic	Refer to ⇒ Fig. "Plastic Cover", page 126

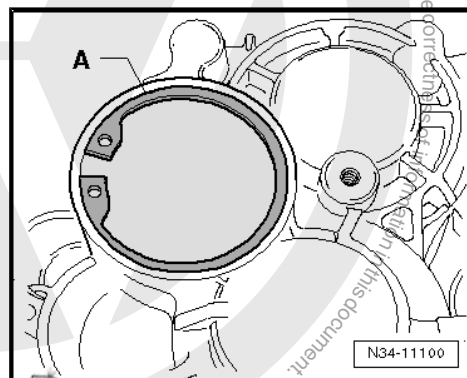


Metal Cover

- Install the cap all the way into the transmission housing.



- Secure the cap with the locking ring -A-.

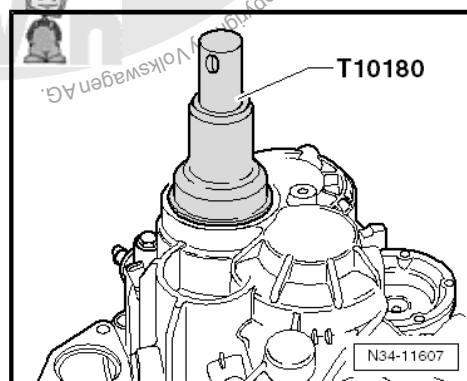


Plastic Cover

- Install the cap all the way into the transmission housing.

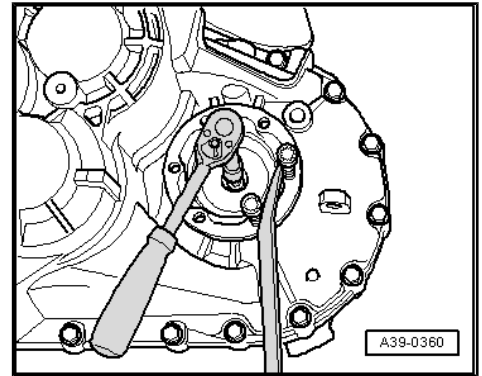
Continuation for All

- Always pay attention to the cover allocation. Refer to
⇒ Fig. "Allocation", page 126 .
- Leaks in the case of incorrect installation.
- For the correct cap, refer to the Parts Catalog.





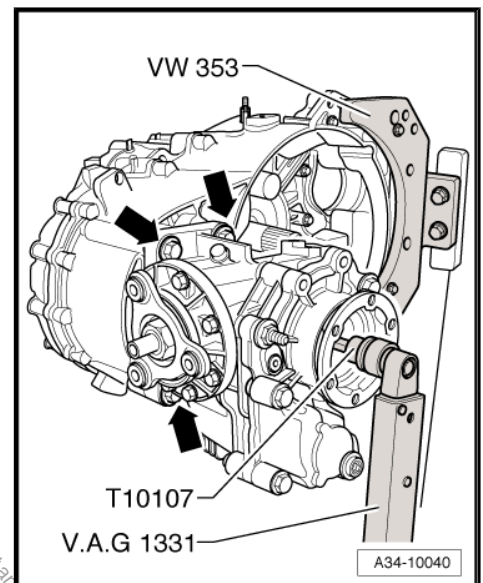
- Install the flange shafts with the springs, thrust washers and tapered rings.



AWD Transmission

Install the Bevel Box/Manual Transmission

- Coat the splines on the manual transmission differential with Grease For Clutch Disc Shaft Splines - G 000 100- .
- Slide bevel box or flange shaft front axle differential lock completely onto manual transmission. While doing this, join splines of input shaft/bevel box or front axle differential lock centrally with the differential.
- Line up the splines on the right flange shaft with the differential bevel gear. Turn the flange shaft if necessary.
- With proper tooth position and central guiding, the bevel box or front axle differential lock slips up to stop against manual transmission.



Note

Do not pull the bevel box or front axle differential lock with mounting bolts against the manual transmission, otherwise the assembly can tilt and the mounting eyes can break off.

- Tighten the four bolts -arrows- attaching the bevel box or the front axle differential lock to the manual transmission (only three bolts are shown in the illustration).
- Tighten the right flange shaft conical head bolt with the Socket Insert .

Tightening Specifications

- ◆ Refer to ➔ ["8.3 Overview - Transmission Housing and Selector Mechanism", page 108](#)
- ◆ Refer to ➔ ["1.4 Overview - Clutch Release Mechanism", page 18](#) .
- ◆ Refer to ➔ ["2.1 Overview - Differential", page 206](#) .

9 Transmission Housing and Clutch Housing

⇒ “9.1 Overview - Transmission Housing”, page 128

⇒ **“9.2 Overview - Clutch Housing”, page 130**

⇒ “9.3 Transmission Housing, Servicing”, page 132

⇒ **“9.4 Clutch Housing, Servicing”, page 137**

9.1 Overview - Transmission Housing

1 - Transmission Housing

- ❑ When replacing: adjust the output shaft and differential. Refer to ⇒ “3 Adjustment Overview”, page 215
- ❑ Changes near the mount area for the cover/input shaft. Refer to ⇒ “8.3 Overview - Transmission Housing and Selector Mechanism”, page 108
- ❑ Allocate component according to the Parts Catalog

2 - Cover

- ❑ Removing. Refer to ⇒ Fig. ““Removing the Cover -A-””, page 132.
- ❑ Installing. Refer to ⇒ Fig. ““Installing the Cover””, page 132.

3 - Oil Drain Plug

- Tightening specification. Refer to Fig. ⁴⁰⁰ Different Versions of the Oil Fill and Drain Plugs³⁰⁴, page 104.

4 - Seal

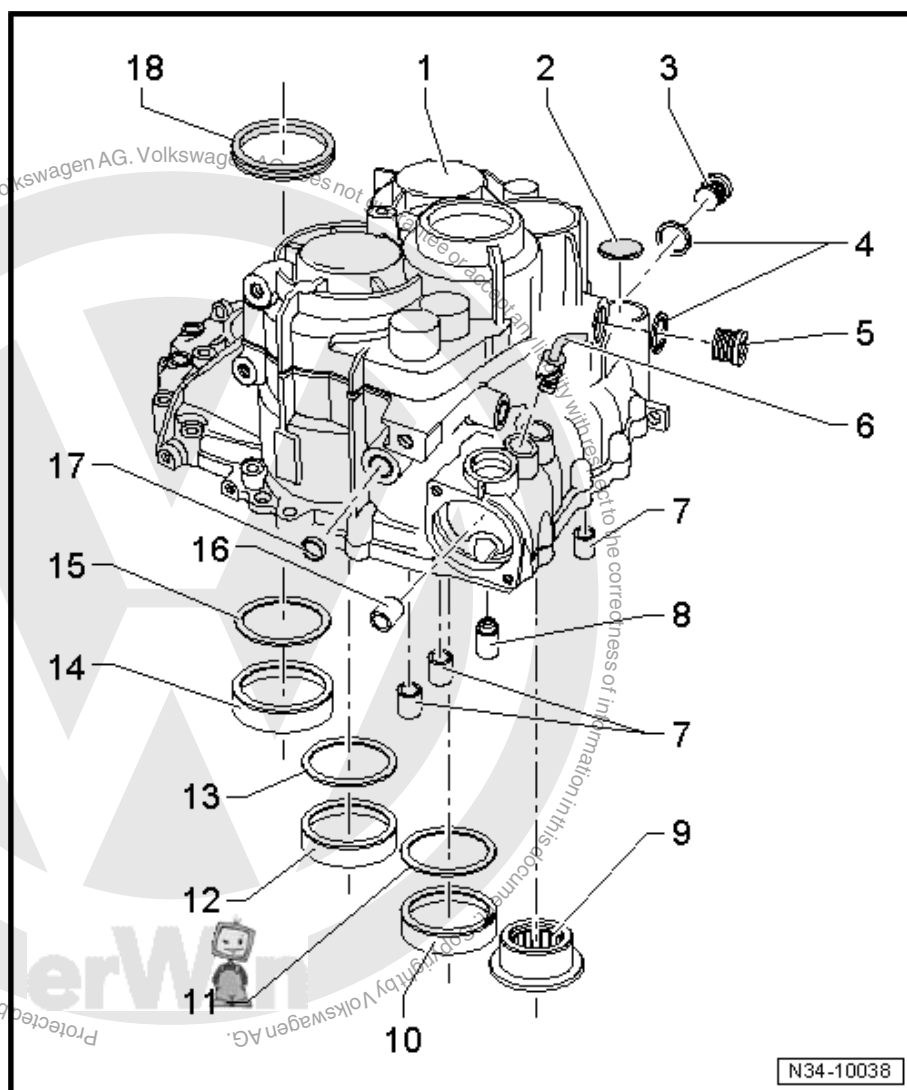
- ☐ If present, replace after removing

5 - Transmission Fluid Filler Plug

- ❑ **Tightening specification.** Refer to
 ⇒ Fig. ““Different Versions of the Oil Fill and Drain Plugs””, page 104 .

6 - Locking Elbow

- ❑ For adjusting the shift mechanism. Refer to ⇒ “1.11 Selector Mechanism, Adjusting”, page 76.
- ❑ Can be replaced with transmission not disassembled
- ❑ Removing. Refer to ⇒ Fig. “Removing the Locking Elbow for the Gearshift Shaft”, page 133.
- ❑ Installation position. Refer to ⇒ Fig. “Installed Position: Locking Elbow”, page 133
- ❑ Installing. Refer to ⇒ Fig. “Drive Lock Elbow -arrow- for Selector Shaft in Up to Tool Stop.”, page 133





7 - Bearing Bushing

- ☐ For the selector rods
- ☐ Removing. Refer to ➤ [Fig. "Removing the Shift Rod Bearing Bushing", page 133](#)
- ☐ Installing. Refer to
➤ [Fig. "Installing the Shift Rod Bearing Bushing All the Way Onto the Tool", page 134](#)

8 - Retaining Sleeve

- ☐ Removing when the transmission is disassembled. Refer to
➤ [Fig. "Removing the Retaining Sleeve -A- from the Transmission Housing", page 134](#)
- ☐ Removing when the transmission is not disassembled. Refer to
➤ [Fig. "Removing the Retaining Sleeve on a Transmission Not Disassembled Using the Guide Pins -10-15-", page 134](#)
- ☐ Different retaining sleeves. Refer to ➤ [Fig. "Lock Sleeve Differentiation", page 134](#)
- ☐ Installing a retaining sleeve with a shoulder. Refer to
➤ [Fig. "Drive in Lock Sleeve with Shoulder As Far As Stop On Tool", page 135](#)
- ☐ Installing the retaining sleeve without a shoulder. Refer to
➤ [Fig. "Drive in Lock Sleeve Without Shoulder As Far As Stop On Tool", page 135](#)

9 - Needle Sleeve

- ☐ For the reverse shaft
- ☐ Replace after removing
- ☐ Removing. Refer to
➤ [Fig. "Removing the Reverse Shaft Needle Sleeve From the Transmission Housing", page 135](#)
- ☐ Installing. Refer to
➤ [Fig. "Installing the Needle Sleeve -A- into the Transmission Housing", page 135](#)

10 - Outer Race/Tapered Roller Bearing

- ☐ Output shaft, 5th, 6th and reverse gears
- ☐ Removing and installing. Refer to
➤ ["2.2.2 Output Shaft, 5th, 6th and Reverse Gears, Disassembling and Assembling", page 176](#) .
- ☐ When replacing: adjust output shaft for 5th/6th and reverse gear. Refer to
➤ ["2.3.2 Output Shaft, 5th, 6th and Reverse Gears, Adjusting", page 184](#) .

11 - Shim

- ☐ Output shaft, 5th/6th and reverse gears
- ☐ Adjustment overview. Refer to ➤ ["3 Adjustment Overview", page 215](#) .

12 - Outer Race/Tapered Roller Bearing

- ☐ Output Shaft, 1st to 4th Gears
- ☐ Removing and installing. Refer to ➤ ["2.1 Overview - Output Shaft", page 157](#) .
- ☐ Adjust, if output shaft for 1st to 4th gear is replaced. Refer to
➤ ["2.3.1 Output Shaft 1st through 4th Gear, Adjusting", page 181](#) .

13 - Shim

- ☐ Output Shaft, 1st to 4th Gears
- ☐ Adjustment overview. Refer to ➤ ["3 Adjustment Overview", page 215](#) .

14 - Outer Race/Tapered Roller Bearing

- ☐ For the differential
- ☐ Removing and installing. Refer to ➤ ["2.1 Overview - Differential", page 206](#) .
- ☐ When replacing: adjust the differential. Refer to ➤ ["2.3 Differential, Adjusting", page 212](#)

15 - Shim

- ☐ For the differential
- ☐ Adjustment overview. Refer to ➤ ["3 Adjustment Overview", page 215](#) .

16 - Bearing Bushing

- ☐ For the selector shaft
- ☐ Removing. Refer to ➤ [Fig. "Removing the Selector Shaft Bearing Bushing", page 136](#)



- ❑ Installing. Refer to
⇒ [Fig. "Installing the Gearshift Shaft Bearing Bushing -A- All the Way Onto the Tool"](#) , page 136

17 - Plugs

- ❑ Removing. Refer to ⇒ [Fig. "Removing the Plug -1- "](#) , page 136
- ❑ Installing. Refer to ⇒ [Fig. "Installing the Plug -1- "](#) , page 137

18 - Seal

- ❑ For the left flange shaft
- ❑ Replacing. Refer to ⇒ ["1.2 Left Seal, Replacing"](#) , page 201 .

9.2 Overview - Clutch Housing

1 - Bearing Bushing

- ❑ For the selector rods
- ❑ Replace after removing
- ❑ Removing. Refer to
⇒ [Fig. "Removing the Shift Rod Bearing Bushing"](#) , page 137
- ❑ Installing. Refer to
⇒ [Fig. "Installing the Shift Rod Bearing Bushing All the Way Onto the Tool"](#) , page 137

2 - Needle Sleeve

- ❑ For the reverse shaft
- ❑ Replace after removing
- ❑ Removing. Refer to
⇒ [Fig. "Removing the Needle Sleeve from the Clutch Housing"](#) , page 138
- ❑ Installing. Refer to
⇒ [Fig. "Installing the Needle Sleeve -A- into the Clutch Housing"](#) , page 138

3 - Alignment Sleeve

- ❑ Quantity: 2

4 - Clutch Housing

- ❑ When replacing: adjust the output shaft and differential. Refer to
⇒ ["3 Adjustment Overview"](#) , page 215

5 - Cap

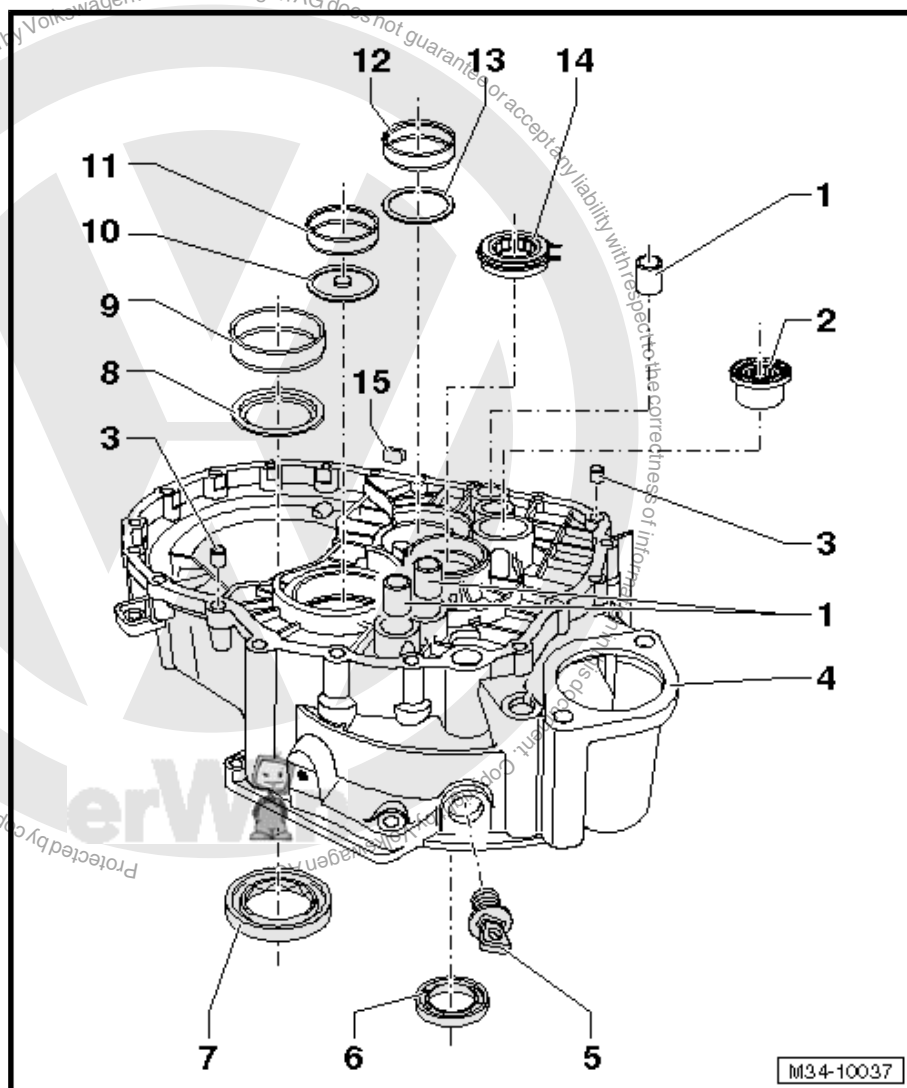
- ❑ Not on all clutch housings

6 - Input Shaft Seal

- ❑ Replacing. Refer to ⇒ ["1.3 Input Shaft Seal, Replacing"](#) , page 155 .

7 - Seal

- ❑ AWD - between the manual transmission and bevel box
- ❑ AWD. Refer to
⇒ ["1.3.2 Right Seal, Replacing on the Manual Transmission, between the Manual Transmission and Bevel Box"](#) , page 205 .





8 - Washer

- ☐ For the differential
- ☐ Installed position: shoulder on the inner diameter faces the seal -item 7- ⇒ [Item 7 \(page 130\)](#)

9 - Outer Race/Tapered Roller Bearing

- ☐ For the differential
- ☐ Removing and installing. Refer to ⇒ ["2.2 Differential, Disassembling and Assembling", page 209](#) .
- ☐ When replacing: adjust the differential. Refer to ⇒ ["2.3 Differential, Adjusting", page 212](#)

10 - Oil Deflector Ring

- ☐ Installed position: shoulder at hole points toward output shaft

11 - Outer Race/Tapered Roller Bearing

- ☐ Output shaft, 1st to 4th gears
- ☐ Removing and installing. Refer to
⇒ ["2.2.1 Output Shaft, 1st to 4th Gears, Disassembling and Assembling", page 166](#) .
- ☐ Adjust, if output shaft for 1st to 4th gear is replaced. Refer to
⇒ ["2.3.1 Output Shaft 1st through 4th Gear, Adjusting", page 181](#) .

12 - Outer Race/Tapered Roller Bearing

- ☐ Output shaft, 5th, 6th and reverse gears
- ☐ Removing and installing. Refer to
⇒ ["2.2.2 Output Shaft, 5th, 6th and Reverse Gears, Disassembling and Assembling", page 176](#) .
- ☐ When replacing: adjust output shaft for 5th/6th and reverse gears. Refer to
⇒ ["2.3.2 Output Shaft, 5th, 6th and Reverse Gears, Adjusting", page 184](#)

13 - Washer

- ☐ Output shaft, 5th/6th and reverse gears
- ☐ Always 0.65 mm thick

14 - Cylindrical Roller Bearing

- ☐ For the input shaft
- ☐ Removing and installing. Refer to ⇒ ["1.2 Input Shaft, Disassembling and Assembling", page 152](#) .

15 - Magnet

- ☐ Held in place by housing joint surface



9.3 Transmission Housing, Servicing

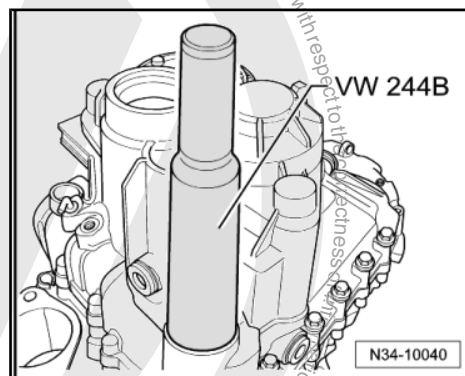
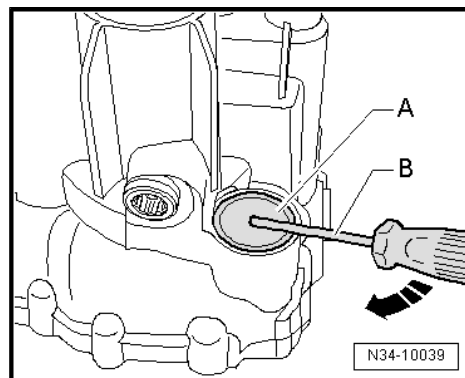
Special tools and workshop equipment required

- ◆ Bearing Driver - Multiple Use - VW244B-
- ◆ Transmission Support - VW353-
- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - 37mm - VW416B-
- ◆ Guide Pin - VW436A-
- ◆ Press Piece - Guide Pin - VW439-
- ◆ Slide Hammer Set - VW771-
- ◆ Crankshaft Holding Fixture - VW801-
- ◆ Guide Pin - 10-15-
- ◆ Press Piece - Pivot Mount Bushing - 3124-
- ◆ Bearing Installer - Crankshaft Pilot Bearing - 3264-
- ◆ Subframe Support Tool - 3290-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Bushing Driver - Selector Shaft - T10168-
- ◆ Locking Sleeve Drift - T10169- or Locking Sleeve Drift - T10362- . Refer to
⇒ [Fig. "Lock Sleeve Differentiation" , page 134](#)
- ◆ Breather Tube Tool - T10203-
- ◆ -1- Puller - Kukko Internal - 14-19mm - Kukko 21/2-
- ◆ -1- Puller - Kukko Internal - 20-30mm - Kukko 21/4-
- ◆ -4- Puller - Kukko Counterstay - Kukko 22/2-
- ◆ Thread adaptor from Puller - Kukko Counterstay - Kukko 22/1-

Removing the Cover -A-

- Pierce the rubber in the center of the cover with a screwdriver -B- and pry it out of the cover in direction of -arrow-.

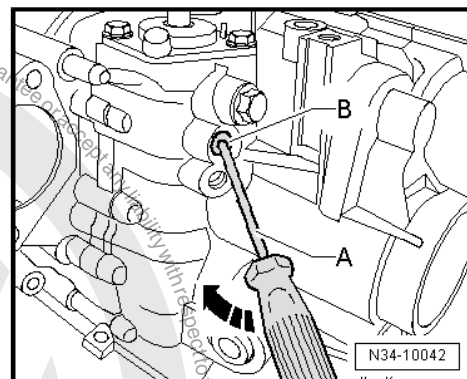
Installing the Cover





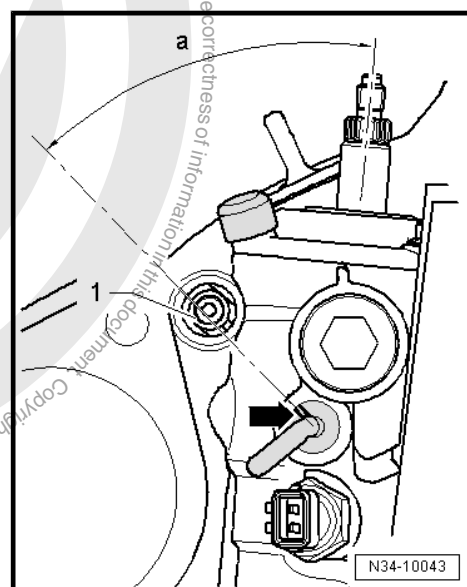
Removing the Locking Elbow for the Gearshift Shaft

- Break off the bracket in its unlocked position.
- Insert a screwdriver -A- into the hole in the locking bracket -B-.
- Pry out the locking elbow in direction of -arrow-.



Installed Position: Locking Elbow

- The mark on the locking elbow -arrow- must point toward the connection on the clutch slave cylinder -1-.
- Dimension -a- must be approximately 45°.

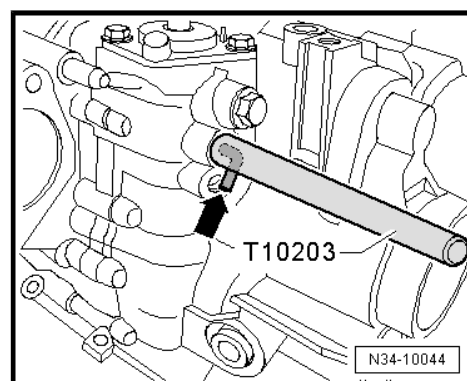


Drive Lock Elbow -arrow- for Selector Shaft in Up to Tool Stop.



Note

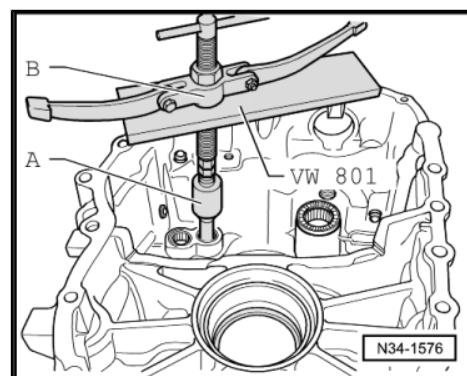
The locking elbow must be unlocked when being installed.



Removing the Shift Rod Bearing Bushing

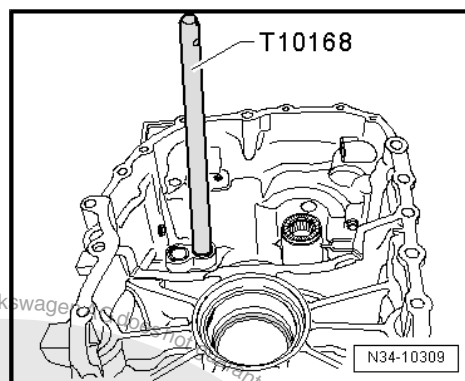
A - Puller - Kukko Internal - 14-19mm , for example Puller - Kukko Internal - 14-19mm - 21/2-

B - Counter Support , for example, Puller - Kukko Counterstay - 22/2-



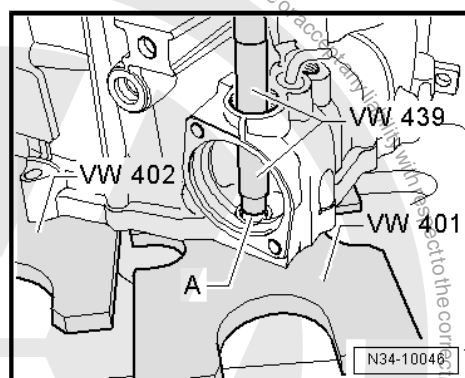


Installing the Shift Rod Bearing Bushing All the Way Onto the Tool



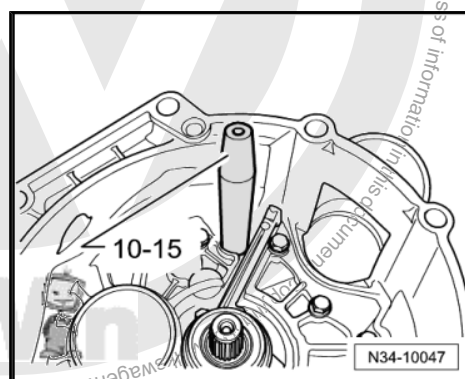
Removing the Retaining Sleeve -A- from the Transmission Housing

- Place transmission housing on Press Plate - VW401- and Press Plate - VW402- in such a way so that the alignment sleeves inside the transmission housing do not get damaged.



Removing the Retaining Sleeve on a Transmission Not Disassembled Using the Guide Pins -10-15- .

- Locking bolt and selector shaft removed.
- Turn the transmission so that the retaining sleeve cannot fall into the transmission.



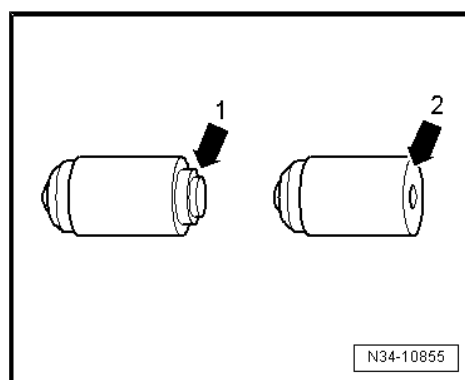
Lock Sleeve Differentiation

The following lock sleeves may be installed:

Lock sleeve with a shoulder -arrow 1-. Refer to [Fig. "Drive in Lock Sleeve with Shoulder As Far As Stop On Tool", page 135](#) .

Lock sleeve without a shoulder -arrow 2-. Refer to [Fig. "Drive in Lock Sleeve Without Shoulder As Far As Stop On Tool", page 135](#) .

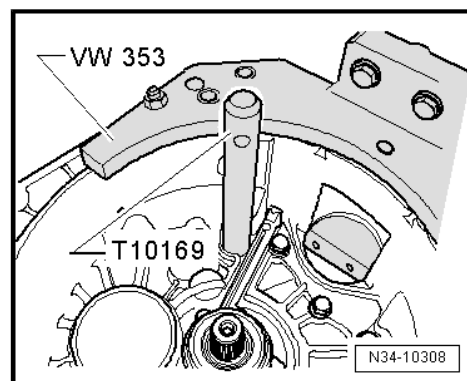
Allocate the components using the Parts Catalog.





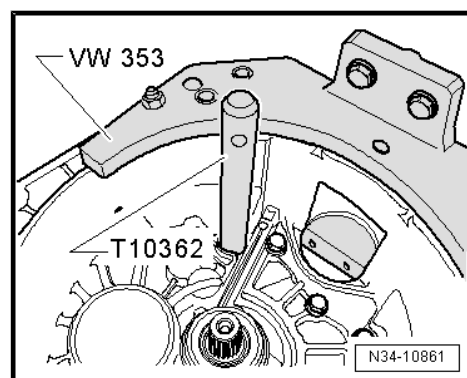
Drive in Lock Sleeve with Shoulder As Far As Stop On Tool

- The transmission housing is bolted to the clutch housing.



Drive in Lock Sleeve Without Shoulder As Far As Stop On Tool

- The transmission housing is bolted to the clutch housing.



Removing the Reverse Shaft Needle Sleeve From the Transmission Housing

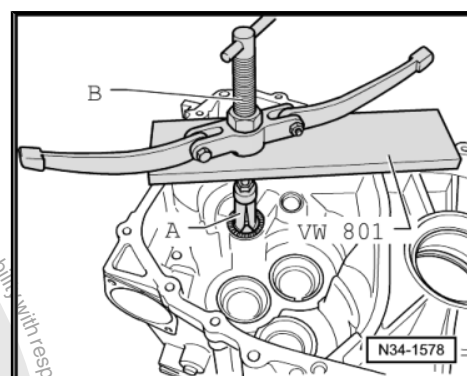
A - Puller - Kukko Internal - 20-30mm , for example - Kukko 21/4-

B - Counter Support , for example, Puller - Kukko Counterstay - Kukko 22/2-



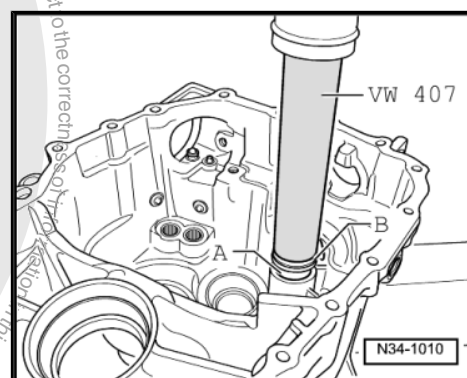
Note

The needle sleeve will get damaged when it is removed and must be replaced.



Installing the Needle Sleeve -A- into the Transmission Housing

- Lay the reverse shaft thrust washer -B- on the needle sleeve while pressing it in.
- Support the transmission housing with the Press Piece - 37mm - VW416B- directly under the bearing mount.

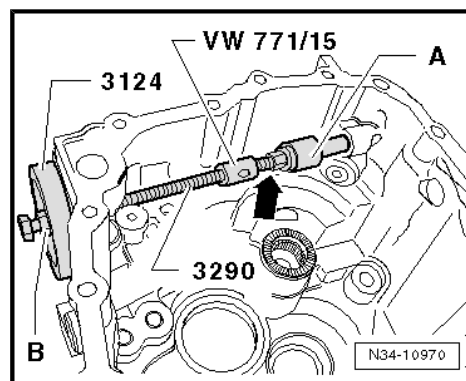




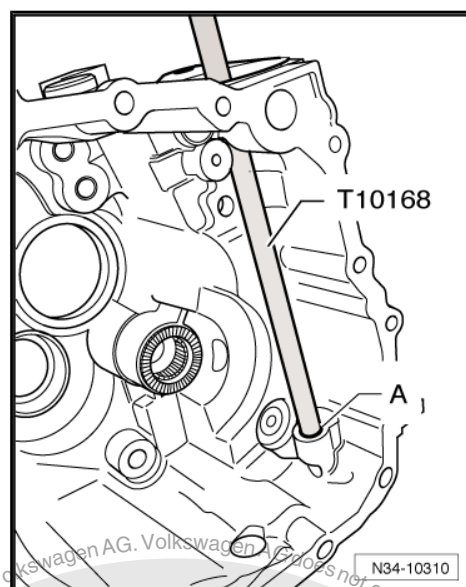
Removing the Selector Shaft Bearing Bushing

- Use the thread adapter from Puller - Kukko Counterstay - Kukko 22/1- -arrow-.
- Hold the spindle on the Subframe Support Tool - 3290- steady and turn the nut -B-.

A - Puller - Kukko Internal - 14-19mm , for example -Kukko 21/2-

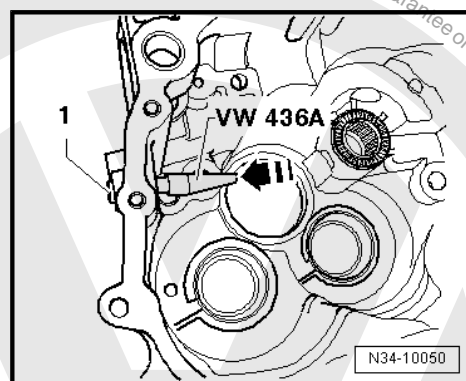


Installing the Gearshift Shaft Bearing Bushing -A- All the Way Onto the Tool



Removing the Plug -1-

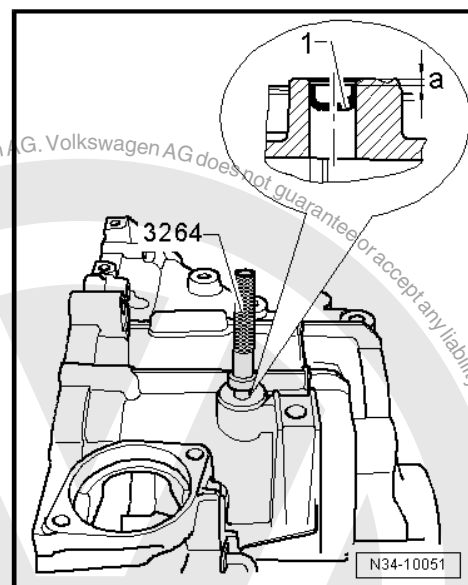
- Remove the plug -1- from the inside of the transmission housing to the outside.





Installing the Plug -1-

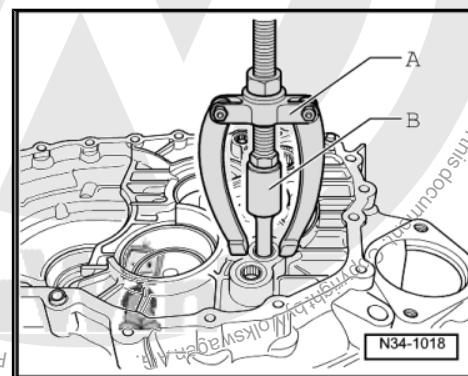
- Using the Bearing Installer - Crankshaft Pilot Bearing - 3264- , drive in the sealing plugs to dimension -a- approximately 3 mm below the upper edge of the housing.



9.4 Clutch Housing, Servicing

Special tools and workshop equipment required

- ◆ Press Piece - Rod - VW407-
- ◆ Bushing Driver - Selector Shaft - T10168-
- ◆ Seal Installer - Drive Axle - T40008-
- ◆ -1- Puller - Kukko Internal - 14-19mm - Kukko 21/2-
- ◆ -1- Puller - Kukko Internal - 20-30mm - Kukko 21/4-
- ◆ -4- Puller - Kukko Counterstay - Kukko 22/1-
- ◆ -4- Puller - Kukko Counterstay - Kukko 22/2-
- ◆ Puller - Crankshaft/Power Steering Seal - T20143-

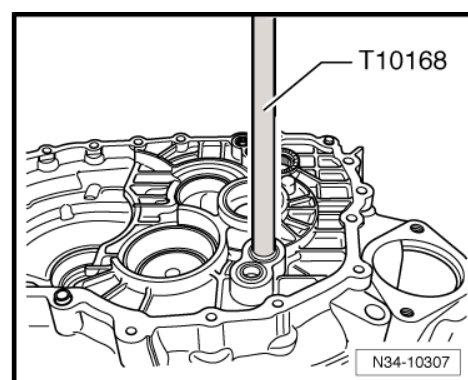


Removing the Shift Rod Bearing Bushing

A - Counter Support , for example Puller - Kukko Counterstay - 22/1-

B - Puller - Kukko Internal - 14-19mm , for example Puller - Kukko Internal - 14-19mm - 21/2-

Installing the Shift Rod Bearing Bushing All the Way Onto the Tool





Removing the Needle Sleeve from the Clutch Housing

A - Counter Support , for example, Puller - Kukko Counterstay - 22/2-

B - Puller - Kukko Internal - 20-30mm , for example Puller - Kukko Internal - 20-30mm - 21/4-

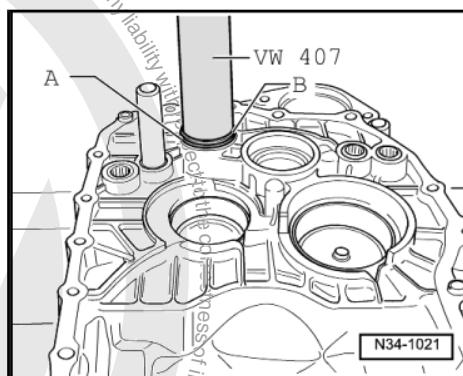
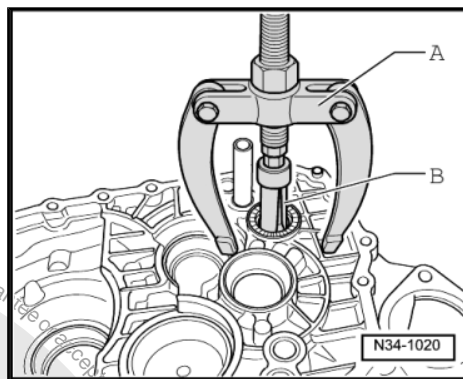


Note

The needle sleeve will get damaged when it is removed and must be replaced.

Installing the Needle Sleeve -A- into the Clutch Housing

- Lay the reverse shaft thrust washer -B- on the needle sleeve while pressing it in.

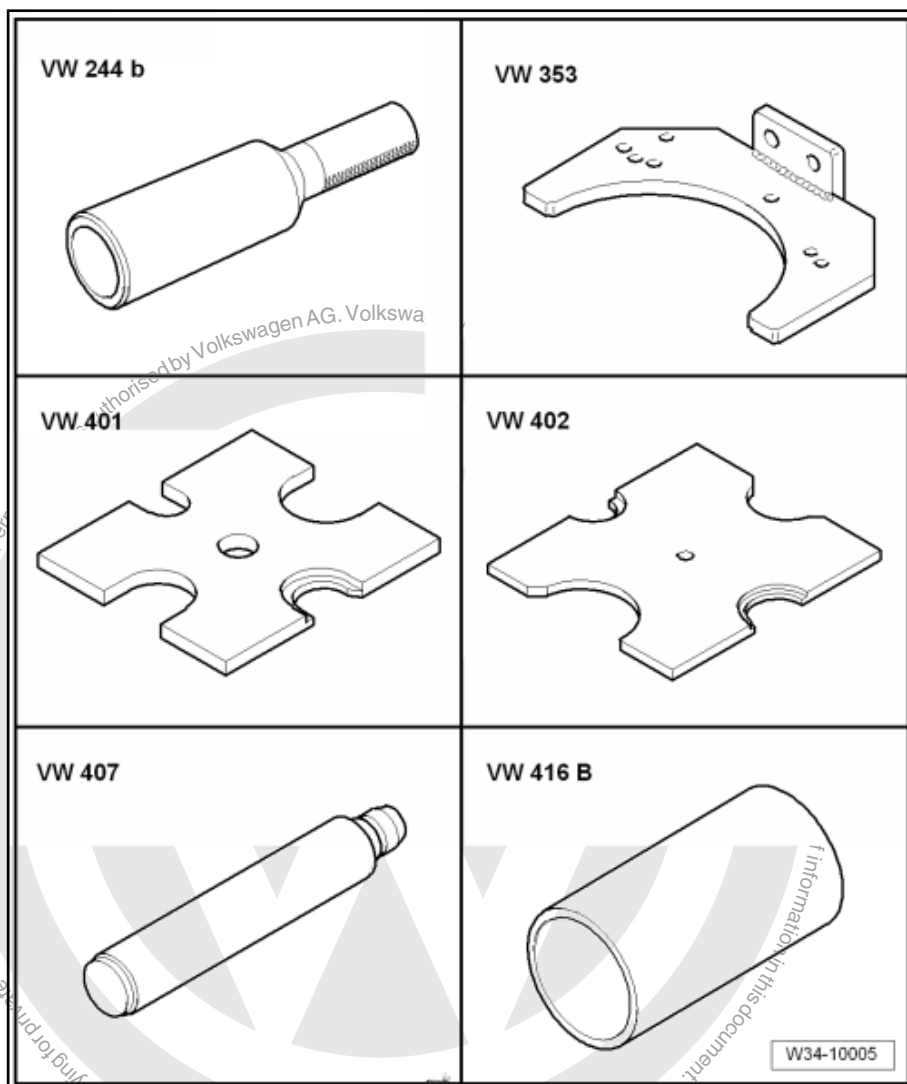




10 Special Tools

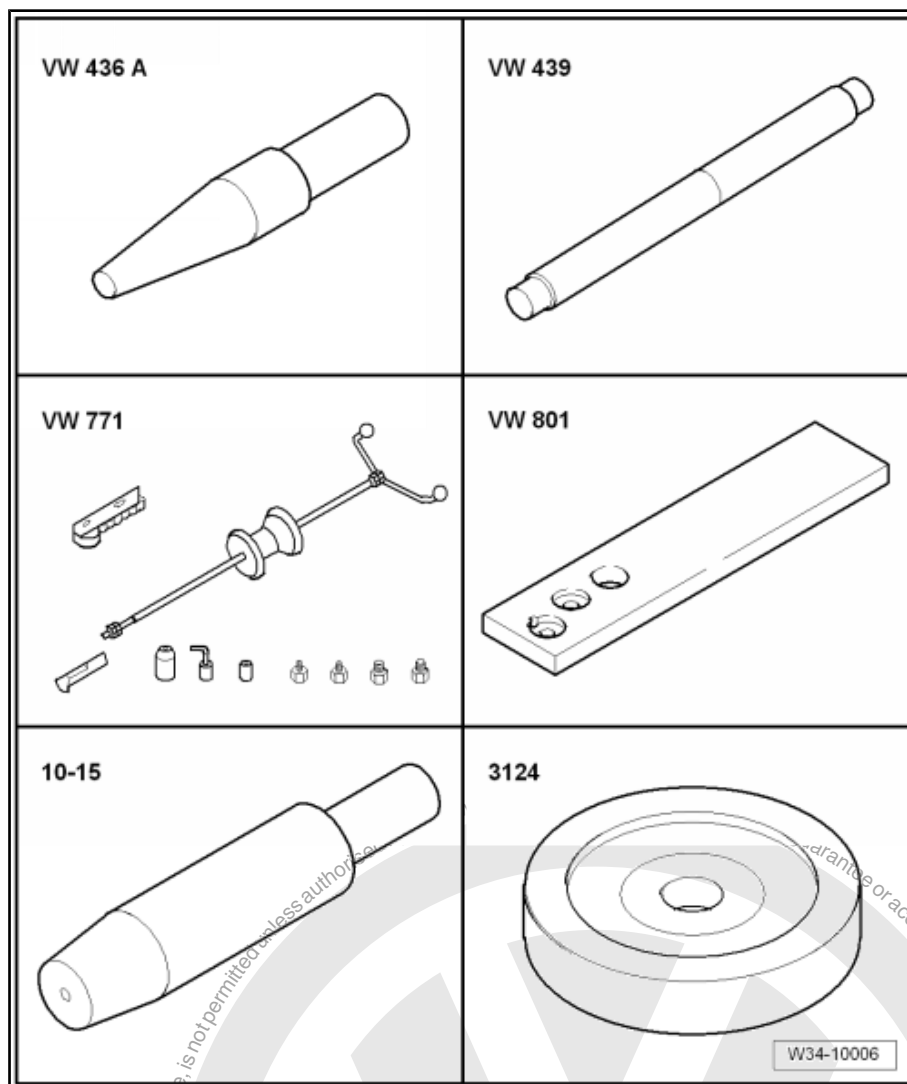
Special tools and workshop equipment required

- ◆ Bearing Driver - Multiple Use - VW244B-
- ◆ Transmission Support - VW353-
- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - 37mm - VW416B-



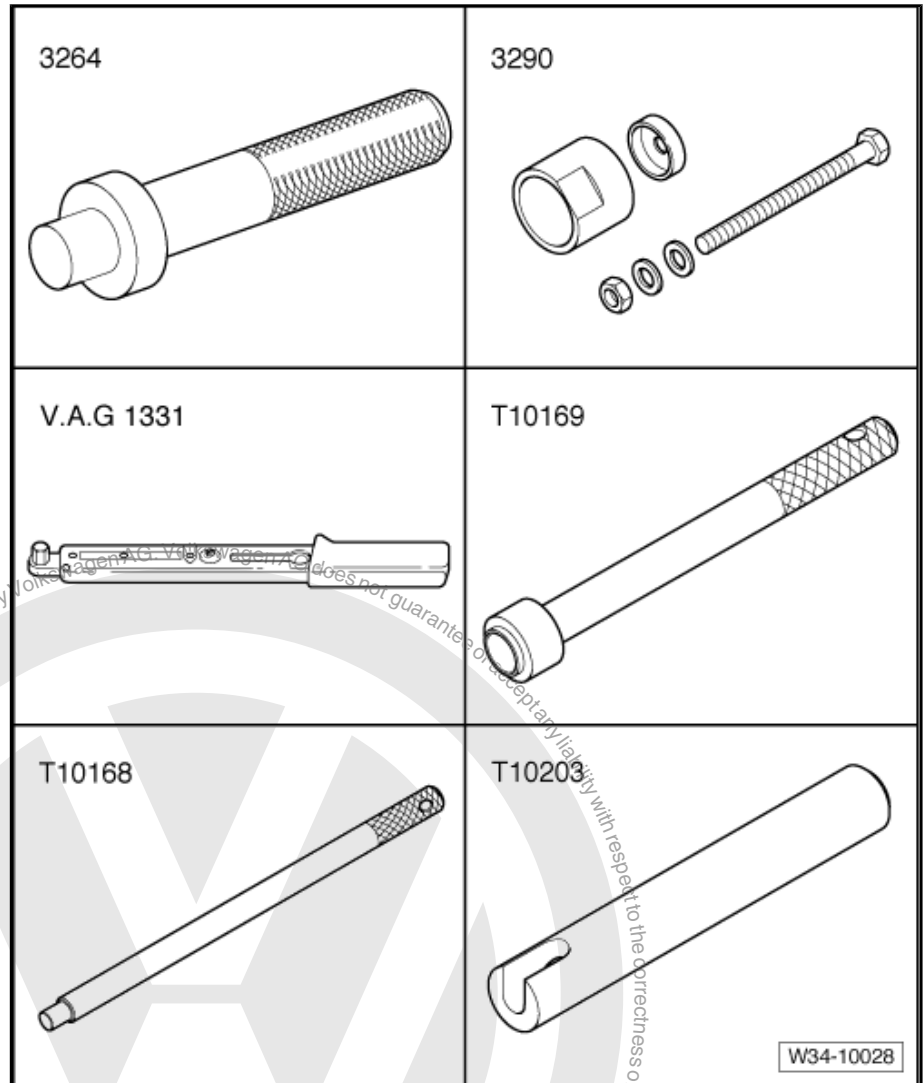


- ◆ Guide Pin - VW436A-
- ◆ Press Piece - Guide Pin - VW439-
- ◆ Slide Hammer Set - VW771-
- ◆ Crankshaft Holding Fixture - VW801-
- ◆ Guide Pin - 10-15-
- ◆ Press Piece - Pivot Mount Bushing - 3124-



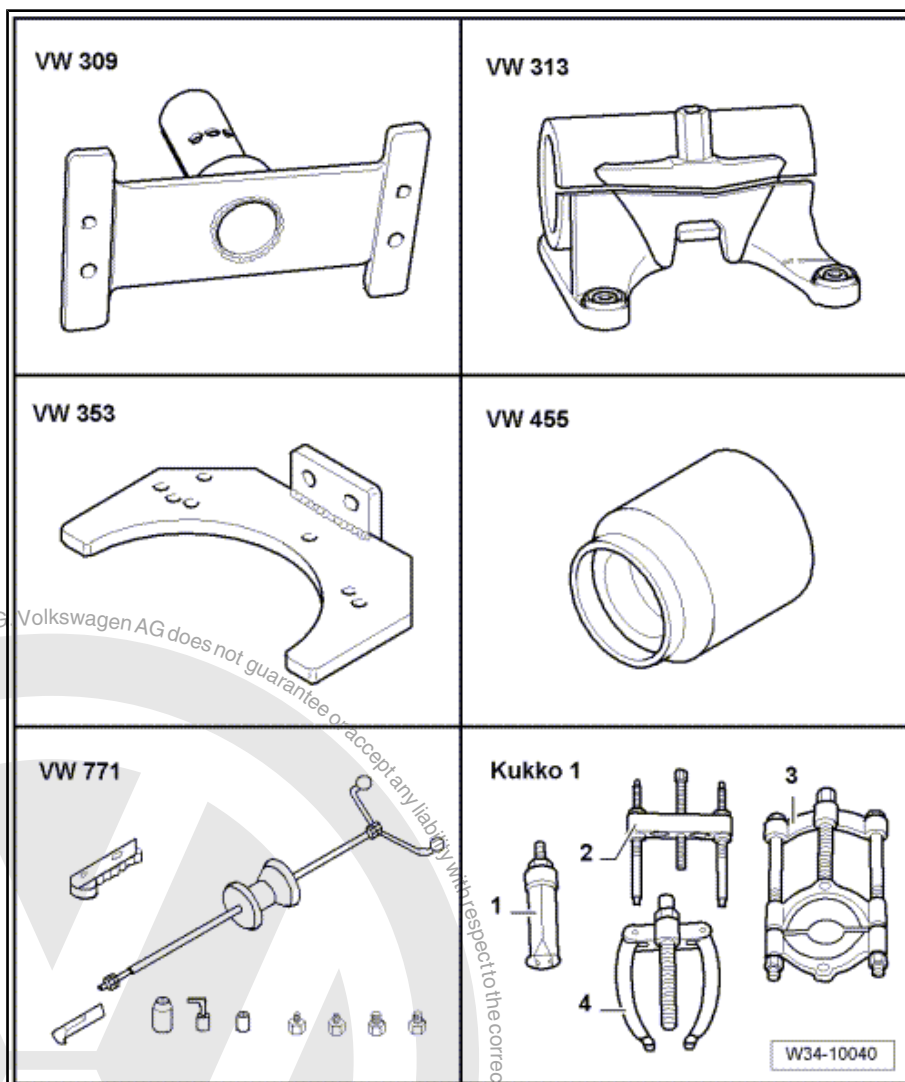


- ◆ Bearing Installer - Crankshaft Pilot Bearing - 3264-
- ◆ Subframe Support Tool - 3290-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Bushing Driver - Selector Shaft - T10168-
- ◆ Locking Sleeve Drift - T10169- or Locking Sleeve Drift - T10362- . . . Refer to ➔ [Fig. "Lock Sleeve Differentiation"](#) , page 134
- ◆ Breather Tube Tool - T10203-



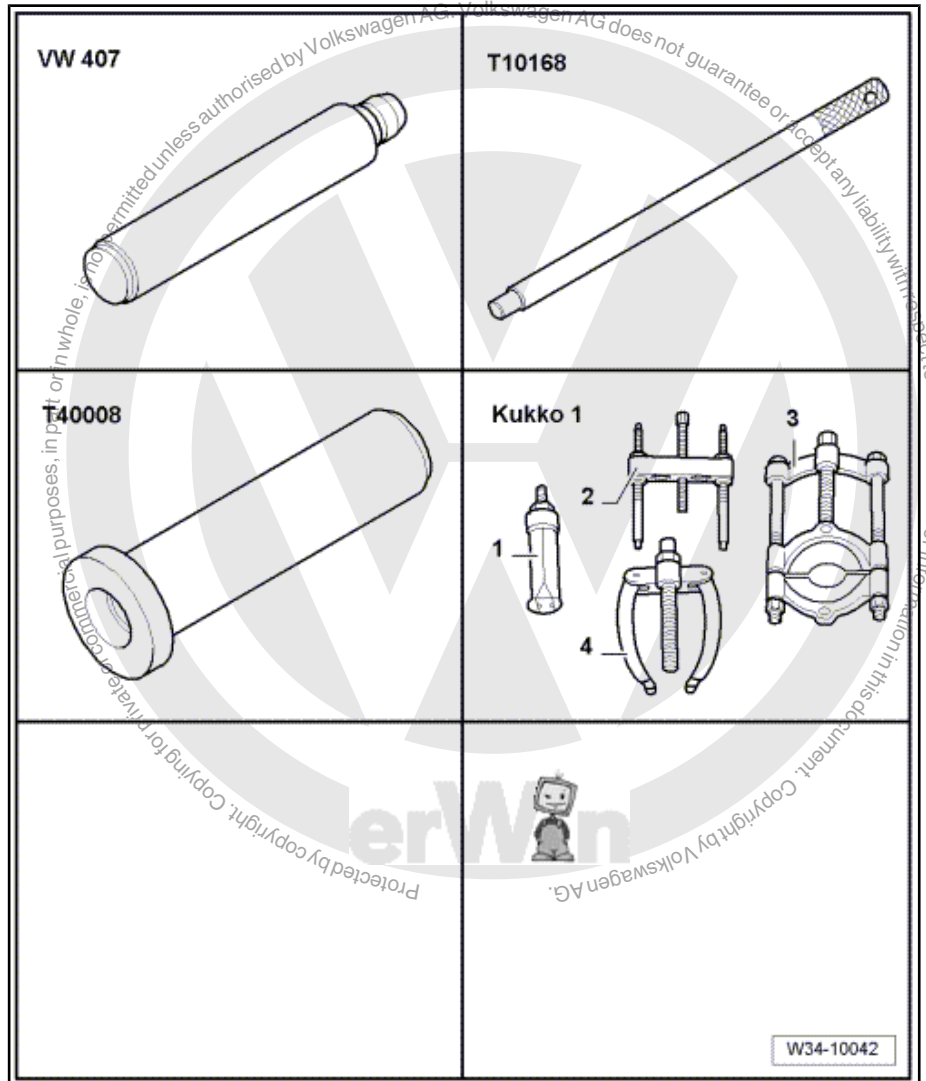


- ◆ Holding Plate - VW309A-
- ◆ Holding Fixture - VW313-
- ◆ Transmission Support - VW353-
- ◆ Press Piece - Multiple Use - VW455- or Press Piece - Front Wishbone - 3160-
- ◆ Slide Hammer Set - VW771-
- ◆ -1- Puller - Kukko Internal - 12-16mm - Kukko 21/01-
- ◆ -3- Puller - Kukko Quick Action Separating Tool - 5-60mm - Kukko 17/0-
- ◆ -4- Puller - Kukko Counterstay - Kukko 22/1-





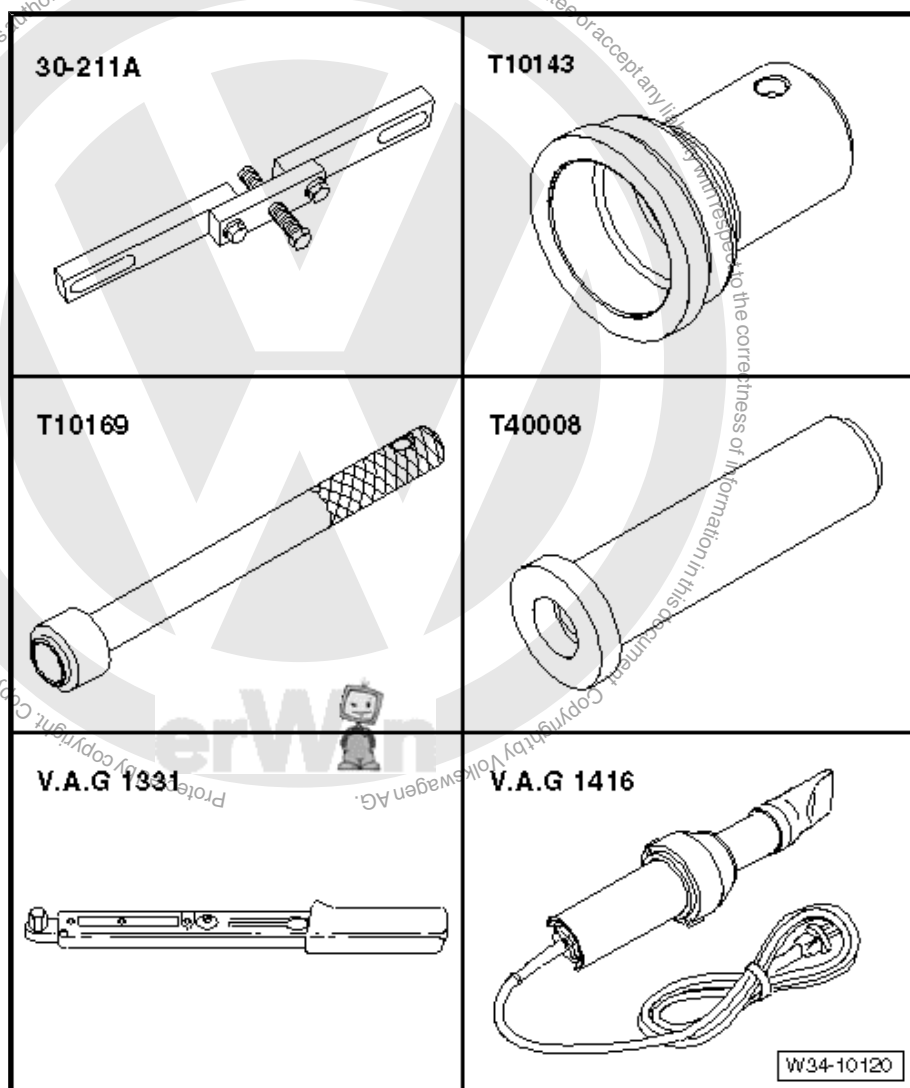
- ◆ Press Piece - Rod - VW407-
- ◆ Bushing Driver - Selector Shaft - T10168-
- ◆ Seal Installer - Drive Axle - T40008-
- ◆ -1- Puller - Kukko Internal - 14-19mm - Kukko 21/2-
- ◆ -1- Puller - Kukko Internal - 20-30mm - Kukko 21/4-
- ◆ -4- Puller - Kukko Counterstay - Kukko 22/1-
- ◆ -4- Puller - Kukko Counterstay - Kukko 22/2-



W34-10042

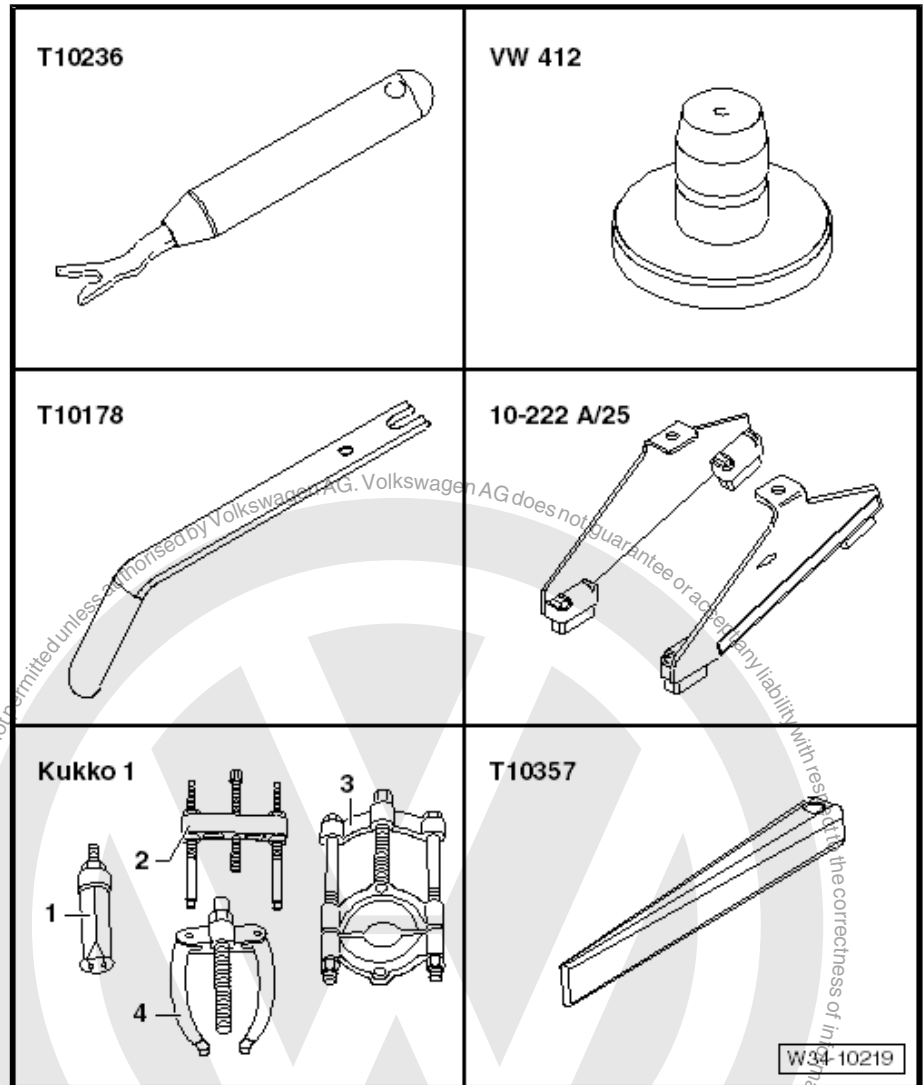


- ◆ Bracket - Multiple Use - 30-211A-
- ◆ Seal Installer - Drive Flange - T10143- or Seal Installer - Output Shaft Oil Seal - T10180-
- ◆ Locking Sleeve Drift - T10169-
- ◆ or Locking Sleeve Drift - T10362- . Refer to [⇒ Fig. "Lock Sleeve Differentiation" , page 134](#)
- ◆ Seal Installer - Drive Axle - T40008-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Hot Air Blower - VAG1416-
- ◆ Pry Lever - 80-200-

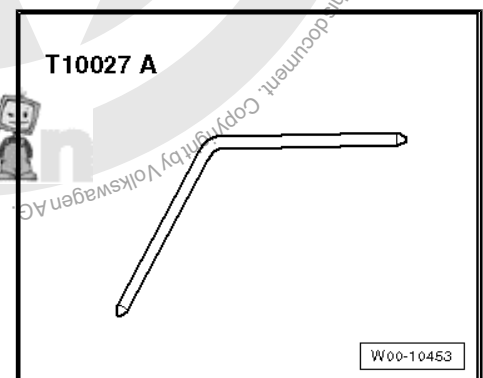




- ◆ Window Release Tool - T10236-
- ◆ Press Piece - Multiple Use - VW412-
- ◆ Over-Center Spring Assembly Tool - T10178-
- ◆ Engine Support Bridge - Engine Support 25 - 10-222A/25-
- ◆ 2 = Counter-Support for example, from -Kukko- model line 16
- ◆ Wedge - T10357-

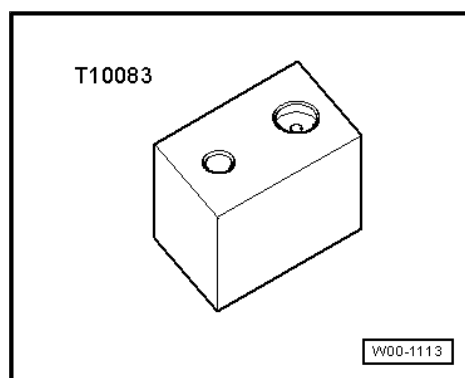


- ◆ Connecting Pin - T10027A-

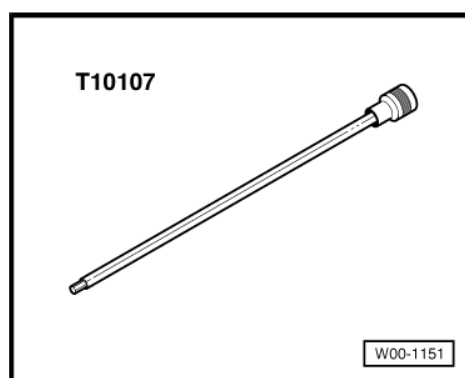




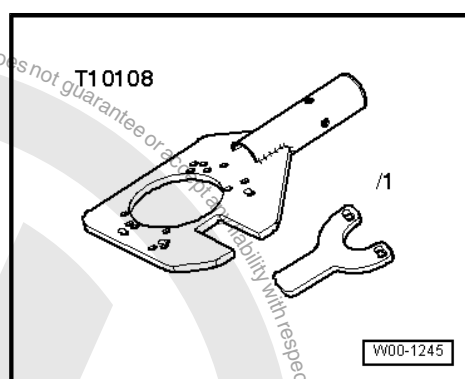
◆ Press Piece - Block - T10083-



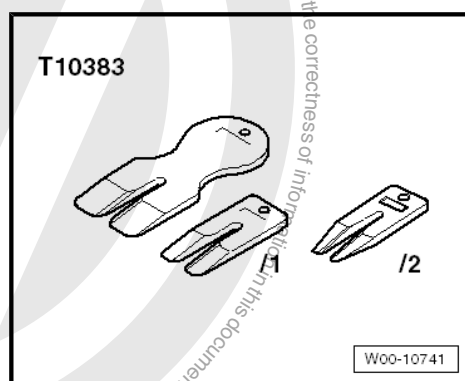
◆ Socket And Extended Bit - T10107-



◆ Gearbox Support - T10108-

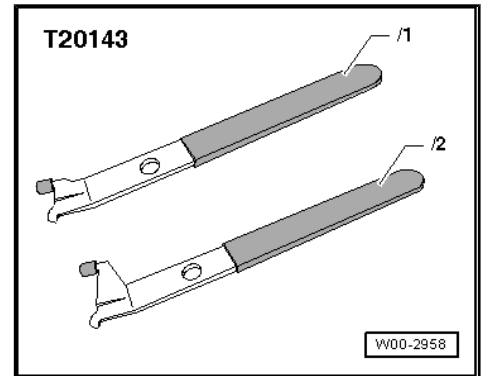


◆ Wedge Set - T10383-

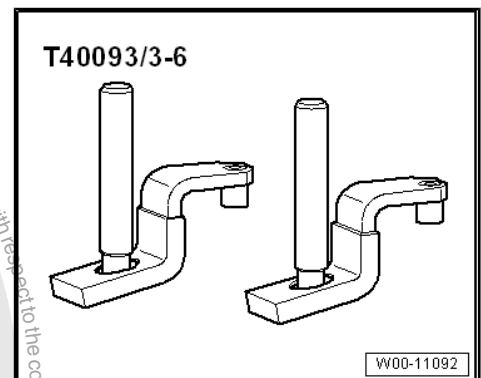




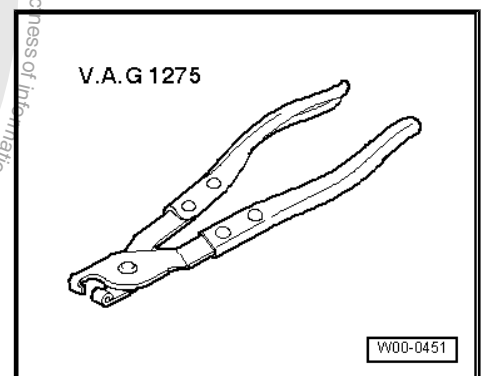
- ◆ Puller - Crankshaft/Power Steering Seal - T20143/1-



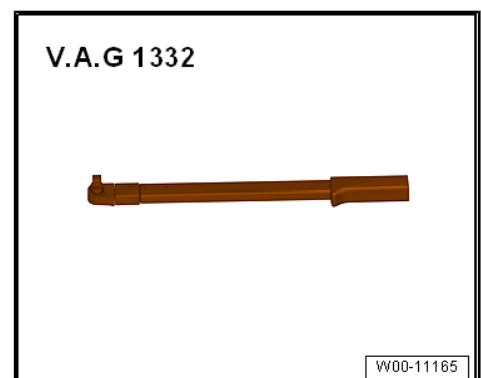
- ◆ Engine Support Brackets - T40093/3-6- (quantity 2)



- ◆ Hose Clip Pliers - VAG1275A-

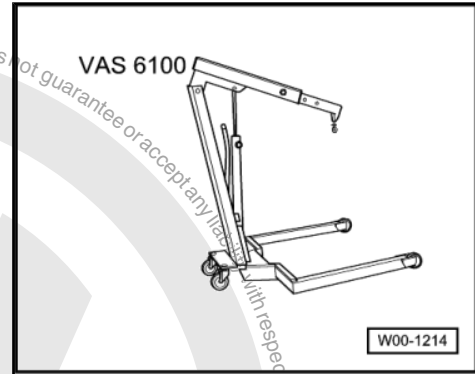


- ◆ Torque Wrench 1332 40-200Nm - V.A.G 1332-

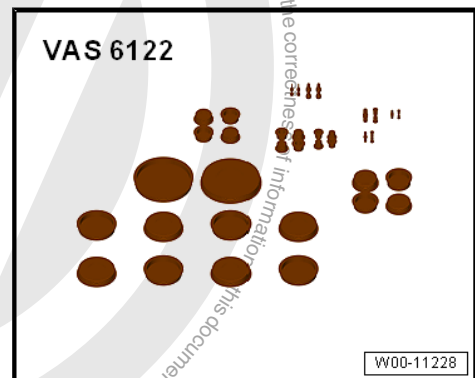




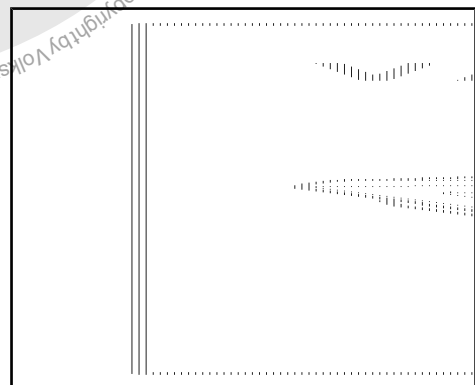
◆ Shop Crane - VAS6100-



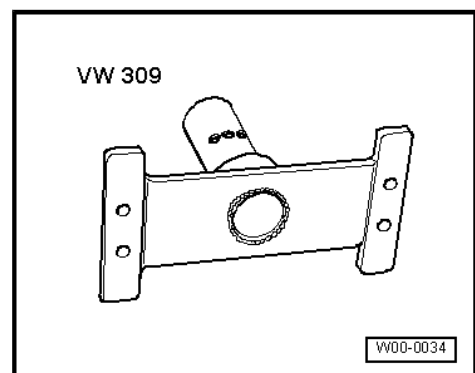
◆ Engine Bung Set - VAS 6122-



◆ Shop Crane - Drip Tray - VAS6208-

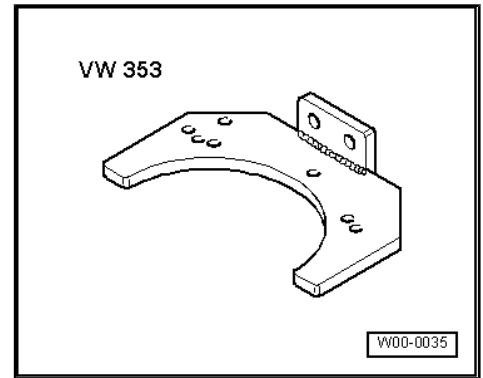


◆ Holding Plate - VW309A-

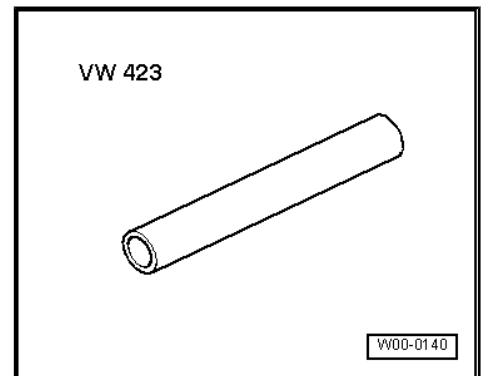




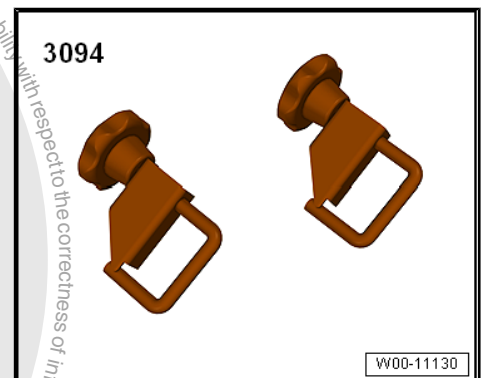
◆ Transmission Support - VW353-



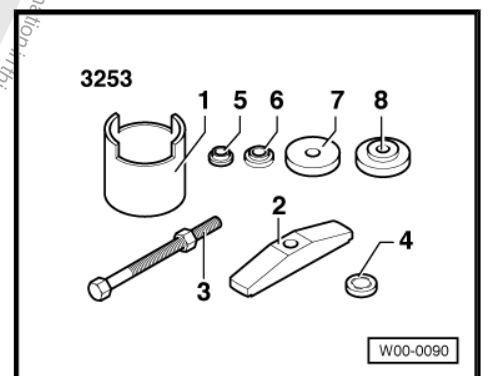
◆ Press Piece - Shift Rod/Alternator - VW423-



◆ Hose Clamps - Up To 25mm - 3094-

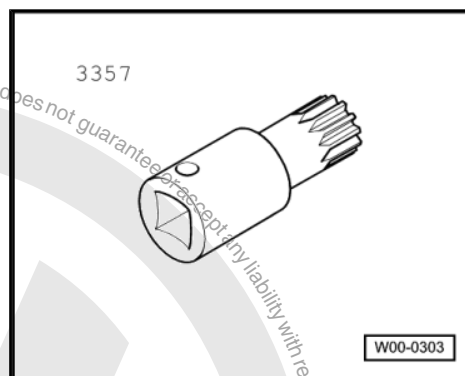


◆ Rear Wheel Bearing Kit - Piece 5 - 3253/5-

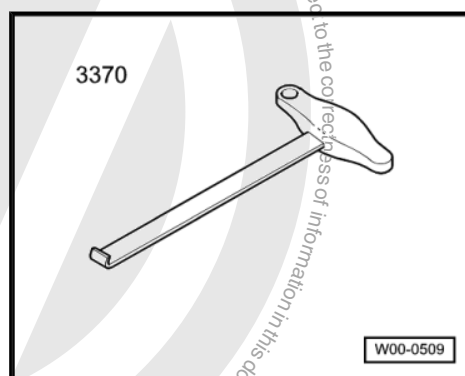




- ◆ For oil filler plug with multi-point fitting Triple Square Socket Driver - 3357- .



- ◆ or the equivalent equipment, Backrest Panel Tool - 3370-



- ◆ Sealing Grease . Refer to the Parts Catalog.
- ◆ Holding Fixture - VW313-



35 – Gears, Shafts

1 Input Shaft

⇒ [“1.1 Overview - Input Shaft”, page 151](#)

⇒ [“1.2 Input Shaft, Disassembling and Assembling”, page 152](#)

⇒ [“1.3 Input Shaft Seal, Replacing”, page 155](#)

1.1 Overview - Input Shaft



Note

- ◆ Warm the toothed gear to approximately 100 °C (212 °F) using Inductive Heater - VAS6414- . Wear protective gloves.
- ◆ Install all input shaft bearings with transmission fluid.
- ◆ Replace grooved ball bearing after removing.

1 - Circlip

- ☐ For grooved ball bearing/input shaft
- ☐ Removing and installing. Refer to
⇒ [“8.8 Transmission, Disassembling and Assembling”, page 115](#) .
- ☐ On transmissions with reinforcement frame the thickness must be re-determined. Refer to
⇒ [Fig. “Transmission with Reinforcement Measures \(Manual Transmission 0FB\)”, page 123](#)

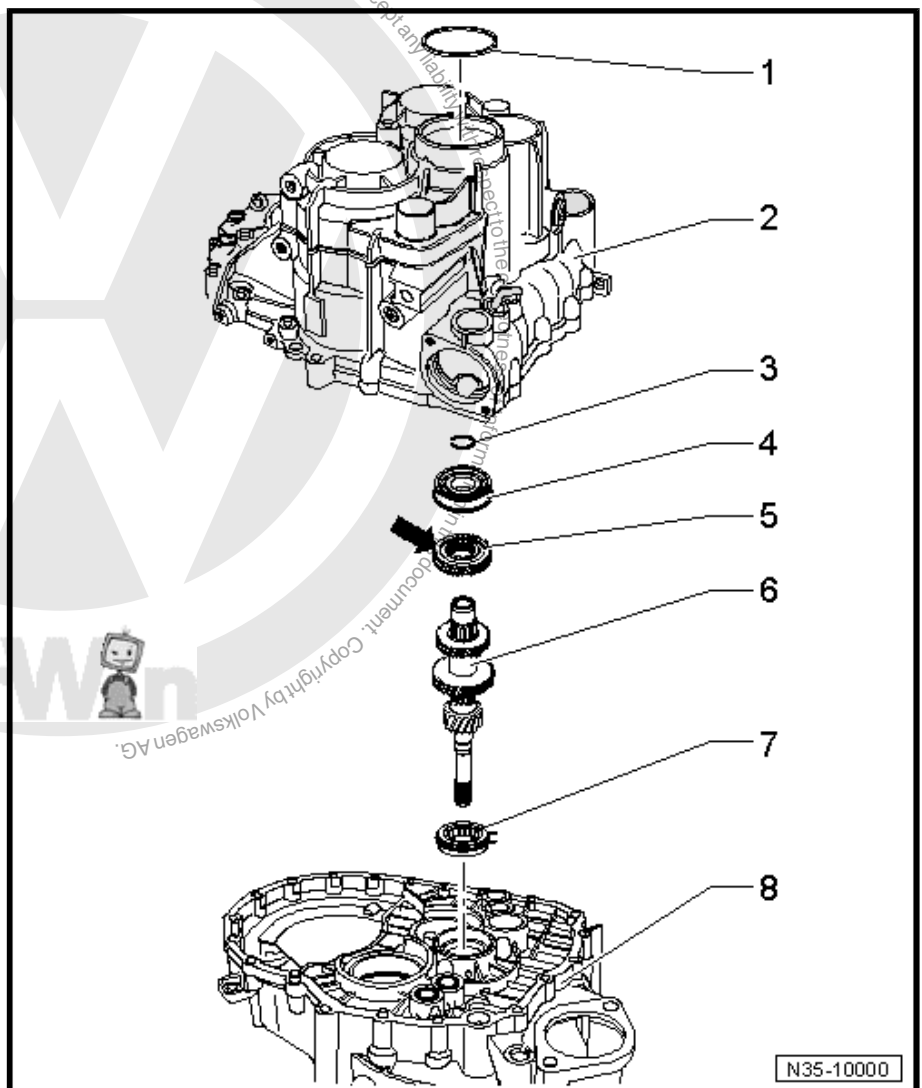
2 - Transmission Housing

3 - Circlip

- ☐ Select when replacing the grooved ball bearing and the input shaft. Refer to
⇒ [Fig. “Selecting the Locking Ring”, page 154](#)

4 - Grooved Ball Bearing

- ☐ Replace after removing
- ☐ Removing. Refer to
⇒ [Fig. “Removing the Grooved Ball Bearing”, page 153](#)
- ☐ Installation position. Refer to
⇒ [Fig. “Grooved Ball Bearing Installation Location and Installing the Grooved Ball Bearing”, page 154](#)



N35-10000



- ☐ Installing. Refer to
⇒ Fig. [“Grooved Ball Bearing Installation Location and Installing the Grooved Ball Bearing”](#),
page 154

5 - 5th Gear Wheel

- ☐ Available as a replacement part together with the input shaft
- ☐ Removing. Refer to ⇒ Fig. [“Removing the 5th Gear Wheel”](#), page 153
- ☐ Installed position: the surrounding groove -arrow- points toward grooved ball bearing
- ☐ Installing. Refer to ⇒ Fig. [“Warming the 5th Gear Wheel and Installing”](#), page 153

6 - Input Shaft

- ☐ With 3rd/4th and 6th gear wheel

7 - Cylindrical Roller Bearing

- ☐ With circlip
- ☐ Removing. Refer to
⇒ Fig. [“Removing the Cylindrical Roller Bearing from the Clutch Housing”](#), page 154
- ☐ Installing. Refer to ⇒ Fig. [“Pressing Cylindrical Roller Bearing into Clutch Housing.”](#), page 155
- ☐ Installed position: the circlip in bearing points to input shaft

8 - Clutch Housing

1.2 Input Shaft, Disassembling and Assembling

Special tools and workshop equipment required

- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Rod - VW412-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Bushing - 50mm Diameter - VW432-
- ◆ Bearing Installer - Multiple Use - 32-111-
- ◆ Inductive Heater - VAS6414-
- ◆ -1- Puller - Kukko Internal - 28-37mm - Kukko 21/5-
- ◆ -3- Puller - Kukko Quick Action Separating Tool - 22-115mm - Kukko 17/2-
- ◆ -4- Puller - Kukko Counterstay - Kukko 22/2-
- ◆ Feeler Gauge



Input Shaft, Disassembling

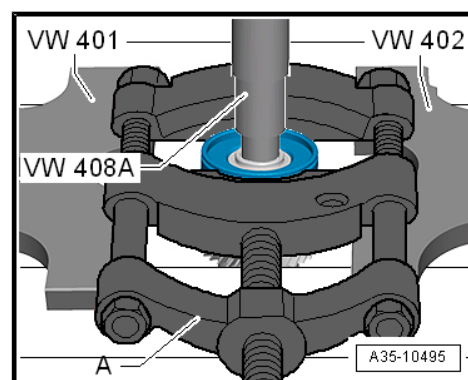
- Remove the grooved ball bearing locking ring.

Removing the Grooved Ball Bearing

- Mount the Separating Tool -A- into the groove in the ball bearing for the locking ring.

A - Separating Tool - 22-115mm , for example Puller - Kukko
Quick Action Separating Tool - 22-115mm - Kukko 17/2-

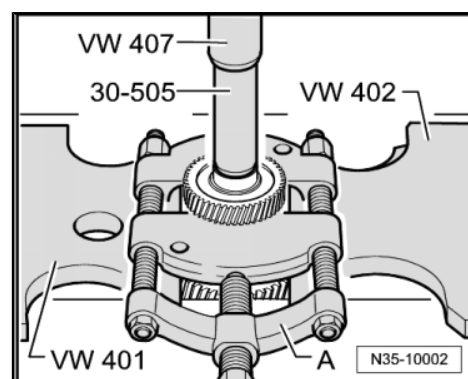
- The grooved ball bearing and 5th gear wheel can also be removed together. To do this, place the Separating Tool -A- as shown in the following illustration under the 5th gear wheel.



Removing the 5th Gear Wheel

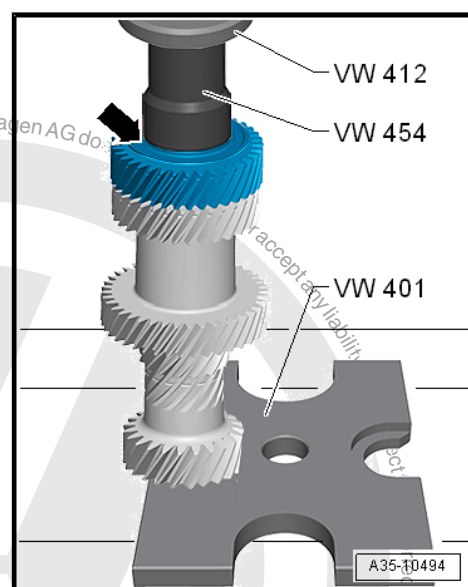
A - Separating Tool - 22-115mm , for example Puller - Kukko
Quick Action Separating Tool - 22-115mm - 17/2-

Input Shaft, Assembling



Warming the 5th Gear Wheel and Installing

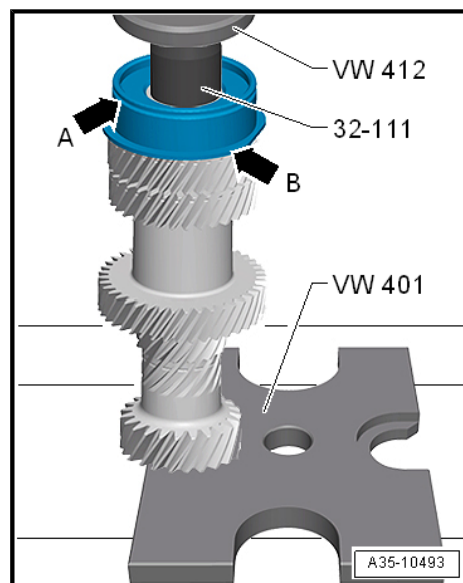
- The groove -arrow- on the gear wheel must face up.





Grooved Ball Bearing Installation Location and Installing the Grooved Ball Bearing

- Grooved ball bearing installation location: the groove for the circlip faces up -arrow A-. The collar -arrow B- must face the 5th gear wheel.
- Then select the grooved ball bearing locking ring and install it on the input shaft. Refer to
⇒ [Fig. "Selecting the Locking Ring", page 154](#).



Selecting the Locking Ring

- Insert a 1.86 mm locking ring -A- into groove in the input shaft and press it upward.
- Measure the gap between the grooved ball bearing -B- and the installed locking ring -A- with a feeler gauge -C-.
- Remove the locking ring used for the measurement.
- Select the locking ring according to the Table.



Note

For the correct locking rings, refer to the *Parts Catalog*.

The following locking rings are available:

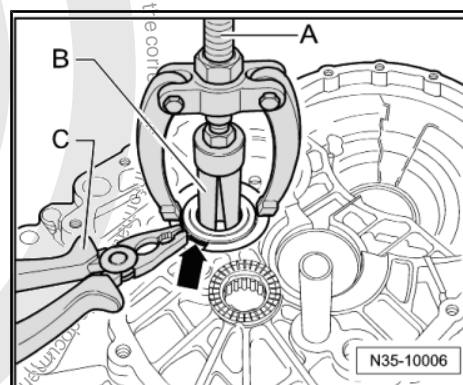
Measured Value (mm)	Circlip Thickness (mm)	Axial Play (mm)
0.01 to 0.05	1.86	0.01 to 0.05
0.05 to 0.07	1.89	0.01 to 0.05
0.07 to 0.10	1.92	0.01 to 0.05
0.10 to 0.13	1.95	0.01 to 0.05
0.13 to 0.16	1.98	0.01 to 0.05

Removing the Cylindrical Roller Bearing from the Clutch Housing

- Compress the cylindrical roller bearing locking ring -arrow- with pliers -C- and remove it.

A - Counter Support , for example, Puller - Kukko Counterstay - Kukko 22/2-

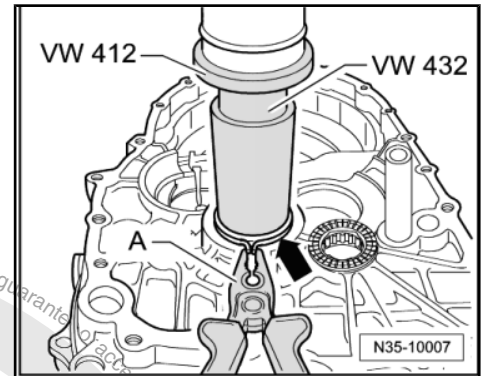
B - Puller - Kukko Internal - 28-37mm , for example, Puller - Kukko Internal - 28-37mm - 21/5-





Pressing Cylindrical Roller Bearing into Clutch Housing.

- Compress the cylindrical roller bearing locking ring -arrow- with pliers -C- and install it.
- Remove the pliers before the cylindrical roller bearing gets into its installed position. The locking ring must lock into the groove on the clutch housing.



1.3 Input Shaft Seal, Replacing

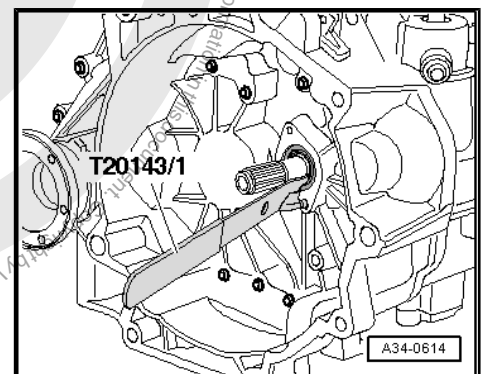
Special tools and workshop equipment required

- ◆ Puller - Crankshaft/Power Steering Seal - T20143/1-
- ◆ Seal Installer - Drive Axle - T40008-
- ◆ Sealing Grease - G 052 128 A1-
- Remove manual transmission.
- Remove the clutch slave cylinder with release bearing. Refer to
[⇒ "1.15 Clutch Slave Cylinder with Release Bearing, Removing and Installing", page 33](#).
- Pry the input shaft seal out.

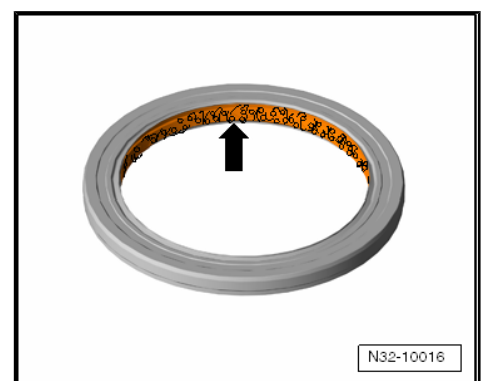


Note

Be careful not to damage the contact surface for the seal on the input shaft.

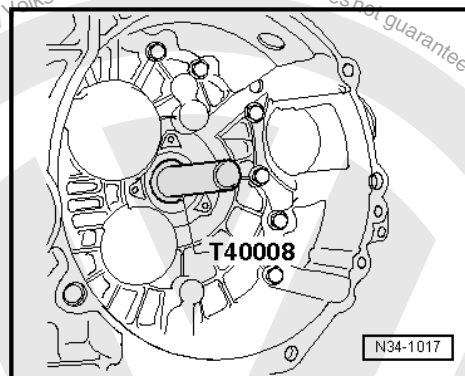


- Fill the space on the new seal between the sealing/dust lip halfway with Sealing Grease .
- Coat the outer circumference of the seal lightly with transmission fluid.





- Install the input shaft seal so that it is flush.
- Install the clutch slave cylinder with release bearing. Refer to
⇒ ["1.15 Clutch Slave Cylinder with Release Bearing, Removing and Installing", page 33](#) .
- Install manual transmission.





2 Output Shaft

⇒ [“2.1 Overview - Output Shaft”, page 157](#)

⇒ [“2.2 Output Shaft, Disassembling and Assembling”, page 166](#)

⇒ [“2.3 Output Shaft, Adjusting”, page 181](#)

2.1 Overview - Output Shaft

⇒ [“2.1.1 Overview - Output Shaft, 1st to 4th Gears”, page 157](#)

⇒ [“2.1.2 Overview - Output Shaft, 5th/6th and Reverse Gears”, page 162](#)

2.1.1 Overview - Output Shaft, 1st to 4th Gears



Note

- ◆ Warm the bearing inner race/tapered roller bearing and synchronizer hub to approximately 100 °C (212 °F) using Inductive Heater - VAS6414- . Wear protective gloves.
- ◆ Install a collar bushing instead of thrust washers -item 19- ⇒ [Item 19 \(page 159\)](#) and retaining ring -item 20- ⇒ [Item 20 \(page 159\)](#) on transmissions with reinforcement measures (manual transmission 0FB). The output shaft components, 1st through 4th gear, 4th gear wheel and the needle bearing for the 4th gear wheel were adapted. Refer to ⇒ [Fig. “Reinforcement Measures on Manual Transmission 0FB Near 4th Gear Wheel”](#), page 161 . Refer to the Parts Catalog.
- ◆ Adjust the output shaft if it or the tapered roller bearing are being replaced. Refer to ⇒ [“2.3 Output Shaft, Adjusting”, page 181](#) .
- ◆ Replace both tapered roller bearings together.



1 - Clutch Housing

2 - Oil Deflector Ring

3 - Dished Washer

- ☐ Removing. Refer to
⇒ [Fig. "Removing the Dished Washer A- from the Output Shaft"](#),
page 166
- ☐ Installing. Refer to
⇒ [Fig. "Installing the Dished Washer into the Output Shaft"](#)
page 167

4 - Outer Race/Tapered Roller Bearing

- ☐ Removing. Refer to
⇒ [Fig. "Removing the Outer Race / Tapered Roller Bearing from the Clutch Housing"](#),
page 167
- ☐ Installing. Refer to
⇒ [Fig. "Installing the Outer Race/Tapered Roller Bearing in the Clutch Housing"](#),
page 168

5 - Bearing Inner Race/Taper Roller Bearing

- ☐ Removing. Refer to
⇒ [Fig. "Removing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Clutch Housing"](#),
page 167
- ☐ Installing. Refer to
⇒ [Fig. "Installing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Clutch Housing"](#),
page 167

6 - Output Shaft

- ☐ For 1st through 4th gear
- ☐ There are different versions. Refer to ⇒ [Fig. "Differentiation of Output Shafts"](#), page 162
- ☐ Allocate according to the transmission code letters. Refer to the Parts Catalog.
- ☐ Adjusting. Refer to ⇒ ["2.3 Output Shaft, Adjusting"](#), page 181 .

7 - Needle Bearing

- ☐ For 2nd gear

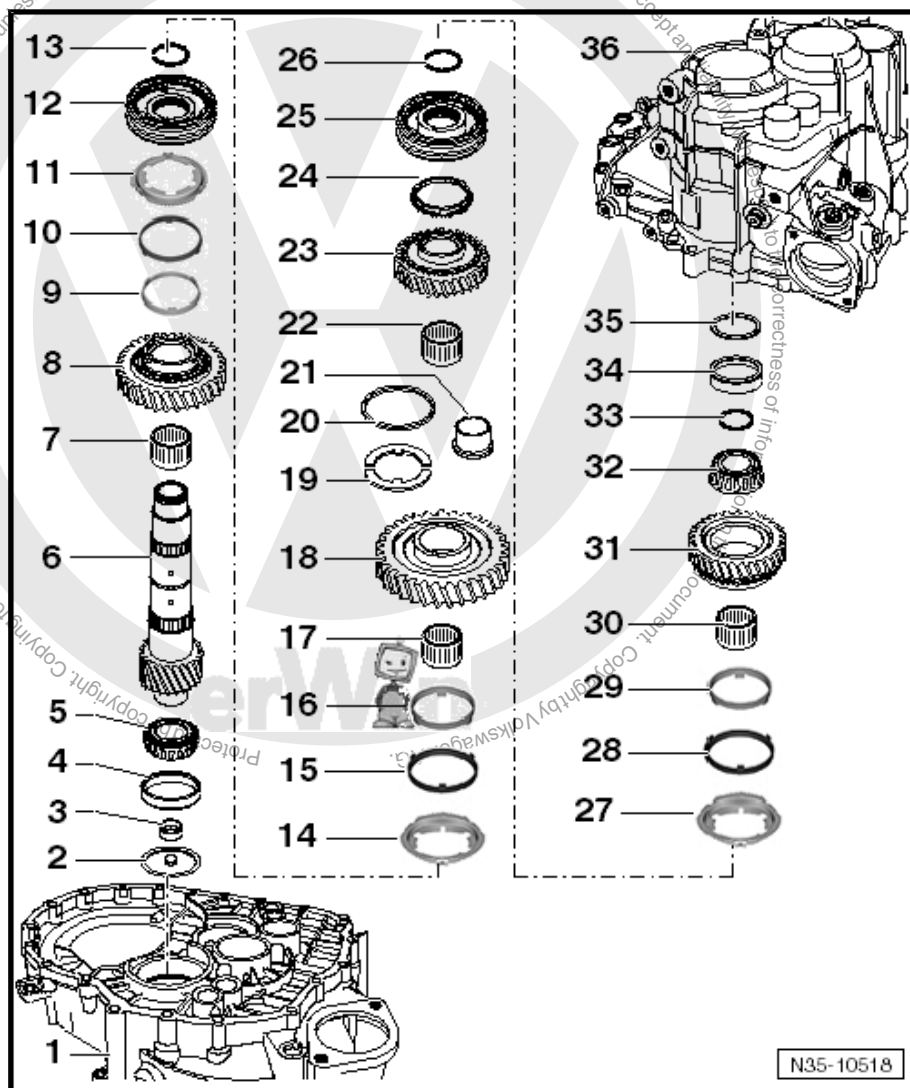
8 - 2nd Gear Wheel

9 - 2nd Gear Inner Race

- ☐ Replace if there are wear grooves
- ☐ Installation position. Refer to
⇒ [Fig. "Installing 2nd Gear Outer Race, Inner Race and Synchronizer Ring"](#), page 171

10 - 2nd Gear Outer Race

- ☐ Check the inner friction surface for wear. Refer to
⇒ [Fig. "Checking the Inner Contact Surface for Wear on the 1st Gear Outer Race, the 2nd Gear Outer Race, and the 3rd Gear Outer Race."](#), page 170
- ☐ Check the outer friction surface for wear. Refer to
⇒ [Fig. "Checking the Outer Contact Surface for Wear on the 1st Gear Outer Ring, the 2nd Gear Outer Ring, and the 3rd Gear Outer Ring"](#), page 170





- ☐ Installation position. Refer to
⇒ [Fig. "Installing 2nd Gear Outer Race, Inner Race and Synchronizer Ring" , page 171](#)

11 - 2nd Gear Synchronizer Ring

- ☐ Check the inner running surface for grooves and radial wear
- ☐ Installation position. Refer to
⇒ [Fig. "Installing 2nd Gear Outer Race, Inner Race and Synchronizer Ring" , page 171](#)

12 - Locking Collar with Synchronizer Hub for 1st and 2nd Gears

- ☐ After removing the locking ring, remove with the 2nd gear wheel. Refer to
⇒ [Fig. "Removing the Locking Collar and the Synchronizer Hub for 1st and 2nd Gear" , page 170 .](#)
- ☐ Disassembling. Refer to
⇒ [Fig. "Disassembling and Assembling the Locking Collar and the Synchronizer Hub for 1st, 2nd, 3rd and 4th Gears" , page 171 .](#)
- ☐ Assembling the locking collar/synchronizer hub. Refer to
⇒ [Fig. "Disassembling and Assembling the Locking Collar and the Synchronizer Hub for 1st, 2nd, 3rd and 4th Gears" , page 171](#) and
⇒ [Fig. "Assembling the Locking Collar/Synchronizer Hub for 1st, 2nd, 3rd and 4th Gears" , page 171](#)
- ☐ Installation position. Refer to
⇒ [Fig. "Installation Position of Locking Collar/Synchronizer Hub for 1st and 2nd Gears" , page 171](#)
- ☐ Installing. Refer to
⇒ [Fig. "Warming and Installing the Locking Collar/Synchronizer Hub for 1st and 2nd Gears" , page 172](#)

13 - Circlip

14 - 1st Gear Synchronizer Ring

- ☐ Check the inner running surface for grooves and radial wear
- ☐ Installation position. Refer to
⇒ [Fig. "Installing the Synchronizer Ring for 1st Gear Outer Race and Inner Race" , page 172](#)

15 - 1st Gear Outer Race

- ☐ Check the inner friction surface for wear. Refer to
⇒ [Fig. "Checking the Inner Contact Surface for Wear on the 1st Gear Outer Race, the 2nd Gear Outer Race, and the 3rd Gear Outer Race." , page 170](#)
- ☐ Check the outer friction surface for wear. Refer to
⇒ [Fig. "Checking the Outer Contact Surface for Wear on the 1st Gear Outer Ring, the 2nd Gear Outer Ring, and the 3rd Gear Outer Ring" , page 170](#)
- ☐ Installation position. Refer to
⇒ [Fig. "Installing the Synchronizer Ring for 1st Gear Outer Race and Inner Race" , page 172](#)

16 - 1st Gear Inner Race

- ☐ Replace if there are wear grooves
- ☐ Installation position. Refer to
⇒ [Fig. "Installing the Synchronizer Ring for 1st Gear Outer Race and Inner Race" , page 172](#)

17 - Needle Bearing

- ☐ For 1st gear

18 - 1st Gear Wheel

- ☐ Mount on the output shaft. Refer to
⇒ [Fig. "Installing 1st Gear Wheel with Needle Bearing" , page 172](#)

19 - Thrust Washer

- ☐ For 1st and 4th gears
- ☐ Quantity: 2
- ☐ The tab on the thrust washer must fit into the hole in the output shaft.
- ☐ Not installed on transmissions with reinforcement measures

20 - Retaining Ring

- ☐ Holds the thrust washers for the 1st and 4th gear in place on the output shaft
- ☐ Not installed on transmissions with reinforcement measures



21 - Collar Bushing

- ☐ For the 4th gear needle bearing
- ☐ Only installed on transmissions with reinforcement measures. Refer to
⇒ [Fig. "Reinforcement Measures on Manual Transmission 0FB Near 4th Gear Wheel" , page 161](#)
- ☐ Allocate according to the transmission code letters. Refer to the Parts Catalog.

22 - Needle Bearing

- ☐ For 4th gear
- ☐ There are different versions. Refer to
⇒ [Fig. "Variations of the Needle Bearing and Gear Wheels for 4th Gear" , page 162](#)
- ☐ Allocate according to the transmission code letters. Refer to the Parts Catalog.

23 - 4th Gear Wheel

- ☐ There are different versions. Refer to
⇒ [Fig. "Variations of the Needle Bearing and Gear Wheels for 4th Gear" , page 162](#)
- ☐ Allocate according to the transmission code letters. Refer to the Parts Catalog.

24 - 4th Gear Synchronizer Ring

- ☐ Brass or steel
- ☐ Checking for wear. Refer to ⇒ [Fig. "Checking the 4th Gear Synchronizer Ring for Wear" , page 173](#)

25 - Locking Collar with Synchronizer Hub for 3rd and 4th Gears

- ☐ After removing the locking ring, remove the 4th gear wheel. Refer to
⇒ [Fig. "Removing the 3rd and 4th Gear Synchronizer Hub/Locking Collar with the 4th Gear Wheel" , page 169](#)
- ☐ Disassembling. Refer to
⇒ [Fig. "Disassembling and Assembling the Locking Collar and the Synchronizer Hub for 1st, 2nd, 3rd and 4th Gears" , page 171](#)
- ☐ Assembling the locking collar/synchronizer hub. Refer to
⇒ [Fig. "Disassembling and Assembling the Locking Collar and the Synchronizer Hub for 1st, 2nd, 3rd and 4th Gears" , page 171](#) and
⇒ [Fig. "Assembling the Locking Collar/Synchronizer Hub for 1st, 2nd, 3rd and 4th Gears" , page 171](#)
- ☐ Installed position: locking collar/synchronizer hub. Refer to
⇒ [Fig. "Installed Position: Locking Collar/Synchronizer Hub for 3rd and 4th Gears" , page 174](#)
- ☐ Installing. Refer to
⇒ [Fig. "Warming and Installing the Synchronizer Hub with Locking Collar for 3rd and 4th Gears" , page 174](#)

26 - Circlip

27 - 3rd Gear Synchronizer Ring

- ☐ Check the inner running surface for grooves and radial wear
- ☐ Installation position. Refer to
⇒ [Fig. "Installing the 3rd Gear Synchronizer Ring, Outer Ring and Inner Ring" , page 174](#)

28 - 3rd Gear Outer Race

- ☐ Check the inner friction surface for wear. Refer to
⇒ [Fig. "Checking the Inner Contact Surface for Wear on the 1st Gear Outer Race, the 2nd Gear Outer Race, and the 3rd Gear Outer Race." , page 170](#)
- ☐ Check the outer friction surface for wear. Refer to
⇒ [Fig. "Checking the Outer Contact Surface for Wear on the 1st Gear Outer Ring, the 2nd Gear Outer Ring, and the 3rd Gear Outer Ring" , page 170](#)
- ☐ Installation position. Refer to
⇒ [Fig. "Installing the 3rd Gear Synchronizer Ring, Outer Ring and Inner Ring" , page 174](#)

29 - 3rd Gear Inner Race

- ☐ Replace if there are wear grooves
- ☐ Installation position. Refer to
⇒ [Fig. "Installing the 3rd Gear Synchronizer Ring, Outer Ring and Inner Ring" , page 174](#)

30 - Needle Bearing

- ☐ For 3rd gear



31 - 3rd Gear Wheel

- ❑ Mount on the output shaft. Refer to
⇒ [Fig. "Installing the 3rd Gear Wheel With Needle Bearing" , page 175](#)

32 - Bearing Inner Race/Taper Roller Bearing

- ❑ Removing. Refer to
⇒ [Fig. "Remove the Bearing Inner Race/Tapered Roller Bearing on the Side of the Transmission Housing" , page 168](#)
- ❑ Installing. Refer to
⇒ [Fig. "Installing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Transmission Housing" , page 168](#)

33 - Circlip

- ❑ Determine again when replacing the bearing inner race/tapered roller bearing and output shaft. Refer to
⇒ [Fig. "Selecting the Locking Ring" , page 168](#)

34 - Outer Race/Tapered Roller Bearing

- ❑ Removing. Refer to
⇒ [Fig. "Removing the Outer Race/Tapered Roller Bearing from the Transmission Housing" , page 169](#)
- ❑ Installing. Refer to
⇒ [Fig. "Installing the Outer Race/Tapered Roller Bearing into the Transmission Housing." , page 169](#)

35 - Shim

- ❑ Selecting thickness. Refer to ⇒ ["2.3 Output Shaft, Adjusting" , page 181 .](#)

36 - Transmission Housing

Reinforcement Measures on Manual Transmission 0FB Near 4th Gear Wheel

The following components are affected.

1 - Output Shaft

Characteristics. Refer to
⇒ [Fig. "Differentiation of Output Shafts" , page 162](#)

2 - Collar Bushing

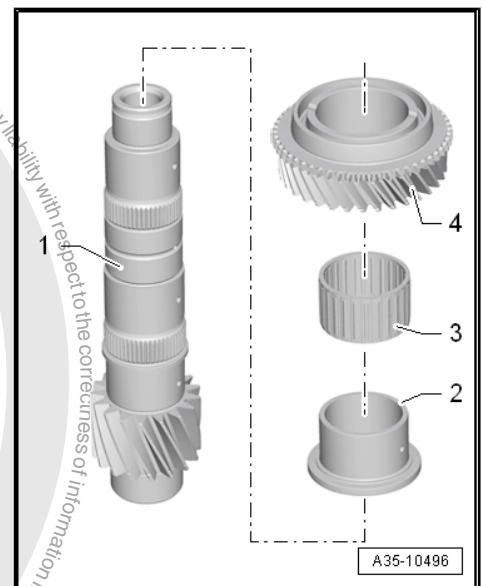
Characteristics. Refer to
⇒ [Fig. "Variations of the Needle Bearing and Gear Wheels for 4th Gear" , page 162](#)

3 - 4th Gear Needle Bearing

Characteristics. Refer to
⇒ [Fig. "Variations of the Needle Bearing and Gear Wheels for 4th Gear" , page 162](#)

4 - 4th Gear Wheel

Characteristics. Refer to
⇒ [Fig. "Variations of the Needle Bearing and Gear Wheels for 4th Gear" , page 162](#)



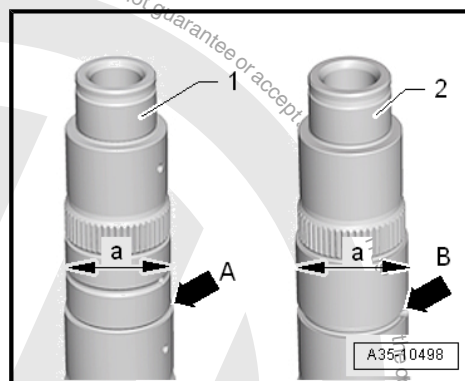
Note

- ◆ *Never mix components for reinforced 4th gear transmissions and 4th gear transmissions without reinforcement. Refer to the Parts Catalog.*
- ◆ *To remove and install modified components, follow instructions in repair manual. Refer to
⇒ ["2.2.1 Output Shaft, 1st to 4th Gears, Disassembling and Assembling" , page 166 .](#)*



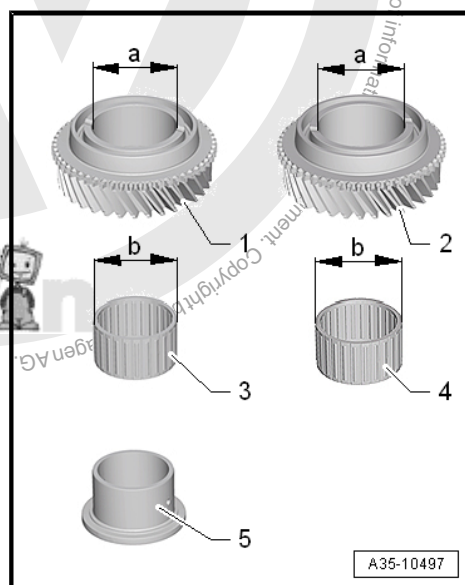
Differentiation of Output Shafts

Output Shaft	-1- with Reinforcement Measures	-1- without Reinforcement Measures
Dimension -a-	40.1 mm	42.0 mm
-Arrow A-	Groove for collar bushing position -item 21- ⇒ Item 21 (page 160)	-
-Arrow B-	-	Two opposite holes and circular groove for the thrust washer mounts -item 19- ⇒ Item 19 (page 159)



Variations of the Needle Bearing and Gear Wheels for 4th Gear

4th Gear Wheel	-1- With Reinforcement Measures	-2- Without Reinforcement Measures
Dimension -a-	52.0 mm	48.0 mm
4th Gear Wheel Needle Bearing	-3- With Reinforcement Measures	-4- Without Reinforcement Measures
Dimension -b-	52.0 mm	48.0 mm
<ul style="list-style-type: none"> The needle bearing -3- is fitted on the collar bushing -5- on transmissions with reinforcement measures. 		



2.1.2 Overview - Output Shaft, 5th/6th and Reverse Gears



Note

- ♦ Warm the bearing inner race/tapered roller bearing and synchronizer hub to approximately 100 °C (212 °F) using Inductive Heater - VAS6414- . Wear protective gloves.
- ♦ Adjust the output shaft if it or the tapered roller bearing are being replaced. Refer to ⇒ **"2.3.2 Output Shaft, 5th, 6th and Reverse Gears, Adjusting", page 184** .
- ♦ Replace both tapered roller bearings together.



1 - Clutch Housing

2 - Washer

- ❑ Always 0.65 mm thick

3 - Outer Race/Tapered Roller Bearing

- ❑ Removing. Refer to [⇒ Fig. "Removing the Outer Race/Tapered Roller Bearing from the Clutch Housing", page 176](#)
- ❑ Installing. Refer to [⇒ Fig. "Installing the Outer Race/Tapered Roller Bearing in the Clutch Housing", page 177](#)

4 - Bearing Inner Race/Taper Roller Bearing

- ❑ Removing. Refer to [⇒ Fig. "Removing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Clutch Housing", page 178](#)
- ❑ Installing. Refer to [⇒ Fig. "Installing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Clutch Housing", page 181](#)

5 - Output Shaft

- ❑ For 5th, 6th and Reverse Gears
- ❑ Adjusting. Refer to [⇒ "2.3.2 Output Shaft, 5th, 6th and Reverse Gears, Adjusting", page 184](#)

6 - Reverse Gear Synchronizer Hub

- ❑ Removing. Refer to [⇒ Fig. "Removing the Reverse Gear Synchronizer Hub", page 178](#)
- ❑ Installation position. Refer to [⇒ Fig. "Installed Position: Reverse Gear Synchronizer Hub", page 179](#)
- ❑ Installing. Refer to [⇒ Fig. "Warming and Installing the Reverse Gear Synchronizer Hub", page 179](#)

7 - Circlip

8 - Reverse Gear Locking Collar

- ❑ With synchronizer ring

9 - Needle Bearing

- ❑ For reverse gear wheel

10 - Reverse Gear Wheel

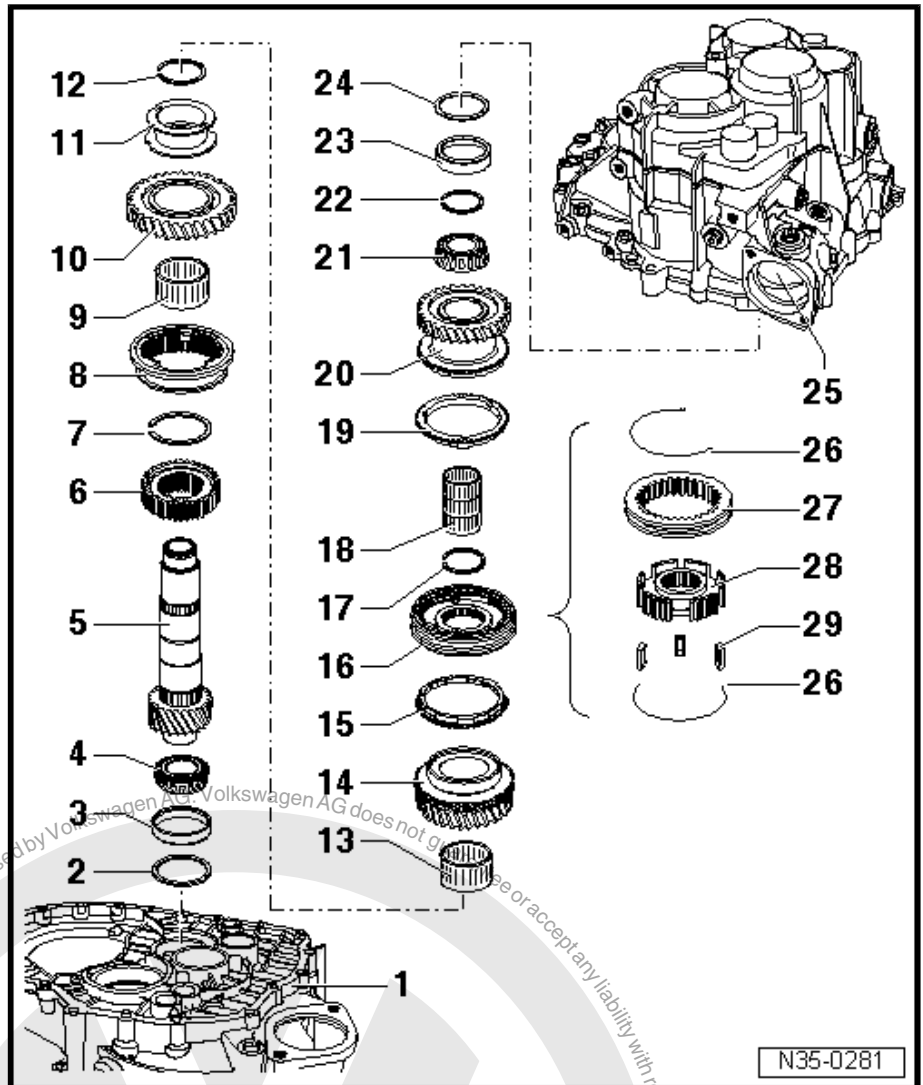
11 - Sleeve

- ❑ Remove with the reverse gear wheel. Refer to [⇒ Fig. "Removing the Sleeve -A- Together with the Reverse Gear Wheel", page 178](#)
- ❑ Installed position: the wider collar on sleeve points toward reverse gear selector gear
- ❑ Installing. Refer to [⇒ Fig. "Installing the Sleeve -A-", page 179](#)

12 - Circlip

13 - Needle Bearing

- ❑ For 6th gear



N35-0281



14 - 6th Gear Wheel

15 - 6th Gear Synchronizer Ring

- ☐ Brass or steel
- ☐ Checking for wear. Refer to
⇒ Fig. [““Check the 5th and 6th Gear Synchronizer Ring for Wear””](#) , page 179

16 - Locking Collar With Synchronizer Hub for 5th and 6th Gears

- ☐ After removing the securing ring, remove with the 6th gear wheel. Refer to
⇒ Fig. [““Removing the 5th and 6th Gear Synchronizer Hub/Locking Collar with the 6th Gear Wheel””](#) , page 178
- ☐ Disassembling. Refer to
⇒ Fig. [““Disassembling and Assembling Locking Collar and Synchronizer Hub for 5th and 6th Gears””](#) , page 180 .
- ☐ Assembling the locking collar/synchronizer hub. Refer to
⇒ Fig. [““Disassembling and Assembling Locking Collar and Synchronizer Hub for 5th and 6th Gears””](#) , page 180 and
⇒ Fig. [““Assembling Locking Collar/Synchronizer Hub for 5th and 6th Gears””](#) , page 180
- ☐ Installing. Refer to
⇒ Fig. [““Installing the Locking Collar/Synchronizer Hub for 5th and 6th Gears””](#) , page 180

17 - Circlip

18 - Needle Bearing

- ☐ For 5th gear

19 - 5th Gear Synchronizer Ring

- ☐ Brass or steel
- ☐ Checking for wear. Refer to
⇒ Fig. [““Check the 5th and 6th Gear Synchronizer Ring for Wear””](#) , page 179

20 - 5th Gear Wheel

21 - Bearing Inner Race/Taper Roller Bearing

- ☐ Removing. Refer to
⇒ Fig. [““Remove the Bearing Inner Race/Tapered Roller Bearing on the Side of the Transmission Housing””](#) , page 177
- ☐ Installing. Refer to
⇒ Fig. [““Installing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Transmission Housing””](#) , page 181

22 - Circlip

- ☐ Determine again when replacing the bearing inner race/tapered roller bearing and output shaft. Refer to
⇒ Fig. [““Selecting the Locking Ring””](#) , page 181

23 - Outer Race/Tapered Roller Bearing

- ☐ Removing. Refer to
⇒ Fig. [““Removing the Outer Race/Tapered Roller Bearing from the Transmission Housing””](#) , page 177
- ☐ Installing. Refer to
⇒ Fig. [““Installing the Outer Race/Tapered Roller Bearing Into the Transmission Housing.””](#) , page 177

24 - Shim

- ☐ Selecting thickness. Refer to
⇒ [“2.3.2 Output Shaft, 5th, 6th and Reverse Gears, Adjusting”](#) , page 184 .

25 - Transmission Housing

26 - Spring

- ☐ Installation position. Refer to
⇒ Fig. [““Assembling Locking Collar/Synchronizer Hub for 5th and 6th Gears””](#) , page 180



27 - Locking Collar

28 - Synchronizer Hub

29 - Locking Piece

- ☐ Quantity: 3
- ☐ Installation position. Refer to
⇒ [Fig. ""Disassembling and Assembling Locking Collar and Synchronizer Hub for 5th and 6th Gears""](#),
[page 180](#)





2.2 Output Shaft, Disassembling and Assembling

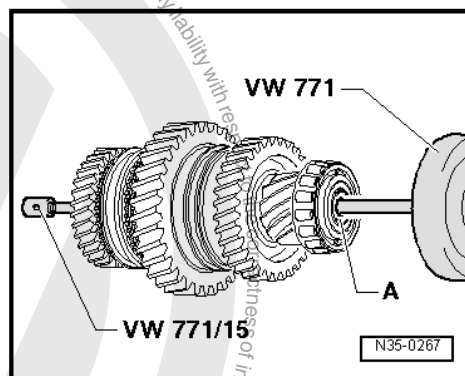
⇒ [“2.2.1 Output Shaft, 1st to 4th Gears, Disassembling and Assembling”, page 166](#)

⇒ [“2.2.2 Output Shaft, 5th, 6th and Reverse Gears, Disassembling and Assembling”, page 176](#)

2.2.1 Output Shaft, 1st to 4th Gears, Disassembling and Assembling

Special tools and workshop equipment required

- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Multiple Use - VW412-
- ◆ Press Piece - 60mm - VW415A-
- ◆ Holding Plate - VW309A-
- ◆ Holding Fixture - VW313-
- ◆ Transmission Support - VW353-
- ◆ Press Piece - Multiple Use - VW431-
- ◆ Press Piece - Multiple Use - VW433-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Multiple Use - VW512-
- ◆ Press Piece - 42mm - VW516-
- ◆ Press Piece - Multiple Use - VW519-
- ◆ Slide Hammer Set - VW771-
- ◆ Crankshaft Holding Fixture - VW801-
- ◆ Press Piece - Multiple Use - 40-105-
- ◆ Bearing Installer - Multiple Use - 40-20-
- ◆ Bearing Installer - Differential Bearing - 40-21-
- ◆ Slide Hammer - Press Plate - 2050-
- ◆ Holding Fixture - Spacers - VW540/1B-
- ◆ Puller - Taper Roller Bearing - VAG1582-
- ◆ Puller - Taper Roller Bearing - Adapter 7 - VAG1582/7-
- ◆ Inductive Heater - VAS6414-
- ◆ -1- Puller - Kukko Internal - 46-56mm - 21/7-
- ◆ -1- Puller - Kukko Internal - 56-70mm - 21/8-
- ◆ -2- Puller - Kukko Puller - 60-200mm Width, 250mm Length - 18/2-
- ◆ -3- Puller - Kukko Quick Action Separating Tool - 22-115mm - 17/2-
- ◆ -4- Puller - Kukko Counterstay - 22/2-

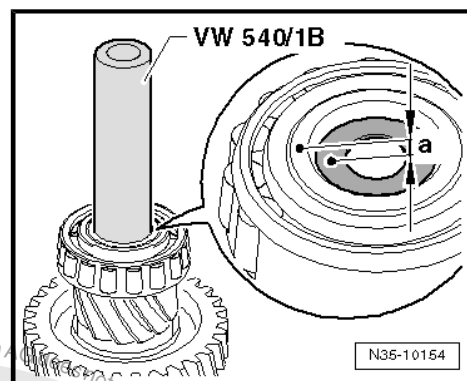


Removing the Dished Washer -A- from the Output Shaft



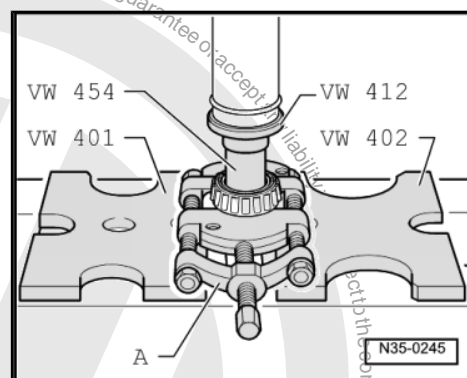
Installing the Dished Washer into the Output Shaft

Dimension "a" = 2 mm

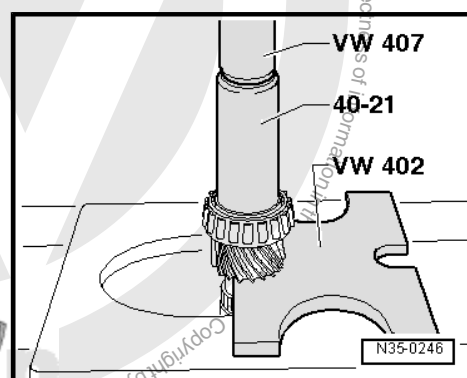


Removing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Clutch Housing

A - Puller - Quick Action Separating Tool - 22-115mm , for example -Kukko 17/2-



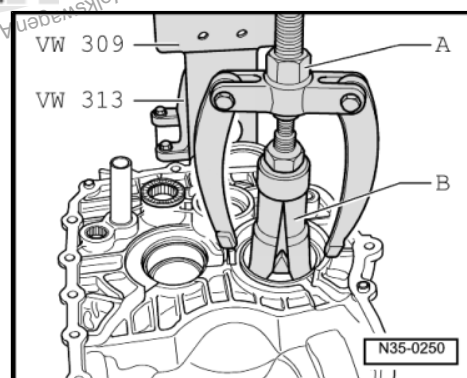
Installing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Clutch Housing



Removing the Outer Race / Tapered Roller Bearing from the Clutch Housing

A - Counter Support , for example, Puller - Kukko Counterstay - 22/2-

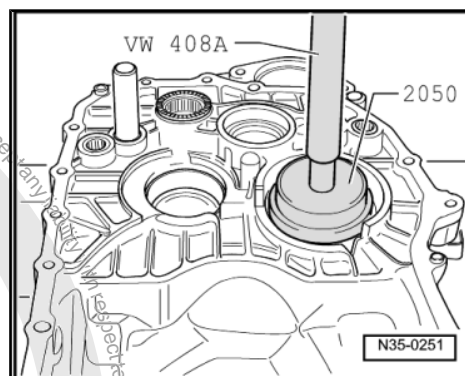
B - Internal Puller 56 to 70 mm , for example, Puller - Kukko Internal - 56-70mm - 21/8-





Installing the Outer Race/Tapered Roller Bearing in the Clutch Housing

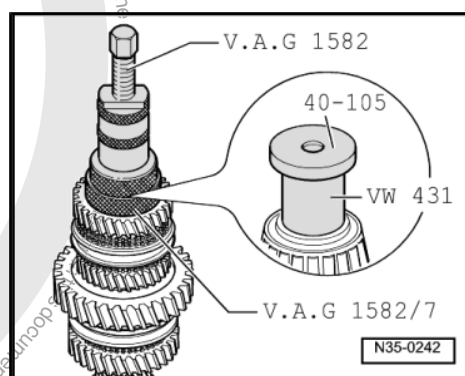
- Support the clutch housing with the Bearing Installer - Multiple Use - 40-20- directly under the bearing mount.



Remove the Bearing Inner Race/Tapered Roller Bearing on the Side of the Transmission Housing

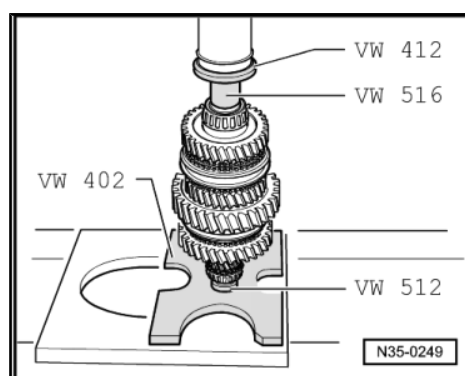
Note the following before installing the Tapered Roller Bearing Puller :

- Remove the bearing inner race/tapered roller bearing locking ring on the side facing the transmission housing.
- Place the Press Piece - Multiple Use - VW431- in the output shaft and lay the Press Piece - Multiple Use - 40-105- on top.



Installing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Transmission Housing

- Choose the correct locking ring. Refer to [Fig. "Selecting the Locking Ring", page 168](#) and install.



Selecting the Locking Ring

- Choose and install the thickest locking ring that will fit.

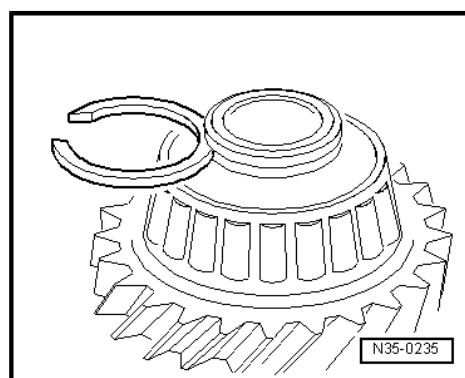


Note

For the correct locking rings, refer to the Parts Catalog.

The following locking rings are available:

Thickness (mm)			
1.79	1.83	1.86	1.89
1.92	1.95	1.98	

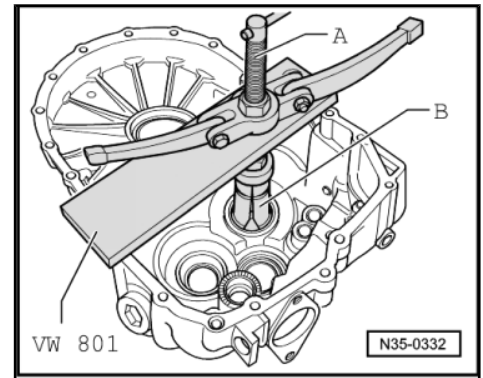




Removing the Outer Race/Tapered Roller Bearing from the Transmission Housing

A - Counter Support , for example, Puller - Kukko Counterstay - 22/2-

B - Internal Puller 46 to 58 mm , for example, Puller - Kukko Internal - 46-56mm - 21/7-



Installing the Outer Race/Tapered Roller Bearing into the Transmission Housing.

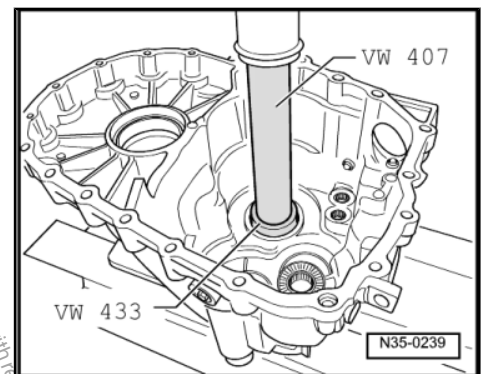
- Install the adjusting shim under the outer race.
- Support the transmission housing under the bearing mount using the Slide Hammer - Press Plate - 2050- .

Disassembling the Output Shaft



Note

Remove the bearing inner race/tapered roller bearing on the side of the transmission housing. Refer to
⇒ Fig. "Remove the Bearing Inner Race/Tapered Roller Bearing on the Side of the Transmission Housing", page 168 .



Removing the 3rd and 4th Gear Synchronizer Hub/Locking Collar with the 4th Gear Wheel

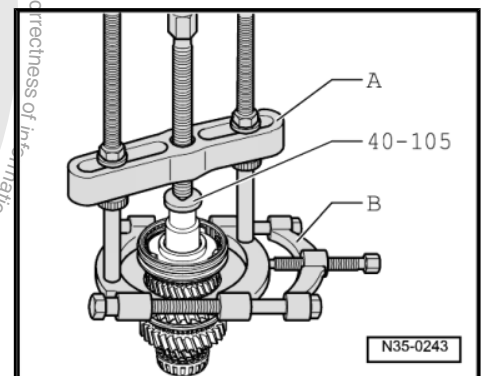
- Remove the locking ring beforehand.

A - Puller , for example, Puller - Kukko Puller - 60-200mm Width, 250mm Length - 18/2-

B - Puller - Quick Action Separating Tool - 22-115mm - 17/2- , for example.

- Then remove the retaining ring -item 20-
⇒ Item 20 (page 159) and thrust washers -item 19-
⇒ Item 19 (page 159) .

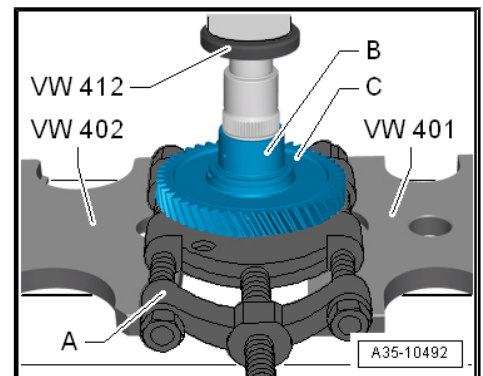
- Then remove the 1st gear wheel with synchronizer ring.



On Transmissions with Reinforcement Measures, Remove the Collar Bushing -B- Together With the 1st Gear Wheel -C-.

A - Puller - Quick Action Separating Tool - 22-115mm - 17/2- , for example .

- Install the Separating Tool -A- underneath the helical-cut gear teeth on the 1st gear wheel.





Removing the Locking Collar and the Synchronizer Hub for 1st and 2nd Gear

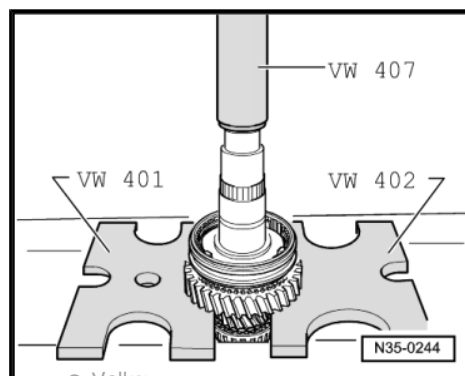
After removing the circlip, press off the gear wheel for 2nd gear and locking collar/synchronizer hub together.

Assemble the Output Shaft.



Note

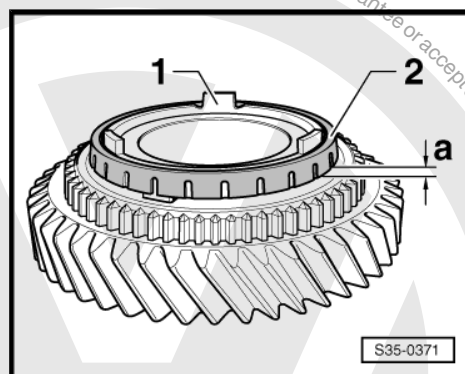
Heat the tapered roller bearing inner races and synchronizer hub to approximately 100 °C (212 °F) with the Inductive Heat Unit - VAS6414- before installing. Press on to the stop so that there is no axial clearance.



Checking the Inner Contact Surface for Wear on the 1st Gear Outer Race, the 2nd Gear Outer Race, and the 3rd Gear Outer Race.

- Install the inner race -1- on the cone on the gear wheel.
- Install the outer race -2- on the cone on the inner race. Measure the gap -a- with a feeler gauge at 3 locations at 120°.
- Note the average value.

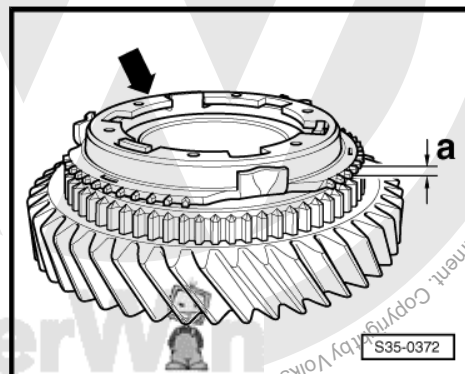
Wear Limit Dimension -a-	
1st gear, 2nd gear, and 3rd gear	0.4 mm



Checking the Outer Contact Surface for Wear on the 1st Gear Outer Ring, the 2nd Gear Outer Ring, and the 3rd Gear Outer Ring

- Check the synchronizer ring -arrow- on the inner running surface for grooves and radial wear, and replace if necessary.
- Install the inner race, the outer race and the synchronizer ring on the cone on the inner race.
- Press the synchronizer ring onto the outer races while turning it at the same time so that the ring seats correctly.
- Measure the gap -a- with a feeler gauge at 3 locations at 120°.
- Note the average value.

Wear Limit Dimension -a-	
1st gear, 2nd gear, and 3rd gear	0.8 mm

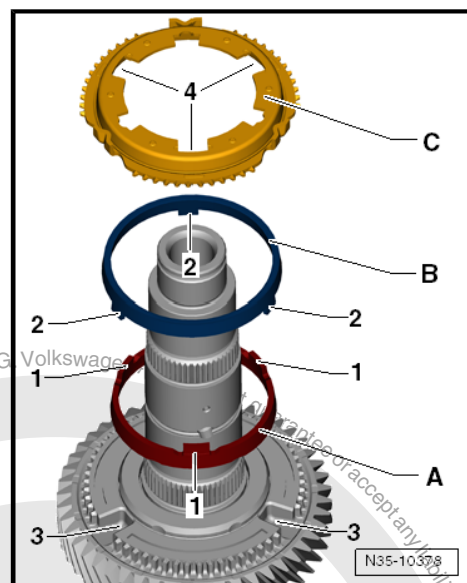


- Install the 2nd gear wheel with the needle bearing.



Installing 2nd Gear Outer Race, Inner Race and Synchronizer Ring

- Place inner race -A- on 2nd gear wheel.
- The tabs -1- face away from the gear wheel.
- Install the outer race -B-.
- The tabs -2- engage in grooves -3- on the gear wheel.
- Install the synchronizer ring -C-.
- The larger openings -4- lock in the tabs -1- on the inner race -A-.



Disassembling and Assembling the Locking Collar and the Synchronizer Hub for 1st, 2nd, 3rd and 4th Gears

- 1 - Spring
 - 2 - Locking piece
 - 3 - Locking collar
 - 4 - Synchronizer hub
- Slide the locking collar over the synchronizer hub.

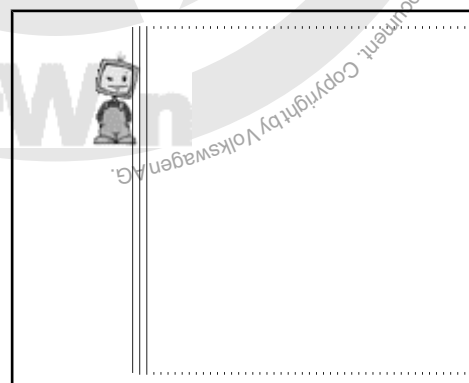
In 3rd and 4th gear, the wide collar on the synchronizer hub and the locking collar face in one direction.

The notches for the locking pieces on the synchronizer hub and locking collar must line up with each other.

Assembling the Locking Collar/Synchronizer Hub for 1st, 2nd, 3rd and 4th Gears

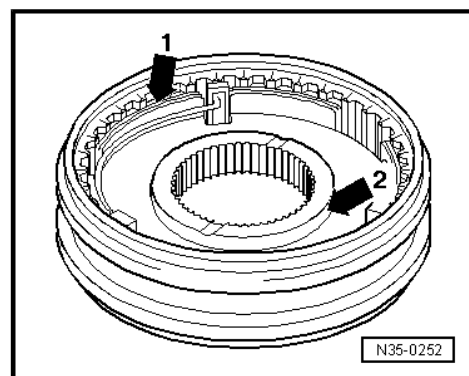
The locking collar is pushed over the synchronizer hub.

- Install the locking pieces and springs offset by 120°. The angled end of the spring must engage into the hollow locking piece.



Installation Position of Locking Collar/Synchronizer Hub for 1st and 2nd Gears

The identification groove -arrow 1- and the narrow collar -arrow 2- on the synchronizer hub face 1st gear.

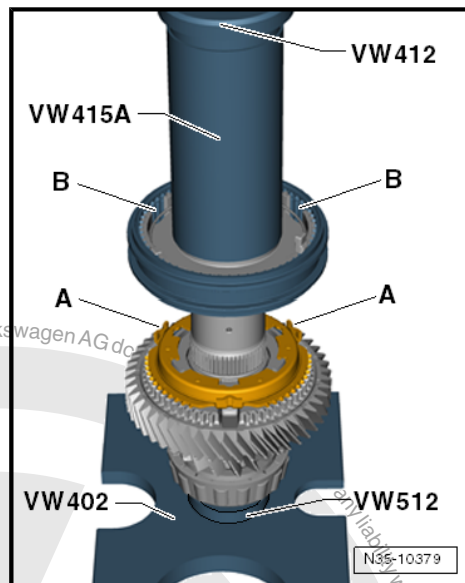




Warming and Installing the Locking Collar/Synchronizer Hub for 1st and 2nd Gears

The pins -A- on the synchronizer ring lock into the recesses -B- in the synchronizer hub.

- Install the locking ring.



Installing the Synchronizer Ring for 1st Gear Outer Race and Inner Race

- Install the synchronizer ring A- into the 1st and 2nd gear synchronizer hub.

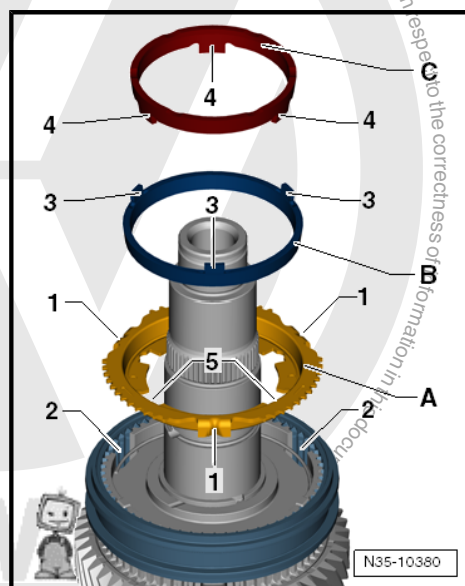
The tabs -1- lock in the openings -2- in the synchronizer hub.

- Install the outer race -B- in the synchronizer ring.

The tabs -3- face away from the synchronizer ring.

- Install the inner race -C- in the outer race.

The tabs -4- lock in the larger openings -5- in the synchronizer ring -A-.

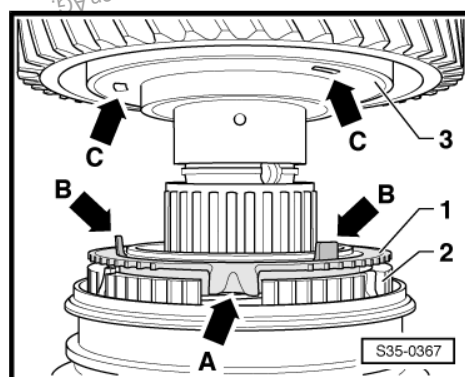


Installing 1st Gear Wheel with Needle Bearing

- The synchronizer ring -1- and the tabs -arrow A- are inside the openings in the synchronizer hub -2-.

The pins -arrows B- in the outer race lock in the recesses -arrows C- in the gear wheel -3-.

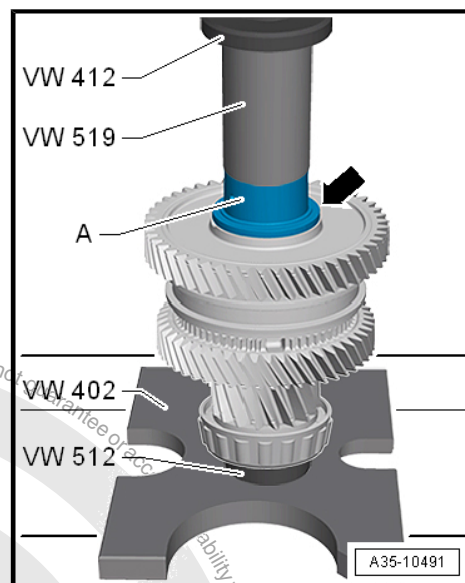
- Install the 1st and 4th gear thrust washers in the output shaft -item 19- ➔ [Item 19 \(page 159\)](#) and -item 20- ➔ [Item 20 \(page 159\)](#) .





On Transmissions with Reinforcement Measures, Install Collar Bushing -A- to Stop.

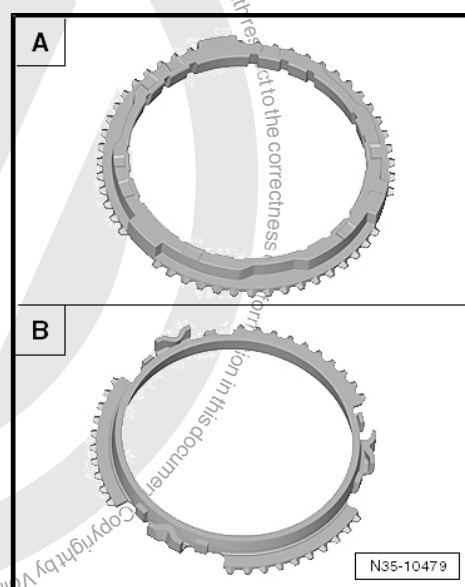
- Installation position of the collar bushing -A-: The collar -arrow- points to the 1st gear wheel.
- Then install the 4th gear wheel with needle bearing.



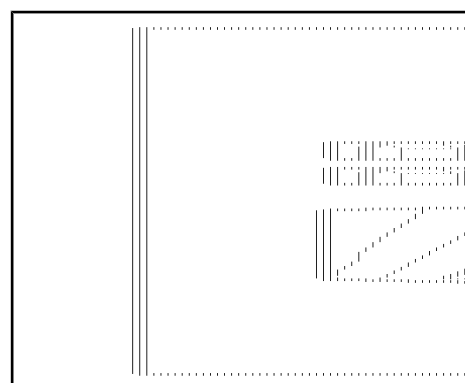
Checking the 4th Gear Synchronizer Ring for Wear

-A- = Brass Synchronizer Ring		
Gap Dimension -a-	Installation Dimension	Wear Limit
4th Gear	1.0 to 1.7 mm	0.5 mm

-B- = Steel Synchronizer Ring		
Gap Dimension -a-	Installation Dimension	Wear Limit
4th Gear	1.3 to 2.4 mm	0.8 mm



- Press synchronizer ring onto taper of the gear wheel and measure gap dimension -a- using a feeler gauge.

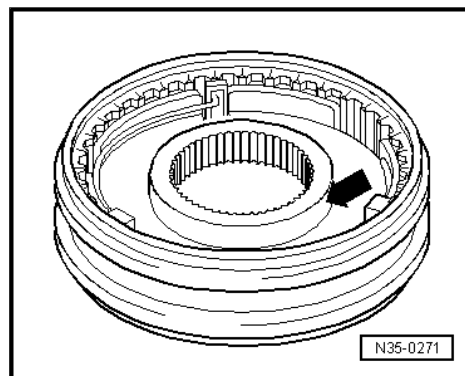




Installed Position: Locking Collar/Synchronizer Hub for 3rd and 4th Gears

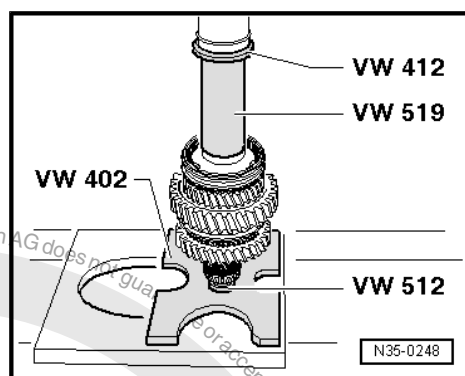
The wider collar on the synchronizer hub -arrow- faces the 3rd gear.

- Place the synchronizer ring for 4th gear on the 4th gear wheel.



Warming and Installing the Synchronizer Hub with Locking Collar for 3rd and 4th Gears

- Turn the 4th gear synchronizer ring so that the grooves line up with the locking pieces.
- Install the locking ring.



Installing the 3rd Gear Synchronizer Ring, Outer Ring and Inner Ring

- Install the synchronizer ring -A- into the 3rd and 4th gear synchronizer hub.

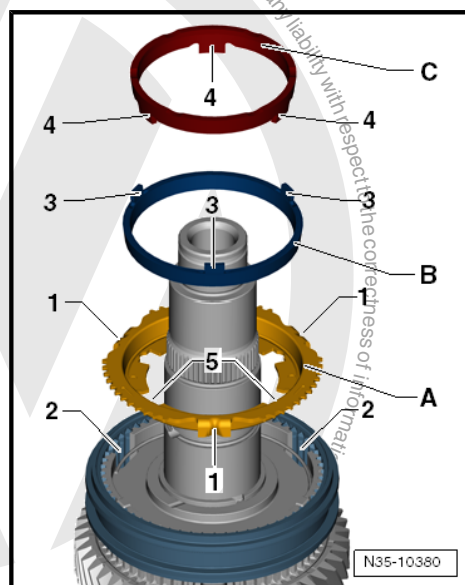
The tabs -1- lock in the openings -2- in the synchronizer hub.

- Install the outer race -B- in the synchronizer ring.

The tabs -3- face away from the synchronizer ring.

- Install the inner race -C- in the outer race.

The tabs -4- lock in the larger openings -5- in the synchronizer ring -A-.





Installing the 3rd Gear Wheel With Needle Bearing

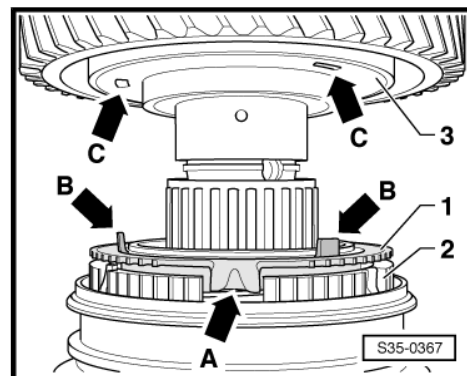
- The synchronizer ring -1- and the tabs -arrow A- are inside the openings in the synchronizer hub -2-.

The pins -arrows B- in the outer race lock in the recesses -arrows C- in the gear wheel -3-.



Note

- ◆ *Installing the bearing inner race/taper roller bearing. Refer to ⇒ Fig. [“Installing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Transmission Housing”](#), page 168 .*
- ◆ *Selecting the locking ring for the bearing inner race/tapered roller bearing. Refer to ⇒ Fig. [“Selecting the Locking Ring”](#), page 168 .*

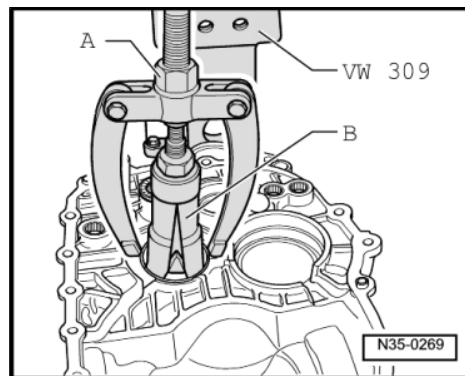




2.2.2 Output Shaft, 5th, 6th and Reverse Gears, Disassembling and Assembling

Special tools and workshop equipment required

- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Multiple Use - VW412-
- ◆ Press Piece - 60mm - VW415A-
- ◆ Holding Plate - VW309A-
- ◆ Transmission Support - VW353-
- ◆ Press Piece - Multiple Use - VW433-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Support Channels - VW457-
- ◆ Crankshaft Holding Fixture - VW801-
- ◆ Press Piece - Multiple Use - VW431-
- ◆ Press Piece - Multiple Use - VW455-
- ◆ Press Piece - Multiple Use - VW510-
- ◆ Press Piece - 42mm - VW516-
- ◆ Press Piece - Multiple Use - VW519-
- ◆ Press Piece - Multiple Use - 30-11-
- ◆ Press Piece - Multiple Use - 40-105-
- ◆ Bearing Installer - Multiple Use - 40-20-
- ◆ Slide Hammer - Press Plate - 2050-
- ◆ Press Piece - Reverse Gear Syncro - 3296-
- ◆ Puller - Taper Roller Bearing - VAG1582-
- ◆ Puller - Taper Roller Bearing - Adapter 4 - VAG1582/4-
- ◆ Puller - Taper Roller Bearing - Adapter 7 - VAG1582/7-
- ◆ Inductive Heater - VAS6414-
- ◆ -1- Puller - Kukko Internal - 46-56mm - 21/7-
- ◆ -3- Puller - Kukko Quick Action Separating Tool - 22-115mm - 17/2-
- ◆ -4- Puller - Kukko Counterstay - 22/2-



Removing the Outer Race/Tapered Roller Bearing from the Clutch Housing

A - Counter Support , for example, Puller - Kukko Counterstay - 22/2-

B - Internal Puller 46 to 58 mm , for example, Puller - Kukko Internal - 46-56mm - 21/7-

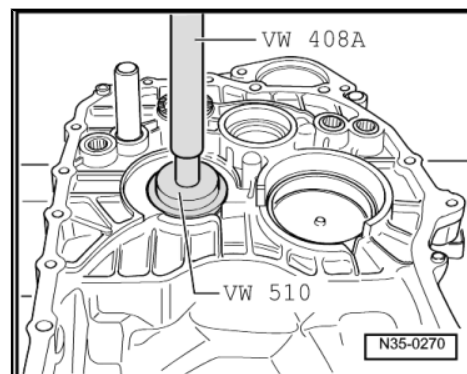


Note

Check the washer for damage after removing it and replace if necessary.

Installing the Outer Race/Tapered Roller Bearing in the Clutch Housing

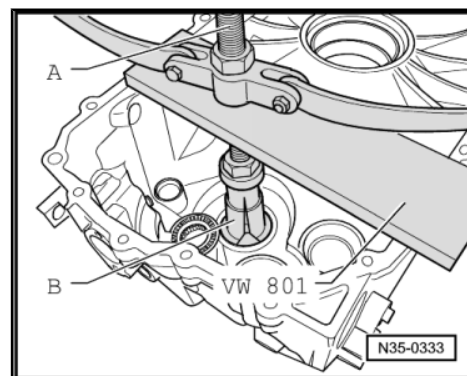
- Place the washer under the outer race.
- Support the clutch housing with the Bearing Installer - Multiple Use - 40-20- directly under the bearing mount.



Removing the Outer Race/Tapered Roller Bearing from the Transmission Housing

A - Counter Support , for example, Puller - Kukko Counterstay - 22/2-

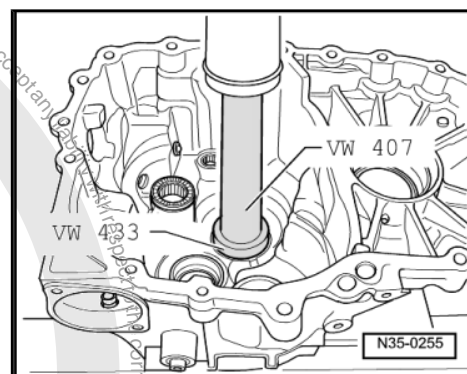
B - Internal Puller 46 to 58 mm , for example, Puller - Kukko Internal - 46-56mm - 21/7-



Installing the Outer Race/Tapered Roller Bearing Into the Transmission Housing.

- Support the transmission housing under the bearing mount using the Slide Hammer - Press Plate - 2050- .

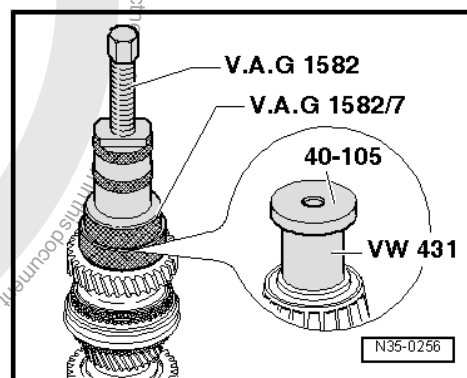
Disassembling the Output Shaft



Remove the Bearing Inner Race/Tapered Roller Bearing on the Side of the Transmission Housing

Note the following before installing the Tapered Roller Bearing Puller

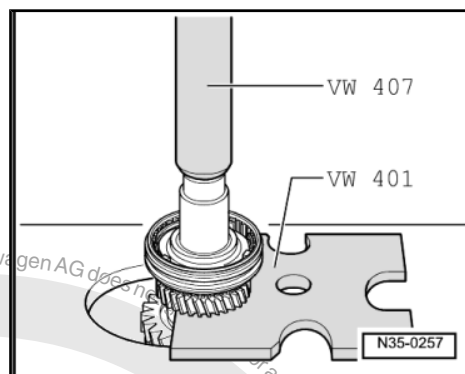
- Remove the bearing inner race/tapered roller bearing locking ring on the side facing the transmission housing.
- Place the Press Piece - Multiple Use - VW431- and Press Piece - Multiple Use - 40-105- on the output shaft.





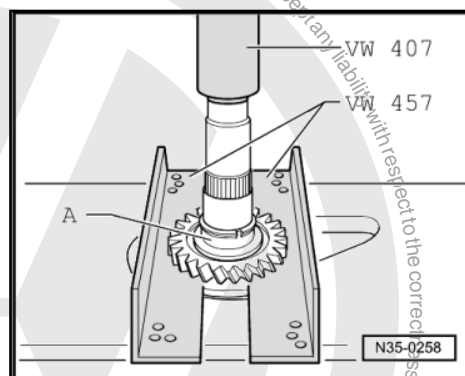
Removing the 5th and 6th Gear Synchronizer Hub/Locking Collar with the 6th Gear Wheel

- Remove the locking ring beforehand.



Removing the Sleeve -A- Together with the Reverse Gear Wheel

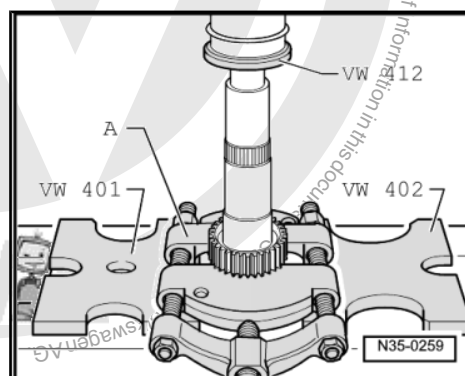
- Remove the locking ring beforehand.



Removing the Reverse Gear Synchronizer Hub

- Remove the locking ring beforehand.

A - Separating Tool - 22-115mm - for example Puller - Kukko
Quick Action Separating Tool - 22-115mm - 17/2-



Removing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Clutch Housing.

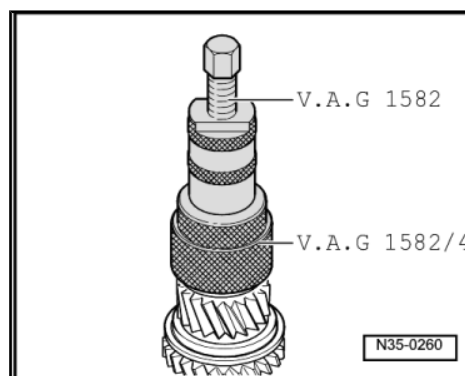
- Mount the Press Piece - Multiple Use - 30-11- on the output shaft before removing the puller.

Assemble the Output Shaft.



Note

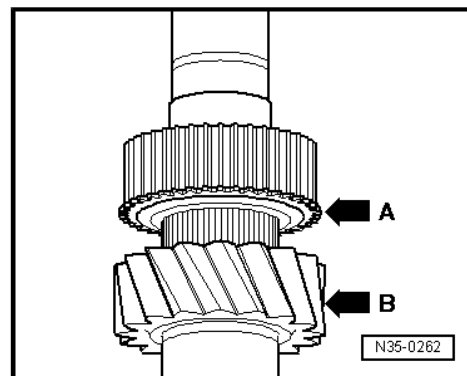
Heat the tapered roller bearing inner races and synchronizer hub to approximately 100 °C (212 °F) with the Inductive Heat Unit - VAS6414- before installing. Press on to the stop so that there is no axial clearance.





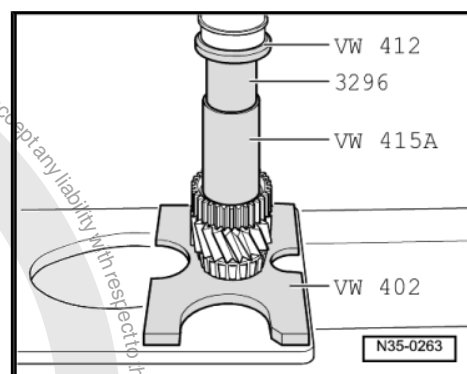
Installed Position: Reverse Gear Synchronizer Hub

The stop -arrow A- on the reverse gear locking collar faces the splines on the output shaft -arrow B-.



Warming and Installing the Reverse Gear Synchronizer Hub

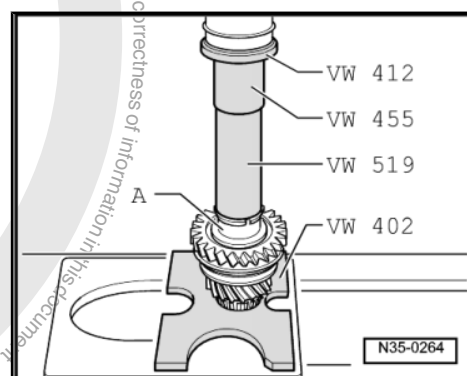
- Install the locking ring.
- Mount the reverse gear locking collar on the reverse gear synchronizer hub.
- Install the reverse gear wheel and the needle bearing.



Installing the Sleeve -A-

Installed position: wide collar points toward reverse gear selector gear.

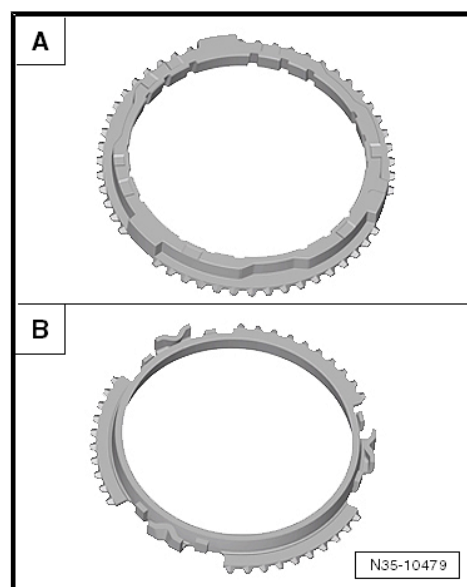
- Install the locking ring.



Check the 5th and 6th Gear Synchronizer Ring for Wear

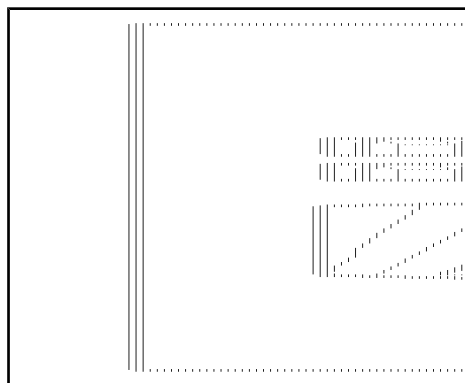
-A- = Brass Synchronizer Ring		
Gap Dimension -a-	Installation Dimension	Wear Limit
5th and 6th gear	1.0 to 1.7 mm	0.5 mm

-B- = Steel Synchronizer Ring		
Gap Dimension -a-	Installation Dimension	Wear Limit
5th and 6th gear	1.2 to 2.1 mm	0.8 mm





- Press synchronizer ring onto taper of the gear wheel and measure gap dimension -a- using a feeler gauge.

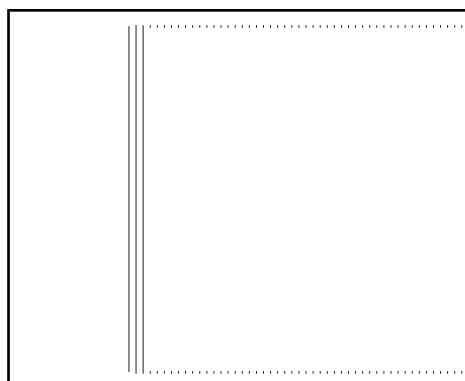


Disassembling and Assembling Locking Collar and Synchronizer Hub for 5th and 6th Gears

- 1 - Spring
- 2 - Locking piece
- 3 - Locking collar
- 4 - Synchronizer hub

- Slide the locking collar over the synchronizer hub.

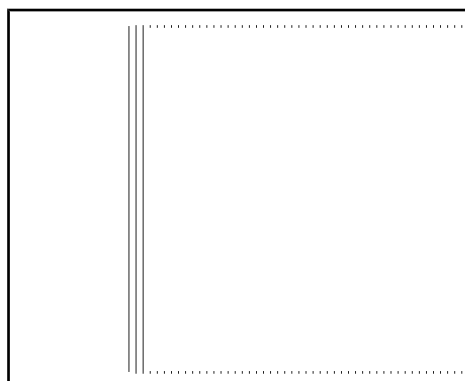
The notches for the locking pieces on the synchronizer hub and locking collar must line up with each other.



Assembling Locking Collar/Synchronizer Hub for 5th and 6th Gears

The locking collar is pushed over the synchronizer hub.

- Install the locking pieces and springs offset by 120°. The angled end of the spring must engage into the hollow locking piece.
- Install the 6th gear wheel with needle bearing.
- Install the 6th gear synchronizer ring.

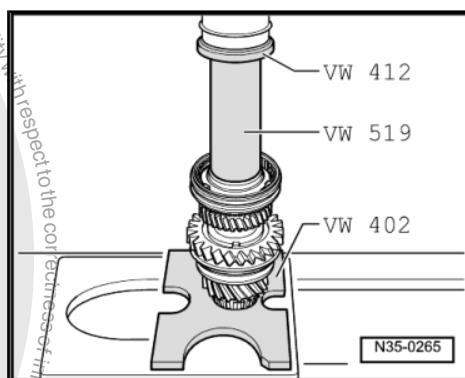


Installing the Locking Collar/Synchronizer Hub for 5th and 6th Gears

On some locking collars, there is a chamfer on the outer diameter.

Installed position: the chamfer on the outer diameter of the locking collar faces toward the 5th gear selector gear

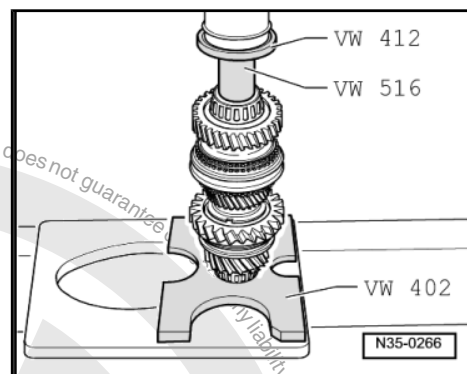
- Turn the synchronizer ring so that the grooves line up with the locking pieces.
- Install the locking ring.
- Install the 5th gear synchronizer ring.
- Install 5th gear wheel with needle bearing.





Installing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Transmission Housing

- Choose the correct locking ring. Refer to
⇒ Fig. “Selecting the Locking Ring”, page 181 and install.

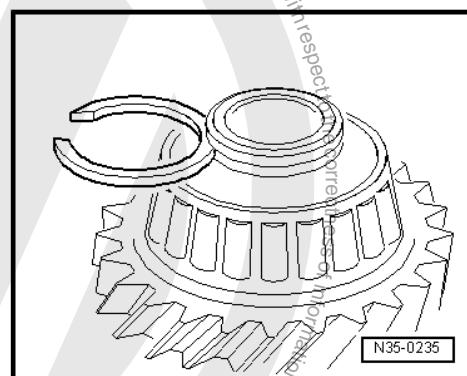


Selecting the Locking Ring

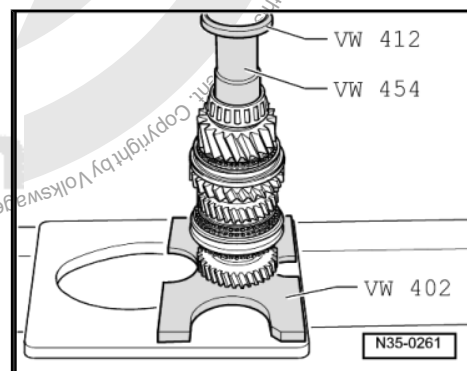
- Choose and install the thickest locking ring that will fit.
- Select the locking ring according to the Table. For the correct part number, refer to the Parts Catalog.

Available Locking Rings:

Thickness (mm)		
1.79	1.89	1.98
1.83	1.92	
1.86	1.95	



Installing the Bearing Inner Race/Tapered Roller Bearing on the Side of the Clutch Housing



2.3 Output Shaft, Adjusting

⇒ “2.3.1 Output Shaft 1st through 4th Gear, Adjusting”,
page 181

⇒ “2.3.2 Output Shaft, 5th, 6th and Reverse Gears, Adjusting”,
page 184

2.3.1 Output Shaft 1st through 4th Gear, Adjusting

Special tools and workshop equipment required

- ◆ Transmission Support - VW353-
- ◆ Dial Gauge Holder - VW387-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Multiple Use - VW433-
- ◆ Seal Installer - Stator - VW792-
- ◆ Crankshaft Holding Fixture - VW801-
- ◆ Holding Plate - VW309A-



- ◆ Slide Hammer - Press Plate - 2050-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ -1- Puller - Kukko Internal - 46-56mm - 21/7-
- ◆ -4- Puller - Kukko Counterstay - 22/2-
- ◆ Dial Indicator - VAS6080A-

(Selecting the correct adjusting shim for the output shaft)

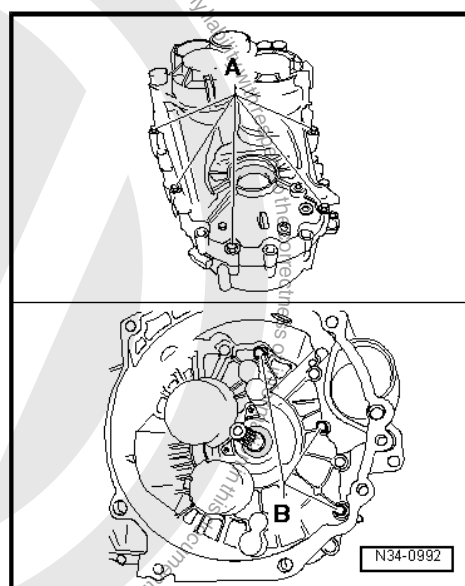
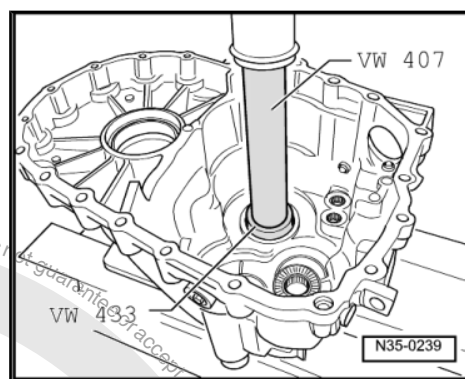
It is necessary to adjust the output shaft if the following components were replaced:

- ◆ Transmission Housing
- ◆ Clutch Housing
- ◆ Output shaft for 1st to 4th gears or
- ◆ Output shaft tapered roller bearing

Adjustment overview. Refer to
⇒ ["3 Adjustment Overview", page 215](#) .

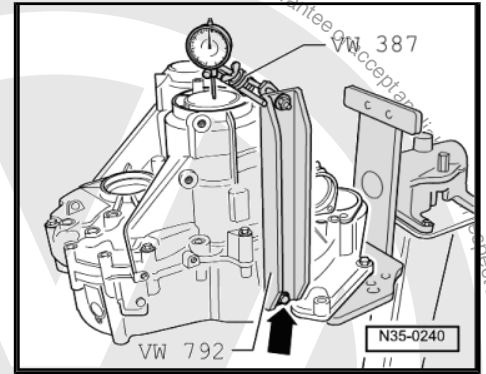
Requirements:

- Remove any sealant remaining on the sealing surfaces on the clutch and transmission housings.
- Install the output shaft that is going to be measured.
- Install the tapered roller bearing outer race in the transmission housing with a 1.70 mm shim. Support transmission housing directly beneath bearing mount using Slide Hammer - Press Plate - 2050 - .
- Install the output shaft for 1st through 4th gears into the clutch housing.
- Install the transmission housing and tighten the bolts -A- and -B- diagonally.





- Position the measuring tools on the clutch housing and secure them with a bolt -arrow-.
- Set the dial gauge (3 mm range) with 1 mm preload to “0”.
- Loosen securing bolts for clutch housing/transmission housing in diagonal sequence until bolts clear transmission housing and output shaft.
- Read measured value on dial indicator and note (example: 0.14 mm).



i Note

- ◆ *The measured value will not be displayed when loosening the bolts that connect the clutch housing to the transmission housing.*
- ◆ *Install a 1.95 mm shim or, if necessary, a 2.20 mm shim in place of the 1.70 mm shim for measuring.*
- ◆ *For the correct adjusting shim, refer to the Parts Catalog.*

Determining the Shim

The required bearing tension is reached as follows:

The specified bearing pre-load is reached when determined measured value (0.14 mm) is subtracted from inserted adjustment shim (1.70 mm).

A constant figure of (0.20 mm) is added to the reading.

Example:

Inserted shim	1.70 mm
- measured value	0.14 mm
+ Preload (constant value)	0.20 mm
Shim thickness	1.76 mm

- Select the correct shim thickness according to the Table. Refer to ["2.3.1 Output Shaft 1st through 4th Gear, Adjusting", page 181](#).



- Remove the transmission housing and remove the tapered roller bearing outer race from the transmission housing.

A - Counter Support , for example, Puller - Kukko Counterstay - 22/2-

B - Internal Puller 46 to 58 mm , for example, Puller - Kukko Internal - 46-56mm - 21/7-

- Remove the inserted shim (1.70 mm) from the transmission housing.

Shim Table

	Thickness (mm)	
1.45	1.75	2.05
1.50	1.80	2.10
1.55	1.85	2.15
1.60	1.90	2.20
1.65	1.95	2.25
1.70	2.00	

Tolerance variations make it possible to find the exact shim thickness required.

- For the correct part number, refer to the Parts Catalog.
- Install the outer race/tapered roller bearing with the selected shim (in the example: 1.75 mm) Support transmission housing directly beneath bearing mount using Slide Hammer - Press Plate - 2050- .

Checking Measurement

- The selected adjusting shim is installed.

- Position the measuring tools on the clutch housing and secure them with a bolt -arrow-.
- Set the dial gauge (3 mm range) with 1 mm preload to "0".
- Loosen securing bolts for clutch housing/transmission housing in diagonal sequence until bolts clear transmission housing and output shaft.
- For correctly selected shim, the dial gauge must now display a value of 0.15 mm to 0.25 mm.

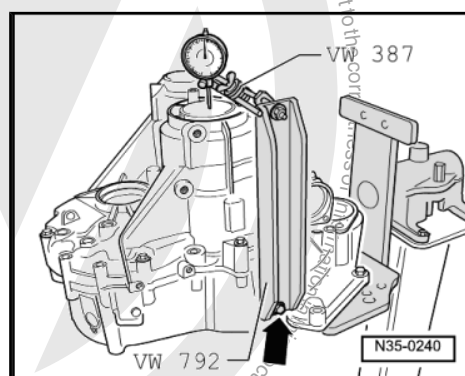
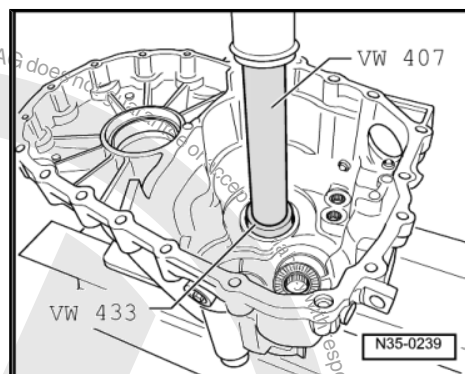
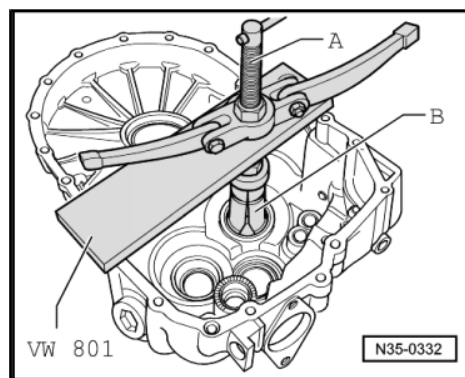
Tightening Specifications

- ♦ Transmission housing to clutch housing. Refer to ["8.3 Overview - Transmission Housing and Selector Mechanism", page 108](#) .

2.3.2 Output Shaft, 5th, 6th and Reverse Gears, Adjusting

Special tools and workshop equipment required

- ♦ Transmission Support - VW353-
- ♦ Dial Gauge Holder - VW387-





- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Multiple Use - VW433-
- ◆ Seal Installer - Stator - VW792-
- ◆ Crankshaft Holding Fixture - VW801-
- ◆ Holding Plate - VW309A-
- ◆ Slide Hammer - Press Plate - 2050-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ -1- Puller - Kukko Internal - 46-56mm - 21/7-
- ◆ -4- Puller - Kukko Counterstay - 22/2-
- ◆ Dial Indicator - VAS6080A-

It is necessary to adjust the output shaft if the following components were replaced:

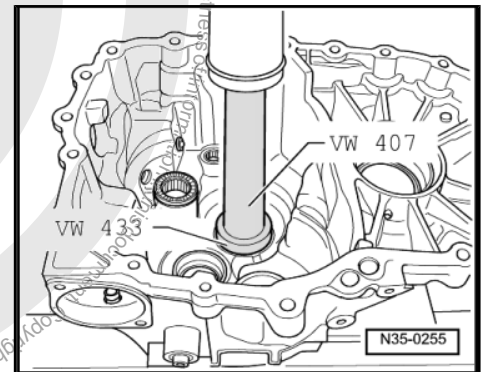
- ◆ Transmission Housing
- ◆ Clutch Housing
- ◆ Output Shaft, 5th, 6th and Reverse Gears or
- ◆ Output shaft tapered roller bearing

Adjustment Overview. Refer to

⇒ ["3 Adjustment Overview", page 215](#) .

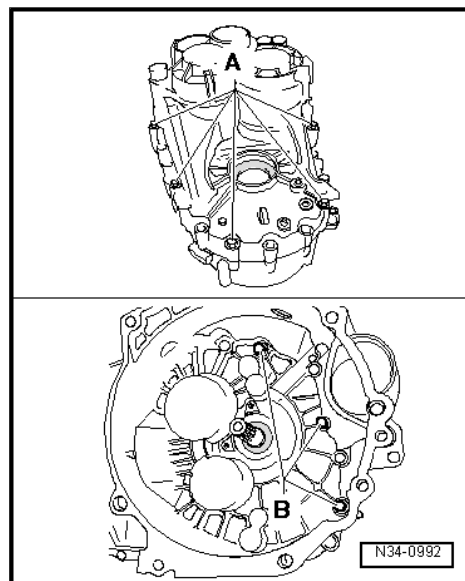
Requirements:

- Remove any sealant remaining on the sealing surfaces on the clutch and transmission housings.
- Install the output shaft that is going to be measured.
- Install the tapered roller bearing outer race in the transmission housing with a 1.70 mm shim. Support transmission housing directly beneath bearing mount using Slide Hammer - Press Plate - 2050- .
- Install the output shaft for 5th/6th gears and reverse gear into the clutch housing.

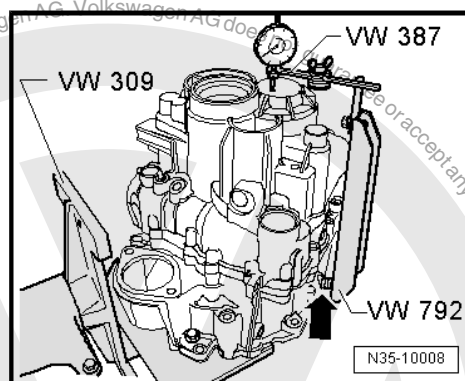




- Install the transmission housing and tighten the bolts -A- and -B- diagonally.



- Attach the measuring tools to the clutch housing.
- In the case of protruding housing edges:
- Place washers (total thickness: 8 mm) under the Seal Installer - Stator - VW792- -arrow-.
 - Set the dial gauge (3 mm range) with 1 mm preload to "0".
 - Loosen securing bolts for clutch housing/transmission housing in diagonal sequence until bolts clear transmission housing and output shaft.
 - Read measured value on dial indicator and note (example: 0.25 mm).



Note

- ♦ The measured value will not be displayed when loosening the bolts that connect the clutch housing to the transmission housing.
- ♦ Install a 1.95 mm shim or, if necessary, a 2.20 mm shim in place of the 1.70 mm shim for measuring.
- ♦ For the correct adjusting shim, refer to the Parts Catalog.

Determining the Shim

The required bearing tension is reached as follows:

The specified bearing pre-load is reached when determined measured value (0.25 mm) is subtracted from inserted shim (1.70 mm).

A constant figure of (0.20 mm) is added to the reading.

Example:

Inserted shim	1.70 mm
- measured value	0.25 mm
+ Preload (constant value)	0.20 mm
Shim thickness	1.65 mm

- Select the correct shim thickness according to the table.



- Remove the transmission housing and remove the tapered roller bearing outer race from the transmission housing.

A - Counter Support , for example, Puller - Kukko Counterstay - 22/2-

B - Internal Puller 46 to 58 mm , for example, Puller - Kukko Internal - 46-56mm - 21/7-

- Remove the inserted shim (1.70 mm) from the transmission housing.

Shim Table

Thickness (mm)		
1.50	1.80	2.10
1.55	1.85	2.15
1.60	1.90	2.20
1.65	1.95	2.25
1.70	2.00	
1.75	2.05	

- For the correct part numbers, refer to the Parts Catalog.

Tolerance variations make it possible to find the exact shim thickness required.

- Install the outer race/tapered roller bearing with the selected shim (in the example: 1.65 mm) Support transmission housing directly beneath bearing mount using Slide Hammer - Press Plate - 2050- .

Checking Measurement

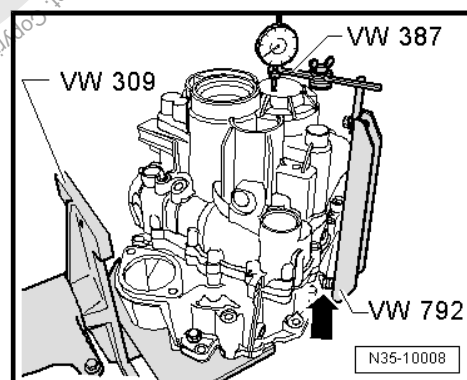
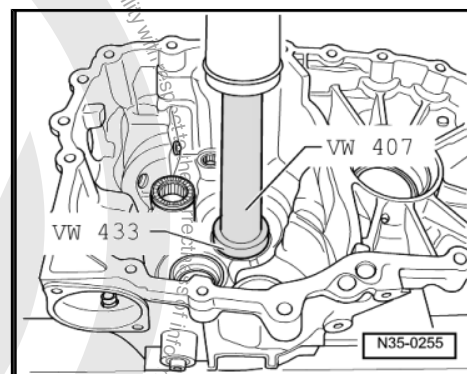
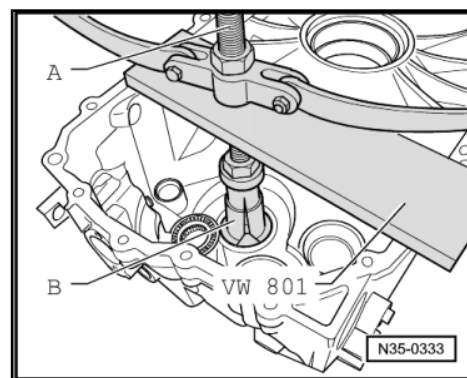
- The selected adjusting shim is installed.
- Attach the measuring tools to the clutch housing.

In the case of protruding housing edges:

- Place washers (total thickness: 8 mm) under the Seal Installer - Stator - VW792- -arrow-.
- Set the dial gauge (3 mm range) with 1 mm preload to "0".
- Loosen securing bolts for clutch housing/transmission housing in diagonal sequence until bolts clear transmission housing and output shaft.
- For correctly selected shim, the dial gauge must now display a value of 0.15 mm to 0.25 mm.

Tightening Specifications

- ◆ Transmission housing to clutch housing. Refer to ["8.3 Overview - Transmission Housing and Selector Mechanism", page 108](#) .

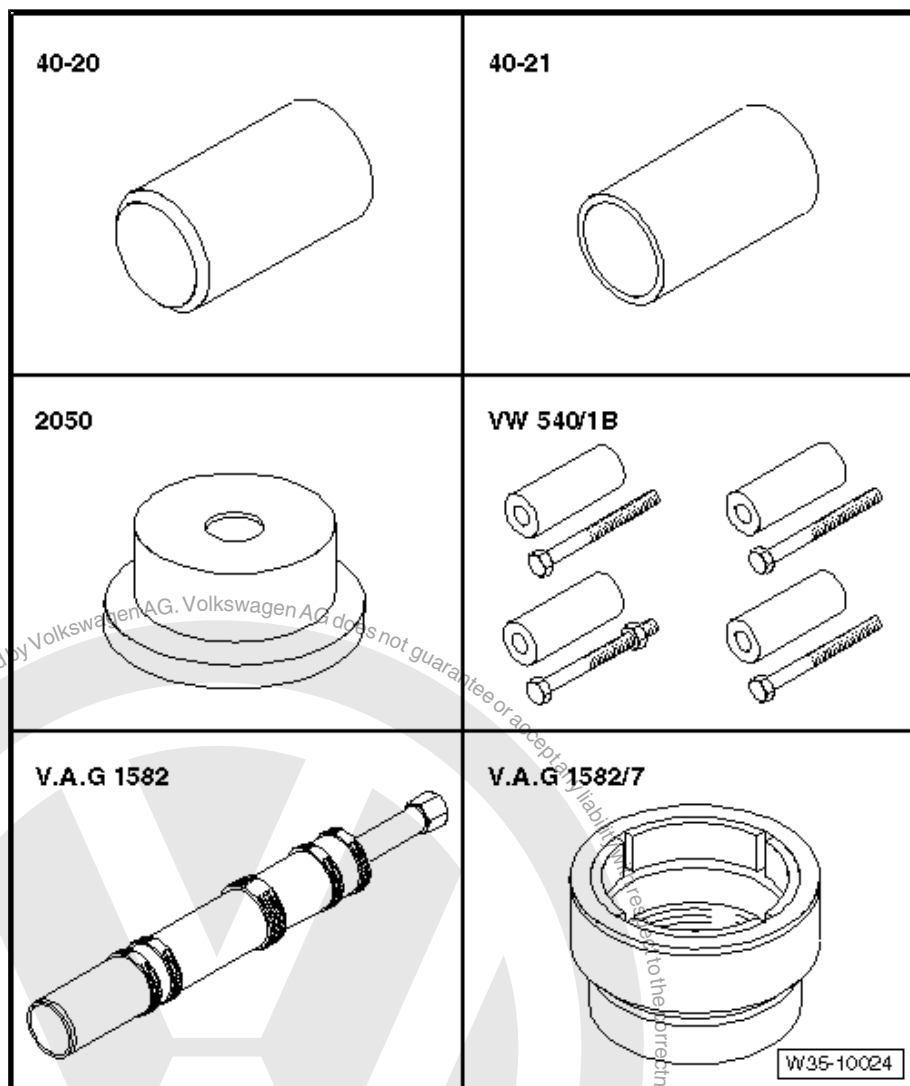




3 Special Tools

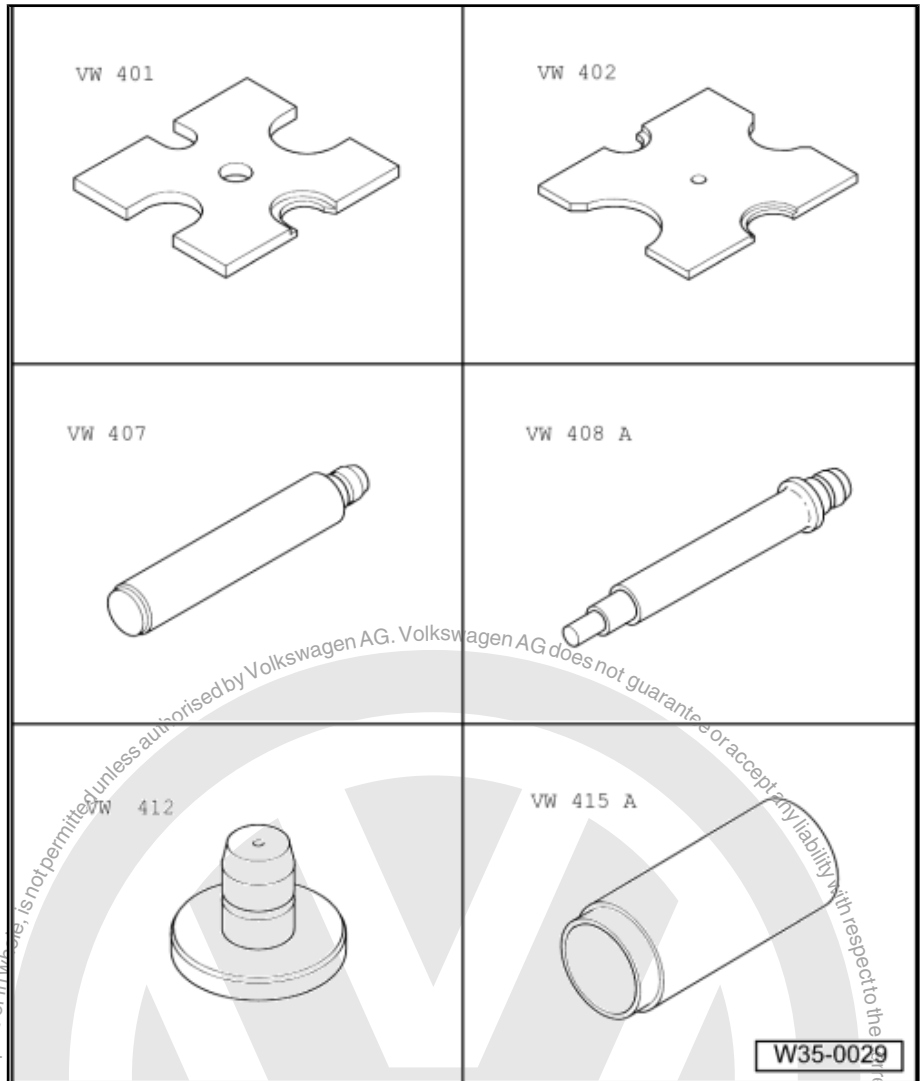
Special tools and workshop equipment required

- ◆ Bearing Installer - Multiple Use - 40-20-
- ◆ Bearing Installer - Differential Bearing - 40-21-
- ◆ Slide Hammer - Press Plate - 2050-
- ◆ Holding Fixture - Spacers - VW540/1B-
- ◆ Puller - Taper Roller Bearing - VAG1582-
- ◆ Puller - Taper Roller Bearing - Adapter 7 - VAG1582/7-



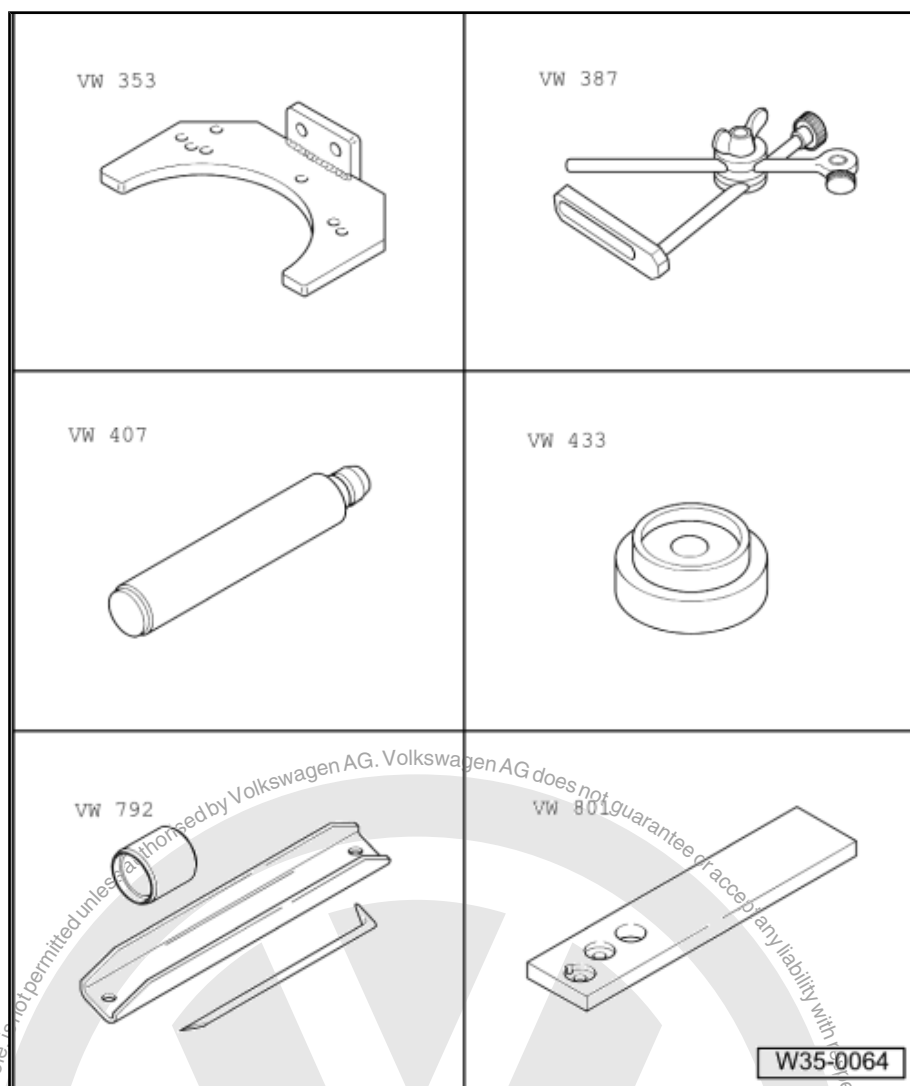


- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Multiple Use - VW412-
- ◆ Press Piece - 60mm - VW415A-



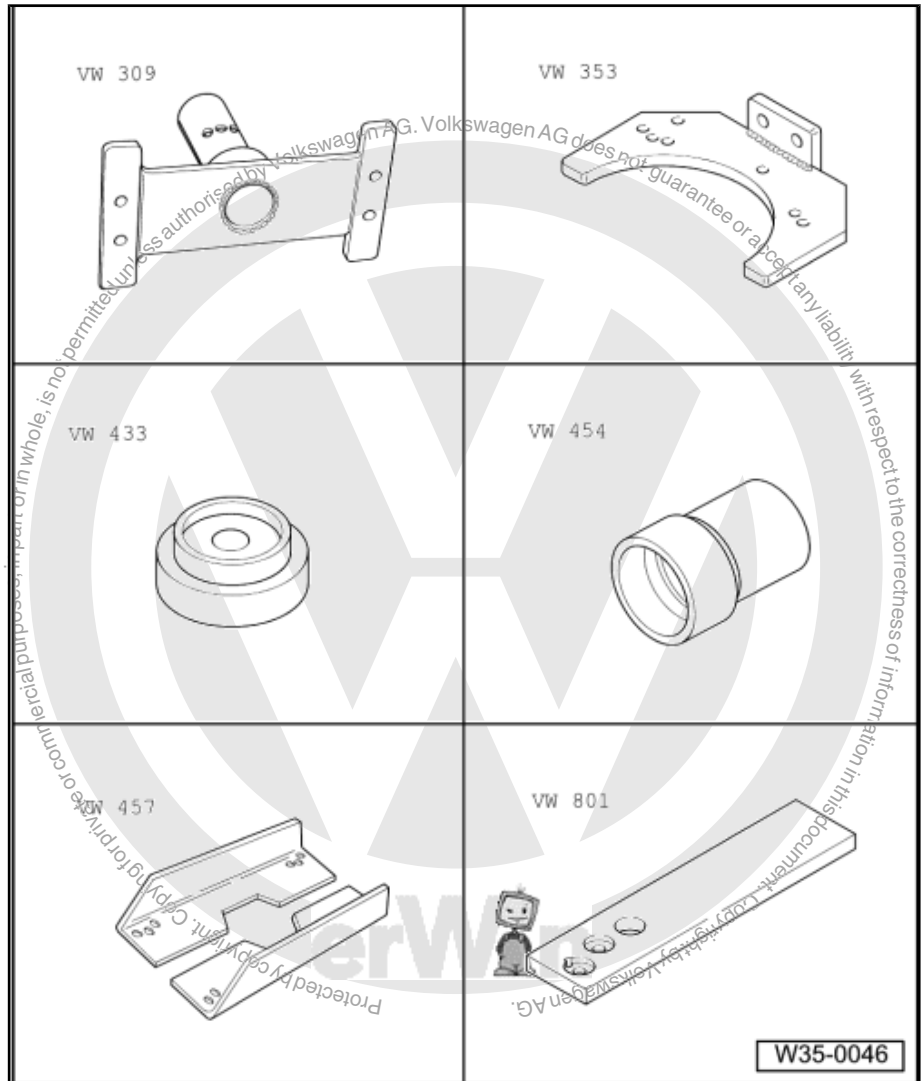


- ◆ Transmission Support - VW353-
- ◆ Dial Gauge Holder - VW387-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Multiple Use - VW433-
- ◆ Seal Installer - Stator - VW792-
- ◆ Crankshaft Holding Fixture - VW801-



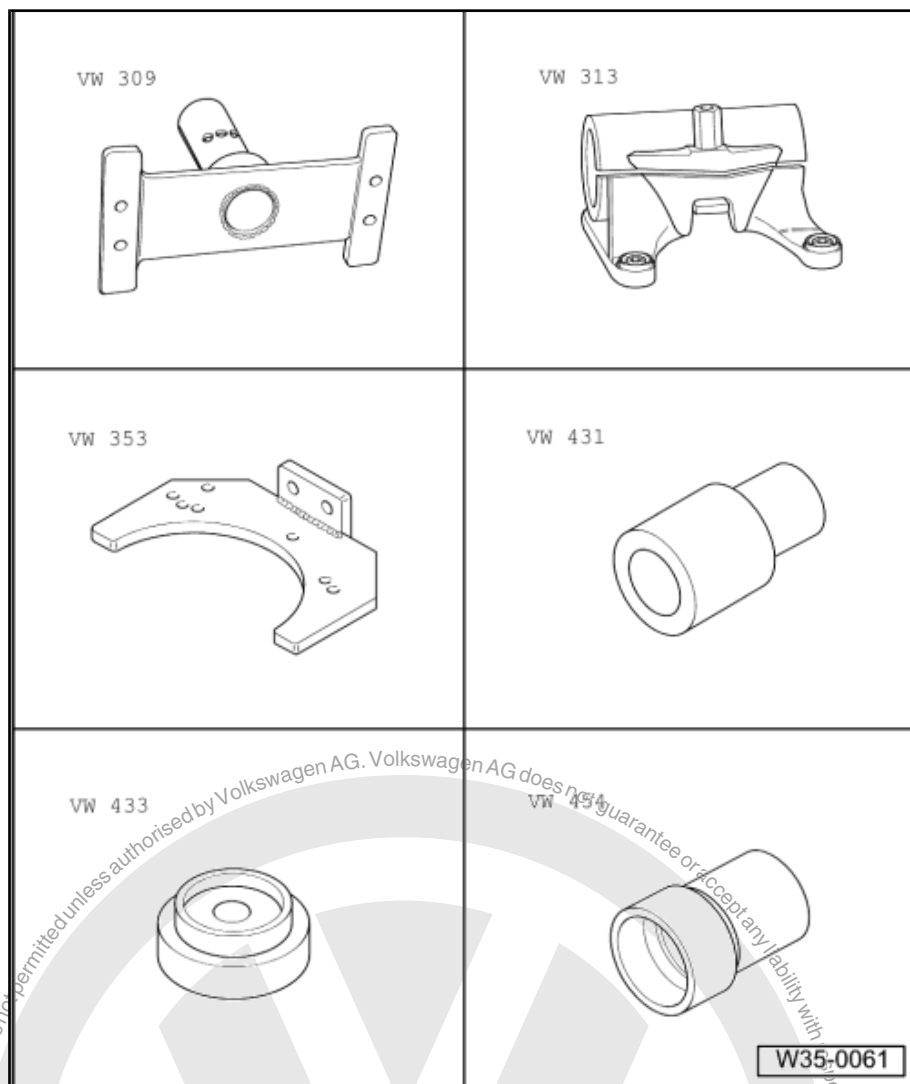


- ◆ Holding Plate - VW309A-
- ◆ Transmission Support - VW353-
- ◆ Press Piece - Multiple Use - VW433-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Support Channels - VW457-
- ◆ Crankshaft Holding Fixture - VW801-



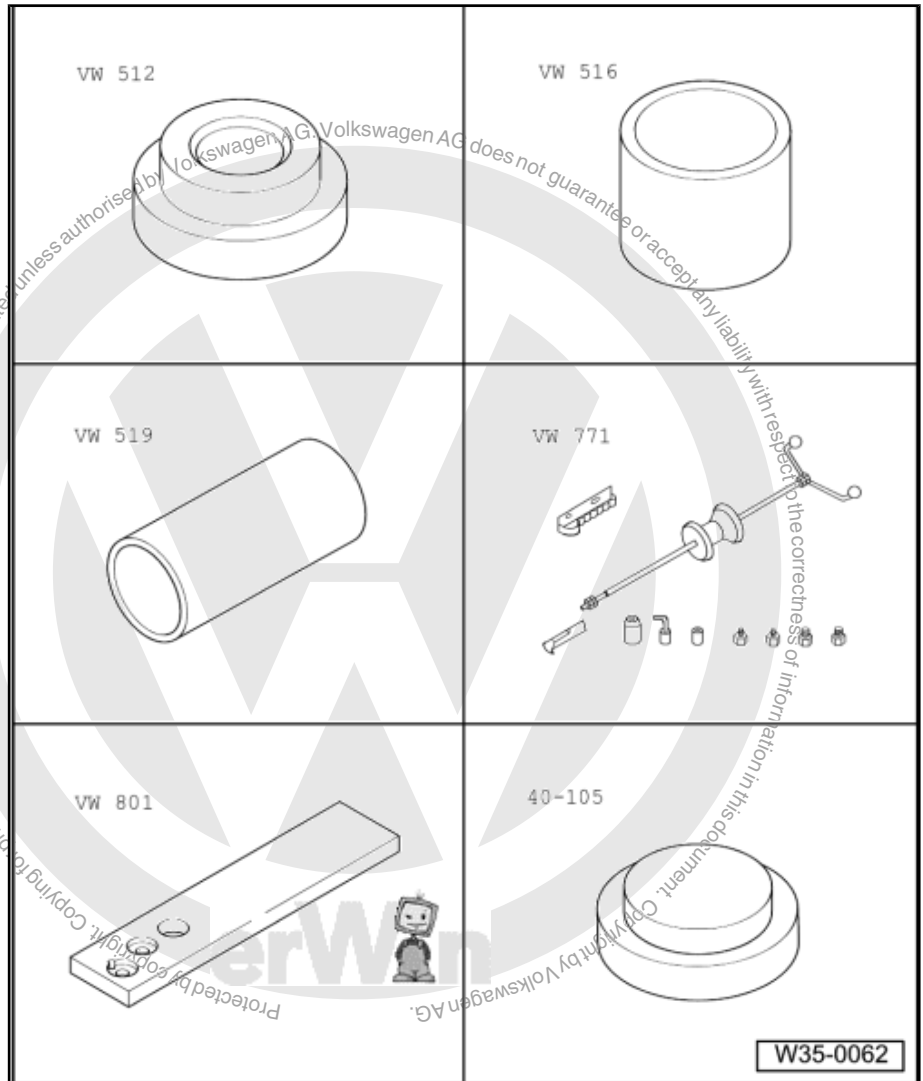


- ◆ Holding Plate - VW309A-
- ◆ Holding Fixture - VW313-
- ◆ Transmission Support - VW353-
- ◆ Press Piece - Multiple Use - VW431-
- ◆ Press Piece - Multiple Use - VW433-
- ◆ Press Piece - Multiple Use - VW454-





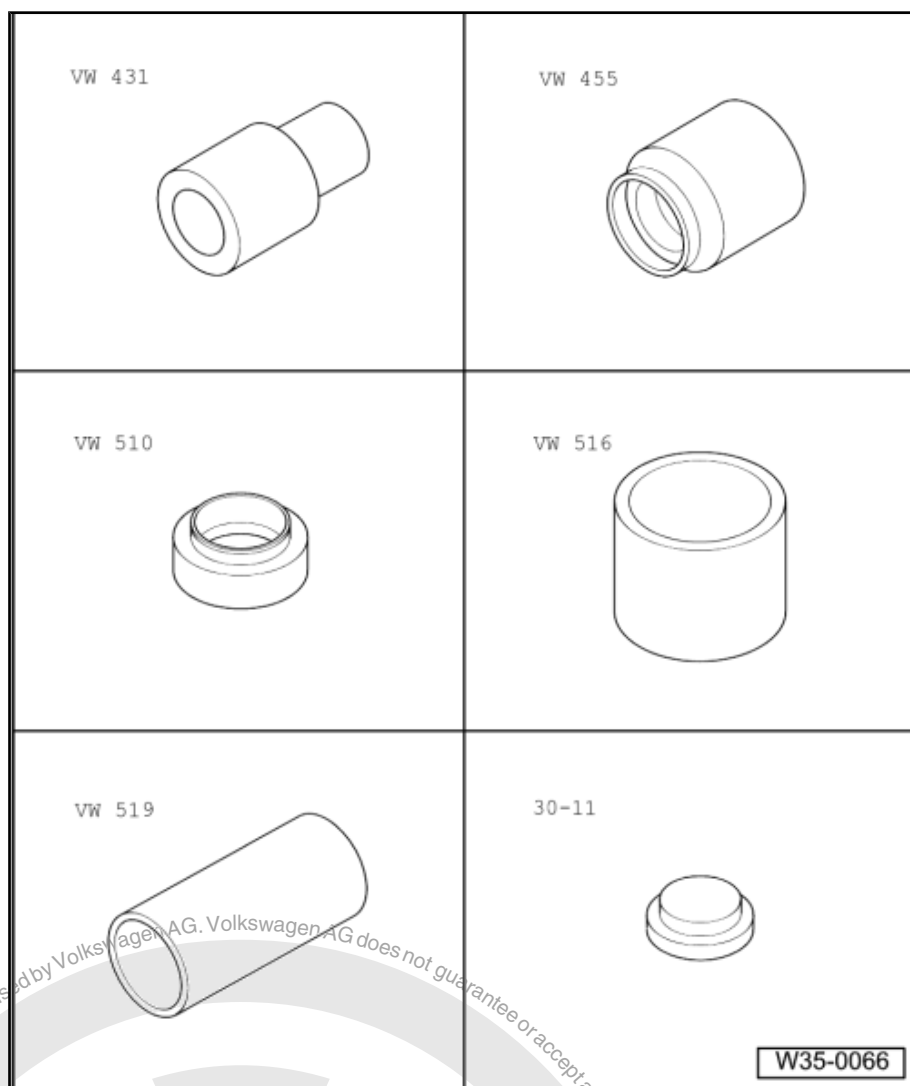
- ◆ Press Piece - Multiple Use
- VW512-
- ◆ Press Piece - 42mm -
VW516-
- ◆ Press Piece - Multiple Use
- VW519-
- ◆ Slide Hammer Set -
VW771-
- ◆ Crankshaft Holding Fixture
- VW801-
- ◆ Press Piece - Multiple Use
- 40-105-



W35-0062

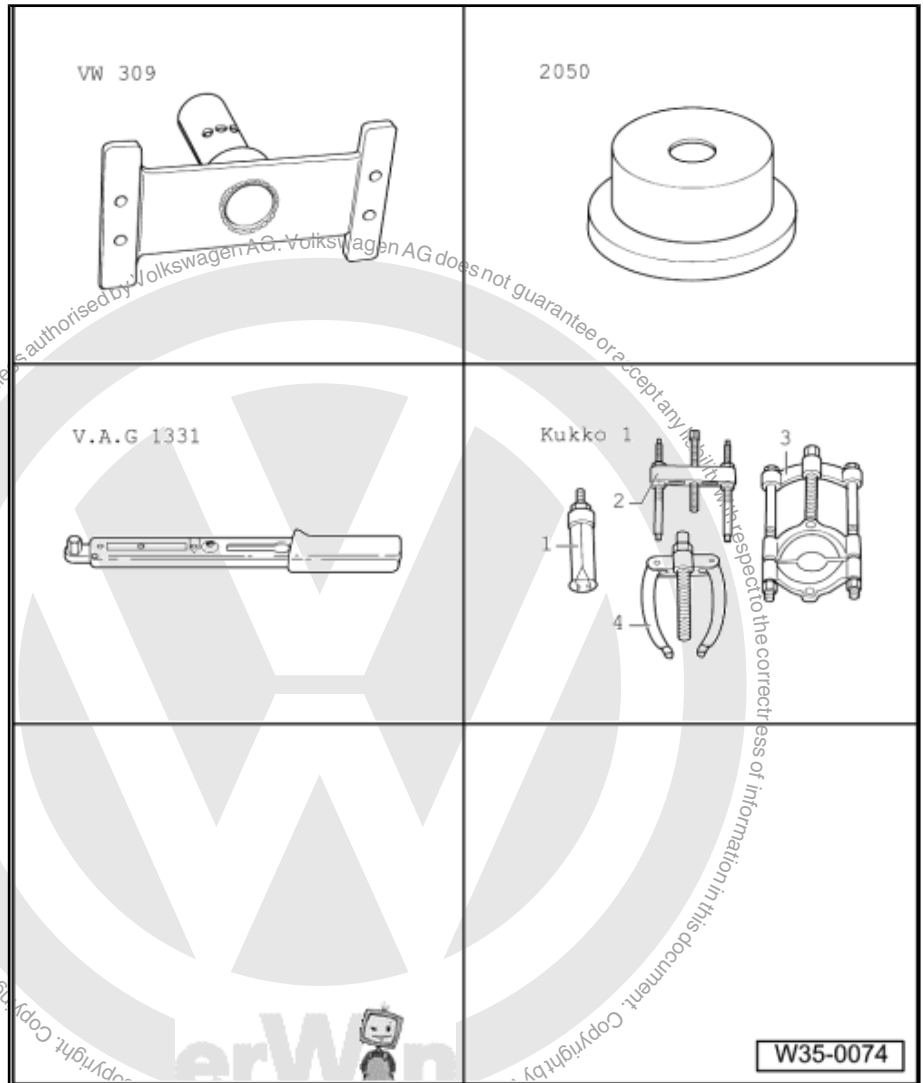


- ◆ Press Piece - Multiple Use
- VW431-
- ◆ Press Piece - Multiple Use
- VW455-
- ◆ Press Piece - Multiple Use
- VW510-
- ◆ Press Piece - 42mm -
VW516-
- ◆ Press Piece - Multiple Use
- VW519-
- ◆ Press Piece - Multiple Use
- 30-11-



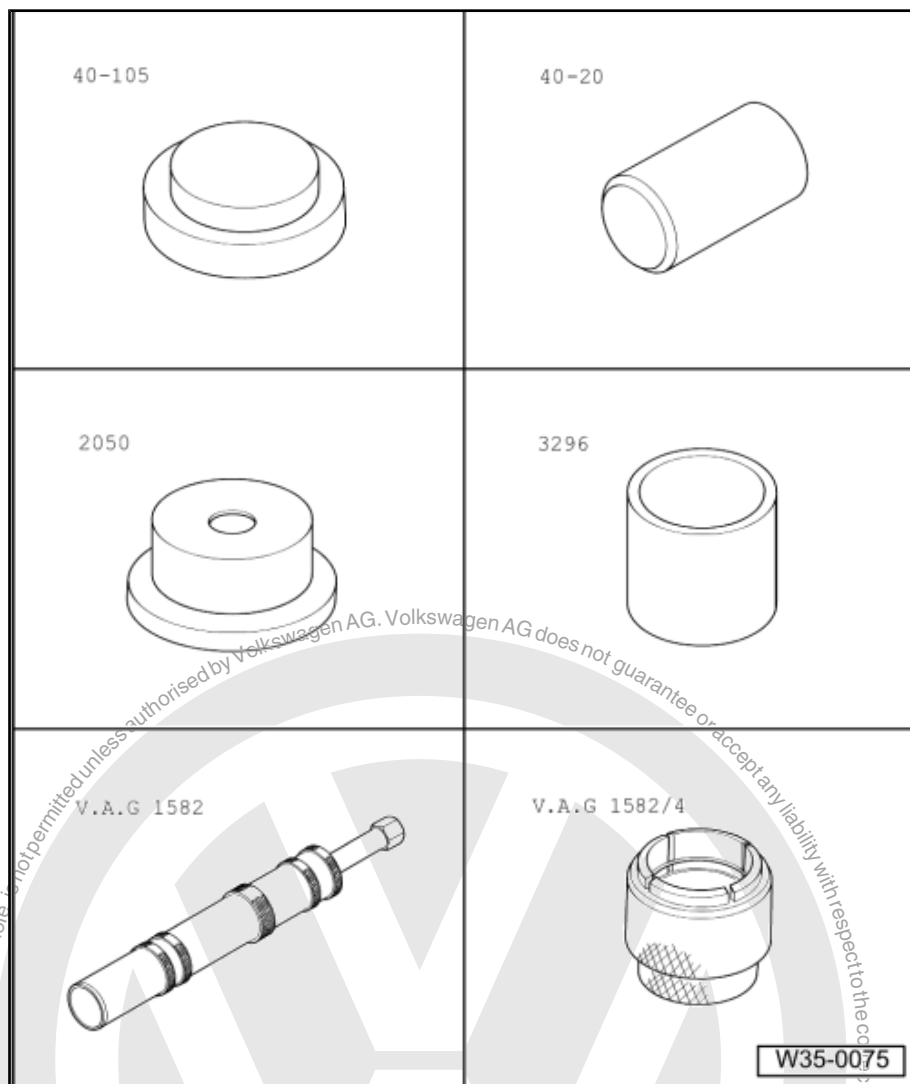


- ◆ Holding Plate - VW309A-
- ◆ Slide Hammer - Press Plate - 2050-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ -1- Puller - Kukko Internal - 46-56mm - 21/7-
- ◆ -4- Puller - Kukko Counter-stay - 2/2-



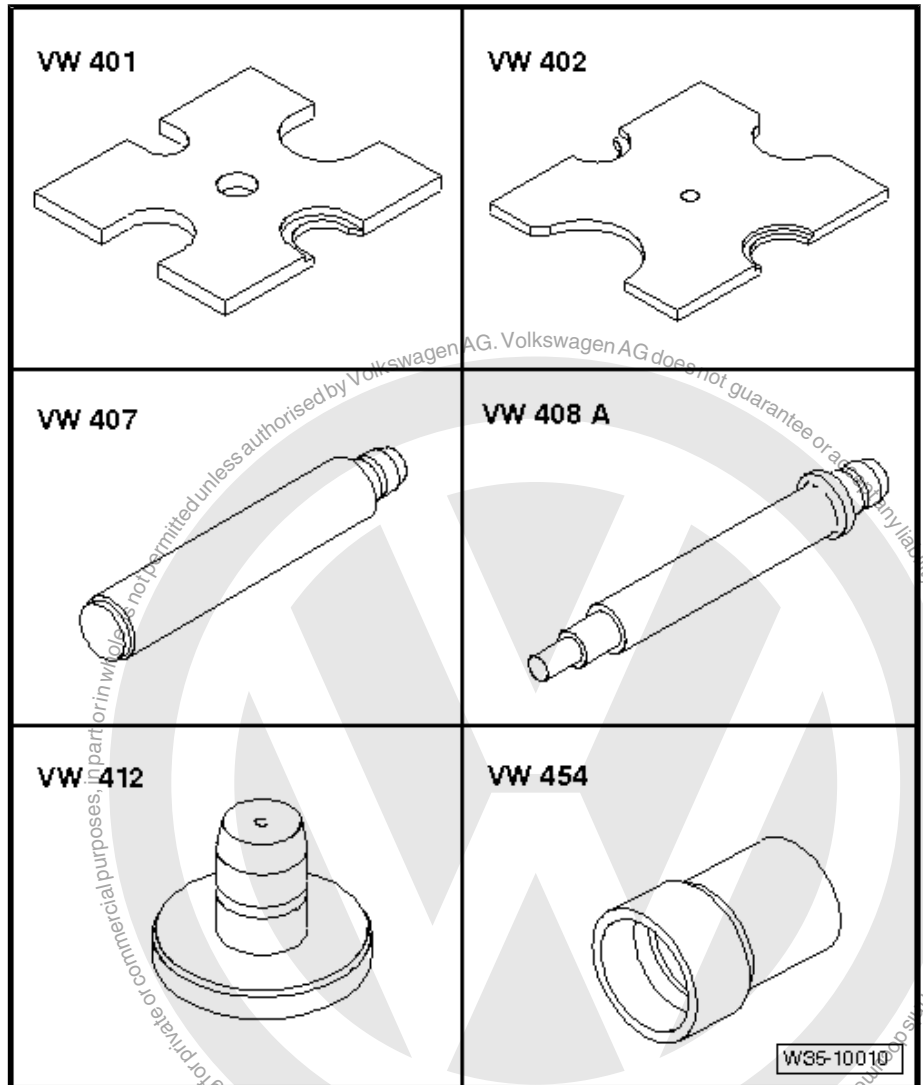


- ◆ Press Piece - Multiple Use - 40-105-
- ◆ Bearing Installer - Multiple Use - 40-20-
- ◆ Slide Hammer - Press Plate - 2050-
- ◆ Press Piece - Reverse Gear Syncro - 3296-
- ◆ Puller - Taper Roller Bearing - VAG1582-
- ◆ Puller - Taper Roller Bearing - Adapter 4 - VAG1582/4-

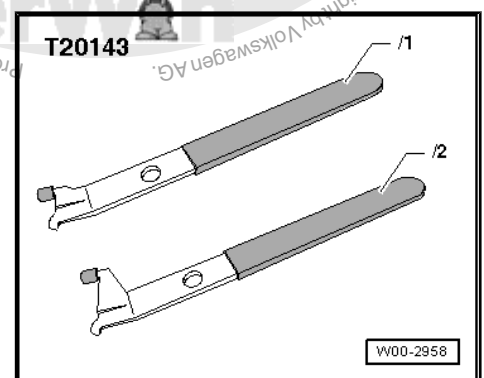




- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Rod - VW412-
- ◆ Press Piece - Multiple Use - VW454-

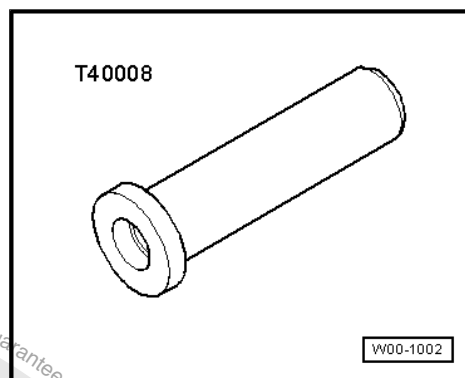


- ◆ Puller - Crankshaft/Power Steering Seal - T20143/1-

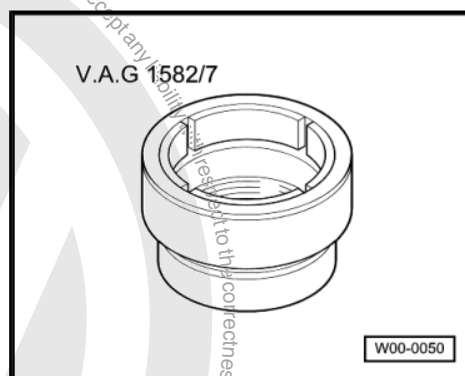




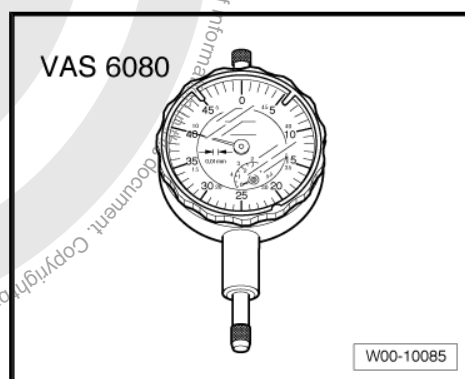
◆ Seal Installer - Drive Axle - T40008-



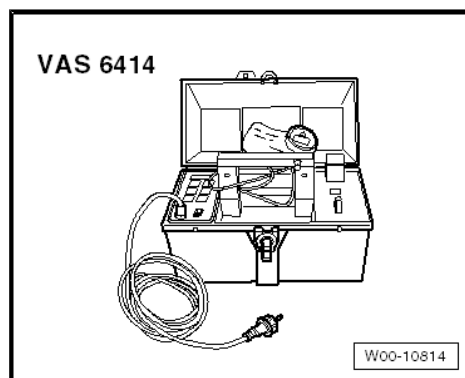
◆ Puller - Taper Roller Bearing - Adapter 7 - VAG1582/7-



◆ Dial Indicator - VAS6080A-

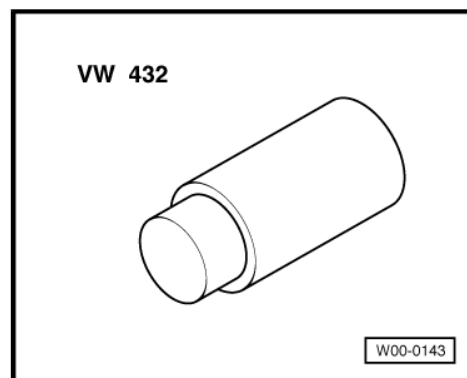


◆ Inductive Heater - VAS6414-

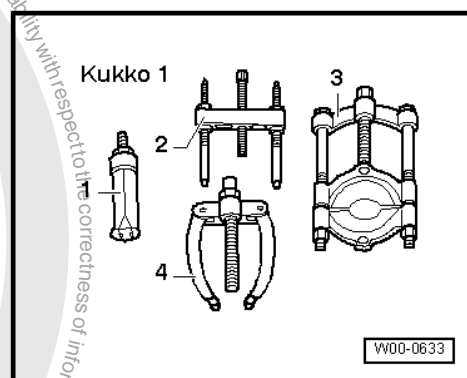




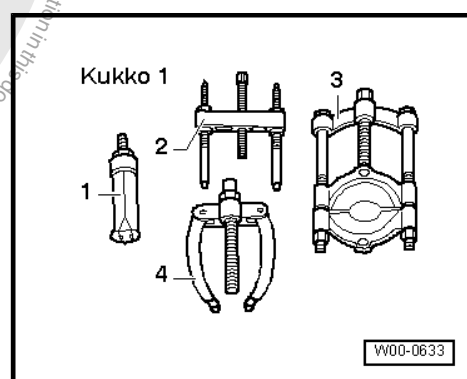
- ◆ Press Piece - Bushing - 50mm Diameter - VW432-



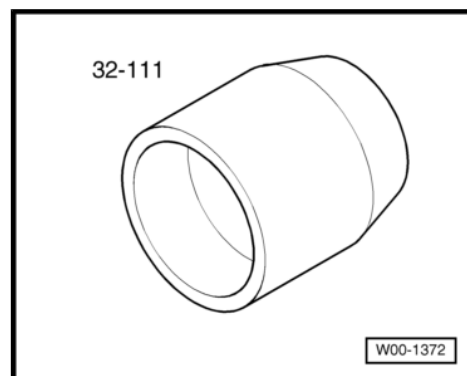
- ◆ -1- Puller - Kukko Internal - 28-37mm - 21/5-



- ◆ -1- Puller - Kukko Internal - 46-56mm - 21/7-



- ◆ Bearing Installer - Multiple Use - 32-111-



- ◆ -3- Puller - Kukko Quick Action Separating Tool - 22-115mm - 17/2-
- ◆ -4- Puller - Kukko Counterstay - 22/2-

39 – Final Drive, Differential

1 Seals

⇒ [“1.1 Overview - Seals”, page 200](#)

⇒ [“1.2 Left Seal, Replacing”, page 201](#)

⇒ [“1.3 Right Seal, Replacing”, page 203](#)

1.1 Overview - Seals

1 - Seal

- ☐ All wheel drive for right flange shaft
- ☐ All wheel drive, replace on installed manual transmission with bevel box. Refer to ⇒ [“1.3.1 Right Seal, Replacing, for Right Flange Shaft, AWD”, page 203](#).

2 - Seal

- ☐ AWD only
- ☐ for output flange bevel box
- ☐ Replace only when the bevel box is removed
- ☐ Replace for bevel box “OCN”. Refer to ⇒ [“4.2.2 Bevel Box OCN Output Flange Seal, Replacing \(Bevel Box Removed\)”, page 219](#).

3 - Seal

- ☐ For the input shaft
- ☐ Replacing. Refer to ⇒ [“1.3 Input Shaft Seal Replacing”, page 155](#).

4 - Seal

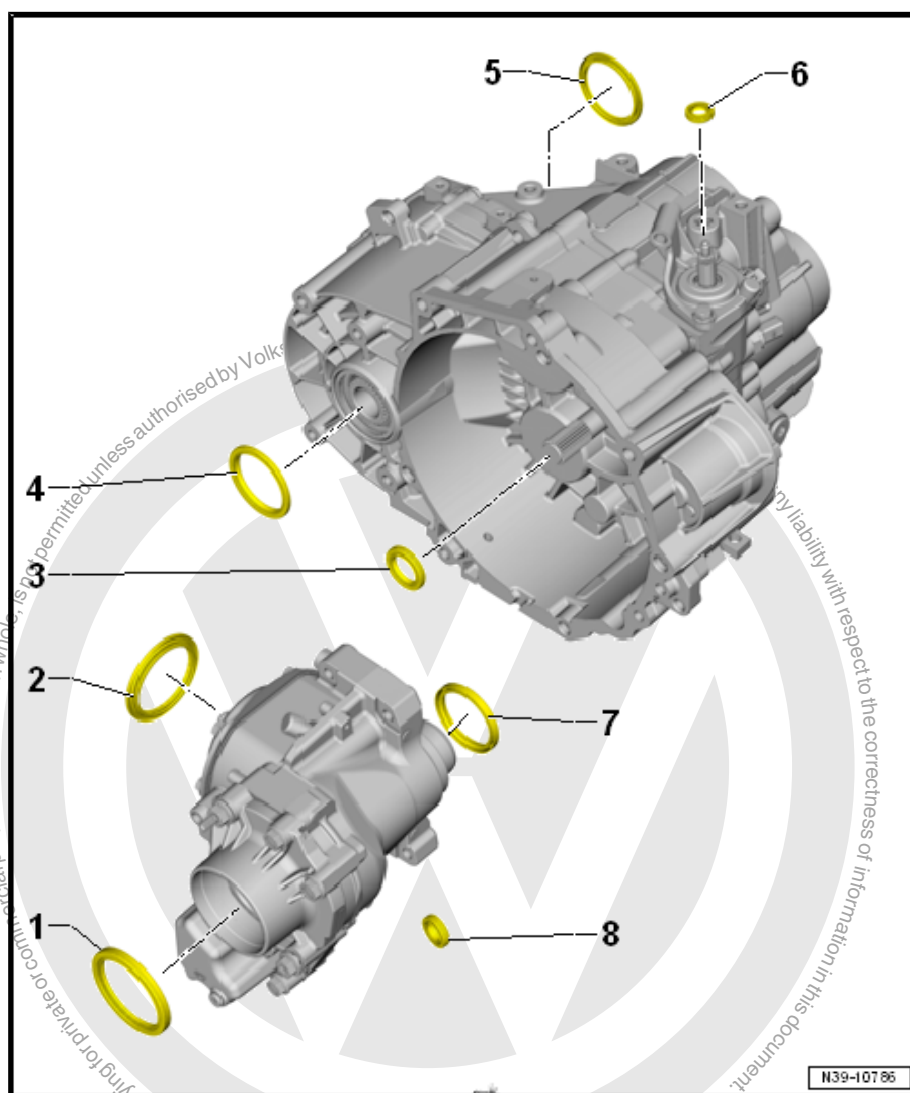
- ☐ FWD, for right flange shaft
- ☐ AWD, between the manual transmission and bevel box
- ☐ AWD, replace when manual transmission and bevel box are removed. Refer to ⇒ [“1.3.2 Right Seal, Replacing on the Manual Transmission, between the Manual Transmission and Bevel Box”, page 205](#).

5 - Seal

- ☐ For the left flange shaft
- ☐ Replace with the transmission installed. Refer to ⇒ [“1.2 Left Seal, Replacing”, page 201](#).

6 - Seal

- ☐ For the selector shaft
- ☐ Replacing. Refer to ⇒ [“8.7 Selector Shaft Seal, Replacing”, page 114](#).





7 - Seal

- ☐ AWD, between the bevel box and the manual transmission
- ☐ AWD, replace when the bevel box is removed. Refer to
⇒ [“4.2.1 Seal between Bevel Box and Manual Transmission, Removing and Installing”, page 218](#) .

8 - Seal

- ☐ AWD, for flange shaft in bevel box. Refer to ⇒ [“4.1 Overview - Bevel Box”, page 216](#) .
- ☐ is replaced from the side of the right flange shaft seal on AWD vehicles. Refer to
⇒ [“4.4 Needle Bearing \(Polygon Bearing\) and Needle Bearing Seal on Right Flange Shaft, Replacing”, page 226](#) .

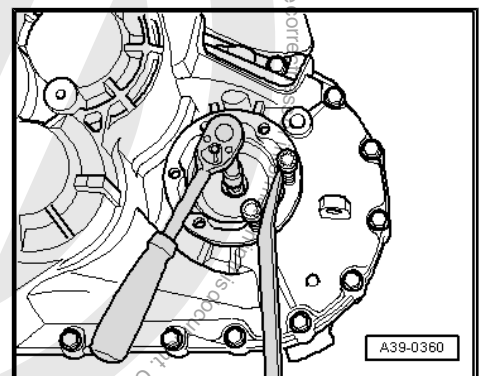
1.2 Left Seal, Replacing

Special tools and workshop equipment required

- ◆ Slide Hammer Set - VW771-
- ◆ Slide Hammer Set - Hook - VW771/37-
- ◆ Seal Installer - Flange Shaft - 3305-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Torque Wrench 1332 40-200Nm - VAG1332-
- ◆ Sealing Grease - G 052 128 A1-
- ◆ Shop Crane - Drip Tray - VAS6208-
- ◆ Sealing Grease - G 052 128 A1-

Removing

- Remove the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .
- Remove the lower section of the left front wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Overview - Front Wheel Housing Liner .
- Remove the left drive axle. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .
- Place the Drip Tray or Used Oil Collection and Extraction Unit - SMN372500- underneath.
- Remove flange shaft bolt. To do this, install two bolts on the flange and counterhold the flange shaft with a pry bar.
- Remove the flange shaft and the pressure spring.



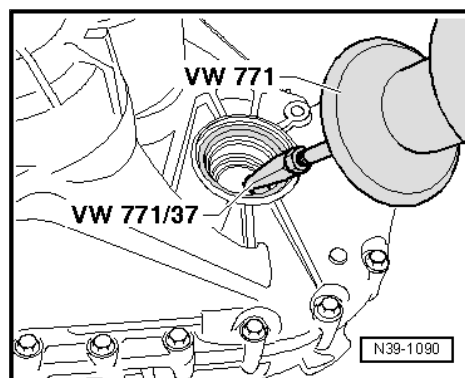


- Remove flange shaft seal.

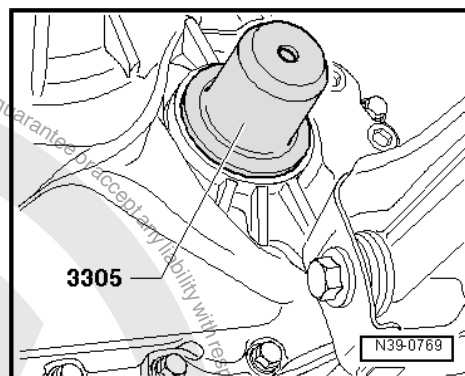
Installing

Install in reverse order of removal. Note the following:

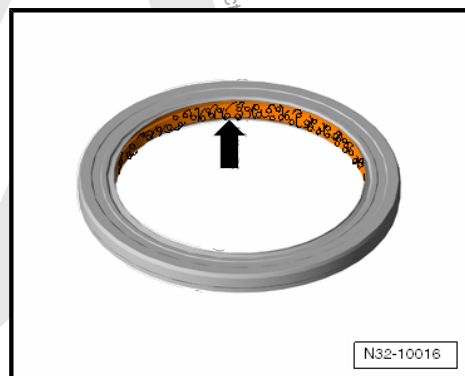
- Lightly oil new seal on outer circumference.



- Install the seal all the way in without tilting it.

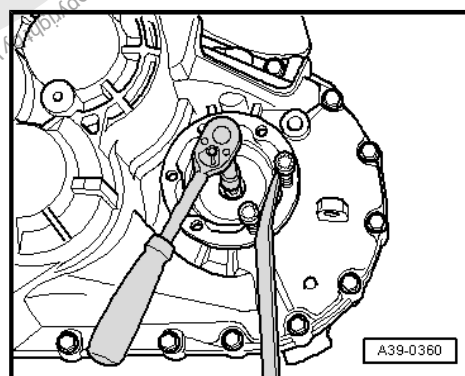


- Fill the space between the sealing and dust lip -arrow- halfway with Sealing Grease - G 052 128 A1- .
- Install the flange shaft.
- Hold the flange shaft to the transmission and tighten.
- Install the left drive axle. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .
- Check transmission fluid level. Refer to ⇒ [“6.1 Transmission Fluid Level, Checking”, page 104](#) .
- Install the lower section of the left front wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Overview - Front Wheel Housing Liner .
- Install the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .



Tightening Specification

- ◆ Refer to ⇒ [“2.1 Overview - Differential”, page 206](#) .





1.3 Right Seal, Replacing

⇒ ["1.3.1 Right Seal, Replacing, for Right Flange Shaft, AWD", page 203](#)

⇒ ["1.3.2 Right Seal, Replacing on the Manual Transmission, between the Manual Transmission and Bevel Box", page 205](#)

1.3.1 Right Seal, Replacing, for Right Flange Shaft, AWD

Special tools and workshop equipment required

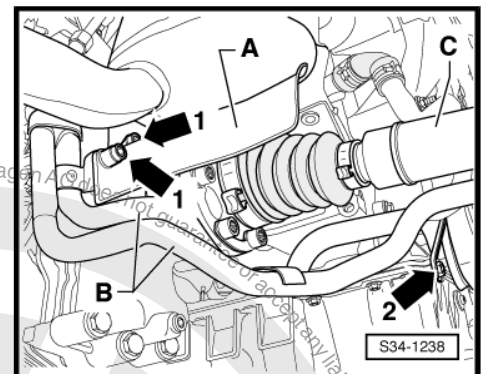
- ◆ Puller - Flanged Shaft - T10037-
- ◆ Seal Installer - Flange Shaft - T10049-
- ◆ Socket And Extended Bit - T10107A-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Sealing Grease - G 052 128 A1-

Removing

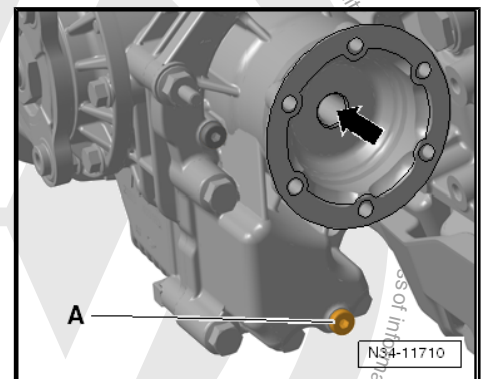
- Remove the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .
- Remove the heat shield -A- (if equipped) for the drive axle -C- -arrows 1-.

The heat shield for the right drive axle is attached with 2 or 3 nuts. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .

- Place the Drip Tray or Used Oil Collection and Extraction Unit - SMN372500- underneath.
- Remove the right drive axle -C-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .



- Drain the fluid from the bevel box, bolt -A-.
- Then install new bolt and tighten. Refer to ⇒ ["4.1 Overview - Bevel Box", page 216](#) .
- Use a Socket Wrench to remove the right flange shaft bolt -arrow- Insert two bolts in the flange and counterhold the flange shaft with the pry lever.





- Attach the Puller - Flanged Shaft - T10037- on the right flange shaft.



Note

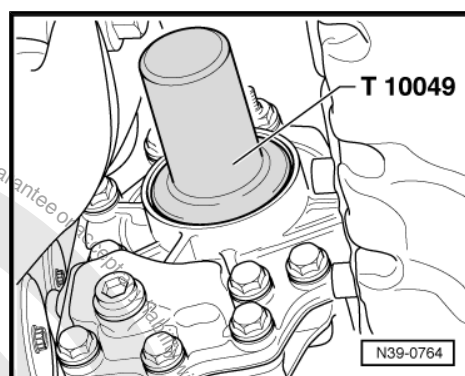
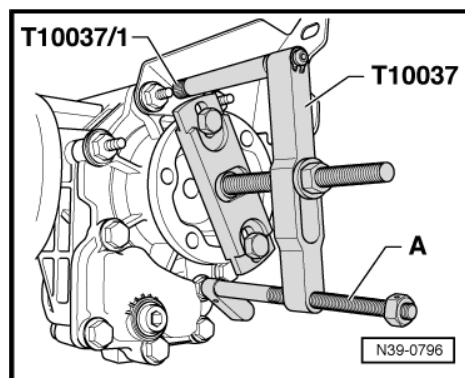
To remove the right flange shaft, use the Puller - Flanged Shaft - T10037- to avoid damaging the bearing on flange shaft.

- If necessary, place a spacer (for example, Press Piece - Bushing - VW434-) between the transmission support and the Puller - Flanged Shaft - Knurled Nut - T10371/1- .
- Turn the Spindle -A- and line up the Puller so that it is parallel to the flange.
- Remove the right flange shaft.
- Pry the seal out of the flange shaft with a lever.

Installing

Install in reverse order of removal. Note the following:

- Lightly oil new seal on outer circumference.
- Install the seal all the way in without tilting it.



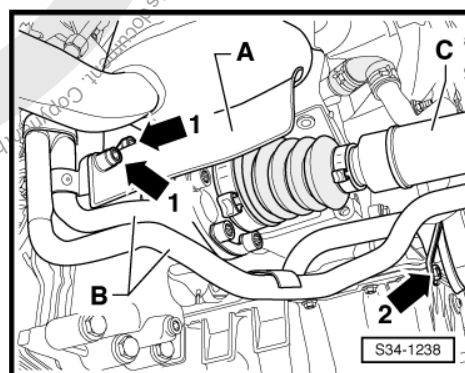
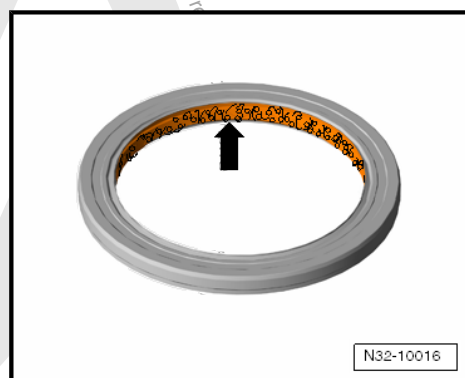
- Fill the space between the sealing and dust lip -arrow- halfway with Sealing Grease - G 052 128 A1- .
- Install the right flange shaft carefully. Rotate the flange shaft while doing this to prevent damaging the bearing.
- Attach flange shaft with screw and tighten. Refer to ⇒ [“2.1 Overview - Differential”, page 206](#) .
- Fill the bevel box with gear oil. Refer to ⇒ [“6.1.2 Gear Oil in Bevel Box, Filling”, page 231](#) .

Install in reverse order of removal. Note the following:

- Install the drive axle -C-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .
- Install the drive axle heat shield -A- -arrows 1-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .
- Install the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .

Tightening Specification

- ◆ Refer to ⇒ [“2.1 Overview - Differential”, page 206](#) .

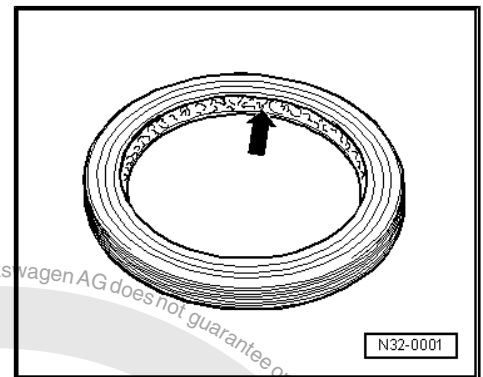




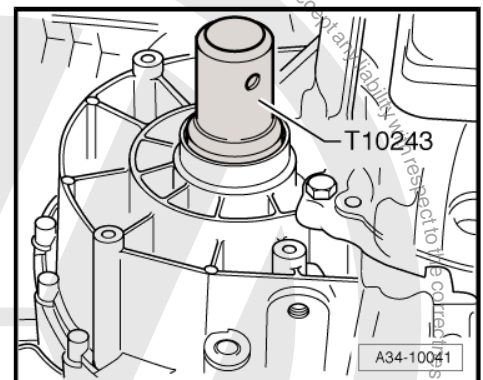
1.3.2 Right Seal, Replacing on the Manual Transmission, between the Manual Transmission and Bevel Box

Special tools and workshop equipment required

- ◆ Puller - Crankshaft/Power Steering Seal - Component 2 - T20143/2-
- ◆ Drip Tray for VAG1202A - VAG1306-
- ◆ Seal Installer - Bevel Box - T10243-
- Remove the bevel box. Refer to
⇒ [“4.1 Bevel Box, Removing”, page 95](#) .
- Place the Drip Tray or Used Oil Collection and Extraction Unit - SMN372500- underneath.
- Pry out the seal on the manual transmission using the Puller - Crankshaft/Power Steering Seal - Component 2 - T20143/2- or Puller - Seal Lever - VW681- .
- Fill the space between the sealing and dust lip -arrow- halfway with Sealing Grease - G 052 128 A1- .
- Lightly oil new seal on outer circumference.



- Install the seal all the way.
- Install the bevel box. Refer to
⇒ [“4.2 Bevel Box, Installing”, page 99](#) .
- Check the level of the axle oil inside the bevel box. Refer to
⇒ [“6.1.1 Bevel Box Gear Oil Level, Checking”, page 230](#) .
- Check transmission fluid level inside the manual transmission. Refer to
⇒ [“6.1 Transmission Fluid Level, Checking”, page 104](#) .





2 Differential

⇒ [“2.1 Overview - Differential”, page 206](#)

⇒ [“2.2 Differential, Disassembling and Assembling”, page 209](#)

⇒ [“2.3 Differential, Adjusting”, page 212](#)

2.1 Overview - Differential



Note

- ◆ To install, heat the bearing inner races/tapered roller bearing to approximately 100 °C (212 °F) with Inductive Heater - VAS6414- . Wear protective gloves.
- ◆ Replace both tapered roller bearings together.
- ◆ Adjust the differential when replacing the tapered roller bearing, differential housing, transmission housing or clutch housing. Refer to ⇒ [“2.3 Differential, Adjusting”, page 212](#) .

1 - Transmission Housing

2 - Shim

- ☐ For the differential
- ☐ Selecting thickness. Refer to ⇒ [“2.3 Differential, Adjusting”, page 212](#) .

3 - Outer Race/Tapered Roller Bearing

- ☐ Removing. Refer to ⇒ [Fig. “Removing the Outer Race/Tapered Roller Bearing from the Transmission Housing”, page 211](#)
- ☐ Installing. Refer to ⇒ [Fig. “Installing Outer Race/Tapered Roller Bearing into the Transmission Housing”, page 211](#)

4 - Bearing Inner Race/Taper Roller Bearing

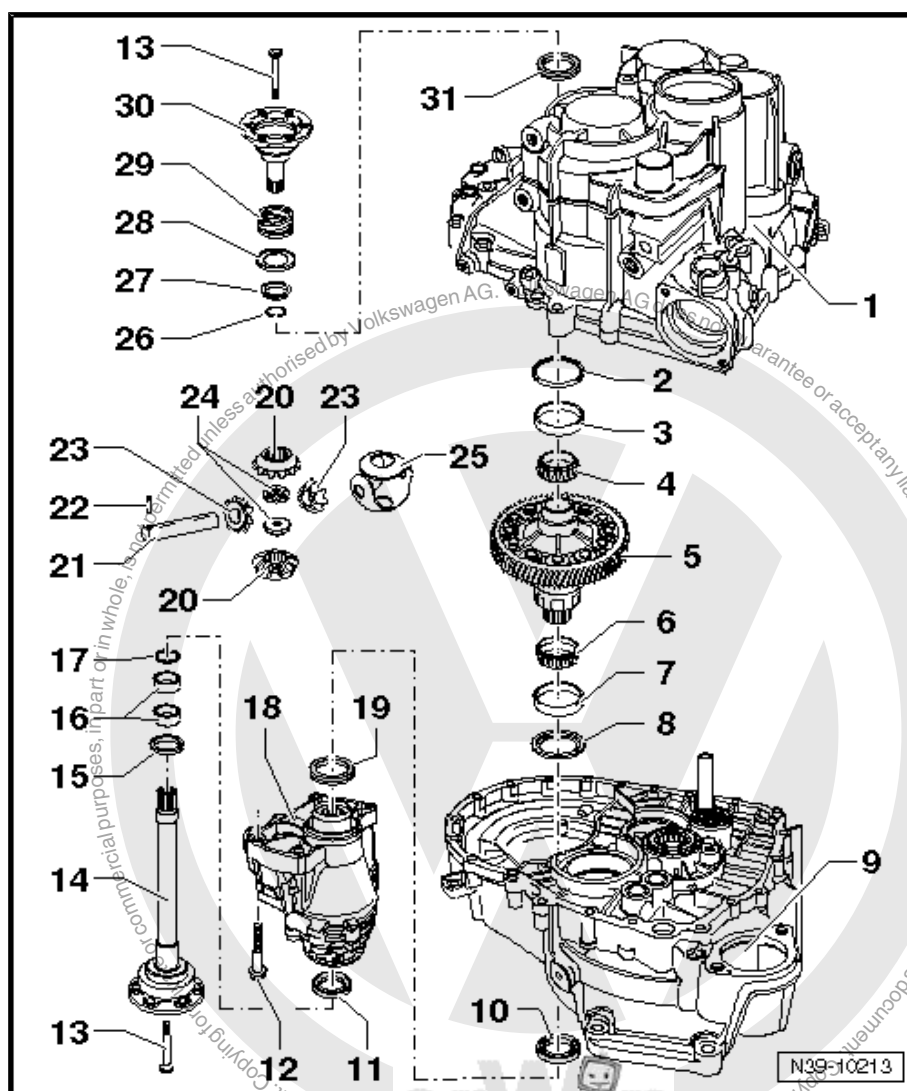
- ☐ Removing. Refer to ⇒ [Fig. “Removing the Bearing Inner Race/Taper Roller Bearing”, page 210](#)
- ☐ Installing. Refer to ⇒ [Fig. “Heat the Bearing Inner Race/Tapered Roller Bearing and Press On It”, page 210](#)

5 - Differential Housing

- ☐ With final drive gear wheel

6 - Bearing Inner Race/Taper Roller Bearing

- ☐ Removing. Refer to ⇒ [Fig. “Removing the Bearing Inner Race/Taper Roller Bearing”, page 210](#)





- ☐ Installing. Refer to
⇒ [Fig. "Heat the Bearing Inner Race/Tapered Roller Bearing and Press On It"](#), page 211

7 - Outer Race/Tapered Roller Bearing

- ☐ Removing. Refer to
⇒ [Fig. "Removing the Outer Race/Tapered Roller Bearing from the Clutch Housing"](#), page 209
- ☐ Installing. Refer to
⇒ [Fig. "Pressing Outer Race/Tapered Roller Bearing with Shim into Clutch Housing."](#), page 210

8 - Washer

Installed position: the collar on the inner circumference faces the seal.

Allocation. Refer to the Parts Catalog.

9 - Clutch Housing

10 - Seal

- ☐ AWD, between the manual transmission and bevel box
- ☐ Replacing. Refer to
⇒ ["1.3.2 Right Seal, Replacing on the Manual Transmission, between the Manual Transmission and Bevel Box"](#), page 205 .
- ☐ FWD with front axle differential lock between the manual transmission and the front axle differential lock.
- ☐ Replacing. Refer to
⇒ ["1.3.2 Right Seal, Replacing on the Manual Transmission, between the Manual Transmission and Bevel Box"](#), page 205 .
- ☐ Remove using the Puller - Seal Lever - VW681- or Puller - Crankshaft/Power Steering Seal - T20143/2- .
- ☐ Can be driven in to the stop with a Seal Installer - Crankshaft - T40007- in a disassembled transmission.

11 - Seal

- ☐ For the right flange shaft
- ☐ For AWD, replace on installed manual transmission with bevel box. Refer to
⇒ ["1.3.1 Right Seal, Replacing, for Right Flange Shaft, AWD"](#), page 203 .

12 - Hex Bolt

- ☐ 40 Nm + 90°
- ☐ Replace after removing
- ☐ Quantity: 4

13 - Bolt

- ☐ 33 Nm
- ☐ Install with the threaded piece -item 24- ⇒ [Item 24 \(page 208\)](#) .

14 - Right Flange Shaft

- ☐ AWD, Removing and installing. Refer to
⇒ ["4.4 Needle Bearing \(Polygon Bearing\) and Needle Bearing Seal on Right Flange Shaft, Replacing"](#), page 226 .

15 - Seal

- ☐ AWD, for flange shaft in bevel box. Refer to ⇒ ["4.1 Overview - Bevel Box"](#), page 216 .
- ☐ Replace AWD from the side of the seal. Refer to
⇒ ["4.4 Needle Bearing \(Polygon Bearing\) and Needle Bearing Seal on Right Flange Shaft, Replacing"](#), page 226

16 - Needle Bearing (Polygon Bearing)

- ☐ AWD only
- ☐ Replacing. Refer to
⇒ ["4.4 Needle Bearing \(Polygon Bearing\) and Needle Bearing Seal on Right Flange Shaft, Replacing"](#), page 226 .

17 - Circlip

- ☐ Replace after removing
- ☐ On AWD for needle bearing (polygon bearing)
- ☐ On FWD with front axle differential lock. Will be replaced later.



18 - AWD Bevel Box

- ☐ AWD, seals, flange shaft bearing and output flange bearing. Refer to [⇒ "4.1 Overview - Bevel Box", page 216](#) .

19 - Seal

- ☐ AWD, between the bevel box and the manual transmission
- ☐ AWD, replace when the bevel box is removed. Refer to [⇒ "4.2.1 Seal between Bevel Box and Manual Transmission, Removing and Installing", page 218](#) .

20 - Large Differential Bevel Gear

- ☐ Availability. Refer to Parts Catalog.
- ☐ Installing. Refer to [⇒ Fig. "Installing the Differential Bevel Gears", page 212](#) .

21 - Differential Bevel Gear Axle

- ☐ Availability. Refer to Parts Catalog.
- ☐ Removing. Refer to [⇒ Fig. "Removing the Differential Bevel Gear Axle and Spring Pin", page 211](#) .
- ☐ Installing. Refer to [⇒ Fig. "Installing the Differential Bevel Gears", page 212](#) .

22 - Adapter Sleeve

- ☐ Availability. Refer to Parts Catalog.
- ☐ For securing the axle for differential bevel gears
- ☐ Removing. Refer to [⇒ Fig. "Removing the Differential Bevel Gear Axle and Spring Pin", page 211](#) .
- ☐ Drive new roll pin in flush. Refer to [⇒ Fig. "Installing the Spring Pin for the Differential Bevel Gear Axle", page 212](#)

23 - Small Differential Bevel Gear

- ☐ Availability. Refer to Parts Catalog.
- ☐ Removing and installing. Refer to [⇒ Fig. "Installing the Differential Bevel Gears", page 212](#) .

24 - Threaded Piece

- ☐ Availability. Refer to Parts Catalog.
- ☐ Installing. Refer to [⇒ Fig. "Installing the Differential Bevel Gears", page 212](#) .

25 - Thrust Washer Union

- ☐ Availability. Refer to Parts Catalog.
- ☐ Install with transmission fluid

26 - Circlip

- ☐ Holds the tapered ring, the thrust washer and the pressure spring when the flange shaft is removed

27 - Tapered Ring

- ☐ With grooves for the thrust washer
- ☐ Installed position: ball toward the differential housing

28 - Thrust Washer

- ☐ Installed position: collar towards spring, tab toward tapered ring

29 - Left Flange Shaft Spring

- ☐ installed behind left flange shaft

30 - Left Flange Shaft

31 - Seal

- ☐ For the left flange shaft
- ☐ Replace with the transmission installed. Refer to [⇒ "1.2 Left Seal, Replacing", page 201](#) .



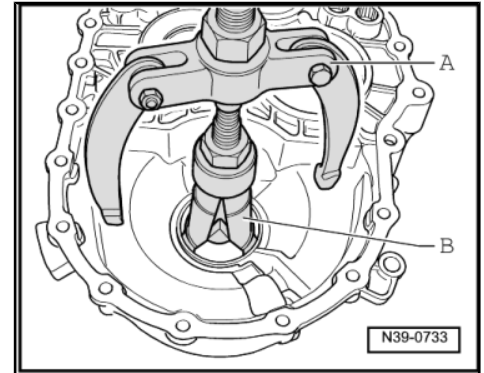
2.2 Differential, Disassembling and Assembling

⇒ **"2.2.1 Differential, Disassembling and Assembling, All Wheel Drive", page 209**

2.2.1 Differential, Disassembling and Assembling, All Wheel Drive

Special tools and workshop equipment required

- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Rod - VW411-
- ◆ Press Piece - Multiple Use - VW412-
- ◆ Press Piece - Multiple Use - 30-23-
- ◆ Press Piece - Multiple Use - 40-105-
- ◆ Press Piece - Multiple Use - 3005-
- ◆ Press Piece - Bushing - 3259-
- ◆ Press Piece - Reverse Gear Syncro - 3296-
- ◆ Subframe Bushing Tool Kit - 3301-
- ◆ Bearing Installer - Wheel Bearing - 3345-
- ◆ 1. Puller - Kukko Internal - 46-56mm - Kukko 21/7-
- ◆ 2. Puller - Kukko Puller - 60-150mm Width, 200mm Length - Kukko 18/1-
- ◆ 3. Puller - Kukko Quick Action Separating Tool - 12-75mm - Kukko 17/1-
- ◆ 4. Puller - Kukko Counterstay - Kukko 22/2-
- ◆ Puller - Kukko 2-Arm w/Side Clamp, 100mm Width, 100mm Length - Kukko 204/2-



Removing the Outer Race/Tapered Roller Bearing from the Clutch Housing

A - Counter Support , for example, Puller - Kukko Counterstay - Kukko 22/2-

B - Internal Puller 46 to 58 mm , for example, Puller - Kukko Internal - 46-56mm - Kukko 21/7-

– Tension the internal puller -B- between the outer race/tapered roller bearing and the shim.



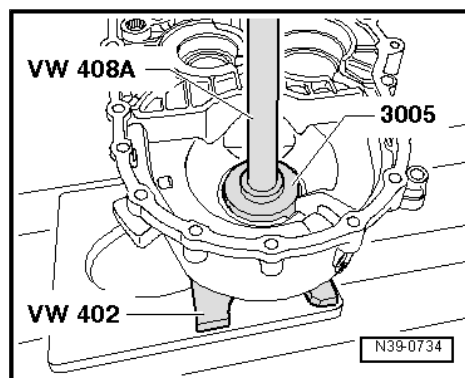
Note

- ◆ *Tension the Internal Puller -B- between the outer race/tapered roller bearing and shim tightly -item 8- ⇒ Item 8 (page 207) .*
- ◆ *Replace the washer after removing it -item 8- ⇒ Item 8 (page 207) .*
- ◆ *Instead of the Puller - Kukko Internal - 46-56mm - Kukko 21/7- the Puller - Kukko Internal - 56-70mm - Kukko 21/8- can also be used.*



Pressing Outer Race/Tapered Roller Bearing with Shim into Clutch Housing.

- First, install window glass -item 8- ➔ [Item 8 \(page 207\)](#) .
- Installation position of washer, shoulder on inner diameter points toward seal in clutch housing.



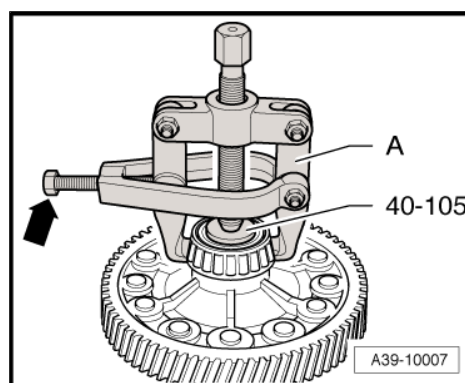
Removing the Bearing Inner Race/Taper Roller Bearing

- Place the Press Piece - Multiple Use - 40-105- on the differential housing.
- Tension the Puller -A-, for example Puller - Kukko 2-Arm w/ Side Clamp, 100mm Width, 100mm Length - 204/2- , under the bearing inner race near the flat side of the differential housing.



Note

When removing the bearing inner race, make sure the hooks do not bend outward; if necessary tighten bolt -arrow-.

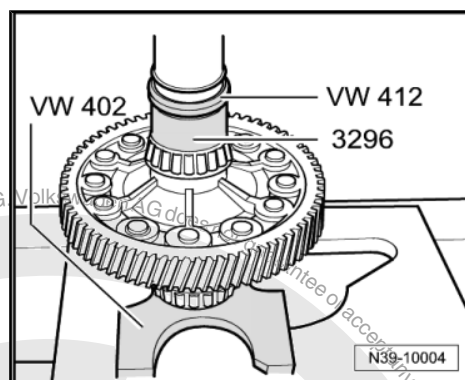


Heat the Bearing Inner Race/Tapered Roller Bearing and Press On It



WARNING

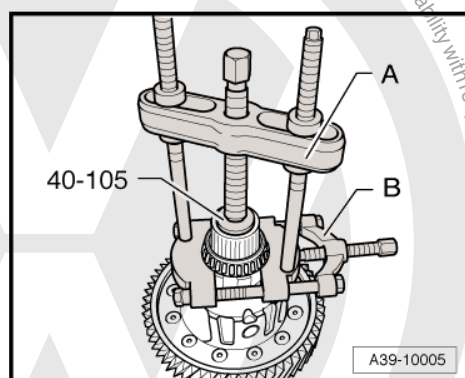
Wear safety gloves.



Removing the Bearing Inner Race/Taper Roller Bearing

A - Puller - 60-150mm Width, 200mm Length - 18/1- , for example.

B - Puller , for example, Puller - Kukko Quick Action Separating Tool - 12-75mm - 17/1-





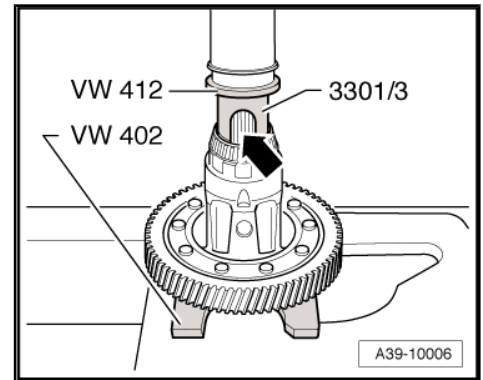
Heat the Bearing Inner Race/Tapered Roller Bearing and Press On It



WARNING

Wear safety gloves.

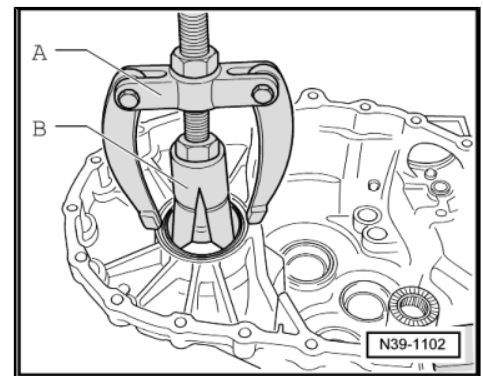
- Mount the Subframe Bushing Tool Kit - Assembly Tool 3 - 3301/3- from the Subframe Bushing Tool Kit - 3301- with the recess -arrow- (larger inner diameter) on the bearing inner race/tapered roller bearing.



Removing the Outer Race/Tapered Roller Bearing from the Transmission Housing

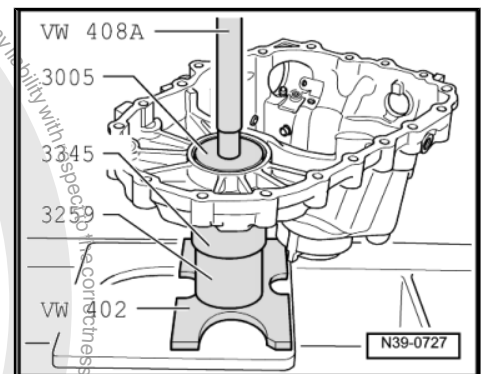
A - Counter Support , for example, Puller - Kukko Counterstay - 22/2-

B - Internal Puller 46 to 58 mm , for example, Puller - Kukko Internal - 46-56mm - 21/7-



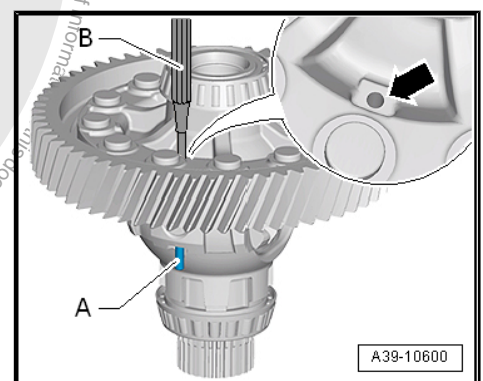
Installing Outer Race/Tapered Roller Bearing into the Transmission Housing

- Support the transmission housing directly under the bearing mount using the Bearing Installer - Wheel Bearing - 3345- .



Removing the Differential Bevel Gear Axle and Spring Pin

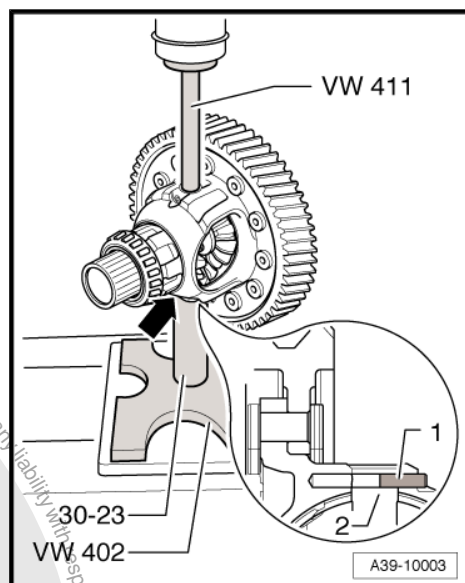
- Use a 5 mm diameter pin punch -B- to remove the adapter sleeve -A- from the hole -arrow- on the differential housing.





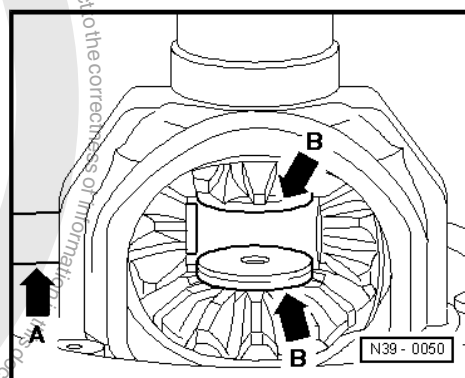
Note

- ◆ If there is no hole -arrow- on the differential housing, install the adapter sleeve as follows:
- ◆ Install the adapter sleeve -1- in the differential bevel gear axle -2- so that it is flush.
- ◆ Place the differential under the press with the adapter sleeve -arrow- facing the Press Piece - Multiple Use - 30-23- .
- ◆ Then, remove the differential bevel gear axle.
- ◆ If necessary, remove the sheared parts of the adapter sleeve from the differential bevel box housing and remove the differential bevel gear axle.



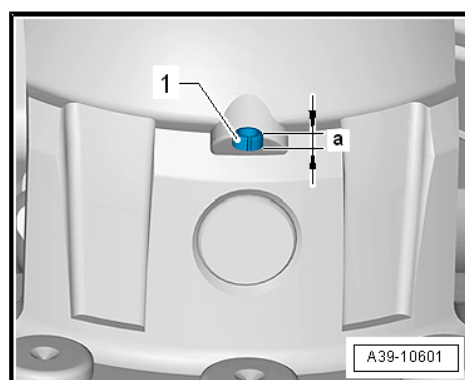
Installing the Differential Bevel Gears

- Insert thrust washer union with transmission fluid.
- Install and secure both large differential planetary gears, for example, with a flange shaft.
- Insert the small differential planetary gears 180° offset and pivot them into position.
- Press the differential bevel gear axle -arrow A- up to the first small differential bevel gear.
- Drive differential planetary gear axle into final position and secure with spring pin. Refer to [Fig. "Installing the Spring Pin for the Differential Bevel Gear Axle" , page 212](#) .



Installing the Spring Pin for the Differential Bevel Gear Axle

- Align the hole in the differential bevel gear axle to the hole in the differential housing.
- Use a needle bearing drift to install the adapter sleeve -1- to the dimension -a- = 2.5 ± 0.5 mm.



2.3 Differential, Adjusting

Special tools and workshop equipment required

- ◆ Transmission Support - VW353-
- ◆ Measuring Set - Magnetic Plate - 50mm - VW385/17-
- ◆ Dial Gauge Holder - VW387-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Multiple Use - 3005-
- ◆ Press Piece - Bushing - 3259-



- ◆ Bearing Installer - Wheel Bearing - 3345-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ -1- Puller - Kukko Internal - 46-56mm - 21/7-
- ◆ -4- Puller - Kukko Counterstay - 22/2-
- ◆ Dial Indicator - VAS6080A-
- ◆ 30 mm dial gauge extension

A New Differential Adjustment is Required When the Following Components Have Been Replaced:

- ◆ Transmission Housing
- ◆ Clutch Housing
- ◆ Differential housing or
- ◆ Differential tapered roller bearing

Adjustment Overview. Refer to

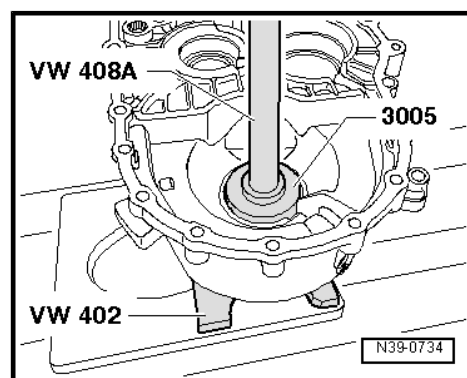
⇒ ["3 Adjustment Overview", page 215](#) .

- Pressing outer race/tapered roller bearing with shim into clutch housing -item 8- ⇒ [Item 8 \(page 207\)](#) .

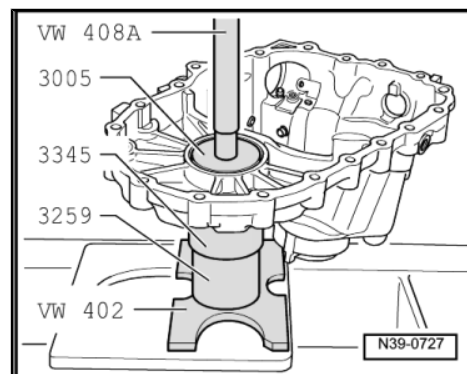


Note

- ◆ *Pay attention to the shim installed position.*
- ◆ *The collar on the inner circumference faces the seal.*



- Install the outer race/tapered roller bearing without adjustment shim into transmission housing.
- Insert differential into clutch housing.
- Mount transmission housing and tighten 5 bolts.
- Press differential in direction of clutch housing and rotate 8 times at the same time.
- Press differential in direction of transmission housing and rotate 8 times at the same time.
- Attach the measuring tools to the transmission housing.





- Set the dial gauge with 1 mm pretension to “0”.

A - 30 mm dial gauge extension

- Move the differential up and down and read the play on the dial gauge and note it (example: 0.70 mm).

Determining the Shim

The specified bearing pre-load is obtained by adding a constant pre-load figure of 0.25 mm to the reading obtained.

Example:

Measured value	0.70 mm
+ Preload (constant value)	0.25 mm
Shim thickness =	0.95 mm

- Remove the transmission housing.
- Removing the outer race/tapered roller bearing from the transmission housing

A - Counter Support , for example, Puller - Kukko Counterstay - 22/2-

B - Internal Puller 46 to 58 mm , for example, Puller - Kukko Internal - 46-56mm - 21/7-

- For the correct part number, refer to the Parts Catalog.
- Insert shim with the correct thickness.

The following shims are available:

Shim Thickness (mm)			
0.65	0.85	1.05	1.25
0.70	0.90	1.10	
0.75	0.95	1.15	
0.80	1.00	1.20	

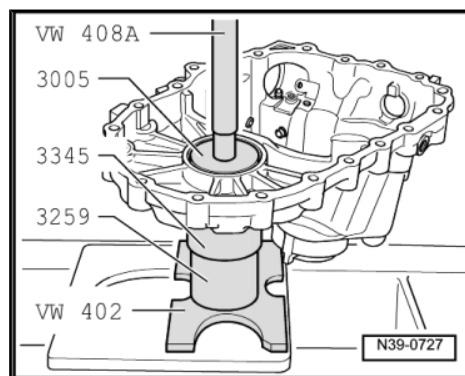
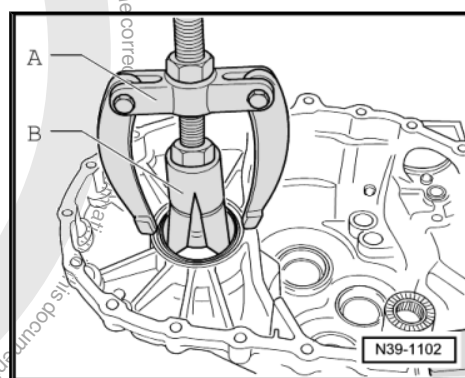
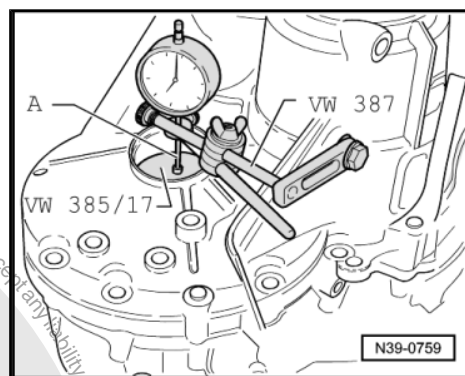
If the measured shim thickness is larger than those listed in the Table, then install two shims that add up to the necessary thickness. Install the thicker shim first.

Tolerance variations make it possible to find the exact shim thickness required.

- Install the outer race again and tighten the transmission housing. Refer to
⇒ [“8.3 Overview - Transmission Housing and Selector Mechanism”, page 108](#) .

Tightening Specifications

- ♦ Transmission housing to clutch housing. Refer to
⇒ [“8.3 Overview - Transmission Housing and Selector Mechanism”, page 108](#) .





3 Adjustment Overview



Note

A readjustment of the output shaft for 1st to 4th gears, output shaft for 5th/6th gears and reverse gears or differential is only required if components that directly influence the transmission adjustment, have been replaced. Note the following table to avoid unnecessary adjustments:

		To be adjusted:		
		Output shaft, 1st to 4th gears. Refer to ⇒ "2.3.1 Output Shaft 1st through 4th Gear, Adjusting" , page 181 .	Output shaft, 5th/6th and reverse gears. Refer to ⇒ "2.3.2 Output Shaft, 5th, 6th and Reverse Gears, Adjusting" , page 184 .	Differential Refer to ⇒ "2.3 Differential, Adjusting" , page 212 .
Replaced part:	Transmission Housing	x	x	x
	Clutch Housing	x	x	x
	Output Shaft 1st through 4th Gear	x		
	Output shaft for 5th/6th and reverse gears		x	
	Differential			x
	Output shaft tapered roller bearing, 1st to 4th gears	x		
	Output shaft tapered roller bearing, 5th/6th and Reverse Gears		x	
	Differential tapered roller bearing			x



4 Bevel Box

⇒ [“4.1 Overview - Bevel Box”, page 216](#)

⇒ [“4.2 Bevel Box Seals, Replacing”, page 218](#)

⇒ [“4.3 Output Flange, Replacing; Output Flange Shim, Redetermining”, page 225](#)

⇒ [“4.4 Needle Bearing \(Polygon Bearing\) and Needle Bearing Seal on Right Flange Shaft, Replacing”, page 226](#)

4.1 Overview - Bevel Box

⇒ [“4.1.1 Bevel Box OCN Assembly Overview”, page 216](#)

4.1.1 Bevel Box OCN Assembly Overview

(Seals, Flange Shaft Bearing, Output Flange Bearing Inside the Bevel Box)

1 - Seal

- ☐ Replace with bevel box removed. Refer to
⇒ [“4.2.1 Seal between Bevel Box and Manual Transmission, Removing and Installing”, page 218](#)
- ☐ Between bevel box and manual transmission

2 - Bevel Box

- ☐ Removing. Refer to
⇒ [“4.1.1 Bevel Box OCN, Removing”, page 96](#).
- ☐ Installing. Refer to
⇒ [“4.2 Bevel Box, Installing”, page 99](#).
- ☐ Removal for vehicles with removed transmission. Refer to
⇒ [Fig. “AWD Transmission”, page 116](#)
- ☐ Installation for vehicles with removed transmission. Refer to
⇒ [Fig. “AWD Transmission”, page 127](#)

3 - Oil Drain Plug

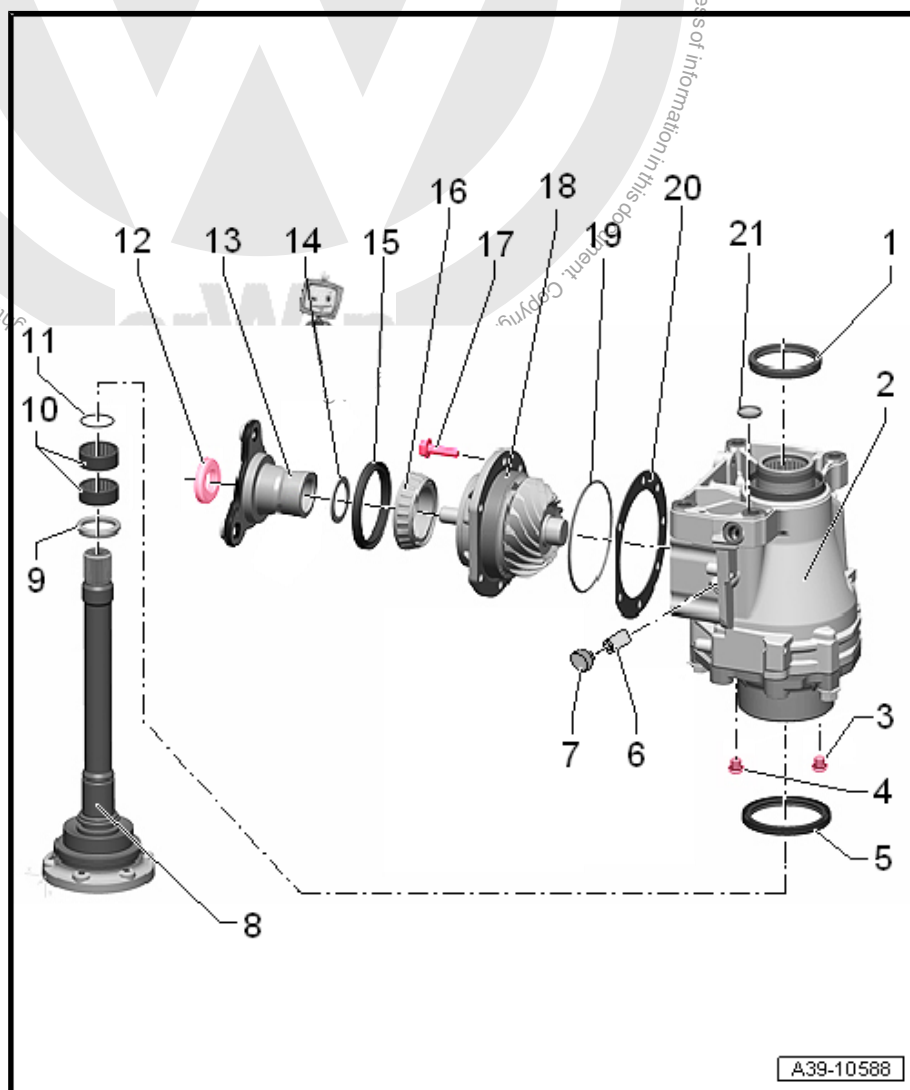
- ☐ 15 Nm
- ☐ Replace after removing
- ☐ With permanent seal

4 - Transmission Fluid Filler Plug

- ☐ 15 Nm
- ☐ Replace after removing
- ☐ With permanent seal

5 - Seal

- ☐ For the right flange shaft





- ☐ Replace with manual transmission installed with bevel box. Refer to
⇒ [“1.3.1 Right Seal, Replacing, for Right Flange Shaft, AWD”, page 203](#) .

6 - Bleed Pipe

- ☐ For bleeding the bevel box
- ☐ Press it all the way

7 - Cap

- ☐ For bleeding the bevel box

8 - Right Flange Shaft

- ☐ Removing and installing. Refer to
⇒ [“1.3.1 Right Seal, Replacing, for Right Flange Shaft, AWD”, page 203](#) .

9 - Seal

- ☐ Remove to replace needle bearing (polygon bearing). Refer to
⇒ [“4.4 Needle Bearing \(Polygon Bearing\) and Needle Bearing Seal on Right Flange Shaft, Replacing”, page 226](#) .

10 - Needle Bearing (Polygon Bearing)

- ☐ The needle bearings (polygon bearings) are difficult to move when the flange shaft is removed. Difficulty in movement is not an indication of faulty bearings. A test for noisy bearings can only be performed with the bearings installed.
- ☐ Check for damage on the bearing, for example, cracks on outer race, replace if necessary.
- ☐ Replacing. Refer to
⇒ [“4.4 Needle Bearing \(Polygon Bearing\) and Needle Bearing Seal on Right Flange Shaft, Replacing”, page 226](#) .

11 - Circlip

- ☐ Replace after removing
- ☐ For the needle bearing (polygon bearing)
- ☐ Insert in the groove running around the stub shaft

12 - Twelve-Point Nut

- ☐ 350 Nm + 15 Nm
- ☐ Replace after removing.
- ☐ Cover nut on 3 opposite sides with peen
- ☐ Removing. Refer to ⇒ [Fig. “Remove Output Flange Twelve-Point Nut”](#) , page 221 .
- ☐ Install with Locking Compound - D 000 600- .
- ☐ Installing. Refer to ⇒ [Fig. “Tighten New Output Flange Twelve-Point Nut.”](#) , page 224 .

13 - Output Flange

- ☐ Replacing. Refer to ⇒ [“4.3 Output Flange, Replacing; Output Flange Shim, Redetermining”, page 225](#) .

14 - Shim

- ☐ Determining the thickness when replacing the output flange. Refer to
⇒ [“4.3 Output Flange, Replacing; Output Flange Shim, Redetermining”, page 225](#)

15 - Seal

- ☐ For output flange
- ☐ Replace only when the bevel box is removed. Refer to
⇒ [“4.2.2 Bevel Box OCN Output Flange Seal, Replacing \(Bevel Box Removed\)”, page 219](#) .

16 - Inner Race / Tapered Roller Bearing

- ☐ Component is not a replacement part

17 - Bolt

- ☐ 38 Nm

18 - Pinion Housing

- ☐ With shaft bevel gear and outer race/tapered roller bearing
- ☐ Components are not replacement parts
- ☐ Carefully pry out from side to side



- ☐ Pay attention to the threaded inserts; the drive pinion housing fits only in one position.

19 - O-Ring

- ☐ To replace, remove the bolts and carefully pry the pinion housing out at the tabs protruding all the way around.
- ☐ Do not remove the hex nut and output flange

20 - Shim

- ☐ Component is not a replacement part
- ☐ Note the bevel box fastening hole; The shim only fits one way.

21 - Cap

- ☐ Drive in until stop using the Holding Fixture - Spacers - VW540/1B-

4.2 Bevel Box Seals, Replacing

⇒ ["1.3.1 Right Seal, Replacing, for Right Flange Shaft, AWD", page 203](#)

⇒ ["1.3.2 Right Seal, Replacing on the Manual Transmission, between the Manual Transmission and Bevel Box", page 205](#)

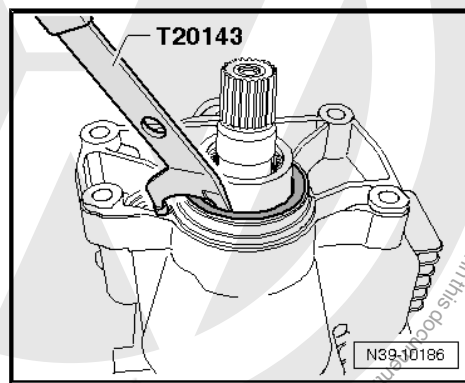
⇒ ["4.2.1 Seal between Bevel Box and Manual Transmission, Removing and Installing", page 218](#)

⇒ ["4.2.2 Bevel Box OCN Output Flange Seal, Replacing \(Bevel Box Removed\)", page 219](#)

4.2.1 Seal between Bevel Box and Manual Transmission, Removing and Installing

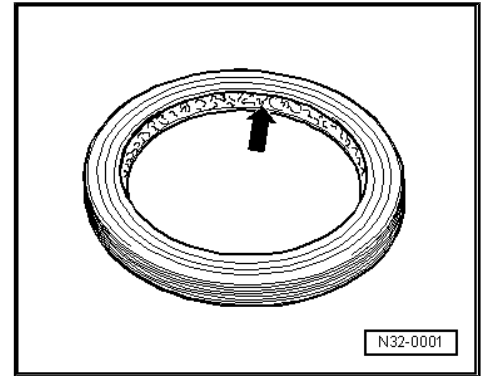
Special tools and workshop equipment required

- ◆ Puller - Crankshaft/Power Steering Seal - T20143-
- ◆ Seal Installer - Bevel Box - T10298-
- Remove the bevel box. Refer to [⇒ "4.1 Bevel Box, Removing", page 95](#).
- Pry out the seal using the Puller - Crankshaft/Power Steering Seal - Component 1 - T20143/1- or Puller - Crankshaft/Power Steering Seal - Component 2 - T20143/2- .

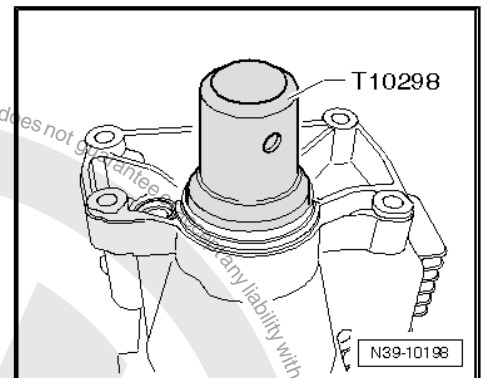




- Fill the space on the new seal between the sealing/dust lip -arrow- halfway with Sealing Grease - G 052 128 A1- .
- Lightly oil new seal on outer circumference.



- Install the seal all the way.
- Install the bevel box. Refer to
⇒ [“4.2 Bevel Box, Installing”, page 99](#) .
- Check the level of the axle oil inside the bevel box. Refer to
⇒ [“6.1.1 Bevel Box Gear Oil Level, Checking”, page 230](#) .
- Check transmission fluid level inside the manual transmission. Refer to
⇒ [“6.1 Transmission Fluid Level, Checking”, page 104](#) .



4.2.2 Bevel Box 0CN Output Flange Seal, Replacing (Bevel Box Removed)

Special tools and workshop equipment required

- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Multiple Use - VW412-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Multiple Use - VW455-
- ◆ Support Channels - VW457-
- ◆ Press Piece - Reverse Gear Syncro - 3296-
- ◆ Gearbox Support - T10108-
- ◆ Gearbox Support - T10108/1-
- ◆ Puller - Taper Roller Bearing - VAG1582- with a short sleeve
- ◆ Puller - Taper Roller Bearing - Adapter 13 - VAG1582/13-
- ◆ Torque Wrench 1601 - VAG1601-
- ◆ Seal Installer - Crankshaft - VW204B-
- ◆ Dial Gauge Holder - VW387-
- ◆ Press Piece - Multiple Use - 40-105-
- ◆ Socket AF 34 mm - T50019-
- ◆ Dial Indicator - VAS6080A-
- ◆ Sealing Grease - G 052 128 A1-
- ◆ Two M8 x 30 mm stud bolts or Guide Pins - M8 - T10273-



- ◆ 2 M10 x 30 bolts
- ◆ 4 M12 x 10 nuts



Note

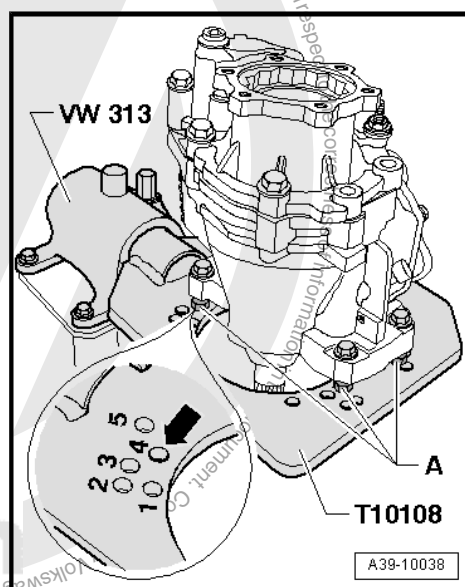
- ◆ *Bevel box output flange seal can only be replaced with bevel box removed.*
- ◆ *Inner race/tapered roller bearing is located in the output flange bevel box.*
- ◆ *These will be removed later in the procedure.*
- ◆ *Do not replace the tapered roller bearing for the output flange bevel box and the shim!*

– Remove the bevel box (refer to
⇒ [“4.1 Bevel Box, Removing”, page 95](#)) or remove the bevel
box from the manual transmission. Refer to
⇒ [Fig. “AWD Transmission”, page 116](#) .

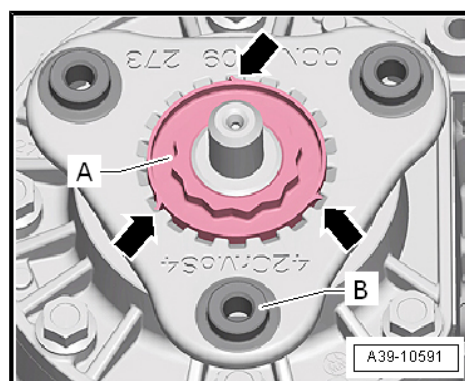
– Mount the bevel gear on the hole marked with the number
-4- -arrow- in the Gearbox Support - T10108- .

A - Insert nut M 12 x 10 (quantity: 4) between bevel box and
Transmission Holder

- Then align bevel box to the remaining three holes and secure.
- Place the Drip Tray underneath.
- Drain the transmission fluid from the bevel box.



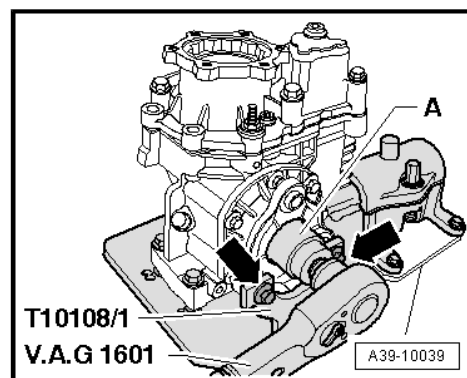
- Turn the peenings -arrows- on the twelve point nut -A- back
into the output flange recesses -B-.
- Secure the bevel box output flange using the Gearbox Support
- Component 1 - T10108/1- . Use M10 x 30 bolts -arrows- to
lock the flange.



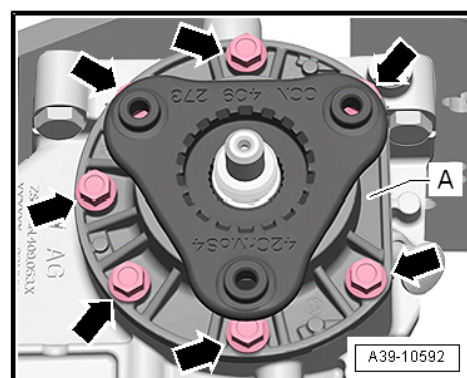


Remove Output Flange Twelve-Point Nut

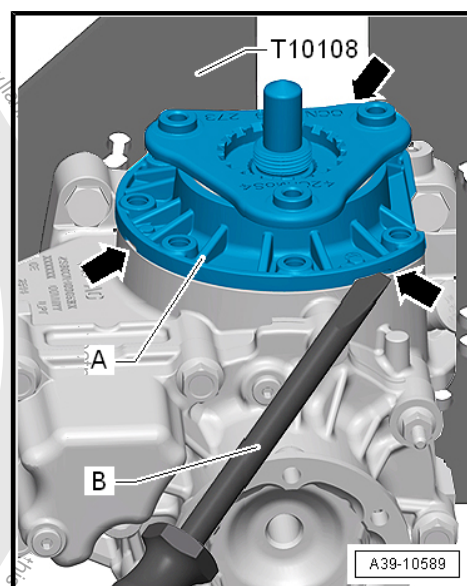
A - Socket AF 34 mm - T50019-



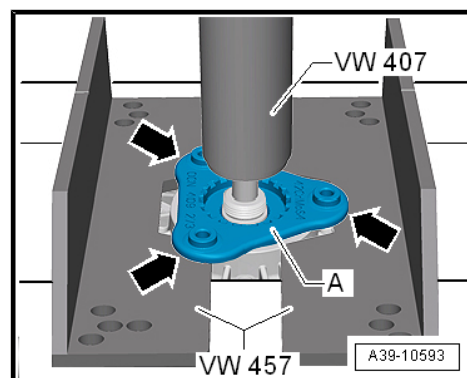
- Pivot bevel box so that output shaft faces upward.
- Remove bolts -arrows- for the pinion housing -A-.



- Insert a suitable flathead screwdriver -B- into the 3 recesses -arrows- on the pinion housing -A- and carefully pry out the pinion housing and shaft bevel gear.
- Place the output flange -A- evenly on the Support Channels -VW457- -arrows-.



- Remove shaft bevel gear from output shaft -A-.
- While doing this, secure the shaft bevel gear and inner race/ tapered roller bearing to prevent from falling.





- Remove output flange -A- from pinion housing.



Note

The seal -arrow- is found on the output flange.

- When removing the output flange seal, the bearing inner race/ tapered roller bearing must also be removed.

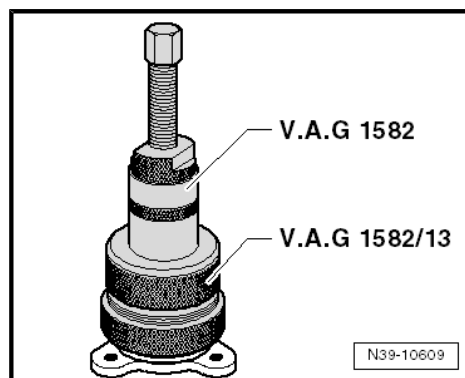
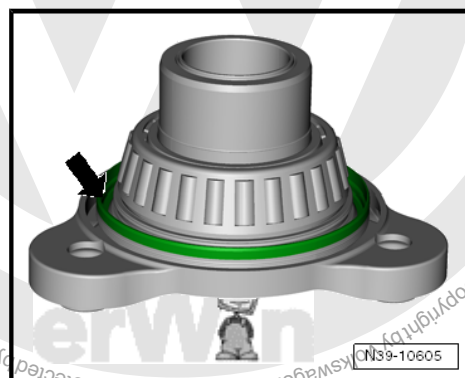
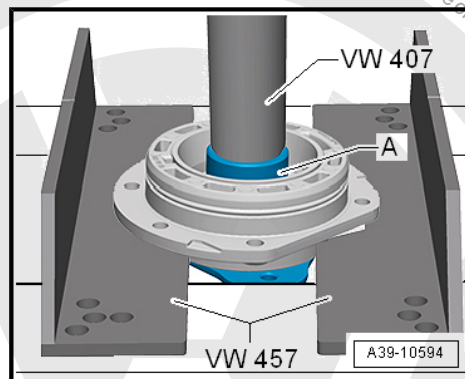


Caution

There is a risk of damaging the inner race/tapered roller bearing.

• **Remove the inner race/tapered roller bearing using the Puller - Taper Roller Bearing - Adapter 13 - VAG1582/13- .**

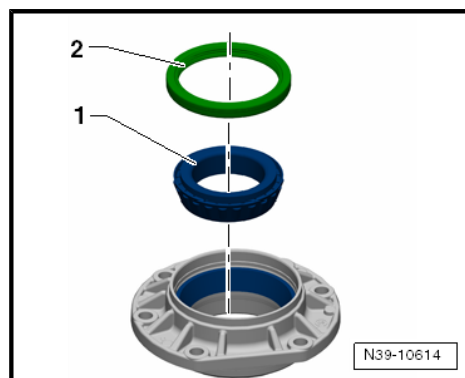
• **Replace the bevel box if the inner race/tapered roller bearing is damaged.**



- Place the Press Piece - Multiple Use - 40-105- on the output flange.
- Remove the bearing inner race/tapered roller bearing from output flange using the Tapered Roller Bearing Puller .
- Remove the output flange seal.

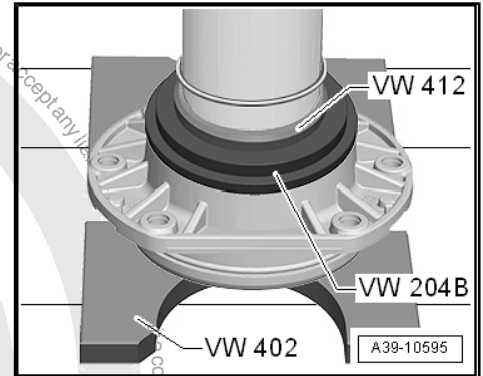
Install Seal and Output Flange

- Place the old bearing inner race/tapered roller bearing -1- into the pinion housing.
- Lightly lubricate the outer diameter of the new output flange seal -2-.

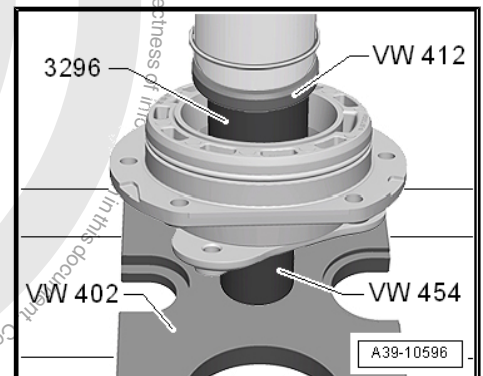




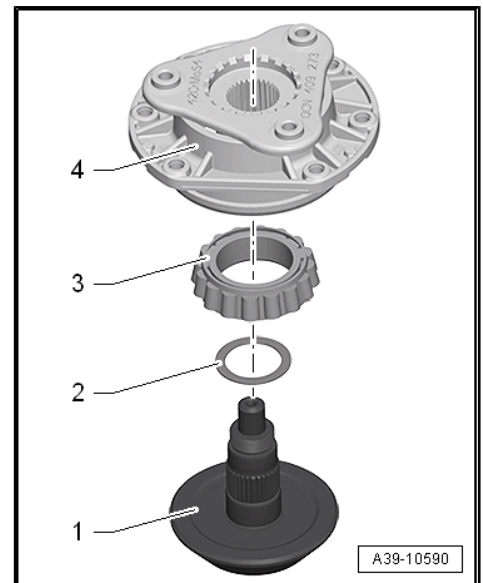
- Install new seal so that it is flush.
- The large diameter on the Seal Installer - Crankshaft - VW204B- faces the seal.
- Fill the space between the sealing and dust lip of the seal half-way with Sealing Grease - G 052 128 A1- .
- Install pinion housing and inner race/tapered roller bearing on the output flange.



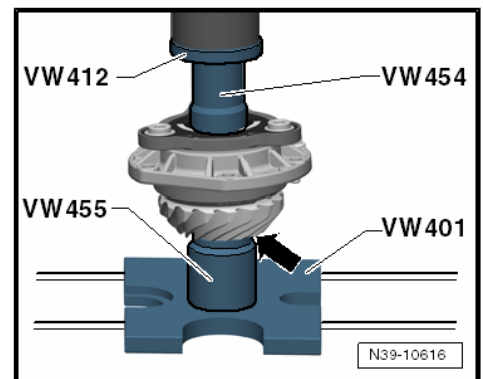
- Press the inner race/tapered roller bearing (refer to [4.1.1 Bevel Box 0CN Assembly Overview](#), page 216) all the way onto the output flange.
- The large diameter on the Press Piece - Multiple Use - VW454- faces the output flange.
- Press the inner race/tapered roller bearing all the way.
- Do not apply any greater pressure to the tapered roller bearing.



- Fit the shim -2-, the inner race/tapered roller bearing -3- and the pinion housing -4- onto the shaft bevel gear -1-.
- Always use the previous shim -2- to reinstall.
- This will maintain the bearing pre-load on the shaft bevel gears inside the pinion housing.



- Press in the output flange along with the pinion housing and shaft bevel gear all the way.
- The shoulder -arrow- of the Press Piece - Multiple Use - VW455- points to the shaft bevel gear.
- Turn pinion housing during pressing procedure.

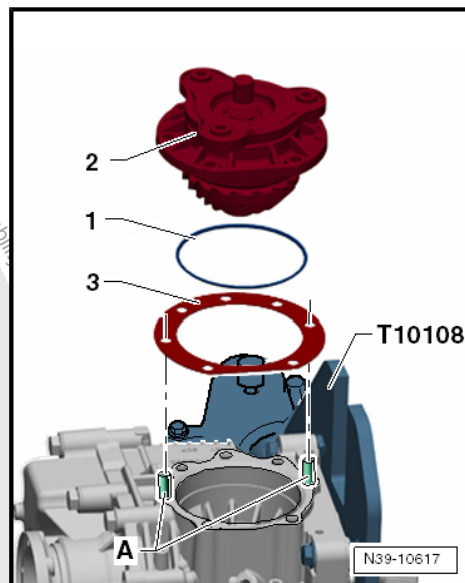




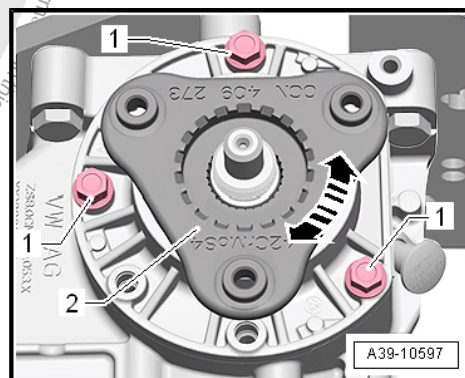
- Install the stud bolts M8 X 30 mm -A- or Guide Pins - M8 - T10273- into the axle drive housing.
- Lubricate the new O-ring -1- with axle oil and slide it onto the pinion housing -2-.

The pinion housing-2- and shim -3- only fit one way.

- Install the previous shim-3-.

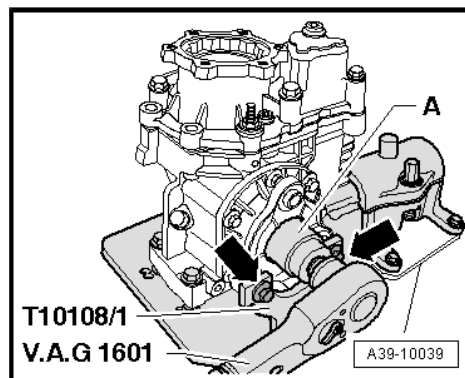


- Tighten the bolts -1- alternating in small steps, all the while turning the output flange -2- back and forth gently.
- Tighten the bolts for the pinion housing-2- diagonally.

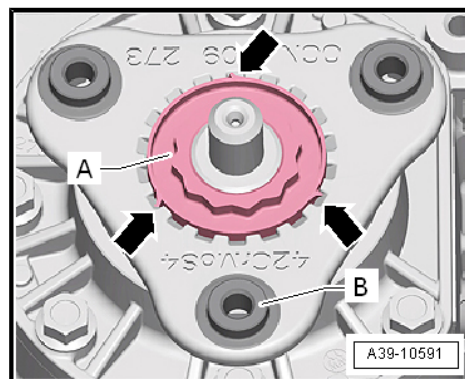


Tighten New Output Flange Twelve-Point Nut.

A - Socket AF 34 mm - T50019-



- Secure twelve-point nut -A-.
- Nut is offset by 120°, cover in the beading -B- on the output shaft with peen -arrows-.





Measure the Radial Run-Out on the Output Flange/Shaft Bevel Gear



Note

Check the radial run-out on the shaft bevel gear centering pin after tightening the output flange nut.

- Secure measuring tools to bevel box with bolt -A- (M8 x 25).
- Position the Dial Indicator - VAS6080A- on the shaft bevel gear centering pin -B- and set the 1 mm pre-tension to "0".
- Turn the output flange one complete rotation direction of -arrow-.
- Read the measured value on the gauge.
- Maximum radial run-out = 0.05 mm.

Attach bevel box to the manual transmission. Refer to ➤ [Fig. "AWD Transmission", page 116](#) or install bevel box. Refer to ➤ ["4.2 Bevel Box, Installing", page 99](#).

- Check the level of the axle oil inside the bevel box. Refer to ➤ ["6.1.1 Bevel Box Gear Oil Level, Checking", page 230](#).

Tightening Specifications

- ◆ Refer to ➤ ["4.1.1 Bevel Box OCN Assembly Overview", page 216](#)

4.3 Output Flange, Replacing; Output Flange Shim, Redetermining

- The bevel box is removed.

The adjustment is necessary whenever the output flange is being replaced. This creates the preload on the tapered roller bearing for the shaft bevel gear.

Bevel Box "OCN":

- Remove the output flange and remove the bearing inner race/ tapered roller bearing from the output flange. Refer to ➤ ["4.2.2 Bevel Box OCN Output Flange Seal, Replacing \(Bevel Box Removed\)", page 219](#).
- Measure the length of the shaft on the old and new output flange to get the difference.

Example:

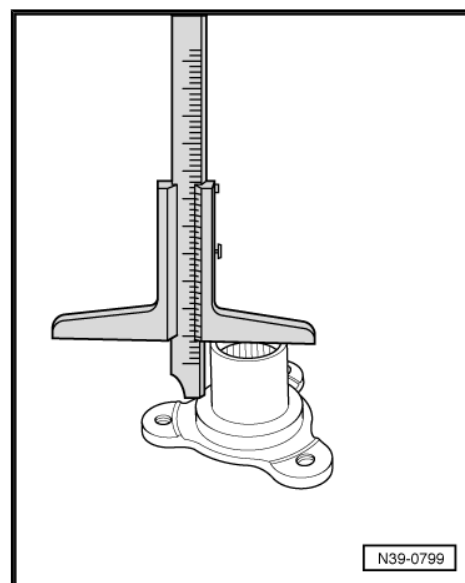
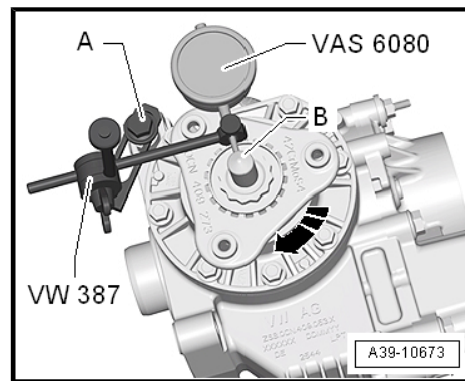
Old output flange	42.90 mm
New output flange	43.00 mm
Difference	0.10 mm

If the new output flange is longer- install a thinner shim.

If the previously mentioned output flange is longer- install a thicker shim.

Allocation. Refer to the Parts Catalog.

- Install the output flange. Refer to ➤ ["4.2.2 Bevel Box OCN Output Flange Seal, Replacing \(Bevel Box Removed\)", page 219](#).
- Install the bevel box. Refer to ➤ ["4.2 Bevel Box, Installing", page 99](#).





4.4 Needle Bearing (Polygon Bearing) and Needle Bearing Seal on Right Flange Shaft, Replacing

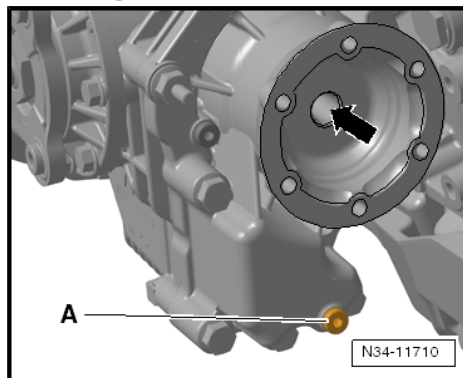
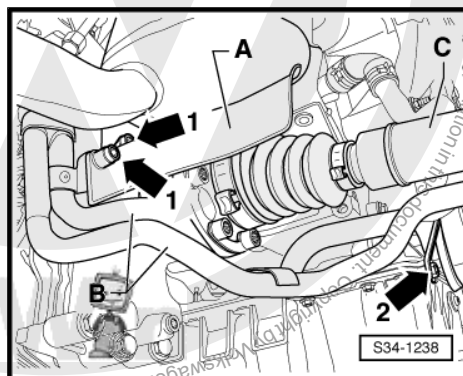
- ◆ Seal Installer - Crankshaft - VW204B-
- ◆ Puller - Flanged Shaft - T10037-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Long Hex Socket - VAG1669-
- ◆ Press Piece - Bushing - VW434-

Removing

- Remove the right wheel.
- Remove the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .
- Remove the heat shield -A- from the drive axle -C- -arrows 1-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .

The heat shield for the right drive axle is attached with 2 or 3 nuts. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .

- Remove the right drive axle -C-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .
- Place the Drip Tray or Used Oil Collection and Extraction Unit - SMN372500- underneath.
- Drain the fluid from the bevel box, bolt -A-.
- Then install new bolt and tighten. Refer to ⇒ ["4.1 Overview - Bevel Box", page 216](#) .





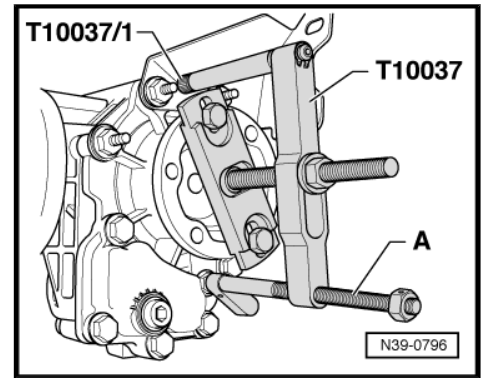
- Use a Socket Wrench to remove the right flange shaft bolt. Insert two bolts in the flange and counterhold the flange shaft with the pry lever.
- Attach the Puller - Flanged Shaft - T10037- on the right flange shaft.



Note

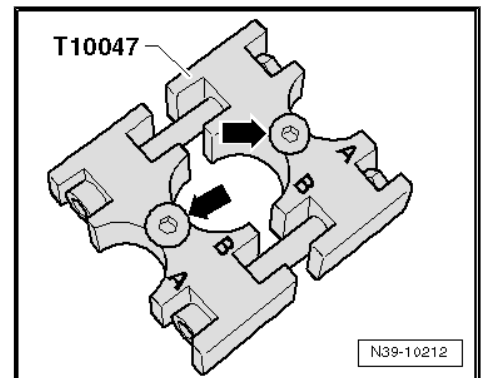
To remove the right flange shaft, use the Puller - Flanged Shaft - T10037- to avoid damaging the bearing on flange shaft.

- If necessary, place a spacer (for example, Press Piece - Bushing - VW434-) between the transmission support and the Puller - Flanged Shaft - Knurled Nut - T10371/1- .
- Turn the Spindle -A- and line up the Puller so that it is parallel to the flange.
- Remove the right flange shaft.

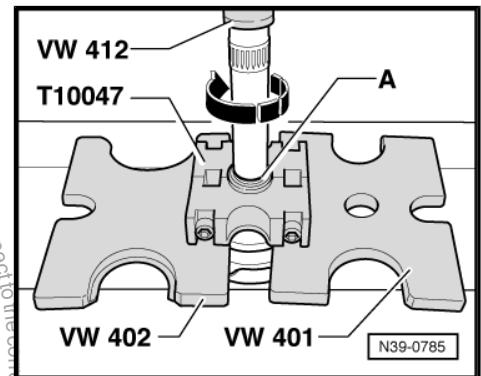


Mount the Bearing Installer - Needle Bearing - T10047- as follows:

- Line up both parts so that the markings "B" face each other.
- The depressions -arrows- must be under the bearing.
- Attach both halves to each other.

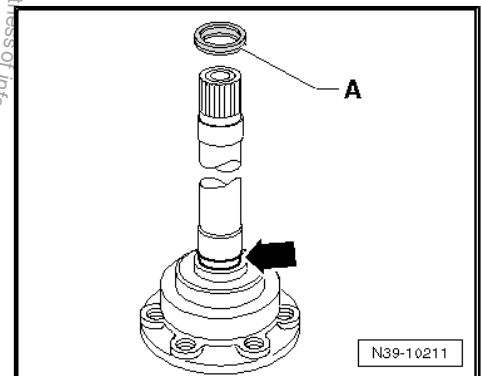


- Pry the locking ring -A- out of the needle bearing.



- So that the bearing contact surface on the shaft is not damaged, the shaft must be rotated during the pressing procedure -arrow-.
- Remove the seal -A- from the groove -arrow-.

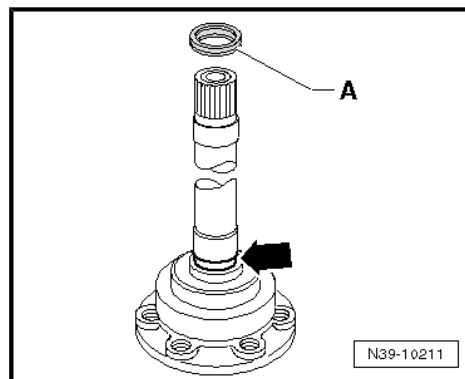
Installing



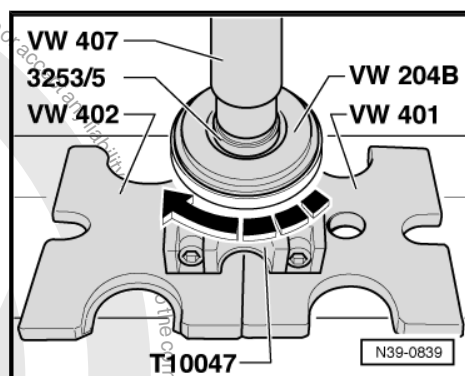


Install in reverse order of removal. Note the following:

- Coat the seal -A- with transmission fluid.
- Install the seal -A- into the groove -arrow- in the flange shaft.
- Do not twist the seal.
- Install the Bearing Installer - Needle Bearing - T10047- see Fig. N39-10212. Refer to [⇒ page 227](#) .

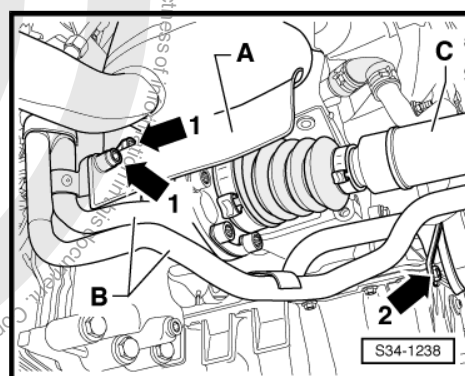


- So that the bearing contact surface on the shaft is not damaged, the shaft must be rotated during the pressing procedure -arrow-.
- Secure the needle bearing with a new locking ring.
- Carefully install the flange shaft while rotating it at the same time.
- Attach the flange shaft with screw. Refer to [⇒ "2.1 Overview - Differential", page 206](#) .
- Fill the gear oil in the bevel box. Refer to [⇒ "6.1.2 Gear Oil in Bevel Box, Filling", page 231](#) .
- Install the right drive axle -C-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .
- Install the drive axle heat shield -A- -arrows 1-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .



The heat shield for the right drive axle is attached with 2 or 3 nuts. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .

- Install the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .
- Attach the wheel. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 44 ; Wheels and Tires; Tires, Mounting .



Tightening Specification

- ◆ Refer to [⇒ "2.1 Overview - Differential", page 206](#) .



5 Haldex Clutch

⇒ [“5.1 Function, Checking”, page 229](#)

⇒ [“5.2 Haldex Clutch Pump V181 Removing and Installing”, page 229](#)

⇒ [“5.3 Haldex Clutch, Removing and Installing”, page 229](#)

5.1 Function, Checking

Refer to ⇒ Rear Final Drive; Rep. Gr. 39 ; Haldex Clutch; Function, Checking .

5.2 Haldex Clutch Pump - V181- Removing and Installing

Refer to ⇒ Rear Final Drive; Rep. Gr. 39 ; Haldex Clutch; Haldex Clutch Pump - V181- , Removing and Installing, Generation V .

5.3 Haldex Clutch, Removing and Installing

Refer to ⇒ Rear Final Drive; Rep. Gr. 39 ; Haldex Clutch; Haldex Clutch, Removing and Installing, Generation V .





6 Gear Oil

⇒ [“6.1 Gear Oil, Checking Level”, page 230](#)

6.1 Gear Oil, Checking Level

⇒ [“6.1.1 Bevel Box Gear Oil Level, Checking”, page 230](#)

⇒ [“6.1.2 Gear Oil in Bevel Box, Filling”, page 231](#)

6.1.1 Bevel Box Gear Oil Level, Checking



Note

The bevel box is attached to the side of the transmission and has its own oil system.

Bevel box gear oil. Refer to the Parts Catalog.

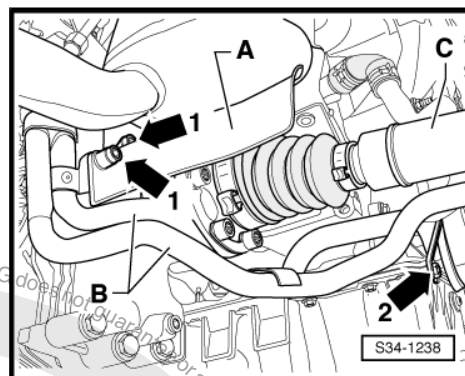
Requirements

- Bevel box must be in installation location.
- Remove the heat shield -A- from the drive axle -C- -arrows 1-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .

The heat shield for the right drive axle is attached with 2 or 3 nuts. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .

- Place the Drip Tray or Used Oil Collection and Extraction Unit -SMN372500- underneath.

Cover the area under the gear oil filler plug -arrow- with a cloth.



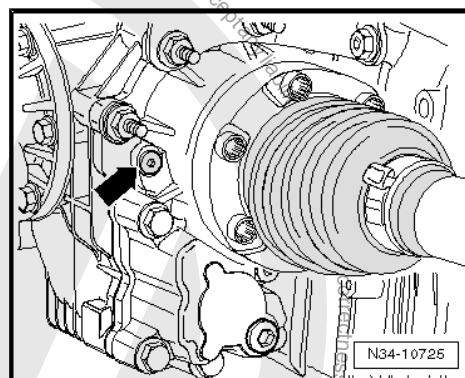
- Remove the transmission fluid filler plug -arrow- from the bevel box.
- It is necessary to replace the transmission fluid filler plug -arrow-.

Oil level is correct if bevel box is filled with oil as far as bottom edge of oil filler hole.

Remove any oil carefully that reaches the bevel box.

- Fill the gear oil. Refer to ⇒ [“6.1.2 Gear Oil in Bevel Box, Filling”, page 231](#) .
- Insert new oil filler plug -arrow- and tighten. Refer to ⇒ [“4.1 Overview - Bevel Box”, page 216](#) .
- Install the heat shield -A- to the drive axle -C- -arrows 1-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .

The heat shield for the right drive axle is attached with 2 or 3 nuts. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .



Tightening Specifications

- ♦ Oil filler plug. Refer to ⇒ [“4.1 Overview - Bevel Box”, page 216](#)



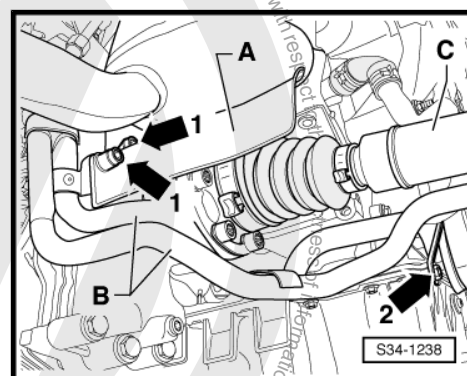
6.1.2 Gear Oil in Bevel Box, Filling

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Charging Device For Haldex Coupling 2 - VAS6291A-
- ◆ Charging Device For Haldex Coupling 2 - Adapter 3 - VAS6291/3-
- ◆ It is necessary to use the Oil Filler - Adapter 6 - VAS6262/6- on some oil containers.

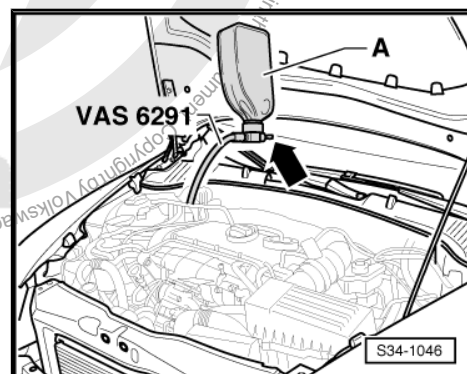
Requirements

- Bevel box must be in installation location.
- Remove the heat shield -A- (if equipped) from the drive axle -C- -arrows 1-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .

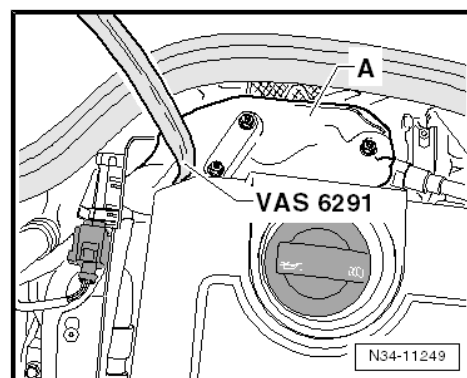


The heat shield for the right drive axle is attached with 2 or 3 nuts. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .

- Use the Charging Device For Haldex Coupling 2 - VAS6291A- to fill:
- Route the Charging Device For Haldex Coupling 2 - VAS6291A- hose through the engine compartment.



- Guide the hose from the Charging Device For Haldex Coupling 2 - VAS6291A- past the particulate filter for vehicles with a particulate filter -A- on the right side.

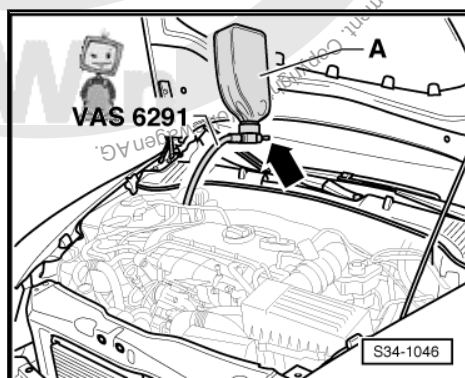
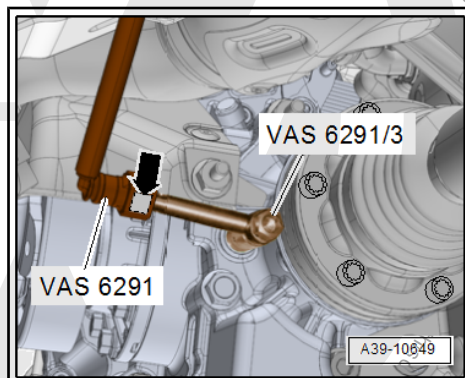
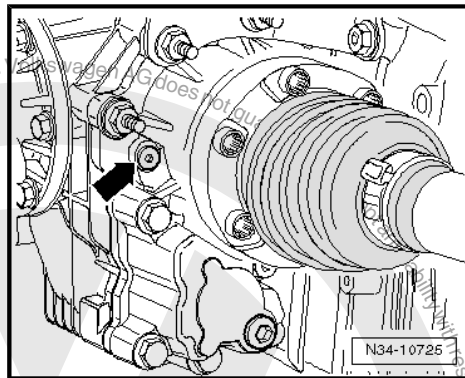




Note

Cover the area under the drain plug -arrow- with a cloth.

- Remove the transmission fluid filler plug -arrow- from the bevel box.
 - Disconnect the Charging Device For Haldex Coupling 2 - Adapter 3 - VAS6291/3- and the elbow -arrow-.
 - Install the Adapter all the way.
 - Lock the elbow to the Adapter
 - Close the valve -arrow-.
 - Attach the oil container -A- to the Charging Device For Haldex Coupling 2 - VAS6291A- .
 - The hose must not hang through.
 - Open the valve -arrow- and hold the oil container as illustrated.
- The bevel box is now filled.
- Lift the vehicle after a few minutes.





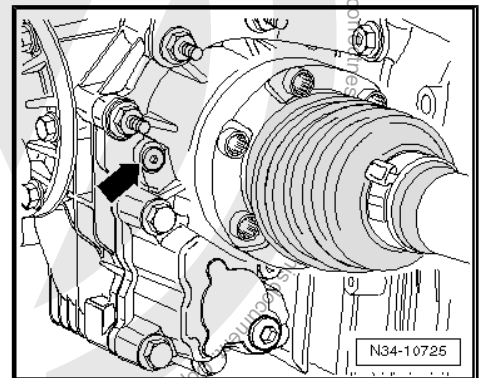
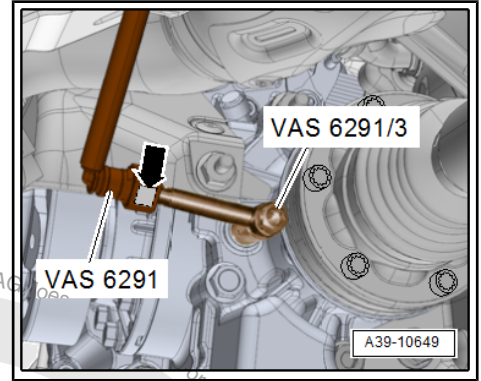
Note

- ◆ If the bevel box is filled correctly, oil should leak out of the Charging Device For Haldex Coupling 2 - Adapter 3 - VAS6291/3- .
- ◆ If no oil is escaping, lower the vehicle and perform filling procedure again.

- Lift the vehicle.
- Set down the oil container (for example, on a tool cart) when the oil starts to leak out of the Adapter .

A portion of the excess oil runs back into the oil container.

- When the oil stops flowing, disconnect the Charging Device For Haldex Coupling 2 - VAS6291A- by pressing the tab in -arrow-.
- Make sure there is still oil in the Charging Device For Haldex Coupling 2 - VAS6291A- hose.
- Remove the Adapter .
- Install the »old« oil filler plug and tighten it lightly.
- Start the engine, engage a gear and let the transmission turn for approximately 2 minutes.
- Switch off engine and remove oil filler plug.
- Check the oil level and fill again with oil up to lower edge of filler hole.
- Insert new oil filler plug -arrow- and tighten. Refer to [⇒ "4.1 Overview - Bevel Box", page 216](#) .
- Remove any oil that reaches the bevel box and other components carefully.
- Install the heat shield -A- to the drive axle -C- -arrows 1-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing.



The heat shield for the right drive axle is attached with 2 or 3 nuts. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .

Tightening Specifications

- ◆ Refer to [⇒ "4.1 Overview - Bevel Box", page 216](#) .



7 High-Performance Haldex Clutch Oil

Refer to ⇒ Rear Final Drive; Rep. Gr. 39 ; High-Performance
Haldex Clutch Oil .

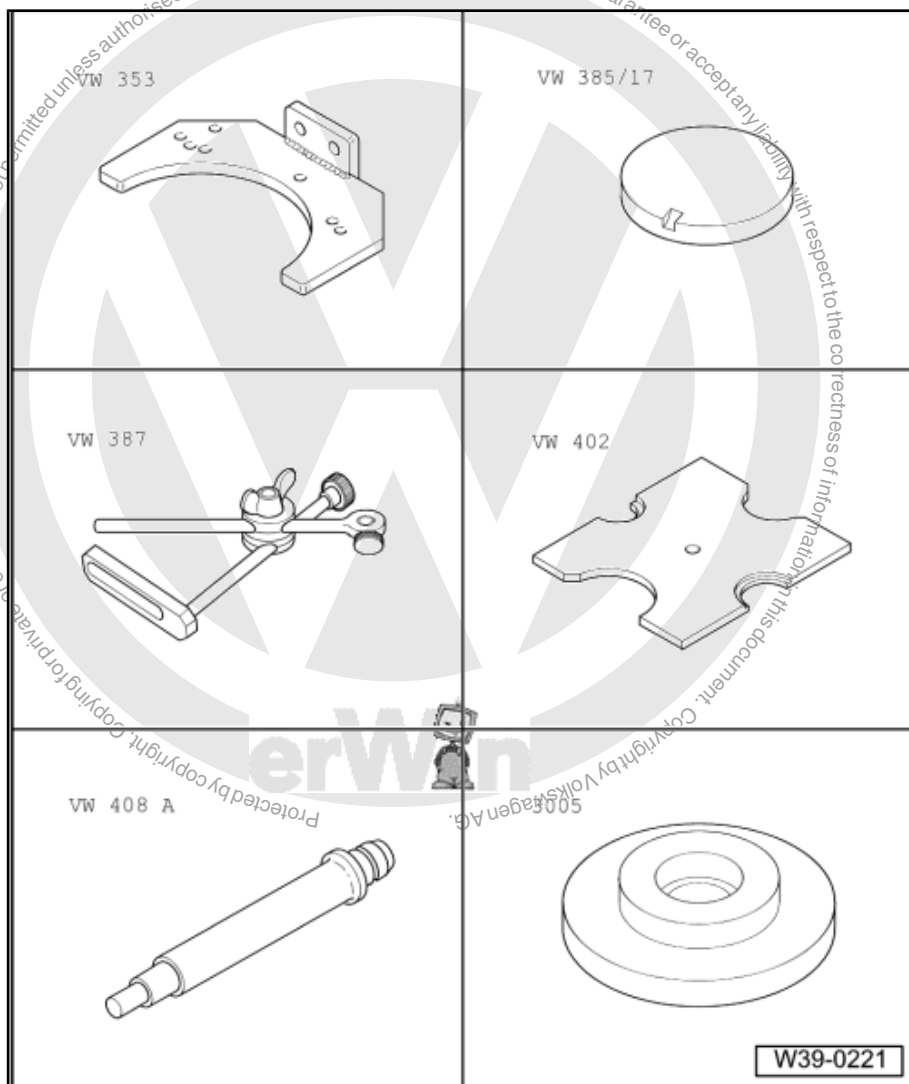




8 Special Tools

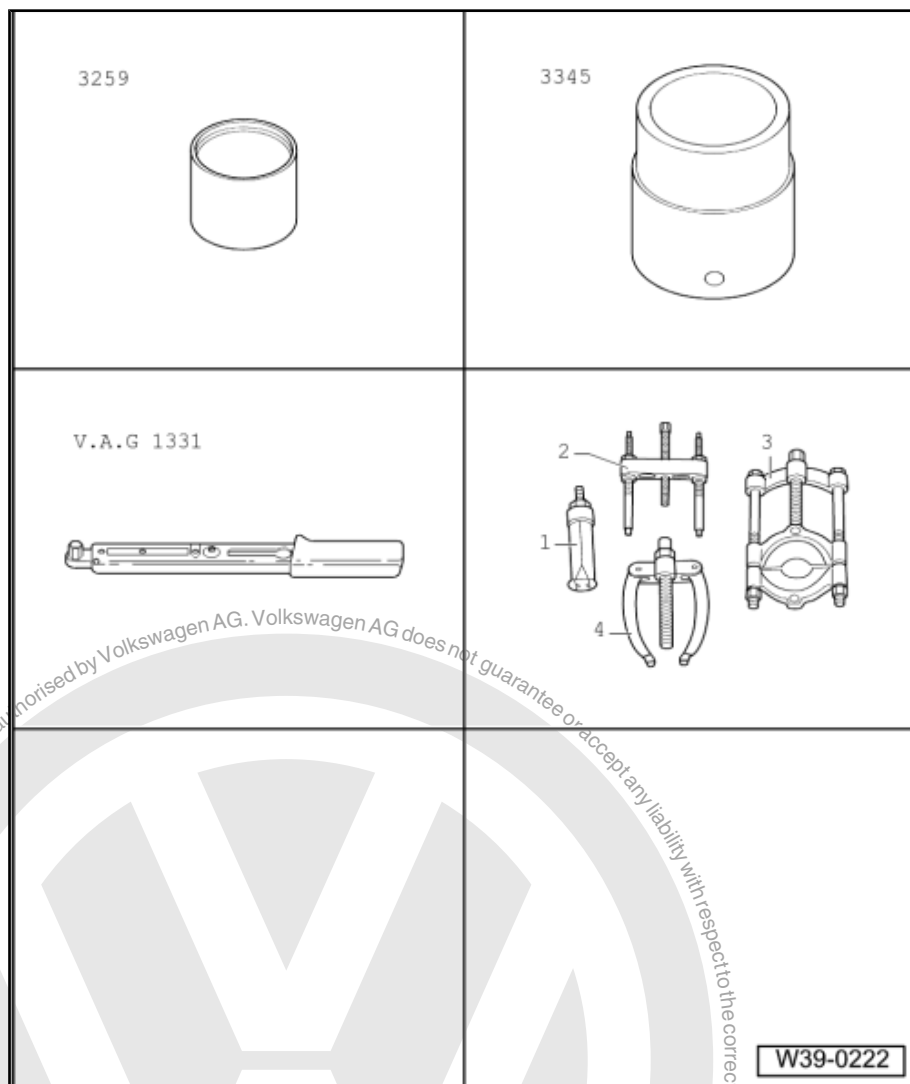
Special tools and workshop equipment required

- ◆ Transmission Support - VW353-
- ◆ Measuring Set - Magnetic Plate - 50mm - VW385/17-
- ◆ Dial Gauge Holder - VW387-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Multiple Use - 3005-



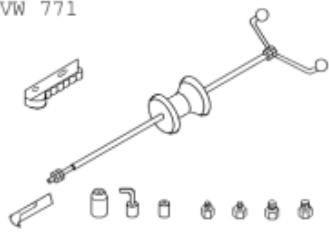
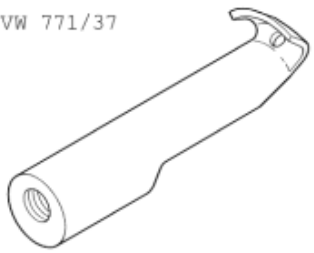
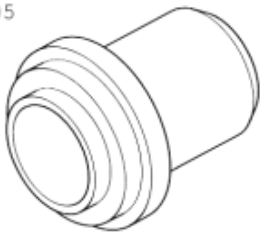




- ◆ Press Piece - Bushing - 3259-
- ◆ Bearing Installer - Wheel Bearing - 3345-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ -1- Puller - Kukko Internal - 46-56mm - 21/7-
- ◆ -4- Puller - Kukko Counter-stay - 22/2-





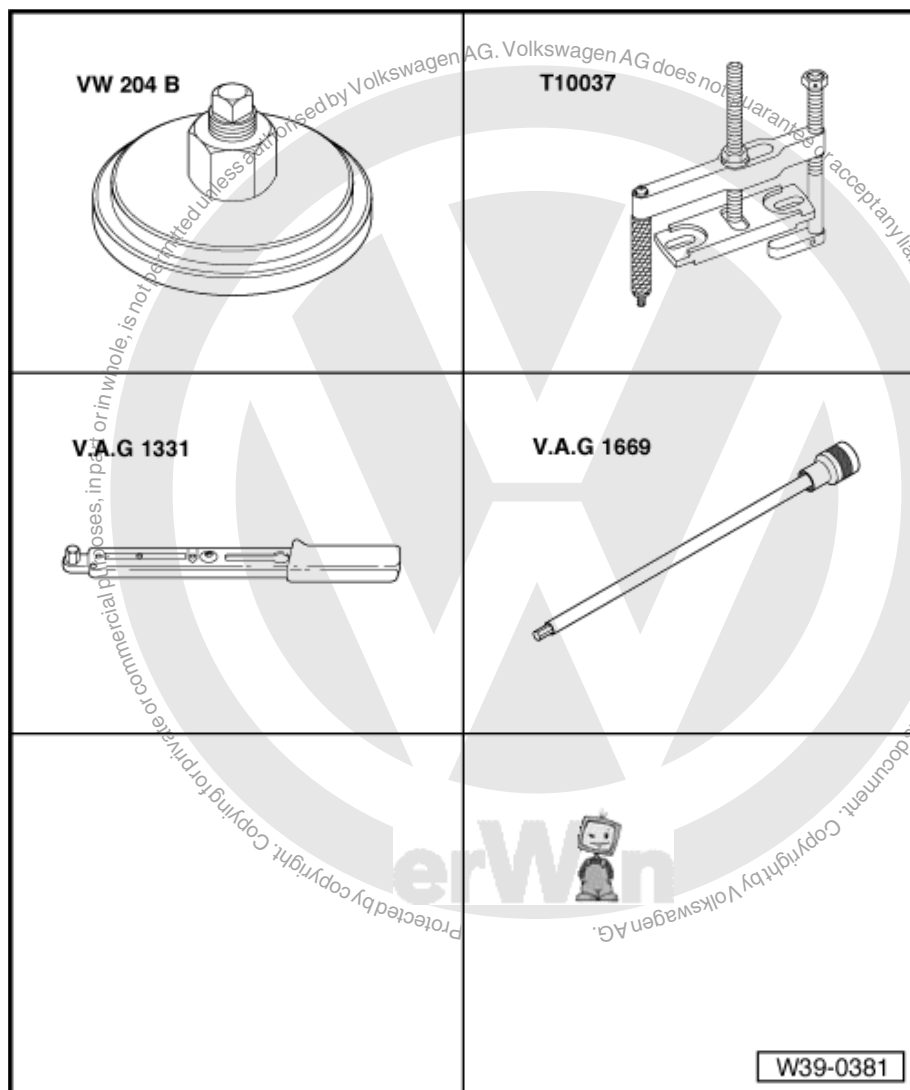
- ◆ Slide Hammer Set - VW771-
- ◆ Slide Hammer Set - Hook - VW771/37-
- ◆ Seal Installer - Flange Shaft - 3305-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Torque Wrench 1332 40-200Nm - VAG1332-

<p>VW 771</p> 	<p>VW 771/37</p> 
<p>3305</p> 	<p>V.A.G 1331</p> 
<p>V.A.G 1332</p> 	<p>W39-0226</p>



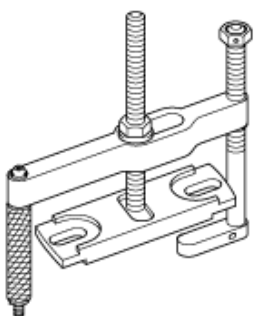
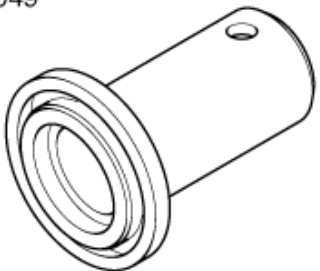




- ◆ Seal Installer - Crankshaft - VW204B-
- ◆ Puller - Flanged Shaft - T10037-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Long Hex Socket - VAG1669-



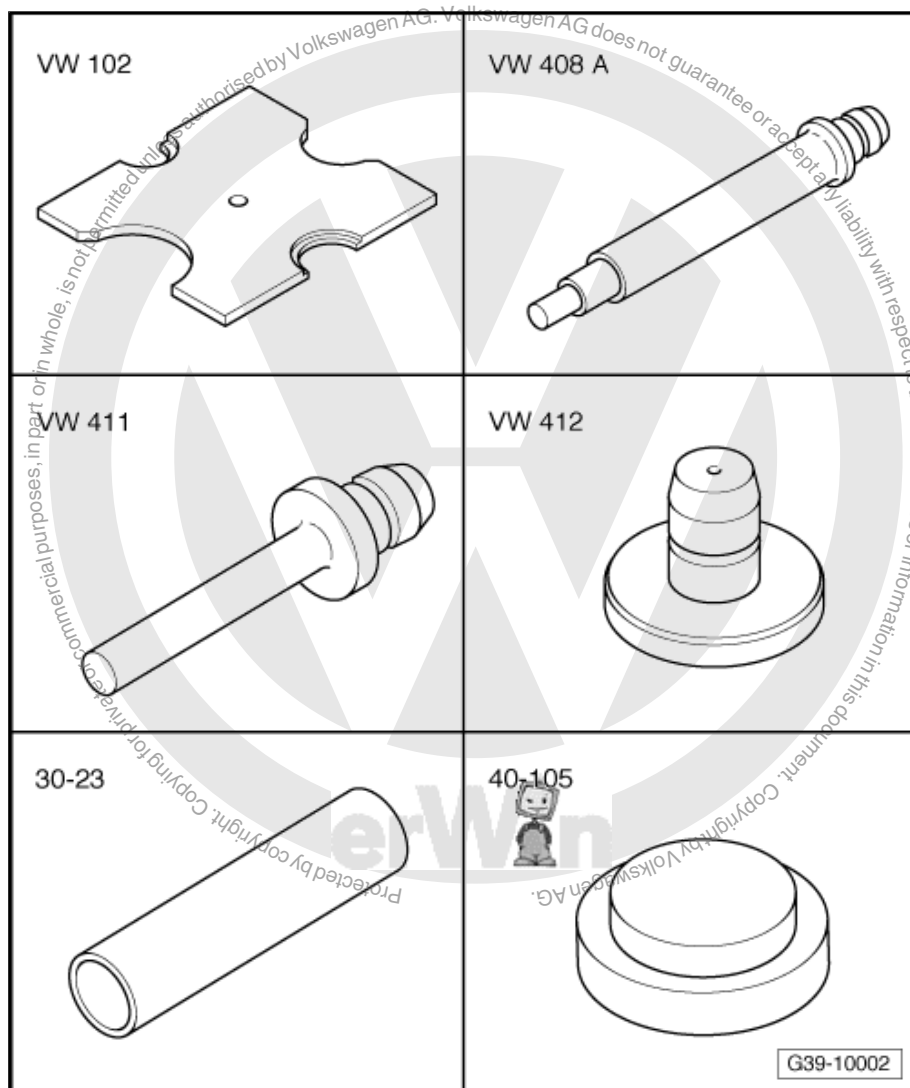


- ◆ Puller - Flanged Shaft - T10037-
- ◆ Seal Installer - Flange Shaft - T10049-
- ◆ Socket And Extended Bit - T10107A-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-

<p>T10037</p> 	<p>T10049</p> 
<p>T10107</p> 	<p>V.A.G 1331</p> 
<p>G39-10001</p>	

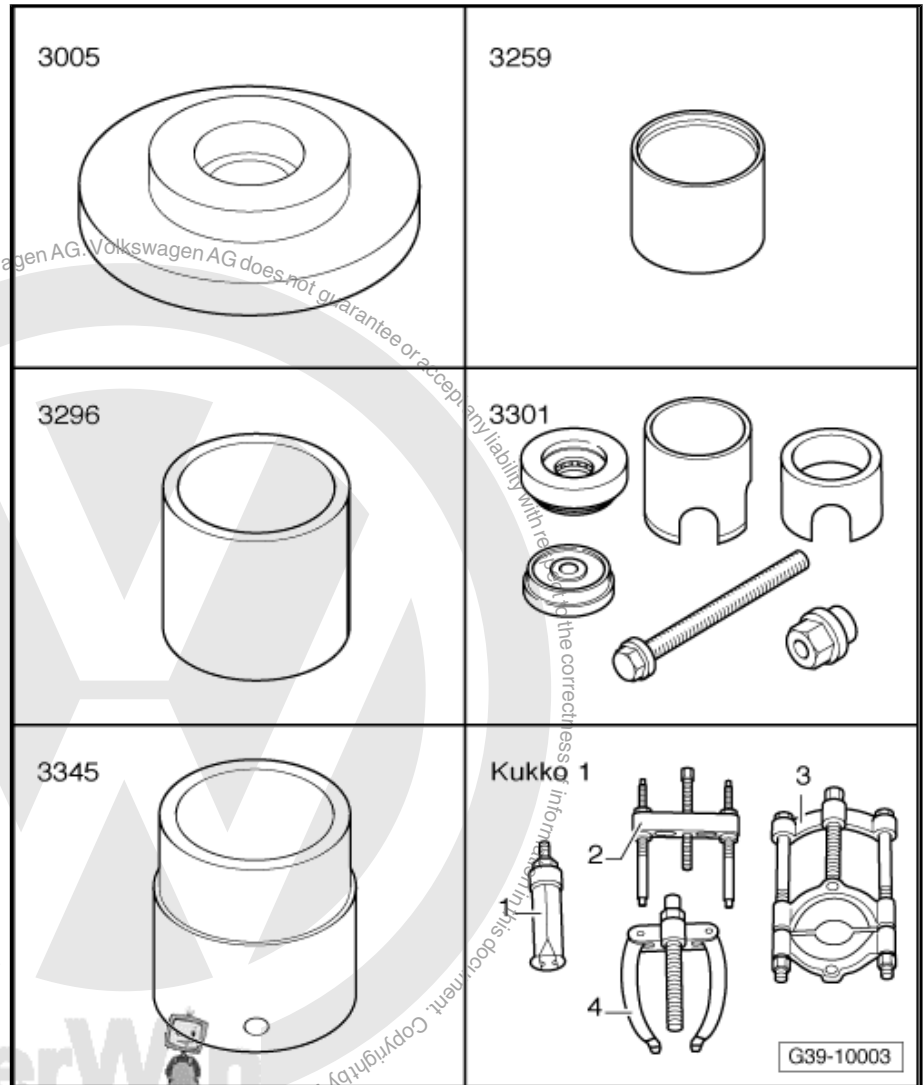


- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Rod - VW411-
- ◆ Press Piece - Multiple Use - VW412-
- ◆ Press Piece - Multiple Use - 30-23-
- ◆ Press Piece - Multiple Use - 40-105-



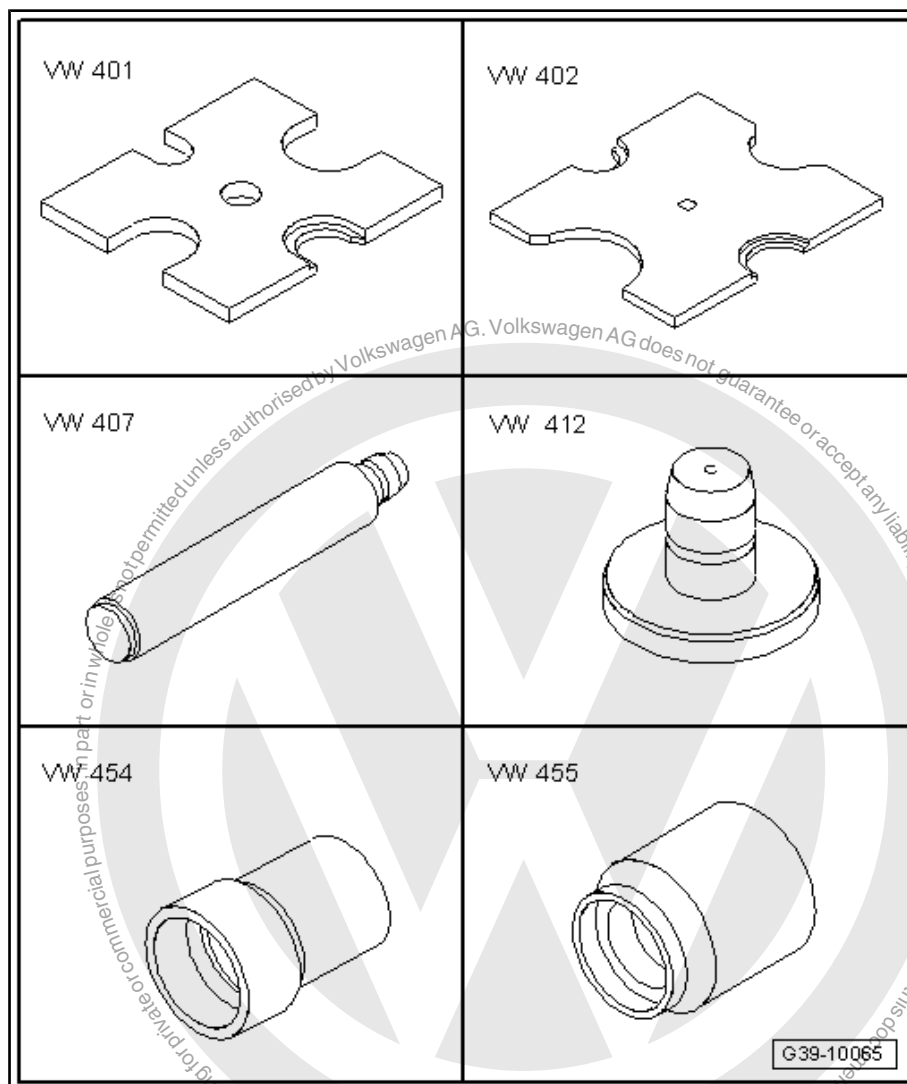


- ◆ Press Piece - Multiple Use - 3005-
- ◆ Press Piece - Bushing - 3259-
- ◆ Press Piece - Reverse Gear Syncro - 3296-
- ◆ Subframe Bushing Tool Kit - 3301-
- ◆ Bearing Installer - Wheel Bearing - 3345-
- ◆ 1. Puller - Kukko Internal - 46-56mm - 21/7-
- ◆ 2. Puller - Kukko Puller - 60-150mm Width, 200mm Length - 18/1-
- ◆ 3. Puller - Kukko Quick Action Separating Tool - 12-75mm - 17/1-
- ◆ 4. Puller - Kukko Counterstay - 22/2-



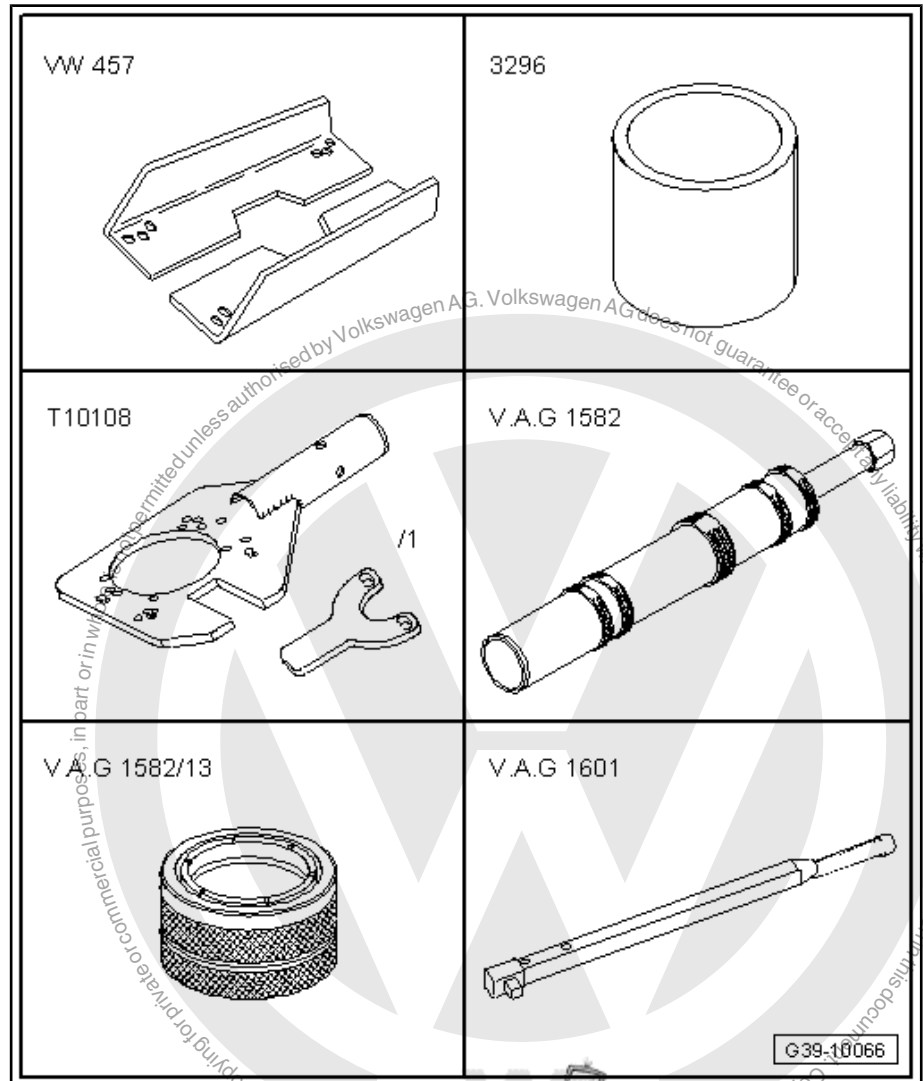


- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Multiple Use - VW412-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Multiple Use - VW455-

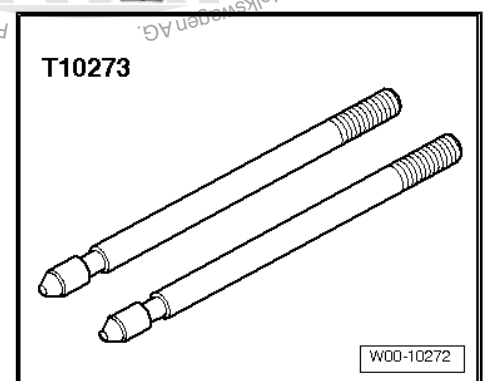




- ◆ Support Channels - VW457-
- ◆ Press Piece - Reverse Gear Syncro - 3296-
- ◆ Gearbox Support - T10108-
- ◆ Gearbox Support - T10108/1-
- ◆ Puller - Taper Roller Bearing - VAG1582- with a short sleeve
- ◆ Puller - Taper Roller Bearing - Adapter 13 - VAG1582/13-
- ◆ Torque Wrench 1601 - VAG1601-

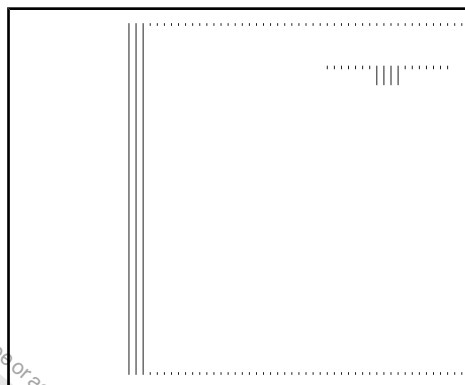


- ◆ Two M8 x 30 mm stud bolts or Guide Pins - M8 - T10273-

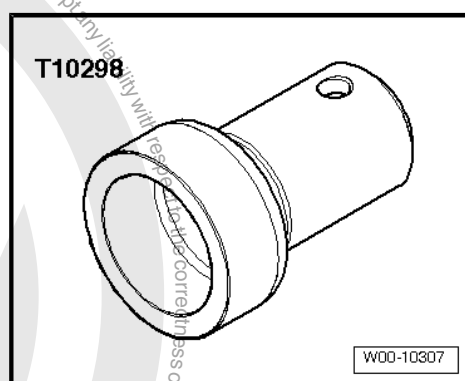




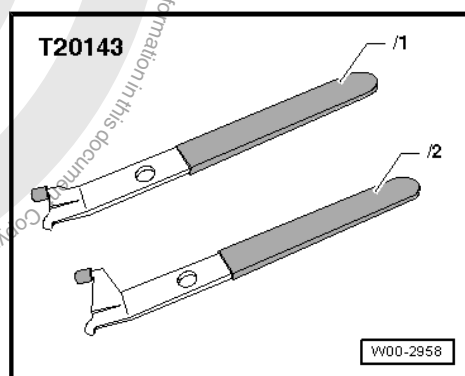
- ◆ Seal Installer - Bevel Box - T10243-



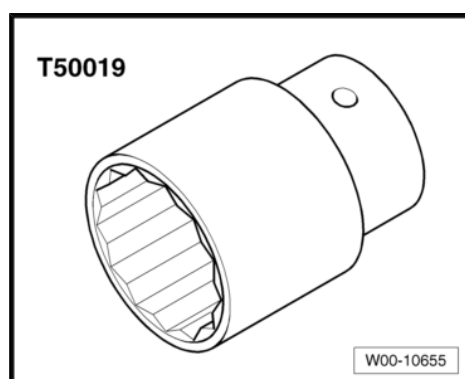
- ◆ Seal Installer - Bevel Box - T10298-



- ◆ Puller - Crankshaft/Power Steering Seal - Component 2 - T20143/2-

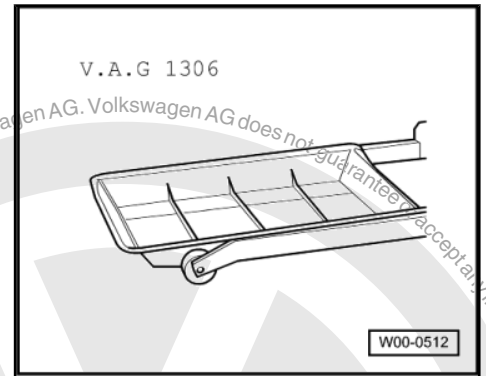


- ◆ Socket AF 34 mm - T50019-

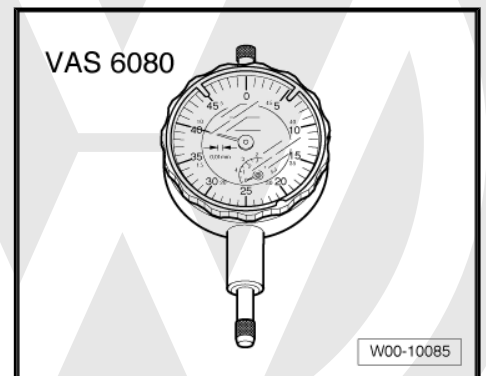




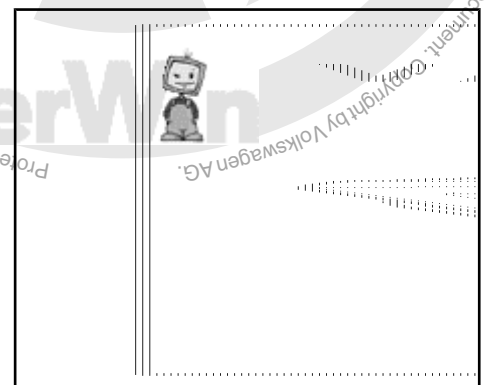
- ◆ Drip Tray for VAG1202A - VAG1306-



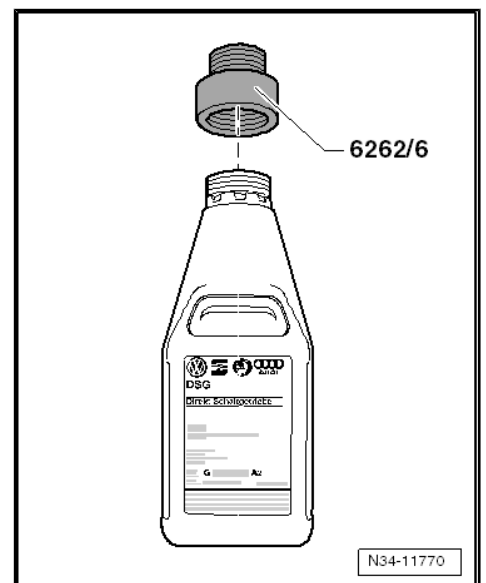
- ◆ Dial Indicator - VAS6080A-



- ◆ Shop Crane - Drip Tray - VAS6208-

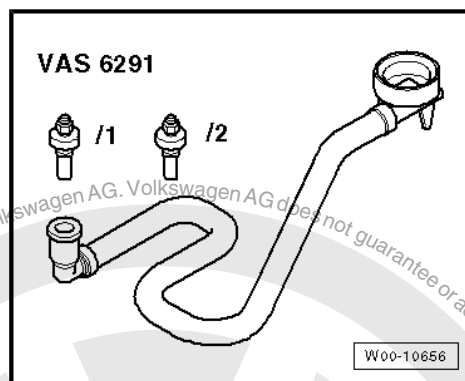


- ◆ It is necessary to use the Oil Filler - Adapter 6 - VAS6262/6- on some oil containers.

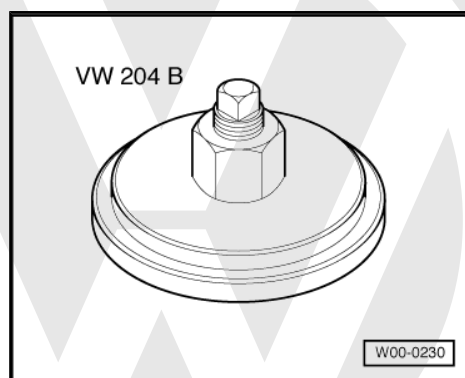




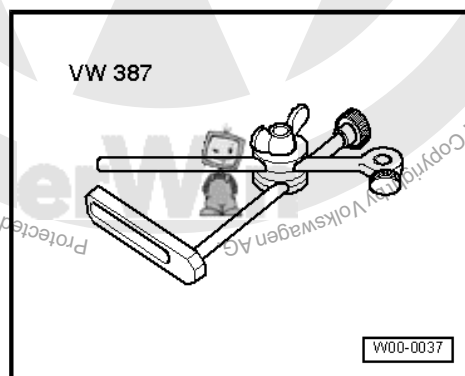
◆ Charging Device For Haldex Coupling 2 - VAS6291A-



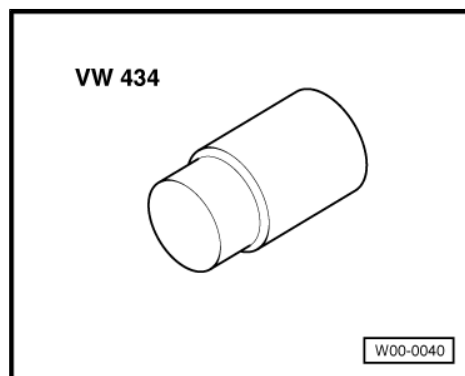
◆ Seal Installer - Crankshaft - VW204B-



◆ Dial Gauge Holder - VW387-

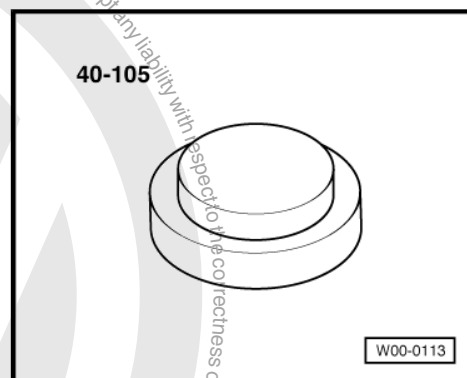


◆ Press Piece - Bushing - VW434-

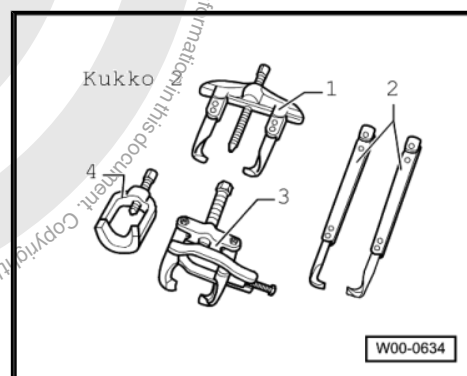




- ◆ Press Piece - Multiple Use - 40-105-



- ◆ Puller - Kukko 2-Arm w/Side Clamp, 100mm Width, 100mm Length - 204/2-



- ◆ Charging Device For Haldex Coupling 2 - Adapter 3 - VAS6291/3-

Edition: K0059213121 - FU - 04/09/2015 – JLH



9 Revision History

Re vi- sion	Date	Job Type	Feedback #	Notes	Editor
4	04/ 09/ 201 5	Factory Up- date			Jim Harder
3	12/ 03/ 201 4	Factory Up- date	N/A	Added AU1 and 0FB2 to metadata, plus minor changes	Eric Puter- baugh
2	11/ 20/ 201 4	Link Check- ing	N/A		Eric Puter- baugh
1	11/ 06/ 201 4	Factory New	N/A		Eric Puter- baugh

Cautions & Warnings

Please read these WARNINGS and CAUTIONS before proceeding with maintenance and repair work. You must answer that you have read and you understand these WARNINGS and CAUTIONS before you will be allowed to view this information.

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized Volkswagen retailer or other qualified shop. We especially urge you to consult an authorized Volkswagen retailer before beginning repairs on any vehicle that may still be covered wholly or in part by any of the extensive warranties issued by Volkswagen.
- Disconnect the battery negative terminal (ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.
- Volkswagen is constantly improving its vehicles and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only. Always check with your authorized Volkswagen retailer parts department for the latest information.
- Any time the battery has been disconnected on an automatic transmission vehicle, it will be necessary to reestablish Transmission Control Module (TCM) basic settings using the VAG 1551 Scan Tool (ST).
- Never work under a lifted vehicle unless it is solidly supported on stands designed for the purpose. Do not support a vehicle on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never work under a vehicle that is supported solely by a jack. Never work under the vehicle while the engine is running.
- For vehicles equipped with an anti-theft radio, be sure of the correct radio activation code before disconnecting the battery or removing the radio. If the wrong code is entered when the power is restored, the radio may lock up and become inoperable, even if the correct code is used in a later attempt.
- If you are going to work under a vehicle on the ground, make sure that the ground is level. Block the wheels to keep the vehicle from rolling. Disconnect the battery negative terminal (ground strap) to prevent others from starting the vehicle while you are under it.
- Do not attempt to work on your vehicle if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset or have taken medicine or any other substances that may impair you or keep you from being fully alert.
- Never run the engine unless the work area is well ventilated. Carbon monoxide (CO) kills.
- Always observe good workshop practices. Wear goggles when you operate machine tools or work with acid. Wear goggles, gloves and other protective clothing whenever the job requires working with harmful substances.
- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.
- Do not re-use any fasteners that are worn or deformed in normal use. Some fasteners are designed to be used only once and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual - replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.



Cautions & Warnings

- Illuminate the work area adequately but safely. Use a portable safety light for working inside or under the vehicle. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.
- Friction materials such as brake pads and clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.
- Finger rings should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.
- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly; do not attempt shortcuts. Use tools that are appropriate to the work and use only replacement parts meeting Volkswagen specifications. Makeshift tools, parts and procedures will not make good repairs.
- Catch draining fuel, oil or brake fluid in suitable containers. Do not use empty food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store the oily rags, which can ignite and burn spontaneously.
- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque listed.
- Keep sparks, lighted matches, and open flame away from the top of the battery. If escaping hydrogen gas is ignited, it will ignite gas trapped in the cells and cause the battery to explode.
- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond, or lake. Consult local ordinances that govern the disposal of wastes.
- The air-conditioning (A/C) system is filled with a chemical refrigerant that is hazardous. The A/C system should be serviced only by trained automotive service technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.
- Before doing any electrical welding on vehicles equipped with anti-lock brakes (ABS), disconnect the battery negative terminal (ground strap) and the ABS control module connector.
- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.
- When boost-charging the battery, first remove the fuses for the Engine Control Module (ECM), the Transmission Control Module (TCM), the ABS control module, and the trip computer. In cases where one or more of these components is not separately fused, disconnect the control module connector(s).
- Some of the vehicles covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag in the event of a frontal impact. The airbag is operated by an explosive device. Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious personal injury. To guard against personal injury or airbag system failure, only trained Volkswagen Service technicians should test, disassemble or service the airbag system.

Cautions & Warnings

- Do not quick-charge the battery (for boost starting) for longer than one minute, and do not exceed 16.5 volts at the battery with the boosting cables attached. Wait at least one minute before boosting the battery a second time.
- Never use a test light to conduct electrical tests of the airbag system. The system must only be tested by trained Volkswagen Service technicians using the VAG 1551 Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the vehicle.
- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.
- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.

I have read and I understand these Cautions and Warnings.