



# Service

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## Workshop Manual Golf Variant 2007 ➤ Golf Variant 2010 ➤ Jetta 2005 ➤

### 6-speed manual gearbox 02S

Edition 07.2009





## List of Workshop Manual Repair Groups

### Repair Group

- 00 - Technical data
- 30 - Clutch
- 34 - Controls, housing
- 35 - Gears, shafts
- 39 - Final drive - differential

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

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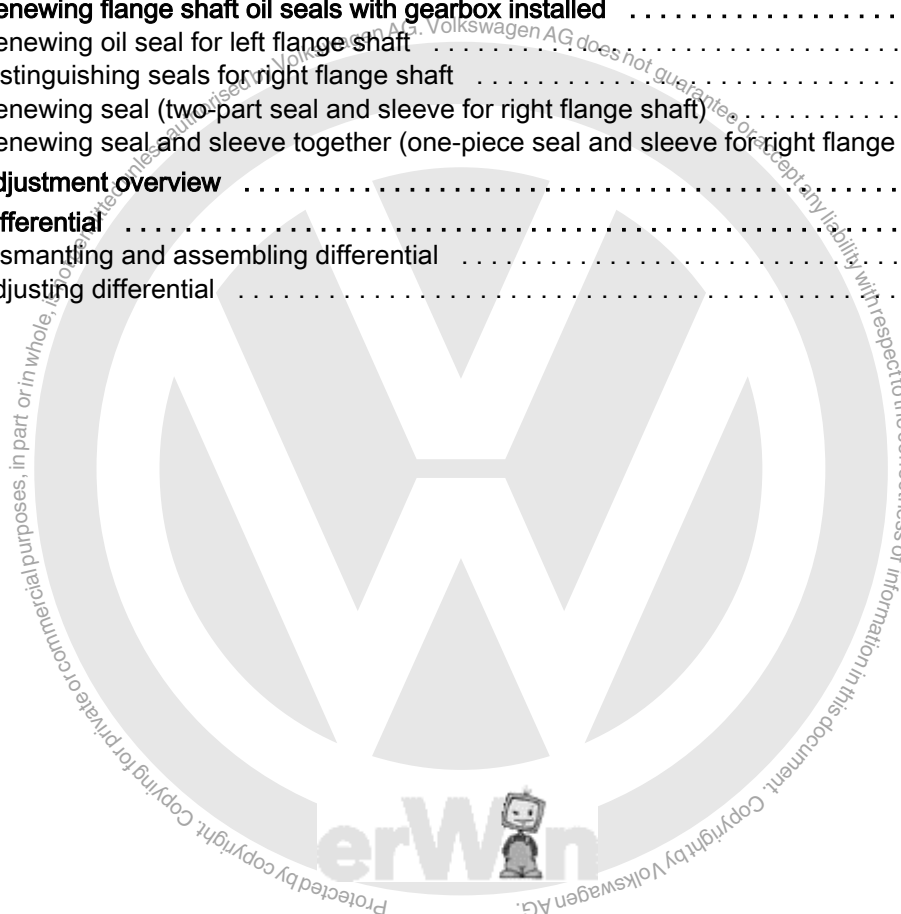


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## 00 – Technical data

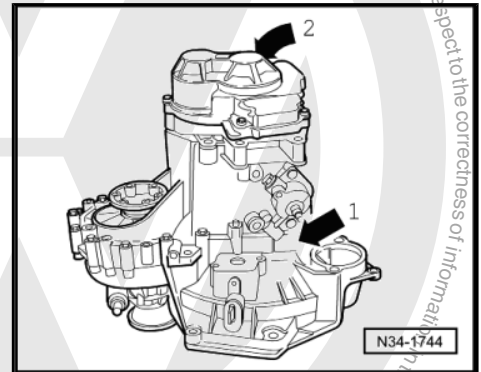
### 1 Gearbox identification

The 6-speed manual gearbox 02S is installed in the Jetta 2005 ▶ , in the Golf Variant 2007 ▶ and in the Golf Variant 2010 ▶ in conjunction with a 4-cylinder engine.

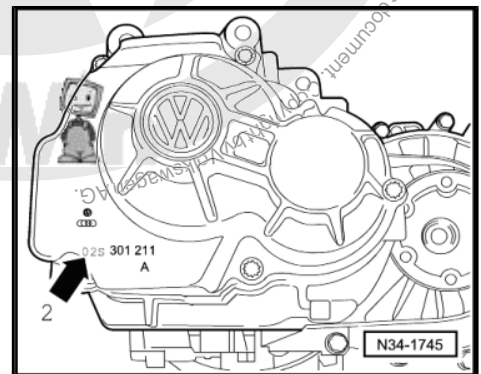
Allocation ⇒ [page 1](#) .

#### 1.1 Location on gearbox

Code letters and date of manufacture -arrow 1- Manual gearbox 02S -arrow 2-



Manual gearbox 02S -arrow 2-



#### Identification code and date of gearbox manufacture

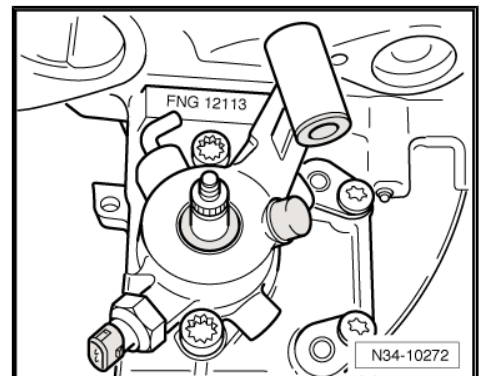
<b>Example:</b>	<b>FNG</b>	<b>12</b>	<b>11</b>	<b>3</b>
	Identification code	Day	Month	Year (2003) of manufacture

Additional data provide information about the production facility.



Note

The gearbox code also appears on the vehicle identification plates.



#### 1.2 Identification code, assembly allocation and capacities

Manual gearbox		6-speed 02S		
Identification code		FNG	HYG	GQM
Manufactured	from to	05.05 05.05	05.06 09.06	05.05
Allocation	Model	Jetta 2005 ▶ Golf Variant 2007 ▶	Jetta 2005 ▶ Golf Variant 2007 ▶	Jetta 2005 ▶ Golf Variant 2007 ▶



Manual gearbox		6-speed 02S		
Identification code		FNG	HYG	QGM
Engine		1.9 l - 74 kW turbo diesel 1.9 l - 77 kW turbo diesel	1.4 l - 103 kW	1.9 l - 74 kW turbo diesel 1.9 l - 77 kW turbo diesel
Ratio Z1 : Z2	Final drive	61 : 18 = 3.389	62 : 17 = 3.647	61 : 18 = 3.389
Capacity of manual gearbox (gearbox completely dismantled)		2.1 l	2.1 l	2.1 l
Capacity of manual gearbox ⇒ <a href="#">page 99</a> (gearbox partially dismantled)		1.9 l	1.9 l	1.9 l
Drive shaft flange Ø		100 mm	100 mm	100 mm
<ul style="list-style-type: none"> <li>The following data can be found in the ⇒ Electronic parts catalogue "ETKA" .</li> <li>◆ Individual gear ratios</li> <li>◆ Specification for gear oil</li> <li>◆ Allocation of clutch plate and pressure plate</li> </ul>				

Manual gearbox		6-speed 02S		
Identification code		GQP	GXV	JAU
Manufactured from to		05.05 07.05	05.05 08.06	11.05 07.06
Allocation Model		Jetta 2005 ▶ Golf Variant 2007 ▶	Jetta 2005 ▶ Golf Variant 2007 ▶	Jetta 2005 ▶ Golf Variant 2007 ▶
	Engine	2.0 l - 110 kW	2.0 l - 110 kW	1.4 l - 125 kW
Ratio Z1 : Z2	Final drive	62 : 17 = 3.647	63 : 16 = 3.938	62 : 17 = 3.647
Capacity of manual gearbox (gearbox completely dismantled)		2.1 l	2.1 l	2.1 l
Capacity of manual gearbox ⇒ <a href="#">page 99</a> (gearbox partially dismantled)		1.9 l	1.9 l	1.9 l
Drive shaft flange Ø		100 mm	100 mm	107 mm
<ul style="list-style-type: none"> <li>The following data can be found in the ⇒ Electronic parts catalogue "ETKA" .</li> <li>◆ Individual gear ratios</li> <li>◆ Specification for gear oil</li> <li>◆ Allocation of clutch plate and pressure plate</li> </ul>				

Manual gearbox		6-speed 02S		
Identification code		JYL	JCL	JCN
Manufactured from to		09.06	05.06 09.06	05.06 09.06
Allocation Model		Jetta 2005 ▶ Golf Variant 2007 ▶	Jetta 2005 ▶ Golf Variant 2007 ▶	Jetta 2005 ▶ Golf Variant 2007 ▶
	Engine	2.0 l - 110 kW	1.9 l - 77 kW turbo diesel	2.0 l - 110 kW
Ratio Z1 : Z2	Final drive	63 : 16 = 3.938	61 : 18 = 3.389	62 : 17 = 3.647



Manual gearbox	6-speed 02S		
Identification code	JYL	JCL	JCN
Capacity of manual gearbox (gearbox completely dismantled)	2.1 l	2.1 l	2.1 l
Capacity of manual gearbox ⇒ page 99 (gearbox partially dismantled)	1.9 l	1.9 l	1.9 l
Drive shaft flange Ø	100 mm	100 mm	100 mm
<ul style="list-style-type: none"> <li>• The following data can be found in the ⇒ Electronic parts catalogue "ETKA" .</li> <li>◆ Individual gear ratios</li> <li>◆ Specification for gear oil</li> <li>◆ Allocation of clutch plate and pressure plate</li> </ul>			

Manual gearbox	6-speed 02S			
Identification code	JCP	JCQ	JYG	
Manufactured	from 05.06 to 09.06	05.06 09.06	09.06	
Allocation	Model	Jetta 2005 ▶ Golf Variant 2007 ▶	Jetta 2005 ▶ Golf Variant 2007 ▶	Jetta 2005 ▶ Golf Variant 2007 ▶
	Engine	2.0 l - 110 kW	1.4 l - 125 kW	1.4 l - 125 kW
Ratio Z1 : Z2	Final drive	63 : 16 = 3.938	62 : 17 = 3.647	62 : 17 = 3.647
Capacity of manual gearbox (gearbox completely dismantled)	2.1 l	2.1 l	2.1 l	
Capacity of manual gearbox ⇒ page 99 (gearbox partially dismantled)	1.9 l	1.9 l	1.9 l	
Drive shaft flange Ø	100 mm	100 mm	100 mm	
<ul style="list-style-type: none"> <li>• The following data can be found in the ⇒ Electronic parts catalogue "ETKA" .</li> <li>◆ Individual gear ratios</li> <li>◆ Specification for gear oil</li> <li>◆ Allocation of clutch plate and pressure plate</li> </ul>				

Manual gearbox	6-speed 02S		
Identification code	JXP	JXR	KWB
Manufactured	from 09.06 to	09.06	07.08
Allocation	Model	Jetta 2005 ▶ Golf Variant 2007 ▶	Jetta 2005 ▶ Golf Variant 2007 ▶ Golf Variant 2010 ▶
	Engine	1.4 l - 103 kW	2.0 l - 110 kW
Ratio Z1 : Z2	Final drive	62 : 17 = 3,647	
Capacity of manual gearbox (gearbox completely dismantled)	2.1 l		
Capacity of manual gearbox ⇒ page 99 (gearbox partially dismantled)	1.9 l		
Drive shaft flange Ø	100 mm		



Manual gearbox	6-speed 02S		
Identification code	JXP	JXR	KWB
<ul style="list-style-type: none"><li>• The following data can be found in the ⇒ Electronic parts catalogue "ETKA" .</li><li>◆ Individual gear ratios</li><li>◆ Specification for gear oil</li><li>◆ Allocation of clutch plate and pressure plate</li></ul>			





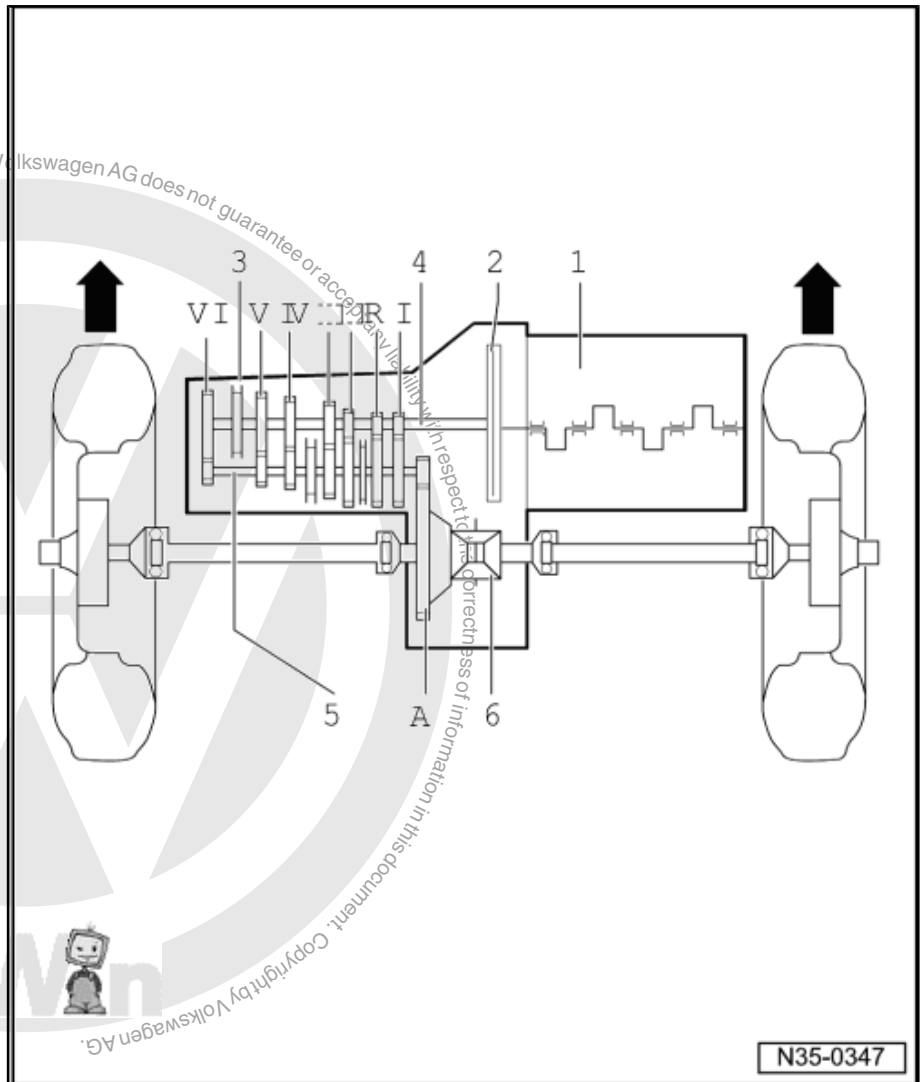


## 2 Overview - power transmission

### Designation

-Arrows- indicate direction of travel.

- 1 - Engine
- 2 - Clutch
- 3 - Manual gearbox
- 4 - Input shaft
- 5 - Output shaft
- 6 - Differential

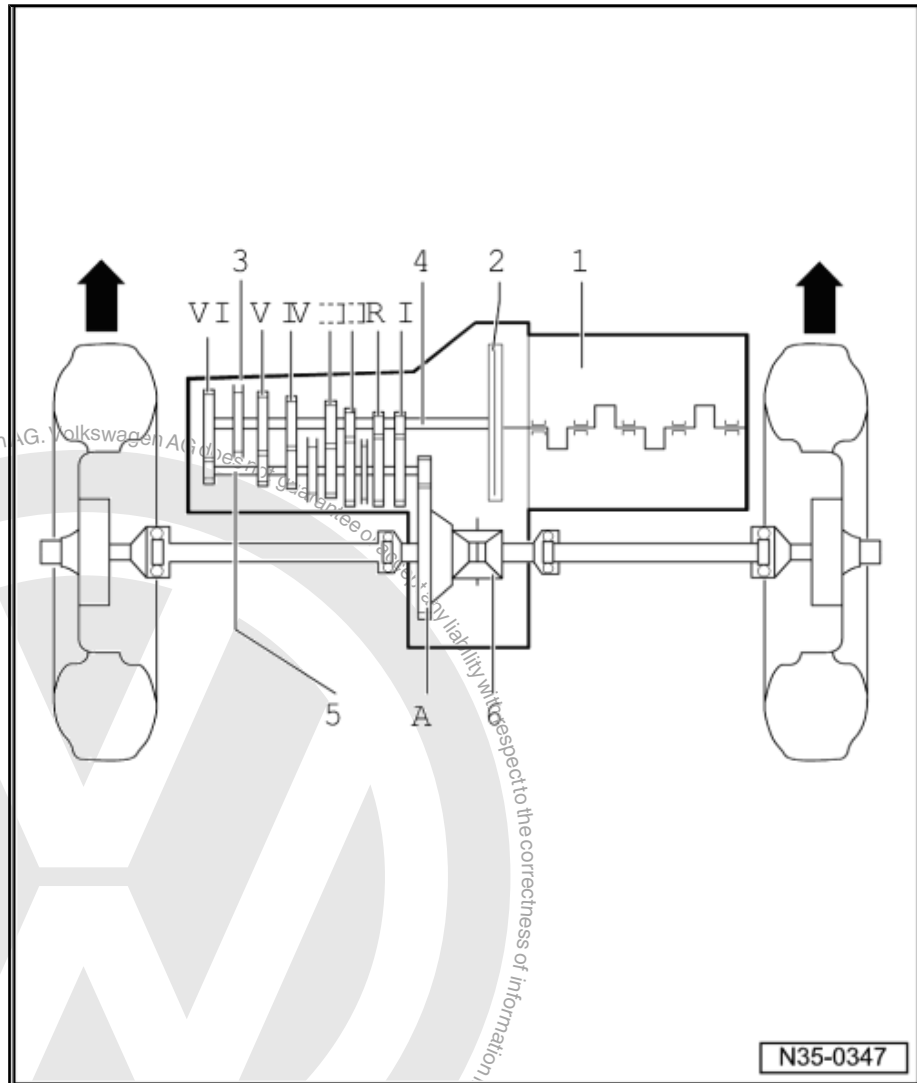


### Ratio

-Arrows- indicate direction of travel.



- I - 1st gear
- II - 2nd gear
- III - 3rd gear
- IV - 4th gear
- V - 5th gear
- VI - 6th gear
- R - Reverse gear
- A - Final drive



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### 3 Calculating overall gear ratio "i"

Example:

	6th gear	Final drive
Drive gear	ZG <sub>1</sub> = 45	ZA <sub>1</sub> = 18
Driven gear	ZG <sub>2</sub> = 34	ZA <sub>2</sub> = 60

$$i = Z_2 : Z_1 \text{ } ^1$$

$$i_G = \text{Gear ratio} = ZG_2 : ZG_1 = 34 : 45 = 0.756$$

$$i_A = \text{Final drive ratio} = ZA_2 : ZA_1 = 60 : 18 = 3.389$$

$$i_{\text{total}} = \text{Overall ratio} = i_G \times i_A = 0.756 \times 3.389 = 2.562$$

1) Z<sub>1</sub> = No. of teeth on driving gear, Z<sub>2</sub> = No. of teeth on driven gear



## 4 General repair notes

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

A number of instructions generally applicable to the various repair procedures - which were previously repeated a number of times at various places in the workshop manual are summarised under the topic "components" ⇒ [page 8](#) . They apply to this workshop manual.

### 4.1 Components

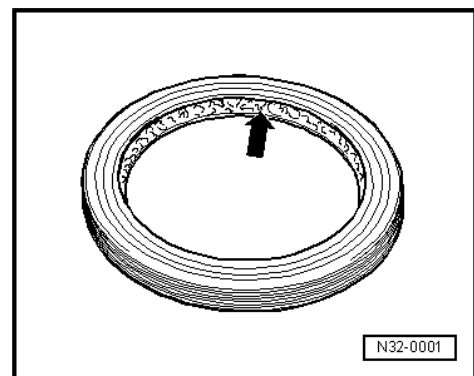
#### 4.1.1 Gearbox

- ◆ When installing the manual gearbox, ensure that the dowel sleeves between the engine and gearbox are correctly seated.
- ◆ When installing mounting brackets or waxed components, clean the contact surfaces. Contact surfaces must be free of wax and grease.
- ◆ Allocate bolts and other components using ⇒ Electronic parts catalogue "ETKA" .
- ◆ Capacity ⇒ [page 1](#) .
- ◆ If the gearbox is repaired, fill with gear oil.

Capacity, gearbox completely dismantled	Gearbox capacity, gearbox partially dismantled ⇒ <a href="#">page 99</a>
2.1 l	1.9 l

#### 4.1.2 O-rings, seals, gaskets and sealants

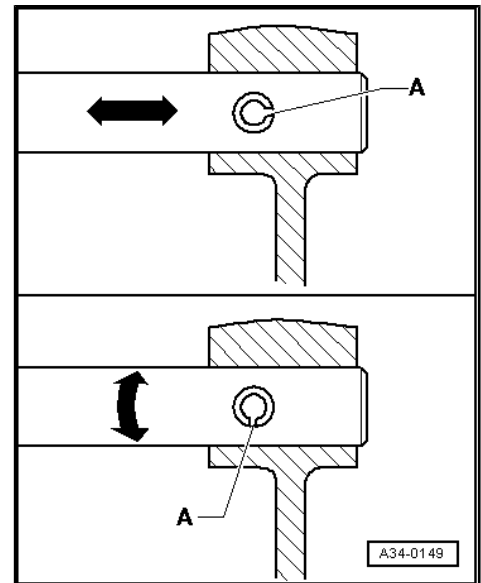
- ◆ Thoroughly clean housing joint surfaces before applying sealant
- ◆ Apply sealant -AMV 188 200 03- uniformly but not too thick.
- ◆ Always renew O-rings, seals and gaskets.
- ◆ After removing gaskets and seals, always inspect contact surface of housing or shaft for burrs resulting from removal or for other signs of damage.
- ◆ Before installing radial shaft seals, lightly oil outer diameter and half-fill space between sealing lips -arrow- with sealing grease -G 052 128 A1- .
- ◆ The open side of the oil seal faces the side with fluid filling.
- ◆ Press in new oil seals so that sealing lip does not contact the shaft in the same place as the old seal (make use of insertion depth tolerances).
- ◆ Lightly oil O-rings before installing; this prevents the rings being crushed when inserted.
- ◆ After renewing seals and gaskets, check oil level in gearbox and replenish if necessary ⇒ [page 99](#) .





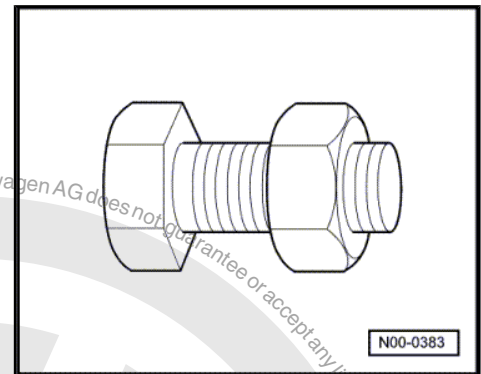
### 4.1.3 Locking devices

- ◆ Do not overstretch retaining rings.
- ◆ Always renew retaining rings which have been damaged or overstretched.
- ◆ Retaining rings must locate properly in grooves.
- ◆ Renew spring pins. Installation position: slit -A- should be in line with the line of force -arrow-.



### 4.1.4 Nuts and bolts

- ◆ Loosen nuts or bolts in the order opposite to the tightening sequence.
- ◆ Nuts and bolts which secure covers and housings should be loosened and tightened diagonally in stages if no tightening sequence is specified.
- ◆ Do not cant especially delicate parts, such as clutch pressure plates. Loosen and tighten bolts and nuts in stages in a diagonal sequence.
- ◆ Torque settings are specified for uncoiled bolts and nuts.
- ◆ Always renew self-locking bolts and nuts.
- ◆ Threads of bolts secured with locking fluid must be cleaned with a wire brush. Then insert bolts with locking fluid - AMV 185 101 A1- .
- ◆ Clean threaded holes in which self-locking bolts or bolts with locking fluid have been inserted, e.g. with a thread chaser. Otherwise there is a danger that the bolts may shear when removed again.



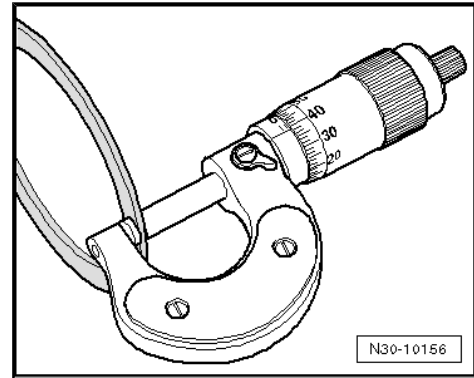
### 4.1.5 Bearing

- ◆ Install needle bearings with lettered side (thicker metal) towards fitting tool.
- ◆ Lubricate all gearbox bearings with gear oil before installing.
- ◆ Tapered roller bearings fitted to one shaft must be renewed as a set. Use same make of bearings.
- ◆ Heat inner races to about 100° C with the inductive heater - VAS 6414- before installing.
- ◆ Do not interchange outer or inner races of bearings of the same size. The bearings are matched in pairs.



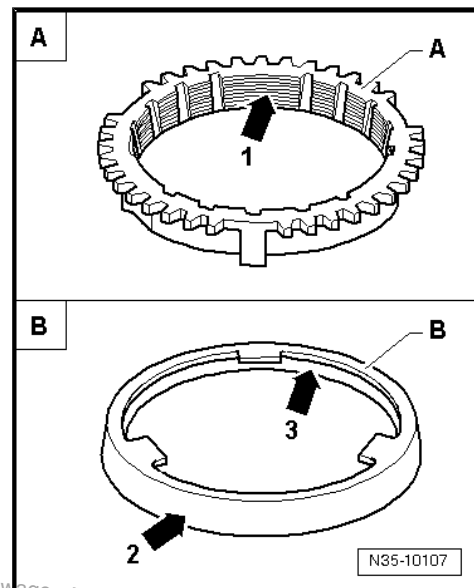
#### 4.1.6 Shims

- ◆ Measure shims at several points with a micrometer. The various thicknesses make it possible to achieve the exact shim thickness required.
- ◆ Check for burrs and damage.
- ◆ Install only flawless shims.



#### 4.1.7 Synchro-rings

- ◆ Do not interchange. When reusing synchro-rings, always fit to the same gear.
- ◆ Check for wear and renew if necessary.
- ◆ Check grooves -arrow 1- of synchro-ring -A- and inner ring for flat spots (worn grooves).
- ◆ If synchro-rings are coated, coating must not be damaged.
- ◆ If an intermediate ring -B- is installed, check the outer friction surface -arrow 2- and inner friction surface -arrow 3- of this intermediate ring for "scoring" and "signs of abnormal wear".
- ◆ Check cone of synchromeshed gear for "scoring" and "signs of abnormal wear".
- ◆ Moisten synchromesh mechanism with gear oil before installing.



#### 4.1.8 Gears, synchro-hubs, inner races for synchromeshed gears

- ◆ Heat inner races for synchromeshed gear to about 100° C with the inductive heater -VAS 6414- before installing.
- ◆ Heat synchro-hub with inductive heater -VAS 6414- to approx. 100 °C before installing. Press in to stop when installing so there is no axial clearance.
- ◆ Heat gears with inductive heater -VAS 6414- to approx. 100 °C before installing. Press in to stop when installing so there is no axial clearance.
- ◆ Observe installation position.

#### 4.1.9 Synchromeshed gears

- ◆ After assembly, check synchromeshed gears for slight play, or for freedom of movement.

#### 4.1.10 Clutch

- ◆ When removing gearbox, remove slave cylinder without disconnecting pipes.
- ◆ If the clutch slave cylinder is removed with the hydraulic line attached, do not depress clutch pedal. Otherwise the piston will be pressed out of the slave cylinder.



- ◆ Ensure that the pressure plate does not cant: loosen and tighten bolts diagonally and in several gradual stages.
- ◆ If the clutch has burnt out, thoroughly clean the clutch housing as well as the friction surface of flywheel with a cloth to reduce the smell of burnt linings.





## 30 – Clutch

### 1 Fault finding, power transmission

- Refer to ⇒ Fault finding, power transmission; Rep. Gr. 30 ;  
Complaints about clutch and clutch mechanism and ⇒ Fault  
finding, power transmission; Rep. Gr. 34 ; Complaints about  
selector mechanism







## 2 Repairing clutch mechanism

### 2.1 Overview



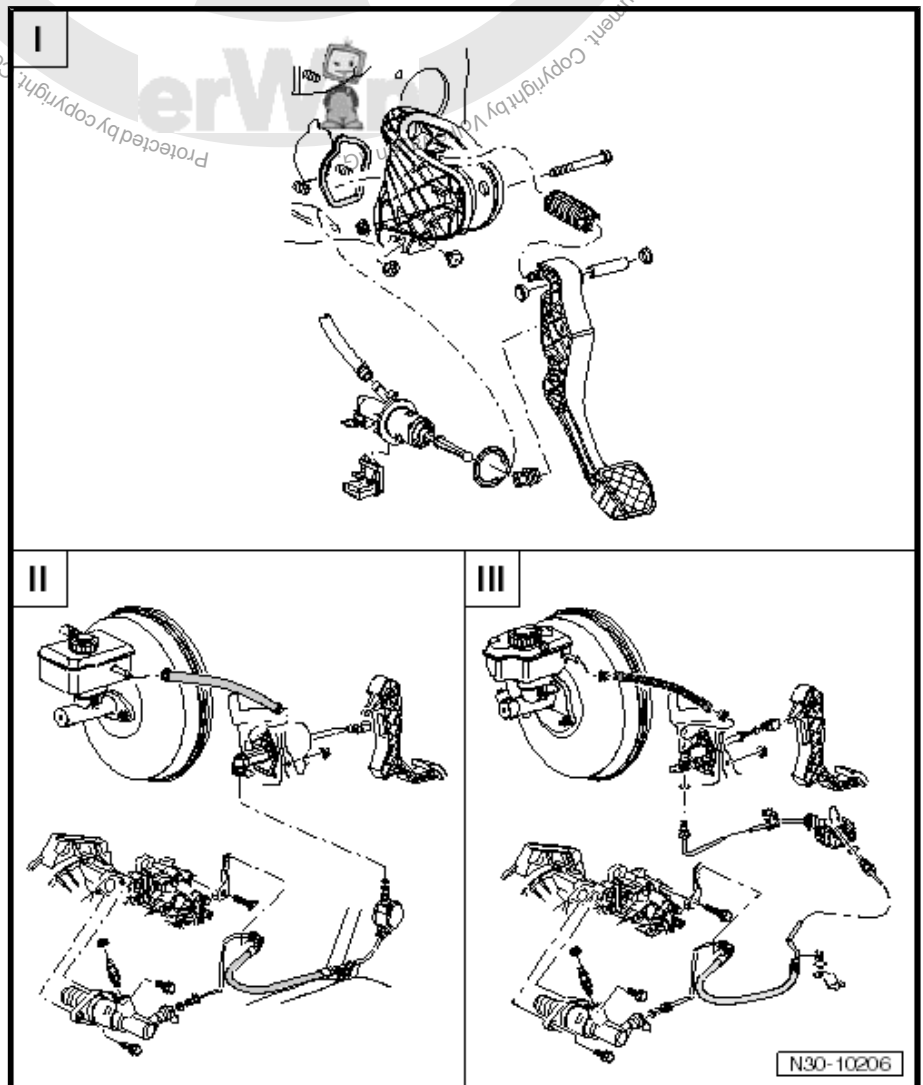
#### Note

- ◆ Before disconnecting battery, obtain code for radio units having anti-theft coding.
- ◆ With ignition switched off, disconnect battery earth strap ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and connecting battery .
- ◆ When reconnecting battery, refer to ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and connecting battery .
- ◆ Lubricate all bearings and contact surfaces with grease -G 000 450 02- .

I - Assembly overview - pedal cluster ⇒ [page 14](#)

II - Assembly overview - hydraulics (LHD) ⇒ [page 37](#)

III - Assembly overview - hydraulics (RHD) ⇒ [page 39](#)







- Qty. 3
- For mounting bracket on bulkhead
- Always renew

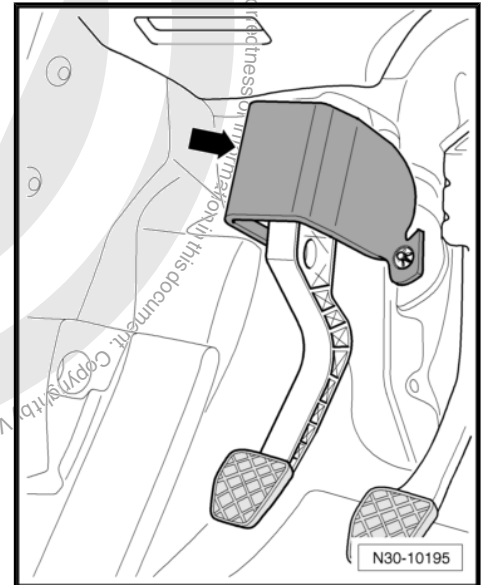
#### 16 - Hexagon nut, 25 Nm

- Always renew

#### 17 - Stop

- For clutch pedal

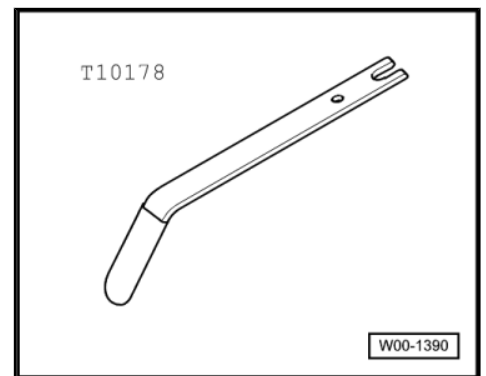
Mounting bracket with damping -arrows-



## 2.3 Removing and installing over-centre spring

Special tools and workshop equipment required

- ◆ Release tool -T10178-



### 2.3.1 Removing

Vehicles with knee airbag



Note

*The installation location of the knee airbag is above the pedal cluster.*

- First check whether a coded radio is fitted. If so, obtain anti-theft code.



- With ignition switched off, disconnect battery earth strap ⇒ Electrical system; Rep. Gr. 27 ; Disconnecting and connecting battery .

**Continuation for all**

- Push driver seat as far back as possible and put steering wheel in highest position.
- Remove trim and cover below trim on drive side ⇒ General body repairs, interior; Rep. Gr. 68 .

**Vehicles with knee airbag**

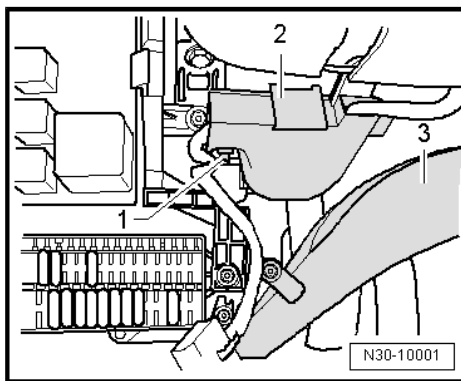
- Remove bracket for knee airbag together with crash bar ⇒ Interior equipment; Rep. Gr. 69 ; Airbag; Removing and installing knee airbag bracket .

**Continuation for all**

- Remove cable guide -2- from steering column.
- Remove footwell vent -3- ⇒ Heating, air conditioning; Rep. Gr. 80 ; Repairing heating .

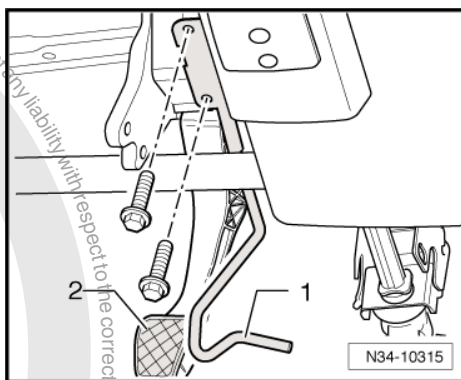
**Vehicles without knee airbag**

The crash bar -1- in front of clutch pedal -2- may be secured in different ways.



**Attachment with 2 bolts**

- Remove crash bar -1- (2 bolts).



**Attachment with 1 bolt**

- Remove crash bar -1- (1 bolt -2-).

