Audi A4 1995 ➢

Automatic Gearbox 01VFWD and 4WD									
Gearbox ID	CJP	CJQ	CJR	CJU	CJV	CJW	DCS	DDS	DDT
	DEQ	DES	DEV	DEY	DKB	DRD	DRK	DRN	DSS
	DST	DTU	DTV	EBU	EBV	EBW	EBX	ECB	ECC
	ECG	EDF	EEK	EFE	EFP	EFQ	EFR	EFP	EKC
	EKD	EMA	EMK	EMP	ETU	ETV	ETZ	EZP	EZR
	EZS	EZV	EZW	EZX	EZY	EZZ	FAL	FAM	FAN
	FAP	FAQ	FAR	FAS	FEV	FHH	FHJ	FNM	FRT
	FRU								
Geartype	01V	01VA							

Edition 01.1999

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List of Workshop Manual Repair GroupsList of Workshop Manual Repair GroupsList of Workshop Manual Repair Groups

Audi A4 1995 ➤

Automatic Gearbox 01VFWD and 4WD

Repair Group

00 - Technical data

32 - Torque converter

37 - Controls, Housing

38 - Gears, Hydraulic controls

39 - Final drive, Differential rear

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

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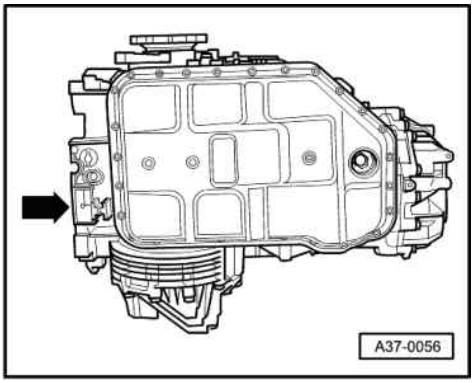
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00 - Technical data

1 - Gearbox identification

1.1 - Gearbox identification



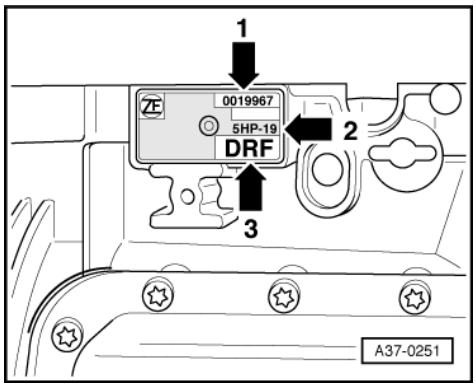
The "automatic 5 gear gearbox 01V" is installed in connection with 4 and 6 cylinder engines in Audi A4 1995 ä
Allocation =>Page 2 .

Arrangement of ID plate on gearbox

-> The coding of the gearbox is located on the ID plate on bottom of gearbox -arrow-.

On the side of the gearbox there is a further identical ID plate which is not accessible when gearbox is installed.

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-> Code and serial number of the gearbox.

Serial gearbox number -arrow 1-
Gearbox marking -arrow 2-
Marking -arrow 3-

The code letters of the gearbox are also given on the vehicle data plates.

2 - Notes on "Automatic 5-gear gearbox 01V"

2.1 - Notes on "Automatic 5-gear gearbox 01V"

The self study program No. 180 provides detailed information about the function of this gearbox.

Torque converter

The torque converter is equipped with a lock-up clutch. The lock-up clutch is closed dependent on load and speed and drives 1st, 2nd, 3rd and 4th gears mechanically independent of slip.

Gearbox

The 5-speed automatic gearbox 01V is equipped with 5 hydraulically activated forward gears. When the lock-up clutch is closed these forward gears become mechanically driven gears by cutting-out the torque converter slip.

Hydraulic control

A distinction is made between two types of gearbox.
Gearbox with hydraulic control E17, in which gearbox input speed sender (inductive sender) is attached to underside of valve body.
Gearbox with hydraulic control E18/2, in which gearbox input speed sender (Hall sender) is attached to gearbox housing behind valve body.

Information on the gearbox concerned can be found in the tables from Page 2 onwards

Self-diagnosis

The self-diagnosis is described in the Booklet Audi A4 1995 ä, Automatic Gearbox 01V, Self-diagnosis.

=> Repair group 01

3 - Code letters, mechanical unit assignment, transmission ratios, equipment

3.1 - Code letters, mechanical unit assignment, transmission ratios, equipment

Front-wheel drive

Automatic gearbox		01V.F	01V.F	01V.J
Gearbox	Code letters	CJQ	EBU	DDT
	Production from to	01.96 10.98	11.98	09.96 08.99
Torque converter	Code letters	M28	M28	M28
Allocation	Model	Audi A4 1995 ä RoW	Audi A4 1995 ä RoW	Audi A4 1995 ä USA
	Engine	1.8 I 5V - 110 kW	1.8 I 5V - 110 kW	1.8 I 5V - 110 kW
Ratios	1st gear	3.665	3.665	3.665
	2nd gear	1.999	1.999	1.999
	3rd gear	1.407	1.407	1.407
	4th gear	1.000	1.000	1.000
	5th gear	0.742	0.742	0.742
	Reverse gear	4.096	4.096	4.096

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Valve body allocation according to coding of gearbox

=> Spare parts catalogue

Gearbox	Code letters		CJQ	EBU	DDT
Intermediate drive	No. of teeth	Input gear	29	29	29
		Output gear	35	35	35
	Ratio		1.207	1.207	1.207
Final drive	No. of teeth	Pinion shaft	11	11	11
		Crown wheel	30	30	34
	Ratio		2.727	2.727	3.091
CAN bus			without CAN bus	with CAN bus	without CAN bus
Electronic throttle			without electronic throttle	with electronic throttle	without electronic throttle
Hydraulic control			E 17	E 18/2	E 17

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Automatic gearbox			01V.J	01V.H	01V.B
Gearbox	Code letters		EFP	DDS	EFR
	Production	from	09.99	09.95	11.98
		to			
torque converter	Code letters		M28	L28	J34
Allocation	Model		Audi A4 1995 ä USA	Audi A4 1995 ä Thailand	Audi A4 1995 ä RoW
	Engine		1.8 l 5V - 110 kW	2.4 l 2V - 110 kW	2.5 l V6 TDI 110 kW, EU II
Ratios	1st gear		3.665	3.665	3.665
	2nd gear		1.999	1.999	1.999
	3rd gear		1.407	1.407	1.407
	4th gear		1.000	1.000	1.000
	5th gear		0.742	0.742	0.742
	Reverse gear		4.096	4.096	4.096

Valve body allocation according to coding of gearbox

=> Spare parts catalogue

Gearbox	Code letters		EFP	DDS	EFR
Intermediate drive	No. of teeth	Input gear	29	29	29
		Output gear	35	35	29
	Ratio		1.207	1.207	1.000
Final drive	No. of teeth	Pinion shaft	11	11	11
		Crown wheel	34	32	34
	Ratio		3.091	2.909	3.091
CAN bus			with CAN bus	without CAN bus	with CAN bus
Electronic throttle			with electronic throttle	without electronic throttle	with electronic throttle

Hydraulic control	E 18/2	E 17	E 17

Automatic gearbox			01V.D	01V.B	01V.F
Gearbox	Code letters		DEQ	EEK	CJU
	Production	from to	03.98 10.98	05.99	04.95
torque converter	Code letters		J34	J34	L28
Allocation	Model		Audi A4 1995 ä RoW	Audi A4 1995 ä RoW	Audi A4 1995 ä all markets
	Engine		2.5 l V6 TDI 110 kW, EU II	2.5 l V6 TDI 110 kW, EU III-D	2.6 l 2V - 110 kW
Ratios	1st gear		3.665	3.665	3.665
	2nd gear		1.999	1.999	1.999
	3rd gear		1.407	1.407	1.407
	4th gear		1.000	1.000	1.000
	5th gear		0.742	0.742	0.742
	Reverse gear		4.096	4.096	4.096

Valve body allocation according to coding of gearbox

=> Spare parts catalogue

Gearbox	Code letters		DEQ	EEK	CJU
Intermediate drive	No. of teeth	Input gear	29	29	29
		Output gear	29	29	35
	Ratio		1.000	1.000	1.207
Final drive	No. of teeth	Pinion shaft	11	11	11
		Crown wheel	30	34	30
	Ratio		2.727	3.091	2.727
CAN bus			with CAN bus	with CAN bus	without CAN bus
Electronic throttle			with electronic throttle	with electronic throttle	without electronic throttle
Hydraulic control			E 17	E 18/2	E 17

Automatic gearbox			01V.F	01V.F	01V.E
Gearbox	Code letters		DES	EBV	CJV
	Production	from to	08.97 11.98	11.98	03.95 03.95
torque converter	Code letters		K28	K28	N24
Allocation	Model		Audi A4 1995 ä all markets	Audi A4 1995 ä all markets	Audi A4 1995 ä all markets
	Engine		2.4 l 5V - 121 kW	2.4 l 5V - 121 kW	2.8 l 2V - 128 kW
Ratios	1st gear		3.665	3.665	3.665
	2nd gear		1.999	1.999	1.999
	3rd gear		1.407	1.407	1.407
	4th gear		1.000	1.000	1.000
	5th gear		0.742	0.742	0.742

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Reverse gear	4.096	4.096	4.096

Valve body allocation according to coding of gearbox

=> Spare parts catalogue

Gearbox	Code letters		DES	EBV	CJV
Intermediate drive	No. of teeth	Input gear	29	29	29
		Output gear	35	35	34
	Ratio		1.207	1.207	1.172
Final drive	No. of teeth	Pinion shaft	11	11	11
		Crown wheel	30	30	30
	Ratio		2.727	2.727	2.727
CAN bus			without CAN bus	with CAN bus	without CAN bus
Electronic throttle			without electronic throttle	with electronic throttle	without electronic throttle
Hydraulic control			E 17	E 18/2	E17

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Automatic gearbox			01V.E	01V.B	01V.B
Gearbox	Code letters		DCS	CJW	DSS
	Production	from to	04.98	09.96 04.97	05.97 10.98
torque converter	Code letters		K28	N28	F31
Allocation	Model		Audi A4 1995 ä all markets	Audi A4 1995 ä RoW	Audi A4 1995 ä RoW
	Engine		2.8 l 2V - 128 kW	2.8 l 5V - 142 kW	2.8 l 5V - 142 kW
Ratios	1st gear		3.665	3.665	3.665
	2nd gear		1.999	1.999	1.999
	3rd gear		1.407	1.407	1.407
	4th gear		1.000	1.000	1.000
	5th gear		0.742	0.742	0.742
	Reverse gear		4.096	4.096	4.096

Valve body allocation according to coding of gearbox

=> Spare parts catalogue

Gearbox	Code letters		DCS	CJW	DSS
Intermediate drive	No. of teeth	Input gear	29	29	29
		Output gear	34	29	29
	Ratio		1.172	1.000	1.000
Final drive	No. of teeth	Pinion shaft	11	11	11
		Crown wheel	30	34	34
	Ratio		2.727	3.091	3.091
CAN bus			without CAN bus	without CAN bus	with CAN bus
Electronic throttle			without electronic throttle	without electronic throttle	without electronic throttle

Hydraulic control	E 17	E 17	E17

Automatic gearbox			01V.B	01V.F	01V.F
Gearbox	Code letters		EBW	DRD	EBX
	Production	from to	11.98	03.97 07.99	07.99
torque converter	Code letters		F31	F31	F31
Allocation	Model		Audi A4 1995 ä RoW	Audi A4 1995 ä USA	Audi A4 1995 ä USA
	Engine		2.8 l 5V - 142 kW	2.8 l 5V - 142 kW	2.8 l 5V - 142 kW
Ratios	1st gear		3.665	3.665	3.665
	2nd gear		1.999	1.999	1.999
	3rd gear		1.407	1.407	1.407
	4th gear		1.000	1.000	1.000
	5th gear		0.742	0.742	0.742
	Reverse gear		4.096	4.096	4.096

Valve body allocation according to coding of gearbox

=> Spare parts catalogue

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Gearbox	Code letters		EBW	DRD	EBX
Intermediate drive	No. of teeth	Input gear	29	29	29
		Output gear	29	35	35
	Ratio		1.000	1.207	1.207
Final drive	No. of teeth	Pinion shaft	11	11	11
		Crown wheel	34	30	30
	Ratio		3.091	2.727	2.727
CAN bus			with CAN bus	with CAN bus	with CAN bus
Electronic throttle			with electronic throttle	without electronic throttle	with electronic throttle
Hydraulic control			E 18/2	E 17	E18/2

Four-wheel drive

Automatic gearbox			01V 0.4	01V 0.4	01V 0.4
Gearbox	Code letters		DKB	DTV	EFQ
	Production	from to	07.96 02.97	03.97 07.99	08.98
torque converter	Code letters		M28	M28	M28
Allocation	Model		Audi A4 1995 ä USA	Audi A4 1995 ä USA	Audi A4 1995 ä USA
	Engine		1.8 l 5V - 110 kW	1.8 l 5V - 110 kW	1.8 l 5V - 110 kW
Ratios	1st gear		3.665	3.665	3.665
	2nd gear		1.99	1.999	1.999
	3rd gear		1.407	1.407	1.407
	4th gear		1.000	1.000	1.000
	5th gear		0.742	0.742	0.742

Reverse gear	4.096	4.096	4.096

Valve body allocation according to coding of gearbox

=> Spare parts catalogue

Gearbox	Code letters		DKB	DTV	EFQ
Intermediate drive-VA	No. of teeth	Input gear	29	29	29
		Output gear	35	35	35
	Ratio		1.207	1.207	1.207
Final drive-VA	No. of teeth	Pinion shaft	11	11	11
		Crown wheel	34	34	34
	Ratio		3.091	3.091	3.091
Intermediate drive-HA	No. of teeth	Input gear	41	41	41
		Output gear	37	37	37
	Ratio		0.902	0.902	0.902
Final drive-HA	No. of teeth	Pinion shaft	9	9	9
		Crown wheel	37	37	37
	Ratio		4.111	4.111	4.111
CAN bus			without CAN bus	without CAN bus	with CAN bus
Electronic throttle			without electronic throttle	without electronic throttle	with electronic throttle
Hydraulic control			E 17	E 17	E18/2

Automatic gearbox			01V 0.3	01V 0.3	01V 0.8
Gearbox	Code letters		DEV	ECC	DRK
	Production	from to	01.98 11.98	11.98	05.98 10.98
torque converter	Code letters		K28	K28	J34
Allocation	Model		Audi A4 1995 ä Japan	Audi A4 1995 ä Japan	Audi A4 1995 ä
	Engine		2.4 l 5V - 121 kW	2.4 l 5V - 121 kW	2.5 l V6 TDI 110 kW, EU II
Ratios	1st gear		3.665	3.665	3.665
	2nd gear		1.999	1.999	1.999
	3rd gear		1.407	1.407	1.407
	4th gear		1.000	1.000	1.000
	5th gear		0.742	0.742	0.742
	Reverse gear		4.096	4.096	4.096

Valve body allocation according to coding of gearbox

=> Spare parts catalogue

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Gearbox	Code letters		DEV	ECC	DRK
Intermediate drive -VA	No. of teeth	Input gear	29	29	29

		Output gear	35	35	29
	Ratio		1.207	1.207	1.000
Final drive - VA	No. of teeth	Pinion shaft	11	11	11
		Crown wheel	30	30	30
	Ratio		2.727	2.727	2.727
Intermediate drive-HA	No. of teeth	Input gear	41	41	38
		Output gear	33	33	28
	Ratio		0.805	0.805	0.737
Final drive - HA	No. of teeth	Pinion shaft	9	9	10
		Crown wheel	37	37	37
	Ratio		4.111	4.111	3.700
CAN bus			without CAN bus	with CAN bus	with CAN bus
Electronic throttle			without electronic throttle	with electronic throttle	with electronic throttle
Hydraulic control			E 17	E 18/2	E 17

Automatic gearbox			**01V.2**	**01V.2**	**01V.1**
Gearbox	Code letters		**DEY**	**EFE**	**CJP**
	Production	from	08.98	02.99	10.95
		to			
torque converter	Code letters		**J34**	**J34**	**K28**
Allocation	Model		Audi A4 1995 ä	Audi A4 1995 ä	Audi A4 1995 ä all markets
	Engine		2.5 l V6 TDI 110 kW, EU II	2.5 l V6 TDI 110 kW, EU III-D	2.8 l 2V - 128 kW
Ratios	1st gear		3.665	3.665	3.665
	2nd gear		1.999	1.999	1.999
	3rd gear		1.407	1.407	1.407
	4th gear		1.000	1.000	1.000
	5th gear		0.742	0.742	0.742
	Reverse gear		4.096	4.096	4.096

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Valve body allocation according to coding of gearbox

=> Spare parts catalogue

Gearbox	Code letters		**DEY**	**EFE**	**CJP**
Intermediate drive -VA	No. of teeth	Input gear	29	29	29
		Output gear	29	29	34
	Ratio		1.000	1.000	1.172
Final drive - VA	No. of teeth	Pinion shaft	11	11	11
		Crown wheel	34	34	30
	Ratio		3.091	3.091	2.727
Intermediate drive -HA	No. of teeth	Input gear	43	43	40
		Output gear	34	34	31

	Ratio		0.791	0.791	0.775
Final drive - HA	No. of teeth	Pinion shaft	9	9	9
		Crown wheel	35	35	37
	Ratio		3.889	3.889	4.111
CAN bus			with CAN bus	with CAN bus	without CAN bus
Electronic throttle			with electronic throttle	with electronic throttle	without electronic throttle
Hydraulic control			E 17	E 18/2	E 17

Automatic gearbox			**01V.2**	**01V.2**	**01V.2**
Gearbox	Code letters		**CJR**	**DTU**	**DST**
	Production	from to	09.96 01.97	01.97 03.97	03.97 10.98
torque converter	Code letters		**N28**	**N28**	**F31**
Allocation	Model		Audi A4 1995 ä RoW	Audi A4 1995 ä RoW	Audi A4 1995 ä RoW
	Engine		2.8 l 5V - 142 kW	2.8 l 5V - 142 kW	2.8 l 5V - 142 kW
Ratios	1st gear		3.665	3.665	3.665
	2nd gear		1.999	1.999	1.999
	3rd gear		1.407	1.407	1.407
	4th gear		1.000	1.000	1.000
	5th gear		0.742	0.742	0.742
	Reverse gear		4.096	4.096	4.096

Valve body allocation according to coding of gearbox

=> Spare parts catalogue

Gearbox	Code letters		**CJR**	**DTU**	**DST**
Intermediate drive -VA	No. of teeth	Input gear	29	29	29
		Output gear	29	29	29
	Ratio		1.000	1.000	1.000
Final drive - VA	No. of teeth	Pinion shaft	11	11	11
		Crown wheel	34	34	34
	Ratio		3.091	3.091	3.091
Intermediate drive -HA	No. of teeth	Input gear	43	43	43
		Output gear	34	34	34
	Ratio		0.791	0.791	0.791
Final drive - HA	No. of teeth	Pinion shaft	9	9	9
		Crown wheel	35	35	35
	Ratio		3.889	3.889	3.889
CAN bus			without CAN bus	without CAN bus	with CAN bus
Electronic throttle			without electronic throttle	without electronic throttle	without electronic throttle
Hydraulic control			E 17	E 17	E 17

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Automatic gearbox			01V.2	01V.3	01V.3
Gearbox	Code letters		ECB	DRN	ECG
	Production	from to	11.98	03.97 08.99	08.99
torque converter	Code letters		F31	F31	F31
Allocation	Model		Audi A4 1995 ä RoW	Audi A4 1995 ä USA	Audi A4 1995 ä USA
	Engine		2.8 l 5V - 142 kW	2.8 l 5V - 142 kW	2.8 l 5V - 142 kW
Ratios	1st gear		3.665	3.665	3.665
	2nd gear		1.999	1.999	1.999
	3rd gear		1.407	1.407	1.407
	4th gear		1.000	1.000	1.000
	5th gear		0.742	0.742	0.742
	Reverse gear		4.096	4.096	4.096

Valve body allocation according to coding of gearbox

=> Spare parts catalogue

Gearbox	Code letters		ECB	DRN	ECG
Intermediate drive -VA	No. of teeth	Input gear	29	29	29
		Output gear	29	35	35
	Ratio		1.000	1.207	1.207
Final drive - VA	No. of teeth	Pinion shaft	11	11	11
		Crown wheel	34	30	30
	Ratio		3.091	2.727	2.727
Intermediate drive -HA	No. of teeth	Input gear	43	41	41
		Output gear	34	33	33
	Ratio		0.791	0.805	0.805
Final drive - HA	No. of teeth	Pinion shaft	9	9	9
		Crown wheel	35	37	37
	Ratio		3.889	4.111	4.111
CAN bus			with CAN bus	with CAN bus	with CAN bus
Electronic throttle			with electronic throttle	without electronic throttle	with electronic throttle
Hydraulic control			E 18/2	E 17	E 18/2

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Automatic gearbox			01V.2
Gearbox	Code letters		EDF
	Production	from to	04.99
torque convert-er	Code letters		D34
Allocation	Model		Audi A4 1995 ä USA
	Engine		2.7 l 5V - 184 kW
Ratios	1st gear		3.665
	2nd gear		1.999

	3rd gear	1.407
	4th gear	1.000
	5th gear	0.742
	Reverse gear	4.096

Valve body allocation according to coding of gearbox

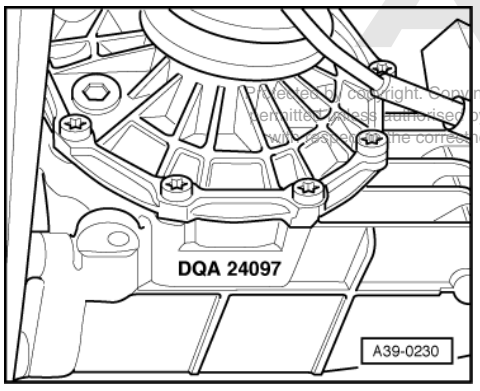
=> Spare parts catalogue

Gearbox	Code letters		**EDF**
Intermediate drive - VA	No. of teeth	Input gear	29
		Output gear	29
	Ratio		1.000
Final drive - VA	No. of teeth	Pinion shaft	11
		Crown wheel	34
	Ratio		3.091
Intermediate drive - HA	No. of teeth	Input gear	43
		Output gear	34
	Ratio		0.791
Final drive - HA	No. of teeth	Pinion shaft	9
		Crown wheel	35
	Ratio		3.889
CAN bus			with CAN bus
Electronic throttle			with electronic throttle
Hydraulic control			E 18/2

4 - Identification of rear final drive

4.1 - Identification of rear final drive

The final drive 01H is assigned to the automatic gearbox 01V 4WD.



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Allocation => Page 12 , Technical data

-> Code letters and manufacturing data for the rear final drive

Example:	DQA	24	09	7
	I	I	I	I
	I	I	I	I
	Code letters	Day	Month	Year (1997) of manufacture

The code letters for the rear final drive are also given on the vehicle data stickers.

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5 - Code letters, mechanical unit Allocation, transmission ratios

5.1 - Code letters, mechanical unit Allocation, transmission ratios

Rear final drive			01H.A	01H.A	01H.A
Final drive	Code letters		DAJ	CKH	DXT
	Insert	from to	05.95 -	03.96 -	01.99 -
Ratio	Final drive	Z2:Z1 = i	35:9 = 3.889	35:9 = 3.889	35:9 = 3.889
Drive shaft	Flange ø mm		100	100	108
Allocation: Automatic gearbox 01V, 4WD	Code letters		CJR, DTU, DST, DRN, ECB, ECG	CJR, DTU, DST, ECB	EDF

Rear final drive			01H.B	01H.B	01H.D
Final drive	Code letters		CKJ	DAK	DRL
	Insert	from to	10.95 04.96	10.95 -	07.97 -
Ratio	Final drive	Z2:Z1 = i	37:9 = 4.111	37:9 = 4.111	37:10 = 3.700
Drive shaft	Flange ø mm		100	100	100
Allocation: Automatic gearbox 01V, 4WD	Code letters		CJP	CJP, DKB, DTV, EFQ, DRN, ECG, DEV, ECC	DRK, DEY, EFE

6 - Filling quantities

6.1 - Filling quantities

Planetary gearbox

Filling quantities	Planetary gearbox	Automatic gearbox
Fresh fill	9.0 l	01V
Change	approx. 2.6 l	
Lubricant	ATF	

ATF is available as a replacement part (also designated VW ATF).

Container 0.5 ltr. -Part No. G 052 162 A1

Container 1.0 ltr. -Part No. G 052 162 A2

Only the ATF available as a replacement part can be used in the planetary gearbox of automatic gearbox 01V.

Front axle drive

Filling quantities	Final drive	Automatic Gearbox
Fresh fill	0.82 l	01V
Change	Filled for life, no change	
Lubricant	Gear oil SAE75 W90 (synthetic oil)	

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Gear oil SAE 75 W90 (synthetic oil) is available as a replacement part

Container 0.5 ltr -Part No. G 052 145 A1

Container 1.0 ltr. -Part No. G 052 145 S2

Transfer gear

Filling quantities	Transfer gear	Automatic Gearbox
Fresh fill	0.8 l	01V
Change	Filled for life, no change	
Lubricant	Gear oil SAE75 W90 (synthetic oil)	

Gear oil SAE 75 W90 (synthetic oil) is available as a replacement part

Container 0.5 ltr -Part No. G 052 145 A1

Container 1.0 ltr. -Part No. G 052 145 S2

Rear final drive

Filling quantities	Final drive	Rear final drive
Fresh fill	1.9 l	01H
Change	Filled for life, no change	
Lubricant	Gear oil SAE75 W90 (synthetic oil)	

Gear oil SAE 75 W90 (synthetic oil) is available as a replacement part

Container 0.5 ltr -Part No. G 052 145 A1

Container 1.0 ltr. -Part No. G 052 145 S2

7 - Repair instructions

7.1 - Repair instructions

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

A number of generally applicable instructions for individual repair operations, which are otherwise mentioned at various points in the Workshop Manual, are summarised here. They apply to this Workshop Manual.

Special tools

A list of the special tools used in the Workshop Manual are listed in folder: "Workshop equipment and tools" or "Special tools".

Gearbox

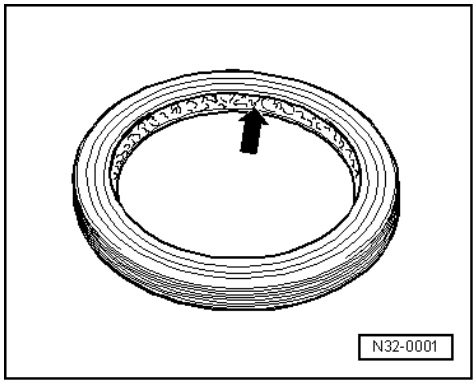
- Rules for cleanliness when working on the automatic gearbox => Page 124 .
- Do not run engine or tow vehicle with oil pan removed or when there is no ATF in the gearbox.
- If the gearbox is removed from the vehicle, secure the torque converter to prevent it dropping out.

- Thoroughly clean all unions and the adjacent areas before disconnecting.
- Check the fitting dimensions of the torque converter before installing the gearbox => Page 20 .
- When installing gearbox, ensure that the dowel sleeves are fitted correctly.
- Place removed parts on a clean surface and cover. Use sheeting and paper. Use lint-free cloths.
- Carefully cover or seal open components if repairs cannot be carried out immediately.
- Only install clean components: do not remove replacement parts from their wrapping until you are ready to install them.
- Check and if necessary correct the following levels on replacing automatic gearbox: ATF in planetary gearbox => Page 12 onwards.
- When exchanging the rear final drive the oil level in rear final drive must be checked and, if necessary, corrected => Page 13 .

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O-rings, seals, gaskets

- Always renew O-rings, seals and gaskets.
- After removing gaskets and seals, always inspect the contact surface on the housing or shaft for burrs resulting from removal or for other signs of damage.
- Thoroughly clean housing joint surfaces before assembling.



- -> Before installing oil seals (radial shaft seals), pack space between sealing lips -arrow- with grease.
- The open side of the oil seals faces toward the side with fluid filling.
- Before installing, lightly lubricate outer circumference of seal and sealing lips with ATF or gear oil, depending on fitting location.
- Lightly lubricate O-rings with ATF before inserting to prevent them being trapped and damaged when assembling.
- Use only ATF in the parts of the gearbox where ATF is the specified lubricant. Other types of lubricant can cause problems with the hydraulic actuation of the gearbox.

- When replacing oil seals, always vary the point at which the sealing lips make contact (use insertion depth tolerances).

- After installation, check and if necessary correct the following levels in the area affected: ATF in planetary gearbox => Page 12 onwards.

Nuts, bolts

- Slacken the bolts in reverse sequence to the specified tightening sequence.
- Nuts and bolts which secure covers and housings should be slackened and tightened crosswise in stages if no tightening sequence is specified.
- Parts which are particularly sensitive to distortion (e.g. valve body) must be kept straight when removing and installing; loosen or tighten diagonally in stages.
- The tightening torques stated apply to non-oiled nuts and bolts.
- Replace self-locking bolts and nuts.
- The threads of bolts which are secured by a locking fluid should be cleaned with a wire brush. Then apply AMV 185 101 A1 when inserting.
- Threaded holes into which self-locking bolts or bolts coated with locking fluid are screwed, must be cleaned (e.g. with a tap). Otherwise there is a danger of bolts shearing when subsequently being removed.

Locking elements

- Do not over-stretch circlips.
- Always renew circlips which have been damaged or over-tensioned.
- Circlips must be properly seated in the base of the groove.

Mounting

- Attach the needle bearing with the written side (greater plate thickness) to the installing tool.
- Lubricate bearings with gear oil or ATF, depending on fitting location.
- The taper roller bearings for the output shaft and the differential in rear final drive are low-friction bearings. Do not additionally oil new taper roller bearings when measuring friction torque. The bearings are pre-treated at the factory with a special type of oil for this purpose.
- Do not interchange inner or outer races of bearings of the same size.

- Always replace the taper roller bearings on one shaft together and use new bearings from a single manufacturer.
- Heat inner races of taper roller bearings to approx. 100 °C before installing. Press in up to stop when installing so there is no axial clearance.

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Adjustment shims

- Use a micrometer to measure the shims at several points. Different tolerances make it possible to obtain exact shim thickness required.
- Check for burrs and damage. Install only adjustment shims which are in perfect condition.
- Only install perfect, undamaged shims.

Valve body

- Renew the valve body if any of the selector elements are scorched.

Self-diagnosis

- Before performing repairs to the automatic gearbox, determine the cause of the fault as precisely as possible using the self-diagnosis.

The self-diagnosis is described in the Booklet Audi A4 1995 ä, Automatic Gearbox 01V, Self-diagnosis.

=> Automatic Gearbox 01V, Self-diagnosis; Repair group 01; Performing self-diagnosis Performing self-diagnosis

32 - Torque converter

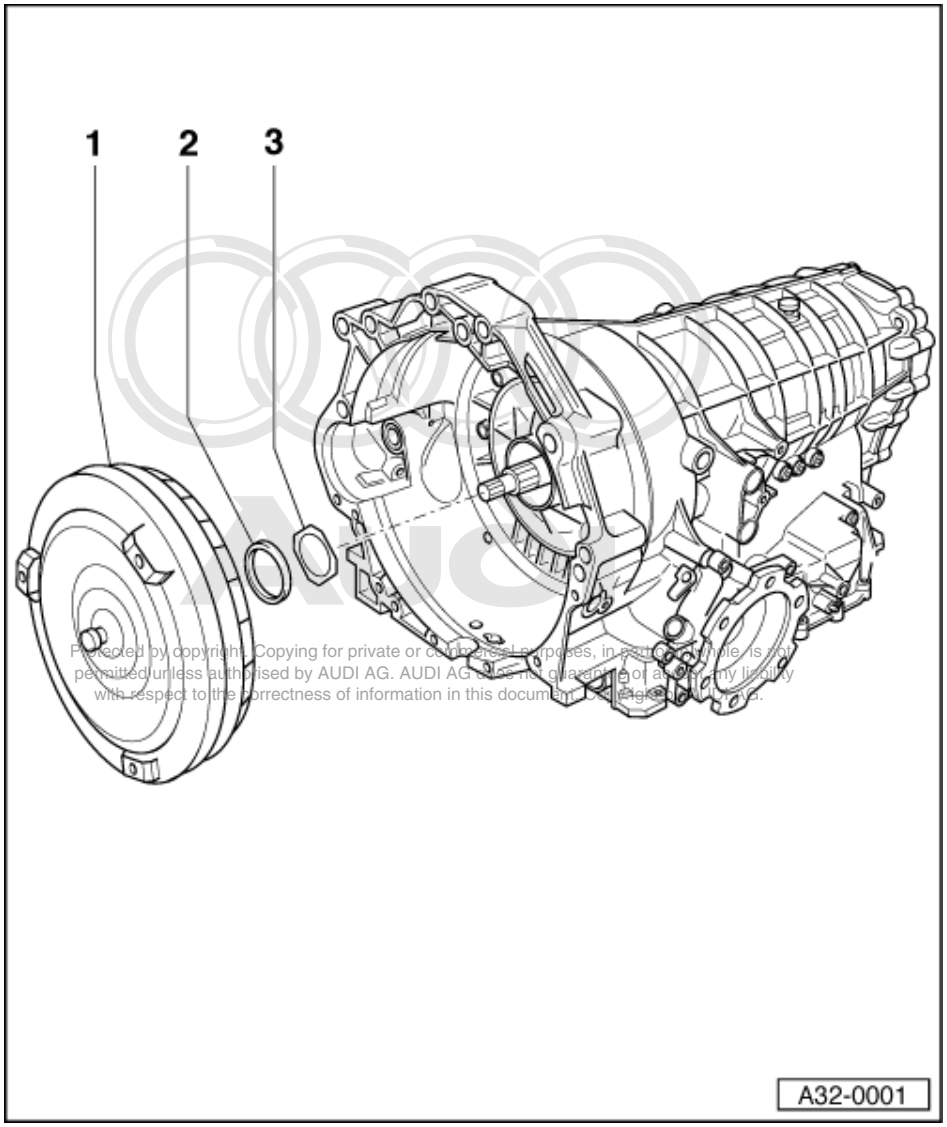
1 - Torque converter

1.1 - Torque converter

Important:
Check the fitting dimensions of the torque converter before installing the gearbox => Page 20 .

Notes:

- Rules for cleanliness when working on the automatic gearbox => Page 124 .
- General repair instructions => Page 14 .
- Coat oil seals thinly with ATF. Other types of lubricant can cause problems with the hydraulic actuation of the gearbox.



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1 Torque converter

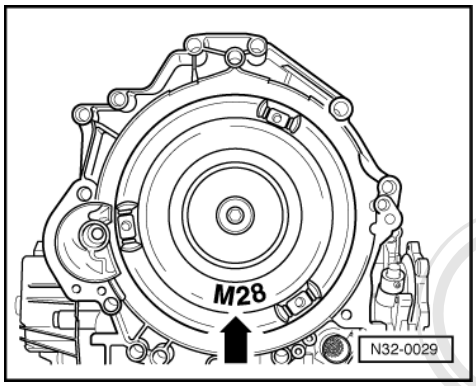
- Secure to prevent it falling out when gearbox is removed
- Labelling => Page 17 .

- Installing =>Page 20 .

2 **Sealing ring**
- Replacing => Page 19 .

3 **Mounting ring**
- Behind oil seal
- Replace. if damaged

1.2 - Identification of torque converter

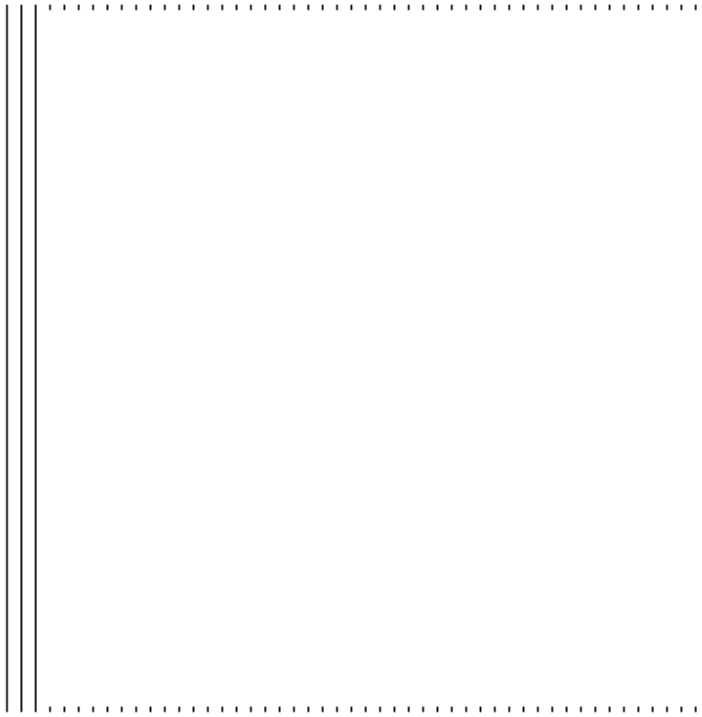


-> There are various torque converters. They are identified by code letters (arrow).

Gearbox/torque converter allocation =>from Page 2

1.3 - Checking torque converter

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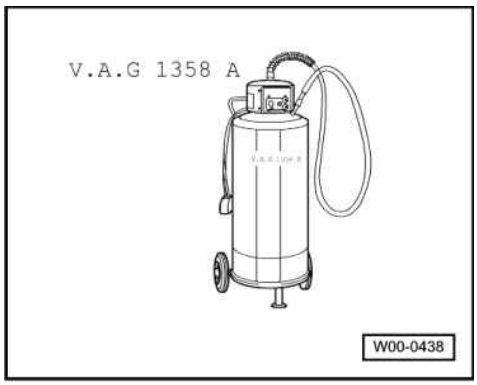


- -> Check torque converter hub -arrow- for scoring.

Note:

The torque converter is welded together and must be replaced as a complete unit if it is damaged or defective.

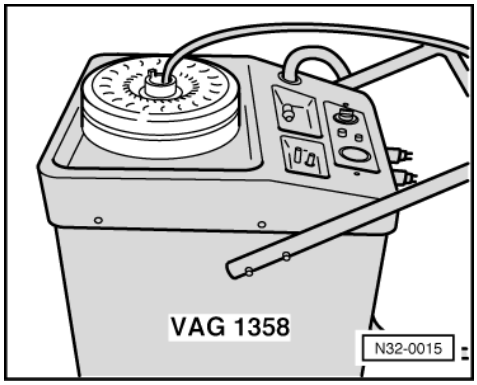
1.4 - Draining torque converter



Special tools, testers and auxiliary equipment required

- V.A.G 1358 A Oil extractor
- Oil extractor probe V.A.G 1358 A/1

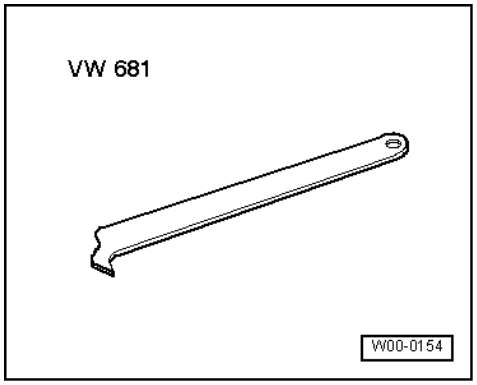
If there is dirt in the ATF resulting from internal wear, or if the gearbox is being overhauled, the torque converter must be drained:



- -> Extract ATF from torque converter using V.A.G 1358 A and probe V.A.G 1358 A/1.

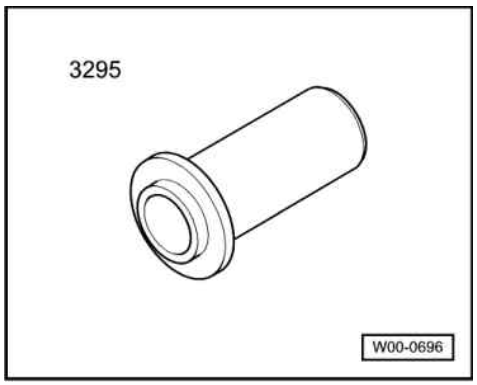
1.5 - Replacing torque converter oil seal

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Special tools, testers and auxiliary equipment required

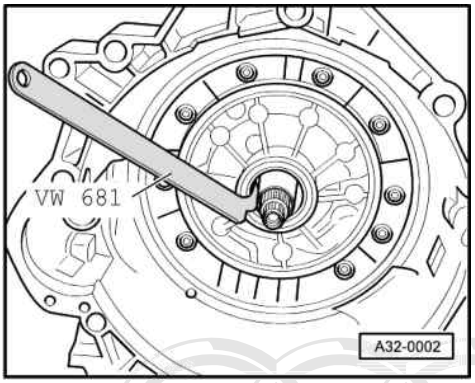
- -> Extractor lever VW 681



- Thrust pad 3295

Removing

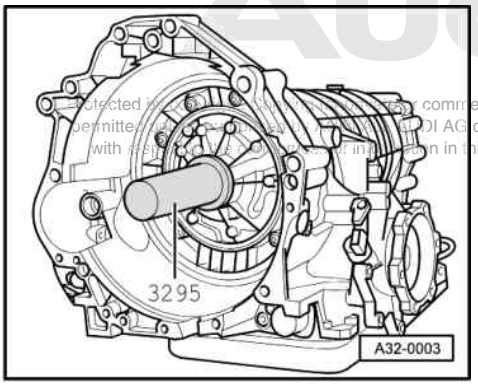
- Removing gearbox => Page 71 .
- Attach the gearbox to the assembly stand => Page 111 or place on a level surface.



- -> Position extractor lever VW 681 directly behind sealing lip of sealing ring so that the mounting ring positioned behind is not damaged.

Installing

- Insert mounting ring.
- Lightly lubricate outer circumference and sealing lips of seal with ATF.
  - Installation position: The open side of the oil seal faces toward the gearbox.



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- -> Use the thrust pad 3295 to push on the oil seal for the torque converter up to the stop of thrust pad.

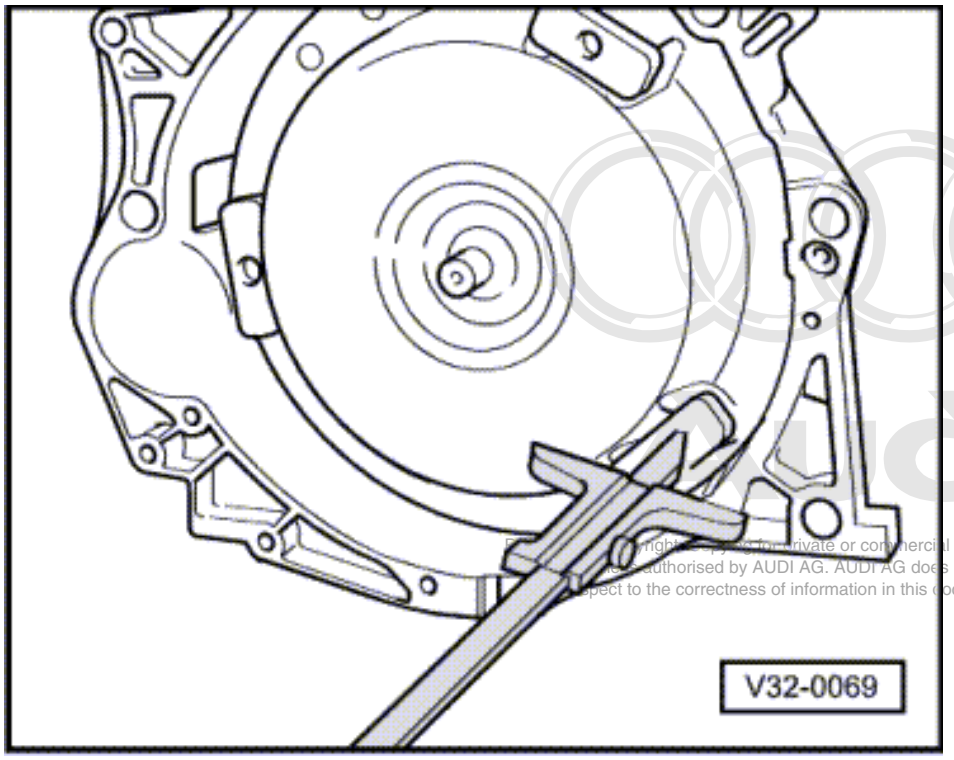
1.6 - Installing torque converter

Special tools, testers and auxiliary equipment required

- Depth gauge

- Press torque converter hub through oil seal as far as first stop.
- Lightly press torque converter inwards and turn until slots on torque converter hub engage in drive lugs on ATF pump gear and torque converter slides in a noticeable distance.

Installation depth



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-> When the torque converter is correctly inserted, the distance between the surface of the securing eyes and the surface of the torque converter bell housing is at least 23 mm.

If the torque converter has not been completely inserted, this distance will be approx. 11 mm.

Important:
If the torque converter is not installed correctly, the torque converter drive plate or the ATF pump will be seriously damaged when the gearbox is joined to the engine.

37 - Controls, Housing

1 - Servicing shift mechanism

1.1 - Servicing shift mechanism

Important:
Before working on engine when it is running, move selector lever into position "P" and apply handbrake.

Notes:

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- Lubricate mountings and sliding surfaces with polyurea grease, part number G 052 142 A2.
- The centre console must be removed for repair work to be carried out.

1.2 - Checking ignition key lock

- Turn ignition key to "ignition on" position.
- Press and hold brake pedal.

- When button in selector lever handle is pressed it must be possible to move selector lever out of position "P" without "catching".
- The ignition key must not be able to be removed in any selector lever setting other than "P".

- Move selector lever to position "P".

- It must be possible to move ignition key to removal position without "sticking".

- Pull out ignition key.

- Selector lever cannot be shifted out of "P" position with locking button and foot brake pressed.

1.3 - Checking shift mechanism

Selector lever in "P" position and ignition switched on:

- Brake pedal not depressed:

  Selector lever is locked and cannot be shifted out of "P" position when the button in the selector lever handle is pressed. The solenoid for the selector lever lock locks the selector lever.

- Brake pedal depressed:

  Solenoid for selector lever lock releases selector lever. It should be possible to engage a gear smoothly when the button on the selector lever handle is pressed.
  Slowly shift the selector lever from "P" through "R, N, D, 4, 3, 2" checking whether the selector lever position in the dash panel insert is the same as the selector lever position.

Selector lever in "N" position and ignition switched on:

- Brake pedal not depressed:

Selector lever is locked and cannot be shifted out of "N" position when the button in the selector lever handle is pressed. The solenoid for the selector lever lock locks the selector lever.

- Brake pedal depressed:

  Solenoid for selector lever lock releases selector lever. It should be possible to engage a gear smoothly when the button on the selector lever handle is pressed.

Additional testing for shift mechanisms with Tiptronic only:

Selector lever in "D" position; ignition and light switched on

- Start the engine and run at idling speed.
- Apply the hand brake and press the brake pedal.

Shift the selector lever out of "D" into the Tiptronic gate. The illuminated "D" symbol on the shift mechanism cover must go out and the "+" and "-" symbols must illuminate.
The selector lever setting display in the dash panel insert must switch from "PRDN432" to "54321" when the selector lever shifts into the Tiptronic gate.

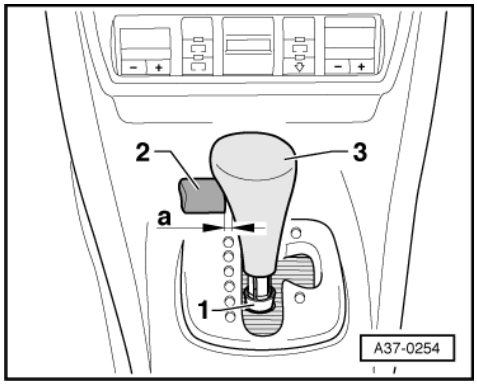
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Notes:

- The starter cannot be actuated if the selector lever is set to "2", "3", "4", "D", and "R".
- In the case of RHD vehicles, it should only be possible to actuate the starter with the selector lever set to "P" or "N" if the lock button in the handle of the selector lever has not been actuated.
- At speeds over 5 km/h and with the selector lever set to "N", the solenoid for the selector lever lock should not engage and should lock the selector lever. Selector lever can be shifted into a driving gear.
- When travelling at speeds below 2 km/h (almost stopped) and shifting into selector lever position "N", solenoid for selector lever lock must not engage until after approx. 1s. Selector lever cannot be shifted out of "N" position until brake pedal is depressed.

1.4 - Shift mechanisms overview

There are various shift mechanisms with or without Tiptronic



Notes:

- -> For shift mechanisms with Tiptronic the Tiptronic gate can be switched manually when in selector lever position D. When touching the selector lever manually the next higher or lower gear can be selected in this gate.
- For shift mechanisms without Tiptronic this additional Tiptronic gate is not present.

The shift mechanism with Tiptronic is described from Page => 23 onwards.

The shift mechanism without Tiptronic is described from Page => 55 onwards.

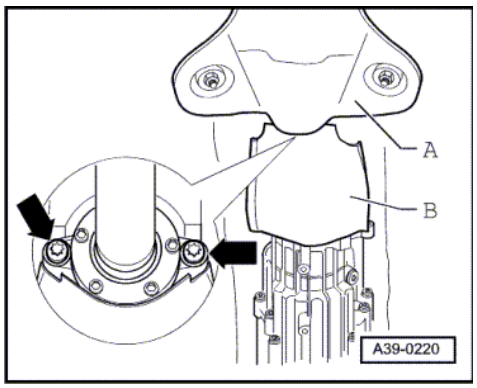
1.5 - Removing and installing shift mechanism with Tiptronic

Removing

- Move selector lever to position "P".
- Observe or obtain radio code on vehicles with coded radio.
- Disconnect earth strap on battery.
- Remove selector lever handle =>Page 35 .
- Remove shift mechanism cover => Page 36 .
- Raise vehicle.
- Disconnect the downpipes with catalytic converter from the rear exhaust and tie them up at the side. => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system

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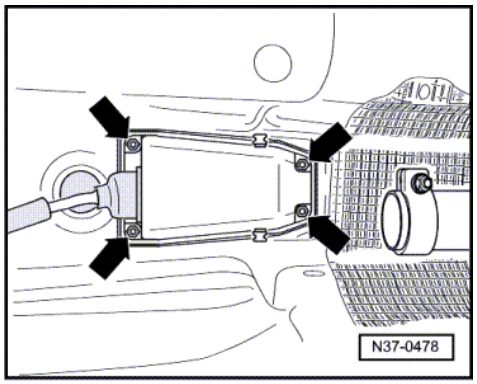
Vehicles with four-wheel drive



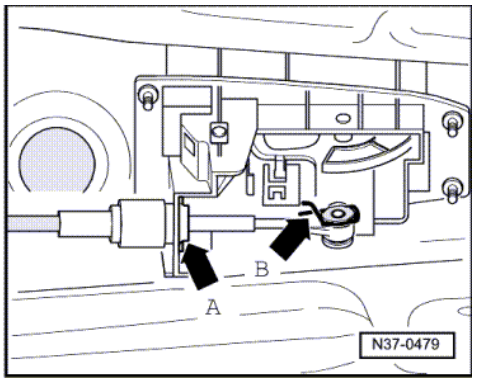
- -> Remove heat shield -A- over propshaft.
- Remove heat shield -B- for propshaft from Torsen differential cover -arrows-.
- Unbolt the propshaft at the gearbox. Suspend or support the propshaft.

Continued for all vehicles

- Loosen selector lever cable sleeve from shift mechanism cover and push back.



- -> Loosen bolts -arrows- and take off cover from bearing cup.



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- -> Press together securing clip -B- at ends and remove.
- Pull locking plate -A- for selector lever cable on mounting bracket out downwards.
- Detach selector lever cable from selector lever.

From above:

- Unclip interlock cable from securing spring on bearing cup, to do this lift securing spring lightly.
- Unscrew the nuts (4 off).

From below:

- Remove the bearing cup downwards.
- At the same time pull selector lever cable out from mounting bracket; for this purpose, do not kink cable.

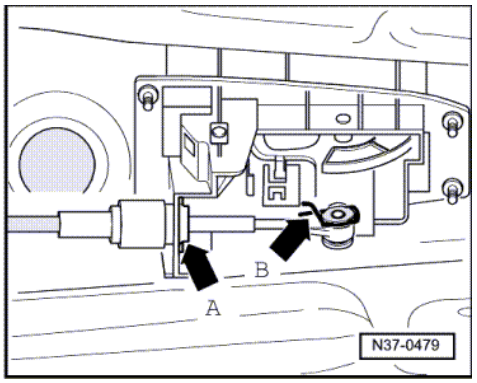
Installing

- Installation must be performed in the reverse order.

You must also perform and observe the following test steps.

- Move the selector lever and lever/selector shaft to "P" (the parking lock must engage).

- Raise vehicle.
- Insert selector lever cable into bearing cup.
- Do not kink selector lever cable.
- Attach bearing cup to vehicle body.
- Tighten nuts (4 off) to 10 Nm from above.
- Fit selector lever cable to cover of shift mechanism.
- Install and adjust interlock cable => from Page 52 .

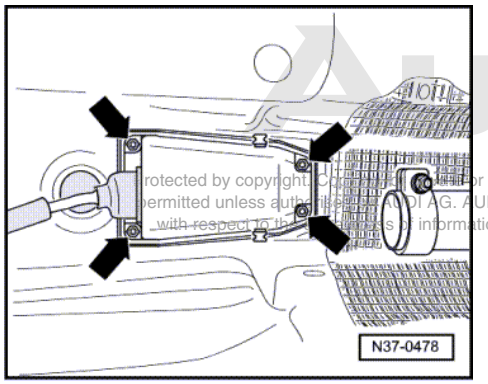


- Fit selector lever cable to selector lever.
- -> Mount lock washer -A- for selector lever cable on bearing cup.

Installation position:

Angled end of lock washer points towards end of selector lever cable.

- Press together securing clip -B- at ends and push onto end of selector lever cable.
- Fit cover.



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- -> Tighten nuts -arrows- (4 off) to 10 Nm.
- Check selector lever cable adjustment, adjust if necessary => Page 48 .
- Check ignition key withdrawal lock => Page 21 .

Vehicles with four-wheel drive

- Bolt the propshaft onto the gearbox flange => Page 225 , Removing and installing propshaft.
- Install heat shield.

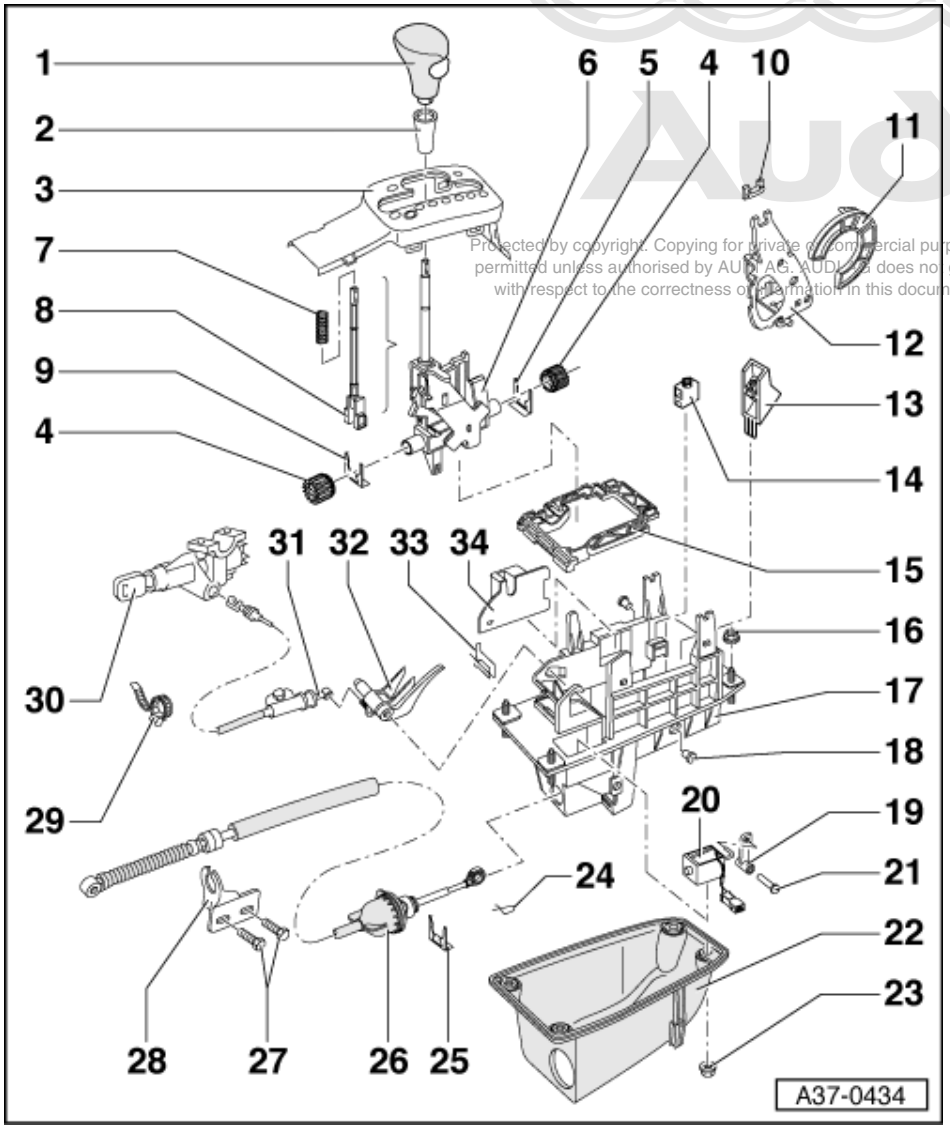
Continued for all vehicles

- Mount downpipe on rear exhaust.
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Install shift mechanism cover => Page 36 .
- Install selector lever handle =>Page 35 .
- Reconnect earth strap to battery.
- On vehicles with coded radio unit, activate code.
- Checking shift mechanism => Page 21 .

Tightening torque:

Components	Tightening torques
Gate selector cable to support bracket	12 Nm
Support bracket on gearbox (2 x M8)	23 Nm
Heat shield/selector lever cable at gearbox, M6	9 Nm
Heat shield/selector lever cable at gearbox, M8	23 Nm
Gear selector mechanism to body, M6	8 Nm

1.6 - Assembly overview of shift mechanism with Tiptronic



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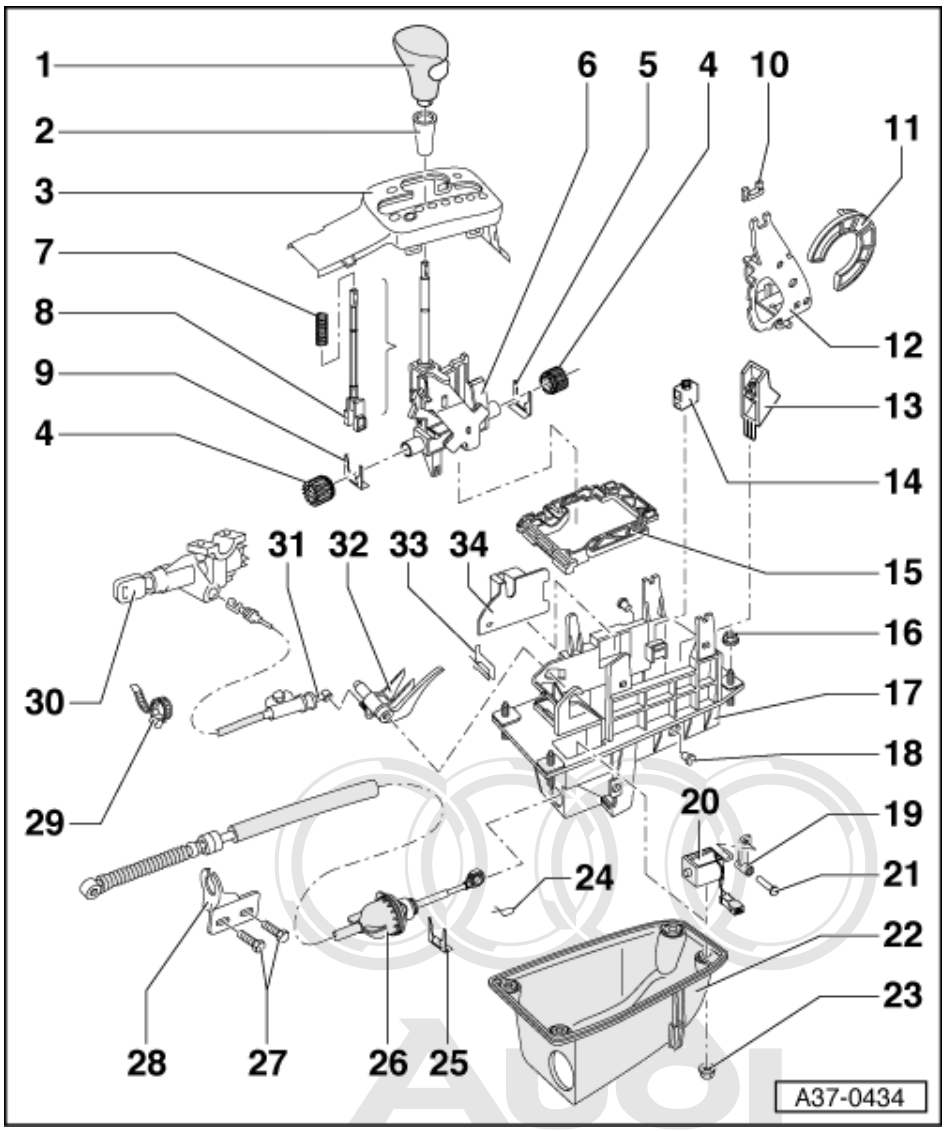
Assembly sequence => Page 43

Lubricate mountings and sliding surfaces with polyurea grease, part number G 052 142 A2.

1 **Handle for selector lever**
- Removing and installing=>Page 35

2 **Sleeve**
- Engages in selector lever handle

3 **Cover**
- Removing and installing=>Page 36
- Dismantling and assembling => Page 38



4 Bush

- Use securing clip - 5 - or - 9 - to secure in bearing cup - 17 -
- Removing and installing=>Page 43

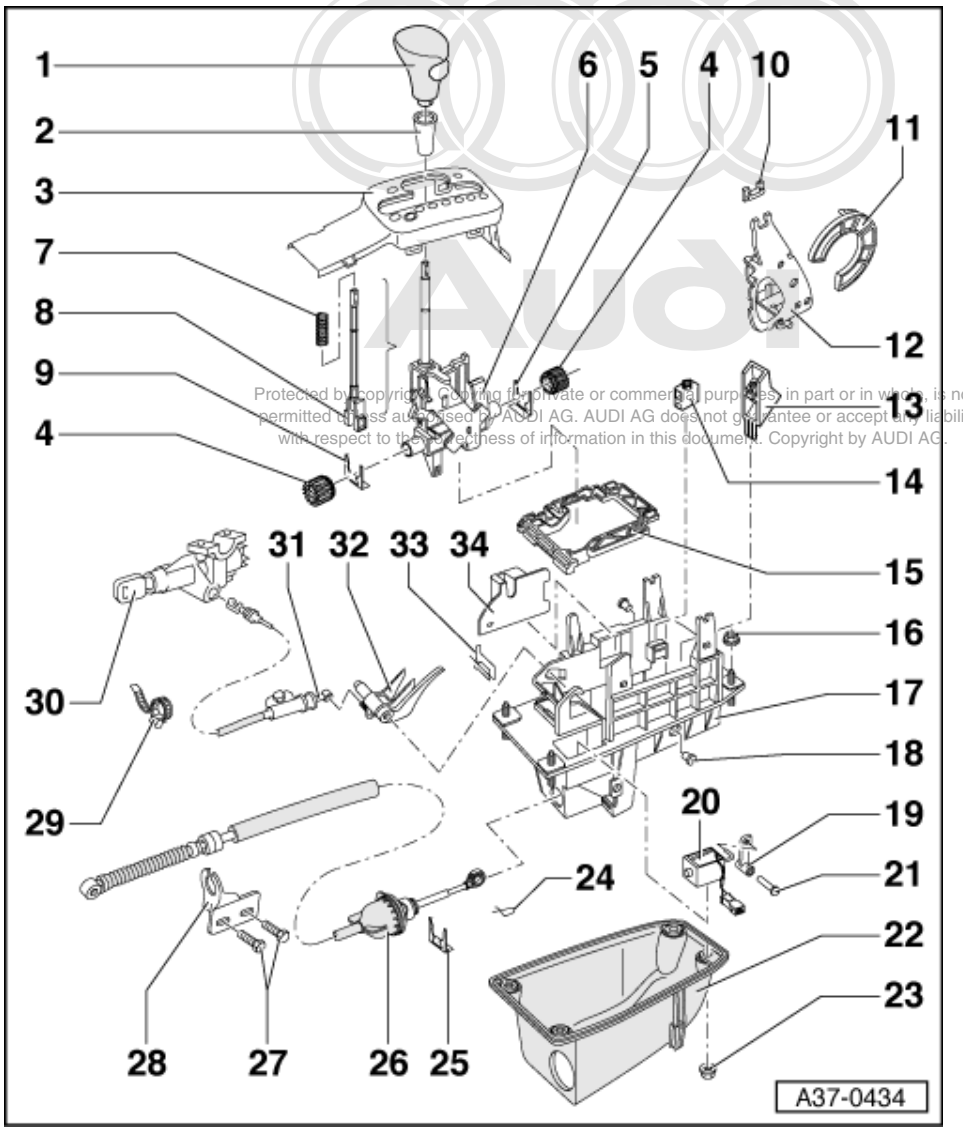
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5 Securing clip (thin, with tensioning spring)

- Secures bearing bush - 4 - in bearing cup - 17 -
- Installation position:
  Angled ends point towards inside of bearing cup

6 Gate lever

- With pull rod, compression spring, shift gate and Tiptronic springing
- Removing and installing => from Page 35
- Dismantling and assembling => Page 43



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7 Spring

- Removing and installing => from Page 43

8 Pull rod

- Removing and installing => from Page 43

9 Securing clip (thick, without tensioning spring)

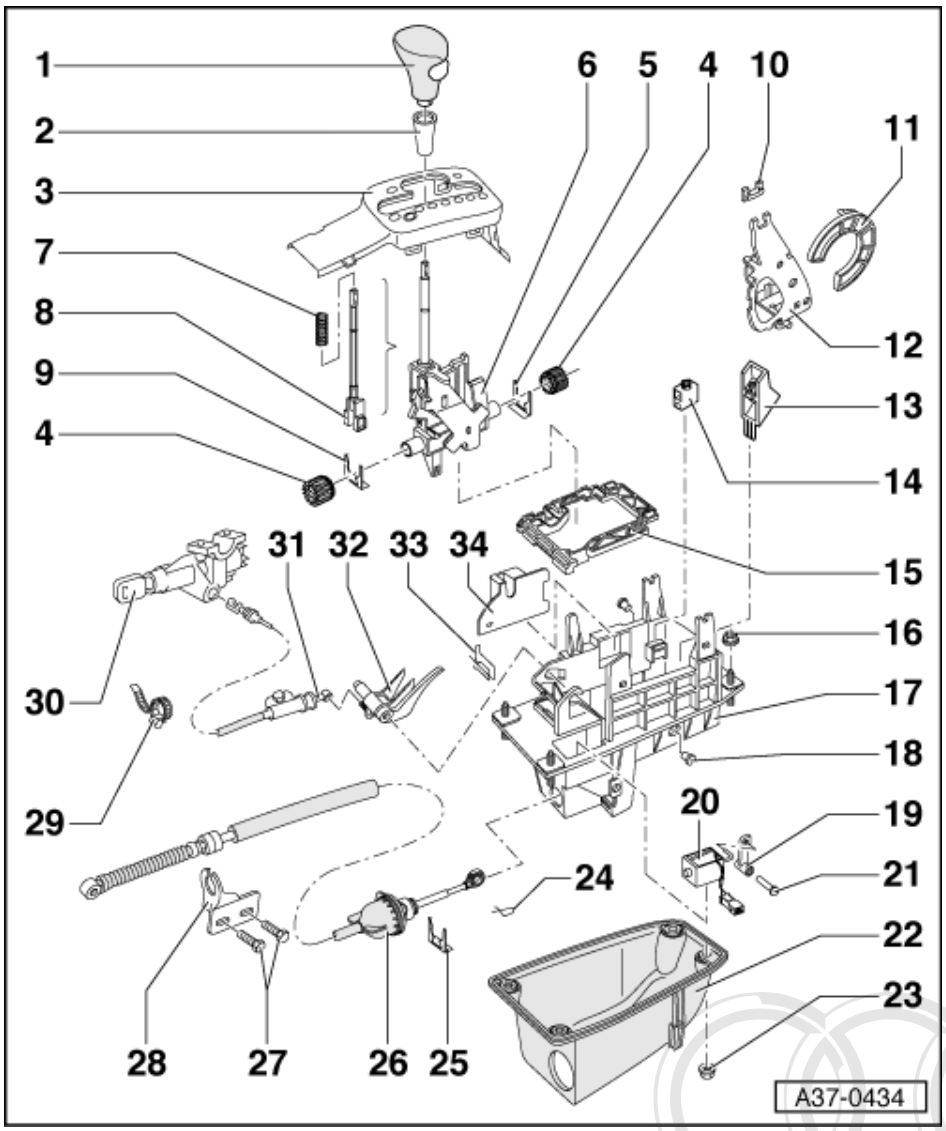
- Secures bearing bush - 4 - in bearing cup - 17 -
- Installation position:
  Angled ends point towards inside of bearing cup

10 Stop buffer

- Clip into cable lever - 12 -
- Installation position: Large contact surface facing selector lever

11 Latch plate

- Clip into cable lever - 12 -
- Removing and installing=>Page 43



12 Cable lever

- Mounted with pivot pin - 18 - in bearing cup - 17 -

13 Detent spring with roller

- For gearshift positions
- Removing and installing => from Page 43

14 Detent spring with roller

- For Tiptronic setting
- Removing and installing => from Page 43

15 Frame

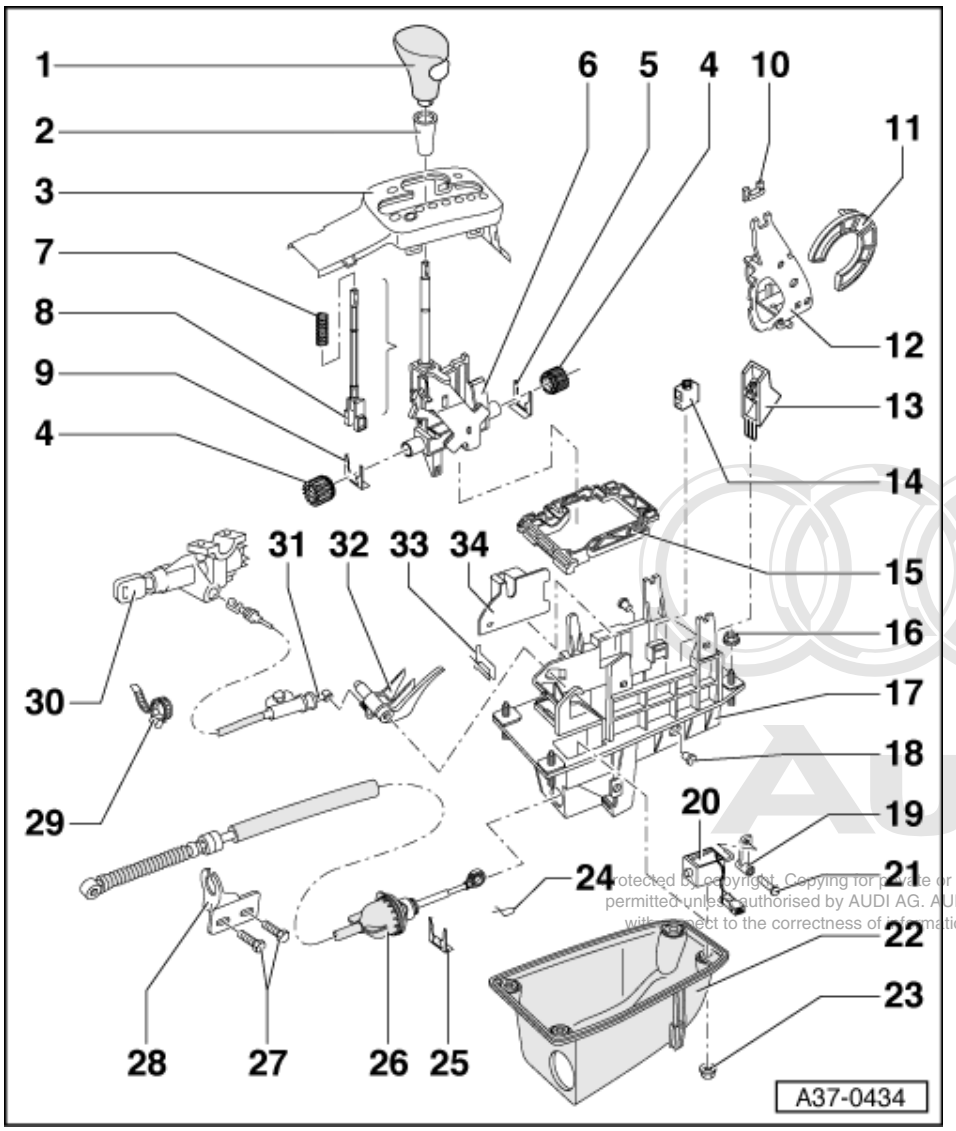
- Clip or bolt onto bearing cup
- Installation position: Ribs upwards

16 Nut, 10 Nm

17 Mount

- Removing and installing => from Page 23

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18 Pivot pin

- Supports cable lever - 12 - in bearing cup - 17 -

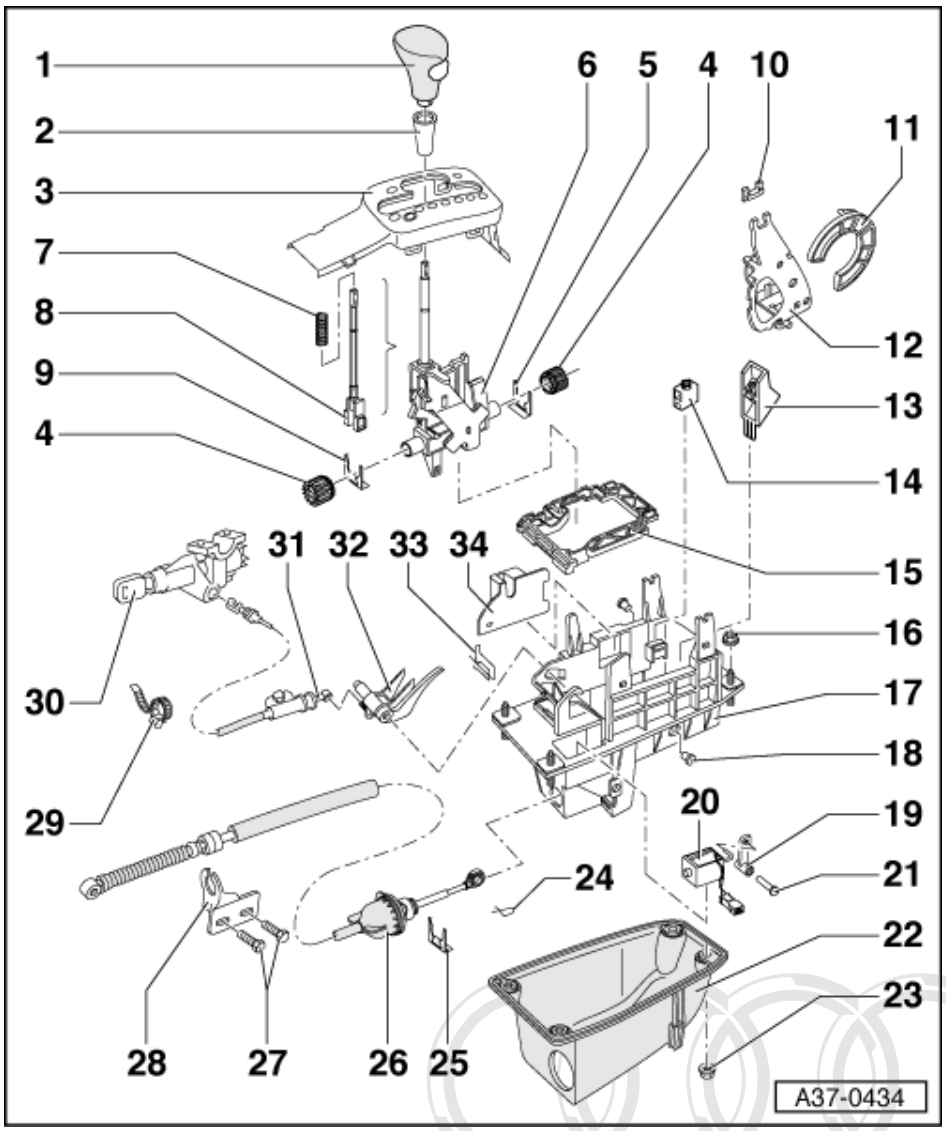
19 Locking pawl

- For selector lever lock
- Removing and installing => from Page 43

20 Selector lever lock solenoid -N110-

- Removing and installing => from Page 43
- Can be checked in electrical test and in measured value block

=> Automatic Gearbox 01V, Self-diagnosis; Repair group 01; Performing self-diagnosis Performing self-diagnosis



21 Pivot pin

- For locking pawl
- Removing and installing => from Page 43

22 Cover

- With gasket for bearing cup
- Removing and installing => from Page 23

23 Nut, 10 Nm

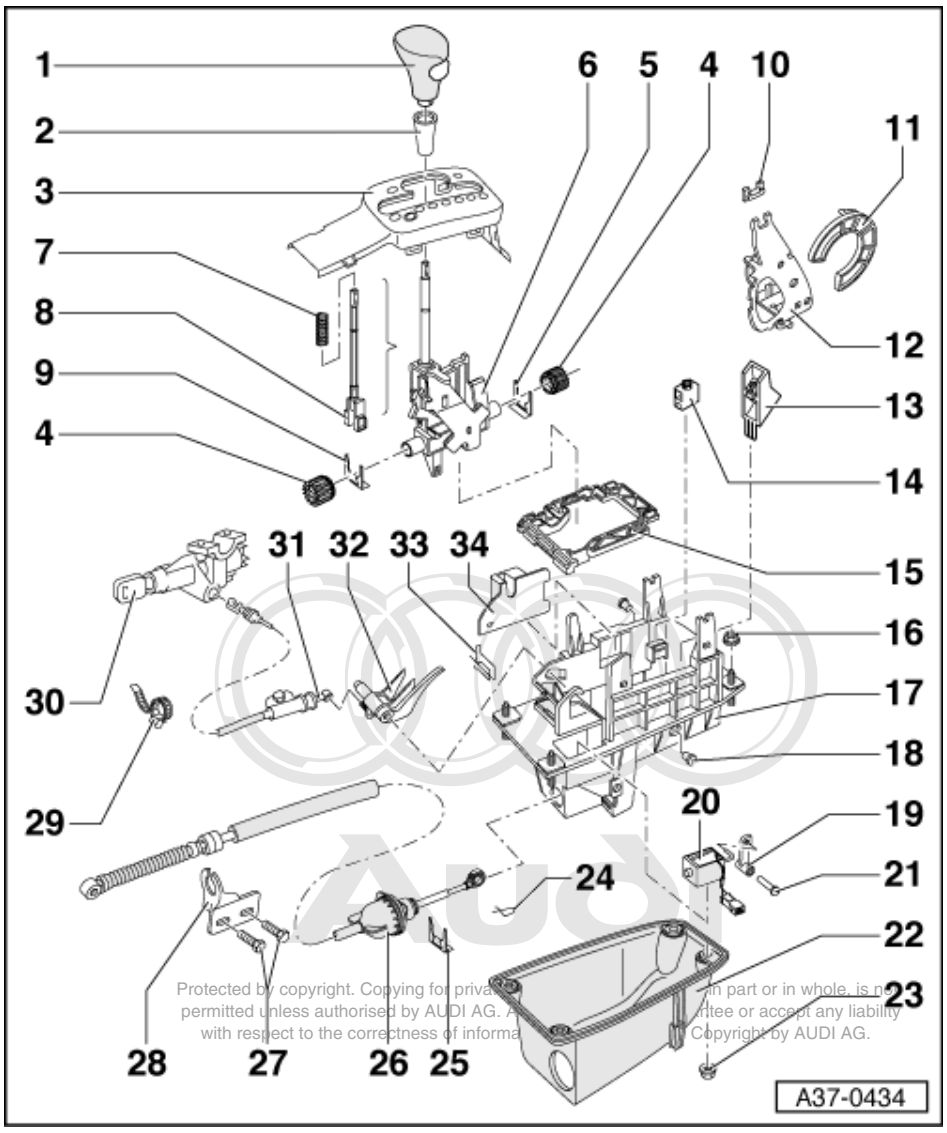
24 Fixing

- For selector lever cable on cable lever - 12 -
- Fit angled end at front

25 Locking plate

- For selector lever cable at bearing cup
- Angled ends point towards inside of bearing cup

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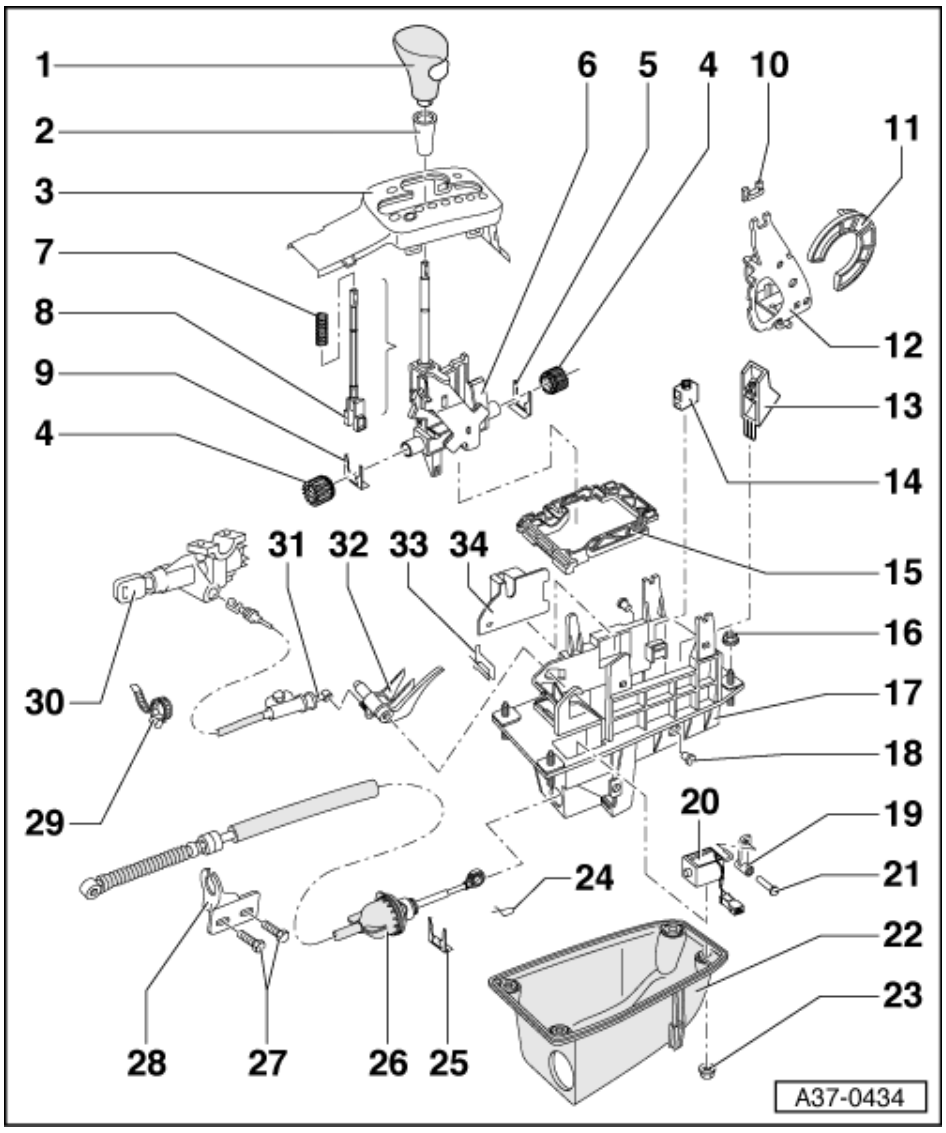
26 Selector lever cable

- Do not bend or kink, lightly grease cable eye and ball socket before installing.
- Removing and installing=>Page 45
- Adjusting => Page 48
- If the rubber sleeves are damaged the selector lever cable must be replaced
- Do not twist rubber sleeve/gearbox side when installing

27 Hexagon bolt, 23 Nm

28 Support bracket

- For selector lever cable to gearbox
- Removing and installing=>Page 45



29 Cable tie

- For locking cable

30 Ignition/starter switch

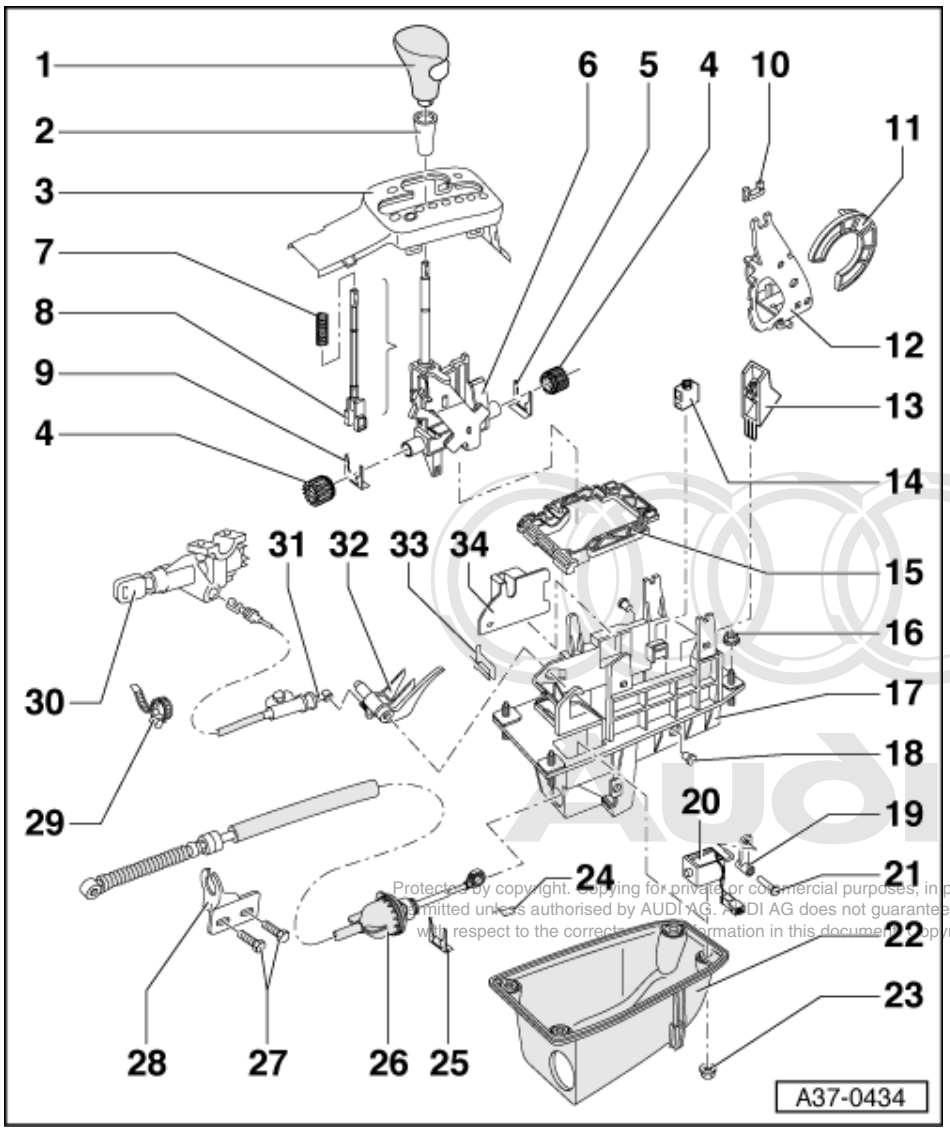
31 Locking cable

- For ignition key removal lock
- Must not be kinked
- Removing and installing=>Page 50
- Adjusting => Page 53

32 Locking lever

- For ignition key removal lock
- Removing and installing => from Page 43

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33 Securing spring

- For locking cable
- Removing and installing => Fig. 35

34 Mounting

- for selector lever in Tiptronic setting
- Removing and installing => from Page 43

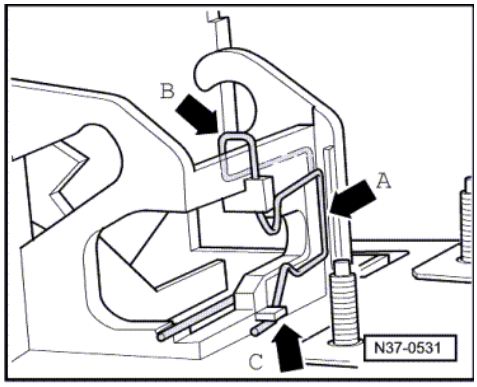


Fig.1 Removing and installing securing spring for locking cable

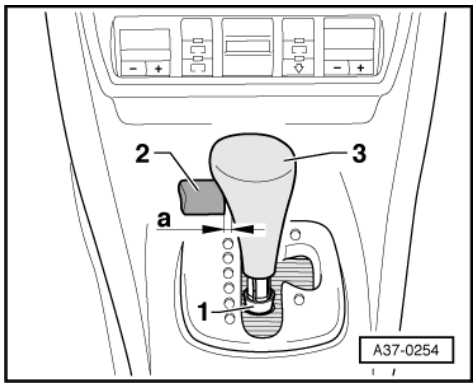
Removing

- -> To remove locking cable, lift spring slightly at the top -arrow B-.
- Disengage spring -arrow A- from retainer lug -arrow C- and lift out.

Installing

- Insert spring from above -arrow B- and engage under retainer lug -arrow C-.
- Align spring so that it lies level in groove -arrow A-.
- To install interlock cable, lift spring slightly at the top -arrow B-.

1.7 - Removing and installing selector lever handle



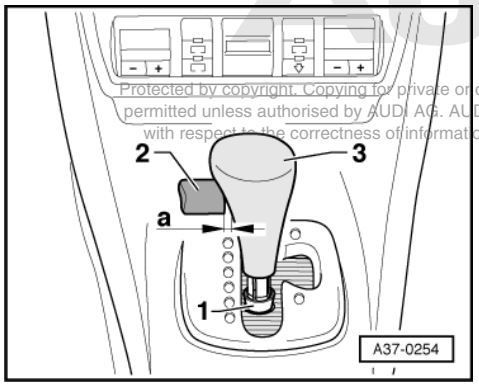
Removing

- Shift selector lever into position "3".
- -> Slide sleeve -1- down as far as it will go.
- Pull button -2- out of selector lever handle -3- until it clicks (distance -a-) and pull handle upwards.

Dimension a = 3 mm

Installing

- Shift selector lever into position "N".
- Carefully pull button -2- out of selector lever handle -3- to the position indicated by distance "a".
- Then, with button -2- pointing towards front of vehicle, fit handle -3- onto selector lever and push down as far as possible.
- Turn handle -3- until button -2- points towards the driver's seat. The handle will engage in a vertical groove on the selector lever.



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- -> Press knob -3- fully onto selector lever; it must engage in annular groove of selector lever.
- Press button -2- into handle on selector lever -3-.

- Pull up sleeve -1- until it engages in selector lever handle -3-.

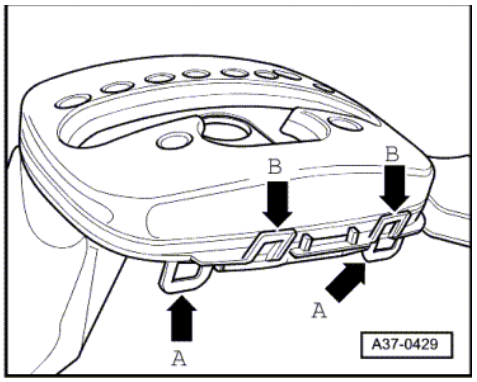
1.8 - Removing and installing shift mechanism cover with Tiptronic

Removing

- Remove centre console cover over shift mechanism.

=> General Body Assembly; Repair group 68; Shelves, trays and covers; Removing centre console Shelves, trays and covers Removing centre console

- Remove selector lever handle => Page 35 .
- Shift selector lever into "P" by pulling on pull rod.
- Switch off ignition.



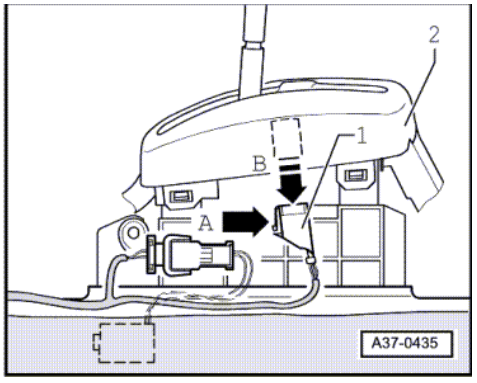
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- -> Carefully lever out the four retaining tabs -arrow A- with a bent piece of wire or a hook from above (retaining tabs are hard to see from above).

Never prise out the four retaining tabs -arrow B- visible from above, as otherwise the printed circuit board will be destroyed. In addition, the chrome-plated upper part is securely bonded to the upper part of the cover.

Note:

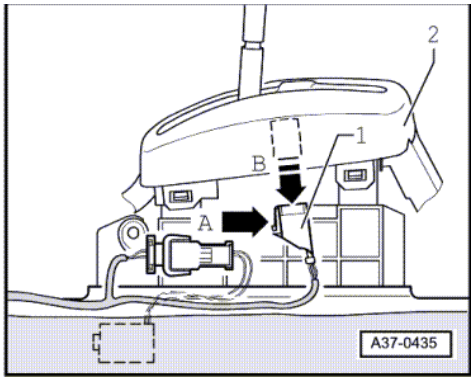
If the four retaining tabs -arrow A- cannot be levered out using a bent piece of wire or a hook, then the centre console will need to be removed to improve access.



- Lift off the complete cover of the shift mechanism.
- -> Press on the unlatching mechanism -arrow A- on connector -1- and pull it out of the cover in the direction of arrow -B-.

Note:

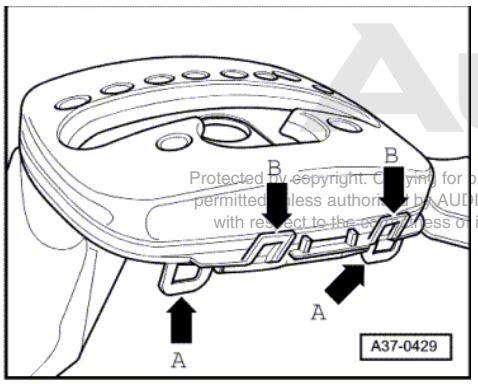
It is necessary to replace the upper part of the cover if the retaining tabs are damaged =>Item 38 .



Installing:

Install in reverse order. Also note the following points:

- -> Push connector -1- in the opposite direction to arrow -B- into the cover before the cover is clipped into the shift mechanism.



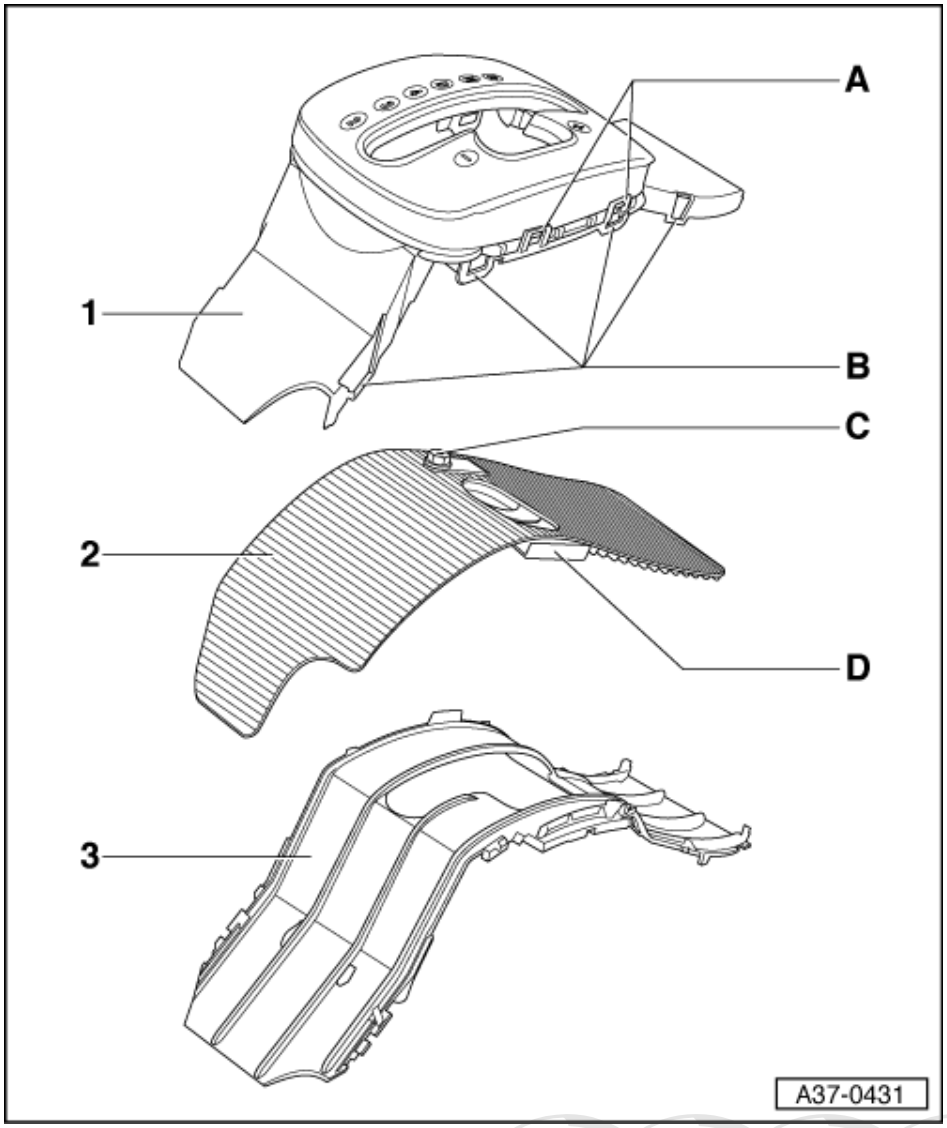
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- Clip the cover onto the shift mechanism.

Note:

-> When clipping on the cover, take great care not to bend the four retaining tabs -arrow A- inwards. The retaining tabs of the shift mechanism must engage on the outside without requiring too much force.

1.9 - Dismantling and assembling shift mechanism cover with Tiptronic



Overview

1 Upper part of cover
- with integrated switch for Tiptronic -F189
- Removing and installing Tiptronic switch -F189- =>Page 41

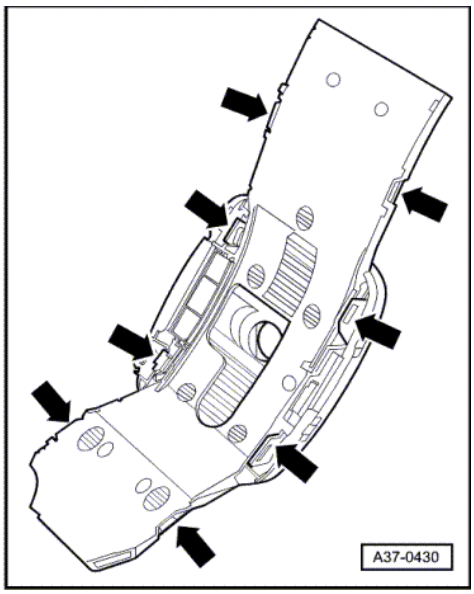
2 Screen
- with integrated magnets -C- and -D-

3 Lower part of cover
- Acts as a guide for the screen

Dismantling

- Remove shift mechanism cover => Page 36

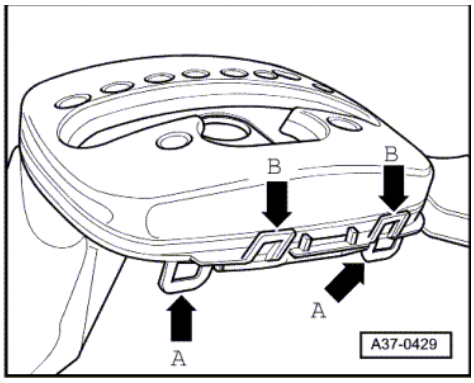
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- -> Carefully prise out retaining tabs -arrows-.

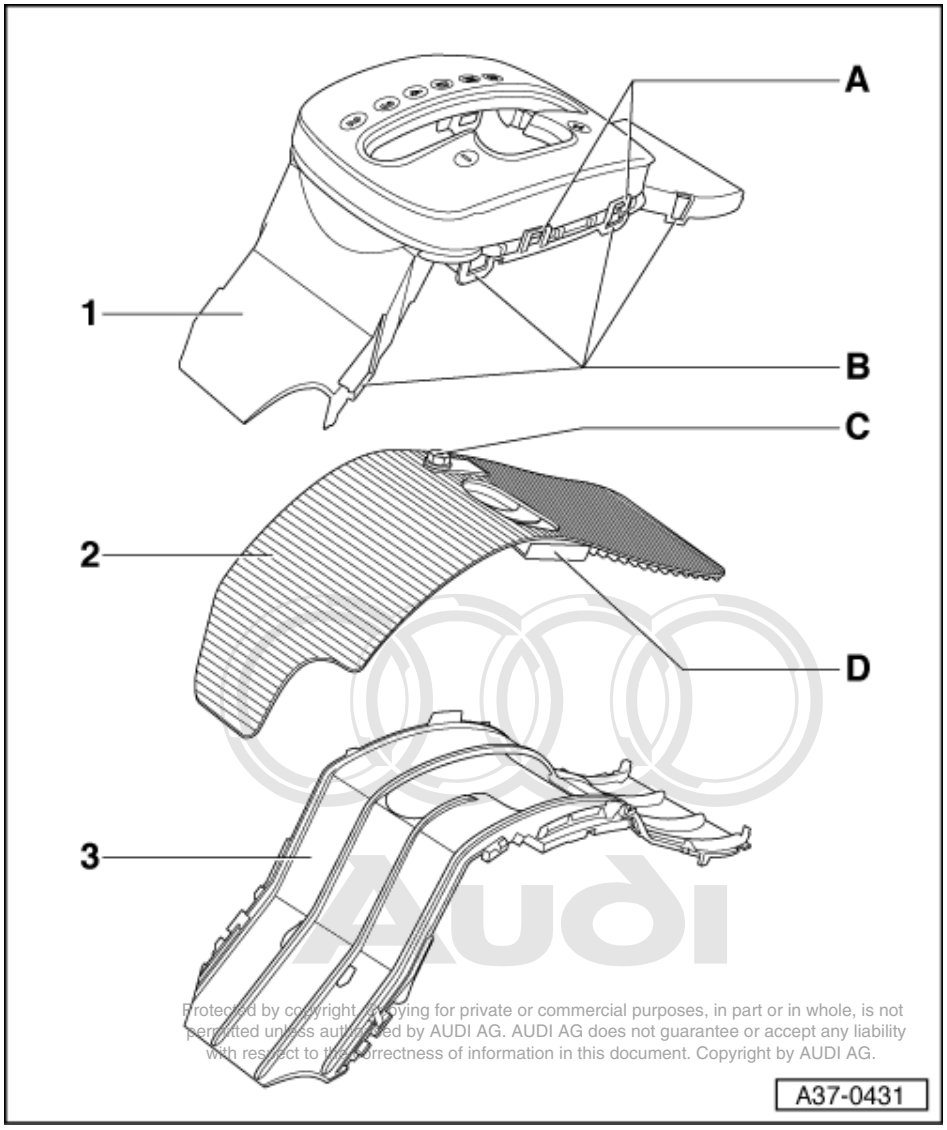
Note:

It is necessary to replace the upper part of the cover if the retaining tabs are damaged =>Item 38 .



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-> Do not prise out the four retaining tabs that are visible from above -arrow B-, as otherwise the printed circuit could be destroyed. In addition, the chrome-plated upper part is securely bonded to the upper part of the cover.



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- Remove lower part of cover -3- and screen -2-.

Assembling

- Lay screen -2- into upper part of cover, installation position as per diagram.

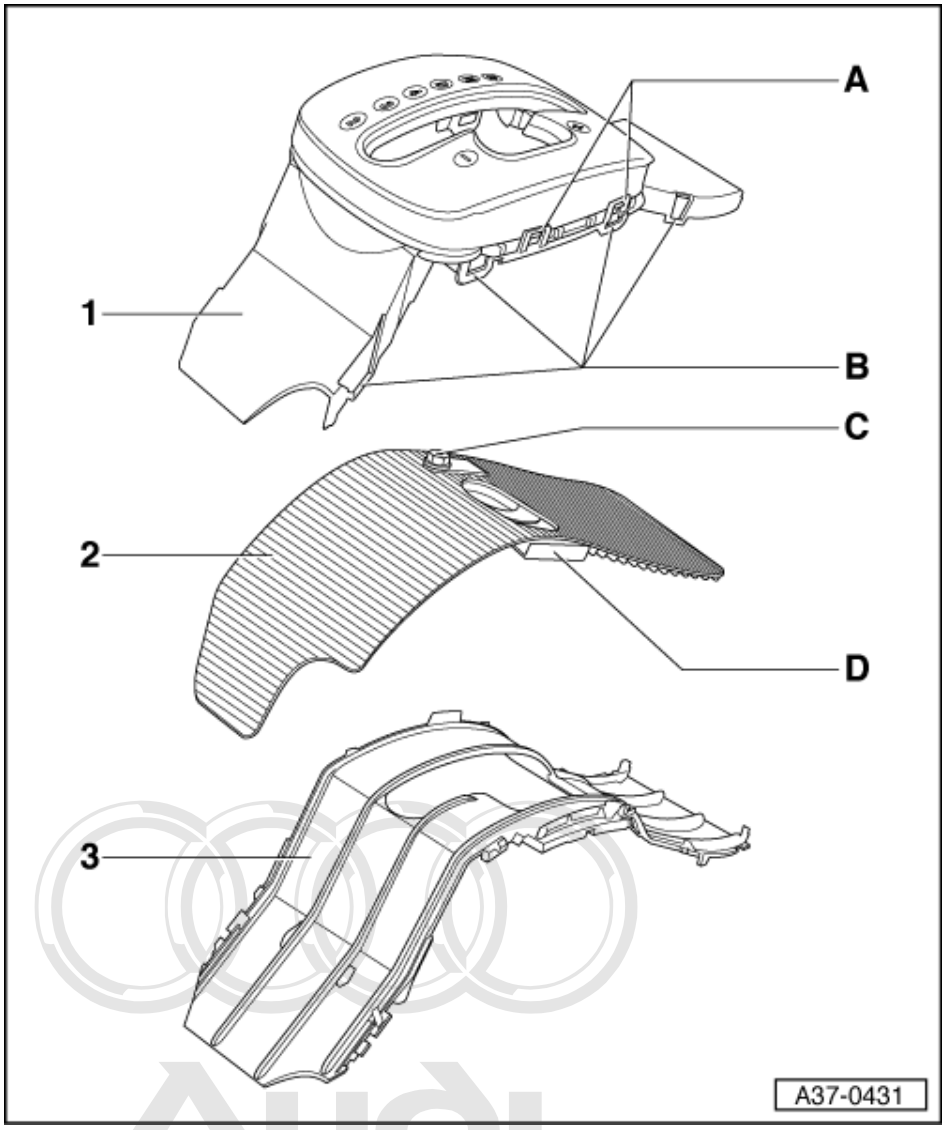
Magnets -C- and -D- must be securely fixed onto the screen, if necessary replace the screen.

- Carefully clip lower part of cover -3- into upper part of cover -1-.

Replace upper part of cover if retaining tabs -A- or -B- are damaged.

- Install shift mechanism cover => Page 36

1.10 - Removing and installing Tiptronic switch -F189

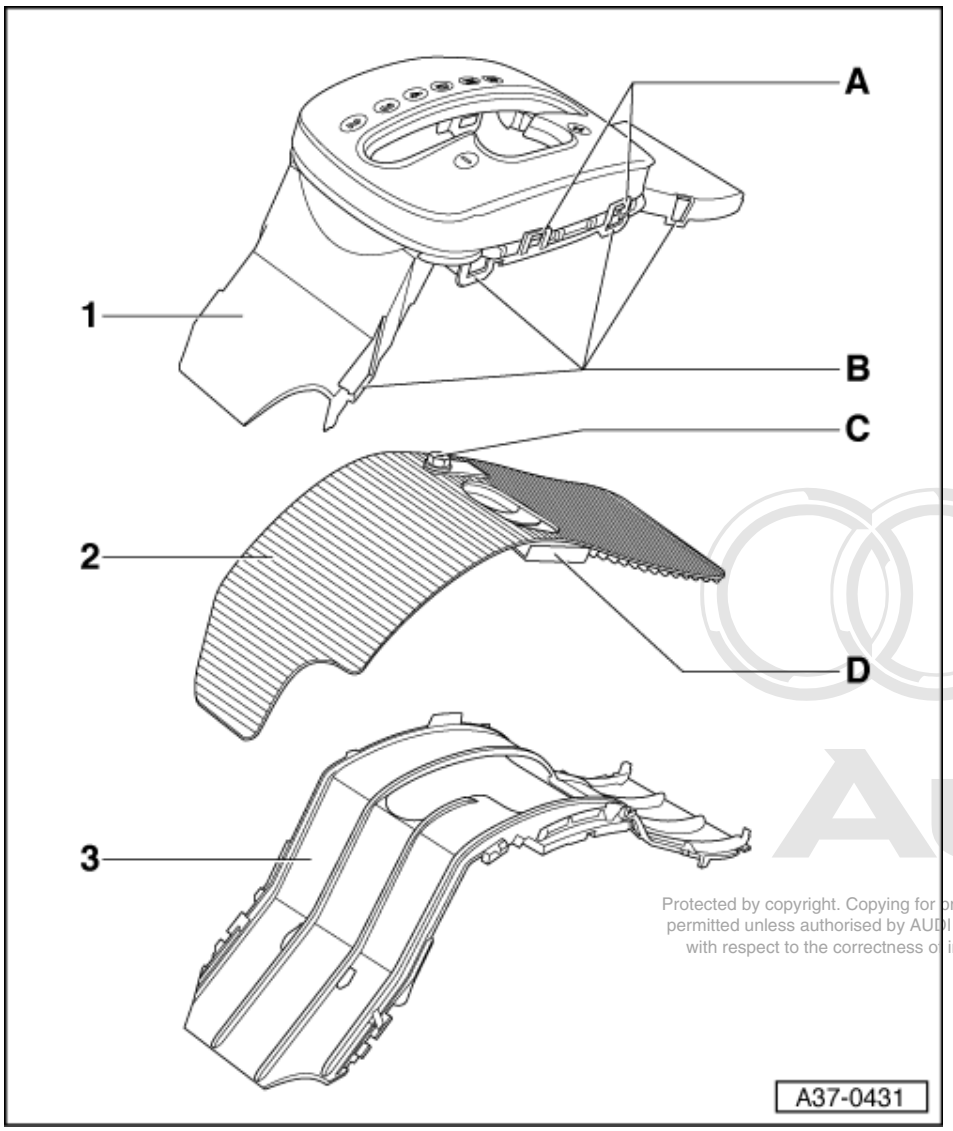


Fitting location:

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The Tiptronic switch is integrated in the upper part of the cover -1- for the shift mechanism.

- When errors occur you must check the Tiptronic switch in the measured value block and in the electrical check for faults. Check the wiring before replacing the Tiptronic switch. On vehicles with Tiptronic sports steering wheel the buttons on the steering wheel and their wiring connections must also be checked.



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Removing

- Dismantle shift mechanism cover => Page 38

Notes:

Magnets -C- and -D- must be securely fixed onto the screen, if necessary replace the screen.

If magnet -D- is missing (or has fallen out) then the Tiptronic switch will not work, i.e. the screen has to be replaced. In this case the Tiptronic switch does not need to be replaced.

- The upper part of the cover -1- also needs to be replaced when replacing the Tiptronic switch.

Installing:

- Assemble shift mechanism cover => Page 38

1.11 - Dismantling and assembling shift mechanism with Tiptronic (assembly overview)

Dismantling

- Removing shift mechanism => Page 23 .
- First detach buffer stop from cable lever.
- Set the selector lever to Tiptronic and then remove the frame.
- Shift selector lever into position "2".
- Disengage lever for interlock cable by lifting it out of its mounting and remove from the bearing cup.
- Shift selector lever into position "D".
- Carefully select the detent spring for the Tiptronic setting out of the bearing cup, working from the outside.
- Withdraw the locks for the selector lever bearing bushes.
- Use a screwdriver to push the selector lever bearing bushes out.

- Remove the complete selector lever.
- Dismantling selector lever => Page 43 .
- To remove the bearing for the selector lever Tiptronic setting release the retaining lugs on the outside of the bearing cup and remove the bearing towards the inside.
- Press out the pin for the locking pawl using a punch.
- Lift out the selector lever lock solenoid together with the locking pawl.
- Carefully lever the detent spring for the selector lever settings out of the bearing cup working from the outside.
- Lever out both pivot pins of the cable lever/retainer.
- Pull the cable lever/retainer out of the bearing cup with the opening of the retainer facing upwards.
- Unclip the retainer from the cable lever.

Assembling

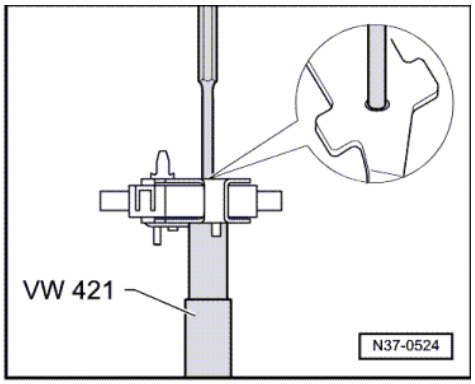
- Clip the retainer into the cable lever.
- Push the cable lever/retainer from above into the bearing cup with the retainer opening first.
- Drive the two pivot pins of the cable lever/retainer from both sides into the bearing cup right to the limit.
- Press the detent spring with roller for the selector lever setting fully into its mounting in the bearing cup.
- Push the selector lever lock solenoid into the bearing cup from above together with the locking pawl.
- Drive the pin for the locking pawl in carefully.
- Check the engagement of the locking pawl in "P" and "N" on the selector lever mechanically using a screwdriver.
- Insert the complete selector lever in the bearing cup.
- Attach the selector lever at the bottom and the top in the cable lever.

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- Push the two bearing bushes for the selector lever into the bearing cup from the front and rear respectively.
- Fit the locks for the bearing bushes in the bearing cup so their angled ends face inwards.
- Press the detent spring for the Tiptronic setting fully into its mounting in the bearing cup.
- Shift selector lever into position "2".
- Place the locking lever in the bearing cup and engage it firmly until it is felt to lock into place in both bearings.
- Check the locking function of the locking lever. When the selector lever is set to "P" it must engage in the retainer and block gear shifting.
- Mount the frame on the bearing cup (with the ribs pointing upwards) and insert the buffer stop in the cable lever.
- Installing shift mechanism => Page 23 .

Dismantling and assembling the selector lever

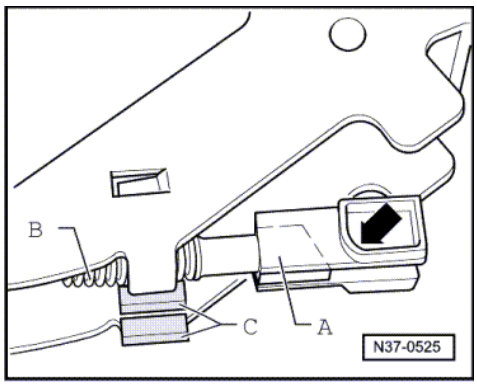
- Removing the selector lever => from Page 43 .



Dismantling

- -> Drive out the pivot pin of the selector lever using a punch.
- Push the shift gate with Tiptronic springing out of the selector lever with the pull rod raised.
- Relieve the pressure on the compression spring and remove the pull rod and compression spring likewise from the selector lever.

Assembling

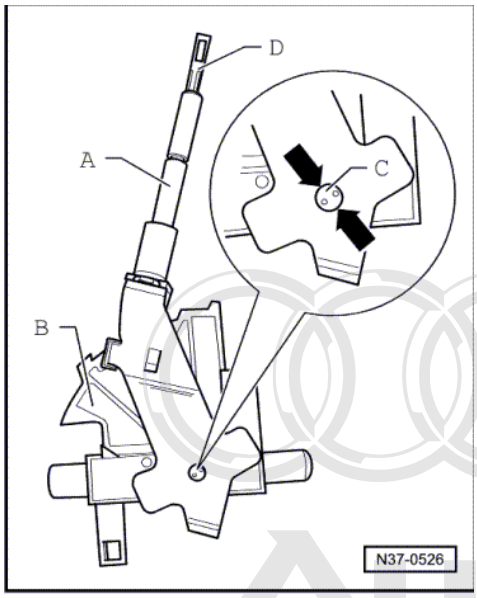


- -> Mount compression spring -B- on pull rod -A-.
- Insert pull rod with compression spring into selector lever.

Installation position:

The rounded edge -arrow- and bevel point in direction of travel.

- Check that the pull rod is running on both guides -C- of the selector lever.



- -> With the pull rod -D- raised push the shift gate -B- with Tiptronic spring arrangement into the selector lever -A-.
- Drive in the pivot pin -C- of the selector lever using a punch => Page 44 , Fig. N37-0524.
- As a securing fixture mount two new studs -arrows- at a 90° offset to the existing ones.

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The pivot pin must not have more than 4 studs.

- Installing the selector lever => from Page 43 .

Removing and installing the selector lever lock solenoid

Removing

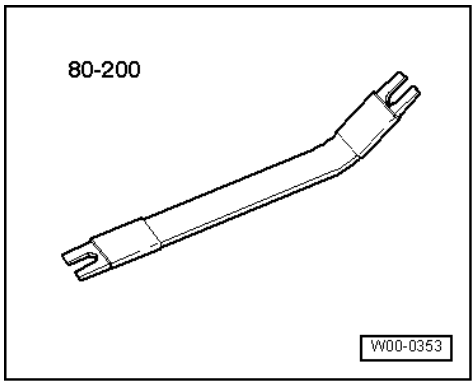
- Removing shift mechanism => Page 23 .
- First detach buffer stop from cable lever.
- Set the selector lever to Tiptronic and then remove the frame.
- Shift selector lever into position "2".
- Disengage lever for interlock cable by lifting it out of its mounting and remove from the bearing cup.
- Press out the pin for the locking pawl using a punch.
- Lift out the selector lever lock solenoid together with the locking pawl.

Installing

- Shift selector lever into position "2".
- Push the selector lever lock solenoid into the bearing cup from above together with the locking pawl.
- Drive the pin for the locking pawl in carefully.
- Check the engagement of the locking pawl in "P" and "N" on the selector lever mechanically using a screwdriver.
- Place the locking lever in the bearing cup and engage it firmly until it is felt to lock into place in both bearings.
- Check the locking function of the locking lever. When the selector lever is set to "P" it must engage in the retainer and block gear shifting.
- Mount the frame on the bearing cup (with the ribs pointing upwards) and insert the buffer stop in the cable lever.
- Installing shift mechanism => Page 23 .

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1.12 - Removing and installing selector lever cable at shift mechanism with Tiptronic

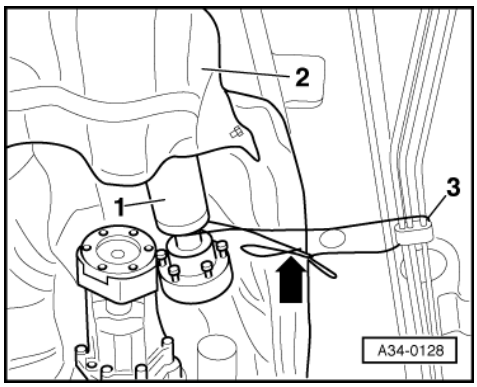


Special tools, testers and auxiliary equipment required

- Pressing lever 80-200

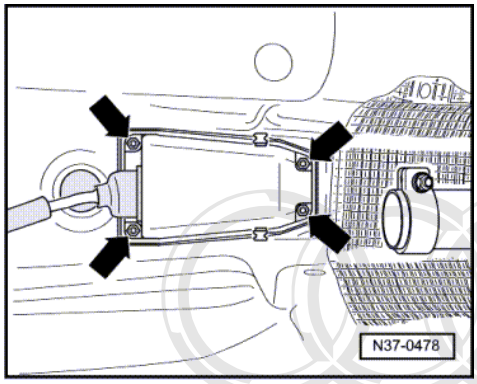
Removing

- Move selector lever to position "P".
- Raise vehicle.
- Remove cross member, if fitted, from underneath exhaust system.
- Disconnect the downpipes with catalytic converter from the rear exhaust and tie them up at the side.
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system



Vehicles with four-wheel drive

- -> Unscrew propshaft -1- from gearbox and place onto heat shield -2- => Page 225 ; Removing and installing propshaft.
- Secure propshaft with wire -arrow- at bracket -3- of fuel lines.

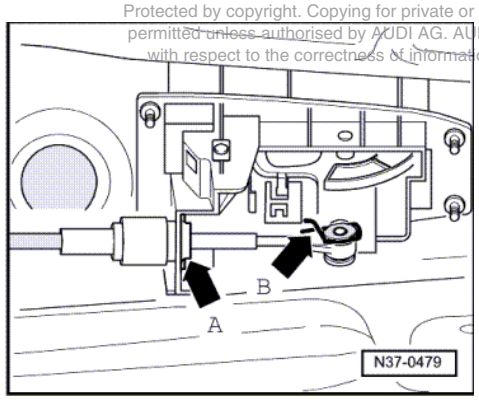


Continued for all vehicles

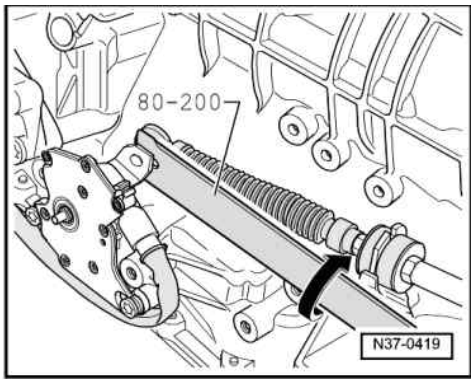
- Unscrew heat shield from below bearing cup.
- -> Remove lid from bearing cup -arrows-.

Detach selector lever cable from bearing cup:

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- -> Press together securing clip -B- at ends and remove.
- Pull locking plate -A- for selector lever cable on mounting bracket out downwards.
- Detach selector lever cable from selector lever.

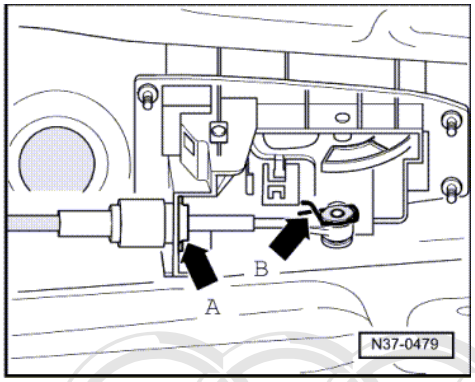


- -> Lever off selector lever cable from lever/selector shaft using special tool 80-200 -arrow-.
- Release the support bracket from the gearbox.
- Remove selector lever cable from support bracket.
- Pull selector lever cable out from mounting bracket; for this purpose, do not kink cable.

Installing

- Move the selector lever and lever/selector shaft to "P" (the parking lock must engage).

- Do not bend or kink the selector lever cable, lightly grease cable eye and cable ends before installing.

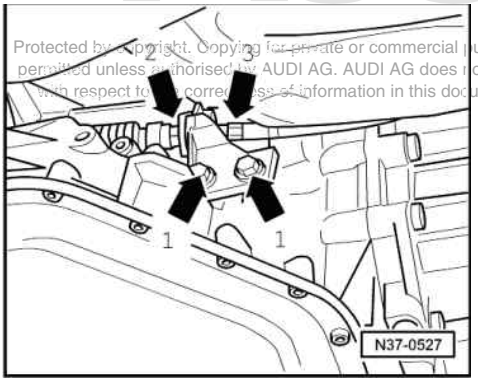


- Insert selector lever cable into bearing cup.
- Fit selector lever cable to selector lever.
- -> Press together securing clip -B- at ends and secure selector lever cable.
- -> Mount lock washer-A- for selector lever cable on bearing cup.

Installation position:

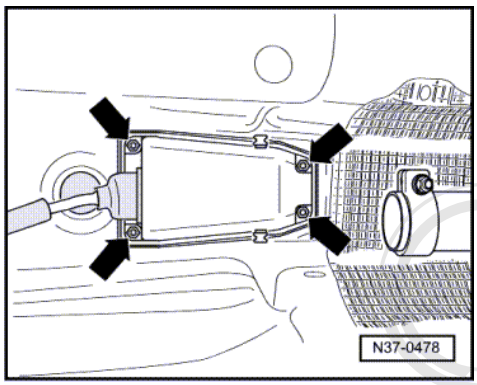
Angled end of lock washer points towards end of selector lever cable.

- Connect selector lever cable handtight to support bracket.
- Bolt support bracket handtight to gearbox.



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- Press selector lever cable onto selector shaft lever.
- Align selector lever cable in support bracket.
- -> Tighten support bracket/gearbox -arrows 1- and selector lever cable/support bracket -arrow 2- to tightening torque. While doing this, hold firm by the hexagon flats -arrow 3-.



- -> Tighten nuts-arrows- (4 off) to 10 Nm.
- Check selector lever cable adjustment, adjust if necessary => Page 48 .
- Install heat shield.

Vehicles with four-wheel drive

- Bolt the propshaft onto the gearbox flange => Page 225 , Removing and installing propshaft.

Continued for all vehicles

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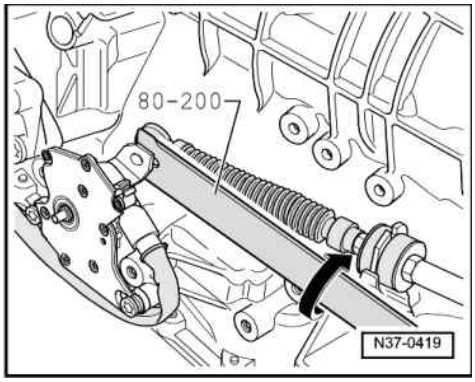
- Mount downpipe on rear exhaust.
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Install front cross member below exhaust system.

Tightening torques

Support bracket/selector lever cable to gearbox	23 Nm
Gate selector cable to support bracket	12 Nm

1.13 - Checking and installing selector lever cable in shift mechanism with Tiptronic

Checking



- Move selector lever to position "P".
- Raise vehicle.
- Remove selector lever cable protective plate.
- -> Lever selector lever cable off lever/selector shaft -arrow-.

- Move the selector lever from "P" to "2".

• Selector lever mechanism and selector lever cable must move freely; if necessary renew selector lever cable or service selector lever mechanism.

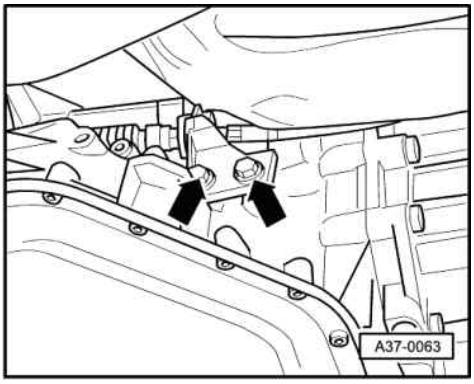
- Move selector lever to position "P".
- Shift selector shaft lever to "P". The parking lock should engage and it should not be possible to turn the two front wheels in the same direction.

• It should be possible to push the selector lever cable onto the selector shaft lever. Adjust selector lever cable if necessary.

Adjusting

• Selector lever cable disconnected from selector shaft lever.

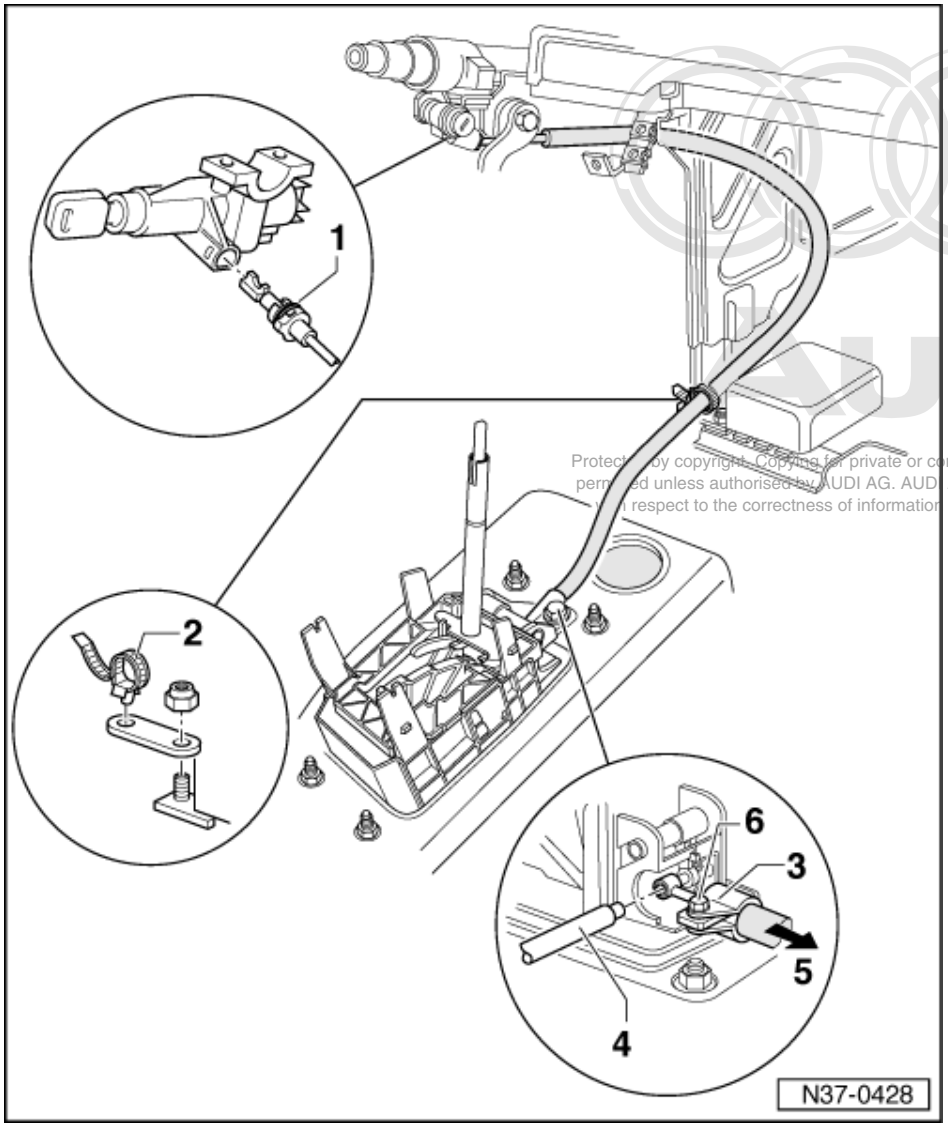
- Move selector lever to position "P".



- Shift selector shaft lever to "P". The parking lock should engage and it should not be possible to turn the two front wheels in the same direction.
- -> Loosen bolts -arrows- securing support bracket to gearbox.
- Press selector lever cable onto selector shaft lever.
- Align selector lever cable in support bracket.
- Tighten securing bolts -arrows- of support bracket - 23 Nm.
- Fit selector lever cable protective plate.
- Checking shift mechanism => Page 21 .

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1.14 - Removing and installing locking cable at shift mechanism with Tiptronic

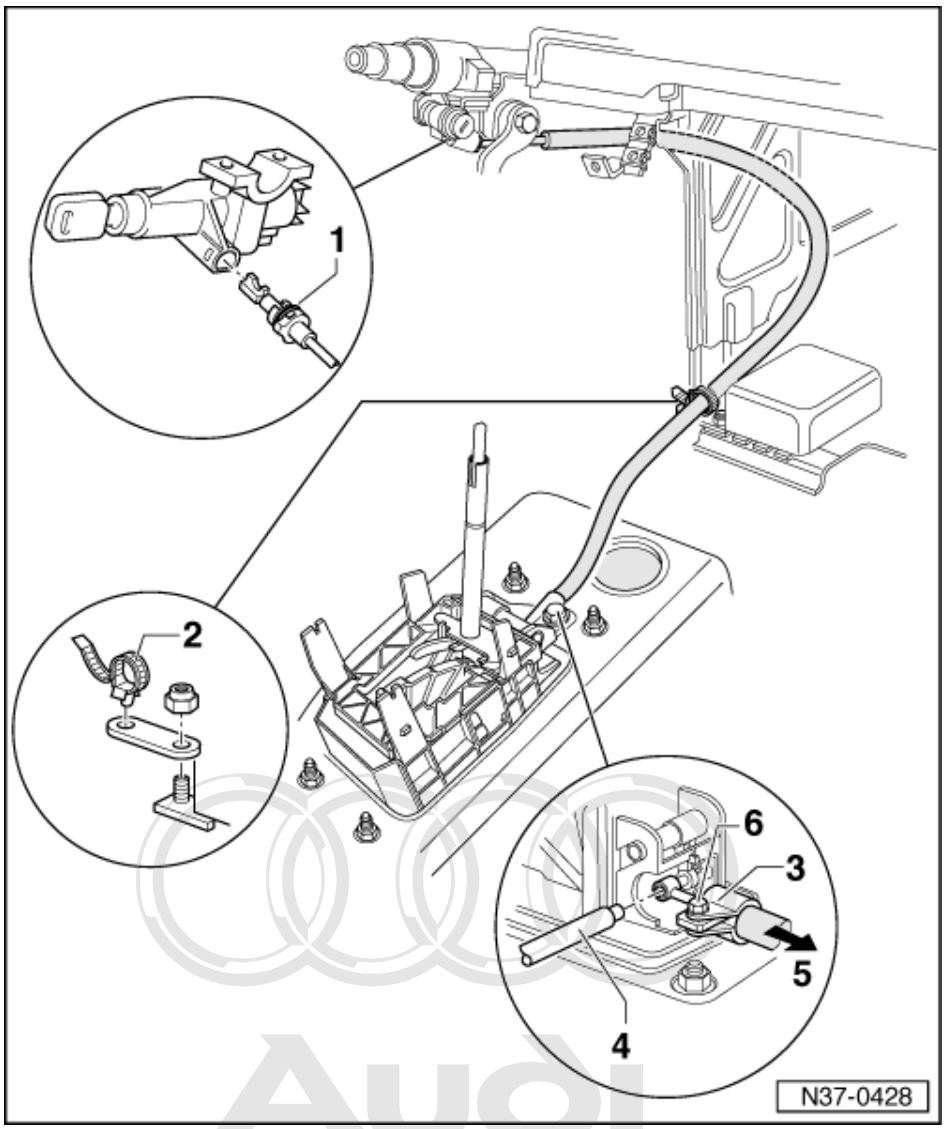


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Removing

- Shift selector lever into position "2".
- Observe or obtain radio code on vehicles with coded radio.
- Disconnect earth strap on battery.
- Detach selector lever handle =>Page 35 .
- Remove the front section of the centre console

=> General Body Assembly, Interior; Repair group 68; Shelves and trays/covers; Removing and installing front part of centre console Shelves and trays/covers Removing and installing front part of centre console

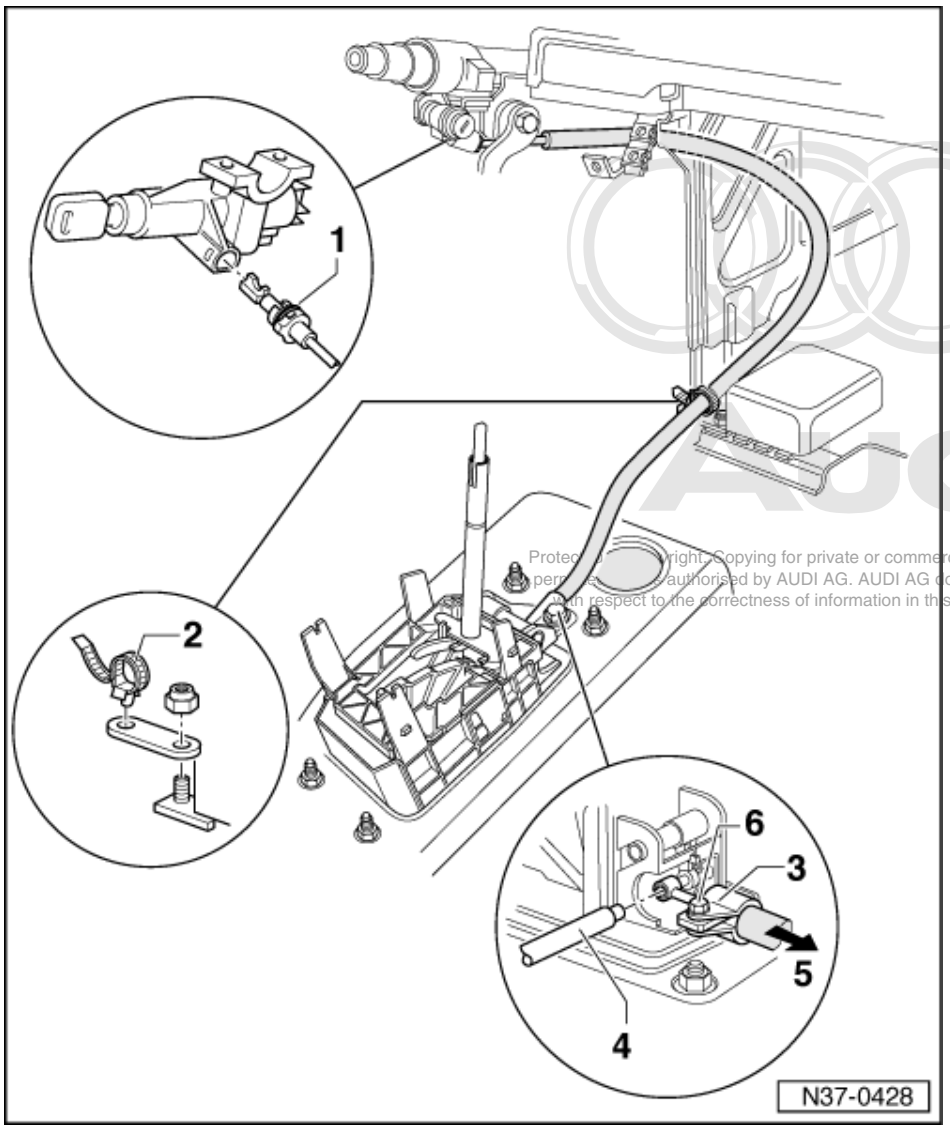


- Remove steering wheel:

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=> General Body Assembly, Interior; Repair group 69; Airbag; Removing and installing steering wheel Airbag Removing and installing steering wheel

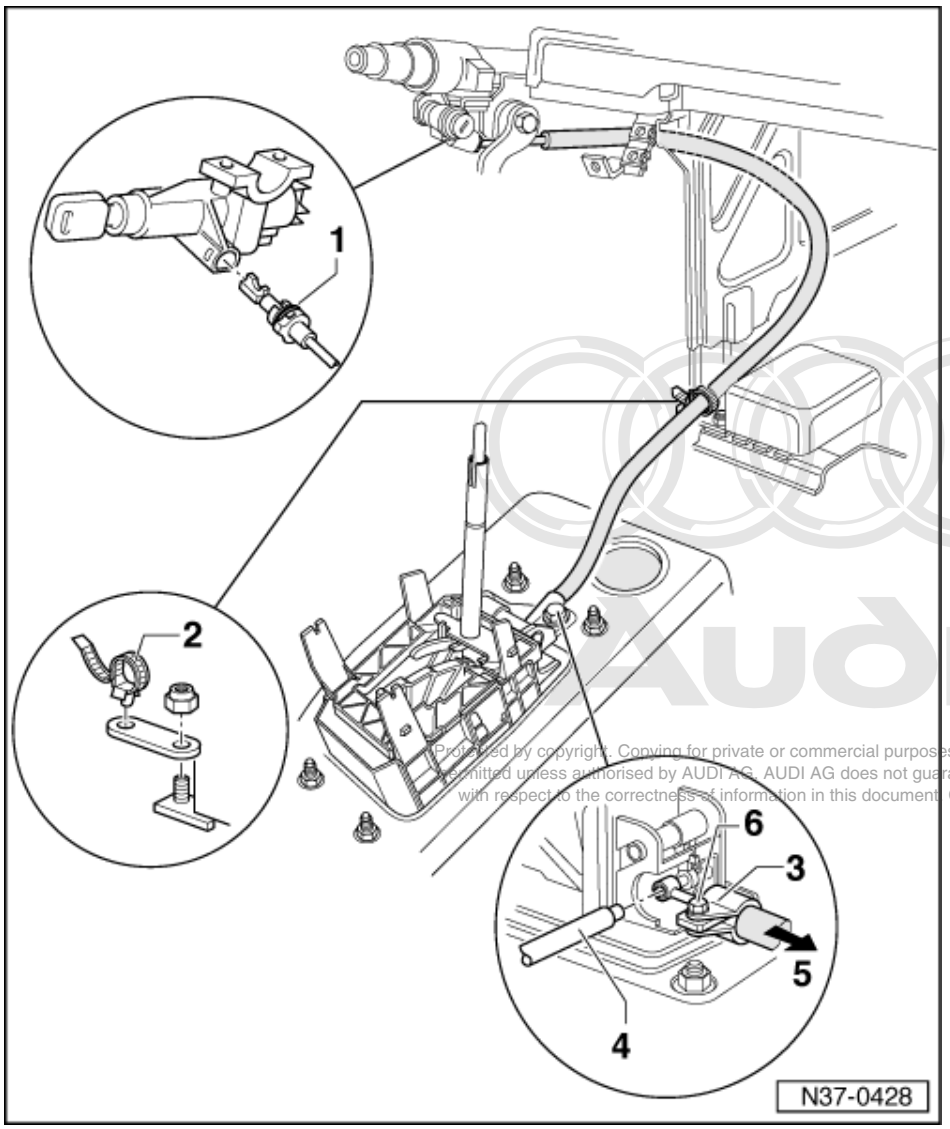
- Turn ignition key to "ignition on" position.
- Move selector lever to position "P".
- Lift locking clip on locking device -1- and withdraw interlock cable from ignition/starter switch.
- Remove cover with guide (selector lever mechanism) => Page 22 .
- Unclip interlock cable from securing spring on bearing cup, to do this lift securing spring slightly => Fig. 35 .
- Release interlock cable from cable tie -2- and remove.



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Installing

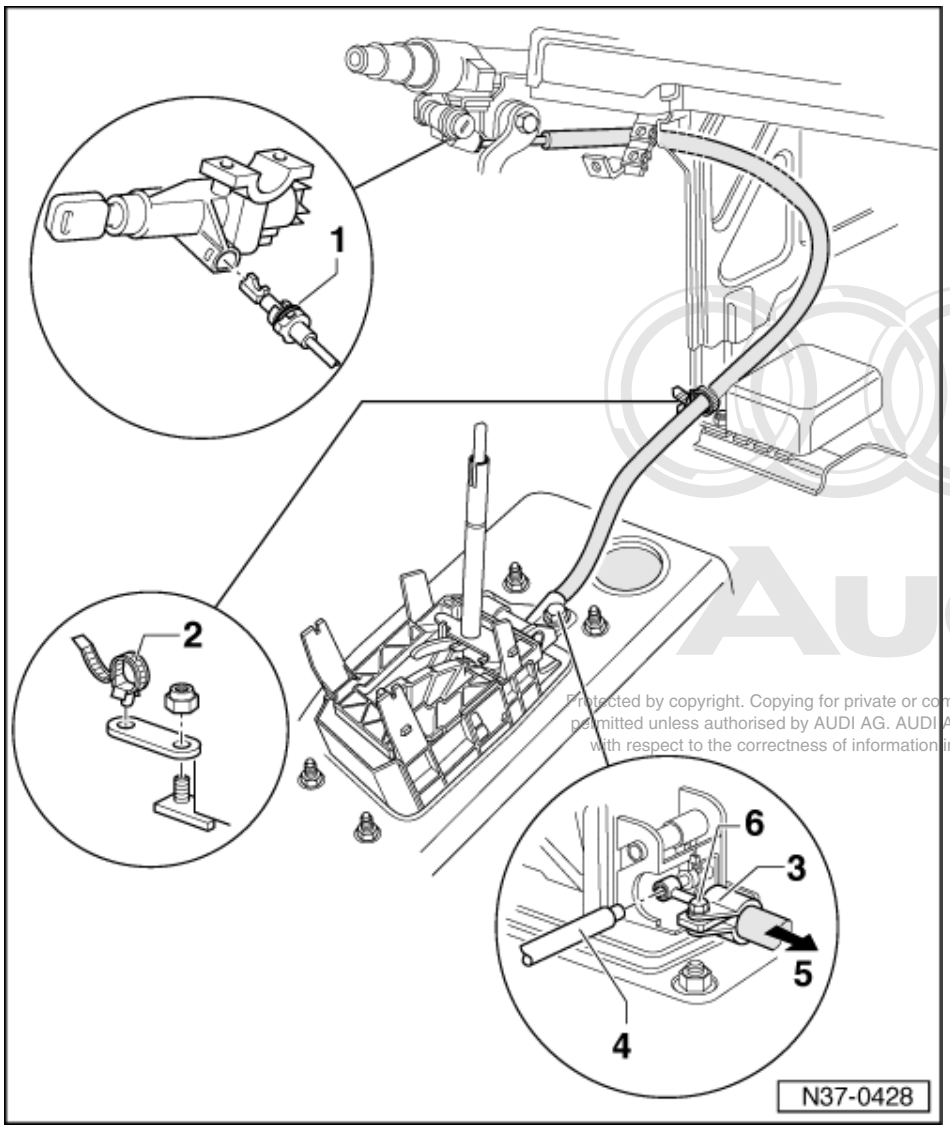
- Route interlock cable free of kinks.
- Turn ignition key to "ignition on" position.
- Fit interlock cable to ignition/starter switch.
- Check that locking device -1- engages.
- Secure interlock cable with cable tie -2- to airbag sensor.
- Turn ignition/starter switch to locked position ("ignition off").
- Move selector lever to position "P".
- Clip interlock cable into securing spring of bearing cup => Fig. 35 .
- Hook interlock cable support bracket -3- into shift mechanism and interlock cable eye into lever (for interlock cable).



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Adjusting

- Move selector lever to position "P".
- Unfasten bolt -6-.
- It must be possible to slide the support bracket -3- in the direction indicated by the arrow -5-.
- Move steering column down.
- Attach setting gauge 3352 A -Item 4- between lever (for interlock cable) and interlock cable eyelet.
- Pull interlock cable in direction of arrow -5- and tighten bolt -6- to 10 Nm.
- Remove setting bar.
- Check ignition key withdrawal lock after each adjustment of interlock cable => Page 21 .



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- Install steering wheel.

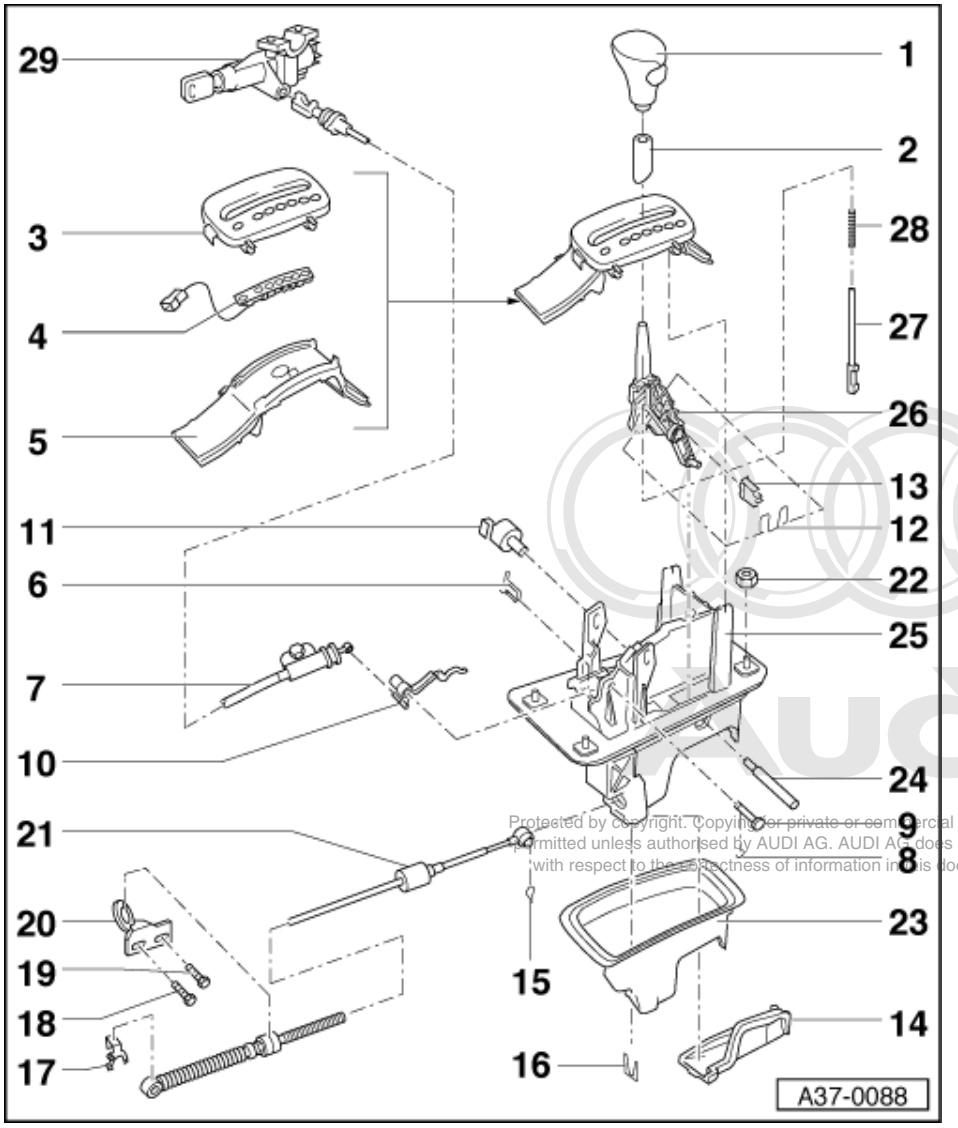
=> General Body Assembly, Interior; Repair group 69; Airbag; Removing and installing steering wheel Airbag Removing and installing steering wheel

- Reinstall front section of the centre console.

=> General Body Assembly, Interior; Repair group 68; Shelves and trays/covers; Removing and installing front part of centre console Shelves and trays/covers Removing and installing front part of centre console

- Attach selector lever handle =>Page 35 .
- Reconnect earth strap to battery.
- On vehicles with coded radio unit, activate code.

1.15 - Dismantling and assembling shift mechanism without Tiptronic



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The shift mechanism with Tiptronic is described from Page => 23 onwards.

1 Handle for selector lever

- Push the sleeve 2 downwards, pull the button in the handle out as far as it will go, and then remove the handle by pulling it upwards.

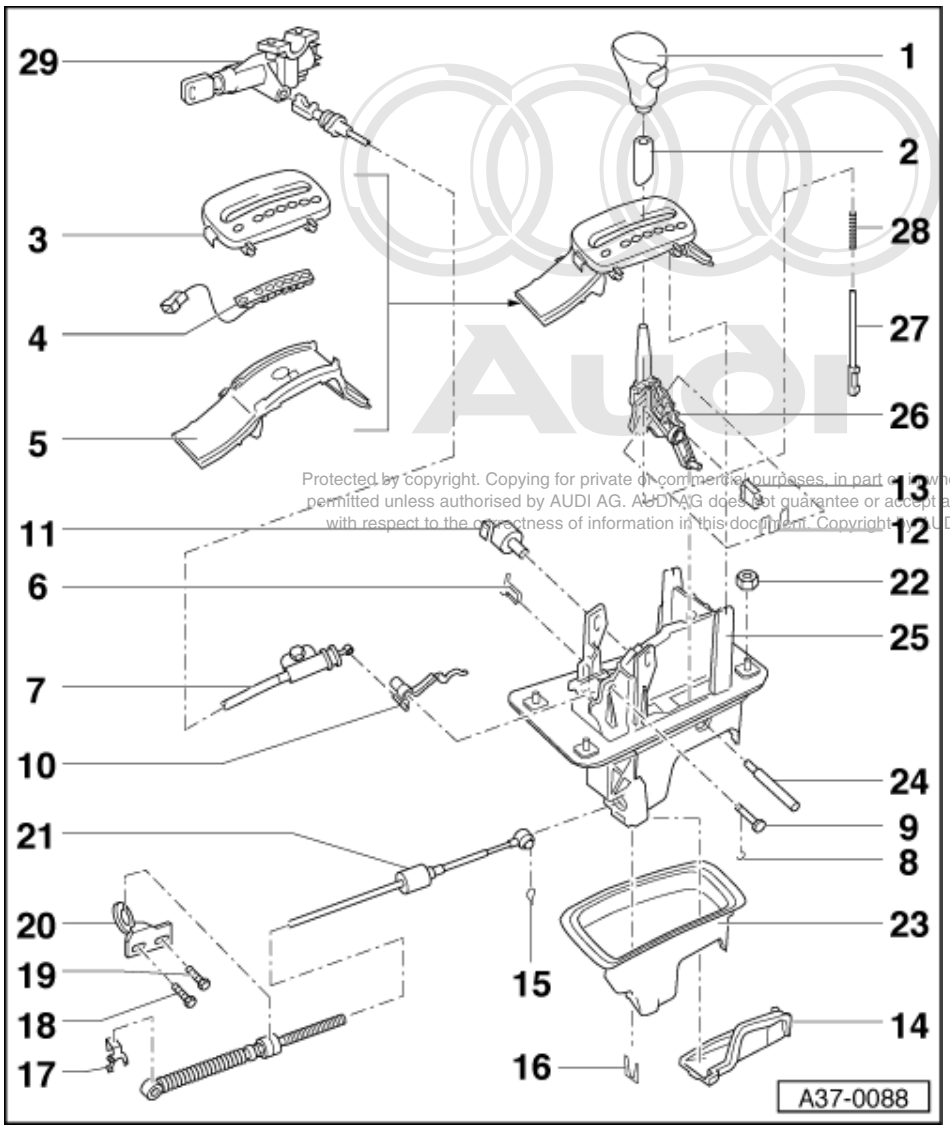
2 Sleeve

- Engages in selector lever handle

Note:

Before any further service work can be performed on the shift mechanism, the front section of the centre console must first be removed.

=> General Body Assembly, Interior; Repair group 68; Shelves and trays/covers; Removing and installing front part of centre console Shelves and trays/covers Removing and installing front part of centre console



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3 Cover

- With gear indicator and indicator for selector lever lock
- To remove, disengage the retainer lugs from the mount
- To remove, lift upwards together with Item 4 and Item 5 .

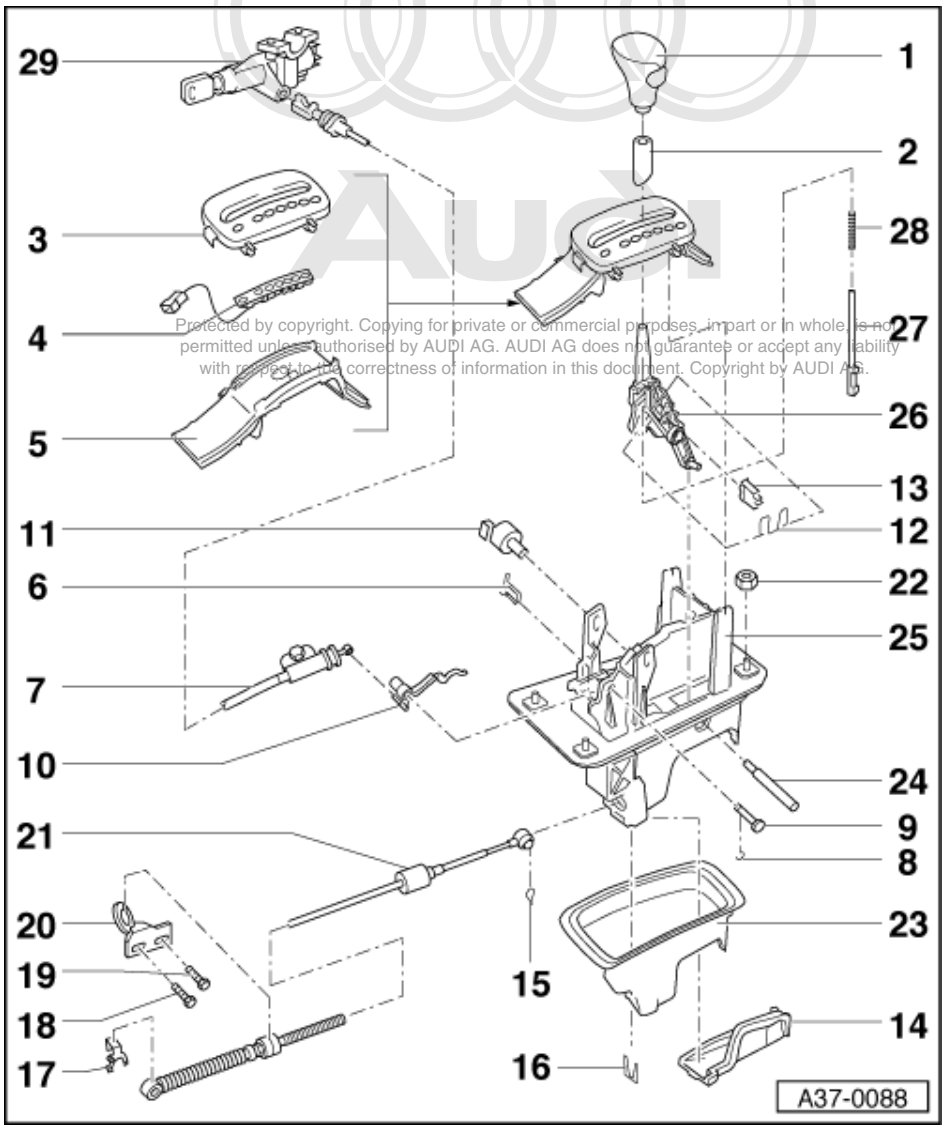
4 Light strip

- With wiring and light emitting diodes (LED) for basic illumination
- Cable layout => Fig. 63

5 Guide

- With masking panel and mirror for individual gear indication
- Removal can be released by releasing the four securing lugs on inner side of cover.

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6 Securing spring

- For locking cable
- Clip into bearing cup => Page 50

7 Locking cable

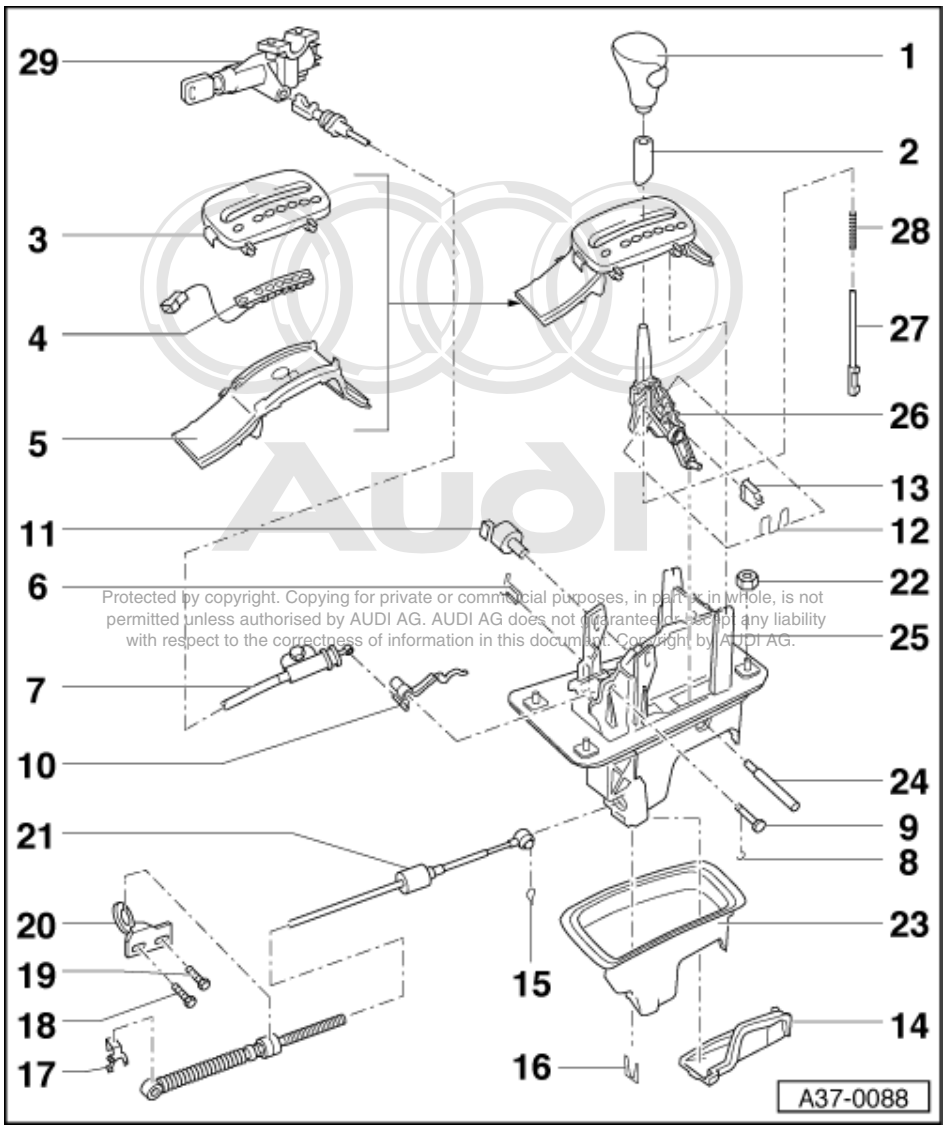
- Must not be kinked
- Removing => Page 50
- Installing and adjusting => Page 69

8 Lock washer

- For bolt, - 9 -

9 Pin

- For lever, - 10 -



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10 Lever for locking cable

11 Solenoid for selector lever lock -N110

- Removing and installing => Fig. 63
- Unclip connector from wiring harness (at centre console) => Fig. 63
- Can be checked in electrical test and in measured value block

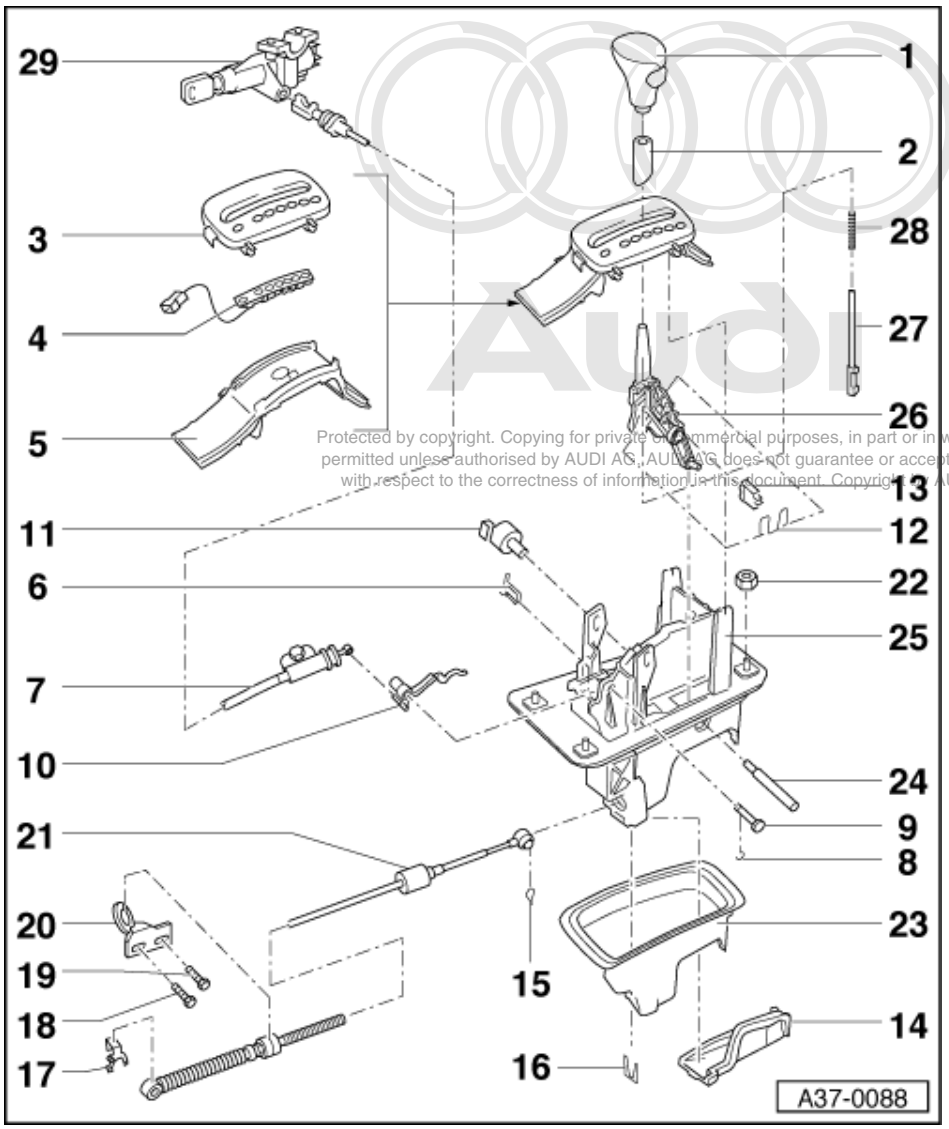
=> Repair group 01; Performing self-diagnosis; Read measured value block Performing self-diagnosis Read measured value block

12 Spring clip

- Insert both ends into selector lever

13 Latch

- Insert together with spring clip in selector lever



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14 Cover

- For mounting bracket
- Removing and installing => Fig. 62

15 Fixing

- To secure the gate selector cable to the selector lever

16 Locking plate

- For selector lever cable at bearing cup =>Fig. 62 Item E

17 Clamp

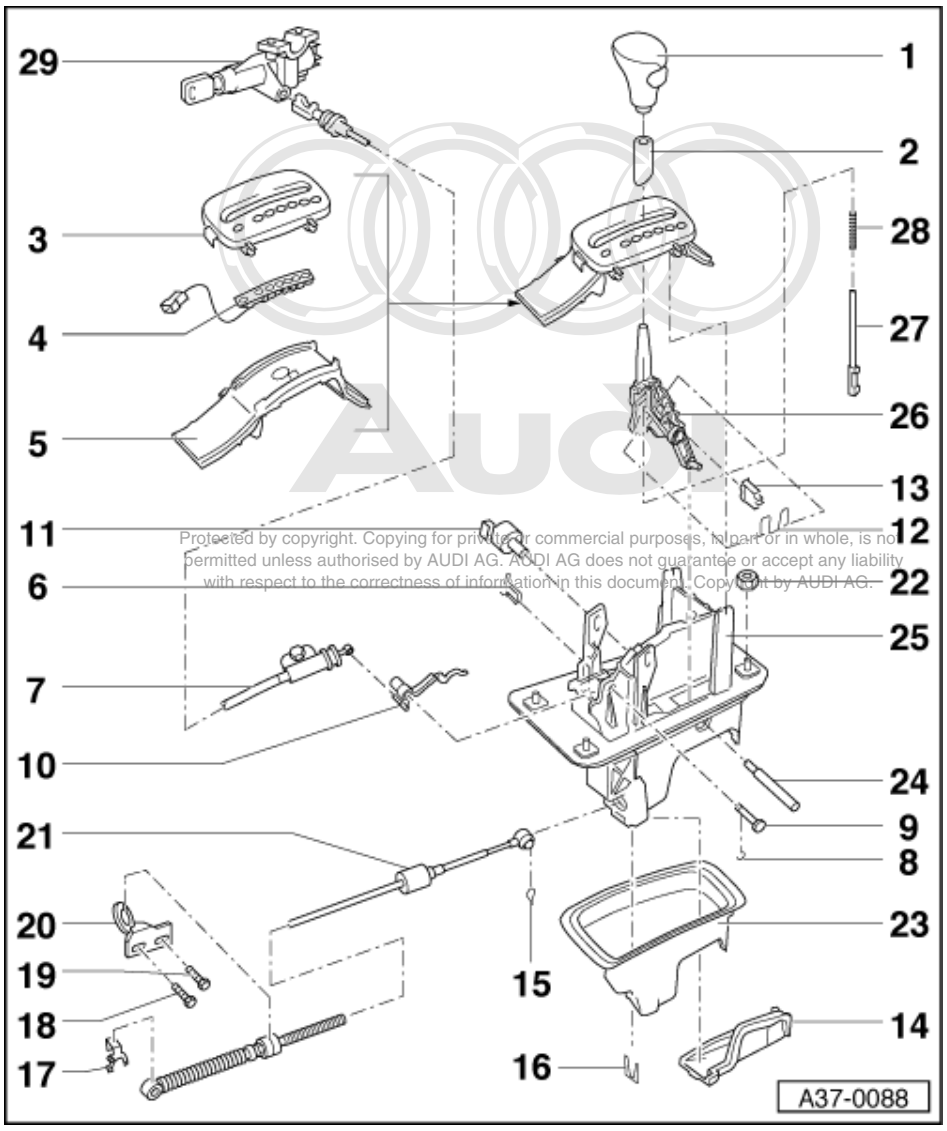
- For selector lever cable on selector lever on gearbox

18 Hexagon bolt - 23 Nm

19 Hexagon bolt - 23 Nm

20 Support bracket

- For gate selector cable at the gearbox



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21 Selector lever cable

- Removing and installing=>Page 63
- Adjusting => Page 48

Note:

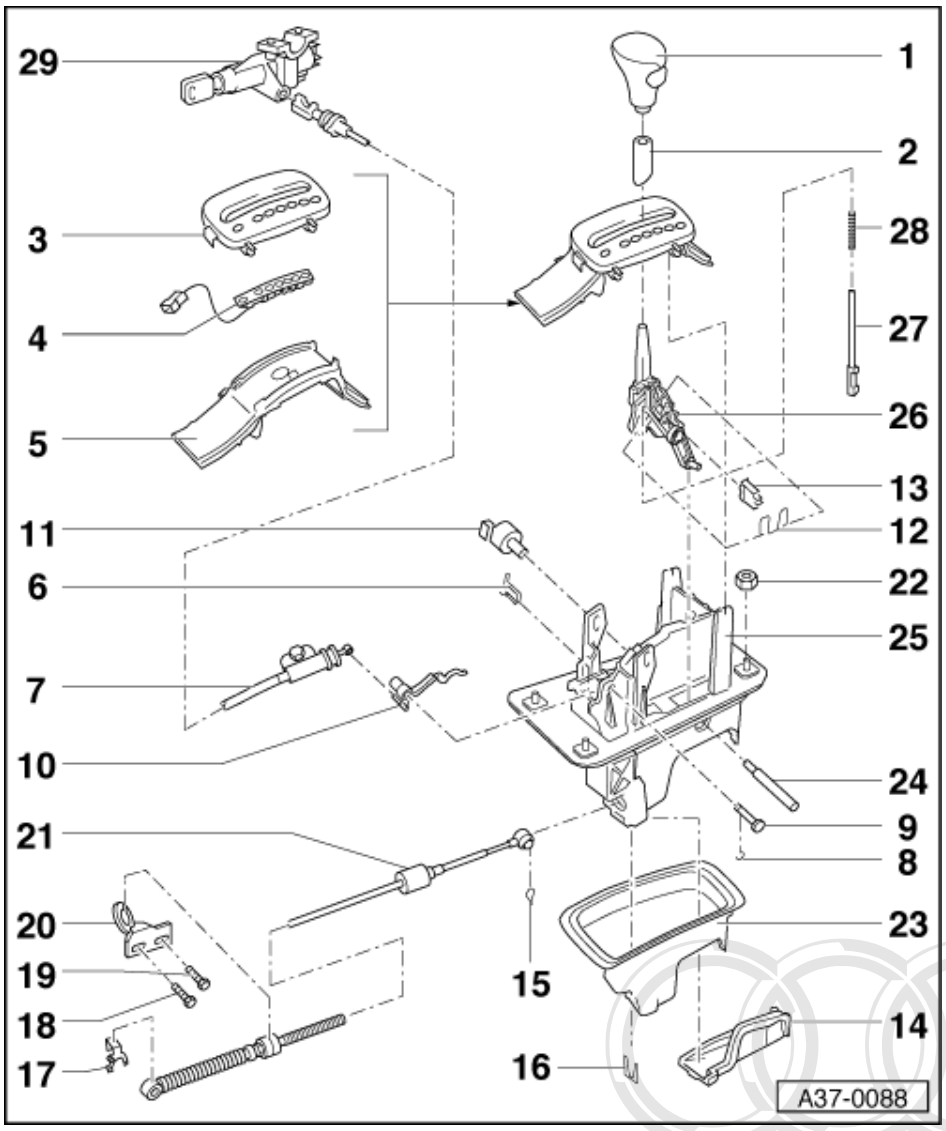
Before any further service work can be performed on the shift mechanism, the shift mechanism must be completely removed from the vehicle.

22 Nut- 9 Nm

- 4 pieces

23 Rubber housing

- Must only be separated from mounting bracket - 25 if damaged and when dismantling selector lever
- Assembly and installation position => Fig. 62



24 Pivot pin

- Removal: Carefully lever out with a screwdriver

25 Mount

- Removing and installing => Fig. 62

26 Gate lever

27 Pull rod

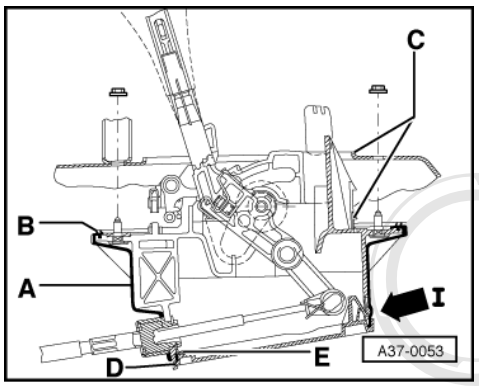
- Insert into the selector lever together with the spring, 28

28 Spring

- For pull-rod

29 Ignition/starter switch

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-> Fig.1 Removing and installing cover

Note:

The cover can be removed and installed from below with shift mechanism installed

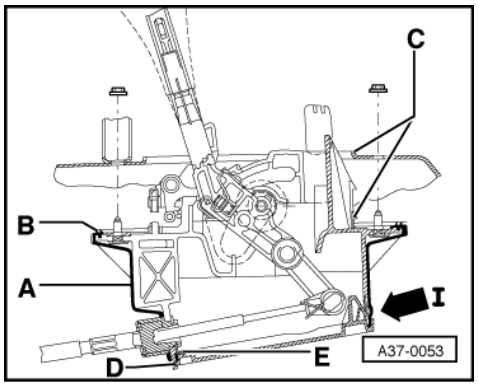
Removal

- Press into direction of -arrow I- and release snap fastener for bearing cup.

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Installing

- Guide cover into groove -D- and then engage the snap fastener.
- Ensure the cover seats and seals perfectly.

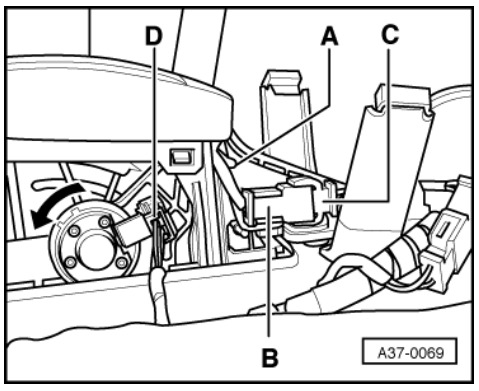


-> Fig.2 Removing and installing bearing cup

- Remove lower protective plate and catalytic converter.
- Detach selector lever cable from bearing cup:
- Before installing secure rubber housing -A- on bearing cup.
- Tighten nut to 9 Nm

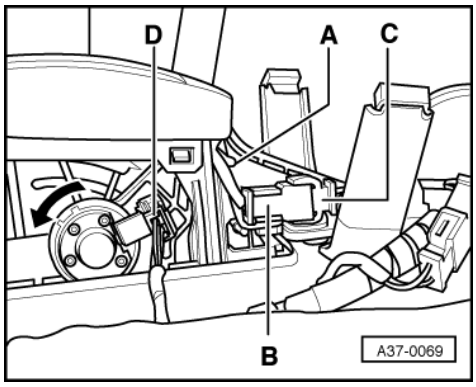
Note:

- The rubber housing -A- has to seal off bearing cup towards body (sealing lip -B-).
- No cables should be installed between the body and mounting bracket



-> Fig.3 Removing and installing solenoid for selector lever lock -N110

- Unclip connector -D- (wiring harness console).
- Rotate solenoid in direction of arrow by approximately 90°.
- When the lifting magnet has been renewed, check the gear shift mechanism =>Page 21



-> Fig.4 Routing wiring for basic illumination

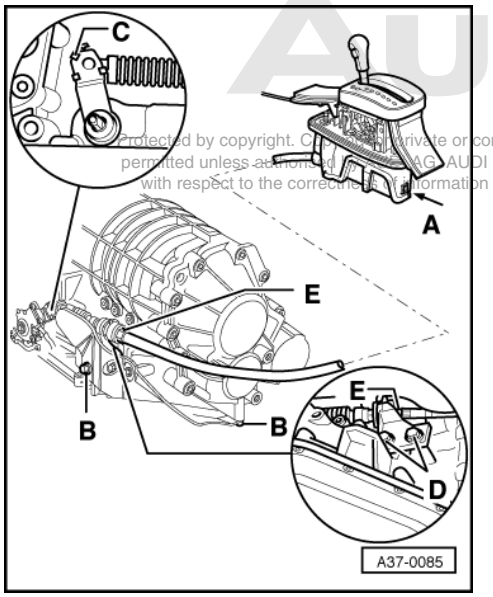
- Route cable for basic illumination under guide and fix into notch -A- (left/right).
- Clip connector -B- into retainer on guide.
- Clip in connector of wiring harness (console).

1.16 - Removing and installing selector lever cable at shift mechanism without Tiptronic

Note:

- Do not bend or kink the gate selector cable. Apply a thin coating of grease to the cable eye and cable ends before installation.
- The gate selector cable should be removed with the selector lever in the "P" position.

Removing



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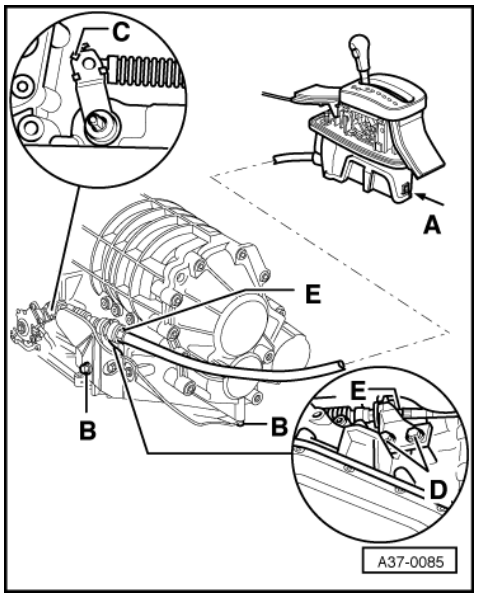
- Remove protective plate (under shift mechanism) for exhaust system.

- -> Remove cover:

  Release snap fastener of cover by pressing in direction of -arrow A- =>Page 62 .

- Release the retaining clips by pressing the two ends together and then remove the gate selector cable from the selector lever.
- Pull locking plate for selector lever cable on mounting bracket out downwards.
- Insert into the slot around the selector lever cable with the angled end pointing towards rear => Fig. 65 .

- Pull out selector lever cable at mounting bracket.
- Install protective plate for selector lever cable -B-.



- -> Press off retaining clip from lever/selector shaft -C-.
- Detach the ball socket of the selector lever cable from the lever/selector shaft.
- Release support bracket from gearbox -D-.
- If necessary, release the gate selector cable from the support bracket -E-.

Installing

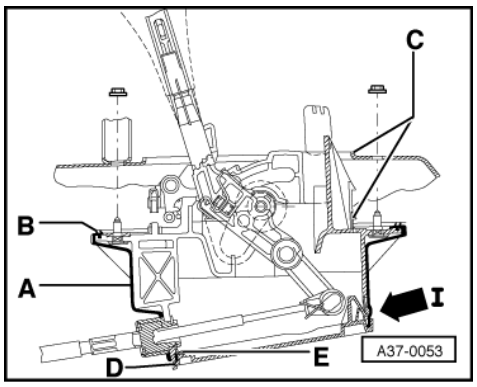
- Move the selector lever and lever/selector shaft to "P" (the parking lock must engage).
- Install in reverse order.
- Apply a thin coating of grease to the cable eye and ball socket of the gate selector cable.

- Check and adjust the gate selector cable=>Page 48 .

Tightening torque:

Components	Tightening torques
Gate selector cable to support bracket	12 Nm
Support bracket to gearbox support (right)	23 Nm
Protective plate to gearbox, M8	23 Nm

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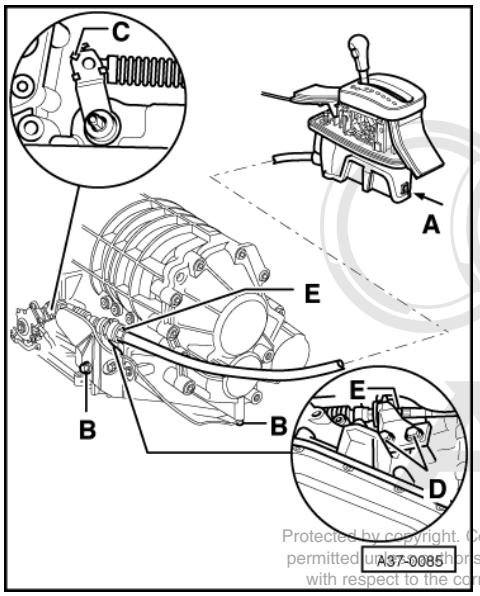
-> Fig.1 Assembly of protective plate

- Installation position of tab washer -E-.

  Insert with angled end pointing towards rear.

1.17 - Checking and adjusting selector lever cable in shift mechanism without Tiptronic

Checking:



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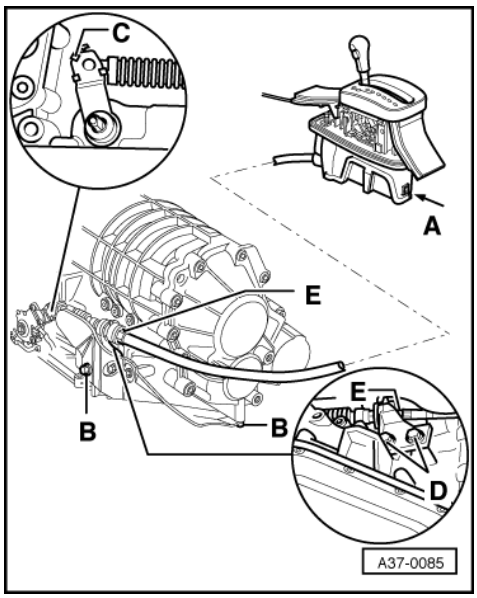
- Remove retaining clip -C- for selector lever cable at lever/selector shaft =>Page 63 .
- Press selector lever cable off lever/selector shaft.
- Move the selector lever from "P" to "2".

- Selector lever mechanism and selector lever cable must move freely; if necessary renew selector lever cable or service selector lever mechanism.

- Move the selector lever to "P".
- Move the lever/selector shaft to "P" (rearmost position, the parking lock must engage).

- It should be possible to push the selector lever cable onto the selector shaft lever. Adjust selector lever cable if necessary.

Adjusting



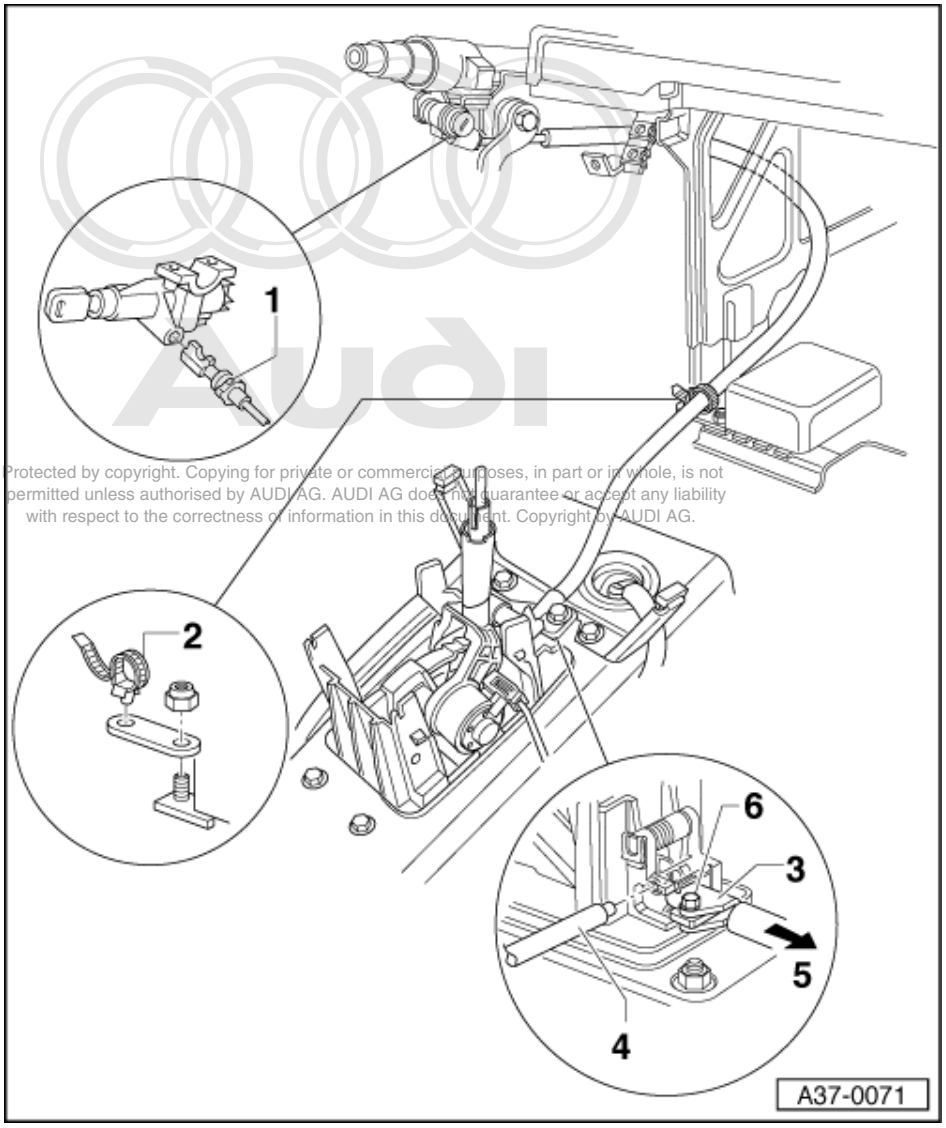
- Set the selector lever to "P".
- Move the lever/selector shaft to "P" (rearmost position, the parking lock must engage).
- Slightly loosen the bolt securing the support bracket to the gearbox.

• Check to ensure that the gate lever cable is free from strain. If necessary, relieve the strain.

- Tighten securing bolt - 23 Nm.
- Checking shift mechanism =>Page 21 .

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1.18 - Removing and installing locking cable at shift mechanism without Tiptronic



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Note:

- The locking cable must not be kinked

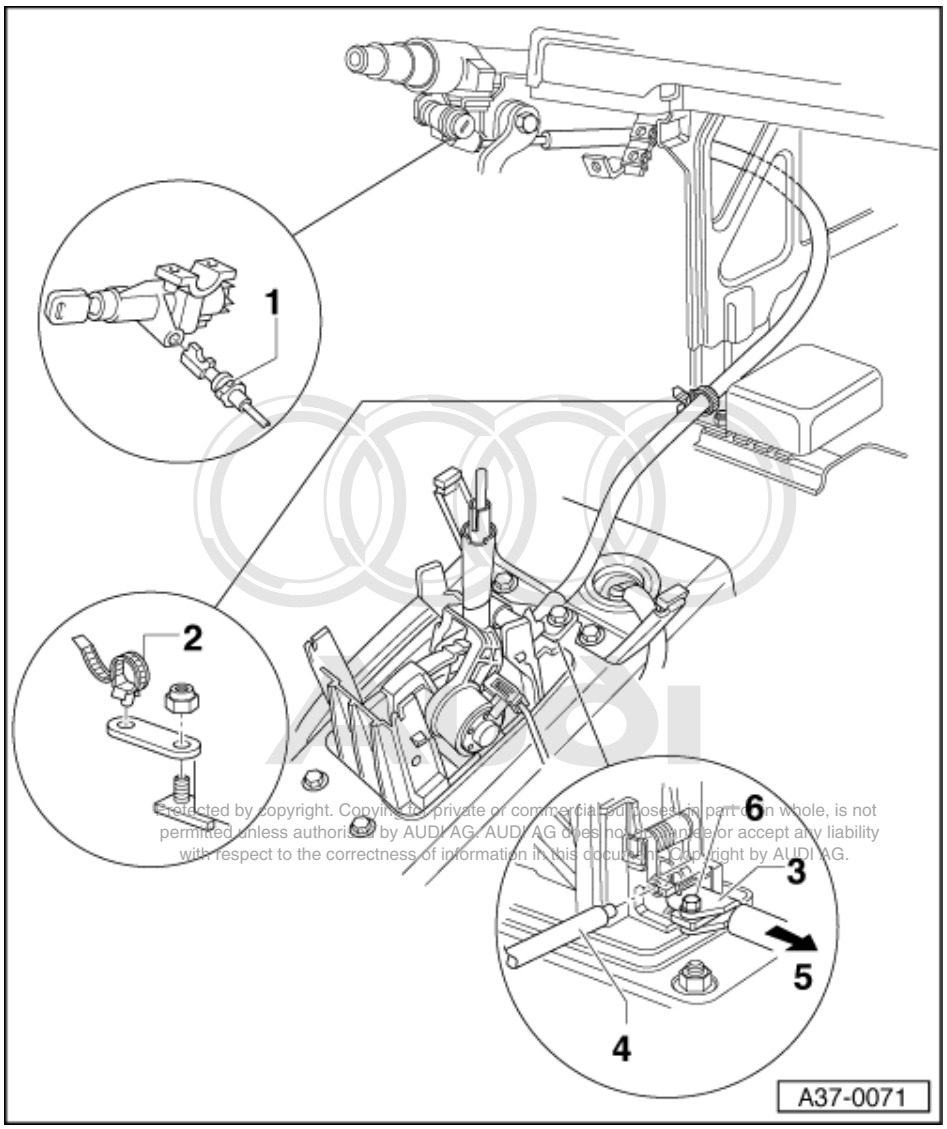
Removal:

- Disconnect earth strap on battery.
- Remove the driver's side storage compartment located under the steering wheel.

=> General Body Assembly, Interior; Repair group 68; Storage compartments, covers; Removing driver's storage compartment Storage compartments, covers Removing driver's storage compartment

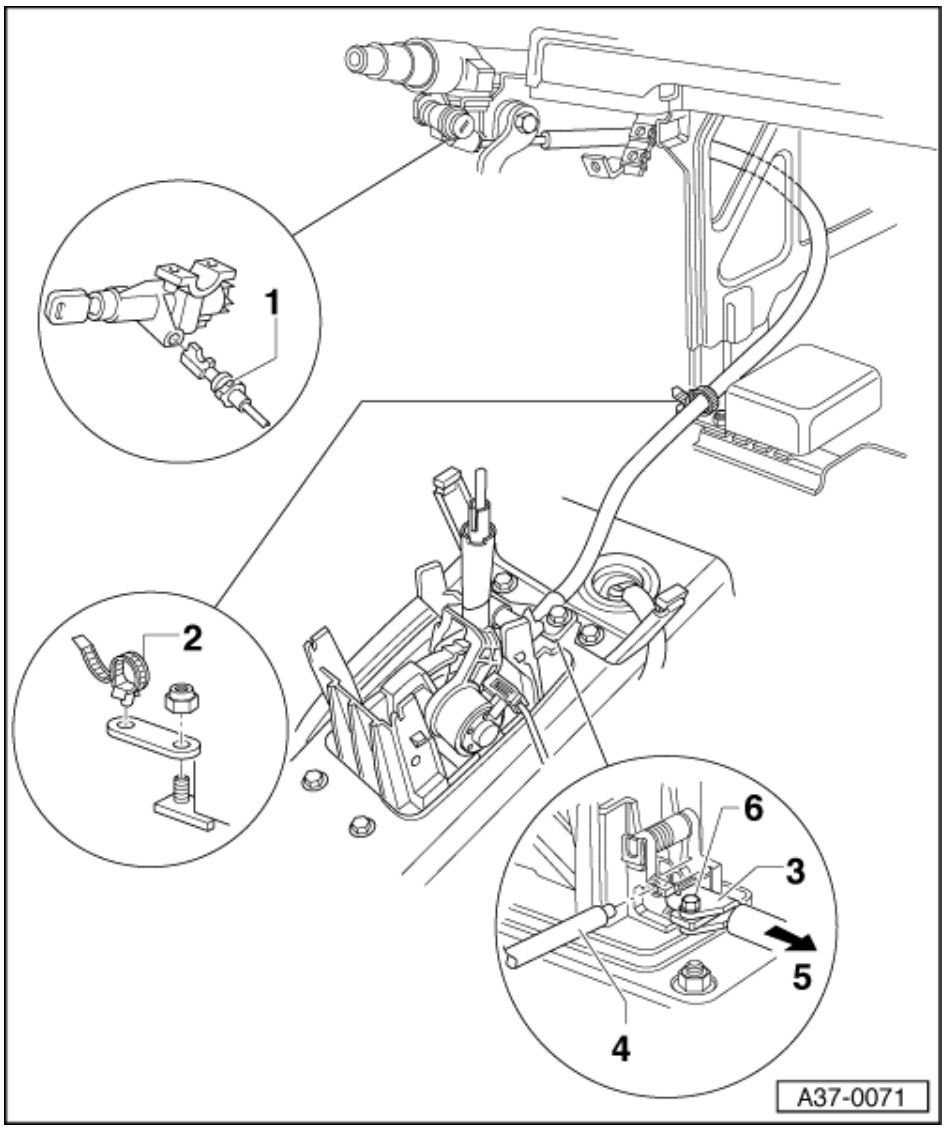
- Remove steering column switch.

=> Electrical system; Repair group 92; Repairing steering column switch; Removing and installing steering column switch Repairing steering column switch Removing and installing steering column switch



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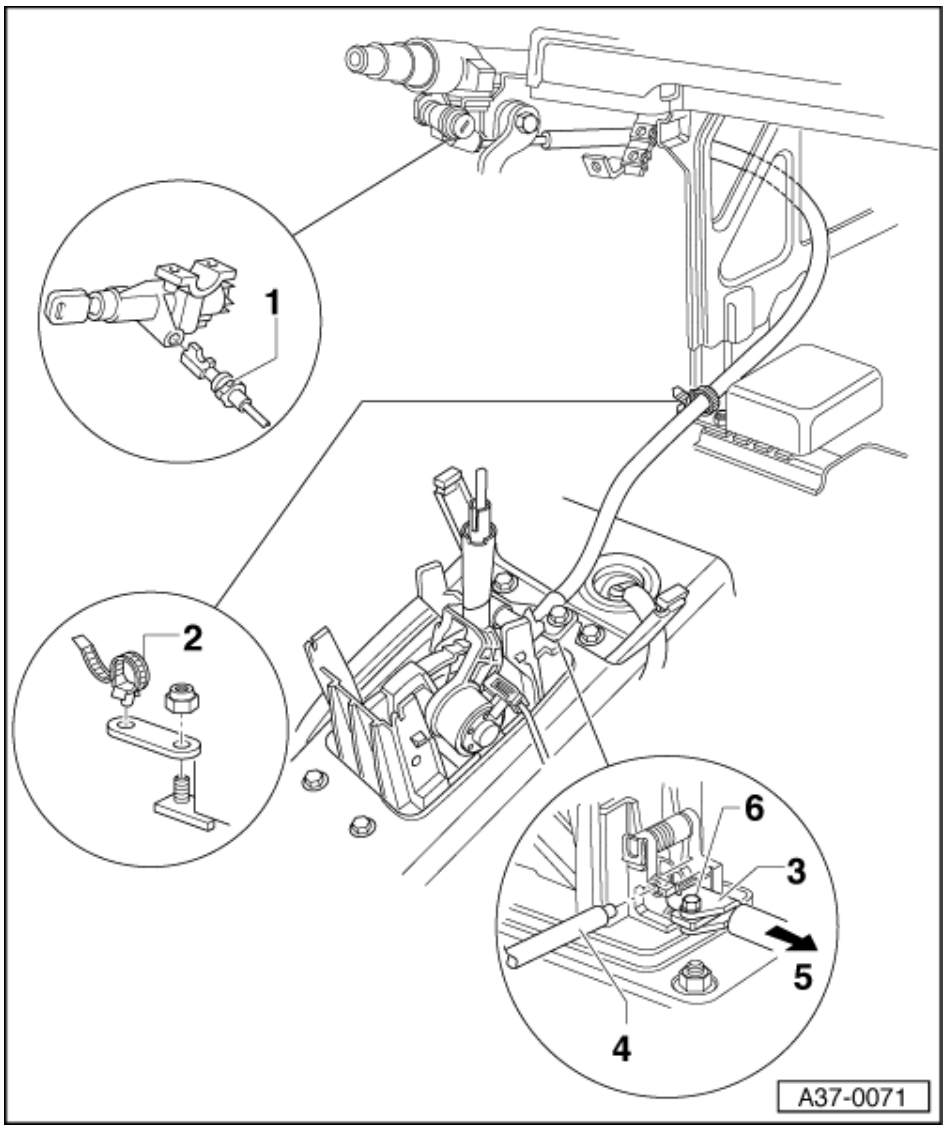
- Set the starter switch to "drive".
- Move the selector lever to "P".
- Raise the locking rod -1- and pull the locking cable from the starter switch.
- Disassemble the cover with guide (gear shift mechanism) =>Page 22 .
- Unclip the locking cable from the retaining spring on the mount. To do this, raise the retaining spring slightly.
- Loosen the cable binder -2- and pull out the locking cable.



Installation and adjustment

- Install in reverse order.
- Install the locking cable without kinks and secure at the position shown using a cable binder -2-.
- Move the steering column back/down.
- Check that locking device -1- engages.
- Loosen the bolt -6- slightly.
- It must be possible to slide the support bracket -3- in the direction indicated by the arrow -5-.
- Ensure that the retaining spring is fitted correctly in the mount.
- Hook interlock cable support bracket -3- into shift mechanism and interlock cable eye into lever (for interlock cable).

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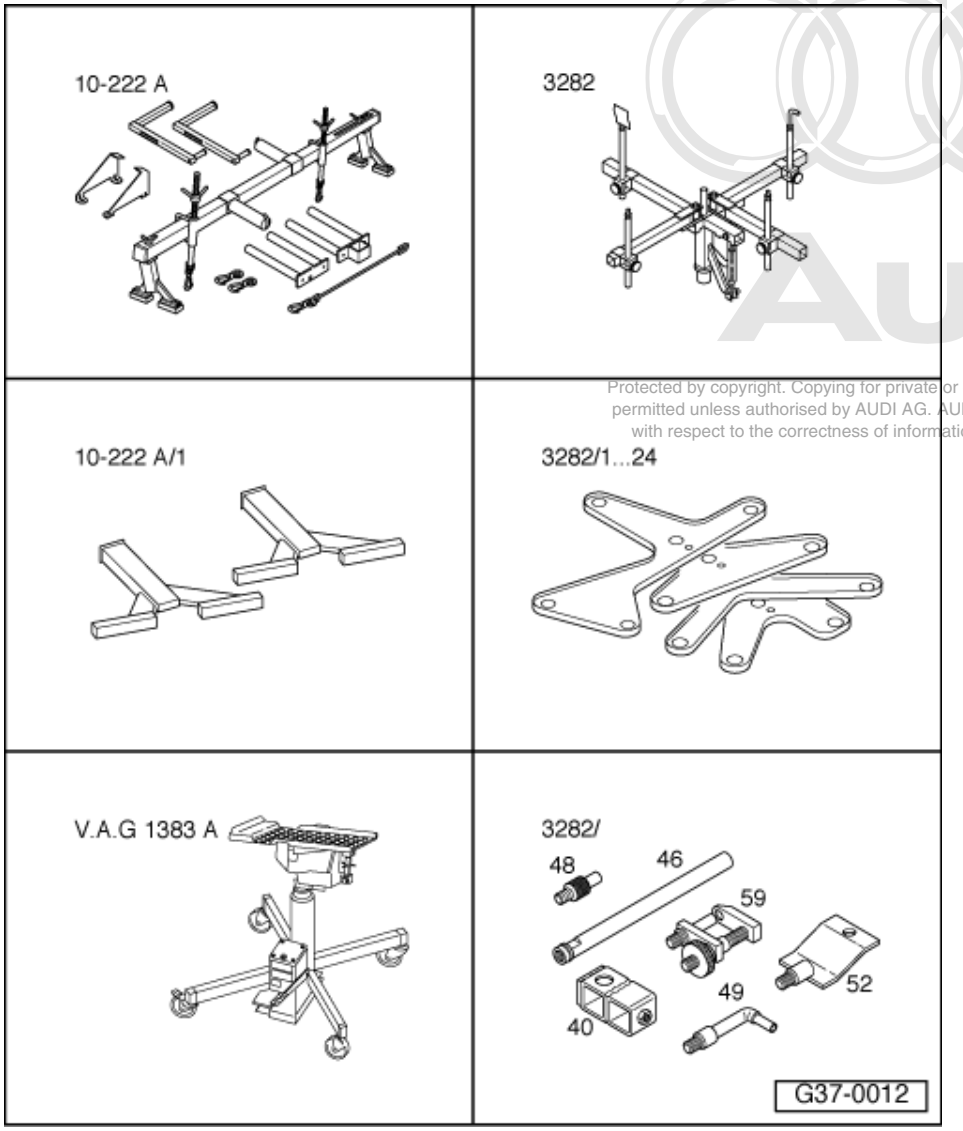


- Insert the adjustment gauge 3352 A, -4- between the lever (for the locking cable) and locking cable eye.
- Pull the locking cable in the direction of the arrow -5- and tighten the bolt -6- to 8 Nm.
- Whenever the locking cable has been adjusted, check the locking cable => Page 21 .

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2 - Removing and installing gearbox

2.1 - Removing and installing gearbox

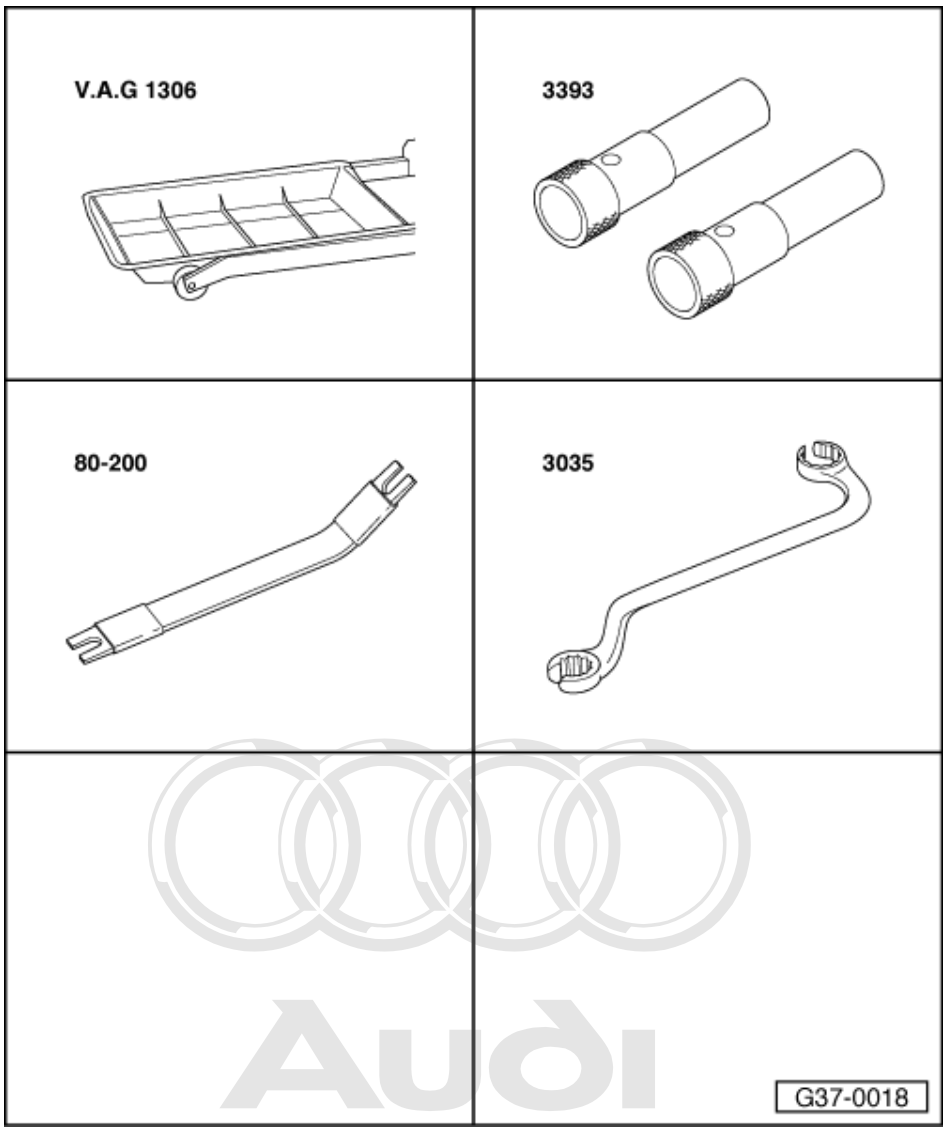


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2.2 - Removing

The following special tools and testing devices are required:

- 10-222 A - Support bar
- 10-222 A/1 - Frame for support bar
- 10-222 A/3 Adapters x 2
- V.A.G.1383A - Jack
- 3282 - Gearbox support
- 3282/19 - Adjustment plate
- 3282/48 - Locating pin
- 3282/52 - Supports x 3

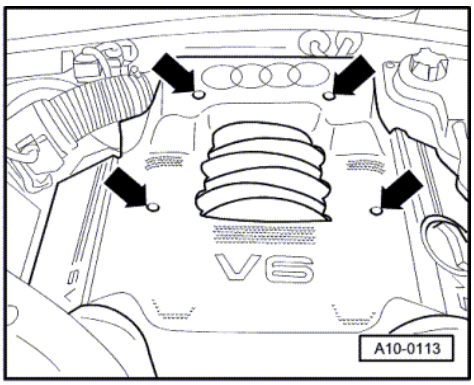


- V.A.G 1306 - Oil pan
- 80-200 - Pressing lever
- 3035 Special socket
- 3393 Test drifts
- Special tool (nut) V 175

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Additionally required information

- Workshop Manual A4 1995 ä ; Running Gear, FWD and 4WD
- Workshop Manual for Audi A4 1995 ä, Electrical System
- Workshop Manual A4 1995 ä, Engine, Mechanical Components

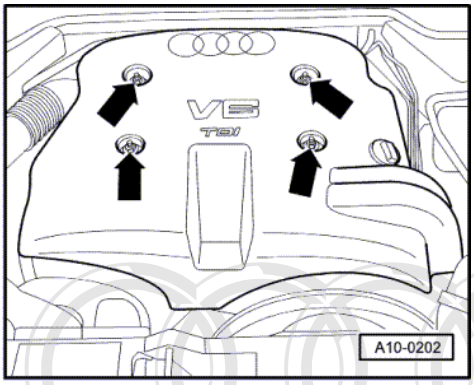


- Observe or obtain radio code on vehicles with coded radio.
- Disconnect earth strap on battery.

For 6-cylinder petrol engines except 2.7l 5V turbo-charged engine:

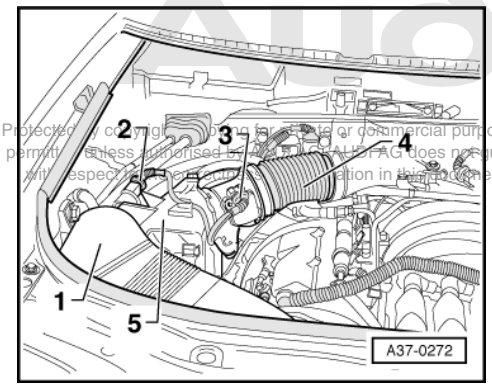
- -> Remove engine cover -arrows-.

For 6-cyl. diesel direct injection engines (TDI)



- -> Remove engine cover -arrows-.

The remaining procedure for removing and installing the gearbox on 2.7l 5V turbo-charged engines is described from Page => 89 onwards.

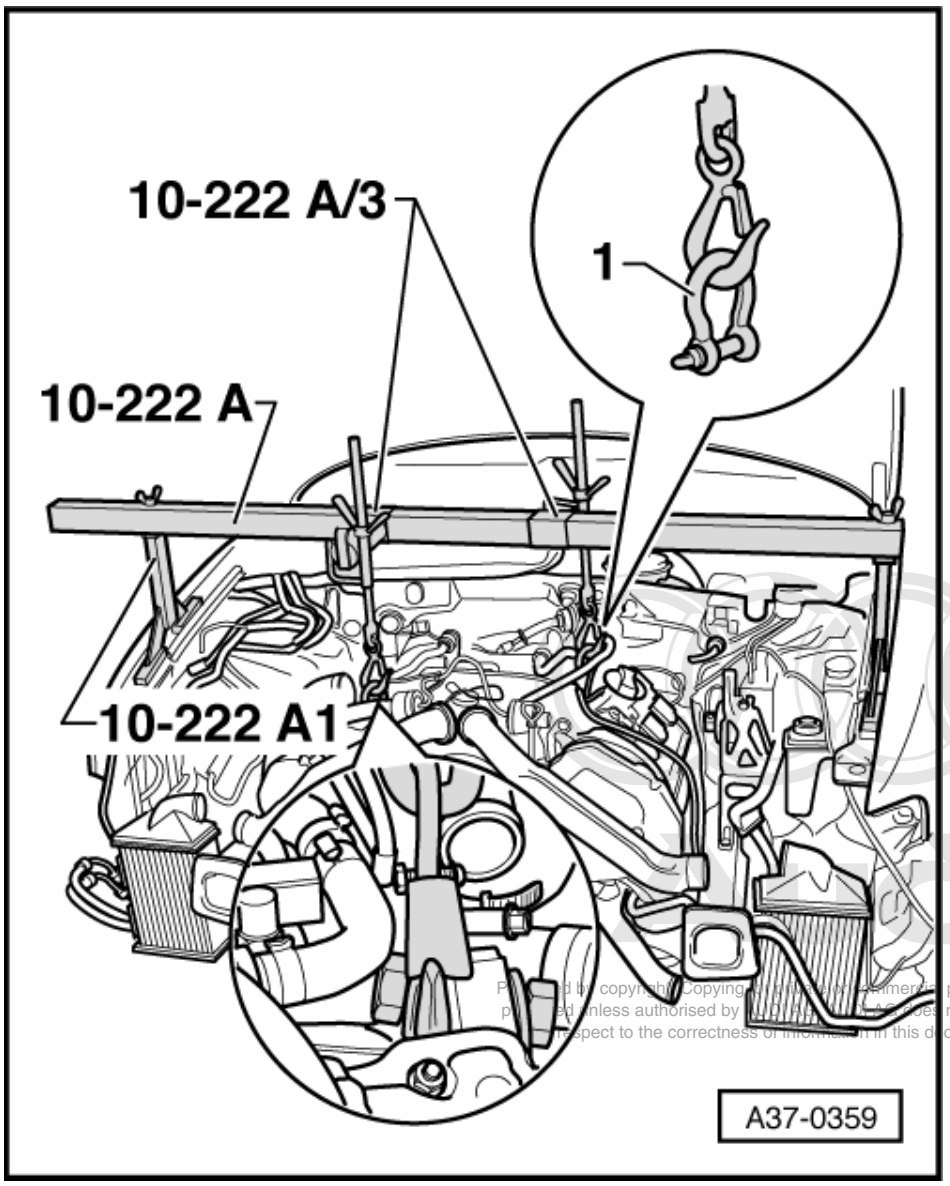


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All except 2.7l 5V turbo engine:

- Detach covers above air cleaner.
- -> Remove air guide -1- between air cleaner housing and lock carrier.
- Disconnect connector at ACF solenoid -2-, pull solenoid off bracket. Disconnect plug -3- from air mass meter.
- Detach intake hose -4- from intake pipe.

- Remove upper part of air cleaner.

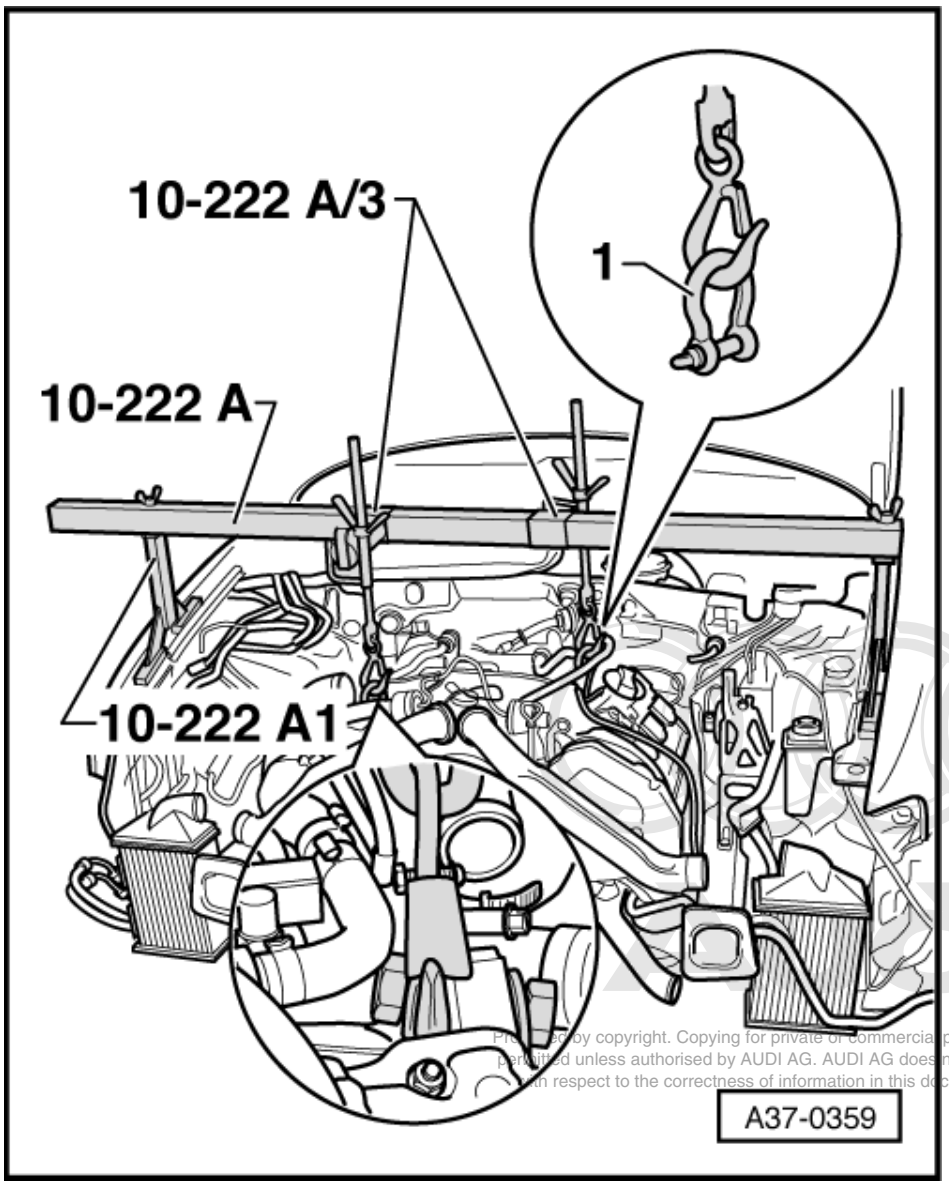


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- Remove coolant system expansion reservoir and lay to one side.
- Unscrew lambda probe from left and right exhaust downpipes.
- Unscrew upper securing nuts on front exhaust pipes (left and right).

On all 6-cylinder engines:

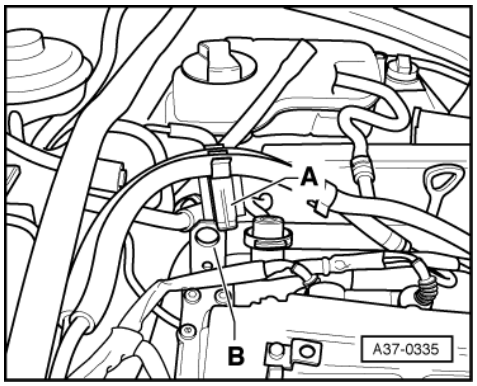
- Install both adapters 10 -222A/3 for front and rear spindles to support bar.
- -> Place support bar 10-222 A on wing panel flange using 10-222 A/1.



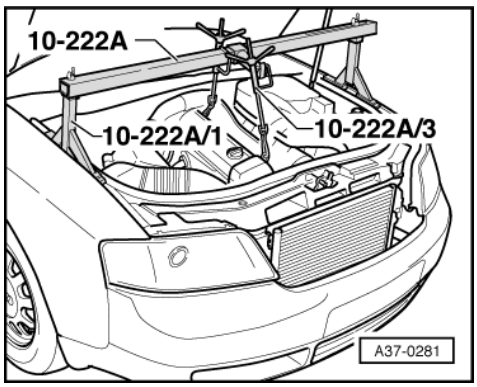
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- -> Attach both spindles to the adapters.
- Attach the engine to the spindles. To do this, also use a shackle -1- at the rear of the engine to avoid damage.

For 4-cylinder engines:



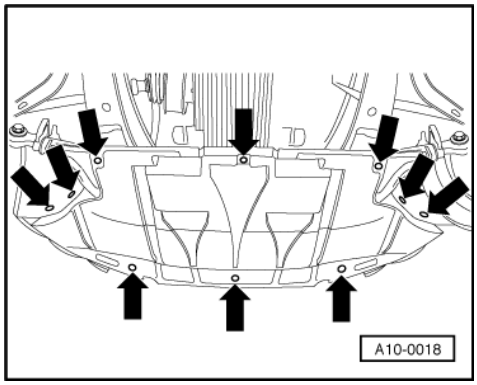
- -> Disconnect plug -A- from bracket -B-



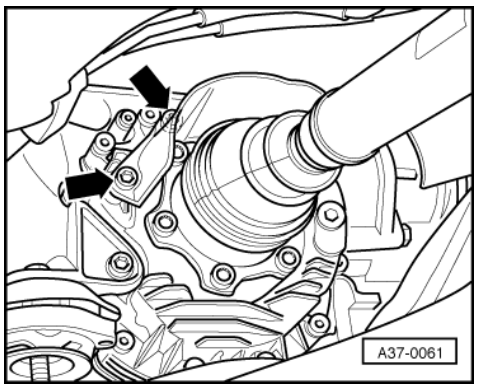
- Assemble adapter 10-222 A/3 for front spindle on support bar.
- -> Fit support bar 10-222 A with legs 10-222 A/1 and support engine/gearbox in this position.

All models:

- Slightly pre-tension engine/gearbox assembly on the spindles.
- Leave the rear spindle slightly loose to allow subsequent lowering to the rear.
- Raise vehicle.
- Remove front wheels.



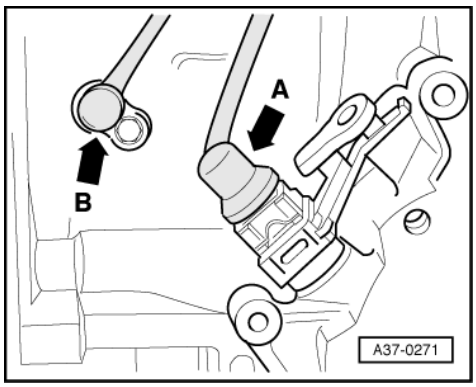
- -> Remove noise insulation tray.



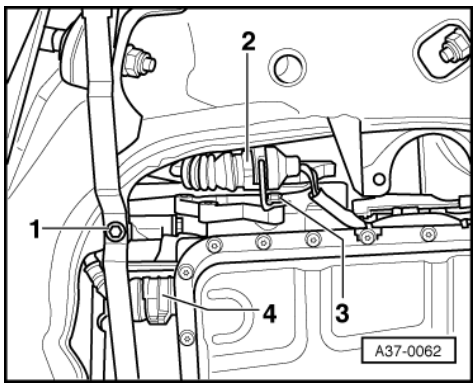
- -> Remove heat shields for drive shafts (left and right) -arrows-.
- Unbolt drive shafts from flanges on gearbox.

=> Running Gear, Front and Four-wheel Drive; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft

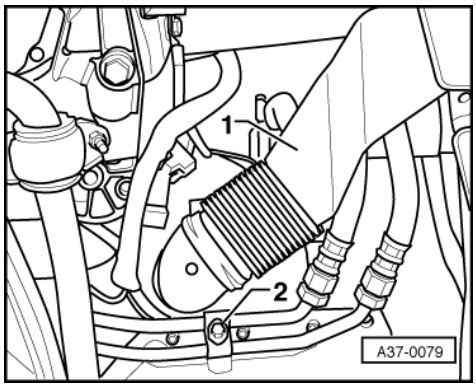
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- -> Remove engine speed sender -G28 arrow B- at front left from gearbox (if fitted).
- Unplug connector for speedometer -arrow A- from gearbox.



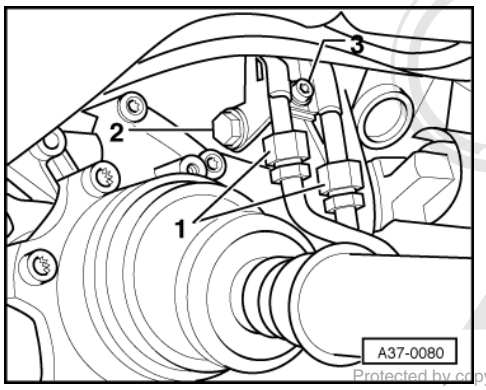
- -> Remove bracket for noise insulation -1-.
- Swivel the retaining lever -4-, and disconnect the plug for the gearbox cable loom.
- Pull connector -2- off wiring of multifunction switch.
- Unbolt retainer -3- for connector.



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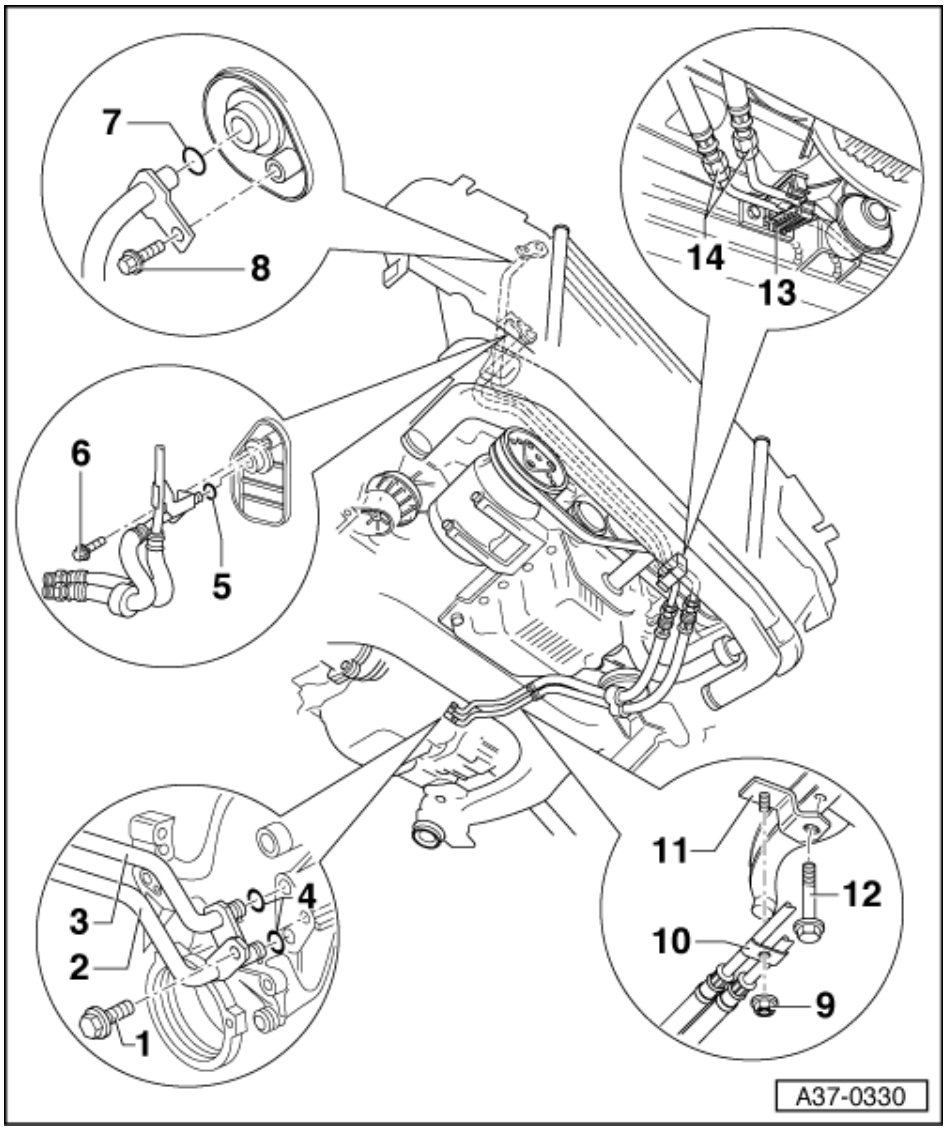
For 6-cylinder engines except 2.7l 5V turbo-charged engine:

- -> Unclip the breather hose for the alternator -1-.
- Unscrew bracket for ATF wiring -2- at oil pan.



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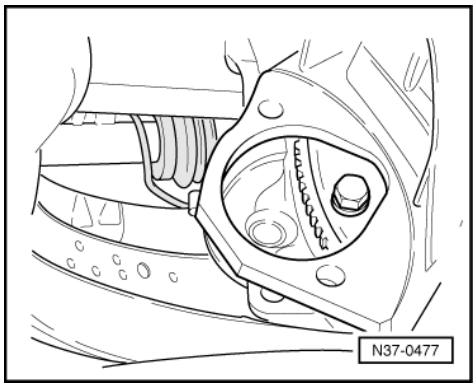
- -> Separate ATF lines -1- from ATF cooler.
- Plug ATF lines with clean plugs.
- Unbolt retainer for ATF line arrow -3-.
- Unscrew starter bolt on gearbox side -2-.



Vehicles with 4-cylinder engine

- Unscrew bolt -12- to separate the bracket for ATF line -11- from engine.
- Unscrew bolt -1-.
- Pull lines -2- and -3- out of gearbox.
- Plug lines and openings at gearbox with clean plugs.
- Put lines to the side in order not to damage them.

All except 2.7l 5V turbo engine:



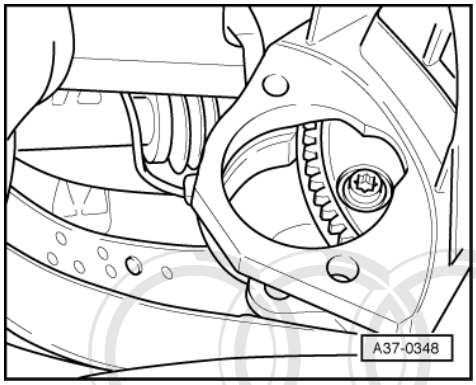
- Remove starter.

=> Electrical System; Repair group 27; Removing and installing starter Removing and installing starter

Separate the torque converter from the drive plate.

Foe vehicles with hexagon bolts:

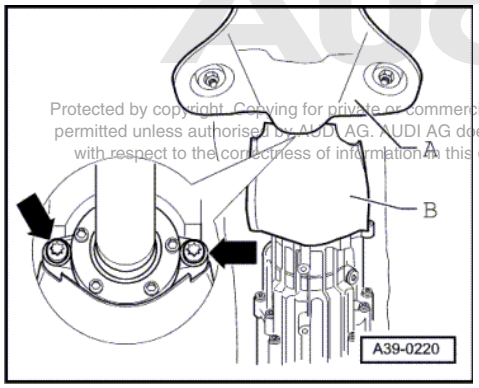
- -> Unscrew the 3 torque converter bolts with special tool V 175 from the drive plate (turn crankshaft a further 1/3 turn each time).



For vehicles with Torx bolts:

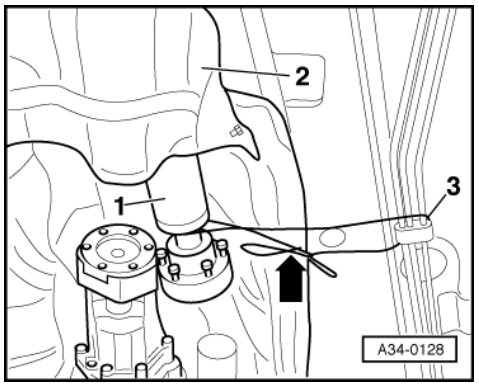
- -> Unscrew the 3 torque converter bolts with an appropriate Torx socket from the drive plate (turn crankshaft a further 1/3 turn each time).

Vehicles with four-wheel drive



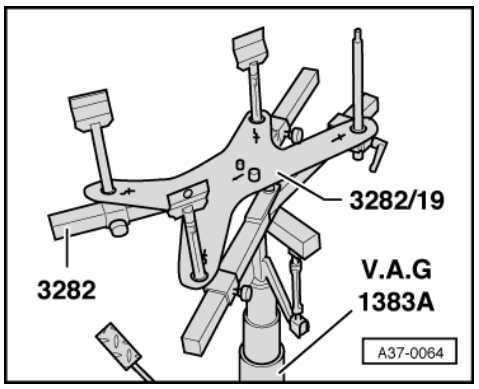
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- -> Remove heat shield -A- over propshaft.
- If necessary, remove the rear part of the exhaust system:
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Remove heat shield -B- for propshaft from Torsen differential cover -arrows-.



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- Unbolt the propshaft at the gearbox. Suspend or support the propshaft.

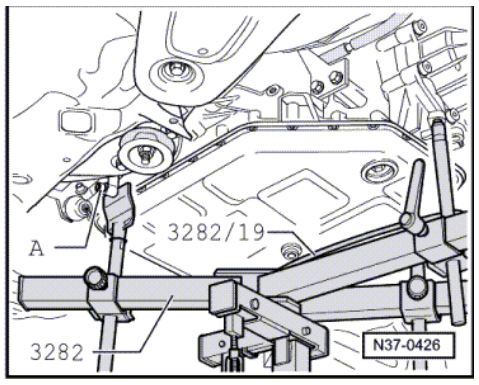


Continued for all vehicles

- -> Set up gearbox support 3282.

The gearbox support 3282 is aligned with the adjusting plate 3282/2 for removing the automatic gearbox 01V.

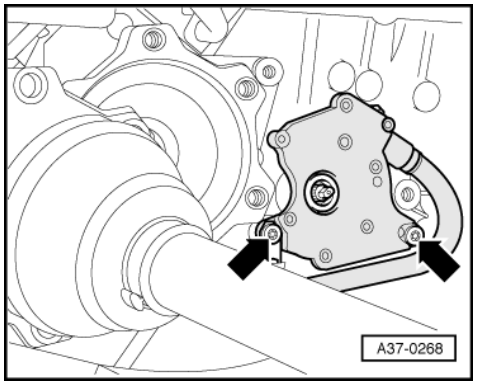
The symbols on the adjusting plate indicate the mounts required, the arrow points forward.



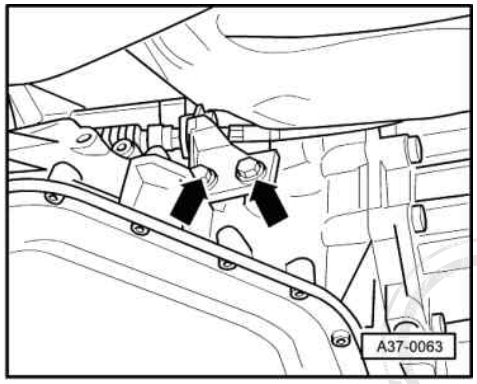
- -> Move jack V.A.G 1383 A with gearbox support 3282 under the gearbox and support gearbox.
- Align adjustment plate parallel to gearbox.
- Secure gearbox to gearbox support 3282 with bolt -A-.

The automatic gearbox 01V with 4WD is supported at the same points as the FWD type.

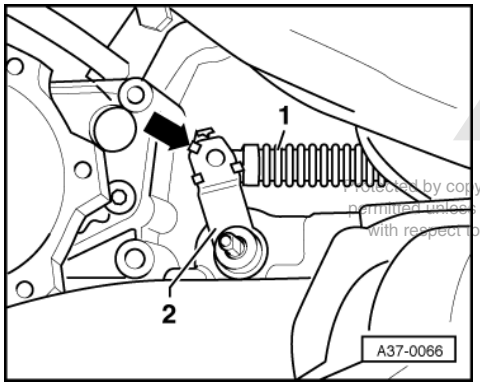
- Remove gearbox support on left and right with gearbox mounting => Page 106



- -> Unscrew multifunction switch -F125 to protect it from damage -arrows- and expose wiring harness.

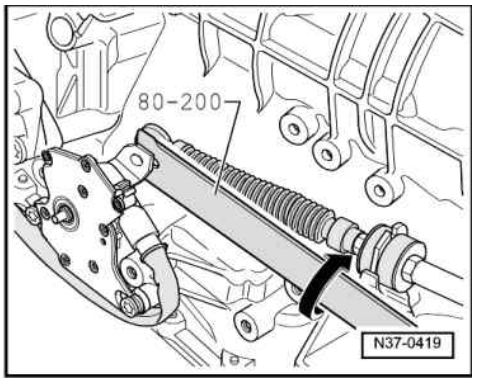


- -> Mark position of mounting bracket for selector lever cable to gearbox housing for reinstalling, unscrew mounting bracket -arrows-.



- If present press off retaining clip -arrow- at end of selector lever cable.

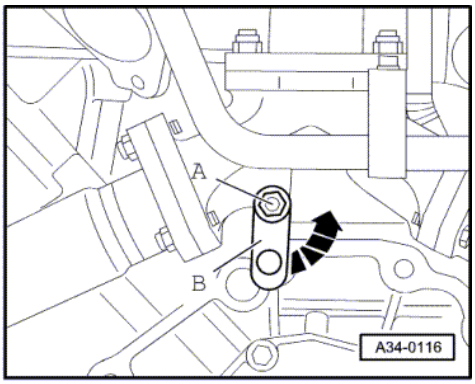
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- -> Lever selector lever cable off lever/selector shaft -arrow-.
- Remove upper engine/gearbox connecting bolts.

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For 6-cylinder TDIengines

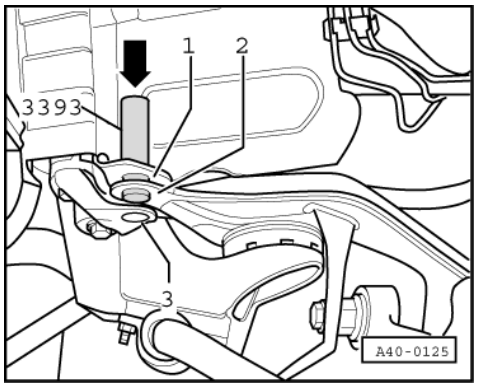


- -> Slacken bolt -A- (on rear of turbocharger) by a few turns and pivot strut -B- to one side in direction of arrow. Then tighten bolt -A- again slightly.

Note:

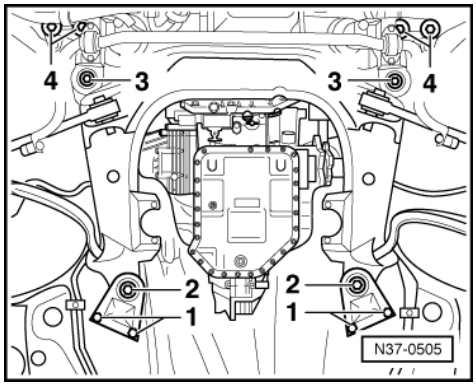
The illustration shows the engine from the rear with the gearbox removed.

Continued for all vehicles



- -> Before undoing the subframe, use special tool 3393 to check that at least holes -1- and -2- line up.

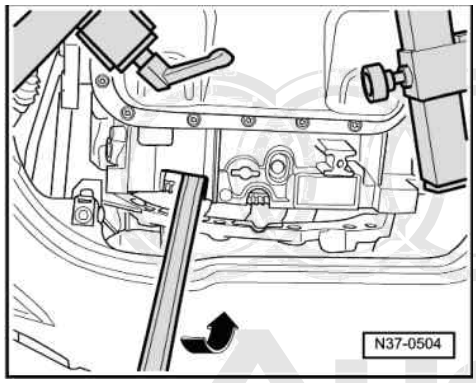
If this is not the case, check axle alignment after installing the subframe.



- -> Unscrew bolts -1- and -2- at rear of subframe on both sides of vehicle.
- Completely unscrew bolts -3- at front of subframe on both sides of vehicles.

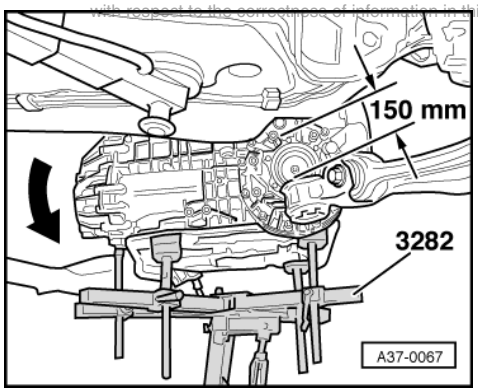
The subframe is lowered by approx. 150 mm by releasing bolts on rear edge => Page 83 , Fig. A37-0067.

- Lower rear of engine/gearbox assembly slightly with jack V.A.G 1383 A.
- Remove front exhaust.
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system



- Remove the remaining bolts connecting the engine to the gearbox.
- Press gearbox off engine; when doing this, press torque converter out of drive plate.
- -> Press torque converter against ATF pump -arrow-.

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- -> Swivel in gearbox -arrow- and remove carefully between subframe and vehicle underbody.
- Lower gearbox.
- Secure torque converter to prevent it falling out.

2.3 - Installing

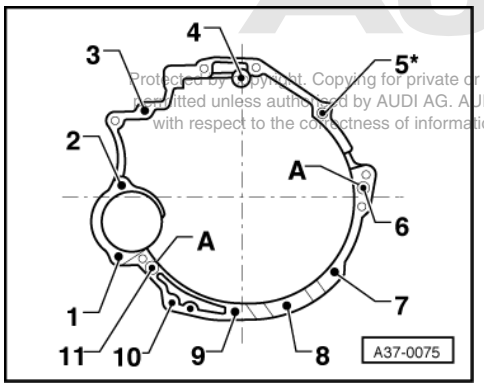
Installation is carried out in the reverse order; note the following:
Before installing:

Vehicles with four-wheel drive

- Clean thread in flange of propshaft!

Continued for all vehicles

- Clean ATF lines => Page 136 .
- Insert torque converter into gearbox => Page 20 .



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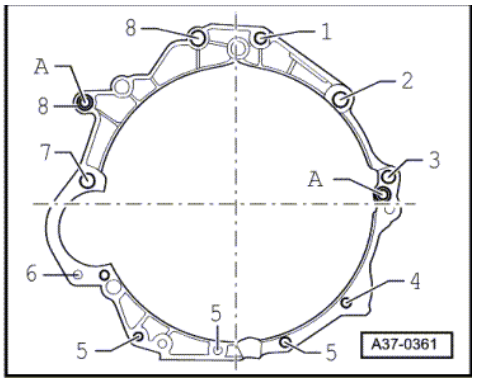
- Ensure that dowel sleeves are seated correctly.

Note:

If the dowel sleeves get stuck in gearbox housing they must be removed and new dowel sleeves must be attached at engine.

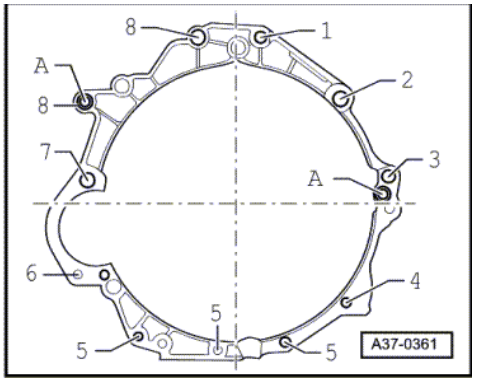
-> For 4-cylinder engines (5-valve, turbo-charged)

A = Dowel sleeves



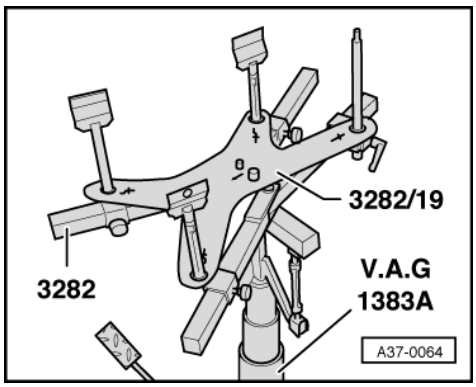
-> For 6-cylinder petrol engines

A = Dowel sleeves



-> For 6-cylinder TDI engines

A = Dowel sleeves

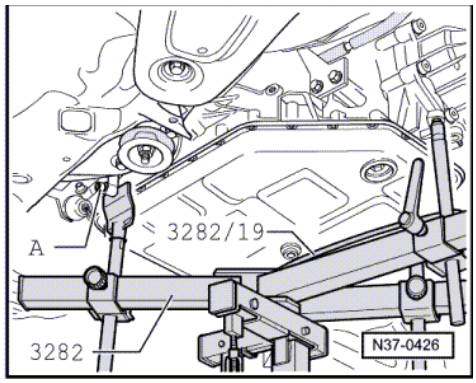


- -> Set up gearbox support 3282.

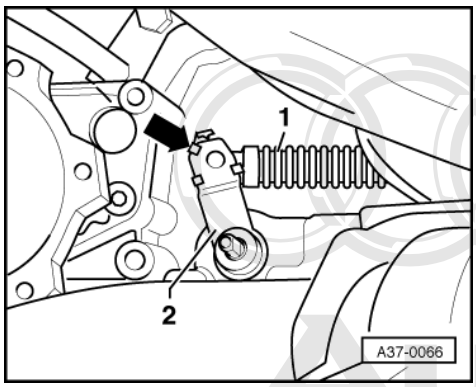
The gearbox support 3282 is aligned with the adjusting plate 3282/2 for removing the automatic gearbox 01V.

The symbols on the adjusting plate indicate the mounts required, the arrow points forward.

- Place gearbox on gearbox jack.



- -> Secure gearbox onto gearbox mount 3282 with bolt -A-.
- Insert gearbox between lowered subframe and vehicle floor.



- -> Press lever/selector shaft -2- at gearbox as far back as it goes (according to illustration completely to the right) until parking lock engages.
- Shift selector lever to "P" and carefully press ball socket of selector lever cable onto lever/selector shaft -2- using for example pliers.
- If present press off retaining clip -arrow- at end of selector lever cable.

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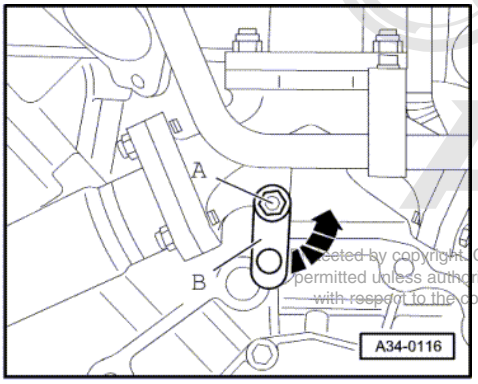
Note:

Do not bend the lever/selector shaft when pressing on the ball socket, as otherwise it will no longer be possible to precisely adjust the shift mechanism

- Align gearbox to engine.

Note:

- Attach intermediate plate (if equipped) onto dowel sleeves.
- When pushing the engine and gearbox together, ensure that no cables can become trapped.



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For 6-cylinder TDIengines

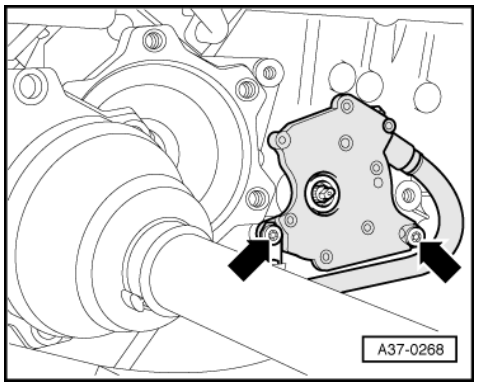
- -> Before installing gearbox, check whether strut -B- is still pivoted to the side - arrow-

Continued for all vehicles

- Install upper engine/gearbox securing bolts.

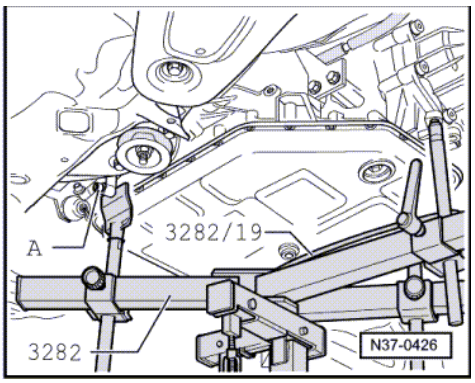
Note:

A bracket or an earth connection may be screwed onto some bolts => see tables of tightening torques from Page 102 onwards



- -> Install multifunction switch -F125
- Raise rear engine/gearbox assembly slightly using jack V.A.G 1383 A.
- Install the remaining bolts connecting the engine to the gearbox.
- Install front exhaust pipe.
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Insert subframe. Whilst doing so observe sequence of tightening and fixing with master bore.

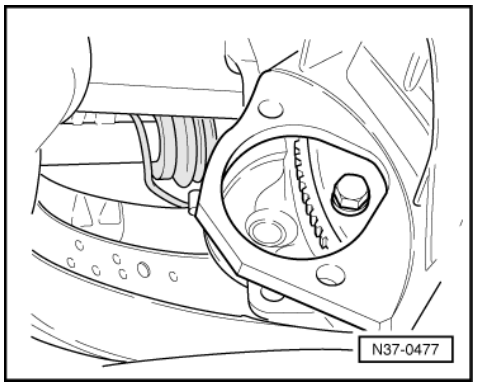
=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing subframe Removing and installing subframe



- Carry out wheel alignment, but only, if necessary.

=> Running Gear, FWD and 4WD; Repair group 44; Wheel alignment Wheel alignment

- Install gearbox support on left and right with gearbox mounting => Page 106
- -> After gearbox has been bolted onto engine unscrew bolt -A-.
- Apply corrosion protection onto contact point of bolt -A- with oil pan.

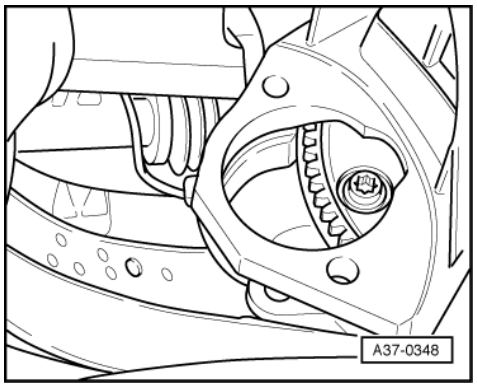


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Bolting together the torque converter and the drive plate

For vehicles with hexagon bolts:

- -> Bolt the 3 torque converter bolts with special tool V 175 to the drive plate (turn crankshaft a further 1/3 turn each time).



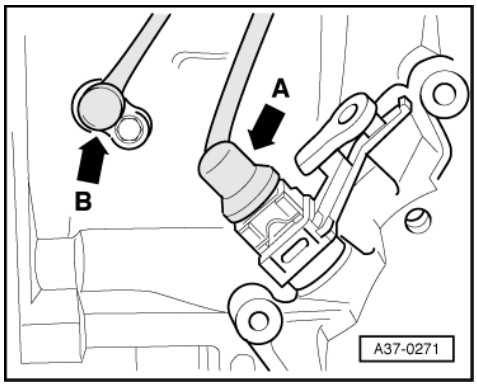
For vehicles with Torx bolts:

- -> Bolt the 3 torque converter bolts with an appropriate Torx socket to the drive plate (turn crankshaft a further 1/3 turn each time).

- Install starter.

=> Electrical System; Repair group 27; Removing and installing starter Removing and installing starter

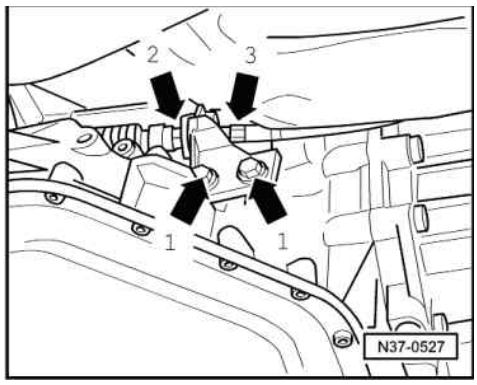
- Fit ATF lines to engine/gearbox assembly.
- Screw on brackets for ATF lines



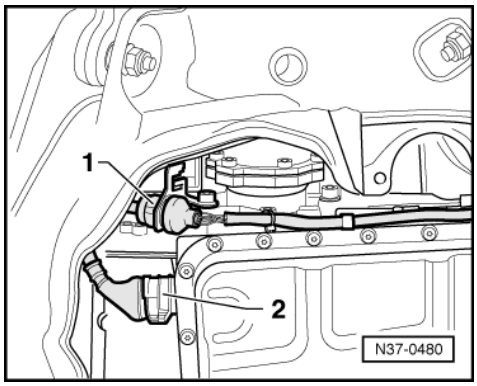
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- Raise rear engine/gearbox assembly slightly using jack V.A.G 1383 A.
- -> Attach engine speed sender -G28 arrow B- at front left to gearbox (if fitted).
- Plug in connector for speedometer sender.
- Unbolt drive shafts from flanges on gearbox.

=> Running Gear, Front and Four-wheel Drive; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft



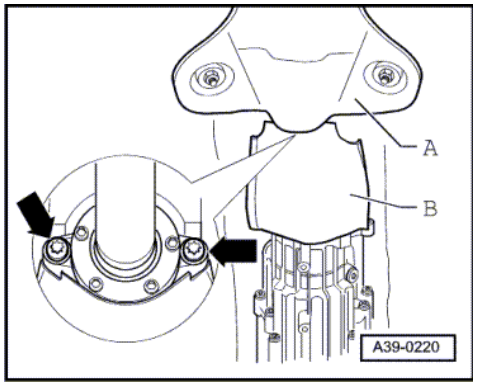
- -> Fit bolts to support bracket of selector lever cable, install selector lever cable and, if necessary, adjust.



- -> Plug in connector of multifunction switch -1-.
- Plug in connector for gearbox wiring harness and secure with securing lever -2-.
- Fit selector lever cable protective plate.

Vehicles with four-wheel drive

- Bolt the propshaft onto the gearbox flange => Page 225 , Removing and installing propshaft.



- -> Bolt heat shield -B- for propshaft to cover for Torsen differential -arrows- (if present).
- Install heat shield -A- over the propshaft.

Continued for all vehicles

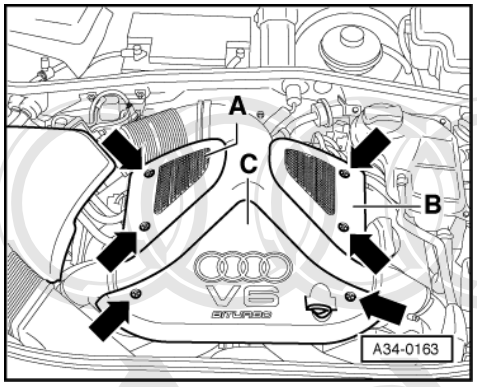
- Install noise insulation tray bracket.
- Install noise insulation tray.
- Install front wheels.
- Reconnect earth strap to battery.
- Check setting of selector lever cable => Page 48
- With gearbox installed, check gear oil level in final drive=> Page 171 .
- Check and top up ATF level =>Page 113 onwards
- After connecting battery, enter anti theft code for radio.

=> Radio -operating instructions

- Close windows fully using electric window switches.
- Then actuate all electric window switches again for at least one second in the "close" direction to activate the automatic open/close function.
- Set clock to correct time.

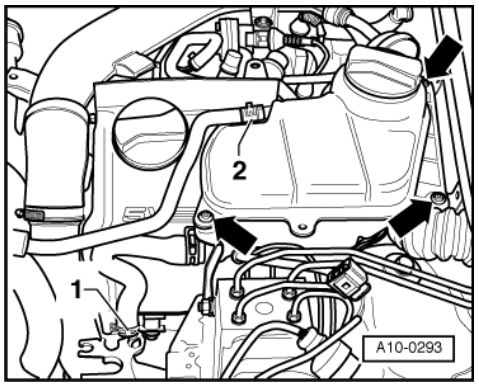
Table of tightening torques from Page 102 onwards

Removal and installation for 2.7l 5V turbo-charged engine:



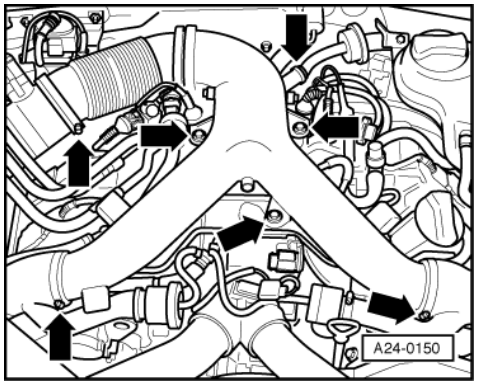
- -> Undo screw fastenings -arrows- and remove engine covers -A...C-.
- Remove cover above air cleaner.

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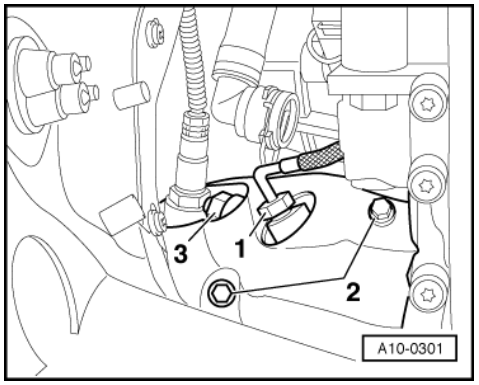


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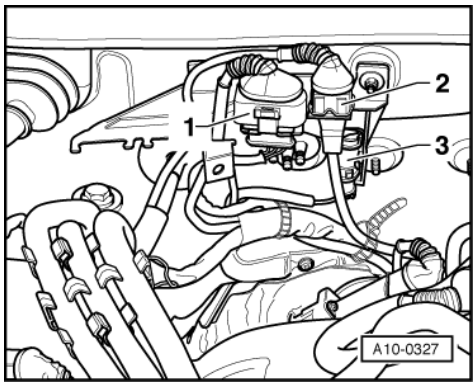
- -> Remove coolant reservoir (arrows) and lay to one side.
- Disconnect plug for coolant level gauge.
- Remove cover from cylinder head cover (cylinder bank 4-6).



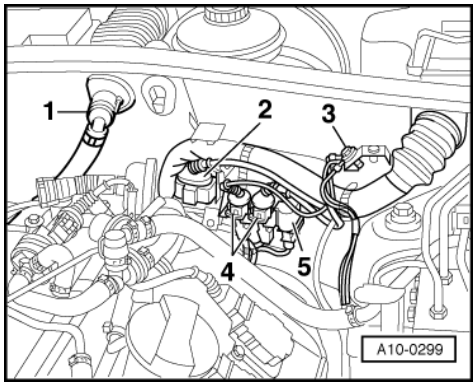
- Remove air distributor -arrows-.



- -> Unbolt heat sender -1- from right turbocharger using special tool 3035.
- Undo protective plate -2- from left and right turbocharger.
- Unscrew upper bolts -3- between downpipe and left and right turbocharger.

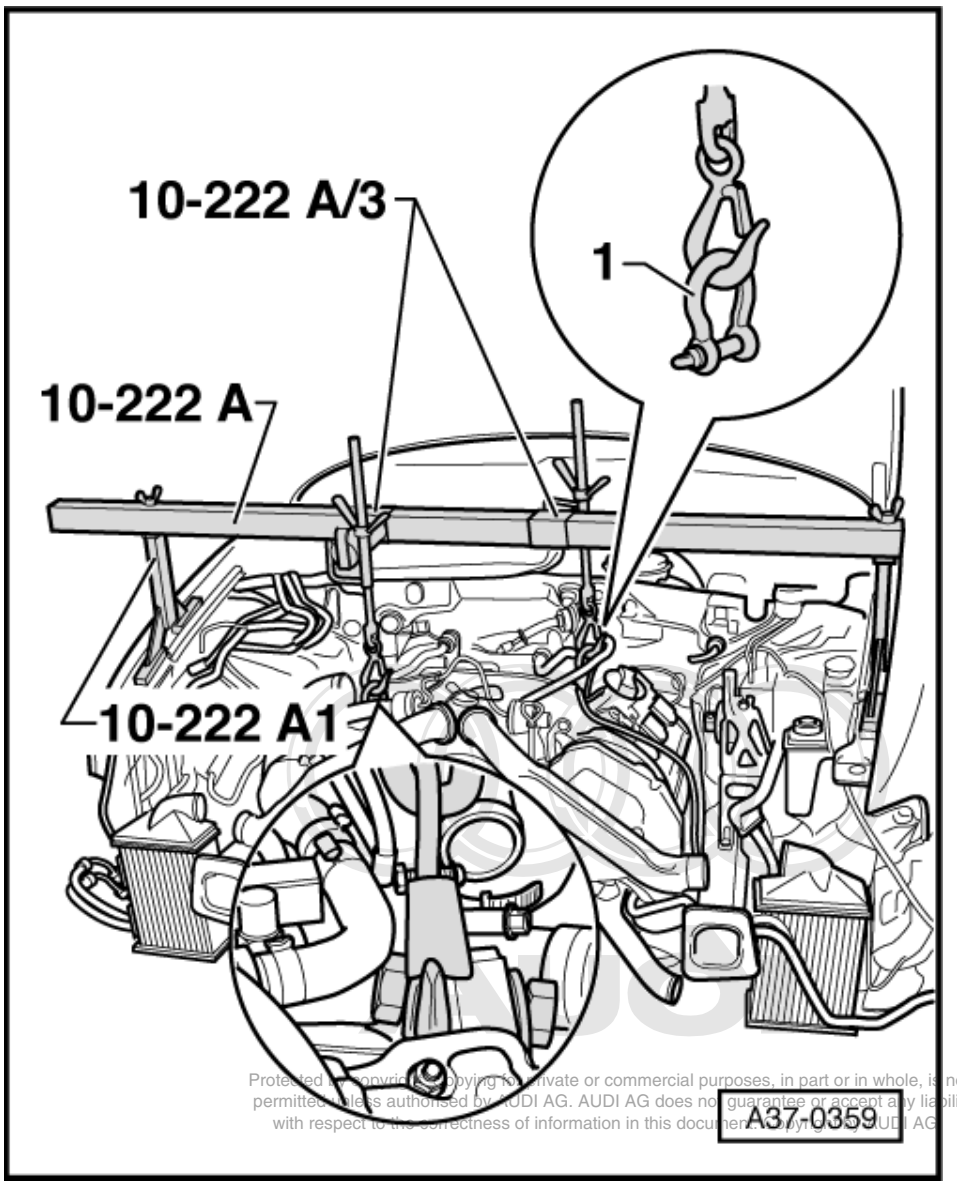


- -> Disconnect plug -1- from right lambda probe at bulkhead.
- Expose wiring with connector to lambda probe.



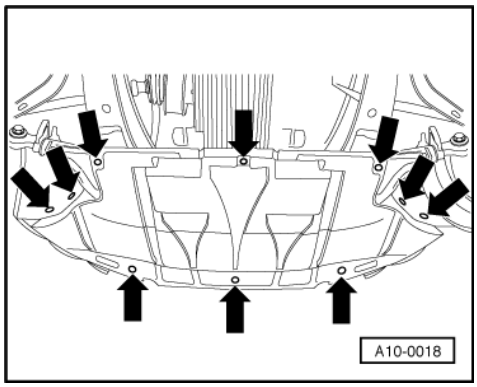
- -> Disconnect plug -2- of left lambda probe at bulkhead and pull lower plug parts out of mounting.
- Expose wiring with connector to lambda probe.
- Remove all engine/gearbox connecting bolts which are accessible from above.

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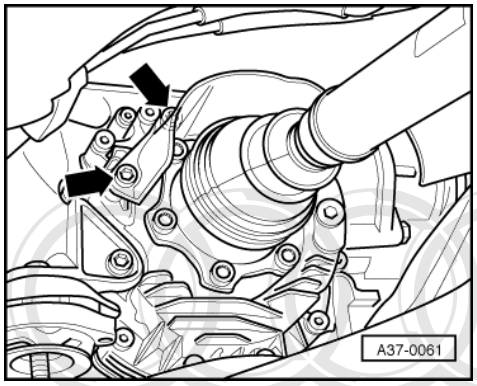
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- Install both adapters 10-222A/3 for front and rear spindles to support bar.
- -> Place support bar 10-222 A on wing panel flange using 10-222 A/1.
- Attach both spindles to the adapters.
- Attach the engine to the spindles. To do this, also use a shackle -1- at the rear of the engine to avoid damage.



- Slightly pre-tension engine/gearbox assembly on the spindles.
- Leave the rear spindle slightly loose to allow subsequent lowering to the rear.
- Raise vehicle.

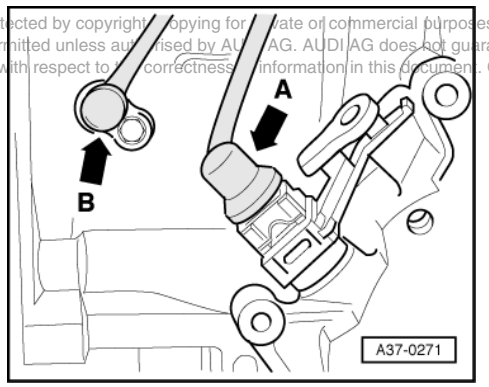
- Remove front wheels.
- -> Remove noise insulation tray.
- Remove noise insulation tray bracket.



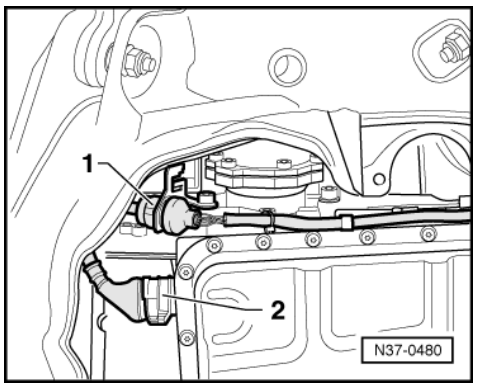
- -> Remove heat shields for drive shafts (left and right) -arrows-.
- Unbolt drive shafts from flanges on gearbox.

=> Running Gear, Front and Four-wheel Drive; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft

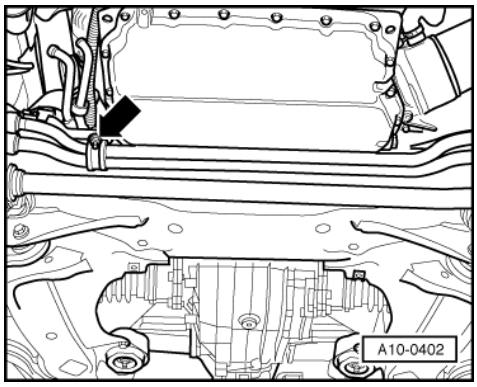
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- -> Remove engine speed sender -G28 arrow B- at front left from gearbox.
- Unplug connector for speedometer - arrow A- from gearbox.

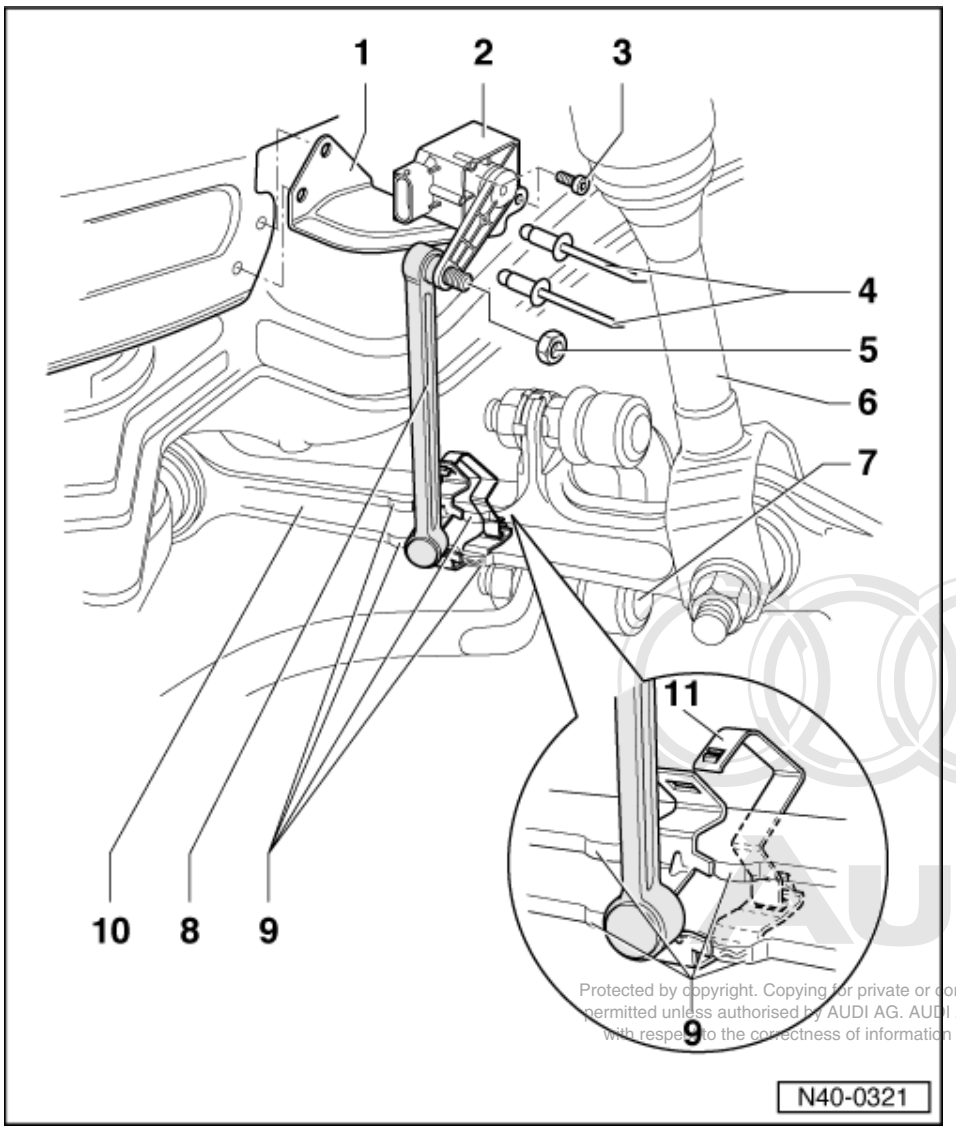


- -> Disconnect plug -1- of multifunction switch wiring.
- Swivel the retaining lever -2-, and disconnect the plug for the gearbox cable loom.



- -> If necessary unscrew A/C line from oil pan -arrow- to improve access to starter.

Important:
The air conditioner refrigerant circuit must not be opened.

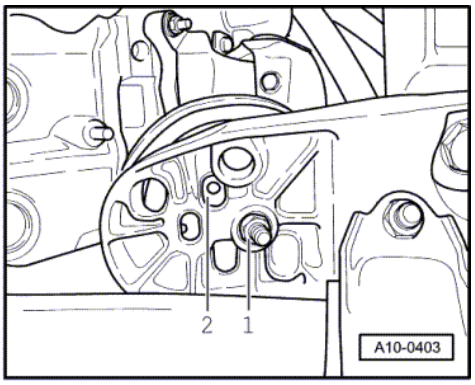


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On vehicles equipped with the automatic headlight range control shown you will also need to refer to the instructions in the following workshop manual before lowering the subframe:

=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing track control link; Vehicle height sender in vehicles equipped with automatic headlight range control. Removing and installing track control link Vehicle height sender in vehicles equipped with automatic headlight range control.

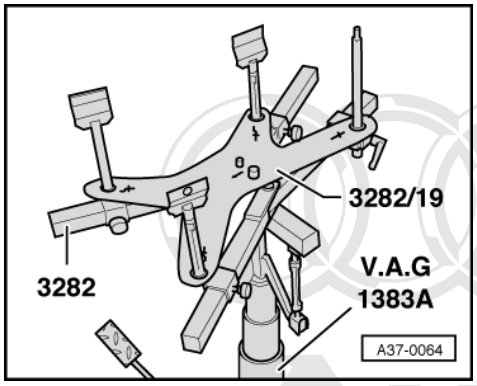
The sender could otherwise be destroyed.



- Loosen gearbox mountings on left and right from subframe => Page 106
- -> Mark installation position of mountings -1- and locating sleeves -2- on left and right engine mountings (bottom).
- Loosen nuts -1- on left and right engine mountings.

Note:

During installation check that locating sleeves -2- engage again.

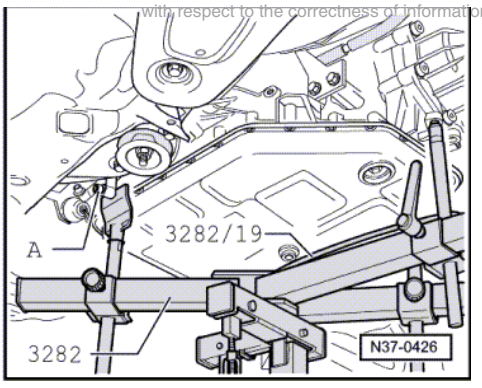


- -> Set up gearbox support 3282.

The gearbox support 3282 is aligned with the adjusting plate 3282/2 for removing the automatic gearbox 01V.

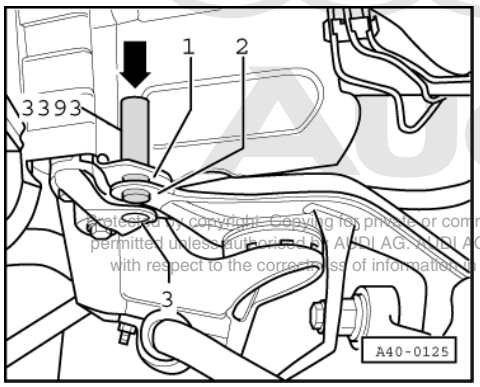
The symbols on the adjusting plate indicate the mounts required, the arrow points forward.

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- -> Move jack V.A.G 1383 A with gearbox support 3282 under the gearbox and support gearbox.
- Align adjustment plate parallel to gearbox.
- Secure gearbox to gearbox support 3282 with bolt -A-.

The automatic gearbox 01V with 4WD is supported at the same points as the FWD type.

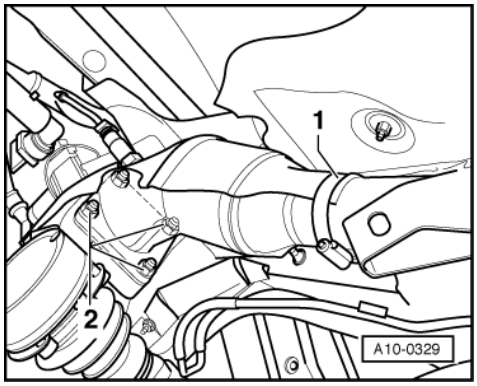


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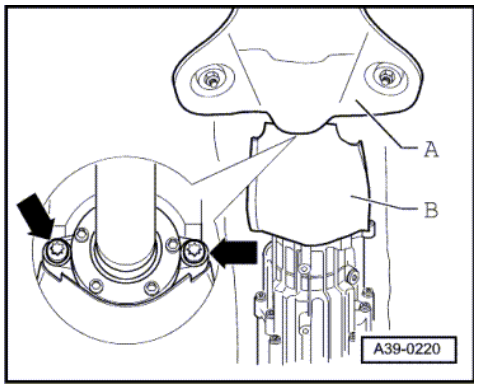
Important:
All of the rules and instructions contained in the workshop manual "Running Gear, FWD and 4WD" must be observed when carrying out work on the subframe.

- -> Before undoing the subframe, use special tool 3393 to check that holes -1- and -2- line up.
- Completely lower the subframe at the front and rear.

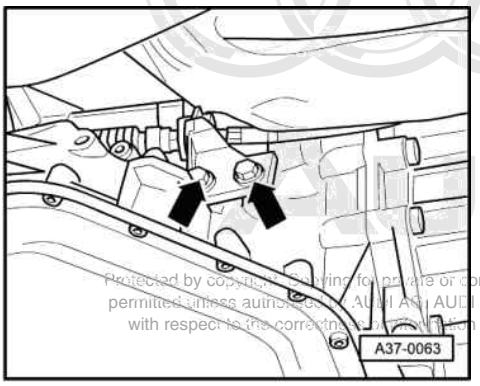
=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing subframe Removing and installing subframe



- -> Using a waterproof pen, mark the installation position of the protective plate and hose clamp -1- on the left and right exhaust pipe in order to find the correct position quickly during installation.
- Undo hose clamp -1- from left and right turbocharger protective plate.
- Unbolt left and right exhaust pipe -2- from turbocharger.

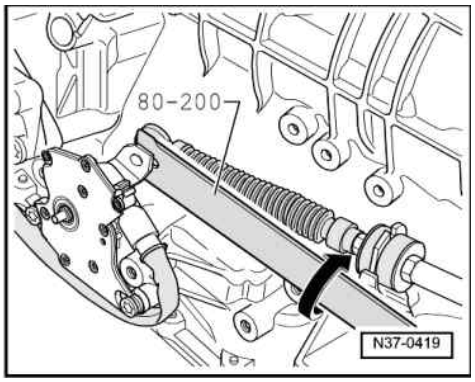


- -> Remove heat shield -A- over propshaft.
- If necessary, remove the rear part of the exhaust system:
  => corresponding Engine Workshop Manual, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Remove heat shield -B- for propshaft from Torsen differential cover -arrows-.
- Unbolt the propshaft at the gearbox. Suspend or support the propshaft.



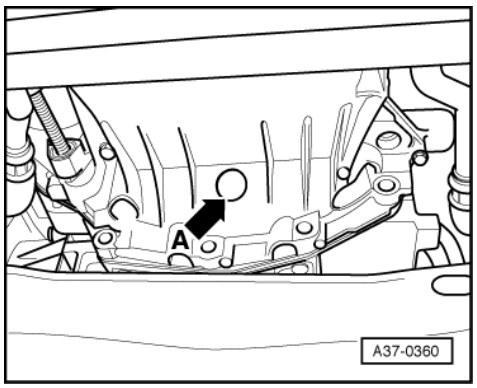
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- -> Mark position of mounting bracket for selector lever cable to gearbox housing for reinstalling, unscrew mounting bracket -arrows-.



- -> Lever off selector lever cable from lever/selector shaft using special tool 80-200 -arrow-.

Remove 3 torque converter bolts

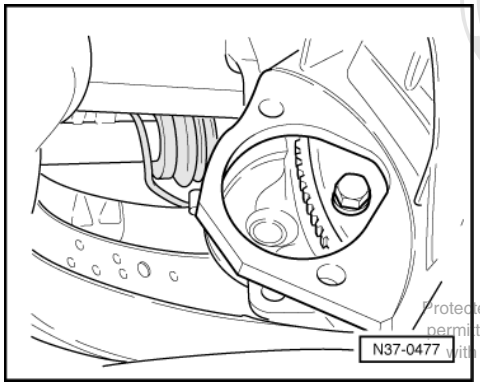


- -> Remove sealing plug through opening -A- in engine flange.
- Unscrew 3 torque converter bolts through opening -A- in engine flange from drive plate (turn crankshaft a further 1/3 turn each time).

If opening -A- is not present then carry out the following two steps in order to gain access to the 3 torque converter bolts.

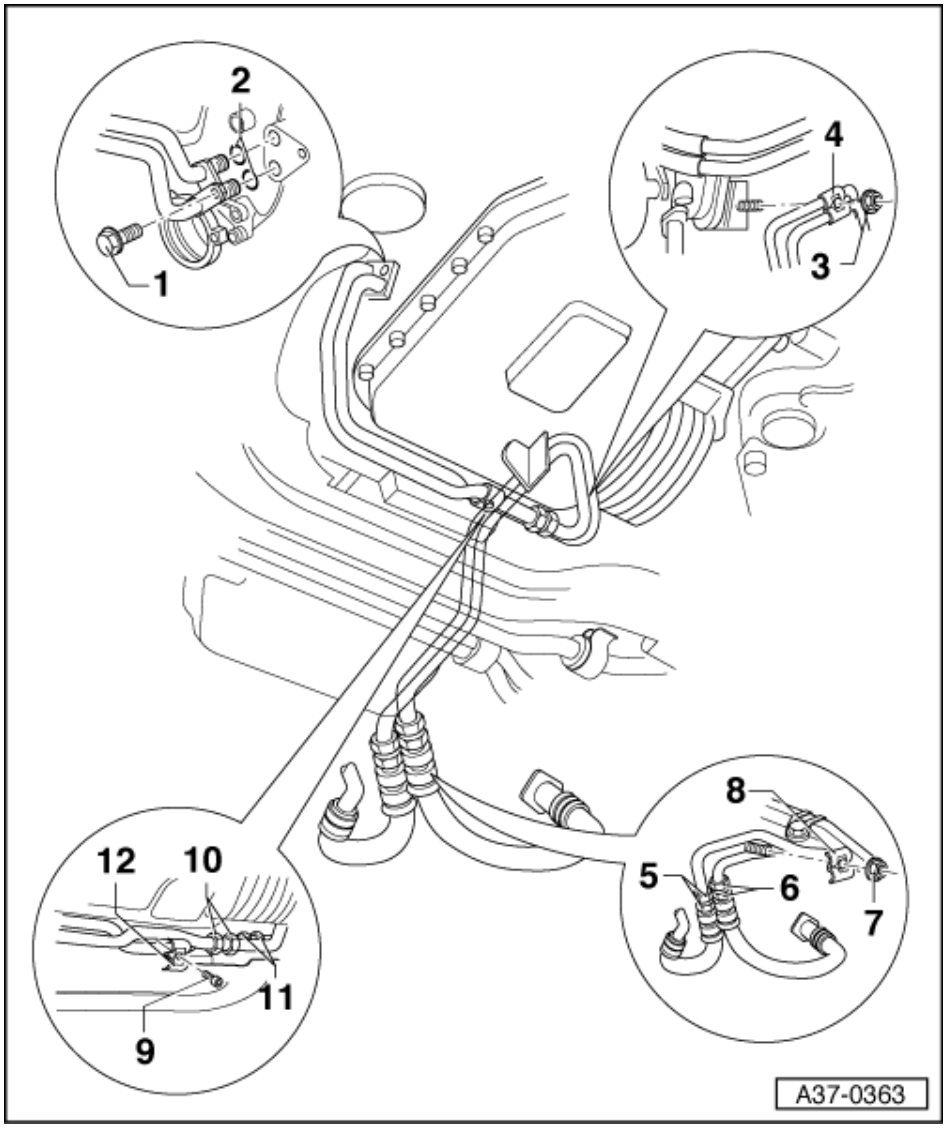
- Remove starter.

=> Electrical System; Repair group 27; Removing and installing starter Removing and installing starter

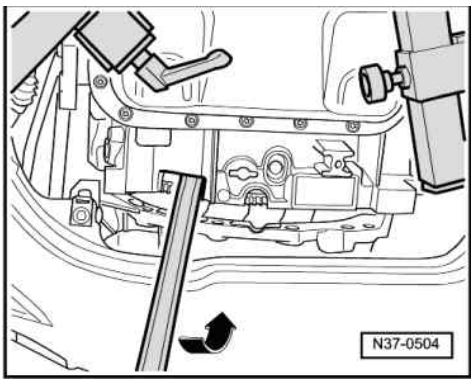


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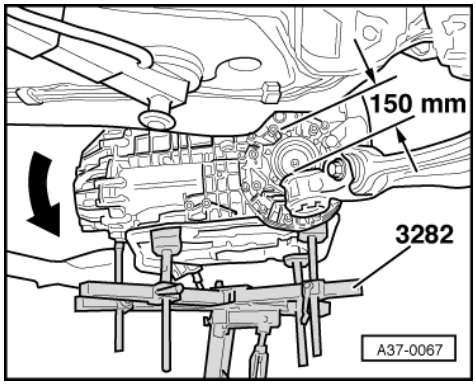
- -> Unscrew the 3 torque converter bolts with special tool V 175 from the drive plate (turn crankshaft a further 1/3 turn each time).



- Slacken bolt -9- with bracket -12-.
- Disconnect ATF lines at bolts -10- and -11- and seal lines with clean plugs.
- Undo nut -3- with bracket -4- to avoid strain during removal and installation.



- Remove the remaining bolts connecting the engine to the gearbox.
- Press gearbox off engine; when doing this, press torque converter out of drive plate.
- -> Press torque converter against ATF pump -arrow-.



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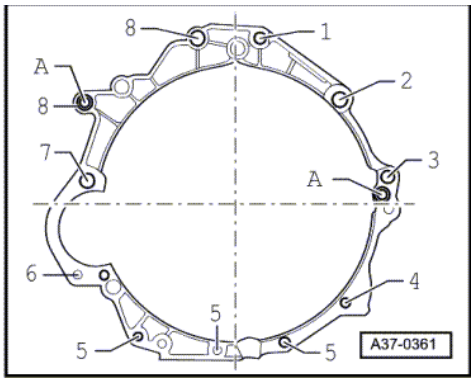
- -> Swivel in gearbox -arrow- and remove carefully between subframe and vehicle underbody.
- Lower gearbox.
- Secure torque converter to prevent it falling out.

Installing

Installation of the gearbox is carried out in the reverse order. Also note the following points:

Before installing:

- Clean thread in flange of propshaft, e.g. with a thread tap.
- Clean ATF lines => Page 136 .
- Insert torque converter into gearbox => Page 20 .



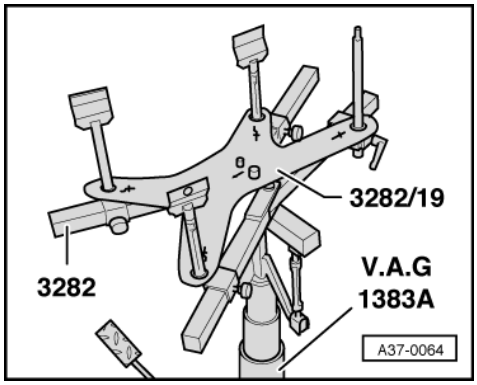
- Ensure that dowel sleeves are seated correctly.

Note:

If the dowel sleeves get stuck in gearbox housing they must be removed and new dowel sleeves must be attached at engine.

-> For 2.7l 5V turbo-charged engine

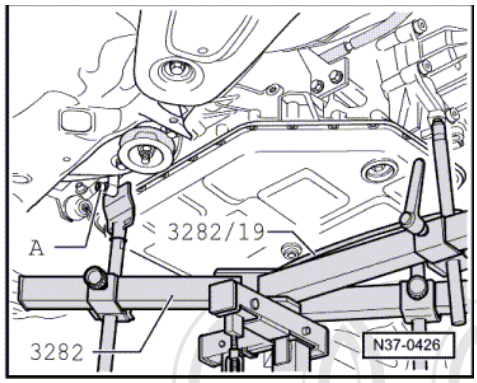
A = Dowel sleeves



- -> Set up gearbox support 3282.

The gearbox support 3282 is aligned with the adjusting plate 3282/2 for removing the automatic gearbox 01V.

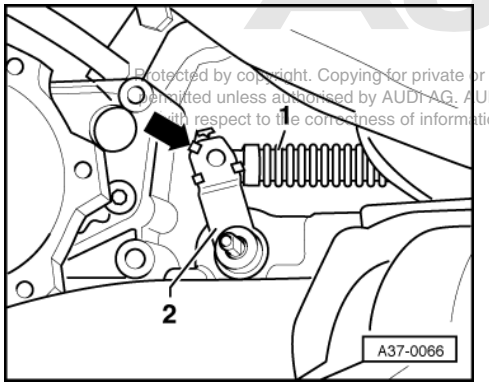
The symbols on the adjusting plate indicate the mounts required, the arrow points forward.



- Place gearbox on gearbox jack.
- -> Secure gearbox onto gearbox mount 3282 with bolt -A-.
- Insert gearbox between lowered subframe and vehicle floor.

In doing so the subframe is lowered approx. 150 mm at the rear => Page 83 , Fig. A37-0067.

- Align gearbox to engine.



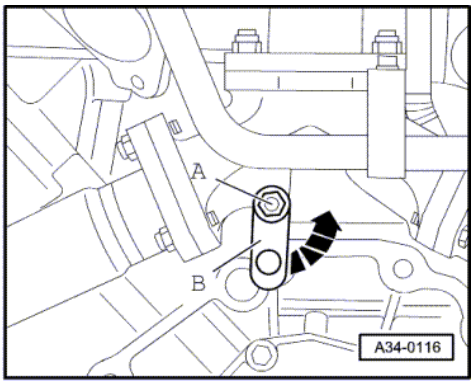
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- -> Press lever/selector shaft -2- at gearbox as far back as it goes (according to illustration completely to the right) until parking lock engages.
- Shift selector lever to "P" and carefully press ball socket of selector lever cable onto lever/selector shaft -2- using for example pliers.

Note:

Do not bend the lever/selector shaft when pressing on the ball socket, as otherwise it will no longer be possible to precisely adjust the shift mechanism

Note:

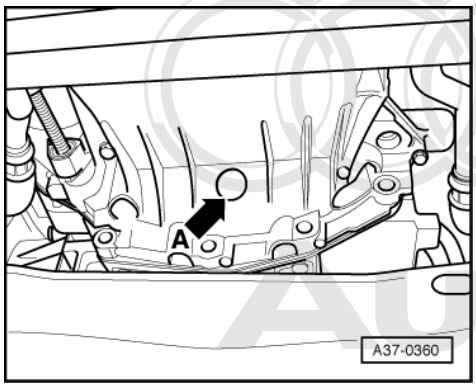


- Attach intermediate plate onto dowel sleeves.
- When pushing the engine and gearbox together, ensure that no cables can become trapped.

- Install upper engine/gearbox securing bolts.

Note:

A bracket or an earth connection may be screwed onto some bolts => see tables of tightening torques from Page 102 onwards



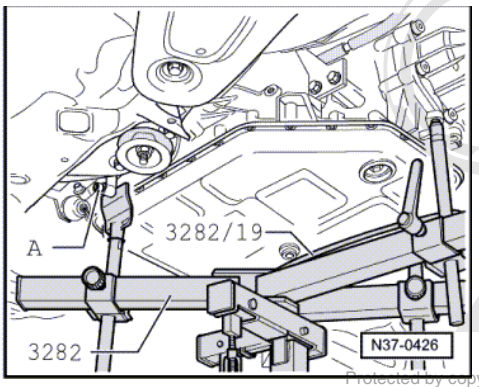
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- -> Fit 3 torque converter bolts through opening -A- in engine flange onto drive plate (turn crankshaft a further 1/3 turn each time).
- Install sealing plug in opening -A- in engine flange.
- Insert subframe. Whilst doing so observe sequence of tightening and fixing with master bore.

=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing subframe Removing and installing subframe

- Carry out wheel alignment, but only, if necessary.

=> Running Gear, FWD and 4WD; Repair group 44; Wheel alignment Wheel alignment



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- Install gearbox support on left and right with gearbox mounting => Page 106
- -> After gearbox has been bolted onto engine unscrew bolt -A-.
- Apply corrosion protection onto contact point of bolt -A- with oil pan.
- Screw in ATF lines => Page 125

- Unbolt drive shafts from flanges on gearbox.

=> Running Gear, Front and Four-wheel Drive; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft

- Bolt the propshaft onto the gearbox flange => Page 225 , Removing and installing propshaft.
- After connecting battery, enter anti theft code for radio.

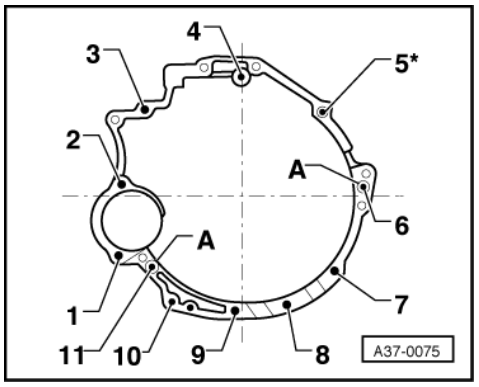
=> Radio-operating instructions

- Check setting of selector lever cable => Page 48
- With gearbox installed, check gear oil level in final drive=> Page 171 .
- Check and top up ATF level =>Page 113 onwards
- Close windows fully using electric window switches.
- Then actuate all electric window switches again for at least one second in the "close" direction to activate the automatic open/close function.
- Set clock to correct time.

2.4 - Tightening torques

Notes:

- The tightening torques listed on this page apply only to lightly greased, oiled, phosphated, or black finished nuts and bolts.
- Additional lubricant such as engine or gearbox oil may be used, but do not use graphite lubricant.
- Do not use degreased parts.



-> Securing engine to gearbox

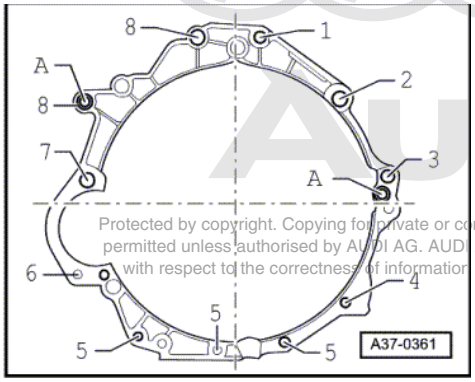
For 4-cylinder engines (5 valve, Turbo)

Item	Bolt	Nm
1, 8, 9, 10	M10 x 45	45
2, 3, 4, 11	M12 x 67	65
5	M12 x 110	65
6	M12 x 90	65
7 1)	M10 x 60	45

1 with nuts

A = Dowel sleeves

Bolts -3- and -5- also secure cable bracket.



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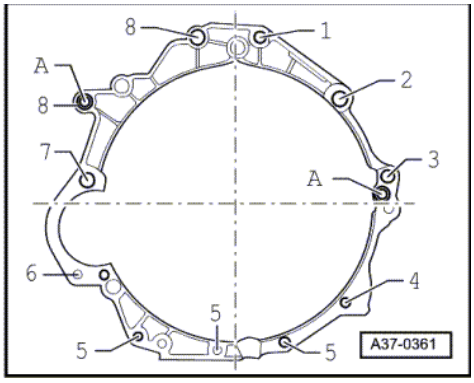
-> Securing engine to gearbox
for 6-cylinder petrol engines except 2.7l 5V turbo-charged engine

Item	Bolt	Nm
1	M12 x 67	65
2	M12 x 90	65
3	M12 x 75	65
4 1)	M10 x 60	45
5	M10 x 45	45
6	M10 x 80	65
7 2)	M12 x 110	65
8	M12 x 67	65

1 with nut

2) with retainer for ATF lines

A = Dowel sleeves



-> Securing engine to gearbox
6-cylinder TDI engines

Item	Bolt	Nm
1 3)	M12 x 80	65
2 4)	M12 x 90	65
3	M12 x 75	65
4 1)	M10 x 60	45
5	M10 x 45	45
6	M10 x 80	65
7 2)	M12 x 110	65
8 2)	M12 x 67	65

1 with nut

2) with retainer for ATF lines

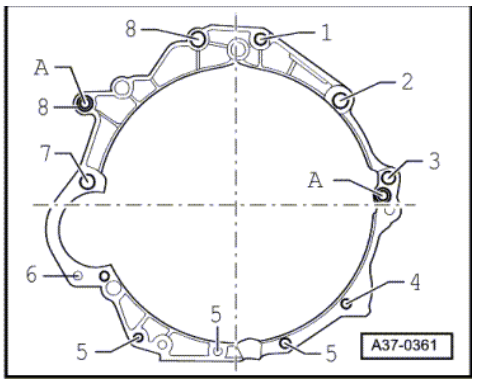
*) with retainer for turbo charger

*) with retainer for cable

5) with additional earth connection

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A = Dowel sleeves



-> Securing engine to gearbox
for 2.7l 5V turbo-charged engine

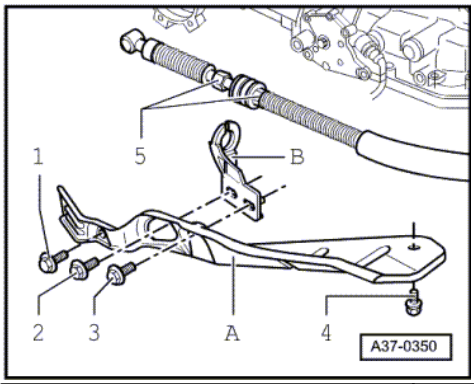
With 11 mm intermediate plate

Item	Bolt	Nm
1	M12 x 90	65
2	M12 x 100	65
3	M12 x 90	65
4 1)	M10 x 70	45
5	M10 x 60	45
6	M10 x 100	65
7	M12 x 110	65
8	M12 x 80	65

1 with nut

A = Dowel sleeves

Valid for all engine/gearbox variations:

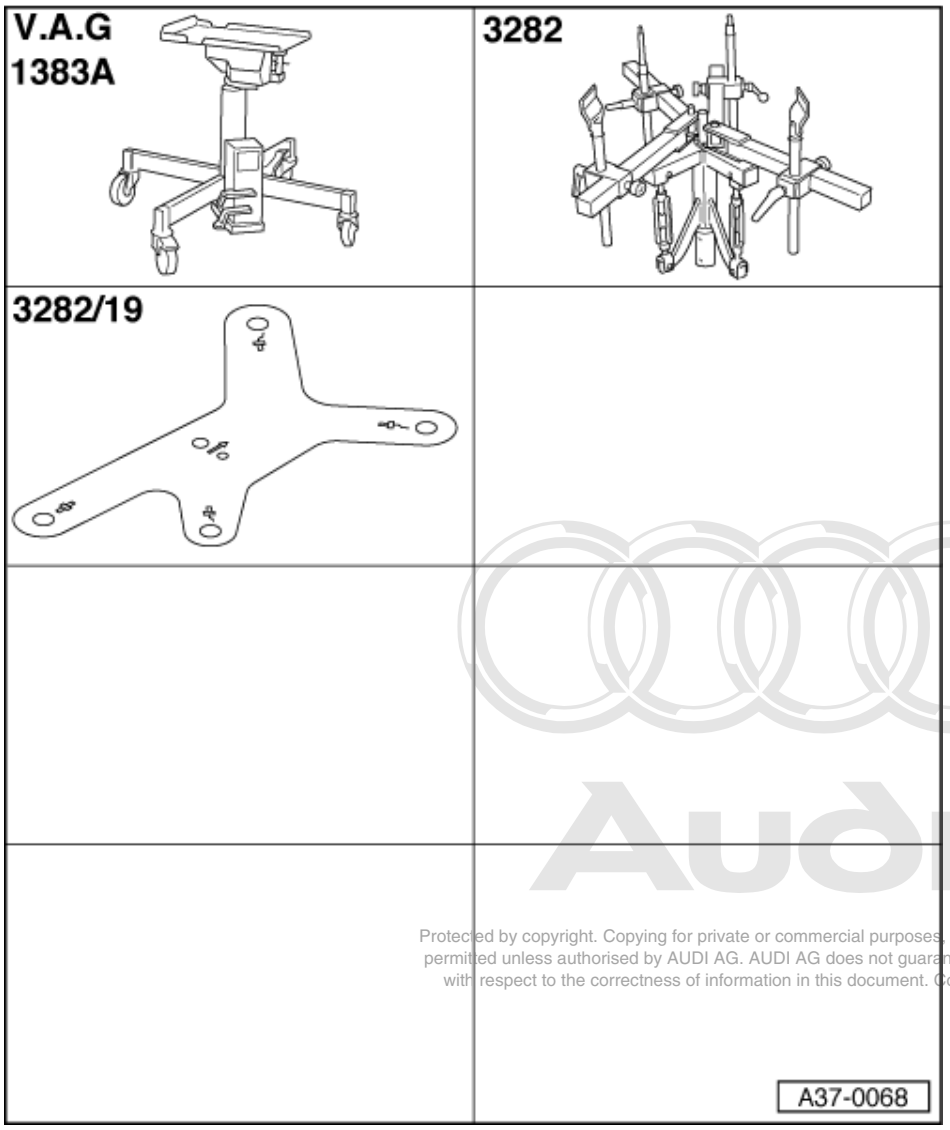


Components		Tightening torques
Support bracket on gearbox (2 x M8) -2- and -3-		23 Nm
Heat shield/selector lever cable on gearbox, -1-		
	M6	9 Nm
	M8	23 Nm
Heat shield/selector lever cable on gearbox, M8, -4-		23 Nm
Selector lever cable on support bracket -B-, -5-		12 Nm

Component		Nm
Bolts/nuts	M6	10
	M8	20
	M10	45
	M12	65
Except for the following:		
Drive plate to torque converter	M10 x1	85
Install ATF lines		Page 125 onwards
Multi-function switch -F125 to gearbox		8
Catalytic converter to mounting lugs		25
Bracket for noise insulation to subframe		10
Drive shaft heat shield		25
Heat shield to turbocharger		10

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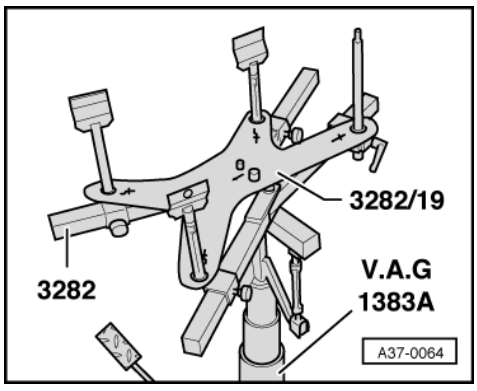
2.5 - Removing and installing gearbox support on left and right



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**Special tools,
testers and auxiliary items required**

- Engine/gearbox lifter V.A.G 1383 A
- Gearbox support 3282
- Adjustment plate 3282/19

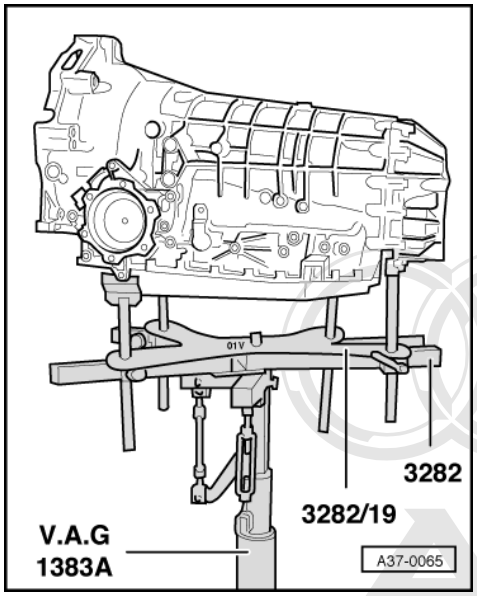


Removing

Note:

If both gearbox supports have been removed, the gearbox must be supported as described. If only one of the gearbox supports has been removed, the jack does not have to be used to support the gearbox.

- -> Align gearbox support 3282 with adjustment plate 3282/19 to support automatic gearbox 01V and attach onto lifter V.A.G 1383 A.



Note:

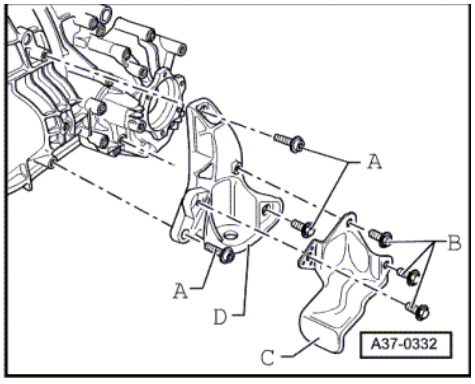
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The symbols on the adjustment plate indicate the required supports for the automatic gearbox 01V (the arrow points in the direction of travel).

- -> Move jack V.A.G 1383 A with gearbox support 3282 under the gearbox and support gearbox.

Note:

If gearbox support 3282 is not available, gearbox can be supported using engine and gearbox jack V.A.G 1383 A and universal support V.A.G 1359/2.



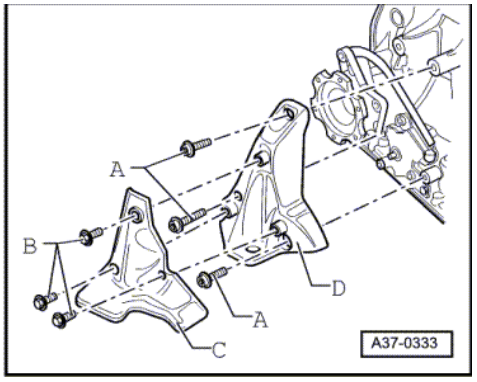
Right gearbox support:

- -> Remove heat shield -C-.

Note:

With 6-cylinder TDI engines the right heat shield is not installed.

- Release gearbox support -D- by unscrewing bolts -A- from gearbox.



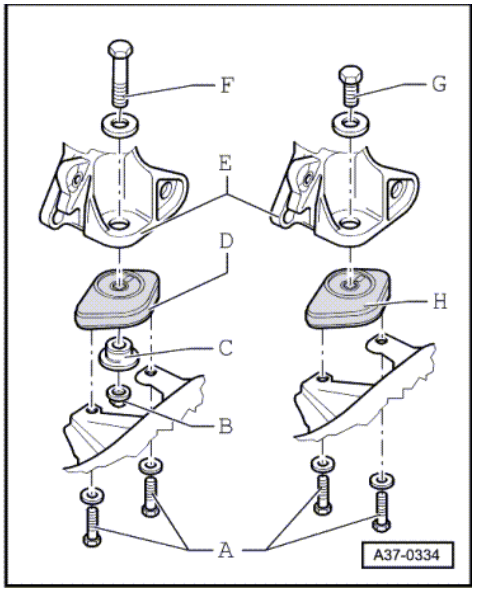
Left gearbox support:

- -> Remove heat shield -C-.

Note:

With 4 cylinder petrol engines the left heat shield is not installed.

- Release left gearbox support -D- by unscrewing bolts -A- from gearbox.



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Gearbox support on left and right

- -> Remove gearbox support -E-.

D - gearbox mounting (conventional)

H - hydraulic gearbox mounting

Note:

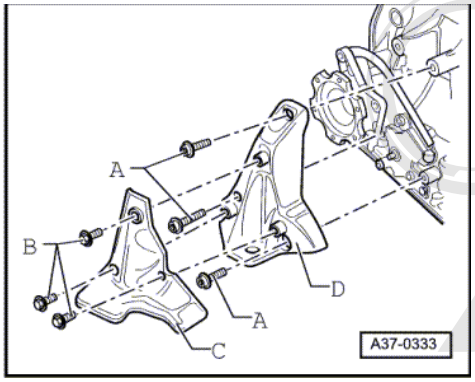
In hydraulic gearbox mounting -H- the positions -C- and -B- are omitted as the bolt. -G- is screwed directly into gearbox mounting. -G-.

Installing

Install in reverse order.

-> Tightening torques for gearbox support on left and right

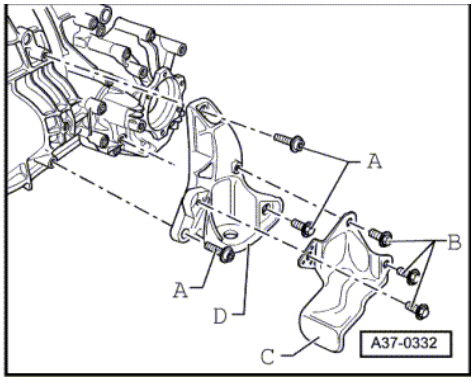
Item	Bolt	Qty.	Nm
A	M8 x 22	2 each	27
B with F	M10 x 70	1	50
G	M10 x 35	1	50



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-> Tightening torques for gearbox support on left

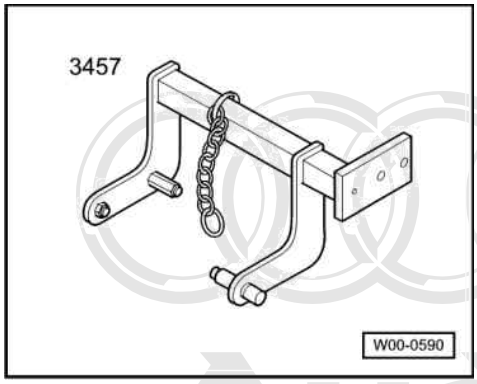
Item	Bolt	Qty.	Nm
A	M10 x 30 M10 x 50	2 1	40
B	M6 x 22	3	10



-> Tightening torques for gearbox support on right

Item	Bolt	Qty.	Nm
A	M10 x 30	3	40
B	M6 x 22	3	10

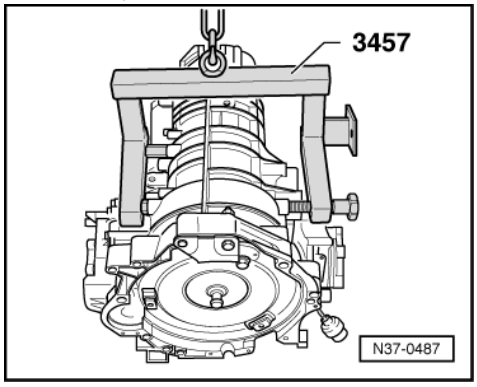
2.6 - Transporting the automatic gearbox



Special tools, testers and auxiliary equipment required

- Transport device 3457

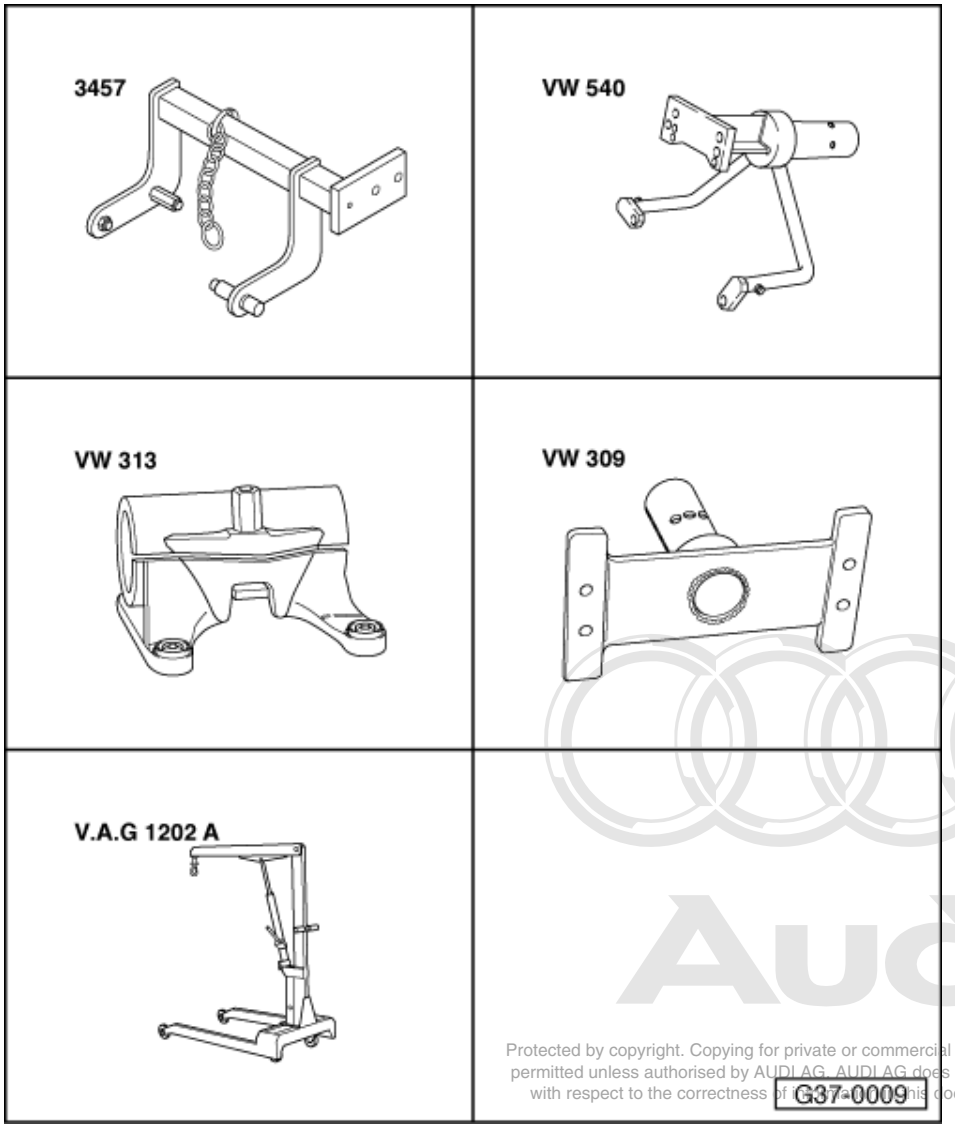
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Transport device 3457 may be used to transport the automatic gearbox and also when setting up gearbox support 3282.

- -> Secure transport device 3457 on mountings of gearbox housing and secure.

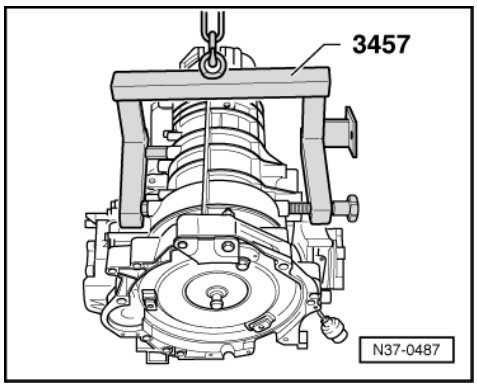
2.7 - Mounting gearbox to assembly stand



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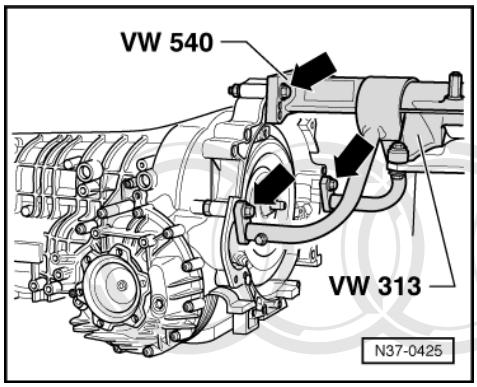
Special tools,
testers and auxiliary items required

- Transport device 3457
- Engine and gearbox bracket VW 540 (for FWD gearboxes only)
- Support clamp VW 313
- Holding plate VW 309
- Workshop crane V.A.G 1202 A



- -> Secure transport device 3457 on mountings of gearbox housing and secure.
- Bolt transport device onto retainer plate VW 309 and install into vice VW 313 with the aid of workshop crane.

For FWD gearboxes the engine and gearbox bracket VW 540 may also be used to secure at vice VW 313.



- -> Secure gearbox to engine and gearbox bracket VW 540 -arrows- and insert into vice VW 313.

Important:
The centre of gravity of the gearbox is outside the pivot centre of the support clamp. A second fitter has to hold the gearbox housing when it is being turned to prevent it from swinging round.

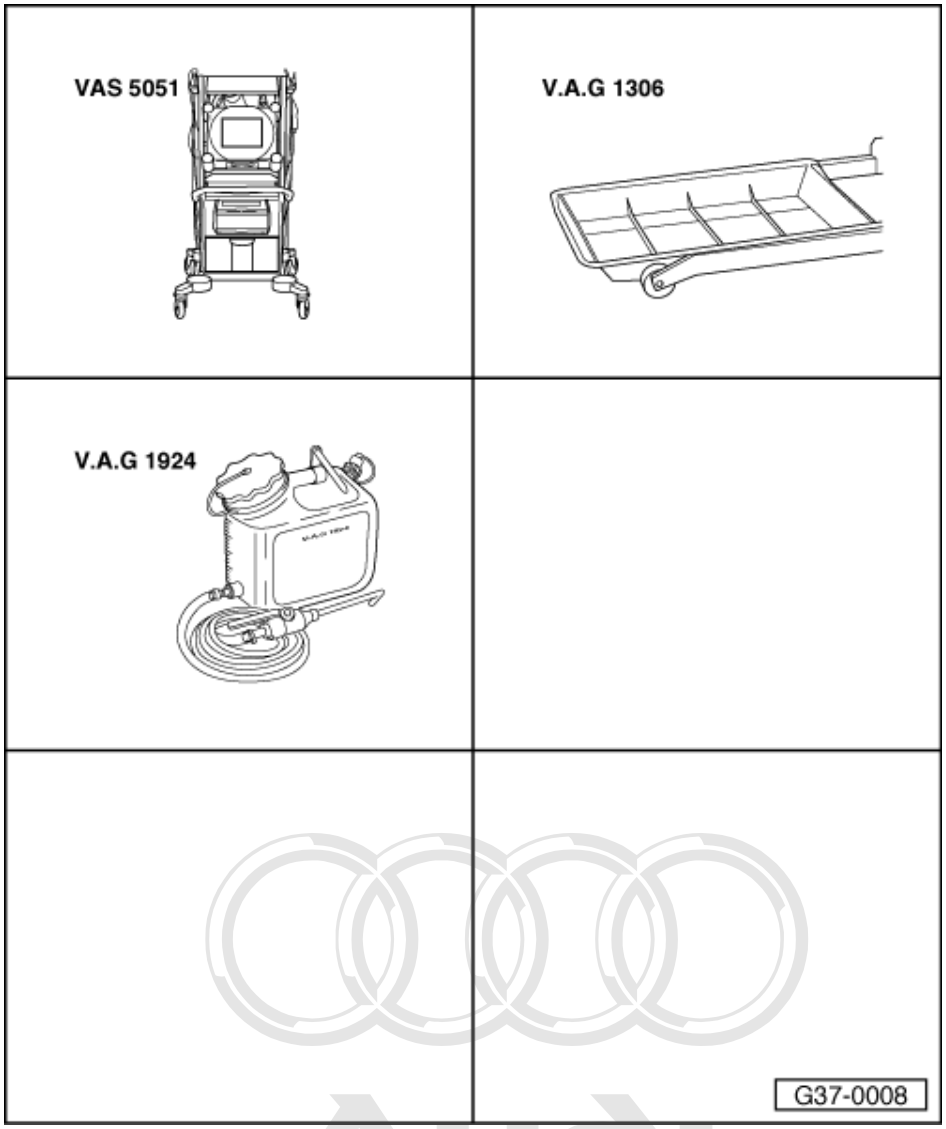
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Note:

If the gearbox is full and it is to be tilted in the assembly stand with the oil pan pointing upwards, the vent holes for the gearbox housing and final drive must be sealed.

3 - Checking and changing ATF

3.1 - Checking and changing ATF



3.2 - Check ATF level

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Special tools and workshop equipment required

- Vehicle diagnostic, Testing and Information System VAS 5051 with diagnostic lead VAS 5051/1 (or fault reader V.A.G 1551 with diagnostic lead V.A.G 1551/3).
- Drip tray V.A.G 1306
- Filler system V.A.G 1924
- Protective goggles

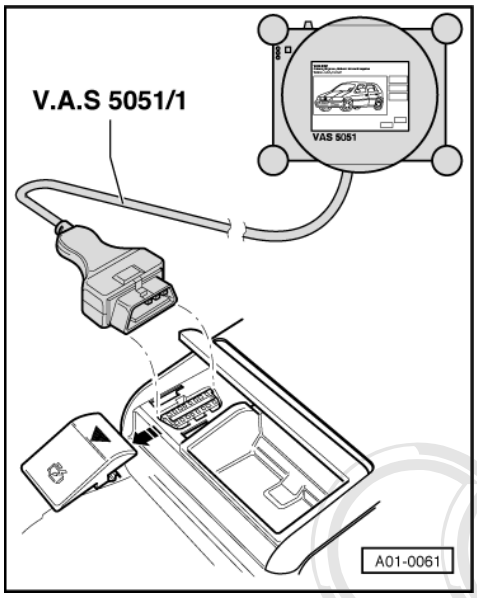
Test requirements:

- Gearbox not in emergency running mode.
- Vehicle must be level (horizontal)
- Selector lever at position "P", engine idling.
- The air conditioner and heating system must be switched off.

- The ATF temperature at the beginning of the test must not be higher than 30° C. Allow the gearbox to cool down as necessary.

Notes:

- The ATF level will vary according to the temperature of the ATF.
- If the ATF level is checked when the ATF temperature is too low, this will result in overfilling.
- If the level is checked when the ATF temperature is too high, this will result in underfilling.
- Both overfilling and underfilling have a detrimental effect on the functioning of the gearbox.
- On vehicles equipped with an additional ATF cooler also carry out an ATF check => Page 116



- The ATF temperature is read from the vehicle diagnostic, testing and information system VAS 5051 or from the fault reader V.A.G 1551.

Reading off ATF temperature

- -> Connect up vehicle diagnosis, testing and information system VAS 5051 with diagnostic cable VAS 5051/1. Alternatively, connect fault reader V.A.G 1551 with diagnostic cable V.A.G 1551/3A.

=> Automatic Gearbox 01V, Self-diagnosis; Repair group 01; Performing self-diagnosis Performing self-diagnosis

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- Start engine.

-> Indicated on display

```
Rapid data transfer      HELP
Select function XX
```

- Enter "08" to select the function "Reading measured value block" and confirm entry with Q key.

-> Indicated on display

```
Reading measured value block     Q
Enter display group number XXX
```

- Enter "004" to select display group number "004" and confirm entry with Q key.

-> Indicated on display

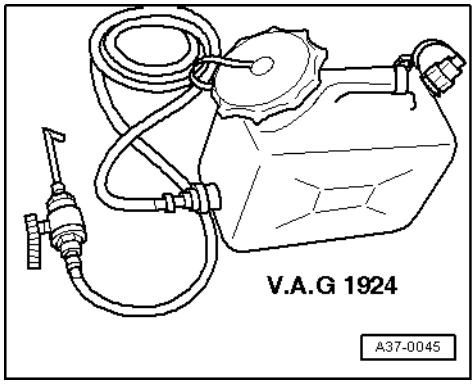
```
Read measured value block     4
1     2     3     4
```

- Read off ATF temperature in display zone 1.

Checking and correcting ATF level

Notes:

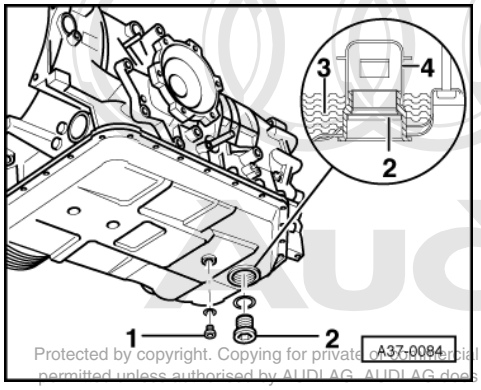
- The ATF level is checked at the ATF inspection plug.



- The ATF level is correct if at an ATF temperature between 35 ° and 45 °C 1) there is still a slight leakage of fluid at the ATF inspection plug (caused by the rise in fluid level due to heating) .

1)50°C for tropical countries

- -> Mount the reservoir of the ATF filler system V.A.G 1924 as high as possible on the vehicle.
- Raise vehicle.
- Place drip tray V.A.G 1306 underneath the gearbox.



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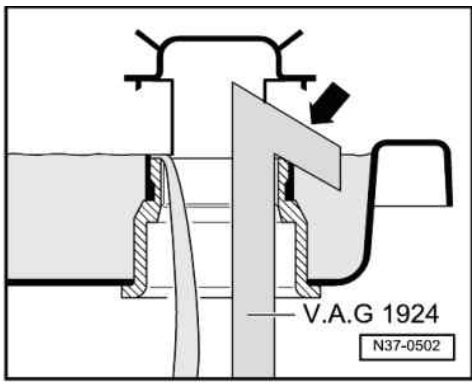
Important:
Wear protective glasses.

- -> When an ATF temperature of 35 °C is reached, unscrew the ATF inspection plug -2- and drain off any surplus ATF.

- If ATF emerges from the ATF filler plug before the ATF has reached 40 °C the ATF level is OK.

Note:

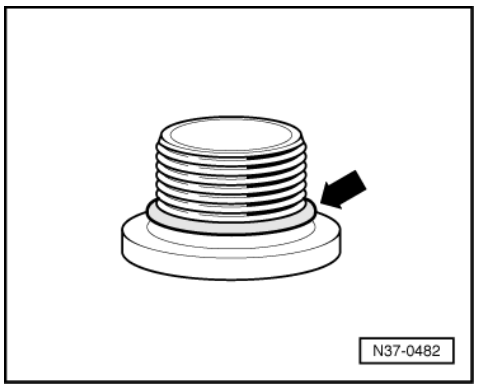
The ATF inspection plug must be closed off again by the time the temperature reaches 45 °C 1) => Page 116 .



1)50°C for tropical countries

- If no ATF emerges from the ATF filler plug by the time the ATF has reached 40 °C, top up ATF.

- Insert V.A.G 1924 into opening -4- at deflector cap. Whilst doing so do not push deflector cap upwards.
- -> Top up ATF with V.A.G 1924 -arrow-, until ATF emerges from the inspection hole.



- -> Always replace the seal -arrow- for the ATF inspection plug.
- Tighten the ATF inspection plug to 80 Nm.
- Press ⇒key on the V.A.G 1551.
- Enter "06" to select the function "End output" and confirm entry with Q key.

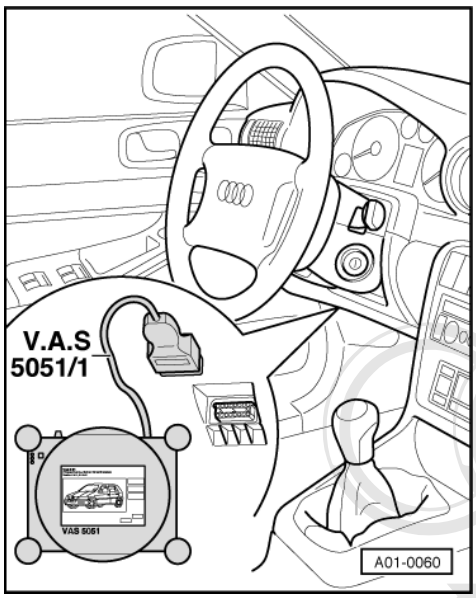
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3.3 - Additional ATF check on vehicles equipped with an additional ATF cooler

This check needs to be performed if the additional ATF cooler has been drained or exchanged. Fitting location of additional ATF cooler => Page 135 , item A.

Test requirements:

- Gearbox not in emergency running mode.
- ATF is topped up => 118



- Selector lever at position "P", engine idling.
- The air conditioner and heating system must be switched off.

- The ATF temperature is read from the vehicle diagnostic, testing and information system VAS 5051 or from the fault reader V.A.G 1551.

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Reading off ATF temperature

- -> Connect up vehicle diagnosis, testing and information system VAS 5051 with diagnostic cable VAS 5051/1. Alternatively, connect fault reader V.A.G 1551 with diagnostic cable V.A.G 1551/3A.

=> Automatic Gearbox 01V, Self-diagnosis; Repair group 01; Performing self-diagnosis Performing self-diagnosis

- Start engine.

-> Indicated on display

```
Rapid data transfer      HELP
Select function XX
```

- Enter "08" to select the function "Reading measured value block" and confirm entry with Q key.

-> Indicated on display

```
Reading measured value block     Q
Enter display group number XXX
```

- Enter "004" to select display group number "004" and confirm entry with Q key.

-> Indicated on display

```
Read measured value block     4
1     2     3     4
```

- Read off ATF temperature in display zone 1.
- Leave the engine running until the ATF reaches a temperature of at least 85 °C. If necessary carry out a road test to achieve this temperature.

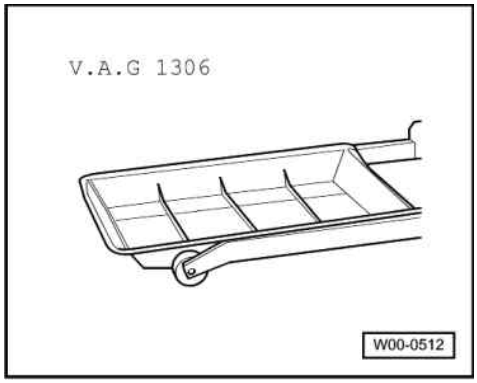
Note:

The thermostat at the input of the additional ATF cooler only opens above 80 °C, allowing the cooler to fill with ATF.

The capacity of the additional ATF cooler is 140 ml of ATF.

- Switch off the engine and allow the ATF to cool back down to a temperature below 35 °C.
- Check the ATF level => Page 113 .

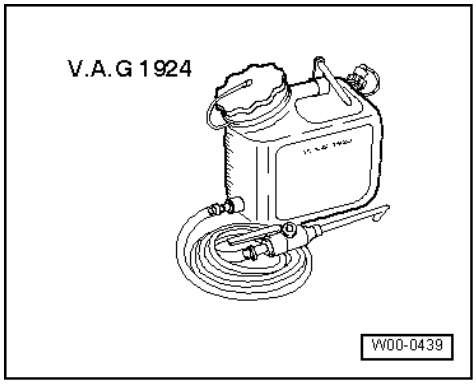
3.4 - Changing ATF or filling up after repairs



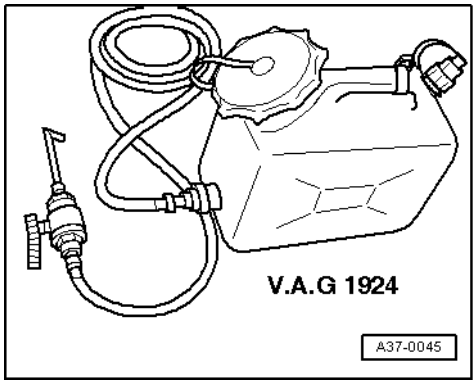
- Engine switched off.

Special tools, testers and auxiliary equipment required

- Drip tray V.A.G 1306



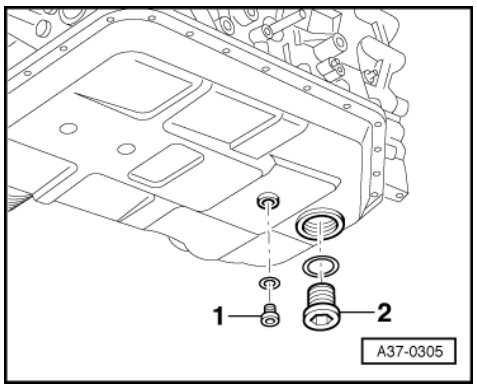
- Filler system V.A.G 1924



- -> Mount the reservoir of the ATF filler system V.A.G 1924 as high as possible on the vehicle.
- Raise vehicle.

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Notes:

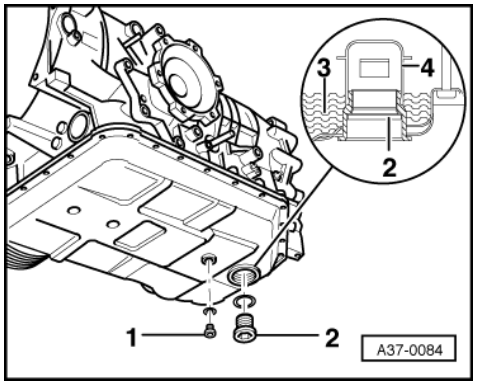


- Always observe the relevant environmental regulations for disposal.
- The engine must not be started or towed without ATF.

- Place drip tray V.A.G 1306 underneath the gearbox.
- -> Unscrew the ATF drain plug -1- and drain off ATF.

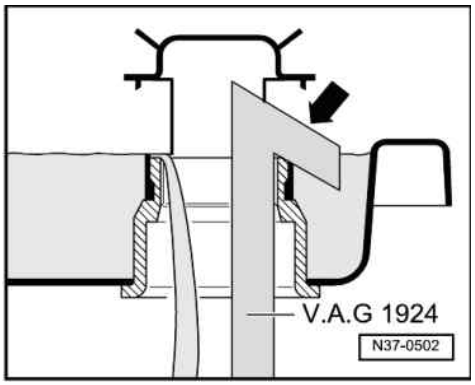
Note:

The drain plug with sealing ring must be replaced.



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- Tighten the ATF drain plug to 40 Nm.
- Remove ATF inspection plug -2-.
- -> Insert V.A.G 1924 into opening -4- at deflector cap. Whilst doing so do not push deflector cap upwards.



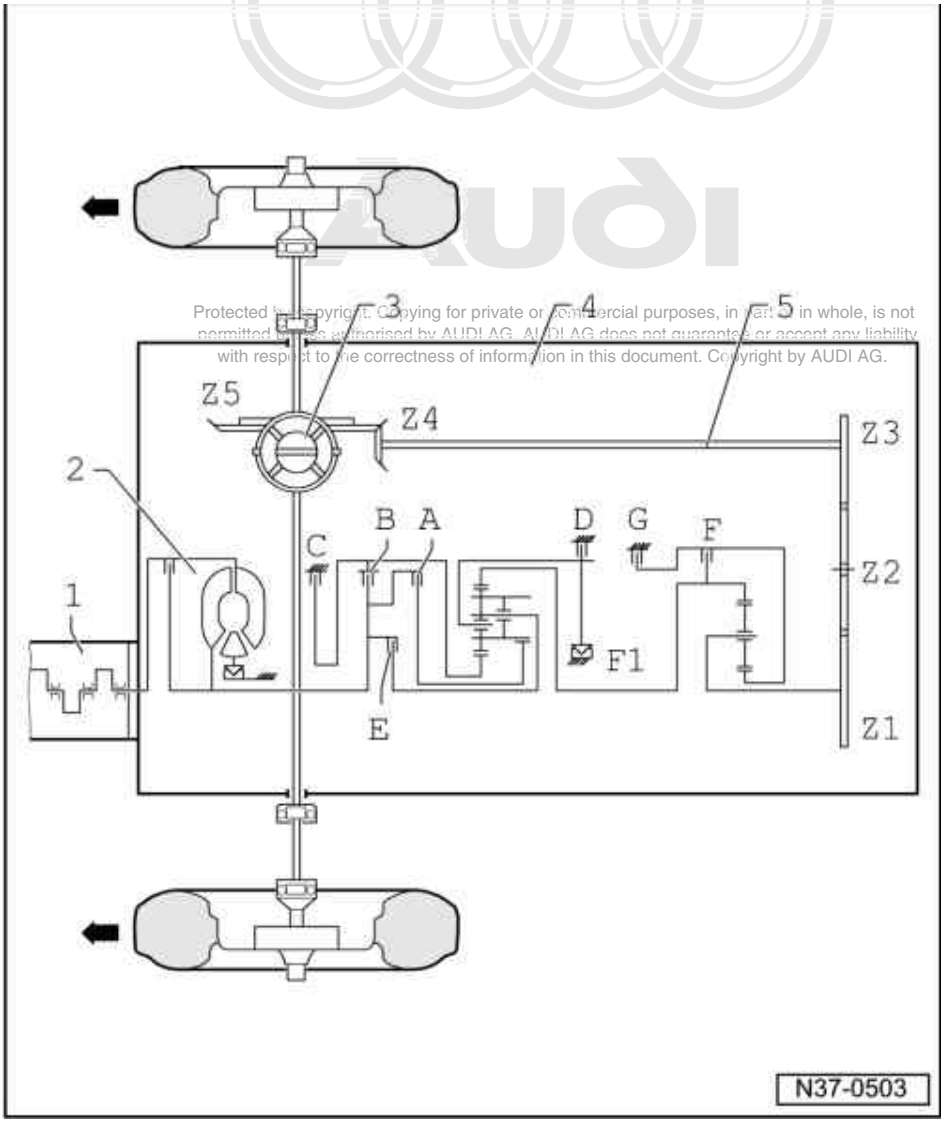
- -> Top up ATF with V.A.G 1924 -arrow-, until ATF emerges from the inspection hole.
- Move selector lever to position "P".
- Start engine.
- With the engine idling press the brake pedal and shift the selector lever through all the selector lever positions leaving the selector lever 10 seconds in each position.
- Move selector lever to position "P".

- Checking ATF level and topping up => Page 113 .

Note:
Observe all notes and test requirements as for "Check ATF level".

4 - Transmission layout

4.1 - Transmission layout

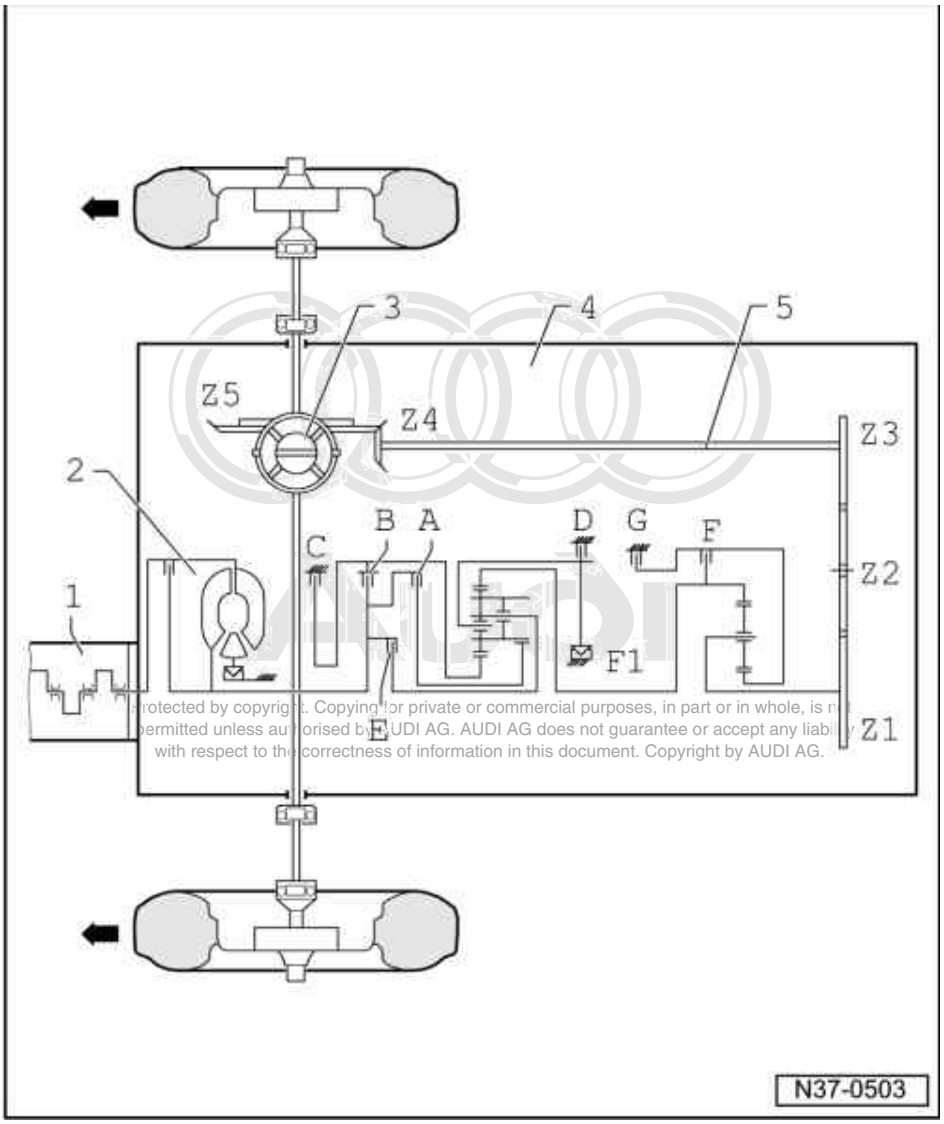


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4.2 - Gearbox diagram for FWD

A - Clutch A
B - Clutch B
E - Clutch E
F - Clutch F
C - Brake C
D - Brake D
G - Brake G

F1 - Free wheel 1



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1 Engine
2 Converter with lock-up-clutch
3 Differential
4 Automatic gearbox
5 Pinion shaft

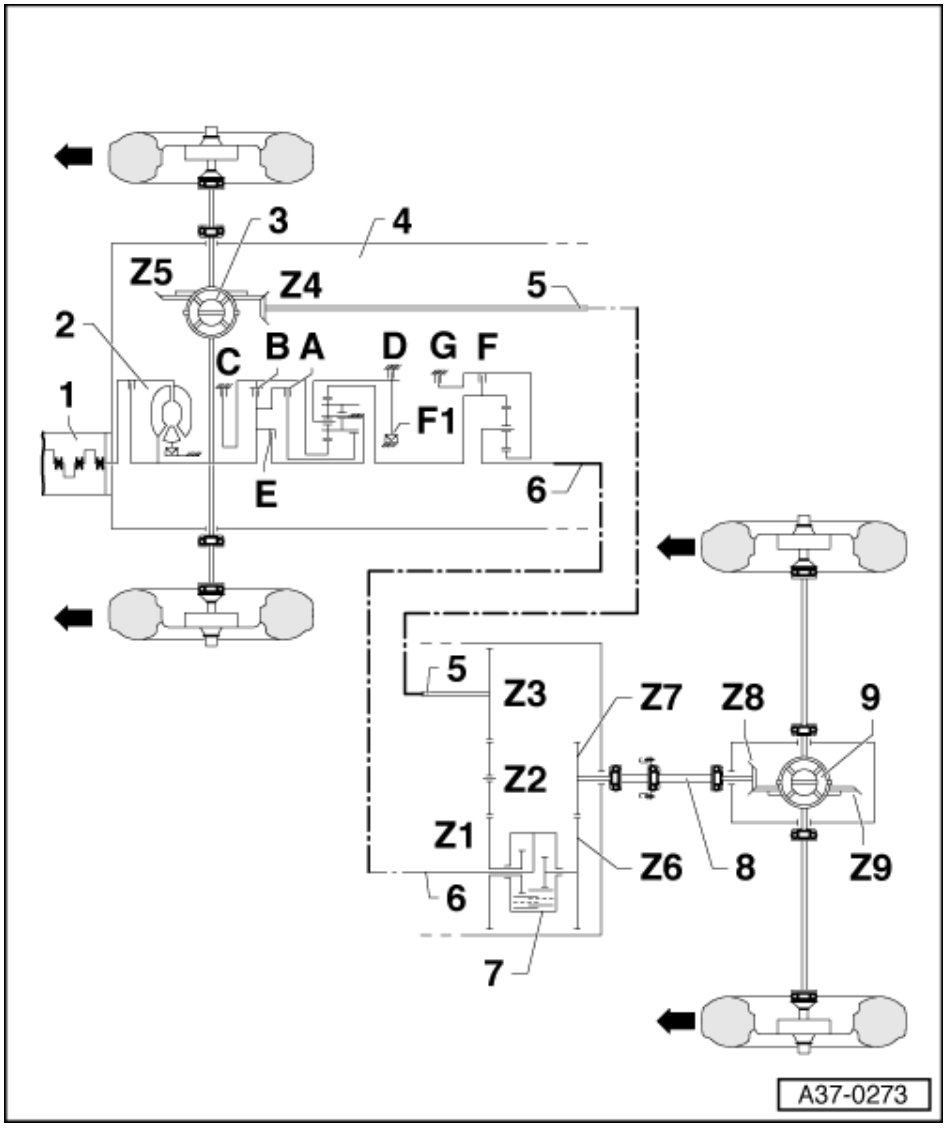
Z1, Z2 and Z3 = spur gears of intermediate drive, transmission =>Page 2

Z4, Z5 = final drive, transmission =>Page 2

Note:

Arrows face in direction of travel.

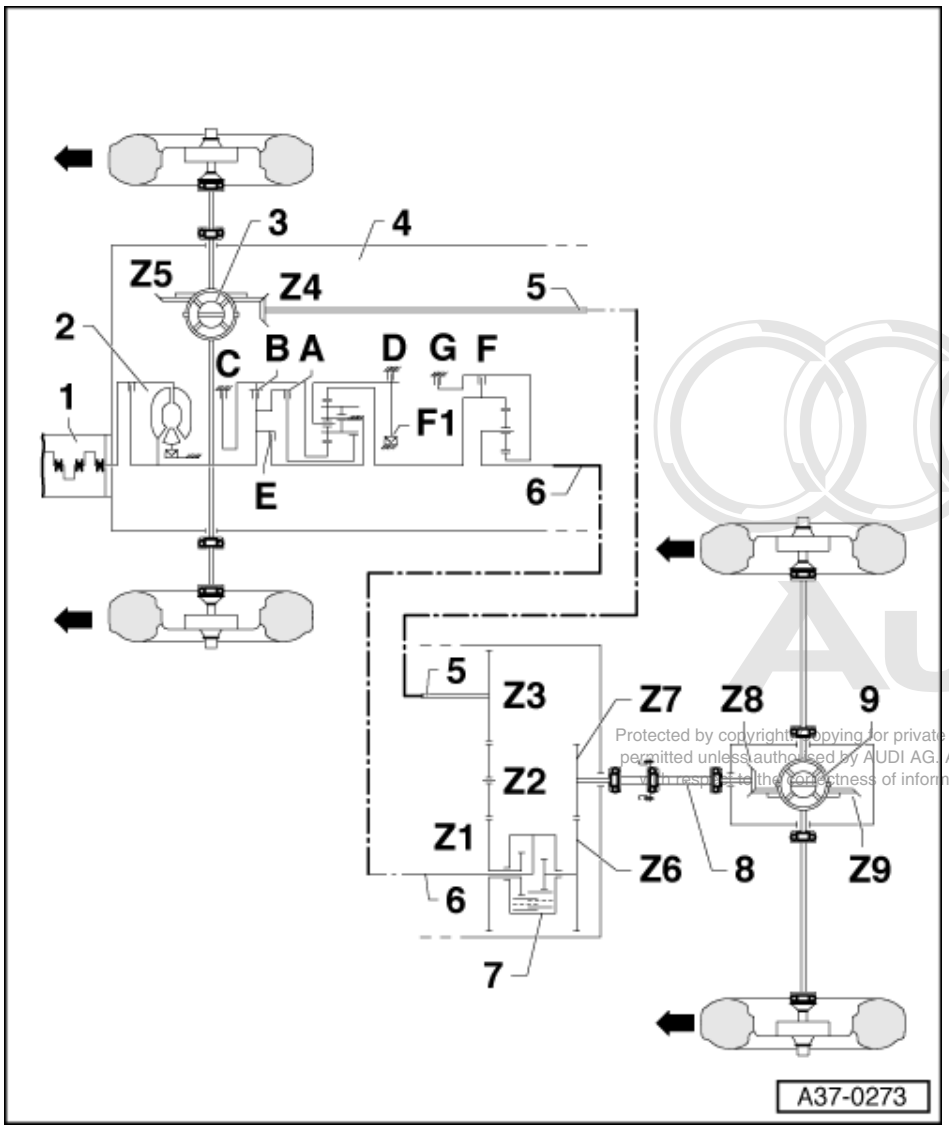
4.3 - Gearbox diagram for 4WD



A - Clutch A
B - Clutch B
E - Clutch E
F - Clutch F
C - Brake C
D - Brake D
G - Brake G
F1 - Free wheel 1

1 Engine
2 Converter with lock-up-clutch
3 Front differential

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4 Automatic gearbox
5 Pinion shaft
6 Output shaft
7 Torsen differential
8 Propshaft
9 Rear differential

Z1, Z2 and Z3 = spur gears of front intermediate drive, transmission =>Page 2

Z4, Z5 = front final drive, transmission =>Page 2

Z6, Z7 = spur gears of rear intermediate drive; transmission ratio =>Page 6

Z8, Z5 = rear final drive, transmission ratio =>Page 6

Note:

Arrows face in direction of travel.

4.4 - Position of selector elements

- To help deal with complaints regarding poor acceleration and performance or general malfunctions, the following tables show which shift elements are operated in the individual gears. It is thus possible to establish which selector elements are not functioning correctly.

	Solenoid valves							Clutches							
	Solenoid valves			Pressure control valves				Clutch				Brake			Free wheel
Position / Gear	1	2	3	1	2	3	4	A	B	E	F	C	D	G	1st gear
R = R-Gear	x			x		x			x				x	x	
N = Neutral	x	x		x		x					x -			x -	
D, 1st gear	x	x		x		x		x						x	x
D, 2nd gear	x	x		x	x	x		x				x		x	
D, 3rd gear		x	x - x	x	x			x			x	x			
D, 4th gear			x - x	x				x		x	x				
D, 5th gear	x		x - x	x	x					x	x	x			
2nd, 1st gear	x			x		x		x					x	x	x
D, 5th to 4th gear	x		x	x	x		x	(x)		x	x	(x)			

5 - Dismantling and assembling gearbox

5.1 - Dismantling and assembling gearbox

- Observe general repair instructions=> Page 14 .

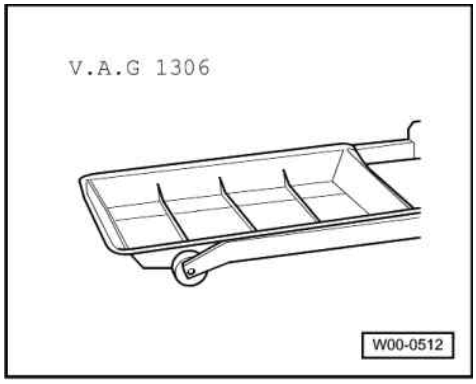
5.2 - Rules for cleanliness when working on the automatic gearbox

- Thoroughly clean all unions and the adjacent areas before disconnecting.
- Place removed parts on a clean surface and cover. Use sheeting and paper. Use lint-free cloths.
- Carefully cover or seal open components if repairs cannot be carried out immediately.
- Only install clean components: do not remove replacement parts from their wrapping until you are ready to install them.
- Always renew O-rings, seals and gaskets.
- Lightly lubricate O-rings with ATF before inserting to prevent them being trapped and damaged when assembling.

- Use only ATF in the parts of the gearbox where ATF is the specified lubricant. Other types of lubricant can cause problems with the hydraulic actuation of the gearbox.
- Check the following fluid levels after installation and top up as necessary: ATF in planetary gearbox => Page 12 onwards.

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5.3 - Removing and installing ATF lines overview



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Special tools, testers and auxiliary equipment required

- Drip tray V.A.G 1306

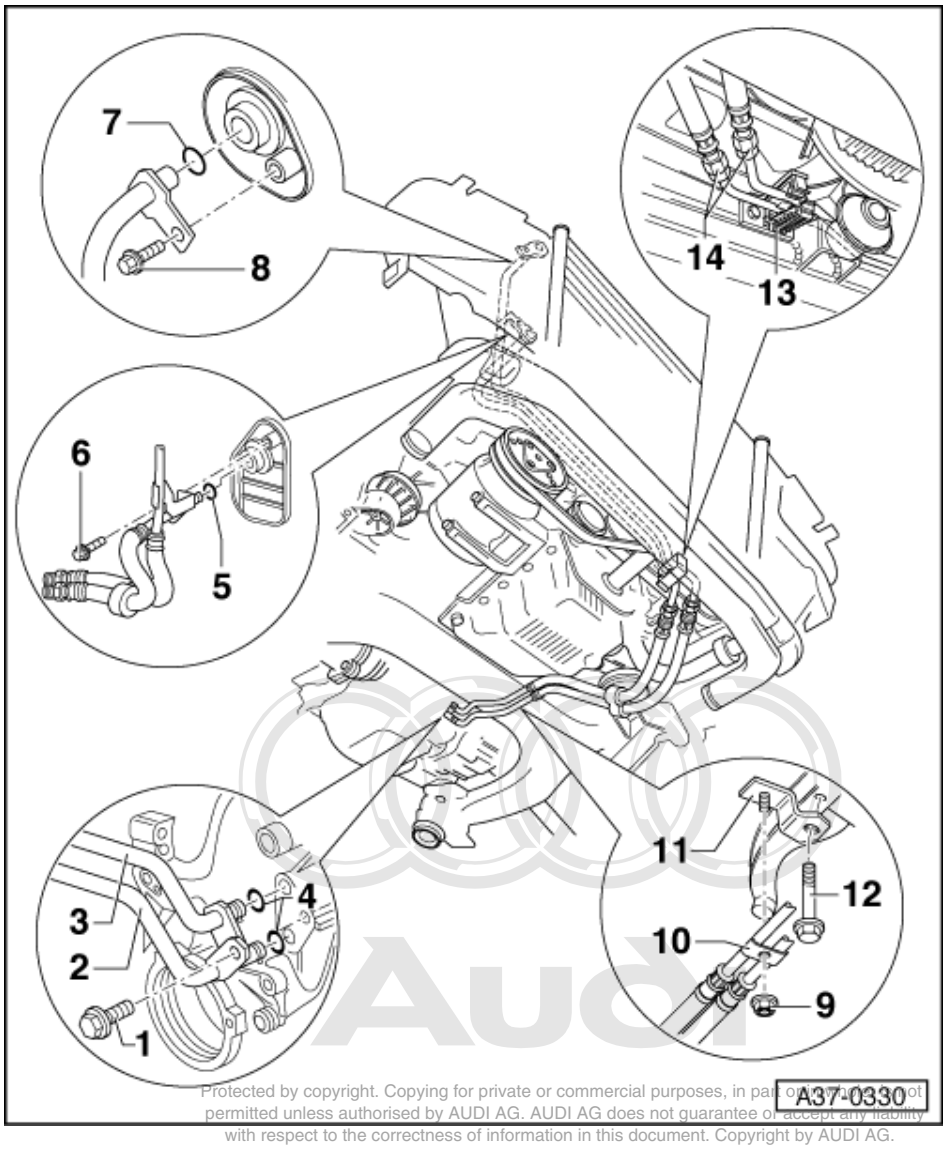
Removing and installing ATF lines for 4-cylinder petrol engines => Page 126

Removing and installing ATF lines for 6-cylinder petrol engines except 2.7l 5V turbo-charged engine => Page 128

Removing and installing ATF lines for 6-cylinder diesel engines => Page 130

Removing and installing ATF lines for 6-cylinder 2.7l 5V turbo-charged engine => Page 132

5.4 - Removing and installing ATF lines for 4-cyl. petrol engines



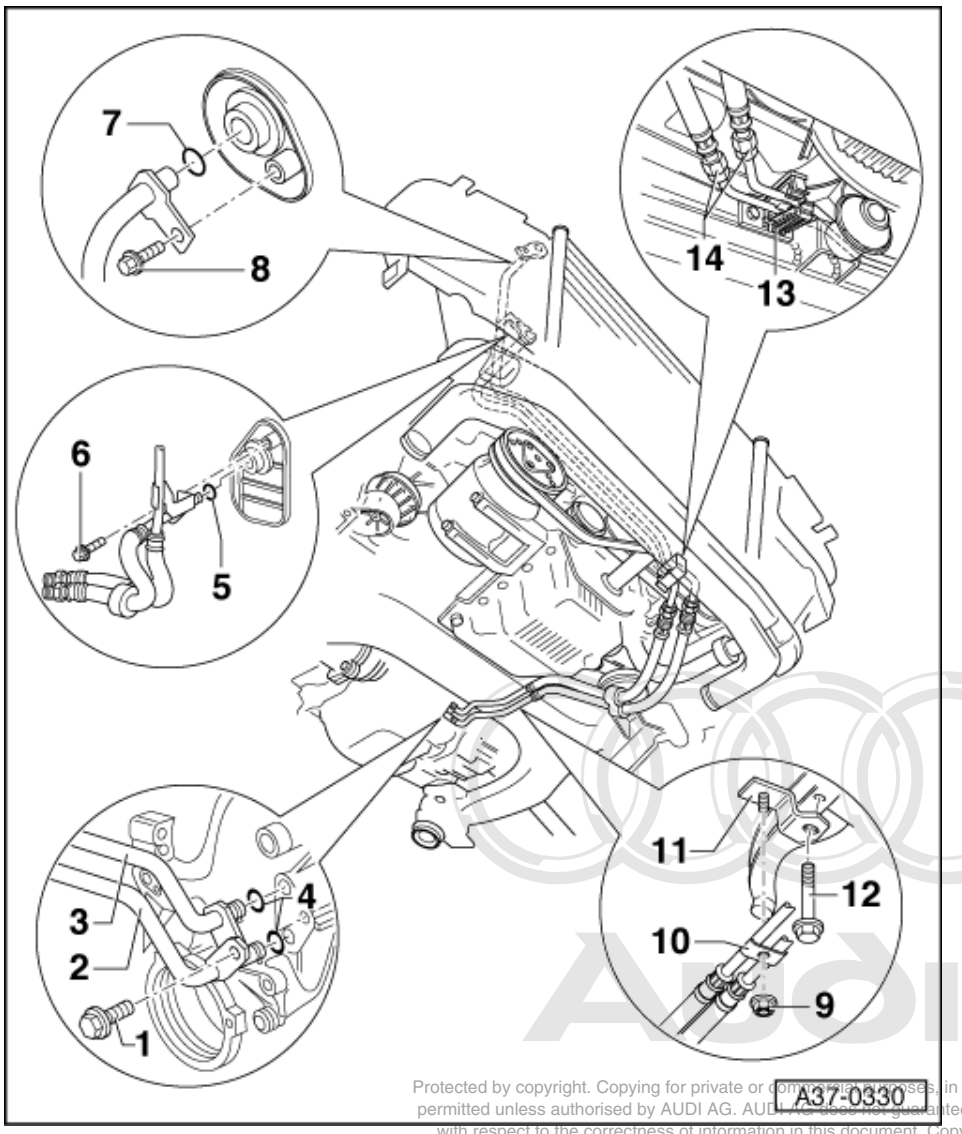
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Notes:

- Place drip tray V.A.G 1306 underneath.

1 **Release and tighten bolt - 21 Nm**
   - Before tightening insert wiring manually until stop
2 **Oil line to radiator**
   - Observe markings on gearbox housing
3 **ATF line from cooler**
   - Observe markings on gearbox housing

4 O-ring
- Insert with ATF
- Always replace



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5 O-ring
- Insert with ATF
- Always replace

6 Release and tighten bolt - 5 Nm

7 O-ring
- Insert with ATF
- Always replace

8 Release and tighten bolt - 5 Nm

9 Nut, 5 Nm

10 Clip

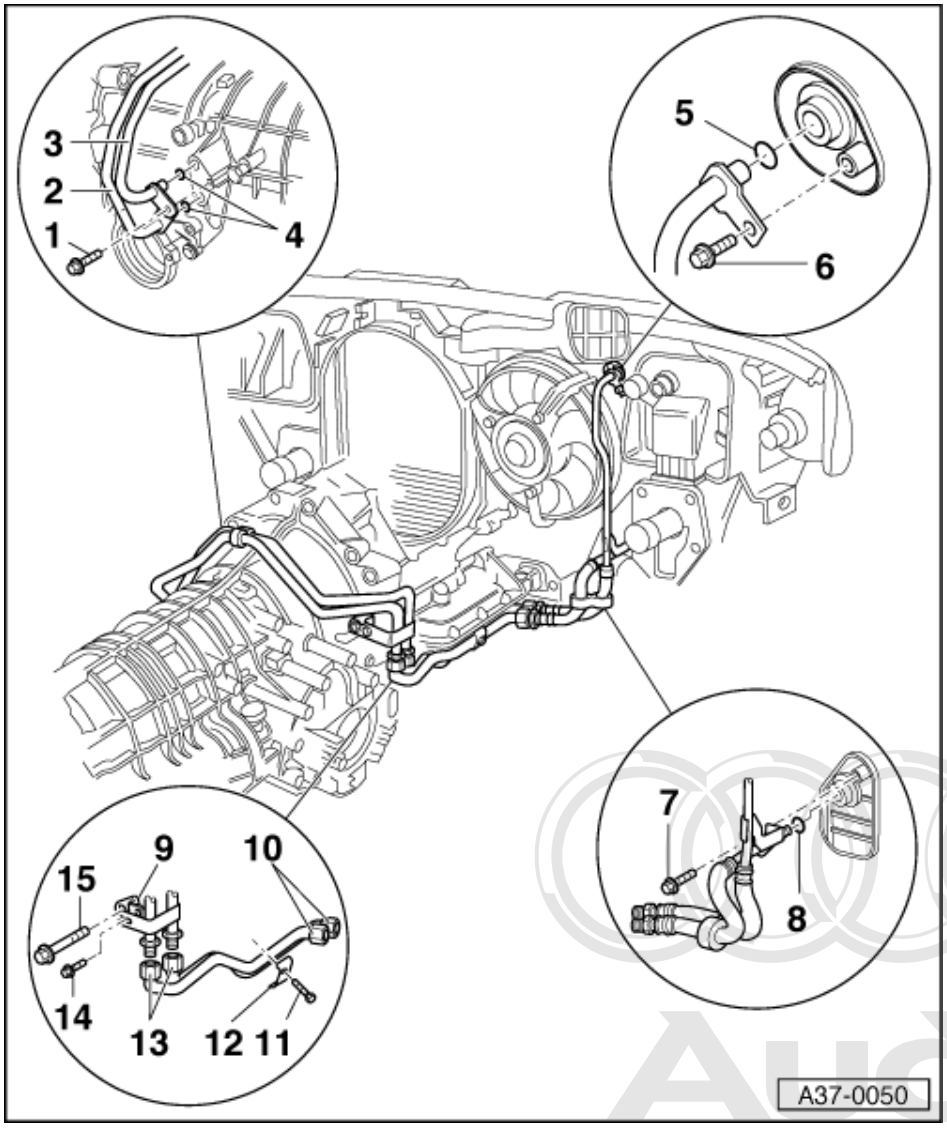
11 Bracket

12 Release and tighten bolt - 5 Nm
- Does not need to be unscrewed when removing and installing of ATF lines

13 Clips-bracket

14 Union nut, 30 Nm

5.5 - Removing and installing ATF lines for 6-cyl. petrol engines



Notes:

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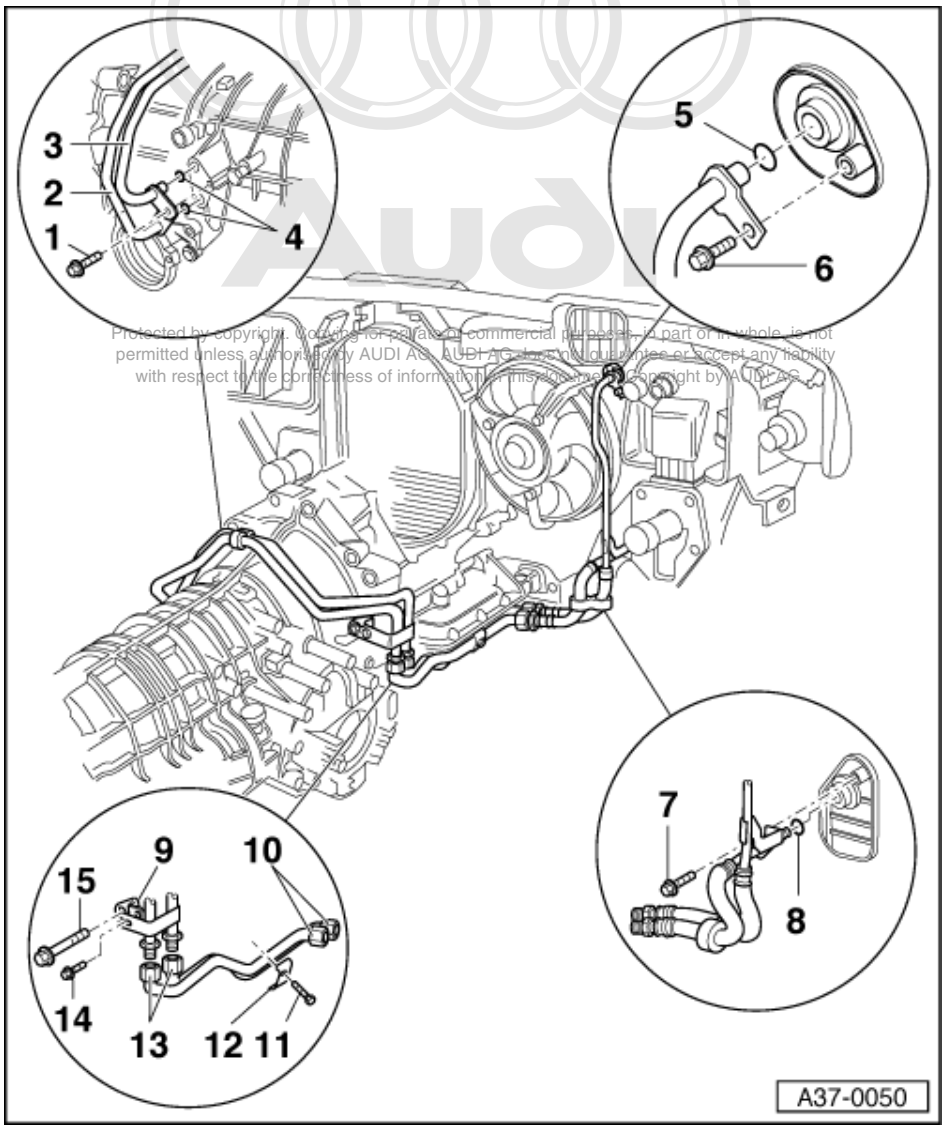
- Place drip tray V.A.G 1306 underneath.

1 Release and tighten bolt - 21 Nm
- Before tightening insert wiring manually until stop

2 ATF line from cooler
- Observe markings on gearbox housing

3 Oil line to radiator
- Observe markings on gearbox housing

4 O-ring
- Insert with ATF
- Always replace



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5 O-ring
- Insert with ATF
- Always replace

6 Release and tighten bolt - 5 Nm

7 Release and tighten bolt - 5 Nm

8 O-ring
- Insert with ATF
- Always replace

9 Bracket

10 Union nut, 25 Nm

11 Hexagon bolt, 5 Nm

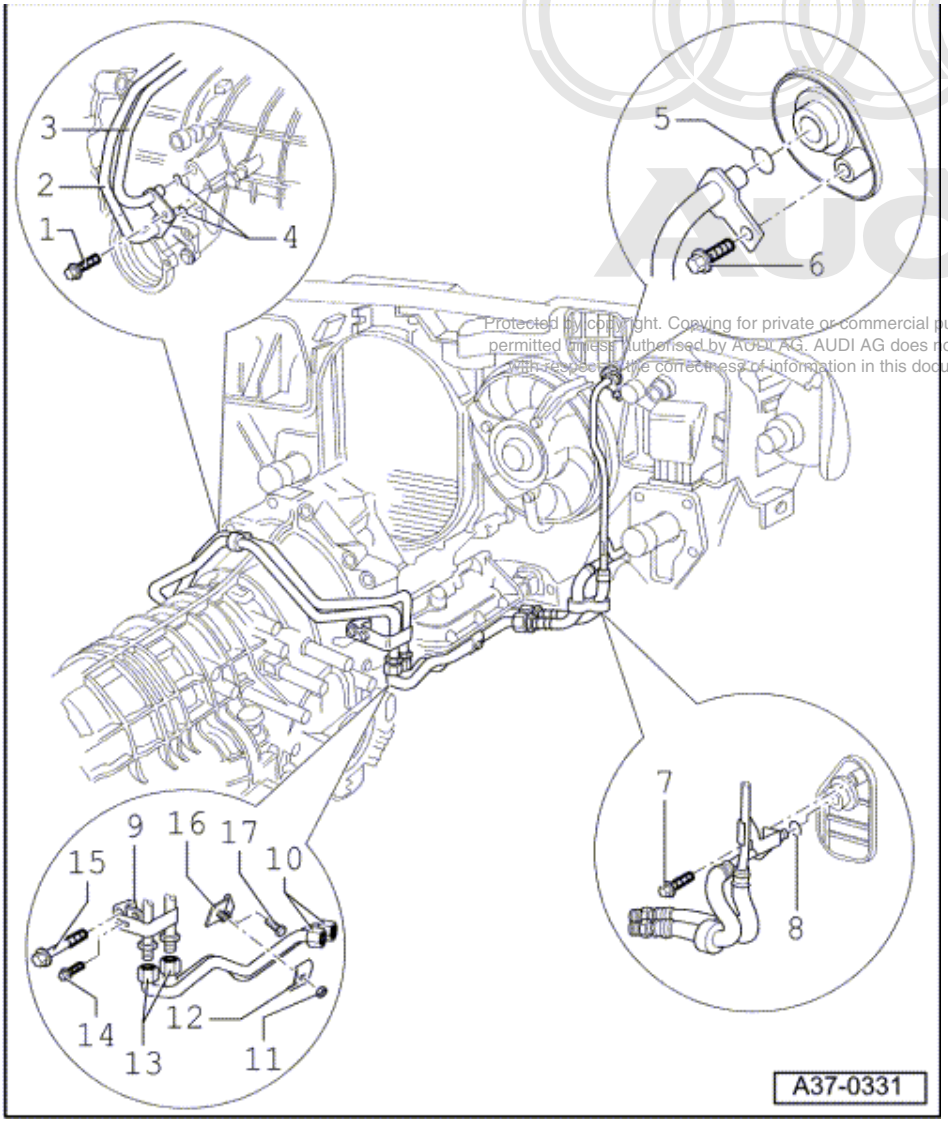
12 Clip

13 Union nut, 25 Nm

14 Hexagon bolt, 10 Nm

15 Hexagon bolt, 65 Nm

5.6 - Removing and installing ATF lines for 6-cyl. diesel engines



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Notes:

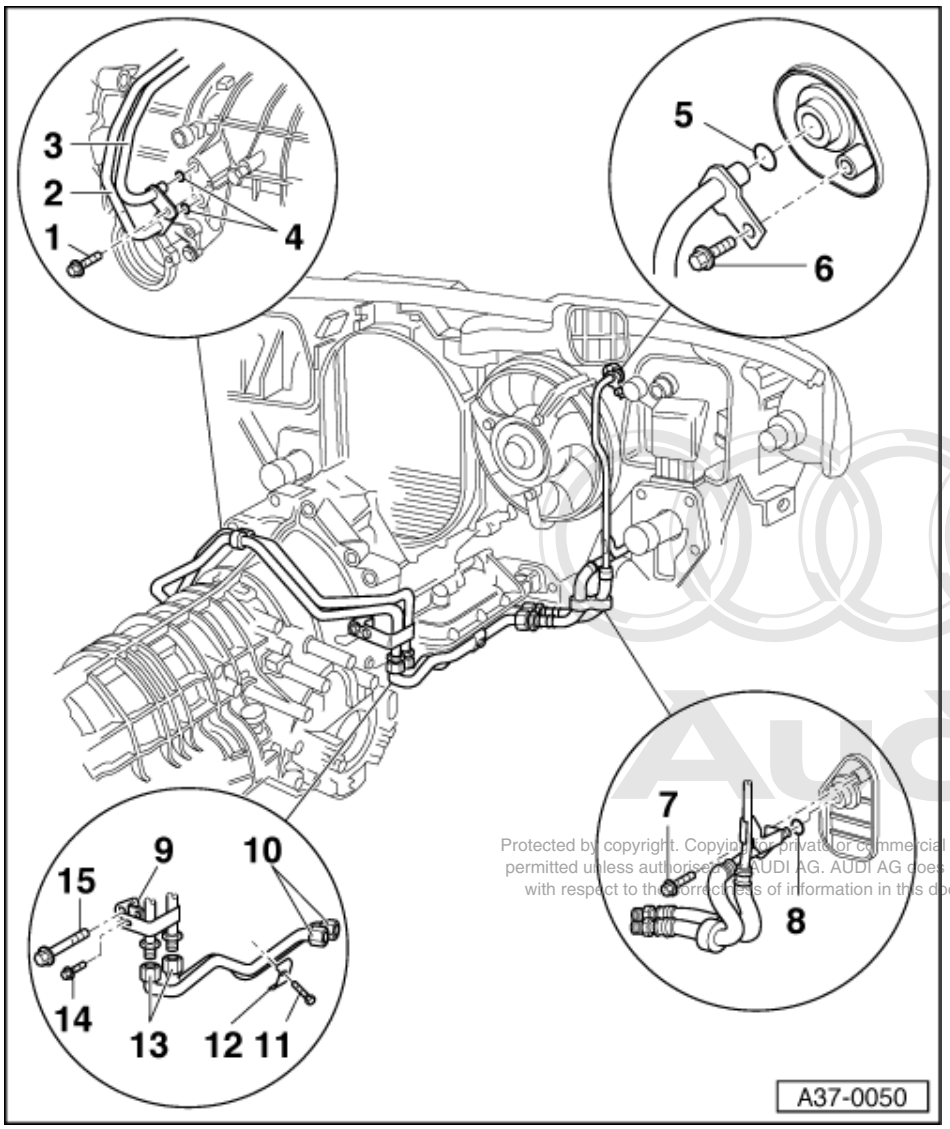
- Place drip tray V.A.G 1306 underneath.

1 Release and tighten bolt - 21 Nm
- Before tightening insert wiring manually until stop

2 ATF line from cooler
- Observe markings on gearbox housing

3 Oil line to radiator
- Observe markings on gearbox housing

4 O-ring
- Insert with ATF
- Always replace



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5 O-ring
- Insert with ATF
- Always replace

6 Release and tighten bolt - 5 Nm

7 Release and tighten bolt - 5 Nm

8 O-ring
- Insert with ATF
- Always replace

9 Bracket

10 Union nut, 29 Nm

11 Nut - 5 Nm

12 Clip

13 Union nut, 29 Nm

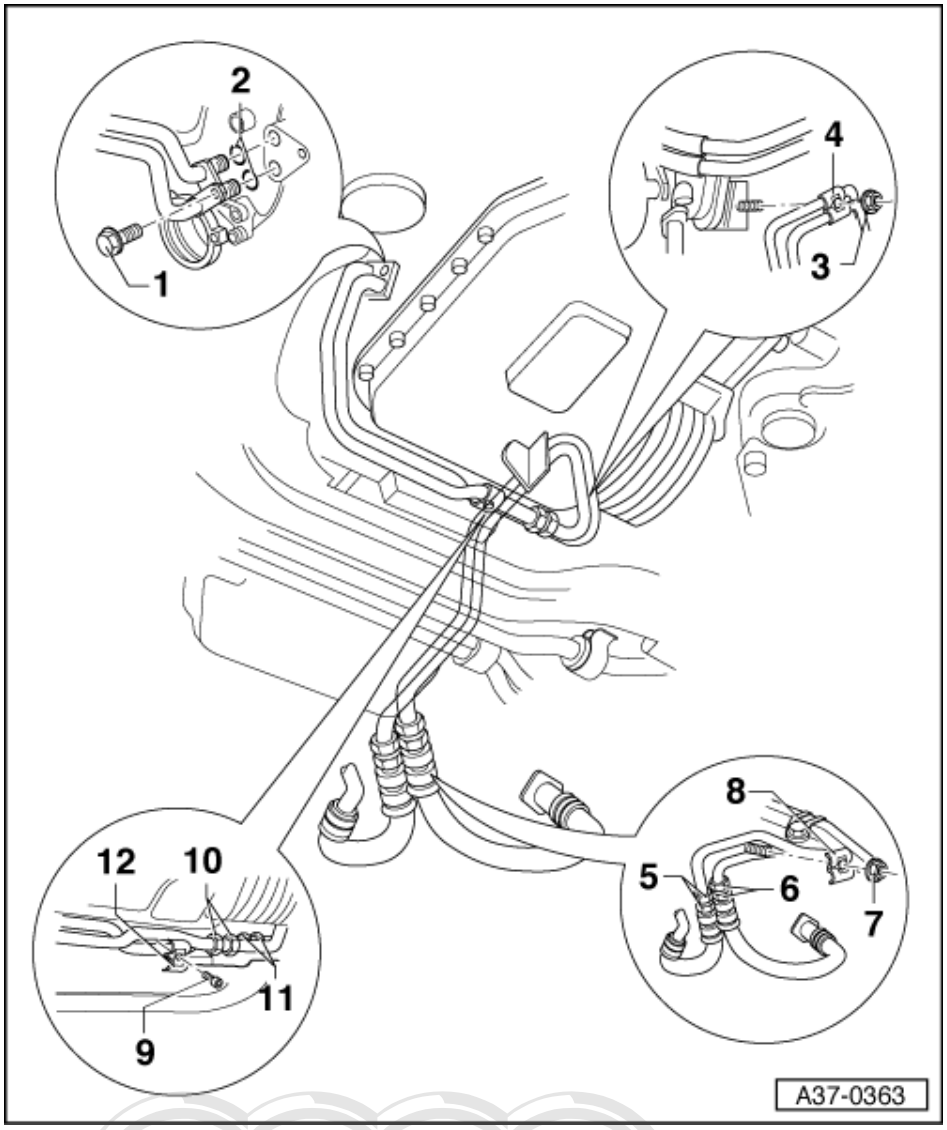
14 Release and tighten bolt -10 Nm

15 Release and tighten bolt - 8 Nm

16 Bracket

17 Release and tighten bolt - 8 Nm

5.7 - Removing and installing ATF lines for 6-cyl. 2.7l 5V turbo-charged engine

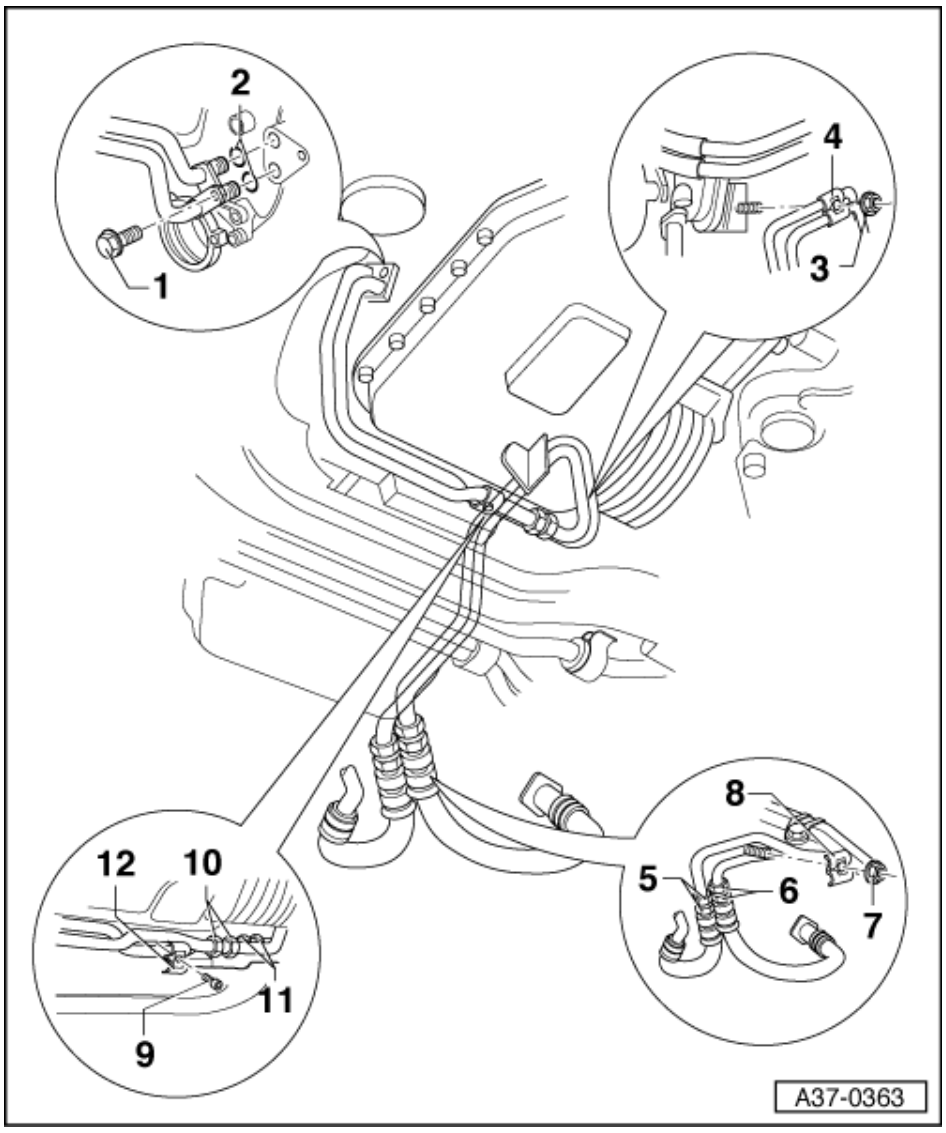


Notes:

- Place drip tray V.A.G 1306 underneath.

1 **Release and tighten bolt - 21 Nm**
   - Before tightening insert wiring manually until stop
2 **O-ring**
   - Insert with ATF
   - Always replace
3 **Nut- 5 Nm**
4 **Clip**
5 **Union nut, 29 Nm**

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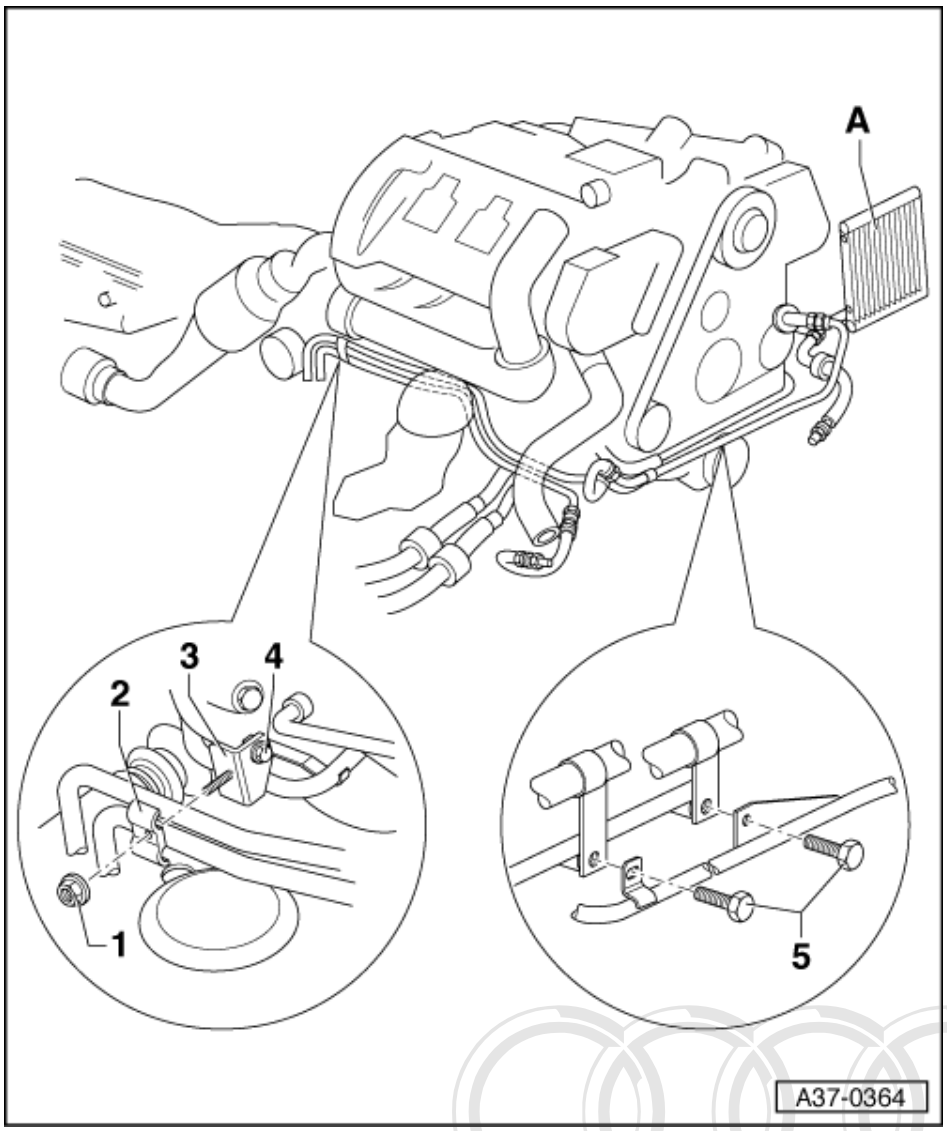


6 Union nut, 29 Nm
- Note yellow colour markings indicating allocation of lines.

7 Nut - 5 Nm
8 Clip
9 Release and tighten bolt - 5 Nm
10 Union nut, 29 Nm
- Note yellow colour markings indicating allocation of lines.

11 Union nut, 29 Nm
12 Clip

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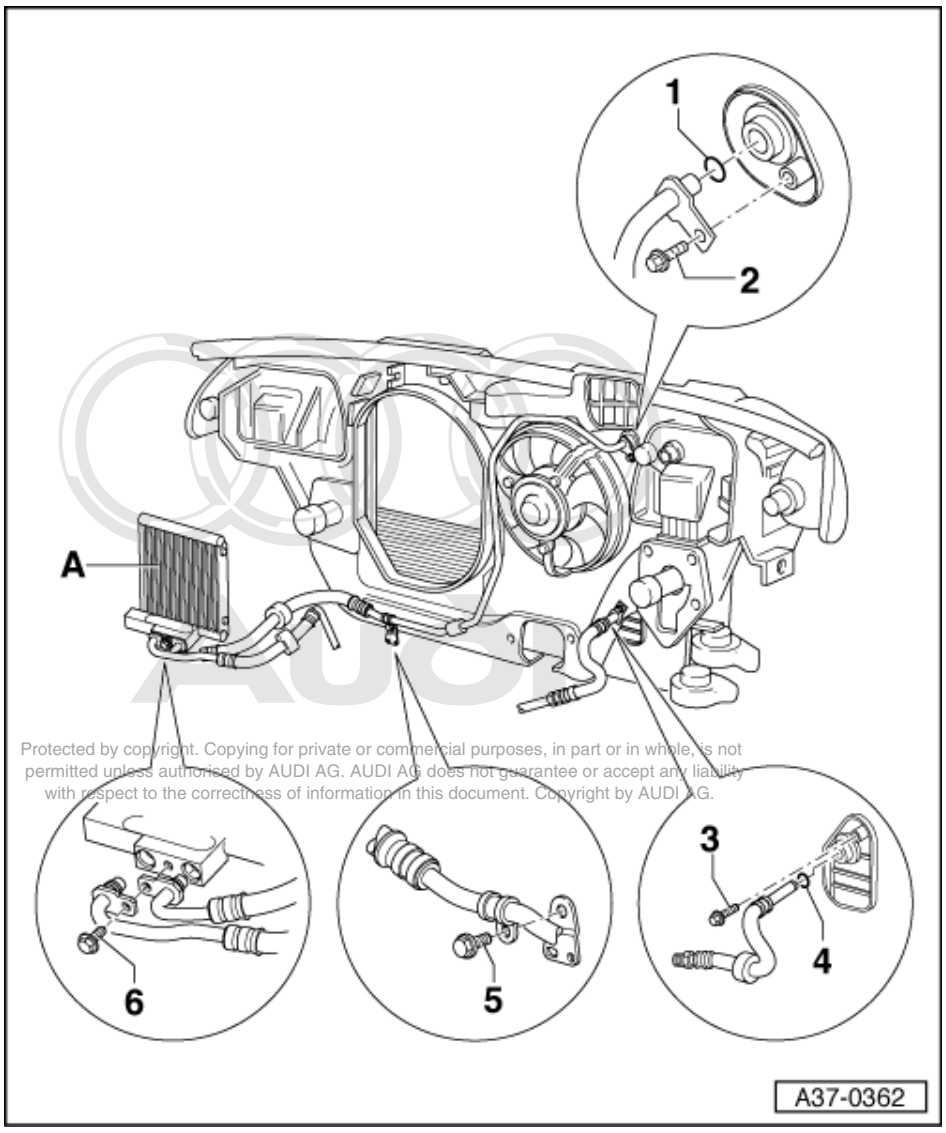


1 Nut - 9.5 Nm
2 Clip
3 Bracket
4 Release and tighten bolt - 9.5 Nm
5 Release and tighten bolt - 22 Nm

A - Additional ATF cooler

- When removing or after draining the additional cooler carry out an additional ATF check => Page 116

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A - Additional ATF cooler

- When removing or after draining the additional cooler carry out an additional ATF check => Page 116

1 O-ring
- Insert with ATF
- Always replace

2 Release and tighten bolt - 5 Nm

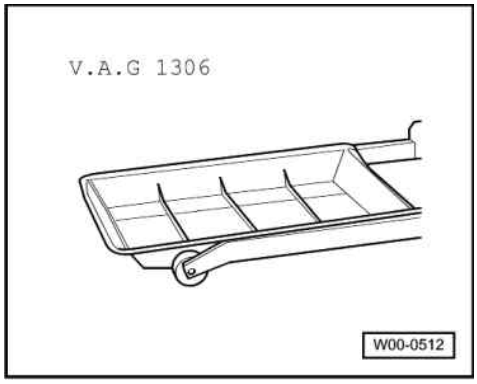
3 Release and tighten bolt - 5 Nm

4 O-ring
- Insert with ATF
- Always replace

5 Release and tighten bolt - 10 Nm

6 Release and tighten bolt - 25 Nm
- Before tightening insert lines manually until stop

5.8 - Cleaning ATF lines and ATF cooler



Special tools, testers and auxiliary equipment required

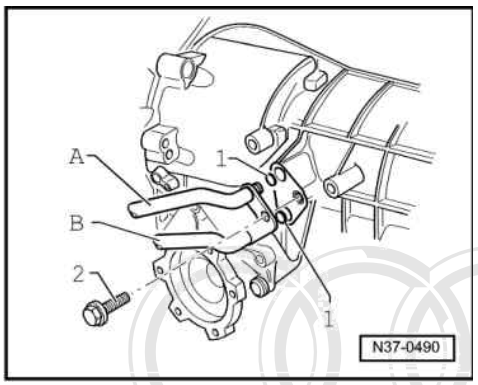
- -> Drip tray V.A.G 1306
- Hose øapprox. 18 mm
- Commercially available compressed air gun
- Protective goggles

Notes:

- Before fitting a replacement gearbox, always blow through the oil cooler and ATF lines with compressed air (not more than 10 bar).
- To install first insert ATF lines into gearbox or cooler by hand as far as they will go, then bolt on.

Important:
Wear protective glasses.

- Place drip tray V.A.G 1306 underneath.



- -> Unscrew bolt -2-.
- Detach ATF lines from gearbox.
- Attach a hose with a diameter of approx. ø18 mm to ATF line -A- and secure with hose clamp. Place the other end of the hose into a suitable container.
- Blow through ATF line -B- with a compressed air gun.
- Change hose from ATF line -A- over to ATF line -B- and repeat sequence.
- Secure ATF lines again.
- Check and top up ATF level =>Page 113 onwards

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38 - Gears, Hydraulic controls

1 - Removing and installing oil pan, ATF screen and valve body

1.1 - Removing and installing oil pan, ATF screen and valve body

Important:
Do not run engine or tow vehicle with oil pan removed or when there is no ATF in the gearbox.

Notes:

- Always replace valve body if it has collected dirt or if it is defective.
- Rules for cleanliness when working on the automatic gearbox => Page 124 .
- General repair instructions => Page 14 .
- Lightly lubricate O-rings and oil seals with ATF. Other types of lubricant can cause problems with the hydraulic actuation of the gearbox.

1.2 - Overview of removed components

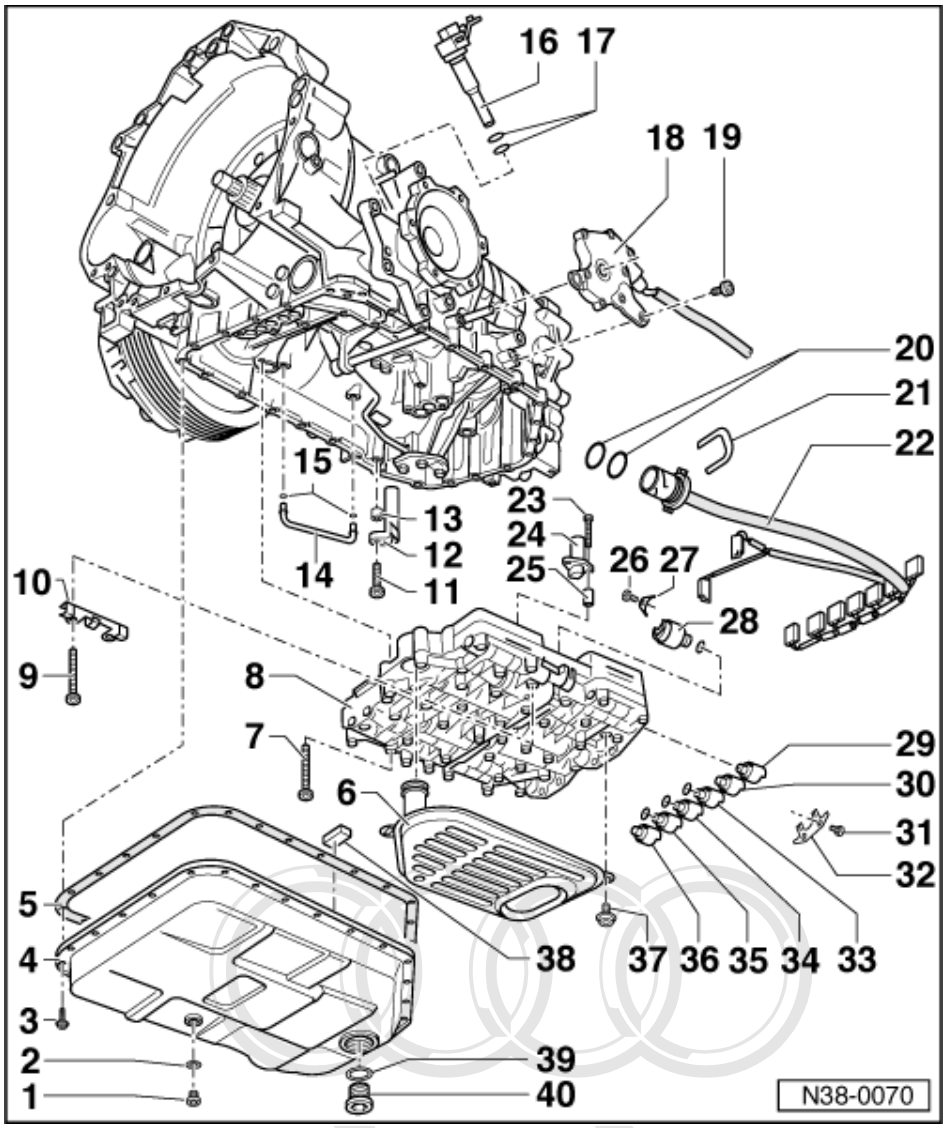
Notes:

- A distinction is made between two types of gearbox.
  Gearbox with hydraulic control E17, in which gearbox input speed sender (inductive sender) is attached to underside of valve body.
  Gearbox with hydraulic control E18/2, in which gearbox input speed sender (Hall sender) is attached to gearbox housing behind valve body.
- Information on the gearbox concerned can be found in the tables from Page 2 onwards

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Overview of removed components for gearbox with hydraulic control E17 => 138

Overview of removed components for gearbox with hydraulic control E18/2 => 146



Overview of removed components for gearbox with hydraulic control E17

1 Drain plug - 40 Nm
- Hexagon socket head 5 mm
- Remove to drain ATF => Page 154

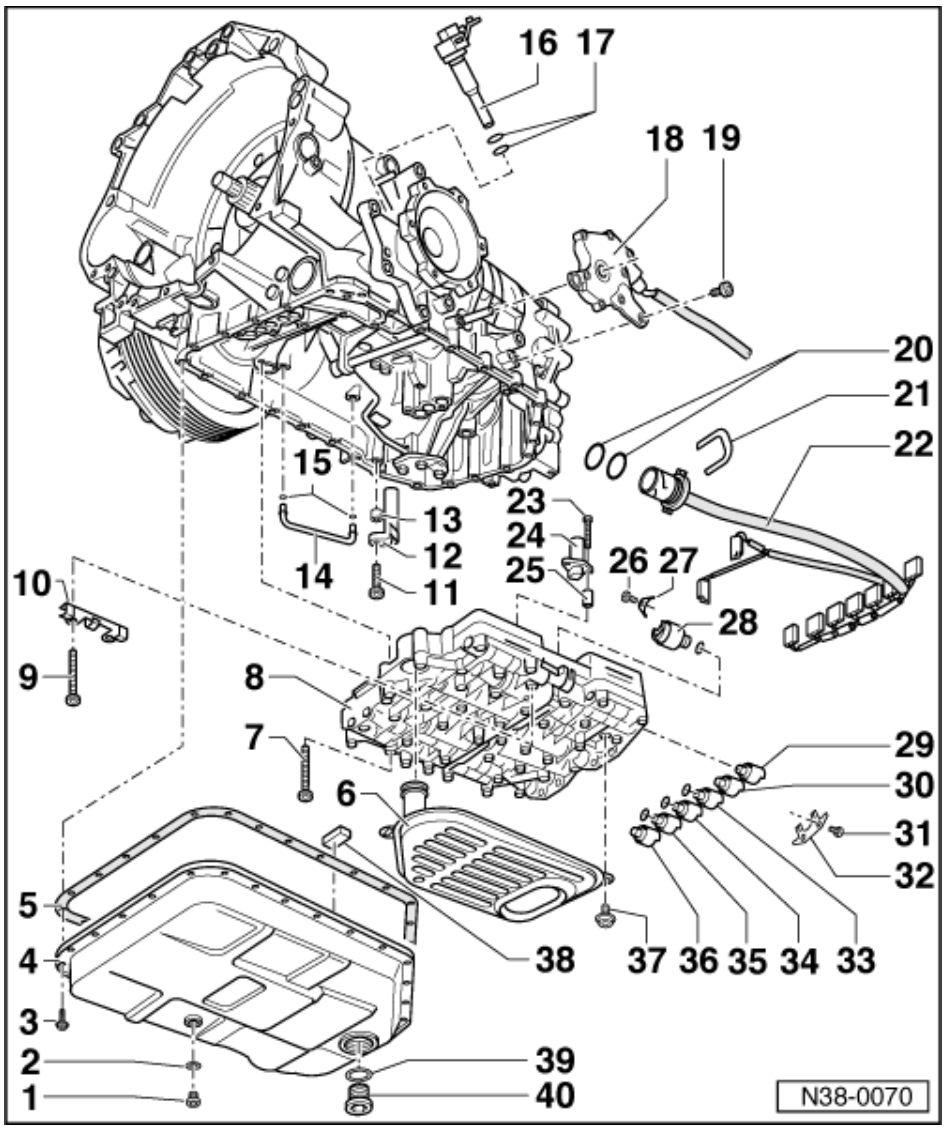
2 Sealing ring
- Replace

3 Release and tighten bolt -10 Nm
- Tighten the bolts for the oil pan in several steps and in a diagonally opposite sequence.

4 Oil pan
- Removing and installing
=>Page 154 .

5 Gasket
- Replace

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6 ATF screen

- Removing and installing
  =>Page 155 .

7 Release and tighten bolt - 8 Nm

- To attach valve body 1 bolt M6 x 30 16 bolts M6 x 60
- Observe the tightening sequence =>Page 160

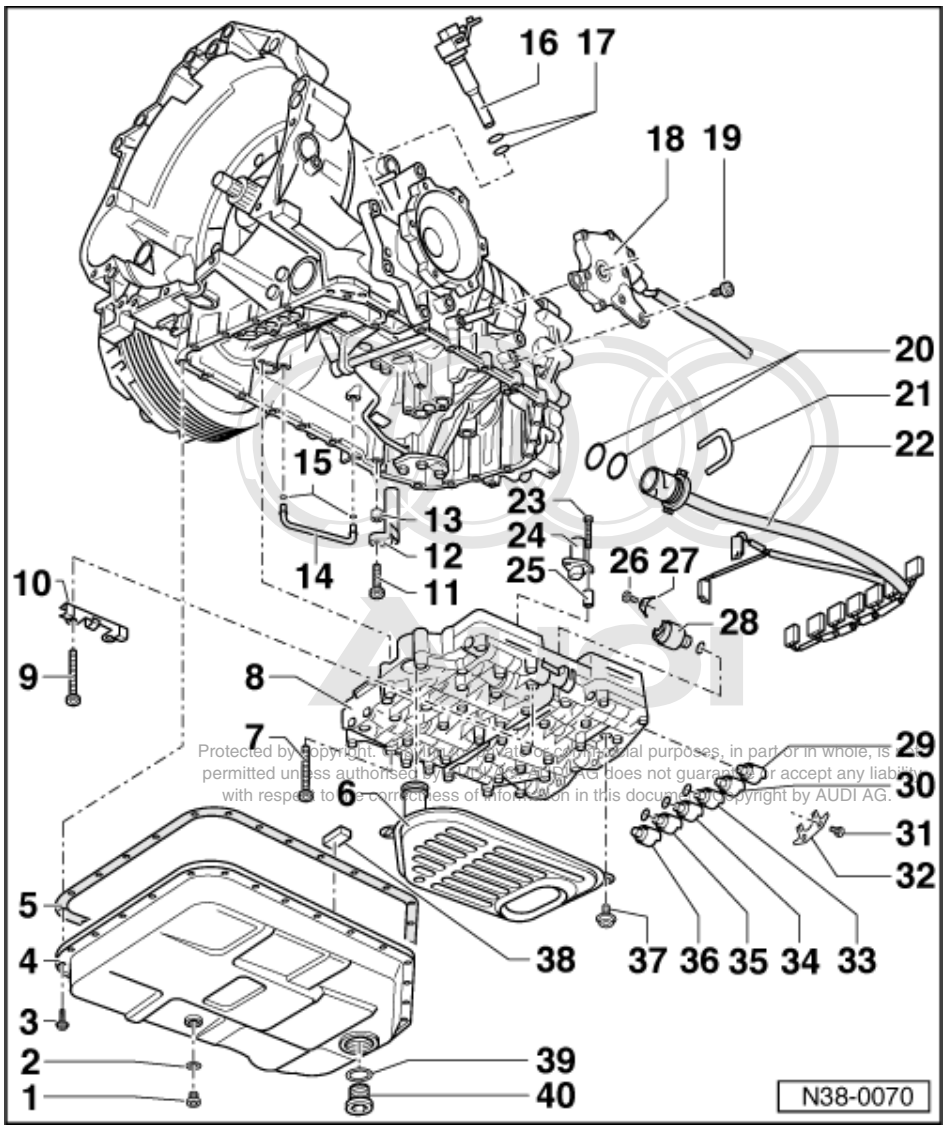
8 Valve body

- Removing and installing
  =>Page 156 .
- Allocation according to coding of gearbox

=> Parts List

9 Release and tighten bolt - 8 Nm

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10 Bracket

- For wiring harness
- Engage wiring harness
- Attached using bolts for valve body

11 Release and tighten bolt - 6 Nm

12 Gearbox speed sender -G38

- Removing and installing
  =>Page 167 .

13 Spacer sleeve

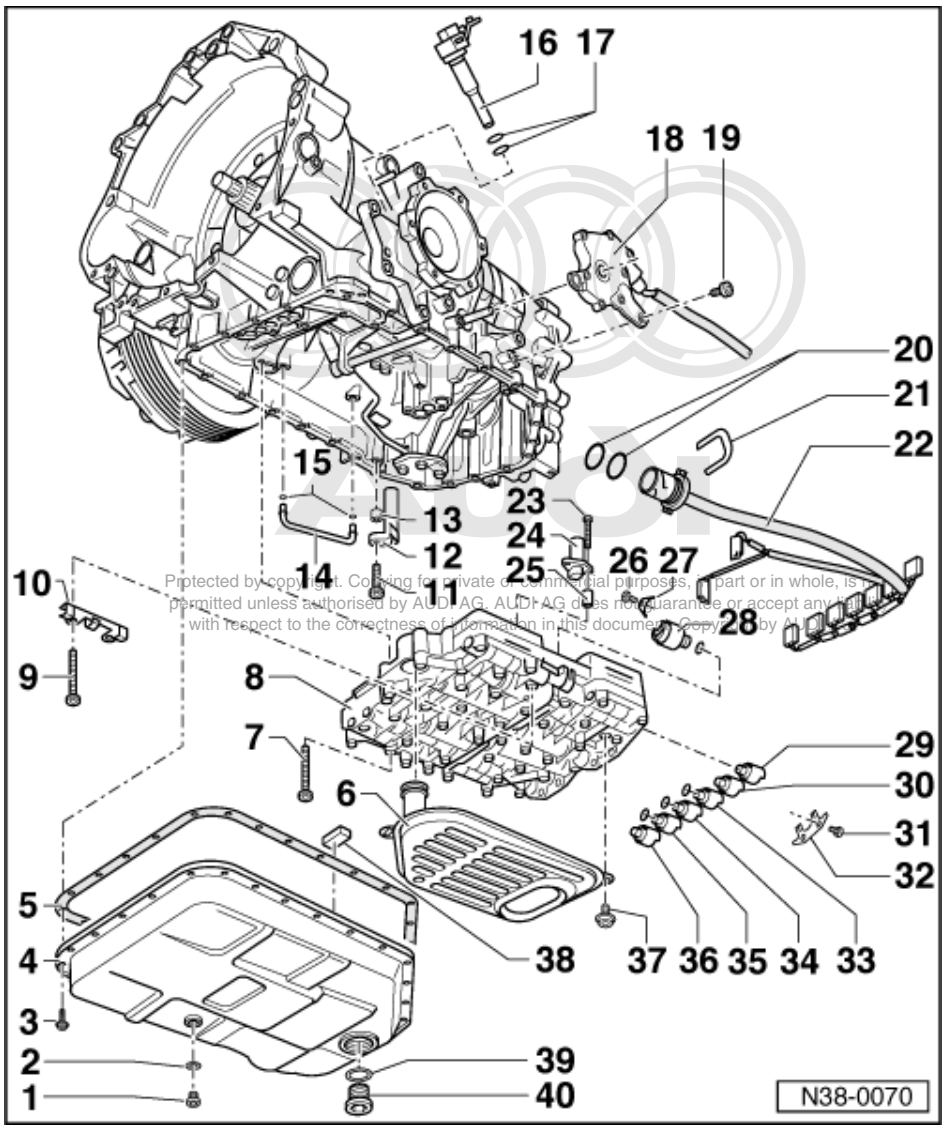
- Height: 8 mm

14 Internal oil pipe

- Replace
- Removing and installing
  =>Page 161 .

15 O-ring

- Replace



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16 Speedometer sender -G22

- Removing and installing
  =>Page 164 .

17 O-ring

- Replace
- Coat with Vaseline

18 Multi-function switch -F125

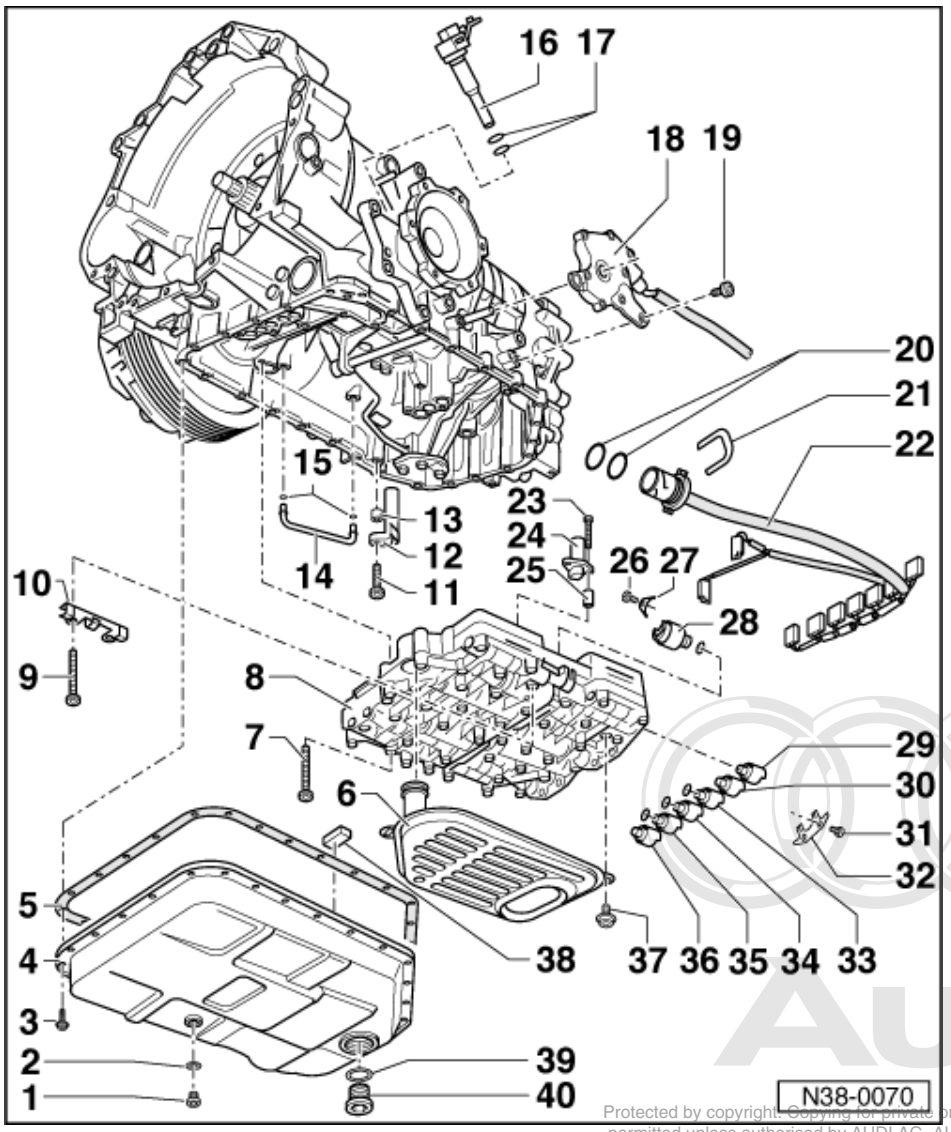
- Removing and installing
  =>Page 163 .
- Replacing selector shaft sealing ring => Page 162

19 Release and tighten bolt - 8 Nm

20 O-ring

- Replace

21 Securing clip



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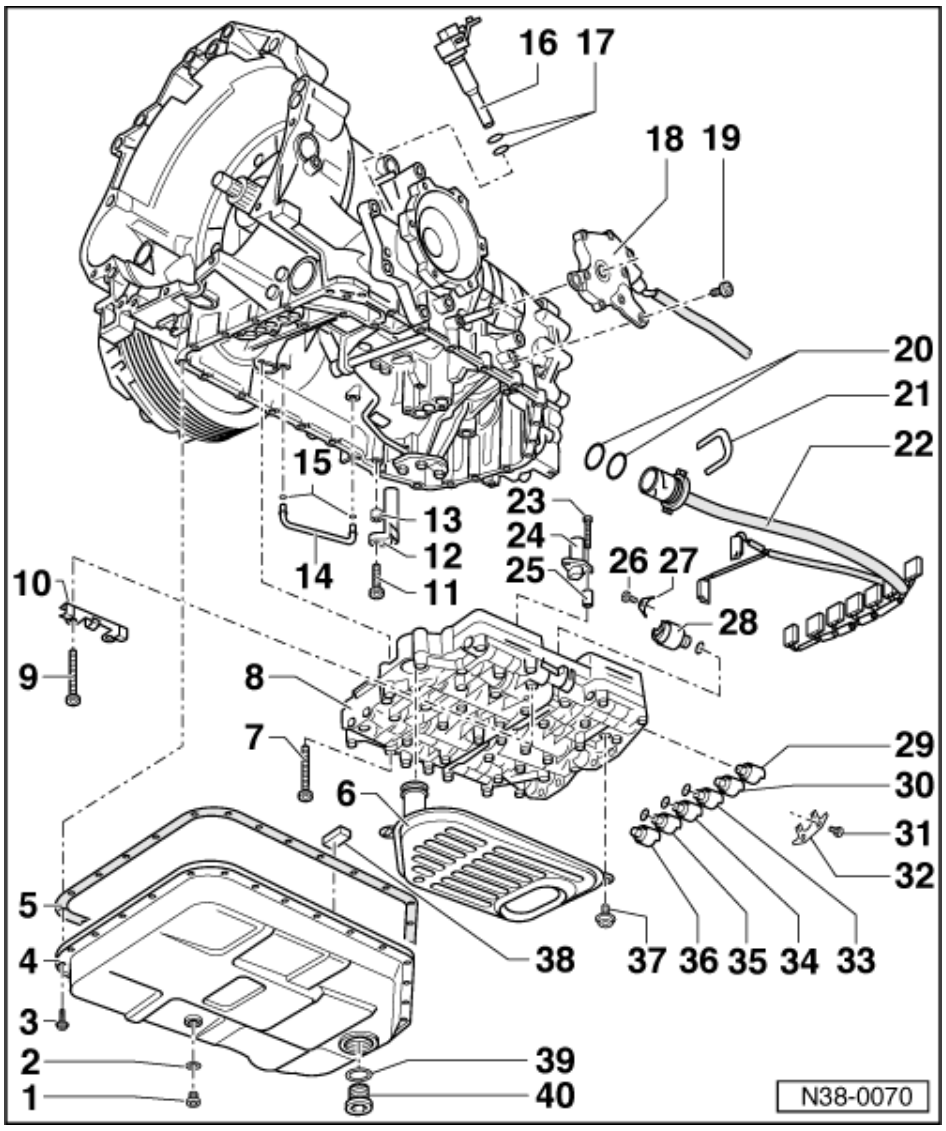
22 Wiring loom

- Replacing => Page 168 .
- ATF oil temperature sender -G93 integrated in the wiring loom.
- To replace removing and installing valve body =>Page 156
- Disengage from bracket for wiring loom -Item 10-.
- Installation position of wiring loom connector: Flat part of rear shoulder faces oil pan, the lugs at shoulder are horizontal

23 Release and tighten bolt - 6 Nm

24 Sender for gearbox input speed -G182

- Removing and installing
  =>Page 165 .



25 Spacer sleeve

- Height: 20 mm

26 Release and tighten bolt - 6 Nm

27 Bracket

- For solenoid valve

28 Solenoid valve 4 -N91

- With O-ring
- To replace remove and install valve body => Page 156

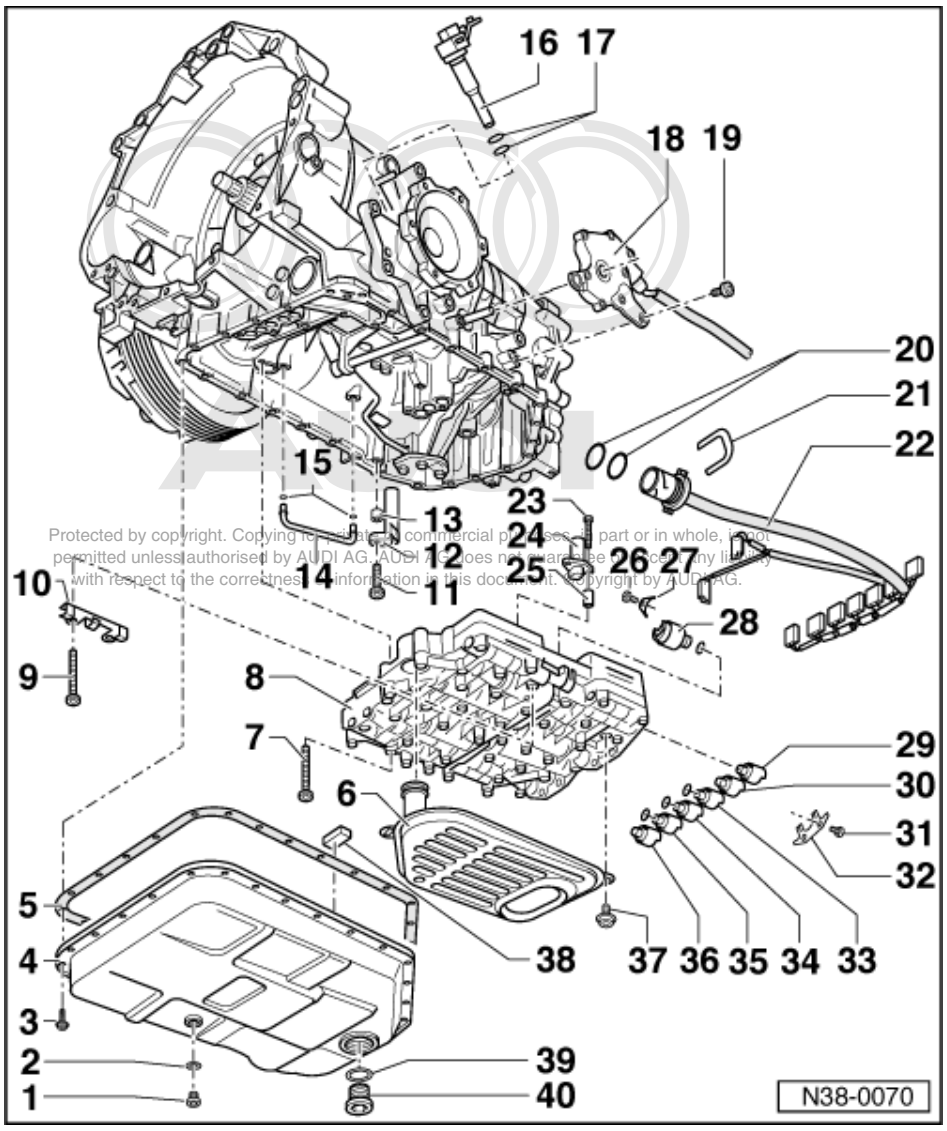
29 Solenoid valve 3 -N90

- Without O-ring
- To replace, remove and install oil pan => Page 154

30 Solenoid valve 2 -N89

- Without O-ring
- To replace, remove and install oil pan => Page 154

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31 Release and tighten bolt - 6 Nm

32 Bracket

- For solenoid valves

33 Solenoid valve 6 -N93

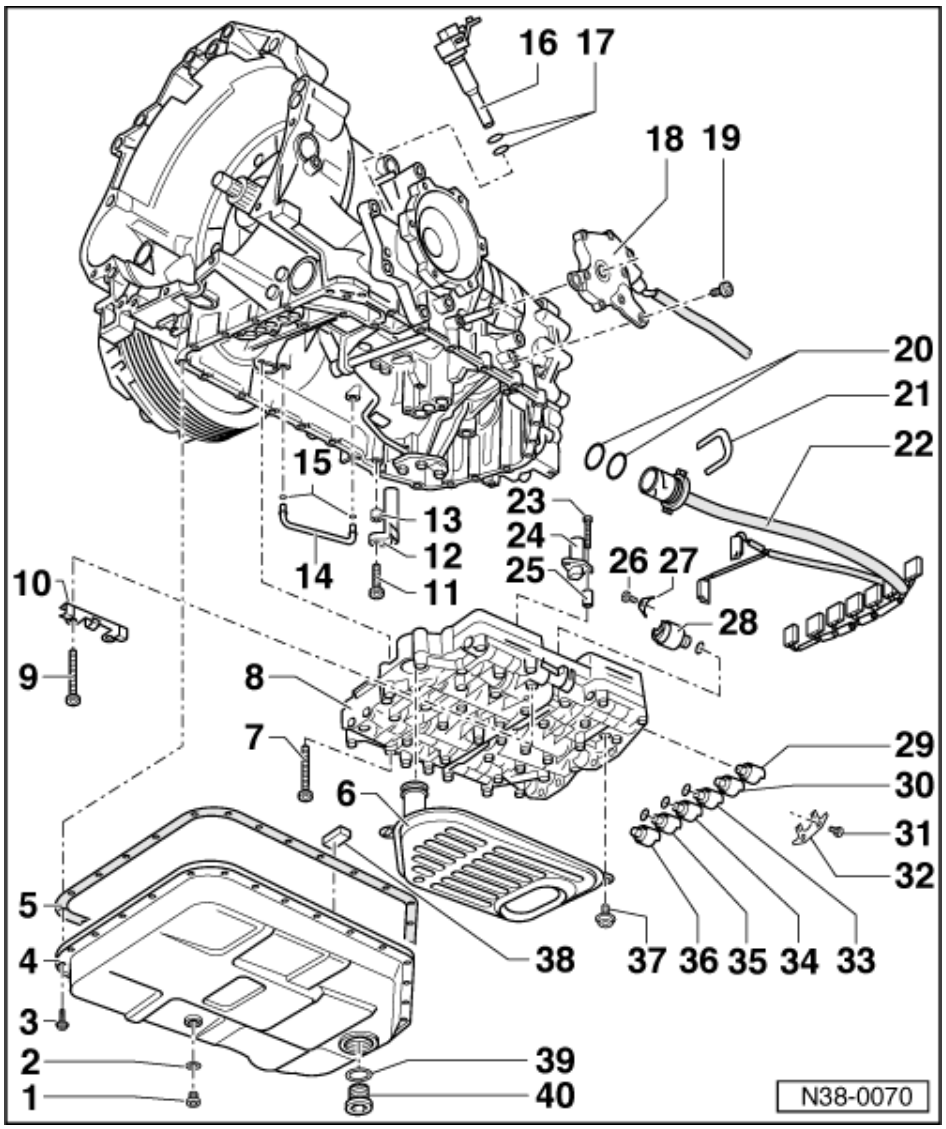
- With O-ring
- To replace, remove and install oil pan => Page 154

34 Solenoid valve 7 -N94

- With O-ring
- To replace, remove and install oil pan => Page 154

35 Solenoid valve 5 -N92

- With O-ring
- To replace, remove and install oil pan => Page 154



36 Solenoid valve 1 -N88

- Without O-ring
- To replace remove oil pan => Page 154 and unbolt guide plate for parking lock mechanism
- When installing bolts for guide plate (23 Nm) do not lock into selector lever position "P"

37 Release and tighten bolt - 6 Nm

38 Solenoid

- 4 off in the flanges of the oil pan

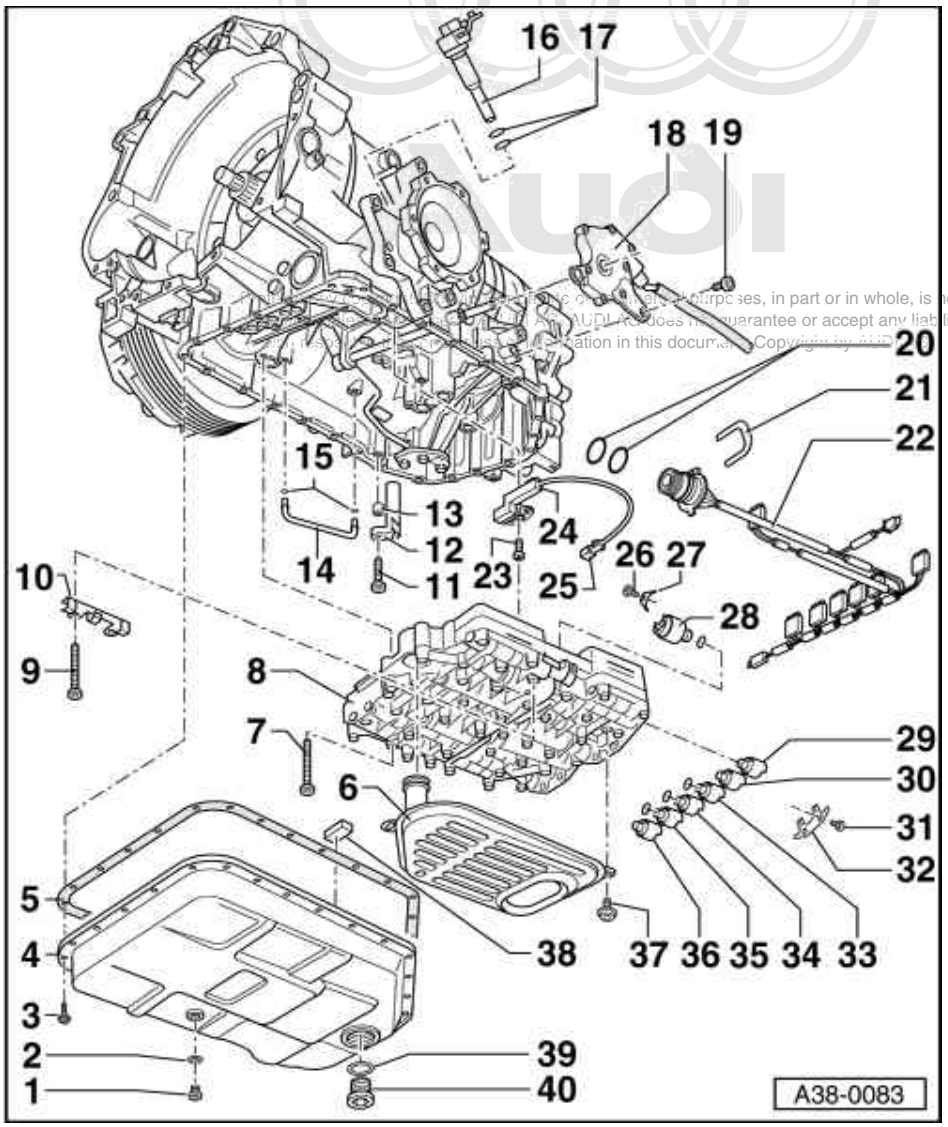
39 O-ring

- Replace

40 ATF-inspection plug - 80 Nm

- Hexagon socket head 17 mm

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Overview of removed components for gearboxes with hydraulic control E18/2

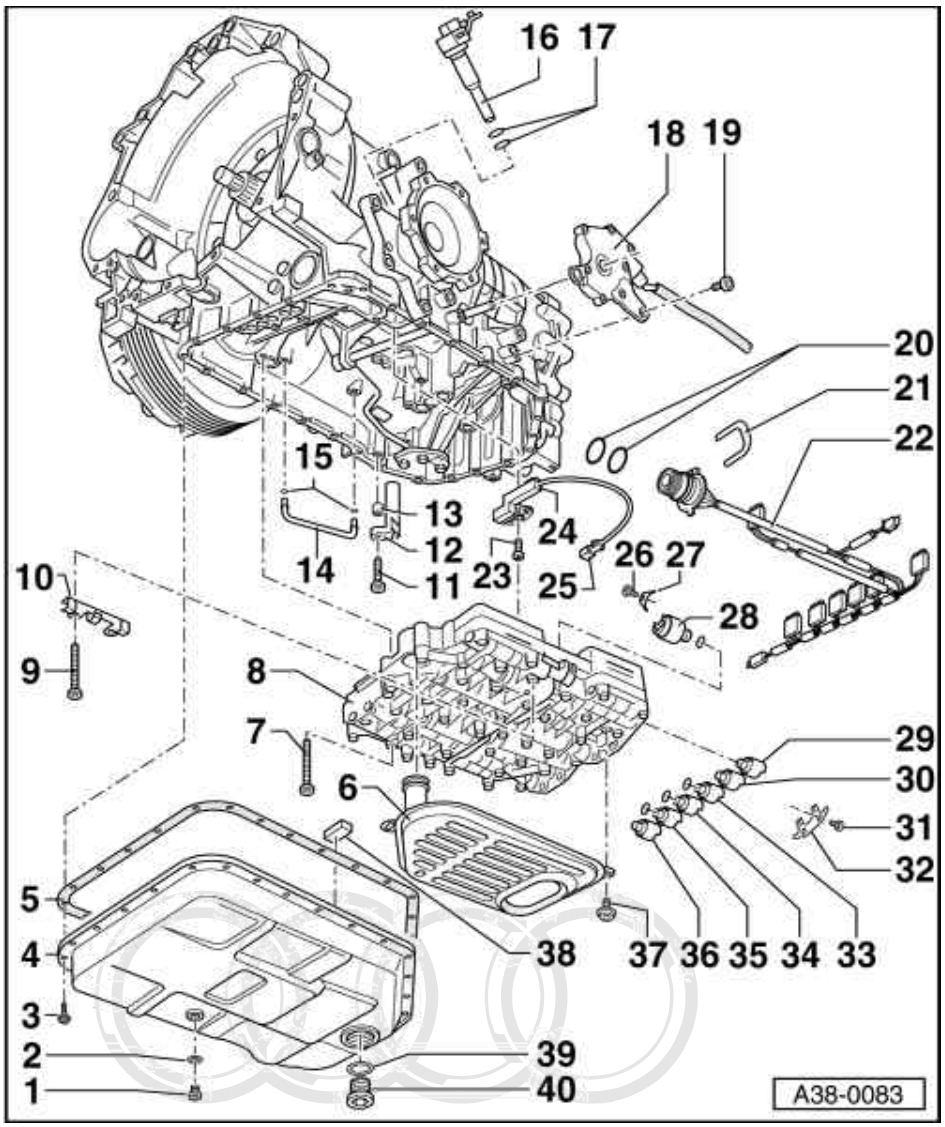
1 **Drain plug - 40 Nm**
- Hexagon socket head 5 mm
- Remove to drain ATF => Page 154

2 **Sealing ring**
- Replace

3 **Release and tighten bolt -10 Nm**
- Tighten the bolts for the oil pan in several steps and in a diagonally opposite sequence.

4 **Oil pan**
- Removing and installing
=>Page 154 .

5 **Gasket**
- Replace



6 ATF screen

- Removing and installing
  =>Page 155 .

7 Release and tighten bolt - 8 Nm

- To attach valve body 1 bolt M6 x 30 16 bolts M6 x 60
- Observe the tightening sequence =>Page 160

8 Valve body

- Removing and installing
  =>Page 156 .
- Allocation according to coding of gearbox

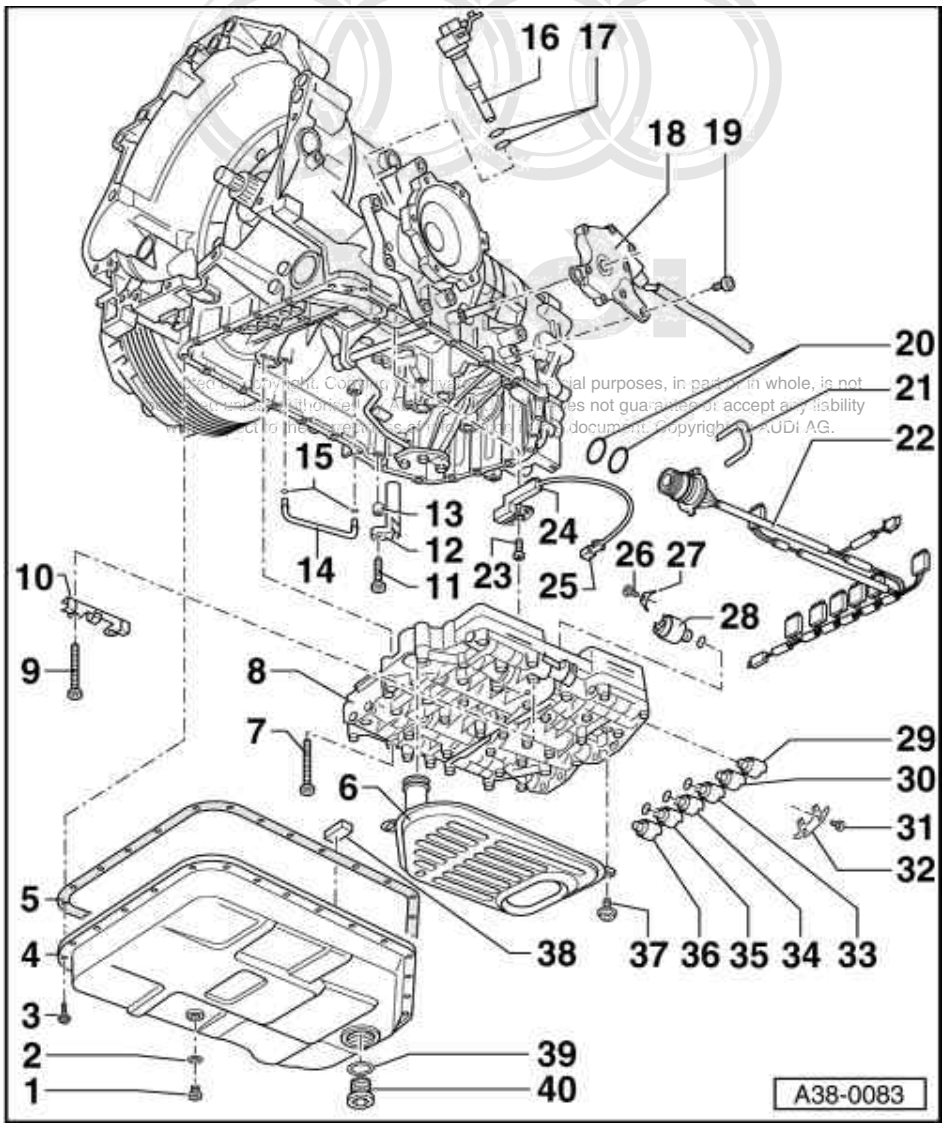
=> Parts List

9 Release and tighten bolt - 8 Nm

10 Bracket

- For wiring harness
- Engage wiring harness
- Attached using bolts for valve body

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11 Release and tighten bolt - 6 Nm

12 Gearbox speed sender -G38

- Removing and installing
  =>Page 167 .

13 Spacer sleeve

- Height: 8 mm

14 Internal oil pipe

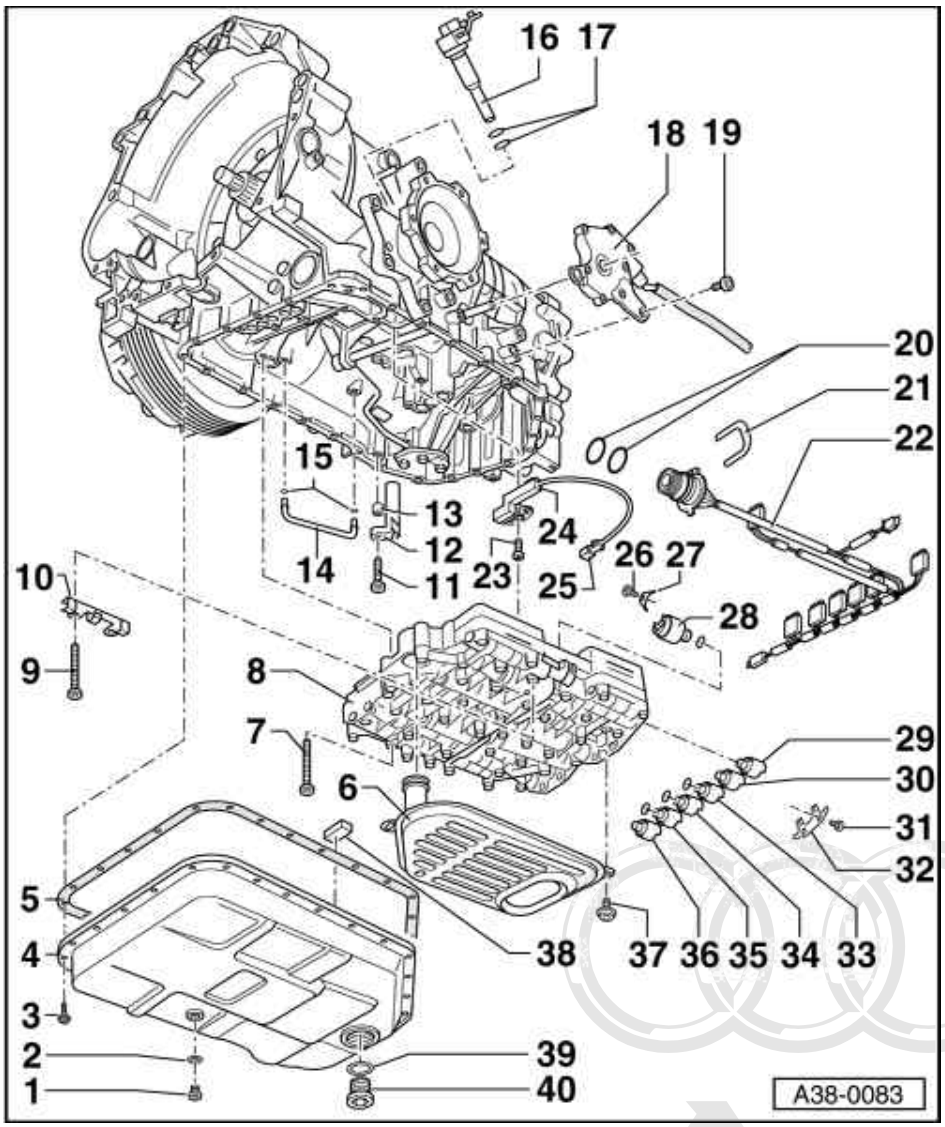
- Replace
- Removing and installing
  =>Page 161 .

15 O-ring

- Replace

16 Speedometer sender -G22

- Removing and installing
  =>Page 164 .



17 O-ring

- Replace
- Coat with Vaseline

18 Multi-function switch -F125

- Removing and installing =>Page 163 .
- Replacing selector shaft sealing ring => Page 162

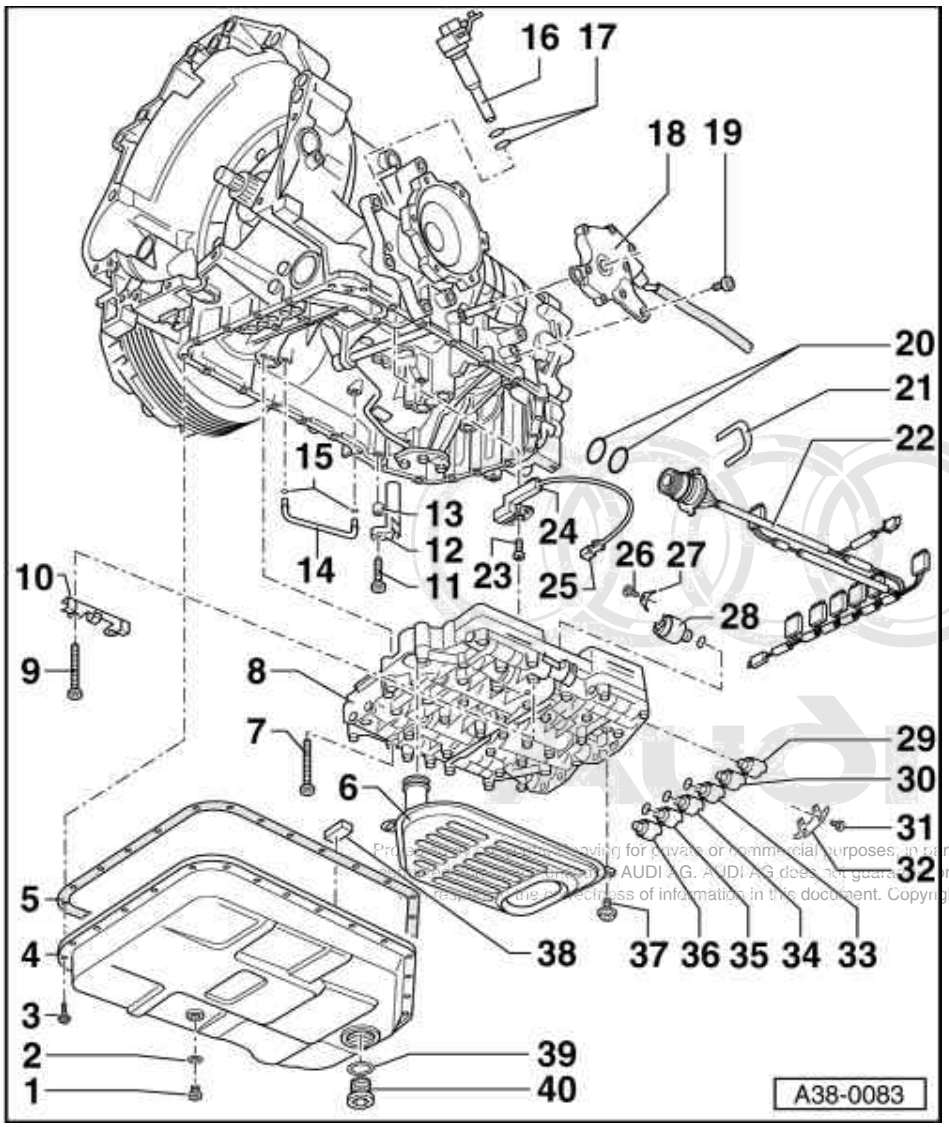
19 Release and tighten bolt - 8 Nm

20 O-ring

- Replace

21 Securing clip

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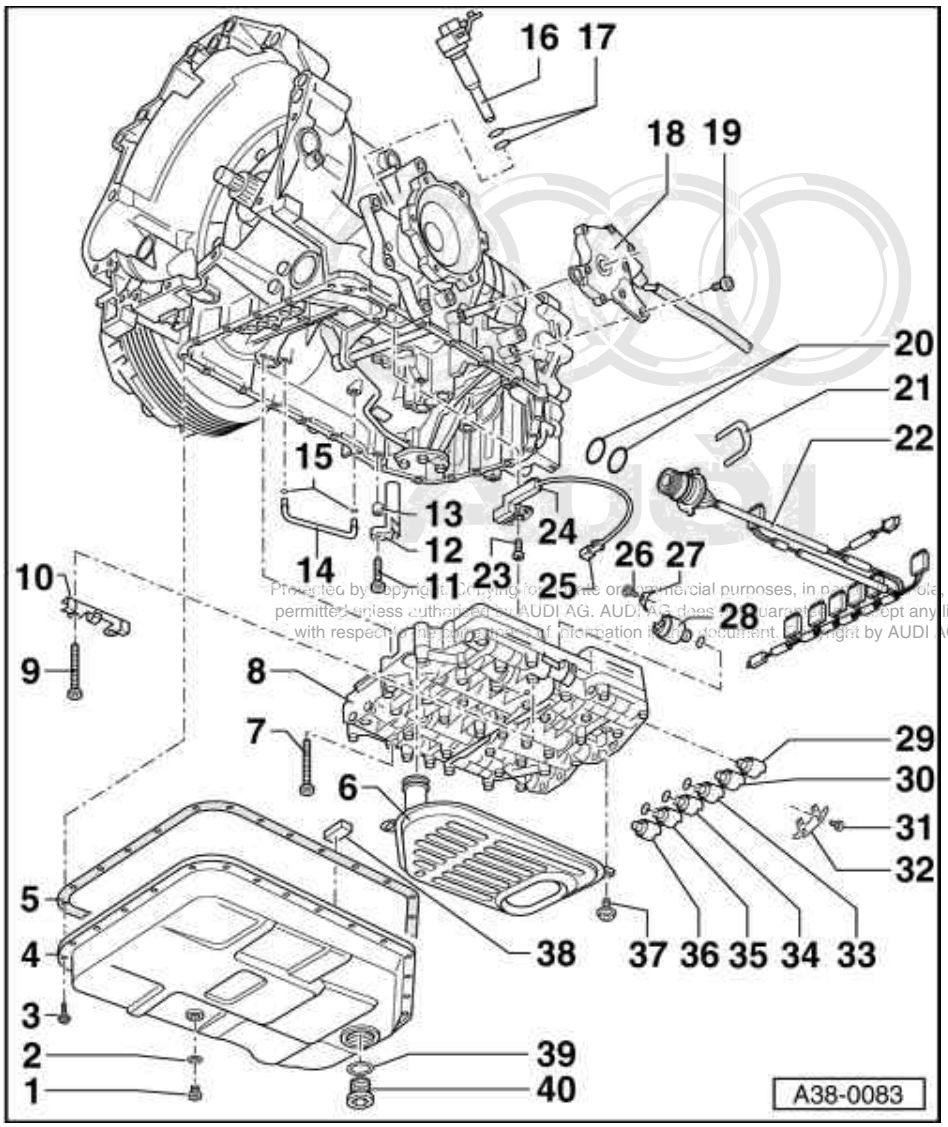
22 Wiring harness in gearbox

- Replacing => Page 168 .
- ATF oil temperature sender -G93 integrated in the wiring loom.
- To replace remove and install valve body =>Page 156
- Disengage from bracket for wiring loom -Item 10-.
- Installation position of wiring loom connector: Flat part of rear shoulder faces oil pan, the lugs at shoulder are horizontal

23 Release and tighten bolt - 9 Nm

24 Sender for gearbox input speed -G182

- Removing and installing
  =>Page 165 .



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25 Connector

- Is connected to wiring harness in gearbox
- Has to be disconnected before removal of valve body

26 Release and tighten bolt - 6 Nm

27 Bracket

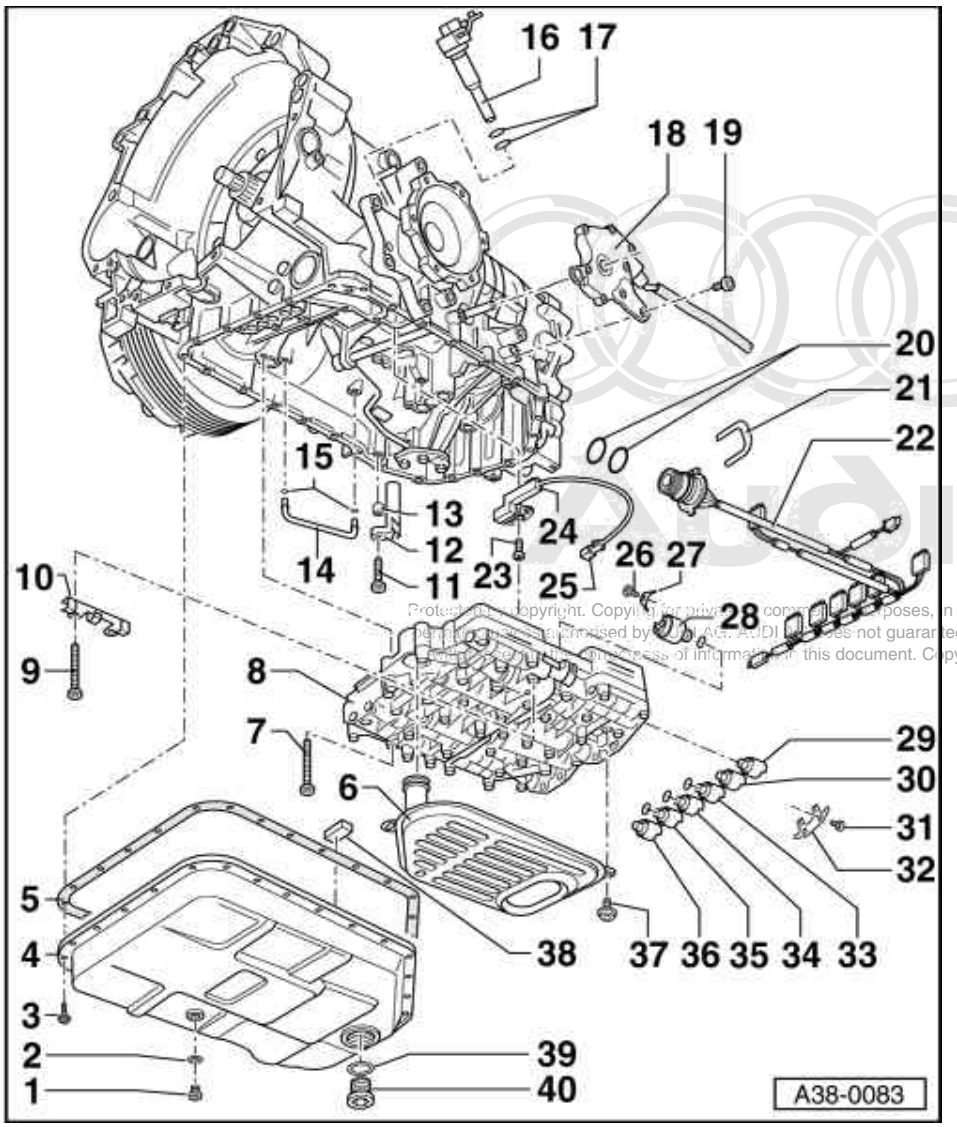
- For solenoid valve

28 Solenoid valve 4 -N91

- With O-ring
- To replace remove and install valve body => Page 156

29 Solenoid valve 3 -N90

- Without O-ring
- To replace, remove and install oil pan => Page 154



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30 Solenoid valve 2 -N89

- Without O-ring
- To replace, remove and install oil pan => Page 154

31 Release and tighten bolt - 6 Nm

32 Bracket

- For solenoid valves

33 Solenoid valve 6 -N93

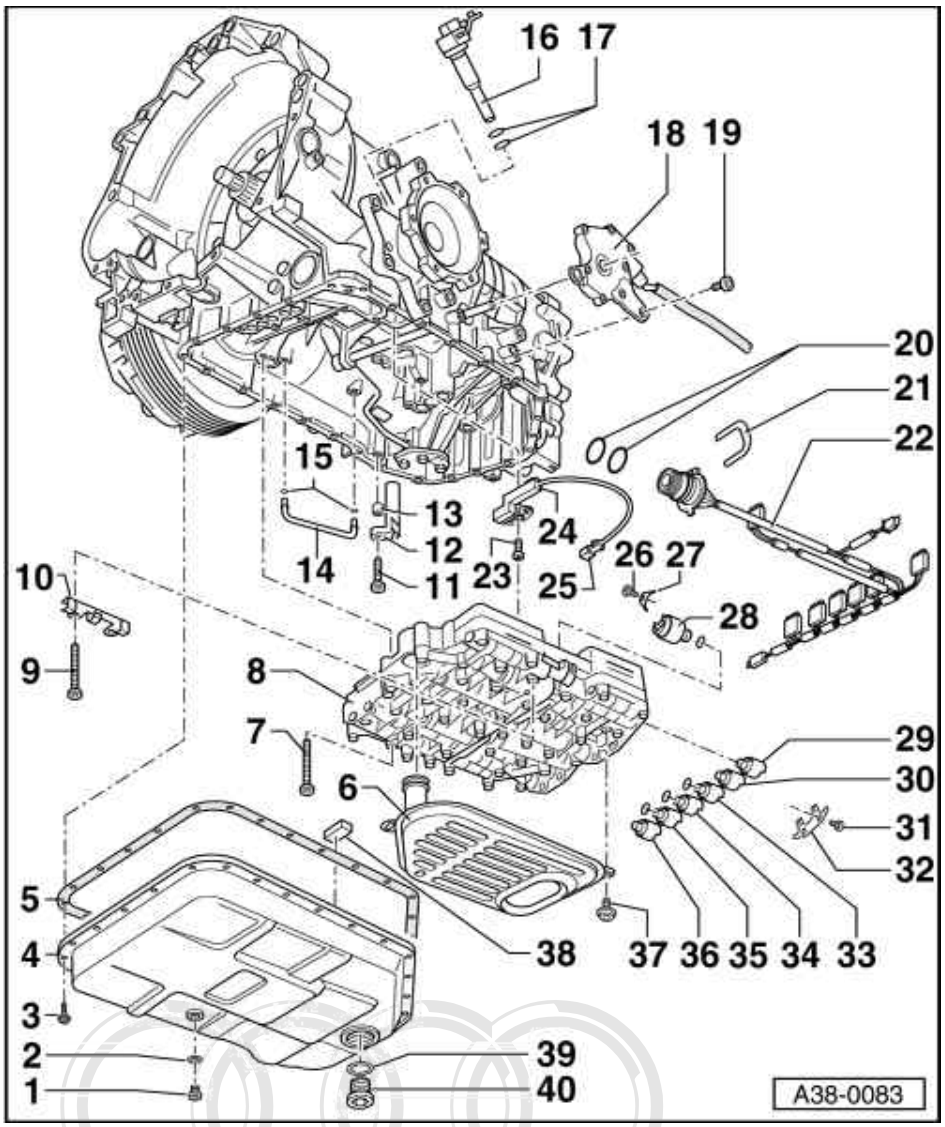
- With O-ring
- To replace, remove and install oil pan => Page 154

34 Solenoid valve 7 -N94

- With O-ring
- To replace, remove and install oil pan => Page 154

35 Solenoid valve 5 -N92

- With O-ring
- To replace, remove and install oil pan => Page 154



36 Solenoid valve 1 -N88

- Without O-ring
- To replace remove oil pan => Page 154 and unbolt guide plate for parking lock mechanism
- When installing bolts for guide plate (23 Nm) do not lock into selector lever position "P"

37 Release and tighten bolt - 6 Nm

38 Solenoid

- 4 off in the flanges of the oil pan

39 O-ring

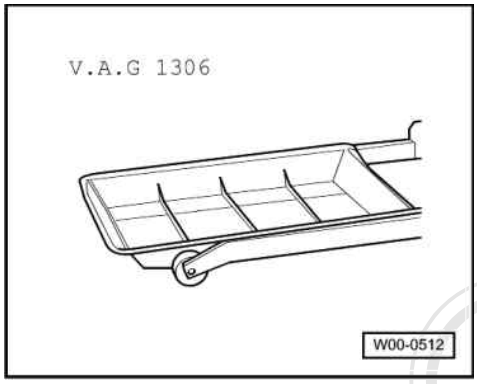
- Replace

40 ATF -inspection plug - 80 Nm

- Hexagon socket head 17 mm

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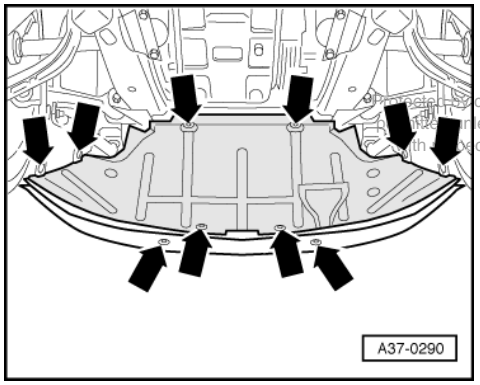
1.3 - Removing and installing oil pan



Special tools, testers and auxiliary equipment required

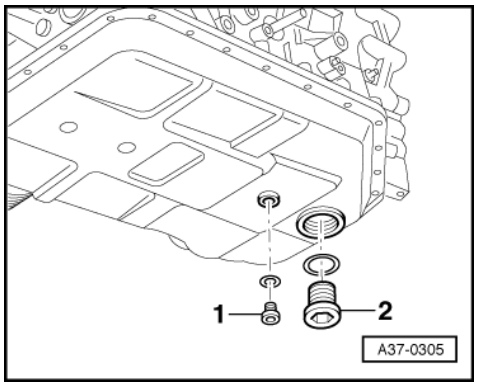
- Drip tray V.A.G 1306

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Removing

- -> Remove noise insulation -arrows-.
- Place drip tray V.A.G 1306 underneath the gearbox.



- -> Unscrew the ATF drain plug -1- and drain off ATF.
- Diagonally loosen bolts of oil pan.

Installing

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

- Clean all 4 solenoids in oil pan. Watch for full contact of solenoids with oil pan.
- Replace gaskets and seals.

Note:

The drain plug with sealing ring must be replaced.

- Top up ATF => Page 118 .

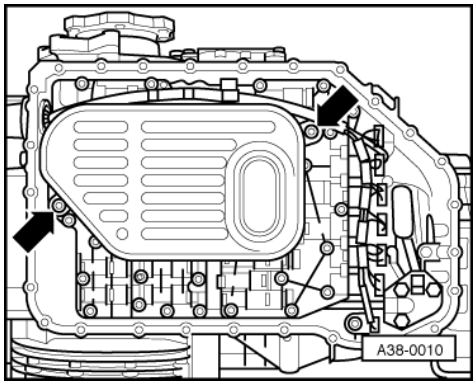
Tightening torques

Component	Nm
Drain plug in oil pan	40
Oil pan at gearbox housing (Tighten in stages and in diagonal sequence)	10

1.4 - Removing and installing ATF screen

Removing

- Remove oil pan => Page 154 .



- -> Unscrew bolts for ATF screen -arrows-.
- Pull ATF screen off valve body.

Installing

- Apply a thin coating of ATF to the seal around the suction collar of ATF screen.
- Carefully press suction collar of ATF screen into opening at valve body until stop.
- Screw on ATF screen.
- Installing oil pan => Page 155
- Top up ATF => Page 118 .

Tightening torque

Component	Nm
ATF screen to valve body	6

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1.5 - Removing and installing valve body

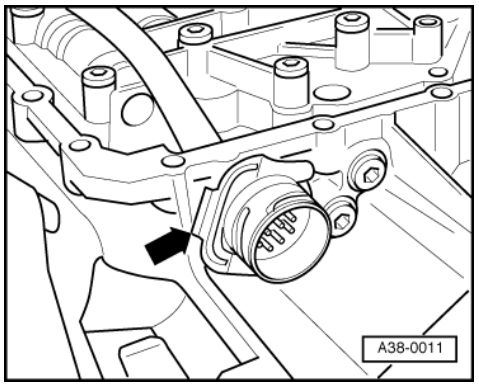
Notes:

- Always replace valve body if it has collected dirt or if it is defective.
- General repair instructions => Page 14 .
- Rules for cleanliness when working on the automatic gearbox => Page 124 .

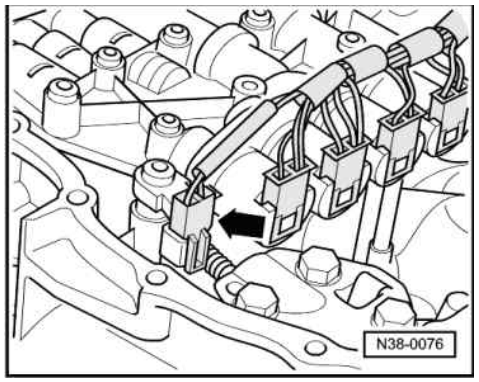
Removing

- Remove oil pan => Page 154 .
- Remove ATF screen => Page 155 .

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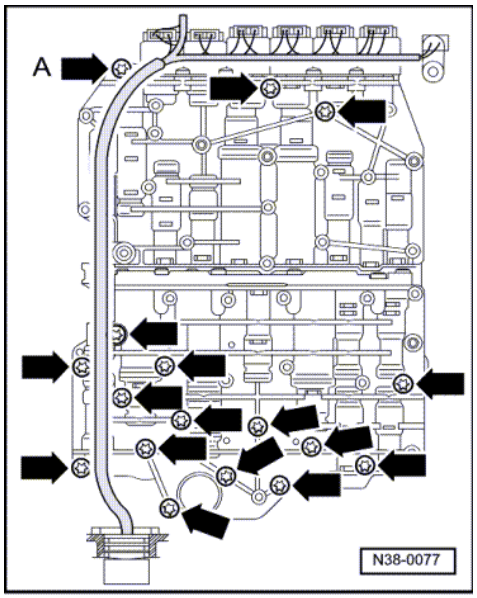


- -> Disconnect the retainer clips for wiring harness connector -arrow-.



For gearbox with hydraulic control E17 only

- -> Unplug connector at gearbox speed sender -G38 -arrow-.

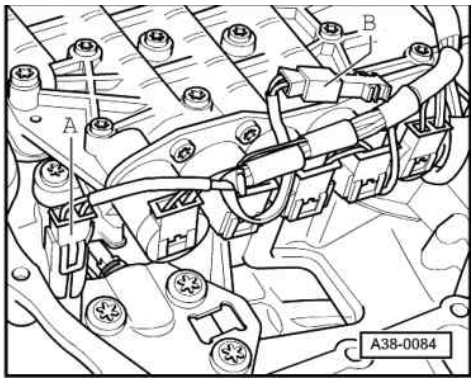


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- -> Unscrew securing bolts -arrows- on valve body and take out valve body together with wiring harness.

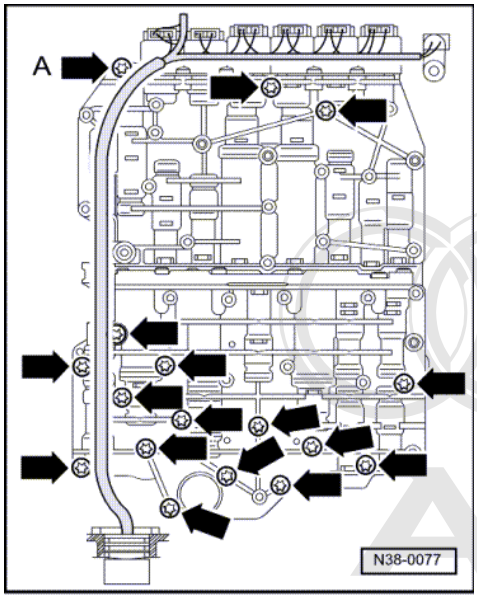
Notes:

- Only slacken the securing bolts -arrows- indicated in the illustration.
- If other bolts are slackened, this may affect the operation of the valve body or the valve body will come apart.
- The bolt -arrow A- is shorter and thinner than the other bolts. Note allocation



For gearbox with hydraulic control E18/2 only

- -> Unplug connector at gearbox speed sender -G38 -A-.
- Unplug connector to Hall sender for gearbox input speed -G182 -B-.



- -> Unscrew securing bolts -arrows- on valve body and take out valve body together with wiring harness.

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Notes:

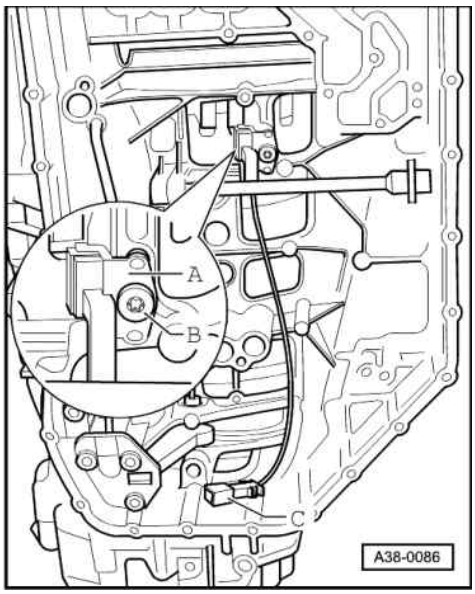
- Only slacken the securing bolts -arrows- indicated in the illustration.
- If other bolts are slackened, this may affect the operation of the valve body or the valve body will come apart.
- Bolt -arrow A- is not fitted on gearboxes with hydraulic control E18/2 and can therefore be ignored here.

All models:

- Remove valve body from gearbox, at the same time guide out connector for wiring harness.

Note for gearbox with hydraulic control E17 only

Do not stand the removed valve body on the gearbox input speed sender on the rear side of the valve body. This may cause damage.

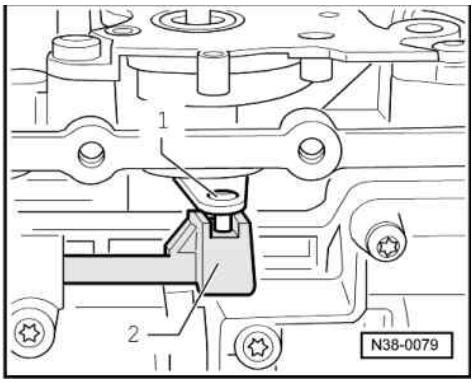


Installing

- Coat O-rings of wiring harness connector thinly with ATF.
- Fit wiring harness connector into gearbox housing.
  - Installation position: Flat part of rear shoulder faces oil pan, the lugs at shoulder are horizontal

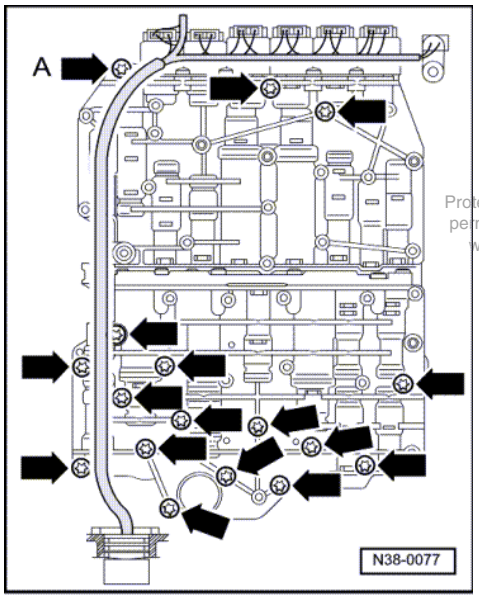
For gearbox with hydraulic control E18/2 only

- -> Route wiring with connector -C- according to illustration, so that wiring does not get stuck when installing valve body.



All models:

- -> Position the valve body without applying force while inserting the bolt in the engaging plate -1- into the slot of the selector slide -2-.



- -> First tighten valve body bolts -arrows- finger tight.

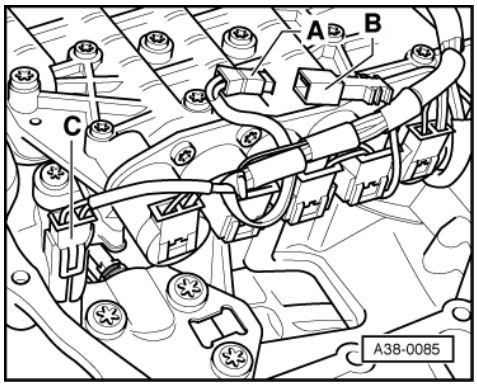
Notes:

On gearboxes with hydraulic control E17 bolt -arrow A- is shorter/thinner than the other bolts. Note allocation

Bolt -arrow A- is not fitted on gearboxes with hydraulic control E18/2 and can therefore be ignored here.

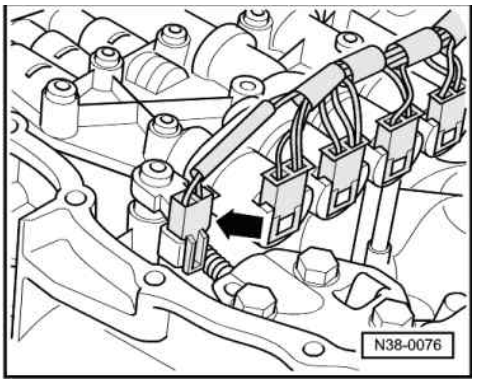
- Then tighten the valve body bolts (starting from the inside and working outwards) to their final tightening torque.

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For gearbox with hydraulic control E18/2 only

- -> Pull wiring with connector -B- of Hall sender for gearbox input speed -G182 upwards between valve body and wiring harness.
- Connect connector -B- to connector -A- at wiring harness.
- Connect connector -C- to gearbox speed sender -G38.

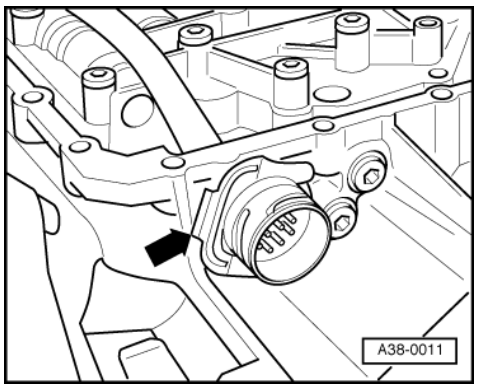


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For gearbox with hydraulic control E17 only

- -> Connect connector -arrow- onto gearbox speed sender -G38.

All models:

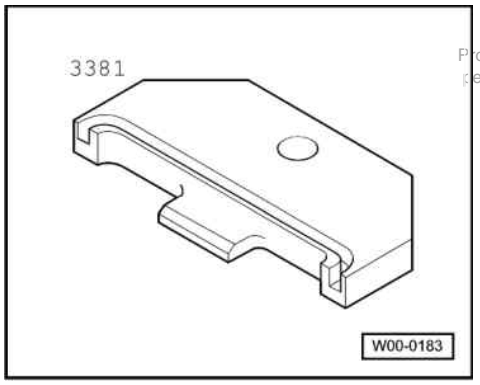


- -> Push retainer clip onto wiring harness connector -arrow-.
- Install ATF screen => Page 155 .
- Installing oil pan => Page 155
- Top up ATF => Page 118 .

Tightening torque

Component	Nm
Valve body to gearbox housing (from inside to outside)	8

1.6 - Removing and installing internal oil pipe



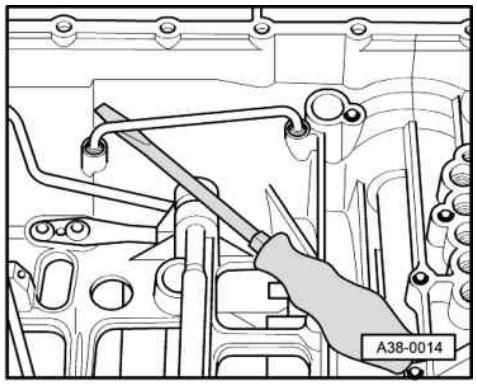
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Special tools, testers and auxiliary equipment required

- Installing tool 3381

Notes:

- A bad fit or defective O-rings on the internal oil pipe will allow ATF to leak into differential, which will overflow and cause oil to drip out of differential breather.
- Always fit new oil pipe after removing.
- The oil pipe may only be used when using installing tool 3381. Otherwise there is danger of leakage through bending of oil pipe.



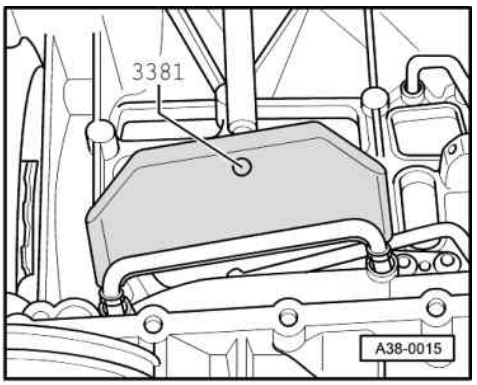
Removing

- Remove valve body => Page 156 .
- -> Lever internal oil pipe off gearbox housing using a screwdriver, applying pressure evenly.

Installing

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

- Replace O-rings.



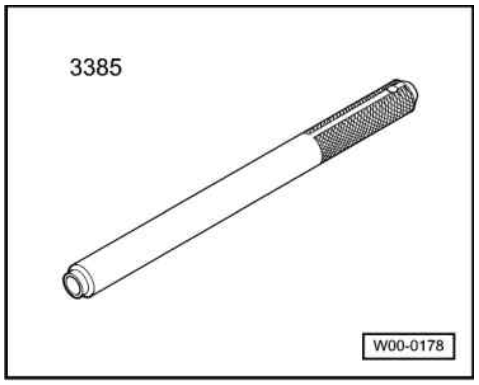
- -> Insert oil pipe into installing tool 3381.
- Drive oil pipe into gearbox housing with light blows of a plastic hammer on installing tool 3381.

Notes:

- Open side of installing tool 3381 faces towards outer wall of gearbox.
- Take care not to tilt oil pipe. Drive in both ends evenly.

- Install valve body => Page 159 .
- Top up ATF => Page 118 .
- Check gear oil level in front final drive => Page 171 .

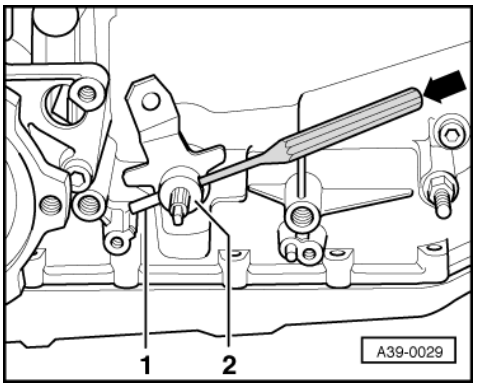
1.7 - Replacing selector shaft sealing ring



Special tools, testers and auxiliary equipment required

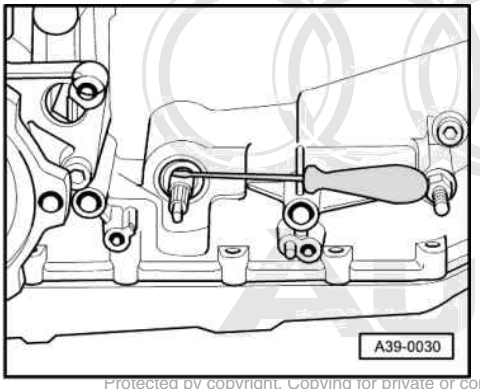
- Thrust pad 3385

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Removing

- Remove the left gearbox support => Page 106 .
- Remove the multi-function switch -F125 => Page 163 .
- -> Push out locking pin -1- at lever/selector shaft -2- in the direction of travel -arrow-, until the lever/selector shaft can be pulled off from the selector shaft.

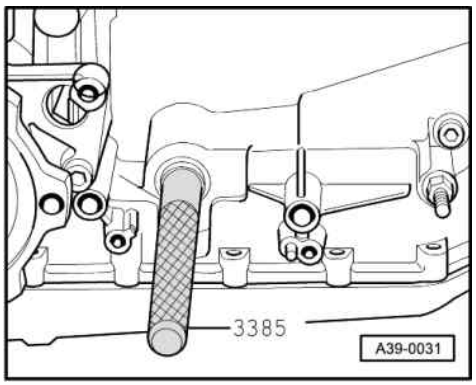


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- -> Push a small screwdriver through the oil seal and pull it out.

Installing

- Lubricate the outer circumference and the space between sealing lips with ATF.
  - Installation position: The open side of the oil seal faces toward the gearbox.



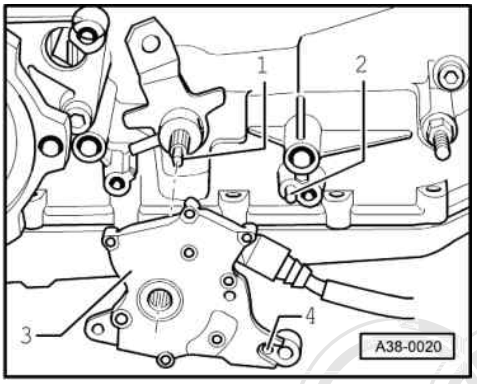
- -> Push new sealing ring onto thrust pad 3385 and drive in until stop of thrust pad, taking care not to cant the sealing ring.
- Install multi-function switch => Page 163 .
- Drive the locking pin in the gearbox selector shaft whilst still removed in the opposite direction through the gate selector.
- Push selector lever on gearbox onto selector shaft and drive in spring pin.
- Install left side gearbox support => Page 106 .

1.8 - Removing and installing multi-function switch -F125

Removing

- Remove the left gearbox support => Page 106 .
- Unbolt the multi-function switch -F125 on the gearbox and remove from the selector shaft.

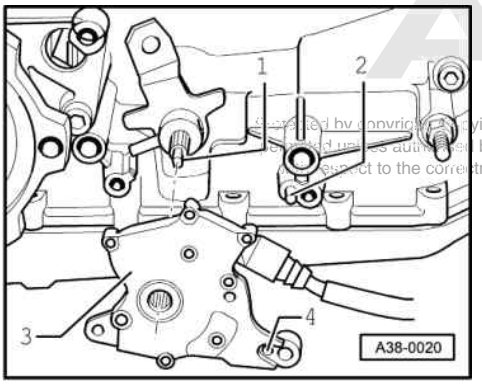
Installing



- -> Attach the multi-function switch -F125 to the selector shaft. The flat surfaces in the splines of the switch -3- must be aligned with the flat surfaces of the selector shaft -1-.

Note:

Attach the multi-function switch -F125 centrally to the selector shaft. Do not tilt and do not use excessive force. This may damage the switch contacts.



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- -> Rotate the switch until the locating hole -4- on the switch housing can be slid over the locating pin -2- on the gearbox housing.
- Install left side gearbox support => Page 106 .

Tightening torques

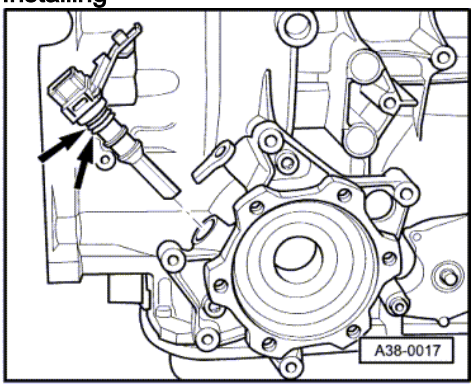
Component	Nm
Multi-function switch -F125 to gearbox	8

1.9 - Removing and installing speedometer sender - Removing and installing -G22

Removing

- Pull connector off speedometer sender -G22.
- Push down the clip holding the sender, rotate, and pull out the sender.

Installing



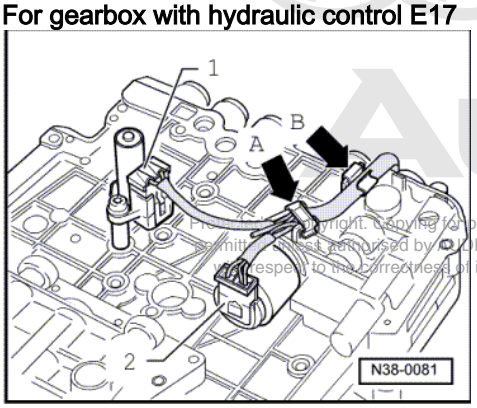
- -> Renew the O-rings -arrows -.
- Grease when installing O-rings.
- Install sender.
- Engage retaining bracket for bearing bracket for flange shaft.

1.10 - Removing and installing gearbox speed sender -G182

Note:

- A distinction is made between two types of gearbox.
  Gearbox with hydraulic control E17, in which gearbox input speed sender (inductive sender) is attached to underside of valve body.
  Gearbox with hydraulic control E18/2, in which gearbox input speed sender (Hall sender) is attached to gearbox housing behind valve body.
- Information on the gearbox concerned can be found in the tables from Page 2 onwards

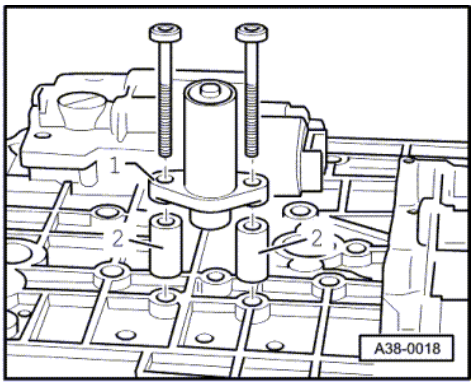
For gearbox with hydraulic control E17



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Removing

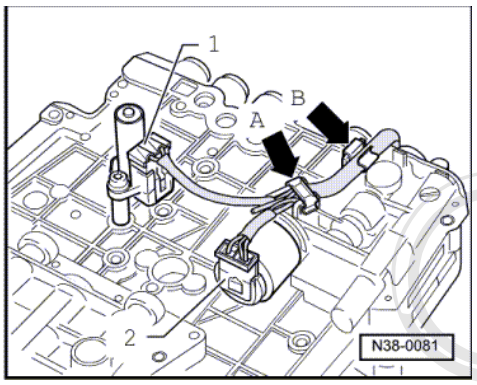
- Remove valve body => Page 156 .
- -> Turn valve body onto back and disconnect connector at gearbox input speed sender -1-.



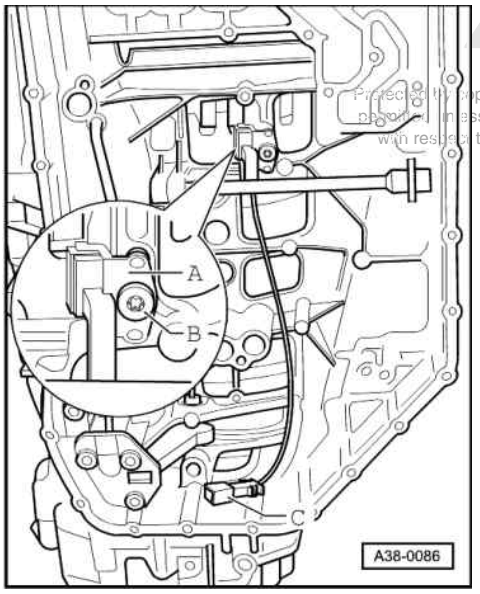
- -> Unbolt the gearbox input speed sender -1- from the valve body.

Installing

- -> Use the spacer sleeves -2- when bolting on the gearbox input speed sender -1- (Height: 20 mm) and tighten to 7 Nm
  - Installation position: The side of the sender with the plug contacts must face the centre of the valve body.



- -> Connect connector onto gearbox speed sender -1-
- Install valve body => Page 159 .
- Top up ATF => Page 118 .



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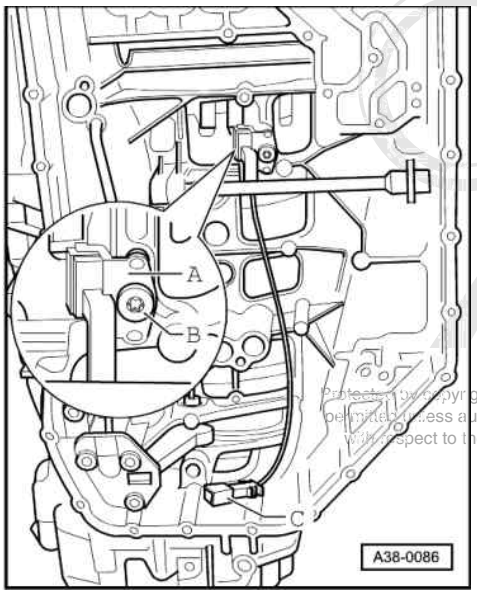
For gearbox with hydraulic control E18/2 only

Removing

- Remove valve body => Page 156 .
- -> Unbolt the gearbox input speed sender -A- from the gearbox.

Installing

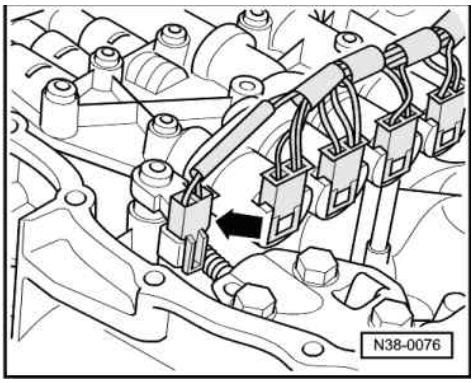
- Bolt gearbox input speed sender -A- to gearbox with bolt -B-. The tightening torque is 9 Nm.



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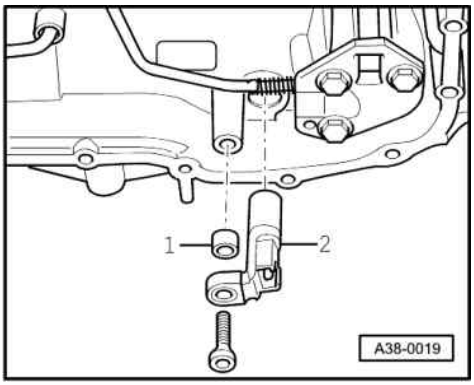
- -> Route wiring with connector -C- according to illustration, so that wiring does not get stuck when installing valve body.
- Install valve body => Page 159 .
- Top up ATF => Page 118 .

1.11 - Removing and installing gearbox speed sender -G38



Removing

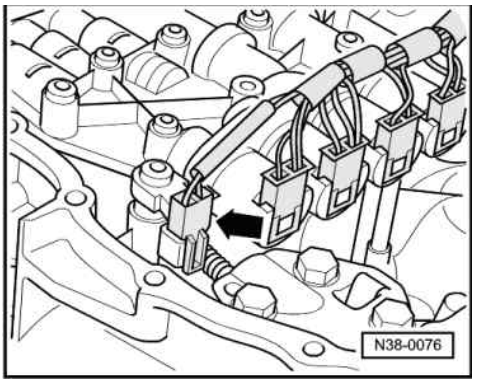
- Remove oil pan => Page 154 .
- -> Unplug connector at gearbox speed sender -G38 -arrow-.



- -> Remove gearbox speed sender -2-.

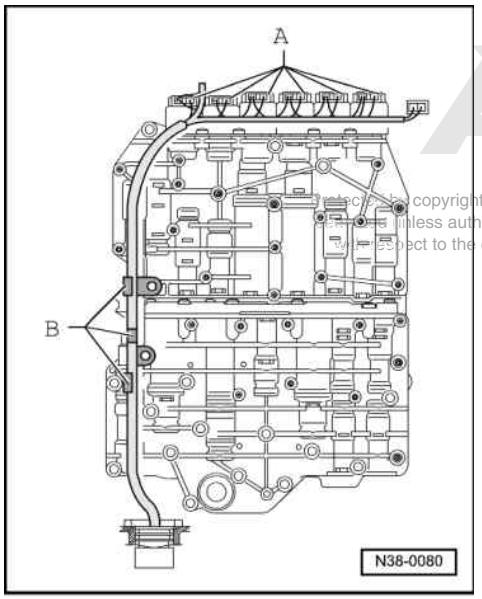
Installing

- Install gearbox speed sender -2- using spacer sleeve -1- (Height: 8 mm) install to 6 Nm



- -> Connect connector at gearbox speed sender -G38 -arrow-.
- Installing oil pan => Page 155
- Top up ATF => Page 118 .

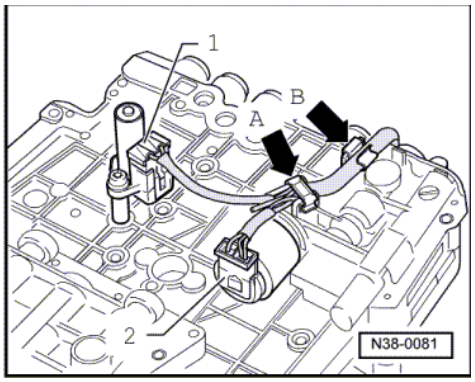
1.12 - Removing and installing wiring harness in gearbox



Audi
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Removing

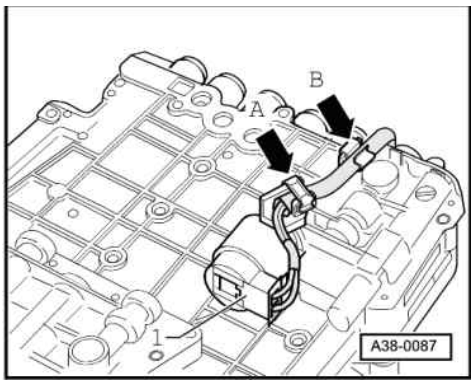
- Remove valve body => Page 156 .
- -> Use small screwdriver to lever out retaining lugs of connectors at solenoid valves and pull off connectors -A- one by one.
- Detach the cable loom from the side retaining lugs -B- of the valve body.



For gearbox with hydraulic control E17 only

- -> Turn valve body onto back and disconnect connector at gearbox input speed sender -1-.
- Remove retaining clip -arrow A- and unclip wiring harness from retaining clip -arrow B-.
- Pull off connector -2- from solenoid valve -N91-.

For gearbox with hydraulic control E18/2 only



- -> Turn valve body onto back and disconnect connector at gearbox input speed sender -1-.
- Remove retaining clip -arrow A- and unclip wiring harness from retaining clip -arrow B-.

Installing, valid for all:

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

- When installing attach connectors of wiring harness onto corresponding solenoid valves and sender.
- Clip wiring harness into intended retaining clamps. If the cable loom is installed differently, it may become jammed when the valve body is reassembled.
- Install valve body => Page 159 .
- Top up ATF => Page 118 .

1.13 - Replacing gearbox oil temperature sender (ATF) -G93

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Note:

The gear oil temperature sender -G93 is integrated in the gearbox wiring harness.

Removal

- Remove wiring harness in gearbox => Page 168

Installing

Install in reverse order. The following steps must also be performed.

- Replace the cable loom with a new one.

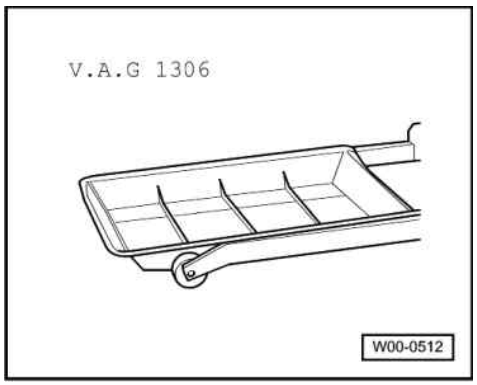
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39 - Final drive, Differential rear

1 - Axle oil in front final drive

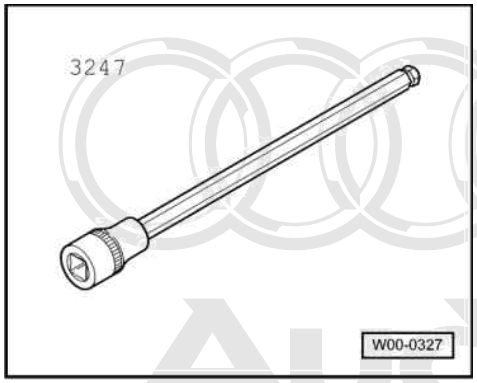
1.1 - Axle oil in front final drive

1.2 - Checking oil in front final drive



Special tools, testers and auxiliary equipment required

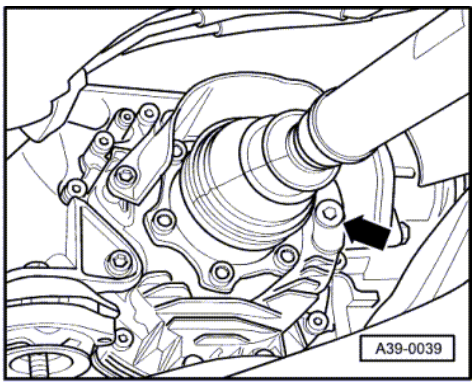
- Drip tray V.A.G 1306



- 3247 Socket 8 mm

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- Carry out a short test drive in order to heat gear oil to 60 °C.
- Drive vehicle onto a four column lifting platform or over an assembly pit in order for it to be absolutely horizontal.
- Switch off engine and let gear oil drip out for 5 minutes.
- Place drip tray V.A.G 1306 underneath.



- -> Unscrew oil filler plug -arrow-.

Note:

Release the blanking plug with an angled hexagon socket, not with socket 3247. In order to improve access you may need to detach the heat shield and the input shaft from the gearbox and lay them to one side. Socket 3247 could be destroyed if used to release the bolt.

- Specified value: oil level up to lower edge of filler hole

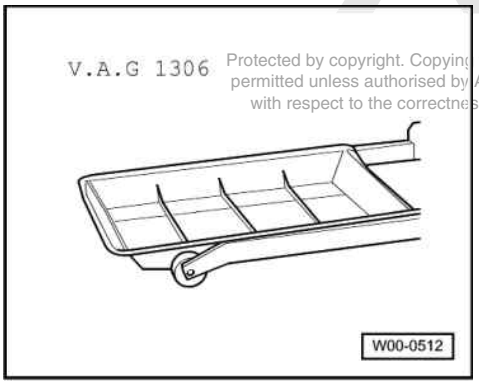
Allow any excess axle oil to drain out, or top up axle oil.

- Specification => Page 12

Always renew O-ring on oil filler plug.

Tighten the blanking plug with special tool 3247 (8 mm socket) to 30 Nm.

1.3 - Topping up gear oil in front final drive after repair work

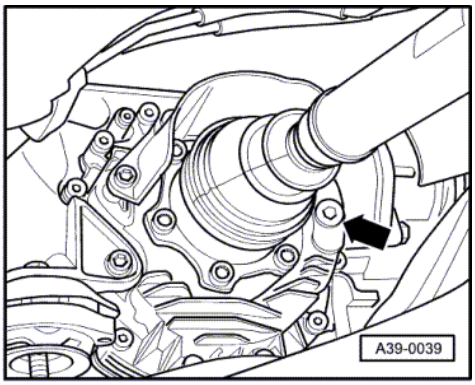


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Special tools, testers and auxiliary equipment required

- Drip tray V.A.G 1306

- Drive vehicle onto a four column lifting platform or over an assembly pit in order for it to be absolutely horizontal.



- Place drip tray V.A.G 1306 underneath.
- -> Unscrew oil filler plug -arrow-.

Note:

Release the blanking plug with an angled hexagon socket, not with socket 3247. In order to improve access you may need to detach the heat shield and the input shaft from the gearbox and lay them to one side.

Socket 3247 could be destroyed if used to release the bolt.

- Charge front final drive slowly and evenly over at least 5 minutes until gear oil appears from lower edge of oil top up bore.
  - Specification => Page 12

Note:

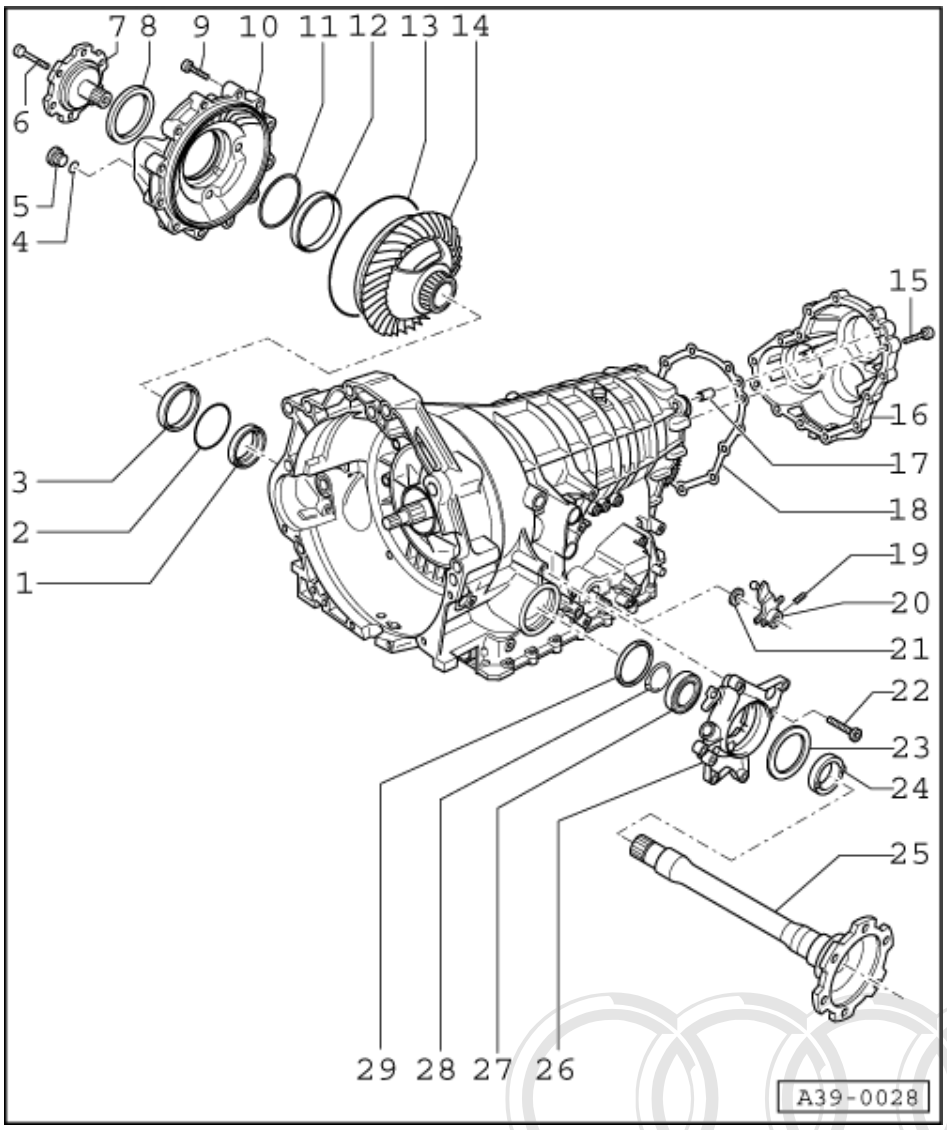
The top up period of at least 5 minutes is necessary so that the internal oil level can be balanced out between differential and reservoir.

- Screw in old oil filler plug.
- Carry out a short test drive in order to heat gear oil to 60 °C.
- It is absolutely necessary to check oil level in front final drive => Page 171 .

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2 - Servicing front final drive

2.1 - Servicing front final drive



- Gearbox installed

Notes:

- General repair instructions =>Page 14 .
- Rules for cleanliness when working on the automatic gearbox => Page 124 .

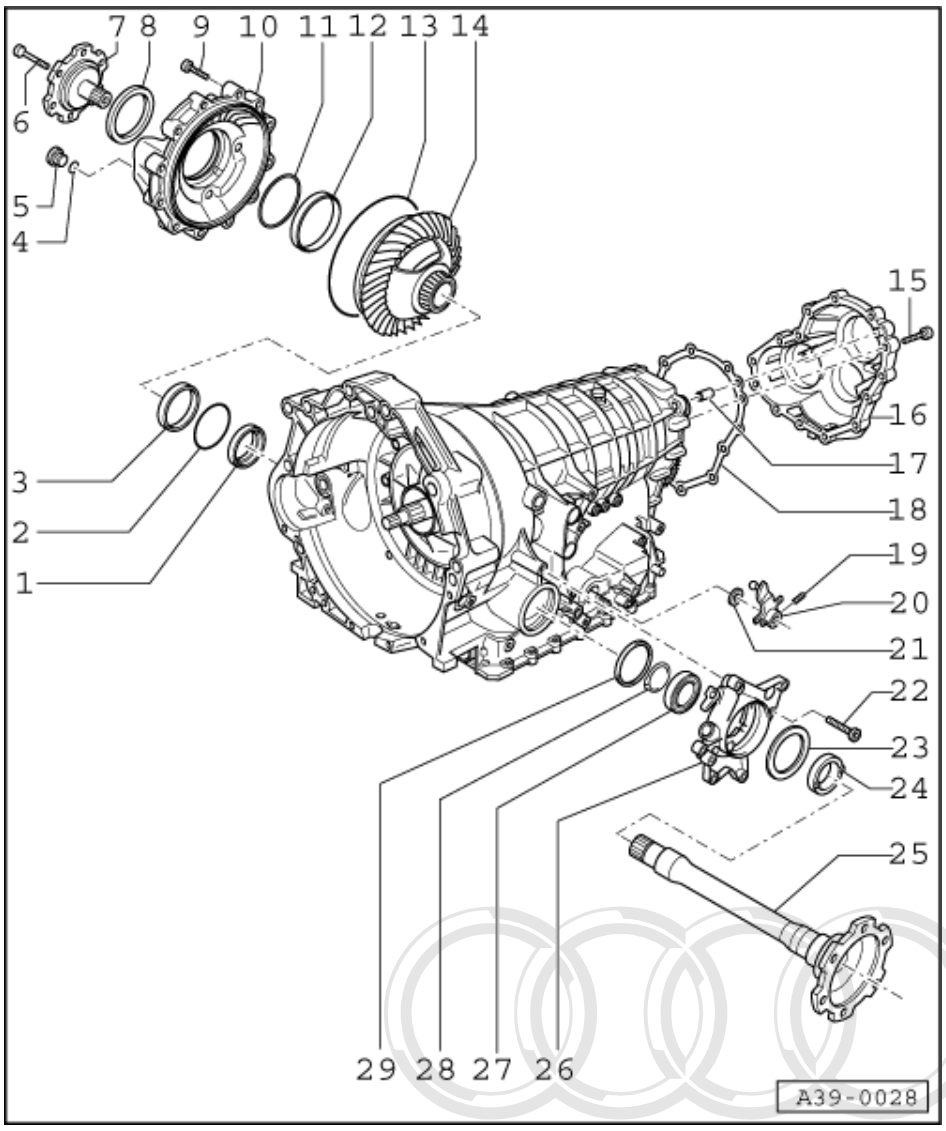
1 Sealing ring
- Between final drive and gearbox housing
- Replacing => Page 191 .

2 Adjustment shim
- Behind taper roller bearing outer race

3 Taper roller bearing outer race

4 O-ring
- Replace

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5 Screw plug - 30 Nm

6 Release and tighten bolt - 23 Nm

7 Flange shaft, right

8 Sealing ring

- For flange shaft, right
- Replacing => Page 178 .

9 Release and tighten bolt - 23 Nm

- Observe the tightening sequence =>Page 195

10 Final drive cover

11 Adjustment shim

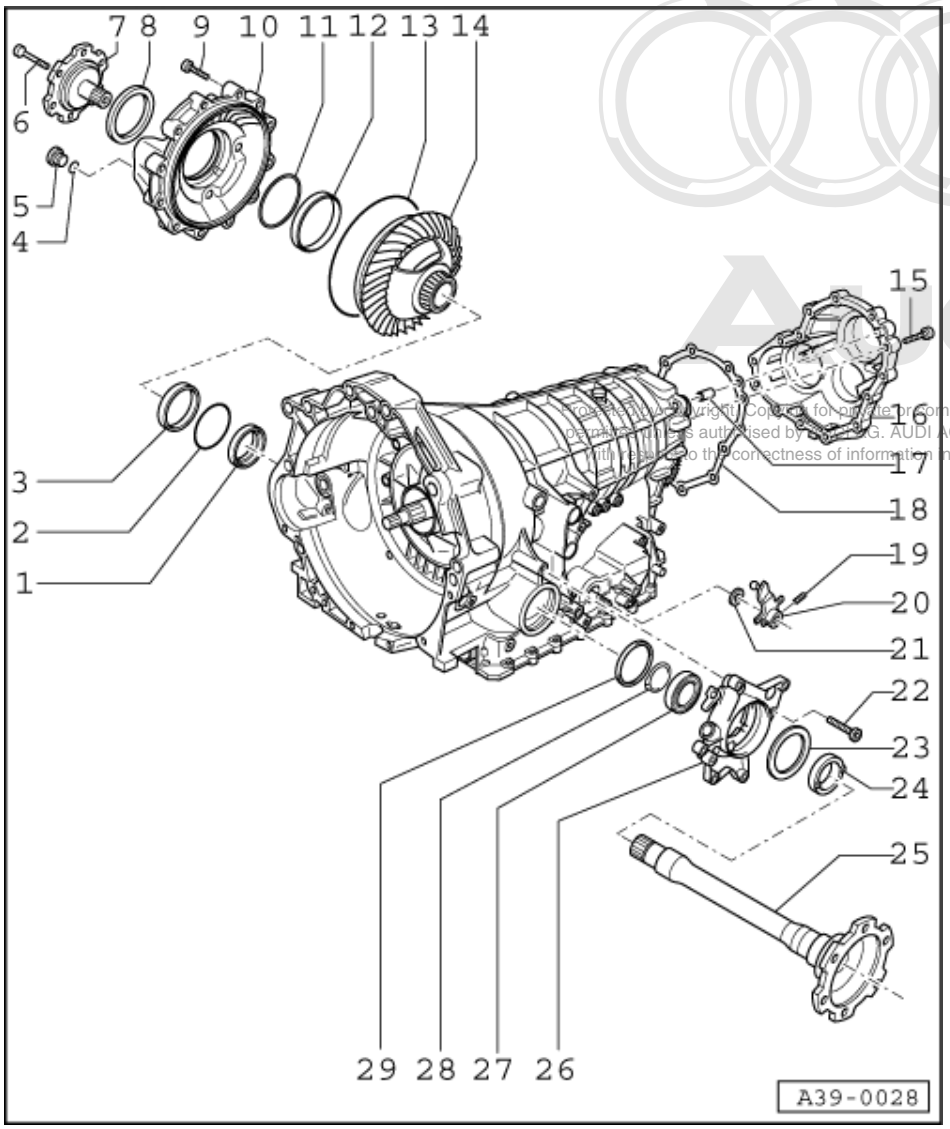
- Behind taper roller bearing outer race

12 Taper roller bearing outer race

13 O-ring

- Replacing => Page 195 .

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14 Differential

15 Release and tighten bolt - 23 Nm

- Observe the tightening sequence =>Page 190

16 Front final drive cover

- Illustrated here: Type FWD
- Type 4WD => Page 207 , Item 31

17 Dowel sleeve

18 Gasket

- Replacing => Page 187 .

19 Spring pin

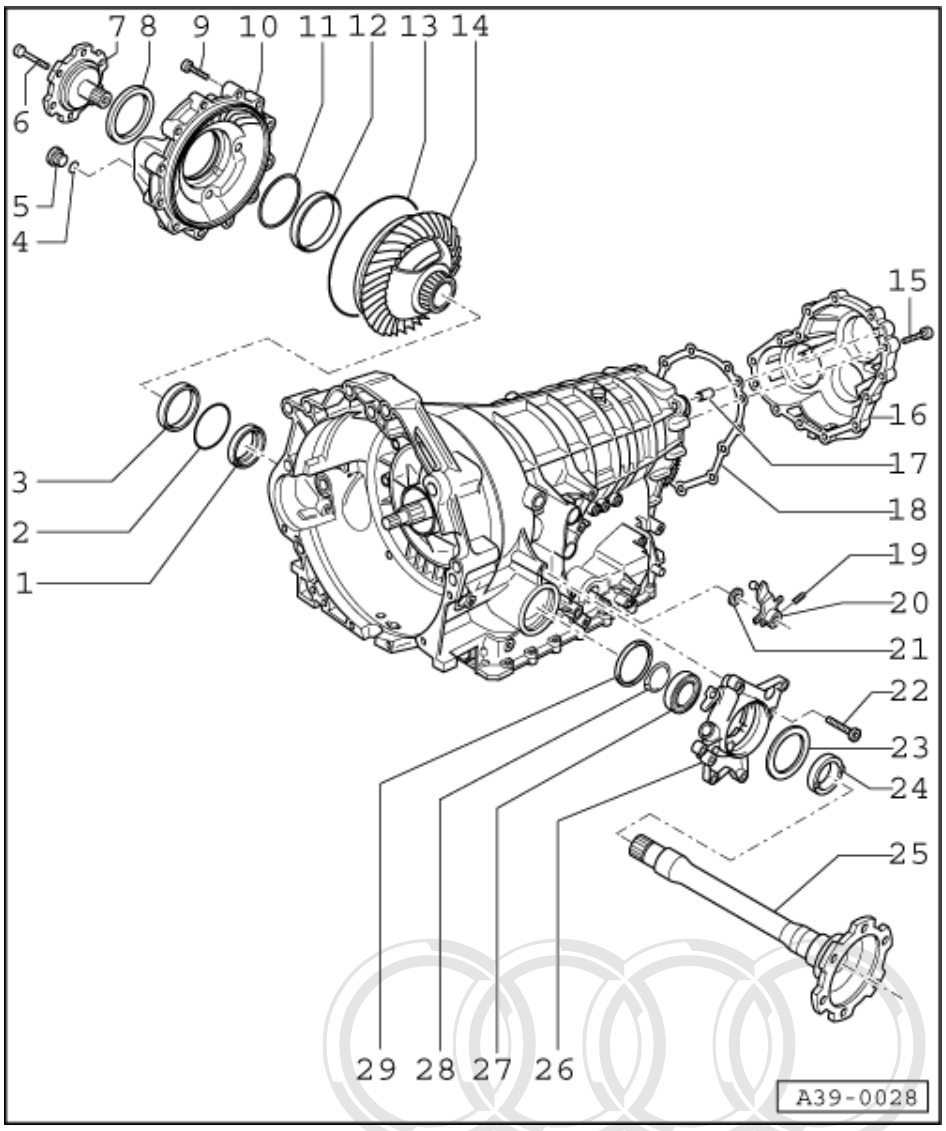
20 Lever

- For selector shaft

21 Sealing ring

- For selector shaft
- Replacing => Page 162 .

22 Release and tighten bolt - 23 Nm



23 Sealing ring

- For left flange shaft
- Replacing => Page 181 .

24 Input gear

- For speedometer sender -G22
- Installation position => Page 185

25 Flange shaft, left

- Removing and installing => from Page 181

26 Bearing bracket for flange shaft

27 Grooved ball bearing for flange shaft

- Replacing => Page 181 .

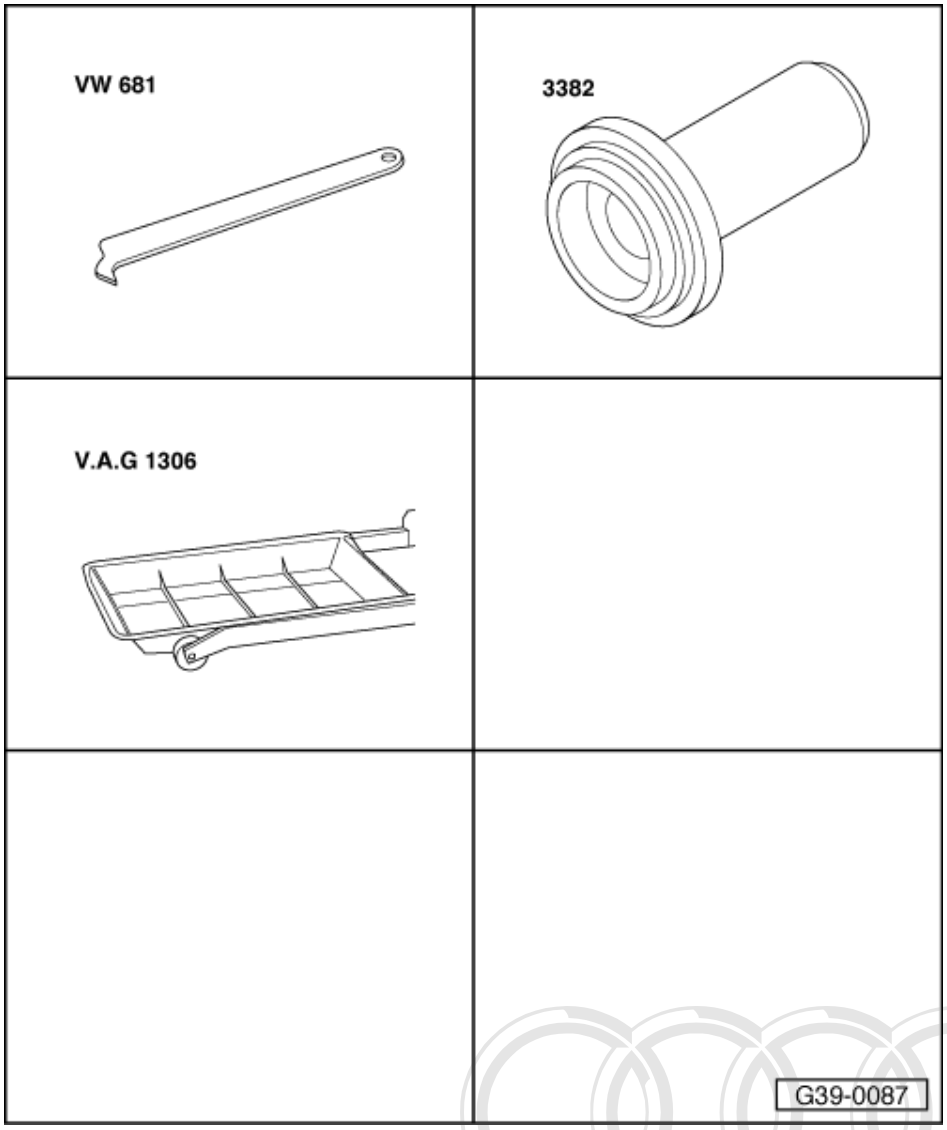
28 Circlip

29 O-ring

- Square cross-section
- To replace: remove and install left flange shaft => Page 181

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2.2 - Replacing seal for right flange shaft



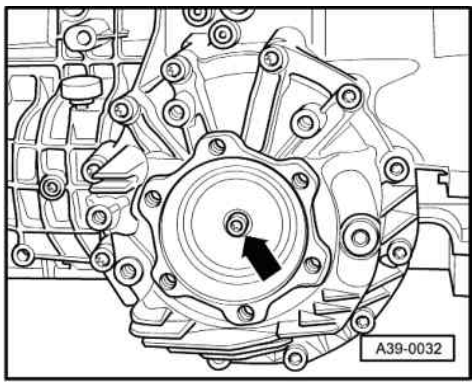
**Special tools,
testers and auxiliary items required**

- Extractor lever VW 681
- Thrust pad 3382
- Drip tray V.A.G 1306

Removing

- Bolt drive shaft/wheel hub whilst the vehicle is standing on its wheels.
- Remove wheel.

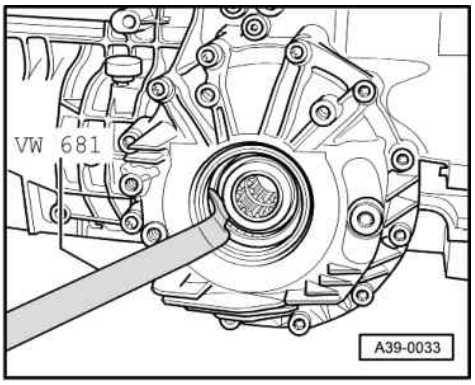
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- Unbolt the heat shield for right drive shaft.
- Remove right drive shaft

=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft

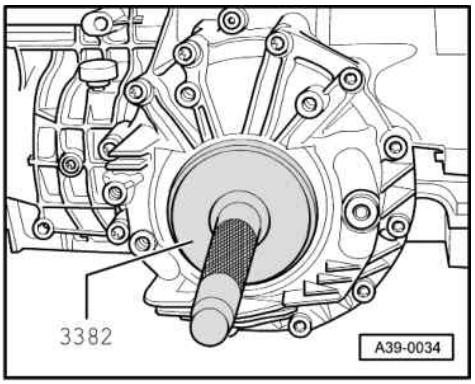
- -> Remove bolt for flange shaft -arrow-. Whilst doing this secure flange shaft with drift against turning.
- Place drip tray V.A.G 1306 underneath.



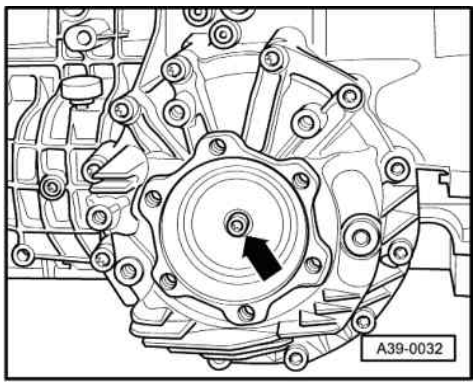
- Pull out the right flange shaft.
- -> Pull out flange shaft oil seal.

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Installing



- Coat outer circumference of seal with gear oil.
- -> Drive new seal in up to stop, for this purpose do not cant seal.
  - Installation position: The open side of the oil seal faces toward the gearbox.
- Install right flange shaft.



- -> Remove bolt for flange shaft -arrow-. (23 Nm) Whilst doing this secure flange shaft with drift against turning.
- Install drive shaft.

=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft

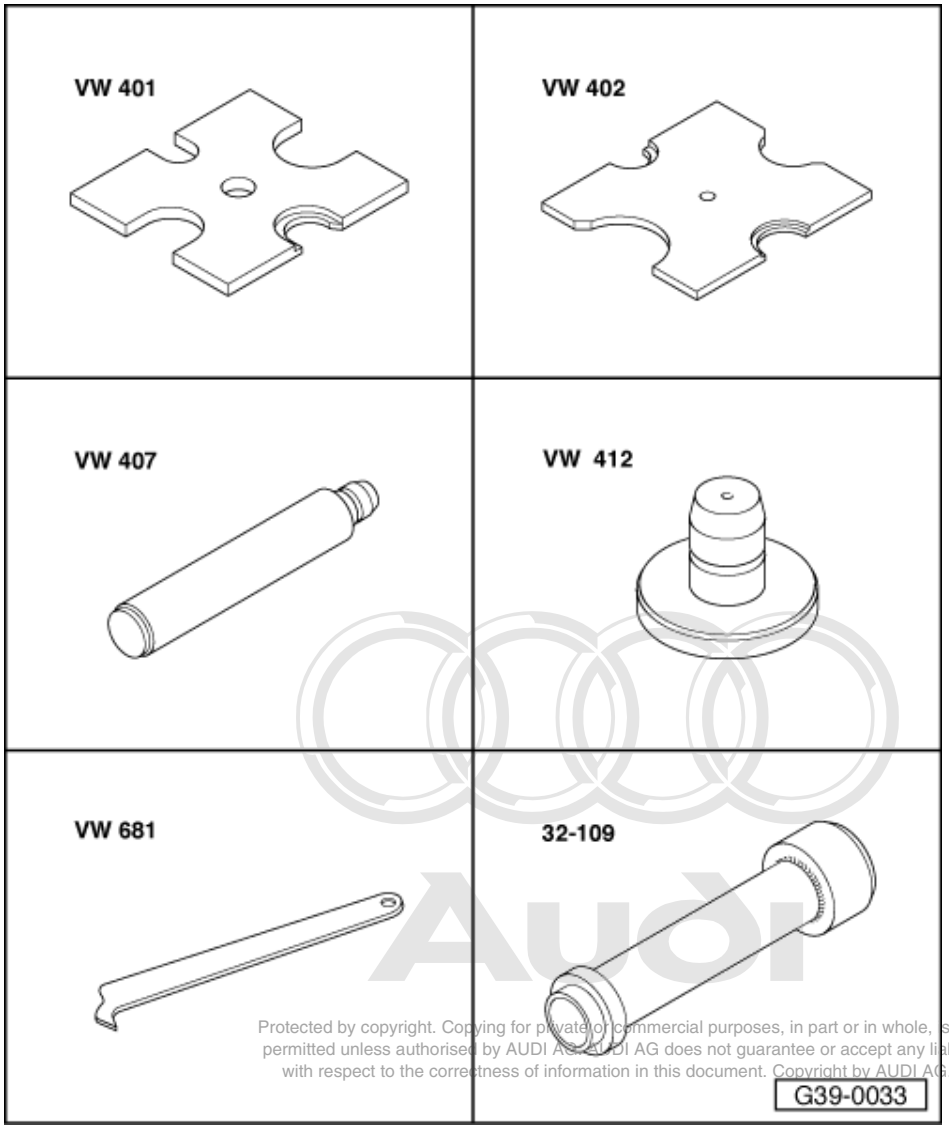
- Unbolt the heat shield for the drive shaft, right.
- Check gear oil level in front final drive => Page 171 .

Tightening torques

Component	Nm
Flange shaft to gearbox	23
Drive shaft to flange shaft M10	77
Drive shaft to flange shaft M8	39
Heat shield for drive shaft to gearbox	23

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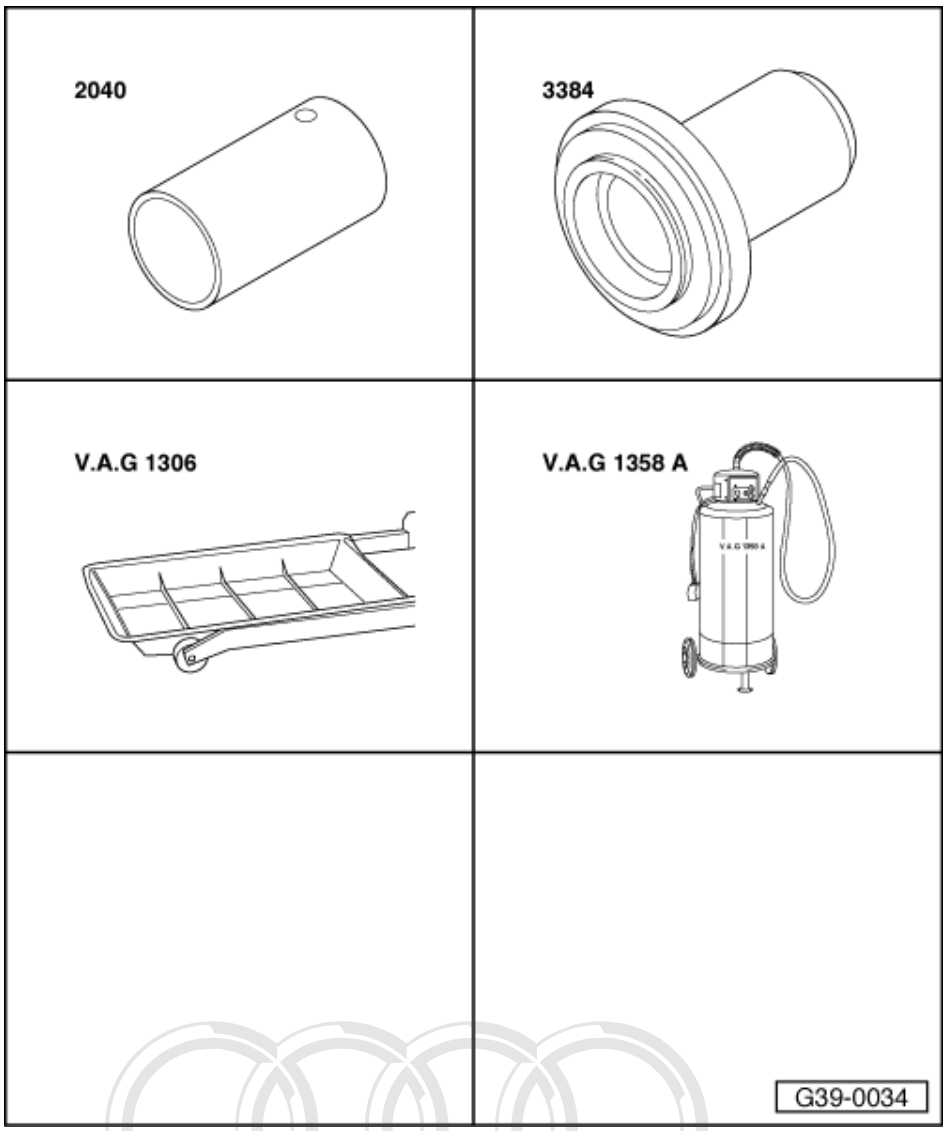
2.3 - Renewing sealing ring and grooved ball bearing for left flange shaft oil seal



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**Special tools,
testers and auxiliary items required**

- Thrust plate VW 401
- Thrust plate VW 402
- Press tool VW 407
- Press tool VW 412
- Extractor lever VW 681
- Press-in tube 32-109



- Tube 2040
- Thrust pad 3384
- Drip tray V.A.G 1306
- V.A.G 1358 A Oil extractor

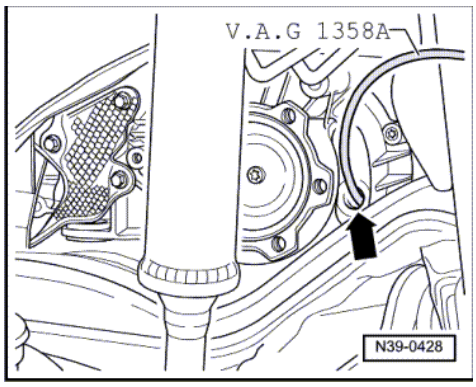
Remove flange shaft (left).

- Bolt drive shaft/wheel hub whilst the vehicle is standing on its wheels.
- Remove wheel.
- Removing left drive shaft

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=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft

- Place drip tray V.A.G 1306 underneath.

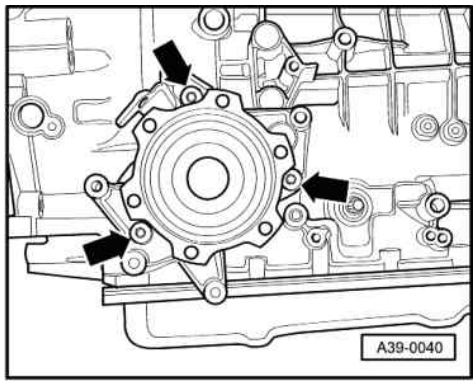


- -> Unscrew oil filler plug -arrow- and extract 0.5 ltr. gear oil from final drive with V.A.G 1358 A.

Note:

It is absolutely necessary that oil is extracted from the final drive as there is danger of mixing gear oil with ATF.

- Remove heat shield for left drive shaft.
- Remove speedometer sender => Page 164 .
- Unbolt the plug connection holder from the mounting bracket for the flange shaft.

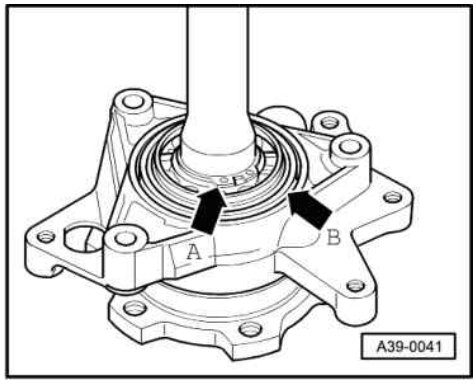


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- -> Unbolt the mounting bracket for the flange shaft -arrows-.
- Pull out flange shaft.

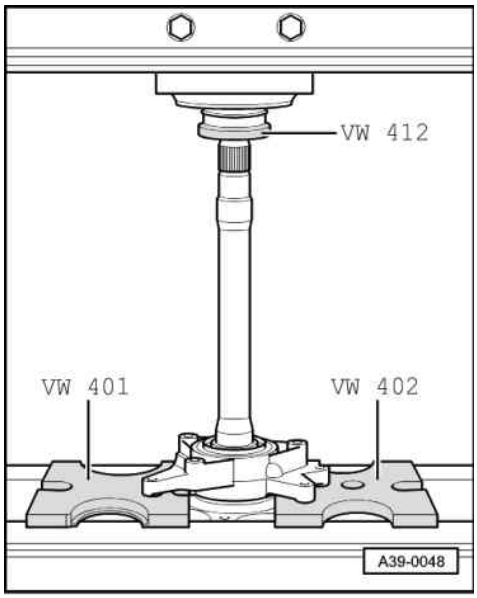
Note:

If the gearbox is installed, it is possible to pull out the flange shaft between the body and subframe by rotating the mounting bracket for the flange shaft to the right by approx. 60°away from the installation position.



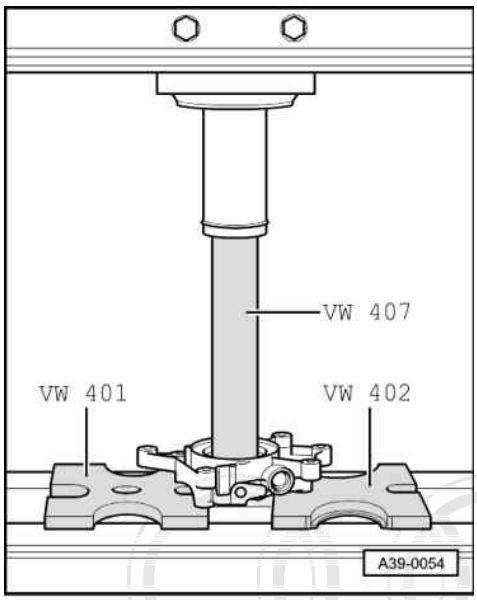
Removing sealing ring

- -> Remove the retaining ring -arrow A- for the grooved ball bearing.



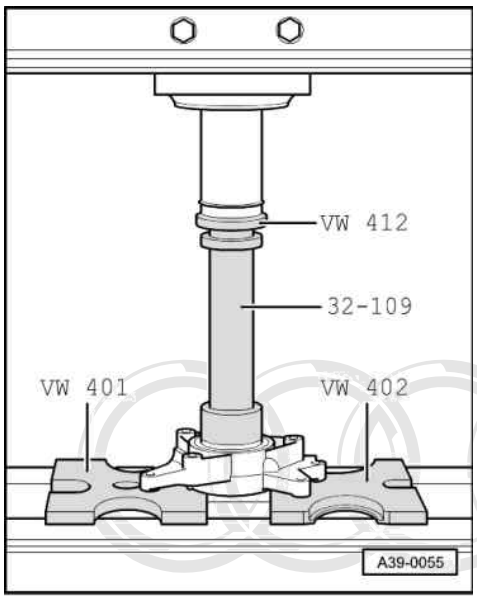
- -> Press flange shaft out of bearing bracket for flange shaft.
- Pull out flange shaft oil seal with VW 681.

Removing grooved ball bearing



- -> Press grooved ball bearing out of mounting bracket.

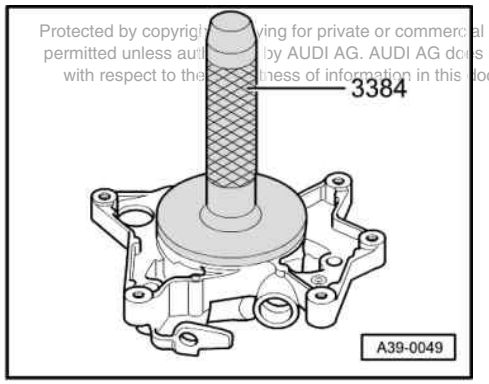
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Installing grooved ball bearing

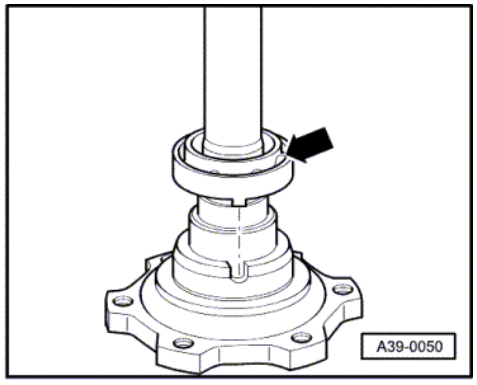
- -> Press new grooved ball bearing into mounting bracket.

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Installing sealing ring

- Lightly lubricate outer circumference and sealing lip of seal with gear oil.
- -> Drive new seal in up to stop of pressure piece, making sure seal goes on straight.
  - Installation position: The open side of the oil seal faces toward the gearbox.

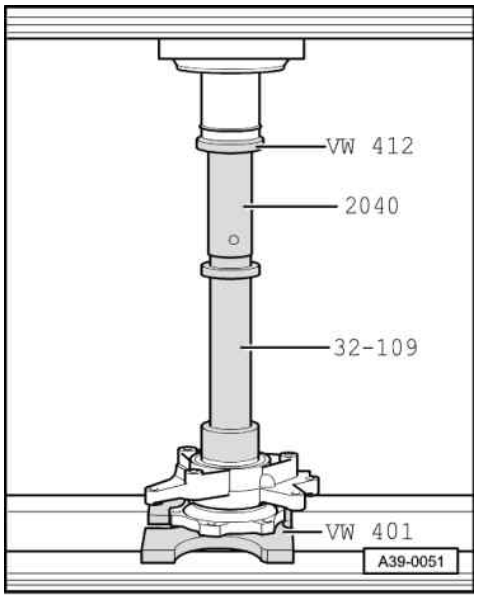


- -> Position input gear for speedometer -G22 onto flange shaft -arrow-.

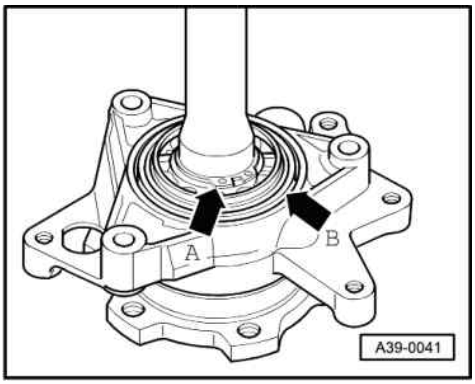
- Installation position: The follower of the drive wheel must engage in the slots on the flange shaft.

Note:

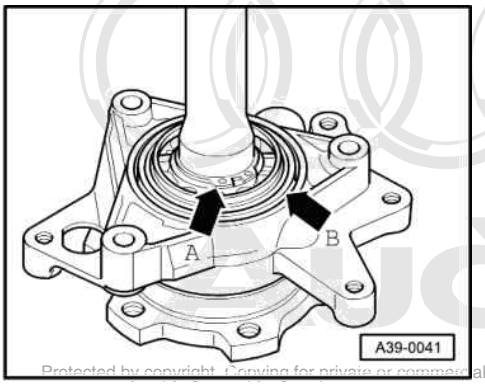
If necessary, fix the installation position of the magnetic ring by coating the contact surface with grease.



- -> Press mounting bracket with grooved ball bearing onto flange shaft.



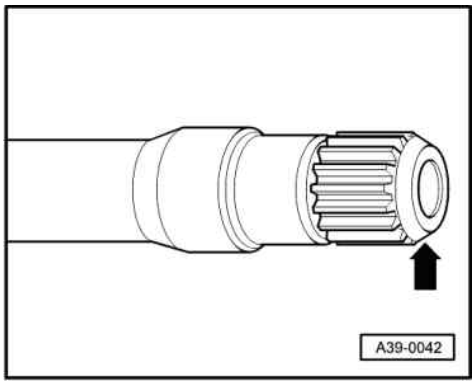
- -> Insert the retaining ring -arrow A-.



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Install flange shaft on left

- -> Renew the O-ring -arrow B- in the mounting bracket for the flange shaft.



- -> Check flange shaft for sharp edges at shaft end on gearbox side -arrow-. If necessary, deburr.
- Insert the left flange shaft into the gearbox.

Note:

When inserting, the flange shaft must be carefully guided by hand in order to avoid damaging the double sealing ring in the gearbox.

- Install drive shaft.

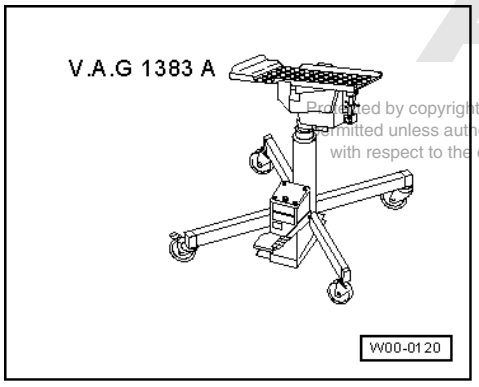
=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft

- Attach heat shield for left drive shaft.
- Check gear oil level in front final drive => Page 171 .

Tightening torques

Component	Nm
Mounting bracket for left flange shaft to gearbox	23
Drive shaft to flange shaft M10	77
Drive shaft to flange shaft M8	39
Heat shield for drive shaft to gearbox	23

2.4 - Replacing seal for front axle drive



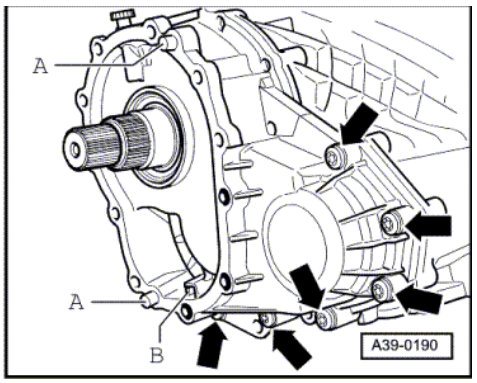
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Special tools, testers and auxiliary equipment required

- Engine/gearbox lifter V.A.G 1383 A

Removing

- Remove right front exhaust pipe
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Remove heat shield for selector lever cable.

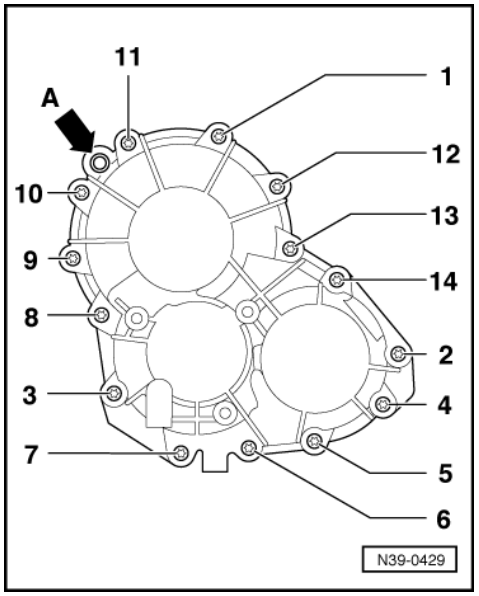


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Vehicles with four-wheel drive:

- Remove transfer gear => Page 209
- -> Unscrew bolts -arrows- on intermediate flange for front axle drive.

Vehicles with front-wheel drive:



- -> Unscrew bolts at lid for front final drive against tightening sequence shown.
- Position gearbox jack V.A.G 1383 A with universal jack.

Important:
- **Slowly and carefully remove the cover for front final drive from the gearbox housing. The spur gears may otherwise fall out of the gearbox.**
- **Spur gears which have fallen to the ground can no longer be installed. The gearbox must in this case be changed.**

All models:

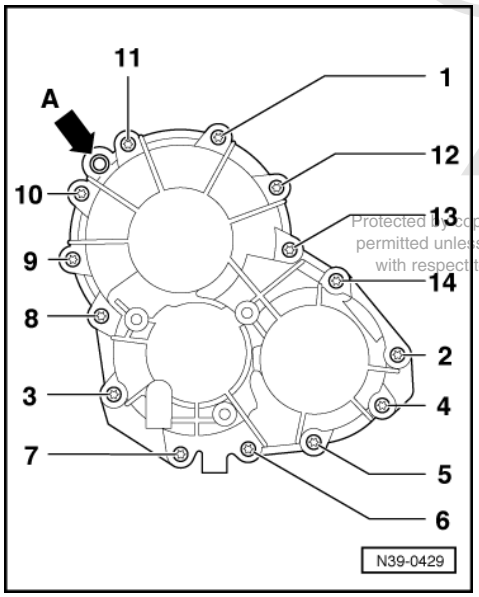
- Raise the cover or intermediate flange for front final drive.

Notes:

- Do not remove the spur gears for the front axle drive. Secure the spur gears such that they cannot fall out.
- However, if the spur gears for the front axle drive have been removed, they must be reinstalled such that the gear code is facing outwards (away from the gearbox).

Installing

- -> Before installing, ensure that the dowel sleeves -A- are correctly located.



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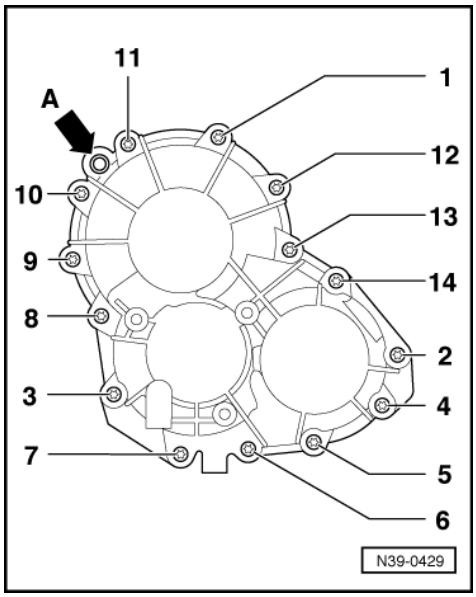
- Install gasket.
- Raise the cover or intermediate flange for front final drive.

Vehicles with four-wheel drive:

Note:

If the intermediate flange is not positioned on the output shaft correctly, the sealing lips of the oil seal may be damaged.

All models:



-> Tightening sequence:

- 1. Stage 1: Replace bolts -1 ... 3- Tighten by hand

Note:

When tightening the bolts by hand, ensure that the gap between the transfer gear housing and the gearbox housing is reduced by the same amount all the way round.

- 2. Stage 1: Replace bolts -1 ... 14- Tighten in given sequence to tightening torque

- Checking ATF level and topping up => Page 113 .

Vehicles with four-wheel drive:

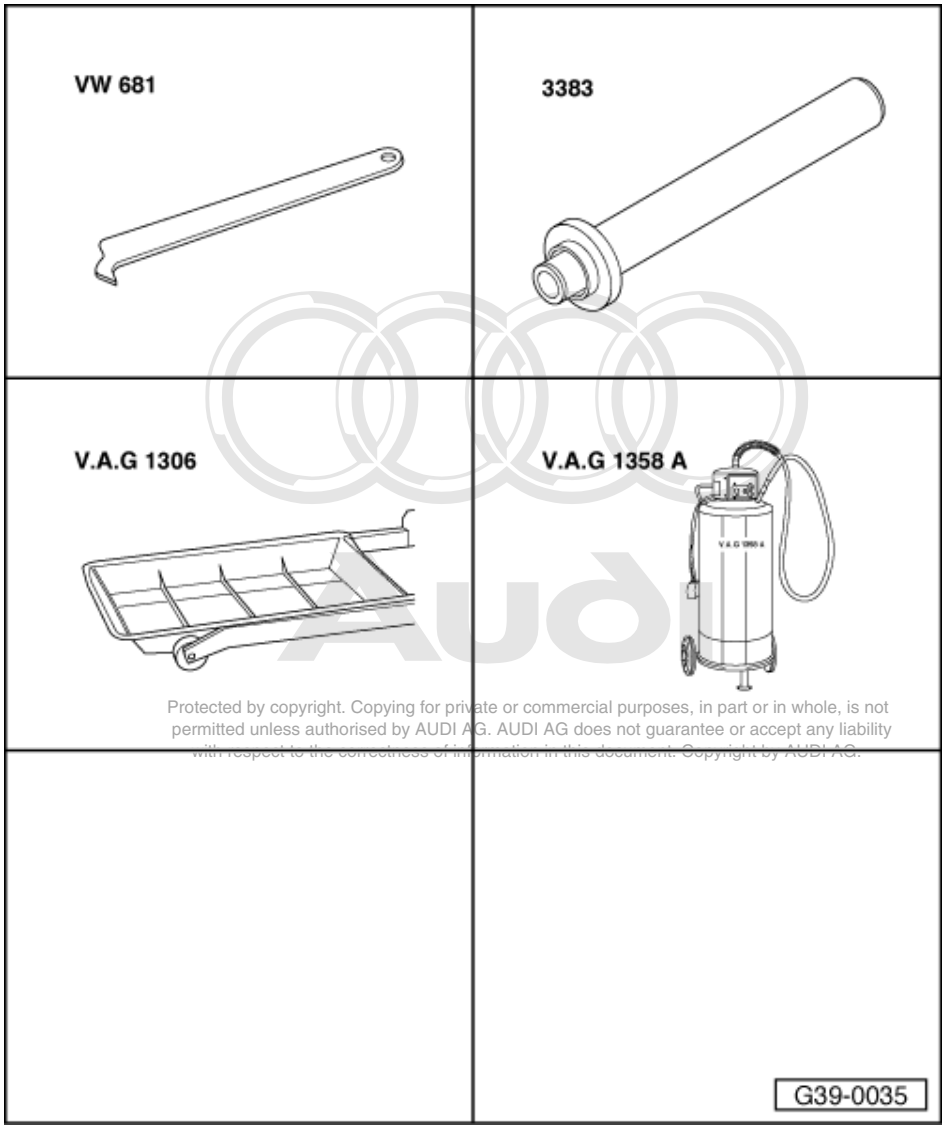
- Install transfer gear => Page 211 .

Tightening torques

Component	Nm
Cover for front final drive at gearbox housing cover	23
Intermediate flange for front final drive at gearbox housing	23
Transfer gearbox at gearbox housing	23

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2.5 - Replacing sealing ring final drive/gearbox housing



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Special tools,
testers and auxiliary items required

- Extractor lever VW 681
- Thrust pad 3383
- Drip tray V.A.G 1306
- V.A.G 1358 A Oil extractor

Notes:

- A damaged sealing ring allows ATF or gear oil to leak into torque converter bell housing via centre breather of shaft ring.
- Furthermore, a damaged sealing ring allows ATF to enter the differential. This is being overfilled and oil leaks at the breather of the differential.

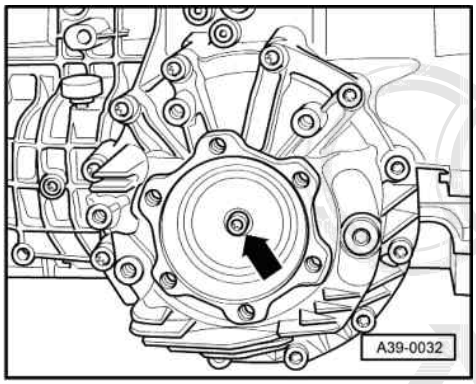
Removing

- Bolt drive shaft/wheel hub whilst the vehicle is standing on its wheels.
- Remove front wheels.

- Unbolt the heat shield for right drive shaft.

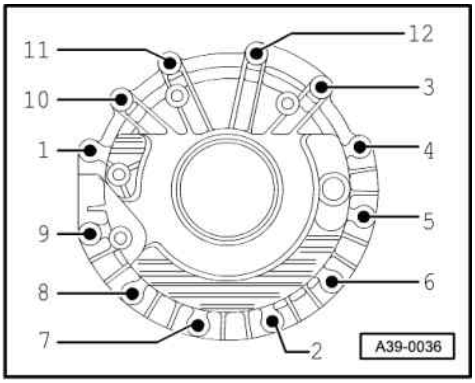
- Remove drive shafts:

=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft

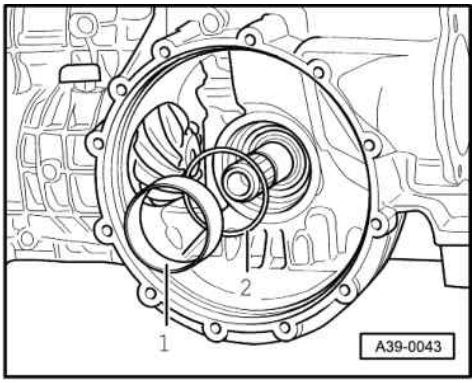


- -> Remove bolt for flange shaft -arrow-. Whilst doing this secure flange shaft with drift against turning.
- Extract gear oil from final drive with oil extractor V.A.G 1358 A.
- Place drip tray V.A.G 1306 underneath.
- Pull out the right flange shaft.
- Remove the right gearbox support => Page 106 .

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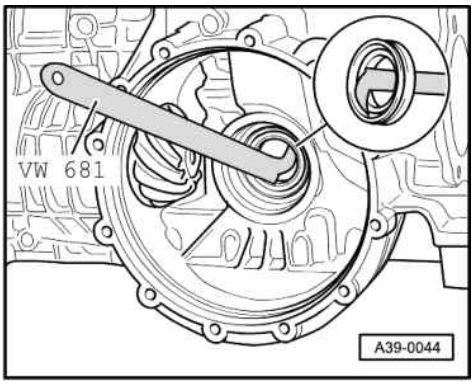
- -> Unscrew bolts of cover for final drive in the reverse sequence to that shown and remove cover.
- Pull out differential and remove.



- -> Manually remove taper roller bearing outer race of differential -1- and shim behind -2- from gearbox housing.

Note:

The shim is fitted and must not be exchanged for a shim with different thickness.

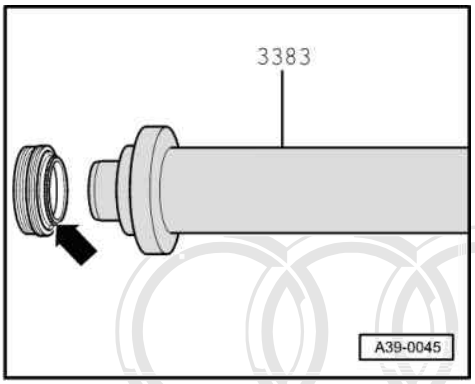


- Remove the left flange shaft => Page 181 .
- -> Pull out sealing ring.

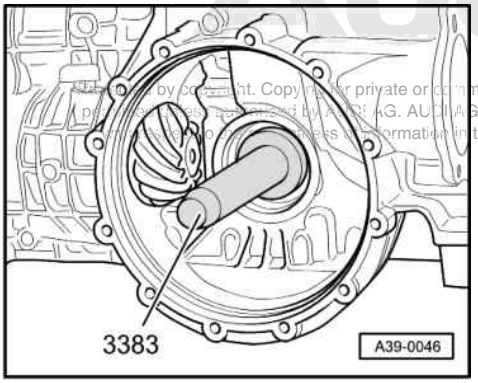
Note:

The levering tool must be positioned behind the two sealing lips of the sealing ring. Do not position at outer ring of sealing ring as the contact surface in the gearbox housing could be damaged. When levering, guide levering tool carefully.

Installing

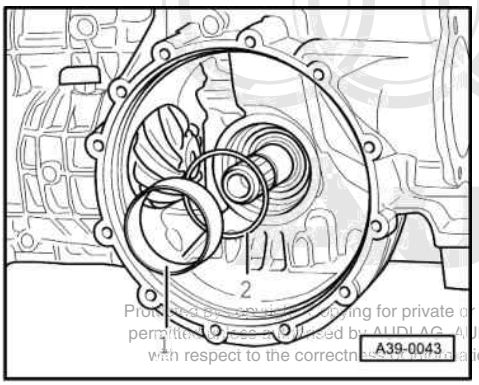


- Check oil seal seat in gearbox housing for damage and rework, if necessary.
- Lightly lubricate outer circumference and sealing lips of seal with ATF.
- -> Slide the double oil seal onto the thrust pad 3383 such that the larger, protruding sealing lip -arrow- of the oil seal faces the tool.



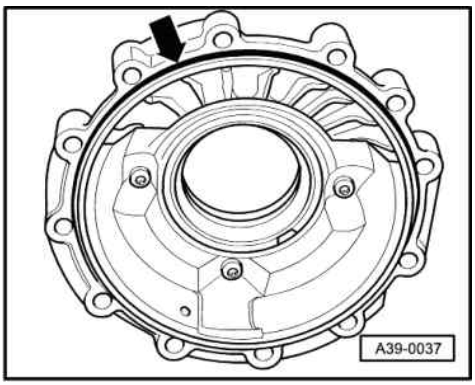
- -> Drive in new seal as far as stop.

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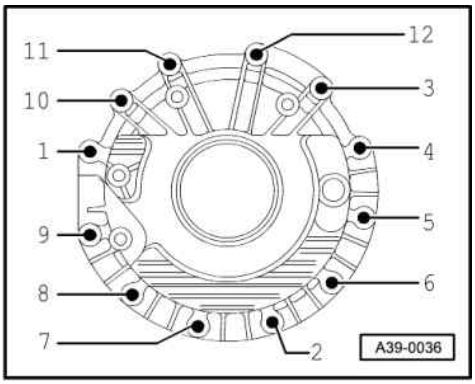


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- Install left flange shaft => Page 186 .
- -> Insert shim -2- and taper roller bearing outer race for differential -1- by hand until stop into gearbox housing.



- -> Renew the O-ring -arrow-.
- Fit differential into gearbox housing.



- -> Install cover for final drive.

Tightening sequence:

- 1. Stage 1: Replace bolts -1 ... 3- Tighten by hand
- 2. Stage 1: Replace bolts -1 ... 12- Tighten in given sequence to tightening torque

- Install right flange shaft.
- Installing right gearbox support => Page 106 .
- Install drive shafts.

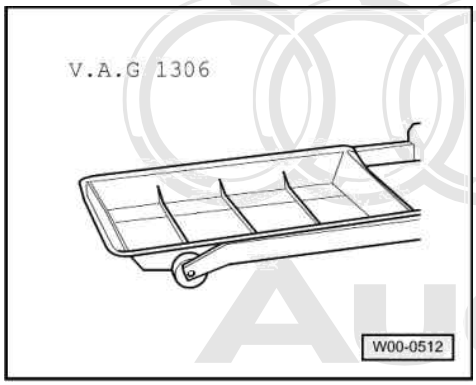
=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft

- -Top up gear oil in front final drive and check oil level => Page 171 .

Tightening torques

Component	Nm
Cover for front final drive at gearbox housing	23
Mounting bracket for left flange shaft to gearbox	23
Flange shaft to gearbox	23
Drive shaft to flange shaft M10	77
Drive shaft to flange shaft M8	39
Heat shield for drive shaft to gearbox	23

2.6 - Replacing O-ring at cover for final drive



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Special tools, testers and auxiliary equipment required

- Drip tray V.A.G 1306

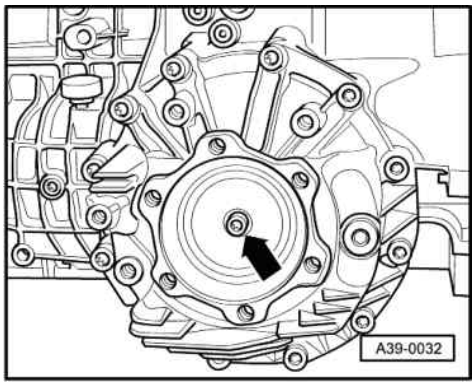
Removing

- Bolt drive shaft/wheel hub whilst the vehicle is standing on its wheels.
- Remove right wheel.
- Unbolt the heat shield for right drive shaft.
- Remove right front exhaust pipe
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system

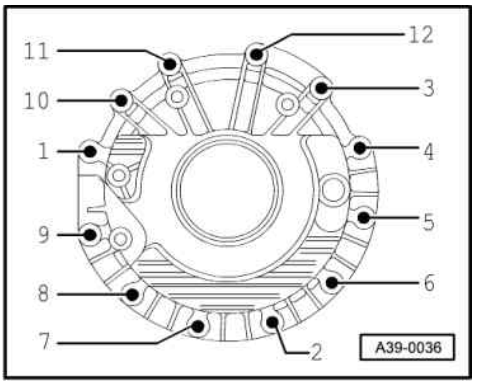
- Remove right drive shaft

=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft

- Remove the right gearbox support => Page 106 .

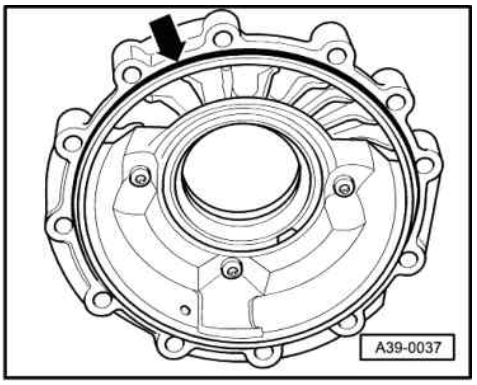


- -> Remove bolt for flange shaft -arrow-. Whilst doing this secure flange shaft with drift against turning.
- Place drip tray V.A.G 1306 underneath.
- Pull out the right flange shaft.

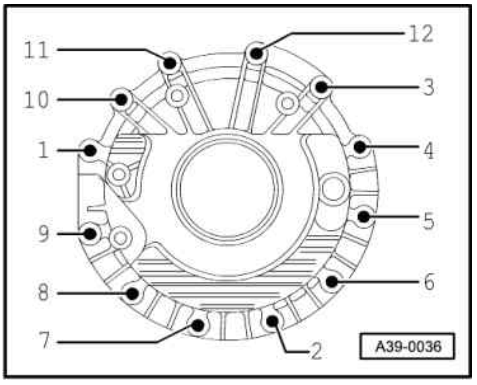


- -> Unscrew bolts of cover for final drive in the reverse sequence to that shown and remove cover.

Installing



- -> Renew the O-ring -arrow-.



- -> Install cover for final drive.

Tightening sequence:

- 1. Stage 1: Replace bolts -1 ... 3- Tighten by hand
- 2. Stage 1: Replace bolts -1 ... 12- Tighten in given sequence to tightening torque

- Install right flange shaft.

- Installing right gearbox support => Page 106 .

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- Install drive shaft.

=> Running Gear, FWD and 4WD; Repair group 40; Removing and installing drive shaft Removing and installing drive shaft

- -Top up gear oil in front final drive and check oil level => Page 171 .

Tightening torques

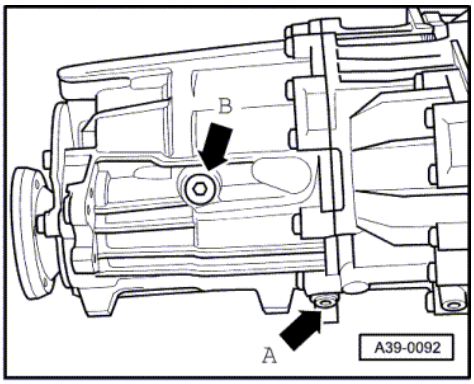
Component	Nm
Cover for front final drive at gearbox housing	23
Flange shaft to gearbox	23
Heat shield for drive shaft to gearbox	23

3 - Gear oil in transfer gear

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3.1 - Gear oil in transfer gear

3.2 - Checking and topping up gear oil in transfer gear

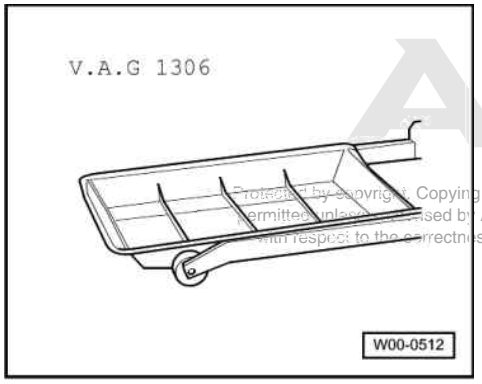


- -> If necessary, slacken or remove corresponding parts of exhaust system to guarantee the accessibility of oil filler plug -arrow B-.
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Remove oil filler plug -arrow B-.
  - Specified value: oil level up to lower edge of filler hole
- Top up with gear oil, if necessary: Specification => Page 13 .
- Always renew oil filler plug.
- Fit new oil filler plug.
- Attach or install exhaust system tension-free.
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system

Tightening torque

Component	Nm
Oil filler plug	35

3.3 - Changing gear oil in transfer gear or filling after repair



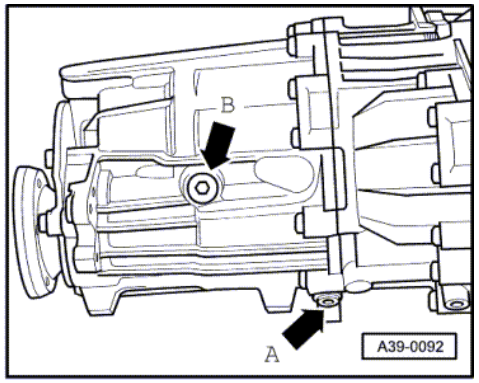
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Special tools, testers and auxiliary equipment required

- Drip tray V.A.G 1306

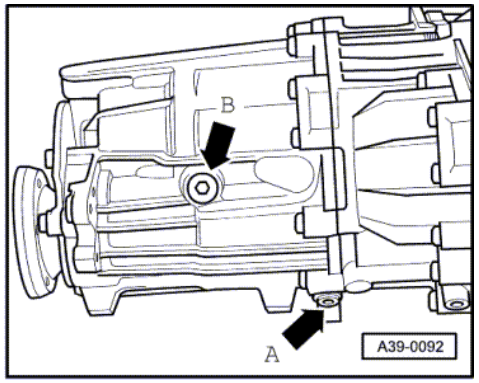
Draining off gear oil

- Place drip tray V.A.G 1306 underneath.



- -> Unscrew drain plug -arrow A- and drain off gear oil.
- Always fit new drain plug.
- Screw in new drain plug -arrow A-.

Filling up with gear oil



- -> If necessary, slacken or remove corresponding parts of exhaust system to guarantee the accessibility of oil filler plug -arrow B-.

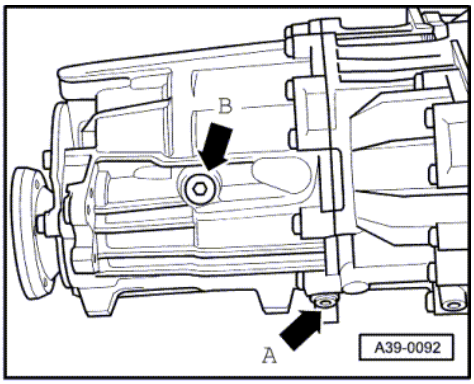
=> corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system

Note:

There are two different cases:

A - Transfer gear was not removed

B - Transfer gear was removed



A - Transfer gear was not removed (e.g. after removing and installing flange shaft)

- -> Unscrew oil filler plug -arrow B-.
- Top up gear oil up to lower edge of oil filler bore. Specification and quantity => Page 13 .
- Screw in old oil filler plug.

Note:

If it was necessary to slacken or remove the exhaust system it must be attached or installed for the test drive and then removed and installed again for the subsequent oil level control.

- Carry out test drive (15 minutes drive time).

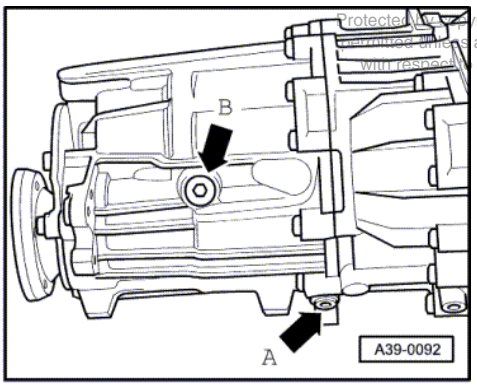
Note:

During the test drive the gear oil reaches the Torsen differential casing; the oil level in the transfer gearbox housing decreases.

- Top up transfer gear with gear oil, and check oil level => Page 197

B - Transfer gear was removed and dismantled

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- Top up with 200 ml gear oil in Torsen differential gear.
- Assembling and installing transfer gear =>Page 211 .
- -> Unscrew oil filler plug -arrow B-.

- Top up with 600 ml gear oil in transfer gear housing.
- Always renew oil filler plug.
- Fit new oil filler plug.

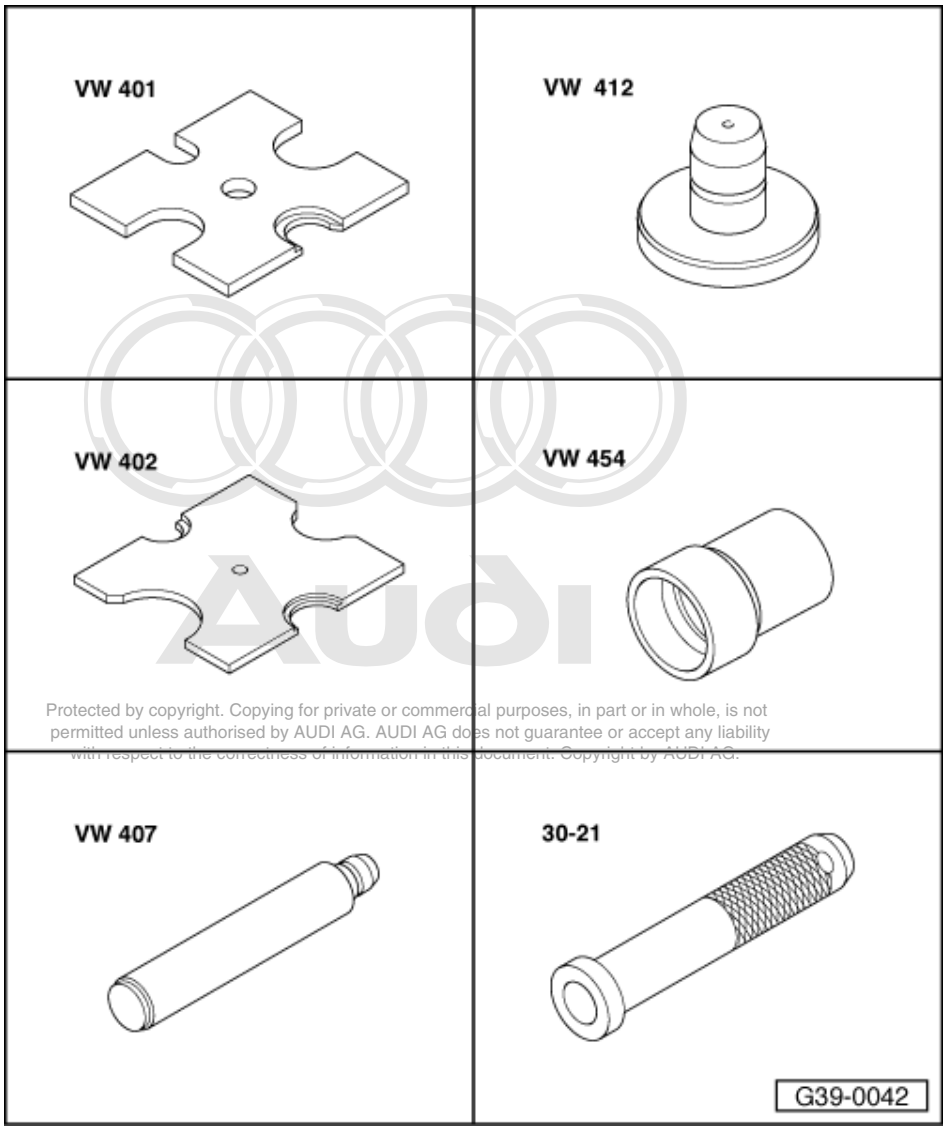
Note:
A subsequent level check is not required.
All models:
- Attach or install exhaust system tension-free.
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system

Tightening torques

Component	Nm
Oil drain plug	20
Oil filler plug	35

4 - Servicing transfer gear

4.1 - Servicing transfer gear

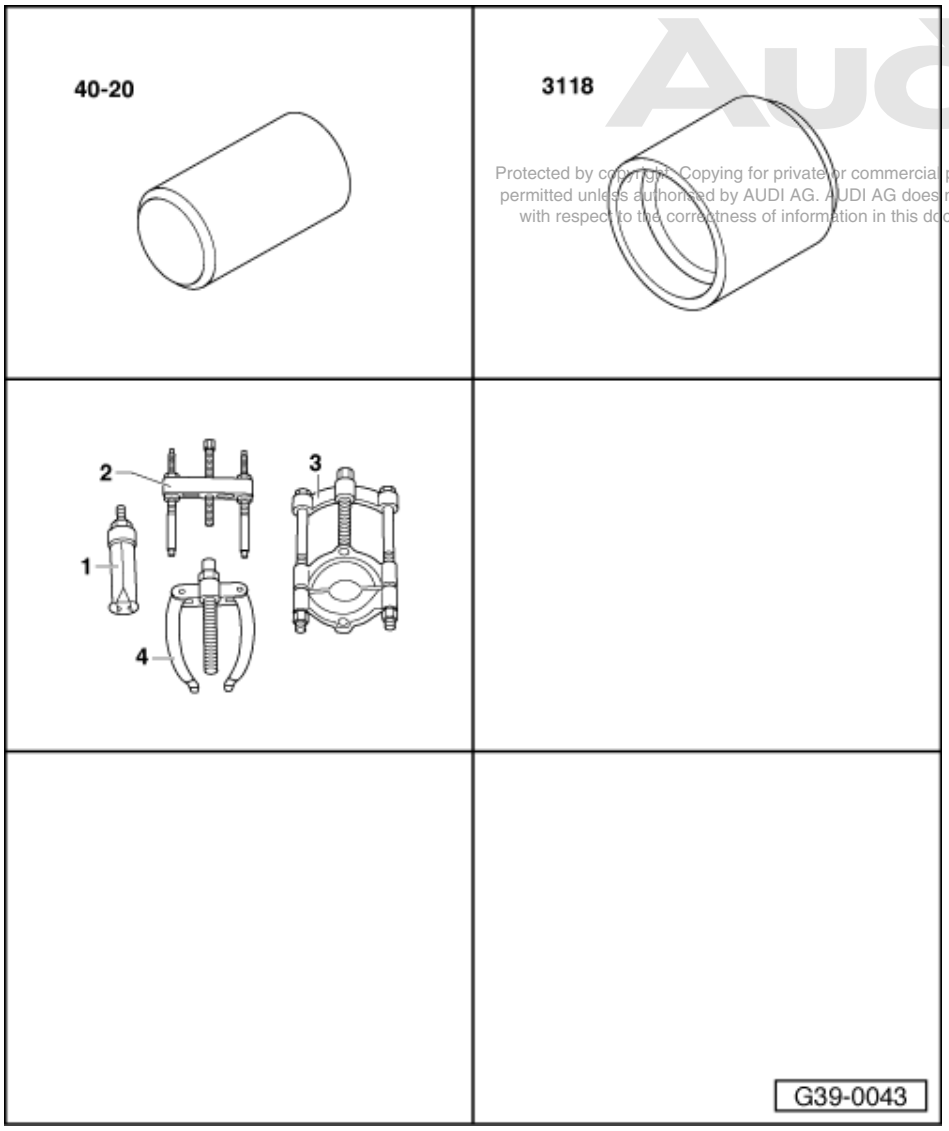


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Gearbox installed

Special tools, testers and auxiliary equipment required

- Thrust plate VW 401
- Press tool VW 412
- Thrust plate VW 402
- Thrust pad VW 454
- Press tool VW 407
- Sleeve 30-21



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- Sleeve 40-20
- Thrust pad 3118
- Item 3 Separating tool Kukko 17/2

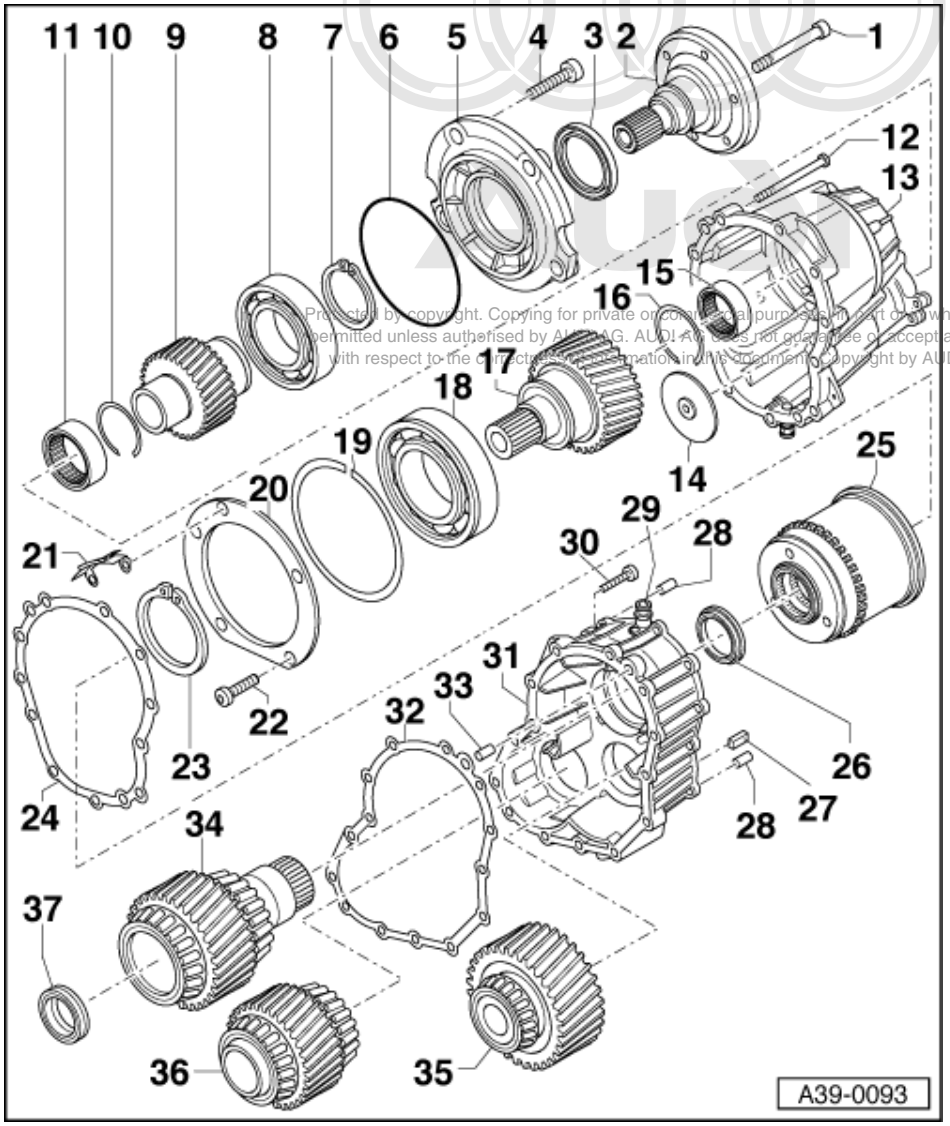
Important:
Do not run the engine or tow the vehicle if the transfer gear is removed or if the gear oil has been drained from the gearbox.

Notes:

- Rules for cleanliness when working on the automatic gearbox => Page 124 .

- General repair instructions => Page 14 .

The parts shown in the following illustration can be removed with the gearbox installed.



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1 **Hexagon socket-head bolt - 25 Nm**

2 **Flange shaft, rear**

3 **Sealing ring**
- Replacing => Page 212 .

4 **Release and tighten bolt - 23 Nm**
- 4 pieces

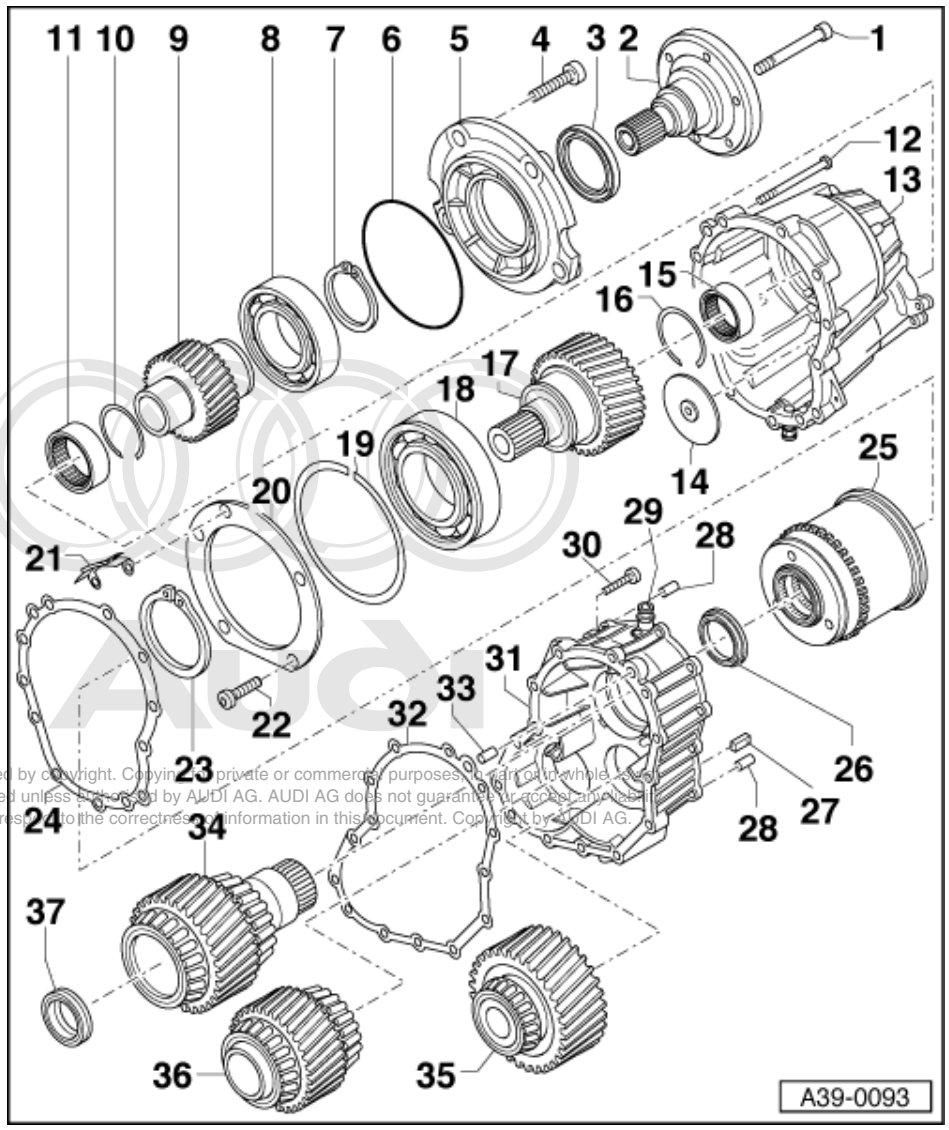
5 **Housing cover**

6 **O-ring**
- Lubricate with gear oil

7 **Circlip**

8 **Grooved ball bearing**
- For spur gear 1
- Pressing off
  => Fig. 208
- Pressing on

=> Fig. 209



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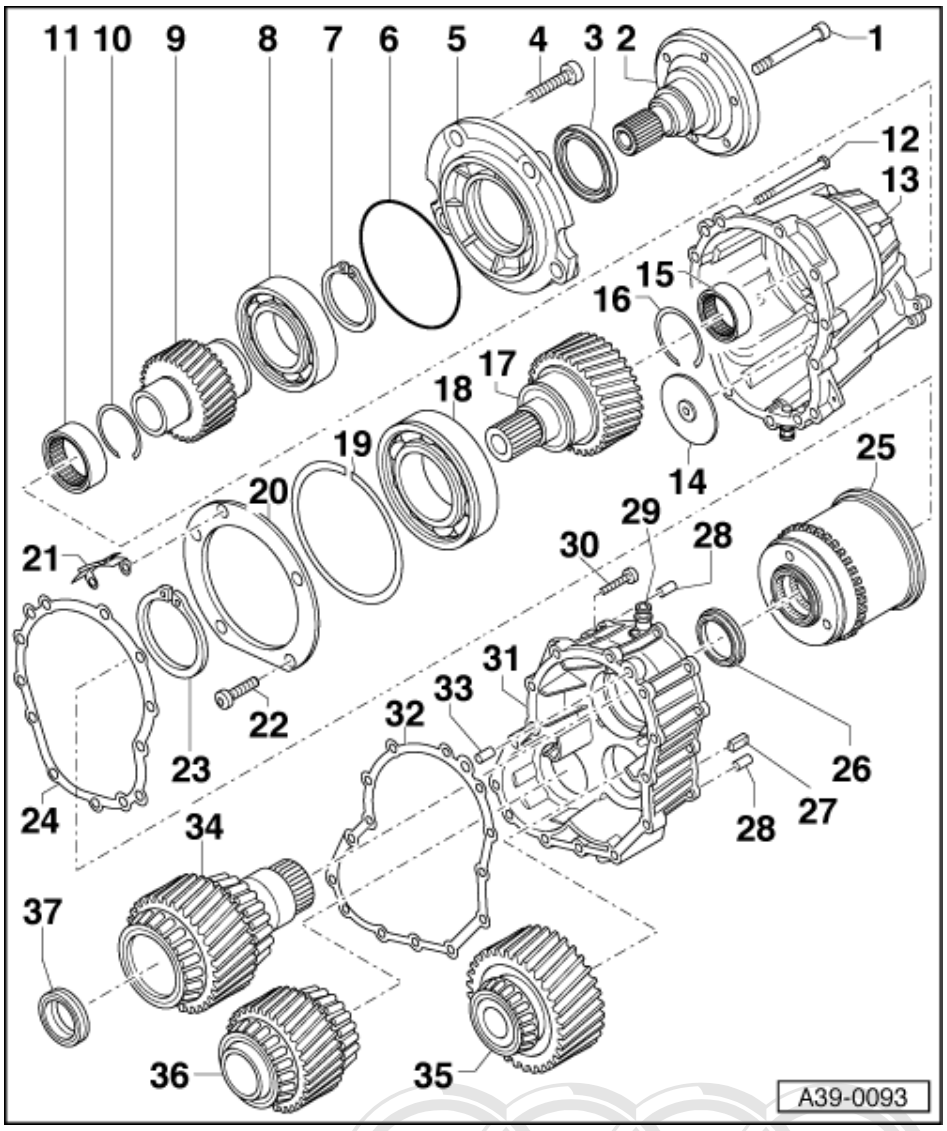
9 for spur gear 1

- For rear final drive set
- If damaged, always renew together with spur gear 2 - 17 - Replace
- To remove and install pull out towards rear together with - 7 - and - 8 - from transfer gear housing

10 Circlip

11 Needle bearing

- For spur gear 1
- Only remove bearing in order to renew
- To replace, heat transfer gear housing to approx. 100 °C and drive out needle bearing to rear with drift (Warning: Wear protective gloves)
- Drive in up to stop using sleeve 30-21



12 Release and tighten bolt - 23 Nm

- Loosen and tighten in diagonal sequence

13 Transfer gear housing

14 Tensioning nut

- For rear flange shaft - 2 -

15 Needle bearing

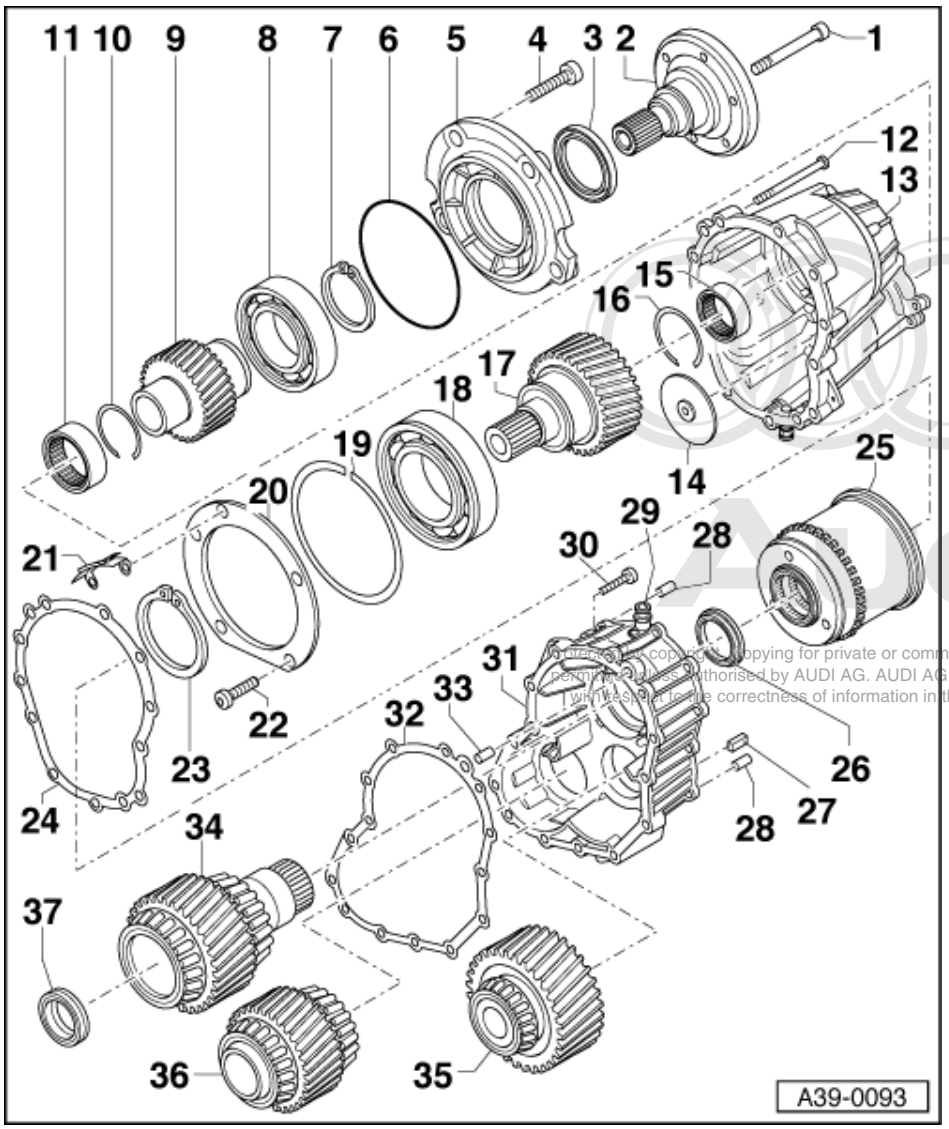
- For spur gear 2
- Only remove bearing in order to renew
- Replacing => Page 219 .

16 Circlip

17 for spur gear 2

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- For rear final drive set
- When damaged, always renew together with spur gear 1 - 9 -
- To remove and install, dismantle transfer gear housing => Page 209 and pull out together with - 18 , 19 , 23 -



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18 Grooved ball bearing

- For spur gear 2
- Pressing off
  => Fig. 209
- Pressing on
  => Fig. 209

19 Circlip

- For securing grooved ball bearing - 18 - in transfer gear housing

20 Washer

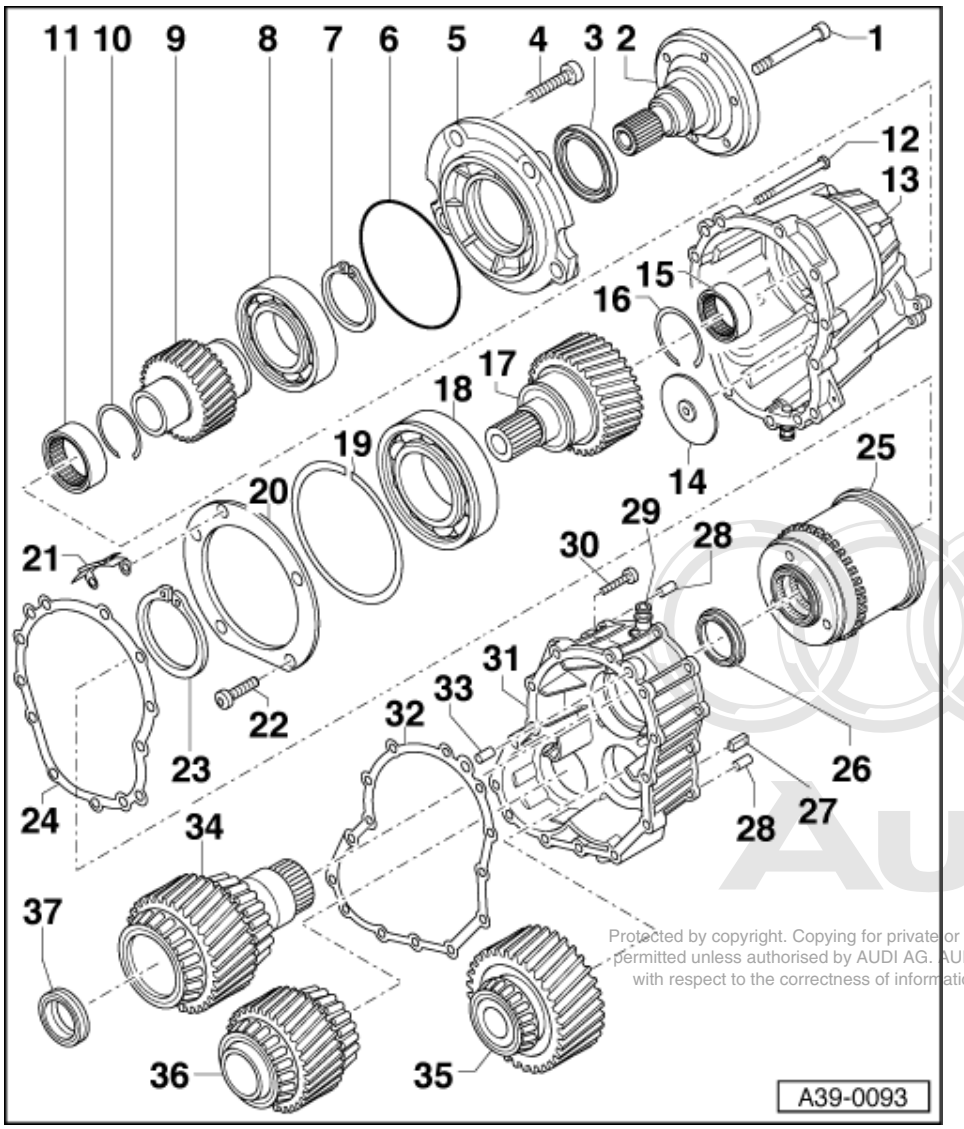
- For groove ball bearing -Item 18 -
- Before installing, clip on alignment plate - 21 -

21 Alignment plate

22 Release and tighten bolt -10 Nm

23 Circlip

- To secure grooved ball bearing - 18 - on spur gear 2 - 17 -



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24 Gasket

- Replacing => Page 209 .

25 Torsen differential

- Renew complete if damaged
- Removing and installing=>Page 209

26 Sealing ring

- Replacing => Page 215 .

27 Solenoid

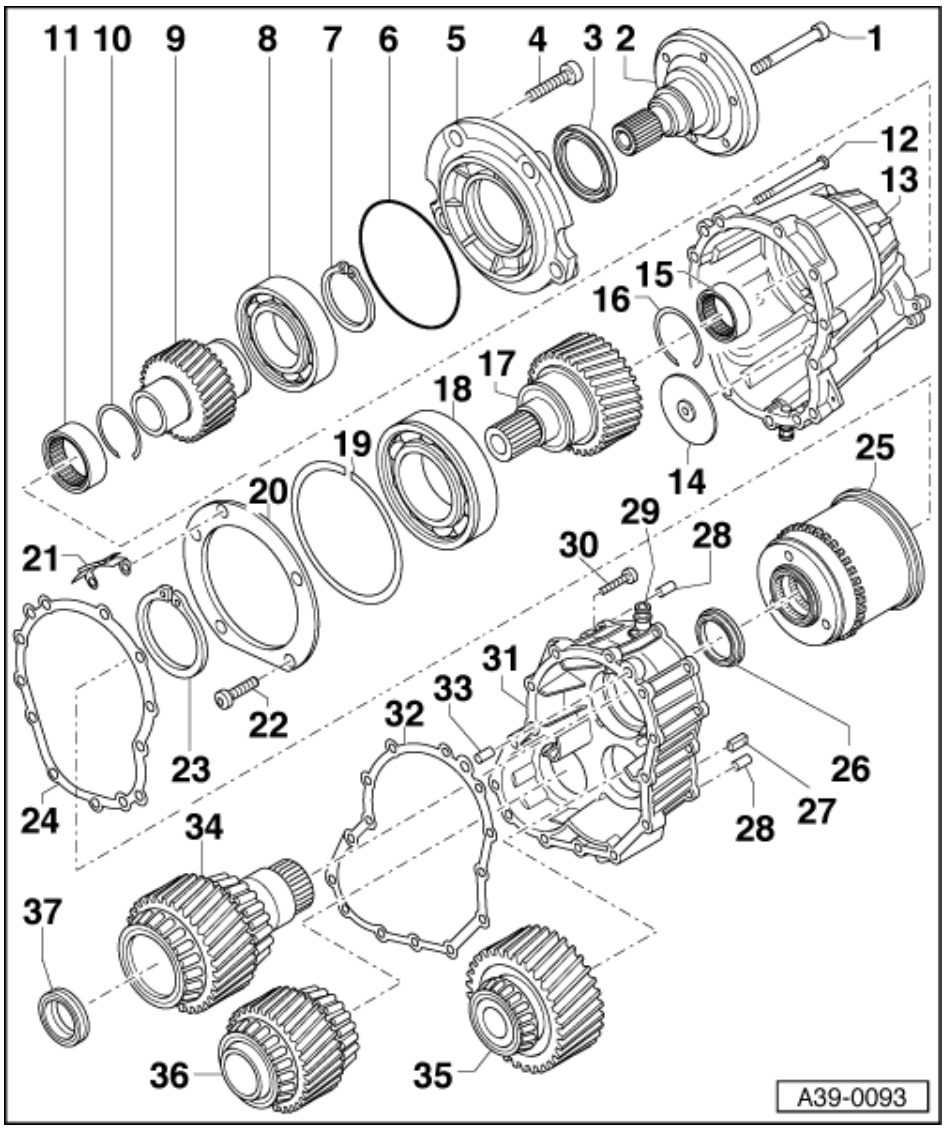
- Removing and installing=>Page 209

28 Dowel sleeve

- 2 pieces

29 Breather

- For transfer gear
- Cap is fitted on breather
- Installation position: Breather must protrude 10 ... 11 mm from housing without cover



30 Release and tighten bolt - 23 Nm

- Observe the tightening sequence =>Page 190

31 Intermediate drive for front axle drive

32 Gasket

- Replacing => Page 187 .

33 Dowel sleeve

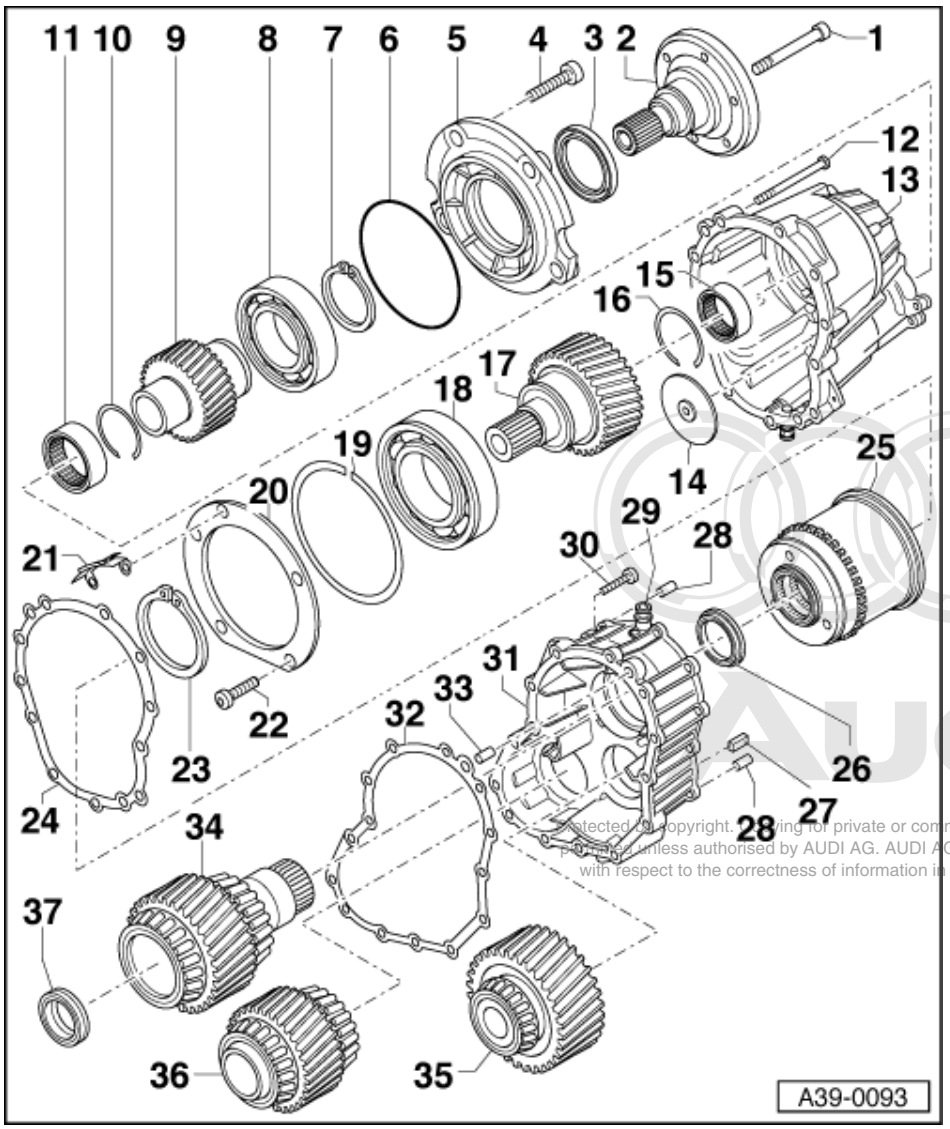
34 Input pinion

- For front final drive
- Removing and installing=>Page 216

35 Intermediate pinion

- For front final drive
- Installation position: gear identification faces towards transfer gear

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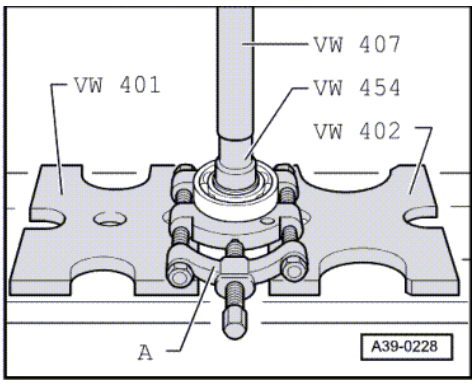
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36 Output pinion

- For front final drive
- Installation position: gear identification faces towards transfer gear

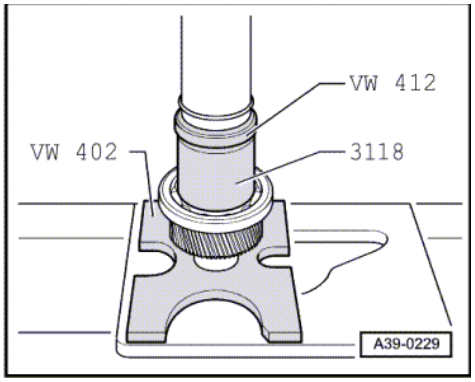
37 Sealing ring

- Replacing => Page 216 .

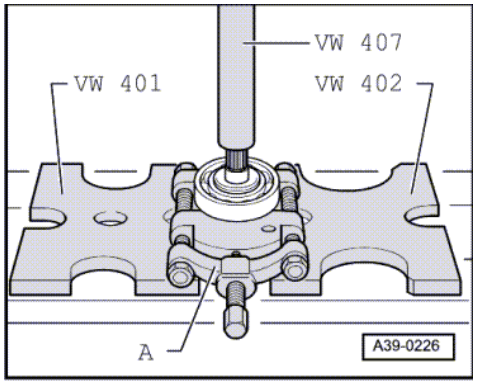


-> Fig1 Pressing off grooved ball bearing for spur gear 1

A - Separating device 22 ... 4.53 in, e.g. Kukko 17/2

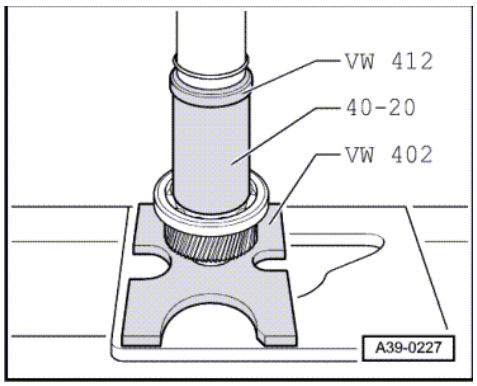


-> Fig2 Pressing on grooved ball bearing for spur gear 1



-> Fig3 Pressing off grooved ball bearing for spur gear 2

A - Separating device 22 ... 4.53 in, e.g. Kukko 17/2



-> Fig4 Pressing on grooved ball bearing for spur gear 2

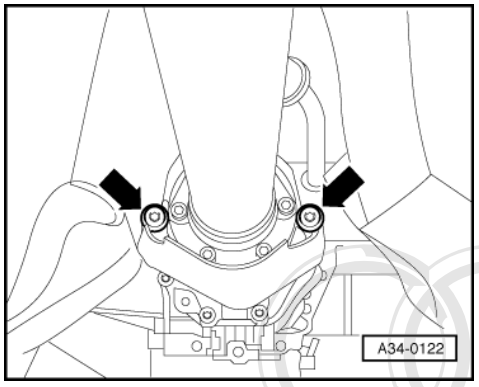
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4.2 - Removing and installing transfer gear

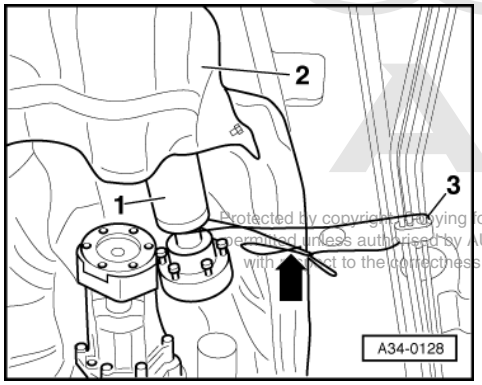
Removing

- Remove front exhaust pipes.

=> corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system

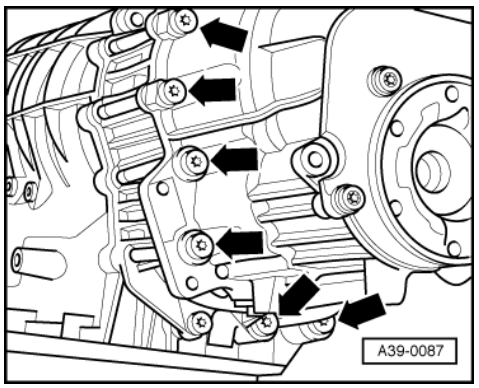


- -> Remove heat shield for propshaft from cover for Torsen differential -arrows-.



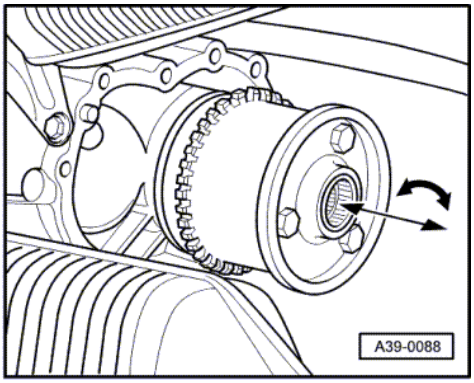
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- -> Unscrew propshaft -1- from gearbox and place onto heat shield -2- => Page 225 ; Removing and installing propshaft.
- Secure propshaft with wire -arrow- at bracket -3- of fuel lines.
- Drain off gear oil from transfer gear housing => Page 197

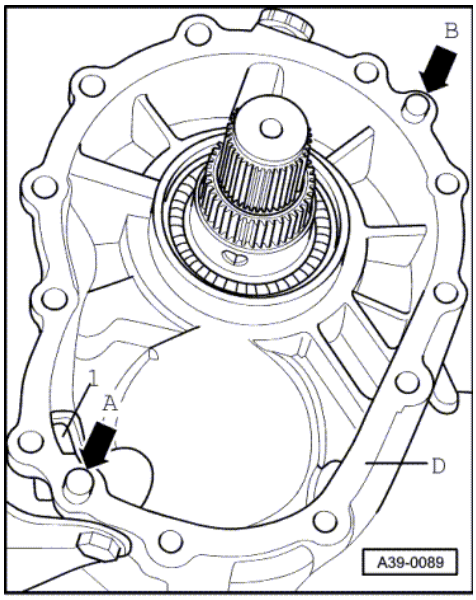


- -> Loosen securing bolts -arrows- for transfer gear housing in diagonal sequence and remove.

Important:
Pull the housing for the transfer gear backwards from the gearbox housing slowly and carefully. The Torsen differential may otherwise fall out of the gearbox.



- -> Pull off Torsen differential towards rear from output shaft.



Installing

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

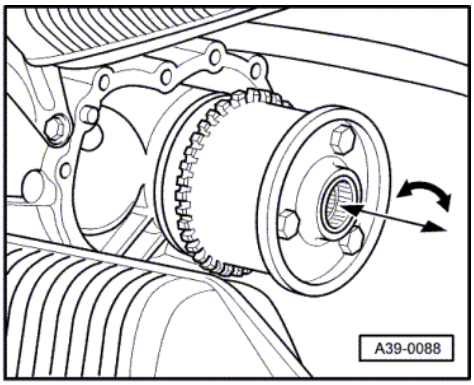
- -> Check to ensure that the dowel sleeves -arrow A- and -arrow B- are fitted.
- Install gasket.

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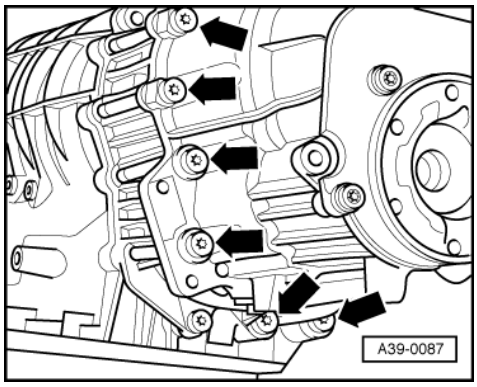
Note:

Thinly coat sealing surface -D- with gear oil in order to prevent slipping of seal.

- Clean the magnet and insert it in chamber -1- on the casting of the intermediate flange.



- Top up with 200 ml gear oil in Torsen differential casing (see also Topping up gear oil with transfer gear housing removed and dismantled => Page 199).
- -> Attach Torsen differential to splines of output shaft and lowest spur gear. Whilst doing so twist slightly.
- Check whether the attached Torsen differential can be turned manually.

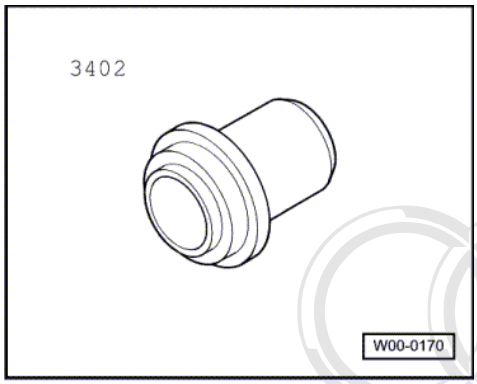


- -> Place the transfer gear housing complete with the fitted spur gears and rear drive flange on the gearbox.
- Insert bolts for transfer gear housing and tighten to end stage diagonally and in several stages.
- Bolt the propshaft onto the gearbox flange => Page 225 , Removing and installing propshaft.
- Top up transfer gear with gear oil, and check oil level => Page 197

Tightening torques

Component	Nm
Transfer gear housing at gearbox housing	23
Heat shield for propshaft to gearbox	23

4.3 - Replacing oil seal on drive flange for propshaft



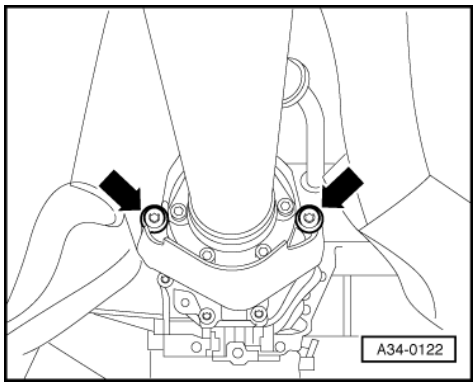
Special tools, testers and auxiliary equipment required

- Thrust pad 3402

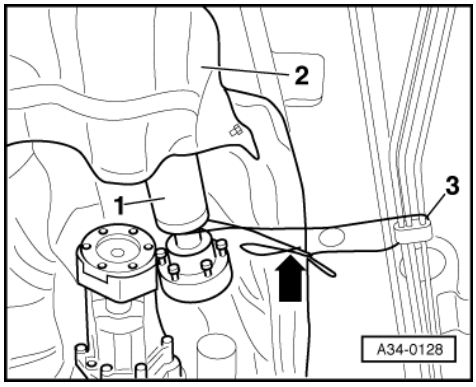
Removing

- Remove front exhaust pipes.
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system

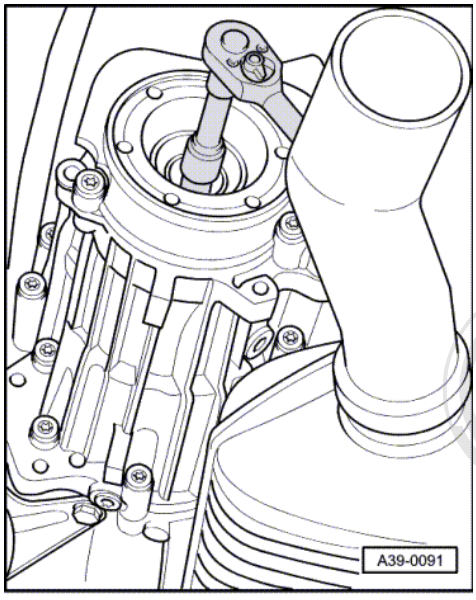
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- -> Remove heat shield for propshaft from cover for Torsen differential -arrows-.

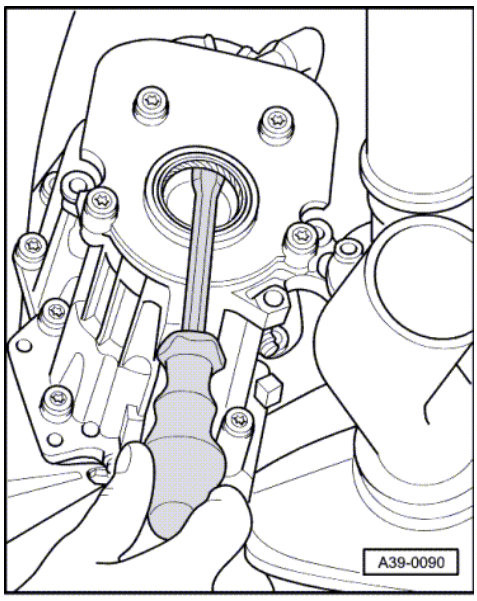


- -> Unscrew propshaft -1- from gearbox and place onto heat shield -2- => Page 225 ; Removing and installing propshaft.
- Secure propshaft with wire -arrow- at bracket -3- of fuel lines.
- Drain off gear oil from transfer gear housing => Page 197



- -> Unscrew drive flange (use pin to prevent drive flange from turning).
- Pull out drive flange.

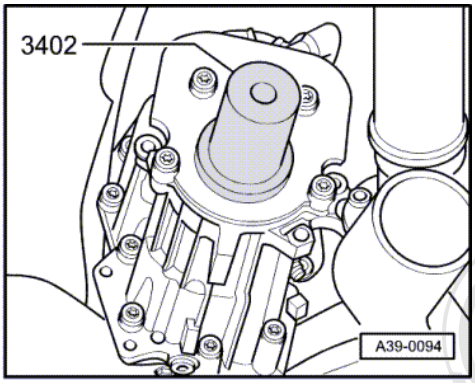
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- -> Remove oil seal using a suitable screwdriver.

Installing

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



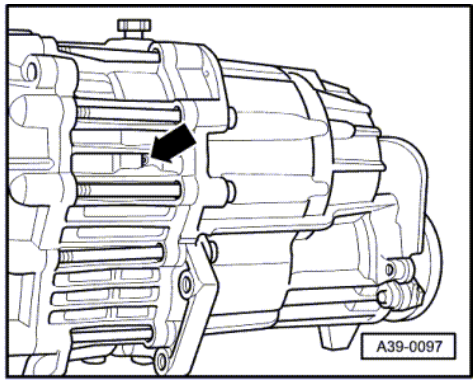
- -> Knock in seal up to stop using 3402.
- Secure drive flange with hexagon socket head bolt.
- Bolt the propshaft onto the gearbox flange => Page 225 , Removing and installing propshaft.
- Top up transfer gear with gear oil, and check oil level => Page 197

Tightening torques

Component	Nm
Hexagon socket head bolt for flange shaft rear	25
Heat shield for propshaft to gearbox	23

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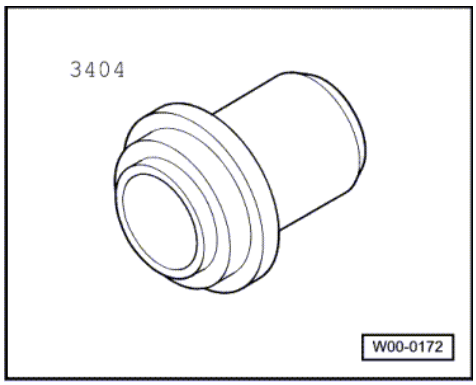
4.4 - Replacing sealing ring in intermediate flange for front final drive



Note:

-> On the left side of intermediate flange is a leakage oil inspection hole -arrow- for the sealing rings in the input pinion and intermediate flange.

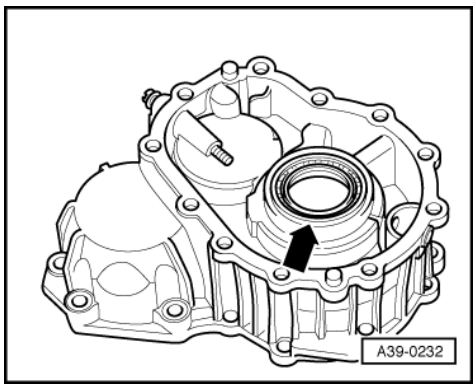
If oil leaks from leakage oil inspection hole the double sealing ring must be replaced.



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Special tools, testers and auxiliary equipment required

- Thrust pad 3404



Removing

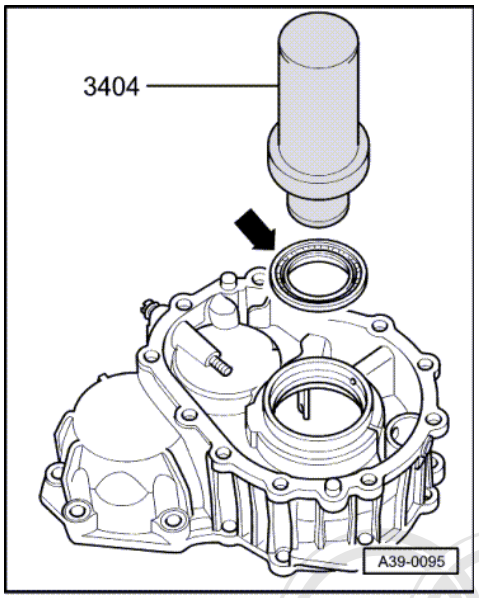
- Remove transfer gear => Page 209
- Remove the intermediate flange for front axle drive

- -> Use a suitable mandrel to drive out the oil seal -arrow- towards the transfer gear.

Installing

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

- Check oil seal seat in gearbox housing for damage and rework, if necessary.



- -> Slide the oil seal onto the thrust pad 3404 such that the larger, protruding outer ring -arrow- of the oil seal faces the tool.
- Drive in sealing ring with the thrust pad 3404 up to the stop in thrust pad.

Note:

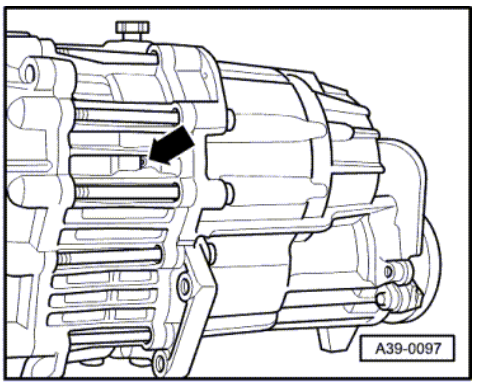
If the intermediate flange is not positioned on the output shaft correctly, the sealing lips of the oil seal may be damaged.

- Install transfer gear => Page 211 .

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4.5 - Replacing oil seal in input pinion

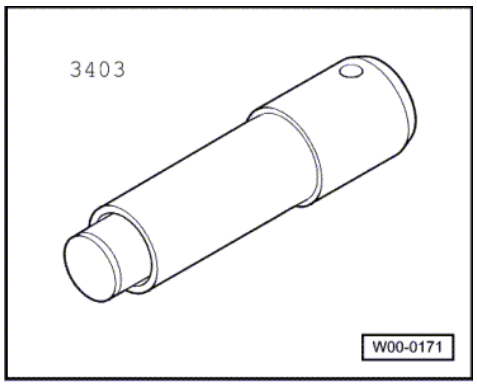
Note:



-> On the left side of intermediate flange is a leakage oil inspection hole -arrow- for the sealing rings in the input pinion and intermediate flange.

If oil leaks from leakage oil inspection hole the double sealing ring must be replaced.

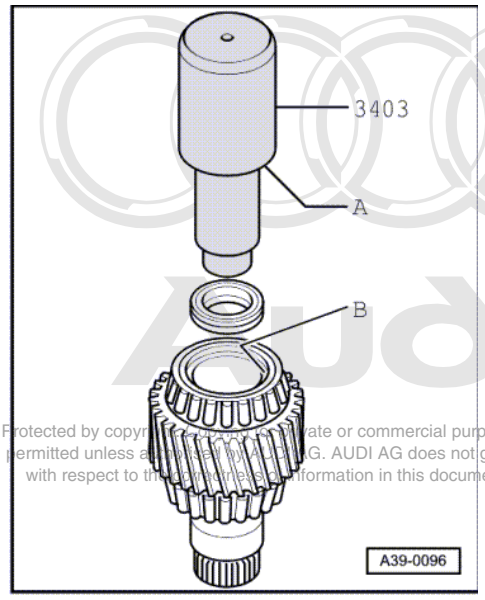
Special tools, testers and auxiliary equipment required



- Thrust pad 3403

Removing

- Remove transfer gear => Page 209
- Remove the intermediate flange for front axle drive
- Carefully pull input pinion off output shaft.



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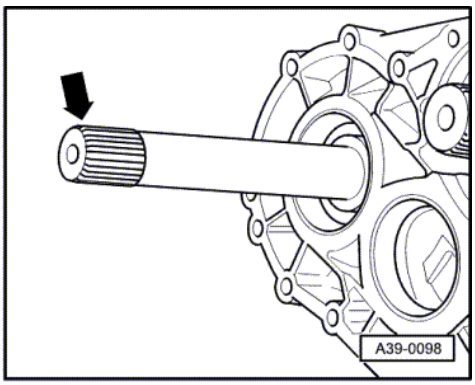
Important:
Spur gears which have fallen to the ground can no longer be installed. The gearbox must be changed in this case.

- Drive out sealing ring with drift

Installing

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

- -> Push the sealing ring onto the thrust pad 3403.
- Drive in sealing ring with the thrust pad 3403 up to the stop in thrust pad.



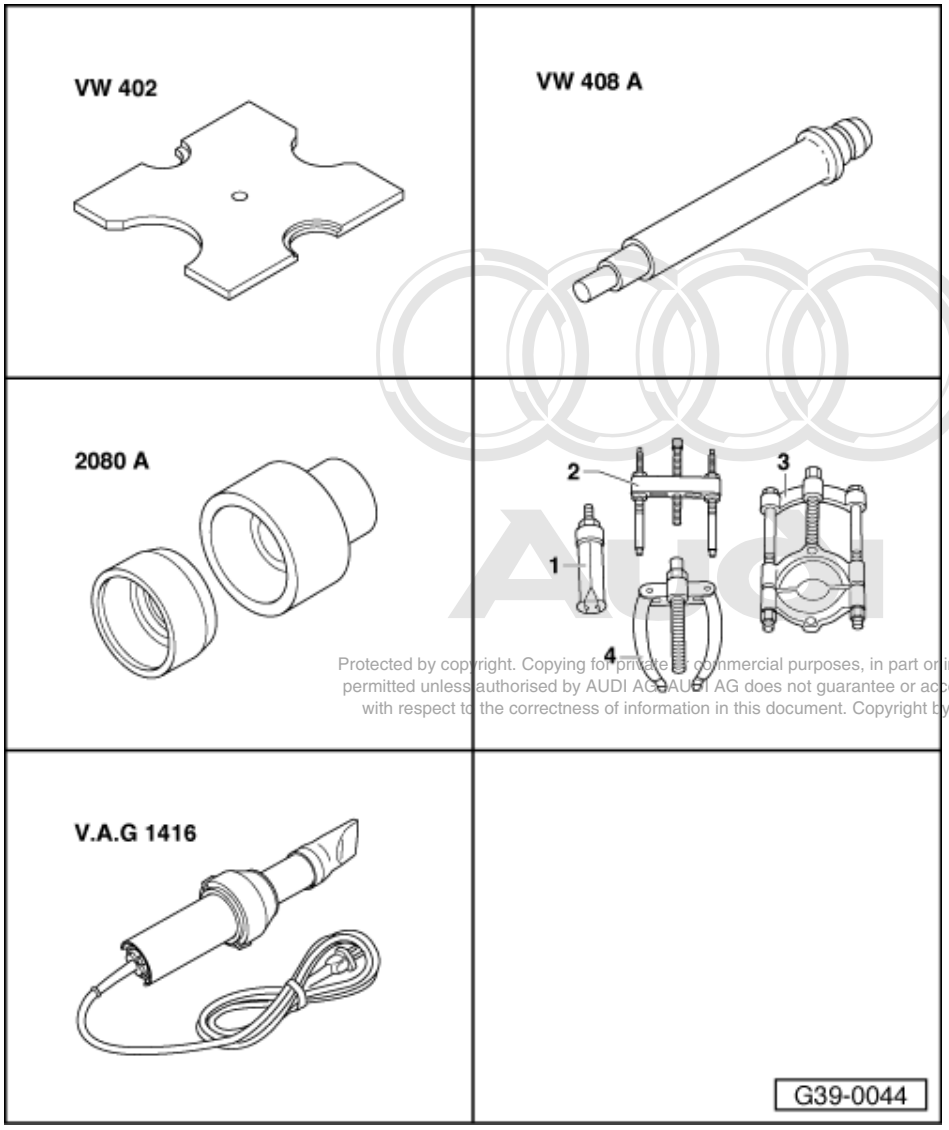
- -> Cover the entire toothed area at the end of the shaft -arrow A- with insulating tape, ensuring that the shaft is not jolted in the process and that there are no folds in the tape covering. This will prevent damage to the oil seal when the input pinion is pushed on.
- Fit input pinion centrally on output shaft (Installation position => Page 208)

Note:

If the input pinion is not fitted correctly, the sealing lips of the oil seal may be damaged.

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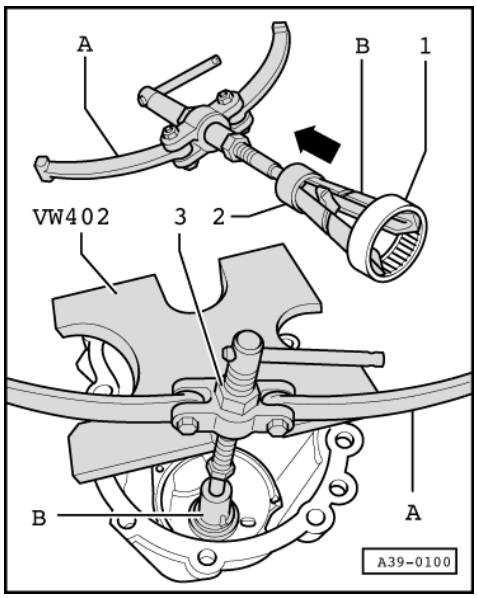
4.6 - Replacing needle bearing for spur gear 2



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Special tools, testers and auxiliary equipment required

- Thrust plate VW 402
- Press tool VW 408 A
- Inserting ring for sealing ring 2080 A
- -1- Internal puller Kukko 21/4
- -4- Counter support Kukko 22/1
- V.A.G 1416 Hot-air blower



Removing

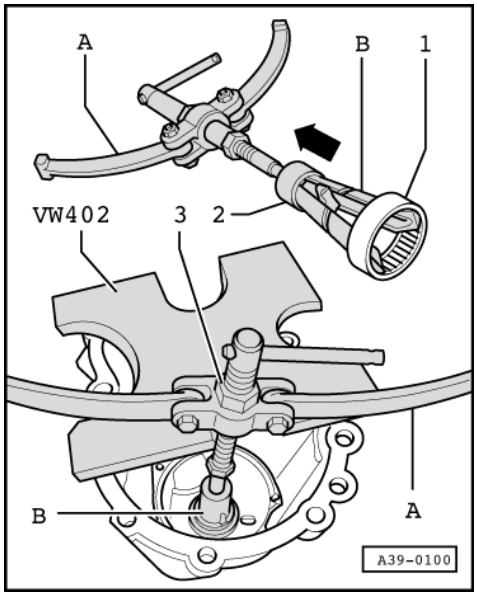
- Remove transfer gear => Page 209

Note:

-> The upper part of the illustration shows how the extractor hooks on internal puller -B- must be inserted in the needle bearing-1-.

- Move the centring sleeve -2- of internal puller -B- approx. 4 mm in the direction of the arrow to allow the extractor hooks of the internal puller to be opened wide enough.

  B - Support, e.g. Kukko 22/1



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- -> Open the internal puller -B- into the upper lip of the spur gear -1- and then tighten the internal puller using the nut.
- Set up support -A- on internal puller -B- as illustrated.
- Support counterhold -A- against thrust plate VW 402 and apply pretension with nut -3- of counterhold.
- Use a commercially available hot-air blower to quickly heat up the outside of the transfer gear housing (around the seat of the needle bearing) to between 80 and 100 °C.

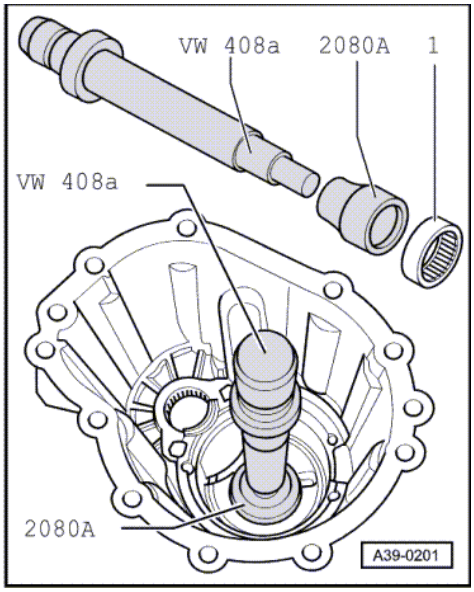
Important:
Wear protective gloves!

- Pull out needle bearing without delay.

Installing

Install in reverse order. The following steps must also be performed.

- Check the needle bearing seat in the transfer gear housing for damage and, if necessary, re-machine.
- Use a commercially available hot-air blower to quickly heat up the outside of the transfer gear housing (around the seat of the needle bearing) to between 80 and 100 °C.



Important:
Wear protective gloves!

- -> Attach puller sleeve 2080 A onto new needle bearing -1-.
- Drive in needle bearing with press tool VW 408 A until stop in transfer gear housing.

5 - Servicing propshaft

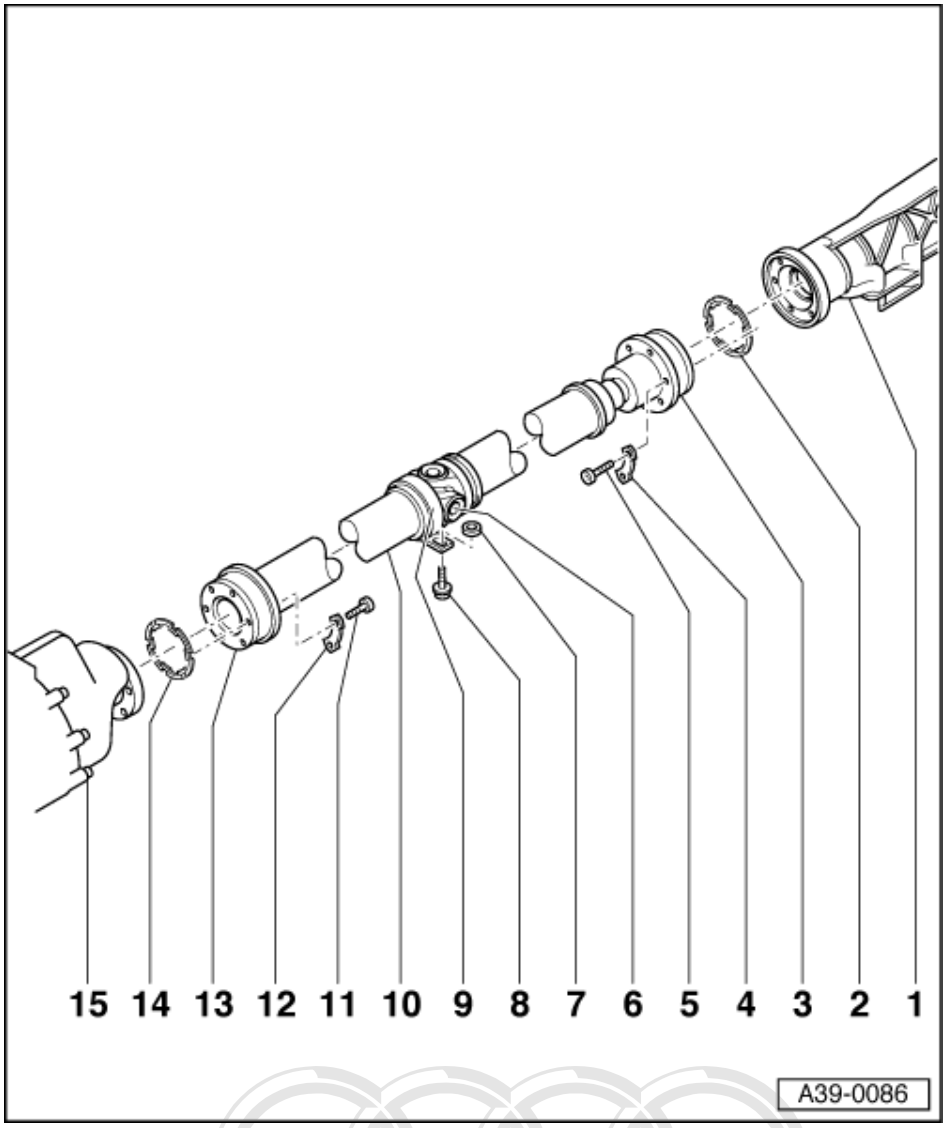
5.1 - Servicing propshaft

Notes:

- General repair instructions => Page 14 .
- Do not kink the propshaft - the maximum permissible bending angle is 25 °. The universal joint could otherwise be damaged.
- Only store and transport propshaft extended.
- No repair work can be carried out on the propshaft with the exception of removing, installing and adjusting.
- If the propshaft is only detached at the gearbox or from rear final drive then the propshaft is to be tied-up or supported at the constant velocity joint.
- Before removing, mark position of propshaft joint in relation to flange. Reinstall in the same positions otherwise the imbalance will be excessive; the bearings could be damaged and humming noises may occur.
- If complaints are received (noises, vibrations), it is essential to check whether correct adjustment of the propshaft rectifies the fault before replacing the propshaft.

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- After removing the propshaft from the rear final drive, the additional balance disc (thicker washer) that may be located between the lock plate and the bolt head must not be reinstalled.



1 **Rear final drive**

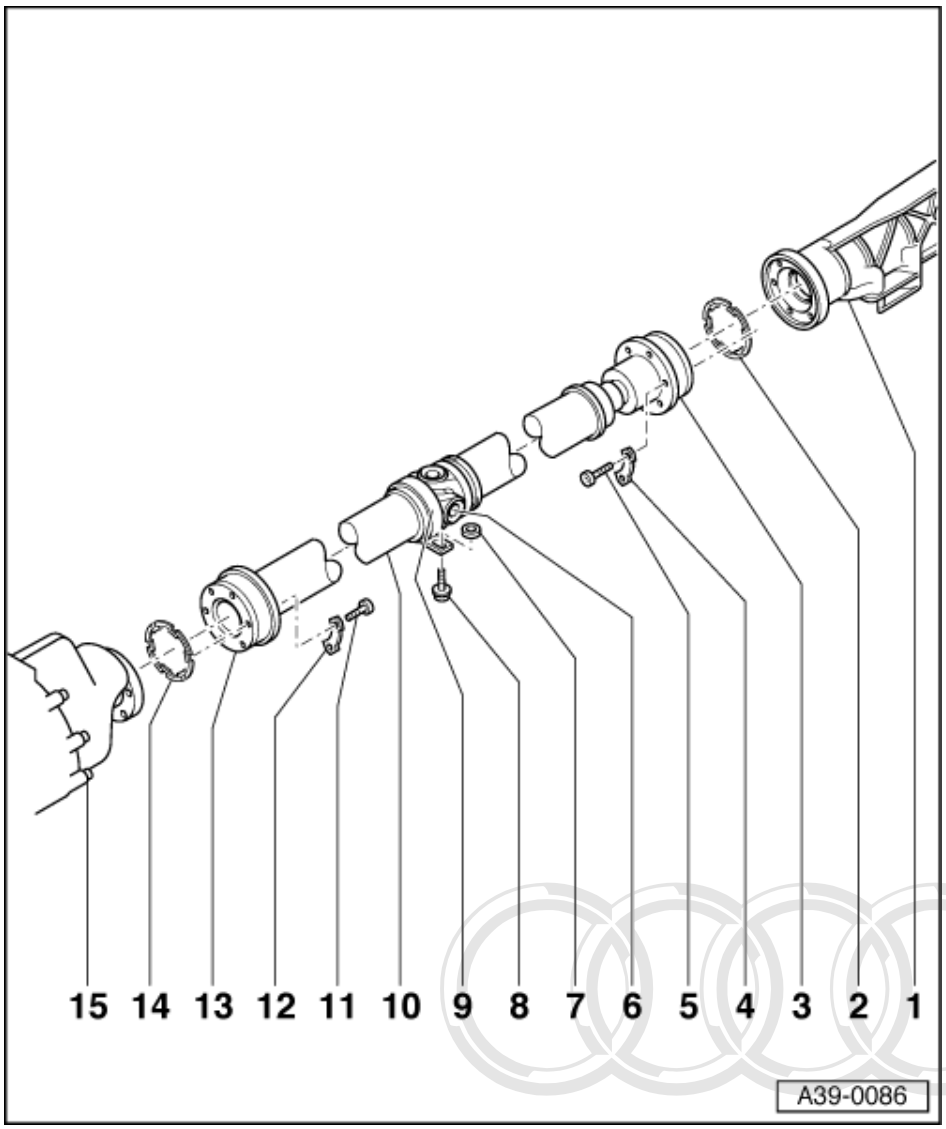
2 **Gasket**
- Replace
- Detach protective foil and stick self-adhesive side of the gasket onto flange shaft
- Degrease flange shaft

3 **Constant velocity joint**
- Max. permissible angle of deflection 8°

4 **Shim**

5 **Hexagon socket-head bolt**
- 55Nm
- Self-locking
- Replace
- Threads for bolts in flange shafts must always be cleaned (e.g. with a thread tap).

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6 Universal joint
- Max. permissible angle of deflection 25°

7 Adjustment shim
- Determining thickness =>Page 229 .

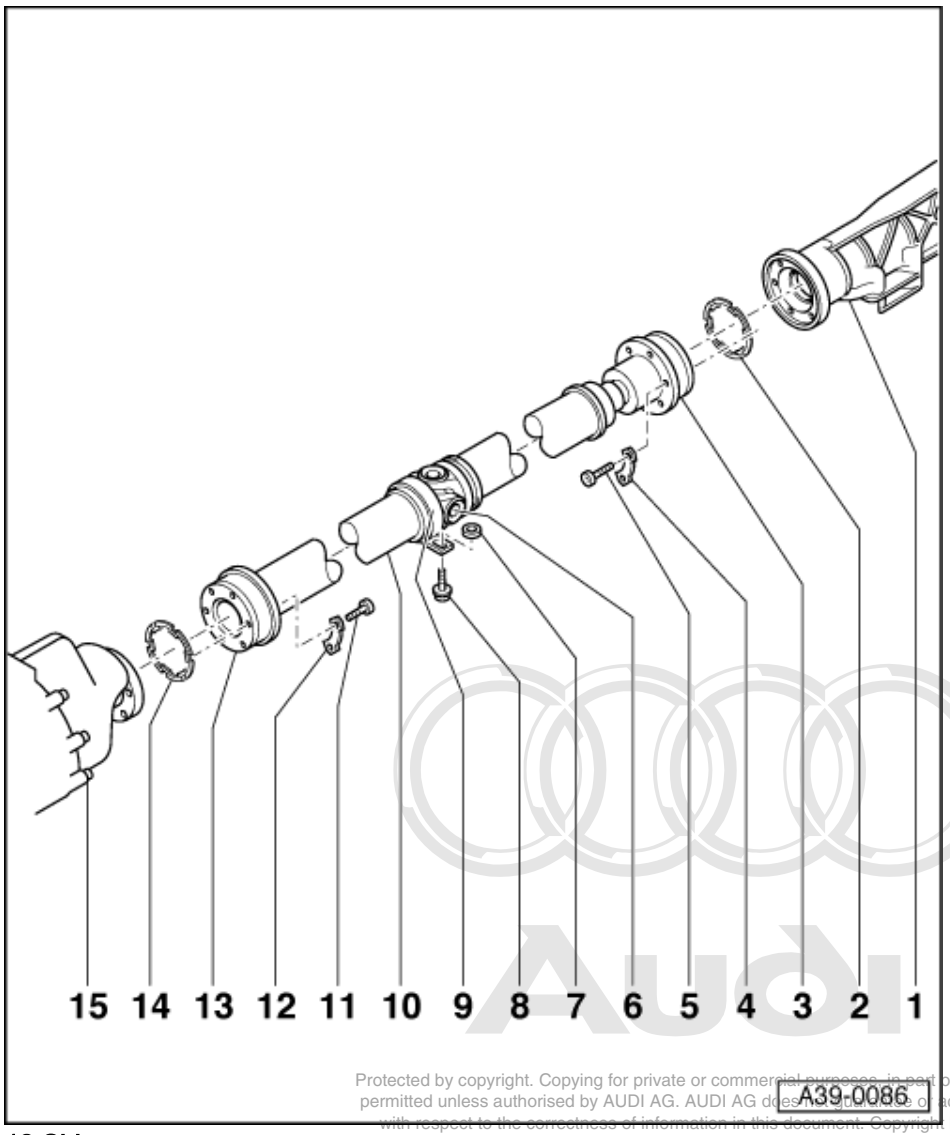
8 Hexagon bolt - 23 Nm

9 Propshaft centre mounting

10 Propshaft
- Adjusting => Page 228

11 Hexagon socket-head bolt - 55Nm
- Self-locking
- Replace
- Threads for bolts in flange shafts must always be cleaned (e.g. with a thread tap).

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12 Shim

13 Constant velocity joint

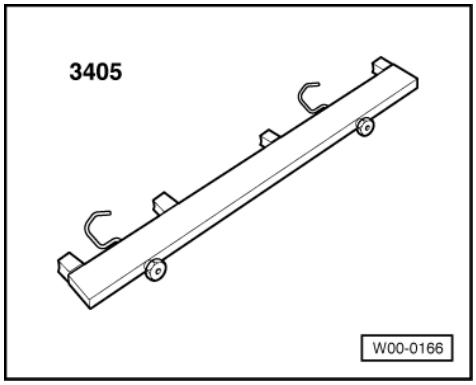
- Max. permissible angle of deflection 8°

14 Gasket

- Replace
- Detach protective foil and stick self-adhesive side of the gasket onto flange shaft
- Degrease flange shaft

15 Gearbox

5.2 - Removing and installing propshaft



Special tools, testers and auxiliary equipment required

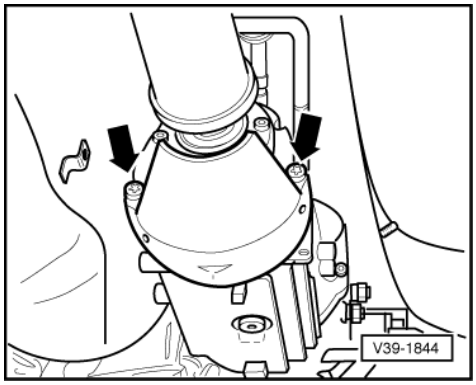
- Assembly tool 3405

- See notes => Page 221

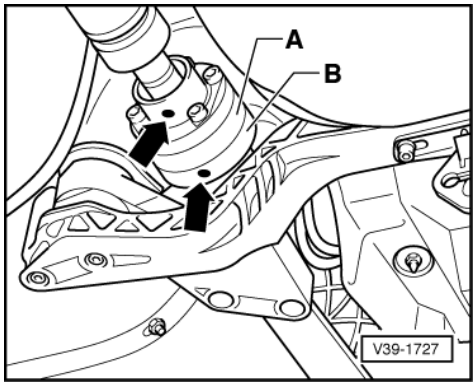
Removing

- Remove cross member, if fitted, underneath exhaust system.
- Remove front exhaust pipes.
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Remove rear part of exhaust system from clamp onwards to guarantee accessibility to propshaft:
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system

- Remove rear heat shield for propshaft.



- -> Remove heat shield for propshaft from cover for Torsen differential -arrows-.



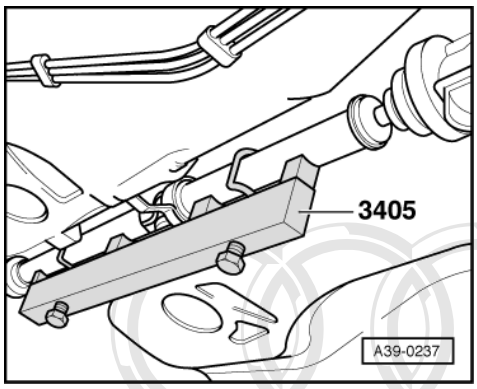
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- -> Check for presence of a factory mark (coloured dot -arrows-) at the propshaft and at the rear axle drive flange/propshaft. If there is no mark, make a coloured mark on rear axle drive -B- to indicate the position of propshaft flange -A-.

Note:

This marking is only required if same propshaft is to be re-installed later.

- Release fastening bolts for both propshaft flanges.
- Remove the three upper securing bolts from each constant velocity joint on the propshaft.
- Loosen securing bolts of centre propshaft mounting slightly.



- -> Engage assembly device 3405 and tighten plastic nuts.

Note:

Never fit assembly appliance onto balance plates.

- Remove securing bolts of flange to gearbox and to rear final drive as well as securing bolts of centre propshaft mounting.
- Slide propshaft together towards rear final drive. The constant velocity joints move along their axes.
- Guide out propshaft with assembly appliance past gearbox flange.

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Note:

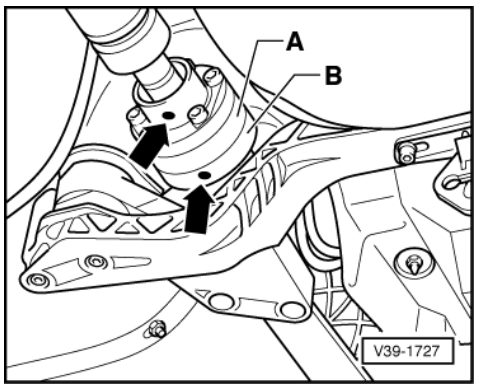
Only transport and store propshaft when extended.

Installing

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

Notes:

- It is essential that the locking fluid remaining in the threads in the flange shafts on the gearbox and rear final drive is cleaned out after removing the propshaft. Otherwise there is a danger that the new bolts will seize when they are screwed in and then shear if they have to removed later.
- The threaded holes can be cleaned with a thread tap.
- Renew gaskets on flange shafts (detach protective foil and stick gasket onto flange shaft). The adhesive surface must be free of grease.



- -> To prevent imbalance, install flanges of propshaft -A- and rear final drive -B- in such a way that the factory markings (or coloured markings made on removal) are in a line -arrows-.

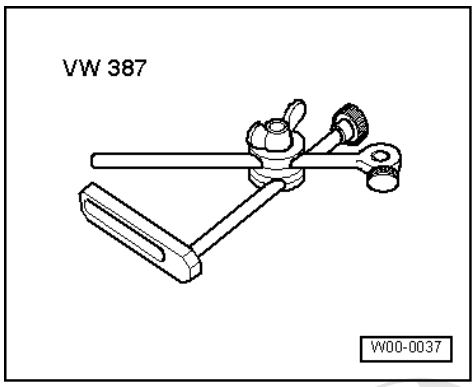
- If a new propshaft is installed and if the factory colour marking on the flange of the rear final drive is no longer visible the radial run-out on the propshaft flange must be measured => Page 227 and the colour marking on the propshaft placed in line with the new marking on the flange.
- After removing the propshaft from the rear final drive, the additional balance disc (thicker washer) that may be located between the lock plate and the bolt head must not be reinstalled.
- Replace propshaft bolts (self-locking).

- After installation adjust propshaft
  =>Page 228 .
- Stress-free alignment of exhaust system:
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system

Tightening torques

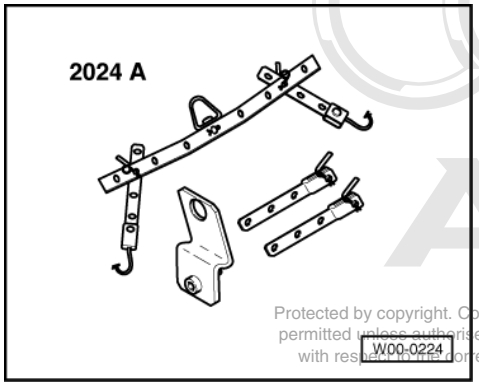
Component	Nm
Propshaft to gearbox (Drive flange)	55
Propshaft to final drive (input flange)	55
Propshaft centre mounting to body	23
Heat shield for propshaft to gearbox	23
Cross member to body	25
Nuts for clamp	40

5.3 - Measuring and marking radial run-out at propshaft flange



Special tools, testers and auxiliary equipment required

- Universal dial gauge retainer VW 387



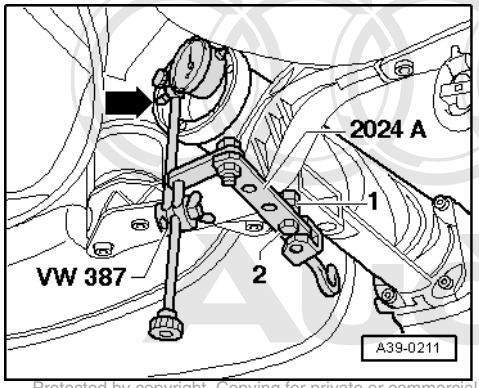
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- Lifting tackle 2024 A
- Dial gauge
- Bolt M10 x 85

Notes:

- It is always necessary to measure radial run-out when thrust tube has been removed. Affix a new coloured dot and remove the old colour marking.
- If a new propshaft is installed and if the marking on the flange shaft of the rear final drive is no longer visible the position of maximum radial run-out must be determined and marked by a coloured dot.
- The coloured dot on the propshaft is positioned opposite the above coloured dot => Page 226 .
- The radial run-out can be measured when rear final drive is installed but the propshaft must be disconnected at rear final drive. See notes => Page 221

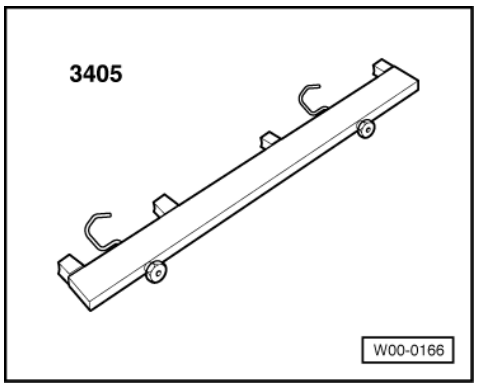
- Remove bolt on front left of rear gearbox support.



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- -> Remove lug from lifting appliance 2024 A and secure it at free hole with an M10 x 85 mm bolt -2-. Use approx. 5 M12 nuts -1- as spacers.
- Secure dial gauge bracket VW 387 to lug when it is secured in position.
- Position dial gauge on ground diameter in propshaft flange -arrow- and set to "0" with 1 mm preload.
- Rotate the differential by turning the two rear wheels (left and right flange shafts) simultaneously in one direction until the propshaft flange has undergone one complete revolution.
- Mark the position of greatest radial run-out on flange exterior by a coloured dot (equates to greatest distance from rotational axis).
- Remove old marking from propshaft flange.
- Install propshaft => Page 226 .

5.4 - Adjusting propshaft



Special tools, testers and auxiliary equipment required

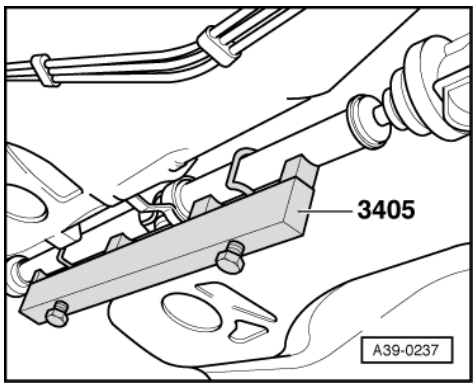
- Assembly tool 3405

- See notes => Page 221

Adjustments must be carried out with the greatest care and attention since a poorly adjusted propshaft is often the cause of vibration and humming.

- Remove cross member, if fitted, underneath exhaust system.
- Remove rear part of exhaust system from clamp onwards to guarantee accessibility to propshaft:
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Remove heat shield above propshaft.

- Loosen securing bolts of centre propshaft mounting slightly.

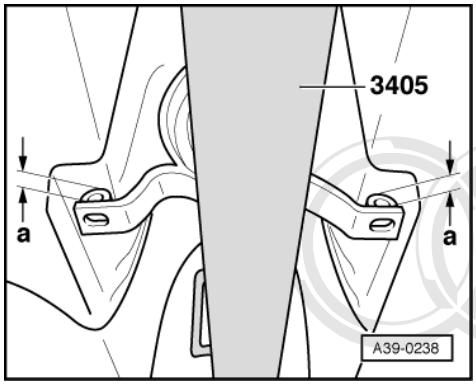


- -> Engage assembly device 3405 and tighten plastic nuts.

Note:

Never fit assembly appliance onto balance plates.

- Remove securing bolts and shims from centre mounting.



- -> Align centre propshaft mounting so that the dimension -a- on left side is the same as dimension -a- on right side.
- Measure the distances -a-.
- Select required shims from table. Part numbers

=> Parts List

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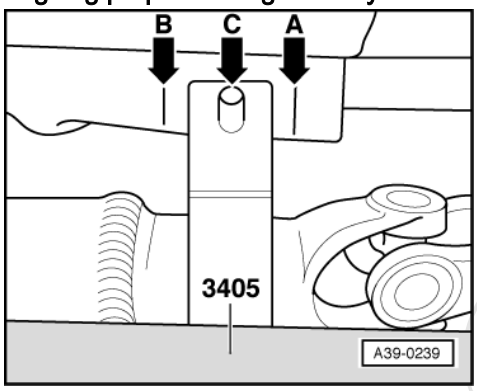
The following shims are available

Distance -a- (mm)	Shim thickness (mm)
0 ... 3.0	-
3.1 ... 5.0	2
5.1 ... 7.0	4
7.1 ... 9.0	6
9.1 ... 11.0	8

Distance -a- (mm)	Shim thickness (mm)
11.1 ... 13.0	10

- Install correct shims on left and right.

Aligning propshaft longitudinally



- -> Slide propshaft with assembly device to rear up to stop.
- Mark position of centre mounting on body -arrow A-.
- Push the propshaft with the assembly device forward as far as it will go.
- Mark position of centre mounting on body -arrow B-.
- Align propshaft -arrow C-.
  - The centre mounting must be positioned centrally between the markings -A- and -B-
- Install securing bolts of propshaft centre mounting and previously determined shims and tighten.
- Remove assembly device.
- Install heat shield above propshaft.

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The remaining installation steps are carried out in the reverse sequence - note the following points:

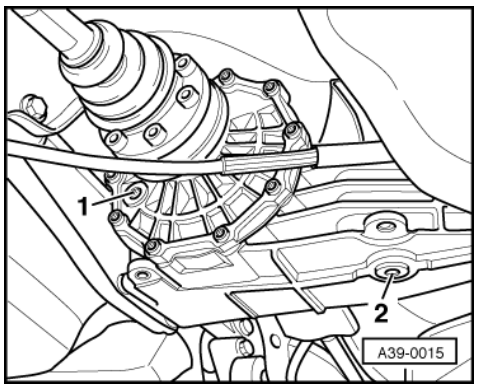
- Stress-free alignment of exhaust system.
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system

Tightening torques

Component	Nm
Propshaft centre mounting to body	23
Cross member to body	25
Nuts for clamp	40

6 - Checking gear oil level in rear final drive

6.1 - Checking gear oil level in rear final drive



- -> Remove oil filler plug -1- to check final drive oil level.
  - Specified value: oil level up to lower edge of filler hole
- Top up with gear oil, if necessary: Specification =>Page 13 .
- Fit oil filler plug.

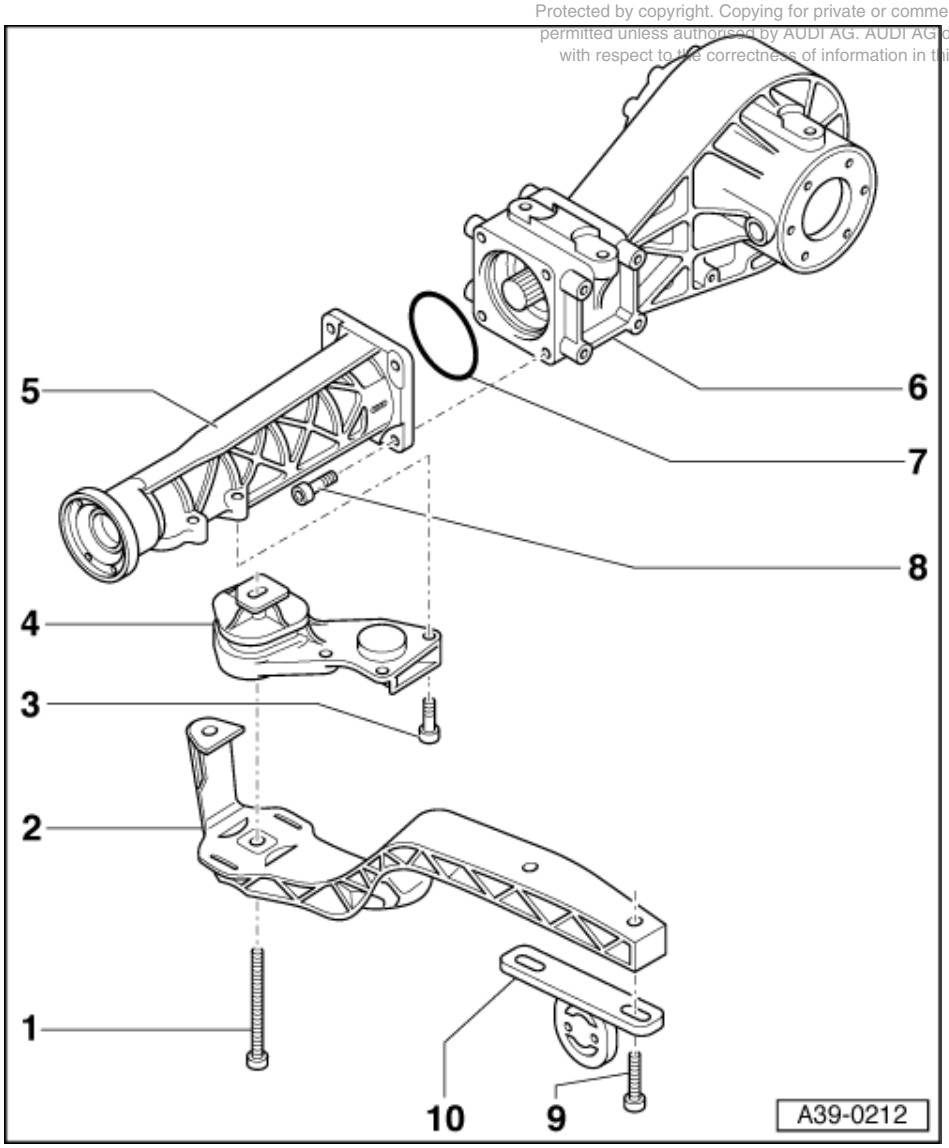
Tightening torque

Component	Nm
Oil filler plug	35

7 - Removing and installing thrust tube

7.1 - Removing and installing thrust tube

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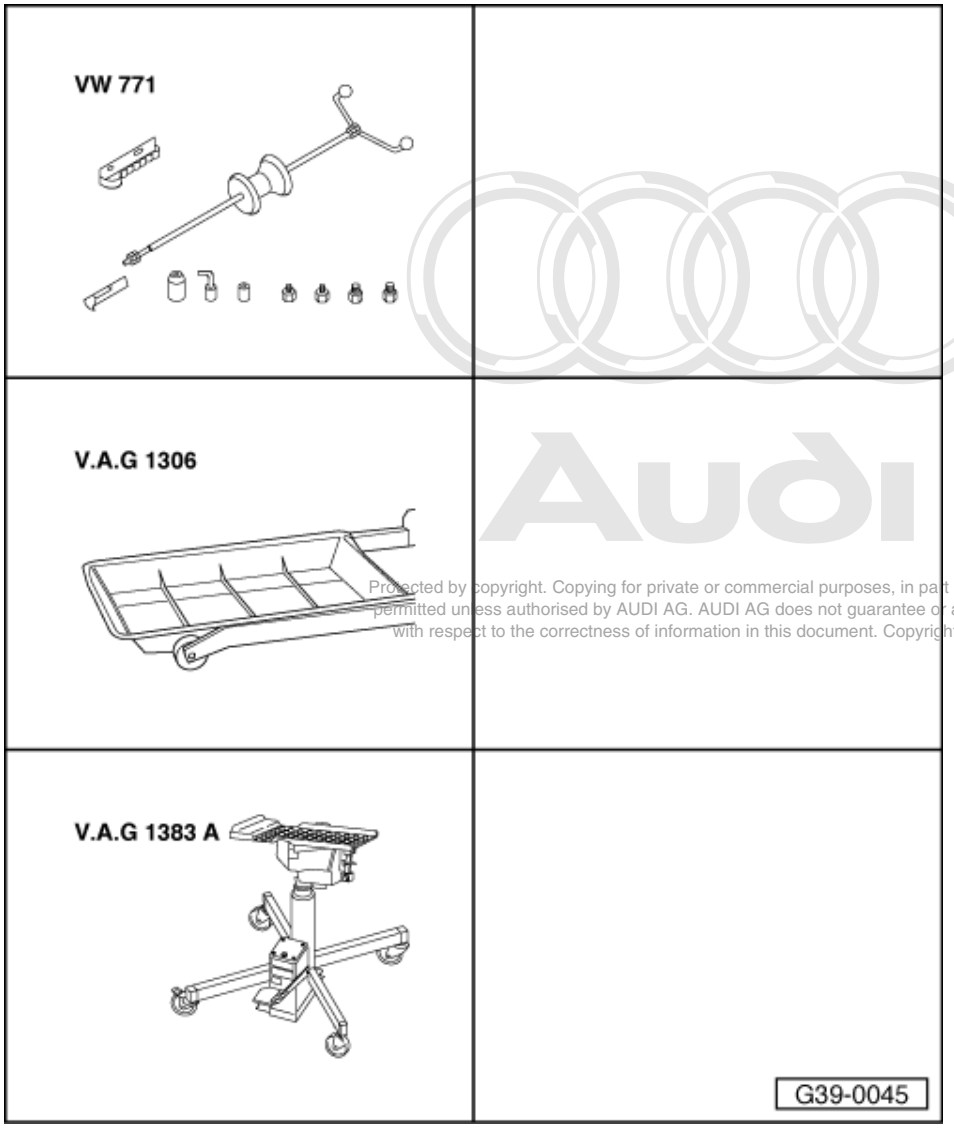


7.2 - Assembly overview

1 Release and tighten bolt -40 Nm
2 Front cross member

3 Release and tighten bolt -40 Nm
4 Final drive support
5 Thrust tube
6 Housing of rear final drive
7 O-ring
8 Release and tighten bolt -35 Nm
9 Release and tighten bolt -23 Nm
10 Bracket
- For exhaust system

7.3 - Removing



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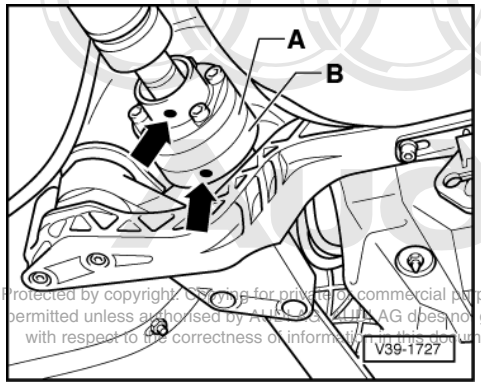
- Rear final drive installed

Special tools, testers and auxiliary equipment required

- Multi-purpose tool VW 771 with 771/15
- Drip tray V.A.G 1306
- Engine/gearbox lifter

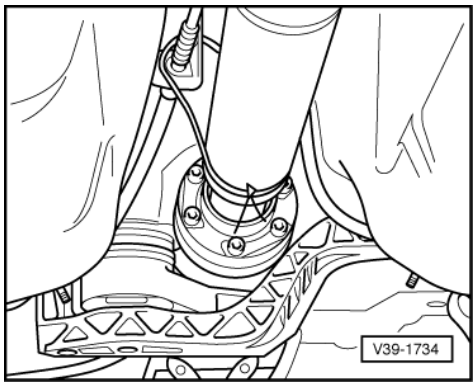
V.A.G 1383 A

- Place drip tray V.A.G 1306 underneath and drain gearbox oil.
- Remove rear section of exhaust system as from clamp(s):
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Remove heat shield above propshaft.



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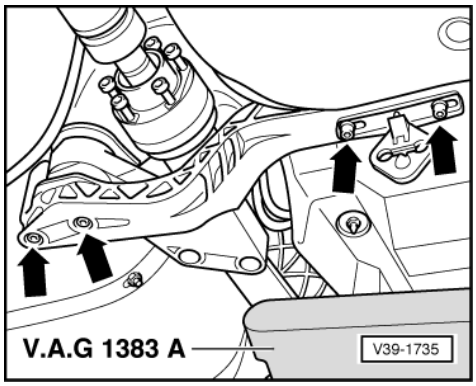
- Remove heat shield next to rear final drive.
- -> Check whether there is a factory marking (paint dot) on propshaft. If there is no mark, make a coloured mark on rear axle drive -B- to indicate the position of propshaft flange -A-.
- Unscrew fastening bolts for propshaft flange.



- -> Secure propshaft to handbrake cable bracket with wire.

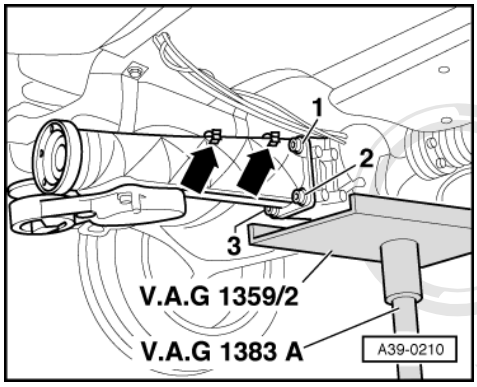
Note:

If it is not possible to push propshaft up and off flange, lower final drive before tying up propshaft. When lowering final drive, prevent propshaft from dropping down, and do not bend centre joint further than maximum angle permitted => notes on Page 221 .



- Support final drive with gearbox lifter V.A.G 1383 A.
- -> Unscrew bolts -arrows- from front of cross member for rear axle drive.

- Detach front cross member.

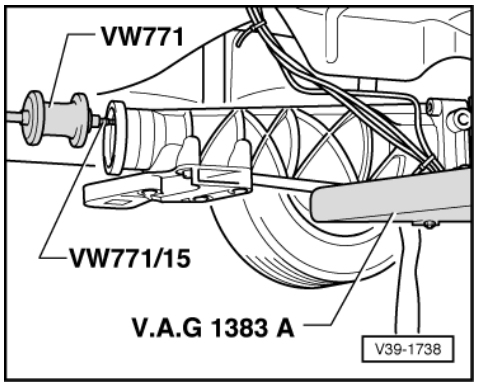


- Lower final drive about 10 cm.
- -> Unscrew 4 bolts for thrust tube -1 ... 3-

Note:

Fourth bolt is not visible in illustration.

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- -> Pull off flange shaft with thrust tube.

7.4 - Installing

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

Notes:

- It is essential that the locking fluid remaining in the threads in the flange shafts on the gearbox and rear final drive is cleaned out after removing the propshaft. Otherwise there is a danger that the new bolts will seize when they are screwed in and then shear if they have to removed later.
- The threaded holes can be cleaned with a thread tap.
- Replace gasket between propshaft and drive flange (remove protective sheet and bond gasket to flanged shaft). The adhesive surface must be free of grease.
- Replace propshaft bolts (self-locking).

- If there is a factory marking on the propshaft adjust the radial run-out on the propshaft flange=>Page 227 and place the colour marking on the propshaft in line with the new marking on the flange.

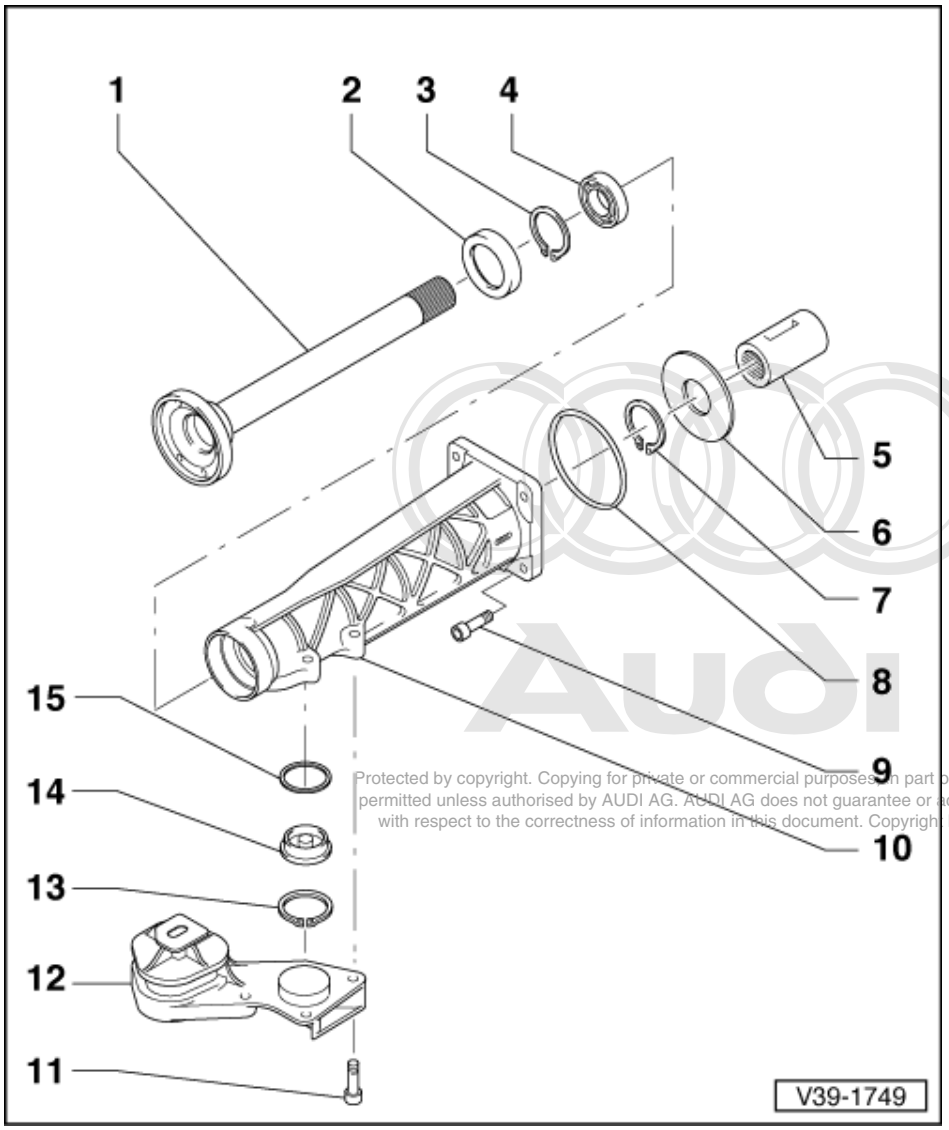
- Stress-free alignment of exhaust system:
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Top-up gear oil in rear final drive and check oil level => Page 230 .

Tightening torques

Component	Nm
Thrust tube to rear final drive	35
Propshaft to final drive (input flange)	55
Front cross member for rear final drive to body	40
Front cross member for rear final drive with exhaust system bracket to body	23
Oil filler plug	35
Nuts for clamp	40

8 - Dismantling and assembling thrust tube - assembly overview

8.1 - Dismantling and assembling thrust tube - assembly overview



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Note:

Removing and installing thrust tube
=>Page 231 .

1 Flange shaft

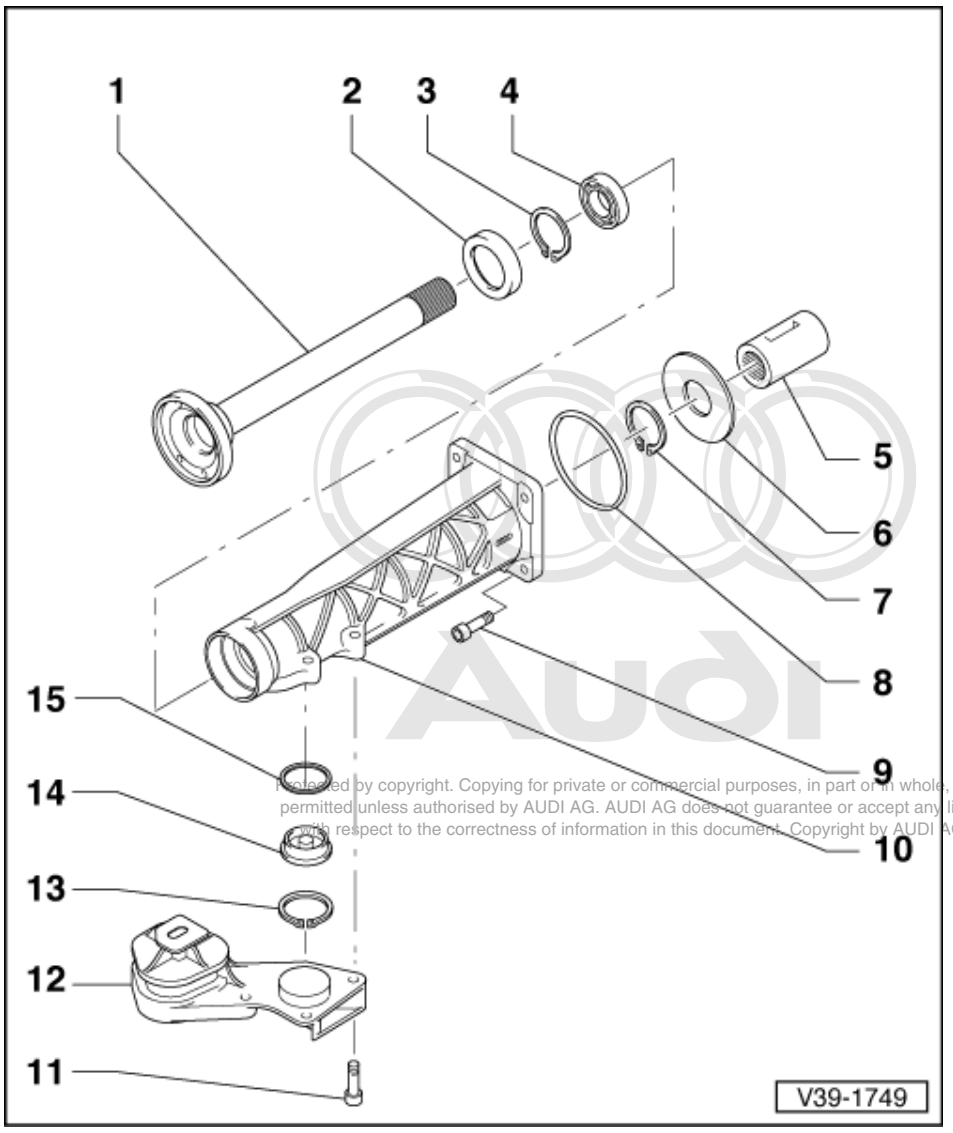
- Removal => Page 240
- When installing flange shaft, circlip - 243 .

2 Sealing ring

- Levering out => Page 241
- Driving in => Page 242

3 Circlip

- Removal => Page 241



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4 Grooved ball bearing for flange shaft

- Removing => Page 241
- Pressing in =>Page 242

5 Sleeve

- Pulling off => Page 240
- Pressing on =>Page 243

6 Baffle plate

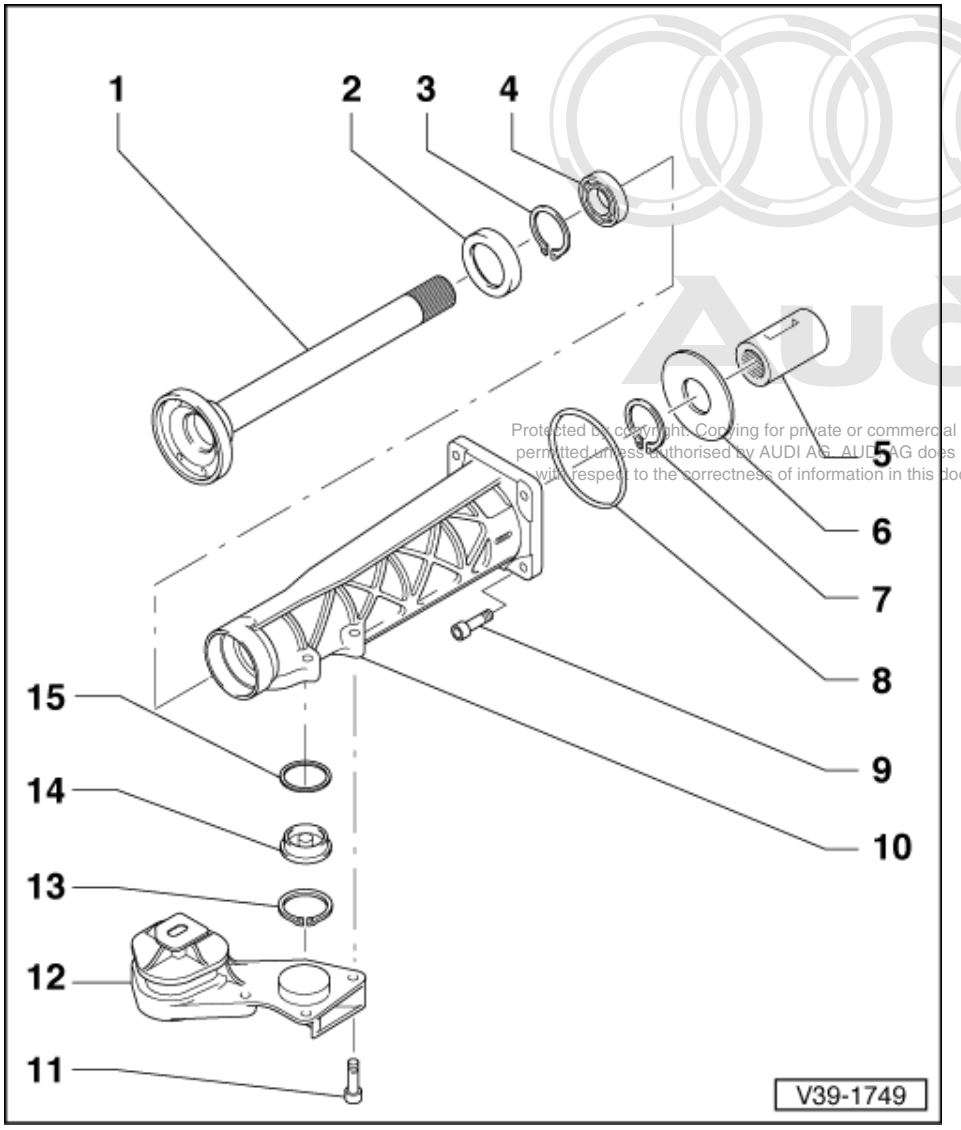
- Press out only if damaged
- Installing => Page 242

7 Circlip

- To remove flange shaft, open out circlip => Page 240

8 O-ring
- Replace

9 Release and tighten bolt -35 Nm
- Secures thrust tube to rear final drive housing



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10 Thrust tube

11 Release and tighten bolt -40 Nm
- Secures gearbox support to thrust tube

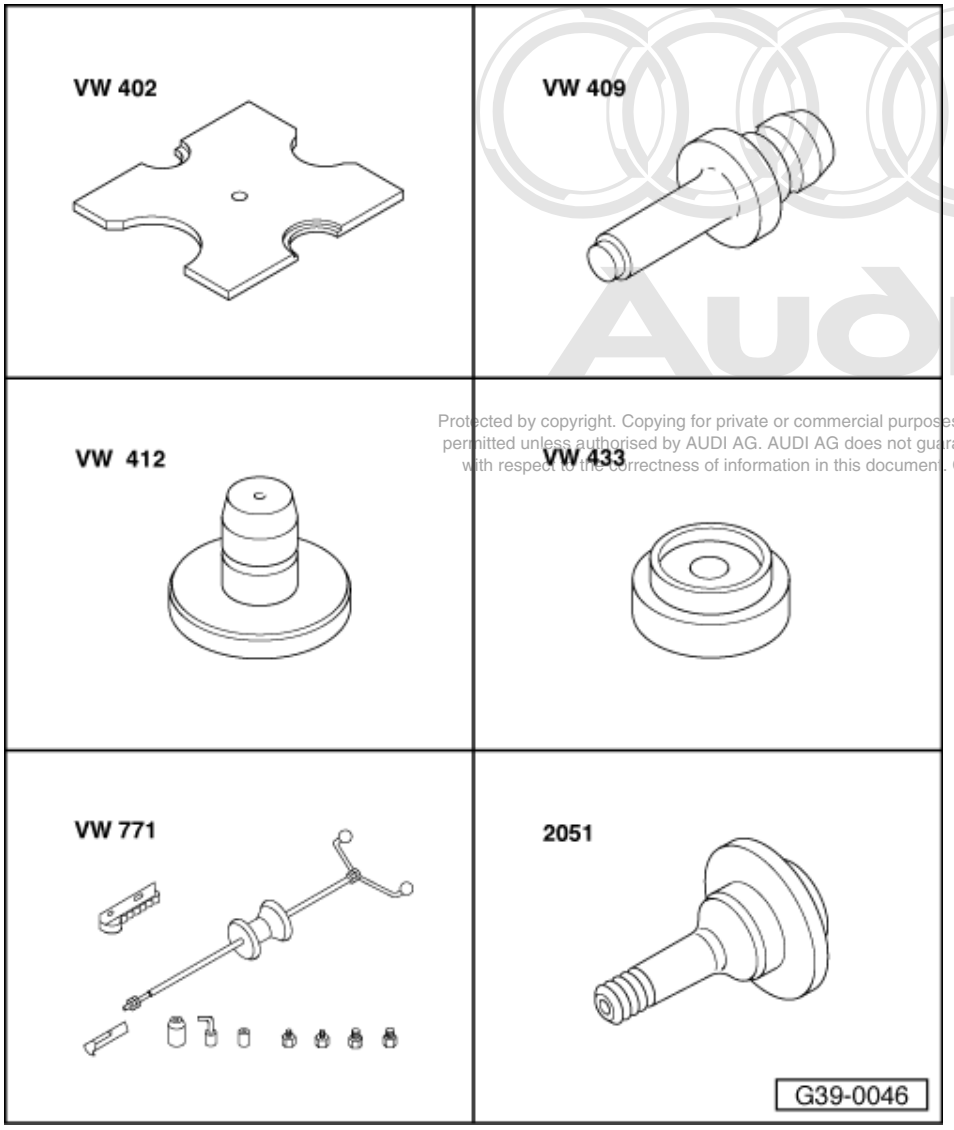
12 Final drive support

13 Circlip
- Removal => Page 240

14 Trim cap
- Removal => Page 240

15 O-ring
- Replace

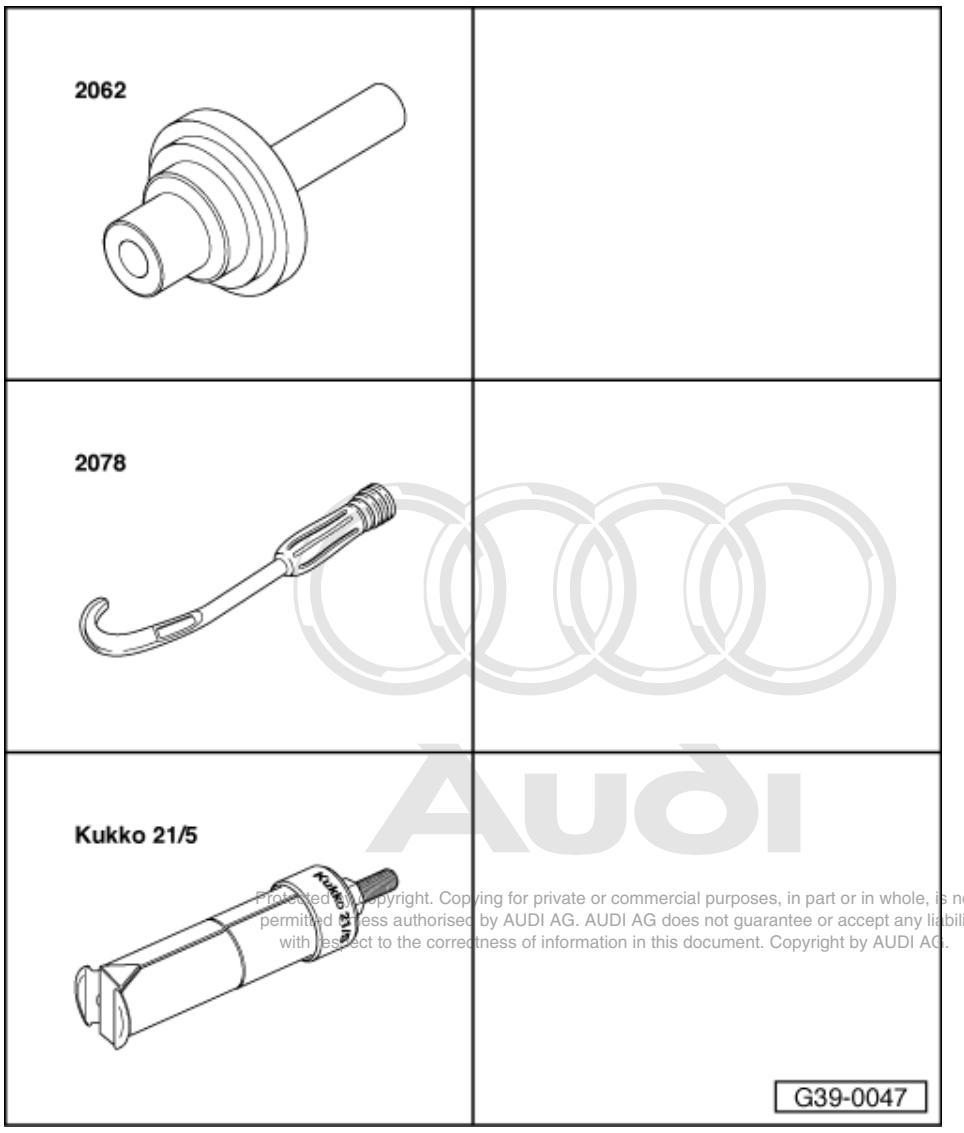
8.2 - Dismantling and assembling thrust tube



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Special tools, testers and auxiliary equipment required

- Thrust plate VW 402
- Press tool VW 409
- Press tool VW 412
- Thrust pad VW 433
- Multi-purpose tool VW 771 with 771/15
- Fitting drift 2051

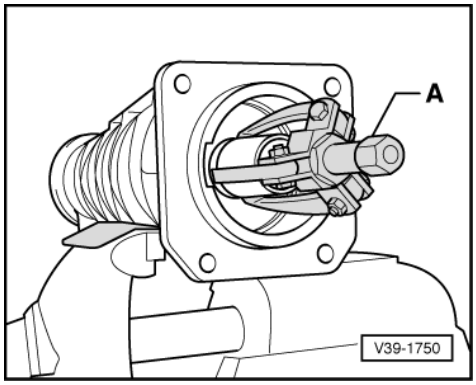


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- Fitting drift 2062
- Bucket tappet compressor2078
- Internal puller Kukko 21/5

Note:

Removing and installing thrust tube => Page 231

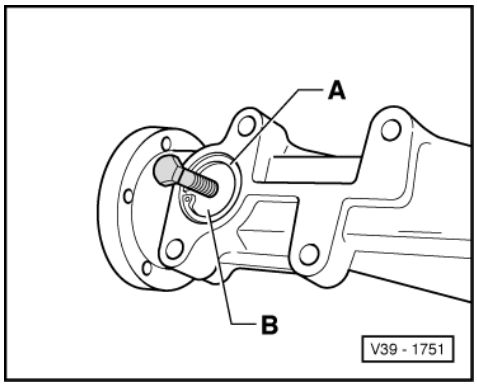


Dismantling

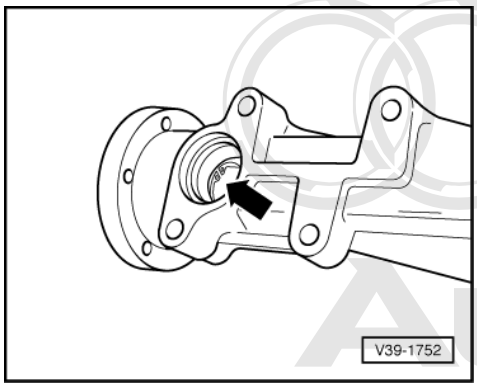
- Clamp thrust tube in vice using soft jaws.
- -> Pull off sleeve.

A - Internal puller 30 ... 37 mm, e.g. Kukko 21/5

- Detach gearbox support

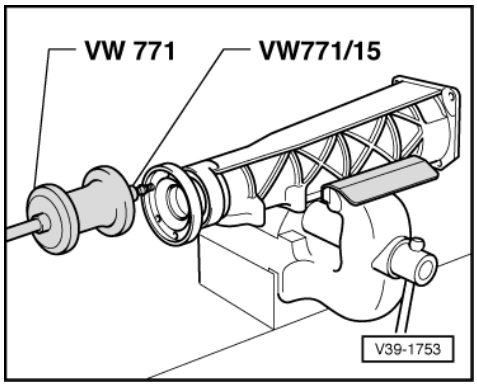


- -> Remove circlip -A-.
- Screw M8 bolt into thread in cover cap -B- and pull out cover cap.



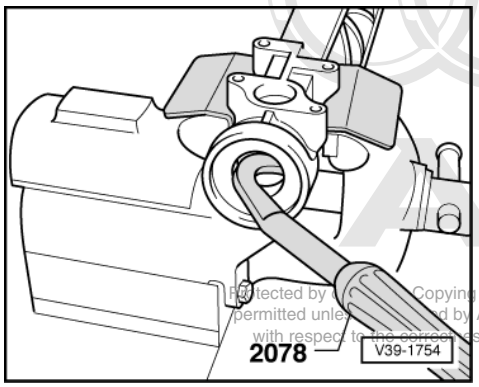
- -> Open out circlip -arrow- on flange shaft and push circlip towards splines.

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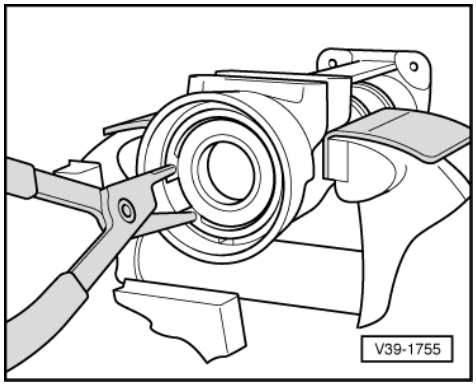


- -> Remove flange shaft.
- Take circlip out of thrust tube.

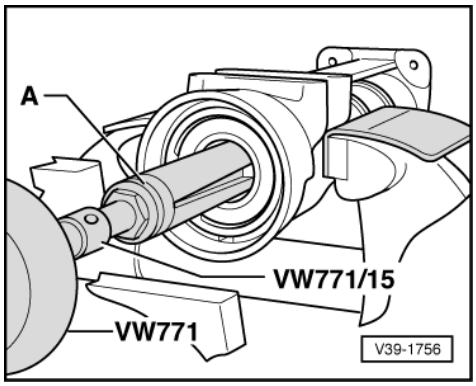
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- -> Lever out seal.



- -> Remove circlip.



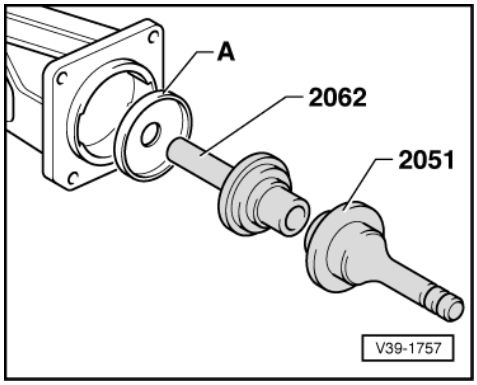
- -> Pull out grooved ball bearing for flange shaft.

A - Internal puller 30 ... 37 mm, e.g. Kukko 21/5

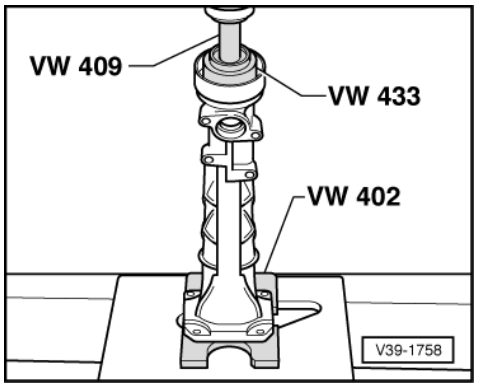
Note:

Removal causes damage to bearing.

Only if baffle plate is damaged:



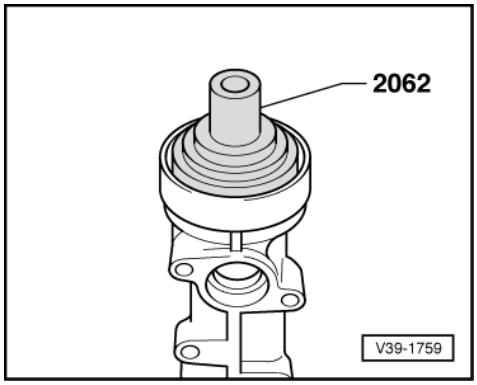
- If baffle plate is damaged, press it out with flange shaft.
- -> To install, drive in baffle plate -A- up to stop.



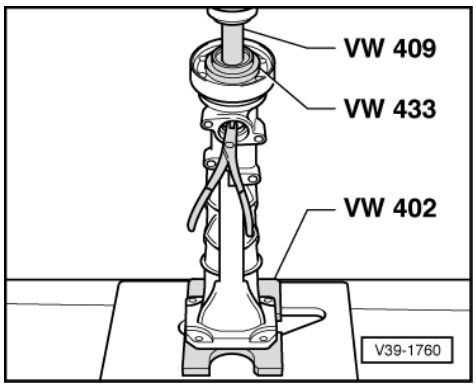
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Assembling

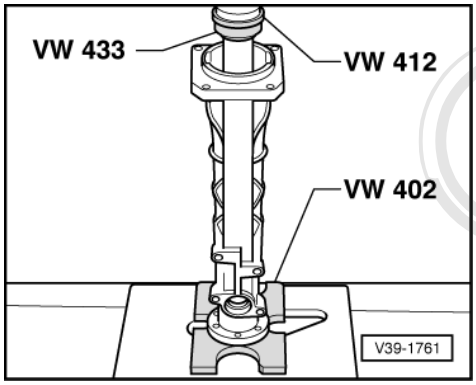
- -> Press grooved ball bearing into thrust tube.
- Fit outer circlip.



- Pack space between sealing lip and dust lip of seal with multi-purpose grease.
- -> Drive in seal as far as stop.



- -> Insert inner circlip in thrust tube and hold in position with pliers; press in flange shaft.
- Insert circlip in groove.

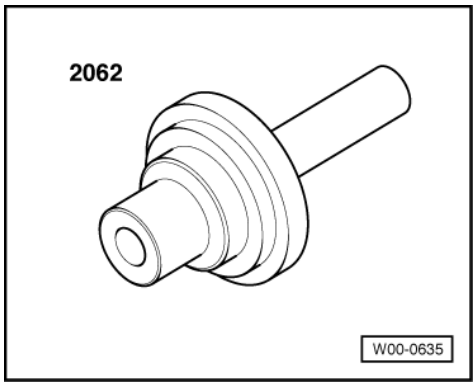


- -> Press sleeve onto flange shaft as far as stop.
- Install cover cap with seal.
- Fit circlip.
- Install gearbox support.
- Fit O-ring on thrust tube

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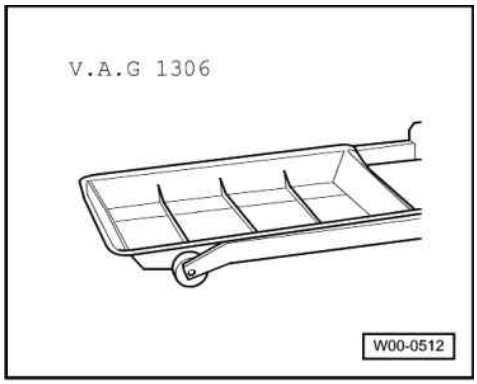
9 - Replacing flange shaft oil seals

9.1 - Replacing flange shaft oil seals

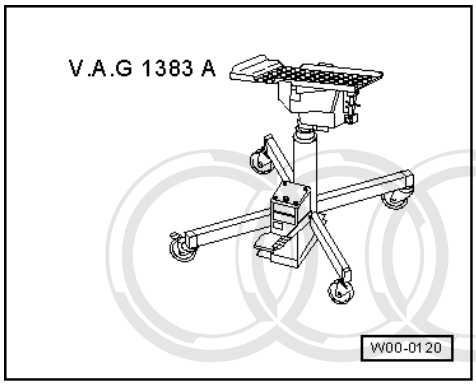


Special tools, testers and auxiliary equipment required

- Fitting drift 2062



- Drip tray V.A.G 1306



- Engine/gearbox lifter V.A.G 1383 A

Removing

- Rear final drive installed

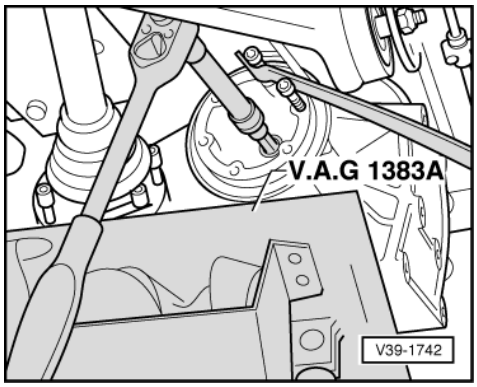
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- Observe general repair instructions =>Page 14 .

Note:

The exhaust system must only be removed when the left sealing ring is replaced.

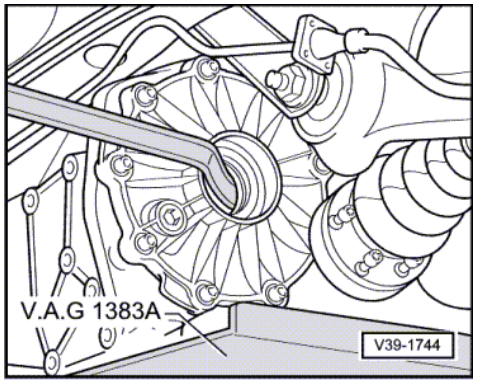
- Remove rear section of exhaust system as from clamp(s):
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system



- Release drive shafts on left or right of final drive and put aside:

=> Running Gear, Front and Four-wheel Drive; Repair group 42; Arrangement of Rear Axle Components (vehicles with 4WD); Removing and installing drive shaft Arrangement of Rear Axle Components (vehicles with 4WD) Removing and installing drive shaft

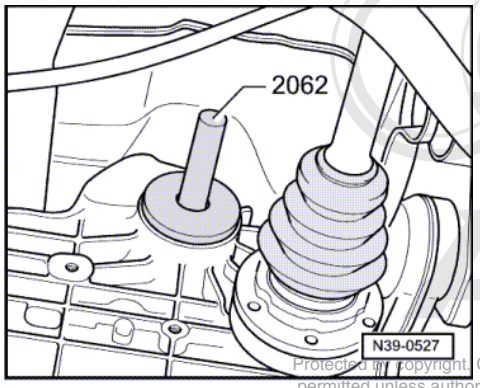
- -> Remove flange shaft. To loosen the securing bolt, screw two bolts into the flange shaft and counter-hold with a lever.



- Place drip tray V.A.G 1306 underneath and drain gearbox oil.
- Pull out flange shaft using the bolts already screwed in.
- -> Lever out flange shaft oil seals using a suitable lever.

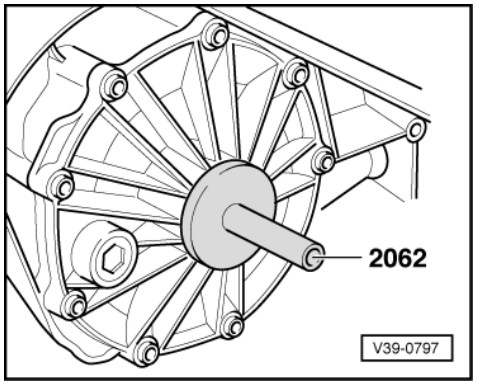
Installing

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



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- Clean seat for oil seal.
- Coat outer circumference of seal with gear oil.
- Fill space between sealing and dust lips with multipurpose grease.
- -> Drive in oil seal for right flange shaft up to stop with drift 2062; do not cant seal.



- -> Drive in oil seal for right flange shaft up to stop with drift 2062; do not cant seal.

- Bolt on drive shaft

=> Running Gear, Front and Four-wheel Drive; Repair group 42; Arrangement of Rear Axle Components (vehicles with 4WD); Removing and installing drive shaft Arrangement of Rear Axle Components (vehicles with 4WD) Removing and installing drive shaft

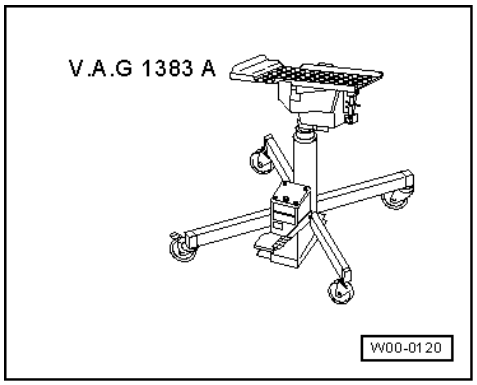
- Stress-free alignment of exhaust system:
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Top-up gear oil in rear final drive and check oil level => Page 230 .

Tightening torque

Component	Nm
Flange shaft on final drive	25

10 - Removing and installing rear final drive

10.1 - Removing and installing rear final drive



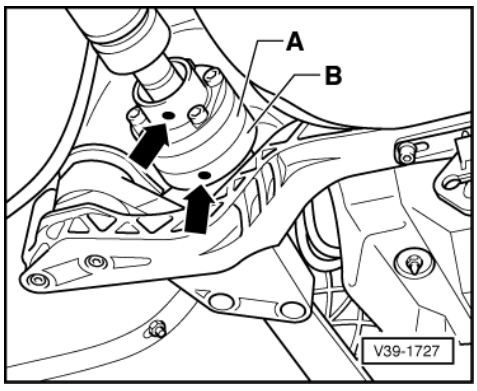
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Special tools, testers and auxiliary equipment required

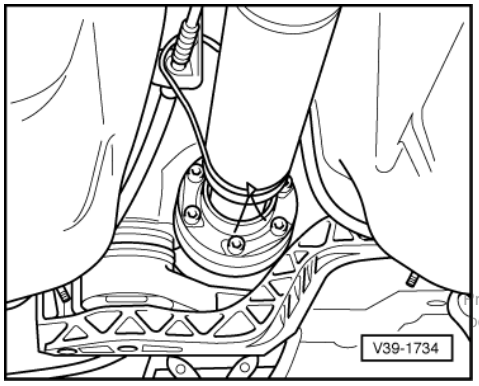
- Engine/gearbox lifter V.A.G 1383 A

Removal

- Remove rear section of exhaust system as from clamp(s):
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system
- Remove heat shield above propshaft.



- -> Check whether there is a factory marking (paint dot) on propshaft. If there is no mark, make a coloured mark on rear axle drive -B- to indicate the position of propshaft flange -A-.
- Unscrew fastening bolts for propshaft flange.



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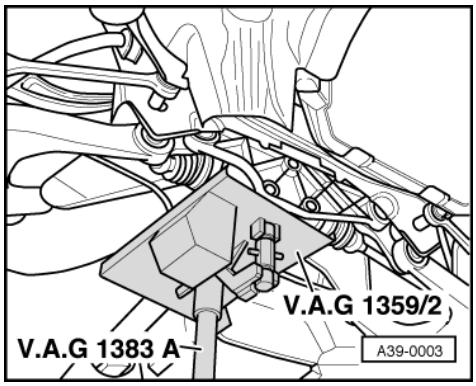
- -> Secure propshaft to handbrake cable bracket with wire.

Note:

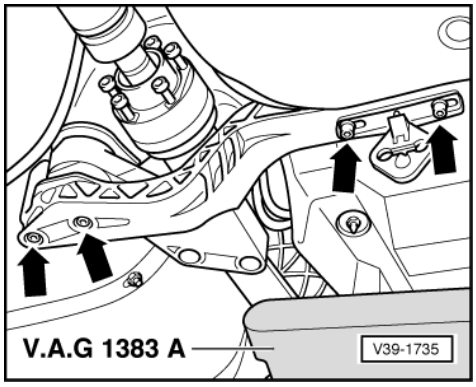
If it is not possible to push propshaft up and off flange, lower final drive before tying up propshaft. When lowering final drive, prevent propshaft from dropping down, and do not bend centre joint further than maximum angle permitted => notes on Page 221 .

- Detach left and right drive shafts from rear final drive

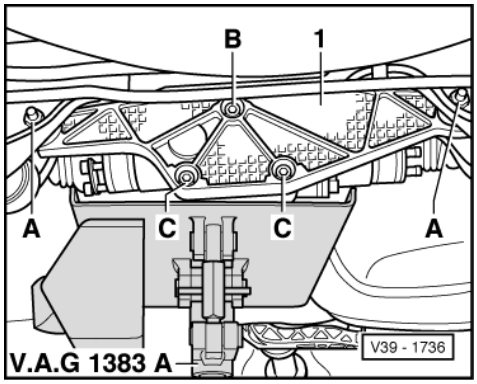
=> Running Gear, Front and Four-wheel Drive; Repair group 42; Arrangement of Rear Axle Components (vehicles with 4WD); Removing and installing drive shaft Arrangement of Rear Axle Components (vehicles with 4WD) Removing and installing drive shaft



- -> Support axle drive with gearbox lifter V.A.G 1383 A and universal mount V.A.G 1359/2.
- Secure final drive with strap.



- -> Unscrew bolts -arrows- from front of cross member for rear axle drive.
- Detach front cross member.



- -> Unscrew securing bolts -B- and -C- of rear cross member on rear final drive.
- Lower final drive with gearbox jack.

Note:

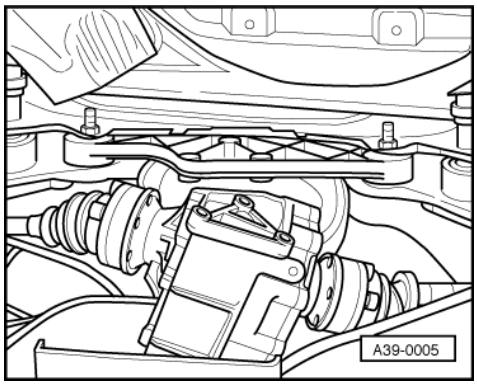
The cross member -1- need not be removed.

Installing

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

Notes:

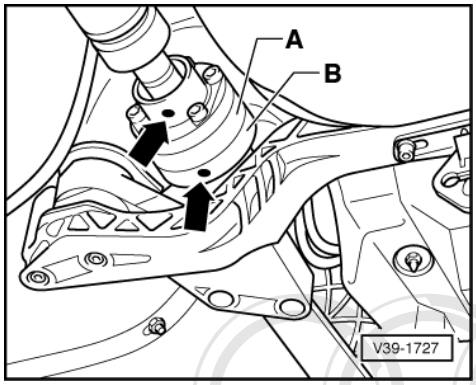
- Always renew self-locking nuts.
- It is essential that the residues of locking fluid are cleaned out from the threaded holes in flange shaft on the rear final drive after removing the propshaft. Otherwise there is a danger that new bolts will seize and then shear when removing them again.
- The threaded holes can be cleaned with a thread tap.
- Replace gasket between propshaft and drive flange (remove protective sheet and bond gasket to flanged shaft). The adhesive surface must be free of grease.
- Replace propshaft bolts (self-locking).



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- -> Raise final drive with gearbox jack until both drive shafts can be connected.
- Lightly tighten securing bolts for drive shafts.
- Lift final drive and bolt to cross member and final drive support.
- Bolt on propshaft => Page 226

Notes:



- -> To prevent imbalance, install flanges of propshaft -A- and rear axle drive -B- in such a way that the coloured markings are in a line -arrows-.
- After removing the propshaft from the rear final drive, the additional balance disc (thicker washer) that may be located between the lock plate and the bolt head must not be reinstalled.
- Replace propshaft bolts (self-locking).

- Checking gear oil level in rear final drive
  =>Page 230 .

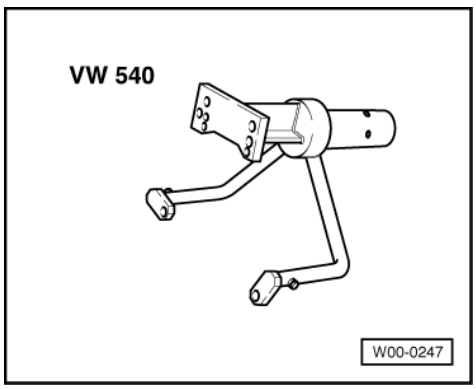
- Stress-free alignment of exhaust system:
  => corresponding Workshop Manual for Engine, Mechanical Components; Repair group 26; Removing and installing exhaust system

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Tightening torques

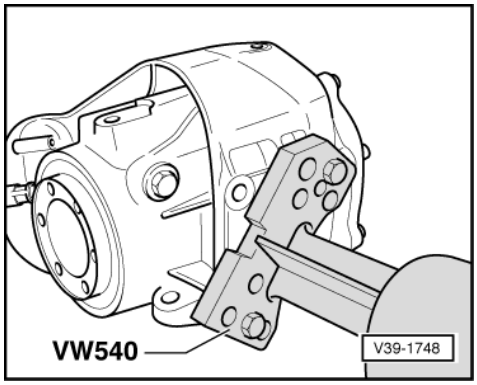
Component		Nm
Propshaft to final drive (input flange)		55
Front cross member for rear final drive to body		40
Front cross member for rear final drive with exhaust system bracket to body		23
Rear cross member for rear final drive to subframe		50
Rear final drive on rear cross member		55
Drive shaft to flange shaft	M8	40
	M10	77

10.2 - Attaching rear final drive to engine stand



Special tools, testers and auxiliary equipment required

- Engine and gearbox support VW 540

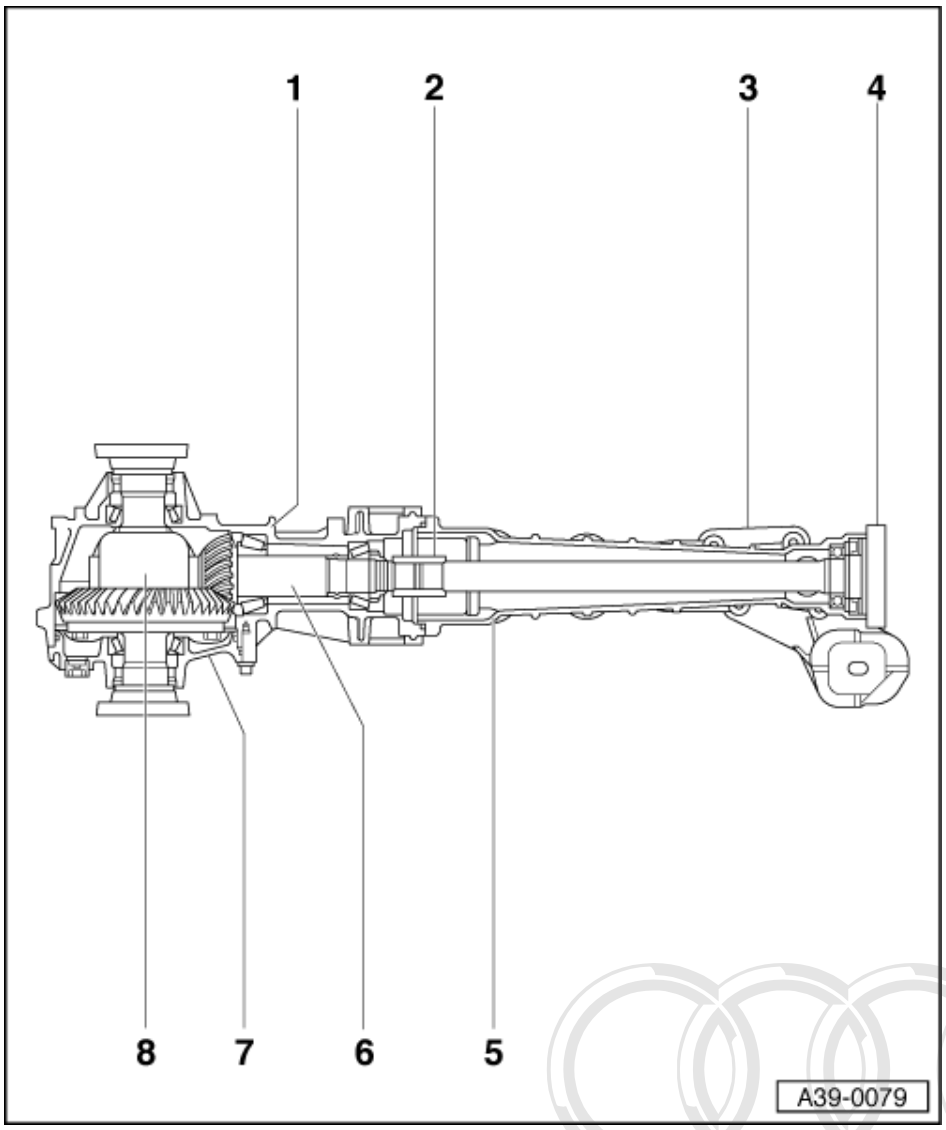


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- -> Secure complete rear final drive to a repair stand with engine and gearbox support VW 540.

11 - Dismantling and assembling rear final drive

11.1 - Dismantling and assembling rear final drive



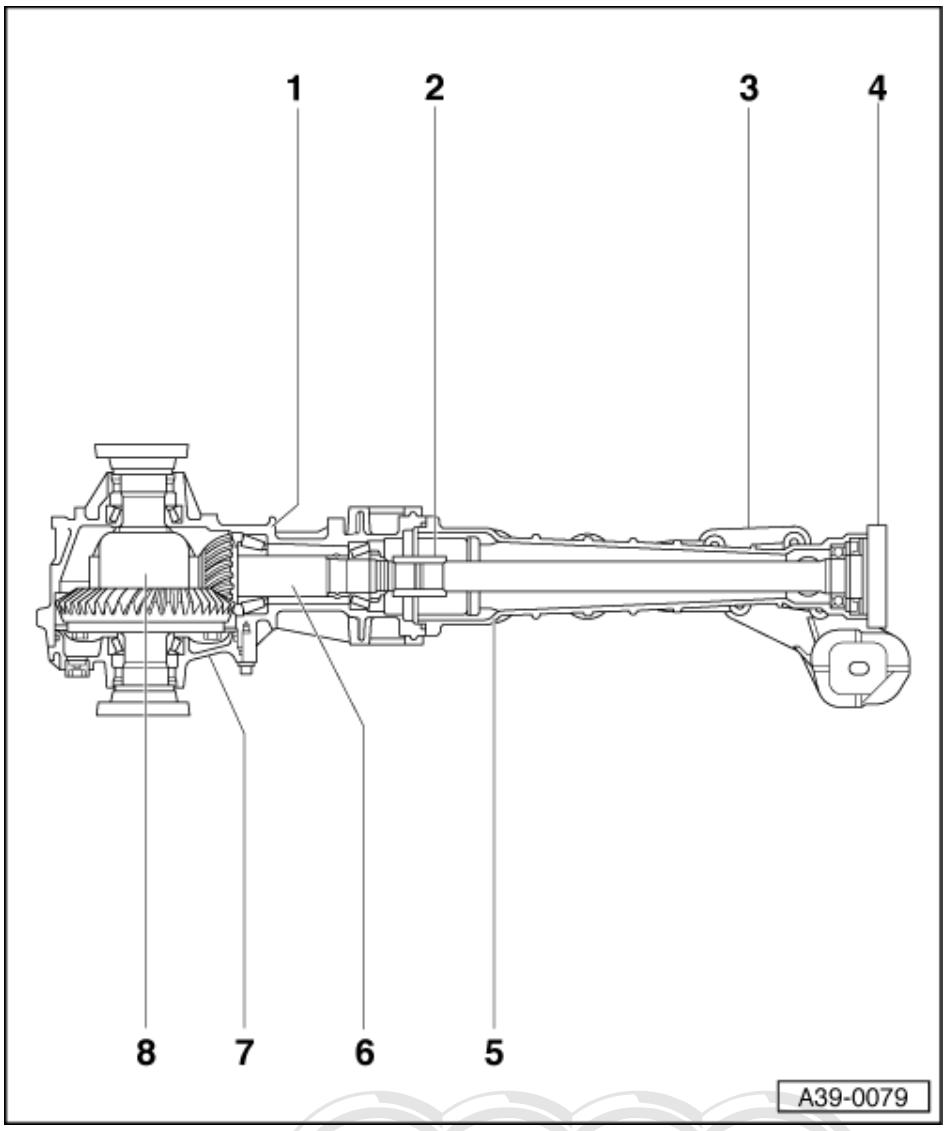
11.2 - Gearbox overview

Notes:

- Removing thrust tube from rear final drive with final drive installed => Page 231.
- Removing thrust tube from rear final drive with final drive removed => Page 253.

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1 Final drive housing
2 Sleeve weld
3 Final drive support
4 Flange for propshaft
- Removal => Page 240



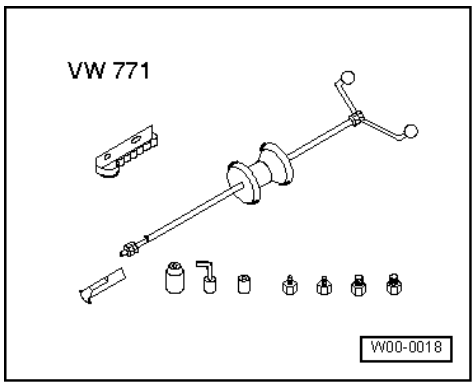
5 **Thrust tube**
- Removing and installing => Page 231

6 **Pinion shaft**
- Paired with crown wheel
- Removing and installing drive pinion => Page 273

7 **Final drive cover**

8 **Differential**
- Must be removed before dismantling drive pinion
- Removing and installing => Page 254
- Dismantling and assembling => Page 260

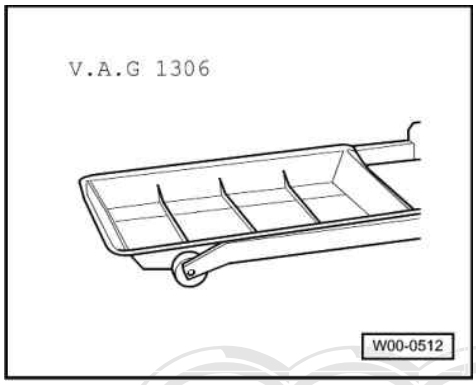
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Removing thrust tube from rear final drive

Special tools, testers and auxiliary equipment required

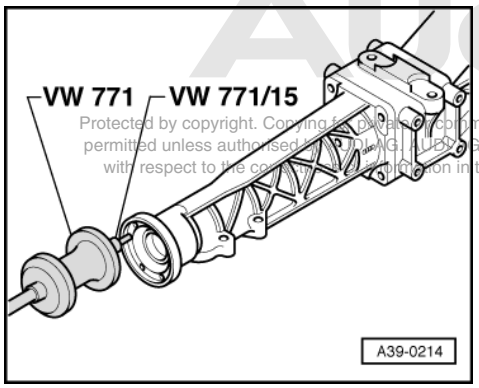
- Multi-purpose tool VW 771 with 771/15



- Drip tray V.A.G 1306

- Rear final drive removed

- Attach rear final drive to assembly bracket => Page 250 .
- Place drip tray V.A.G 1306 underneath and drain gearbox oil.
- Remove bolts securing thrust tube to rear final drive housing.

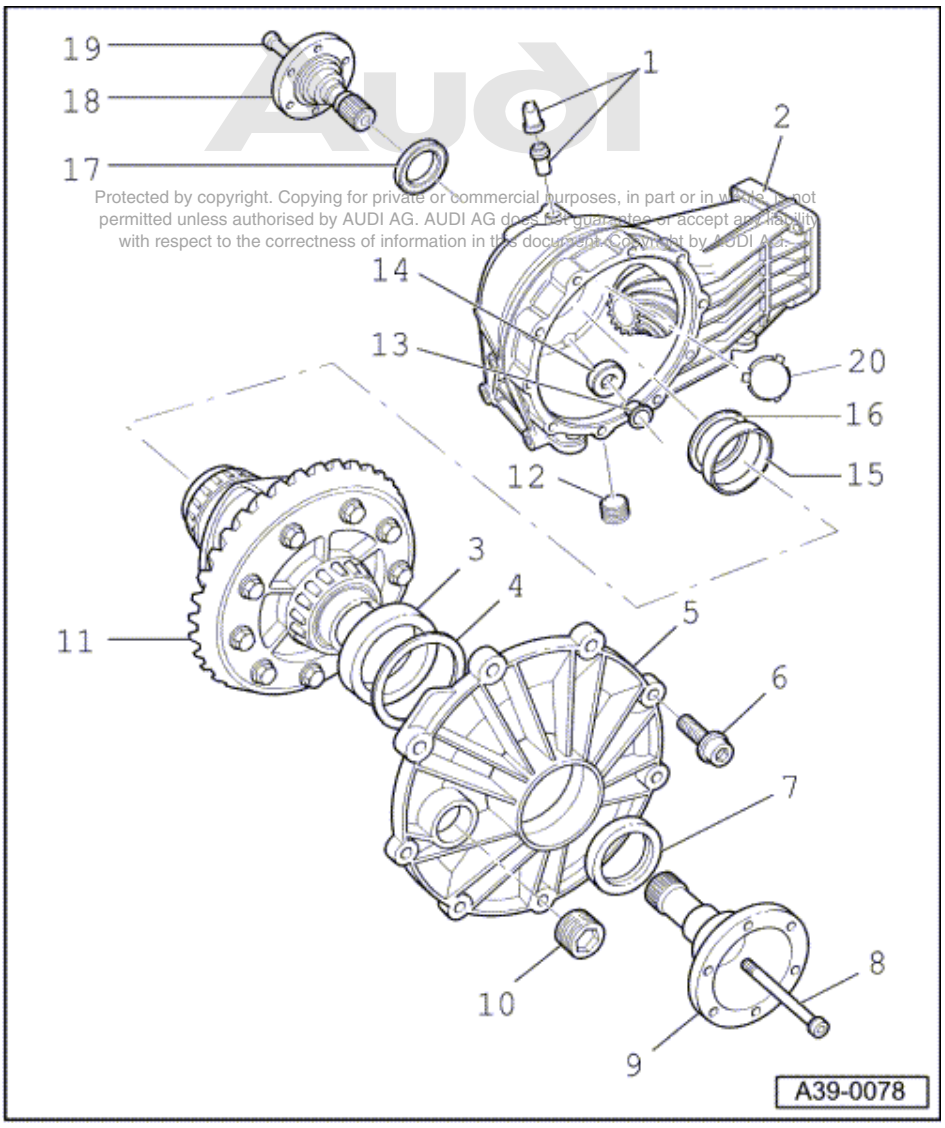


- -> Pull off thrust tube with flange shaft; support thrust tube.

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12 - Removing and installing differential

12.1 - Removing and installing differential



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Notes:

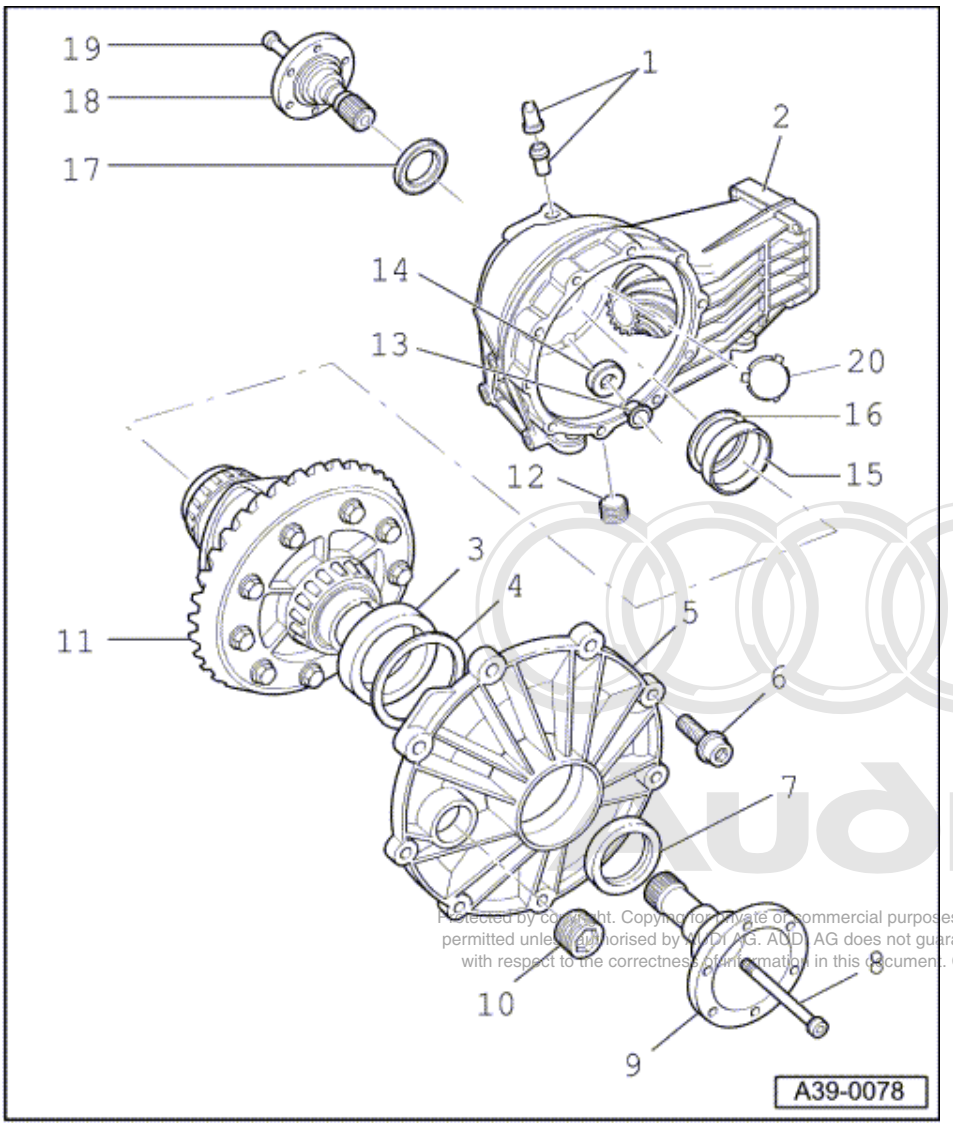
- General repair instructions
  =>Page 14 .
- Securing rear final drive to repair stand => Page 39-121.
- Adjustments are required when replacing components marked1) => adjustment overview, Page 285 .

1 Vent sleeve

- With rubber valve
- Installation position => Fig. 3 .

2 Final drive housing 1)

- With drive pinion
- Removing and installing drive pinion
  =>Page 273 .



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3 Outer race for large taper roller bearing 1)

- Driving out => Fig. 269
- Pressing in => Fig. 270

4 Shim "S1"

- Note thickness
- Adjustment overview =>Page 285 .

5 Cover for final drive 1)

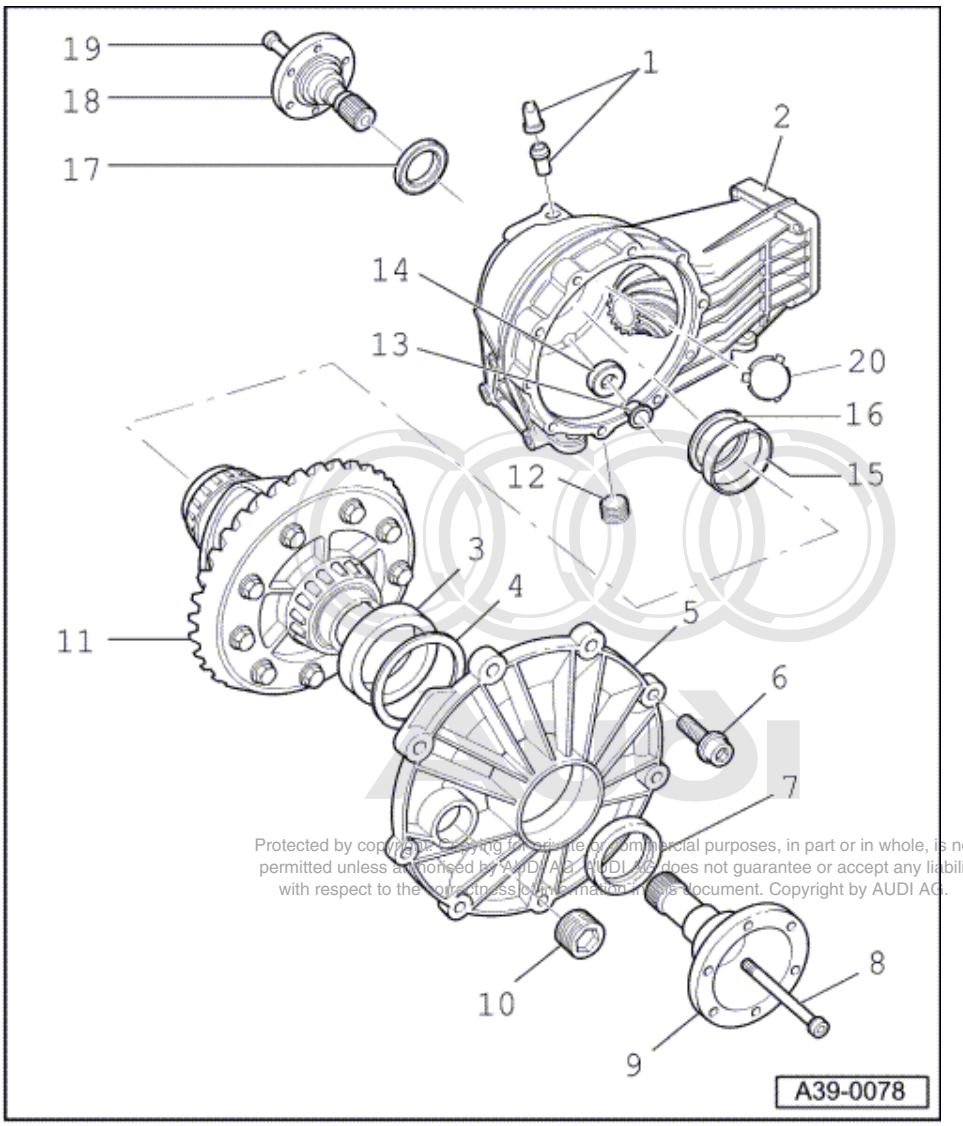
- With O-ring
- Replace O-ring
- Insert O-ring with oil

6 TORX-bolt - 25 Nm

7 Seal, right

- Replacing => Page 243 .

8 Hexagon socket-head bolt - 25 Nm



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9 Flange shaft, right

- Removing and installing =>Fig. 1

10 Oil filler plug - 35 Nm

11 Differential with crown wheel 1)

- Dismantling and assembling => Page 260

12 Oil drain plug, 35 Nm

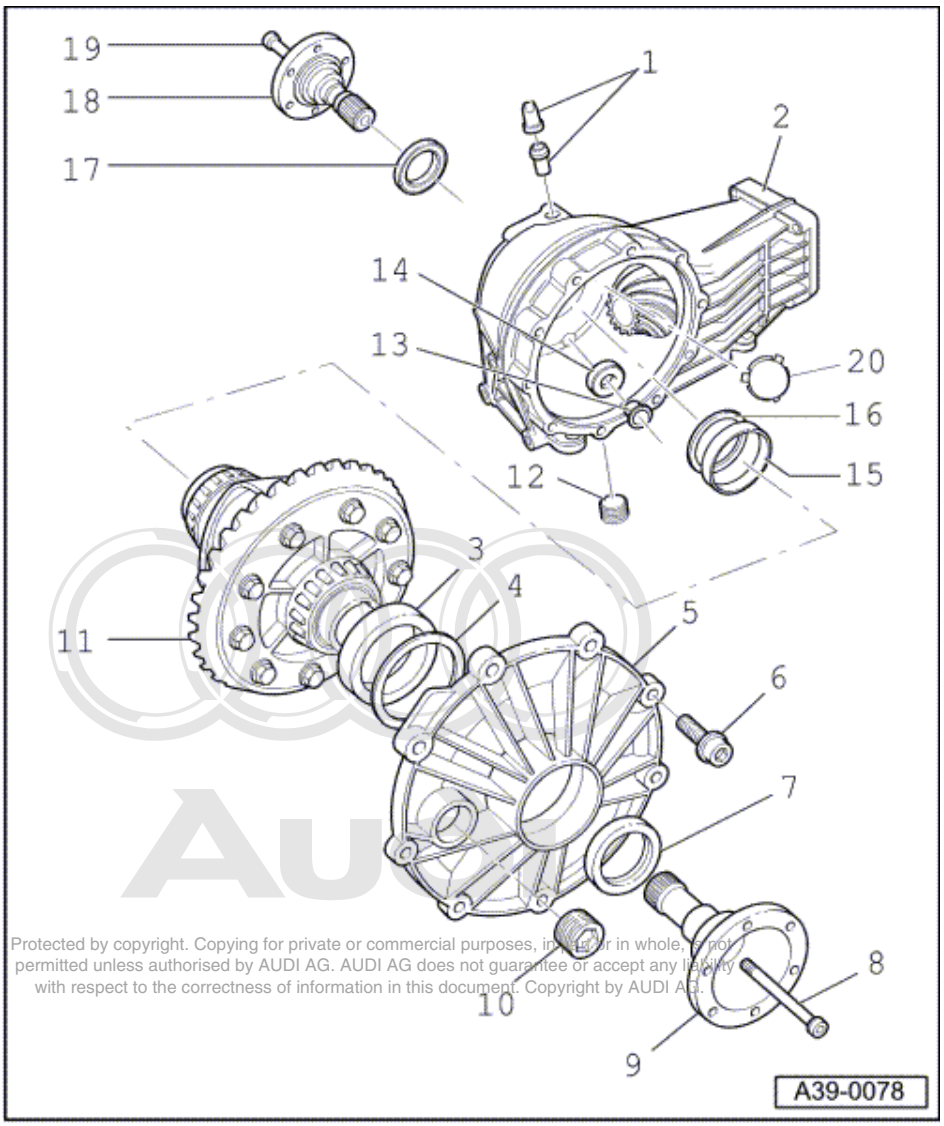
13 Socket

- holds solenoid in position
- Drive in up to stop

14 Solenoid

15 Outer race for small taper roller bearing 1)

- Driving out
  => Fig. 267
- Pressing in
  => Fig. 267



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16 Shim "S2"

- Note thickness
- Adjustment overview
  =>Page 285 .

17 Seal, left

- Replacing => Page 243 .

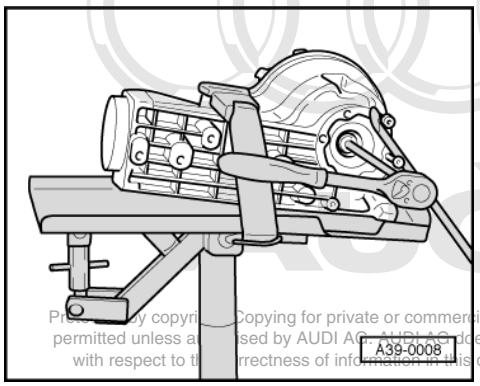
18 Flange shaft, left

- Removing and installing =>Fig. 1

19 Hexagon socket-head bolt
- 25 Nm

20 Cover

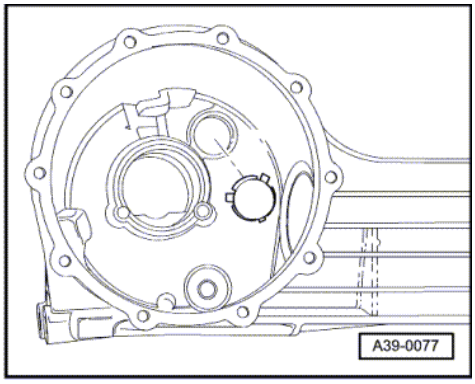
- Installing => Fig. 2



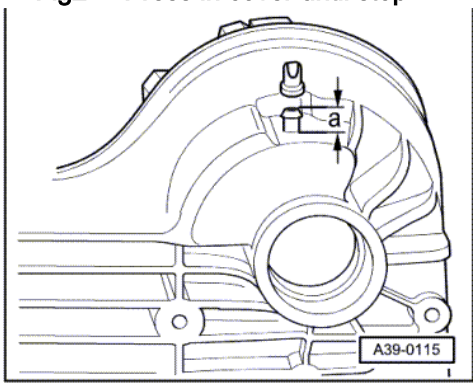
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-> Fig.1 Removing and installing flange shaft

- To loosen the securing bolt, screw two bolts into the flange shaft and counter-hold with a lever.
- Pull out flange shaft using the bolts already screwed in.

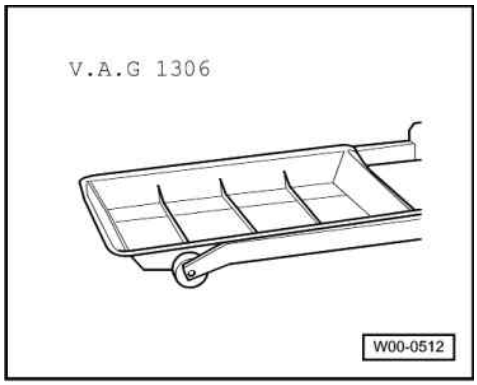


-> Fig2 Press in cover until stop



-> Fig.3 Installation position vent sleeve

The vent sleeve must protrude from the housing by 13 mm (dimension -a-) after being pressed in.
The slot in the rubber valve is located longitudinally in the direction of travel.



Removing and installing differential

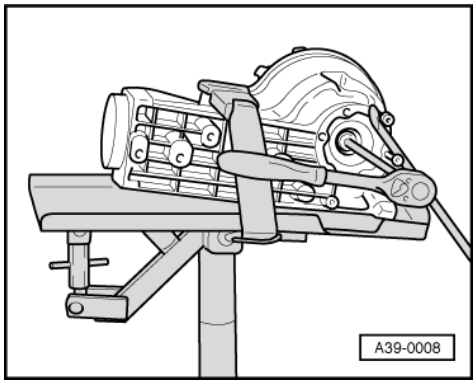
- Rear final drive removed

Special tools, testers and auxiliary equipment required

- Drip tray V.A.G 1306

Removing

- Secure complete rear final drive to repair stand => Page 250 .
- Place drip tray V.A.G 1306 underneath and drain gearbox oil.



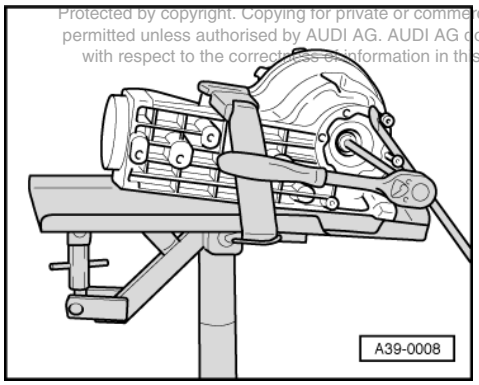
- -> Remove left and right flange shafts.
- To loosen the securing bolt, screw two bolts into the flange shaft and counter-hold with a lever.
- Mark flange shafts (left and right).
- Pull out flange shaft using the bolts already screwed in.
- Unscrew securing bolts from cover for final drive.
- Take cover for final drive off axle housing and remove differential.

Installing

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

- Insert differential.
- Renew O-ring for cover for final drive and oil when installing.
- Fit cover for final drive onto final drive housing and using diagonal sequence tighten to 25 Nm.
- Replace sealing ring for flange shaft
  =>Page 243 .
- Fill space between sealing and dust lips with multipurpose grease.

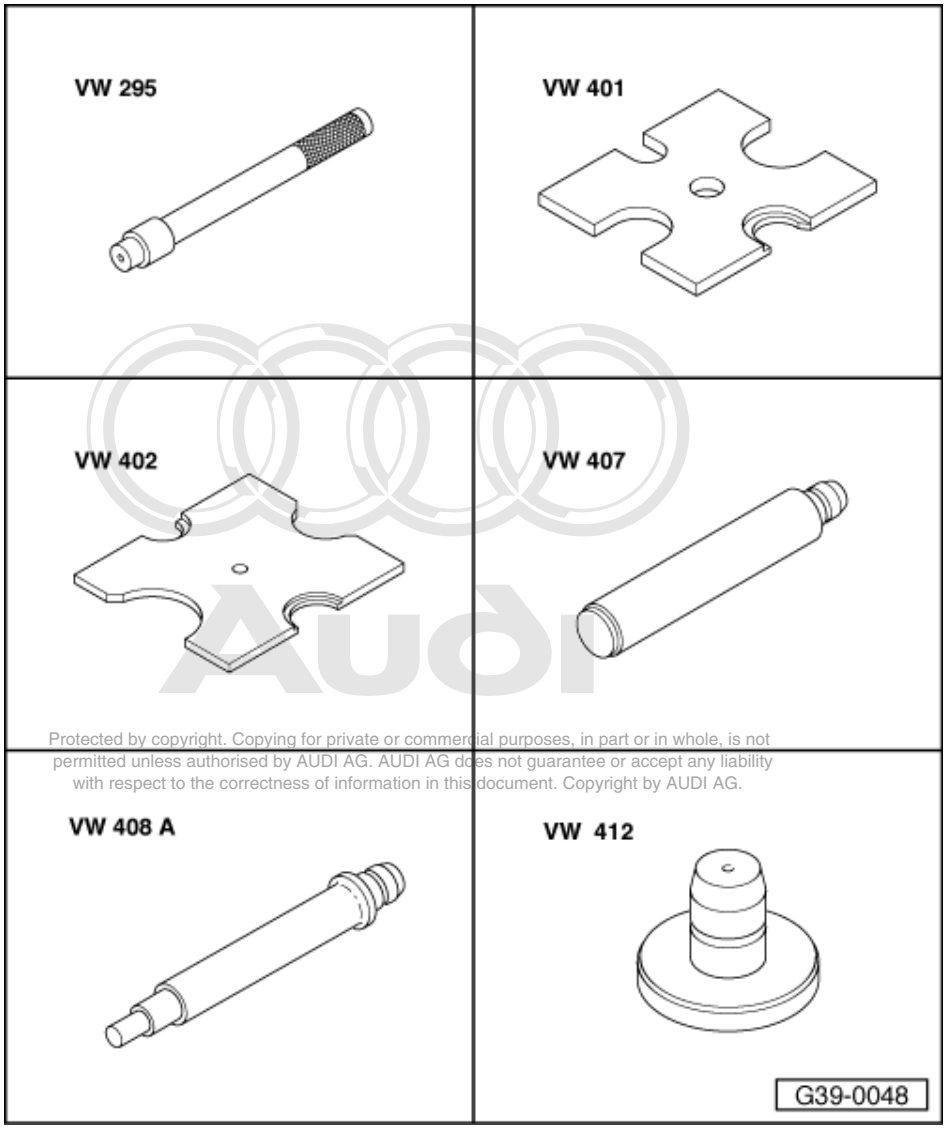
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- -> Insert flange shafts and tighten to 25 Nm.
- Top-up gear oil in rear final drive and check oil level => Page 230 .

13 - Dismantling and assembling differential

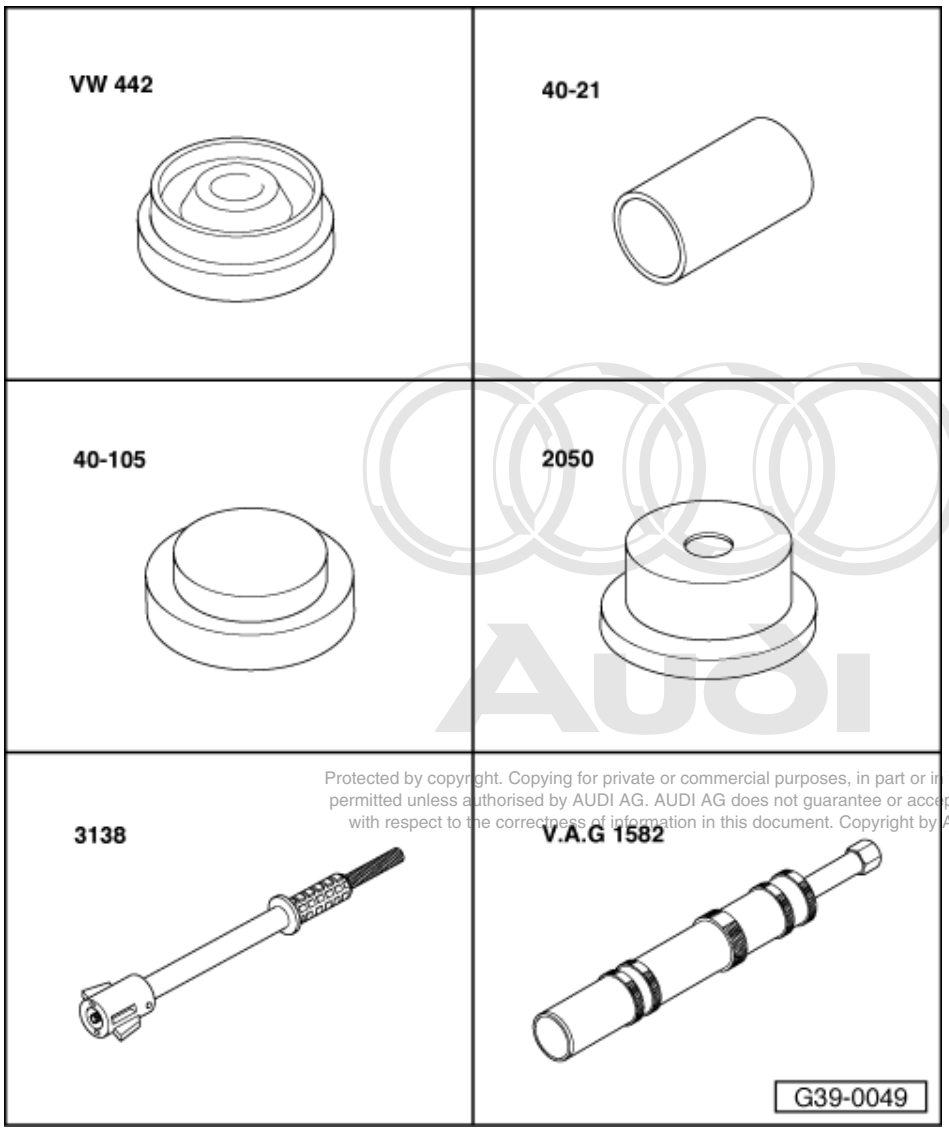
13.1 - Dismantling and assembling differential



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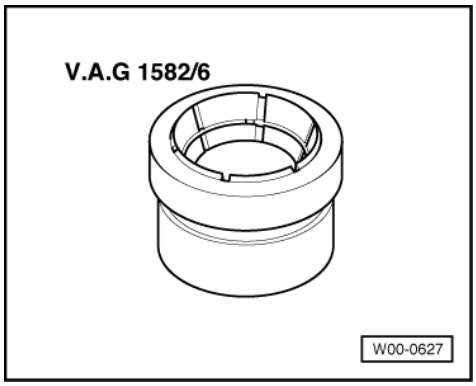
Special tools, testers and auxiliary equipment required

- Drift VW 295
- Thrust plate VW 401
- Thrust plate VW 402
- Press tool VW 407
- Press tool VW 408 A
- Press tool VW 412

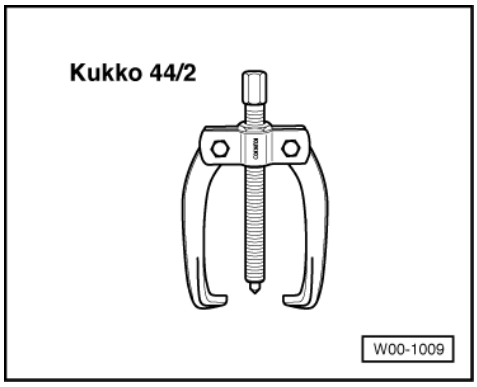


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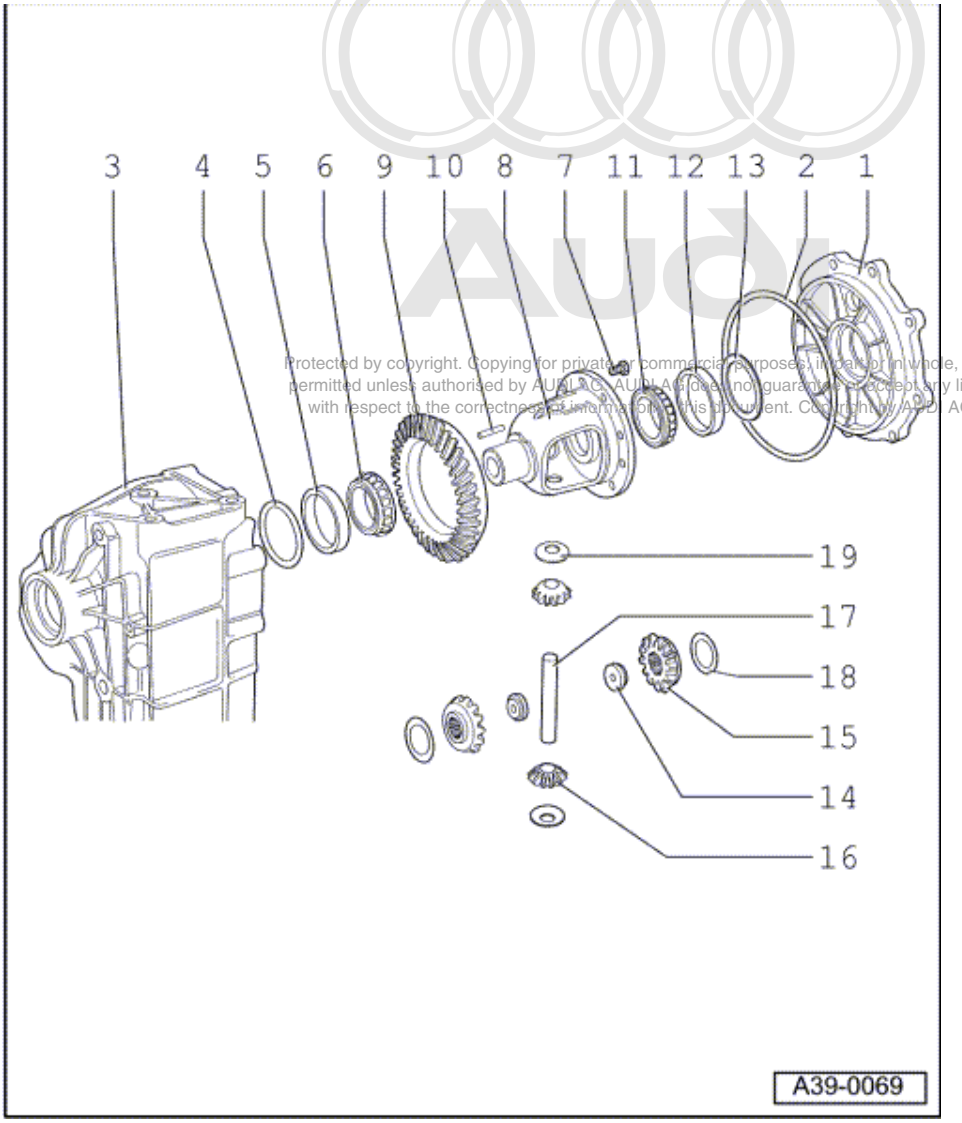
- Thrust pad VW 442
- Sleeve 40-21
- Thrust plate 40-105
- Thrust pad 2050
- Drift 3138
- Taper roller bearing puller V.A.G 1582



- V.A.G 1582/6



- Two-arm puller Kukko 44/2



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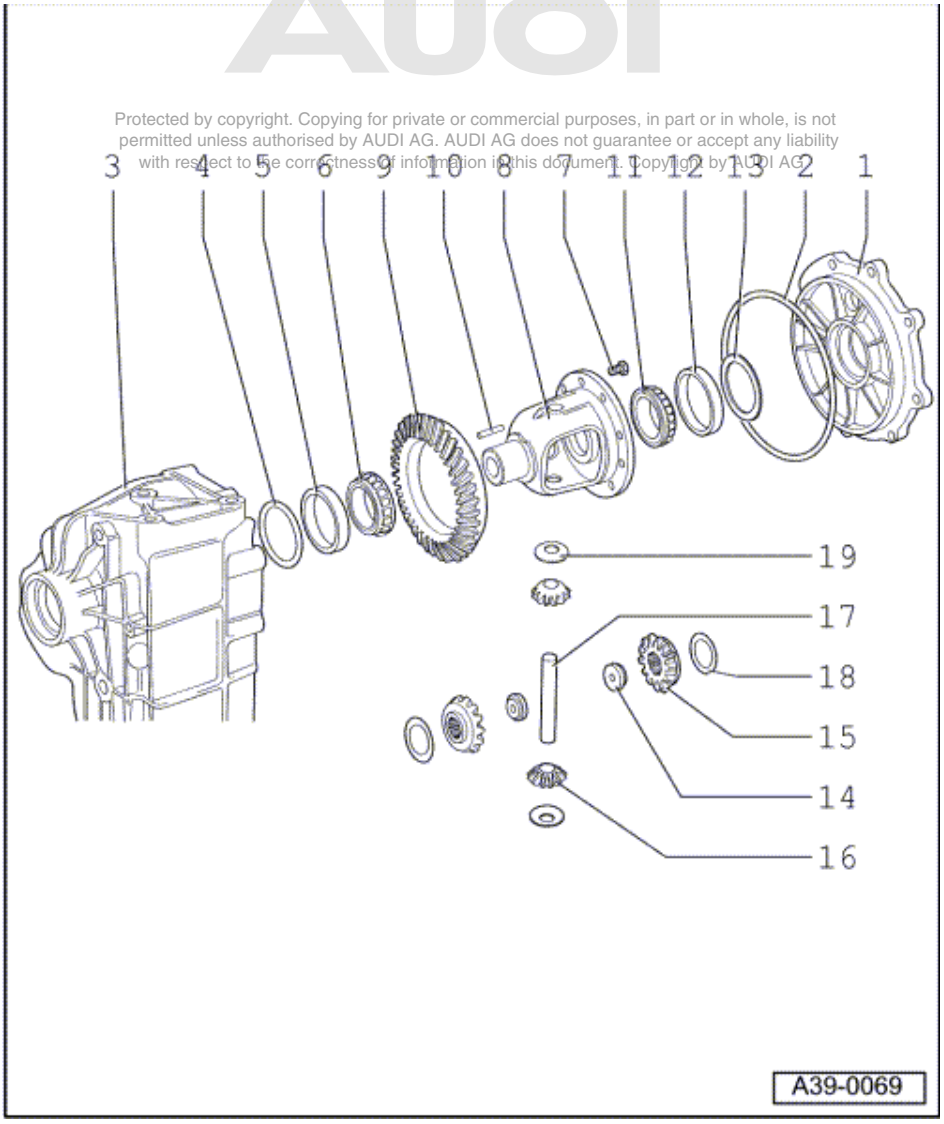
- General repair instructions
  =>Page 14 .
- Replace both taper roller bearings of the differential together. Use same make if possible.

- Adjustments are required when replacing components marked1) => adjustment overview, Page 285 .

1 Cover for final drive 1)
2 O-ring
- Replace
- Insert with oil

3 Final drive housing 1)

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4 Shim "S2"
- Note thickness
- Adjustment overview
=>Page 285 .

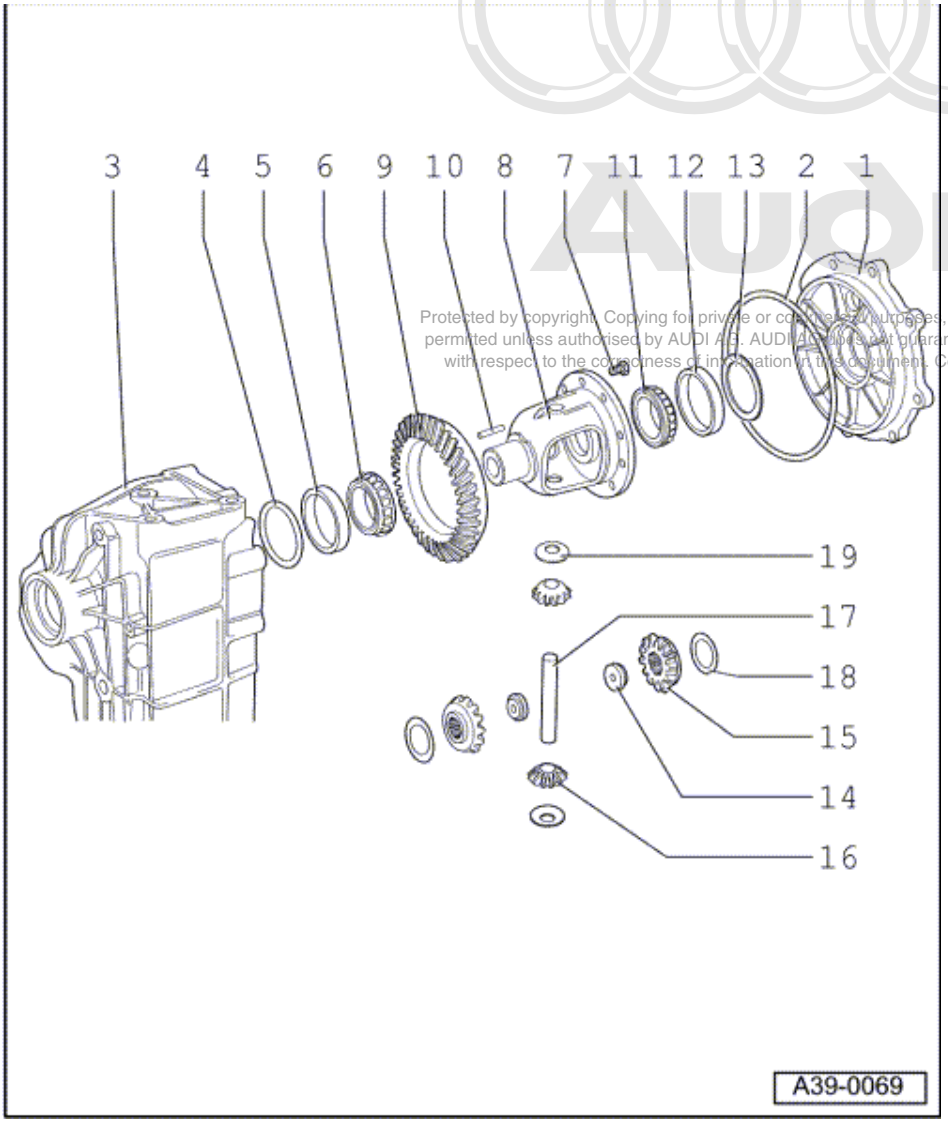
5 Outer race for small taper roller bearing 1)
- Tapping out => Fig. 1
- Pressing in => Fig. 2

6 Inner race for small taper roller bearing 1)
- Pulling off => Fig. 3
- Pressing on => Fig. 4

7 Bolt - 60 Nm + turn 45°further
- Replace
- Allocation

=> Parts List

- Lightly tighten bolts then tighten diagonally to specified torque.



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8 Differential housing 1)

9 Crown wheel 1)

- Paired with pinion shaft (final drive set)
- Allocation based on gearbox code letters

=> Parts List

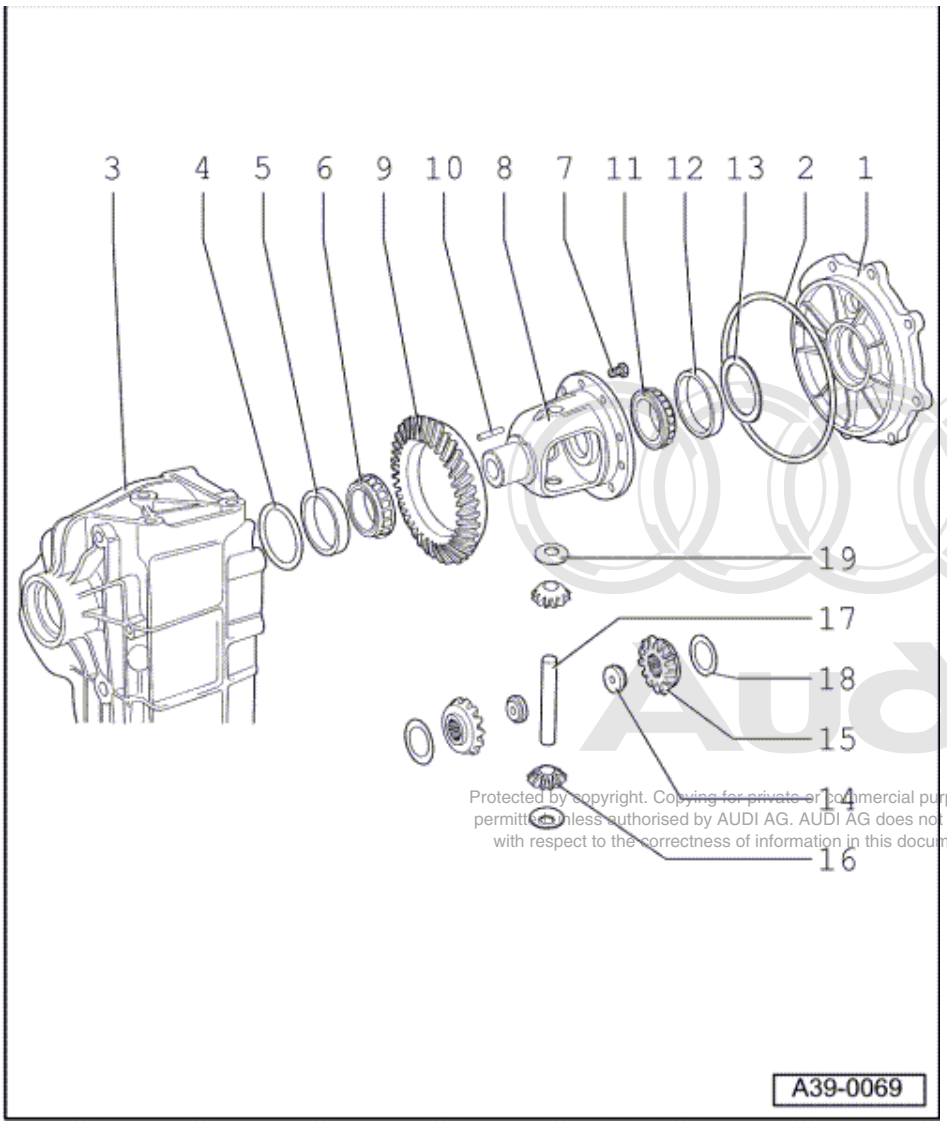
- Drive off housing with a drift => Fig. 9
- Fit to differential housing => Fig. 10

10 Spring pin

- For securing shaft for bevel gears
- Drive in flush

11 Inner race for large taper roller bearing 1)

- Pulling off => Fig. 5
- Pressing on => Fig. 6



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12 Outer race for large taper roller bearing 1)

- Tapping out => Fig. 7
- Pressing in => Fig. 8

13 Shim "S1"

- Note thickness
- Adjustment overview
  =>Page 285 .

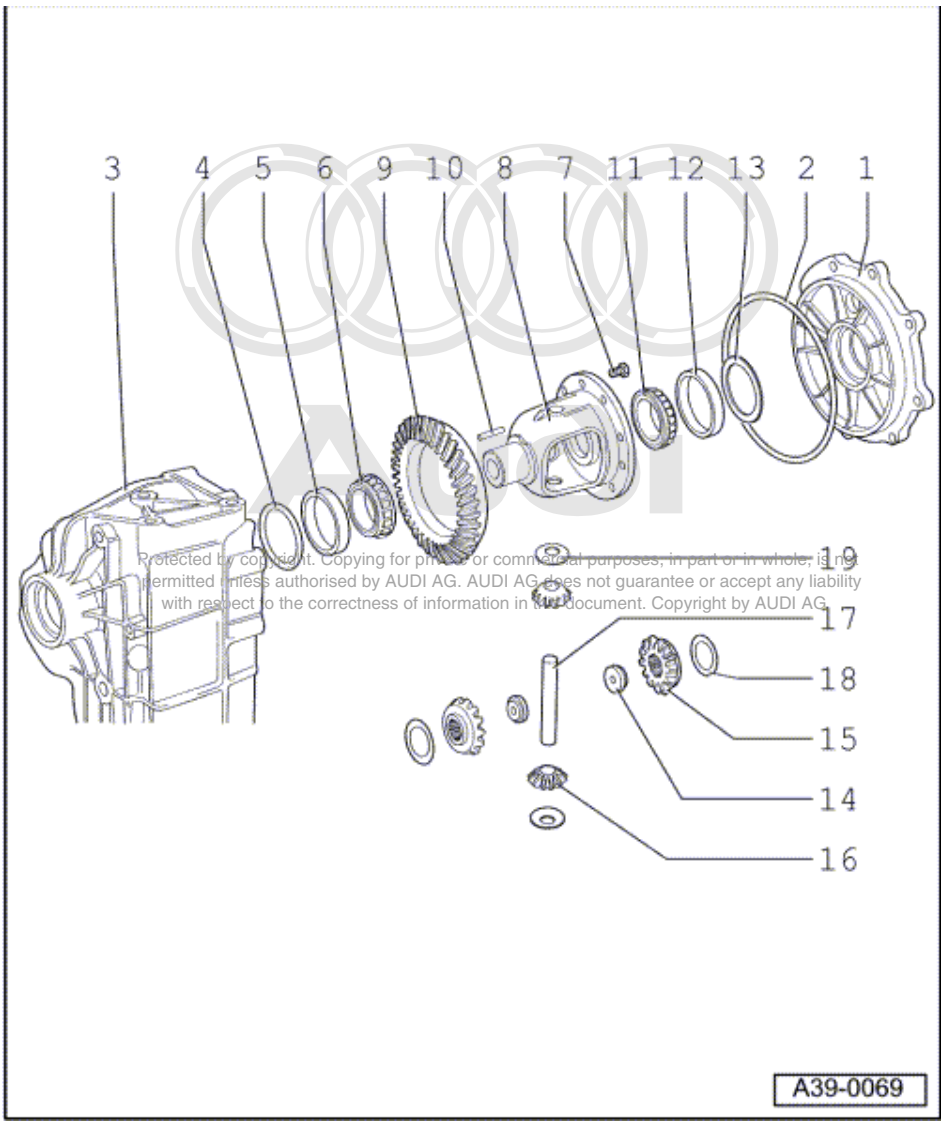
14 Threaded piece

15 Large bevel gear

- Installing => Fig. 11
- Adjusting => Fig. 12

16 Small bevel gear

- Installing => Fig. 11



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17 Shaft for planet wheels

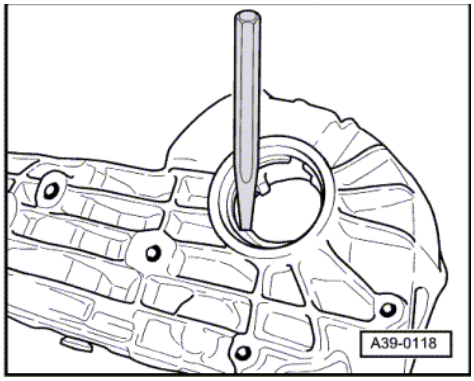
- Drive out with drift
- Drive in carefully so that the thrust washers are not damaged
- Secure with spring pin - 10 -

18 Adjustment shim

- Determining thickness
  => Fig. 12

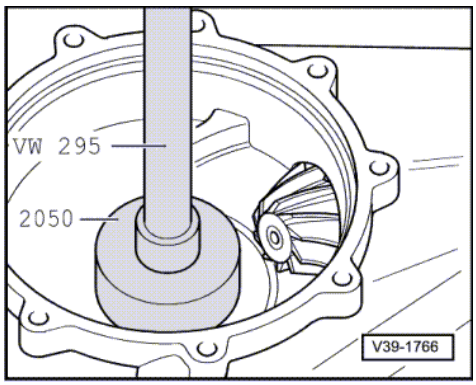
19 Thrust washer

- Check for cracks



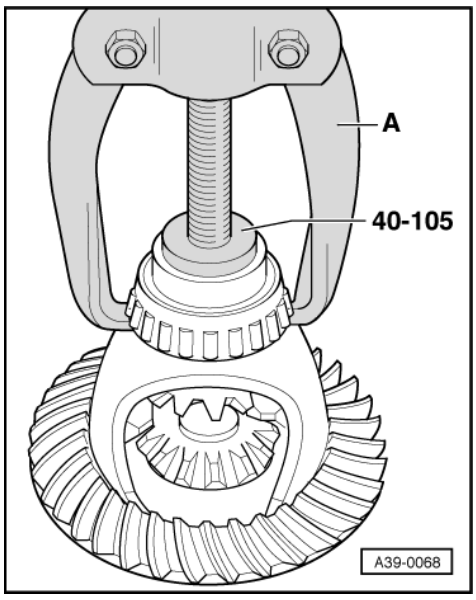
-> Fig.1 Driving out small taper roller bearing outer race of cover

- After removing check shims for damage.



-> Fig2 Pressing in taper roller bearing outer race small until stop into housing

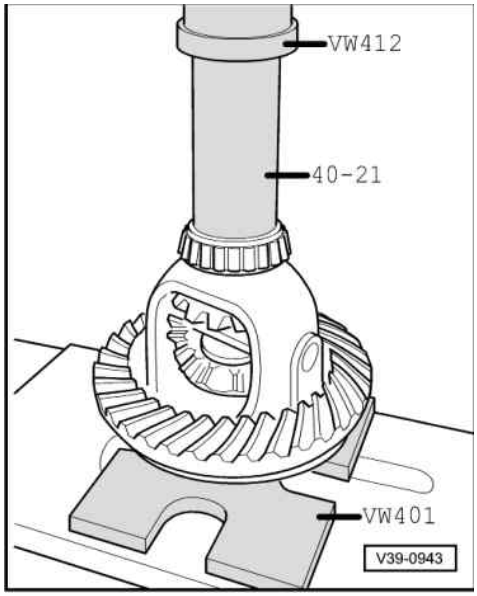
- Position outer race using VW 295 and light even blows with a hammer.
- Then drive in up to stop as shown in illustration.



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-> Fig.3 Pulling off inner race for small taper roller bearing

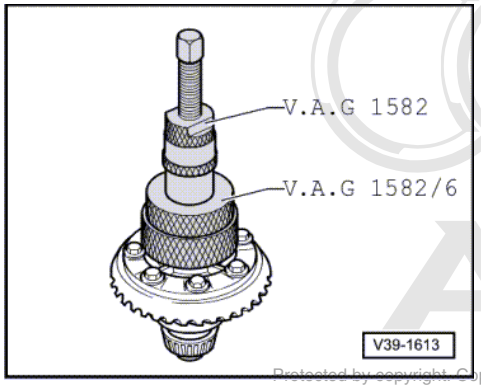
A - Two arm puller, e.g. Kukko 44/2



-> Fig.4 Pressing on small taper roller bearing inner race

Important:
Wear protective gloves!

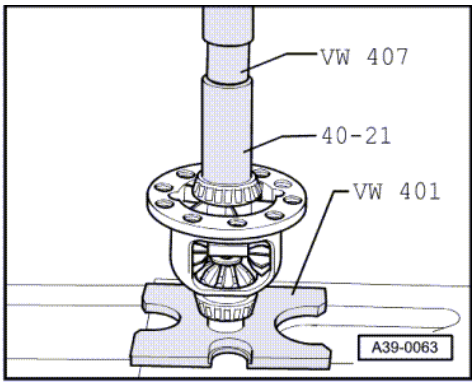
- Heat the inner race to approx. 100 °C, position and push to final position.



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-> Fig.5 Pulling off inner race for large taper roller bearing

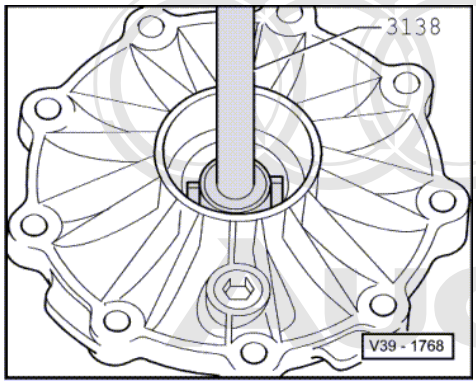
- Fit thrust plate 40-105 onto differential housing before fitting puller.



-> Fig.6 Pressing on large taper roller bearing inner race

Important: Wear protective gloves!

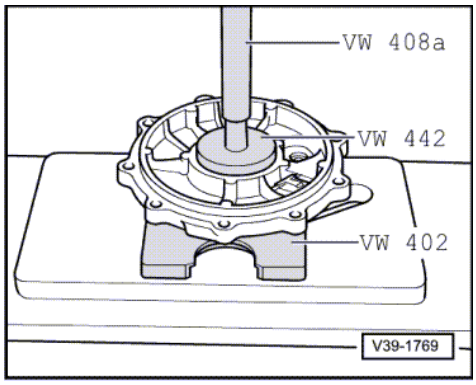
- Heat the inner race to approx. 100 °C, position and push to final position.



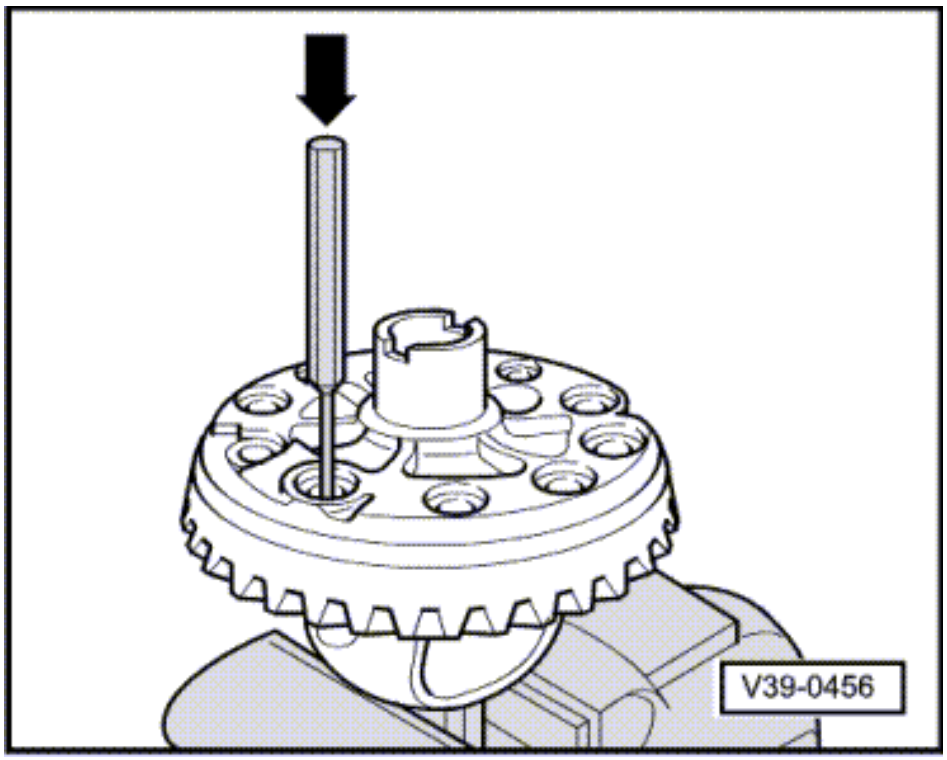
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-> Fig.7 Driving out outer race for large taper roller bearing out of cover

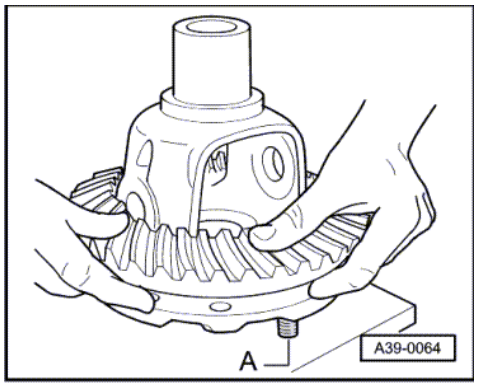
- After removing check shims for damage.



-> Fig.8 Pressing in outer race for large taper roller bearing into cover



-> Fig.9 Driving crown wheel off housing

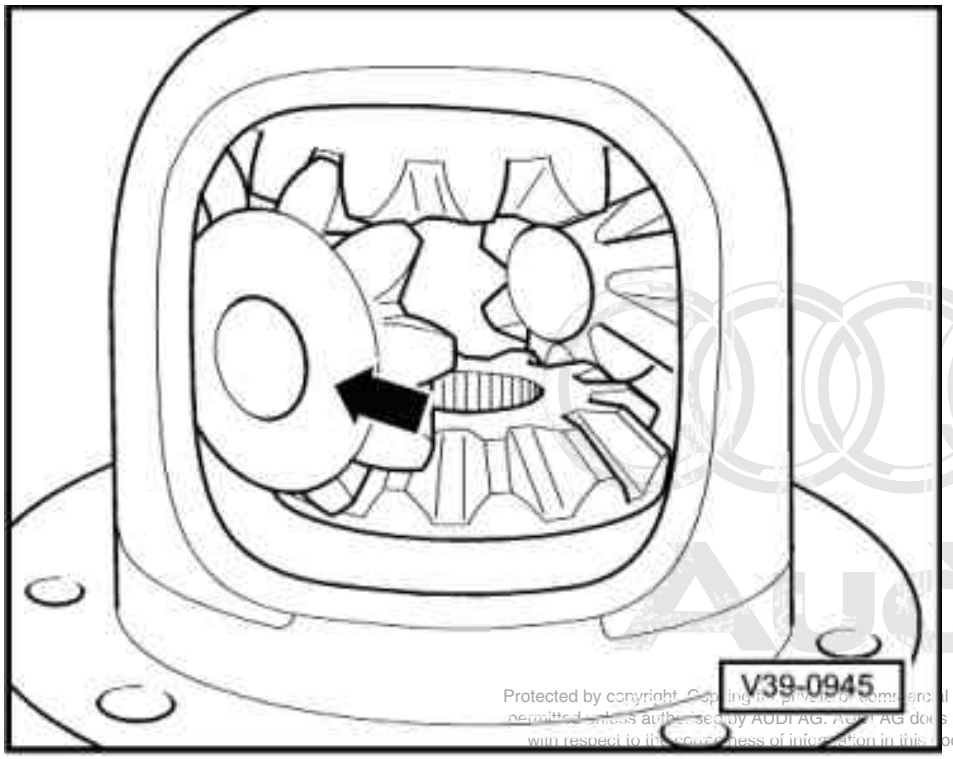


-> Fig.10 Fitting crown wheel

Important:
Wear protective gloves!

- When fitting crown wheel guide it on centring pins -A- (locally made).
- Heat the crown wheel to approx. 100 °C and position.

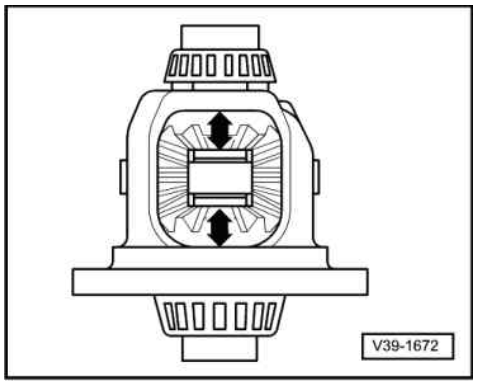
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-> Fig.11 Installing small bevel gears

- If large bevel gears have been replaced, measure and select new shims => Fig. 12 .
- Insert large bevel gears with re-calibrated shims.
- Insert small bevel gears spaced 180° apart, and then rotate into place -arrow-.
- Insert washers and align.
- Insert threaded pieces.
- Drive small bevel gear shaft into final position and secure.



-> Fig.12 Adjusting differential bevel gears

- Insert large bevel gears with thinnest shims (0.5 mm).
- Insert small bevel gears at a 180° offset with thrust washers.

Note:

Do not now interchange bevel gears and thrust washers.

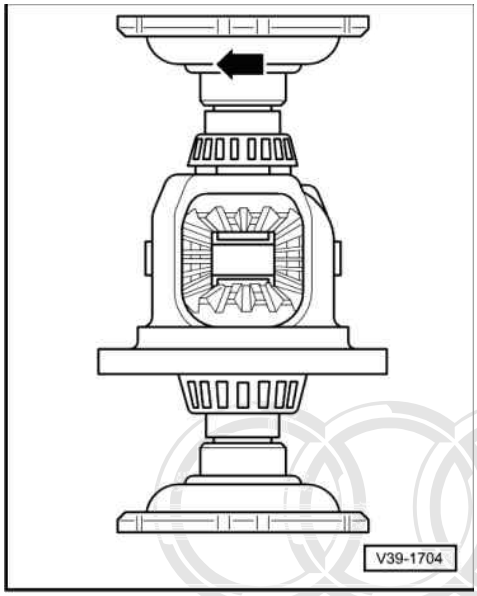
- Drive in shaft for bevel gears.
- Press planet wheels outwards.
- Press large bevel gears in direction of arrow and check play.
- Ascertain the thickest - just fitting - shim for the large bevel gears on each side.

- The same thickness of shim should be used on both sides.
- Select required shims from table. Part numbers

=> Parts List

The following shims are available:

Shim thickness (mm)		
0.50	0.70	0.90
0.60	0.80	1.00



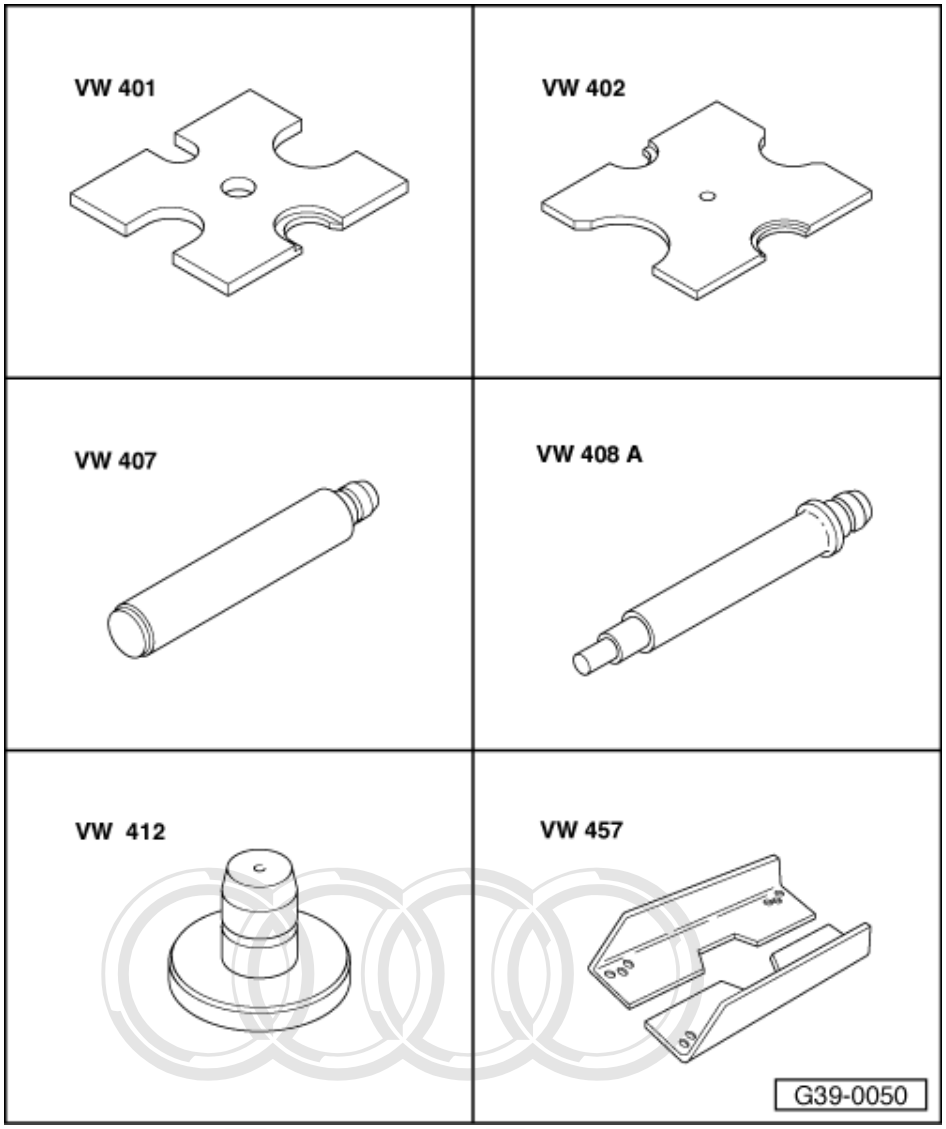
Note:

-> The adjustment is also correct if no further play is perceptible, although it is still possible to rotate the differential bevel gears -arrow-.

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14 - Removing and installing and dismantling and assembling drive pinion

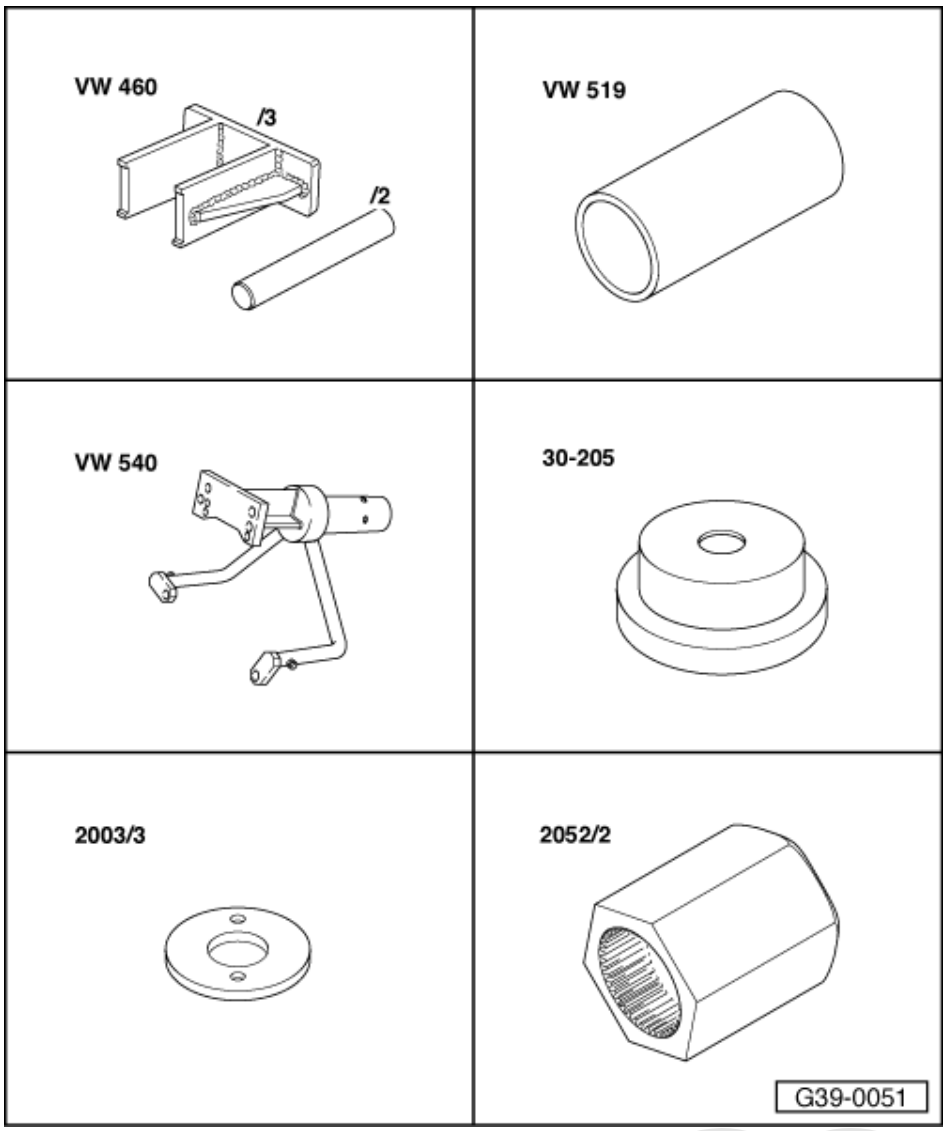
14.1 - Removing and installing and dismantling and assembling drive pinion



Special tools, testers and auxiliary equipment required

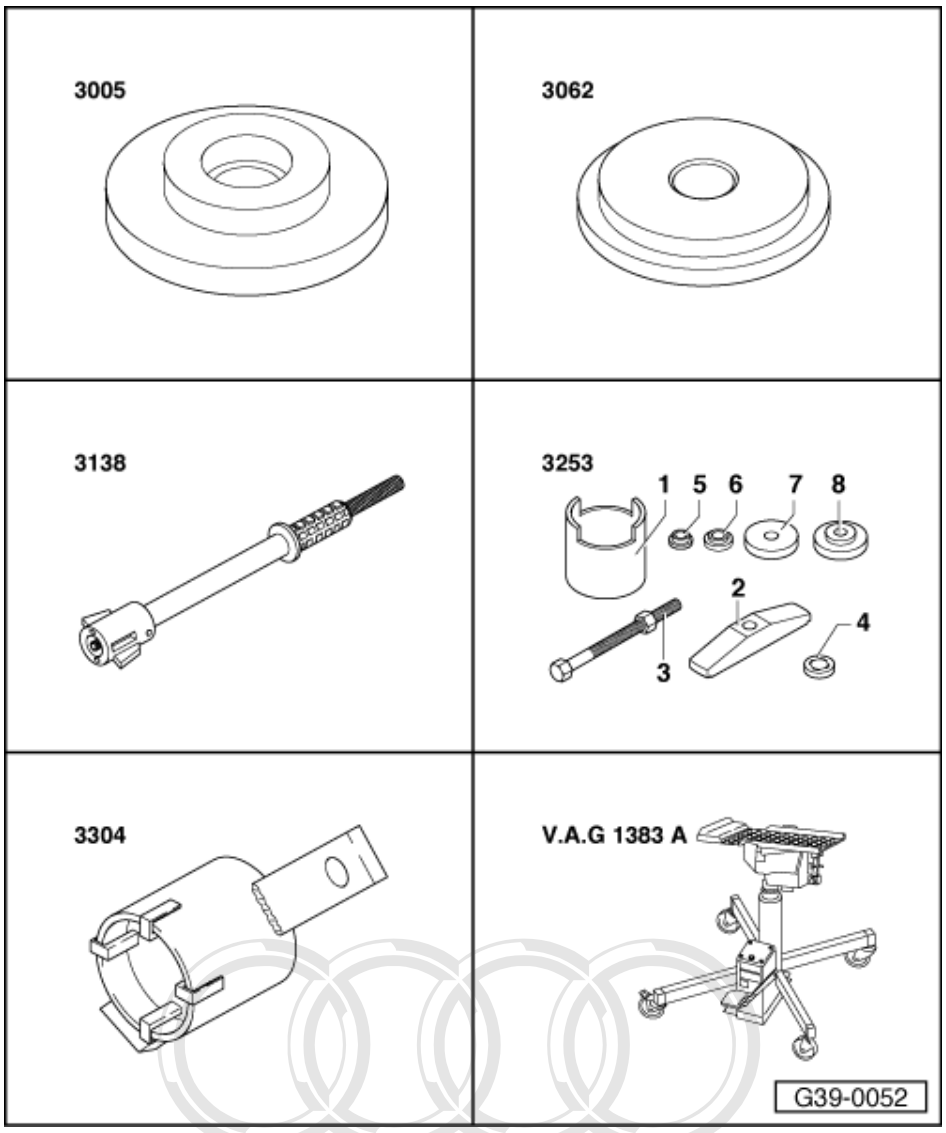
- Thrust plate VW 401
- Thrust plate VW 402
- Press tool VW 407
- Press tool VW 408 A
- Press tool VW 412
- Mounting rails VW 457

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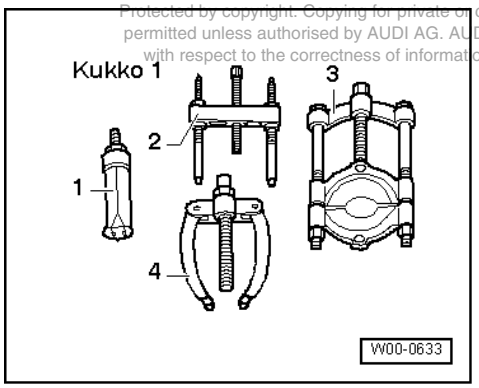
- Drift VW 460/2
- Tube VW 519
- Engine and gearbox support VW 540
- Thrust plate 30-205
- Inserter ring 2003/3
- Pinion assembly device 2052/2

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- Thrust plate 3005
- Thrust pad 3062
- Drift 3138
- Assembly device 3253 with 3253/3 and 3253/4
- Holding tool 3304
- Engine/gearbox lifter V.A.G 1383 A

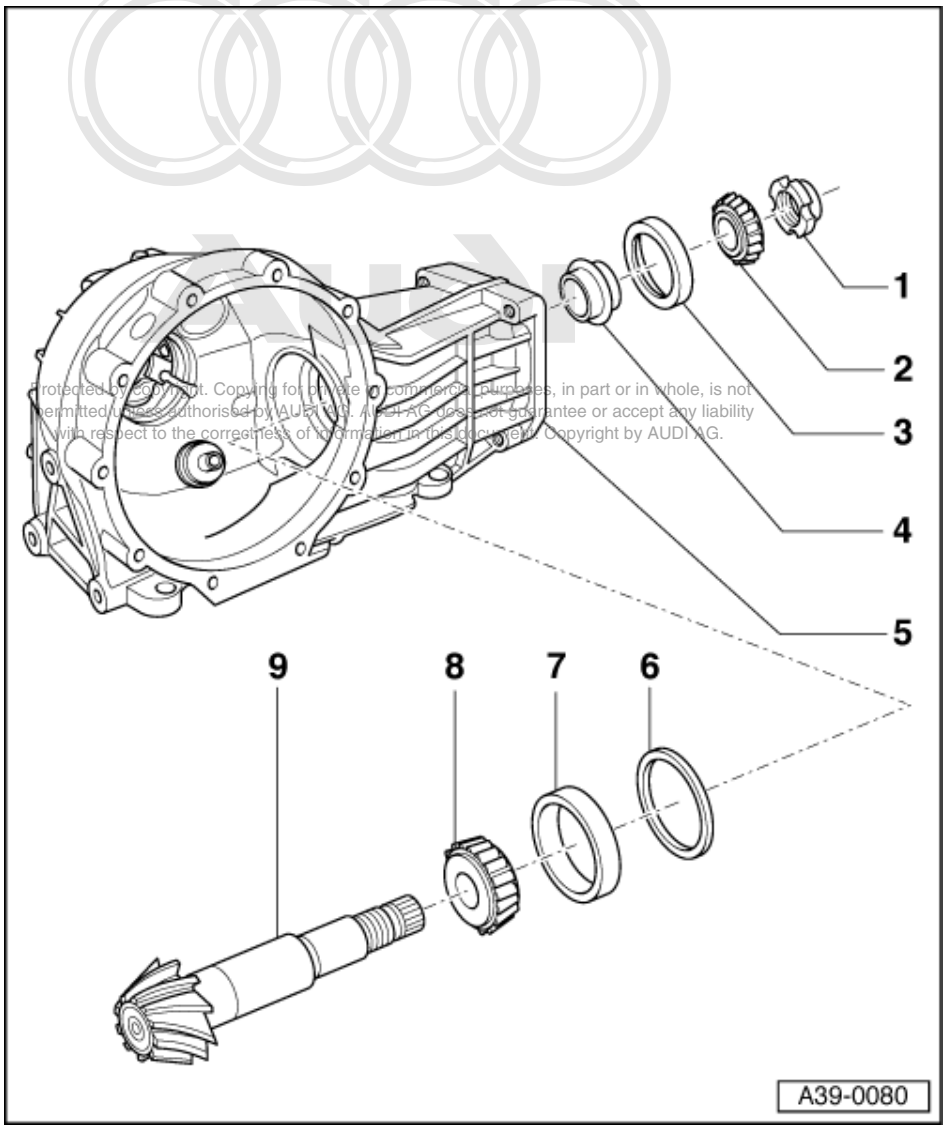
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- Item 1: Internal puller Kukko 21/7
- Item 2: Counter support Kukko 22/2
- Item 3: Separating tool Kukko 17/2
- Torque gauge 0 ... 600 Ncm

- Socket, long, 32 A/F

Notes:
- General repair instructions =>Page 14 .
- Removing thrust tube from rear final drive with final drive installed => Page 232 .
- Removing thrust tube from rear final drive with final drive removed => Page 253 .
- Replace both taper roller bearings together. Use same make if possible.
- Do not additionally oil new taper roller bearings for frictional torque measurement. The bearings have already been treated with special oil by the manufacturer.
- Remove differential => Page 254 .
- Adjustments are required when replacing components marked 1) => adjustment overview, Page 285 .



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1 Nut
- Replace
- Unscrewing => Fig. 1 and Fig. 2
- Screwing in => Fig. 11
- Measuring friction torque =>Fig. 12
- Securing => Fig. 13

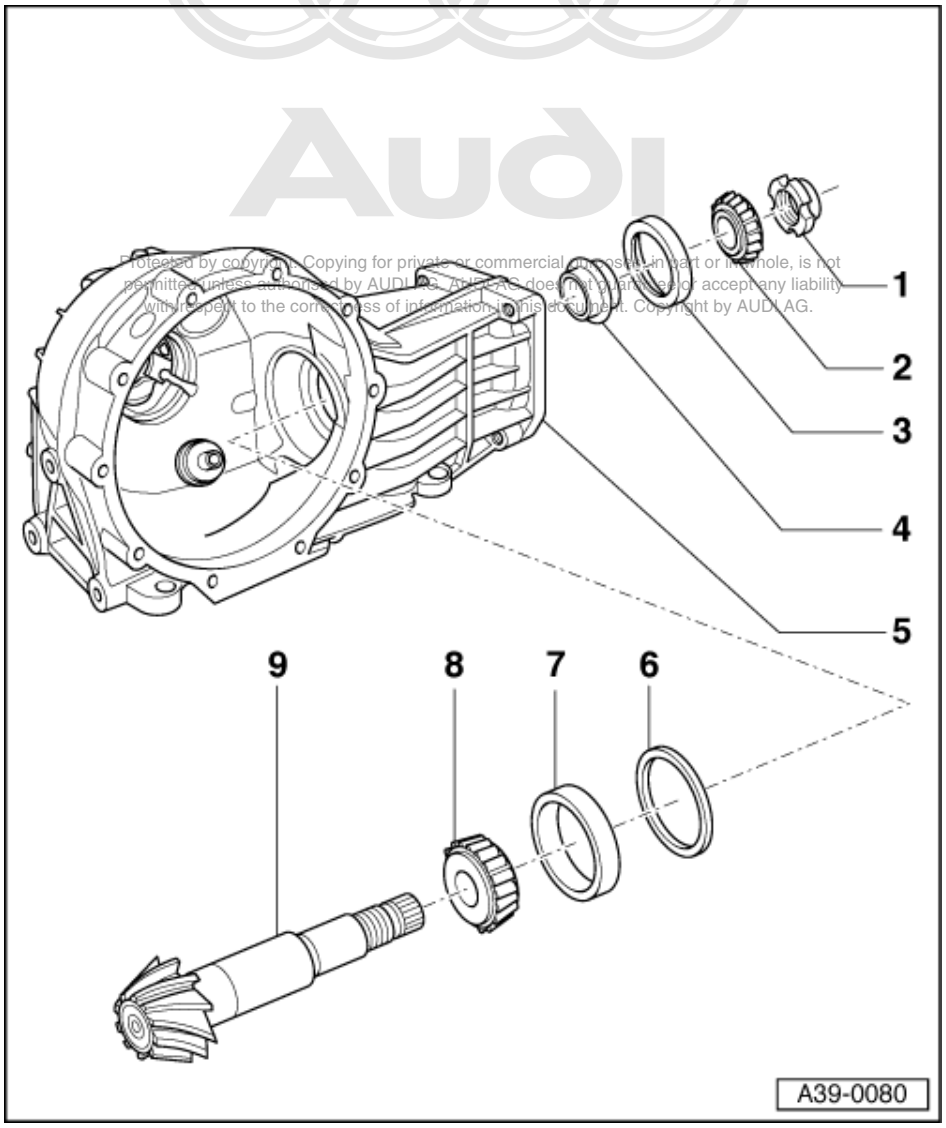
2 Inner race for small taper roller bearing 1)
- Pressing out drive pinion => Fig. 3
- Pressing on => Fig. 10

3 Outer race for small taper roller bearing 1)
- Pulling out =>Fig. 4

- Pressing in => Fig. 9

4 Spacer sleeve 1)
- Replace

5 Final drive housing 1)

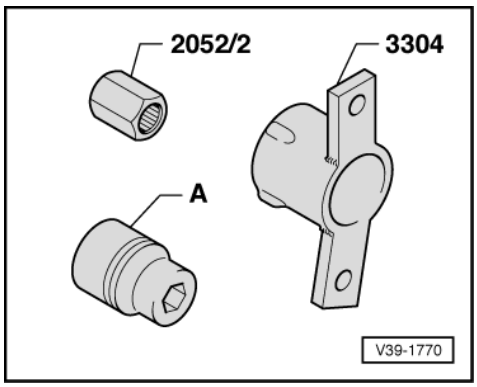


6 Shim "S3"
- Note thickness
- Adjustment overview
  =>Page 285 .

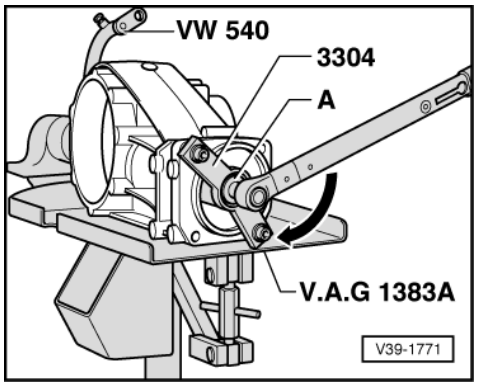
7 Outer race for large taper roller bearing 1)
- Driving out => Fig. 5
- Inserting => Fig. 8

8 Inner race for large taper roller bearing 1)
- Pressing off => Fig. 6
- Pressing on => Fig. 7

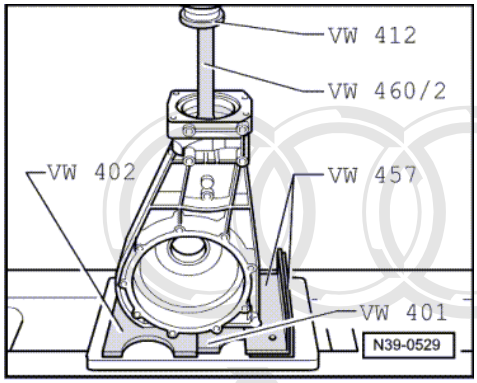
9 Drive pinion1)
- Is mated with crown wheel, renew together as a set



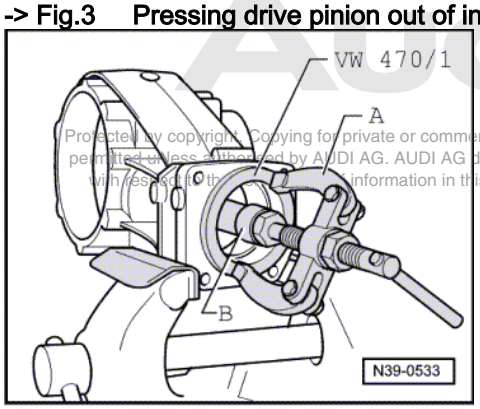
-> Fig.1 Tool for slackening and tightening drive pinion nut
A - 32 mm socket insert



-> Fig.2 Removing nut for drive pinion
- Fit counterhold 3304 with two hexagon bolts M8 x 30.
- Final drive must be supported when loosening nut (e.g. using universal support V.A.G 1359/2 in combination with gearbox jack V.A.G 1383 A).



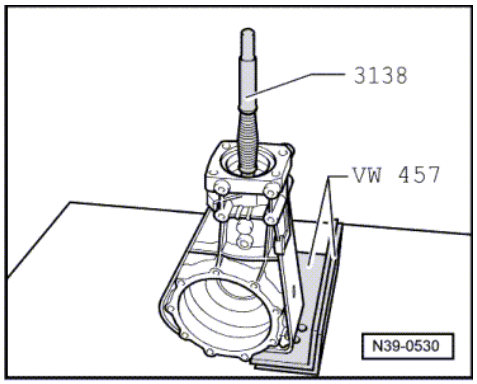
-> Fig.3 Pressing drive pinion out of inner race for small taper roller bearing



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-> Fig.4 Pulling out small taper roller bearing outer race

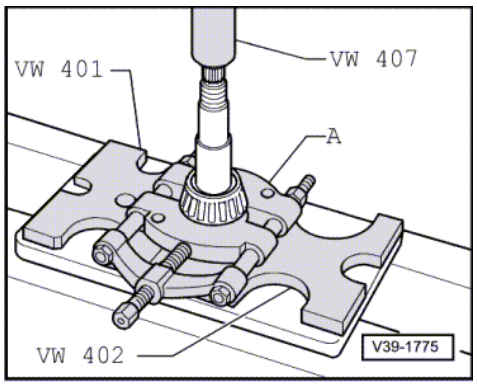
B - Support, e.g. Kukko 22/2
B - Internal puller 46 ... 58 mm, e.g. Kukko 21/7



-> Fig.5 Driving out outer race for large taper roller bearing

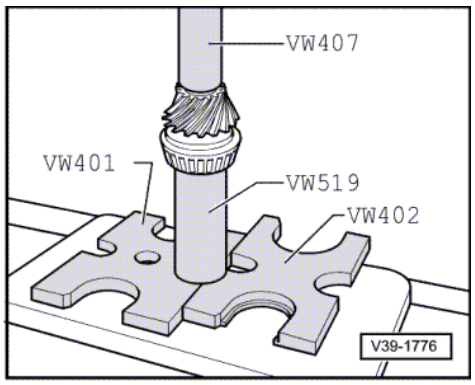
- After removing check shims for damage.

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-> Fig.6 Pressing inner race for large taper roller bearing off drive pinion

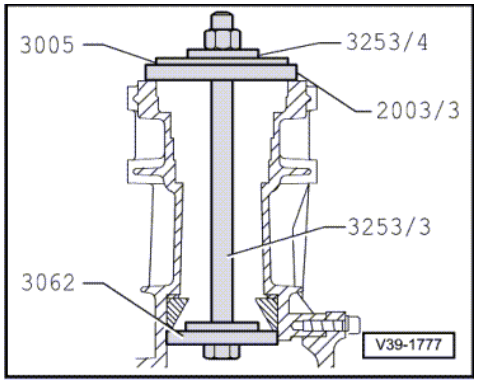
A - Separating device 22 ... 4.53 in, e.g. Kukko 17/2



-> Fig.7 Pressing inner race for large taper roller bearing onto drive pinion

Important: Wear protective gloves!

- Heat the inner race to approx. 100 °C, position and push to final position.

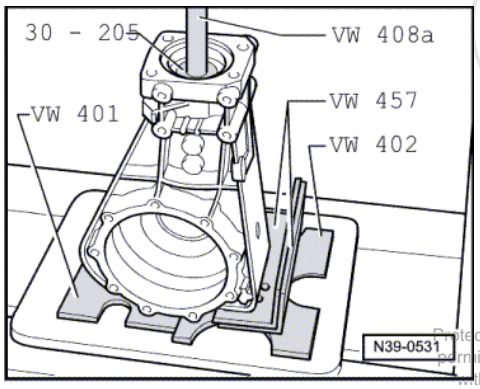


-> Fig.8 Pulling in outer race for large taper roller bearing

- Insert predetermined shim "S3" for drive pinion => Page 291 .

Note:

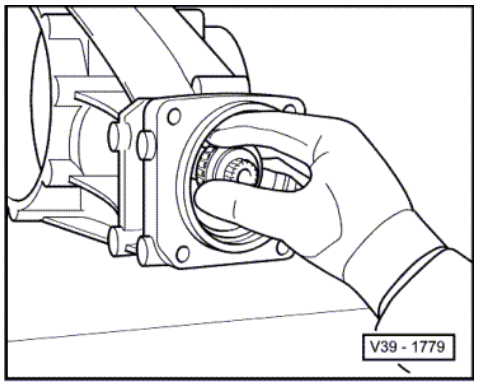
Inscription "Oben" ("top") with thrust pad 3253/4 faces the nut of the puller.



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-> Fig.9 Pressing in small taper roller bearing outer race

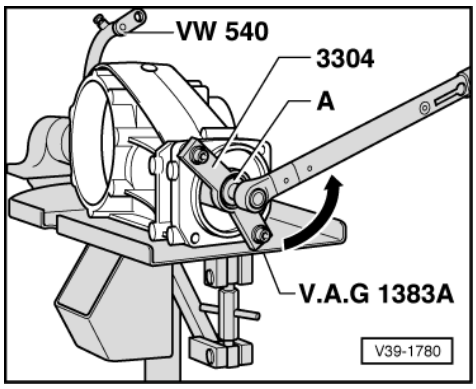
- Oil the outer race and mount it using press tool VW 408 A and thrust plate 30-205.



-> Fig.10 Pressing on small taper roller bearing inner race

Important: Wear protective gloves!

- Insert the new drive pinion with a new spacer sleeve.
- Heat inner race for small taper roller bearing to approx. 100 °C and fit onto drive pinion.
- Press up drive pinion and insert bearing with thrust plate 40-21 up to stop.

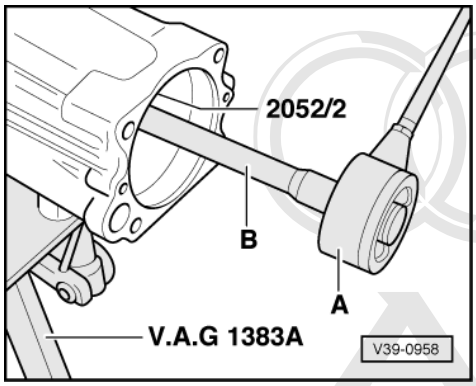


-> Fig11 Tighten nut for drive pinion and adjusting friction torque

- Fit counterhold 3304 with two hexagon bolts M8 x 30.
- Final drive must be supported when tightening nut (e.g. using universal support V.A.G 1359/2 in combination with gearbox jack V.A.G 1383 A).
- Fit new drive pinion nut.
- Tighten drive pinion nut just far enough so that no play can be felt at drive pinion.
- Gradually increase tightening torque, checking friction torque at regular intervals, until specified friction torque is obtained => Fig. 12 .

Note:

If the specified frictional torque is exceeded, the spacer sleeve must be replaced and the adjustment repeated. It is not possible to re-use a spacer sleeve that has been excessively compressed.



-> Fig.12 Measuring frictional torque

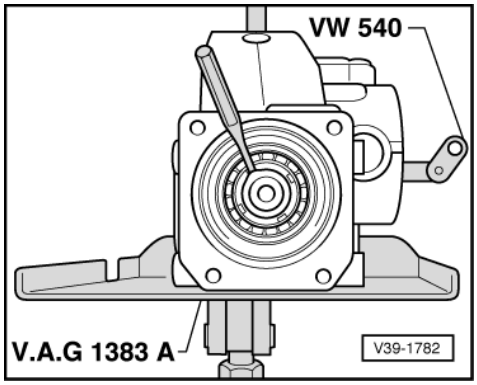
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A - Torque gauge, commercially available, 0 ... 600 Ncm
B - Extension with 32 mm socket insert

- The following frictional torques should be set:

New bearings	Used bearings 1)
200... 250 Ncm	30... 60 Ncm

1) with at least 50 km service



-> Fig.13 Removing nut for drive pinion

- Peen drive pinion nut with a punch.

15 - Adjusting drive pinion and crown wheel

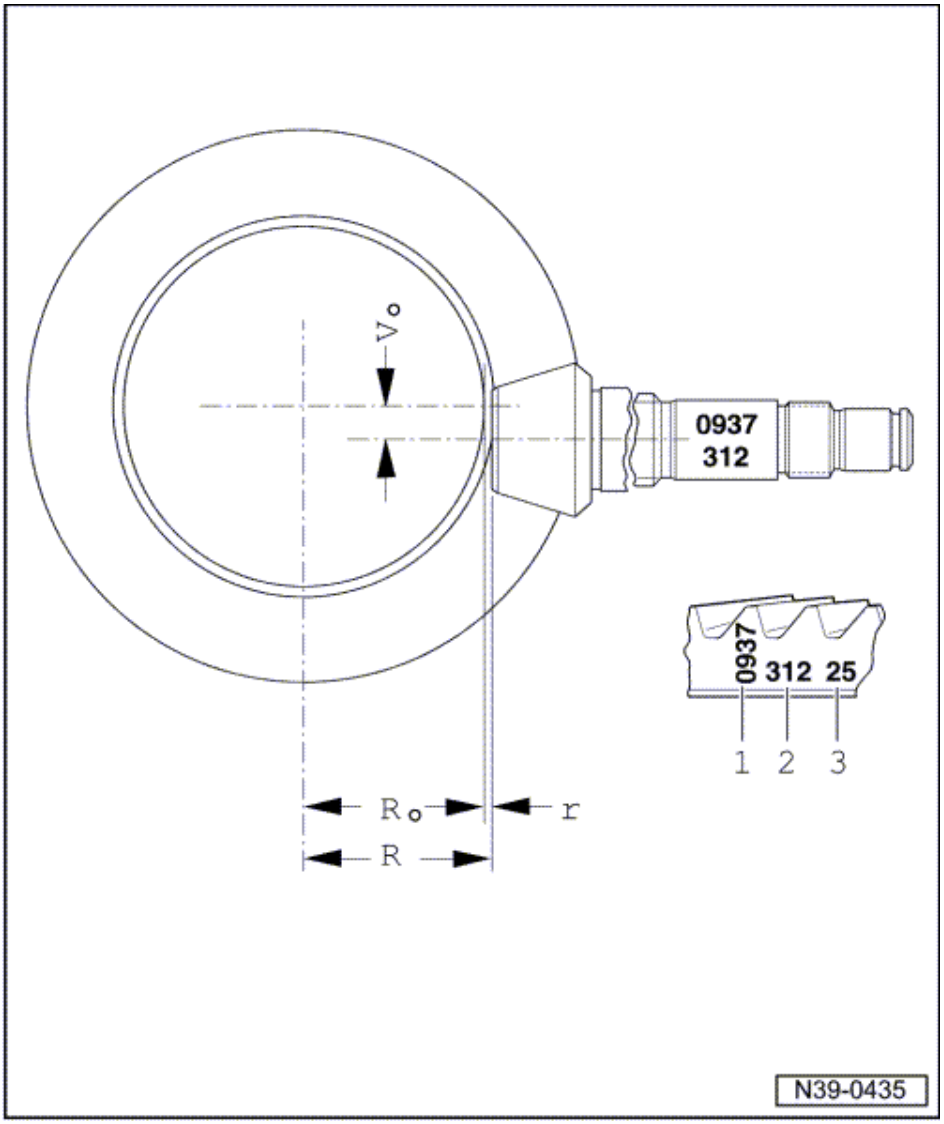
15.1 - Adjusting drive pinion and crown wheel

General notes:

- Careful adjustment of the drive pinion and crown wheel is important for the service life and smooth running of the final drive. For this reason, the drive pinion and crown wheel are matched together during manufacture, and checked to ensure a good mesh pattern and quiet running in both directions of rotation. The position of quietest running is found by moving the drive pinion in an axial direction and at the same time lifting the crown wheel out of the zero-play mesh position by the amount necessary to maintain the backlash within the specified tolerance.
- The object of the adjustment is to reproduce the setting for quietest possible running, as obtained on the test machine in production.
- The deviation "r", which is related to the master gauge "Ro" is measured for the final drive sets supplied as replacement parts and marked on the outer circumference of the crown wheel. The final drive set (drive pinion and crown wheel) must only be replaced together as a matched pair.
- Observe the general repair instructions for taper roller bearings and shims.
- Maximum care and cleanliness are essential for achieving good results when performing repairs and taking measurements.

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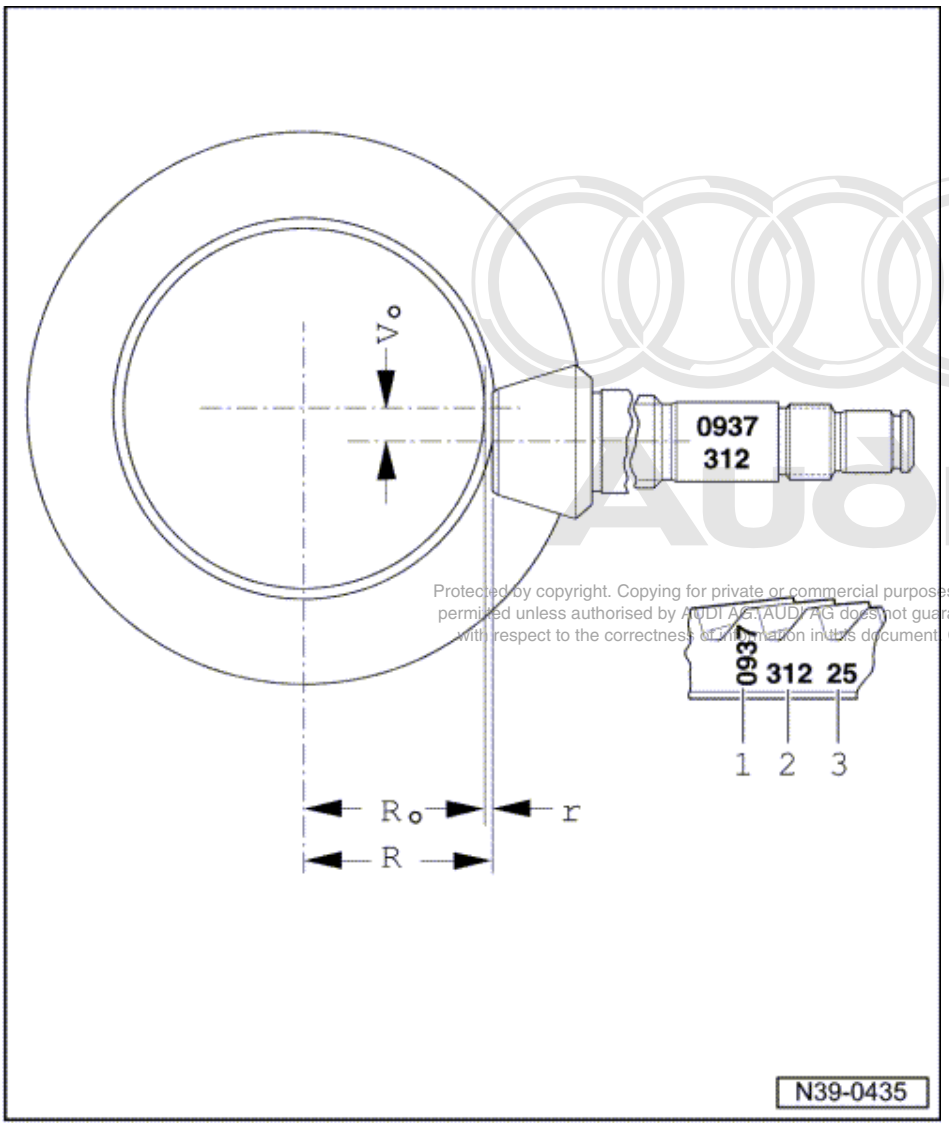
15.2 - Adjusting and marking of final drive sets



1 Marking "0937" indicates Oerlikon final drive set with transmission ratio 37 : 9.
2 Gear set pairing number (312).
3 Deviation (tolerance) "r" is based on the test machine master gauge used in production. The deviation "r" is always given in 1/100 mm. Example: "25" means
r = 0.25 mm

Ro - Length of adjustment master "Ro" of tester used.
Ro -Crown wheel = 57.50 mm

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R - Actual dimension between crown wheel and face of pinion shaft at point with quietest running for this gear set.
R = Ro + r

Vo - Hypoid offset

15.3 - Sequence of readjustment of final drive

The following procedure is recommended to save time when the drive pinion and crown wheel have to be adjusted:

1.) Determine total shim thickness "Stotal" for "S1" + "S2" for the specified preload for taper roller bearings for differential.
2.) Determine total shim thickness "S3" to reproduce the installation position for the drive pinion determined on the test machine in production.
3.) Distribute total shim thickness "Stotal" for "S1" + "S2" so that the specified backlash exists between crown wheel and drive pinion.

Note:

Overview of components and shims

=>Page 286 .

15.4 - Adjustment overview

Note:

If performing assembly work on the final drive it is only necessary to adjust the drive pinion or final drive set if components have been renewed which have a direct effect on the adjustments of the final drive. To eliminate unnecessary adjustments observe following table:

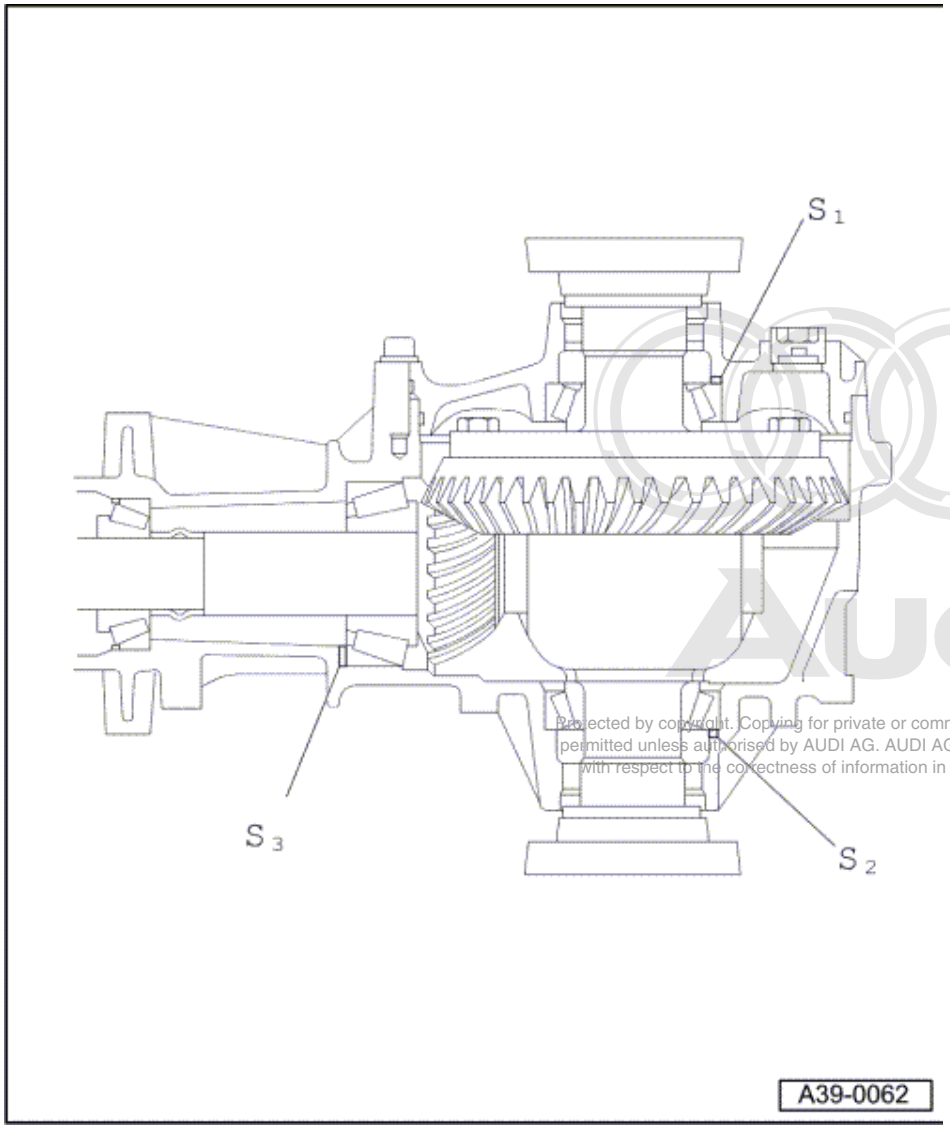
	To adjust:		
Parts renewed: ▼	Crown wheel "S1"+"S2" 1) =>Page 297	Pinion shaft "S3" 1) using deviation "r" =>Page 291	Backlash Testing =>Page 300
Final drive housing	X	X	X
Differential housing	X		X
Taper roller bearings for pinion shaft		X	X
Taper roller bearing for differential	X		X
Final drive set 2)	X	X	X
Final drive cover	X		X

1) Shims; installation position => Page 286 .

2) Drive pinion and crown wheel; only replace together.

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15.5 - Position of shims



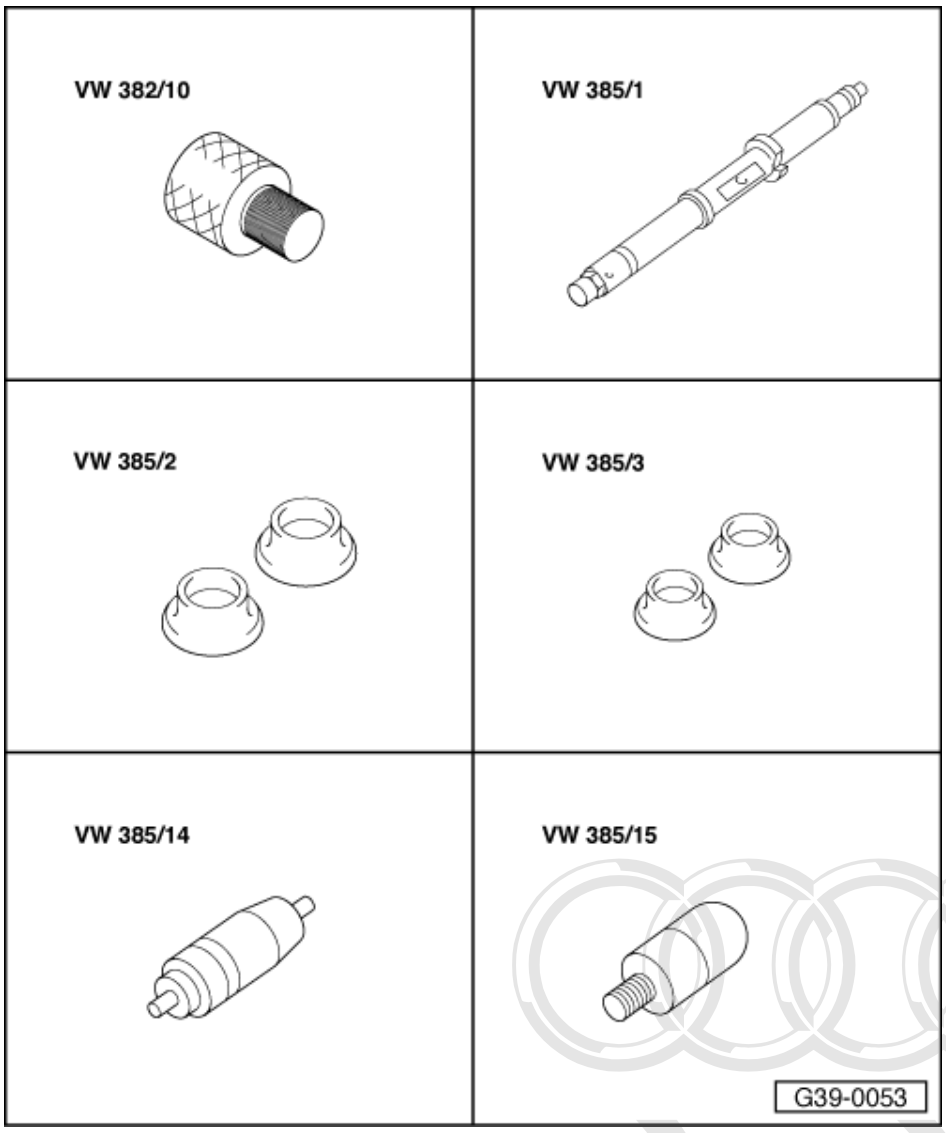
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Note:

Overview of adjustments when replacing individual components

=>Page 285 .

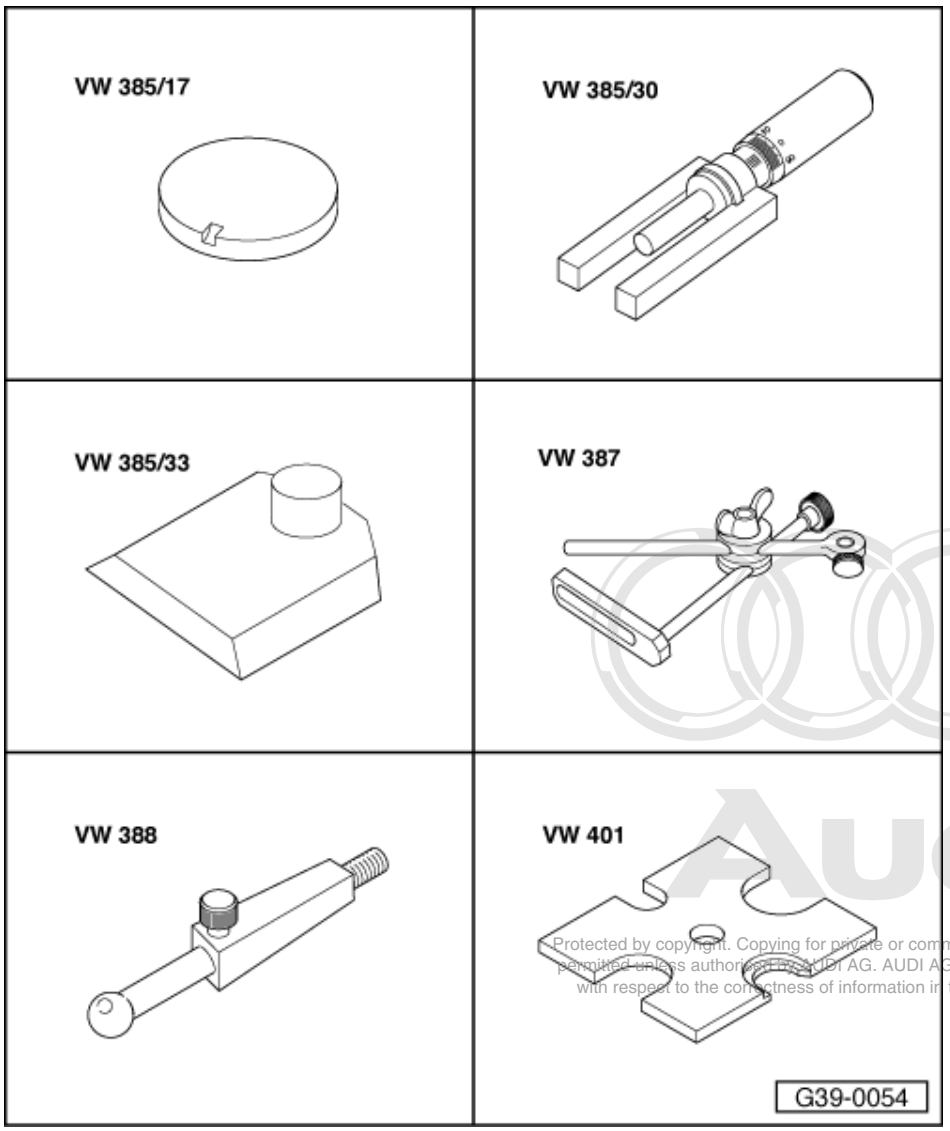
S1 - Adjustment shim for crown wheel in cover for final drive
S2 - Shim for crown wheel in final drive housing
S3 - Shim for drive pinion in final drive housing



Special tools, testers and auxiliary equipment required

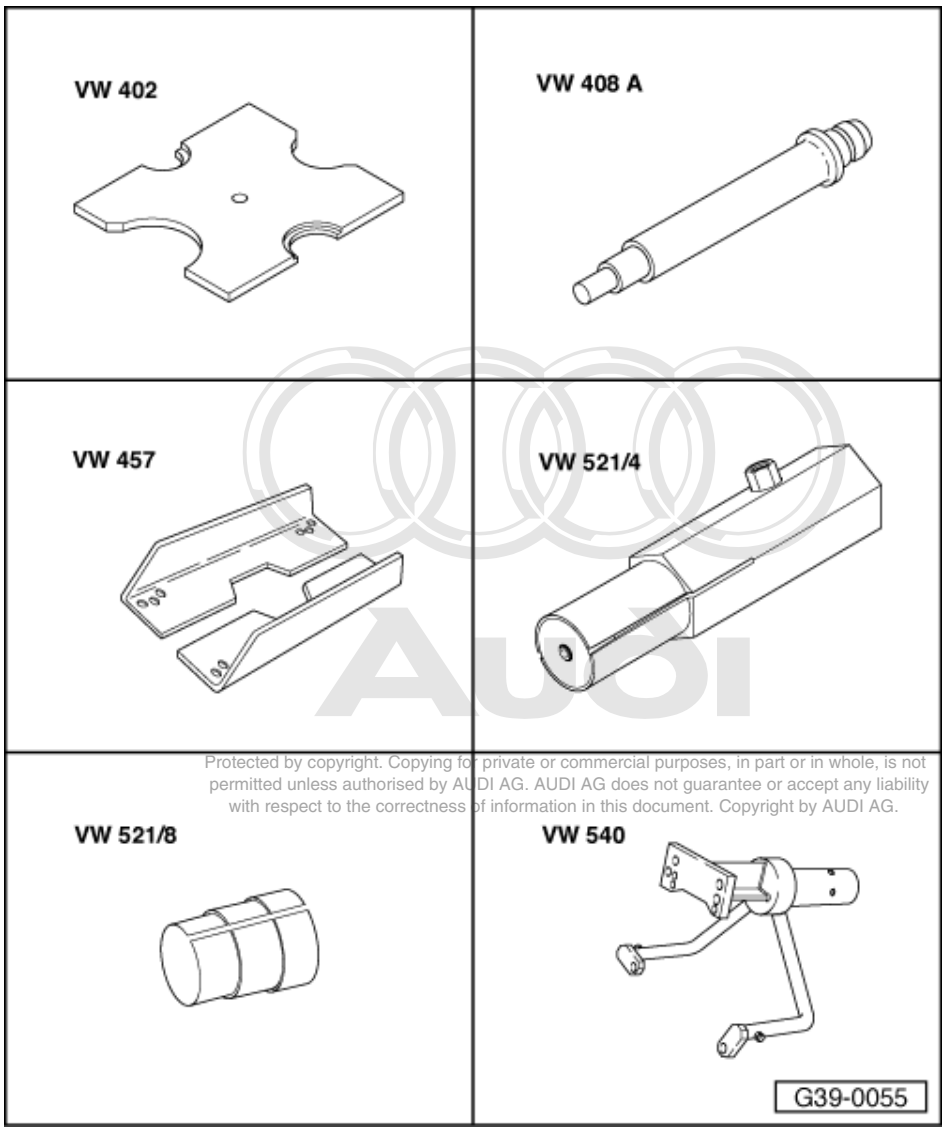
- Dial gauge extension VW 382/10
- Universal mandrel VW 385/1
- Centring disc VW 385/2
- Centring disc VW 385/3
- Measuring plunger VW 385/14
- Dial gauge extension VW 385/15

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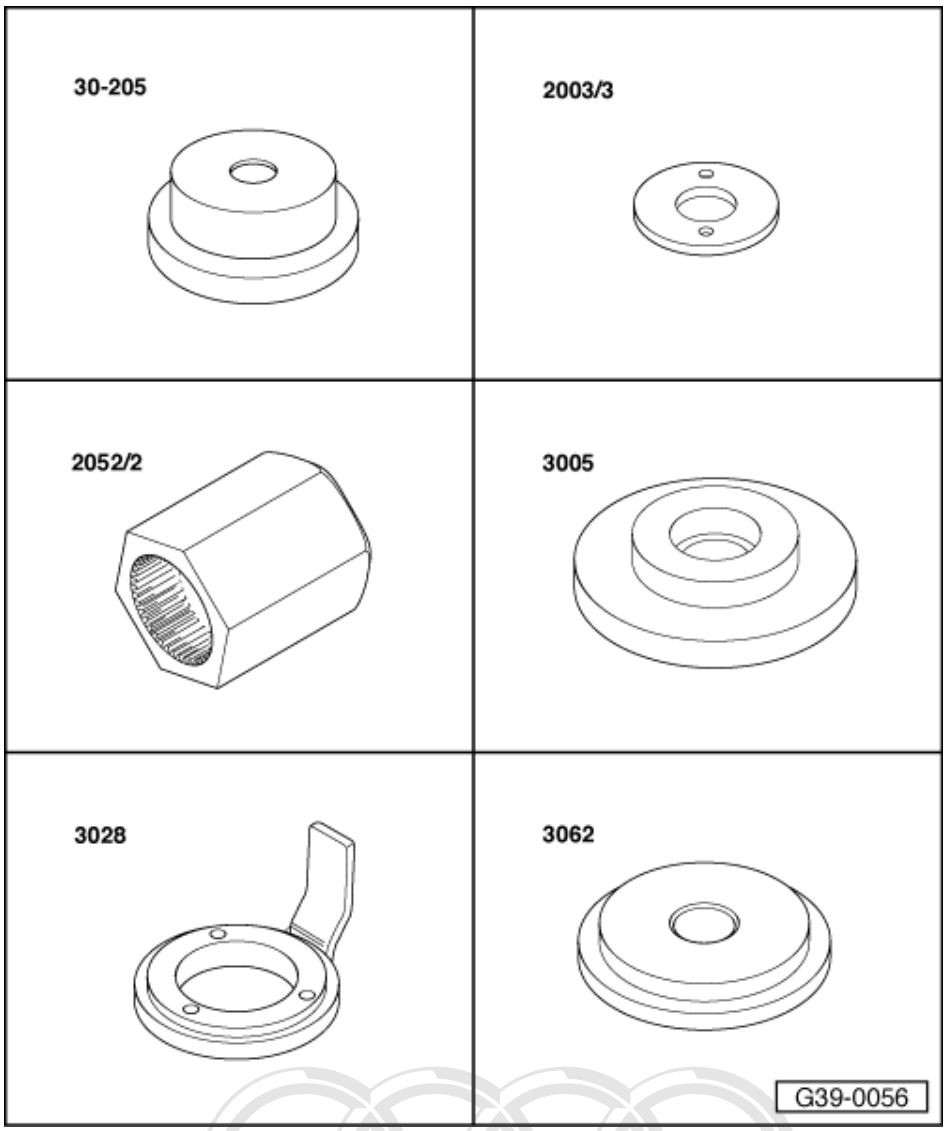
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- Measuring plate VW 385/17
- Master gauge VW 385/30
- End measuring plate VW 385/33
- Universal dial gauge retainer VW 387
- Measuring lever VW 388
- Thrust plate VW 401



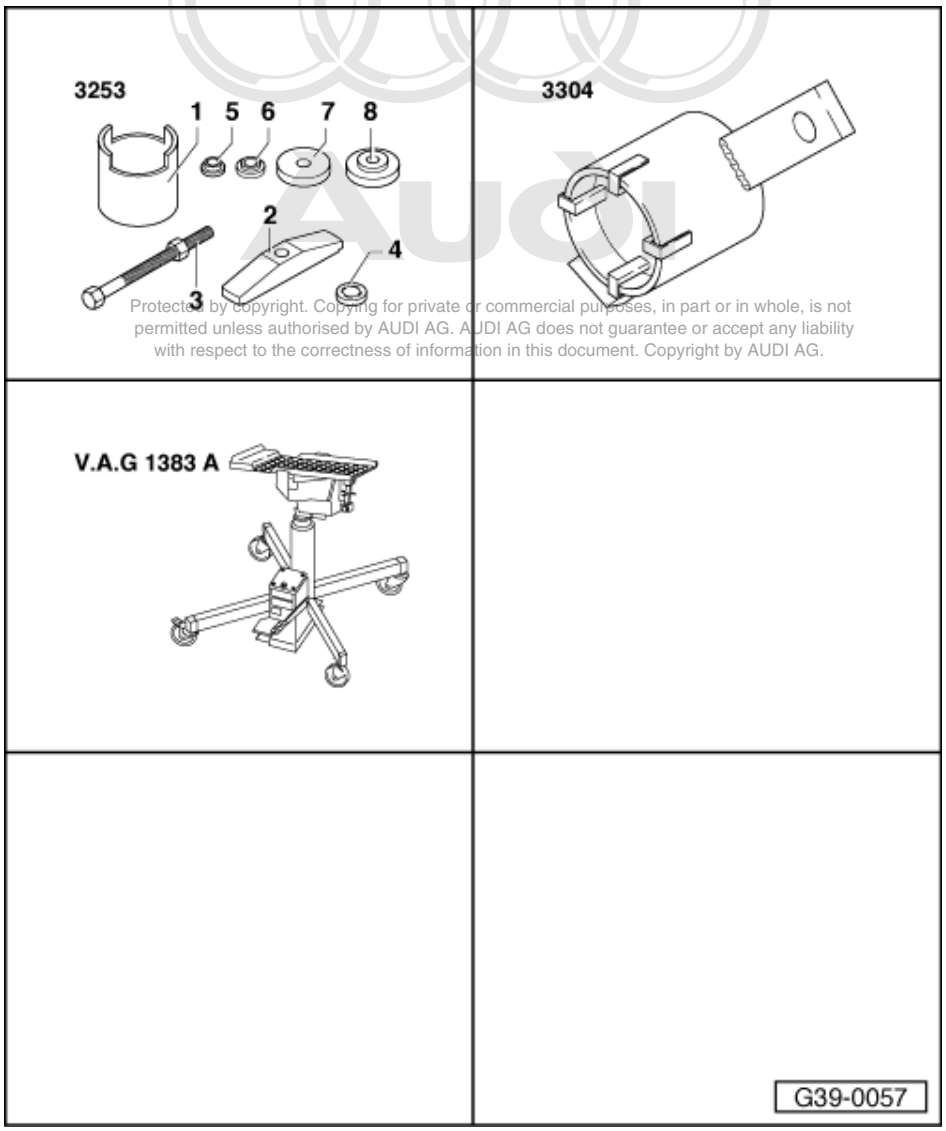
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- Thrust plate VW 402
- Press tool VW 408 A
- Mounting rails VW 457
- Adjustment tool for crown wheel VW 521/4
- Adjustment tool for crown wheel VW 521/8
- Engine and gearbox support VW 540



- Thrust plate 30-205
- Inserter ring 2003/3
- Pinion assembly device 2052/2
- Thrust plate 3005
- Holding tool 3028
- Thrust pad 3062

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- Assembly device 3253 with 3253/3 and 3253/4
- Holding tool 3304
- Engine/gearbox lifter V.A.G 1383 A
- Dial gauge extension 30 mm
- Dial gauge
- Torque gauge 0 ... 600 Ncm

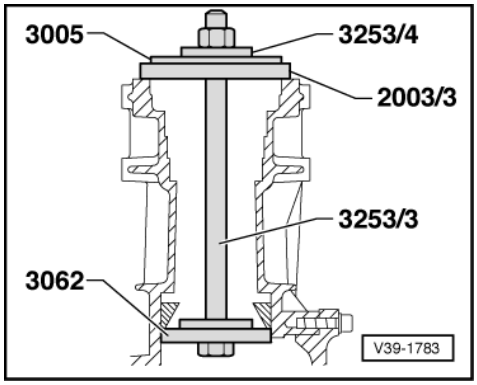
15.6 - Adjusting drive pinion

Notes:

- Before adjusting the drive pinion adjust the crown wheel (ascertain total shim thickness "S" for shims "S1" + "S2") => Page 297 .
- Re-adjustment of the drive pinion is only necessary if the final drive set, taper roller bearing for drive pinion or housing for final drive is replaced. Adjustments => Page 285 .
- Do not additionally oil new taper roller bearings for frictional torque measurement. The bearings have already been treated with special oil by the manufacturer.

Ascertaining shim "S3" thickness

(Setting preload of taper roller bearing for drive pinion)

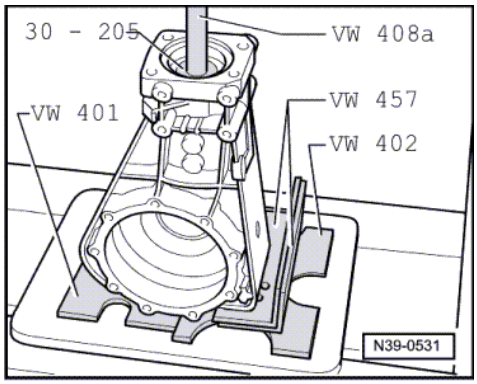


- Tensioning final drive in engine and gearbox bracket => Page 250 .
- -> Pull outer race for large taper roller bearing into housing without shim.

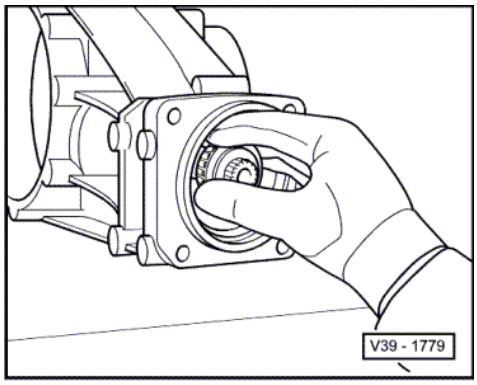
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Note:

Inscription "Oben" ("top") with thrust pad 3253/4 faces the nut of the puller.



- -> Pull outer race for small taper roller bearing into housing.
- Oil the outer race and mount it using press tool VW 408 A and thrust plate 30-205.



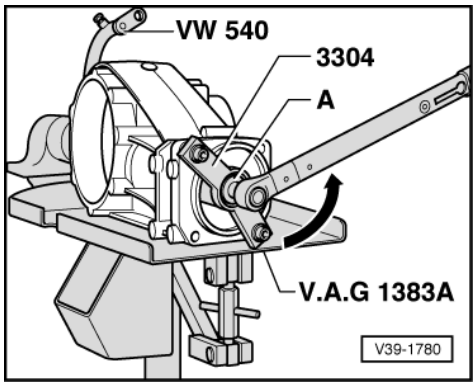
- -> Insert drive pinion without spacer sleeve.

Important:
Wear protective gloves!

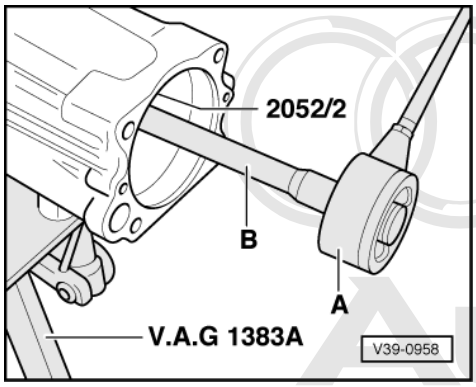
- Heat inner race for taper roller bearing to approx. 100 °C and fit onto drive pinion.

Notes:

- Do not additionally oil new taper roller bearings for frictional torque measurement. The bearings have already been treated with special oil by the manufacturer.
- Only install spacer sleeve for final frictional torque measurement (after determining shim "S3").



- -> Fit support tool 3304 with two hexagon bolts M8 x 30.
- Final drive must be supported when tightening nut (e.g. using universal support V.A.G 1359/2 in combination with gearbox jack V.A.G 1383 A).
- Fit new drive pinion nut.
- Tighten drive pinion nut just far enough so that no play can be felt at drive pinion.
- Gradually increase tightening torque, checking friction torque at regular intervals, until specified friction torque is obtained.



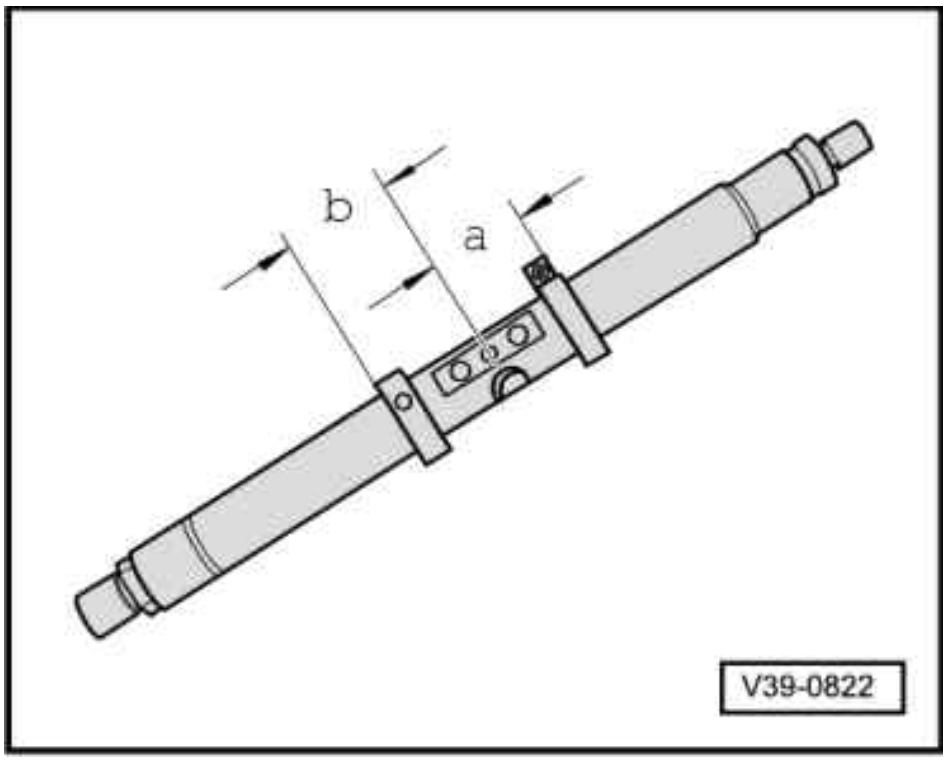
A - -> Torque gauge, commercially available, 0 ... 600 Ncm
B - Extension with 32 mm socket insert

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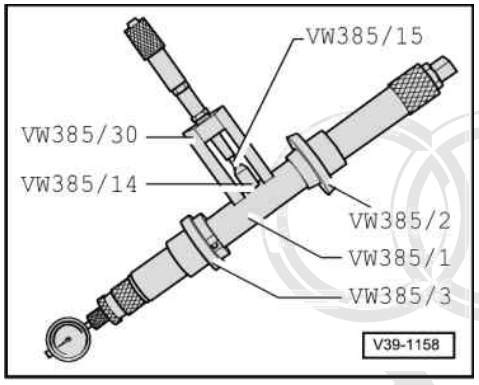
- The following frictional torques should be set:

New bearings	Used bearings 1)
200 ... 250 Ncm	30 ... 60 Ncm

1) with at least 50 km service

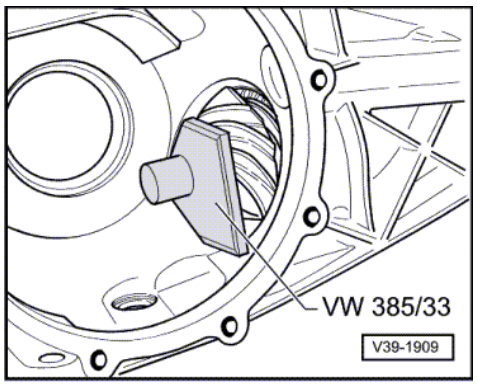


- -> Set adjustment ring of universal mandrel VW 385/1.
  - Distance a = 60 mm
- Set sliding adjustment ring.
  - Distance b = 55 mm



- -> Assemble universal mandrel as illustrated.
  - Dial gauge extension VW 385/15 = 9 mm long
- Set universal master gauge VW 385/30.
  - Ro = 57.50 mm
- Set dial gauge (3 mm measuring range) to "0" with 2 mm preload.

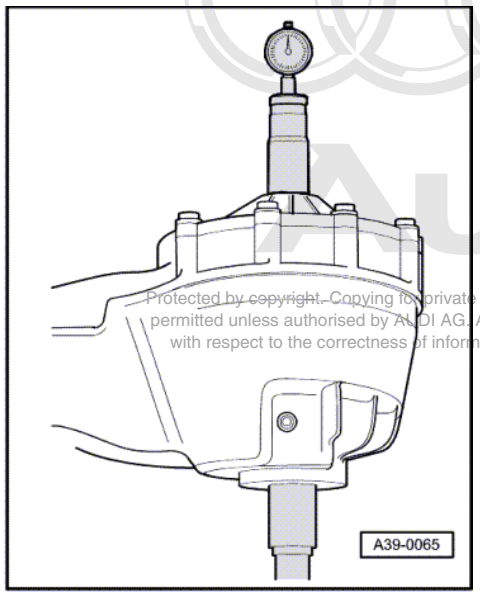
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Note:

Before performing following measurements turn drive pinion at least five turns in both directions, so that the taper roller bearings settle. Otherwise a false reading will be obtained.

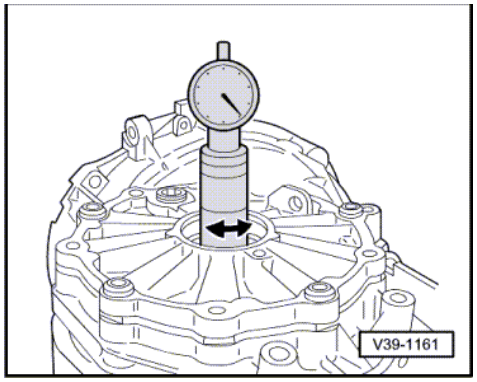
- -> Place end measuring plate VW 385/33 onto drive pinion head.



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- -> Remove master gauge and insert measuring mandrel in the housing.
  - The centring disc for VW 385/3 faces towards cover for final drive
- Fit cover for final drive and tighten 4 bolts.
- Using the adjustable ring, move 2nd centring disc out as far as possible so that the mandrel can still just be turned by hand.

Determining dimension "e"



- -> Turn mandrel until the dial gauge point touches the end measuring plate on pinion shaft head, then measure maximum deflection (return point). The measured value is dimension "e" (in red range).
  - Dimension in following example: "e" = 1.60 mm

Note:

Dimension "e" is required to determine thickness of shim "S3".

- Then, (after removing universal mandrel) check again that the dial gauge, with master gauge VW 385/30 fitted, indicates "0" with 2 mm preload, otherwise repeat the measurement.

Determining shim thickness "S3"

Formula:
"S3" = "e" - "r"
e = determined value
r = deviation (marked on crown wheel in 1 /100 mm)

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Example:		
	Determined value "e"	1.60 mm
-	Deviation "r"	0.42 mm
=	Thickness of shim "S3"	1.18 mm

- Determine shim(s) as accurately as possible from table. Part numbers

=> Parts List

The following shims are available for "S3"

Shim thickness (mm) 1)		
0.95	1.20	1.45
1.00	1.25	1.50
1.05	1.30	1.55
1.10	1.35	
1.15	1.40	

1) Using the shim tolerance variations it is possible to find the exact shim thickness required, insert two shims if necessary.

- Remove universal mandrel.

- Remove drive pinion and outer race for large taper roller bearing and reinstall with calibrated shims "S3" and spacer sleeves => fromPage 278 .
- Insert inner race for small taper roller bearing and tighten drive pinion nut until specified frictional torque is achieved => Fig. 281

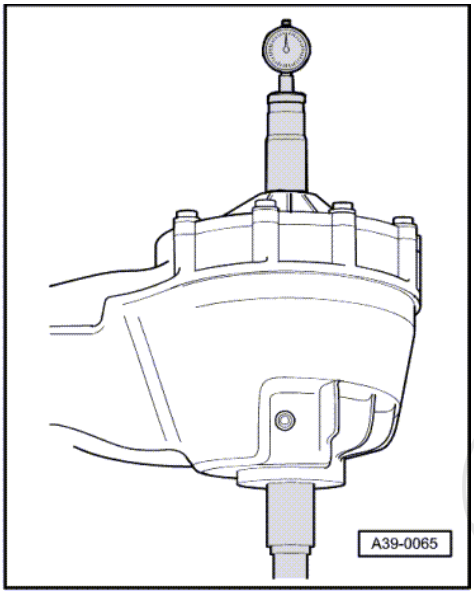
Notes:

- Do not additionally oil new taper roller bearings for frictional torque measurement. The bearings have already been treated with special oil by the manufacturer.
- Only increase tightening torque slowly and read-off frictional torque frequently. If the specified frictional torque is exceeded, the spacer sleeve must be replaced and the adjustment repeated. It is not possible to re-use a spacer sleeve that has been excessively compressed.

- Set to following frictional torques:

New bearings	Used bearings 1)
200 ... 250 Ncm	30 ... 60 Ncm

1) with at least 50 km service

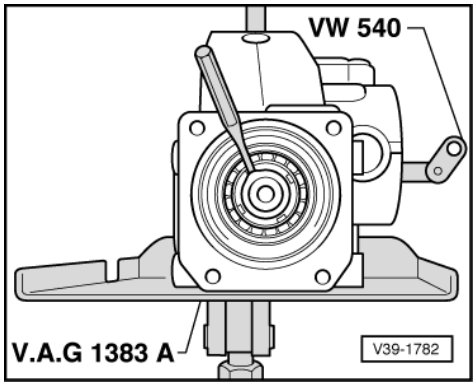


Performing check measurement

Checking dimension "r"

- Turn drive pinion at least 5 turns in both directions.
- -> Insert universal mandrel and perform check measurement.
  - If the shims have been correctly selected, the dial gauge, reading anti-clockwise (in red range), will show the deviation "r" within a tolerance of ± 0.04 mm.

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- -> Peen drive pinion nut with a drift.

15.7 - Adjusting crown wheel

(Adjusting differential)

Repairs after which the crown wheel must be adjusted => adjustment overview on Page 285 .

Notes:

- Differential taper roller bearings are low friction bearings. Therefore the frictional torque only has a limited use as a check. Correct adjustment is only possible by determining the total shim thickness "Stotal".

- Do not additionally oil new taper roller bearings for frictional torque measurement. The bearings have already been treated with special oil by the manufacturer.

Determining total shim thickness "Stotal" for shims "S1" + "S2"

(Setting preload of taper roller bearing for differential)

- Drive pinion removed or crown wheel dismantled from differential housing

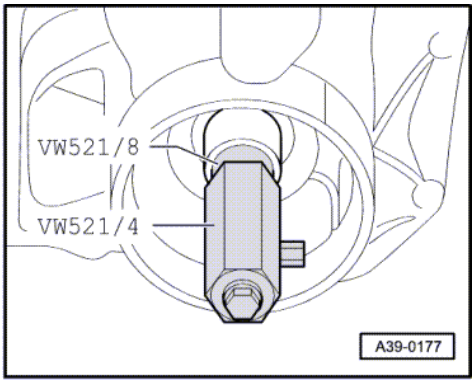
- Lever out seals for flange shaft using a suitable lever.
- Remove outer races of differential taper roller bearings and remove shims => Page 260 .

- Drive in left taper roller bearing outer race for differential (housing side) with shim "S2" into final drive housing => Fig. 267 . For measurement purposes use a 1.00 mm thick "S2*" shim (2 shims, 1 of 0.80 mm and 1 of 0.20 mm).

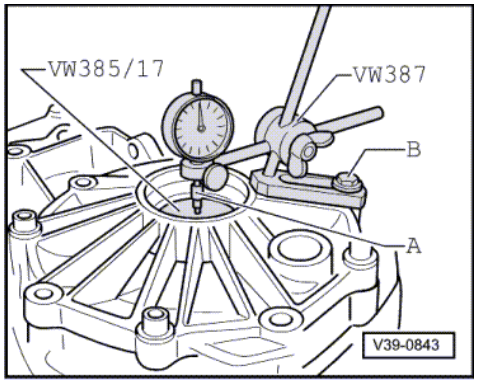
Note:

For measurement purposes a shim "S2" with a thickness of 0.04 in is initially inserted. It is referred to as "S2" in the following. After determining the backlash "S2*" will be replaced by the correct "S2".*

- Press in outer race for right taper roller bearing for differential (cover side) without shim in up to stop => Fig. 260 .
- Insert differential into housing. The crown wheel is positioned on the right side (cover side).



- Fit cover and tighten bolts to 25 Nm.
- -> Install special tools VW 521/4 and 521/8 onto housing side in differential housing.
- Turn cover side of differential housing upwards.

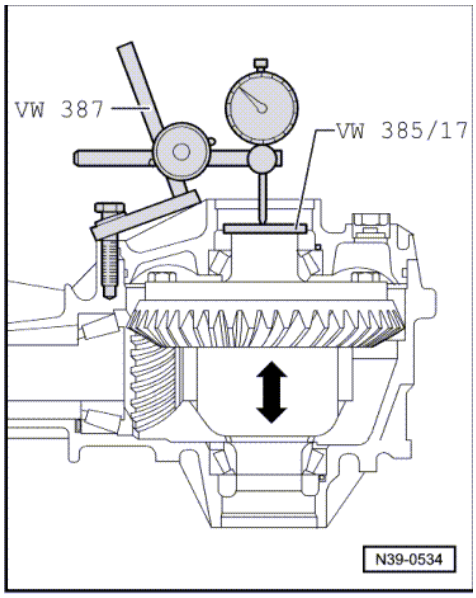


- Turn differential 5 turns in both directions to settle the taper roller bearing.
- Place measuring plate VW 385/17 onto differential.
- -> Fit measuring tools.

A - Dial gauge extension approx. 30 mm long
B - Hexagon bolt M8 x 45

- Position dial gauge extension in middle of measuring plate VW 385/17.

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- Set dial gauge (3 mm measuring range) to "0" with 2 mm preload.
- -> Lift differential without turning; read off play on dial gauge and note it down.
  - Measurement in following example: 0.50 mm

Note:

If the measurement has to be repeated, the differential must again first be turned 5 turns in each direction to settle the taper roller bearing.

Formula:
"Stotal" = "S2*" + measurement + bearing preload

Example:		
	Inserted shim(s) "S2*"	1.00 mm
+	Measurement	0.50 mm
+	Bearing preload (constant)	0.30 mm
=	Total shim thickness "Stotal" for shims "S1" + "S2"	1.80 mm

Determining thickness of shim "S1*"

Notes:

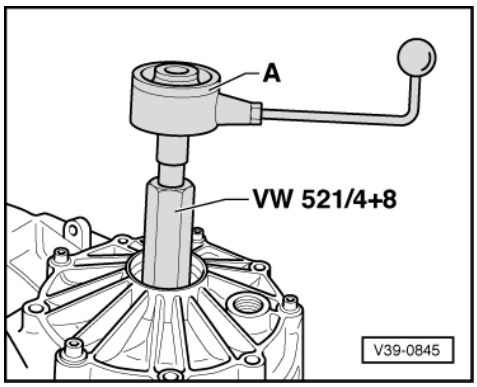
- The preliminary adjustment shim "S1*" will be replaced with the final shim "S1" after determining the backlash.
- The total shim thickness "Stotal" remains the same.

Formula:
"S1*" = "Stotal" - "S2*"

Example:		
	Total shim thickness "Stotal" for shims "S1" + "S2"	1.80 mm
-	Inserted shim(s) "S2*"	1.00 mm
=	Thickness of shim "S1*"	0.80 mm

Audi
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- Define shim(s) as precisely as possible based on the table => Page 302 .



Measuring frictional torque (check)

- Pinion shaft removed
- Differential fitted with shims "S1*" and "S2*"

- -> Fit torque gauge 0 ... 600 Ncm -A- onto differential.
- Read off friction torque.

Frictional torque specified values:

New bearings	Used bearings 1)
150 ... 300 Ncm	30 ... 60 Ncm

1) with at least 50 km service

Notes:

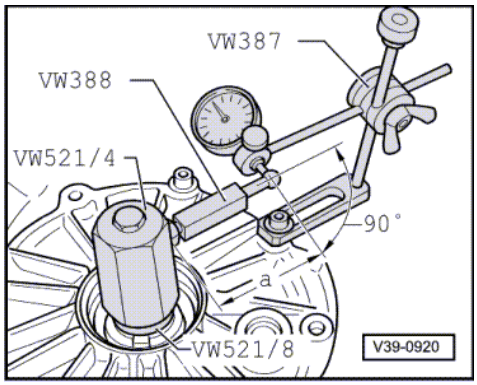
- Differential taper roller bearings are low friction bearings. Therefore the frictional torque only has a limited use as a check. Correct adjustment is only possible by determining the total shim thickness "Stotal".
- Do not additionally oil new taper roller bearings for frictional torque measurement. The bearings have already been treated with special oil by the manufacturer.
- If the final drive set is being re-adjusted, the adjustment of the pinion shaft should be performed now, and the adjustment should be checked =>Page 291 .

Adjusting backlash

(Position of crown wheel in gearbox housing)

- Drive pinion with shim "S3" installed
- Differential with shims "S1*" + "S2*" installed

- Insert differential into final housing mount cover and tighten all bolts to 25 Nm.
- Turn differential 5 turns in both directions so that the taper roller bearings settle.



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- -> Fit measuring tools.
- Use dial gauge extension VW 382/10 (6 mm flat).
- Set measuring lever VW 388 to dimension "a" = 60 mm.
- Measure play between teeth flanks (backlash) as follows:
  - Turn crown wheel until it makes contact with a tooth flank (end of backlash travel).
  - Preload dial gauge to 1 mm and set to zero.

  - Turn crown wheel back until lying against an opposite tooth flank (backlash).
  - Read off backlash and note value.
  - Turn crown wheel through 90° and repeat measurements a further 3 times.

Note:

If the individual measurements differ by more than 0.06 mm from each other, the installation of the crown wheel or the final drive set itself is not correct. Check installation; replace final drive set, if necessary.

Determining average backlash

Example:	
1st Measurement	0.28 mm
+ 2nd Measurement	0.30 mm
+ 3rd Measurement	0.30 mm
+ 4th Measurement	0.28 mm
= Sum of measured values	1.16 mm

- Result: The average backlash is 1.16 divided by 4 = 0.29 mm

Determining thickness of shim "S2"

Formula:
"S2" = "S2*" - backlash + lift

Example:	
Inserted shim "S2*"	1.00 mm
- Average backlash	0.29 mm
+ Lift (constant)	0.15 mm
= Thickness of shim "S2"	0.86 mm

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- Determine shim(s) as accurately as possible from table. Part numbers

=> Parts List

The following shims are available for "S2"

Shim thickness (mm) 1)		
0.15	0.50	1.50
0.20	0.80	
0.25	1.00	

1) Using the shim tolerance variations it is possible to find the exact shim thickness required, insert two shims if necessary.

Determining thickness of shim "S1"

Formula:
"S1" = "Stotal" - "S2"

Example:

	Total shim thickness "Stotal" for "S1" + "S2"	1.80 mm
-	Thickness of shim "S2"	0.86 mm
=	Thickness of shim "S1"	0.94 mm

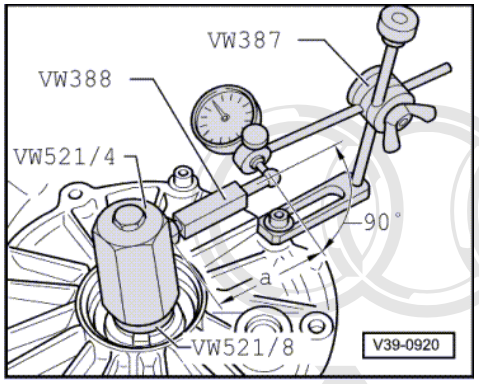
- Determine shim(s) as accurately as possible from table. Part numbers

=> Parts List

The following shims are available for "S1"

Shim thickness (mm) 1)		
0.15	0.50	0.90
0.20	0.60	1.00
0.30	0.70	1.20
0.40	0.80	

1) Using the shim tolerance variations it is possible to find the exact shim thickness required, insert two shims if necessary.



-> Check measurement

- Drive pinion with shim "S3" installed
- Differential with shims "S1" + "S2" installed

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- Turn differential 5 turns in both directions so that the taper roller bearings settle.
- Measure backlash four times on circumference.
  - Specified value: 0,12 ... 0.22 mm

Notes:

- If the backlash is beyond the tolerance, the adjustments must be repeated. The total shim thickness "Stotal" must not be changed.
- The individual measurements must not differ by more than 0.06 mm from each other.