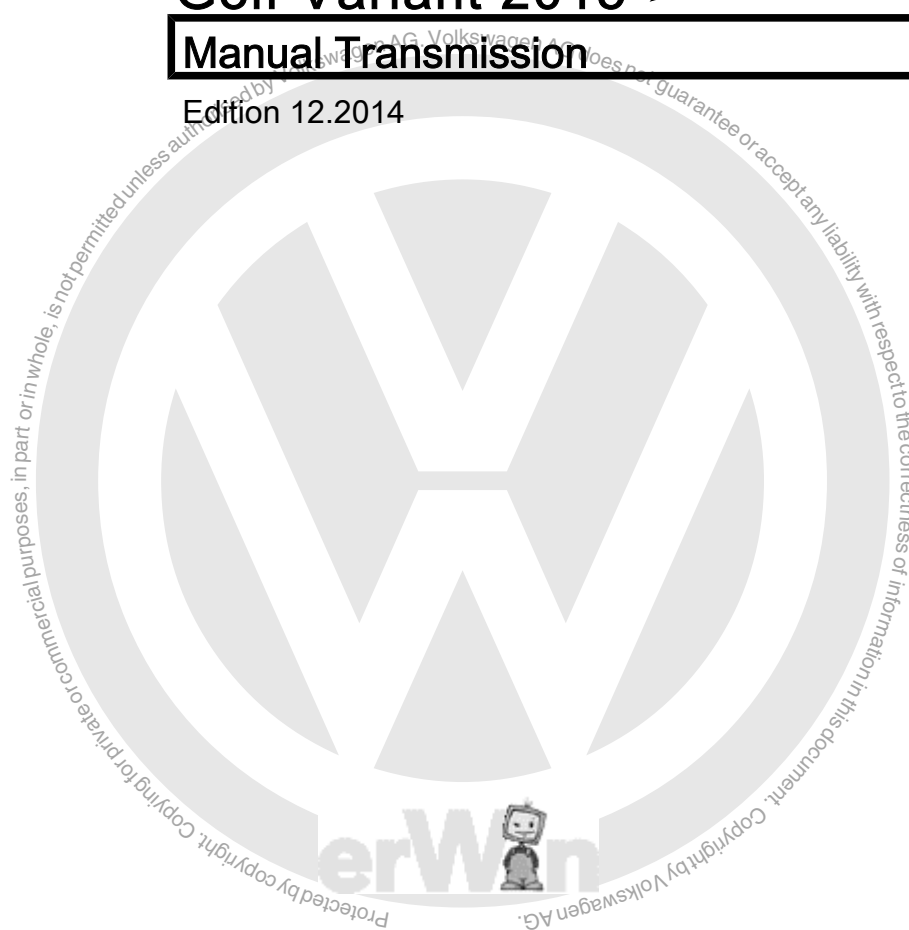




Repair Manual Golf 2015 ➤ Golf Variant 2015 ➤ **Manual Transmission**

Edition 12.2014





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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00 – General, Technical Data

1 Safety Precautions

(Edition 12.2014)

⇒ [“1.1 Start/Stop System Safety Precautions”, page 1](#)

1.1 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.*



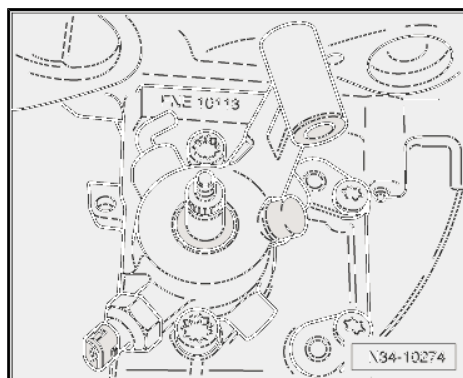
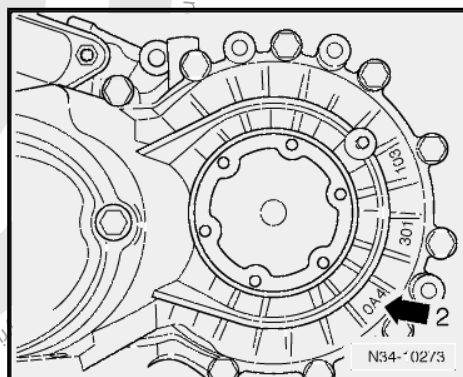
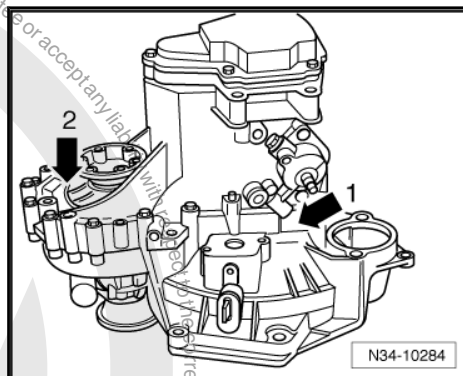
2 Identification

⇒ "2.1 Transmission Identification", page 2

2.1 Transmission Identification

Code Letters and Build Date -arrow 1- Manual Transmission 0A4
-arrow 2-

Manual Transmission 0A4 -arrow 2-



Transmission Code Letters and Build Date

Example:	FNE	10	11	3
	Codes	Day	Month	Year (2003) 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 3**

3.1 General Repair Information

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

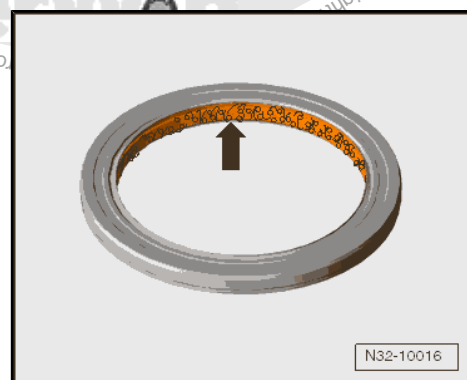
- ◆ Make sure that the alignment sleeves between the engine and transmission are positioned correctly when installing the transmission.
- ◆ Clean the contact surfaces when installing brackets as well as parts that have been waxed. Contact surfaces must be free of wax and grease.
- ◆ Allocate the bolts 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 Sealing Compound - 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

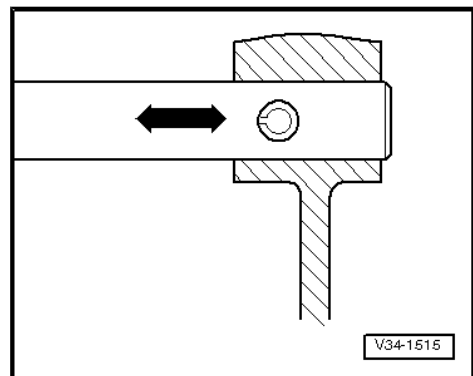
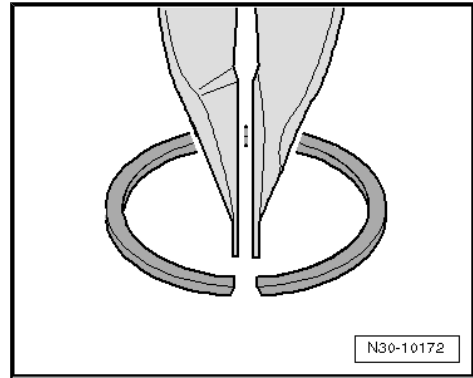
- ◆ Replace the circlips.
- ◆ Do not overstretch the circlips.
- ◆ The circlips must fit completely inside the groove.
- ◆ Replace the adapter sleeves. Installed position: slot is lengthwise to line of force.

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 bolts 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

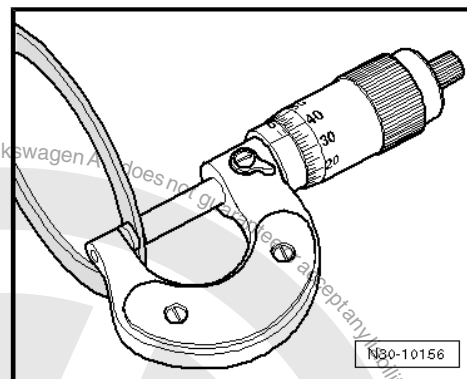
- ◆ Insert the bearings with transmission fluid.
- ◆ Install the new tapered roller bearings. It is not necessary to oil them.
- ◆ Install needle bearings with lettered side (thicker metal) racing the fitting tool.
- ◆ Replace all the tapered roller bearings that are on the same shaft. Use tapered roller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





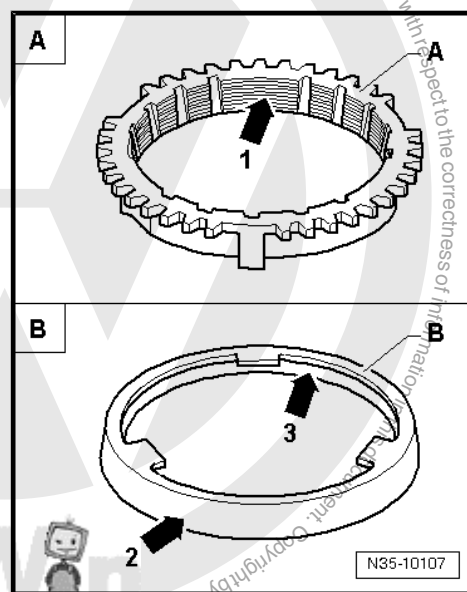
Adjusting Shims

- ◆ 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 and warm to maximum 100 °C (212 °F) using the Inductive Heat Unit - VAS6414- before installing.
- ◆ 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 6

⇒ "4.2 Capacities", page 6

⇒ "4.3 Gear Ratio Calculation", page 7

4.1 Transmission/Engine Allocation

⇒ "4.1.1 Transmission/Engine Allocation, Golf", page 6

⇒ "4.1.2 Transmission/Engine Allocation, Golf Wagon", page 6

4.1.1 Transmission/Engine Allocation, Golf

Manual Transmission		5-Speed Manual Transmission 0A4	
Codes		NZA	
Manufactured	from through	06/2013	
Allocation	Engine	1.8L - 125 kW	
Ratio Z1 : Z2	Final Drive	61 : 18 = 3.389	
Drive axle flange diameter		100 mm	

Refer to the Parts Catalog for the following information:

- ◆ The individual gear ratios
- ◆ Transmission fluid
- ◆ Clutch allocation

4.1.2 Transmission/Engine Allocation, Golf Wagon

Manual Transmission		5-Speed Manual Transmission 0A4	
Codes		QSY	
Manufactured	from through	11/2014	
Allocation	Engine	1.8L - 125 kW	
Ratio Z1 : Z2	Final Drive	61 : 18 = 3.389	
Drive Axle flange diameter		100 mm	

Refer to the Parts Catalog for the following information:

- ◆ The individual gear ratios
- ◆ Transmission fluid
- ◆ Clutch allocation

4.2 Capacities

Manual transmission capacity (transmission completely disassembled)	Refer to ⇒ Fluid Capacity Tables; Rep. Gr. 03
Manual transmission capacity (transmission partly disassembled)	Refer to ⇒ Fluid Capacity Tables; Rep. Gr. 03



4.3 Gear Ratio Calculation

Example:

	6th Gear	Final Drive
Drive gear	$Z_{G1} = 47$	$Z_{A1} = 18$
Driven gear	$Z_{G2} = 31$	$Z_{A2} = 61$

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

i_G = gear ratio = $Z_{G2} : Z_{G1} = 31 : 47 = 0.660$

i_A = axle ratio = $Z_{A2} : Z_{A1} = 61 : 18 = 3.389$

i_{total} = total ratio = $i_G \times i_A = 0.660 \times 3.389 = 2.237$



5 Overview - Powertrain

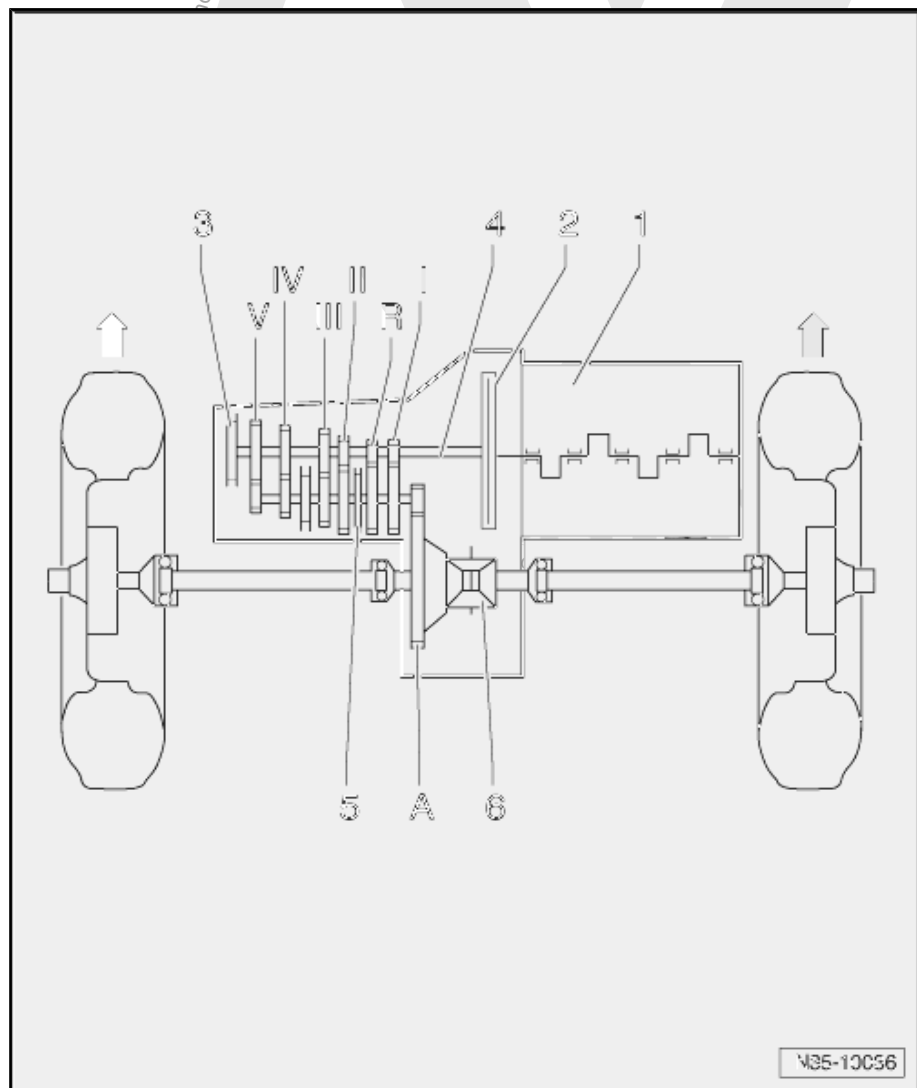
⇒ "5.1 Overview - Powertrain, Front Wheel Drive", page 8

5.1 Overview - Powertrain, Front Wheel Drive

Name

The -arrows- point in the direction of travel.

- 1 - Engine
- 2 - Clutch
- 3 - Manual Transmission
- 4 - Input Shaft
- 5 - Output Shaft
- 6 - Differential



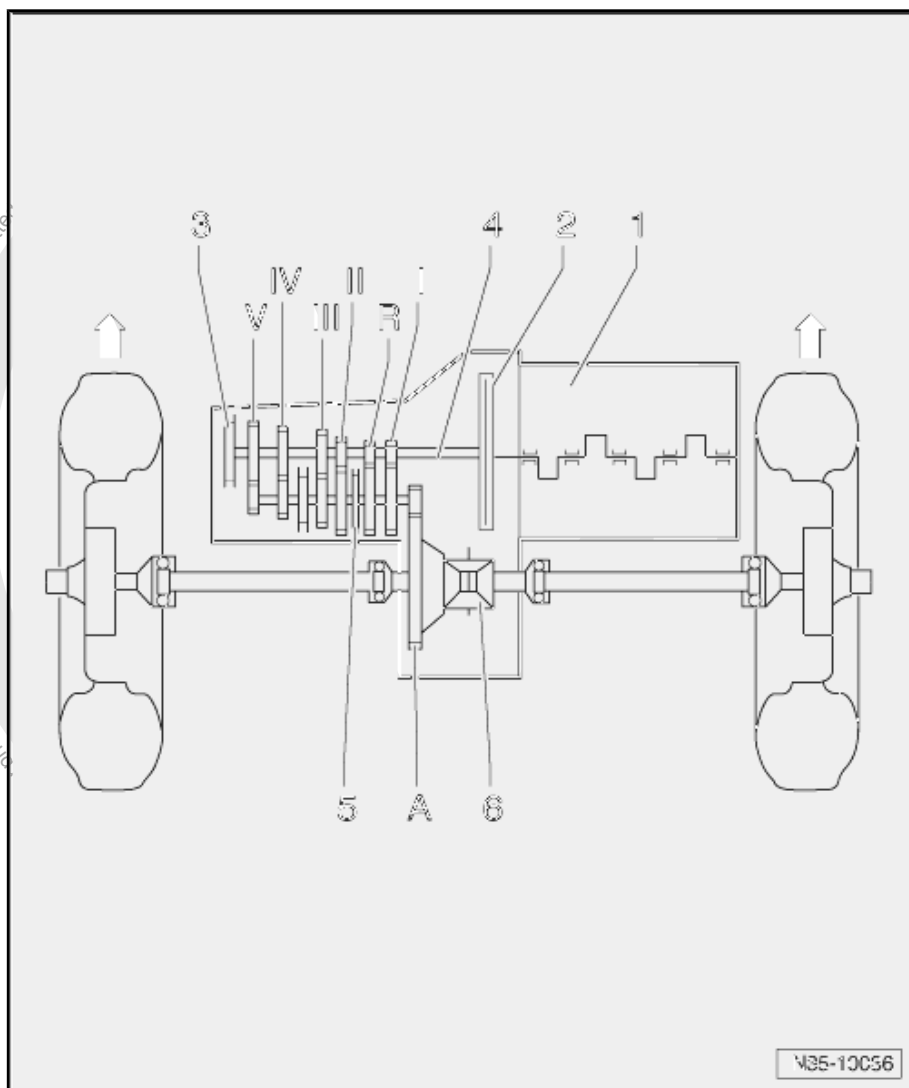
Ratio

The -arrows- point in the direction of travel.



- I - 1st Gear
- II - 2nd Gear
- III - 3rd Gear
- IV - 4th Gear
- V - 5th Gear
- R - Reverse Gear
- A - Final Drive

Private or commercial purposes, in part or in whole, is not permitted.





6 Electrical Components

⇒ ["6.1 Component Location Overview - Electrical Components", page 10](#)

6.1 Component Location Overview - Electrical Components

⇒ ["6.1.1 Component Location Overview - Electrical Components, Manual Transmission", page 10](#)

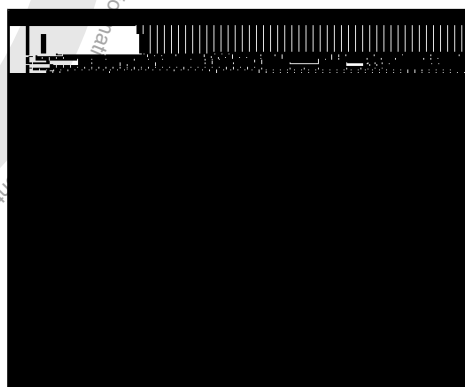
⇒ ["6.1.2 Component Location Overview - Electrical Components, Clutch Mechanism", page 10](#)

6.1.1 Component Location Overview - Electrical Components, Manual Transmission

Back-Up Lamp Switch - F4- -arrow -

Component location: on the shift unit

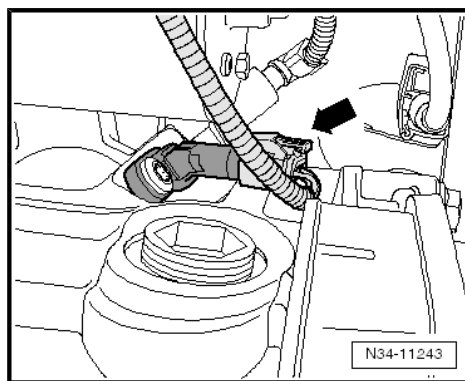
Back-Up Lamp Switch - F4- , Removing and installing. Refer to
⇒ ["5.5 Overview - Shift Unit", page 96](#) .



Transmission Neutral Position Sensor - G701- -arrow -

Component location: on top of the oil filler plug.

Transmission Neutral Position Sensor - G701- , Removing and installing. Refer to
⇒ ["5.4 Overview - Transmission Housing and Selector Mechanism", page 95](#) .

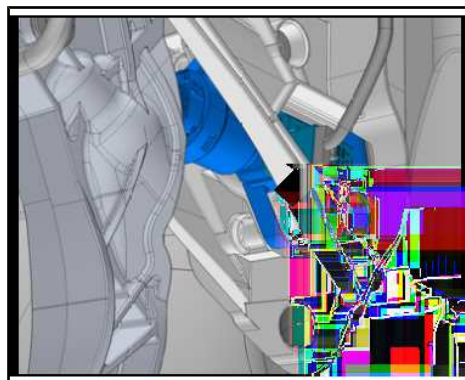


6.1.2 Component Location Overview - Electrical Components, Clutch Mechanism

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
⇒ ["1.15 Clutch Position Sensor G476 , Removing and Installing", page 34](#) .





30 – Clutch

1 Clutch Mechanism

⇒ [“1.1 Component Location Overview - Clutch Mechanism”, page 11](#)

⇒ [“1.2 Overview - Pedal Assembly”, page 13](#)

⇒ [“1.3 Overview - Clutch Hydraulics”, page 15](#)

⇒ [“1.4 Overview - Clutch Release Mechanism”, page 18](#)

⇒ [“1.5 Clutch Pedal, Removing and Installing”, page 19](#)

⇒ [“1.6 Bearing Bushing, Removing and Installing”, page 20](#)

⇒ [“1.7 Over-Center Spring, Removing and Installing”, page 21](#)

⇒ [“1.8 Return Spring, Removing and Installing”, page 23](#)

⇒ [“1.9 Mounting Bracket, Removing and Installing”, page 26](#)

⇒ [“1.10 Clutch Master Cylinder, Removing and Installing”, page 29](#)

⇒ [“1.11 Clutch Slave Cylinder, Removing and Installing”, page 30](#)

⇒ [“1.12 Clutch Mechanism Lines, Removing and Installing”, page 31](#)

⇒ [“1.13 Clutch Mechanism, Bleeding”, page 33](#)

⇒ [“1.14 Clutch Master and Clutch Slave Cylinder, Checking”, page 34](#)

⇒ [“1.15 Clutch Position Sensor G476 , Removing and Installing”, page 34](#)

⇒ [“1.16 Clutch Release Mechanism, Servicing”, page 35](#)

1.1 Component Location Overview - Clutch Mechanism



I - Refer to

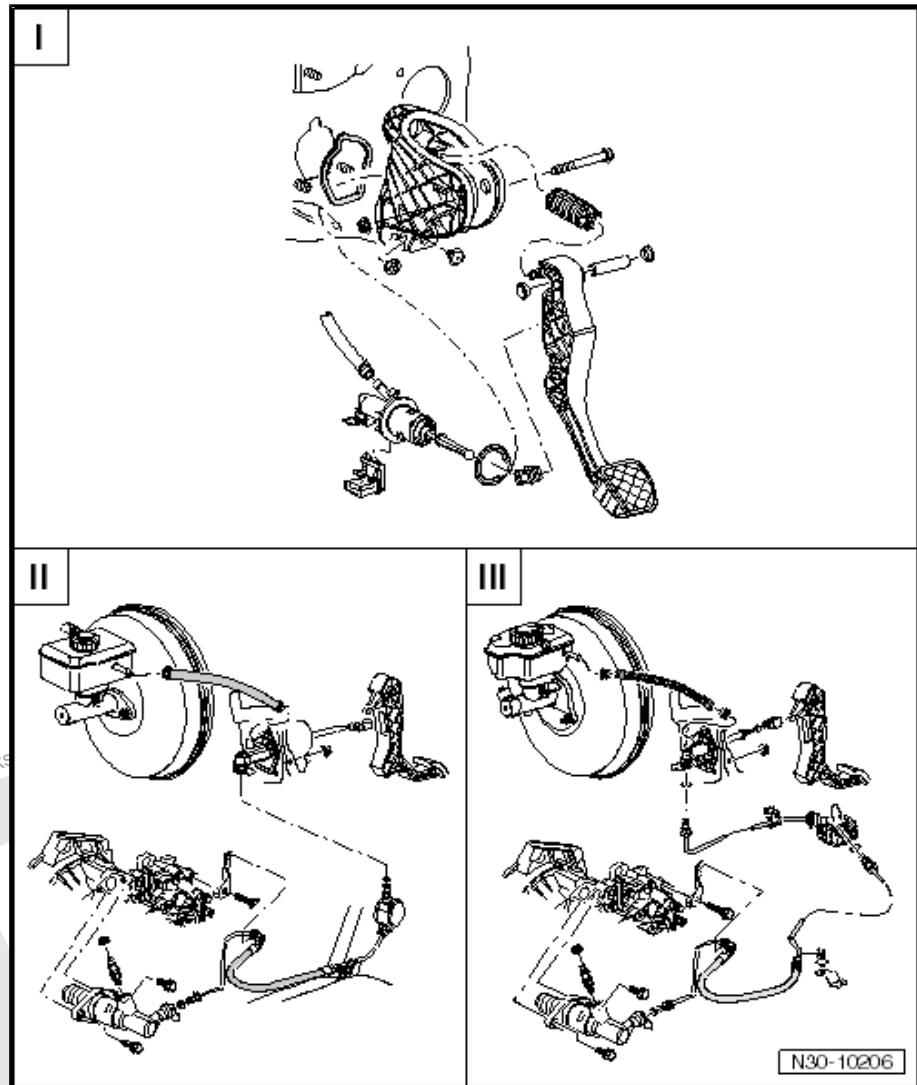
⇒ **"1.2 Overview - Pedal Assembly", page 13**

II - Refer to

⇒ **"1.3.1 Overview - Clutch Hydraulics", page 15**

III - Refer to

⇒ **"1.3.2 Overview - Clutch Hydraulics, RHD", page 17**





1.2 Overview - Pedal Assembly

1 - Clutch Master Cylinder

- ☐ Removing and installing. Refer to
⇒ ["1.10 Clutch Master Cylinder, Removing and Installing", page 29](#).

2 - Bearing Bushing

- ☐ Removing and installing. Refer to
⇒ ["1.6 Bearing Bushing, Removing and Installing", page 20](#).
- ☐ 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 ⇒ ["1.15 Clutch Position Sensor G476, Removing and Installing", page 34](#).

6 - Bearing Axle

- ☐ Replace after removing
- ☐ Do not lubricate

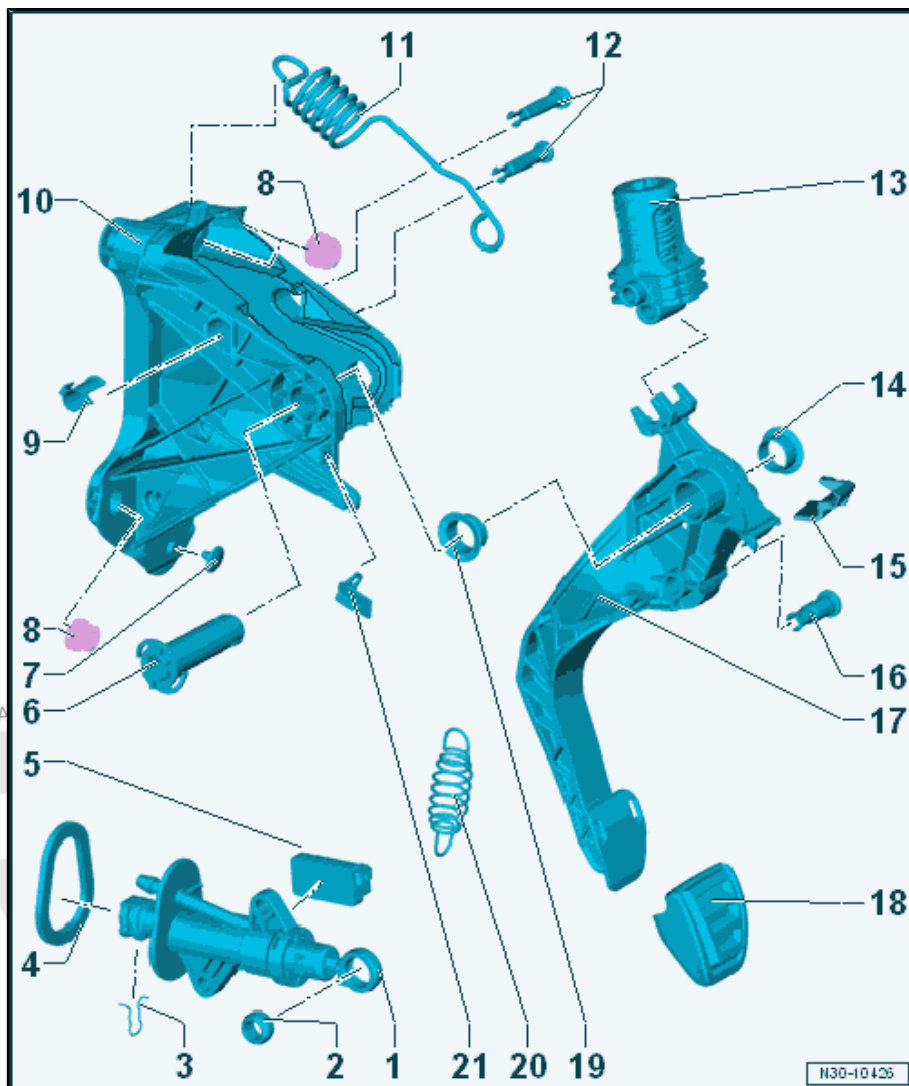
7 - Rubber Stop

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 ⇒ ["1.9 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 23](#) .
- ☐ 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; allocation. Refer to the Parts Catalog.
- ☐ Removing and installing. Refer to ⇒ ["1.7 Over-Center Spring, Removing and Installing", page 21](#) .
- ☐ 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 ⇒ ["1.5 Clutch Pedal, Removing and Installing", page 19](#) .
- ☐ 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 ⇒ removing and installing over-center spring. Refer to ⇒ ["1.7 Over-Center Spring, Removing and Installing", page 21](#) .
- ☐ Do not lubricate

21 - Damping Element

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



1.3 Overview - Clutch Hydraulics

⇒ ["1.3.1 Overview - Clutch Hydraulics", page 15](#)

1.3.1 Overview - Clutch Hydraulics

1 - Hex Bolt

- ☐ Tightening specification. Refer to
⇒ ["1.4 Overview - Clutch Release Mechanism", page 18](#).

2 - Bleed Valve

- ☐ 4.5 Nm
- ☐ Bleed clutch mechanism. Refer to
⇒ ["1.13 Clutch Mechanism, Bleeding", page 33](#).

3 - Dust Cap

4 - Supply Hose

5 - Brake Fluid Reservoir

6 - Seals

- ☐ Must be located inside the supply hose.

7 - Clutch Master Cylinder

- ☐ Removing and installing. Refer to
⇒ ["1.10 Clutch Master Cylinder, Removing and Installing", page 29](#).

8 - Clamp

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

9 - 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 16](#)
- ☐ Allocation. Refer to the Parts Catalog.

10 - Hose/Line Assembly

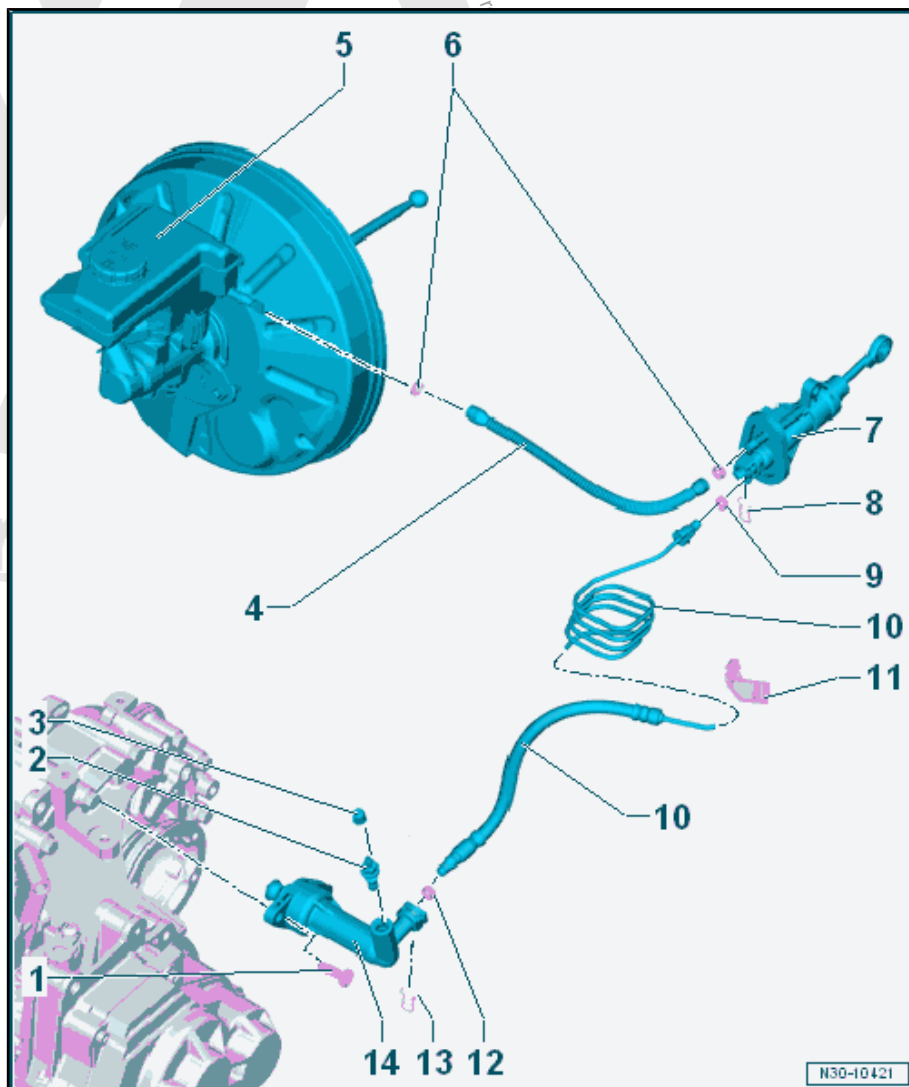
- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Removing and installing. Refer to
⇒ ["1.12 Clutch Mechanism Lines, Removing and Installing", page 31](#).

11 - Bracket

- ☐ For hose/line assembly

12 - 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 16
- ❑ Allocation. Refer to the Parts Catalog.

13 - Clamp

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

14 - Clutch Slave Cylinder

- ❑ Removing and installing. Refer to ⇒ [“1.11 Clutch Slave Cylinder, Removing and Installing”](#), page 30 .

Disconnect and Connect Clutch Mechanism Wires

Separating

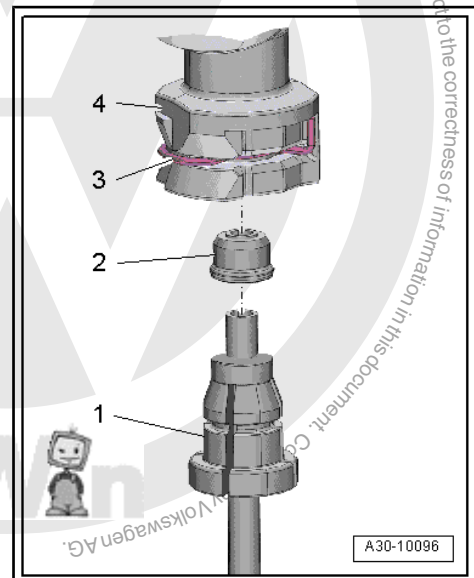
- Open the clip -3- with a screwdriver and remove the hose/line assembly -1- from the connection -4-.

Connecting



Note

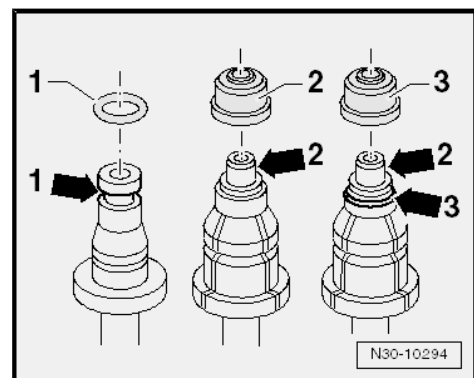
- ◆ An O-ring can also be installed instead of a seal -2-. Refer to
⇒ Fig. [“Sealing Rings/O-Rings for Hose/Line Assembly or Pipe”](#), page 16 .
- ◆ Replace the damaged seal -2-.
- Press in the hose/line assembly -1- at the connection -4- until the clip -3- engages audibly.
- Pull on the hose/line assembly 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-.





1.3.2 Overview - Clutch Hydraulics, RHD

1 - Clutch Slave Cylinder

- ☐ Removing and Installing. Refer to
⇒ ["1.11 Clutch Slave Cylinder, Removing and Installing", page 30](#).

2 - Bleed Valve

- ☐ Bleed clutch mechanism. Refer to
⇒ ["1.13 Clutch Mechanism, Bleeding", page 33](#).
- ☐ 4.5 Nm

3 - Dust Cap

4 - Supply Hose

5 - Brake Fluid Reservoir

6 - Seals

- ☐ must be located inside the supply hose.

7 - Clutch Master Cylinder

- ☐ Removing and Installing. Refer to
⇒ ["1.10 Clutch Master Cylinder, Removing and Installing", page 29](#).

8 - Clamp

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

9 - Seal/O-Ring

- ☐ Replace if damaged
- ☐ Install on the line connection
- ☐ Install with brake fluid
- ☐ Seals/O-rings suitable for the line connection material
⇒ [Fig. "Sealing Rings/O-Rings for Hose/Line Assembly or Pipe", page 16](#)
- ☐ Allocation. Refer to the Parts Catalog.

10 - Bracket

- ☐ For hose/line assembly

11 - Hose/Line Assembly

- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Removing and Installing. Refer to
⇒ ["1.12 Clutch Mechanism Lines, Removing and Installing", page 31](#).

12 - Seal/O-Ring

- ☐ Replace if damaged
- ☐ Install on the line connection
- ☐ Install with brake fluid
- ☐ Seals/O-rings suitable for the line connection material
⇒ [Fig. "Sealing Rings/O-Rings for Hose/Line Assembly or Pipe", page 16](#)
- ☐ Allocation. Refer to the Parts Catalog.





13 - Clamp

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

14 - Hex bolt

- ☐ Tightening specification. Refer to [⇒ "1.4 Overview - Clutch Release Mechanism", page 18](#) .

1.4 Overview - Clutch Release Mechanism

1 - Transmission

2 - Ball Stud

- ☐ 25 Nm
- ☐ For removing and installing, remove the transmission
- ☐ Remove grease from extractor lever contact surfaces
- ☐ Grease the contact surface on the ball stud with Grease for Clutch Disc Shaft Splines - G 000 100-

3 - Input Shaft Seal

- ☐ Replacing. Refer to [⇒ "1.4 Input Shaft Seal, Replacing", page 152](#) .

4 - Guide Sleeve

- ☐ For removing and installing, remove the transmission
- ☐ With vulcanized O-ring
- ☐ Replace the guide sleeve and O-ring if the O-ring is damaged.

5 - Spring

- ☐ For removing and installing, remove the transmission
- ☐ Attach to the clutch release lever

6 - Cylinder Bolt

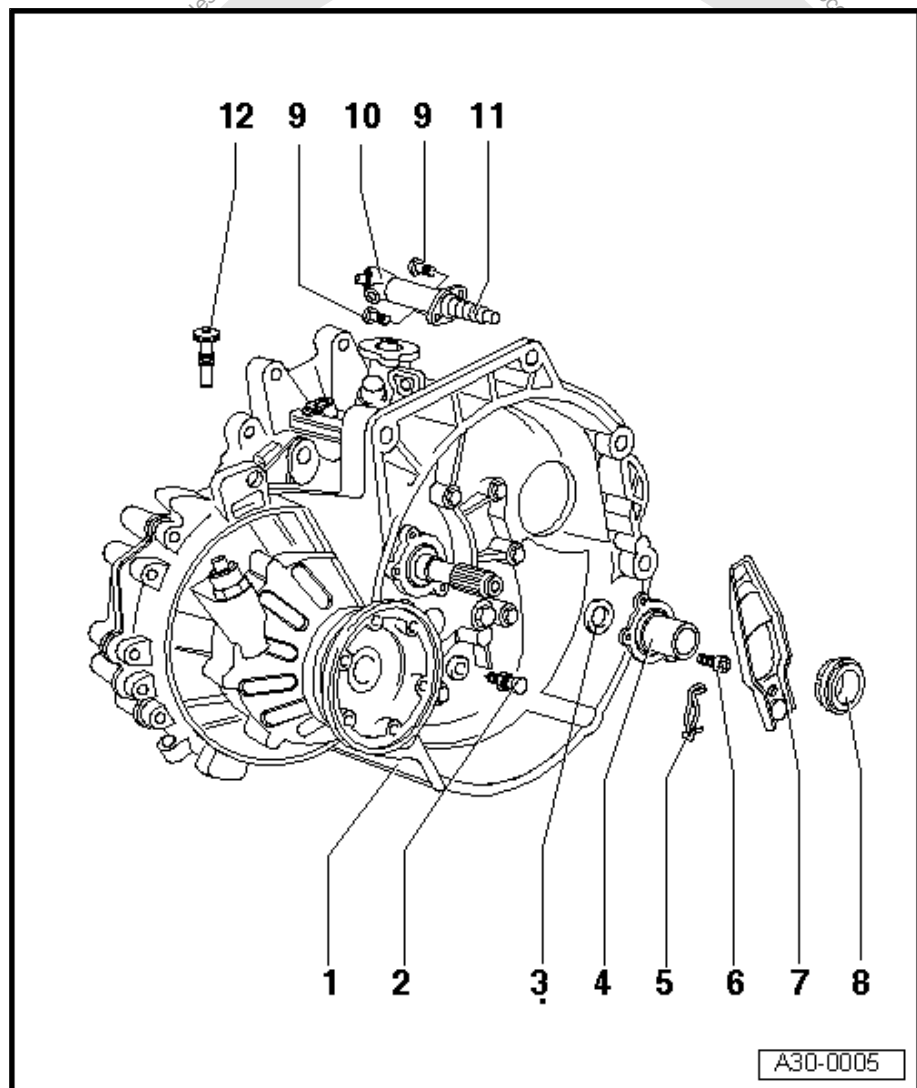
- ☐ 20 Nm

7 - Clutch Release Lever

- ☐ For removing and installing, remove the transmission
- ☐ Remove and install together with release bearing
[⇒ Fig. "Remove and Install the Clutch Release Lever with the Release Bearing", page 35](#)
- ☐ Remove grease already present
- ☐ Grease the contact surface on the ball stud with Grease for Clutch Disc Shaft Splines - G 000 100-

8 - Release Bearing

- ☐ For removing and installing, remove the transmission
- ☐ Do not wash the bearing, just wipe it off.
- ☐ Replace loud bearings





- ☐ Removing from and installing in the clutch release lever
⇒ [Fig. "Removing and Installing the Release Bearing", page 35](#)
- ☐ Lubricate release lever contact surface with MoS 2 grease

9 - Hex Bolt

- ☐ 20 Nm

10 - Clutch Slave Cylinder

- ☐ Removing and installing. Refer to ⇒ ["1.11 Clutch Slave Cylinder, Removing and Installing", page 30](#) .

11 - Plunger

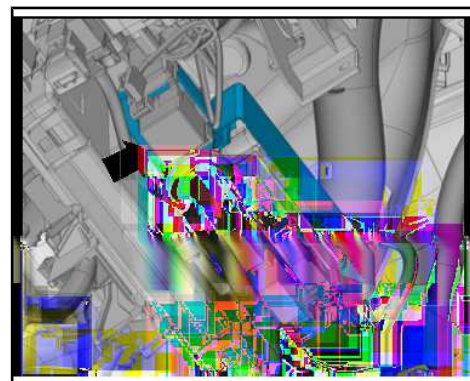
12 - Bolt

- ☐ Secures the clutch release lever when installing transmission
- ☐ Remove after installing the transmission
- ☐ Use an M8 x 35 bolt if the assembly bolt is missing.

1.5 Clutch Pedal, Removing and Installing

Removing

- Move the driver seat as far back as possible.
- Position the steering wheel as far upward as possible.
- 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 the return spring. (Refer to ⇒ ["1.8 Return Spring, Removing and Installing", page 23](#) .) or remove the over-center spring. Refer to ⇒ ["1.7 Over-Center Spring, Removing and Installing", page 21](#) .



Remove the Clutch Pedal Bearing Axle as Follows:

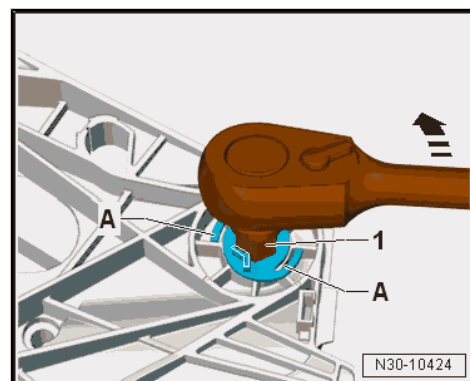
- 1- = 14 mm internal socket wrench

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, in direction of -arrow-.

The Brackets -A- will be Damaged.

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





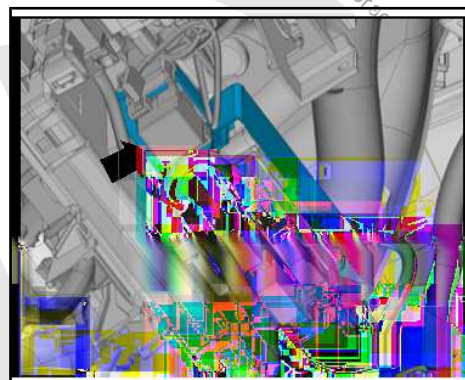
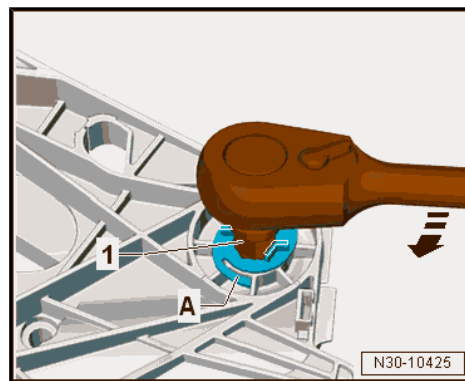
Installing

Install in reverse order of removal. Note the following:

-1- = 14 mm internal socket wrench

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, in direction of -arrow-.
- The retainers -A- must engage audibly.
- Install the return spring (Refer to [⇒ "1.8 Return Spring, Removing and Installing", page 23](#) .) or install the over-center spring. Refer to [⇒ "1.7 Over-Center Spring, Removing and Installing", page 21](#) .
- Install bracket -arrow- with Parking Aid Control Module - J446- . Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Parking Aid; Overview - Parking Aid .



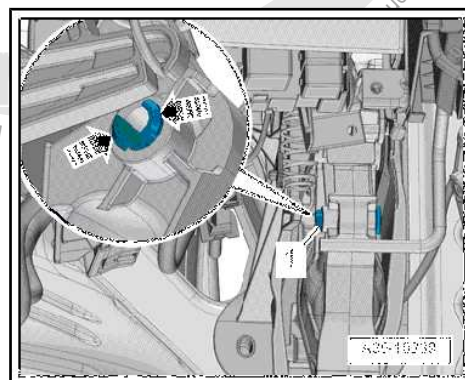
1.6 Bearing Bushing, Removing and Installing

Removing

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

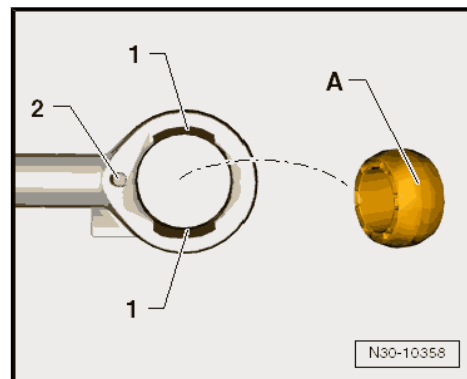
- Press together the retainers in direction of -arrows- and remove the studs -1- to the right side.
- Turn the valve fitter such that the openings -1- or pin -2- are visible.

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





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

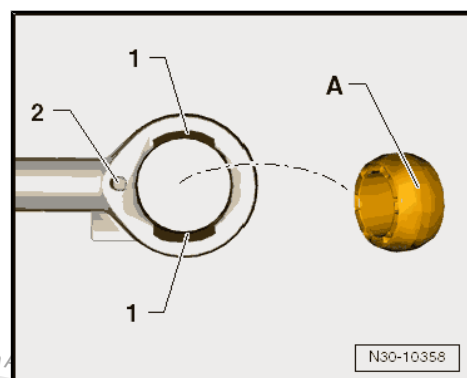


Installing

- 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.



1.7 Over-Center Spring, Removing and Installing

Removing

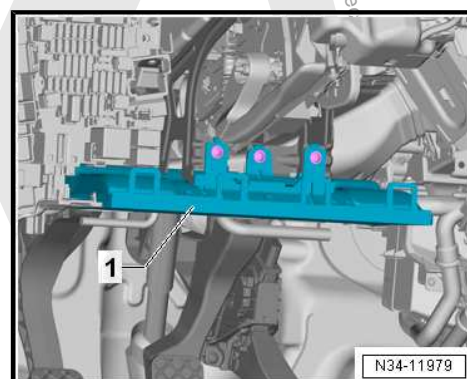
- Move the driver seat as far back as possible.
- Position the steering wheel as far upward as possible.

Vehicles with a Knee Airbag

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

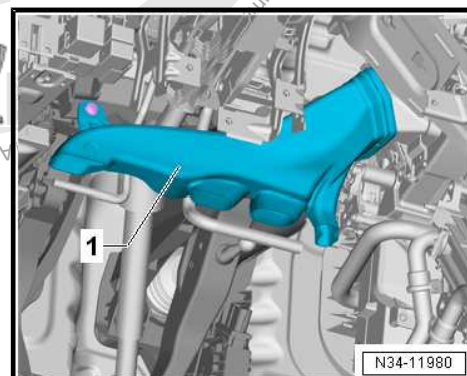
Vehicles without Knee Airbag

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



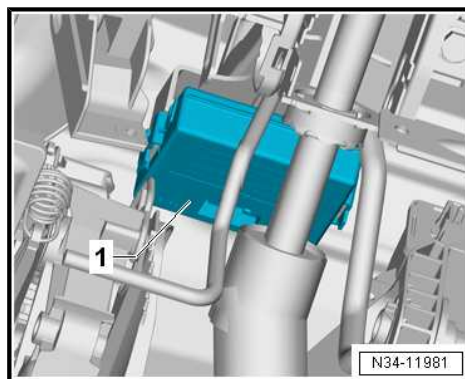
Continuation for All

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





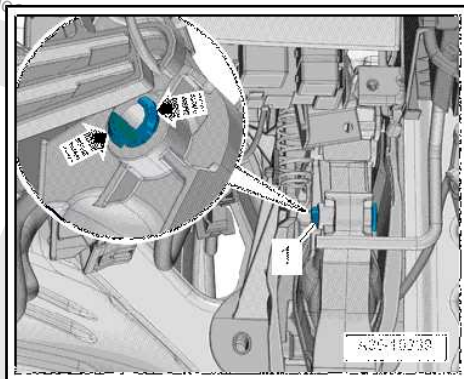
- Remove the Data Bus on Board Diagnostic Interface - J533-1- from the bracket. Refer to ➔ Electrical Equipment; Rep. Gr. 97 ; Control Modules; Component Location Overview - Control Modules and push it aside.



- 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-.

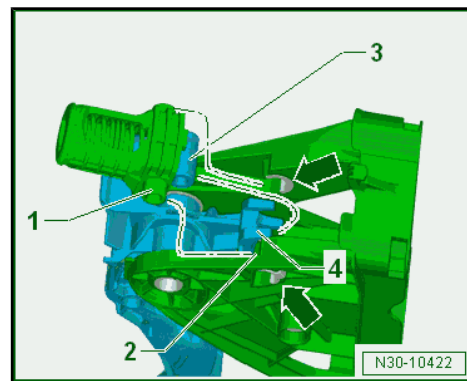




Installing

Install in reverse order of removal. Note the following:

- 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- (⇒ 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; Driver Side 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 .

1.8 Return Spring, Removing and Installing

Removing

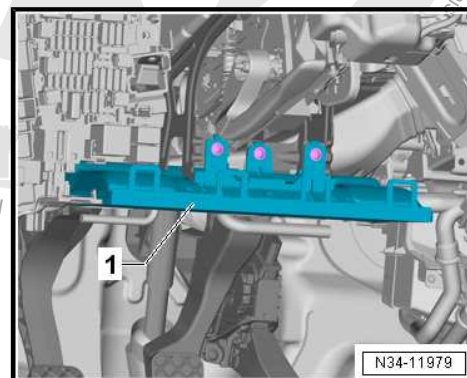
- Move the driver seat as far back as possible.
- Position the steering wheel as far upward as possible.

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

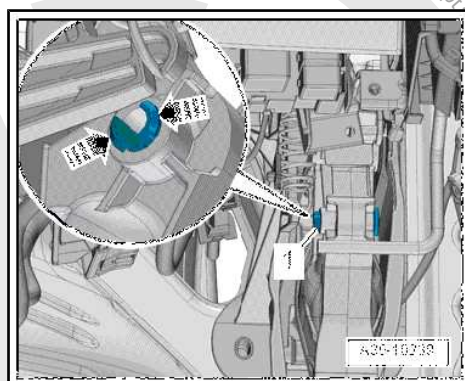
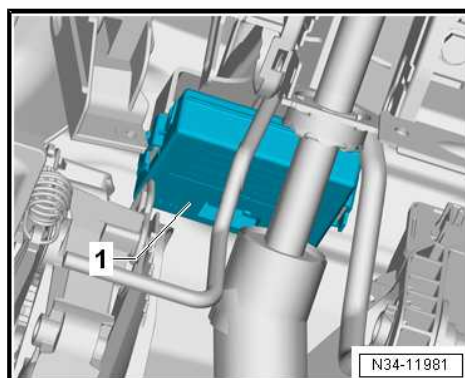
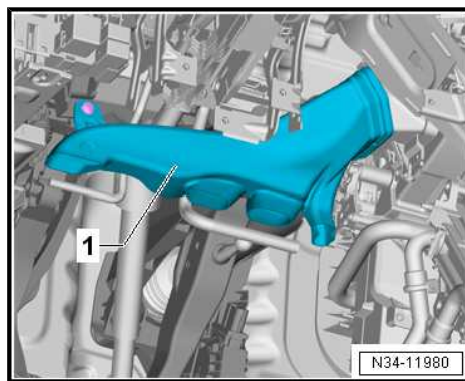
Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .





Continuation for All

- Remove driver side footwell vent -1-. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Air Routing; Driver Side 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.



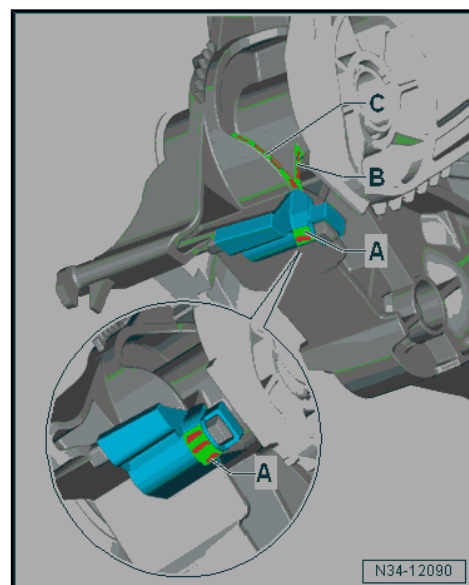
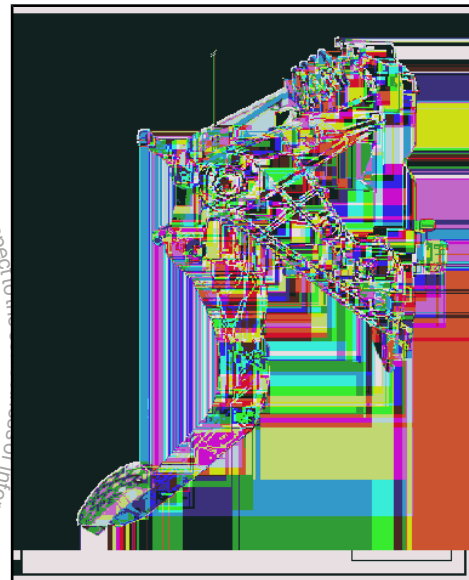


- Move the clutch pedal in direction of -arrow-, unclip the return spring -1- and remove.

Installing

Install in reverse order of removal. Note the following:

- For the return spring -1- (⇒ previous illustration), slightly 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- and engage the return spring -1- (⇒ previous illustration).
- 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; Driver Side 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 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-
- ◆ Sealing Tool - T10249/1-



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

- ◆ Nuts - Mounting Bracket to Body

Removing

- Move the driver seat as far back as possible.
- Position the steering wheel as far upward as possible.

Vehicles with a Knee Airbag

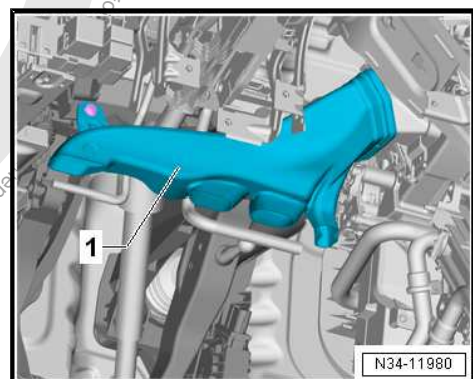
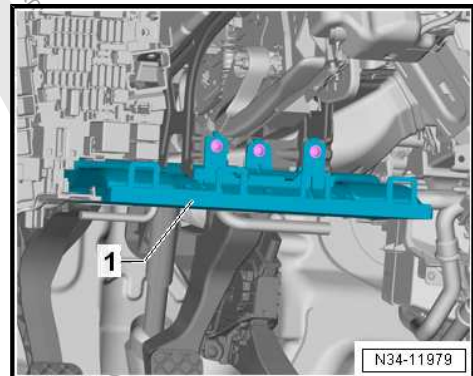
- Remove the driver side knee airbag -1-. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .

Vehicles without Knee Airbag

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

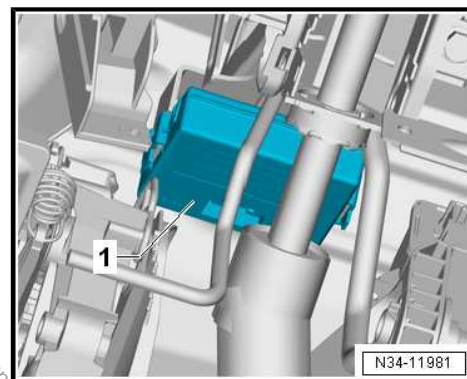
Continuation for All

- Remove driver side footwell vent -1-. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Air Routing; Driver Side 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, Disconnecting and Connecting .



Caution

Danger of leaking brake fluid.

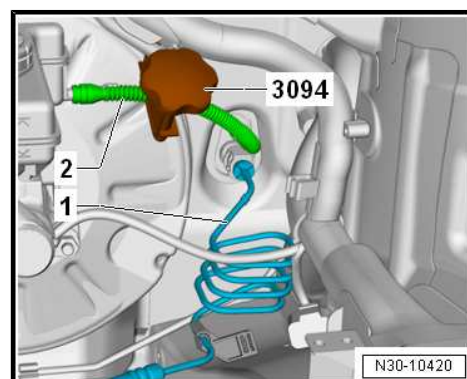
- ◆ ***Be careful not to get any brake fluid on the longitudinal member or on the transmission when performing the following work. If it does, clean the area thoroughly.***
- ◆ ***Place a lint-free cloth under the clutch master cylinder.***

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



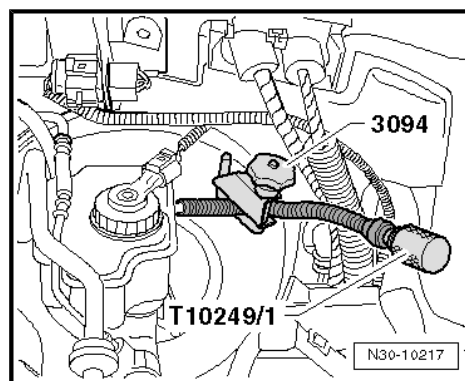
Note

- ◆ ***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.





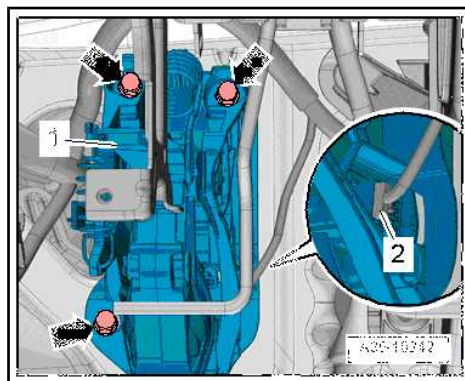
- Remove the clutch master cylinder return hose and seal with the Sealing Tool - T10249/1- .



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:

- 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; Driver Side 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 .



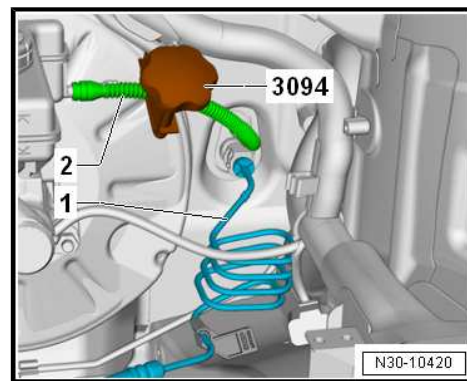
Note

The battery will be installed and connected later.

Continuation for All



- Connect hose/line assembly -1- with connection
⇒ Fig. ““Disconnect and Connect Clutch Mechanism Wires””,
page 16 .
- 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
⇒ “1.13 Clutch Mechanism, Bleeding”, page 33 .



Vehicles with a Knee Airbag

- Install drivers side knee airbag 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 Equip-
ment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and
Connecting .

Tightening Specifications

- ◆ Mounting bracket to bulkhead. Refer to
⇒ “1.2 Overview - Pedal Assembly”, page 13 .

1.10 Clutch Master Cylinder, Removing and Installing

Removing



Note

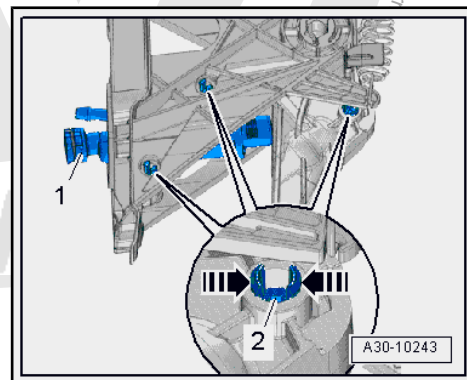
- ◆ Before replacing the clutch master cylinder due to an assumed
defect, perform the Guided Fault Finding Vehicle Diag-
nostic Tester first.
- ◆ When working inside the footwell, cover the carpet with cloths
to protect it from leaking brake fluid.
- Remove the bracket. Refer to
⇒ “1.9 Mounting Bracket, Removing and Installing”, page 26 .
- Remove the Clutch Position Sensor - G476- . Refer to
⇒ “1.15 Clutch Position Sensor G476 , Removing and Instal-
ling”, page 34 .
- Release retainers in direction of -arrows- and remove mount-
ing 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
⇒ “1.9 Mounting Bracket, Removing and Installing”, page 26 .
- Install the Clutch Position Sensor - G476- . Refer to
⇒ “1.15 Clutch Position Sensor G476 , Removing and Instal-
ling”, page 34 .





1.11 Clutch Slave Cylinder, Removing and Installing

Special tools and workshop equipment required

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



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

- ◆ Nuts - Transmission Support to Transmission

Removing

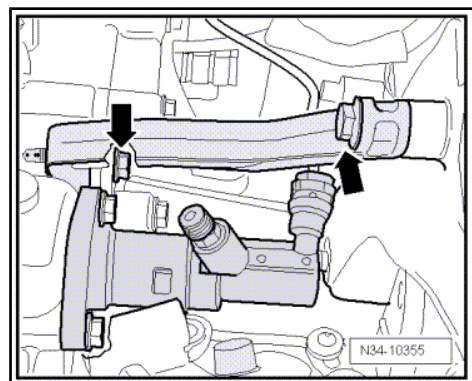


Note

- ◆ Before replacing the clutch master cylinder due to an assumed defect, perform the Guided Fault Finding Vehicle Diagnostic Tester first.
- ◆ If the clutch slave cylinder is removed from the transmission with the hose/line assembly connected, do not operate (depress) clutch pedal any more. Otherwise, the pistons are pushed out of the clutch slave cylinder and thus damaged.

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

- Remove the entire air filter housing if it makes the clutch slave cylinder inaccessible. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- Remove the transmission support -arrows-.
- Remove the battery and the battery tray if necessary. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Removing and Installing .





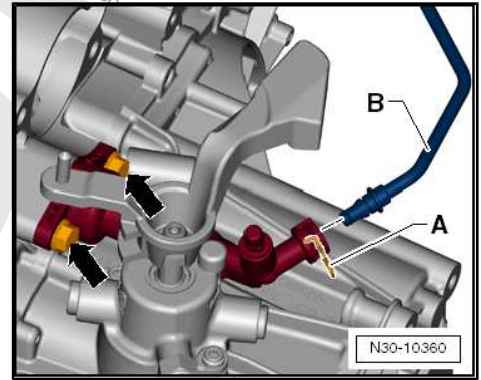
- Place a lint-free cloth under the clutch slave cylinder.
- Release the clamp -A- with a screwdriver and remove the hose/line assembly -B- from the connection.
- Remove the hose/line assembly -B- from the clutch slave cylinder and seal off the openings.
- Remove the bolts -arrows- and the clutch slave cylinder.



Caution

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

- ◆ *When the hose/line assembly is separated from the connection, do not press the clutch pedal.*



Installing

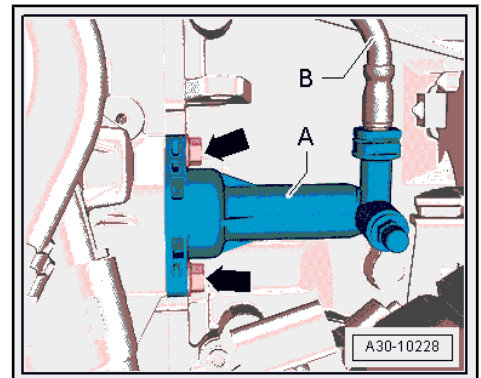
Install in reverse order of removal. Note the following:



Note

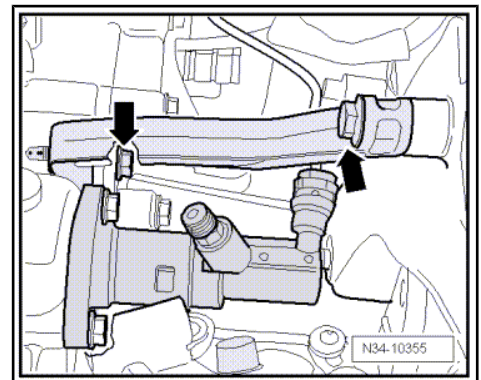
- ◆ *Lubricate all bearing areas and contact surfaces.*
- ◆ *Allocation of the grease. Refer to the Parts Catalog.*

- Install the clutch slave cylinder -A- and secure with the bolts -arrows-.
- Connect the hose/line assembly -B-
⇒ [Fig. “Disconnect and Connect Clutch Mechanism Wires”](#), [page 16](#) .
- Bleed the clutch mechanism. Refer to
⇒ [“1.13 Clutch Mechanism, Bleeding”](#), [page 33](#) .
- Install the air filter housing if it was removed earlier. Refer to
⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- Install the battery and the battery tray if they were removed earlier. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Overview - Battery .



Tightening Specifications

- ◆ Refer to
⇒ [“1.4 Overview - Clutch Release Mechanism”](#), [page 18](#) .
- ◆ Transmission support to transmission bracket and transmission -arrows-. Refer to
⇒ [“3.1 Overview - Subframe Mount”](#), [page 87](#) .



1.12 Clutch Mechanism Lines, Removing and Installing

Special tools and workshop equipment required



- ◆ Hose Clamps - Up To 25 mm - 3094-

Removing

- 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 and the battery tray. Refer to ➤ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery Tray, 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

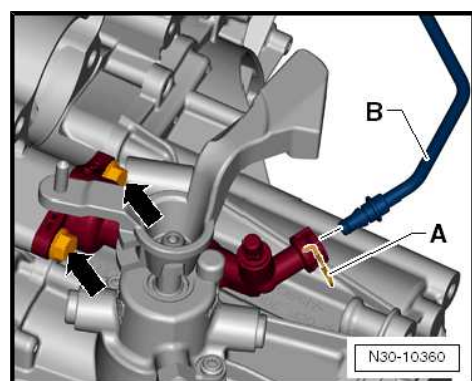
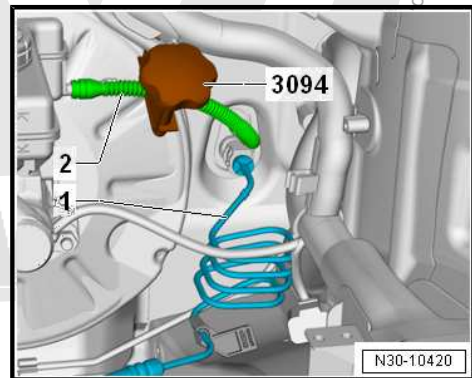
- ◆ *A slight deformation of the supply hose remains after the Hose Clamps - Up To 25mm - 3094- have been unclamped.*
- ◆ *The supply hose is therefore not defective.*
- ◆ *After removing the Hose Clamp up to 25mm - 3094- , the supply hose must be formed back into its original shape.*
- Remove clip for hose/line assembly -1- all the way and remove hose/line assembly.
- Seal off openings.
- Remove the clamp -A- until stop and remove the hose/line assembly -B-.
- Seal off openings.



Note

Ignore -arrows-.

- 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.

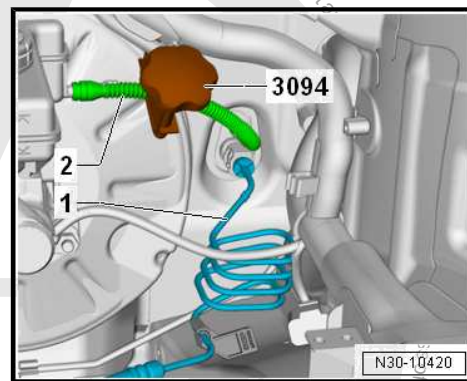




Installing

Install in reverse order of removal. Note the following:

- Connect the hose/line assembly -1- with the connection on the clutch master cylinder and the clutch slave cylinder.
- Pull on the line to make sure it is secure.
- After removing the Hose Clamp up to 25mm - 3094- , the return hose -2- must be formed back into its original shape.
- Bleed the clutch mechanism. Refer to [⇒ "1.13 Clutch Mechanism, Bleeding", page 33](#) .
- Install the battery tray and the battery. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery Tray, Removing and Installing .



1.13 Clutch Mechanism, Bleeding

Special tools and workshop equipment required

- ◆ Brake Charger/Bleeder Unit - VAS5234-
- ◆ Bleeder Hose (670 mm) - VAG1238/B3-



Note

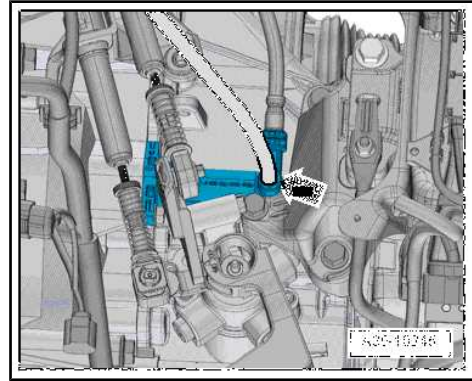
- ◆ *The system must be bled after working on the hydraulic clutch mechanism.*
- ◆ *Make sure no brake fluid gets on the transmission when performing the following work.*
- ◆ *It is not necessary to pre-fill the system.*
- ◆ *Before bleeding, fill the brake fluid reservoir to the "Max" marking with brake 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 the bleed valve (-arrow- lower illustration) is not accessible. 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- .
- Connect the bleed hose with the collector bottle pressure hose.

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

- Switch the Brake Charger/Bleeder Unit - VAS5234- on.
 - Working pressure 2.0 bar (29 psi).
- Open the bleed valve.
- Let approximately 100 cm (3.381 oz.)³ of brake fluid flow out.
- Close the bleed valve.
- Operate the clutch pedal rapidly from stop to stop, 10 to 15 times.
- Open the bleed valve.
- Let another 50 cm (1.690 oz.)³ of brake fluid flow out.
- Close the bleed valve.
- Turn off the Brake Charger/Bleeder Unit - VAS5234- and release the pressure from the device completely.
- Press the clutch pedal a few times after bleeding the system.
- While doing this check the function of the clutch mechanism.



Tightening Specifications

- ♦ Bleed Valve. Refer to
⇒ ["1.3 Overview - Clutch Hydraulics", page 15](#) .

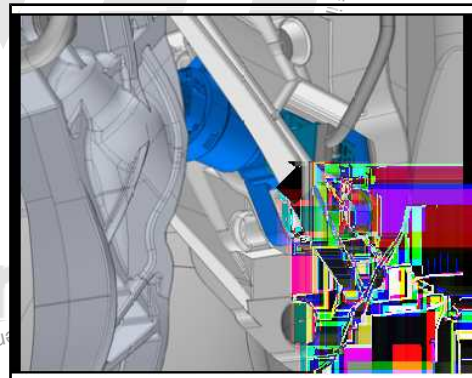
1.14 Clutch Master and Clutch Slave Cylinder, Checking

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

1.15 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 -1- in direction of -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.
- Adapt the Clutch Position Sensor - G476- in the Guided Fault Finding using the Vehicle Diagnostic Tester .



1.16 Clutch Release Mechanism, Servicing

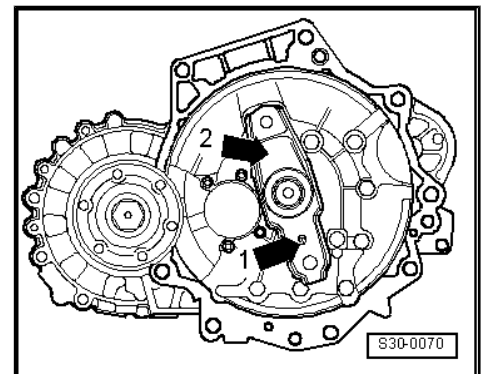
Special tools and workshop equipment required

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

- The transmission is removed.

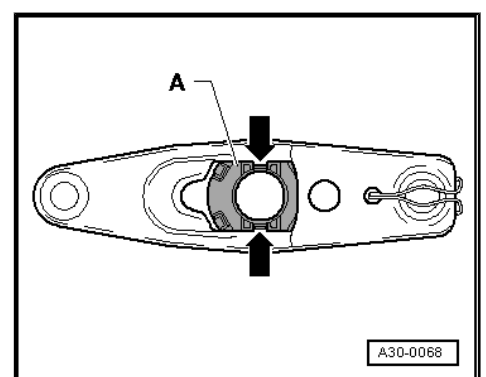
Remove and Install the Clutch Release Lever with the Release Bearing

- Disengage the spring -arrow 1-.
- Remove the clutch release lever -arrow 2- and release bearing.
- Install in reverse order of removal.



Removing and Installing the Release Bearing

- Squeeze the hooks -arrows- on the back of the clutch release lever and remove the release bearing -A- from the clutch release lever.
- Press the release bearing -A- into the clutch release lever until the hooks -arrows- engage.
- Install the transmission. Refer to [⇒ "2 Transmission, Removing and Installing", page 67](#) .



2 Clutch

⇒ ["2.1 Overview - Clutch", page 36](#)

⇒ ["2.2 Clutch, Removing and Installing", page 39](#)

2.1 Overview - Clutch

⇒ ["2.1.1 Overview - Clutch, with Dual Mass Flywheel, Sachs", page 36](#)

⇒ ["2.1.2 Overview - Clutch, with Dual Mass Flywheel, LuK", page 37](#)

⇒ ["2.1.3 Overview - Clutch, with Single Flywheel", page 38](#)

2.1.1 Overview - Clutch, with Dual Mass Flywheel, Sachs

1 - Dual Mass Flywheel

- ☐ Removing and installing. Refer to ⇒ 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

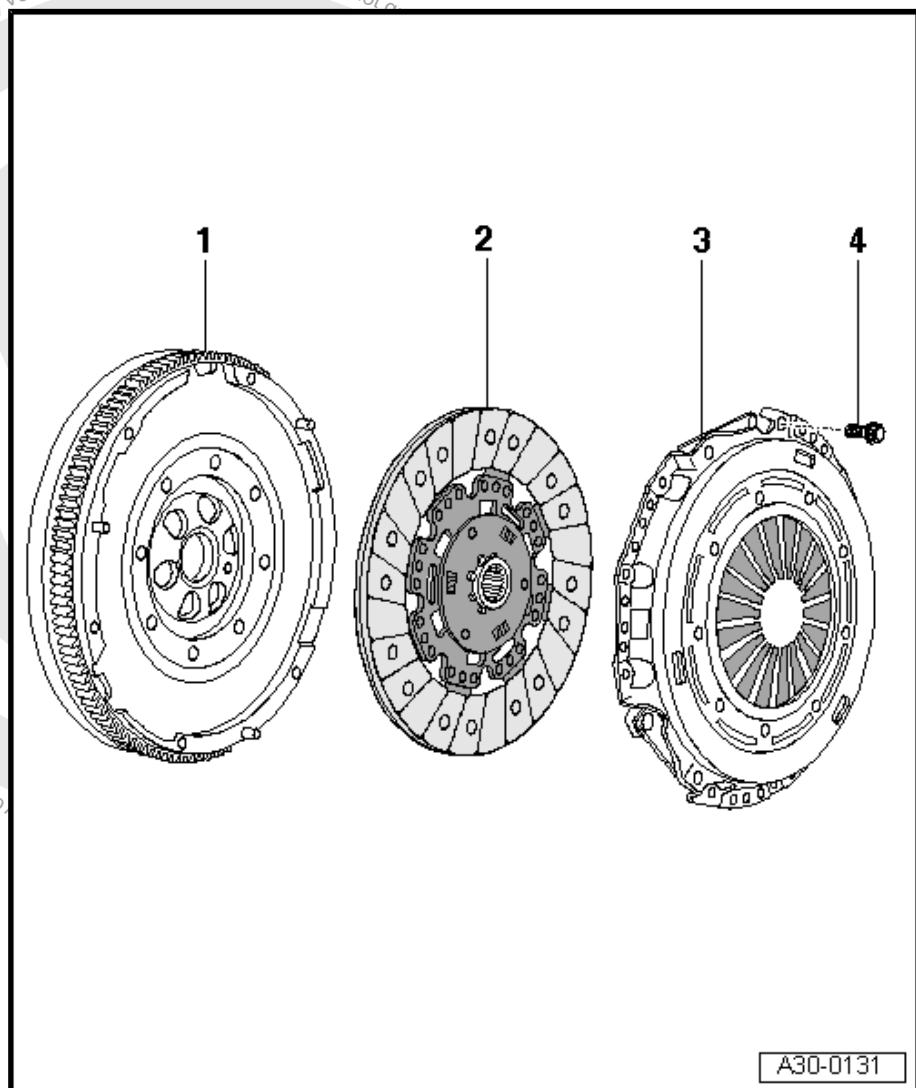
- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Removing and installing. Refer to ⇒ ["2.2.1 Clutch, Removing and Installing, with Dual Mass Flywheel, Sachs", page 39](#) .
- ☐ Only replace together with the pressure plate
- ☐ Installed position. Refer to ⇒ [Fig. "Clutch Plate Installed Position", page 40](#)

3 - Pressure Plate

- ☐ With adjustment mechanism
- ☐ Only replace together with the clutch plate
- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Removing and installing. Refer to ⇒ ["2.2.1 Clutch, Removing and Installing, with Dual Mass Flywheel, Sachs", page 39](#) .
- ☐ Check the ends of the diaphragm spring. Refer to ⇒ [Fig. "Check the Ends of the Diaphragm Spring", page 41](#)
- ☐ Checking the spring connections and rivet connections. Refer to ⇒ [Fig. "Checking the Spring Connections and Rivet Connections", page 41](#)

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 - Flywheel

- ☐ Removing and installing. Refer to ⇒ 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

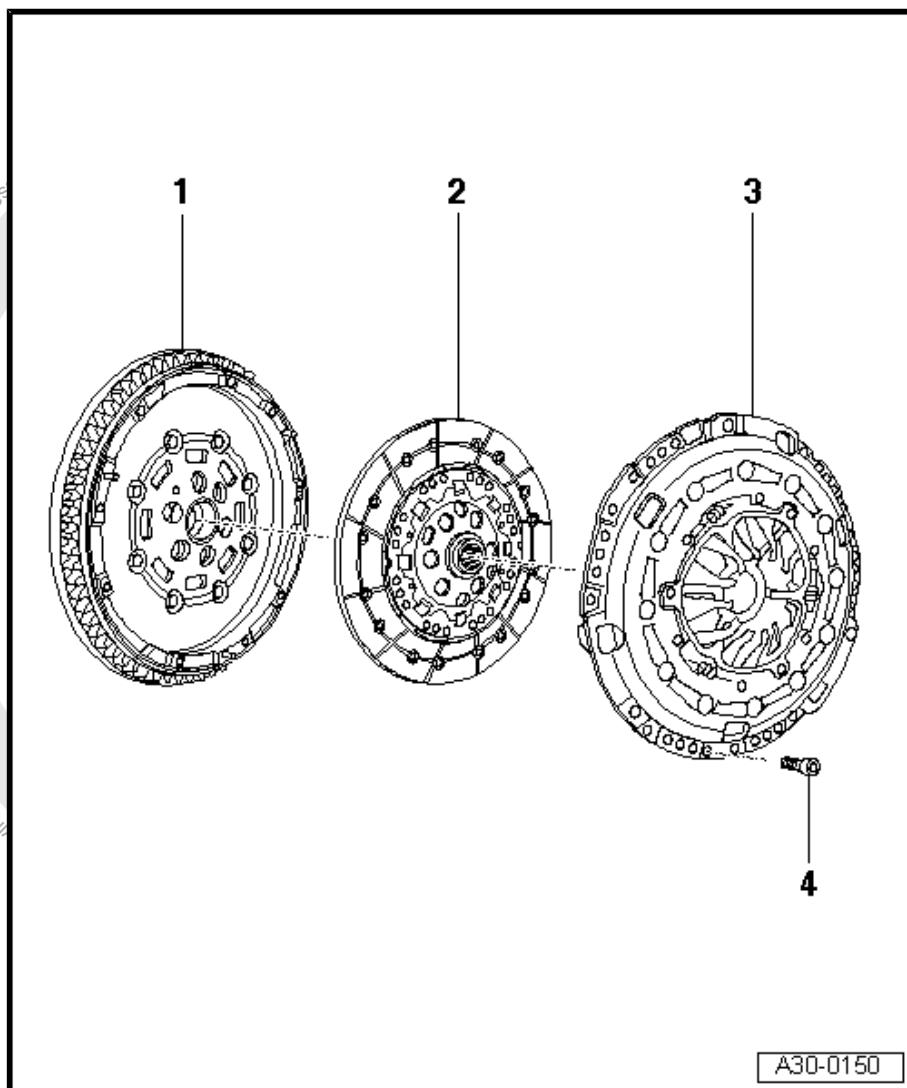
- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Removing and installing. Refer to ⇒ ["2.2.2 Clutch, Removing and Installing, with Dual Mass Flywheel, LuK", page 42](#)
- ☐ Only replace together with the SAC pressure plate
- ☐ Installed position. Refer to ⇒ [Fig. "Clutch Plate Installed Position", page 43](#)

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 42](#) .
- ☐ Check the ends of the diaphragm spring. Refer to ⇒ [Fig. "Check the Ends of the Diaphragm Spring", page 41](#)
- ☐ Checking the spring connection and rivet connections. Refer to ⇒ [Fig. "Checking the Spring Connections and Rivet Connections", page 41](#)

4 - Bolt

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



2.1.3 Overview - Clutch, with Single Flywheel

1 - Flywheel

- ☐ Removing and installing. Refer to ➤ 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

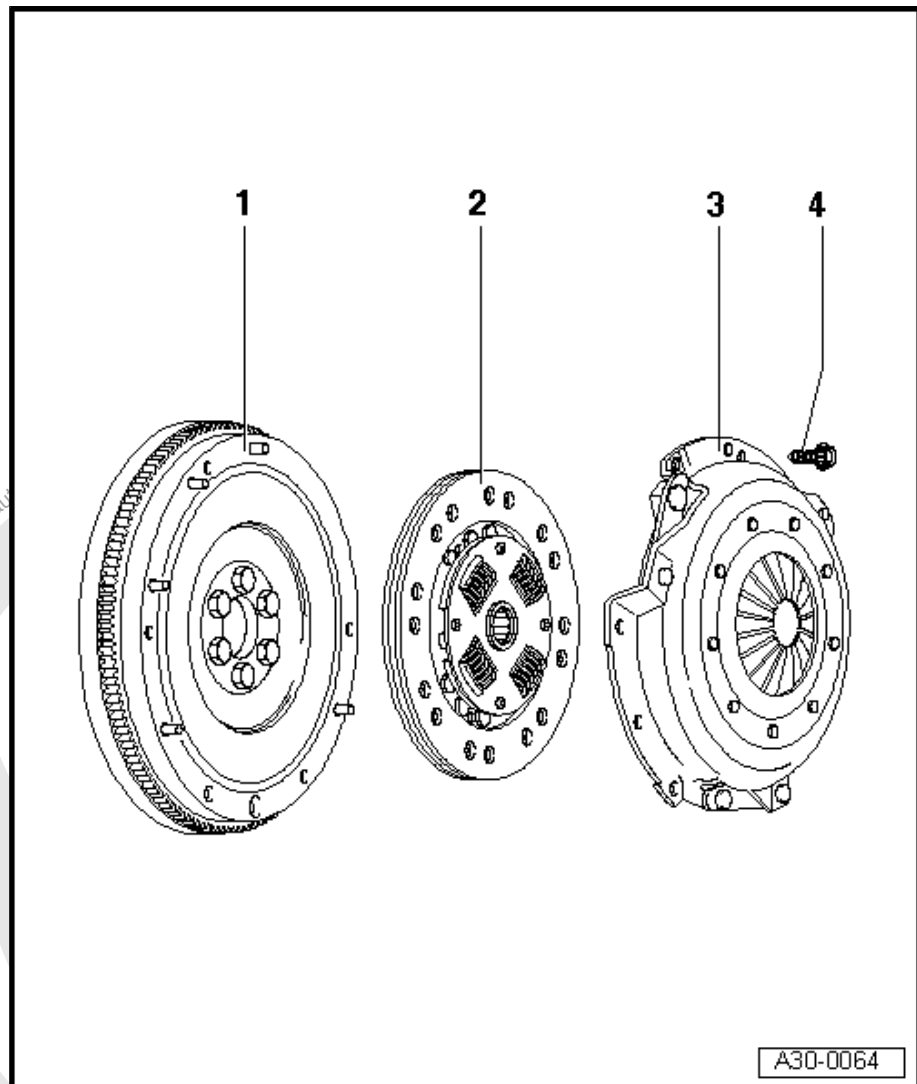
- ☐ Allocation. Refer to the Parts Catalog.
- ☐ Centering. Refer to ➤ ["2.2.3 Clutch, Removing and Installing, with Single Flywheel"](#), page 45

3 - Pressure Plate

- ☐ Removing and installing. Refer to ➤ ["2.2.3 Clutch, Removing and Installing, with Single Flywheel"](#), page 45 .
- ☐ Check the ends of the diaphragm spring. Refer to ➤ [Fig. "Check the Ends of the Diaphragm Spring"](#) , page 47
- ☐ Checking the spring connections and rivet connections. Refer to ➤ [Fig. "Check the Spring Connection and Rivet Connections"](#) , page 47

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 39

⇒ "2.2.2 Clutch, Removing and Installing, with Dual Mass Flywheel, LuK", page 42

⇒ "2.2.3 Clutch, Removing and Installing, with Single Flywheel", page 45

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

Special tools and workshop equipment required

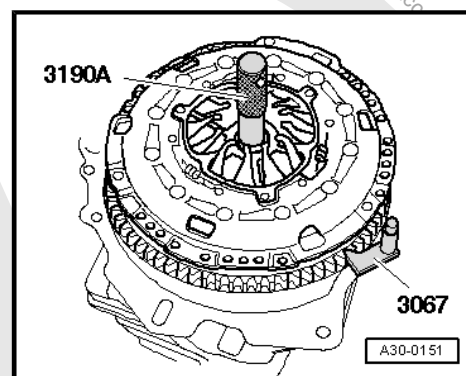
- ◆ Flywheel Retainer - 3067-
- ◆ Alignment Tool - Clutch Plate - 3190A-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Grease for Clutch Disc Shaft Splines - G 000 100-

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:

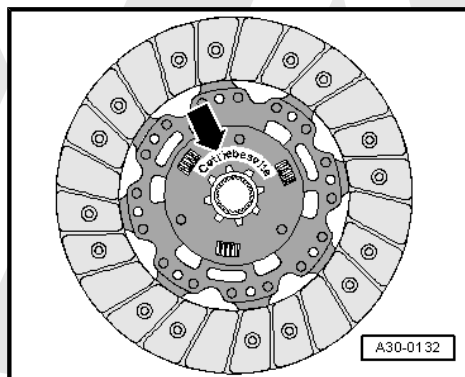
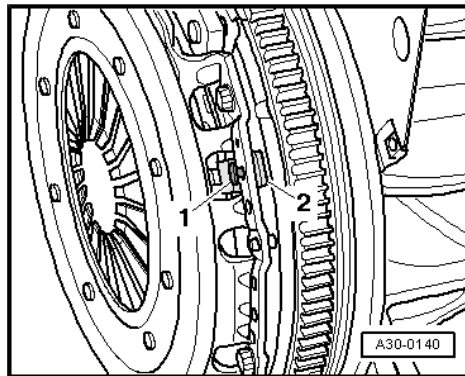


Note

- ◆ 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 clutch housing, the flywheel and the side of the engine facing toward the transmission.
- ◆ 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.



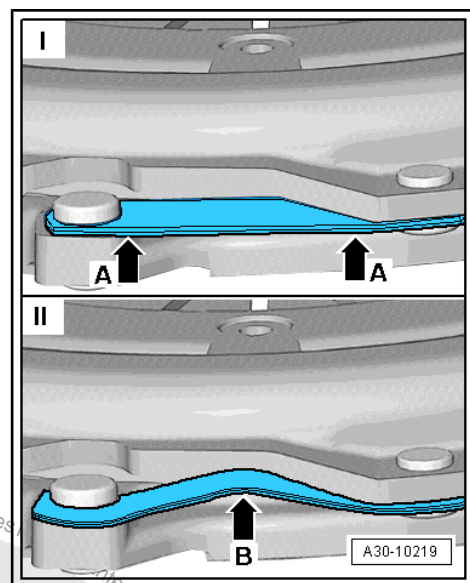
Checking the Spring Connections and Rivet Connections

I - Pull-spring OK

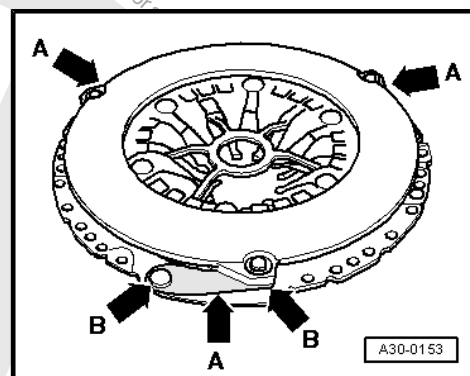
- Slight offset in the outer area -arrows A-.

II - Pull-springs damaged

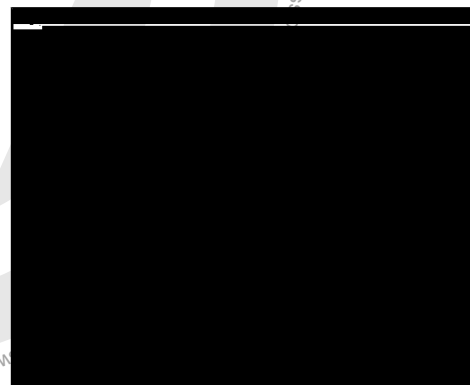
- The clutch pressure plates must be replaced if the pull-spring is bent or broken off -arrow B-.



- 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-.



- Install the Flywheel Retainer - 3067- .
- Install the clutch pressure plate on the centering pins.
- Center the clutch plate with the Alignment Tool - Clutch Plate - 3190A- .



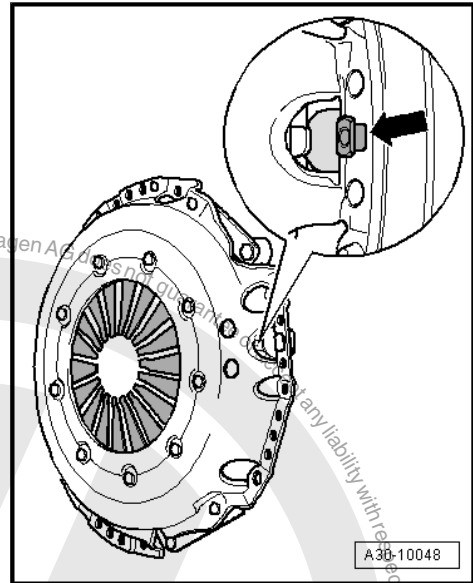


When Installing, Tighten Bolts as Follows so Clutch Pressure Plate Does Not Distort (Causing Shuddering On Acceleration):

- Make sure the stop pin (position sensor) -arrow- moves easily.
- Install all bolts evenly, by hand, until the bolt heads touch the clutch 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 77](#) .

Tightening Specifications

- ◆ Refer to
⇒ ["2.1.1 Overview - Clutch, with Dual Mass Flywheel, Sachs", page 36](#) .



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 - 3190A-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Grease for Clutch Disc Shaft Splines - G 000 100-

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.



- Remove the clutch pressure plate and clutch plate.

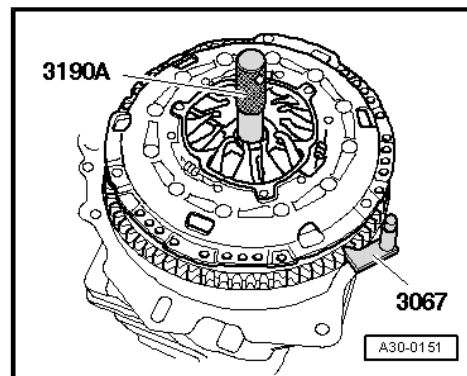
Installing

Install in reverse order of removal. Note the following:



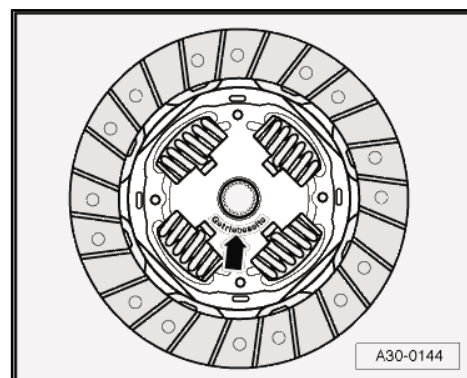
Note

- ◆ 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 clutch housing, the flywheel and the side of the engine facing toward the transmission.
- ◆ 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.





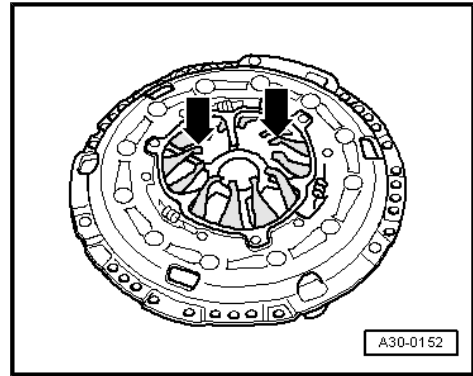
Check the Ends of the Diaphragm Spring

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



Note

Allocate clutch pressure plate and clutch plate according to the engine code. Refer to the Parts Catalog.



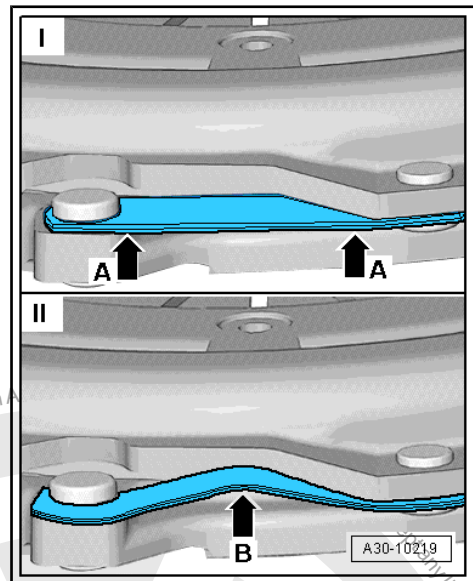
Checking the Pull-Springs and Rivet Connection

I - Pull-spring OK

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

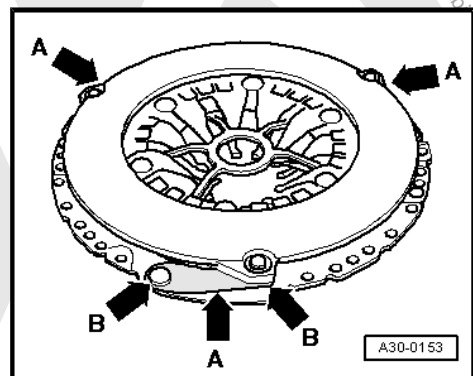
II - Pull-springs damaged

- 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

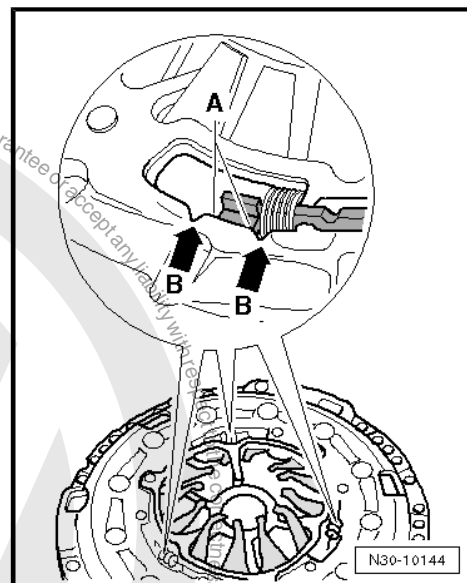
- Make sure the rivet connections -arrows B- fit correctly on all pull-springs -arrows A-.
- Replace any clutch pressure plates that have loose rivet connections -arrows B-.





Only Check Position of Adjustment Mechanism with New Pressure Plates

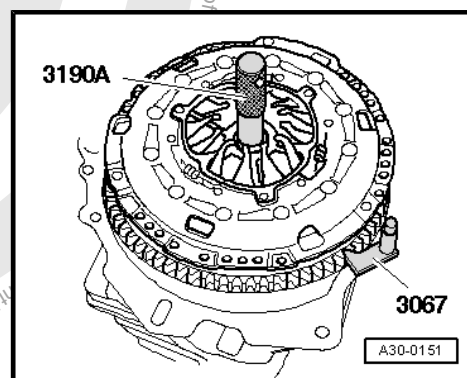
- Both edges -A- of the adjusting ring must be located between both notches -arrows B-.
- If the adjusting ring takes on a different position with new pressure plates, pressure plate and clutch plate must not be installed.
- With used clutches, the adjusting ring may take on a position outside of the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



- Install the Flywheel Retainer - 3067- .
- Install the clutch pressure plate on the centering pins.
- Center the clutch plate with the Alignment Tool - Clutch Plate - 3190A- .

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

- Install all bolts evenly, by hand, until the bolt heads touch the clutch pressure plate.
- Tighten the bolts diagonally in small steps.
- Install the transmission. Refer to [⇒ "2.2 Transmission, Installing", page 77](#) .



Tightening Specifications

- ◆ Pressure plate on the flywheel. Refer to [⇒ "2.1.2 Overview - Clutch, with Dual Mass Flywheel, LuK", page 37](#) .

2.2.3 Clutch, Removing and Installing, with Single Flywheel

Special tools and workshop equipment required

- ◆ Flywheel Retainer - 3067-
- ◆ Alignment Tool - Clutch Plate - 3190A-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Grease for Clutch Disc Shaft Splines - G 000 100-

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.
- Remove the pressure plate and the clutch plate.

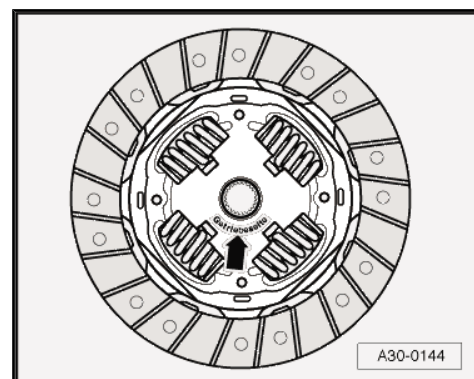
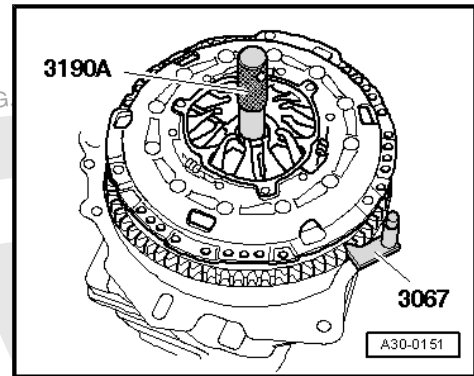
Installing



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 clutch housing, the flywheel and the side of the engine facing toward the transmission.*
- ◆ *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).*

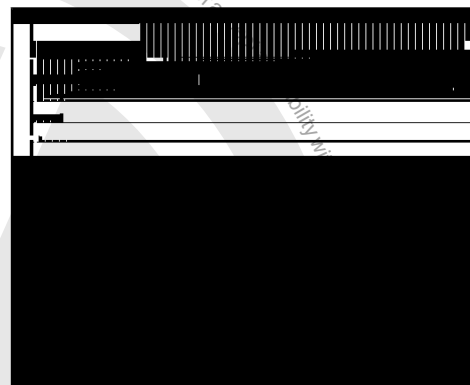
- Clutch plate installed location: The labeling "Getriebeseite" (transmission side) or the shorter end of the hub with the spring cage faces the pressure plate.





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.



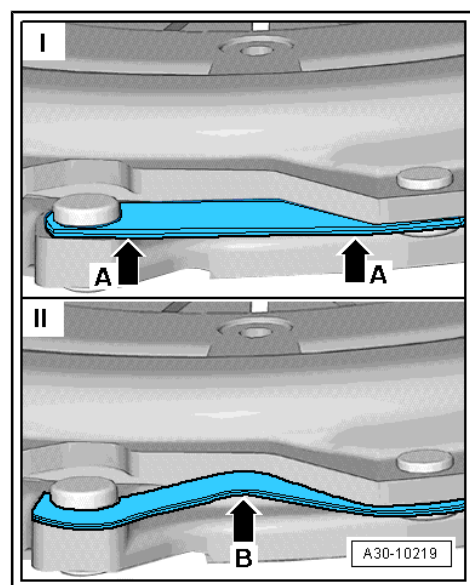
Checking the Pull-Springs and Rivet Connection

I - Pull-spring OK

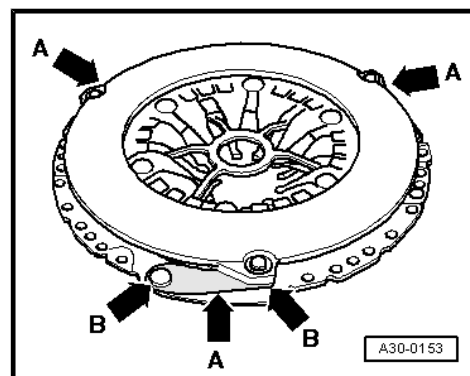
- Slight offset in the outer area -arrows A-.

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.



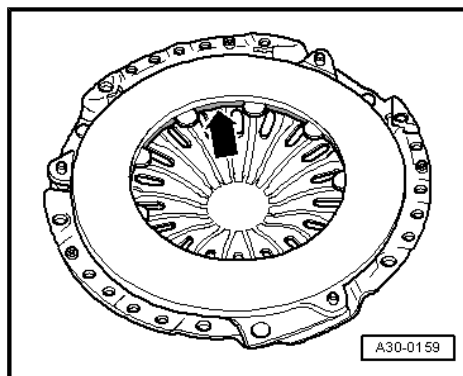
- Make sure the rivet connections -arrows B- fit correctly on all pull-springs -arrows A-.
- Replace any clutch pressure plates that have loose rivet connections -arrow B-.





Checking the Metal Ring

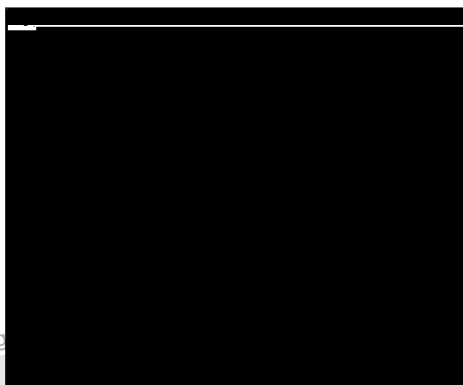
- Check the metal ring in the clutch pressure plate -arrow- for damage.
- Replace any clutch pressure plates that have a broken metal ring.



- Use the Alignment Tool - Clutch Plate - 3190A- to center the clutch plate.
- Tighten the bolt diagonally in small steps.
- Install the transmission. Refer to
⇒ ["2.2 Transmission, Installing", page 77](#) .

Tightening Specifications

- ◆ Pressure plate on the flywheel. Refer to
⇒ ["2.1.3 Overview - Clutch, with Single Flywheel", page 38](#) .

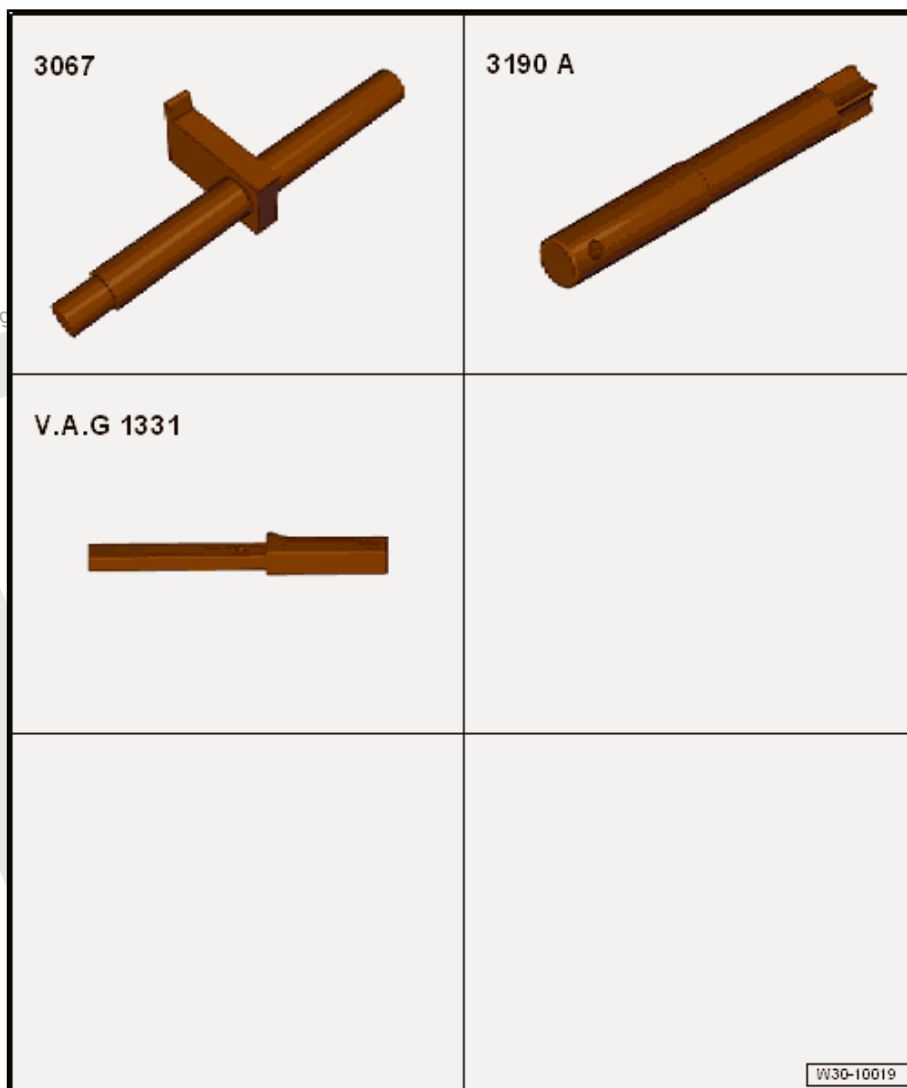




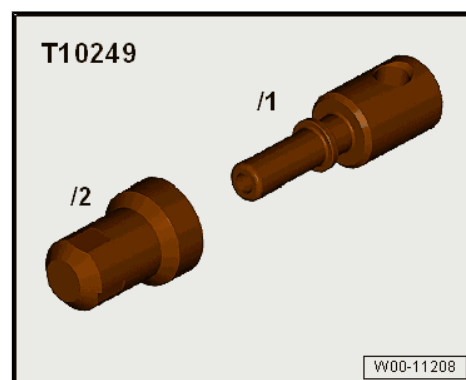
3 Special Tools

Special tools and workshop equipment required

- ◆ Flywheel Retainer - 3067-
- ◆ Alignment Tool - Clutch Plate - 3190A-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Grease for Clutch Disc Shaft Splines - G 000 100-

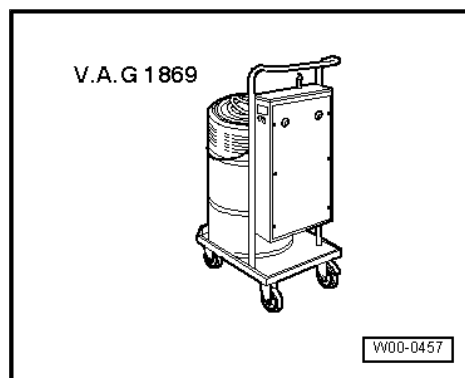


- ◆ Sealing Tool - T10249-

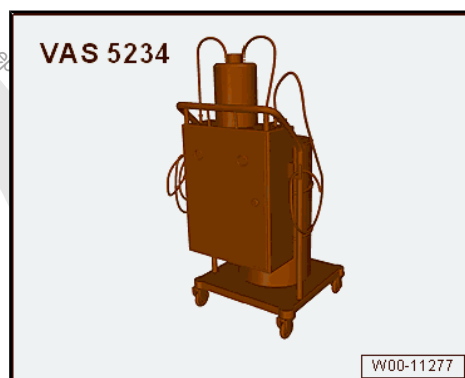




◆ Brake Charger/Bleeder Unit - VAG1869-



◆ Brake Charger/Bleeder Unit - VAS5234- or



◆ Hose Clamps - Up To 25 mm - 3094-





34 – Controls, Housing

1 Selector Mechanism

⇒ [“1.1 Selector Mechanism Installation Position”, page 51](#)

⇒ [“1.3 Overview - Selector Mechanism”, page 53](#)

⇒ [“1.2 Overview - Gearshift Knob and Cover”, page 52](#)

⇒ [“1.4 Gearshift Knob, Removing and Installing”, page 54](#)

⇒ [“1.5 Selector Mechanism, Removing and Installing”, page 56](#)

⇒ [“1.6 Selector Mechanism, Adjusting”, page 63](#)

⇒ [“1.7 Selector Mechanism, Checking”, page 65](#)

⇒ [“1.8 Selector Shaft Seal, Replacing”, page 65](#)

1.1 Selector Mechanism Installation Position

-Arrow A- Gearshift Lever Movement

-Arrow B- Selector Lever Movement

A - Gearshift Lever Cable

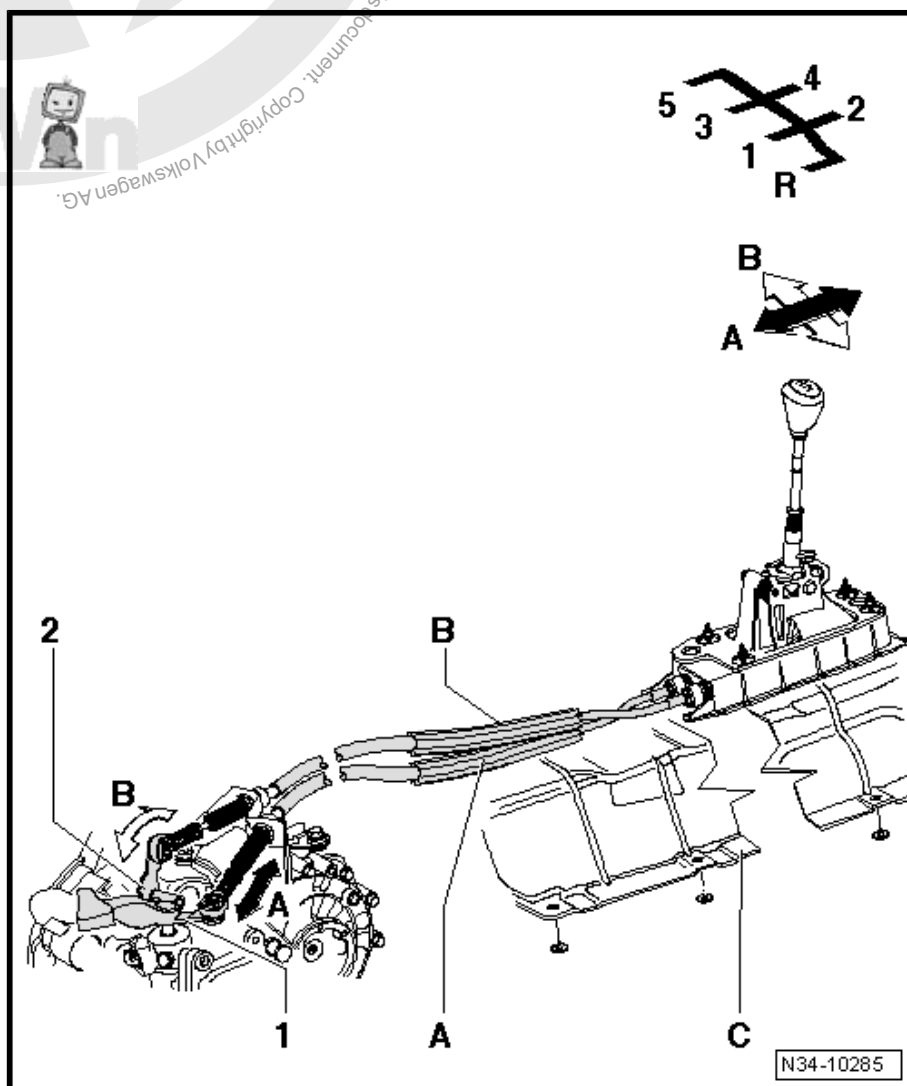
B - Selector Cable

C - Heat Shield

- ☐ Remove the shift mechanism before removal.

1 - Gearshift Lever

2 - Selector Relay Lever



1.2 Overview - Gearshift Knob and Cover

1 - Gearshift Housing with Gearshift Lever

2 - Nut

- ☐ M6: 8 Nm
- ☐ M8: 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

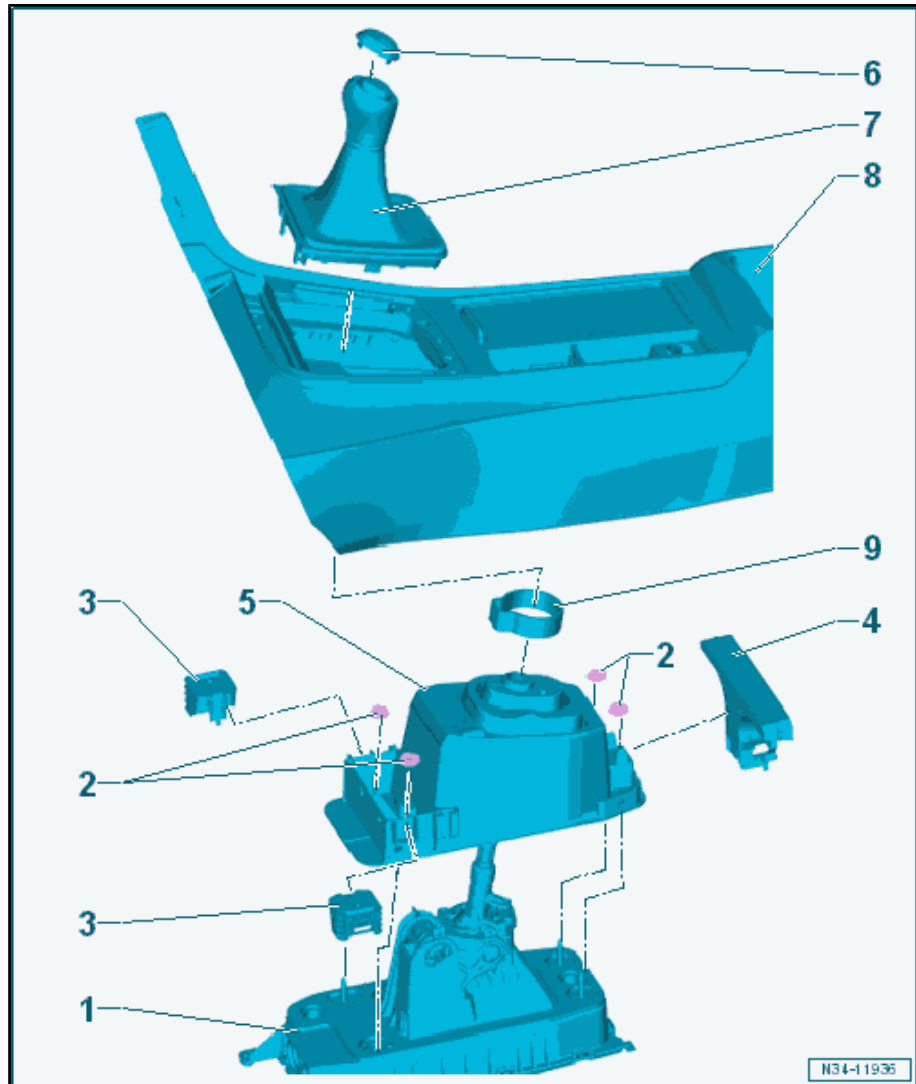
- ☐ With boot
- ☐ The shift knob and boot cannot be separated from each other.
- ☐ Always replace together
- ☐ Removing and installing. Refer to ⇒ ["1.4 Gearshift Knob, Removing and Installing", page 54](#) .

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- .





1.3 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 - Sliding Shoe

3 - Relay Lever

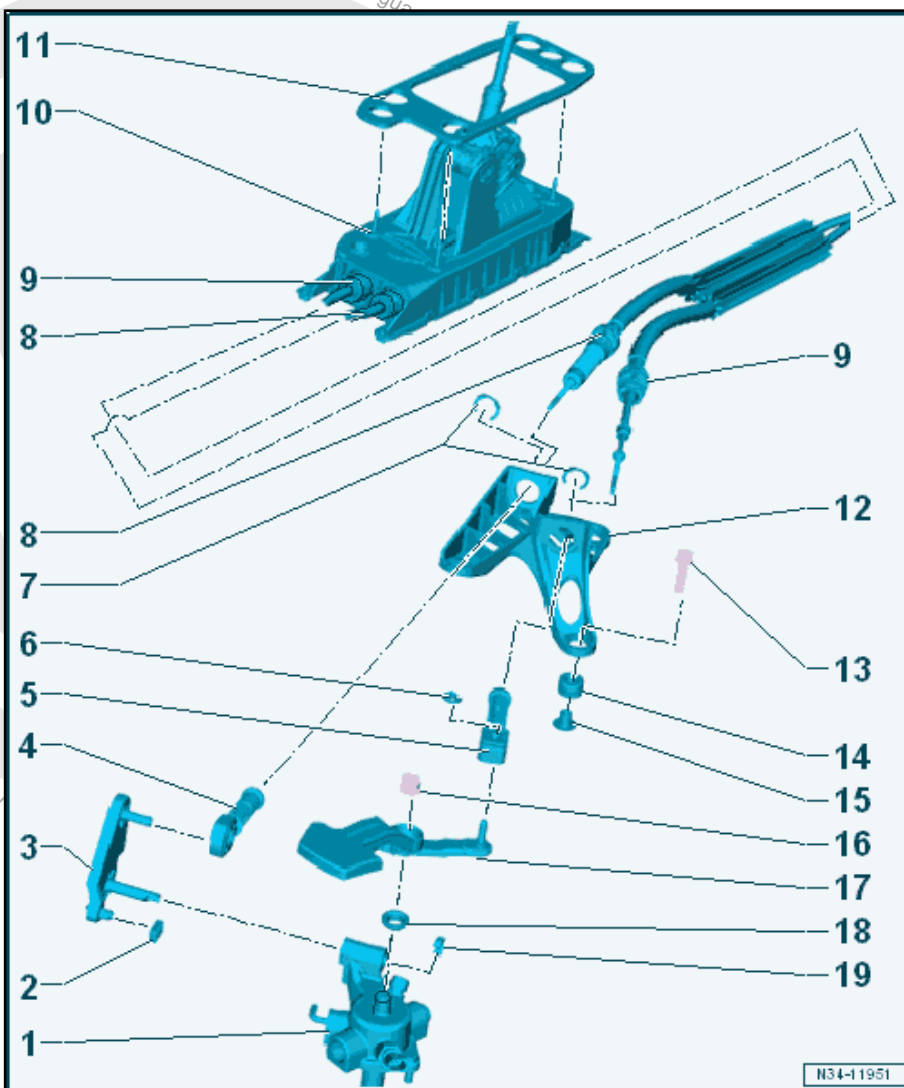
- ☐ Allocation. Refer to the *Parts Catalog*.
- ☐ Installed position. Refer to
⇒ [Fig. "Selector Lever/ Relay Lever Installed Position", page 61](#)
- ☐ Adjust the gearshift mechanism after installing. Refer to
⇒ ["1.6 Selector Mechanism, Adjusting", page 63](#).
- ☐ Relay lever and cable retainer, removing and installing. Refer to
⇒ [Fig. "Remove the Relay Lever and the Cable Retainer.", page 58](#)

4 - Cable Retainer

- ☐ For attaching the selector cable to the relay lever
- ☐ Adjust the gearshift mechanism after installing. Refer to
⇒ ["1.6 Selector Mechanism, Adjusting", page 63](#).
- ☐ Do not interchange, cable locking mechanisms for selector cable on linkage lever and for shift cable on transmission shift lever are different
- ☐ Allocation. Refer to ⇒ [Fig. "Cable Retainer Allocation", page 60](#).
- ☐ Remove from the relay lever. Refer to
⇒ [Fig. "With the Relay Lever Removed: Pry the Selector Cable Retainer Off of the Relay Lever.", page 59](#)
- ☐ Press onto the relay lever. Refer to
⇒ [Fig. "Installing the Selector Cable Retainer on the Relay Lever", page 59](#)

5 - Cable Retainer

- ☐ For attaching the shift cable to the transmission shift lever
- ☐ Adjust the gearshift mechanism after installing. Refer to
⇒ ["1.6 Selector Mechanism, Adjusting", page 63](#).
- ☐ Do not interchange, cable locking mechanisms for selector cable on linkage lever and for shift cable on transmission shift lever are different
- ☐ Allocation. Refer to ⇒ [Fig. "Cable Retainer Allocation", page 60](#).





6 - Lock Washer

- ☐ Replace after removing

7 - Lock Washer

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

8 - Selector Cable

- ☐ Attach to the cable retainer
- ☐ Do not bend
- ☐ Installed position. Refer to ➔ ["1.1 Selector Mechanism Installation Position", page 51](#)

9 - Gearshift Cable

- ☐ Attach to the cable retainer
- ☐ Do not bend
- ☐ Installed position. Refer to ➔ ["1.1 Selector Mechanism Installation Position", page 51](#)

10 - Gearshift Housing

11 - Seal

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

12 - Cable Mounting Bracket

- ☐ Adjust the gearshift mechanism after installing. Refer to ➔ ["1.6 Selector Mechanism, Adjusting", page 63](#)

13 - Hex Bolt

- ☐ 20 Nm
- ☐ For the cable bracket
- ☐ Quantity: 3

14 - Grommet

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

15 - Spacer

- ☐ Quantity: 3

16 - Nut

- ☐ Tightening specification. Refer to ➔ ["5.5 Overview - Shift Unit", page 96](#)

17 - Gearshift Lever

- ☐ Insert so that master spline aligns with shift rod. Refer to ➔ [Fig. "Installing the Transmission Shift Lever", page 62](#)
- ☐ Installed position. Refer to ➔ [Fig. "Selector Lever/Relay Lever Installed Position", page 61](#)
- ☐ Adjust the gearshift mechanism after installing. Refer to ➔ ["1.6 Selector Mechanism, Adjusting", page 63](#)

18 - Gearshift Shaft Seal

- ☐ Replacing. Refer to ➔ ["5.5 Overview - Shift Unit", page 96](#)

19 - Clip

1.4 Gearshift Knob, Removing and Installing

Special tools and workshop equipment required



- ◆ Hose Clip Pliers - VAG1275A-
- ◆ Wedge Set - T10383-
- ◆ Wedge Set - Wedge 1 - T10383/1-
- ◆ or the equivalent equipment, Backrest Panel Tool - 3370-



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

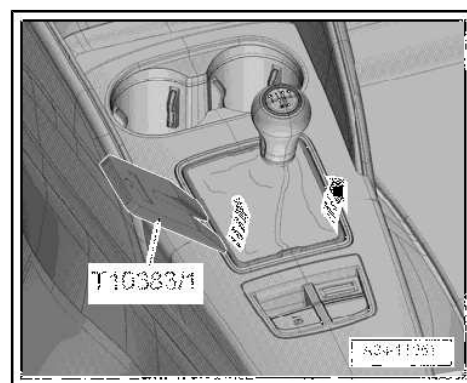
Mandatory Replacement Parts

- ◆ Clamp - Shift Knob to Shift Lever

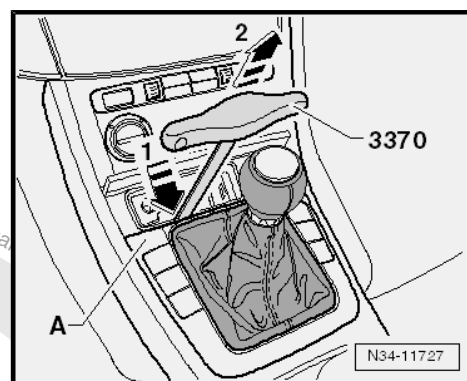
Removing

- 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 in direction of -arrow 1- until stop.
- Remove boot with plastic frame from center console frame -A- in direction of -arrow 2-.
- Roll the selector lever boot up over the gearshift knob.

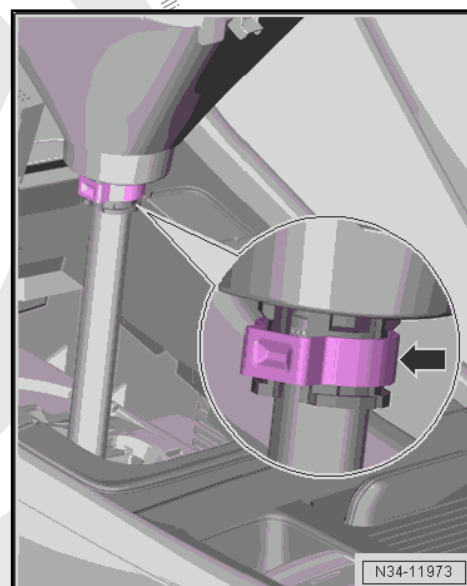


- Open the clamp -arrow- and remove the gearshift lever knob with the shift lever boot.

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 gearshift lever (⇒ previous illustration). Use the Hose Clamp Pliers - VAG1275- to do this.





1.5 Selector Mechanism, Removing and Installing

Special tools and workshop equipment required

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



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

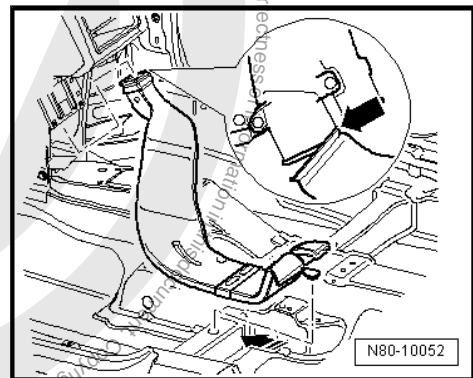
- ◆ Lock Washer - Cable Retainer
- ◆ Lock Washer - Gearshift Cable

Removing

- Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .
- Remove the boot with the gearshift knob and, if necessary, remove the noise insulation from the center console frame as well. Refer to ⇒ **"1.4 Gearshift Knob, Removing and Installing", page 54** .

The Footwell Rear Channel is Located Above the Bracket for the Center Console on Some Vehicles:

- 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 the nuts from the center console mounting bracket. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Center Console, Removing and Installing .
- Remove the nuts from the gearshift housing. Refer to ⇒ **Fig. "Installed Position of Gearshift Housing Nuts -arrows-", page 57** .
- 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.
- Remove the center console mounting bracket. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Center Console, Removing and Installing .



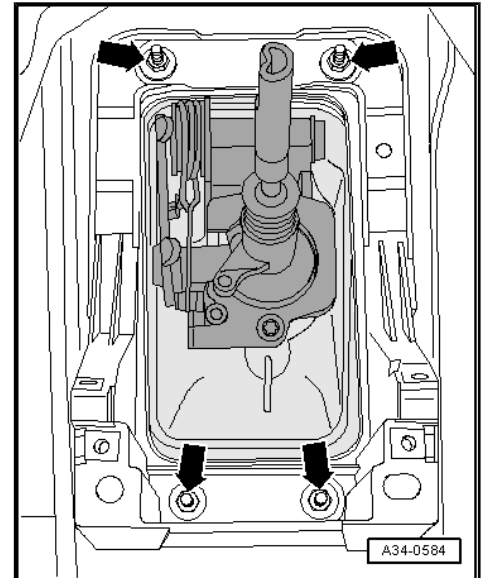
If the Center Console Bracket Cannot be Removed Separately:

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



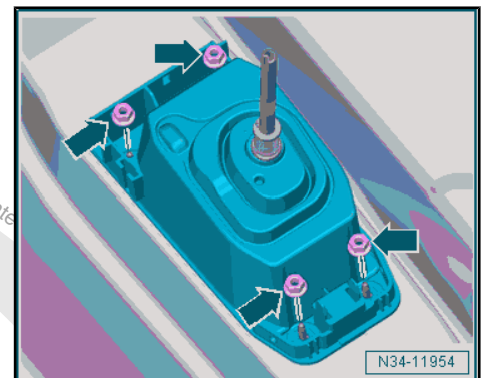
Installed Position of Gearshift Housing Nuts -arrows-.

- 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 .



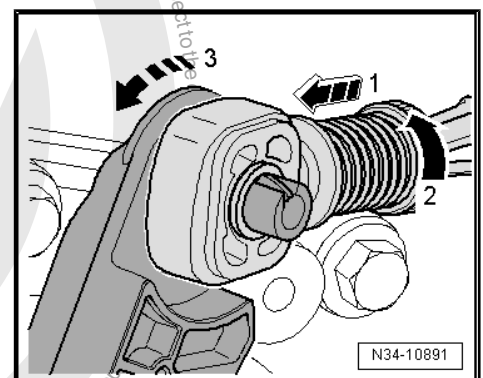
Installed Position of Noise Insulation and Gearshift Housing Nuts -arrows-.

- 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 air filter housing if it is located over the gearshift mechanism. Refer to ➤ Engine Mechanical, Fuel Injection and Glow Plug; Rep. Gr. 23 ; Air Filter; Overview - Air Filter Housing or ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- Remove the shift cable from the gearshift lever pins.



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 relay lever forward (in direction of -arrow 3-).





Remove the Relay Lever and the Cable Retainer.

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



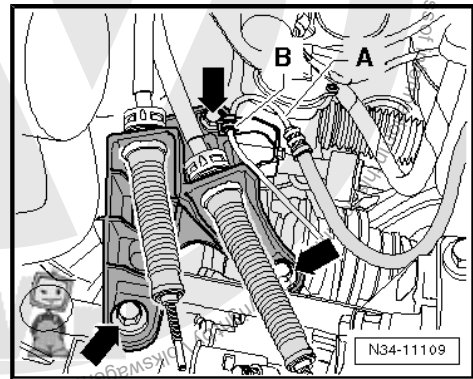
- Remove the cable bracket from the transmission -arrows-. Unclip the hose line -A- from the bracket -B- beforehand, if necessary.



Caution

There is a danger of causing damage to the decoupling element on the exhaust pipe.

- ♦ Pay attention to ⇒ Rep. Gr. 26 ; Emissions Control; Overview - Emissions Control .



- Remove the exhaust pipe under the gearshift mechanism. Refer to ⇒ Rep. Gr. 26 ; Exhaust Pipes/Mufflers; Overview - Muffler .
- Remove the heat shield under the gearshift mechanism.

Removing the heat shield. 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.

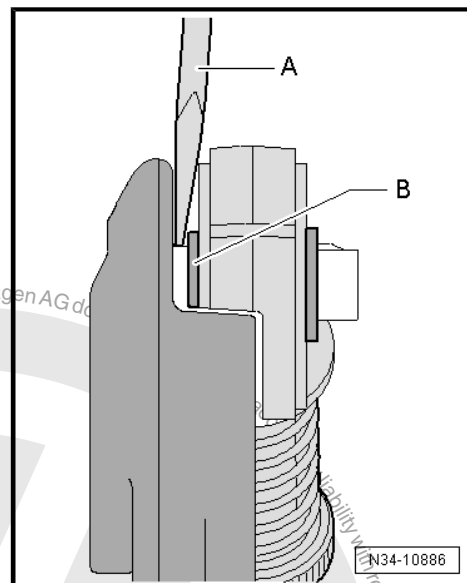


With the Relay Lever Removed: Pry the Selector Cable Retainer Off of the Relay Lever.

- Insert a screwdriver -A- between the bushing -B- and the relay lever.

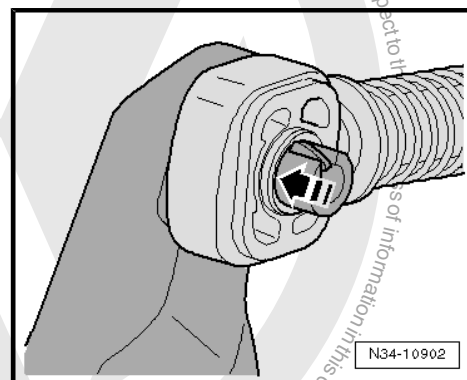
Installing

Install in reverse order of removal. Note the following:



Installing the Selector Cable Retainer on the Relay Lever

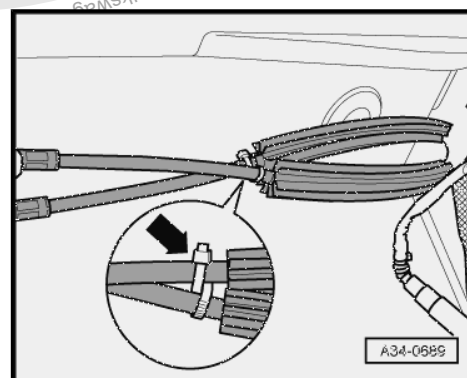
- The relay lever is removed.
- Lubricate cable retainer locating bore.
- Grease allocation. Refer to the Parts Catalog.
- The cable retainer may only be installed at the bushing in direction of -arrow-.
- The cable retainer must move freely on the relay lever.
- The cable retainer must be behind the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

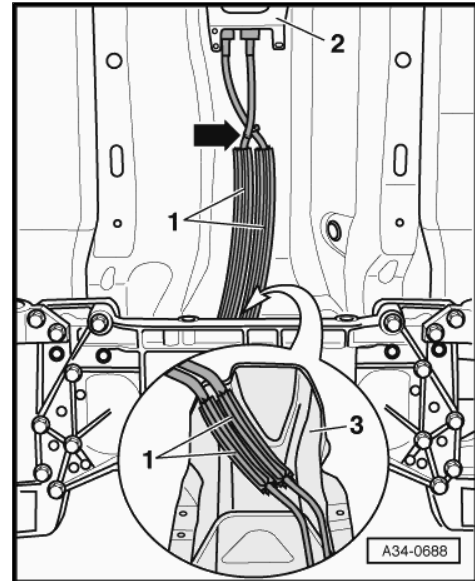
Cable Tie Installation Locations

- Wrap the cable tie -arrow- in a crossover pattern around the cables and attach it as illustrated.

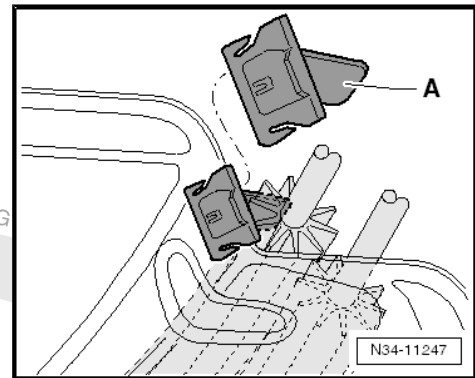




- Route the cables -1- from the gearshift mechanism -2- to the transmission as follows:
- ◆ After the cables cross each other diagonally -arrow-, they must run parallel to each other up to the cable mounting bracket on the transmission.
- ◆ The cable tie -arrow- for securing the cables must be installed correctly. Installation location. Refer to [⇒ Fig. "Cable Tie Installation Locations", page 59](#).
- ◆ The cables must be routed inside the depression in the heat shield -3-.



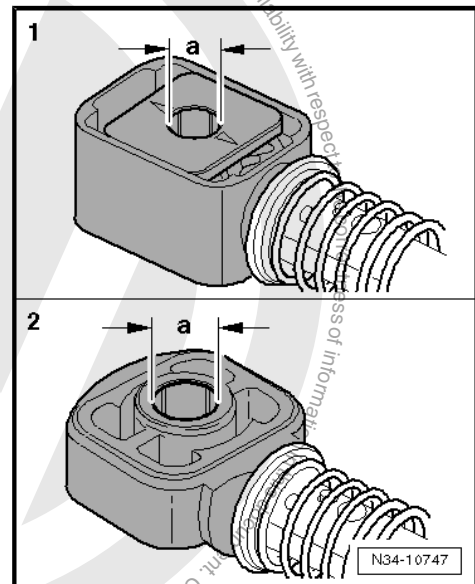
A clip -A- holds the cables and heat shield to each other in place.



Cable Retainer Allocation

These holes have different diameters.

Cable Retainer For:	Dimension "a"
1. - Shift cable to transmission selector lever	8.5 mm
2. - selector cable to relay lever	10 mm

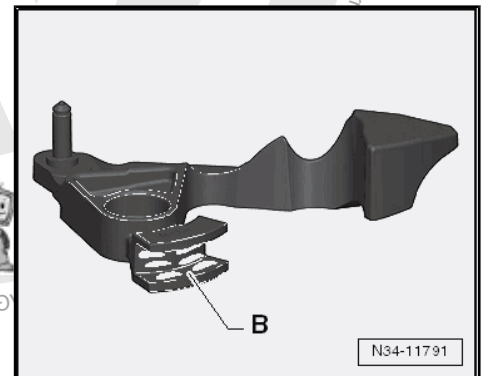
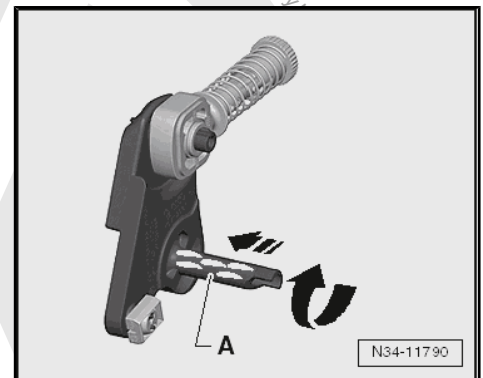
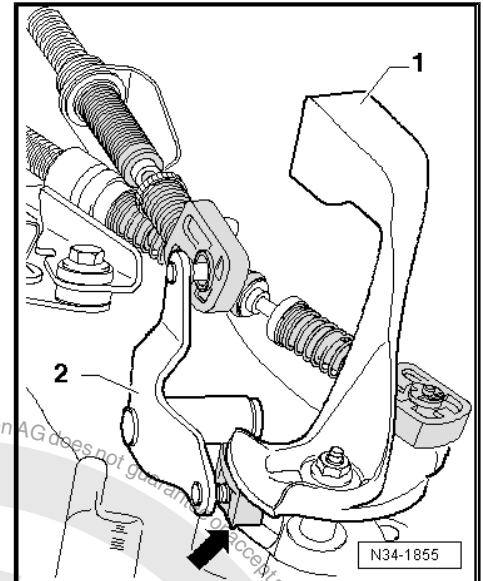




Selector Lever/Relay Lever Installed Position

1 - Gearshift lever

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

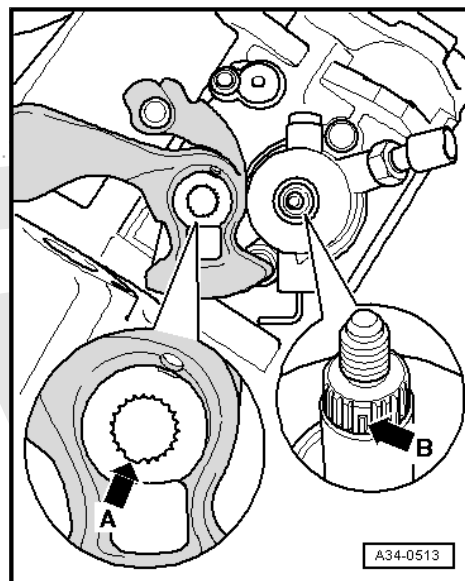


- Lubricate the following areas very carefully when installing.
- Relay lever shaft -A- -arrows-.
- Gearshift lever glide track -B- fits into the relay lever.
- Cable retainer locating bore.
- Grease allocation. Refer to the Parts Catalog.
- The selector relay lever and gearshift lever in the illustration may differ from the Original Part.



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-.
- Secure the shift cable with new lock washers to the gearshift lever.



Install the Relay Lever and the Cable Retainer Together.



Note

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

- Install the 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.
- Install the selector cable in the cable retainer.
- Install the center console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Center Console, Removing and Installing .
- Install the boot with the shifter knob and noise insulation. Refer to ⇒ [“1.4 Gearshift Knob, Removing and Installing”, page 54](#) .
- Install 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 .
- Assemble the exhaust system free of tension. Refer to ⇒ Rep. Gr. 26 ; Exhaust Pipes/Mufflers; Overview - Muffler .
- Adjust the gearshift mechanism. Refer to ⇒ [“1.6 Selector Mechanism, Adjusting”, page 63](#) .
- Install the air filter housing if it was removed earlier. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing or ⇒ Engine Mechanical, Fuel Injection and Glow Plug; Rep. Gr. 23 ; Air Filter; Overview - Air Filter Housing .
- Connect the battery. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .



Tightening Specifications

- ♦ Refer to ⇒ [“1.2 Overview - Gearshift Knob and Cover”, page 52](#)
- ♦ Refer to ⇒ [“1.3 Overview - Selector Mechanism”, page 53](#) .



1.6 Selector Mechanism, Adjusting

Special tools and workshop equipment required

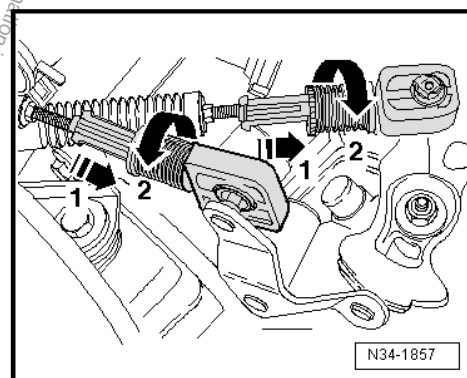
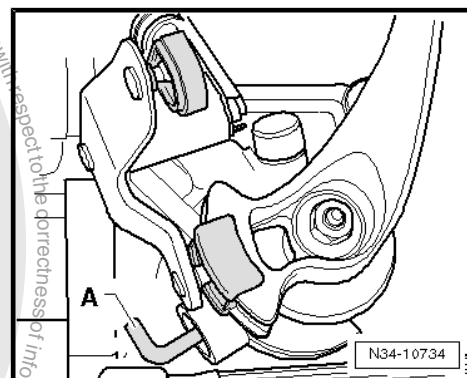
- ◆ Connecting Pin - T10027A-

Adjusting Requirements

- Operating and transfer elements of shift mechanism must be in proper condition.
- Shift mechanism must move freely.
- The transmission, clutch and clutch mechanism must also be in proper condition.
- Transmission in neutral.

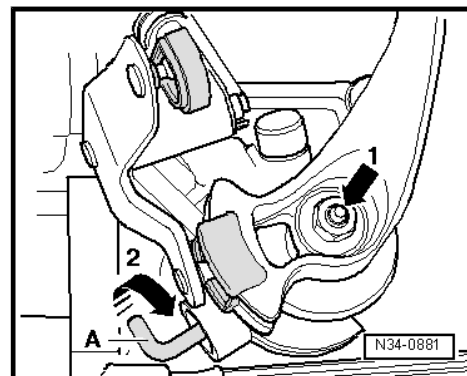
- Remove the entire air filter housing if the bracket -A- and the securing mechanism for the shift and selector cables are not accessible. Refer to ➔ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .

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 2- upward and simultaneously press it in until it engages in the gearshift shaft.

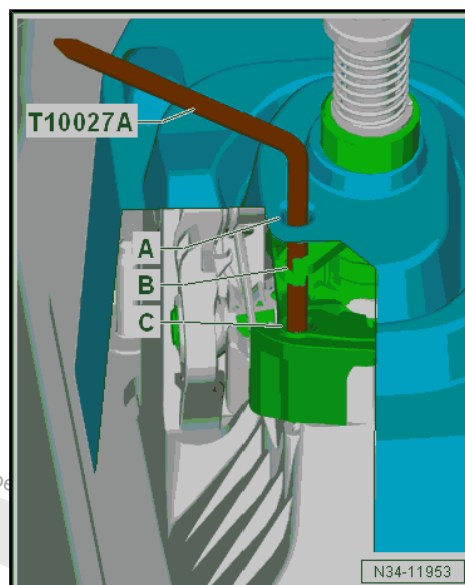




- Remove the boot and, if possible, the noise insulation from the center console. Refer to
⇒ [“1.4 Gearshift Knob, Removing and Installing”, page 54](#) .

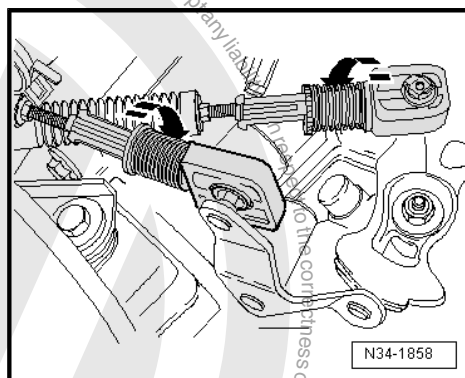
Secure the gearshift shaft as follows:

- 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-.

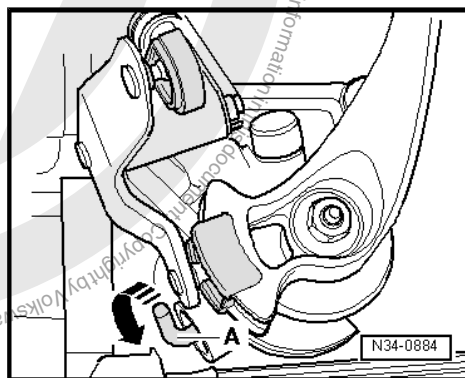


- Position the safety mechanism on the cable retainer for the shift cable and selector cable all the way to the right in direction of -arrow-.

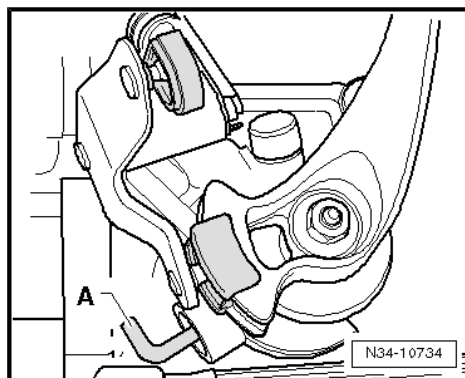
The spring will push the safety mechanism into the starting position.



- Push the angle -A- back in the starting position direction of -arrow-.

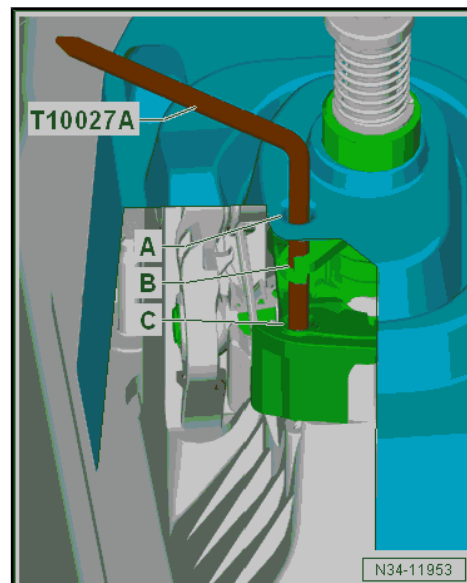


- The bracket -A- must be pressed out of the selector housing as far as the stop and it must face toward the rear.





- Remove the Locking Pin from the noise insulation -A- and the holes -B and C-.
- Install the boot and if the insulation (if equipped). Refer to ⇒ [“1.4 Gearshift Knob, Removing and Installing”, page 54](#) .
- Make sure the gearshift shaft moves easily.
- Install the air filter housing if it was removed earlier. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .



1.7 Selector Mechanism, Checking

- The gearshift lever must rest in the 3rd/4th gear 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.
- It will be necessary to adjust the gearshift mechanism again if a hook does not appear each time a gear is engaged. Refer to ⇒ [“1.6 Selector Mechanism, Adjusting”, page 63](#) .

1.8 Selector Shaft Seal, Replacing

Special tools and workshop equipment required

- ◆ Press Piece - Shift Rod/Alternator - VW423-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Sealing Grease - G 052 128 A1-



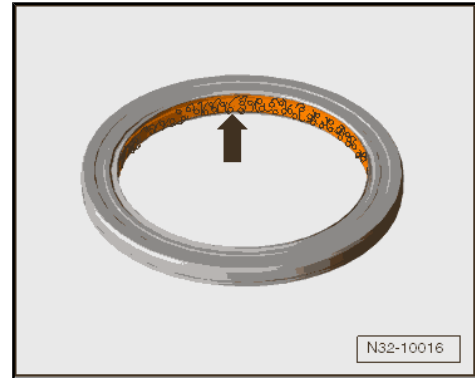
Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

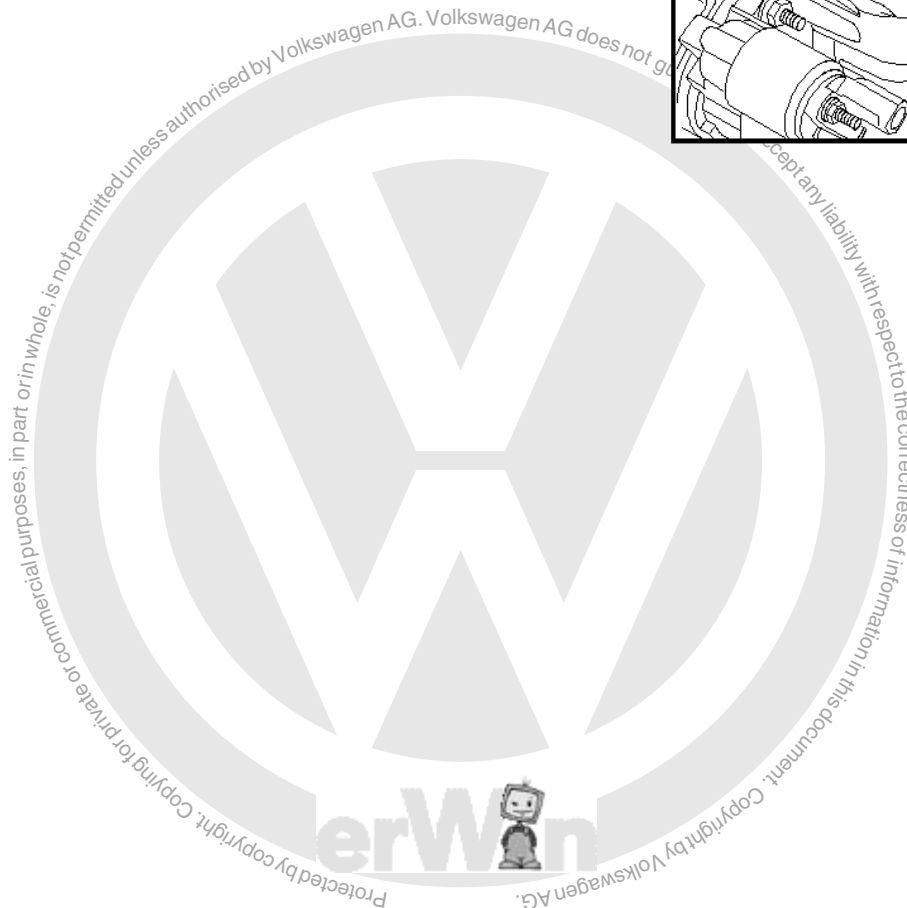
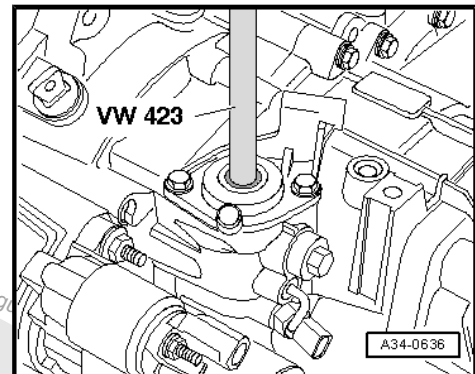
- Remove transmission shift lever and relay lever. Refer to ⇒ [“1.3 Overview - Selector Mechanism”, page 53](#) .
- Remove the seal with a screwdriver.



- 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 the gearshift lever and relay lever. Refer to [⇒ "1.3 Overview - Selector Mechanism", page 53](#) .





2 Transmission, Removing and Installing

⇒ [“2.1 Transmission, Removing”, page 67](#)

⇒ [“2.2 Transmission, Installing”, page 77](#)

⇒ [“2.3 Transmission Tightening Specifications”, page 86](#)

2.1 Transmission, Removing

Special tools and workshop equipment required

- ◆ Engine Support Bridge - 10-222A-
- ◆ Engine Support Bridge - Gearbox Adapter - 10-222A/29-
- ◆ Engine Support Bridge - Engine Support 18 - 10-222A/18-
- ◆ Engine/Gearbox Support Shackle (2 pc.) - 10-222A/12-
- ◆ Transmission Support - Pins 29 - 3282/29-
- ◆ Transmission Support - 3282-
- ◆ Transmission Support - Mounting Plate 39 - 3282/39-
- ◆ Transmission Support Elements (determine when mounting the Adjustment Plate on the Transmission Support)
- ◆ Engine and Gearbox Jack - VAS6931-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Torque Wrench 1332 40-200Nm - VAG1332-
- ◆ Transmission Support Jig - 3336- to transport the transmission.
- ◆ Grease for Clutch Disc Shaft Splines - G 000 100-
- ◆ Allocate the grease for gearshift mechanism. Refer to the Parts Catalog.
- ◆ Engine Support Bridge - Special Hook (2 pc.) - 10-222A/20-
- ◆ Spindle from the Seal Installer - Driver Set - 3066- or M8 x 105 bolt
- ◆ Seal Installer - One-Piece Seal - T10148-
- ◆ Engine Support - Basic Set Square Pipe - T40091/1- (quantity 2)
- ◆ Engine Support - Basic Set Movable Joint - T40091/3- (quantity 2)
- ◆ Engine Support - Supplement Kit Spindle - T40093/3- (quantity 2) from the Engine Support - Supplement Kit - T40093A-
- ◆ Engine Support Brackets - T40093/3-6- (quantity 2)



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

- ◆ Bolt - Transmission Support to Transmission
- ◆ Bolt - Transmission Support to Transmission Bracket
- ◆ Bolt - Pendulum Support to Transmission



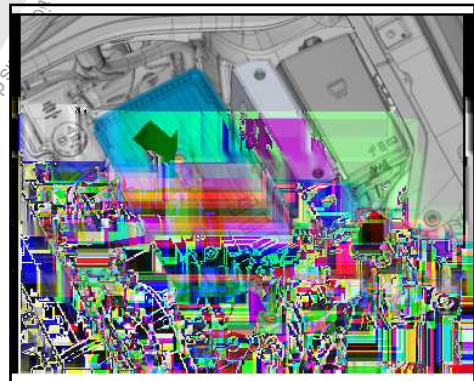
- ◆ Bolt - Pendulum Support to Subframe
- ◆ Bolts - Transmission Bracket to Transmission
- ◆ Bolts - Transmission Mount to Transmission Bracket
- ◆ Lock Washer - Cable Retainer
- ◆ Lock Washer - Gearshift Cable
- ◆ Nut - Coupling Rod to Stabilizer Bar
- ◆ Bolts - CV Boot to Inner CV Joint
- ◆ Seals - Transmission

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

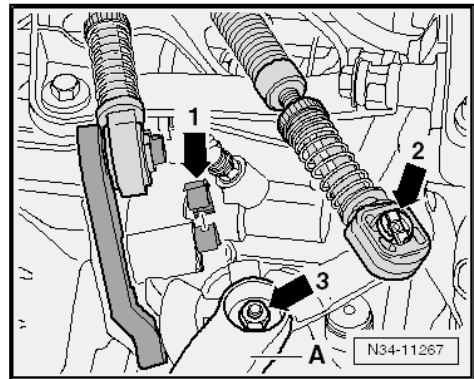
Remove the engine cover. Refer to ➔ Rep. Gr. 10 ; Engine Cover; Engine Cover, Removing and Installing .

Remove the air filter housing. Refer to ➔ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .

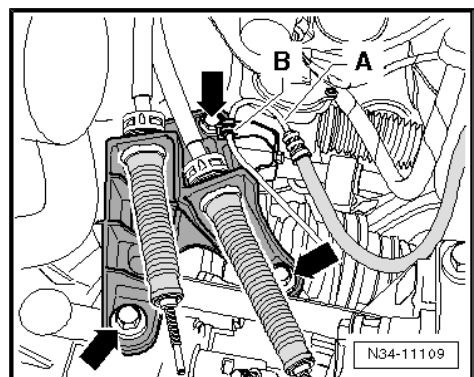
- Remove the battery and the battery tray -1- -arrows-. Refer to ➔ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery Tray, Removing and Installing .
- Remove the cable retainer from the selector cable. Refer to ➔ [Fig. "Disconnecting the Cable Retainer from the Selector Cable"](#), page 57 .



- Remove the clip -arrow 1- and then remove the relay lever and the cable retainer.
- Remove the shift cable lock washer -arrow 2- from the selector lever -A-.
- Remove the shift cable from the gearshift lever pins.
- Remove the nut -arrow 3- and then remove the transmission shift lever -A-.



- Remove the cable mounting bracket from the transmission -arrows-.
- Tie up the shift cable and the selector cable.
- If equipped, remove the bracket -B- from the transmission. Remove the bracket from the hose/line assembly -A-.





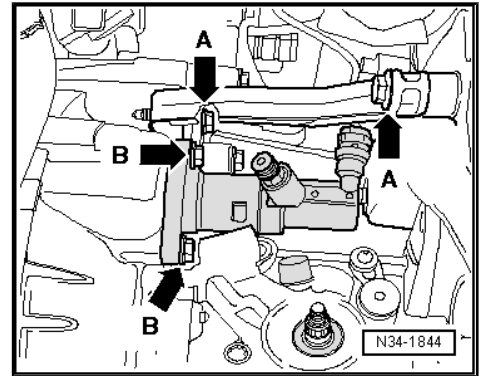
- Remove the transmission support -A arrows-.
- Remove the clutch slave cylinder -B arrows- lay aside and secure with wire. Do not open the line system.



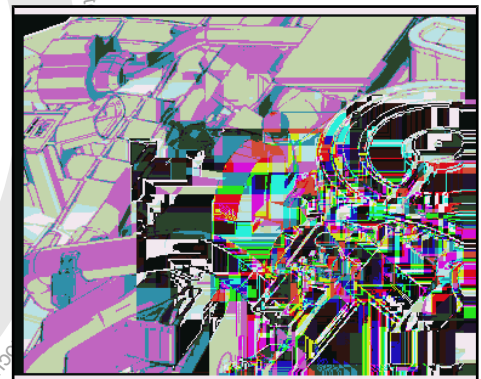
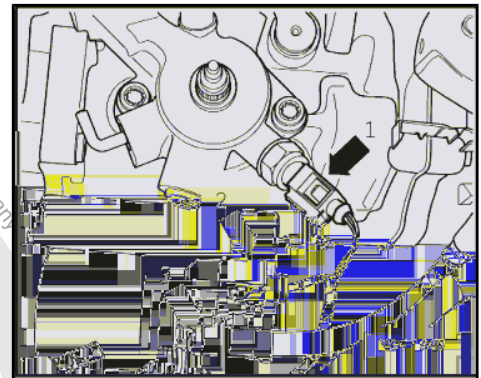
Caution

The clutch slave cylinder could be damaged.

- ◆ *If the clutch slave cylinder is removed from the transmission with pipe/hose line still connected, do not press the clutch pedal.*



- Remove the ground cable upward from the engine/transmission connecting bolt or from the upper starter bolt.
- Disconnect the connector -arrow 1- from the Back-Up Lamp Switch - F4- .
- Remove the connector -arrow 2- and wire -arrow 3- from the starter.
- Remove the upper bolt from the starter.
- Remove the upper engine/transmission bolts.
- Unlock the retaining tab in direction of -arrow- and remove the left engine cover mount -1-.



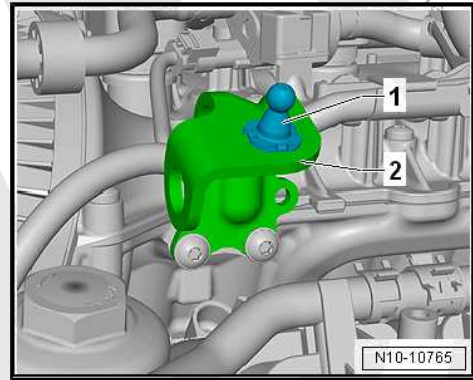


- Unclip the right mount -1- for the engine cover from the bracket -2-.

- Attach the Engine Support Bridge - 10-222A- as follows:

The following are needed:

- ◆ Engine Support Bridge - Engine Support 18 - 10-222A/18-
- ◆ Engine Support - Bracket w/Spindle and hook - 10-222A/20-
- ◆ Engine/Gearbox Support Shackle (2 pc.) - 10-222A/12- (is needed if the Spindle from the Engine Support Bridge cannot be engaged in the engine lifting eye).
- ◆ Engine Support Bridge - Engine Support 29 - 10-222A/29- (quantity 2)
- ◆ Engine Support - Basic Set Square Pipe - T40091/1- (quantity 2)
- ◆ Engine Support - Basic Set Movable Joint - T40091/3- (quantity 2)
- ◆ Engine Support - Supplement Kit Spindle - T40093/3- (quantity 2)
- ◆ Engine Support Brackets - T40093/3-6- (quantity 2)



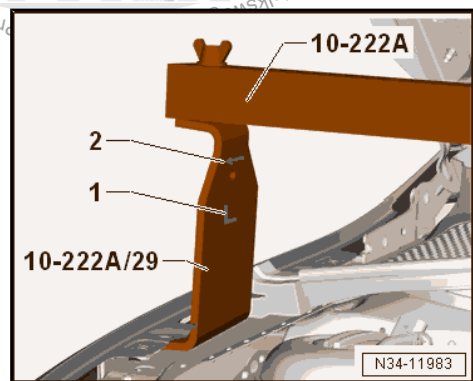
- Insert the Engine Support Bridge - Engine Support 29 - 10-222A/29- between the fender bolting edge and the fender bolting plate underneath it on both sides of the vehicle.

- ◆ Installed position:

"L" = -1- Adapter is Installed on the "right" Side of the Vehicle (Adapter Locks in the Hole on the Fender).

"R" (Not Illustrated Here), Adapter is Installed on the "left" Side of the Vehicle.

The arrow -2- on the Engine Support Bridge - Engine Support 29 - 10-222A/29- always points in the direction of travel.

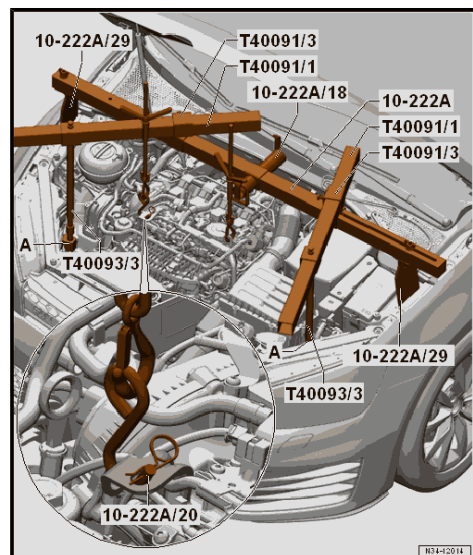


- Slide the Engine Support Bridge - Engine Support 18 - 10-222A/18- and two Engine Support - Basic Set Movable Joint - T40091/3- onto the Engine Support Bridge - 10-222A- .

- Tighten the Engine Support Bridge - 10-222A- on the Engine Support Bridge - Engine Support 29 - 10-222A/29- .

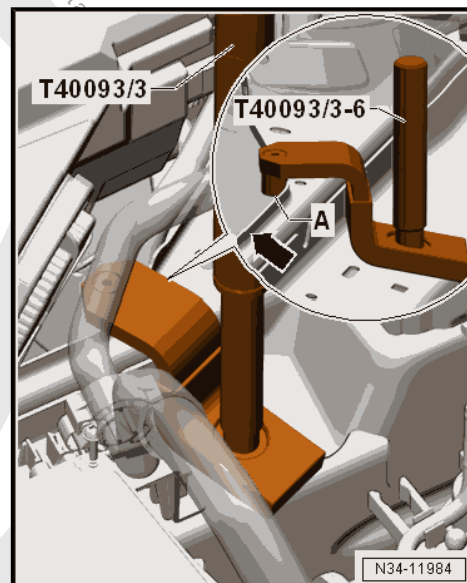
-A- = Engine Support Brackets - T40093/3-6- (⇒ next illustration)

- Remove the filler tube for the windshield washer system washer fluid reservoir. Refer to ⇒ Electrical Equipment; Rep. Gr. 92 ; Windshield Washer System; Washer Fluid Reservoir, Removing and Installing .



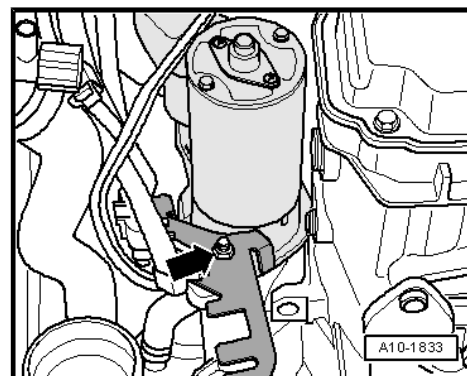


- If present, remove wires from the front area of both longitudinal members -arrow-. Do not disconnect line system.
- Place the Engine Support Brackets - T40093/3-6- on both longitudinal members (the right longitudinal member is illustrated here).
- If necessary, carefully unclip the A/C system pipe in the front area. Do not disconnect the line system. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 87 ; Refrigerant Circuit; System Overview - Refrigerant Circuit .
- The Engine Support Brackets - T40093/3-6- locks respectively with the pins -A- behind the tab on the longitudinal member -arrow-.
- Install the Engine Support - Supplement Kit Spindle - T40093/3- .
- Connect the Engine Support - Supplement Kit Spindle - T40093/3- over the Engine Support - Basic Set Square Pipe - T40091/1- with the Engine Support Bridge - 10-222A- and tension it (⇒ previous illustration).



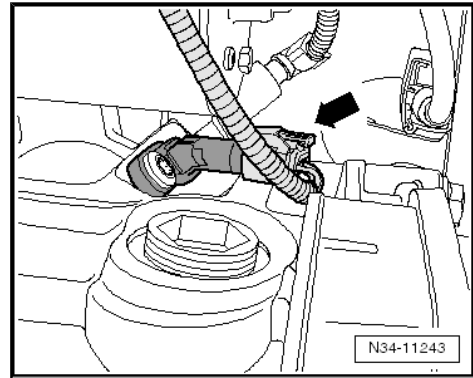
Note

- ◆ *The Engine Support - Basic Set - Square Pipe - T40091/1- must not touch the windshield.*
- ◆ *The Engine Support Bridge - Engine Support 18 - 10-222A/18- must not lie on the windshield wiper arm.*
- Engage the Spindles with the Engine Support Bridge - Special Hook (2 pc.) - 10-222A/20- and if necessary with the Engine/ Gearbox Support Shackle (2 pc.) - 10-222A/12- in the engine lifting eyes.
- Pretension the engine/transmission assembly and Engine Support Bridge via the Spindles .
- Raise the vehicle and remove the left front wheel.
- 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; Front Wheel Housing Liner, Removing and Installing .
- Remove the nut -arrow- and then remove the wire mount.

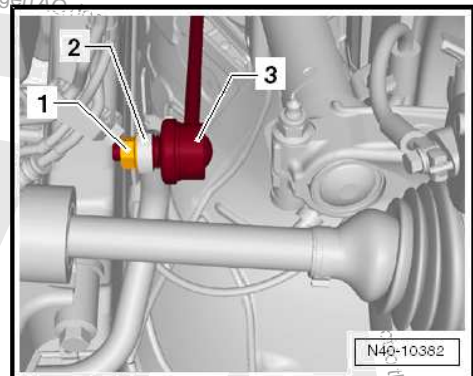




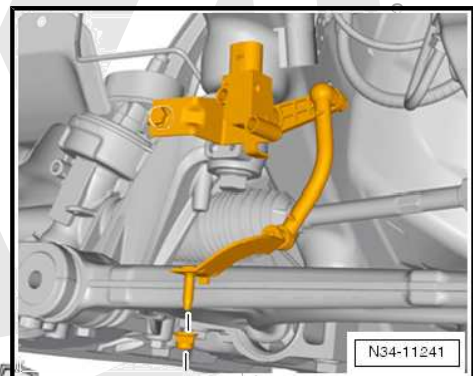
- Remove all wires from the transmission.
- Transmission on vehicles with Start/Stop System: disconnect the connector -arrow- from the Transmission Neutral Position Sensor - G701- .
- Remove the starter. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Starter; Starter, Removing and Installing .



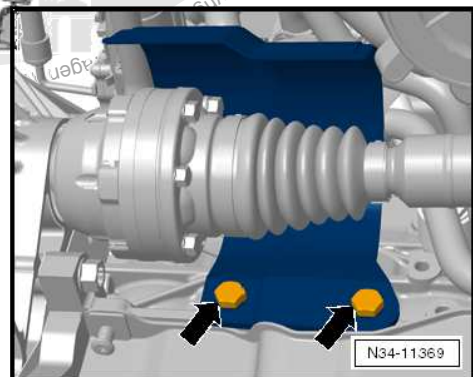
- Remove the nuts -1- from both sides of the coupling rod -3-.
- Remove the coupling rod -3- from both sides of the stabilizer bar -2-.



- If equipped, remove the Left Front Level Control System Sensor - G78- from the lower control arm. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 43 ; Level Control System Sensor; Overview - Front Level Control System Sensor .



- Remove the drive axle heat shield -arrows- (if equipped). 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 .



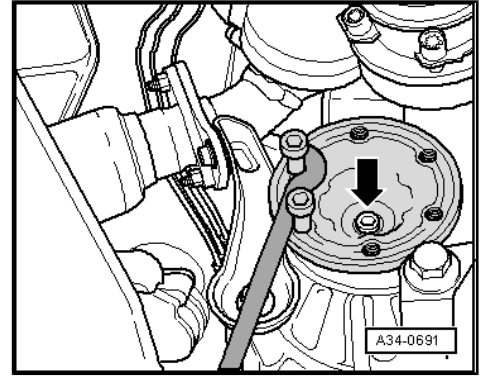


- Install the two bolts into the flange and counterhold the flange shaft with the pry lever to remove the right flange shaft bolt -arrow-.
- Remove the flange shaft.



Note

- ◆ Check the seal for leaks before removing the flange shaft. If the seal has leaks, replace it when installing. Refer to ⇒ ["1.3 Right Seal, Replacing", page 185](#).
- ◆ If transmission fluid leaks out while removing the flange shaft, drain and refill transmission fluid on the installed transmission and installed flange shaft. Refer to ⇒ ["8 Transmission Fluid", page 125](#).

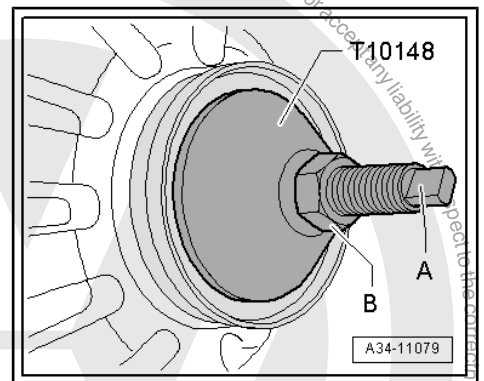


- Attach the spindle -A- from the Seal Installer - Driver Set - 3066- into the threaded piece on the differential.
- Insert the Seal Installer - One-Piece Seal - T10148- and secure with the nut -B-.



Note

- ◆ The Seal Installer - One-Piece Seal - T10148- protects the right seal and the transmission from dirt.
- ◆ A M8 x 105 mm bolt may be installed by hand into the differential threaded piece instead of a spindle -A-.

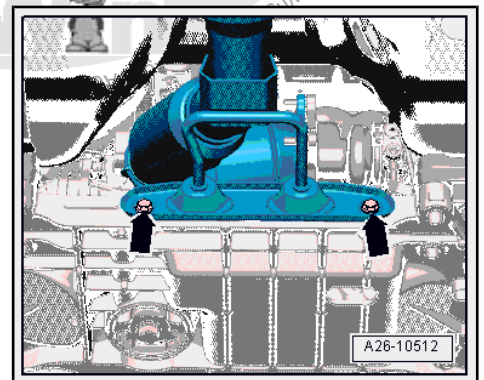


Caution

There is a danger of causing damage to the decoupling element.

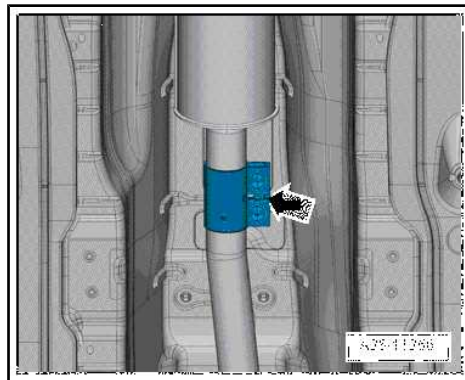
- ◆ Pay attention. Refer to ⇒ [Rep. Gr. 26; Emissions Control; Overview - Emissions Control](#).

- Remove the bracket bolts -arrows- for the exhaust system on the subframe.

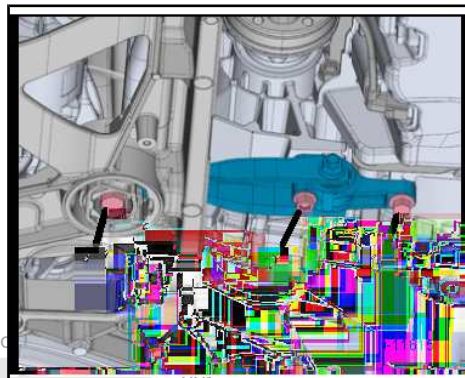




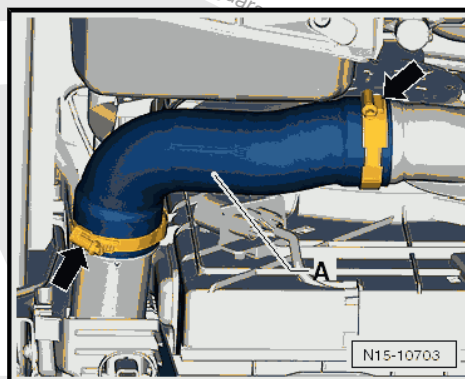
- Disconnect the exhaust system at the clamping sleeve -arrow-. Refer to ➤ Rep. Gr. 26 ; Exhaust Pipes/Mufflers; Overview - Muffler .



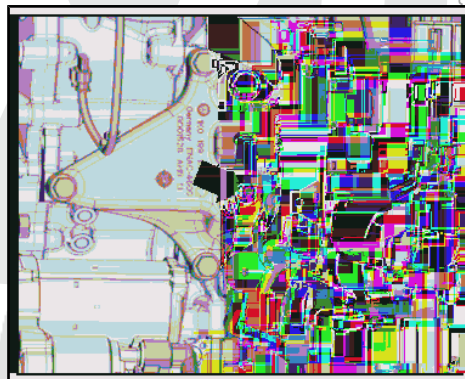
- Remove bolts -1 through 3- and remove pendulum support.



- Loosen the hose clamps -arrows- and remove the left charge air hose -A-. Refer to ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 21 ; Charge Air System; Overview - Charge Air System .

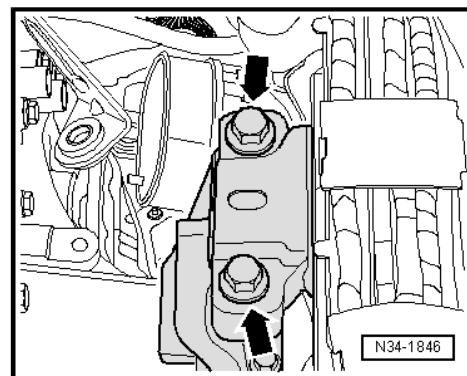


- If present, remove nut -arrow- and ground cable.

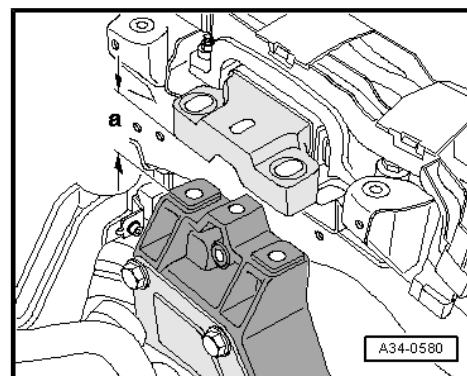




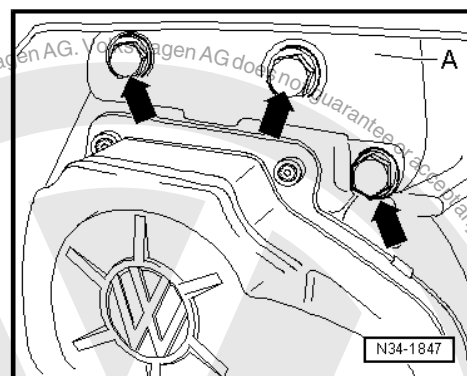
- Remove the left assembly mounting hex bolts -arrows- from the transmission mounting.



- Turn the spindles on the Engine Support Bridge - 10-222A- and lower the transmission to dimension -a-.
- Dimension -a- = approximately 50 mm

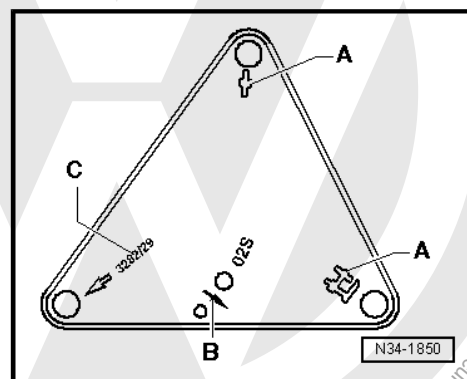


- Remove the transmission bracket -A- -arrows-.



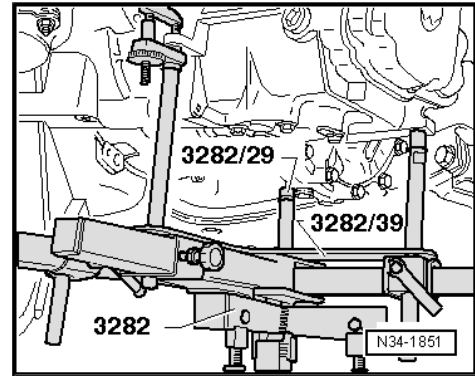
Align the Transmission Support - 3282- with the Transmission Support - Mounting Plate 39 - 3282/39- in order to remove the "0A4" transmission.

- Insert the Transmission Support - 3282- into the Engine and Gearbox Jack - VAS6931- .
- Align the arms of the Transmission Support so that they match up with the holes in the Adjustment Plate .
- Install the Mounting Elements -A and C- on the Adjusting Plate , as illustrated.
- Position the Engine-Transmission Jack under the vehicle. The arrow symbol -B- on the Adjusting Plate points in the direction of travel.

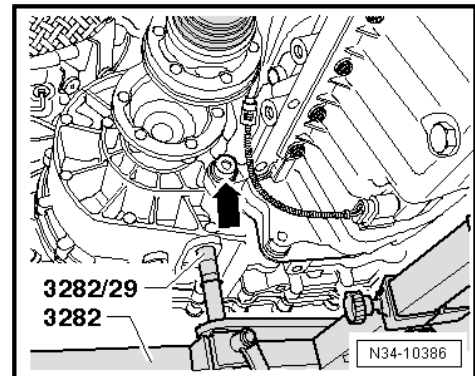




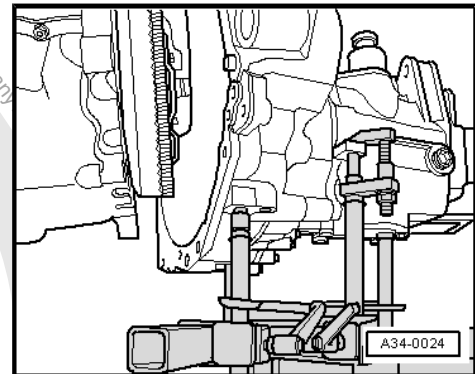
- Align the Adjusting Plate so that it is parallel to the transmission and secure the safety support to the transmission.



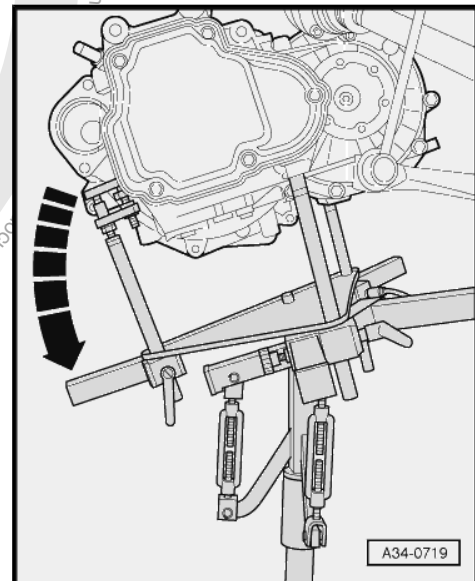
- Install the Transmission Support - Pins 29 - 3282/29- into the rear hole for the pendulum support bolt on the transmission.
- Remove the engine/transmission bolt near the right flange -arrow-.
- Remove the lower engine/transmission bolts.



- Remove the transmission from the alignment bushings and carefully move it toward the subframe.

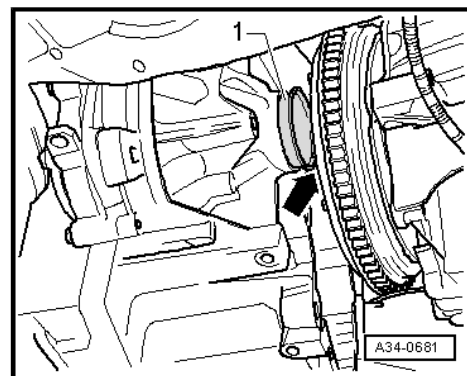


- Tip the transmission over the adjusting spindle for the Transmission Support - 3282- in the direction of -arrow-.
- Carefully push the engine forward slightly with a second technician.

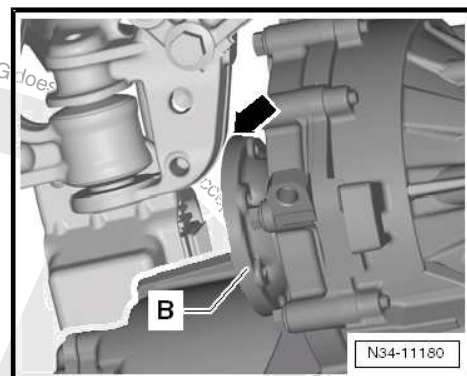




- Carefully lower the transmission with the Engine and Gearbox Jack - VAS6931- , while making sure that the right flange shaft seal -1- is guided through without any damage to the pressure plate -arrow-.



- Guide the left flange shaft -B- past the subframe -arrow- as shown. Move the Engine and Gearbox Jack with the transmission to the front.
- When lowering, change position of transmission with spindles on Transmission Support - 3282-



- Reinsert the right flange shaft if necessary and tighten the bolt -arrow- to the tightening specification.



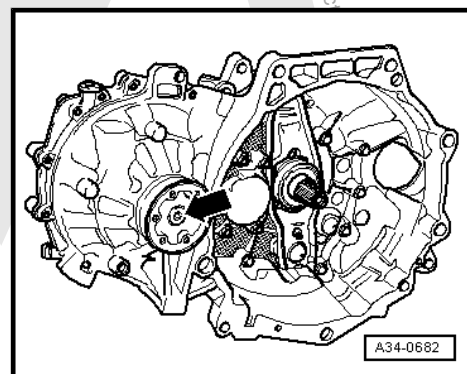
Note

Pay attention to the lines when lowering the transmission.

Transmission, transporting. Refer to
⇒ ["4 Transmission, Transporting", page 89](#) .

Tightening Specification

- ◆ Flange shaft to transmission. Refer to
⇒ ["2.1 Overview - Differential", page 189](#) .



2.2 Transmission, Installing



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

- ◆ Bolt - Transmission Support to Transmission
- ◆ Bolt - Transmission Support to Transmission Bracket
- ◆ Bolt - Pendulum Support to Transmission
- ◆ Bolt - Pendulum Support to Subframe
- ◆ Bolts - Transmission Bracket to Transmission
- ◆ Bolts - Transmission Mount to Transmission Bracket
- ◆ Lock Washer - Cable Retainer



- ◆ Lock Washer - Gearshift Cable
- ◆ Nut - Coupling Rod to Stabilizer Bar
- ◆ Bolts - CV Boot to Inner CV Joint
- ◆ Seals - Transmission



Note

Refer to "Transmission, Removing" to get a list of the special tools needed. Refer to ⇒ ["2.1 Transmission, Removing", page 67](#).

Pay attention to the following list for the subject -"Transmission Fluid, Checking and Filling":

"Transmission Fluid, Checking and Filling"				
Transmission		»No«	»Yes«	»Yes«
	Original Part	X		
	No oil outlet	X		
	Was completely disassembled		X before installation -item 3- ⇒ Item 3 (page 119) transmission fluid capacity. Refer to ⇒ "4.2 Capacities", page 6 .	
	Was partially disassembled • (the transmission housing and the clutch housing were not separated from each other)			X after installation. Refer to ⇒ "8 Transmission Fluid", page 125 .

- Use a thread cutter to carefully clean all threaded holes containing self-locking bolts to remove any locking compound residue.
- Replace self-locking screws and nuts after removing them.
- 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).

- Make sure the intermediate plate fits correctly on the engine.



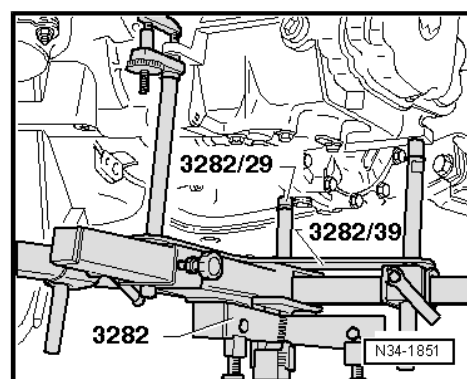
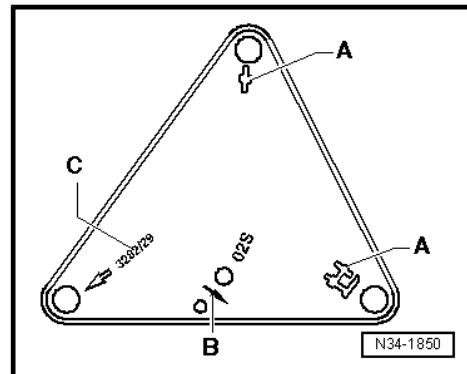
- Clean the drive axle splines and grease lightly with Grease For Clutch Disc Shaft Splines - G 000 100- .

It must be possible to slide the clutch plate back and forth on the input shaft.

- Check clutch release bearing for wear, replace if necessary.

Align the Transmission Support - 3282- with the Transmission Support - Mounting Plate 39 - 3282/39- in order to install the "0A4" transmission.

- Align the arms of the Transmission Support so that they match up with the holes in the Adjustment Plate .
- Install the Mounting Elements -A and C- (Transmission Support - Pins 29 - 3282/29-) on the Adjusting Plate as illustrated.
- 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 - Mounting Plate 29 - 3282/29- into the rear hole in the transmission for the pendulum support bolt.
- Position the Engine and Gearbox Jack under the vehicle. The -arrow symbol B- on the adjusting plate points in direction of travel.

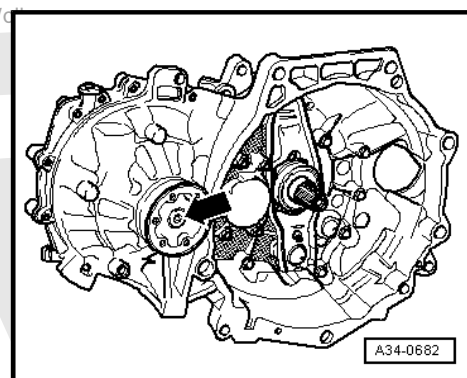


- Remove from a new transmission or replacement transmission right flange shaft -arrow-.



Note

- ◆ Check the seal for leaks before removing the flange shaft. If the seal has leaks, replace it when installing. Refer to ⇒ "1.3 Right Seal, Replacing", page 185 .
- ◆ If transmission fluid leaks out while removing the flange shaft, drain and refill transmission fluid on the installed transmission and installed flange shaft. Refer to ⇒ "8 Transmission Fluid", page 125 .

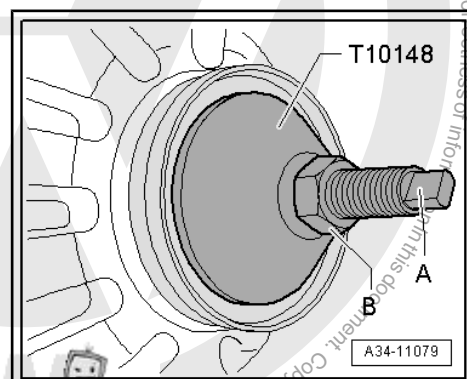


- Attach the spindle -A- for the Seal Installer - Driver Set - 3066- into the threaded piece on the differential.
- Insert the Seal Installer - One-Piece Seal - T10148- and secure with the nut -B-.



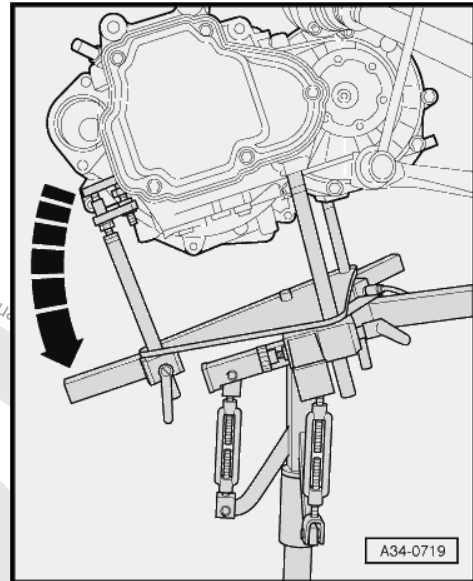
Note

- ◆ The Seal Installer - One-Piece Seal - T10148- protects the right seal and the transmission from dirt.
- ◆ An M8 x 105 mm bolt may be installed by hand into the differential threaded piece instead of a spindle -A-.

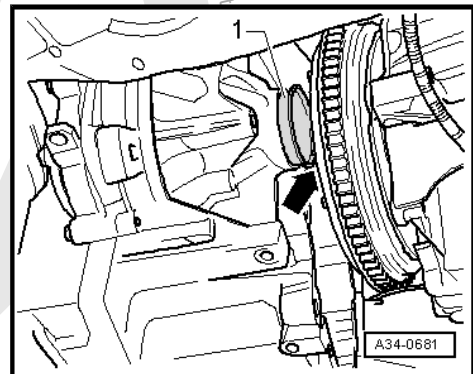




- Tip the transmission over the adjusting spindle for the Transmission Support - 3282- in the direction of -arrow-.
- Push the engine forward slightly with a second technician.



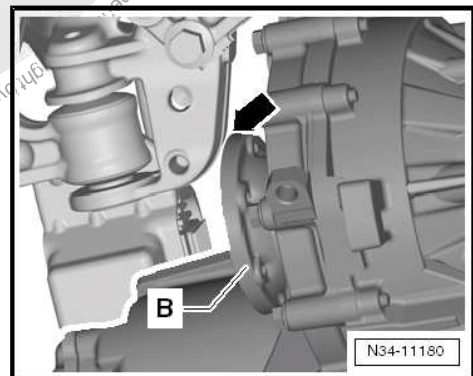
- Carefully lift the transmission with the Engine and Gearbox Jack , while making sure that the seal -1- is guided through without any damage to the pressure plate -arrow-.



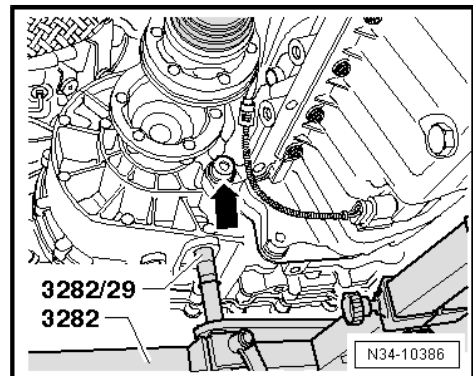
Note

Guide the left flange shaft -B- past the subframe -arrow-.

- Align the transmission with the engine and install it.

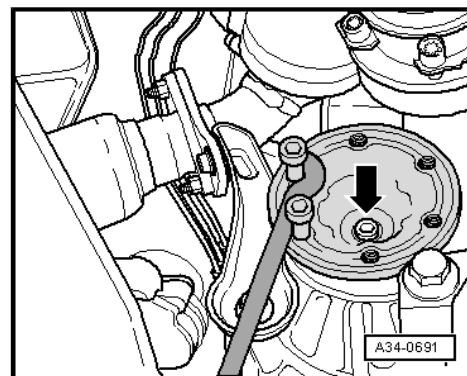


- Install the bolt for the engine/transmission in the area of the right flange shaft -arrow- (Refer to [⇒ "2.3 Transmission Tightening Specifications", page 86 .](#)) and tighten.
- Install lower engine/transmission connecting bolts and tighten. Refer to [⇒ "2.3 Transmission Tightening Specifications", page 86 .](#)
- After the transmission is attached to the engine, remove the Engine and Gearbox Jack from the transmission.

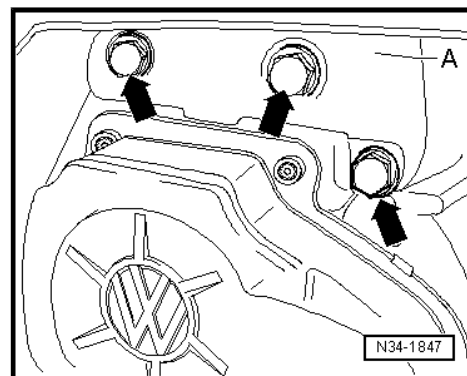




- Reinsert the right flange shaft and tighten the bolt -arrow- to the tightening specification. Refer to
⇒ [“1.3 Right Seal, Replacing”, page 185](#) .
- Install upper engine/transmission connecting bolts and tighten. Refer to
⇒ [“2.3 Transmission Tightening Specifications”, page 86](#) .



- Attach the transmission bracket -A- with new hex collar bolts -arrows- to the transmission and tighten. Refer to
⇒ [“3.1 Overview - Subframe Mount”, page 87](#) .



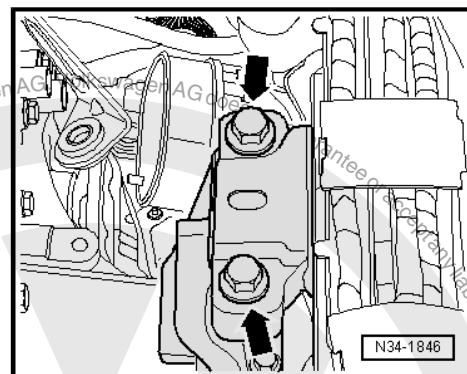
- Align the engine/transmission in its installed position. Lift until the transmission bracket is touching the transmission mount completely.



Caution

Risk of damaging threads in transmission bracket by inserting bolts crooked.

- ◆ **Before installing bolts -arrows-, transmission bracket and transmission mount support arm must be absolutely parallel to each other. If necessary, lift the back of the transmission using the Engine and Gearbox Jack .**



Note

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

- Install new bolts -arrows- of left assembly mounting into transmission mount and tighten to tightening specification. Refer to
⇒ [“3.1 Overview - Subframe Mount”, page 87](#) .



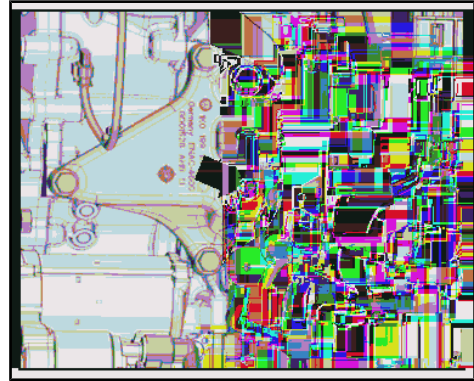
Caution

Risk of accident!

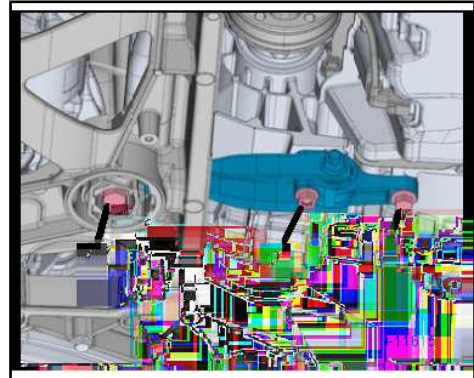
- **Only remove Engine Support Bridge - 10-222A- when all subframe mount bolts are tightened to the tightening specification.**



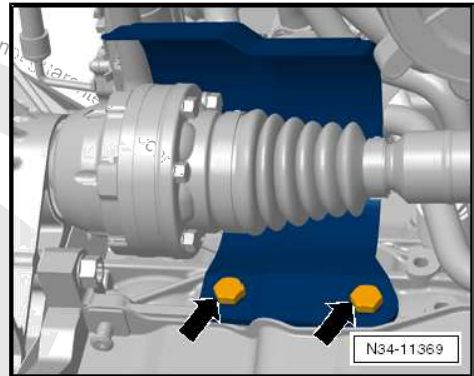
- If equipped install the ground cable on the transmission mount -arrow-.



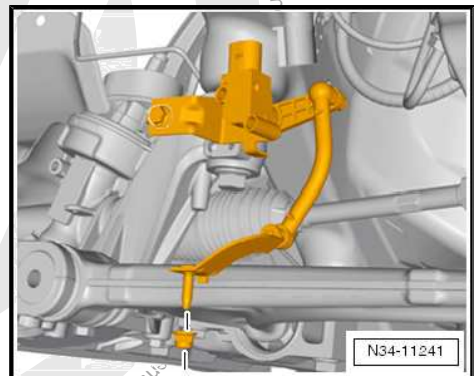
- Install the pendulum support with new bolts -1 to 3-. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Subframe Mount; Pendulum Support, Removing and Installing .
- Assemble the exhaust system. Refer to ⇒ Rep. Gr. 26 ; Emissions Control; Overview - Emissions Control .



- Attach the drive axles to the transmission. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .
- Attach the drive axle heat shield -arrows- (if equipped). Refer to ⇒ Suspension, Wheels; Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .

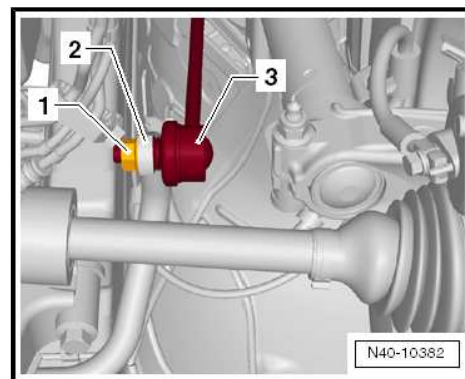


- If equipped, attach the Left Front Level Control System Sensor - G78- on the lower control arm. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 43 ; Level Control System Sensor; Overview - Front Level Control System Sensor .

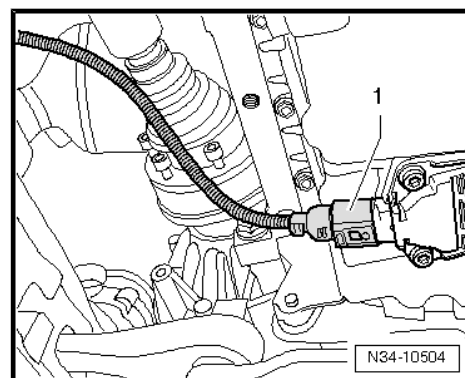




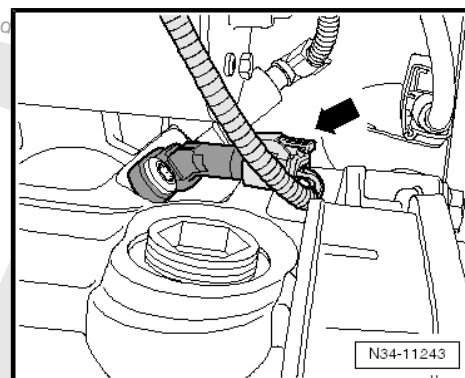
- Install the coupling rod -3- on both side of the stabilizer bar -2-. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .



- Connect the connector -1- to the Oil Level Thermal Sensor - G266- .

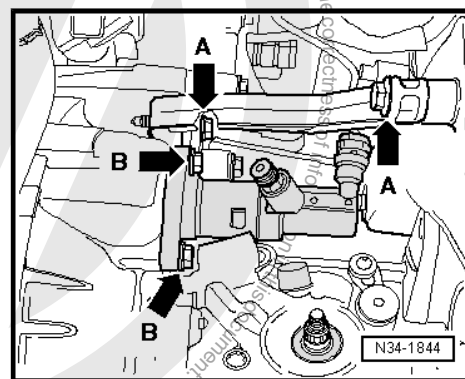


- Transmission on vehicles with Start/Stop System: connect the connector -arrow- to the Transmission Neutral Position Sensor - G701- .



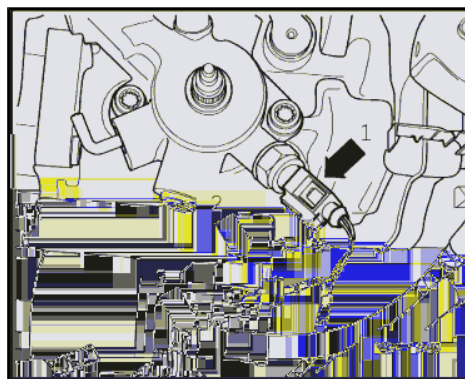
- Install the clutch slave cylinder and tighten the bolts -B arrows-. Refer to ⇒ [“1.4 Overview - Clutch Release Mechanism”, page 18](#) .

- Install and secure the transmission support -A arrows-. Refer to ⇒ [“3.1 Overview - Subframe Mount”, page 87](#) .

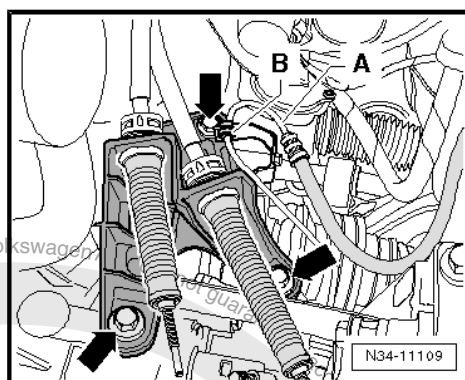




- Connect the connector -1- to the Back-Up Lamp Switch - F4- .
- Install the starter, connect the connector -arrow 2- and attach the wire -arrow 3-. Refer to ➔ Electrical Equipment; Rep. Gr. 27 ; Starter; Overview - Starter .
- If equipped, install the upper ground cable.
- Make sure the vacuum hose for the brake system is installed correctly. Install a vacuum hose, if necessary. Refer to ➔ Brake System; Rep. Gr. 47 ; Brake Booster/Brake Master Cylinder; Overview - Brake Booster/Brake Master Cylinder .



- If equipped, attach the bracket -B- on the transmission.
- If necessary press the hose/line assembly -A- into the bracket -B- on the transmission.
- Mount the cable bracket on the transmission and tighten the bolts -arrows-. Refer to
[➔ "1.3 Overview - Selector Mechanism", page 53](#) .

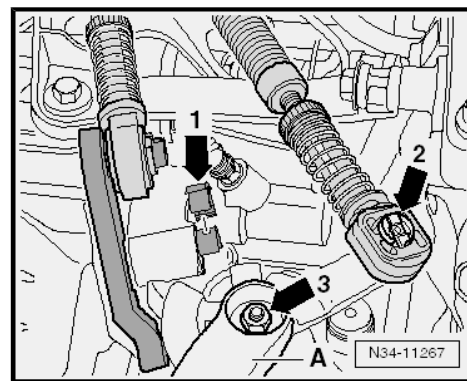




- Install the transmission shift lever -A-. Refer to ➤ [Fig. “Installing the Transmission Shift Lever”](#), page 62 .
- Tighten the hex nut -arrow 3-. Refer to ➤ [“5.5 Overview - Shift Unit”](#), page 96 .
- Coat the pin on the gearshift lever with a small amount of grease -A-.

Allocate the grease for gearshift mechanism. Refer to the Parts Catalog.

- Attach the shift cable to the gearshift lever.
- Replace the lock washer -arrow 2- after removing.
- Install the relay lever together with the cable retainer. Refer to ➤ [Fig. “Remove the Relay Lever and the Cable Retainer.”](#), page 58 .



The clip -arrow 1- secures the relay lever.

- Make sure the clips locks securely.
- Connect the selector cable to the cable retainer.
- Adjust the gearshift mechanism. Refer to ➤ [“1.6 Selector Mechanism, Adjusting”](#), page 63 .
- 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 ➤ Rep. Gr. 20 ; Fuel Filter; Overview - Fuel Filter .



Note

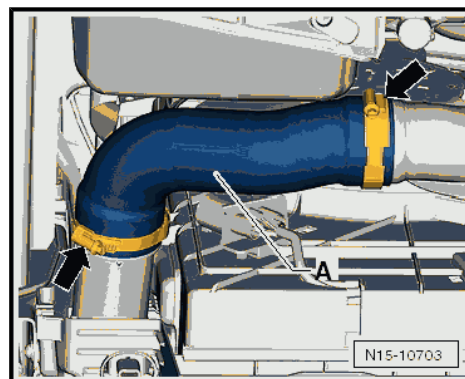
If when removing the flange shaft, the transmission fluid leaks out, drain and fill the transmission fluid for the installed transmission and flange shaft. Refer to ➤ [“8 Transmission Fluid”](#), page 125 .

- 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 .
- Connect the battery and follow the procedure regarding what to do after connecting a battery. Refer to ➤ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .



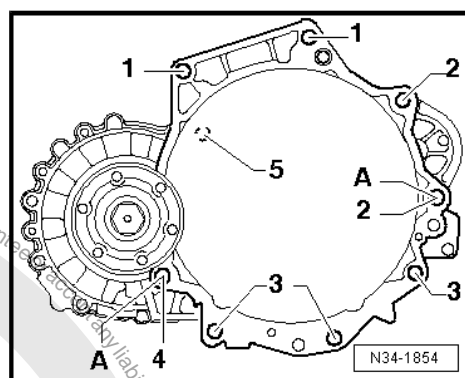


- Install the left charge air hose -A- -arrows-. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 21 ; Charge Air System; Overview - Charge Air System .
- Install the lower section of the left front wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Front Wheel Housing Liner, Removing and Installing .
- Install the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .
- Check the headlamp adjustment on vehicles with Left Front Level Control System Sensor - G78- . Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Headlamp; Headlamp, Adjusting .



2.3 Transmission Tightening Specifications

Item	Bolt	Quantity	Nm
1	M12 x 50	2	80
2	◆ M12 x 150 Also starter to transmission	2	80
3	M10 x 50 or M10 x 55	3	40
4	M12 x 60	1	80
5	6 x 8 Small flywheel cover plate (Not present on all)	1	10



-A- alignment sleeves for centering

Component	Nm
Mount for lower starter plug wires	23
Ground cable on the upper starter plug	20



3 Subframe Mount

⇒ [“3.1 Overview - Subframe Mount”, page 87](#)

3.1 Overview - Subframe Mount

1 - Bolt

- ☐ 20 Nm +90°
- ☐ Replace after removing
- ☐ Transmission support to transmission bracket and transmission
- ☐ Tightening sequence. Refer to
⇒ [Fig. “Transmission Support to Transmission Bracket and Transmission”](#), page 88

2 - Transmission Support

- ☐ To the transmission bracket and transmission

3 - Engine Mount with Engine Support

- ☐ Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

4 - Bolt

- ☐ Pendulum support to the subframe. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

5 - Pendulum Support

- ☐ Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

6 - Bolt

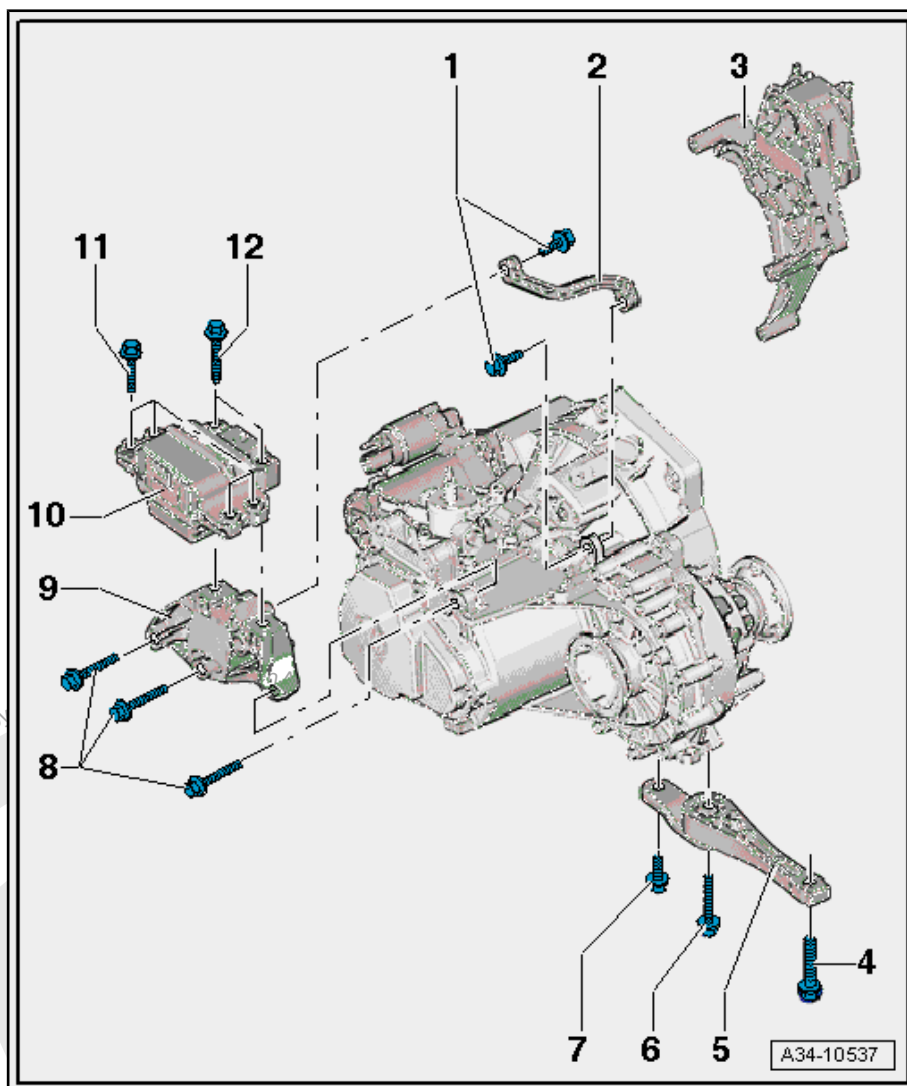
- ☐ Pendulum support to the transmission. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

7 - Bolt

- ☐ Pendulum support to the transmission. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

8 - Bolt

- ☐ 40 Nm +90°
- ☐ Replace after removing
- ☐ Tightening sequence. Refer to ⇒ [Fig. “Transmission Bracket A- to Transmission.”](#), page 88
- ☐ Transmission bracket to transmission.





9 - Transmission Bracket

10 - Transmission Mount

- ❑ Check the adjustment. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Subframe Mount; Subframe Mount, Checking Adjustment
- ❑ Adjusting. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Subframe Mount; Subframe Mount, Adjusting

11 - Bolt

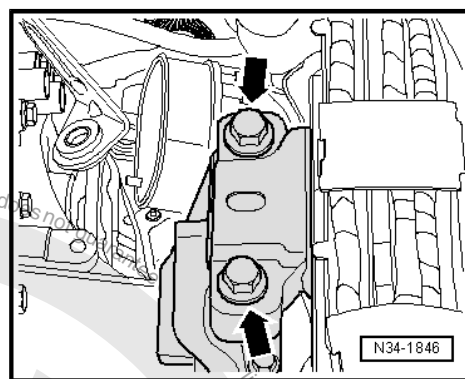
- ❑ Transmission mount to chassis
- ❑ Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

12 - Bolt

- ❑ 60 Nm +90°
- ❑ Replace after removing
- ❑ Tightening sequence. Refer to
⇒ [Fig. "Attaching the Transmission Mount to the Transmission Bracket", page 88](#)
- ❑ Transmission mount to transmission bracket

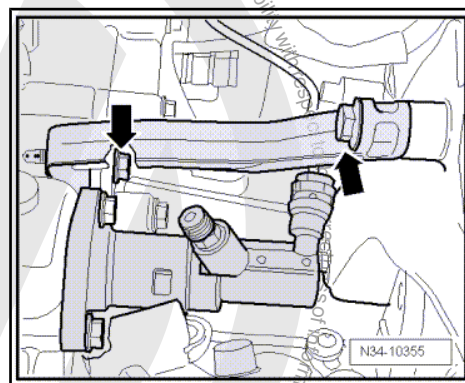
Attaching the Transmission Mount to the Transmission Bracket

- Replace the bolts -arrows-.
- Tighten all bolts hand-tight.
- Tighten the bolt to the tightening specification.



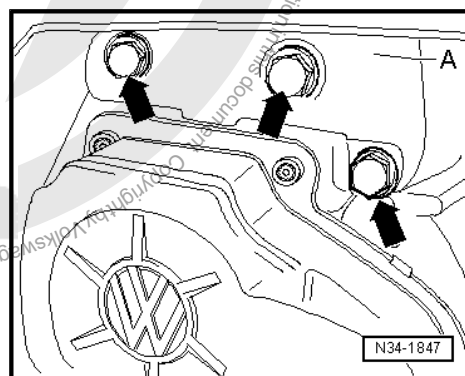
Transmission Support to Transmission Bracket and Transmission

- Replace the bolts -arrows-.
- Tighten both bolts -arrows- hand-tight at first.
- Tighten the bolt to the tightening specification.



Transmission Bracket -A- to Transmission.

- Replace the bolts -arrows-.
- Tighten all bolts hand-tight.
- Tighten the bolt to the tightening specification.

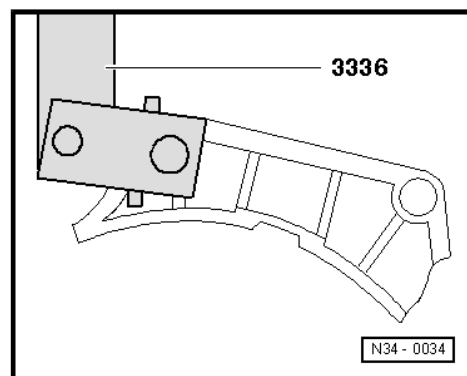




4 Transmission, Transporting

Special tools and workshop equipment required

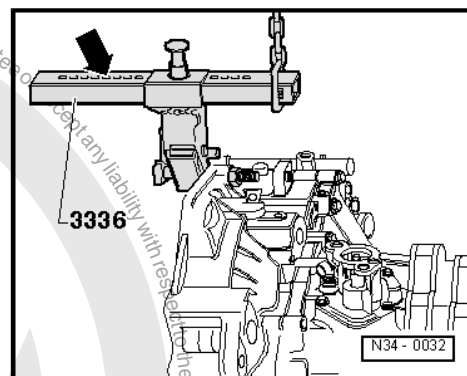
- ◆ Transmission Support Jig - 3336-
- ◆ Shop Crane - VAS6100-
- Attach the Transmission Support Jig - 3336- to the clutch housing.



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

Number of visible holes = 5.

- Lift the transmission using the Shop Crane - VAS6100- and the Transmission Support Jig - 3336-.
- Set the transmission down, for example, into the transport container.





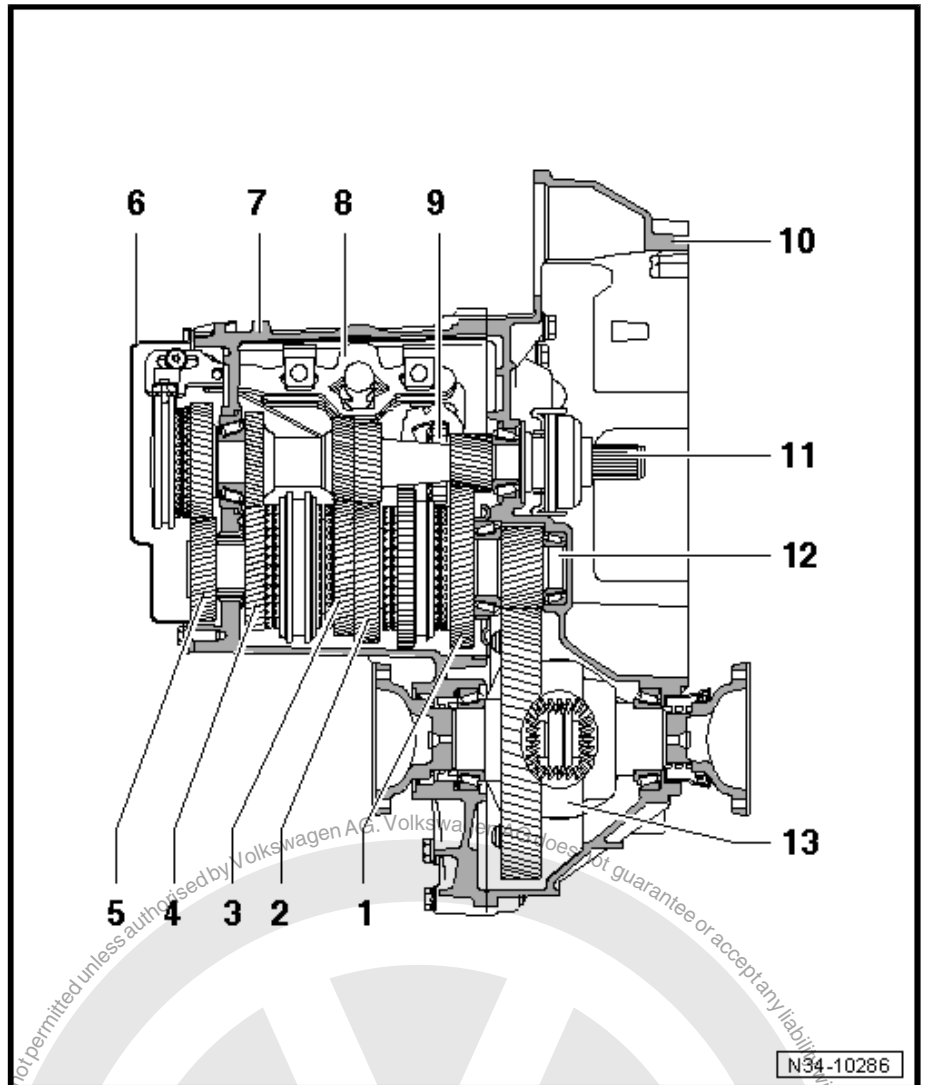
5 Transmission, Disassembling and Assembling

- ⇒ ["5.1 Schematic Overview - Transmission", page 90](#)
- ⇒ ["5.2 Overview - Transmission", page 92](#)
- ⇒ ["5.3 Overview - Transmission Housing Cover and 5th Gear", page 93](#)
- ⇒ ["5.4 Overview - Transmission Housing and Selector Mechanism", page 95](#)
- ⇒ ["5.5 Overview - Shift Unit", page 96](#)
- ⇒ ["5.6 Overview - Input Shaft, Output Shafts, Differential, Gear-shift Rods", page 97](#)
- ⇒ ["5.7 Overview - Shift Forks", page 98](#)
- ⇒ ["5.8 Shift Unit, Servicing", page 99](#)
- ⇒ ["5.9 Shift Forks, Servicing", page 100](#)
- ⇒ ["5.10 Transmission Housing Cover and 5th Gear, Removing", page 101](#)
- ⇒ ["5.11 Transmission, Disassembling and Assembling", page 105](#)
- ⇒ ["5.12 Transmission Housing Cover and 5th Gear, Installing", page 114](#)

5.1 Schematic Overview - Transmission



- 1 - 1st Gear
- 2 - 2nd Gear
- 3 - 3rd Gear
- 4 - 4th Gear
- 5 - 5th Gear
- 6 - Transmission Housing Cover
- 7 - Transmission Housing
- 8 - Selector Mechanism
□ (Shift forks)
- 9 - Reverse Drive Gear
- 10 - Clutch Housing
- 11 - Input Shaft
- 12 - Output Shaft
- 13 - Differential





5.2 Overview - Transmission

I - Refer to
⇒ ["5.3 Overview - Transmission Housing Cover and 5th Gear", page 93](#)

II - Refer to
⇒ ["5.4 Overview - Transmission Housing and Selector Mechanism", page 95](#)

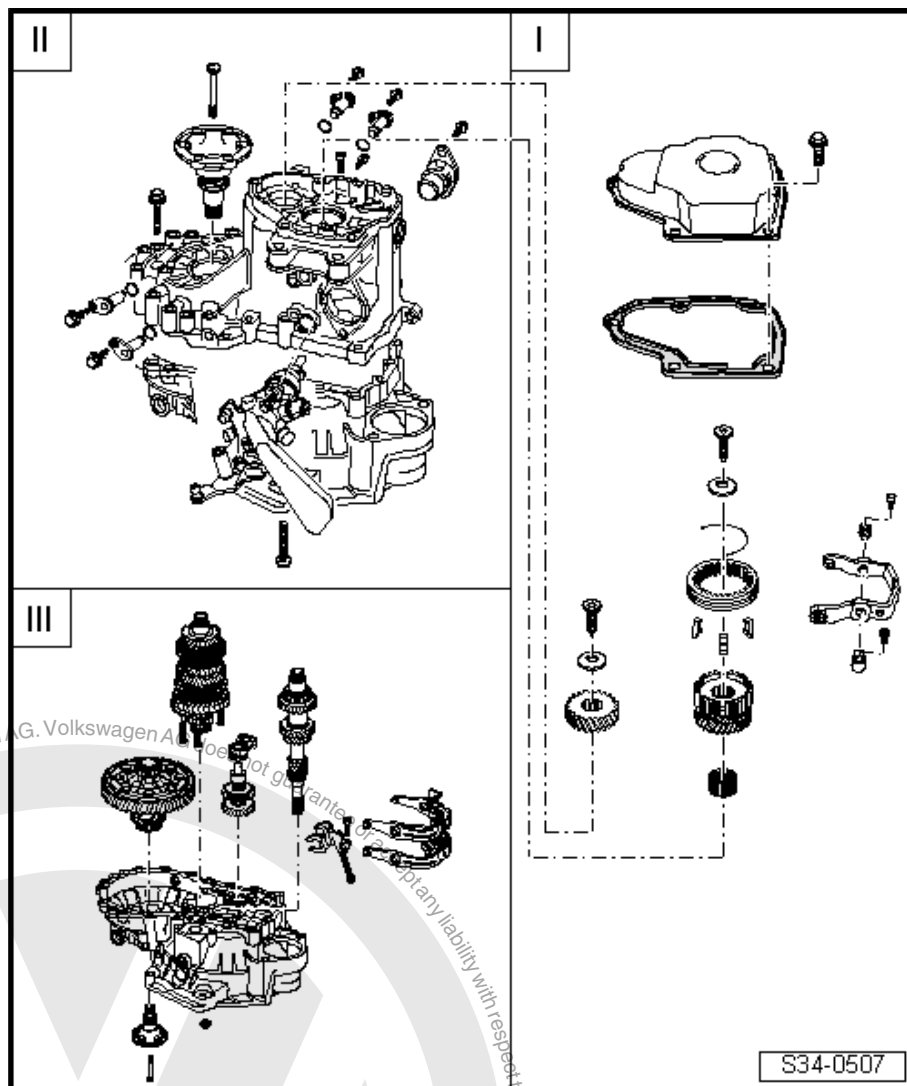
II - Refer to
⇒ ["5.5 Overview - Shift Unit", page 96](#)

II - Refer to
⇒ ["5.8 Shift Unit, Servicing", page 99](#)

III - Refer to
⇒ ["5.6 Overview - Input Shaft, Output Shafts, Differential, Gearshift Rods", page 97](#)

III - Refer to
⇒ ["5.7 Overview - Shift Forks", page 98](#)

III - Refer to
⇒ ["5.9 Shift Forks, Servicing", page 100](#)





5.3 Overview - Transmission Housing Cover and 5th Gear

1 - Bolt

- ☐ 18 Nm
- ☐ Cover to transmission housing
- ☐ Quantity: 5

2 - Transmission Housing Cover

- ☐ With a magnet. Refer to ➔ [Fig. "Transmission Housing Cover with a Magnet -A-""](#), page 94



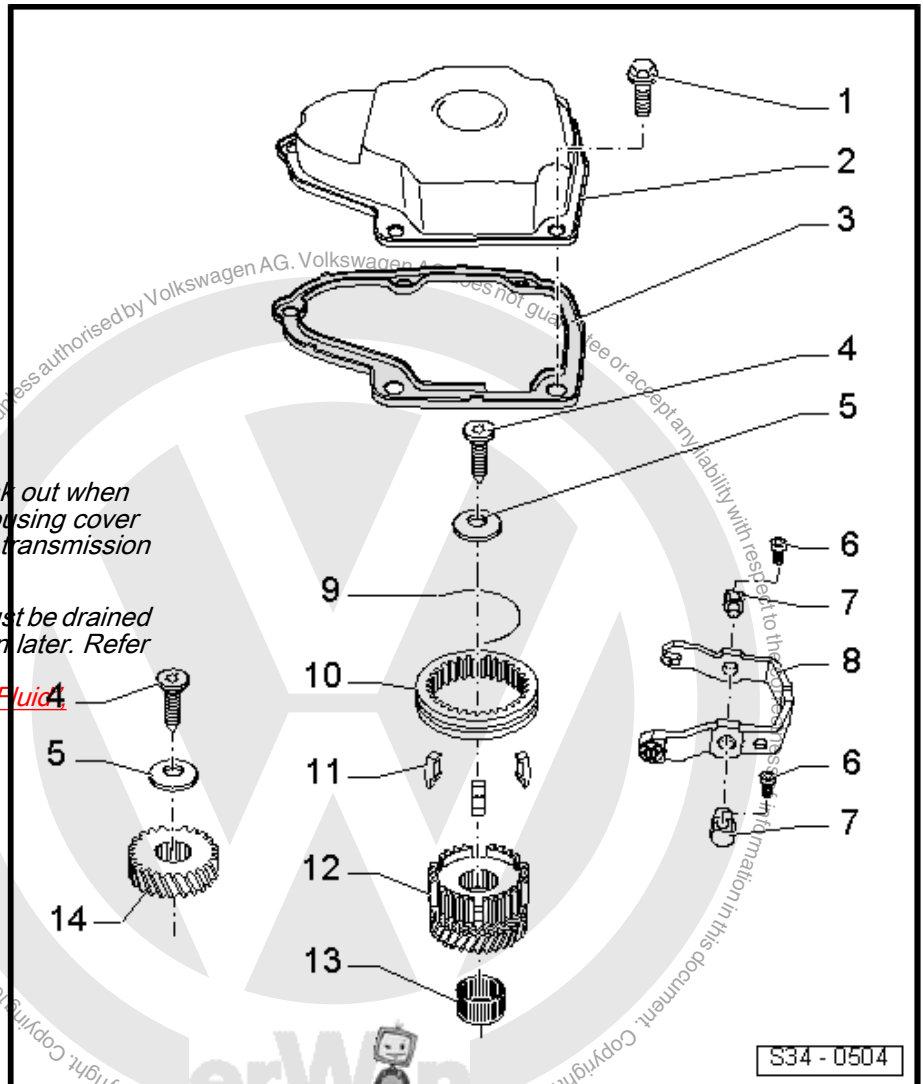
Note

- ◆ Note that oil will leak out when the transmission housing cover is removed with the transmission installed.
- ◆ Therefore the oil must be drained and then filled again later. Refer to ➔ ["8 Transmission Fluid"](#), page 125

3 - Seal

4 - Bolt

- ☐ 80 Nm +90°
- ☐ Replace after removing
- ☐ Hold with the adapter on the plate spring bolt head in position
- ☐ Clean the 5th gear synchronizer hub and 5th gear drive gear threaded holes of locking compound residue with a thread tap. Otherwise, there is the danger that the bolts could shear off.



5 - Plate Spring

- ☐ Installing. Refer to ➔ [Fig. "Installed Position of Plate Springs for 5th Gear Synchronizer Hub and Gear Securing Bolts""](#), page 117 .

6 - Cylinder Bolt

- ☐ 25 Nm
- ☐ For the pivot pin to the transmission housing

7 - Pivot Pin

8 - 5th Gear Shift Fork

- ☐ Disassembling and assembling. Refer to ➔ ["5.9 Shift Forks, Servicing"](#), page 100 .
- ☐ Adjusting. Refer to ➔ [Fig. "Adjusting 5th Gear""](#), page 118 .

9 - Spring

- ☐ Offset version
- ☐ Installing. Refer to ➔ [Fig. "Installation of Offset Springs -A-""](#), page 148

10 - 5th Gear Locking Collar

- ☐ Installed position. Refer to ➔ [Fig. "5th Gear Locking Collar/Synchronizer Hub Assembly""](#), page 147



- ❑ Adjusting. Refer to ➔ [Fig. "Adjusting 5th Gear", page 118](#).

11 - Locking Pieces (quantity: 3)

- ❑ Installed position. Refer to ➔ [Fig. "5th Gear Synchronizing", page 147](#)

12 - Synchronizer Hub with Gear Wheel and 5th Gear Synchronizer Ring

- ❑ Remove together with the transmission housing. Refer to ➔ ["5.11 Transmission, Disassembling and Assembling", page 105](#)
- ❑ Remove individually. Refer to ➔ ["5.10 Transmission Housing Cover and 5th Gear, Removing", page 101](#)
- ❑ Disassembling and assembling. Refer to ➔ [Fig. "5th Gear Locking Collar/Synchronizer Hub Assembly", page 147](#)

13 - Needle Bearing

- ❑ For the 5th gear wheel

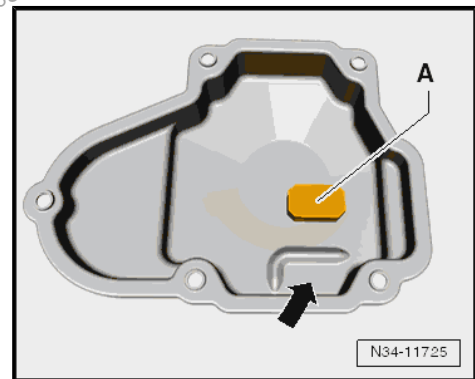
14 - 5th Gear Wheel

- ❑ Remove together with the transmission housing. Refer to ➔ ["5.11 Transmission, Disassembling and Assembling", page 105](#)
- ❑ Remove individually. Refer to ➔ ["5.10 Transmission Housing Cover and 5th Gear, Removing", page 101](#)
- ❑ Installed position. Refer to ➔ [Fig. "Installed Position, 5th Gear Wheel", page 115](#)

Transmission Housing Cover with a Magnet -A-

Magnet can only be inserted in the cover with notch -arrow-

The magnet is held in place by the bolt for the 5th gear shift fork pivot pin when the cover is installed.





5.4 Overview - Transmission Housing and Selector Mechanism

1 - Bolt

- ☐ 25 Nm

2 - Flange Shaft with Pressure Spring

- ☐ Removing and installing. Refer to ➔ ["1.3 Right Seal, Replacing", page 185](#) .
- ☐ Assembling. Refer to ➔ ["2 Differential", page 189](#) .

3 - Inner TORX® Bolt

- ☐ 25 Nm
- ☐ Replace after removing
- ☐ For the reverse shaft support
- ☐ Self-locking

4 - Inner TORX® Bolt

- ☐ 30 Nm
- ☐ Replace after removing
- ☐ For the reverse shaft support
- ☐ Self-locking

5 - O-Ring

- ☐ Replace after removing

6 - Pivot Pin

7 - Bolt

- ☐ 25 Nm

8 - Bolt

- ☐ 25 Nm

9 - Cap

10 - Internal Multi-Point Bolt

- ☐ 25 Nm
- ☐ Replace after removing
- ☐ For the reverse shaft support

11 - Bolt

- ☐ 6 Nm

12 - Transmission Neutral Position Sensor - G701-

- ☐ For vehicles with the Start/Stop System

13 - Transmission Housing

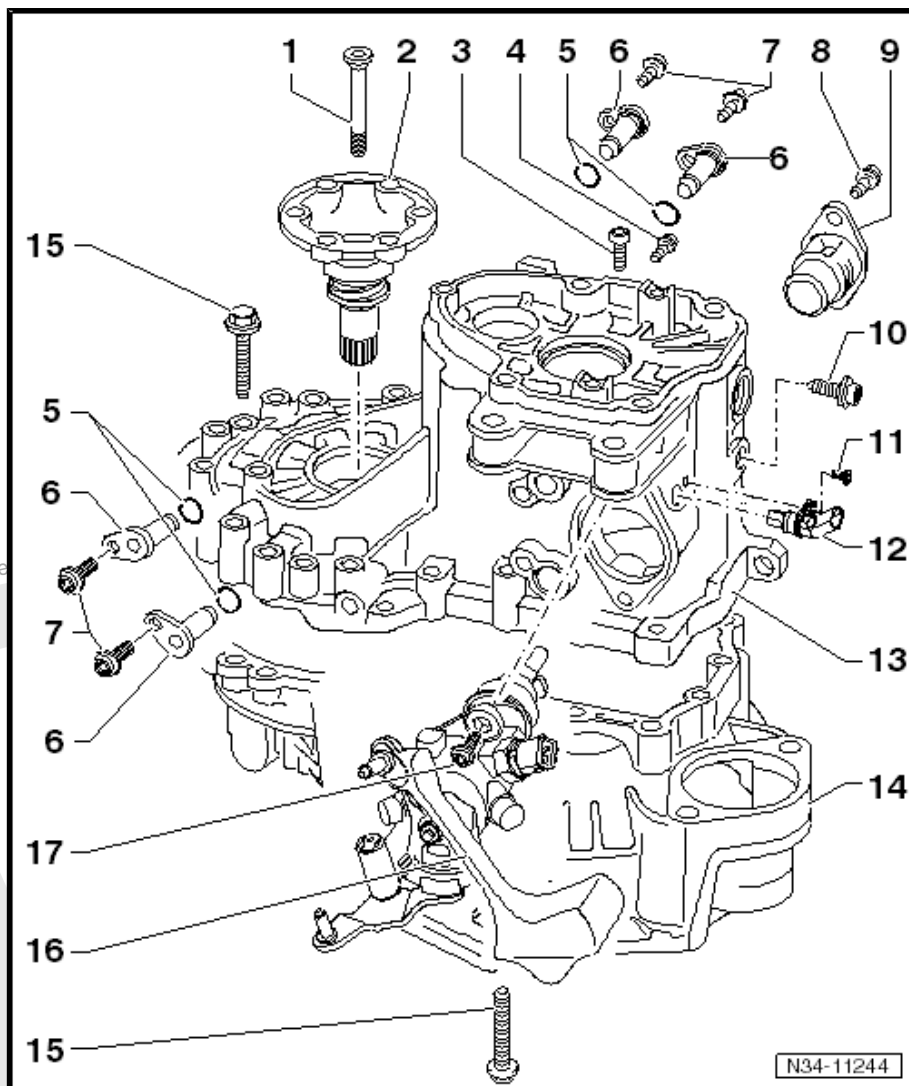
- ☐ Remove together with 5th gear. Refer to ➔ ["5.11 Transmission, Disassembling and Assembling", page 105](#) .
- ☐ Servicing. Refer to ➔ ["6 Transmission Housing and Clutch Housing", page 119](#) .

14 - Clutch Housing

- ☐ Servicing. Refer to ➔ ["6 Transmission Housing and Clutch Housing", page 119](#) .

15 - Hex Bolt

- ☐ 25 Nm +90°





- ☐ Replace after removing

16 - Gearshift Shaft with Gearshift Cover

- ☐ (Shift unit)
- ☐ Servicing. Refer to ➤ ["5.8 Shift Unit, Servicing", page 99](#) .

17 - Internal Multi-Point Bolt

- ☐ 25 Nm

5.5 Overview - Shift Unit

1 - Gearshift Unit

- ☐ Consisting of the gearshift shaft and the gearshift cover
- ☐ The components cannot be separated from each other

2 - Back-Up Lamp Switch - F4-

- ☐ 20 Nm
- ☐ Coat the tab lightly with MoS 2 grease.

3 - Locking Elbow

- ☐ For adjusting the shift mechanism
- ☐ Removing. Refer to ➤ [Fig. "Removing the Locking Elbow -A- from the Shift Cover", page 99](#) .
- ☐ Installing. Refer to ➤ [Fig. "Pressing the Locking Elbow -A- into Selector Cover", page 99](#) .

4 - Relay Lever

- ☐ Installed position. Refer to ➤ [Fig. "Selector Lever/ Relay Lever Installed Position", page 61](#) .

5 - Clip

- ☐ Secure the relay lever in the gearshift cover

6 - Seal

- ☐ Replacing. Refer to ➤ ["1.8 Selector Shaft Seal, Replacing", page 65](#) .

7 - Nut

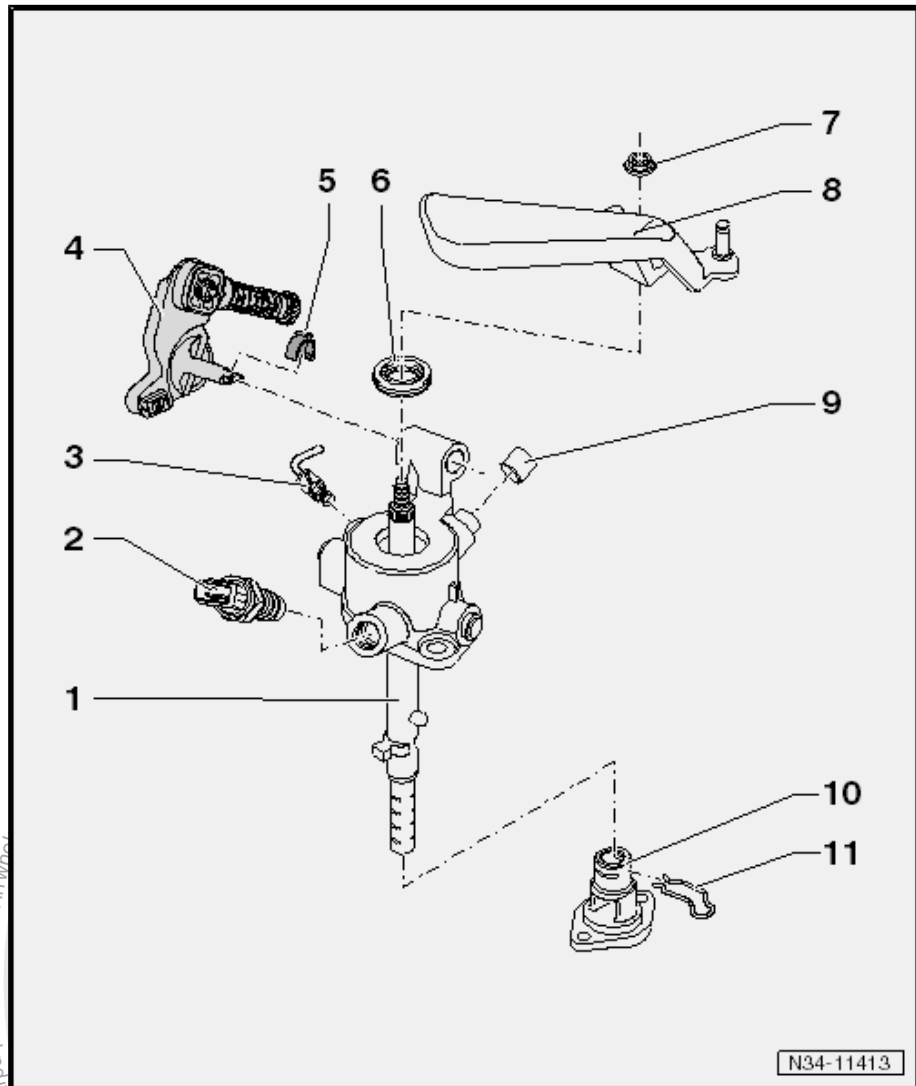
- ☐ 23 Nm
- ☐ Replace after removing
- ☐ Self-locking

8 - Gearshift Lever

- ☐ Installing. Refer to ➤ [Fig. "Installing the Transmission Shift Lever", page 62](#) .

9 - Cap

- ☐ For the transmission ventilation





10 - Cap

11 - Spring

- ☐ Not installed in all transmissions
- ☐ Install if present

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

1 - Differential

- ☐ Disassembling and assembling. Refer to [⇒ "2 Differential", page 189](#).

2 - Seal

- ☐ Quantity: 4
- ☐ Replace after removing

3 - Output Shaft

- ☐ Disassembling and assembling. Refer to [⇒ "2 Output Shaft", page 154](#).

4 - Reverse Shaft Support

- ☐ Disassembling and assembling. Refer to [⇒ "3 Reverse Shaft", page 170](#).

5 - Reverse Shaft

- ☐ Disassembling and assembling. Refer to [⇒ "3 Reverse Shaft", page 170](#).

6 - Input Shaft

- ☐ Disassembling and assembling. Refer to [⇒ "1 Input Shaft", page 141](#).

7 - Reverse Gear Shift Fork

- ☐ Disassembling and assembling. Refer to [⇒ "5.9 Shift Forks, Servicing", page 100](#).

- ☐ Installed position. Refer to [⇒ "5.11 Transmission, Disassembling and Assembling", page 105](#)

8 - Inner TORX® Bolt

- ☐ 25 Nm

9 - Selector Mechanism

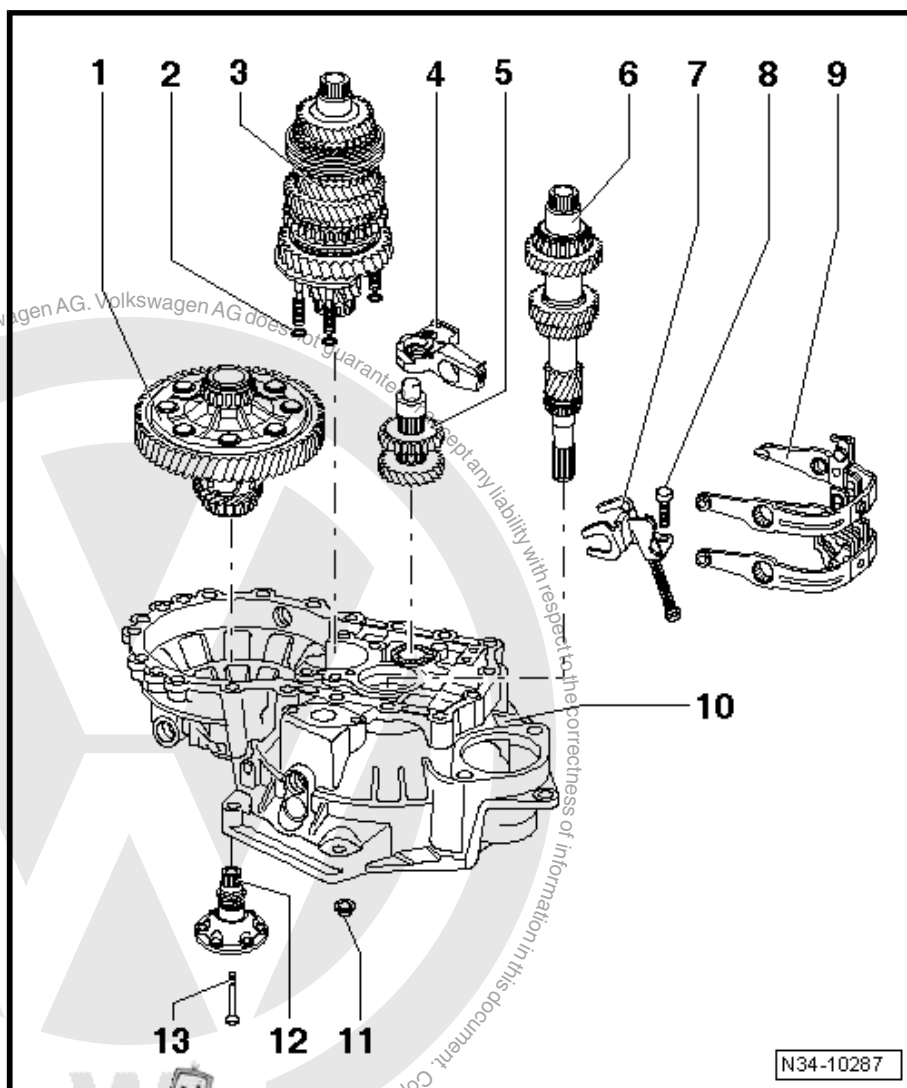
- ☐ (Shift forks)
- ☐ Disassembling and assembling. Refer to [⇒ "5.9 Shift Forks, Servicing", page 100](#).

10 - Clutch Housing

- ☐ Servicing. Refer to [⇒ "6 Transmission Housing and Clutch Housing", page 119](#).

11 - Nut

- ☐ 25 Nm +90°
- ☐ Replace after removing





- ❑ Quantity: 4

12 - Flange Shaft with Pressure Spring

- ❑ Removing and installing. Refer to ➤ ["1.3 Right Seal, Replacing", page 185](#) .
- ❑ Assembling. Refer to ➤ ["2 Differential", page 189](#) .

13 - Bolt

- ❑ 25 Nm

5.7 Overview - Shift Forks



Note

- ◆ *The shift fork group does not need to be disassembled to remove and install shift segments, lock washers and angular contact ball bearings.*
- ◆ *Shift Forks, Servicing. Refer to ➤ ["5.9 Shift Forks, Servicing", page 100](#) .*

1 - 5th Gear Shift Segment

- ❑ Identification. Refer to ➤ [Fig. "Shift Segment Identification", page 100](#)
- ❑ The shift segment must still rotate easily after the lock washer is installed.

2 - Lock Washer

- ❑ Replace after removing
- ❑ Removing. Refer to ➤ [Fig. "Removing the Lock Washer", page 100](#) .
- ❑ Installing. Refer to ➤ [Fig. "Installing the Lock Washer", page 100](#) .

3 - 5th Gear Shift Fork

- ❑ Adjusting. Refer to ➤ [Fig. "Adjusting 5th Gear", page 118](#) .

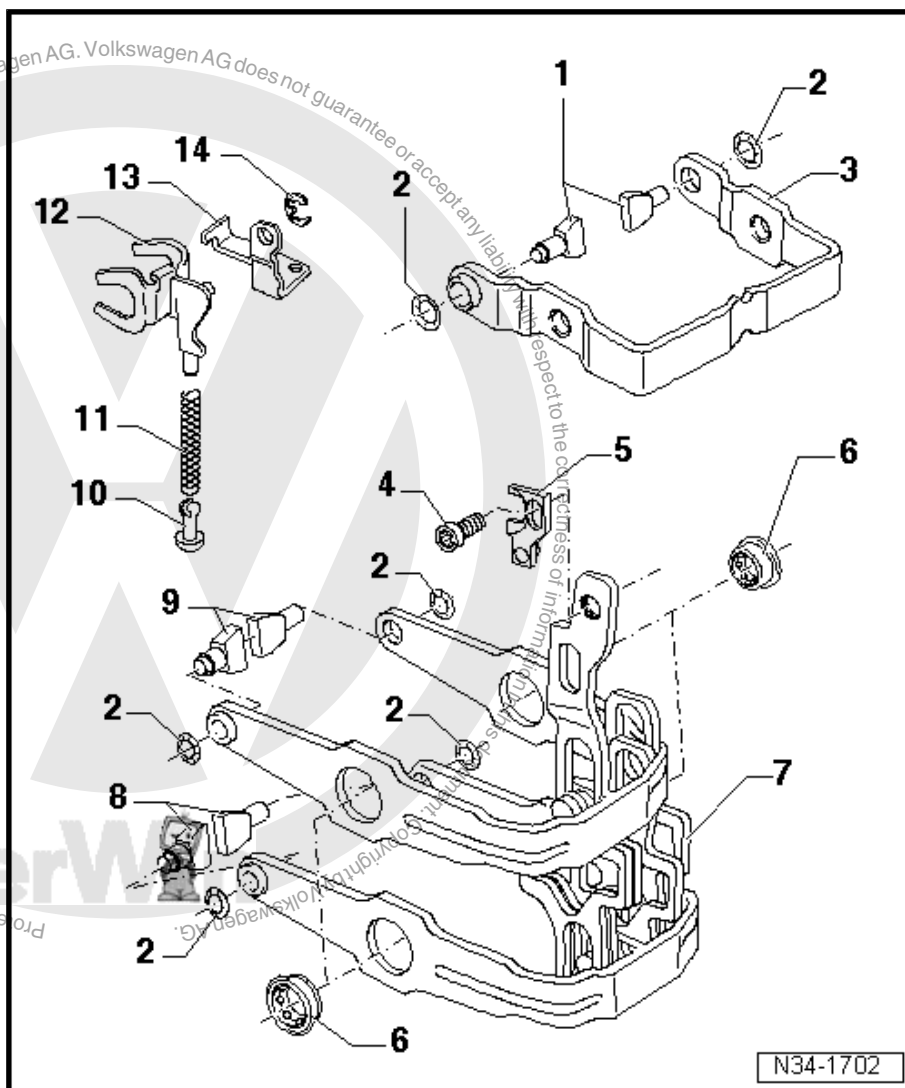
4 - Bolt

- ❑ 25 Nm

5 - 5th Gear Shift Jaw

6 - Angular Contact Ball Bearing

- ❑ Quantity: 4
- ❑ Removing. Refer to ➤ [Fig. "Removing the Angular Contact Ball Bearing", page 101](#) .
- ❑ Installing the bearing inner race into the outer race. Refer to ➤ [Fig. "Installing the Angular Contact Ball Bearing Inner Race -A- into the Outer Race", page 101](#)



N34-1702



- ❑ Installing. Refer to ➤ [Fig. "Installing the Angular Contact Ball Bearing into the Shift Fork"](#), page 101 .

7 - Shift Fork Group with Gearshift Rails

8 - 1st/2nd Gear Shift Segment

- ❑ Identification. Refer to ➤ [Fig. "Shift Segment Identification"](#), page 100 .
- ❑ The shift segment must still rotate easily after the lock washer is installed.

9 - 3rd/4th Gear Shift Segment

- ❑ Identification. Refer to ➤ [Fig. "Shift Segment Identification"](#), page 100 .
- ❑ The shift segment must still rotate easily after the lock washer is installed.

10 - Glide

11 - Spring

12 - Reverse Gear Shift Fork

13 - Support for the Reverse Gear Shift Fork

14 - Circlip

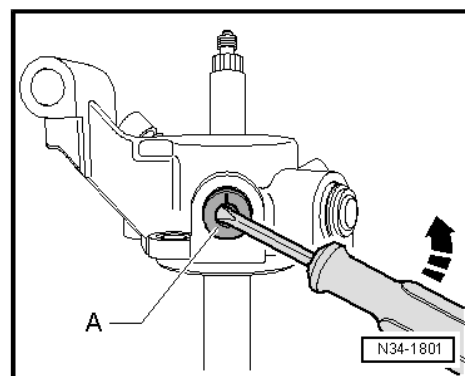
5.8 Shift Unit, Servicing

Special tools and workshop equipment required

- ◆ Breather Tube Tool - T10203-
- ◆ Torque Wrench 1331 5-50Nm, VAG1331-
- Remove the shift unit. Refer to ➤ ["5.4 Overview - Transmission Housing and Selector Mechanism"](#), page 95 .

Removing the Locking Elbow -A- from the Shift Cover

- Remove the outer part of the locking elbow.
- Pry out the locking elbow with a screwdriver.

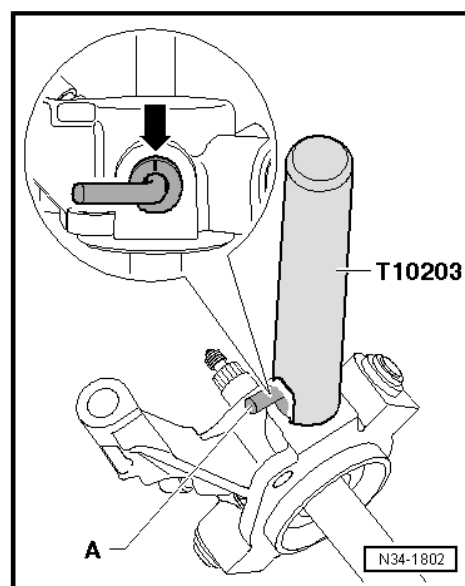


Pressing the Locking Elbow -A- into Selector Cover

Installed position:

The marking -arrow- faces toward upper part of gearshift shaft.

- Install the shift unit. Refer to ➤ ["5.4 Overview - Transmission Housing and Selector Mechanism"](#), page 95 .





5.9 Shift Forks, Servicing

Special tools and workshop equipment required

- ◆ Press Plate - VW402-
- ◆ Subframe Support Tool - Press Piece - 3290/1-
- ◆ Press Piece - Multiple Use - VW431-
- ◆ Subframe Bushing Tool Kit - 3301-
- ◆ Press Piece - Multiple Use Spacer Sleeve - VW472/2-
- ◆ Valve Guide/Clutch Release Push Rod Seal Drift - 10-206-
- ◆ Pry Lever - 80-200-
- ◆ Assembly Mandrel for Gear Selector Rod - 10-508-
- ◆ Spring Strut Compressor - 2070-

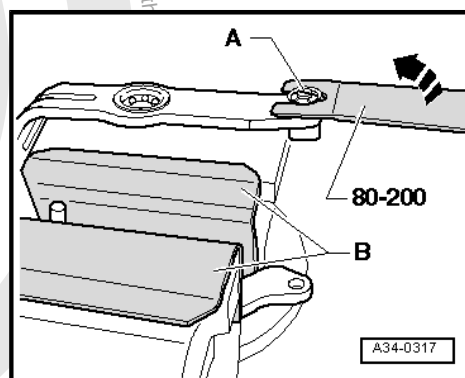
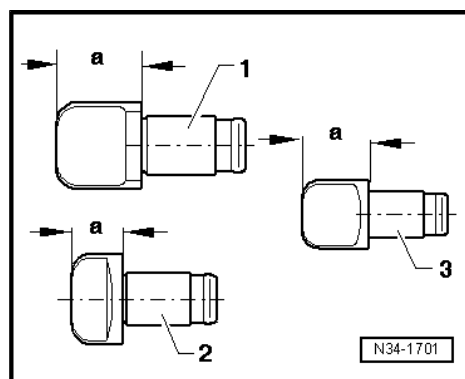
Shift Segment Identification

Dimension -a-

- 1 - 1st and 2nd gear shift segments = 11.4 mm
- 2 - 3rd gear and 4th gear selector segments = 7.7 mm
- 3 - 5th gear shift segments = 12.1 mm

Removing the Lock Washer

- Secure shift fork in vise with protective jaws -B-.
- Pry off the lock washer -A- in the direction of -arrow-.



Installing the Lock Washer

- Press the lock washer in the groove in the shift segment using a socket wrench



Note

The shift segment must still rotate easily after the lock washer is installed.

A - 10 mm socket wrench

B - Protective Jaws





Removing the Angular Contact Ball Bearing

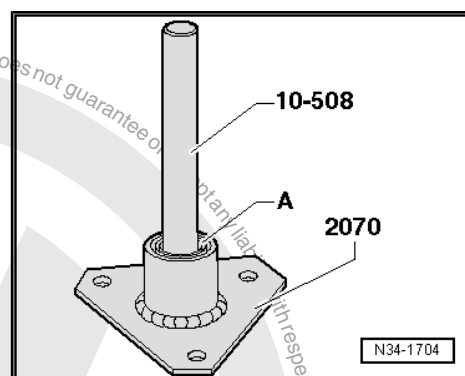


Note

Be careful not to bend the shift forks when removing and installing the angular contact ball bearing.

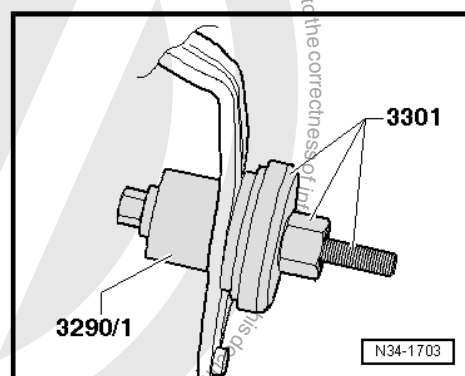
Installing the Angular Contact Ball Bearing Inner Race -A- into the Outer Race

The bearing inner race must engage with outer race.



Installing the Angular Contact Ball Bearing into the Shift Fork

The recess in the Subframe Support Tool - Press Piece - 3290/1-point to the ball bearing.



Shift Fork with the Shift Segments Installed

	Dimension -a- (mm)
1st/2nd gear shift fork	87.2 to 87.4
3rd/4th gear shift fork	93.6 to 93.8

Shift segment allocation

⇒ Fig. "Shift Segment Identification", page 100

5.10 Transmission Housing Cover and 5th Gear, Removing

Special tools and workshop equipment required

- ◆ Holding Plate - VW309A-
- ◆ or Holding Plate - VW309A-
- ◆ Transmission Support - VW353-



- ◆ Bearing/Bushing Installer - Multiple Use - VW295-
- ◆ Bearing Driver - Multiple Use - VW244B-
- ◆ For example Hot Air Blower - VAG1416-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Bracket - Multiple Use - 30-211A-
- ◆ Bearing Installer - Multiple Use - 32-111-
- ◆ Assembly Tool Kit - Press Piece 2 - T10030/4- from the Hydraulic Press - Bushing Tool Kit - T10030-
- ◆ Press Piece - 37mm - VW416B-
- ◆ Puller - Transmission Gears - T10309-
- ◆ Puller - Two Arm - T10040-
- ◆ With the Puller - Two Arm w/Thrust Piece - T10040/2A-
- ◆ Puller - Two Arm Thrust Piece - T10040/3-
- ◆ Support Bridge - T10323-
- ◆ Rear Wheel Bearing Kit - Piece 7 - 3253/7-
- ◆ Press Piece - Multiple Use - VW433-
- ◆ Press Piece - Multiple Use - 40-105-
- ◆ Torque Wrench 1332 40-200Nm - VAG1332-



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

- ◆ Bolts - Plate Spring to Transmission

5th Gear and Transmission Housing Cover, Installing. Refer to ⇒ ["5.12 Transmission Housing Cover and 5th Gear, Installing"](#), page 114 .



Note

- ◆ *If only 5th has to be removed, follow this procedure:*
- ◆ *Pay attention to the work procedure if the transmission housing must be removed. Refer to ⇒ ["5.11 Transmission, Disassembling and Assembling"](#), page 105 .*
- Remove the clutch release lever and release bearing. Refer to ⇒ ["1.16 Clutch Release Mechanism, Servicing"](#), page 35 .





- Be careful not to damage the bearing for the input and output shafts when removing and installing 5th gear.
- When securing the transmission to the Transmission Support - VW353-, install the following tools for support:

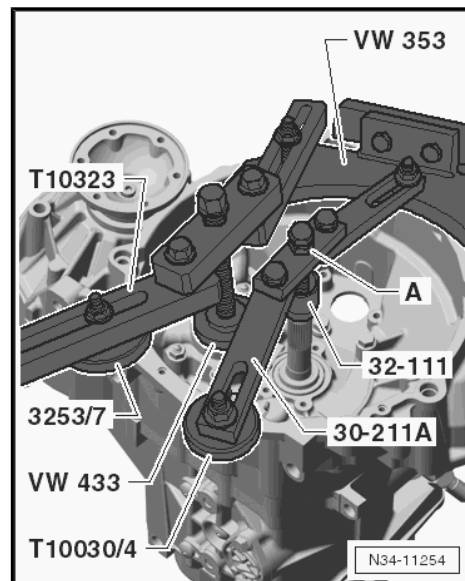
Under the Input Shaft:

- ◆ Bracket - Multiple Use - 30-211A-
- ◆ Bearing Installer - Multiple Use - 32-111-
- ◆ Assembly Tool Kit - Press Piece 2 - T10030/4-
- Input shaft may be supported by Bearing Installer - Multiple Use - 32-111- only at a later time.

Under the Output Shaft Bracket

- ◆ Support Bridge - T10323-
- ◆ Rear Wheel Bearing Kit - Piece 7 - 3253/7-
- ◆ Press Piece - Multiple Use - VW433-

- Secure the transmission on the Transmission Support - VW353- .
- Remove the transmission housing cover -arrow-.



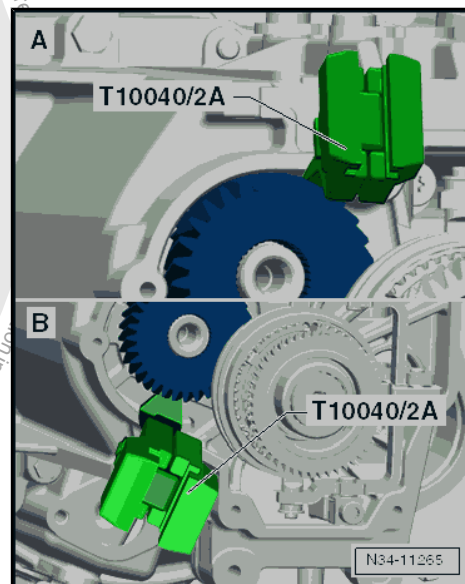
- Make sure the Puller - Two Arm w/Thrust Piece - T10040/2A- can be installed correctly under the 5th gear wheel.

Puller - Two Arm w/Thrust Piece - T10040/2A- cannot be Installed Correctly.

-A- Puller - Two Arm w/Thrust Piece - T10040/2A- prematurely touch the: ◆ Transmission housing wall ◆ The ribbing in the transmission housing under the 5th gear wheel	"Combined" removal of the: "5th gear synchronizer hub", "5th gear wheel" and "transmission housing". Refer to ⇒ "5.11 Transmission, Disassembling and Assembling", page 105 .
The-B- Puller - Two Arm w/Thrust Piece - T10040/2A- touch the ribs in the transmission housing under the 5th gear wheel.	

Puller - Two Arm w/Thrust Piece - T10040/2A- can be Installed Correctly.

5th gear is removed individually ⇒
⇒ [Fig. "5th Gear, Removing Separately", page 104](#)





5th Gear, Removing Separately

- Cover the openings in the transmission housing with a cloth.
- Move the shift fork -1- into neutral.
- Remove the bolt -2- with the shift jaw for 5th gear.
- Remove both bolts -arrows- for the pivot pin.
- Remove the pivot pin.
- Remove the 5th gear shift fork.
- It is not necessary to remove the spring -3- and the locking collar -4-.
- Remove the bolts -A- for the synchronizer hub and for the 5th gear wheel. Do this by engaging 5th gear -arrow 1- and 1st gear -arrow 2- and -3-.
- The input shaft and the output shaft are blocked after both gears are engaged. The synchronizer hub and the gear wheel cannot turn. Both bolts can be loosened now.



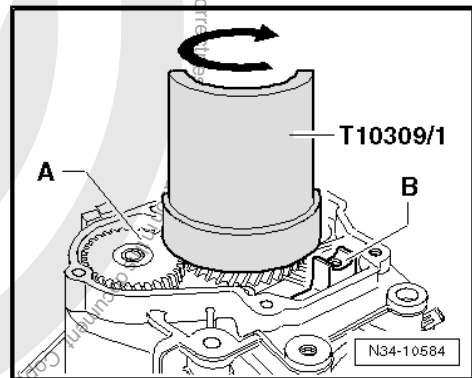
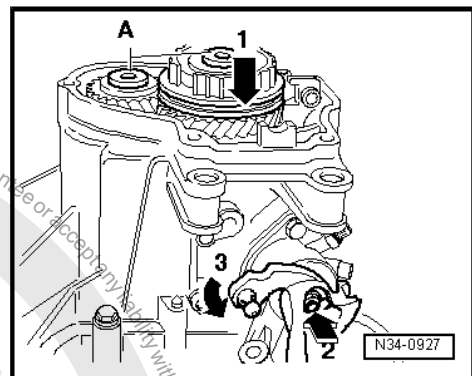
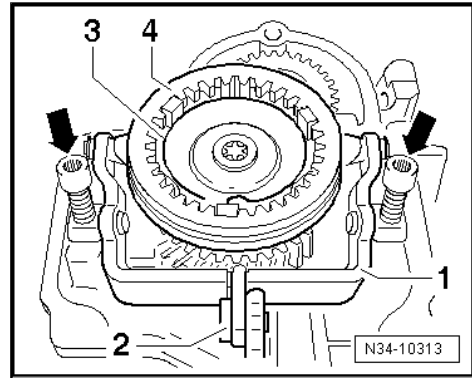
Note

Remove any locking compound residue still in the threaded holes using a thread tap if the shafts are not going to be replaced.

Remove 5th Gear Synchronizer Hub Together with Locking Collar and Locking Pieces.

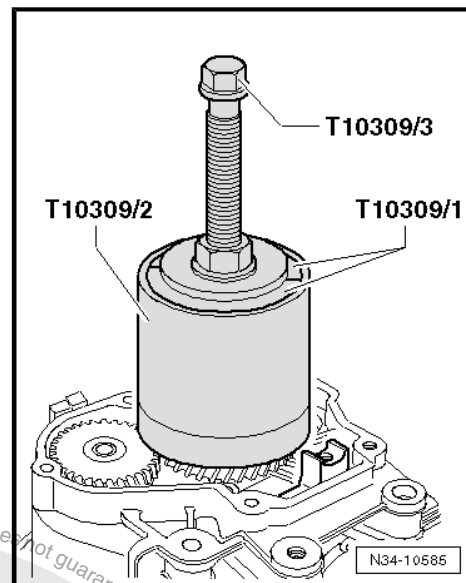
To Do This Use the Puller - Transmission Gears - T10309- .

- Insert the Puller - Transmission Gears - Half Shell - T10309/1- between the 5th gear wheel -A- and the mount for 5th gear shift fork -B-.
- The Puller - Transmission Gears - Half Shell - T10309/1- must be placed under the synchronizer ring.
- Press the Puller into the end position, if necessary.
- Rotate the Puller - Transmission Gears - Half Shell - T10309/1- to the opposite side in direction of -arrow-.





- Install the Puller - Transmission Gears - Threaded Insert - T10309/3- in the Puller - Transmission Gears - Half Shell .
- Insert the second Puller - Transmission Gears - Half Shell - T10309/1- and put the Puller - Transmission Gears - Tube - T10309/2- on the tool.
- Check synchronizer hub after pulling for damage.
- Replace the synchronizer ring.
- Remove the 5th gear selector gear with needle bearing.

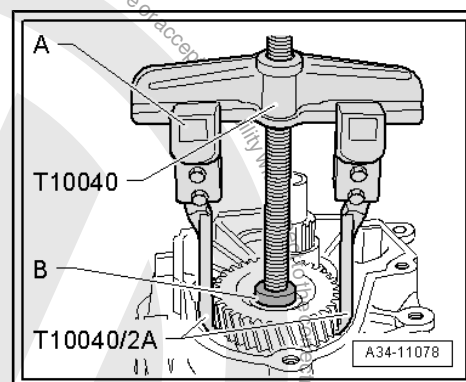


- Remove the 5th gear wheel.
 - Insert the hook -A-.
- B - Puller - Two Arm Thrust Piece - T10040/3- or M10 x 20 bolt, 17 mm



Note

- ◆ When remove drive gear, make sure the hook does not bend outward. Check the 5th gear for damage.
- ◆ Slightly heat 5th gear wheel with Hot Air Blower - VAG1416- if necessary.



5th gear and transmission housing cover, installing. Refer to
⇒ [“5.12 Transmission Housing Cover and 5th Gear, Installing”](#),
[page 114](#) .

5.11 Transmission, Disassembling and Assembling

Special tools and workshop equipment required

- ◆ Holding Plate - VW309A-
- ◆ Transmission Support - VW353-
- ◆ Bearing/Bushing Installer - Multiple Use - VW295-
- ◆ Bearing Driver - Multiple Use - VW244B-
- ◆ For example Hot Air Blower VAG1416 - VAG1416-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Bracket - Multiple Use - 30-211A-
- ◆ Bearing Installer - Multiple Use - 32-111-
- ◆ Assembly Tool Kit - Press Piece 2 - T10030/4- from the Hydraulic Press - Bushing Tool Kit - T10030-
- ◆ Press Piece - 37mm - VW416B-
- ◆ Puller - Transmission Gears - T10408-
- ◆ Puller - Transmission Gears - Thrust Piece - T10408/2-



- ◆ Spacer Plate - T10408/3-
- ◆ M7 x 35 hex collar bolt and washer (components of the Puller - Transmission Gears - T10408-)
- ◆ Support Bridge - T10323-
- ◆ Rear Wheel Bearing Kit - Piece 7 - 3253/7-
- ◆ Press Piece - Multiple Use - VW433-
- ◆ Torque Wrench 1332 40-200Nm - VAG1332-
- ◆ -2- Puller - Kukko Puller - 60-150mm Width, 200mm Length - Kukko 18/1- (quantity 2)
- ◆ Shop Crane - Drip Tray - VAS6208-
- ◆ Inductive Heater - VAS6414-
- ◆ Sealing Compound - AMV 188 200 03-
- ◆ M8 x 100 mm stud bolt



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

- ◆ Bolts - Plate Spring to Transmission
- ◆ Nut - Gearshift Lever to Gearshift Unit

Transmission Housing Cover, Transmission Housing, Gearshift Shaft with Gearshift Cover, Input Shaft, Output Shaft, Differential and Gearshift Mechanism, Removing and Installing

Transmission, Disassembling

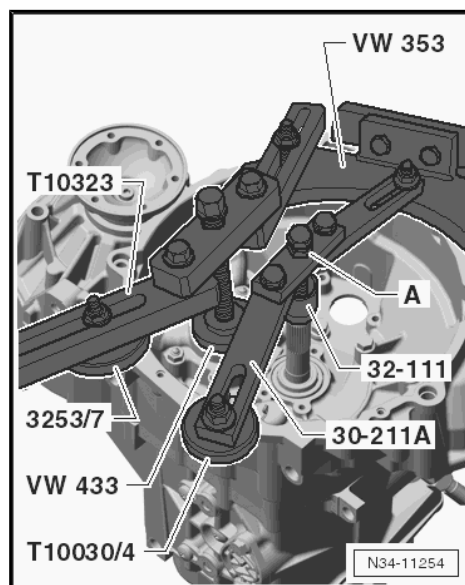
- Remove the clutch release lever, the release bearing and the guide sleeve. Refer to
⇒ ["1.16 Clutch Release Mechanism, Servicing", page 35](#).
- Be careful not to damage the bearing for the input and output shafts when removing and installing 5th gear.
- When securing the transmission to the Transmission Support - VW353- , install the following tools for support:

Under the Input Shaft:

- ◆ Bracket - Multiple Use - 30-211A-
- ◆ Bearing Installer - Multiple Use - 32-111-
- ◆ Assembly Tool Kit - Press Piece 2 - T10030/4-
- Secure the bolt on the Bracket - Multiple Use - 30-211A- with the nut -A-.

Under the Output Shaft Bracket

- ◆ Support Bridge - T10323-
- ◆ Rear Wheel Bearing Kit - Piece 7 - 3253/7-
- ◆ Press Piece - Multiple Use - VW433-



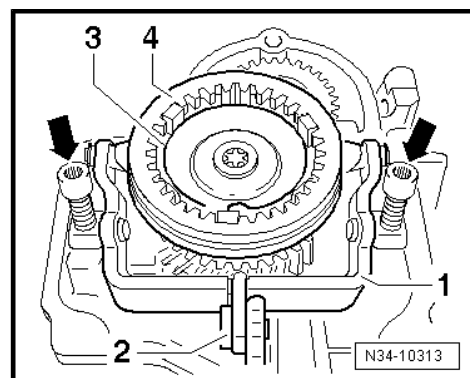


- Secure the transmission on the Transmission Support - VW353- .
- Place the Drip Tray underneath.
- Open the oil filler plug and the oil drain plug.
- Drain the transmission fluid.
- Remove the transmission housing cover -arrow-.

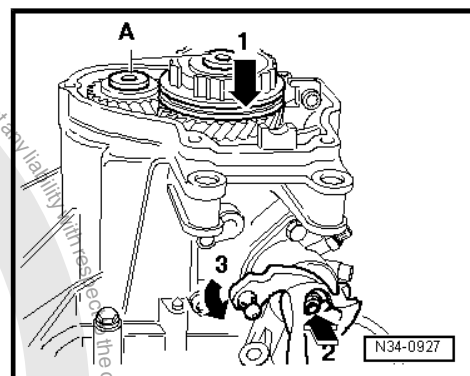


Remove the 5th gear shift fork as follows:

- Move the shift fork -1- into neutral.
- Remove the bolt -2- with the shift jaw for 5th gear.
- Remove both bolts -arrows- for the pivot pin.
- Remove the pivot pin.
- Remove the 5th gear shift fork.
- It is not necessary to remove the spring -3- and the locking collar -4-.



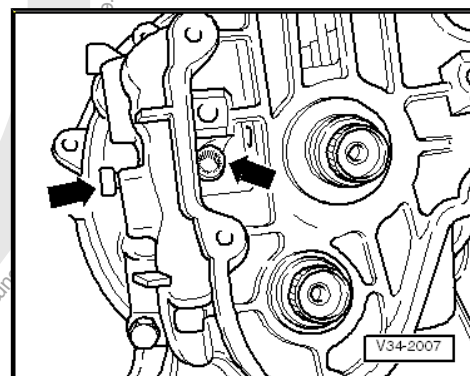
- Engage 5th gear -arrow 1- and 1st gear -arrows 2 and 3- and then remove the bolts -A- for the synchronizer hub and for the 5th gear wheel.
- The input shaft and the output shaft are blocked after both gears are engaged. The synchronizer hub and the gear wheel cannot turn. Both bolts can be loosened now.



Note

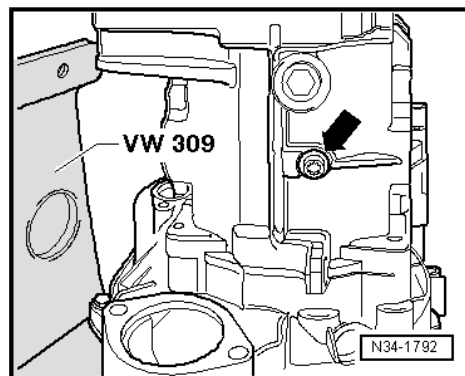
Remove any locking compound residue still in the threaded holes using a thread tap if the shafts are not going to be replaced.

- Remove both bolts -arrows- for the reverse shaft support.

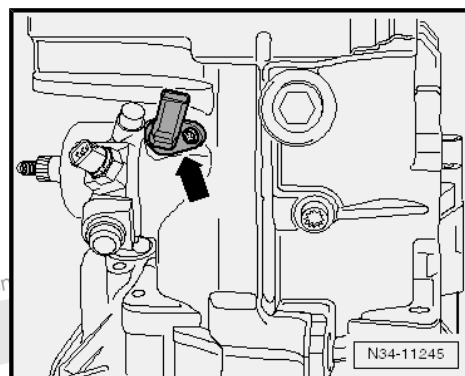




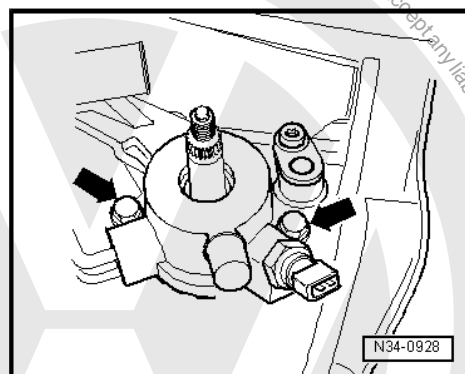
- Remove the third bolt -arrow- from the reverse shaft support.



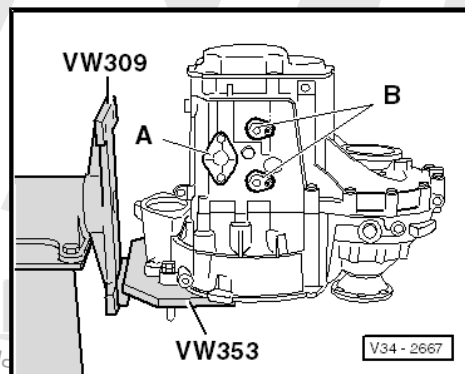
- Transmission on vehicles with Stop/Start system: remove the Transmission Neutral Position Sensor - G701- -arrow-.



- Move the gearshift shaft into neutral and remove the gearshift shaft with the gearshift cover. Remove the bolts -arrows- and pull the gearshift shaft out of the transmission housing.

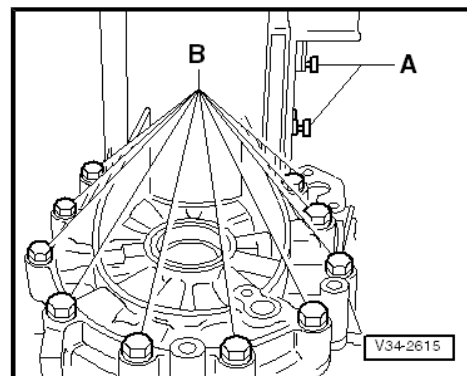


- Remove the cover -A- and pivot pin -B- on the bottom of the transmission.





- Remove pivot pins -A- on top side of transmission and bolts -B- for transmission housing to clutch housing in area of differential.

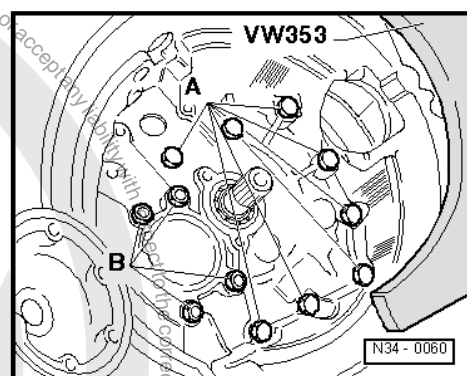


- Remove the bolts -A- that connect the clutch and transmission housing.

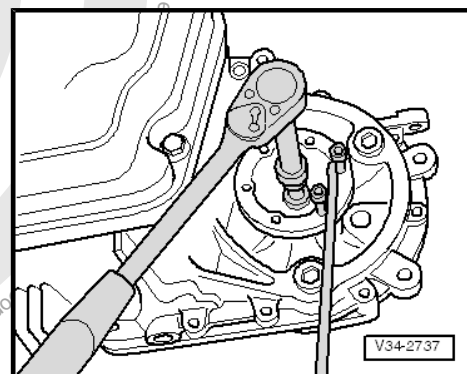


Note

Do not remove the nuts -B- for the bearing mount on the output shaft.

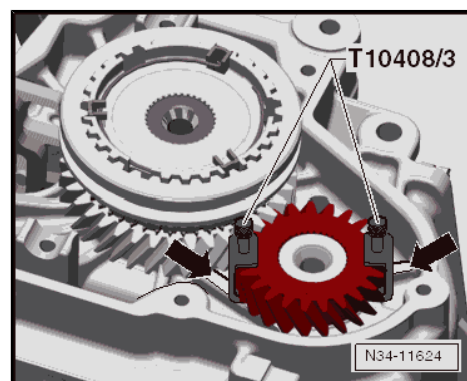


- Remove both flange shafts.
- Remove the flange shafts with the springs, thrust washers and tapered rings.



Remove the Following Components Together with the Transmission Housing:

- ◆ 5th Gear Synchronizer Hub
- ◆ 5th Gear Wheel
- Both Spacer Plate - T10408/3- must be attached to the 5th gear wheel.
- The Spacer Plate must be located above the 2 ribs on the housing, opposite each other -arrows-.



Note

- ◆ *There is a needle bearing under the 5th gear wheel.*
- ◆ *Secure the Straps so that the needle bearing does not touch the 5th gear wheel when removing the transmission housing.*



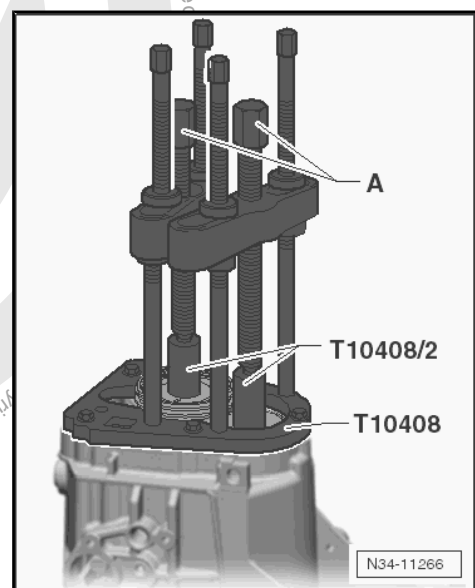
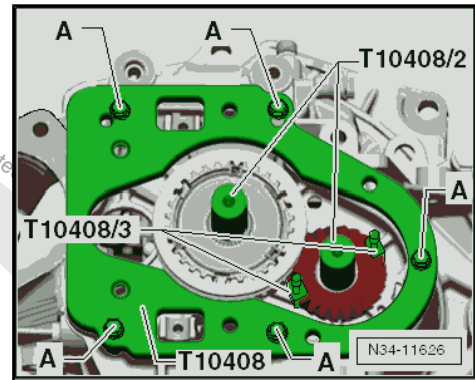
Use the Puller - Transmission Gears - T10408- with the Following Special Tools:

- ◆ Puller - Transmission Gears - Thrust Piece - T10408/2-
- ◆ Spacer Plate - T10408/3
- ◆ Kukko 18/1 puller (quantity: 2)
- Install the Puller - Transmission Gears - T10408- in the threaded holes in the transmission housing cover using the bolts -A-.

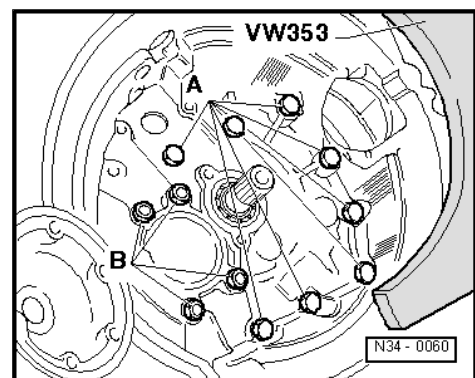
A - M7 x 35 Hex Bolts with Washers

Tightening specification 18 Nm

- Place the Puller - Transmission Gears - Thrust Piece - T10408/2- on the shaft.
- Install Kukko puller 18/1 -A-.
- Remove the 5th gear synchronizer hub, the 5th gear wheel and the transmission housing by tightening the spindles -A- (approximately $\frac{1}{2}$ turn), alternating from side to side.
- Warm the 5th gear wheel slightly using the Hot Air Blower - VAG1416- .

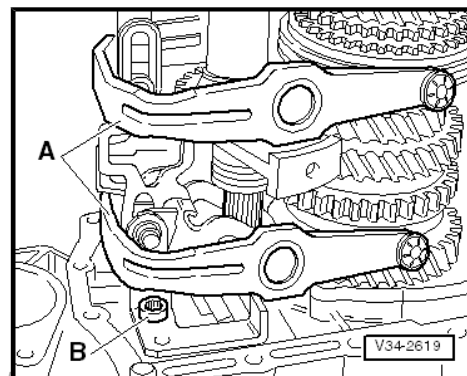


- Remove the nuts -B- from the bearing mount/output shaft.





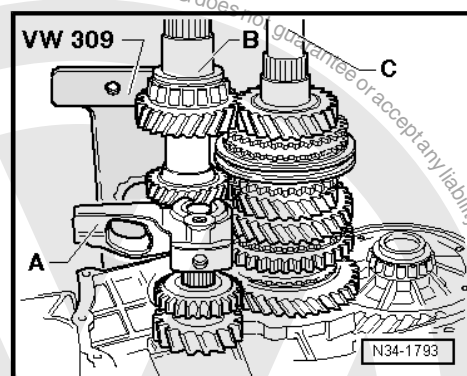
- Remove the shift forks -A- together with the gearshift rails.
- Remove the gearshift mechanism/reverse gear -B-.



- Remove the reverse gear -A-, the input shaft -B- and the output shaft -C-, one after the other, from the clutch housing.
- Remove the differential.

Assembling the Transmission

- Install the differential.

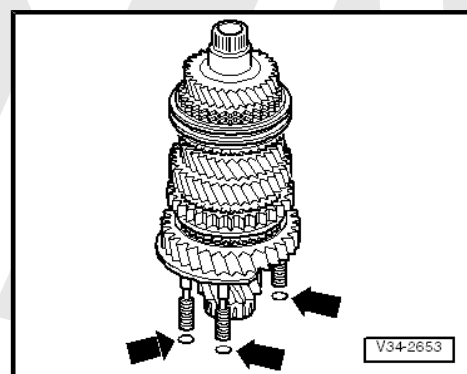


- Replace the sealing rings -arrows- for output shaft bearing mount after removing.



Note

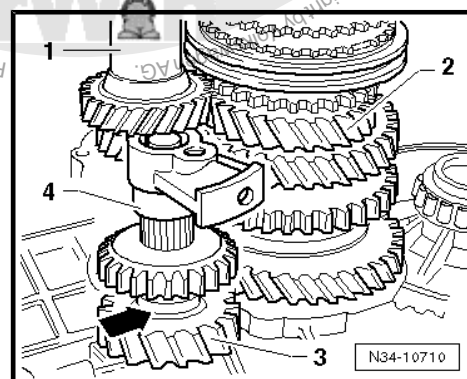
The illustration only shows 3 of the 4 seals.



- Insert output shaft -1- and output shaft -2- together.
- Tighten the nuts for the bearing mount / output shaft.
- Install the reverse gear wheel -3- on the needle bearing inside the clutch housing.

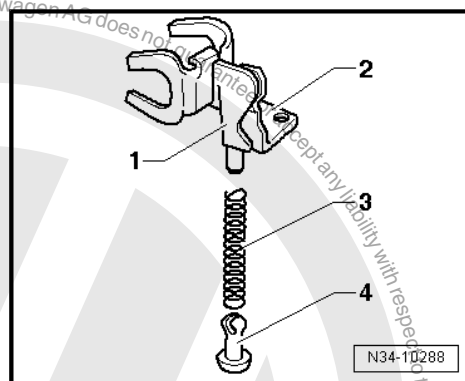
Shoulder -arrow- faces away from clutch housing.

- Make sure the reverse shaft -4- is complete. Refer to ["3.2 Reverse Shaft, Disassembling and Assembling", page 170](#). Do not mount the support on the reverse shaft.
- Install the reverse shaft into the clutch housing.
- Clean all threaded holes in reverse shaft supports of locking compound; cleaning can be done with a thread tap.
- Mount the reverse shaft support.

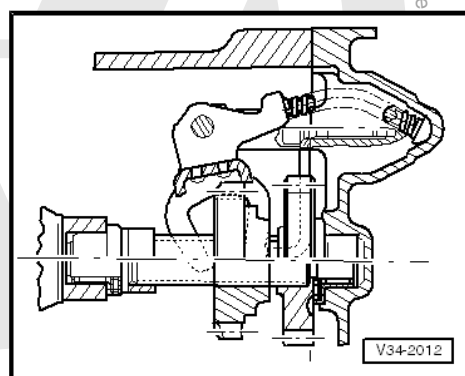




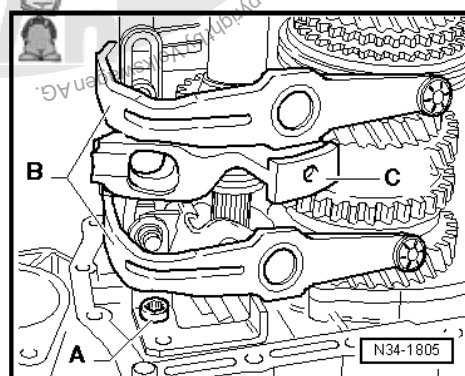
- Install the reverse gear shift fork -1- with the support for the reverse gear shift fork -2-, the spring -3- and the sliding piece -4-.



Reverse gear location



- Install the gearshift mechanism/reverse gear -A-.
 - Install the shift forks -B- together with the gearshift rails.
- Reverse gear supports -C- are located in front of selector rails.



- Install the M8 x 100 stud bolts -A- into reverse shaft support so that this shaft is aligned after mounting the transmission housing.
- Align the gearshift rails.



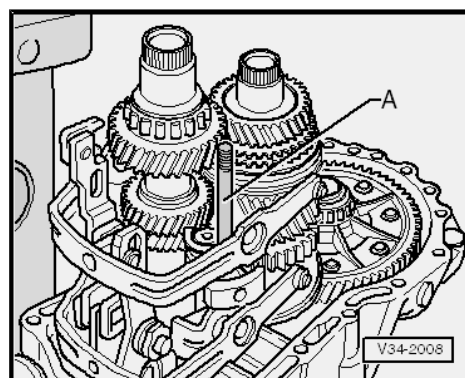
Note

The shift segments must be installed in the grooves on the locking collars.

- Apply Sealing Paste - AMV 188 200 03- evenly onto the sealing surface of the clutch housing.
- Install the transmission housing and tighten it secure.

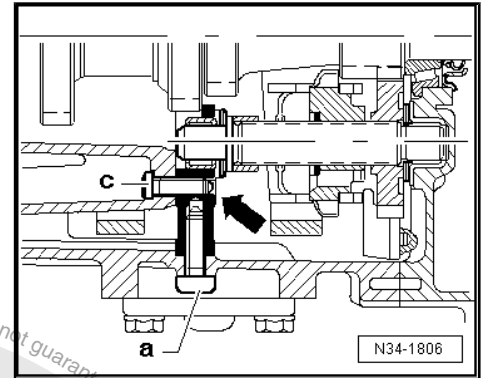
Install the bolts for the reverse shaft support -arrow- as follows:

- Install the bolt -a-.
- Remove stud bolts -A- (⇒ upper illustration).



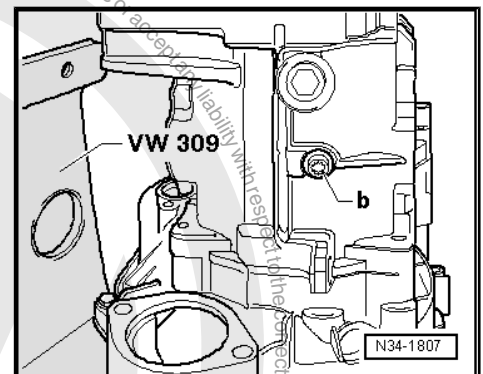


- Install the bolt -c-.

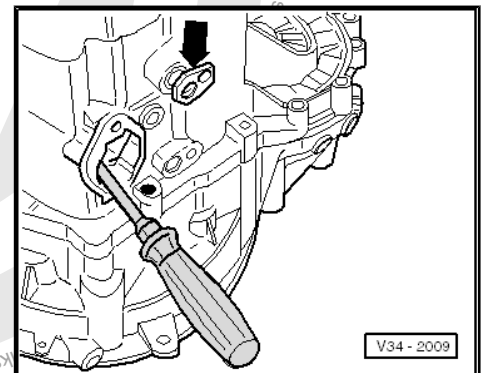


Tightening sequence:

- Tighten the bolt -a- (⇒ upper illustration).
- Tighten the bolt -b-.
- Tighten the bolt -c- (⇒ upper illustration).

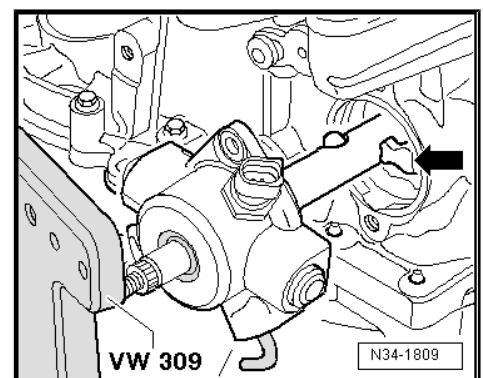


- Install the pivot pin -arrow- for the shift forks. To do this align shift mechanism using a screwdriver, so that the relevant pivot pin can be installed.
- Apply Sealing Paste - AMV 188 200 03- evenly onto the cap sealing surface.
- Install the gearshift shaft cover.



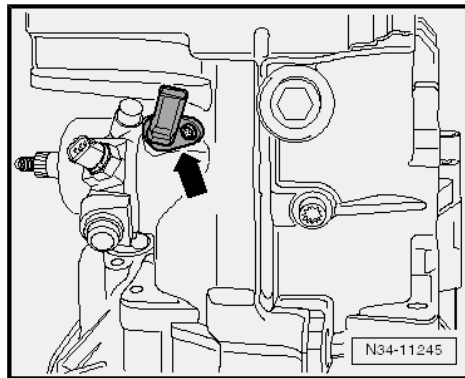
Install the gearshift shaft cover as follows:

- Move the gearshift rail into the neutral position.
- Apply Sealing Paste - AMV 188 200 03- evenly onto the sealing surface of the gearshift cover.
- Move the gearshift shaft into neutral.
- Position the selector shaft so that selector finger -arrow- is inserted into the selector rails.
- Tighten the gearshift shaft gearshift cover.





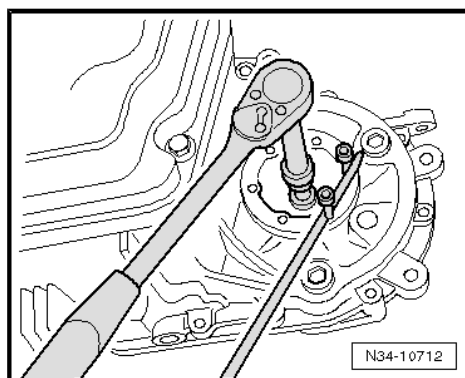
- Transmission on vehicles with Stop/Start system: install the Transmission Neutral Position Sensor - G701- -arrow- and tighten the screw.



- Install both flange shafts with springs, thrust washers and tapered rings. Refer to ➤ [“2 Differential”, page 189](#) .

Tightening Specifications

- ◆ Refer to
➤ [“5.4 Overview - Transmission Housing and Selector Mechanism”, page 95](#)
- ◆ Refer to
➤ [“5.6 Overview - Input Shaft, Output Shafts, Differential, Gearshift Rods”, page 97](#) .
- ◆ Flange shaft to transmission (conical head bolt). Refer to
➤ [“2.1 Overview - Differential”, page 189](#) .



5th Gear and Transmission Housing Cover, Installing. Refer to ➤ [“5.12 Transmission Housing Cover and 5th Gear, Installing”, page 114](#) .

5.12 Transmission Housing Cover and 5th Gear, Installing



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

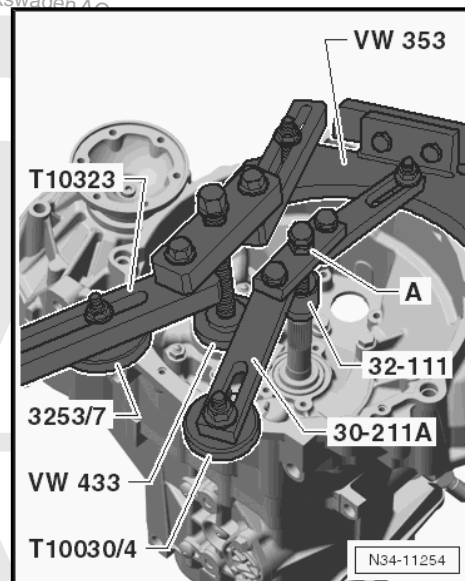
- ◆ Bolts - Plate Spring to Transmission



Refer to

⇒ ["5.10 Transmission Housing Cover and 5th Gear, Removing", page 101](#), "Transmission Housing Cover and 5th Gear, Removing" to get a list of the special tools needed.

- Pay attention that the Bracket - Multiple Use - 30-211A- and the Support Bridge - T10323- is installed.
- Secure the bolt on the Bracket - Multiple Use - 30-211A- with the nut -A-.



Installed Position, 5th Gear Wheel

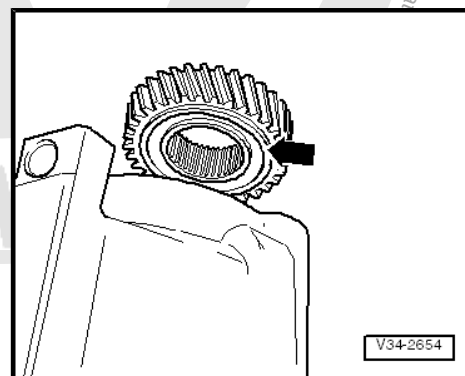
The groove all the way around -arrow- faces the transmission housing.

- To install, heat the 5th gear wheel to approximately 100 °C (212 °F) with the Inductive Heater - VAS6414- .

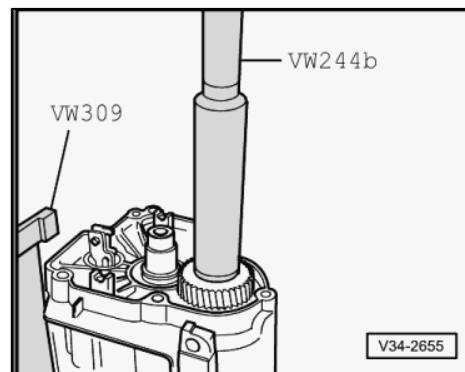


WARNING

Wear safety gloves.



- Install the 5th gear wheel.



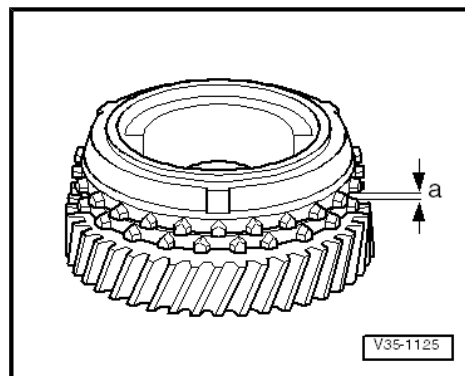


Checking 5th Gear Synchronizer Ring

- Before re-installing the gear wheel and the 5th gear synchronizer ring push the synchronizer ring onto the taper of the drive gear. Measure the gap dimension -a- with a feeler gauge.

Gap Dimension -a-	Installation Dimension	Wear Limit
5th Gear	1.1 to 1.7 mm	0.5 mm

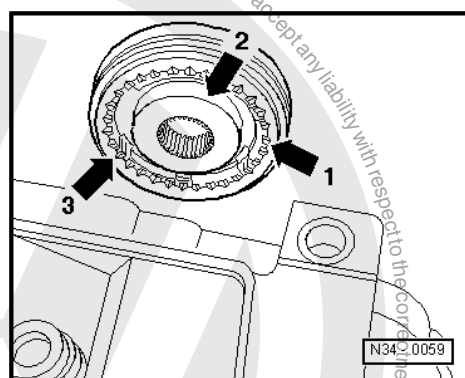
- Install 5th gear wheel with needle bearing.
- Place the 5th gear synchronizer ring onto the selector gear.
- If disassembled, assemble the 5th gear synchronizer hub/locking collar before installing. Refer to [Fig. "5th Gear Locking Collar/Synchronizer Hub Assembly", page 147](#).



Installed Position of 5th Gear Synchronizer Hub/Locking Collar

The pointed teeth on the locking collar -arrow 1- and the high collar on the synchronizer hub -arrow 2- face the transmission housing.

The notches -arrow 3- on the synchronizer hub must line up with the cast locking pieces on the synchronizer ring (⇒ [Fig. "5th Gear Synchronizer Ring with Cast Locking Pieces", page 116](#) lower).



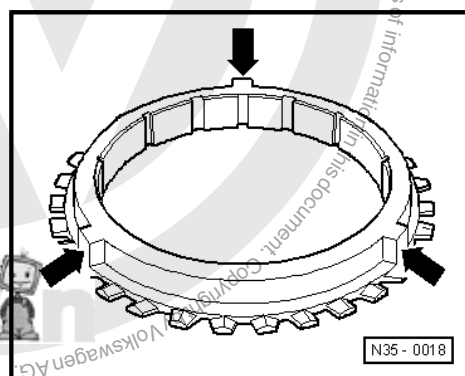
5th Gear Synchronizer Ring with Cast Locking Pieces

- Cover all openings with a cloth to prevent foreign objects from getting into the transmission.
- To install, heat the 5th gear synchronizer hub to approximately 100 °C (212 °F) with the Inductive Heater - VAS6414- .



WARNING

Wear safety gloves.

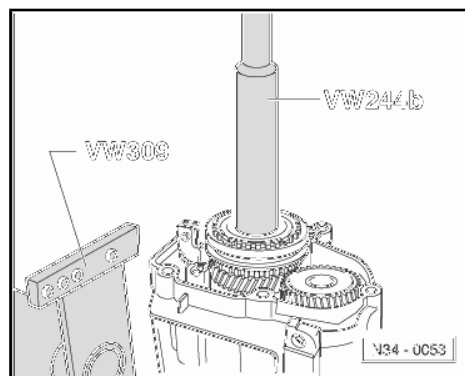


- Install the 5th gear synchronizer hub



Note

Make sure there is enough clearance when installing the synchronizer ring.



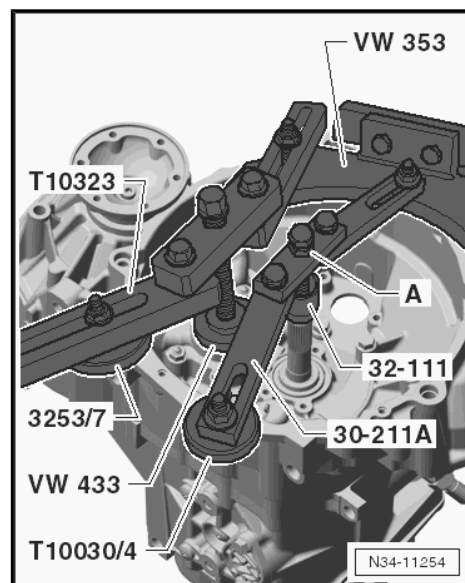


- Loosen the support for the input shaft.

If it has not been done already, locking fluid residue from the threaded holes for the synchronizer hub bolts and 5th gear wheel must be cleaned with a thread tap.

Otherwise, there is the danger that the bolts could shear off.

- Screw-in new synchronizer hub bolts and 5th gear wheel.

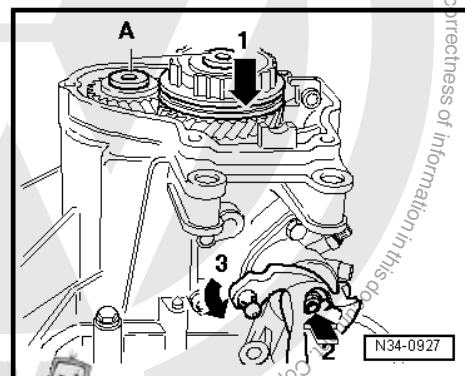


Installed Position of Plate Springs for 5th Gear Synchronizer Hub and Gear Securing Bolts

The outer diameter -arrows- faces 5th gear.



- Engage 5th gear -arrow 1- and 1st gear -arrows 2 and 3- and then tighten the bolts -A- for the synchronizer hub and for the 5th gear wheel.
- The input shaft and the output shaft are blocked after both gears are engaged. The synchronizer hub and the gear wheel cannot turn. Both bolts can be loosened now.
- Install the 5th gear shift fork.





Adjusting 5th Gear

- Engage 5th gear. Loosen the bolt -1-. Push the locking collar and the shift jaw in direction of -arrow-. Tighten the bolt -1- to the tightening specification.
- Check measurement: it must not be possible to slide a 0.2 mm feeler gauge between the locking collar and drive gear. Repeat the adjusting procedure if necessary.
- Remove 5th gear. The locking collar must be in the neutral position. The synchronizer ring must move freely.
- Move the gearshift lever (selector lever) through all the gears.
- Install the transmission housing cover. Refer to [⇒ "5.3 Overview - Transmission Housing Cover and 5th Gear", page 93](#).
- Install the release bearing guide sleeve. Refer to [⇒ "1.4 Overview - Clutch Release Mechanism", page 18](#).
- Install the clutch release lever and release the bearing. Refer to [⇒ "1.16 Clutch Release Mechanism, Servicing", page 35](#).
- Fill the transmission fluid. Refer to [⇒ page 78](#).

Tightening Specifications

- ◆ Refer to [⇒ "5.3 Overview - Transmission Housing Cover and 5th Gear", page 93](#)
- ◆ Refer to [⇒ "5.7 Overview - Shift Forks", page 98](#).





6 Transmission Housing and Clutch Housing

⇒ [“6.1 Overview - Transmission Housing and Clutch Housing”, page 119](#)

⇒ [“6.2 Transmission Housing, Servicing”, page 121](#)

⇒ [“6.3 Clutch Housing, Servicing”, page 122](#)

6.1 Overview - Transmission Housing and Clutch Housing

1 - Transmission Housing

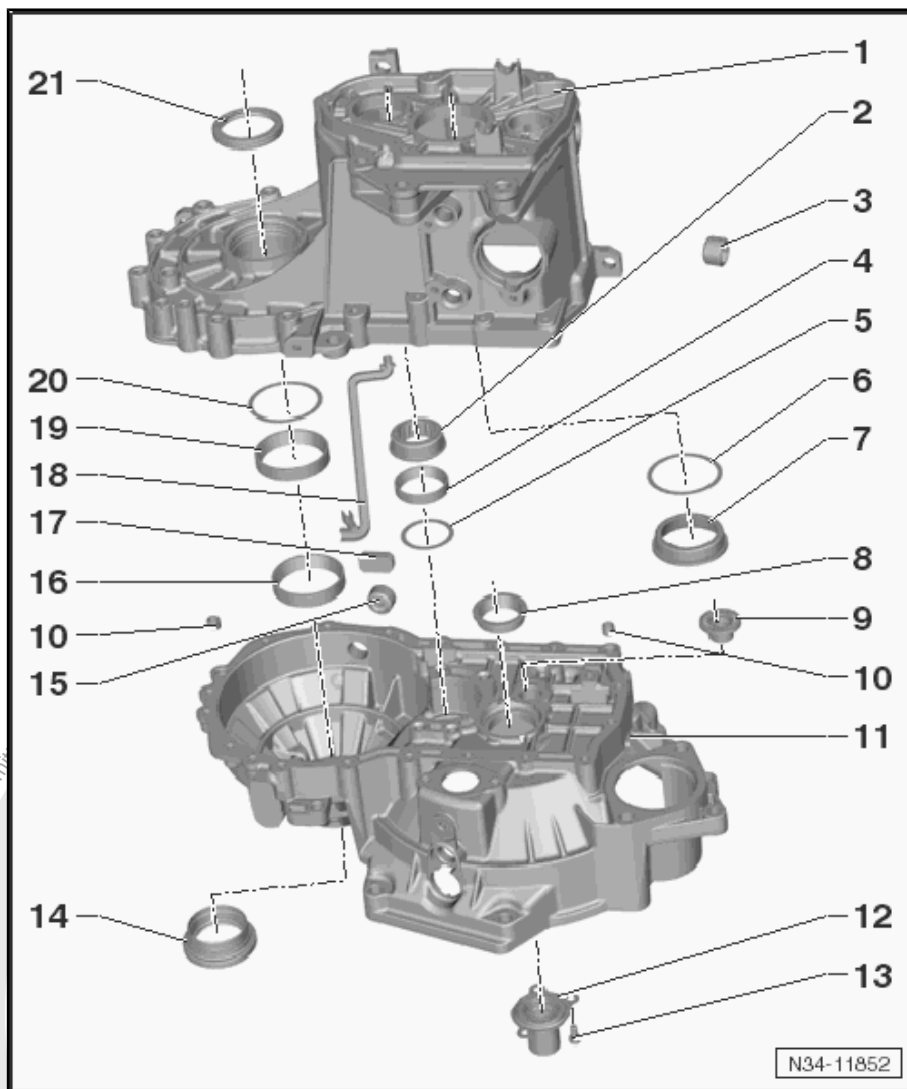
- ❑ When replacing: adjust the input shaft and differential. Refer to ⇒ [“3 Adjustment Overview”, page 198](#)

2 - Needle Bearing

- ❑ For the output shaft
- ❑ Removing. Refer to ⇒ [Fig. “Removing the Needle Bearing”, page 121](#).
- ❑ Installing and securing. Refer to ⇒ [Fig. “Installing the Needle Bearing”, page 121](#)

3 - Transmission Fluid Filler Plug

- ❑ 35 Nm
- ❑ The transmission fluid level cannot be checked by removing oil filler plug.
- ❑ If transmission was disassembled, it must be filled before being installed again.
- ❑ Manual transmission capacity (transmission completely disassembled). Refer to ⇒ [Fluid Capacity Tables; Rep. Gr. 03](#)
- ❑ Manual transmission capacity (transmission partly disassembled). Refer to ⇒ [Fluid Capacity Tables; Rep. Gr. 03](#)



4 - Outer Race/Tapered Roller Bearing

- ❑ For the output shaft
- ❑ Refer to ⇒ [“2.2 Output Shaft, Disassembling and Assembling”, page 158](#)
- ❑ When replacing: adjust the output shaft. Refer to ⇒ [“2.3 Output Shaft, Adjusting”, page 166](#).

5 - Shim

- ❑ For the output shaft
- ❑ Adjustment overview. Refer to ⇒ [“3 Adjustment Overview”, page 198](#).

6 - Shim

- ❑ For the input shaft



- ☐ Adjustment overview. Refer to ⇒ [“3 Adjustment Overview”, page 198](#) .
- 7 - Outer Race/Tapered Roller Bearing**
 - ☐ For the input shaft
 - ☐ Removing and installing. Refer to ⇒ [“1.2 Input Shaft, Disassembling and Assembling”, page 143](#) .
 - ☐ When replacing: adjust the input shaft. Refer to ⇒ [“1.3 Input Shaft, Adjusting”, page 148](#)
- 8 - Outer Race/Tapered Roller Bearing**
 - ☐ For the input shaft
 - ☐ Removing and installing. Refer to ⇒ [“1.2 Input Shaft, Disassembling and Assembling”, page 143](#) .
 - ☐ When replacing: adjust the input shaft. Refer to ⇒ [“1.3 Input Shaft, Adjusting”, page 148](#)
- 9 - Needle Sleeve**
 - ☐ Removing and installing. Refer to ⇒ [“3.2 Reverse Shaft, Disassembling and Assembling”, page 170](#) .
- 10 - Alignment Sleeve**
 - ☐ Quantity: 2
- 11 - Clutch Housing**
 - ☐ When replacing: ⇒ adjustment overview. Refer to ⇒ [“3 Adjustment Overview”, page 198](#)
- 12 - Guide Sleeve**
 - ☐ With sealing ring for the drive axle and vulcanized O-ring
 - ☐ For removing and installing, remove the transmission
 - ☐ Removing the seal. Refer to ⇒ [Fig. “Removing the Seal from the Guide Sleeve” , page 122](#)
 - ☐ Installing the seal. Refer to ⇒ [Fig. “Installing the Seal All the Way Into the Guide Sleeve” , page 122](#)
 - ☐ Remove the guide sleeve to replace the seal.
 - ☐ Replace the guide sleeve and O-ring if the O-ring is damaged.
- 13 - Cylinder Bolt**
 - ☐ Removing and installing. Refer to ⇒ [“1.4 Overview - Clutch Release Mechanism”, page 18](#) .
- 14 - Seal with Sleeve**
 - ☐ For the right flange shaft
 - ☐ Replace the seal and the sleeve together.
 - ☐ Replace when the transmission is installed. Refer to ⇒ [“1.3 Right Seal, Replacing”, page 185](#) .
 - ☐ Replacing the removed transmission. Refer to ⇒ [“6.3 Clutch Housing, Servicing”, page 122](#) .
- 15 - Oil Drain Plug**
 - ☐ 35 Nm
- 16 - Outer Race/Tapered Roller Bearing**
 - ☐ For the differential
 - ☐ Removing and installing. Refer to ⇒ [“2 Differential”, page 189](#)
 - ☐ When replacing: adjust the differential. Refer to ⇒ [“2.3 Differential, Adjusting”, page 194](#)
- 17 - Magnet**
 - ☐ Held in place by housing joint surface
- 18 - Oil Catch Tray**
 - ☐ Install the oil catch tray into the transmission housing. Refer to ⇒ [Fig. “Installing the Oil Catch Tray -A- into the Transmission” , page 122](#)
- 19 - Outer Race/Tapered Roller Bearing**
 - ☐ For the differential
 - ☐ Removing and installing. Refer to ⇒ [“2 Differential”, page 189](#)
 - ☐ When replacing: adjust the differential. Refer to ⇒ [“2.3 Differential, Adjusting”, page 194](#)
- 20 - Shim**
 - ☐ For the differential
 - ☐ Adjustment overview. Refer to ⇒ [“3 Adjustment Overview”, page 198](#) .



21 - Seal

- ☐ For the left flange shaft
- ☐ Replacing. Refer to ⇒ ["1.3 Right Seal, Replacing", page 185](#)

6.2 Transmission Housing, Servicing

Special tools and workshop equipment required

- ◆ Bearing/Bushing Installer - Multiple Use - VW295-
- ◆ Bearing/Bushing Installer - Multiple Use - VW295A-
- ◆ Press Piece - Multiple Use - VW447H-
- ◆ Press Piece - Multiple Use - VW512-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Front Control Arm - 2040-



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

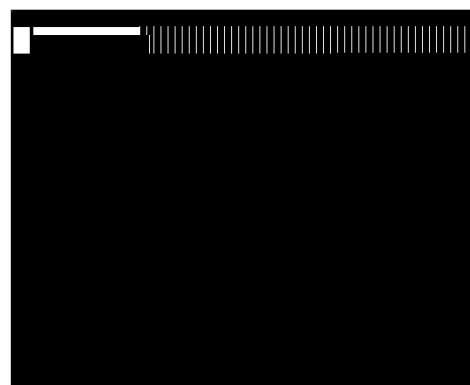
Mandatory Replacement Parts

- ◆ Seal - Guide Sleeve

Removing the Needle Bearing

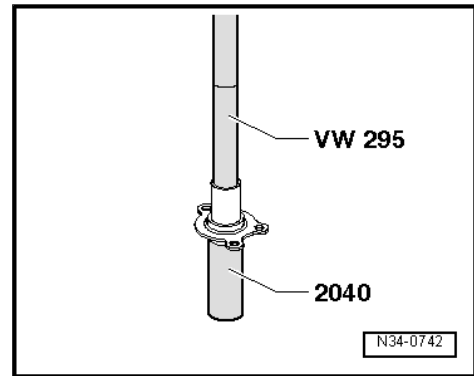
Installing the Needle Bearing

- Secure the needle bearing at three points inside the transmission housing, offset by 120°, using a mandrel.





Removing the Seal from the Guide Sleeve

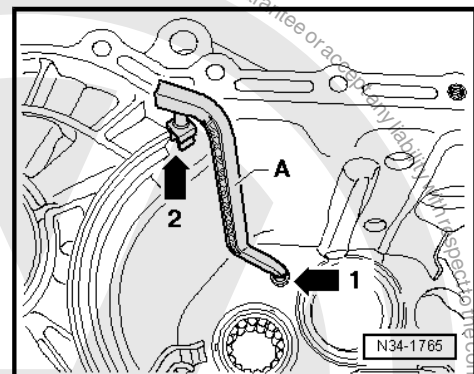


Installing the Seal All the Way Into the Guide Sleeve



Installing the Oil Catch Tray -A- into the Transmission

- Insert the oil catch tray into the hole -arrow 1- and groove -arrow 2- at the same time.



6.3 Clutch Housing, Servicing

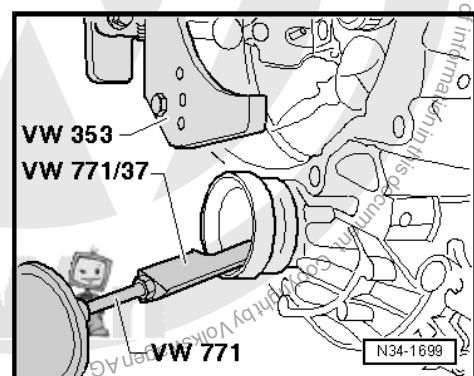
Special tools and workshop equipment required

- ◆ Slide Hammer Set - VW771-
- ◆ Slide Hammer Set - Hook - VW771/37-
- ◆ Spindle from the Seal Installer - Driver Set - 3066-
- ◆ Seal Installer - One-Piece Seal - T10148-

Removing the Sleeve and Seal

The sleeve has a shoulder on the inside.

- Slide Hammer Set - Hook - VW771/37- behind the shoulder inside the sleeve.
- Using force, push the Slide Hammer Set - Hook - VW771/37- into the sleeve.





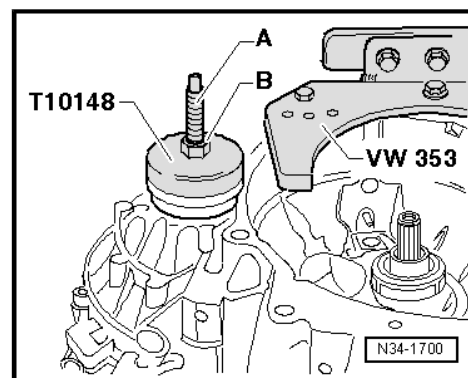
Installing the Sleeve and Seal

- Clean the seal seat inside the transmission.
- Attach the spindle -A- for the Seal Installer - Driver Set - 3066- into the threaded piece on the differential.
- Turn the nut -B- and pull the sleeve all the way over the Seal Installer - One-Piece Seal - T10148- .



Note

If transmission is disassembled, press sleeve in onto stop using Seal Installer - One-Piece Seal - T10148- .

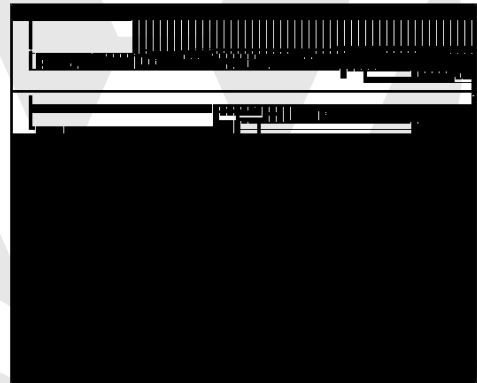




7 Securing on Engine and Transmission Holder

Special tools and workshop equipment required

- ◆ Holding Plate - VW309-
- ◆ or Holding Plate - VW309A-
- ◆ Transmission Support - VW353-
- Secure the transmission on the Transmission Support - VW353- .
- Place a Shop Crane - Drip Tray - VAS6208- for example underneath.





8 Transmission Fluid

⇒ ["8.1 Transmission Fluid Level, Checking", page 125](#)

⇒ ["8.2 Transmission Fluid, Draining and Filling", page 125](#)

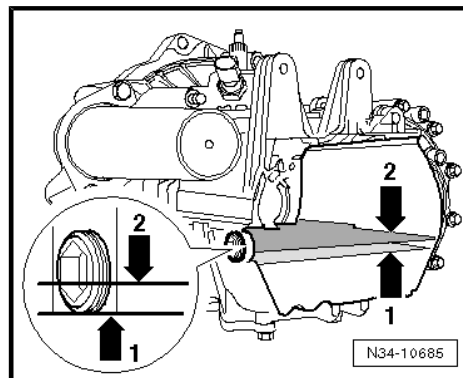
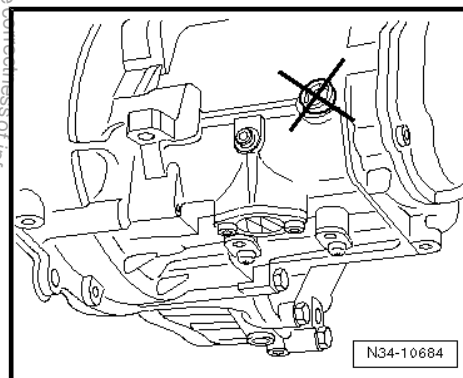
8.1 Transmission Fluid Level, Checking

It is not possible to check the transmission fluid level by removing oil filler plug.

Due to the angle of the engine/transmission assembly, the lower edge of the filler hole -arrow 1- is located below the oil level -arrow 2-.

The Transmission Fluid Level In Transmission Can Only be Checked When the Transmission Fluid Has Been Drained Completely and then Filled Again. Refer to

⇒ ["8.2 Transmission Fluid, Draining and Filling", page 125](#) .



8.2 Transmission Fluid, Draining and Filling

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Hose (approximately 600 mm long, outside diameter 10 mm) with commercially available funnel.

Transmission Fluid, Draining

Transmission fluid. Refer to the Parts Catalog.

- Remove the entire air filter housing if it is located above the gearshift lever. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing .
- Remove the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .



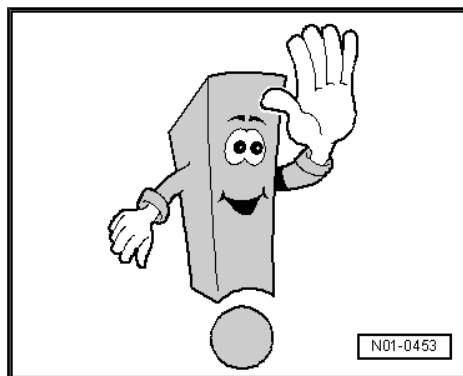
Clean the transmission.



Caution

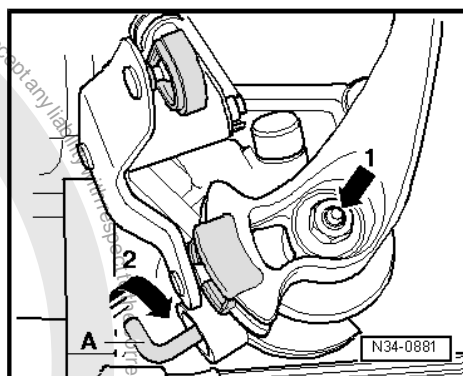
To drain gear oil, journal for shift forks in transmission must be removed.

To avoid that the position of the shift forks is changed, for example by involuntarily operating shift mechanism, shift rod must be secured.



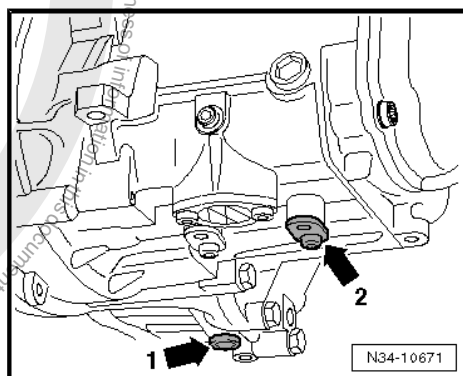
Secure the Gearshift Shaft as Follows:

- 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 2- upward and simultaneously press it in until it engages in the gearshift shaft.
- The gearshift shaft is secured.



Use a Clean Container that Holds three Liters (3.17 quarts) With a Scale Printed On It To Catch the Transmission Fluid.

- Remove the drain plug -arrow 1- and then the pivot pins for the shift forks -arrow 2- and drain the transmission fluid.
- Install the pivot pins for the shift forks -arrow 2- with a new O-ring. Refer to
⇒ ["5.4 Overview - Transmission Housing and Selector Mechanism", page 95](#) .
- Install the oil drain plug -arrow 1- -item 15-
⇒ [Item 15 \(page 120\)](#) .



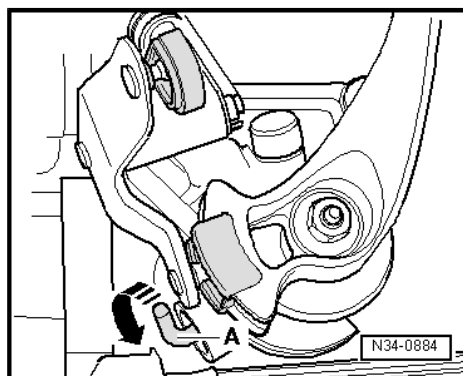
- Rotate the bracket -A- back into its starting position direction of -arrow- so that the gearshift shaft moves freely.

Transmission Fluid, Filling

- The oil drain plug is tightened to the tightening specification.
- Install the shift fork journal with a new O-ring. Refer to
⇒ ["5.4 Overview - Transmission Housing and Selector Mechanism", page 95](#) .

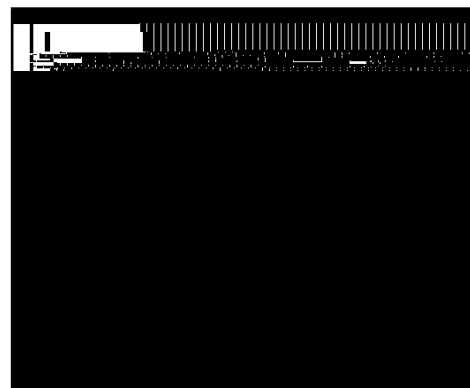
Transmission fluid. Refer to the Parts Catalog.

Fill the Transmission Fluid Capacity into the Container to 1.8 Liters (1.9 quarts).





- Remove the Back-Up Lamp Switch - F4- -arrow-.
- Hose (approximately 600 mm (23.6 in.) long, outside diameter 10 mm) with commercially available funnel.
- Insert the hose into the hole in the Back-Up Lamp Switch - F4- (seconded technician) and fill the transmission fluid.
- Reinstall the Back-Up Lamp Switch - F4- -arrow-. Refer to [⇒ "5.5 Overview - Shift Unit", page 96](#) .
- Check the selector mechanism function. Refer to [⇒ "1.7 Selector Mechanism, Checking", page 65](#) .
- Install the air filter housing if it was removed earlier. Refer to [⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 24 ; Air Filter; Air Filter Housing, Removing and Installing](#) .
- Install the noise insulation. Refer to [⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation](#) .

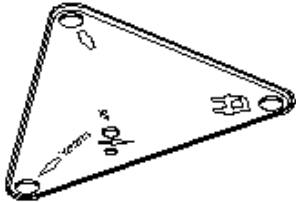
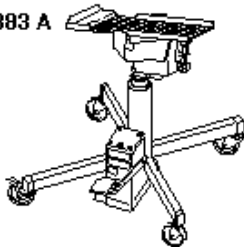
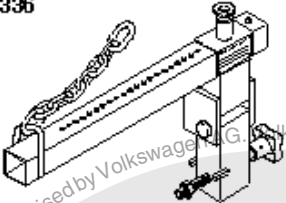




9 Special Tools

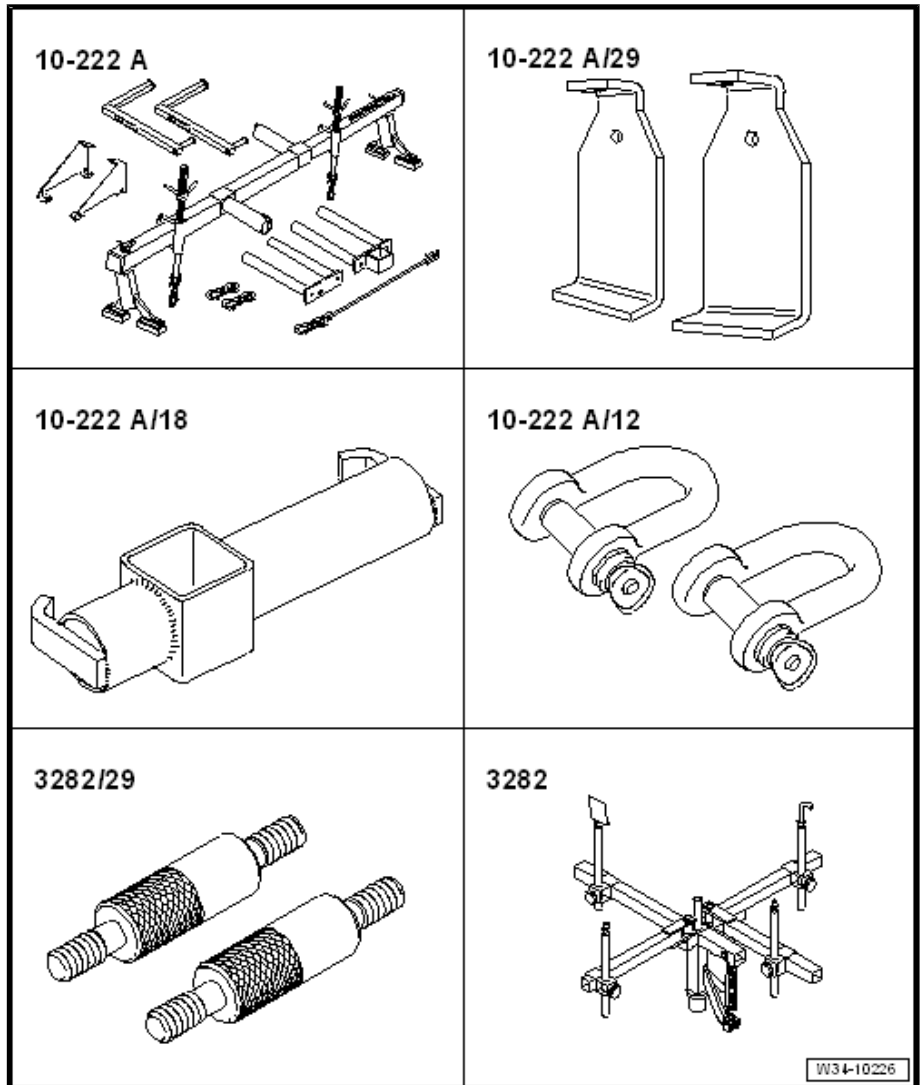
Special tools and workshop equipment required

- ◆ Transmission Support - Mounting Plate 39 - 3282/39-
- ◆ Transmission Support Elements (determine when mounting the Adjustment Plate on the Transmission Support)
- ◆ Engine and Gearbox Jack - VAS6931-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Torque Wrench 1332 40-200Nm - VAG1332-
- ◆ Transmission Support Jig - 3336- to transport the transmission.
- ◆ Grease for Clutch Disc Shaft Splines - G 000 100-
- ◆ Allocate the grease for gearshift mechanism. Refer to the Parts Catalog.

3282/39 	V.A.G 1383 A 
V.A.G 1331 	V.A.G 1332 
3336 	W34-0169

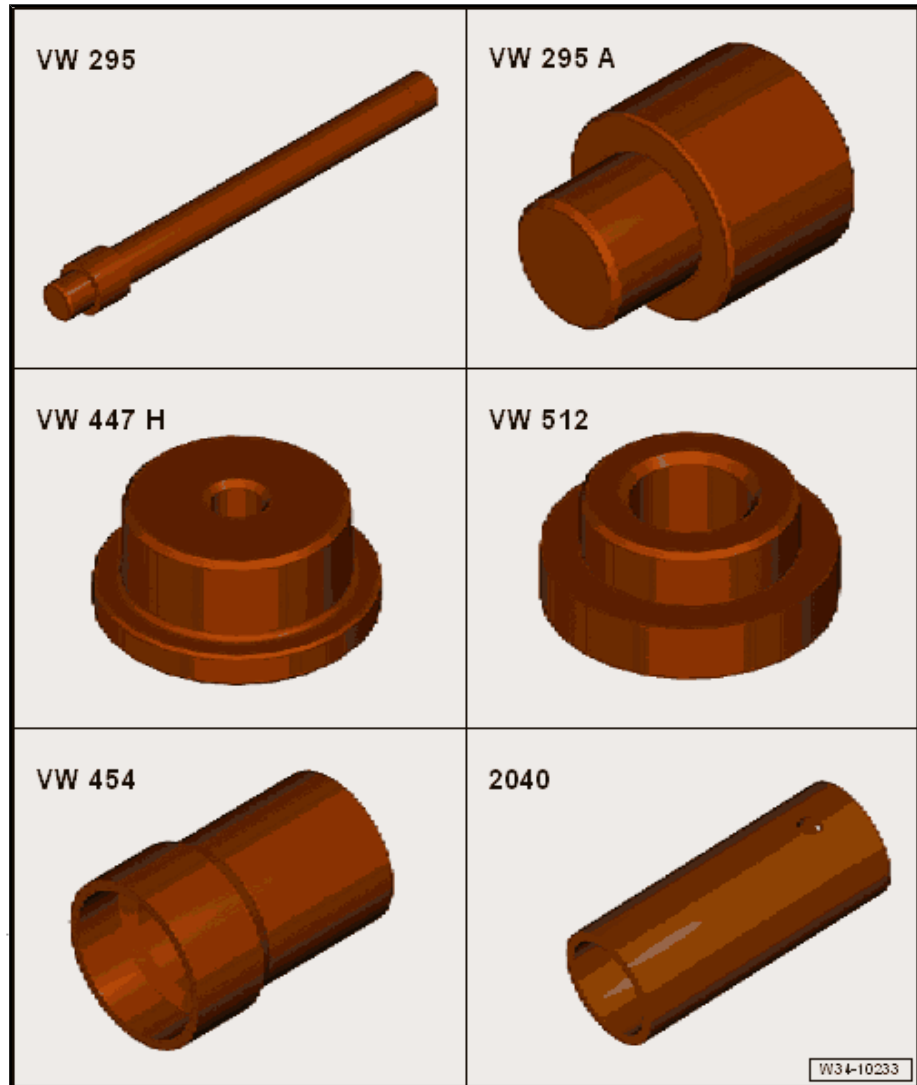


- ◆ Engine Support Bridge - 10-222A-
- ◆ Engine Support Bridge - Gearbox Adapter - 10-222A/29-
- ◆ Engine Support Bridge - Engine Support 18 - 10-222A/18-
- ◆ Engine/Gearbox Support Shackle (2 pc.) - 10-222A/12-
- ◆ Transmission Support - Pins 29 - 3282/29-
- ◆ Transmission Support - 3282-





- ◆ Bearing/Bushing Installer - Multiple Use - VW295-
- ◆ Bearing/Bushing Installer - Multiple Use - VW295A-
- ◆ Press Piece - Multiple Use - VW447H-
- ◆ Press Piece - Multiple Use - VW512-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Front Control Arm - 2040-



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- ◆ Holding Plate - VW309A-
- ◆ or Holding Plate - VW309A-
- ◆ Transmission Support - VW353-
- ◆ Bearing/Bushing Installer - Multiple Use - VW295-
- ◆ Bearing Driver - Multiple Use - VW244B-
- ◆ For example Hot Air Blower - VAG1416-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-



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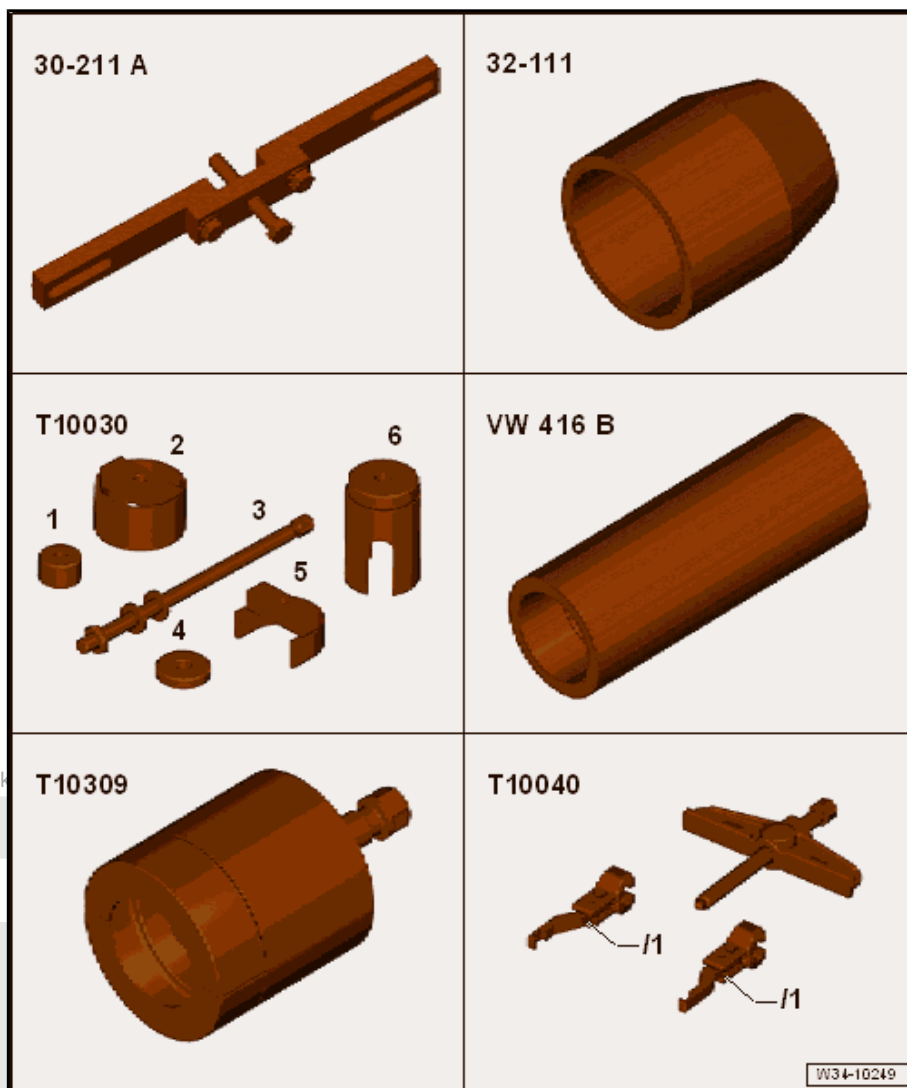


- ◆ Press Plate - VW402-
- ◆ Subframe Support Tool - Press Piece - 3290/1-
- ◆ Press Piece - Multiple Use - VW431-
- ◆ Subframe Bushing Tool Kit - 3301-
- ◆ Press Piece - Multiple Use Spacer Sleeve - VW472/2-
- ◆ Valve Guide/Clutch Release Push Rod Seal Drift - 10-206-





- ◆ Bracket - Multiple Use - 30-211A-
- ◆ Bearing Installer - Multiple Use - 32-111-
- ◆ Assembly Tool Kit - Press Piece 2 - T10030/4- from the Hydraulic Press - Bushing Tool Kit - T10030-
- ◆ Press Piece - 37mm - VW416B-
- ◆ Puller - Transmission Gears - T10309-
- ◆ Puller - Two Arm - T10040-
- ◆ With the Puller - Two Arm w/Thrust Piece - T10040/2A-
- ◆ Puller - Two Arm Thrust Piece - T10040/3-



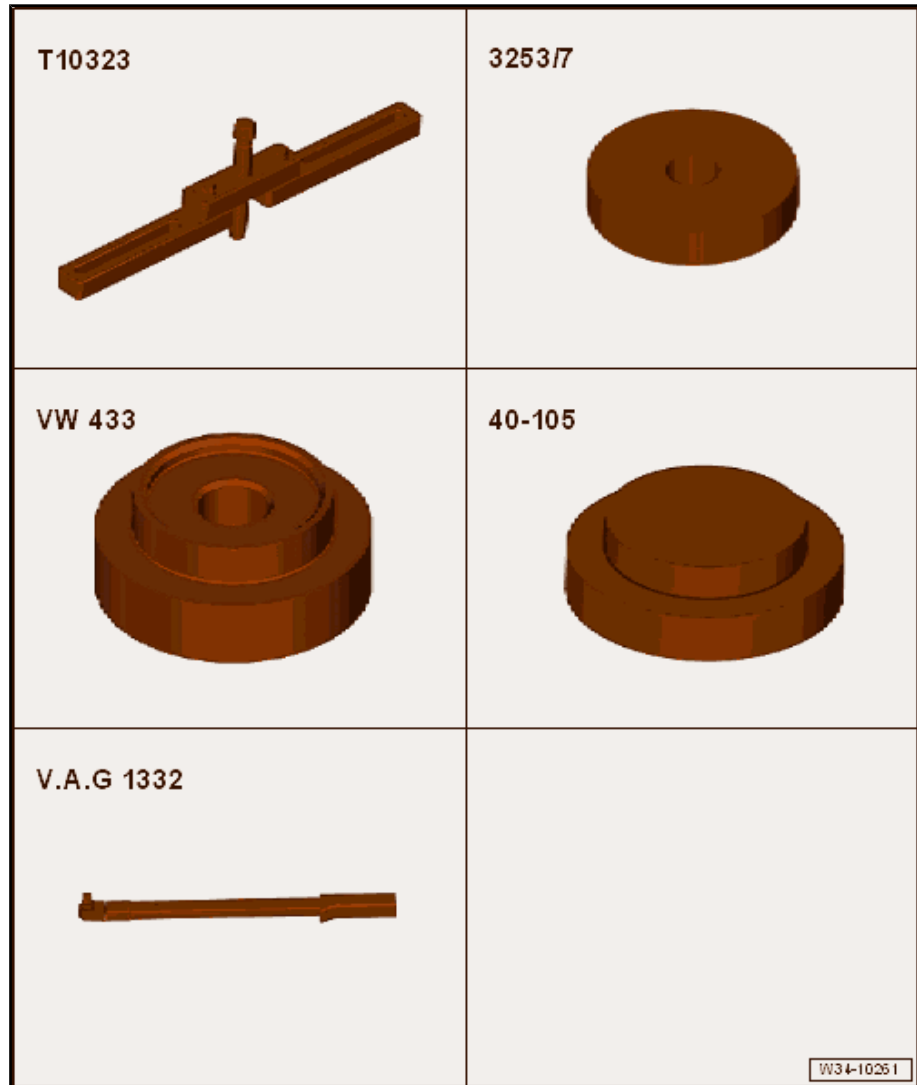
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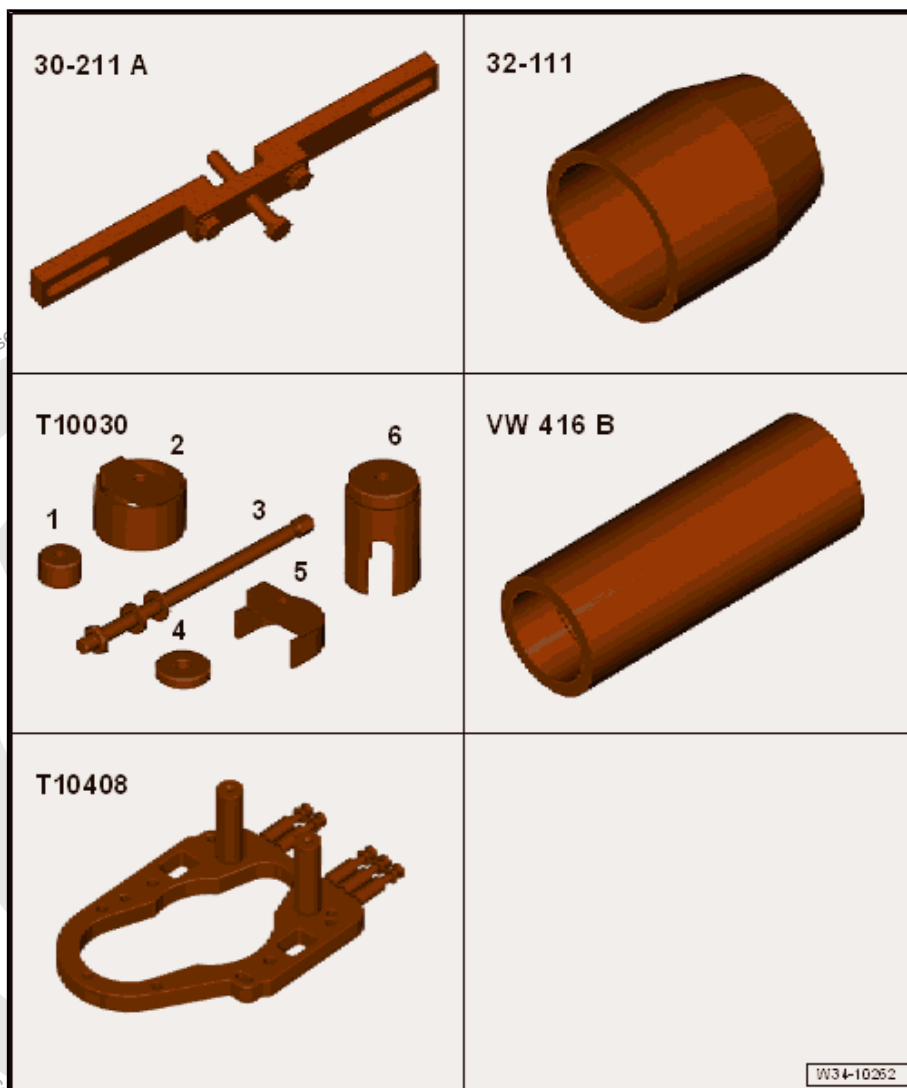


- ◆ Support Bridge - T10323-
- ◆ Rear Wheel Bearing Kit -
Piece 7 - 3253/7-
- ◆ Press Piece - Multiple Use
- VW433-
- ◆ Press Piece - Multiple Use
- 40-105-
- ◆ Torque Wrench 1332
40-200Nm - VAG1332-

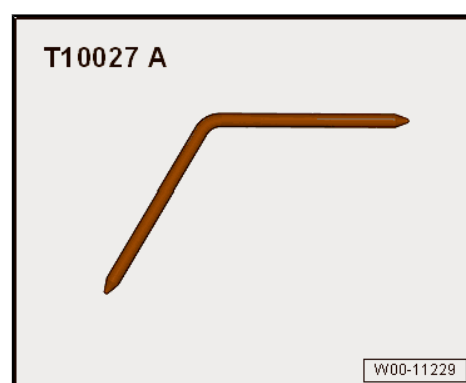




- ◆ Bracket - Multiple Use - 30-211A-
- ◆ Bearing Installer - Multiple Use - 32-111-
- ◆ Assembly Tool Kit - Press Piece 2 - T10030/4- from the Hydraulic Press - Bushing Tool Kit - T10030-
- ◆ Press Piece - 37mm - VW416B-
- ◆ Puller - Transmission Gears - T10408-
- ◆ Puller - Transmission Gears - Thrust Piece - T10408/2-
- ◆ Spacer Plate - T10408/3-
- ◆ M7 x 35 hex collar bolt and washer (components of the Puller - Transmission Gears - T10408-)



- ◆ Connecting Pin - T10027A-





- ◆ Seal Installer - One-Piece Seal - T10148-



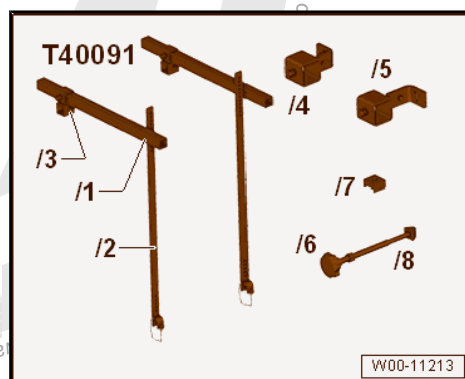
- ◆ Breather Tube Tool - T10203-



- ◆ Wedge Set - T10383-



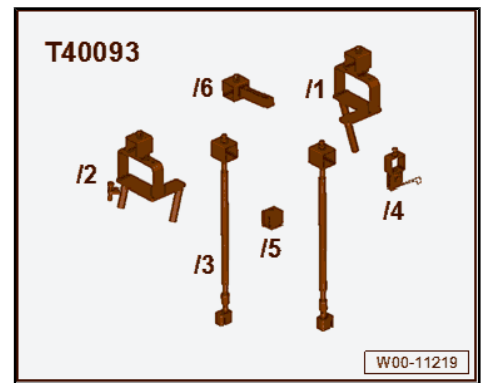
- ◆ Engine Support - Basic Set Square Pipe - T40091/1- (quantity 2)



- ◆ Engine Support - Basic Set Movable Joint - T40091/3- (quantity 2)



- ◆ Engine Support - Supplement Kit Spindle - T40093/3- (quantity 2) from the Engine Support - Supplement Kit - T40093A-



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



- ◆ Hose Clip Pliers - VAG1275A-



- ◆ Shop Crane - VAS6100-





◆ Shop Crane - Drip Tray - VAS6208-



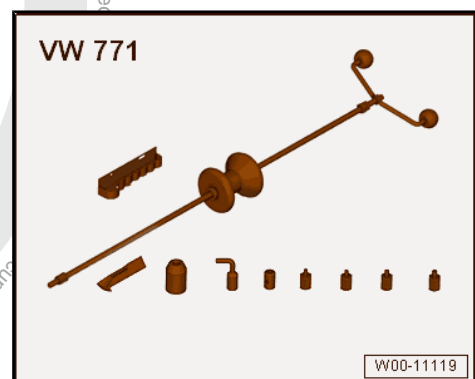
◆ Inductive Heater - VAS6414-



◆ Press Piece - Shift Rod/Alternator - VW423-

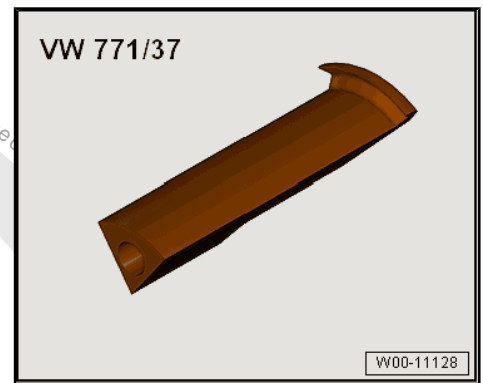


◆ Slide Hammer Set - VW771-





◆ Slide Hammer Set - Hook - VW771/37-



◆ -2- Puller - Kukko Puller - 60-150mm Width, 200mm Length - Kukko 18/1- (quantity 2)



◆ Engine Support Bridge - Special Hook (2 pc.) - 10-222A/20-

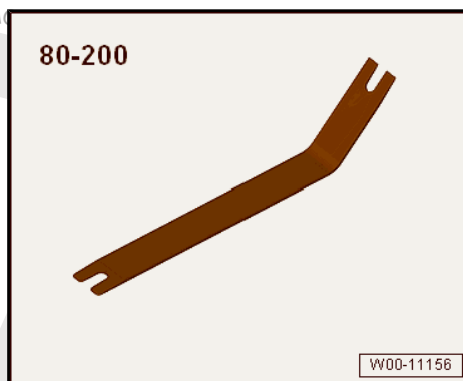


◆ Assembly Mandrel for Gear Selector Rod - 10-508-





- ◆ Pry Lever - 80-200-



- ◆ Spring Strut Compressor - 2070-



- ◆ Spindle from the Seal Installer - Driver Set - 3066- or M8 x 105 bolt



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



- ◆ Sealing Compound - AMV 188 200 03-
- ◆ M8 x 100 mm stud bolt



35 – Gears, Shafts

1 Input Shaft

⇒ [“1.1 Overview - Input Shaft”, page 141](#)

⇒ [“1.2 Input Shaft, Disassembling and Assembling”, page 143](#)

⇒ [“1.3 Input Shaft, Adjusting”, page 148](#)

⇒ [“1.4 Input Shaft Seal, Replacing”, page 152](#)

1.1 Overview - Input Shaft



Note

- ◆ Pay attention to the *Parts Catalog* and to the *Technical data* when installing new gear wheels or a new input shaft. Refer to ⇒ [“4 Technical Data”, page 6](#).
- ◆ The input shaft must be adjusted because the position of the tapered roller bearing is affected when parts are replaced. Pay attention to the adjustment overview. Refer to ⇒ [“3 Adjustment Overview”, page 198](#).
- ◆ Replace both tapered roller bearings together.
- ◆ Wearing safety gloves, warm the inner race/tapered roller bearing, the gear wheels and the synchronizer hubs to approximately 100 °C (212 °F) using an Inductive Heat Unit - VAS6414- before installing them.

1 - Clutch Housing

2 - Outer Race/Tapered Roller Bearing

- ❑ Removing. Refer to
⇒ [Fig. "Removing the Outer Race/Tapered Roller Bearing"](#),
page 144
- ❑ Installing. Refer to
⇒ [Fig. "Installing the Outer Race/Tapered Roller Bearing"](#),
page 144

3 - Inner Race / Tapered Roller Bearing

- ❑ Removing. Refer to
⇒ [Fig. "Removing the Inner Race/Tapered Roller Bearing"](#),
page 144
- ❑ Installing. Refer to
⇒ [Fig. "Installing the Inner Race/Tapered Roller Bearing"](#), page 145

4 - Input Shaft

- ❑ Adjusting. Refer to
⇒ ["1.3 Input Shaft, Adjusting"](#), page 148 .

5 - 3rd Gear Wheel

- ❑ Installed position: shoulder faces 4th gear
- ❑ Removing. Refer to
⇒ [Fig. "Removing the 3rd Gear Wheel"](#), page 145

- ❑ Installing. Refer to ⇒ [Fig. "Installing 3rd Gear Wheel"](#), page 145

6 - Circlip

- ❑ Replace after removing

7 - 4th Gear Wheel

- ❑ Removing with the outer race/tapered roller bearing and sleeve. Refer to
⇒ [Fig. "Removing the 4th Gear Wheel with the Tapered Roller Bearing and Sleeve"](#), page 145
- ❑ Installing. Refer to ⇒ [Fig. "Removing 4th Gear Wheel"](#), page 146
- ❑ The shoulder faces 3rd gear

8 - Inner Race / Tapered Roller Bearing

- ❑ Removing with 4th gear wheel and sleeve. Refer to
⇒ [Fig. "Removing the 4th Gear Wheel with the Tapered Roller Bearing and Sleeve"](#), page 145
- ❑ Installing. Refer to ⇒ [Fig. "Installing the Inner Race/Tapered Roller Bearing"](#), page 146

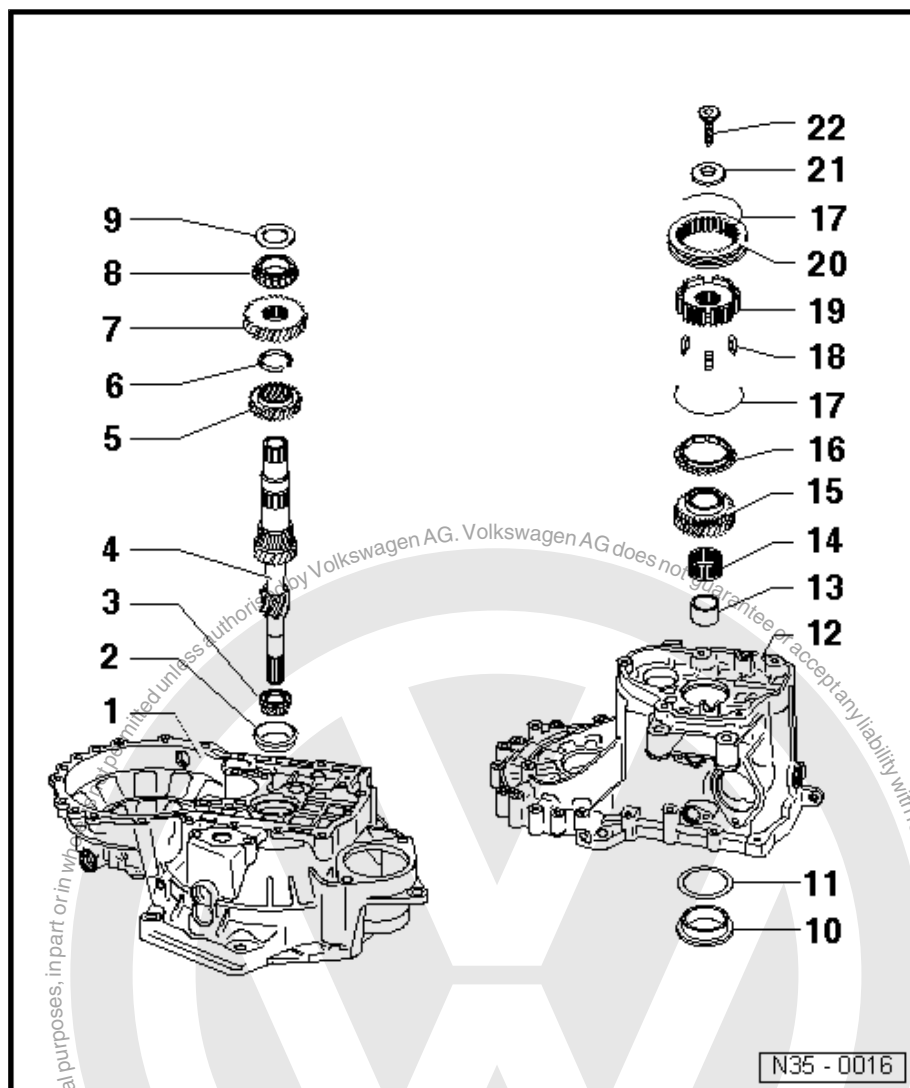
9 - Thrust Washer

10 - Outer Race/Tapered Roller Bearing

- ❑ Removing. Refer to ⇒ [Fig. "Installing the Outer Race/Tapered Roller Bearing"](#), page 147
- ❑ Installing. Refer to ⇒ [Fig. "Installing the Outer Race/Tapered Roller Bearing"](#), page 147

11 - Shim

- ❑ Selecting thickness. Refer to ⇒ ["1.3 Input Shaft, Adjusting"](#), page 148 .





12 - Transmission Housing

13 - Sleeve

- ☐ For the 5th gear needle bearing
- ☐ Pressing off with 4th gear drive gear and the inner race/tapered roller bearing. Refer to [⇒ Fig. "“Removing the 4th Gear Wheel with the Tapered Roller Bearing and Sleeve”", page 145](#)
- ☐ Installing. Refer to [⇒ Fig. "“Installing the Needle Bearing Sleeve”", page 146](#)
- ☐ Mount before installing the thrust washer -item 9- [⇒ Item 9 \(page 142\)](#) .

14 - Needle Bearing

- ☐ For 5th gear

15 - 5th Gear Wheel

16 - 5th Gear Synchronizer Ring

- ☐ With cast locking pieces. Refer to [⇒ Fig. "“5th Gear Synchronizer Ring with Cast Locking Pieces”", page 116](#)
- ☐ Checking for wear. Refer to [⇒ Fig. "“Checking 5th Gear Synchronizer Ring”", page 116](#)

17 - Spring

- ☐ Installation position. Refer to [⇒ Fig. "“5th Gear Locking Collar/Synchronizer Hub Assembly”", page 147](#) and [⇒ Fig. "“Installation of Offset Springs -A-”", page 148](#)

18 - Locking Pieces (quantity: 3)

- ☐ Installed position. Refer to [⇒ Fig. "“5th Gear Synchronizing”", page 147](#)

19 - 5th Gear Synchronizer Hub

- ☐ Remove. Refer to [⇒ "5.10 Transmission Housing Cover and 5th Gear, Removing", page 101](#)

20 - 5th Gear Locking Collar

- ☐ Remove with 5th gear synchronizer hub. Refer to [⇒ "5.10 Transmission Housing Cover and 5th Gear, Removing", page 101](#)

21 - Plate Spring

- ☐ Installed position. Refer to [⇒ Fig. "“Installed Position of Plate Springs for 5th Gear Synchronizer Hub and Gear Securing Bolts”", page 117](#)

22 - Bolt

- ☐ Replace after removing
- ☐ Holds in position with the adapter on the plate spring bolt head. Refer to [⇒ Fig. "“Installed Position of Plate Springs for 5th Gear Synchronizer Hub and Gear Securing Bolts”", page 117](#)
- ☐ Removing and installing. Refer to [⇒ "5.10 Transmission Housing Cover and 5th Gear, Removing", page 101](#) .
- ☐ Tightening specification. Refer to [⇒ "5.3 Overview - Transmission Housing Cover and 5th Gear", page 93](#) .

1.2 Input Shaft, Disassembling and Assembling

Special tools and workshop equipment required

- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Multiple Use - VW447H-
- ◆ Press Piece - Rod - VW412-
- ◆ Press Piece - Shift Rod/Alternator - VW422-
- ◆ Press Plate - VW401-
- ◆ Press Piece - Rod - VW408A-



- ◆ Press Piece - 28x100mm - VW421-
- ◆ Press Piece - VW447i-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Multiple Use - VW510-
- ◆ Press Tube - 41-501-
- ◆ -3- Puller - Kukko Quick Action Separating Tool - 12-75mm - Kukko 17/1-
- ◆ Press Plate - VW402-
- ◆ Inductive Heater - VAS6414-



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

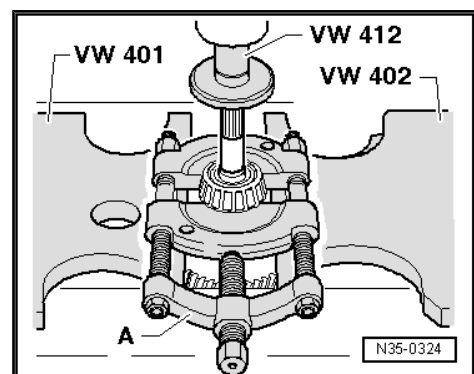
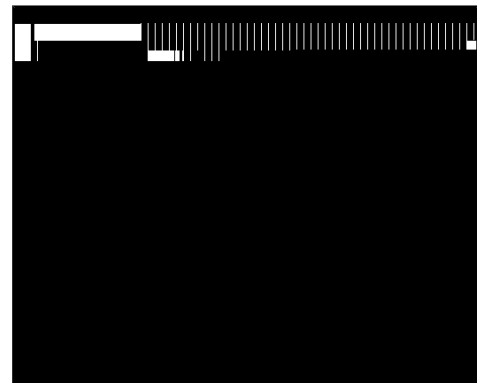
- ◆ Circlip - Input Shaft

Removing the Outer Race/Tapered Roller Bearing

Installing the Outer Race/Tapered Roller Bearing

Removing the Inner Race/Tapered Roller Bearing

A - Puller - Quick Action Separating Tool - 12-75mm -Kukko 17/1-



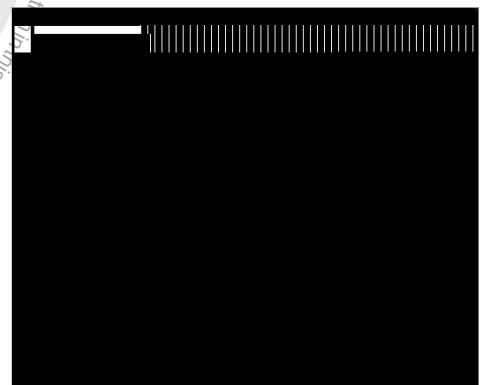
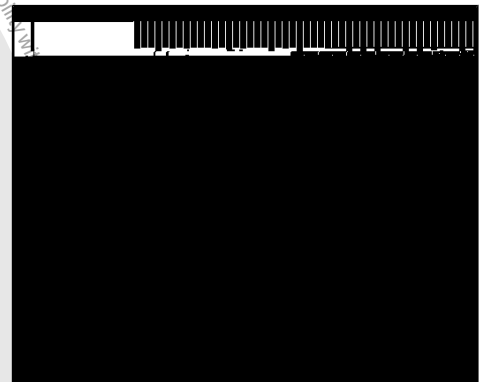
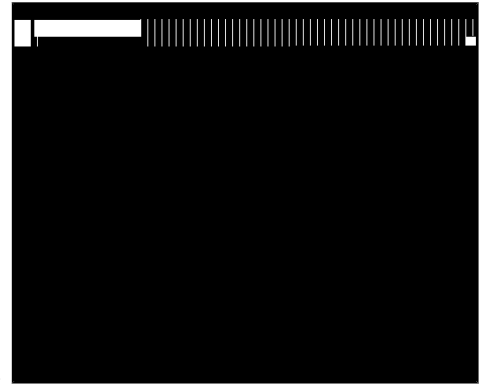


Installing the Inner Race/Tapered Roller Bearing

Removing the 4th Gear Wheel with the Tapered Roller Bearing and Sleeve

Removing the 3rd Gear Wheel

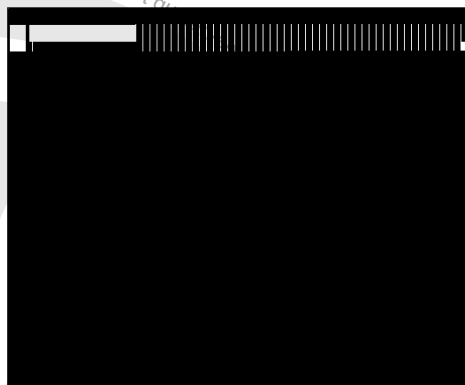
Installing 3rd Gear Wheel



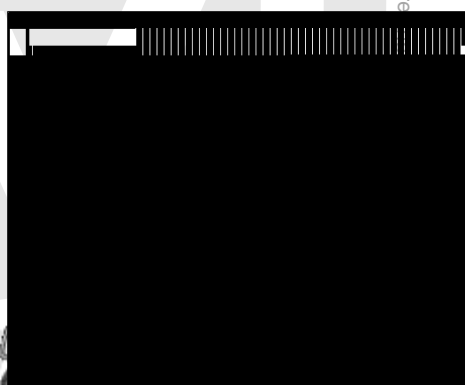


Removing 4th Gear Wheel

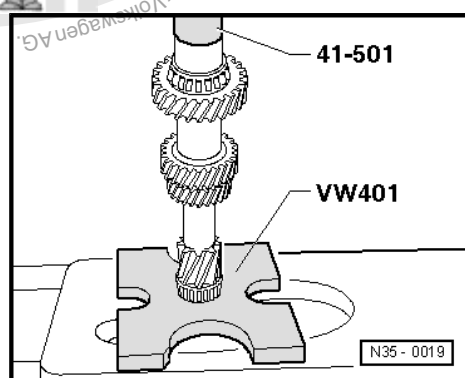
The shoulder faces 3rd gear.



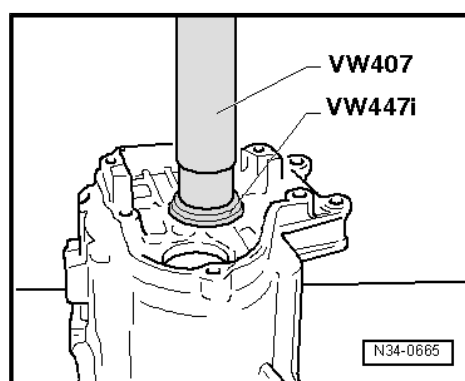
Installing the Inner Race/Tapered Roller Bearing



Installing the Needle Bearing Sleeve



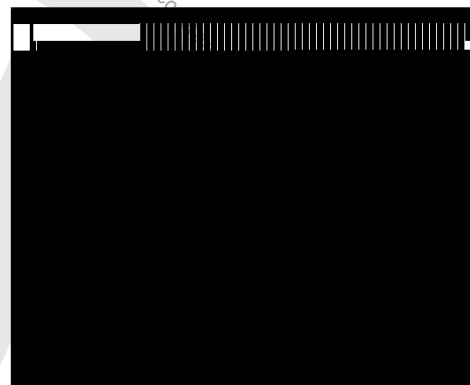
Removing the Outer Race/Tapered Roller Bearing





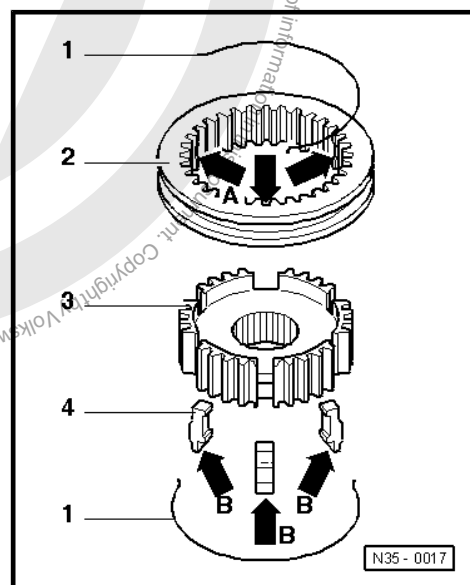
Installing the Outer Race/Tapered Roller Bearing

- Install with shim after adjusting input shaft.



5th Gear Synchronizing

- 1 - Springs for Locking Pieces
- 2 - Locking Collar with 3 Notches -arrow A- for Locking Pieces
- 3 - Synchronizer Hub
- 4 - Locking pieces - installed position: the extension -arrow B- faces toward the pointed teeth of the locking collar -2-



5th Gear Locking Collar/Synchronizer Hub Assembly

- Slide the locking collar over the synchronizer hub.

The pointed teeth -A- and the shoulder -B- on the synchronizer hub face in the same direction. Recesses for locking pieces in locking collar and synchronizer hub must line up. (Refer to [⇒ Fig. "5th Gear Synchronizing", page 147](#)).

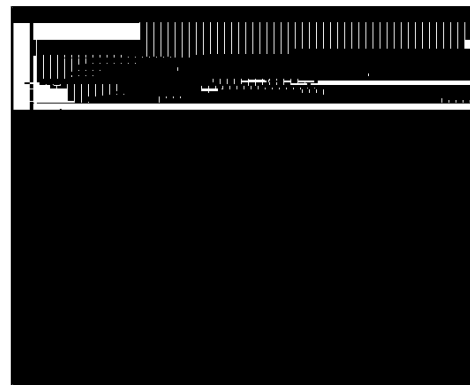
- Insert locking pieces (installed position: Refer to [⇒ Fig. "5th Gear Synchronizing", page 147](#)).
- Install the springs offset by 120° under the tabs -C-.

Installed Position of the Springs with Locking Pieces that are Not Hollow Inside:

The angled end of the spring must be positioned in front of the locking pieces -arrows-.

Installed Position of the Springs with Locking Pieces that are Hollow Inside:

- The angled end of the spring must engage into the hollow locking piece (⇒ illustration following the next one).





Installation of Offset Springs -A-

These springs are installed on both sides.

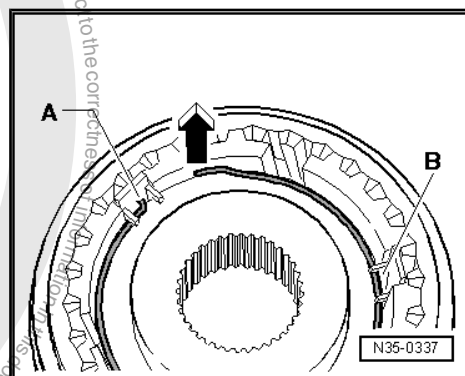
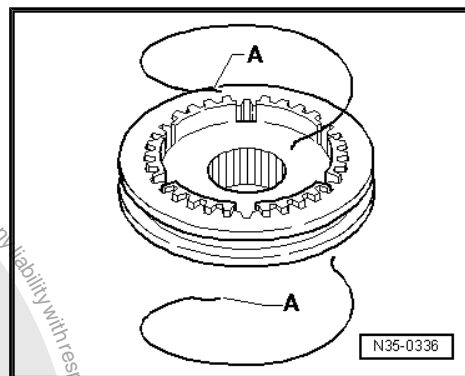
- Springs are only installed in conjunction with hollow locking pieces.
- Insert locking pieces (installed position: Refer to [⇒ Fig. "5th Gear Synchronizing", page 147](#)).

Spring installed position:

- Install the spring offset by 120°.
- Angled end -A- of spring must engage into the hollow locking piece.

The spring must be located below the tab -B- of the locking pieces.

The offset end always faces away from the synchronizer hub in direction of -arrow-.



1.3 Input Shaft, Adjusting

Special tools and workshop equipment required

- ◆ Dial Gauge Holder - VW387-
- ◆ Measuring Set - Magnetic Plate - 50mm - VW385/17-
- ◆ Press Piece - Multiple Use - VW510-
- ◆ Press Piece - VW447i-
- ◆ Press Piece - Rod - VW407-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Dial Gauge

A new input shaft adjustment is required when the following components have been replaced:

- ◆ Transmission Housing
- ◆ Clutch Housing
- ◆ Input Shaft
- ◆ 4th Gear Wheel

or the

- ◆ Tapered roller bearing

Adjustment overview. Refer to

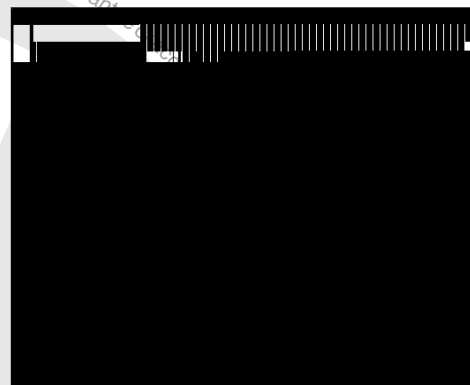
[⇒ "3 Adjustment Overview", page 198](#) .

Requirement:

- Remove any sealant remaining on the sealing surfaces on the clutch and transmission housings.



- Press the taper roller bearing outer race into the clutch housing all the way.



- Install the outer race/tapered roller bearing all the way into the transmission housing without the adjusting shim.
- Install the input shaft into the clutch housing and mount the transmission housing. Install the hex bolts. Refer to ["5.4 Overview - Transmission Housing and Selector Mechanism", page 95](#).



- Install the measuring device and the dial gauge in the clutch housing.
- Rotate the input shaft before measuring so the tapered roller bearing settles. Set the dial gauge with 1 mm pretension to "0".



Note

Repeat this process each time a measurement is taken otherwise the dial gauge will not go back to its start setting.



- Press the input shaft toward the dial gauge direction of -arrow-.
- Read and make note of the play on the dial gauge (example: 1.21 mm).



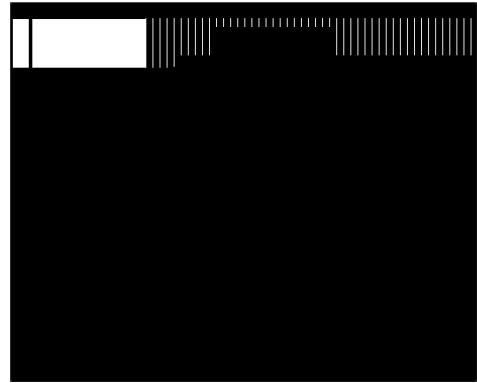
Note

The dial gauge does not return to its starting position.

Determining the Shim

Example:

Bearing Clearance Measured Value	Adjustment Shim Thickness According To the Table
1.21 mm	1.175 mm





Shim Table

Bearing Play	Shim
Measured Value (mm)	Thickness (mm)
0.671 to 0.699	0.650
0.700 to 0.724	0.675
0.725 to 0.749	0.700
0.750 to 0.774	0.725
0.775 to 0.799	0.750
0.800 to 0.824	0.775
0.825 to 0.849	0.800
0.850 to 0.874	0.825
0.875 to 0.899	0.850
0.900 to 0.924	0.875
0.925 to 0.949	0.900
0.950 to 0.974	0.925
0.975 to 0.999	0.950
1.000 to 1.024	0.975
1.025 to 1.049	1.000
1.050 to 1.074	1.025
1.075 to 1.099	1.050
1.100 to 1.124	1.075
1.125 to 1.149	1.100
1.150 to 1.174	1.125
1.175 to 1.199	1.150
1.200 to 1.224	1.175
1.225 to 1.249	1.200
1.250 to 1.274	1.225
1.275 to 1.299	1.250
1.300 to 1.324	1.275
1.325 to 1.349	1.300
1.350 to 1.374	1.325
1.375 to 1.399	1.350
1.400 to 1.424	1.375
1.425 to 1.449	1.400
1.450 to 1.474	1.425
1.475 to 1.499	1.450
1.500 to 1.524	1.475
1.525 to 1.549	1.500
1.550 to 1.574	1.525
1.575 to 1.599	1.550
1.600 to 1.624	1.575
1.625 to 1.649	1.600
1.650 to 1.674	1.625
1.675 to 1.699	1.650
1.700 to 1.724	1.675



Note

Allocate the shims. Refer to the Parts Catalog.

- Remove the drive axle and pry out the outer race/tapered roller bearing using the Press Piece - VW447i- from the transmission housing.
- Install the shim with the correct thickness, thickest shim first.

If the measured shim thickness is larger than those listed in the Table, then install two shims that add up to the necessary thickness.



- Press the outer race/tapered roller bearing and the selected shim (1.175 mm in the example) into the transmission housing using the Press Piece - Multiple Use - VW510- .
- Install the transmission housing and tighten the bolts.

Checking Measurement

- Install the measuring device and the dial gauge.
- Turn the input shaft so that the tapered roller bearings settle.
- Press the input shaft in direction of -arrow-.
- Bearing play must be between a minimum 0.01 to maximum 0.09 mm.



Note

The adjustment is OK if it is not possible to measure the bearing play and yet the input shaft still have a noticeable play and it easy to turn.

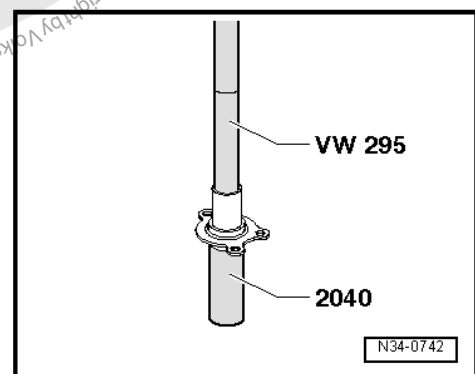
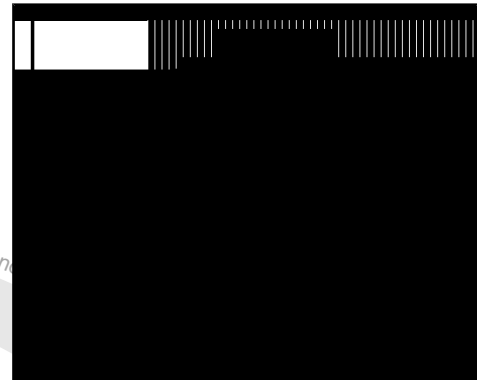
Tightening Specifications

- ◆ Refer to
⇒ [“5.4 Overview - Transmission Housing and Selector Mechanism”, page 95](#) .

1.4 Input Shaft Seal, Replacing

Special tools and workshop equipment required

- ◆ Bearing/Bushing Installer - Multiple Use - VW295-
- ◆ Bearing/Bushing Installer - Multiple Use - VW295A-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Front Control Arm - 2040-
- Remove the transmission. Refer to
⇒ [“2.1 Transmission, Removing”, page 67](#) .
- Remove the clutch release lever with the release bearing and guide sleeve. Refer to
⇒ [“1.16 Clutch Release Mechanism, Servicing”, page 35](#) .
- Drive seal out of guide sleeve.





- Fill the space between the sealing and dust lip -arrow- halfway with Sealing Grease - G 052 128 A1- .
- Coat the outer circumference of the seal lightly with transmission fluid.



- Install the seal all the way into the guide sleeve.
- Install the clutch release lever with the release bearing and guide sleeve. Refer to
[⇒ "1.16 Clutch Release Mechanism, Servicing", page 35](#) .
- Install the transmission. Refer to
[⇒ "2.2 Transmission, Installing", page 77](#) .

Tightening Specifications

- ◆ Refer to
[⇒ "1.4 Overview - Clutch Release Mechanism", page 18](#)





2 Output Shaft

⇒ ["2.1 Overview - Output Shaft", page 154](#)

⇒ ["2.2 Output Shaft, Disassembling and Assembling", page 158](#)

⇒ ["2.3 Output Shaft, Adjusting", page 166](#)

2.1 Overview - Output Shaft



Note

- ◆ *Disassemble the output shaft as follows: place the separating device under the 2nd gear wheel -item 21- ⇒ [Item 21 \(page 157\)](#) and remove it as described. Refer to ⇒ [Fig. ""Removing the 3rd/4th Gear Synchronizer Hub/Locking Collar, 2nd Gear Wheel, 3rd and 4th Gear with Output Shaft Needle Bearing Sleeve""](#), [page 160](#) . Remove the locking ring -item 17- ⇒ [Item 17 \(page 156\)](#) . Remove the locking collar and the 1st/2nd gear synchronizer hub as described. Refer to ⇒ [Fig. ""Removing the Locking Collar with the Synchronizer Hub and Bearing Mount""](#), [page 160](#) .*
- ◆ *Consult the [Parts Catalog](#) and the [Technical data](#) when installing new gear wheels or a new output shaft. Refer to ⇒ ["4 Technical Data", page 6](#) .*
- ◆ *Replace both tapered roller bearings together.*
- ◆ *Wearing safety gloves, warm the inner race/tapered roller bearing, the gear wheels and the synchronizer hubs to approximately 100 °C (212 °F) using an Inductive Heat Unit - VAS6414- before installing them.*



1 - Nut

- ☐ 4 nuts for the bearing mount
- ☐ Replace after removing
- ☐ Tightening specification. Refer to
⇒ ["5.6 Overview - Input Shaft, Output Shafts, Differential, Gearshift Rods", page 97](#).

2 - Clutch Housing

3 - Shim

- ☐ For the output shaft
- ☐ Adjustment overview. Refer to
⇒ ["3 Adjustment Overview", page 198](#).

4 - Small Outer Race/Tapered Roller Bearing

- ☐ Removing. Refer to
⇒ [Fig. "Remove the Small Outer Race/Tapered Roller Bearing", page 159](#).
- ☐ Installing. Refer to
⇒ [Fig. "Installing the Small Outer Race/Tapered Roller Bearing", page 159](#)

5 - Small Inner Race/Tapered Roller Bearing

- ☐ Removing. Refer to
⇒ [Fig. "Removing the Inner Race/Small Tapered Roller Bearing", page 159](#)

- ☐ Installing. Refer to ⇒ [Fig. "Installing the Inner Race/Small Tapered Roller Bearing", page 160](#)

6 - Output Shaft

- ☐ Adjusting. Refer to ⇒ ["2.3 Output Shaft, Adjusting", page 166](#).

7 - Inner Race/Tapered Roller Bearing

- ☐ Removing. Refer to ⇒ [Fig. "Removing the Inner Race/Large Tapered Roller Bearing", page 160](#)
- ☐ Installing. Refer to ⇒ [Fig. "Installing the Inner Race/Large Tapered Roller Bearing", page 161](#)

8 - Seal

- ☐ Place the four seals on the bearing mount bolts.
- ☐ Replace after removing

9 - Bearing Mount

- ☐ With the large outer race/tapered roller bearing and bolts
- ☐ Replace the outer race only together with the large tapered roller bearing and bearing mount

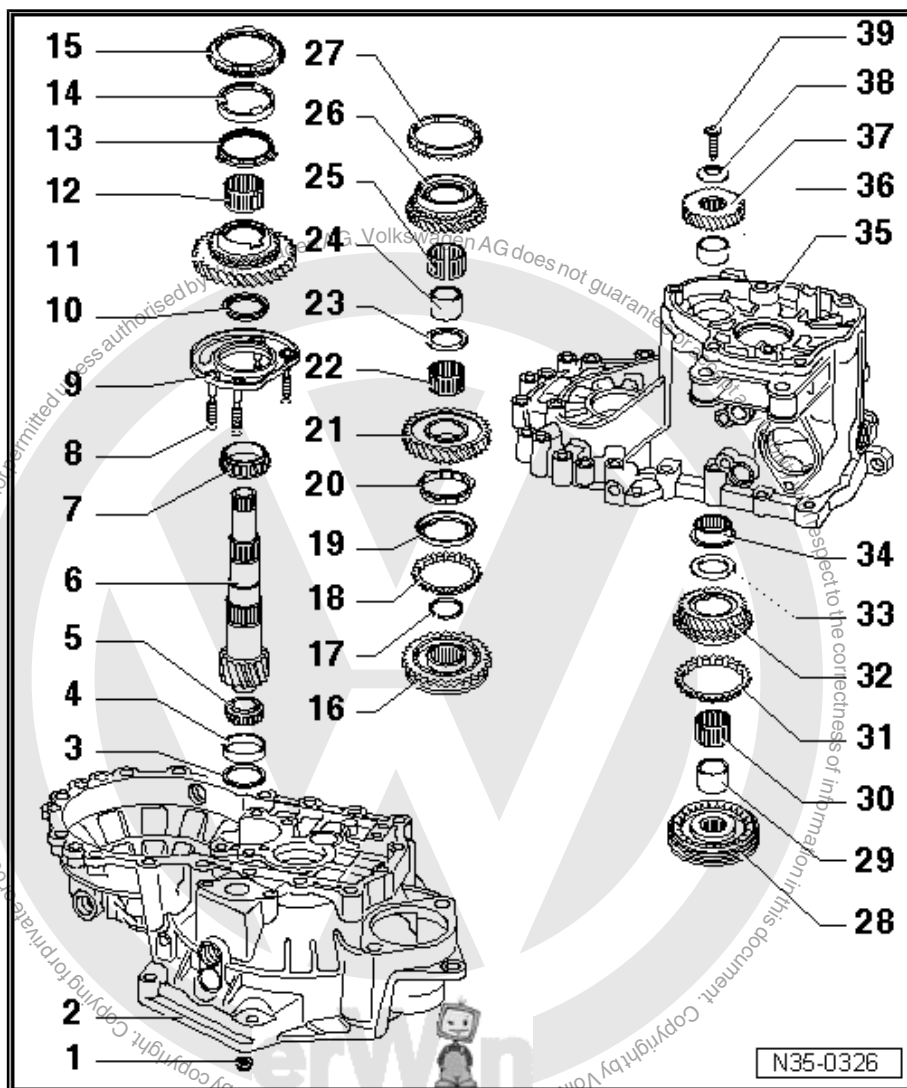
10 - Thrust Washer

- ☐ The collar on the thrust washer faces the tapered roller bearing

11 - 1st Gear Wheel

12 - Needle Bearing

- ☐ For 1st gear





13 - Synchronizer Ring

- ☐ (Inner race for 1st gear)
- ☐ Installed position. Refer to
⇒ [Fig. "Installed Position of the Inner Race, the Outer Race and the 1st Gear Synchronizer Ring", page 161](#)
- ☐ Checking for wear. Refer to
⇒ [Fig. "Checking Inner Race for 1st Gear and 2nd Gear for Wear", page 161](#)
- ☐ Check for scoring

14 - 1st Gear Outer Race

- ☐ Installed position. Refer to
⇒ [Fig. "Installed Position of the Inner Race, the Outer Race and the 1st Gear Synchronizer Ring", page 161](#)
- ☐ Checking for wear. Refer to
⇒ [Fig. "Checking 1st Gear and 2nd Gear Synchronizing Ring for Wear", page 161](#)
- ☐ Replace if there are grooves or scoring

15 - 1st Gear Synchronizer Ring

- ☐ Installed position. Refer to
⇒ [Fig. "Installed Position of the Inner Race, the Outer Race and the 1st Gear Synchronizer Ring", page 161](#)
- ☐ Checking for wear. Refer to
⇒ [Fig. "Checking 1st Gear and 2nd Gear Synchronizing Ring for Wear", page 161](#)

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

- ☐ After removing the locking ring -item 17- ⇒ [Item 17 \(page 156\)](#) , remove with the bearing mount. Refer to ⇒ [Fig. "Removing the Locking Collar with the Synchronizer Hub and Bearing Mount", page 160](#)
- ☐ Disassembling. Refer to
⇒ [Fig. "Disassembling and Assembling Locking Collar and Synchronizer Hub for 1st and 2nd Gears", page 162](#) .
- ☐ Assembling operating sleeve/synchronizer hub. Refer to
⇒ [Fig. "Disassembling and Assembling Locking Collar and Synchronizer Hub for 1st and 2nd Gears", page 162](#) ,
⇒ [Fig. "Assembly: Locking Collar/Synchronizer Hub for 1st and 2nd Gears Together with Locking Pieces That Are Hollow on the Inside", page 162](#) and
⇒ [Fig. "Assembly: Locking Collar/Synchronizer Hub for 1st and 2nd Gears Together with locking Pieces That Are Not Hollow", page 162](#)
- ☐ Installed position. Refer to
⇒ [Fig. "Installed Position: Locking Collar/Synchronizer Hub for 1st and 2nd Gears", page 163](#)
- ☐ Installing. Refer to
⇒ [Fig. "Installing the Locking Collar/Synchronizer Hub for 1st and 2nd Gears.", page 163](#)

17 - Circlip

18 - 2nd Gear Synchronizer Ring

- ☐ Checking for wear. Refer to
⇒ [Fig. "Checking 1st Gear and 2nd Gear Synchronizing Ring for Wear", page 161](#)
- ☐ Install so that cut-outs engage in engagement pieces of locking collar for 1st and 2nd gear.

19 - 2nd Gear Outer Race

- ☐ Insert in the 2nd gear synchronizer ring -item 18- ⇒ [Item 18 \(page 156\)](#) .
- ☐ Installed position. Refer to ⇒ [Fig. "Installed Position of 2nd Gear Outer Race", page 163](#)
- ☐ Replace if there are grooves or scoring

20 - Synchronizer Ring

- ☐ (Inner race for 2nd gear)
- ☐ Checking for wear. Refer to
⇒ [Fig. "Checking 1st Gear and 2nd Gear Synchronizing Ring for Wear", page 161](#)
- ☐ Check for scoring
- ☐ Installed position. Refer to
⇒ [Fig. "Installed Position: Synchronizer Ring -A- \(2nd Gear Inner Race\)", page 163](#)



21 - 2nd Gear Wheel

- ☐ Installed position. Refer to ➔ [Fig. "“Installed Position: 2nd Gear Wheel”", page 164](#)

22 - Needle Bearing

- ☐ For 2nd gear

23 - Thrust Washer

24 - Sleeve

- ☐ For the 3rd gear needle bearing
- ☐ Removing with the 2nd gear wheel. Refer to ➔ [Fig. "“Removing the 3rd/4th Gear Synchronizer Hub/Locking Collar, 2nd Gear Wheel, 3rd and 4th Gear with Output Shaft Needle Bearing Sleeve”", page 160](#)
- ☐ Installing. Refer to ➔ [Fig. "“Installing the Sleeve for the 3rd Gear Needle Bearing”", page 164](#)

25 - Needle Bearing

- ☐ For 3rd gear

26 - 3rd Gear Wheel

27 - 3rd Gear Synchronizer Ring

- ☐ Checking for wear. Refer to ➔ [Fig. "“Checking 3rd/4th Gear Synchronizing Ring for Wear”", page 164](#)

28 - Locking Collar with Synchronizer Hub for 3rd and 4th Gears

- ☐ Remove with 2nd gear wheel and 3rd gear. Refer to ➔ [Fig. "“Removing the 3rd/4th Gear Synchronizer Hub/Locking Collar, 2nd Gear Wheel, 3rd and 4th Gear with Output Shaft Needle Bearing Sleeve”", page 160](#)
- ☐ Disassembling. Refer to ➔ [Fig. "“Disassembling and Assembling Locking Collar and Synchronizer Hub for 3rd/4th Gears”", page 165](#).
- ☐ Assembling the locking collar/synchronizer hub. Refer to ➔ [Fig. "“Disassembling and Assembling Locking Collar and Synchronizer Hub for 3rd/4th Gears”", page 165](#), ➔ [Fig. "“Assembly: Locking Collar/Synchronizer Hub for 3rd and 4th Gears Together with Locking Pieces that are Hollow on the Inside”", page 165](#) and ➔ [Fig. "“Assembly: Locking Collar/Synchronizer Hub for 3rd and 4th Gears Together with Locking Pieces that are Not Hollow”", page 165](#).
- ☐ Installed position: locking collar/synchronizer hub. Refer to ➔ [Fig. "“Installed Position: Locking Collar/Synchronizer Hub for 3rd and 4th Gears”", page 166](#)
- ☐ Installing. Refer to ➔ [Fig. "“Installing the Synchronizer Hub with Locking Collar for 3rd and 4th Gears”", page 166](#)

29 - Sleeve

- ☐ For the 4th gear needle bearing
- ☐ Removing with the locking collar and the 3rd/4th gear synchronizer hub. Refer to ➔ [Fig. "“Removing the 3rd/4th Gear Synchronizer Hub/Locking Collar, 2nd Gear Wheel, 3rd and 4th Gear with Output Shaft Needle Bearing Sleeve”", page 160](#)
- ☐ Installing. Refer to ➔ [Fig. "“Installing the Sleeve for the 4th Gear Needle Bearing”", page 166](#)

30 - Needle Bearing

- ☐ For 4th gear

31 - 4th Gear Synchronizer Ring

- ☐ Checking for wear. Refer to ➔ [Fig. "“Checking 3rd/4th Gear Synchronizing Ring for Wear”", page 164](#)

32 - 4th Gear Wheel

33 - Thrust Washer

34 - Needle Bearing

- ☐ For the output shaft
- ☐ Removing and installing. Refer to ➔ [Fig. "“Removing the Needle Bearing”", page 121](#)



35 - Transmission Housing

36 - Sleeve

- ☐ For the needle bearing/output shaft
- ☐ Removing. Refer to
⇒ [Fig. "“Removing the 3rd/4th Gear Synchronizer Hub/Locking Collar, 2nd Gear Wheel, 3rd and 4th Gear with Output Shaft Needle Bearing Sleeve”", page 160](#)
- ☐ Installing. Refer to ⇒ [Fig. "“Installing the Sleeve for the Needle Bearing/Output Shaft”", page 166](#)

37 - 5th Gear Wheel

- ☐ Removing and installing. Refer to
⇒ ["5.10 Transmission Housing Cover and 5th Gear, Removing", page 101](#) .

38 - Plate Spring

- ☐ Installed position. Refer to
⇒ [Fig. "“Installed Position of Plate Springs for 5th Gear Synchronizer Hub and Gear Securing Bolts”", page 117](#)

39 - Bolt

- ☐ Replace after removing
- ☐ Holds in position with the adapter on the plate spring bolt head. Refer to
⇒ [Fig. "“Installed Position of Plate Springs for 5th Gear Synchronizer Hub and Gear Securing Bolts”", page 117](#)
- ☐ Removing and installing. Refer to
⇒ ["5.10 Transmission Housing Cover and 5th Gear, Removing", page 101](#) .
- ☐ Tightening specification. Refer to
⇒ ["5.3 Overview - Transmission Housing Cover and 5th Gear", page 93](#)

2.2 Output Shaft, Disassembling and Assembling

Special tools and workshop equipment required

- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Rod - VW412-
- ◆ Press Piece - Multiple Use - VW512-
- ◆ Puller - Taper Roller Bearing - VAG1582-
- ◆ Puller - Taper Roller Bearing - Adapter 4 - VAG1582/4-
- ◆ Puller - Taper Roller Bearing - Adapter 5 - VAG1582/5-
- ◆ Press Plate - VW402-
- ◆ Bearing Installer - Multiple Use - 32-111-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Rod - VW409-
- ◆ Support Channels - VW457-
- ◆ Press Piece - Multiple Use - VW 519-
- ◆ Press Piece - Multiple Use - VW429-
- ◆ Press Piece - 60mm - VW415A-
- ◆ Press Piece - Multiple Use - VW447H-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Multiple Use - VW455-
- ◆ Press Tube - 41-501-
- ◆ -1- Puller - Kukko Internal - 36-46mm - 21/6-



- ◆ -3- Puller - Kukko Quick Action Separating Tool - 22-115mm - 17/2-
- ◆ -4- Puller - Kukko Counterstay - 22/2-
- ◆ Inductive Heater - VAS6414-
- ◆ Feeler Gauge



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

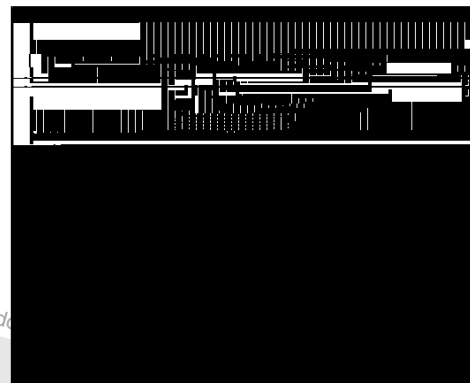
Mandatory Replacement Parts

- ◆ Nuts - Bearing Mount
- ◆ Seals - Bearing Mount Bikts

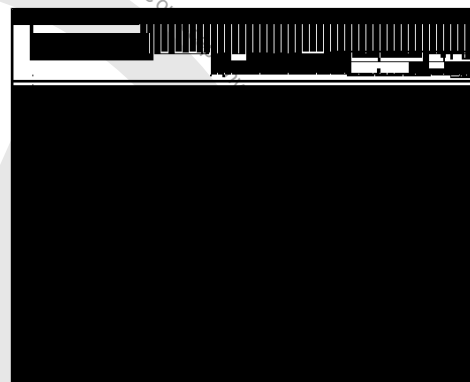
Remove the Small Outer Race/Tapered Roller Bearing

A - Internal Puller - 37-46mm for example Puller - Kukko Internal - 36-46mm - Kukko 21/6-

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



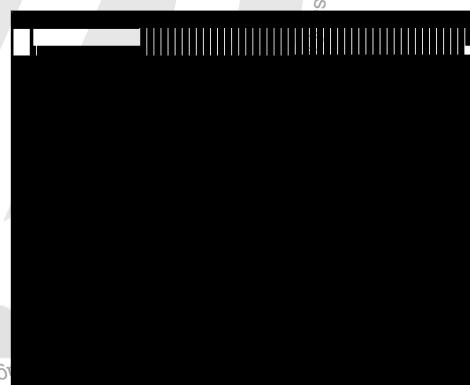
Installing the Small Outer Race/Tapered Roller Bearing



Removing the Inner Race/Small Tapered Roller Bearing

A - Protective jaws/vise

- Attach grip and securely clamp it behind bearing rollers. Then turn the bearing and apply tension to the grip.





Installing the Inner Race/Small Tapered Roller Bearing

Removing the 3rd/4th Gear Synchronizer Hub/Locking Collar, 2nd Gear Wheel, 3rd and 4th Gear with Output Shaft Needle Bearing Sleeve

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

B - M10 x 20, 17 mm Hex Bolt

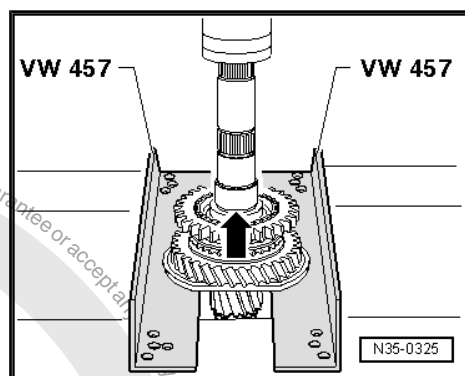


Note

Support the separating tool so that the 1st/2nd gear locking collar does not come off as well.

Removing the Locking Collar with the Synchronizer Hub and Bearing Mount

- Remove the locking ring -arrow- beforehand.



Removing the Inner Race/Large Tapered Roller Bearing

-A- vise protectors

- Before installing puller, insert a M10 x 20 bolt into the hole in the output shaft.



Installing the Inner Race/Large Tapered Roller Bearing

-A- thrust washer

- Install the thrust washer before installing the inner race. The shoulder faces the inner race.

Installed Position of the Inner Race, the Outer Race and the 1st Gear Synchronizer Ring

- Place inner race -A- on drive gear for 1st gear.

The angled tabs -arrow 1- face the outer race -B-.

- Install the outer race -B-.

The tabs -arrow 2- must lock into the retainers -arrow 3- in the gear wheel.

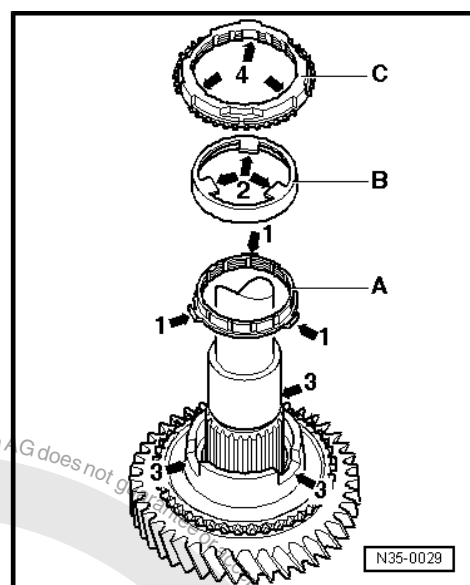
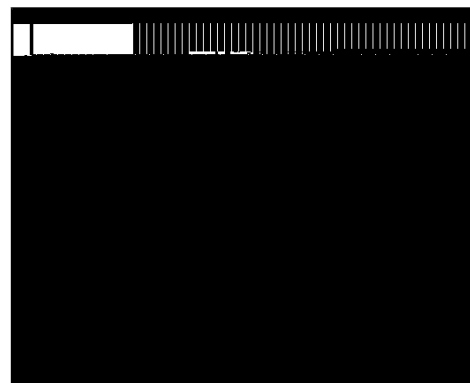
- Install the synchronizer ring -C-.

The retainers -arrow 4- lock in the tabs -arrow 1- on the inner race -A-.



Note

If the parts are not to be replaced, make sure they are reallocated to their original gear.



Checking Inner Race for 1st Gear and 2nd Gear for Wear

- Install the inner race onto taper of selector gear and then measure gap dimension -a- with a feeler gauge.

Gap Dimension -a-	Installation Dimension	Wear Limit
1st and 2nd gear	0.75 to 1.25 mm	0.3 mm



Checking 1st Gear and 2nd Gear Synchronizing Ring for Wear

- Install the synchronizer ring, outer race and inner race onto taper of selector gear and then measure the gap dimension -a- with a feeler gauge.

Gap Dimension -a-	Installation Dimension	Wear Limit
1st and 2nd gear	1.2 to 1.8 mm	0.5 mm





Disassembling and Assembling Locking Collar and Synchronizer Hub for 1st and 2nd Gears

1 - Spring

Spring allocation. Refer to the Parts Catalog.

Assembly in conjunction with hollow locking pieces. Refer to
⇒ Fig. [“Assembly: Locking Collar/Synchronizer Hub for 1st and 2nd Gears Together with Locking Pieces That Are Hollow on the Inside”](#), page 162 .

Assembly in conjunction with locking pieces that are not hollow.
Refer to
⇒ Fig. [“Assembly: Locking Collar/Synchronizer Hub for 1st and 2nd Gears Together with locking Pieces That Are Not Hollow”](#),
page 162 .

2 - Locking collar

3 - Synchronizer Hub

4 - Locking piece

Allocate the locking pieces. Refer to the Parts Catalog.

The collar has the same width on both side of the synchronizer hub.

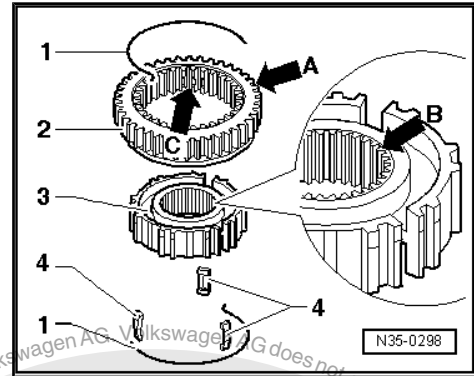
The Shoulder Has a Chamfer on One Side -arrow B-

The bevel on the synchronizer hub collar and the splines on the outside of the locking collar -arrow A- face in the same direction after being assembled.

The notches on the synchronizer hub and locking collar for the locking pieces -arrow C- must line up.

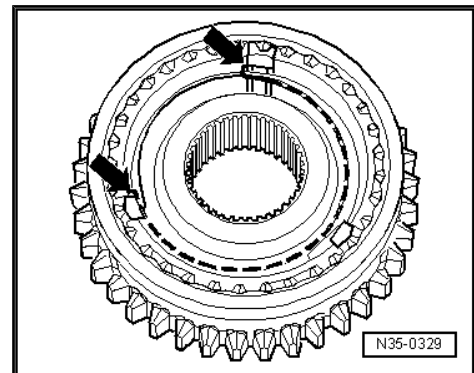
Assembly: Locking Collar/Synchronizer Hub for 1st and 2nd Gears Together with Locking Pieces That Are Hollow on the Inside

- 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.



Assembly: Locking Collar/Synchronizer Hub for 1st and 2nd Gears Together with locking Pieces That Are Not Hollow

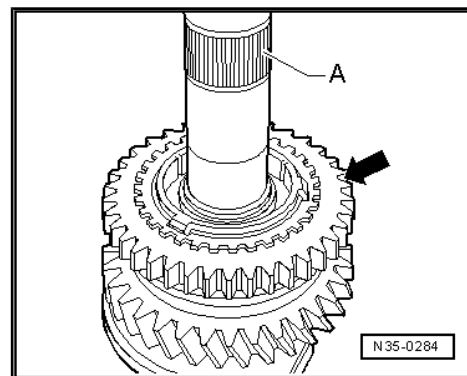
- The locking collar is pushed over the synchronizer hub.
- Install the locking pieces and springs offset by 120°.
- The angled end of the spring must be positioned in front of the locking pieces -arrows-.





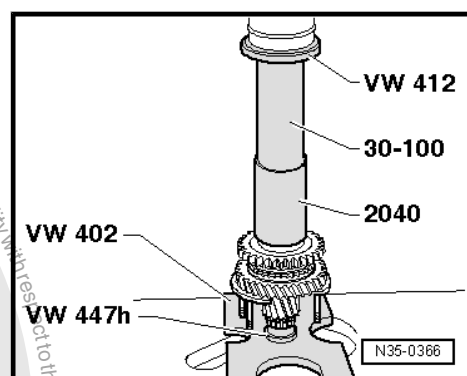
Installed Position: Locking Collar/Synchronizer Hub for 1st and 2nd Gears

The teeth of the locking collar -arrow- point toward the splines of the 3rd/4th gear synchronizer hub -A-.



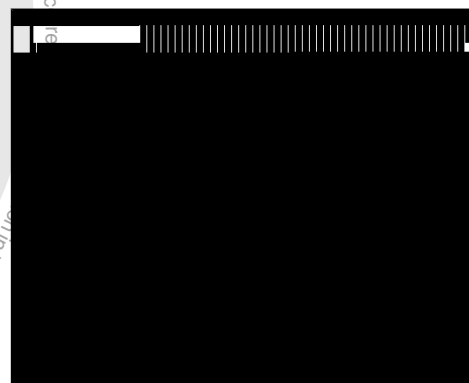
Installing the Locking Collar/Synchronizer Hub for 1st and 2nd Gears.

Turn the synchronizer ring so that the grooves line up with the locking pieces.



Installed Position of 2nd Gear Outer Race

The tabs -arrows- face 1st gear -A-.



Installed Position: Synchronizer Ring -A- (2nd Gear Inner Race)

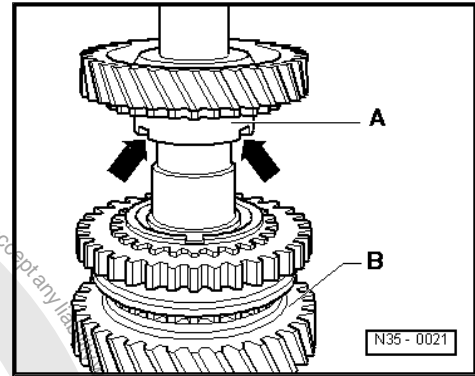
The tabs -arrow 1- engage into the holes -arrow 2- inside the synchronizer ring -B-.



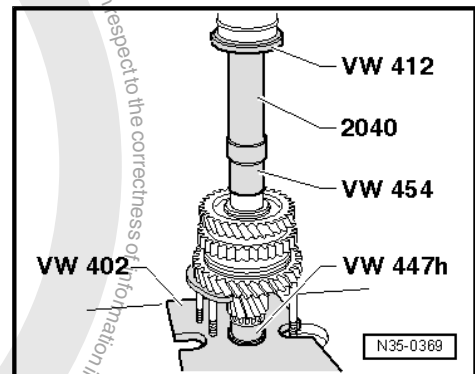


Installed Position: 2nd Gear Wheel

The higher collar -A- faces toward 1st gear -B-. The notches in the collar -arrow- lock into the tabs on the outer race. Refer to ⇒ Fig. "Installed Position of 2nd Gear Outer Race", page 163 .



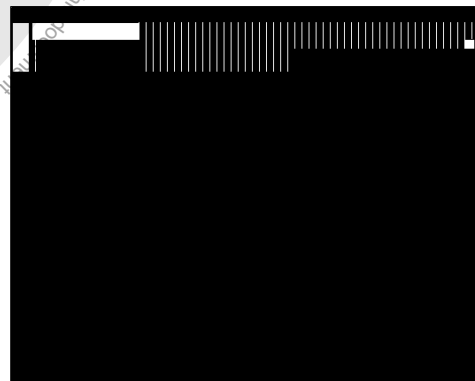
Installing the Sleeve for the 3rd Gear Needle Bearing



Checking 3rd/4th Gear Synchronizing Ring for Wear

- Press synchronizer ring onto taper of the gear wheel and measure gap dimension -a- using a feeler gauge.

Gap Dimension -a-	Installation Dimension	Wear limit
3rd and 4th gear	1.0 to 1.7 mm	0.5 mm





Disassembling and Assembling Locking Collar and Synchronizer Hub for 3rd/4th Gears

1 - Spring

Allocate the correct springs. Refer to the Parts Catalog.

Assembly in conjunction with hollow locking pieces. Refer to
⇒ Fig. “Assembly: Locking Collar/Synchronizer Hub for 1st and 2nd Gears Together with Locking Pieces That Are Hollow on the Inside”, page 162 .

Assembly in conjunction with locking pieces that are not hollow.
Refer to

⇒ Fig. “Assembly: Locking Collar/Synchronizer Hub for 1st and 2nd Gears Together with locking Pieces That Are Not Hollow”, page 162 .

2 - Locking piece

Allocate the locking pieces. Refer to the Parts Catalog.

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.

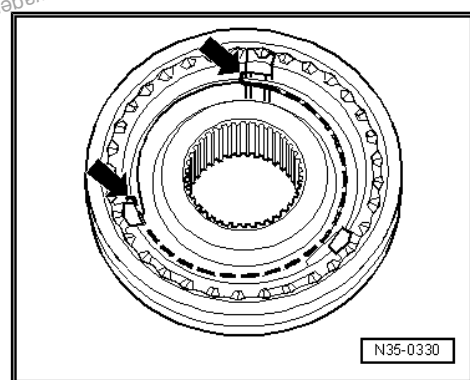
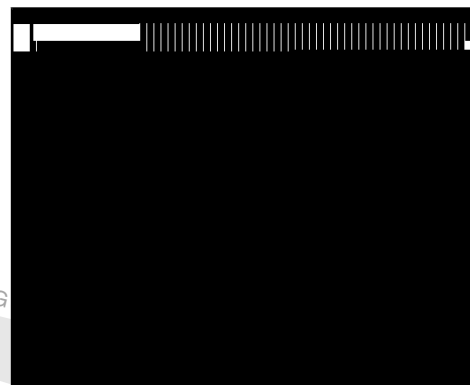
Assembly: Locking Collar/Synchronizer Hub for 3rd and 4th Gears Together with Locking Pieces that are Hollow on the Inside

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.

Assembly: Locking Collar/Synchronizer Hub for 3rd and 4th Gears Together with Locking Pieces that are Not Hollow

- 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 be positioned in front of the locking pieces -arrows-.



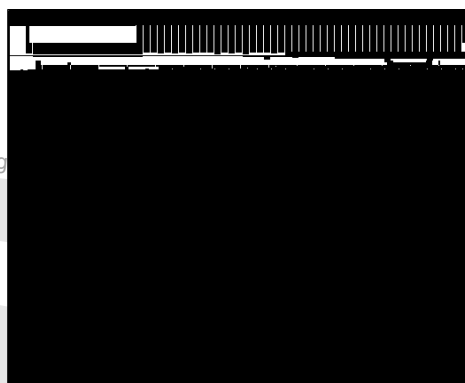


Installed Position: Locking Collar/Synchronizer Hub for 3rd and 4th Gears

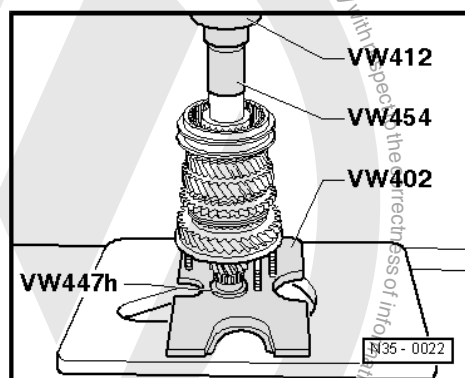
The bevel -arrow- faces 4th gear.



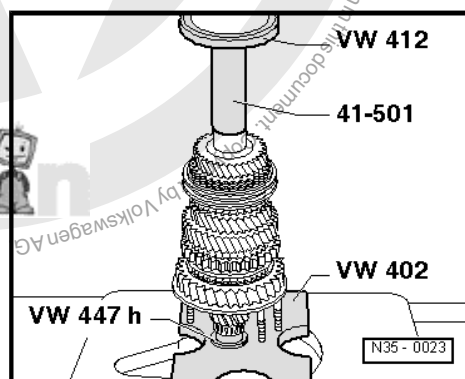
Installing the Synchronizer Hub with Locking Collar for 3rd and 4th Gears



Installing the Sleeve for the 4th Gear Needle Bearing



Installing the Sleeve for the Needle Bearing/Output Shaft



2.3 Output Shaft, Adjusting

(Selecting the correct adjusting shim for the output shaft)

Special tools and workshop equipment required

- ◆ Dial Gauge Holder - VW387-
- ◆ Measuring Set - Magnetic Plate - 50mm - VW385/17-
- ◆ Press Piece - Multiple Use - VW512-



- ◆ Door Alignment Device - Replacement Stud - 3114/2-
- ◆ Press Piece - Rod - VW407-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Dial Gauge
- ◆ -1- Puller - Kukko Internal - 36-46mm - 21/6-
- ◆ -4- Puller - Kukko Counterstay - 22/2-

It is necessary to adjust the output shaft if the following components were replaced:

- ◆ Output Shaft
- ◆ Clutch Housing

or

- ◆ Tapered roller bearing

Adjustment overview. Refer to

⇒ [“3 Adjustment Overview”, page 198](#) .

Requirements:

- Remove any sealant remaining on the sealing surfaces on the clutch and transmission housings.
- Press the outer race/small tapered roller bearing with the adjustment shim 0.65 mm into the clutch housing as far as the stop. Refer to
⇒ [Fig. “Installing the Small Outer Race/Tapered Roller Bearing”, page 159](#) .
- Install the output shaft and tighten the nuts for the bearing mount.
- Rotate the output shaft 20 to 30 times in one direction.



Note

- ◆ *For this reason, it must be rotated in one direction so the tapered roller bearing rollers are seated in one direction.*
- ◆ *Therefore, it must also be rotated 20 to 30 times in one direction.*
- ◆ *Otherwise the measurements will be incorrect.*



- Install dial gauge (3 mm measuring range) and set to “0” with 1 mm pre-load.
- Move the input shaft up and down, check the play on the dial gauge and make a note of it.

Determining the Shim

The specified bearing tension is reached when the adjustment shim (0.65 mm) is added to the measured value.

Example:

Bearing Play = (Adjustment Shim 0.65 mm Plus the Measured Value)	Adjustment Shim Thickness According to the Table
0.740 mm	0.900 mm

Shim Table

Bearing Play = (Adjustment Shim 0.65 mm Plus the Measured Value)	Adjustment Shim Thickness (mm)
0.650	0.750
0.660 to 0.689	0.800
0.690 to 0.739	0.850
0.740 to 0.789	0.900
0.790 to 0.839	0.950
0.840 to 0.889	1.000
0.890 to 0.939	1.050
0.940 to 0.989	1.100
0.990 to 1.039	1.150
1.040 to 1.089	1.200
1.090 to 1.139	1.250
1.140 to 1.189	1.300
1.190 to 1.239	1.350
1.240 to 1.289	1.400
1.290 to 1.339	1.450
1.340 to 1.389	1.500
1.390 to 1.429	1.550



Note

Allocate the shims. Refer to the Parts Catalog.

- Remove the output shaft and then remove the small taper roller bearing outer race. Refer to [Fig. “Remove the Small Outer Race/Tapered Roller Bearing”, page 159](#)
- Install the shim with the correct thickness, thickest shim first.
 - If the previous 0.65 mm adjustment shim will be inserted again, it must be checked for damage.

If the measured shim thickness is larger than those listed in the Table, then install two shims that add up to the necessary thickness.

Tolerance variations make it possible to find the exact shim thickness required.

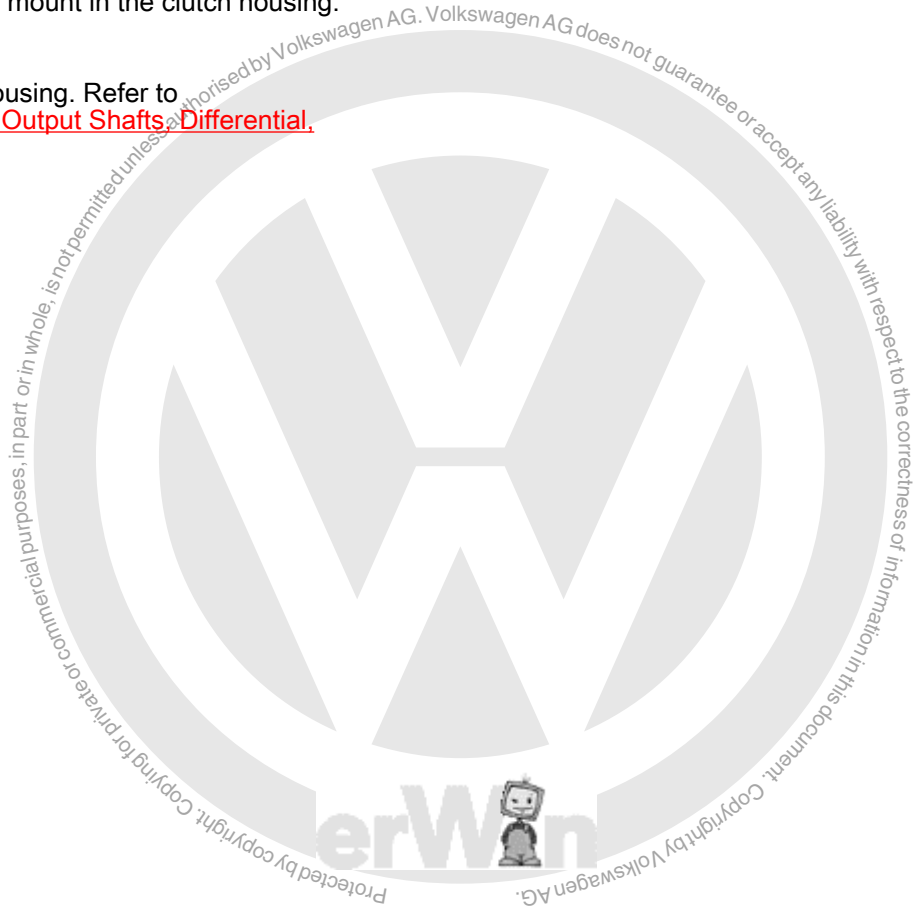
- Press in the outer race/small tapered roller bearing with determined shim (0.70 mm as in example). Refer to [Fig. “Installing the Small Outer Race/Tapered Roller Bearing”, page 159](#) and install output shaft.



- Tighten the nut for the bearing mount in the clutch housing.

Tightening Specifications

- ◆ Bearing mount to the clutch housing. Refer to
⇒ ["5.6 Overview - Input Shaft, Output Shafts, Differential, Gearshift Rods", page 97](#) .





3 Reverse Shaft

⇒ [“3.1 Overview - Reverse Shaft”, page 170](#)

⇒ [“3.2 Reverse Shaft, Disassembling and Assembling”, page 170](#)

3.1 Overview - Reverse Shaft



Note

Always replace the needle sleeve after removing it from the clutch housing or from the reverse shaft support.

1 - Clutch Housing

2 - Needle Sleeve

- ☐ Removing. Refer to
⇒ [Fig. “Removing the Needle Sleeve from the Clutch Housing”](#),
[page 171](#)
- ☐ Installing. Refer to
⇒ [Fig. “Installing the Needle Sleeve -A- into the Clutch Housing”](#),
[page 171](#)

3 - Reverse Drive Gear

4 - Circlip

- ☐ Replace after removing

5 - Reverse Gear Wheel

- ☐ Remove before replacing the locking ring
- ☐ Collar faces reverse gear wheel

6 - Reverse Shaft

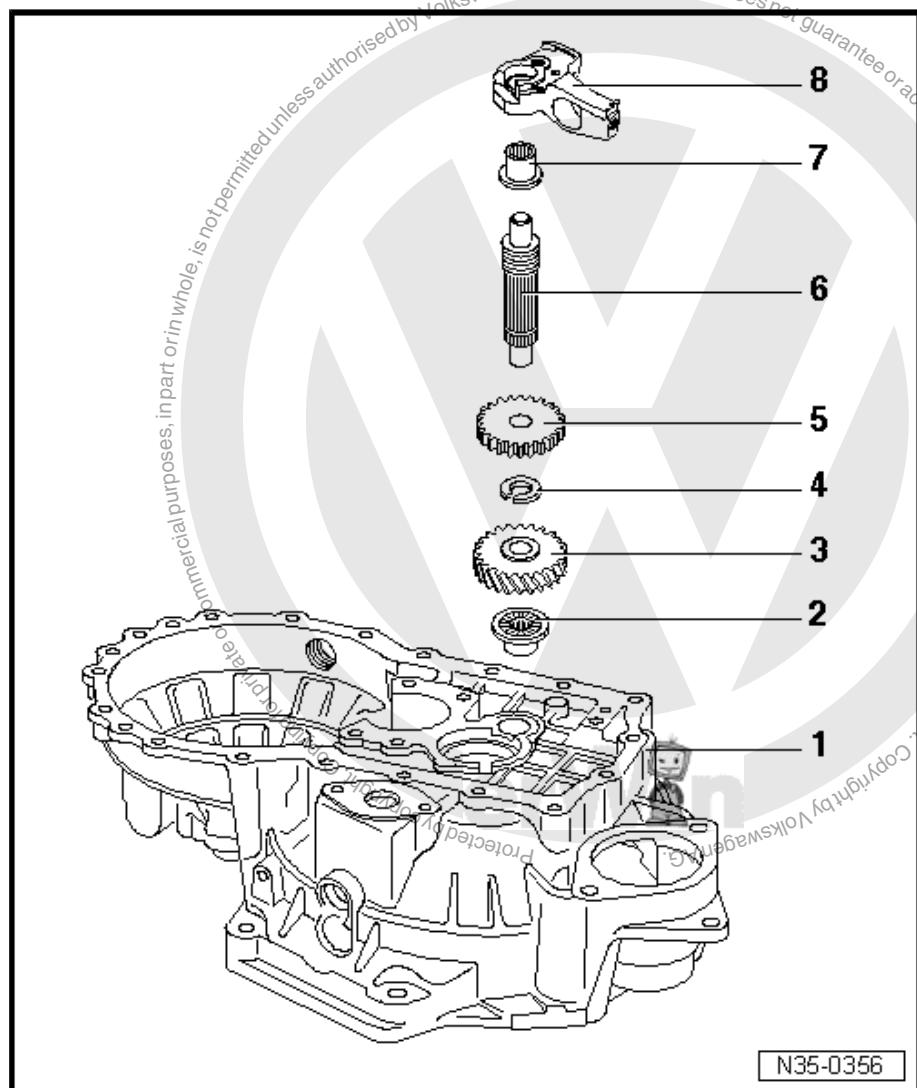
- ☐ Removing and installing. Refer to
⇒ [“5.11 Transmission, Disassembling and Assembling”, page 105](#)

7 - Needle Sleeve

- ☐ Removing. Refer to
⇒ [Fig. “Removing the Needle Sleeve from the Reverse Shaft Support”](#), [page 171](#)
- ☐ Installing. Refer to
⇒ [Fig. “Installing the Needle Sleeve into the Reverse Shaft Support”](#), [page 172](#)

8 - Reverse Shaft Support

- ☐ Removing and installing. Refer to ⇒ [“5.11 Transmission, Disassembling and Assembling”, page 105](#)



3.2 Reverse Shaft, Disassembling and Assembling

Special tools and workshop equipment required



- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Multiple Use - VW447H-
- ◆ Press Piece - Rod - VW411-
- ◆ Centering/Press Pin - 12-551-
- ◆ Press Plate - VW401-
- ◆ Press Piece - Rod - VW408A-
- ◆ -1- Puller - Kukko Internal - 14-19mm - 21/2-
- ◆ -4- Puller - Kukko Counterstay - 22/1-



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

- ◆ Needle Sleeve - Reverse Shaft

Removing the Needle Sleeve from the Clutch Housing

A - Puller - Kukko Counterstayt - 22/1- , for example.

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

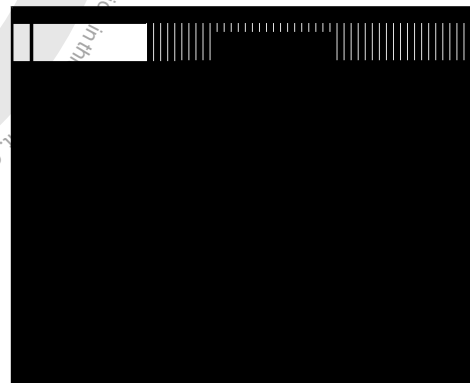
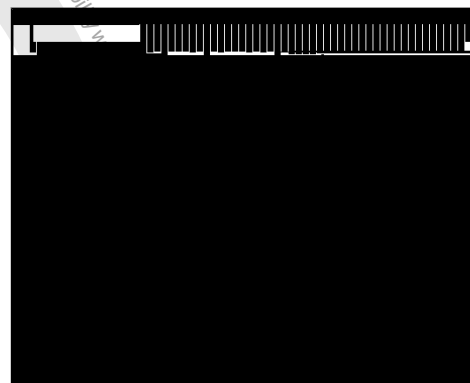


Note

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

Installing the Needle Sleeve -A- into the Clutch Housing

Removing the Needle Sleeve from the Reverse Shaft Support





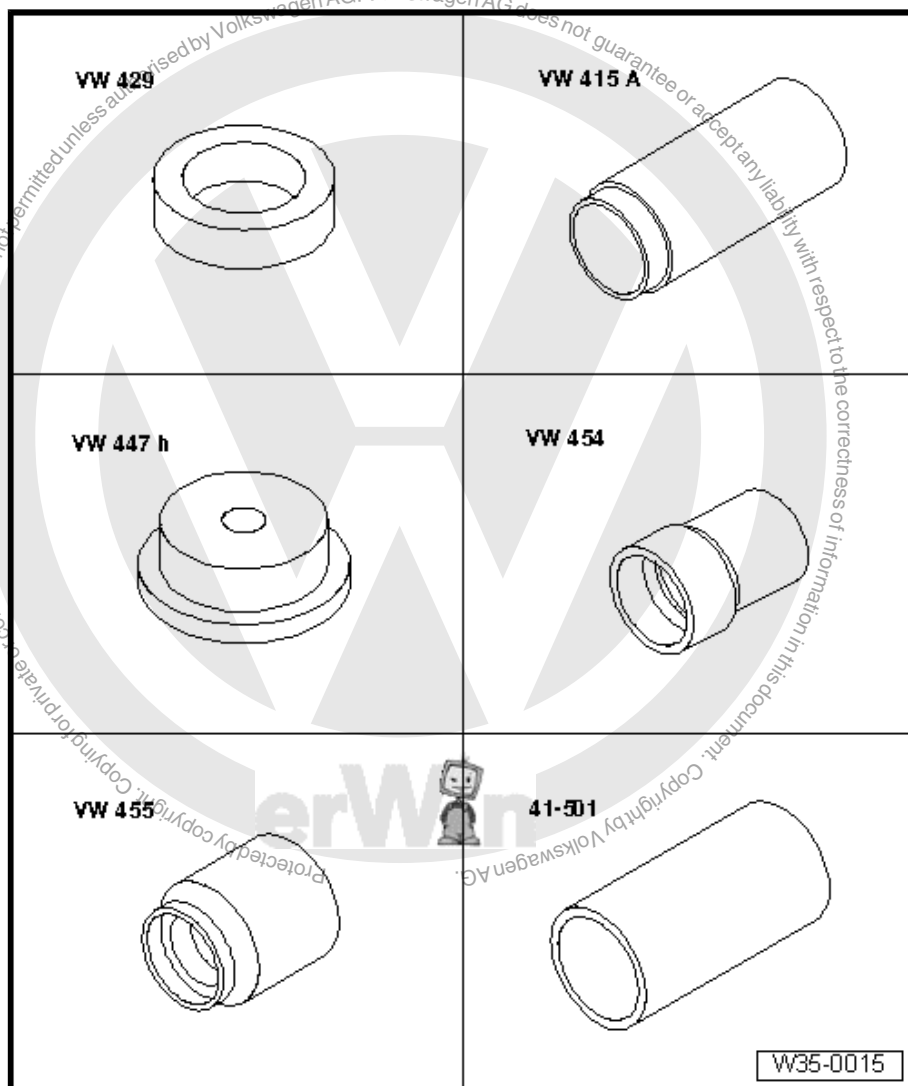
Installing the Needle Sleeve into the Reverse Shaft Support





4 Special Tools

- ◆ Press Piece - Multiple Use
- VW429-
- ◆ Press Piece - 60mm -
VW415A-
- ◆ Press Piece - Multiple Use
- VW447H-
- ◆ Press Piece - Multiple Use
- VW454-
- ◆ Press Piece - Multiple Use
- VW455-
- ◆ Press Tube - 41-501-





- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Multiple Use - VW447H-
- ◆ Press Piece - Rod - VW412-
- ◆ Press Piece - Shift Rod/Alternator - VW422-
- ◆ Press Plate - VW401-
- ◆ Press Piece - Rod - VW408A-



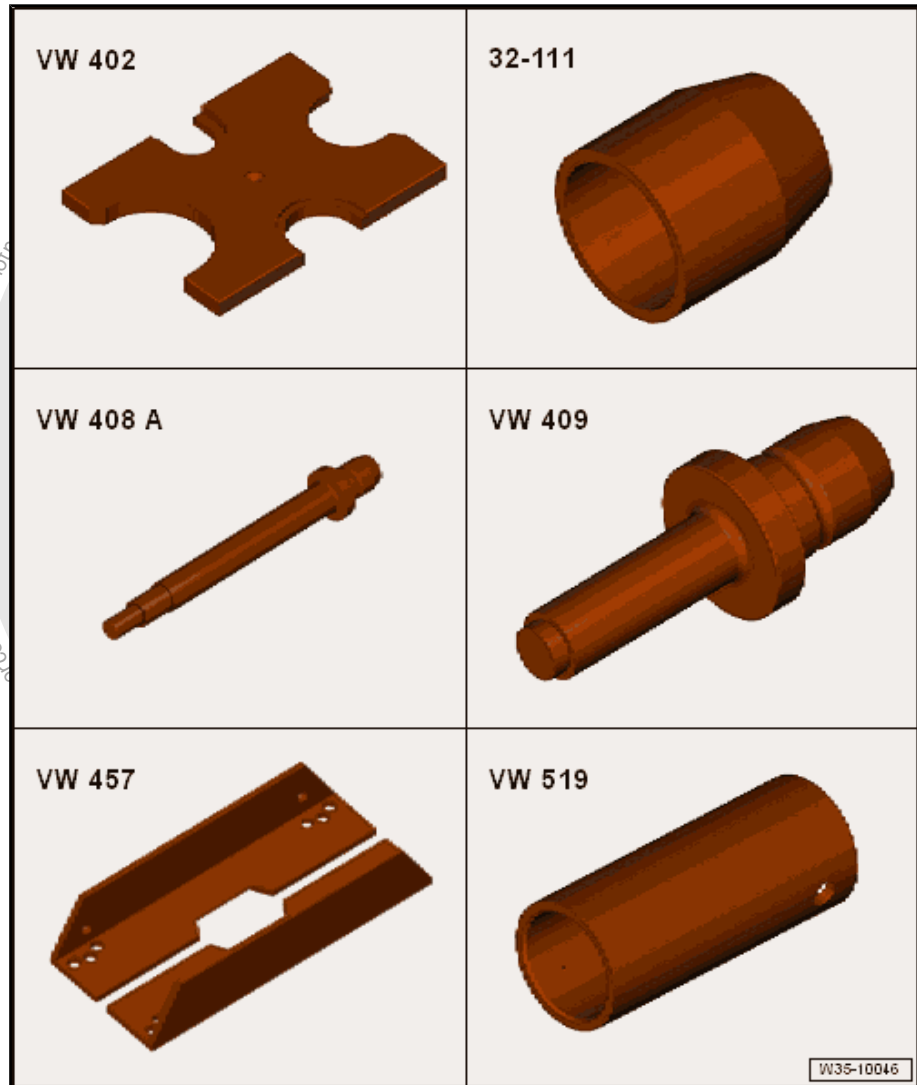


- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Rod - VW412-
- ◆ Press Piece - Multiple Use - VW512-
- ◆ Puller - Taper Roller Bearing - VAG1582-
- ◆ Puller - Taper Roller Bearing - Adapter 4 - VAG1582/4-
- ◆ Puller - Taper Roller Bearing - Adapter 5 - VAG1582/5-





- ◆ Press Plate - VW402-
- ◆ Bearing Installer - Multiple Use - 32-111-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Rod - VW409-
- ◆ Support Channels - VW457-
- ◆ Press Piece - Multiple Use - VW 519-





Special tools and workshop equipment required

- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Multiple Use - VW447H-
- ◆ Press Piece - Rod - VW411-
- ◆ Centering/Press Pin - 12-551-
- ◆ Press Plate - VW401-
- ◆ Press Piece - Rod - VW408A-





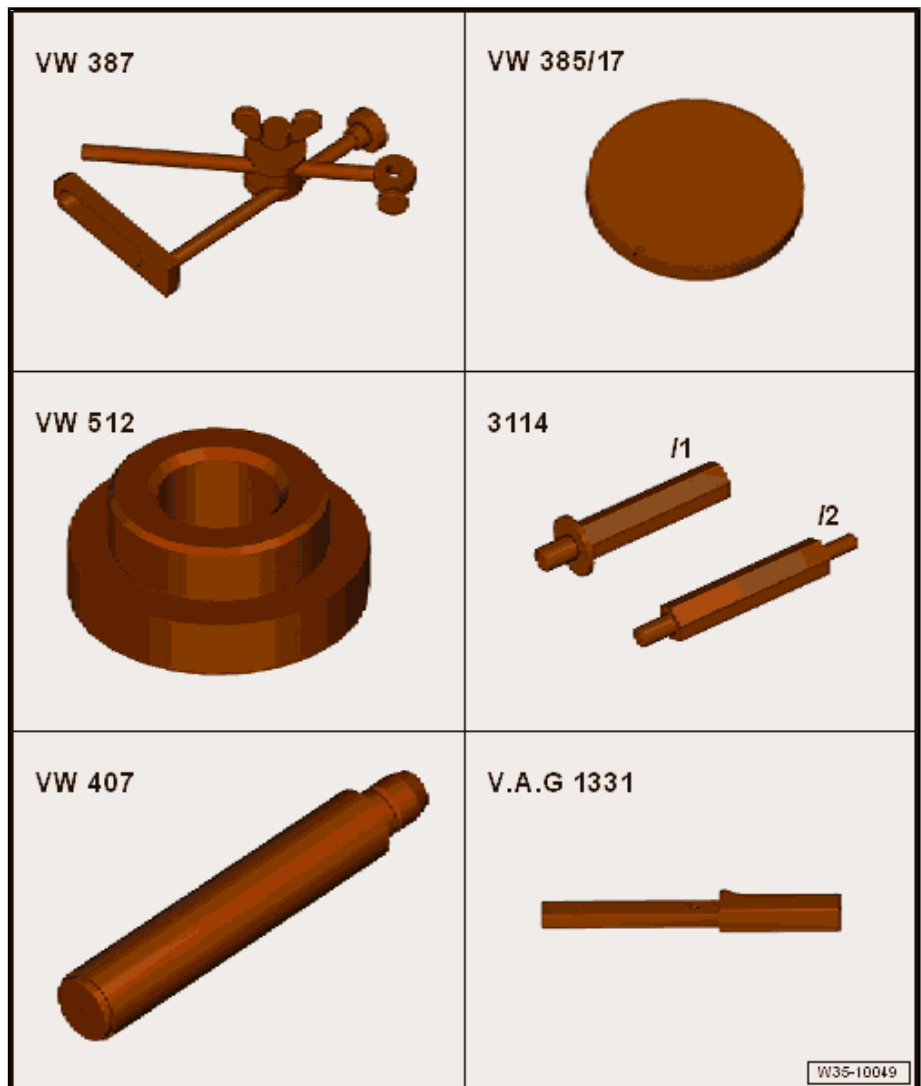
- ◆ Dial Gauge Holder - VW387-
- ◆ Measuring Set - Magnetic Plate - 50mm - VW385/17-
- ◆ Press Piece - Multiple Use - VW510-
- ◆ Press Piece - VW447i-
- ◆ Press Piece - Rod - VW407-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Dial Gauge



to the correctness of:



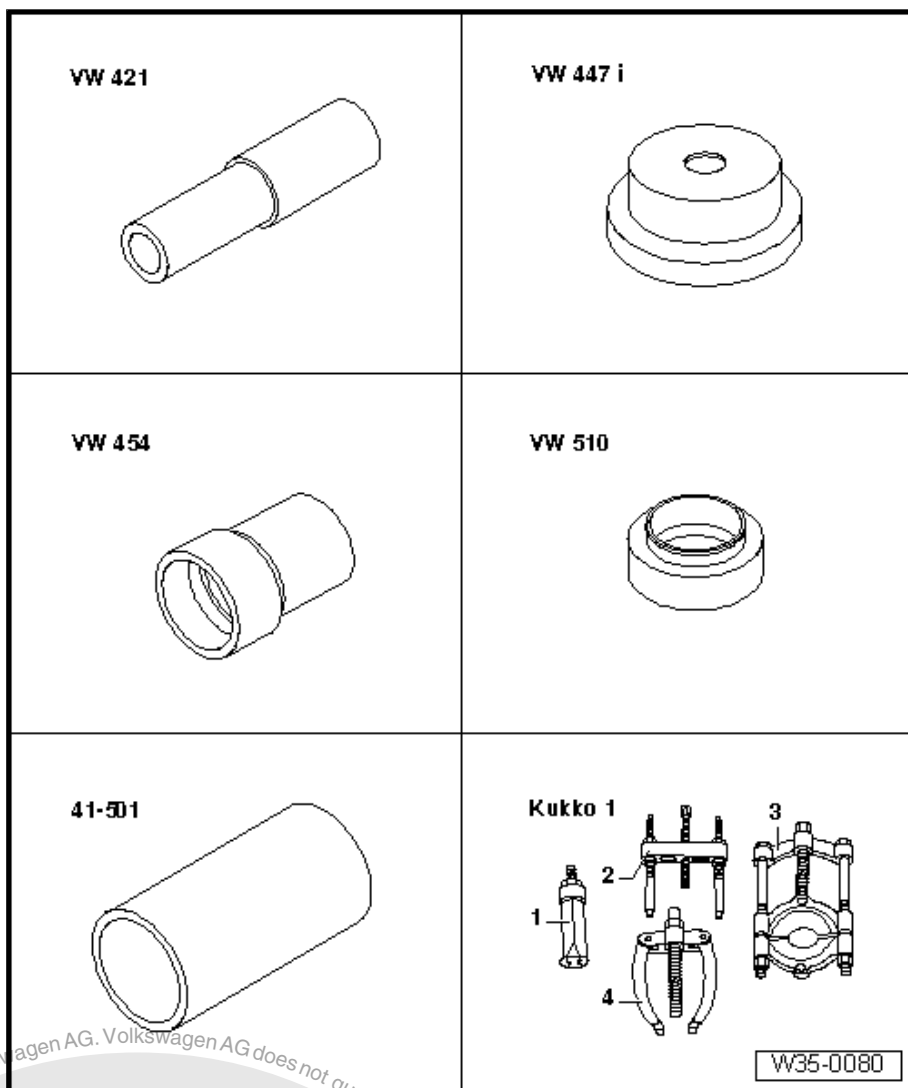
- ◆ Dial Gauge Holder - VW387-
- ◆ Measuring Set - Magnetic Plate - 50mm - VW385/17-
- ◆ Press Piece - Multiple Use - VW512-
- ◆ Door Alignment Device - Replacement Stud - 3114/2-
- ◆ Press Piece - Rod - VW407-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Dial Gauge



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- ◆ Press Piece - 28x100mm - VW421-
- ◆ Press Piece - VW447i-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Multiple Use - VW510-
- ◆ Press Tube - 41-501-
- ◆ -3- Puller - Kukko Quick Action Separating Tool - 12-75mm - Kukko 17/1-

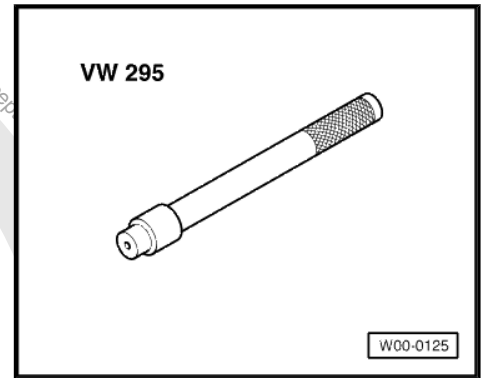


- ◆ Inductive Heater - VAS6414-

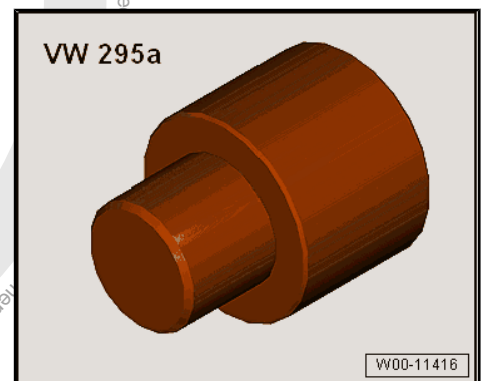




- ◆ Bearing/Bushing Installer - Multiple Use - VW295-



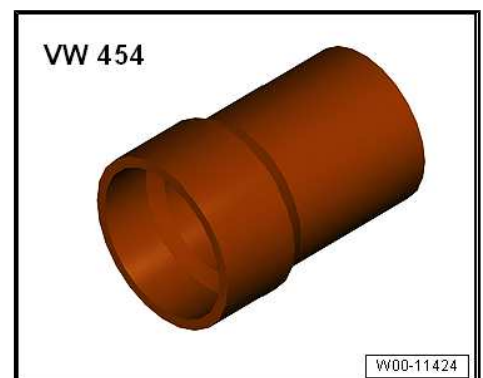
- ◆ Bearing/Bushing Installer - Multiple Use - VW295A-



- ◆ Press Plate - VW402-

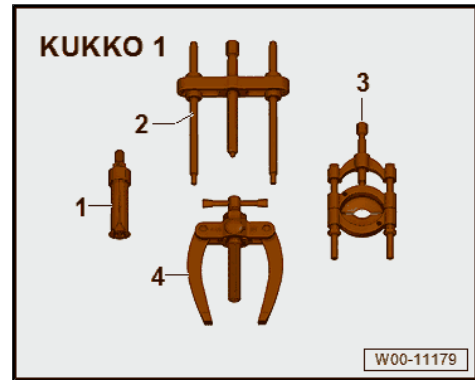


- ◆ Press Piece - Multiple Use - VW454-

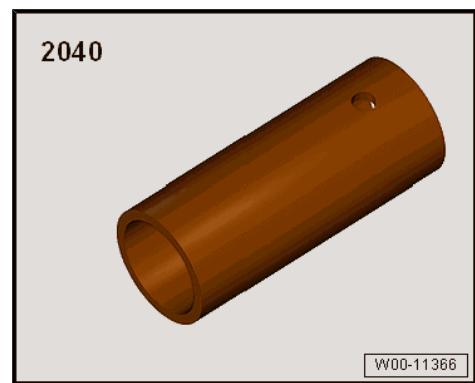




- ◆ -1- Puller - Kukko Internal - 36-46mm - 21/6-



- ◆ -3- Puller - Kukko Quick Action Separating Tool - 22-115mm - 17/2-
- ◆ -4- Puller - Kukko Counterstay - 22/2-
- ◆ Press Piece - Front Control Arm - 2040-





39 – Final Drive, Differential

1 Seals

⇒ [“1.1 Component Location Overview - Seals”, page 183](#)

⇒ [“1.2 Left Seal, Replacing”, page 183](#)

⇒ [“1.3 Right Seal, Replacing”, page 185](#)

1.1 Component Location Overview - Seals

1 - Input Shaft Seal

- ❑ Replacing. Refer to
⇒ [“1.4 Input Shaft Seal, Replacing”, page 152](#).

2 - Seal

- ❑ For the right flange shaft
- ❑ Replacing. Refer to
⇒ [“1.3 Right Seal, Replacing”, page 185](#).

3 - Seal

- ❑ For the left flange shaft
- ❑ Replacing. Refer to
⇒ [“1.2 Left Seal, Replacing”, page 183](#).

4 - Gearshift Shaft Seal

- ❑ Replacing. Refer to
⇒ [“1.8 Selector Shaft Seal, Replacing”, page 65](#).



1.2 Left Seal, Replacing

Replacing the left flange shaft seal

Special tools and workshop equipment required

- ◆ Slide Hammer Set - VW771-
- ◆ Slide Hammer Set - Hook - VW771/37-
- ◆ Seal Installer - Flange Shaft Oil Seal - T10160-
- ◆ Used Oil Collection and Extraction Unit - SMN372500-



- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Sealing Grease - G 052 128 A1-



Caution

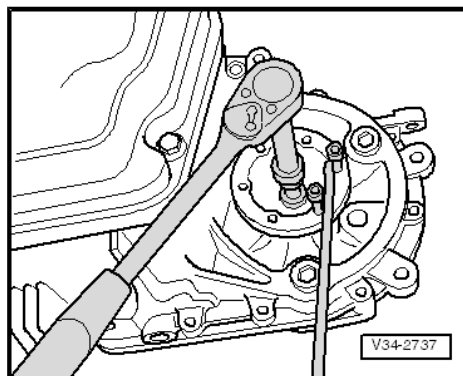
This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

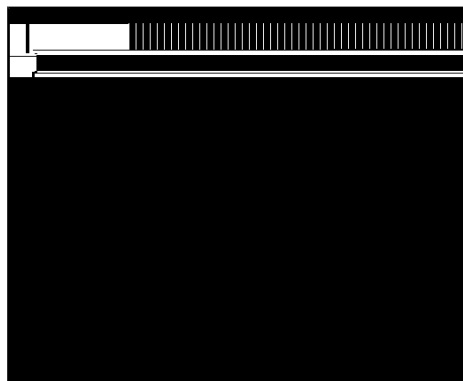
- ◆ Seal - Left Flange Shaft

Removing

- Remove the left wheel.
- 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; Front Wheel Housing Liner, Removing and Installing .
- Turn the steering wheel to the left.
- Remove drive axle from flange shaft. Refer to ➤ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .
- Tie the drive axle as high up as possible. Do not damage the paint on the drive axle.
- Place the Used Oil Collection and Extraction Unit - SMN372500- or Drip Tray under the transmission.
- Remove the flange shaft bolt. To do this, install two bolts into the flange and counterhold the flange shaft using a pry bar.
- Remove the flange shaft and the pressure spring.



- Remove the flange shaft seal using the Slide Hammer Set - VW771- and the Slide Hammer Set - Hook - VW771/37- .



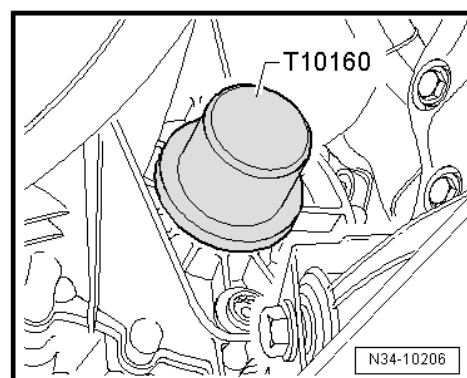


Installing

- 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- .



- Install the seal all the way in without tilting it.
- Install the flange shaft.
- Press the flange shaft against the transmission and secure it with the bolt.
- Attach the drive axles to the transmission. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .
- Check the transmission fluid and fill if necessary. Refer to ⇒ ["8 Transmission Fluid", page 125](#) .
- Install the lower section of the left front wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Front Wheel Housing Liner, Removing and Installing .
- Install the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .
- Install the wheel. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 44 ; Wheels and Tires; Wheel Bolt Tightening Specifications .



Tightening Specification

- ◆ Refer to ⇒ ["2.1 Overview - Differential", page 189](#) .

1.3 Right Seal, Replacing

Special tools and workshop equipment required

- ◆ Seal Installer - One-Piece Seal - T10148-
- ◆ Spindle from the Seal Installer - Driver Set - 3066-
- ◆ Slide Hammer Set - VW771-
- ◆ Slide Hammer Set - Hook - VW771/37-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Used Oil Collection and Extraction Unit - SMN372500-



Caution

This procedure contains mandatory replaceable parts. Refer to component overview prior to starting procedure.

Mandatory Replacement Parts

- ◆ Seal - Right Flange Shaft
- ◆ Bolts - CV Boot to Inner CV Joint



Right Flange Shaft Seal, Replacing

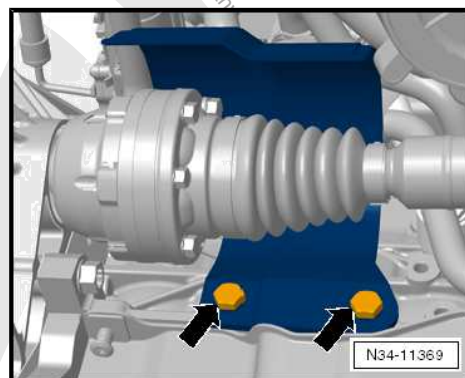
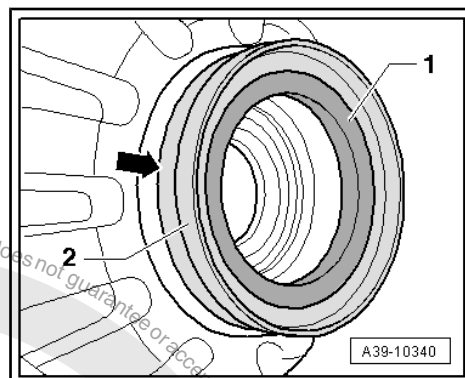


Note

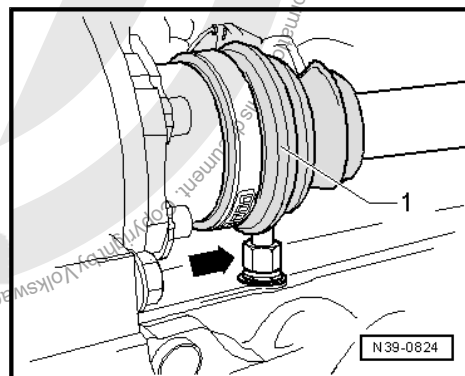
- ◆ The seal -1- and the sleeve -2- are a single part.
- ◆ The seal and the sleeve can only be replaced together.

Removing

- Remove the noise insulation. Refer to ➤ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .
- Turn steering as far as possible toward right.
- Remove the drive axle heat shield if equipped -arrows-.



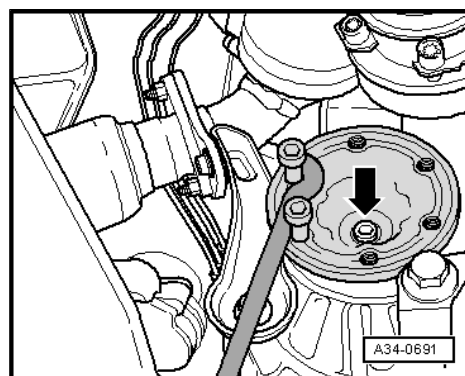
- Remove drive axle -1- from flange shaft. Refer to ➤ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .
- Tie the drive axle as high up as possible. Do not damage the paint on the drive axle.



Note

- ◆ On some engines, the drive axle cannot be tied up so that the transmission flange shaft can be removed.
- ◆ Remove the right drive axle. Refer to ➤ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .

- Place the Used Oil Collection and Extraction Unit - SMN372500- or Drip Tray under the transmission.
- Remove the flange shaft bolt -arrow-. To do this, install two bolts into the flange and counterhold the flange shaft using a tire iron.
- Remove the flange shaft and the pressure spring.





The seal is located in a metal housing.

- Remove the seal and the sleeve together.

A ridge is located on the internal diameter of the sleeve.

- Install the Slide Hammer Set - Hook - VW771/37- directly behind the ridge inside the sleeve.
- Using force, push the Slide Hammer Set - Hook - VW771/37- into the sleeve.

Installing

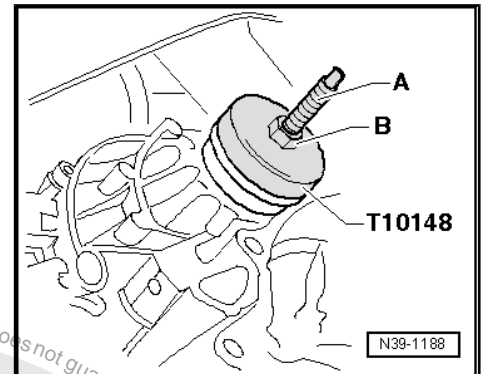
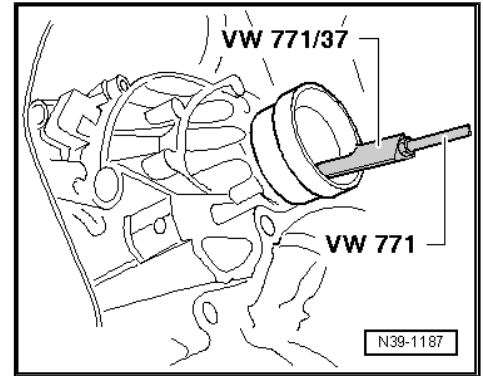
- Clean the seal seat inside the transmission.

- Install the seal and the sleeve together.

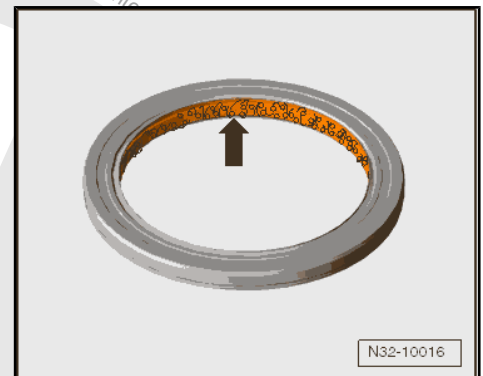
A - Install the Spindle on the Seal Installer - Driver Set - 3066- into the threaded piece in the differential.

B - M12 Nut

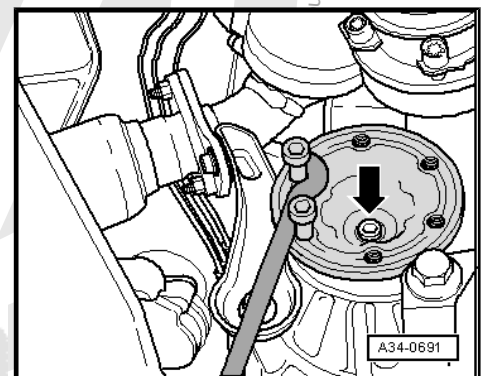
- Turn the nut -B- and pull the seal with the sleeve all the way over the Seal Installer - One-Piece Seal - T10148- .



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



- Press the flange shaft against the transmission and secure it with the bolt -arrow-.
- Fasten the right drive axle to the flange shaft. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle, Removing and Installing .

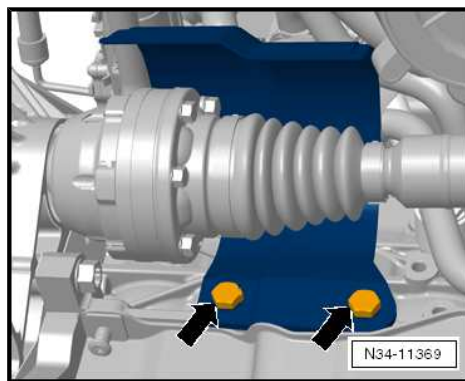




- Attach the drive axle heat shield -arrows- (if equipped). Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Drive Axle; Drive Axle Heat Shield, Removing and Installing .
- Check the transmission fluid and fill if necessary. Refer to ⇒ ["8 Transmission Fluid", page 125](#) .
- Install the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .

Tightening Specification

- ◆ Refer to ⇒ ["2.1 Overview - Differential", page 189](#) .





2 Differential

⇒ [“2.1 Overview - Differential”, page 189](#)

⇒ [“2.2 Differential, Disassembling and Assembling”, page 190](#)

⇒ [“2.3 Differential, Adjusting”, page 194](#)

2.1 Overview - Differential

1 - Transmission Housing

2 - Shim

- ☐ For the differential
- ☐ Selecting thickness. Refer to
⇒ [“2.3 Differential, Adjusting”, page 194](#).

3 - Outer Race/Tapered Roller Bearing

- ☐ Removing. Refer to
⇒ [Fig. “Removing the Outer Race/Tapered Roller Bearing from the Transmission Housing”](#), page 192
- ☐ Installing. Refer to
⇒ [Fig. “Installing the Outer Race/Tapered Roller Bearing Into the Transmission Housing”](#), page 192

4 - Inner Race / Tapered Roller Bearing

- ☐ Removing. Refer to
⇒ [Fig. “Removing the Inner Races/Tapered Roller Bearings”](#), page 191
- ☐ Installing. Refer to
⇒ [Fig. “Installing the Inner Races/Tapered Roller Bearings”](#), page 191

5 - Differential

- ☐ With final drive gear wheel

6 - Inner Race / Tapered Roller Bearing

- ☐ Removing. Refer to ⇒ [Fig. “Removing the Inner Races/Tapered Roller Bearings”](#), page 191
- ☐ Installing. Refer to ⇒ [Fig. “Installing the Inner Races/Tapered Roller Bearings”](#), page 191

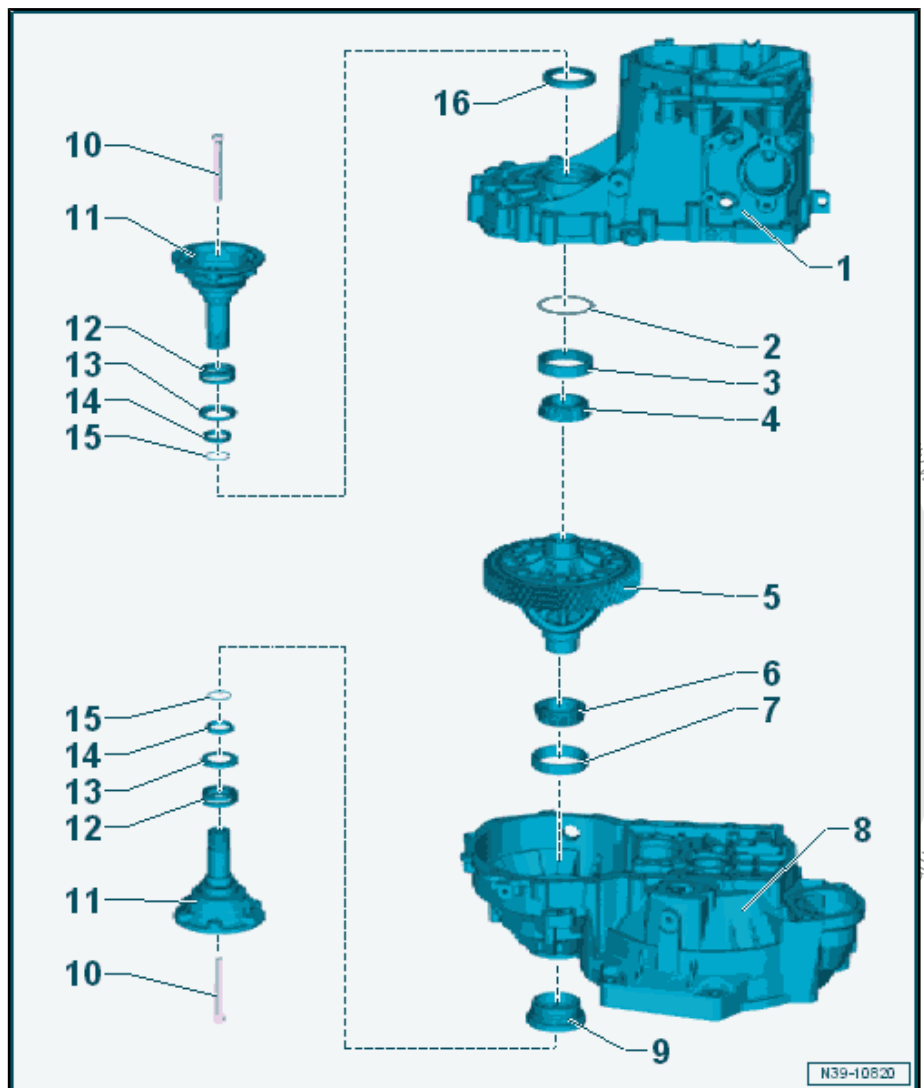
7 - Outer Race/Tapered Roller Bearing

- ☐ Removing. Refer to
⇒ [Fig. “Removing the Outer Race/Tapered Roller Bearing from the Clutch Housing”](#), page 191
- ☐ Installing. Refer to
⇒ [Fig. “Installing Outer Race/Tapered Roller Bearing Into the Clutch Housing”](#), page 191

8 - Clutch Housing

9 - Seal

- ☐ With sleeve





- ☐ For the right flange shaft
- ☐ If the seal is damaged, then replace both the seal and sleeve. Refer to
⇒ ["1.3 Right Seal, Replacing", page 185](#) .

10 - Bolt

- ☐ 25 Nm

11 - Flange Shaft

- ☐ Removing and installing. Refer to ⇒ ["1 Seals", page 183](#) .

12 - Flange Shaft Pressure Spring

13 - Thrust Washer

- ☐ Installed position. Refer to ⇒ [Fig. "Installed Position: Tapered Ring Thrust Washer -1- """, page 194](#)

14 - Tapered Ring

- ☐ With grooves for the thrust washer
- ☐ Installed position: ball toward the differential housing

15 - Circlip

- ☐ Holds the tapered ring, the thrust washer and the pressure spring when the flange shaft is removed

16 - Seal

- ☐ For the left flange shaft
- ☐ Replacing. Refer to ⇒ ["1.2 Left Seal, Replacing", page 183](#) .

2.2 Differential, Disassembling and Assembling

Special tools and workshop equipment required

- ◆ Puller - Taper Roller Bearing - VAG1582-
- ◆ Puller - Taper Roller Bearing - Adapter 3 - VAG1582/3-
- ◆ Press Piece - Multiple Use - VW412-
- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Multiple Use - VW 473-
- ◆ Press Piece - Multiple Use - 30-205
- ◆ Bearing Installer - Wheel Bearing - 3144-
- ◆ Bearing Installer - Taper Roller Bearing - 2007-
- ◆ Torque Wrench 1332 40-200Nm - VAG1332-
- ◆ Inductive Heater - VAS6414-
- ◆ -1- Puller - Kukko Internal - 46-56mm - 21/7-
- ◆ -4- Puller - Kukko Counterstay - 22/2-



Note

- ◆ Heat the inner race / tapered roller bearing to 100 °C (212 °F) before installing.
- ◆ Replace both tapered roller bearings together.
- ◆ Adjust the differential when replacing the tapered roller bearing, differential, transmission housing or clutch housing. Refer to ⇒ ["3 Adjustment Overview", page 198](#).

Removing the Outer Race/Tapered Roller Bearing from the Clutch Housing

- First remove the right flange shaft seal. Refer to ⇒ ["1.3 Right Seal, Replacing", page 185](#).

Installing Outer Race/Tapered Roller Bearing Into the Clutch Housing

There is no adjusting shim on the side of the clutch housing.

Removing the Inner Races/Tapered Roller Bearings

- Mount the Press Piece - Multiple Use - 40-105- on the differential housing before removing the puller.



Note

Both tapered roller bearing inner races are removed from the differential housing in the same way.

Installing the Inner Races/Tapered Roller Bearings



Note

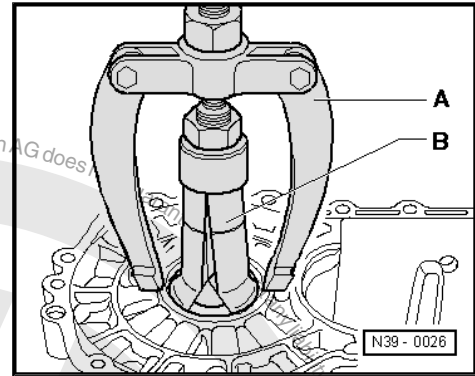
Inner race/tapered roller bearing for transmission housing and clutch housing are installed using the same special tools



Removing the Outer Race/Tapered Roller Bearing from the Transmission Housing

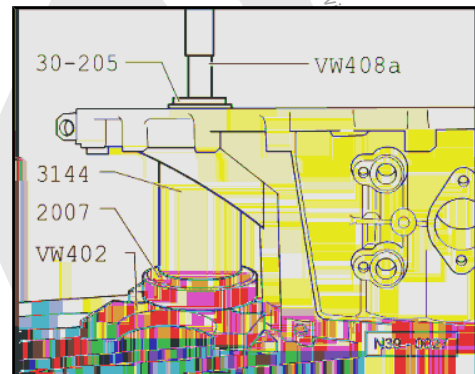
A - Counter Support , for example, Puller - Kukko Counterstay - 22/2-

B - Internal Puller 46 to 58 mm , for example, Puller - Kukko Internal - 46-56mm - 21/7-



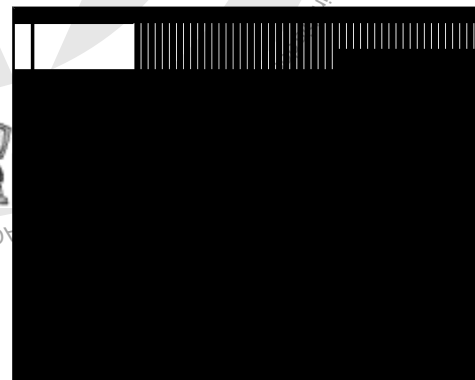
Installing the Outer Race/Tapered Roller Bearing Into the Transmission Housing.

- Install the adjusting shim under the outer race.
- Support the transmission housing with the Bearing Installer - Wheel Bearing - 3144- directly under the bearing mount.



Differentiating the Spring Pins

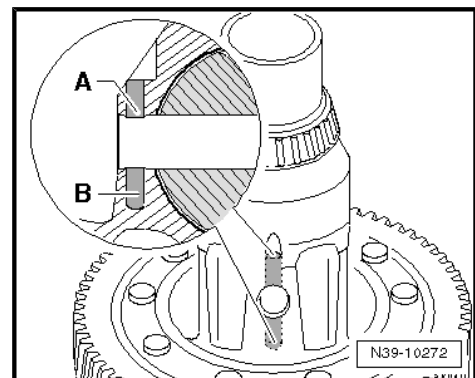
Dimension "a" mm	Identifying Feature
28.5 (short tension sleeve), removing and installing. Refer to ⇒ Fig. "Spring Pin with Surrounding Groove (Short Spring Pin): Removing and Installing" , page 193	Groove all the way around -arrows-
36.0 (long spring pin), removing. Refer to ⇒ Fig. "Spring Pin Without Surrounding Groove (Long Spring Pin), Removing: Press Out the Differential Bevel Gear Axle" , page 193 , installing. Refer to ⇒ Fig. "Spring Pin Without Surrounding Groove (Long Spring Pin), Installing" , page 193	no surrounding groove



Allocation, Differential Housing

The hole in the differential housing was modified due to the longer spring pin.

Hole	Spring Pin Length (mm)
-A-	28.5 (short spring pin)
-A- and -B-	36.0 (long spring pin)





Spring Pin with Surrounding Groove (Short Spring Pin): Removing and Installing

Removing

- Cover the inner race/tapered roller bearing in order to prevent possible damage and entry of shavings.
- Remove the adapter sleeve using a chisel.

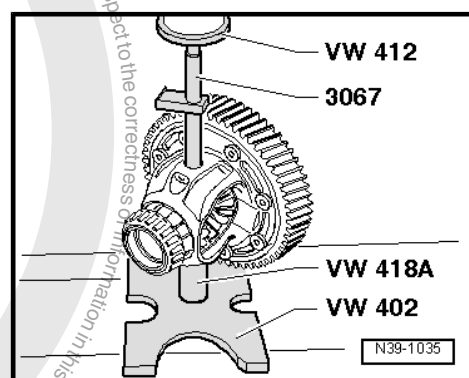
Installing

- Drive into the differential housing up to the stop.

Spring Pin Without Surrounding Groove (Long Spring Pin), Removing: Press Out the Differential Bevel Gear Axle

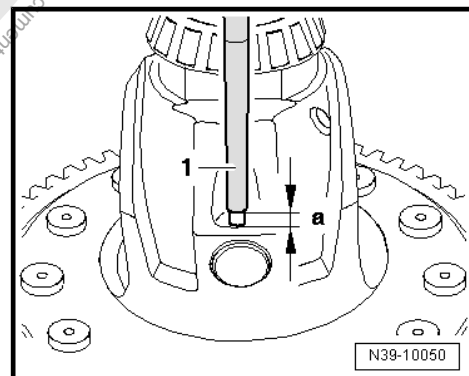
Spring pin is sheared off when it is removed.

- Drive remaining part of roller pin out of differential housing.



Spring Pin Without Surrounding Groove (Long Spring Pin), Installing

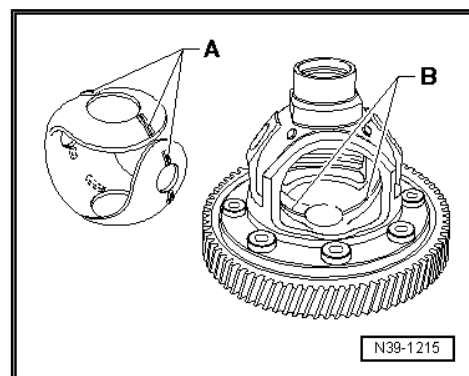
- Align the hole in the differential bevel gear axle to the hole in the differential housing.
- Install the new adapter sleeve to dimension -a- = 3.0 mm using a mandrel -1-.
- The spring pin must not come in contact with the transmission when the differential housing is installed.



On Some Transmissions, the Thrust Washer Union Has a Ridge -A-.

Also, the differential housing has a groove -B- all the way around it.

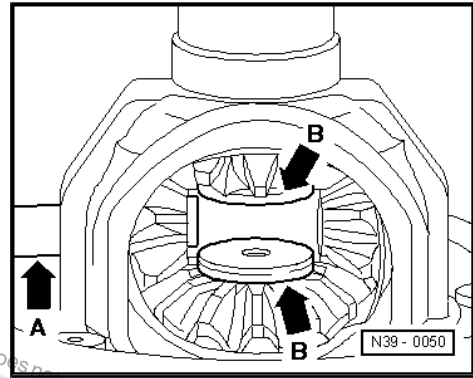
- Insert thrust washer union with transmission fluid.
- Install the thrust washer union so that it fits into the groove -B- in the differential housing.





Installing the Differential Planetary Gears and Differential Bevel Gear Axle

- 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.
- Insert threaded pieces -arrow B- into the large differential planetary gears.



Installed position: shoulder faces the differential bevel gear

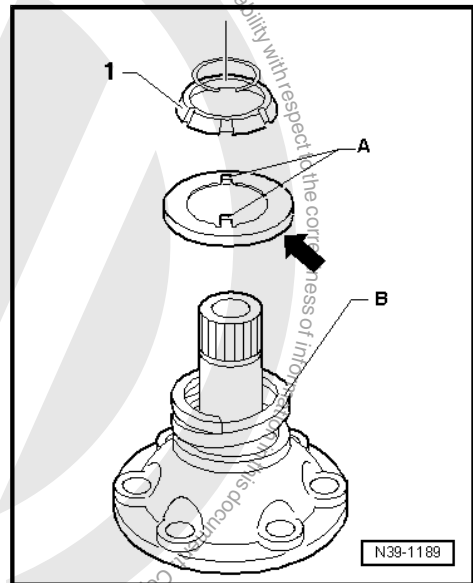
- Install the differential bevel gear axle up the end position and secure it with a new spring pin.

Installed Position: Tapered Ring Thrust Washer -1-

The collar -arrow- faces the pressure spring -B-.

Some transmissions are not equipped with ridges -A-.

The ridges -A- face the tapered ring -1-.



2.3 Differential, Adjusting

Special tools and workshop equipment required

- ◆ Dial Gauge Holder - VW387-
- ◆ Measuring Set - Magnetic Plate - 50mm - VW385/17-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Multiple Use - 30-205-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ -1- Puller - Kukko Internal - 46-56mm - 21/7-
- ◆ -4- Puller - Kukko Counterstay - 22/2-
- ◆ Dial Gauge

A new differential adjustment is required when the following components have been replaced:

- ◆ Transmission Housing
- ◆ Clutch Housing
- ◆ Differential Housing

or the



◆ Differential tapered roller bearing

Adjustment Overview. Refer to

⇒ [“3 Adjustment Overview”, page 198](#) .

- Press tapered roller bearing outer race into transmission housing without shim, using Press Piece - Multiple Use - 30-205- . Refer to
⇒ [Fig. ““Installing the Outer Race/Tapered Roller Bearing Into the Transmission Housing.””, page 192](#) .



Note

Bearing inner race and outer race of tapered roller bearing are paired. Do not interchange them.

- Press tapered roller bearing outer race into clutch housing, using Press Piece - Multiple Use - 30-205- . Refer to
⇒ [Fig. ““Installing Outer Race/Tapered Roller Bearing Into the Clutch Housing””, page 191](#) .
- Insert differential into clutch housing.
- Position the transmission housing and tighten the 5 bolts to the tightening specification.





- Attach the Dial Gauge Holder - VW387- and set the dial gauge to "0" with 1 mm preload.
- Move differential up and down, read off play on dial gauge and note. (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:

Bearing Clearance Measured Value	Adjustment Shim Thickness According to the Table
0.70 mm	0.95 mm

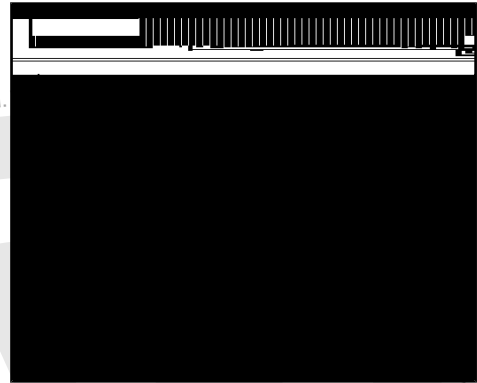
Shim Table

Bearing Play	Shim
Measured value (mm)	Thickness (mm)
0.303 to 0.449	0.650
0.450 to 0.499	0.700
0.500 to 0.549	0.750
0.550 to 0.599	0.800
0.600 to 0.649	0.850
0.650 to 0.699	0.900
0.700 to 0.749	0.950
0.750 to 0.799	1.000
0.800 to 0.849	1.050
0.850 to 0.899	1.100
0.900 to 0.949	1.150
0.950 to 0.999	1.200
1.000 to 1.049	1.250
1.050 to 1.099	1.300
1.100 to 1.149	1.350
1.150 to 1.199	1.400



Note

Allocate the shims. Refer to the Parts Catalog.





- 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-

- Install the shim with the correct thickness, thickest shim first.

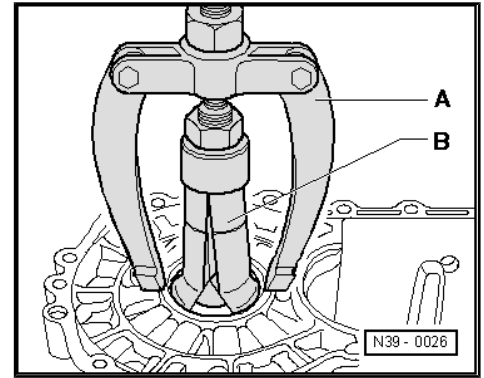
If the measured shim thickness is larger than those listed in the Table, then install two shims that add up to the necessary thickness.

Tolerance variations make it possible to find the exact shim thickness required.

Install the tapered roller bearing inner race again. Refer to
⇒ [Fig. "Installing the Outer Race/Tapered Roller Bearing Into the Transmission Housing."](#), page 192 and fasten the transmission housing.

Tightening Specifications

- ◆ Refer to
⇒ ["5.4 Overview - Transmission Housing and Selector Mechanism"](#), page 95 .





3 Adjustment Overview



Note

A re-adjustment of the drive axle, output shaft or differential is only required only required if components, which have a direct influence on transmission adjustment, have been replaced. Note the following table to avoid unnecessary adjustments:

		to be adjusted:		
		Input Shaft Refer to ⇒ "1.3 Input Shaft, Ad- justing", page 148 .	Output Shaft Refer to ⇒ "2.3 Out- put Shaft, Adjusting", page 166 .	Differential Refer to ⇒ "2.3 Differ- ential, Ad- justing", page 194 .
Replaced part:	Transmission Housing	x		x
	Clutch Housing	x	x	x
	Input Shaft	x		
	Output Shaft		x	
	Differential			x
	Output shaft tapered roller bearing	x		
	Output shaft tapered roller bearing		x	
	Differential tapered roller bearing			x
	4th Gear Wheel	x		



4 Special Tools

- ◆ Press Piece - Rod - VW408A-
- ◆ Press Piece - Multiple Use - VW 473-
- ◆ Press Piece - Multiple Use - 30-205-
- ◆ Bearing Installer - Wheel Bearing - 3144-
- ◆ Bearing Installer - Taper Roller Bearing - 2007-
- ◆ Torque Wrench 1332 40-200Nm - VAG1332-



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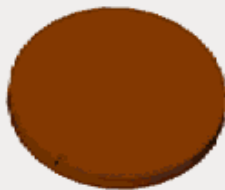
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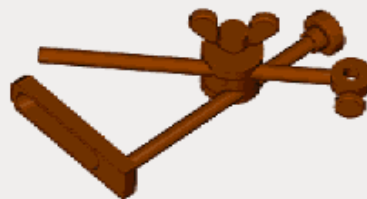
Special tools and workshop equipment required

- ◆ Dial Gauge Holder - VW387-
- ◆ Measuring Set - Magnetic Plate - 50mm - VW385/17-
- ◆ Press Piece - Rod - VW407-
- ◆ Press Piece - Multiple Use - 30-205-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ -1- Puller - Kukko Internal - 46-56mm - 21/7-
- ◆ -4- Puller - Kukko Counterstay - 22/2-
- ◆ Dial Gauge

VW 385/17



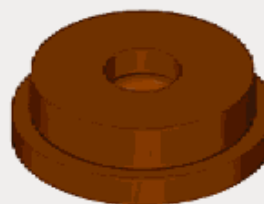
VW 387



VW 407



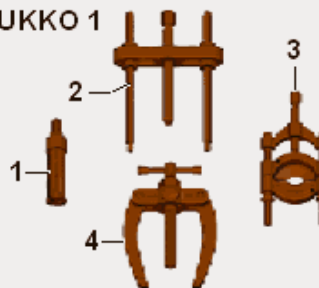
30-205



V.A.G 1331



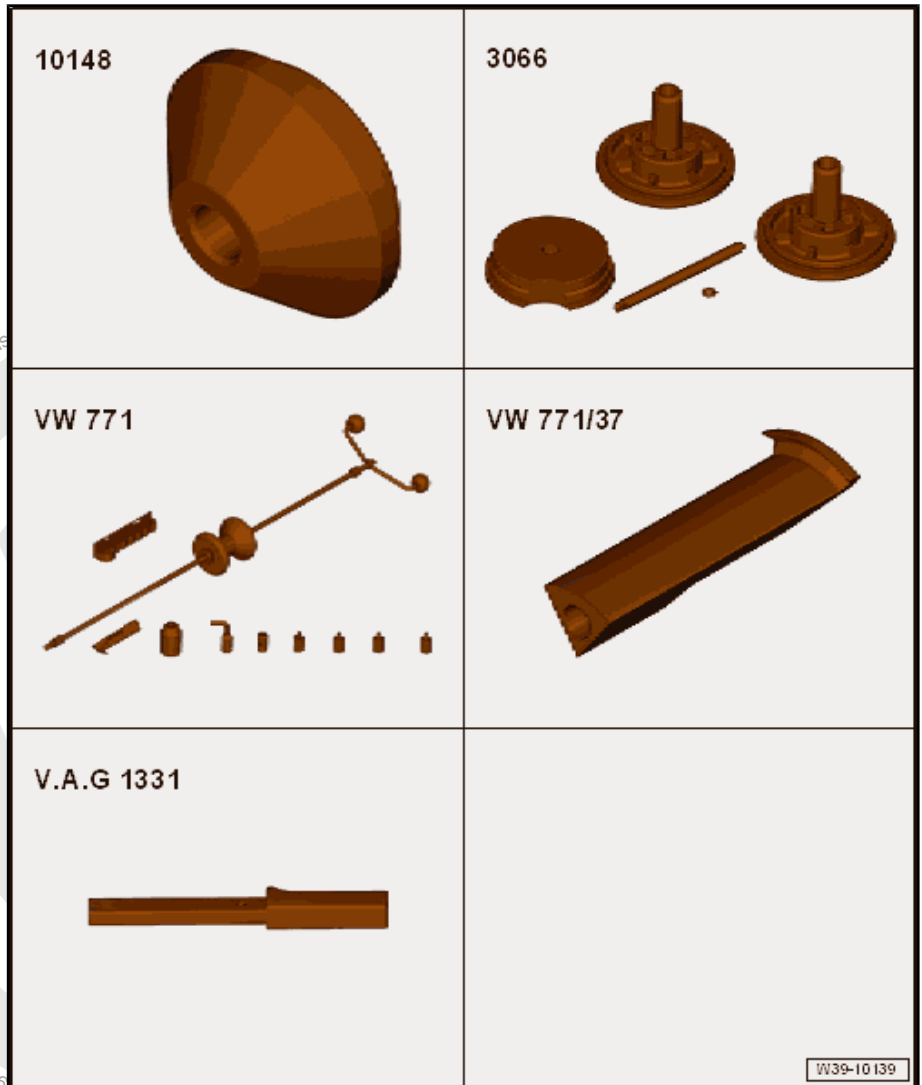
KUKKO 1



W39-10 133



- ◆ Seal Installer - One-Piece Seal - T10148-
- ◆ Spindle from the Seal Installer - Driver Set - 3066-
- ◆ Slide Hammer Set - VW771-
- ◆ Slide Hammer Set - Hook - VW771/37-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-



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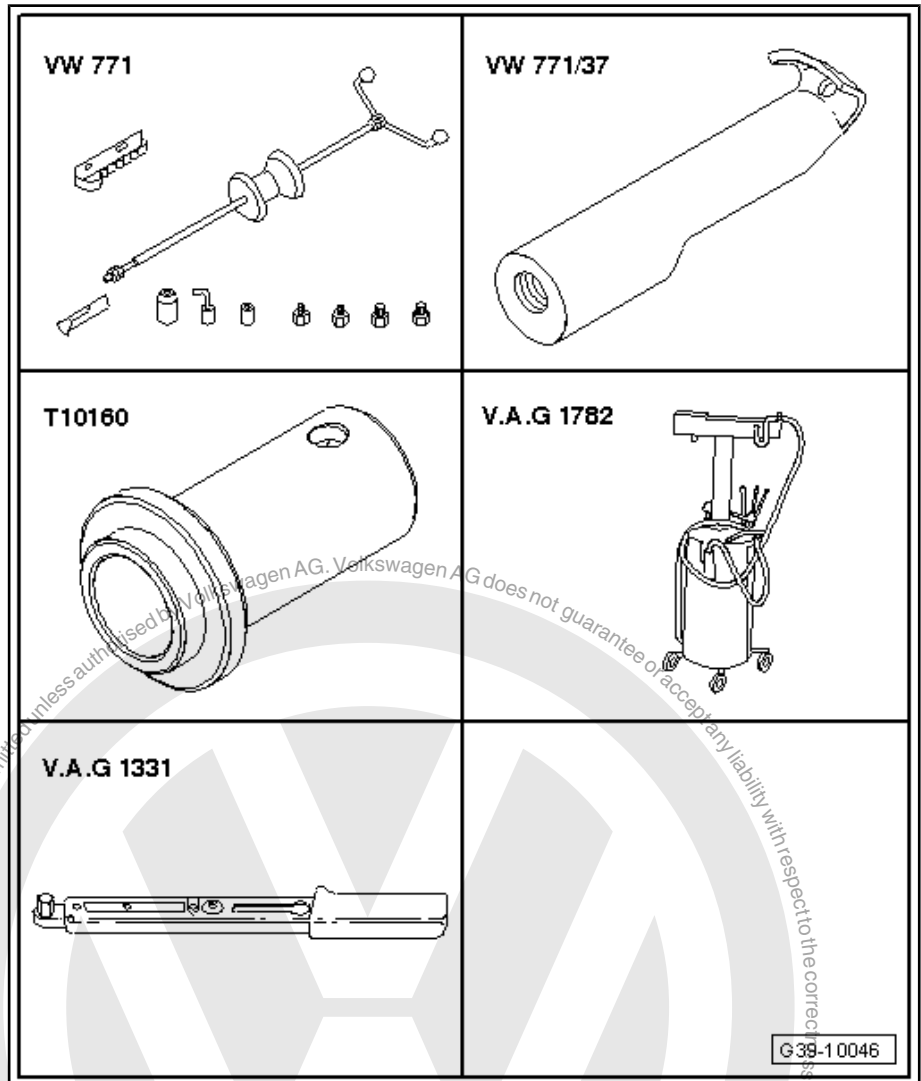


- ◆ Puller - Taper Roller Bearing - VAG1582-
- ◆ Puller - Taper Roller Bearing - Adapter 3 - VAG1582/3-
- ◆ Press Piece - Multiple Use - VW412-
- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-





- ◆ Slide Hammer Set - VW771-
- ◆ Slide Hammer Set - Hook - VW771/37-
- ◆ Seal Installer - Flange Shaft Oil Seal - T10160-
- ◆ Used Oil Collection and Extraction Unit - SMN372500-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Sealing Grease - G 052 128 A1-



- ◆ Inductive Heater - VAS6414-





5 Revision History

DRUCK NUMBER: K0059240221

Fac- tory Edi- tion	Edit Edi- tion	Job Type	Fe ed- ba ck	Notes	Quality Checke d By
12.2 014	8/14/ 2015	Edi- torial Re- view			Jim H
12.2 014	02/1 3/20 15	Link Chec king		Updated ext-rl tags	Eric P
12.2 014	01/1 6/20 15	Fac- tory Up- date			Eric P



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.

next

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.

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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.

back

OK