



Maintenance

New Beetle 1999 ➤

New Beetle Cabrio 2003 ➤

Edition 05.2011





Maintenance

Heading

1. Engine list
2. Service work
3. General
4. Descriptions of work
5. Exhaust emissions test
6. Glossary



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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1 Engine list

Petrol and diesel engines are listed separately.

The engine codes are listed in alphabetical order.

♦ Petrol engines ➤ [page 1](#)

♦ Diesel engines ➤ [page 4](#)

Petrol engines

Engine codes	AEG	APH	APK
Capacity in litres	2.0	1.8	2.0
Number of cylinders	4	4	4
Valves per cylinder	2	5	2
Output/kW at rpm	85/5200	110/5700	85/5200
Torque/Nm at rpm	165/2400	220/2000...4200	170/2400
Compression ratio	10.5	9.5	10.5
Injection/ignition	Motronic M 5.9.2 SRE	Motronic ME 7.5 SRE	Motronic M 5.9.2 SRE
RON unleaded, at least	91	95 also 91 RON, but with reduced output	95 also 91 RON, but with reduced output
Camshaft drive	Toothed belt	Toothed belt	Toothed belt

Petrol engines

Engine codes	AQN	AQY	AVC
Capacity in litres	2.3	2.0	1.8
Number of cylinders	5	4	4
Valves per cylinder	4	2	5
Output/kW at rpm	125/6200	85/5200	110/5700
Torque/Nm at rpm	220/3300	170/2400	210/1750...4600
Compression ratio	10.5	10.5	9.5
Injection/ignition	Motronic ME 7.1 SRE	Motronic M 5.9.2 SRE	Motronic ME 7.5 SRE
RON unleaded, at least	98 also 95 RON, but with reduced output	95 also 91 RON, but with reduced output	95 also 91 RON, but with reduced output
Camshaft drive	Timing chain	Toothed belt	Toothed belt

Petrol engines

Engine codes	AVH	AWH	AWP
Capacity in litres	2.0	1.6	1.8
Number of cylinders	4	4	4
Valves per cylinder	2	2	5
Output/kW at rpm	85/5400	74/5600	132/5500
Torque/Nm at rpm	165/2600	145/3800	235/2190...5000
Compression ratio	10.0	10.3	9.5



Engine codes	AVH	AWH	AWP
Capacity in litres	2.0	1.6	1.8
Injection/ignition	Motronic ME 7.5 SRE	Simos 3.3 SRE	Motronic ME 7.5 SRE
RON unleaded, at least	91	95 also 91 RON, but with reduced output	95 also 91 RON, but with reduced output
Camshaft drive	Toothed belt	Toothed belt	Toothed belt

Petrol engines

Engine codes	AWU	AWV	AYD
Capacity in litres	1.8	1.8	1.6
Number of cylinders	4	4	4
Valves per cylinder	5	5	2
Output/kW at rpm	110/5700	110/5700	75/5600
Torque/Nm at rpm	210/1750...4600	220/1750...4600	148/3800
Compression ratio	9.5	9.5	10.2
Injection/ignition	Motronic ME 7.5 SRE	Motronic ME 7.5 SRE	Simos 3.3 SRE
RON unleaded, at least	95 also 91 RON, but with reduced output	95 also 91 RON, but with reduced output	95 also 91 RON, but with reduced output
Camshaft drive	Toothed belt	Toothed belt	Toothed belt

Petrol engines

Engine code	AZG	AZJ	BDC
Capacity in litres	2.0	2.0	2.0
Number of cylinders	4	4	4
Valves per cylinder	2	2	2
Output/kW at rpm	85/5400	85/5400	85/5400
Torque/Nm at rpm	165/2600	172/3200	170/3000
Compression ratio	10.0	11.5	10.0
Injection/ignition	Motronic ME 7.5 SRE	Motronic ME 7.5 SRE	Motronic ME 7.5 SRE
RON unleaded, at least	91	95 also 91 RON, but with reduced output	91
Camshaft drive	Toothed belt	Toothed belt	Toothed belt

Petrol engines

Engines	Petrol engine	Petrol engine	Petrol engine
Engine code	BEJ	BCA	BER
Capacity in litres	2.0	1.4	2.0
Number of cylinders	4	4	4
Valves per cylinder	2	4	2
Output/kW at rpm	85/5400	55/5000	85/5400
Torque/Nm at rpm	165/2600	128/3300	170/3200



Engines	Petrol engine	Petrol engine	Petrol engine
Engine code	BEJ	BCA	BER
Capacity in litres	2.0	1.4	2.0
Compression ratio	10.3	10.5	11.5
Injection/ignition	Motronic ME 7.5 SRE	Motronic ME 7.5 SRE	Motronic ME 7.5 SRE
RON unleaded, at least	87	95 also 91 RON, but with reduced output	87
Camshaft drive	Toothed belt	Toothed belt	Toothed belt

Petrol engines

Engine code	BEV	BFS	BGD
Capacity in litres	2.0	1.6	2.0
Number of cylinders	4	4	4
Valves per cylinder	2	2	2
Output/kW at rpm	85/5400	75/5600	85/5400
Torque/Nm at rpm	165/2600	148/3800	170/3000
Compression ratio	10.0	10.2	10.3
Injection/ignition	Motronic ME 7.5 SRE	Simos 3.3 SRE	Motronic ME 7.5 SRE
RON unleaded, at least	91	95 also 91 RON, but with re- duced output	91
Camshaft drive	Toothed belt	Toothed belt	Toothed belt

Petrol engines

Engine code	BHP	BKF	BNU
Capacity in litres	2.0	1.8	1.8
Number of cylinders	4	4	4
Valves per cylinder	2	5	5
Output/kW at rpm	85/5400	110/5700	132/5500
Torque/Nm at rpm	165/2600	220/1750...4600	235/2190...5000
Compression ratio	11.5	9.5	9.5
Injection/ignition	Motronic ME 7.5 SRE	Motronic ME 7.5 SRE	Motronic ME 7.5 SRE
RON unleaded, at least	87	95 also 91 RON, but with re- duced output	98 also 95 RON, but with reduced output
Camshaft drive	Toothed belt	Toothed belt	Toothed belt

Petrol engines

Engine code	BPR	BPS	BSE
Capacity in litres	2.5	2.5	1.6
Number of cylinders	5	5	4
Valves per cylinder	4	4	2
Output/kW at rpm	110/5200	110/5200	75/5600



Engine code	BPR	BPS	BSE
Capacity in litres	2.5	2.5	1.6
Torque/Nm at rpm	228 / 4000	228 / 4000	148/3800
Compression ratio	9.5	9.5	10.5
Injection/ignition	MPI Bosch Motronic SRE	MPI Bosch Motronic SRE	SIMOS 7.1 SRE
RON unleaded, at least	91 also 87 RON, but with reduced output	91 also 87 RON, but with reduced output	95 also 91 RON, but with reduced output
Camshaft drive	Timing chain	Timing chain	Toothed belt

Petrol engines

Engine code	CBPA
Capacity in litres	2.0
Number of cylinders	4
Valves per cylinder	2
Output/kW at rpm	85/5200
Torque/Nm at rpm	170/2400
Compression ratio	10,3
Injection/ignition	Motronic M 7.5.2 SRE
RON unleaded, at least	95 also 91 RON, but with reduced output
Camshaft drive	Toothed belt

Diesel engines

Engine code	ALH	ATD	AXR
Capacity in litres	1,9	1,9	1,9
Number of cylinders	4	4	4
Valves per cylinder	2	2	2
Output/kW at rpm	66/3750	74/4000	74/4000
Torque/Nm at rpm	210/1900	240/1800-2400	240/1800-2400
Compression ratio	19.5	19.0	19.0
Injection/ignition	TDI	TDI (unit injector)	TDI (unit injector)
Fuel conforming to	DIN EN 590	DIN EN 590	DIN EN 590
Diesel particulate filter	no	no	no
Camshaft drive	Toothed belt	Toothed belt	Toothed belt

Diesel engines

Engines	Diesel engine	Diesel engine
Engine code	BEW	BSW
Capacity in litres	1.9	1.9
Number of cylinders	4	4
Valves per cylinder	2	2
Output/kW at rpm	74/4000	77/4000
Torque/Nm at rpm	240/1800...2400	250/1800...2500



Engines	Diesel engine	Diesel engine
Engine code	BEW	BSW
Capacity in litres	1.9	1.9
Compression ratio	19.0	19.0
Injection/ignition	TDI - unit injector	TDI (unit injector)
Fuel conforming to	DIN EN 590	DIN EN 590
Diesel particulate filter	no	no / yes Engine is also available with open DPF system
Camshaft drive	Toothed belt	Toothed belt





2 Service work

This chapter provides information on the following subjects:

- ◆ Information on LongLife service and time or distance dependent service ➔ [page 6](#)
- ◆ Service tables ➔ [page 8](#)
- ◆ Time or distance dependent additional work ➔ [page 8](#)

Information on delivery inspection, oil change service and inspection service:



Note

Create your maintenance list via the reference medium „maintenance table“. This ensures that the current and engine-specific maintenance list is always available.

2.1 Information on LongLife service and time or distance dependent service

Service identification

LongLife service

Time or distance dependent service

Service interval display

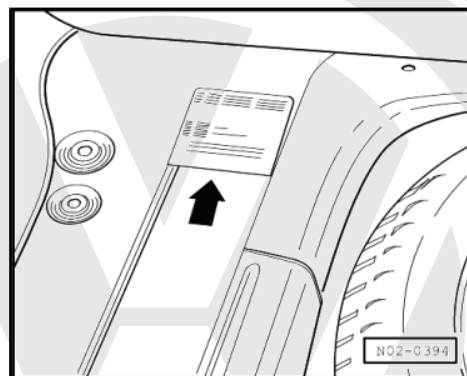
2.1.1 Service identification

- Check vehicle data sticker -arrow- to determine whether the vehicle is equipped with PR number „QG0“, „QG1“ or „QG2“. The PR number is decisive for the service intervals ➔ [page 8](#).

Vehicle IDs with the following PR number

„QG1“ indicates LongLife service.

„QG0“ or „QG2“ indicates time or distance dependent service.



2.1.2 LongLife service

Vehicles with PR number „QG1“

The LongLife service enables long service intervals, depending on individual driving style and the conditions under which the vehicle is used.



Note

For the LongLife service a special LongLife engine oil is required ➔ [page 8](#).

Vehicles with PR number „QG1“ are factory-fitted with active LongLife service. This means, these vehicles have a flexible service interval display and are fitted with the following components:

- ◆ Flexible service interval display in dash panel insert



- ◆ Engine oil level sensor
- ◆ Brake pad wear indicator (if fitted)

For vehicles with LongLife service the service interval is determined by the control unit and is indicated on service interval display (SID) ➤ [page 8](#) .

Therefore the service intervals for LongLife service are flexible.

These flexible service intervals apply to all types of service including an engine oil change.

2.1.3 Time or distance dependent service

On vehicles with time or distance dependent service with PR number „QG0/QG2“ non-flexible service intervals apply. This means that the mileage or time values are already set by Volkswagen. For normal operating conditions achieving these service intervals is technically assured.

Therefore the service intervals for time or distance dependent service are non-flexible.

For vehicles

- ◆ Which were delivered without extended servicing intervals (ESI) (PR number „QG0“ = without ESI, PR number „QG2“ = ESI cannot be activated)
- ◆ When the extended servicing interval (ESI) was stopped
- ◆ When no LongLife engine oil was used

the time or distance dependent service applies.

These non-flexible service intervals apply to all types of service including an engine oil change.

Vehicles with PR number „QG0“

Vehicles are „not“ factory-fitted with components for LongLife service. For maintenance the time or distance dependent intervals (non-flexible intervals) apply.

Vehicles with PR number „QG2“

For these vehicles the LongLife service is not factory-activated. Therefore, these vehicles have a non-flexible service interval display (SID) ➤ [page 8](#) and for maintenance the time or distance dependent intervals (non-flexible intervals) apply. These vehicles are fitted with the following components:

- ◆ Non-flexible service interval display in dash panel insert
- ◆ Engine oil level sensor
- ◆ Brake pad wear indicator (if fitted)

Vehicles with PR number „QG3“

For these vehicles the LongLife service is not factory-activated. Therefore, these vehicles have a non-flexible service interval display (SID) ➤ [page 8](#) and for maintenance the time or distance dependent intervals (non-flexible intervals) apply. These vehicles are fitted with the following components:

- ◆ Non-flexible service interval display in dash panel insert
- ◆ Brake pad wear indicator (if fitted)



2.1.4 Flexible service interval display

Flexible service interval display (only vehicles with „long-life service“, PR number QG1).

In dash panel insert, only the display „service“ is left.

For vehicles with long-life service, oil must be changed at the latest after 30,000 km or 2 years after the last service.

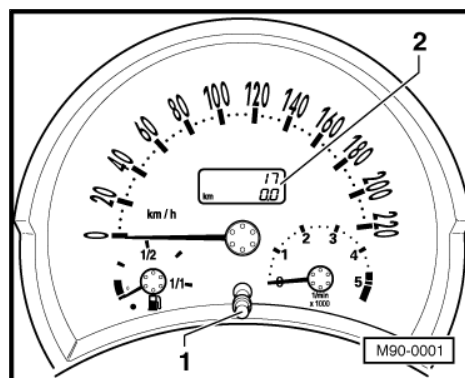
The first indication in the dash panel insert for a service due occurs 3000 km or 2000 miles before the end of the specified interval, (max. 2 years or 30,000 km). However, if the maximum time until the next service has been exceeded and the vehicle has not been driven 3,000 km or 2,000 miles, the service warning will appear without an initial warning.

3,000 km or 2,000 miles before the end of the specified interval, each time the ignition is switched on, the initial service indication „Service in 3,000 km“ or „Service in 2,000 miles“ appears steadily for 20 seconds in the dash panel insert display. Thereafter the remaining distance is counted down in steps of 100 km continuously to 0 km.

When a service is due, the service warning „Service“ or „Service now“ will flash for about 20 seconds in the dash panel insert display -2-. When the engine is started, the service warning extinguishes.

Calculating the service interval for the flexible service interval display:

To calculate service interval for vehicles with petrol engines, input values such as distance driven, fuel consumption and oil temperature are evaluated. The result of the evaluation is a measure of the deterioration of the oil due to thermal load. Oil deterioration is the decisive factor in determining the distance that can still be driven before the next service.



Note

For vehicles with long-life service (PR number QG1) but which are serviced according to „time or distance dependent“ intervals, the service interval display need not be recoded to „non-flexible“.

2.2 Service tables

The following chapter contains the well-known service tables with the service specifications of the Volkswagen brand. Since, in the past, individual service specifications were set up in various markets, mostly through severe operating conditions, these are listed in service tables with specific deviations.

Service intervals ➔ [page 9](#)

VW engine oil standards ➔ [page 10](#)

Filter change intervals ➔ [page 11](#)

Toothed belt change intervals ➔ [page 11](#)

Spark plugs ➔ [page 13](#)

Service tables with market-specific deviations ➔ [page 23](#)



2.2.1 Service intervals



Caution

Only applies to diesel engines:

- *In some countries the sulphur content in diesel fuel exceeds 2000 ppm.*
- *The high sulphur content leads to excessive wear of cylinders and it considerably reduces the cleanliness of pistons.*
- ◆ *Therefore, in countries with elevated sulphur content in diesel fuel, change engine oil and fuel filter every 7,500 km.*
- ◆ *Your importer will inform you about countries with elevated sulphur content in diesel fuel.*



Note

- ◆ *For extremely uneconomical driving style or use under extreme conditions, the shortest interval for an oil change service or interval service is „15,000 km or 1 year“ ➔ [page 29](#).*
- ◆ *However, other intervals apply for other countries. Your importer will inform you about this.*

New Beetle		
Service intervals / appointments, petrol and diesel engines		
From - to	Engine/Engine code/PR No./Remarks	Intervals: Service
10.97 - week 24/99	Petrol and diesel	Every 15,000 km: oil change service ¹⁾ or every year inspection service
		Every 30,000 km or 1 year: inspection service whichever occurs first
From week 25/99	Petrol and diesel: QG0/QG2 or QG1 vehicles coded to non-flexible interval	Every 15,000 km or 1 year: oil change service ¹⁾ whichever occurs first
		Every 30,000 km / 2 years: Inspection service whichever occurs first Time- or mileage-dependent
	Petrol: QG1	Flexible from 15,000 to max. 30,000 km / max. 2 years inspection service long-life service whichever occurs first
From MY 02	TDI: QG1	Flexible from 15,000 to max. 30,000 km / max. 2 years inspection service long-life service whichever occurs first
	TDI unit injector: QG1	

1) When using diesel fuel with elevated sulphur content, an oil change service of 7,500 km is valid. Countries with elevated sulphur content in diesel fuel ➔ [page 30](#).



2.2.2 VW engine oil standards



Caution

Only engine oils approved by VW may be used, up-to-date information ⇒ ServiceNet, Technical information, Inspections and Servicing, Approved oils , or ask your importer.



Note

*For vehicles with long-life service (PR number QG1) but which are serviced according to „time or distance dependent“ intervals, the service interval display must be recoded to „non-flexible“
⇒ [page 113](#) .*

New Beetle			
VW ENGINE OIL STANDARDS			
♦ PETROL ENGINES			
• „With LongLife service (QG1)“		• „Without LongLife service (QG0, QG2)“	
Engine type	Engine oil standards	Engine type	Engine oil standards
4-cylinder engines, VR5 engines without FSI	504 00 ²⁾ , alternative 503 00 ³⁾	4+5-cylinder engines ➤2007	501 01/502 00
		4+5-cylinder engines 2008➤	502 00
		VR5 engines	502 00 / 505 01 / 503 01

New Beetle			
VW ENGINE OIL STANDARDS			
DIESEL ENGINES			
◆ Without diesel particulate filter			
◆ And diesel engines with retrofitted diesel particulate filter			
• „With LongLife service QG1“		• „Without LongLife service QG0, QG2“	
Engine type	Engine oil standards	Engine type	Engine oil standards
4-cylinder TDI, TDI unit injector	507 00 ²⁾ alternative 506 01 ⁴⁾	4-cylinder engines without unit injector	505 00 / 505 01
		TDI unit injector	505 01
◆ DIESEL ENGINES with factory-fitted diesel particulate filter			
• „With LongLife service QG1“		• „Without LongLife service QG0, QG2“	
Engine type	Engine oil standards	Engine type	Engine oil standards
4-cylinder TDI-PD	507 00 ¹⁾	4-cylinder TDI unit injector	507 00 ¹⁾

2) Combination product: 504 00 / 507 00

3) Combination product: 503 00 / 506 00

4) Combination product: 503 00 / 506 00 / 506 01



2.2.3 Toothed belt change intervals

- If the engine is fitted with toothed belt or timing chain can be found in the engine list ➔ [page 1](#)



Note

The camshaft drive with timing chain is maintenance-free!

New Beetle				
Toothed belt change intervals, tensioning roller change intervals				
◆ DIESEL ENGINES				
Engine type	Engine code	Period	Toothed belt change intervals	Belt tensioner change interval
1.9 l TDI	ALH	Up to and including model year 2001	Every 90,000 km	---
		From model year 2002	Every 120,000 km	Idler roller (038 109 244 H) once 120,000 km, replaced by 038 109 244 M
		From model year 2003	Every 150,000 km	---
1.9l TDI unit injector	ATD, AXR	Since introduction	Every 90,000 km	Tensioning roller: every 90,000 km
	ATD, AXR, BEW, BSW	From model year 2004	Every 120,000 km	Tensioning roller: every 240,000 km
TDI unit injector	All	From model year 2007	Every 150,000 km	Tensioning roller: every 300,000 km

New Beetle			
Toothed belt change intervals			
◆ PETROL ENGINES			
Engine type	Engine code	Period	Toothed belt change intervals
1.4 l	BCA	---	No prescribed change interval, toothed belt drive with test interval
1.6 l, 2.0 l	AEG, APK, AQY, AVH, AWH, AYD, AZG, AZJ, BDC, BEJ, BER, BEV, BFS, BGD, BHP, BSE, CBPA	---	No prescribed change interval, toothed belt drive with test interval
1.8 l 5V	APH, AVC, AWP, AWU; AWV; BKF, BNU	Since introduction	Every 180,000 km

2.2.4 Filter change intervals

New Beetle	
FILTER CHANGE INTERVALS	
◆ ENGINE OIL FILTER	
SERVICE TYPE	CHANGE INTERVALS



New Beetle	
FILTER CHANGE INTERVALS	
»Petrol engines« with LongLife service QG1	According to service interval display from 15,000 km or 1 year to max. 30,000 km or 2 years
SDI, TDI (VEP) »diesel engines« with LongLife service QG1	According to service interval display from 15,000 km or 1 year to max. 30,000 km or 2 years
TDI unit injector »diesel engines« from model year 02 with LongLife service QG1	According to service interval display from 15,000 km or 1 year to max. 30,000 km or 2 years
All remaining vehicles without LongLife service QG0, QG2	Every 15,000 km or 1 year whichever occurs first

♦ AIR FILTER	
ENGINE TYPE	CHANGE INTERVALS
All engine types	EVERY 4 years
	♦ Mileage < than 60,000 km in 4 years
	EVERY 60,000 km ♦ Vehicles driving > than 60,000 km in 4 years whichever occurs first

♦ FUEL FILTER						
ENGINE TYPE	DIESEL STANDARDS / CHANGE INTERVALS					
All diesel engines	Diesel conforming to EN 590		Diesel not conforming to EN 590		Biodiesel (RME)	
	Change	Drain water	Change	Drain water	Change	Drain water
	Every 60,000 km	Every 30,000 km	Every 30,000 km	Every 15,000 km	Every 30,000 km	Every 15,000 km

♦ DUST AND POLLEN FILTER	
ENGINE TYPE	CHANGE INTERVALS
All engine types	EVERY 30,000 km
	♦ Vehicles driving > than 30,000 km in 2 years
	EVERY 2 years ♦ Mileage < than 30,000 km in 2 years whichever occurs first

♦ OIL FILTER OF DUAL CLUTCH GEARBOX	
GEARBOX TYPE	CHANGE INTERVALS
6-speed DSG, 02E	Every 60,000 km

♦ OIL FILTER Haldex coupling	
Diesel vehicles	Every 100,000 km



Petrol vehicles	Every 60,000 km
-----------------	-----------------

2.2.5 Spark plug change intervals

- Spark plug designation: see „Power unit“ ⇒ Rep. gr. 28 „Test data, spark plugs“

New Beetle		
Spark plug change intervals		
Engine type	Engine code	Change intervals
1.4 SRI 1.6 SRI 1.8 SRI 2.0 SRI 2.3 SRI 2.5 SRI	AEG, APH, APK, AQN, AQY, AVC, AVH, AWH, AWP, AWU, AWV, AYD, AZG, AZJ, BDC, BEJ, BCA, BER, BEV, BFS, BGD, BHP, BKF, BNU, BPR, BPS BSE, CBPA	EVERY 60,000 km ♦ Vehicles driving > than 60,000 km in 4 years EVERY 4 years ♦ Mileage < than 60,000 km in 4 years

2.2.6 Additional work ► 1999

Depending on conditions under which the vehicle is used
⇒ [page 29](#) and vehicle equipment, extra service work must be performed in addition to the oil change service.

This additional work must be carried out depending on time and / or distance.

It is also possible, to perform additional work outside the service intervals with regard to the entries in the service schedule (or sticker: next service).

Every 30,000 km

Additional work	Page
– Fuel filter: „RENEW“ - when using diesel: • »NOT« conforming to EN 590 • When using RME (biodiesel) conforming to „EN 14214“	⇒ page 58
– Renew dust and pollen filter (cabin filter) ♦ For vehicles driving more than 30,000 km in 2 years	⇒ page 122

Every 60,000 km

Additional work	Page
– Renew air filter element; clean housing and snow screen if fitted. ♦ For vehicles driving more than 60,000 km in 4 years	⇒ page 65
– Renewing spark plugs ♦ For vehicles driving more than 60,000 km in 4 years ♦ Spark plug designation ⇒ Engine mixture preparation; Rep. gr. 28 ; Test data, spark plugs	⇒ page 131
– Fuel filter: „RENEW“ - when using diesel: • Conforming to EN 590	⇒ page 58



Additional work	Page
<ul style="list-style-type: none"> – Direct shift gearbox - DSG -: Change oil and oil filter ◆ 02E gearbox 	⇒ page 55
<ul style="list-style-type: none"> – Automatic gearbox: Check final drive oil level ◆ 01M gearbox 	⇒ page 39
<ul style="list-style-type: none"> – Automatic gearbox: Change ATF ◆ Vehicles with 4-speed automatic gearbox only ◆ 01M gearbox ◆ In hot countries • List of hot countries ⇒ page 31 	⇒ page 39
<ul style="list-style-type: none"> – Check automatic gearbox ATF ◆ Vehicles with 4-speed automatic gearbox only ◆ 01M gearbox ◆ Not hot countries • List of hot countries ⇒ page 31 	⇒ page 39

At 60,000 km then every 120,000 km thereafter

Additional work	Page
<ul style="list-style-type: none"> – Change ATF screen ◆ Vehicles with 4-speed automatic gearbox only ◆ 01M gearbox ◆ In hot countries • List of hot countries ⇒ page 31 	⇒ page 39

Every 90,000 km (up to and including model year 2001)

Additional work	Page
<ul style="list-style-type: none"> – Renewing toothed belt ◆ SDI / TDI diesel engines 	⇒ page 130

At 90,000 km then every 30,000 km

Additional work	Page
<ul style="list-style-type: none"> – Check camshaft drive toothed belt ◆ 4-cylinder petrol engines • Additional work not as a separate charge! 	⇒ page 129

Every 180,000 km

Additional work	Page
<ul style="list-style-type: none"> – Renew camshaft drive toothed belt ◆ 4-cylinder 5-valve petrol engines 	⇒ page 131



Every 12 months

- For vehicles with commercial passenger transport, e.g. taxis
- Only applies to Germany

Additional work (in Germany only)	Page
<ul style="list-style-type: none"> – Exhaust emissions test: Perform test • Additional work as a separate charge! 	⇒ page 140

Every 2 years

Additional work	Page
<ul style="list-style-type: none"> – Dust and pollen filter: Renew filter element ◆ For vehicles driving less than 30,000 km in 2 years 	⇒ page 122
<ul style="list-style-type: none"> – Brake fluid change • Additional work as a separate charge! 	⇒ page 49
<ul style="list-style-type: none"> – Check convertible top latch, New Beetle Cabriolet 	⇒ page 126

3 years after initial registration and then every 2 years

- Only applies to Germany

Additional work (in Germany only)	Page
<ul style="list-style-type: none"> – Exhaust emissions test: Perform test • Additional work as a separate charge! 	⇒ page 140

Every 4 years

Additional work	Page
<ul style="list-style-type: none"> – Renew air filter element; clean housing and snow screen (if fitted). ◆ For vehicles driving less than 60,000 km in 4 years 	⇒ page 65
<ul style="list-style-type: none"> – Renewing spark plugs ◆ For vehicles driving less than 60,000 km in 4 years ◆ Spark plug designation ⇒ Engine mixture preparation; Rep. gr. 28 ; Test data, spark plugs 	⇒ page 131
<ul style="list-style-type: none"> – Tyre repair set: Renew tyre sealant ◆ If fitted • Additional work as a separate charge! 	⇒ page 87

Every 6 years

Additional work	Page
<ul style="list-style-type: none"> – Air filter element: Renew and clean housing ◆ For vehicles driving less than 90,000 km in 6 years 	⇒ page 65



2.2.7 Additional work 2000 ➤

Depending on conditions under which the vehicle is used
⇒ [page 29](#) and vehicle equipment, extra service work must be performed in addition to the inspection service.

This additional work must be carried out depending on time and / or distance.

It is also possible, to perform additional work outside the service intervals with regard to the entries in the service schedule (or sticker: next service).

Every 30,000 km

Additional work	Page
<ul style="list-style-type: none"> – Fuel filter: „DRAIN WATER“ - when using diesel: • Conforming to EN 590 	⇒ page 61
<ul style="list-style-type: none"> – Fuel filter: „RENEW“ - when using diesel: • »NOT« conforming to EN 590 • When using RME (biodiesel) conforming to „EN 14214“ 	⇒ page 58
<ul style="list-style-type: none"> – Dust and pollen filter (interior filter): Clean housing and renew filter element. ◆ For vehicles driving more than 30,000 km in 2 years 	⇒ page 122

Every 60,000 km

Additional work	Page
<ul style="list-style-type: none"> – Renew air filter element; clean housing and snow screen if fitted. ◆ For vehicles driving more than 60,000 km in 4 years 	⇒ page 65
<ul style="list-style-type: none"> – Renewing spark plugs ◆ For vehicles driving more than 60,000 km in 4 years ◆ Spark plug designation ⇒ Engine mixture preparation; Rep. gr. 28 ; Test data, spark plugs 	⇒ page 131
<ul style="list-style-type: none"> – Fuel filter: „RENEW“ - when using diesel: • Conforming to EN 590 	⇒ page 58
<ul style="list-style-type: none"> – Automatic gearbox: Change ATF ◆ Vehicles with 4-speed automatic gearbox only ◆ 01M gearbox ◆ In hot countries • List of hot countries ⇒ page 31 	⇒ page 39
<ul style="list-style-type: none"> – Check automatic gearbox ATF ◆ Vehicles with 4-speed automatic gearbox only ◆ 01M gearbox ◆ Not hot countries • List of hot countries ⇒ page 31 	⇒ page 39
<ul style="list-style-type: none"> – Automatic gearbox: Check ATF level, top-up if necessary ◆ 09G gearbox 	⇒ page 39



Additional work	Page
<ul style="list-style-type: none"> – Direct shift gearbox - DSG -: Change oil ◆ 02E gearbox 	⇒ page 55
<ul style="list-style-type: none"> – Direct shift gearbox - DSG -: Change oil filter ◆ 02E gearbox 	⇒ page 55

At 60,000 km then every 120,000 km thereafter

Additional work	Page
<ul style="list-style-type: none"> – Change ATF screen ◆ Vehicles with 4-speed automatic gearbox only ◆ 01M gearbox ◆ In hot countries • List of hot countries ⇒ page 31 	⇒ page 39

Every 90,000 km (up to and including model year 2001)

Additional work	Page
<ul style="list-style-type: none"> – Renewing toothed belt ◆ Generally it is not necessary to renew the toothed belt before the actual change interval is reached. Especially cracks on the belt side are not relevant for service life ◆ Engine codes and change intervals ⇒ page 8 ◆ 1.9 l TDI -diesel engines ◆ Additional work as a separate charge! 	⇒ page 130

Every 90,000 km (from model year 2001)

Additional work	Page
<ul style="list-style-type: none"> – Toothed belt and toothed belt tensioning roller: Renew ◆ Generally it is not necessary to renew the toothed belt before the actual change interval is reached. Especially cracks on the belt side are not relevant for service life ◆ Engine codes and change intervals ⇒ page 8 ◆ Diesel engines ◆ 4-cylinder TDI unit injector engines ◆ Additional work as a separate charge! 	⇒ page 131

At 90,000 km then every 30,000 km

Additional work	Page
<ul style="list-style-type: none"> – Check camshaft drive toothed belt ◆ 4-cylinder petrol engines ◆ Additional work not as a separate charge! 	⇒ page 129



Every 120,000 km (from model year 2002)

Additional work	Page
<ul style="list-style-type: none">– Renew toothed belt and guide roller◆ Generally it is not necessary to renew the toothed belt before the actual change interval is reached. Especially cracks on the belt side are not relevant for service life◆ Engine codes and change intervals ➔ page 8◆ 1.9 I SDI / 1.9 I TDI diesel engines◆ Additional work as a separate charge!	➔ page 130

Every 120,000 km (from model year 2004)

Additional work	Page
<ul style="list-style-type: none">– Camshaft drive toothed belt: Renew◆ Generally it is not necessary to renew the toothed belt before the actual change interval is reached. Especially cracks on the belt side are not relevant for service life◆ Engine codes and change intervals ➔ page 8◆ 4-cylinder unit injector diesel engines◆ Additional work as a separate charge!	➔ page 131

Every 150,000 km (from model year 2003)

Additional work	Page
<ul style="list-style-type: none">– Renewing toothed belt◆ Generally it is not necessary to renew the toothed belt before the actual change interval is reached. Especially cracks on the belt side are not relevant for service life◆ Engine codes and change intervals ➔ page 8◆ 1.9 I SDI / 1.9 I TDI diesel engines	➔ page 130

Every 150,000 km (from model year 2006)

Additional work	Page
<ul style="list-style-type: none">– Renewing toothed belt◆ Generally it is not necessary to renew the toothed belt before the actual change interval is reached. Especially cracks on the belt side are not relevant for service life◆ Engine codes and change intervals ➔ page 8◆ All TDI unit injector engines	➔ page 130

Every 180,000 km

Additional work	Page
<ul style="list-style-type: none">– Renew camshaft drive toothed belt◆ Engine codes and change intervals ➔ page 8◆ 4-cylinder 5-valve petrol engines	➔ page 131



Every 240,000 km (from model year 2004)

Additional work	Page
<ul style="list-style-type: none"> – Camshaft drive tensioning roller: Renew ◆ Engine codes and change intervals ⇒ page 8 ◆ 4-cylinder unit injector engines ◆ Additional work as a separate charge! 	⇒ page 131

Every 300,000 km (from model year 2006)

Additional work	Page
<ul style="list-style-type: none"> – Camshaft drive tensioning roller: Renew ◆ Engine codes and change intervals ⇒ page 8 ◆ All TDI unit injector engines ◆ Additional work as a separate charge! 	⇒ page 131

Every 12 months

- For vehicles with commercial passenger transport, e.g. taxis
- Only applies to Germany

Additional work (in Germany only)	Page
<ul style="list-style-type: none"> – Exhaust emissions test: Perform test • Additional work as a separate charge! 	⇒ page 140

Every 2 years

Additional work	Page
<ul style="list-style-type: none"> – Dust and pollen filter: Renew filter element ◆ For vehicles driving less than 30,000 km in 2 years 	⇒ page 122
<ul style="list-style-type: none"> – Check convertible top latch, New Beetle Cabriolet 	⇒ page 126
<ul style="list-style-type: none"> – Changing brake fluid • Additional work as a separate charge! 	⇒ page 49

3 years after initial registration and then every 2 years

- Only applies to Germany

Additional work (in Germany only)	Page
<ul style="list-style-type: none"> – Exhaust emissions test: Perform test • Additional work as a separate charge! 	⇒ page 140



Every 4 years

Additional work	Page
– Renew air filter element; clean housing and snow screen (if fitted). ◆ For vehicles driving less than 60,000 km in 4 years	⇒ page 65
– Renewing spark plugs ◆ For vehicles driving less than 60,000 km in 4 years ◆ Spark plug designation ⇒ Engine mixture preparation; Rep. gr. 28 ; Test data, spark plugs	⇒ page 131
– Tyre repair set: Renew tyre sealant ◆ If fitted	⇒ page 87

Every 6 years

Additional work	Page
– Air filter element: Renew and clean housing ◆ For vehicles driving less than 90,000 km in 6 years	⇒ page 65

2.2.8 Additional work 2010 ➤

Depending on conditions under which the vehicle is used
⇒ [page 29](#) and vehicle equipment, extra service work must be performed in addition to the inspection service.

This additional work must be carried out depending on time and / or distance.

It is also possible, to perform additional work outside the service intervals with regard to the entries in the service schedule (or sticker: next service).

Every 30,000 km

Additional work	Page
	⇒ page 61
– Fuel filter: „RENEW“ - when using diesel: • »NOT« conforming to EN 590	⇒ page 58
– Dust and pollen filter (interior filter): Clean housing and renew filter element. ◆ For vehicles driving more than 30,000 km in 2 years	⇒ page 122

Every 60,000 km

Additional work	Page
– Renew air filter element; clean housing and snow screen if fitted. ◆ For vehicles driving more than 60,000 km in 4 years	⇒ page 65
– Renewing spark plugs ◆ For vehicles driving more than 60,000 km in 4 years ◆ Spark plug designation ⇒ Engine mixture preparation; Rep. gr. 28 ; Test data, spark plugs	⇒ page 131



Additional work	Page
<ul style="list-style-type: none"> – Fuel filter: „RENEW“ - when using diesel: • Conforming to EN 590 	⇒ page 58
<ul style="list-style-type: none"> – Automatic gearbox: Change ATF ◆ Vehicles with 4-speed automatic gearbox only ◆ 01M gearbox ◆ In hot countries • List of hot countries ⇒ page 31 	⇒ page 39
<ul style="list-style-type: none"> – Check automatic gearbox ATF ◆ Vehicles with 4-speed automatic gearbox only ◆ 01M gearbox ◆ Not hot countries • List of hot countries ⇒ page 31 	⇒ page 39
<ul style="list-style-type: none"> – Automatic gearbox: Check ATF level, top-up if necessary ◆ 09G gearbox 	⇒ page 39
<ul style="list-style-type: none"> – Direct shift gearbox - DSG -: Change oil ◆ 02E gearbox 	⇒ page 55
<ul style="list-style-type: none"> – Direct shift gearbox - DSG -: Change oil filter ◆ 02E gearbox 	⇒ page 55

At 60,000 km then every 120,000 km thereafter

Additional work	Page
<ul style="list-style-type: none"> – Change ATF screen ◆ Vehicles with 4-speed automatic gearbox only ◆ 01M gearbox ◆ In hot countries • List of hot countries ⇒ page 31 	⇒ page 39

At 90,000 km then every 30,000 km

Additional work	Page
<ul style="list-style-type: none"> – Check camshaft drive toothed belt ◆ 4-cylinder petrol engines ◆ Additional work not as a separate charge! 	⇒ page 129



Every 150,000 km

Additional work	Page
<ul style="list-style-type: none"> – Camshaft drive toothed belt: Renew ◆ Generally it is not necessary to renew the toothed belt before the actual change interval is reached. Especially cracks on the belt side are not relevant for service life ◆ Engine codes and change intervals ➔ page 8 ◆ All diesel engines ◆ Additional work as a separate charge! 	➔ page 131

Every 180,000 km

Additional work	Page
<ul style="list-style-type: none"> – Renew camshaft drive toothed belt ◆ Engine codes and change intervals ➔ page 8 ◆ 4-cylinder 5-valve petrol engines 	➔ page 131

Every 300,000 km

Additional work	Page
<ul style="list-style-type: none"> – Camshaft drive tensioning roller: Renew ◆ Engine codes and change intervals ➔ page 8 ◆ 4-cylinder unit injector engines ◆ Additional work as a separate charge! 	➔ page 131

Every 12 months

- For vehicles with commercial passenger transport, e.g. taxis
- Only applies to Germany

Additional work (in Germany only)	Page
<ul style="list-style-type: none"> – Exhaust emissions test: Perform test • Additional work as a separate charge! 	➔ page 140

Every 2 years

Additional work	Page
<ul style="list-style-type: none"> – Dust and pollen filter: Renew filter element ◆ For vehicles driving less than 30,000 km in 2 years 	➔ page 122
<ul style="list-style-type: none"> – Check convertible top latch, New Beetle Cabriolet 	➔ page 126
<ul style="list-style-type: none"> – Brake and clutch system: Change brake fluid • Additional work as a separate charge! 	➔ page 49

3 years after initial registration and then every 2 years

- Only applies to Germany



Additional work (in Germany only)	Page
<ul style="list-style-type: none"> Exhaust emissions test: Perform test Additional work as a separate charge! 	⇒ page 140

Every 4 years

Additional work	Page
<ul style="list-style-type: none"> Renew air filter element; clean housing and snow screen (if fitted). For vehicles driving less than 60,000 km in 4 years 	⇒ page 65
<ul style="list-style-type: none"> Renewing spark plugs For vehicles driving less than 60,000 km in 4 years Spark plug designation ⇒ Engine mixture preparation; Rep. gr. 28 ; Test data, spark plugs 	⇒ page 131
<ul style="list-style-type: none"> Tyre repair set: Renew tyre sealant If fitted 	⇒ page 87

2.2.9 Service tables with market-specific deviations

Indian market

Additional work	Interval	Description of work
Fuel filter: „RENEW“: <ul style="list-style-type: none"> All diesel engines 	Every 15,000 km	⇒ page 58
Renew air filter element; clean housing and snow screen (if fitted). ♦ For vehicles driving more than 15,000 km in 1 years	Every 15,000 km	⇒ page 65
Dust and pollen filter (interior filter): Clean housing and renew filter element. ♦ For vehicles driving more than 15,000 km in 1 years	Every 15,000 km	⇒ page 122
Renewing spark plugs ♦ All petrol engines ♦ For vehicles driving more than 30,000 km in 2 years ♦ Spark plug designation ⇒ Engine mixture preparation; Rep. gr. 28 ; Test data, spark plugs	Every 30,000 km	⇒ page 131
Automatic gearbox: Change ATF ♦ Vehicles with 4-speed automatic gearbox only ♦ 01M gearbox only	Every 60,000 km	⇒ page 39



Additional work	Interval	Description of work
♦ Automatic gearbox: Change ATF ♦ Vehicles with 6-speed automatic gearbox only ♦ 09G gearbox only	Every 60,000 km	⇒ page 39
♦ Renew camshaft drive toothed belt ♦ Engine codes and change intervals ⇒ page 8 ♦ 4-cylinder 5-valve petrol engines	Every 90,000 km	⇒ page 131
♦ Renew air filter element; clean housing and snow screen (if fitted). ♦ For vehicles driving less than 15,000 km in 1 years	1 year	⇒ page 65
♦ Dust and pollen filter (interior filter): Clean housing and renew filter element. ♦ For vehicles driving less than 15,000 km in 1 years	1 year	⇒ page 122
♦ Renewing spark plugs ♦ All petrol engines ♦ For vehicles driving less than 30,000 km in 2 years ♦ Spark plug designation ⇒ Engine mixture preparation; Rep. gr. 28 ; Test data, spark plugs	2 years	⇒ page 131

North American market

Additional work	Interval	Description of work
♦ Sliding sunroof drains: Check flow and clean if necessary	Every 60,000 km	⇒ page 106



3 General

This chapter provides information on the following subjects:

- ◆ Lifting vehicle ➔ [page 25](#)
- ◆ Sticker ➔ [page 26](#)
- ◆ Connecting fault reader ➔ [page 28](#)
- ◆ Severe operating conditions ➔ [page 29](#)
- ◆ Vehicle data sticker ➔ [page 29](#)
- ◆ Vehicle identification number ➔ [page 30](#)
- ◆ Information on long-life service or time or distance dependent service ➔ [page 6](#)
- ◆ Countries with elevated sulphur content in diesel fuel ➔ [page 30](#)
- ◆ List of hot countries for changing ATF in the AG4 (01M gearbox) ➔ [page 31](#)
- ◆ Engine oils ➔ [page 31](#)
- ◆ Engine code and engine number ➔ [page 31](#)
- ◆ RME fuel (biodiesel) ➔ [page 31](#)
- ◆ Service intervals ➔ [page 32](#)
- ◆ Type plate ➔ [page 32](#)

3.1 Lifting vehicle



WARNING

- ◆ *Vehicle may be lifted only at points indicated in figure to avoid damaging vehicle floor pan or tipping vehicle.*
- ◆ *Never start engine and engage a gear with vehicle lifted as long as even one driven wheel has contact with the floor! Disregarding these warnings risks the danger of an accident!*
- ◆ *If work is to be performed under vehicle, it must be supported by suitable stands.*

Please note the following:

Trolley jack:

To prevent damage always use a suitable rubber or wooden block.

On no account should vehicle be lifted at the engine sump, gearbox or on front or rear axle as this may cause serious damage.

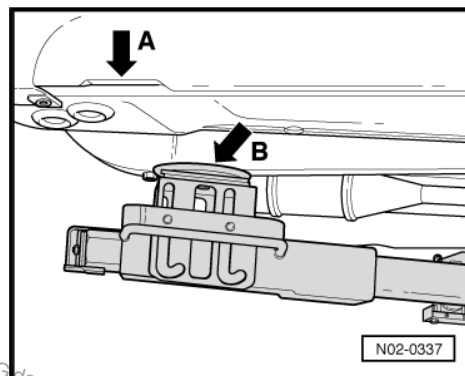
Lifting platform:

Before driving onto a lifting platform ensure there is sufficient clearance between low lying vehicle components and lifting platform.



Lifting points for lifting platform and trolley jack:

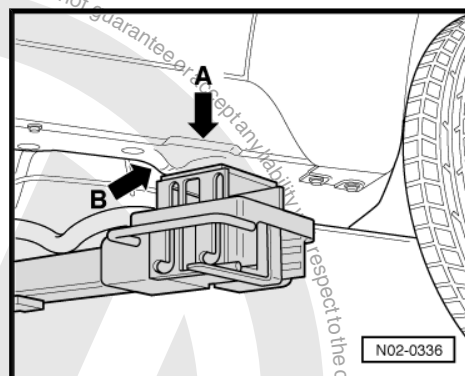
Front:



On the reinforcing plate -arrow B- which is welded to the under floor in the vicinity of the marking for the vehicle jack -arrow A-

Rear:

On the cross member -arrow B- in the vicinity of the marking for the vehicle jack -arrow A-.

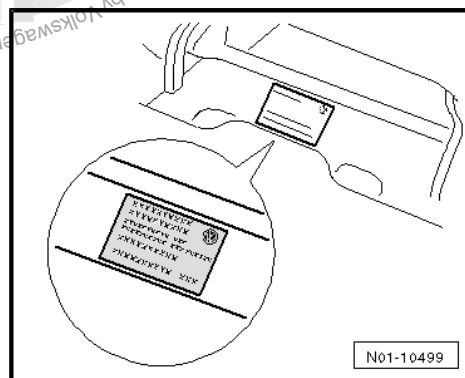


3.2 Sticker

- ◆ Attach hotline sticker ➔ [page 26](#)
- ◆ Attaching „Your first service“ sticker (at delivery inspection) ➔ [page 27](#)
- ◆ Attaching „Your next service“ sticker ➔ [page 27](#)
- ◆ Attaching „LongLife engine oil“ sticker ➔ [page 27](#)
- ◆ Attaching „data sticker“ in customer service schedule ➔ [page 28](#)

3.2.1 Attaching hotline sticker

- Attach hotline sticker to the inside of glove box cover as shown.
- Only valid for Germany

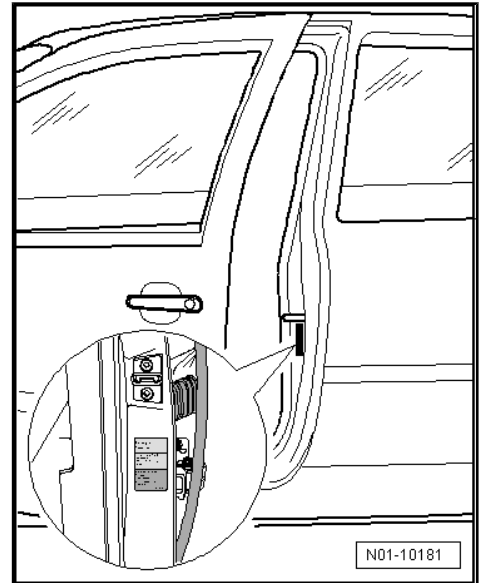




3.2.2 Attaching „Your first service“ sticker (at delivery inspection)

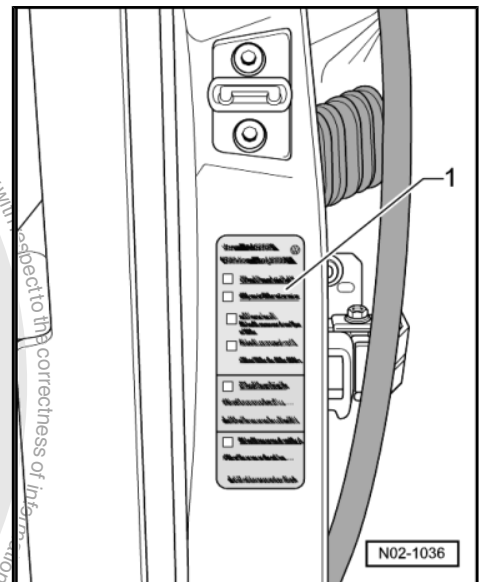
Attaching „Your next service“ sticker ➔ [page 26](#)

- Attach sticker on driver door pillar (B-pillar); the sticker is found on an instruction which is attached at front in the vehicle wallet. Destroy the instruction after attaching the sticker!



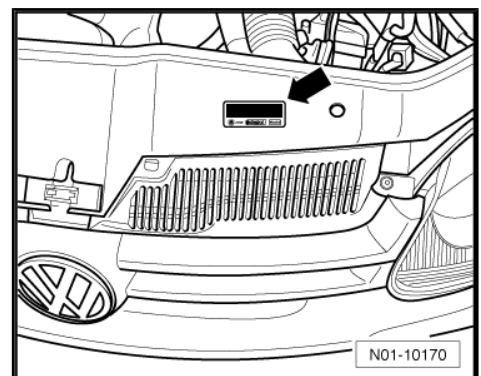
3.2.3 Attaching „Your next service“ sticker

- „Your next service“ sticker: Enter a cross in position for next oil change service or inspection service (next service due) and enter date/odometer reading.
- Attach sticker to driver door pillar (B-pillar).



3.2.4 Attaching „LongLife engine oil“ sticker:

- For vehicles with LongLife service (PR number QG1), the sticker must be attached as shown below.
- Attach sticker -arrow- as shown on left side of lock carrier (from driver perspective).





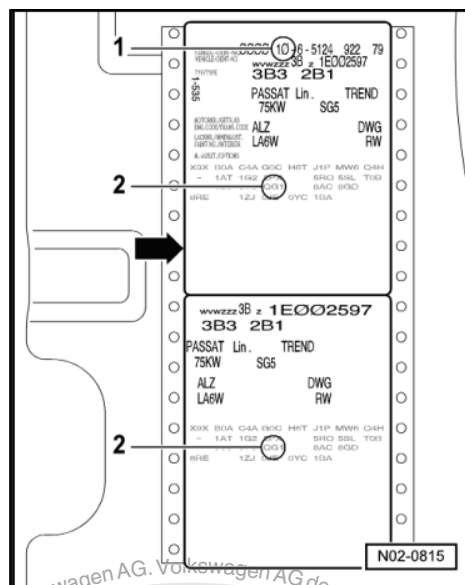
3.2.5 Attaching „data sticker“ in customer service schedule

Installation position of vehicle data sticker ➔ [page 29](#) .

- Attach the upper of the two data stickers -arrow- in customer service schedule.

1 - Week of production

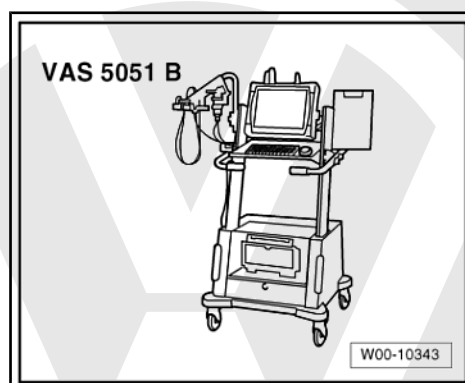
2 - PR number



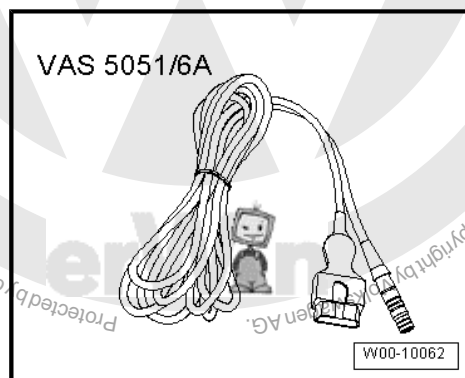
3.3 Connecting vehicle diagnosis tester

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system



- ◆ Diagnosis cable -VAS 5051/6A-



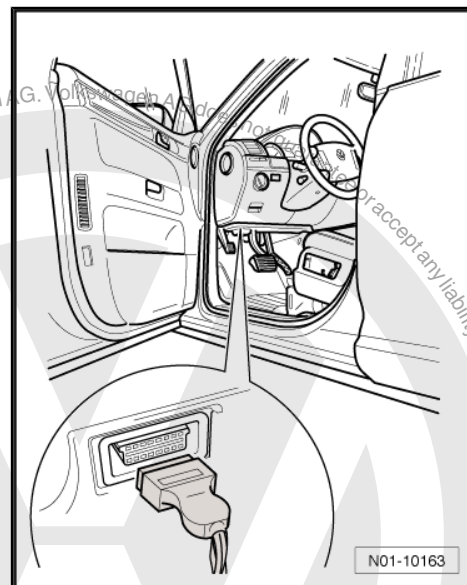


WARNING

- ◆ *Always secure testing and measuring equipment on the rear seat during a road test.*
- ◆ *Only a passenger may operate these devices during a drive.*

- Connect diagnosis lead connector to diagnosis connection.
- Pull on handbrake.
- Automatic gearbox: Selector lever in position „P“ or „N“.
- Manual gearbox: Gear lever in neutral.
- Switch on tester.
- Switch on ignition.

Now follow screen display to start desired functions.



3.4 Severe operating conditions

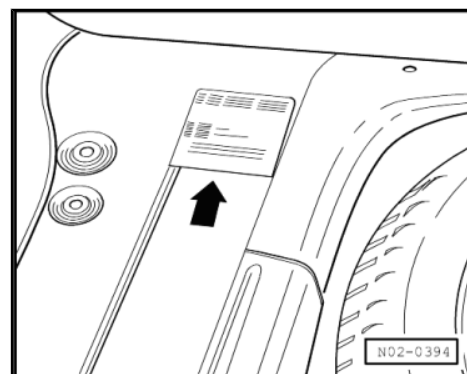
If the vehicle is used under severe operating conditions some jobs will have to be performed before the next service due or at shorter service intervals.

Severe operating conditions

- Regular short trips or stop and go operation in urban traffic
- High percentage of cold starts
- Vehicle is used in areas with winter temperatures over a long period
- Regular long periods of idling (e.g. taxis)
- Vehicle is often driven at full throttle with high payload or whilst towing a trailer
- Using diesel with elevated sulphur content
- Regular operation in areas with high levels of dust

3.5 Vehicle data sticker

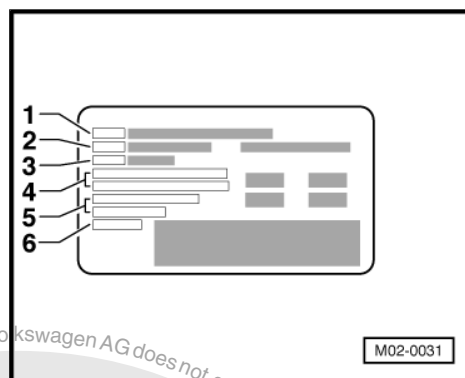
The vehicle data sticker -arrow- is located in rear of vehicle on the left in the spare wheel recess. The vehicle data sticker is also found in the service schedule for the customer.





The sticker includes the following vehicle data:

- 1 - Production control number
- 2 - Vehicle identification number
- 3 - Model identification number
- 4 - Model explanation/engine output
- 5 - Engine and gearbox code letters
- 6 - Paint number/interior equipment identification number, optional equipment identification number

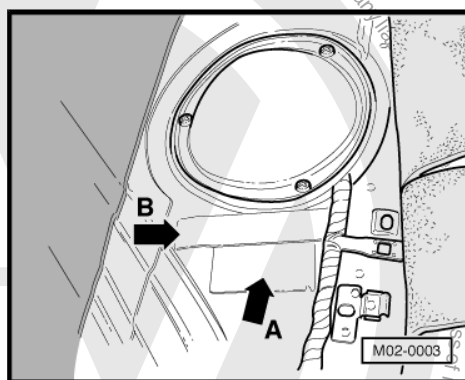


3.6 Vehicle identification number

B - Vehicle identification number

Stamped into the floor panel under the rear seat on the right.

Interpretation of vehicle identification number:



WVW	ZZZ	9C / 1C / 1Y	Z	Y ⁵⁾	W	000 279
				5		
Manufacturer code	Filler characters	Type	Filler characters	Model year 2005	Production location	Serial number

5) Y - means model year 2000; up to model year 2000, letters were used to encrypt the numbers of the years.

3.7 Countries with elevated sulphur content in diesel fuel



Caution

For vehicles with TDI unit injector and DP engines an oil change service must always be performed »every 7,500 km« in the following countries:

Countries with elevated sulphur content in diesel fuel			
Egypt	Jamaica	Morocco	Saudi Arabia
Armenia	Jordan	Mauritius	Zimbabwe
Bahrain	Yugoslavia (Serbia, Montenegro, Vojvodina, Kosovo)	Macedonia	Sri Lanka
Bangladesh	Cambodia	Moldova	South Africa
Chile	Kazakhstan	Mozambique	Surinam
Dominican Republic	Kenya	Myanmar	Tajikistan



Countries with elevated sulphur content in diesel fuel			
El Salvador	Columbia	New Caledonia	Tanzania
Ecuador	Cuba	Nigeria	Turkey
Ghana	Kuwait	Oman	Uruguay
Guatemala	Lebanon	Pakistan	Uzbekistan
Honduras	Madagascar	Panama	Venezuela
Indonesia	Malawi	Papua New Guinea	United Arab Emirates
Iraq	Malaysia	Peru	Vietnam
Iran	Mali	Russia (East & West)	

3.8 List of hot countries for changing ATF in the AG4 (01M gearbox)

Jordan	Syria	Lebanon	Palestine
Egypt	Kuwait	Bahrain	Saudi Arabia
Qatar	Abu Dhabi (United Arab Emirates)	Yemen	Iran / Iraq
Tunisia	Morocco	Afghanistan	Turkey
Israel			

3.9 Engine oil

VW engine oil standards ➔ [page 8](#)


3.10 Engine code and engine number

Engine code and engine number can be found for:

- ◆ Petrol engines: ➔ Rep. gr. 00 ; Technical data, engine number
- ◆ Diesel engines: ➔ Rep. gr. 00 ; Technical data, engine number
- ◆ On vehicle data sticker ➔ [page 29](#)

3.11 RME fuel (biodiesel)

RME fuel may be used only in vehicles which have been approved for this purpose by Volkswagen - either in the standard version or in vehicles which have had special equipment (PR No. 2G0) for this purpose.

 **Caution**

- ◆ *When RME fuel is used and your vehicle is not suitable for this, the fuel system can be damaged.*
- ◆ *When filling the tank with biodiesel, only use RME fuel conforming to EN 14214 (FAME)!*
- ◆ *When biodiesel is used which does not conform to the required standard, the fuel filter can become blocked.*

RME fuel must conform to EN 14214 (FAME).

- ◆ RME means „Rapeseed Methyl Ester“.
- ◆ EN means „Euro standard“.
- ◆ FAME means „Fatty Acid Methyl Ester“.



If the vehicle is factory fitted for RME can be recognised on the PR No. 2G0 on the vehicle data sticker ➔ [page 29](#) .

Characteristics of RME fuel

- ◆ Performance can slightly be lower when using biodiesel.
- ◆ Fuel consumption can slightly be higher when using biodiesel.
- ◆ RME can be used in winter at temperatures to approx. -10 °C
- ◆ At ambient temperatures below -10 °C we recommend using winter diesel fuel.



Note

- ◆ *When using biodiesel observe the changed intervals for draining and changing the fuel filter ➔ [page 32](#) .*
- ◆ *If it is planned not to use the vehicle for approx. two weeks, it is recommended to fill the tank with original diesel beforehand and drive approx. 50 km, to prevent damage to the fuel injection system.*

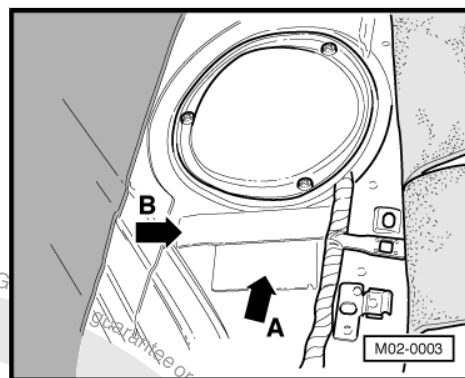
3.12 Service intervals

Service intervals ➔ [page 8](#)

3.13 Type plate

The type plate -A- is located on the right on the floor under the rear seat.

Vehicles for certain export countries have no type plate.





4 Descriptions of work

This chapter provides information on the following subjects:

- ◆ Removable towing bracket: Check and clean if necessary
⇒ [page 35](#)
- ◆ Swivel joints: Visual check ⇒ [page 37](#)
- ◆ Front passenger airbags: Checking activation / deactivation,
in vehicles without seat occupancy recognition ⇒ [page 37](#)
- ◆ Ambient temperature display: Select desired unit
⇒ [page 38](#)
- ◆ Automatic gearbox: Check gear oil in final drive (01M gearbox)
⇒ [page 39](#)
- ◆ Automatic gearbox: Change ATF (01M gearbox)
⇒ [page 39](#)
- ◆ Automatic gearbox: Change ATF strainer (01M gearbox)
⇒ [page 39](#)
- ◆ Automatic gearbox: Check ATF level, top-up if necessary
(01M gearbox) ⇒ [page 39](#)
- ◆ Automatic gearbox: Check ATF level, top-up if necessary
(09G gearbox) ⇒ [page 39](#)
- ◆ Automatic gearbox: Change ATF (09G gearbox)
⇒ [page 39](#)
- ◆ Battery: Check ⇒ [page 39](#)
- ◆ Battery: Check battery terminal clamps for secure seating
⇒ [page 39](#)
- ◆ Checking tyres: Condition, wear pattern, inflation pressures,
tread depth ⇒ [page 41](#)
- ◆ Brake system: Perform visual check for leaks and damage
⇒ [page 46](#)
- ◆ Front and rear brake pads: Check thickness ⇒ [page 46](#)
- ◆ Brake and clutch system: Change brake fluid ⇒ [page 49](#)
- ◆ Brake fluid level: Check ⇒ [page 52](#)
- ◆ Anti-theft wheel bolts: Installing ⇒ [page 53](#)
- ◆ Digital clock: Set time and display mode ⇒ [page 54](#)
- ◆ Direct shift gearbox - DSG -: Change oil and oil filter (02E
gearbox) ⇒ [page 55](#)
- ◆ Electric windows: Perform initialisation (activation)
⇒ [page 55](#)
- ◆ Performing vehicle system test ⇒ [page 55](#)
- ◆ Constant velocity joint bellows: Visual check ⇒ [page 56](#)
- ◆ Checking first aid box expiry date ⇒ [page 57](#)
- ◆ Poly V-belt: Check condition ⇒ [page 57](#)
- ◆ Poly V-belt: Adjust tension on engines without automatic ten-
sioning roller ⇒ [page 57](#)
- ◆ Fuel filter: Renew (diesel engine) ⇒ [page 58](#)
- ◆ Fuel filter: Drain water (diesel engine) ⇒ [page 61](#)
- ◆ Cooling system: Check frost protection and coolant level
⇒ [page 62](#)



- ◆ Air filter: Clean housing and renew filter element
⇒ [page 65](#)
- ◆ Engine cover -top-: Removing and installing ⇒ [page 66](#)
- ◆ Removing and installing engine compartment cover -bottom-
(noise insulation) ⇒ [page 71](#)
- ◆ Engine oil level: Check ⇒ [page 72](#)
- ◆ Engine oil: Drain or extract; renew oil filter and replenish engine oil ⇒ [page 72](#)
- ◆ Engine and components in engine compartment (from above and below): Perform visual check for leaks and damage
⇒ [page 82](#)
- ◆ Performing road test ⇒ [page 82](#)
- ◆ Wheel securing bolts: Tighten to correct torque setting
⇒ [page 83](#)
- ◆ Reading radio code with fault reader ⇒ [page 85](#)
- ◆ Radio: Activate anti-theft coding ⇒ [page 86](#)
- ◆ Tyre repair set: Check ⇒ [page 87](#)
- ◆ Final drive for manual gearbox: Check oil level ⇒ [page 88](#)
- ◆ Windscreen wash/wipe system and headlight washer system: Check function ⇒ [page 90](#)
- ◆ Windscreen wiper blades: Check park position, if wiper blades »judder«: Check setting angle ⇒ [page 93](#)
- ◆ Wiper blade protection: Remove ⇒ [page 95](#)
- ◆ Headlight setting: Check, if necessary adjust ⇒ [page 98](#)
- ◆ Sliding roof: Check function, clean and grease guide rails
⇒ [page 106](#)
- ◆ Sliding sunroof drains: Check flow and clean if necessary
⇒ [page 106](#)
- ◆ Service interval display: Reset ⇒ [page 108](#)
- ◆ Service interval display: Recode / adapt ⇒ [page 113](#)
- ◆ Power assisted steering: Check fluid level ⇒ [page 120](#)
- ◆ Track rod ends: Check play, security and boots ⇒ [page 122](#)
- ◆ Dust and pollen filter: Renew filter element ⇒ [page 122](#)
- ◆ Transportation device: Remove blocking pieces from springs on front axle ⇒ [page 123](#)
- ◆ Transportation anchorage openings: Seal with caps
⇒ [page 125](#)
- ◆ Door arrester: Grease ⇒ [page 125](#)
- ◆ Underbody protection: Perform visual check for damage
⇒ [page 126](#)
- ◆ Convertible top end position latch (with electric convertible top actuation): Visual check (with convertible top open)
⇒ [page 126](#)
- ◆ Convertible top protective film: Remove (convertible)
⇒ [page 127](#)
- ◆ Camshaft drive toothed belt: Check (4-cylinder petrol engines)
⇒ [page 129](#)



- ◆ Camshaft drive toothed belt: Check for wear (SDI/TDI diesel engines) ➤ [page 130](#)
- ◆ Toothed belt and idler roller for camshaft drive: Renew, SDI / TDI diesel engines ➤ [page 130](#)
- ◆ Camshaft drive toothed belt: Renew (unit injector diesel engines) ➤ [page 131](#)
- ◆ Camshaft drive belt tensioner: Renew (unit injector diesel engines) ➤ [page 131](#)
- ◆ Camshaft drive toothed belt and toothed belt tensioner: Renew (4-cylinder 5-valve petrol engines) ➤ [page 131](#)
- ◆ Spark plugs: Renew ➤ [page 131](#)

4.1 Removable towing bracket: Check and clean if necessary

This chapter describes how to check and repair a removable towing bracket.

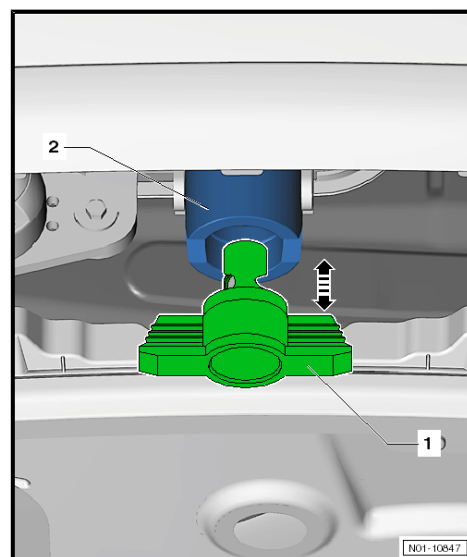
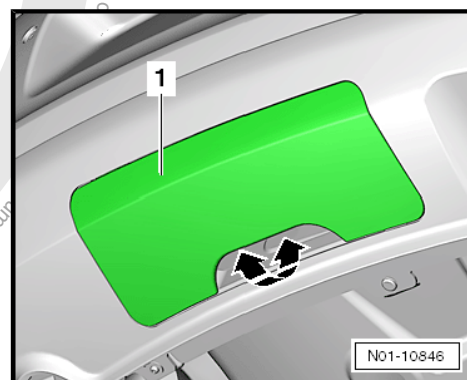


Note

Note that checking towing bracket is included in the respective service. However, a repair is charged separately and must be required by the customer.

Check procedure

- Remove cover -1-.
- Pull off protective cap -1- from ball head mounting -2-.
- Insert ball head into mounting.





After ball head has been inserted, green mark on hand wheel must be aligned with white mark on ball head. Hand wheel must be entirely in contact. Afterwards, it must be possible to close the towing bracket lock by removing the key. If this is not possible, the following repair procedure must be performed.



Note

If a repair has to be performed, it has only to be in agreement with the customer. A repair must be charged separately.

Repair procedure:

- Check contact surfaces -arrows- of ball head mounting for corrosion.
- If contact surfaces are corroded, eliminate corrosion with a triangular scraper and clean the treated areas with silicone remover.
- Apply a thin coat of lubricating paste G 000 650 or G 000 150 on cleaned surfaces.

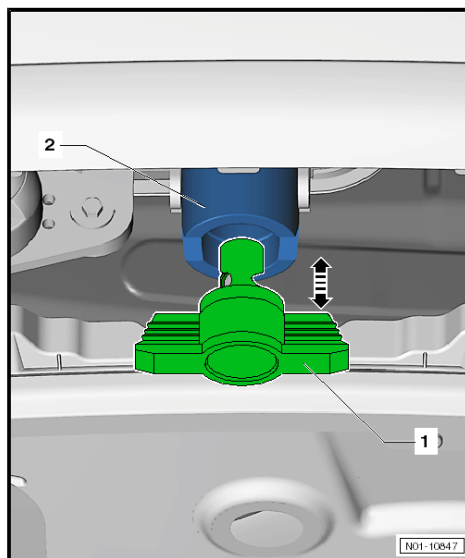
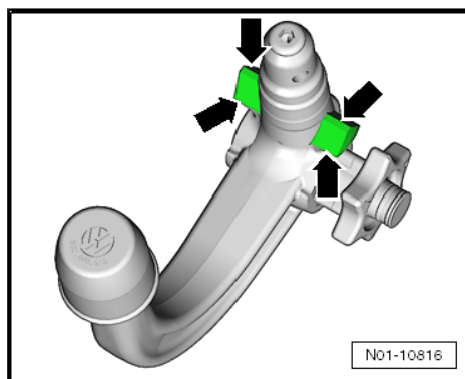
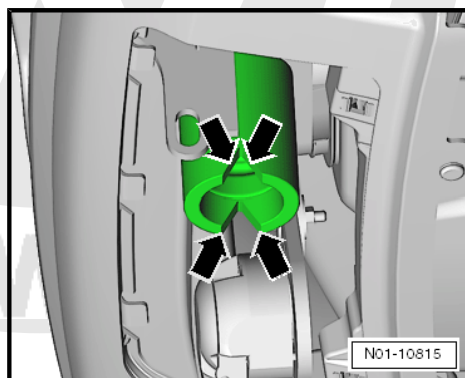
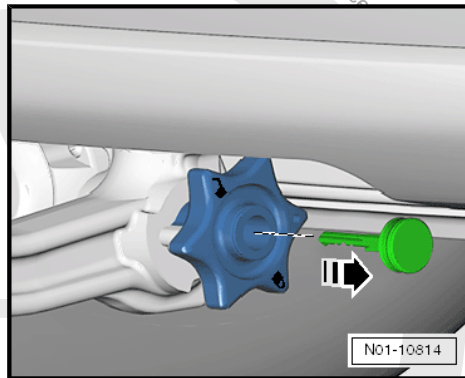
- Check contact surfaces -arrows- of ball head for corrosion.
- If contact surfaces are corroded, eliminate corrosion with a triangular scraper and clean the treated areas with silicone remover.
- Apply a thin coat of lubricating paste G 000 650 or G 000 150 on cleaned surfaces.
- Check again ball head seat in mounting ⇒ [page 35](#) .

- After checking, fit protective cap -1- into ball head mounting -2-.



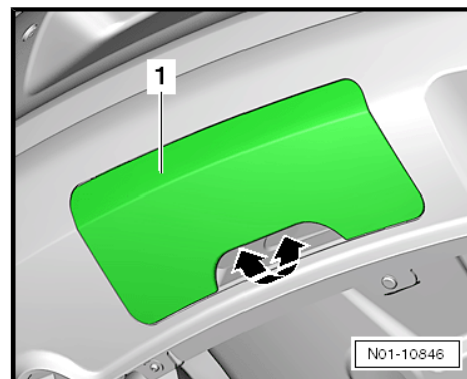
Note

*If protective cap is damaged or not available, a new protective cap must be fitted to protect ball head mounting against corrosion.
⇒ ETKA*





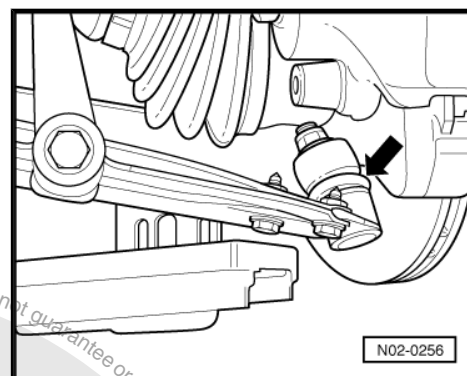
- Insert cover -1-.



4.2 Swivel joints: Visual check

Carry out the following procedure:

- Check swivel joint boots -arrow- for leaks and damage.

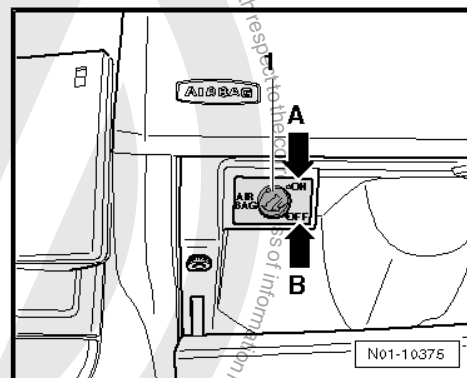


4.3 Front passenger front airbag: Check activation / deactivation for vehicles without seat occupied recognition

The front airbag can be deactivated on front passenger side using key switch -1-. The front passenger side airbag and all other airbags in the vehicle remain functional.

! WARNING

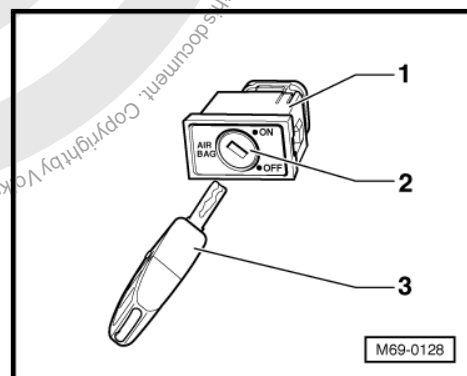
The front passenger front airbag must only be deactivated if in exceptional cases a child is transported in a rear-facing child seat on the front passenger seat.



- Check „On / Off function“ of key switch as follows:

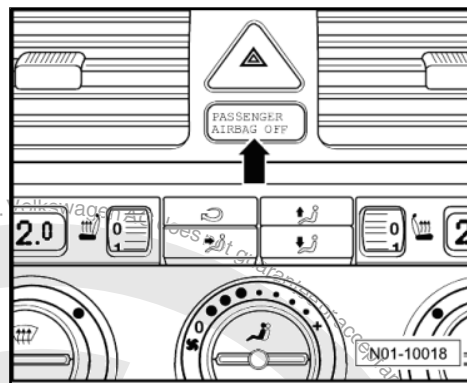
Front passenger front airbag deactivated

- Switch off ignition.
- Turn key switch -2- with the vehicle key -3- in position „AIR-BAG OFF“. The key slot must point to „OFF“.



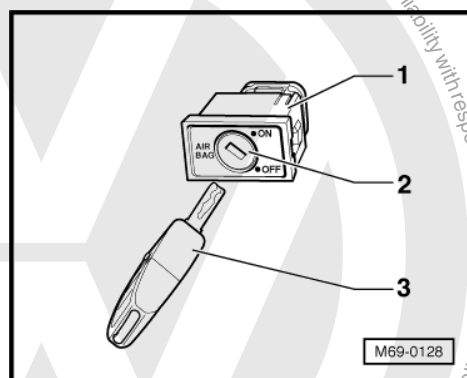


- With ignition switched on, check if warning lamp in instrument panel -arrow- lights up continuously.
- Switch off ignition.

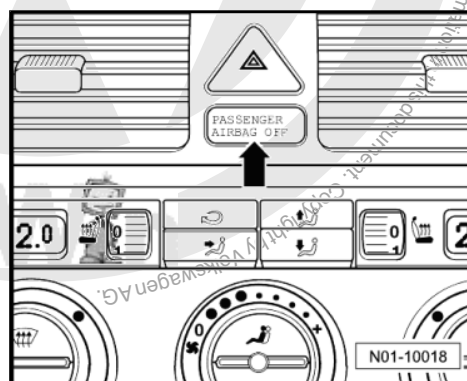


Front passenger front airbag activated

- Switch off ignition.
- Turn key switch -2- with ignition key -3- to position „ON“ The key slot must show to „ON“.



- With ignition switched on, check if warning lamp in instrument panel -arrow- does „NOT“ light up.
- Switch off ignition.



4.4 Ambient temperature display: Select temperature units



Note

- ◆ The ambient temperature display is located above the rear view mirror in the right-hand side of the display.
- ◆ The adjustments are made using two buttons (on the left and right-hand side of the display).
- ◆ The display can be set to degrees Celsius (Centigrade) or degrees Fahrenheit.

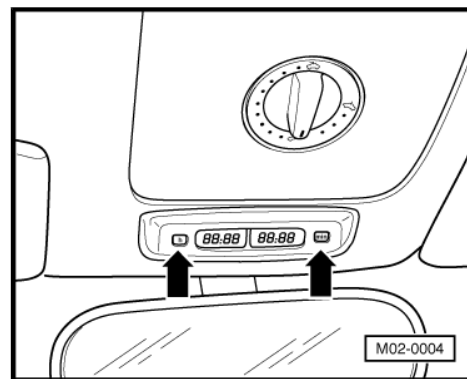


Carry out adjustment as follows:

- Switch on ignition.
- Press and hold both buttons (-h- and (min)) down simultaneously for at least 3 seconds.

The new temperature unit will appear on the display.

- Select the temperature units desired by the customer.
- Once the new mode appears, release both buttons and switch ignition off.



4.5 Automatic gearbox: Changing ATF (01M gearbox)

⇒ Rep. gr. 37 Change ATF.

4.6 Automatic gearbox: Changing ATF strainer (01M gearbox)

⇒ Automatic gearbox 01M; Rep. gr. 38 ; Removing and installing valve body ; Removing and installing valve body

4.7 Automatic gearbox: Check gear oil in final drive (01M gearbox)

- ⇒ Rep. gr. 39 ; Checking gear oil in final drive

4.8 Automatic gearbox: Check ATF level, top-up if necessary (01M gearbox)

- Carry out procedure ⇒ Automatic gearbox; Rep. gr. 37 ; Checking ATF level and topping up

4.9 Automatic gearbox: Check ATF level, top-up if necessary (09G gearbox)

- Carry out procedure ⇒ Automatic gearbox; Rep. gr. 37 ; Checking ATF level and topping up

4.10 Automatic gearbox: Change ATF (09G gearbox)

- Carry out procedure ⇒ Automatic gearbox; Rep. gr. 37 ; Checking ATF level and topping up ; Checking ATF level and topping up

4.11 Battery: Check using battery tester with printer -VAS 5097A-

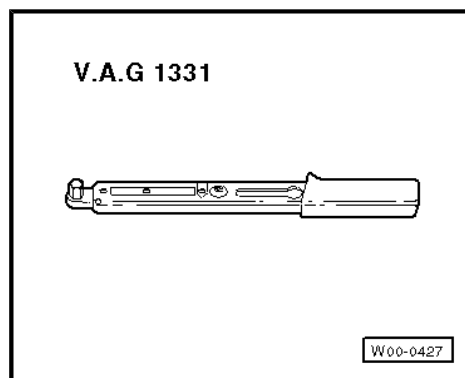
- Check battery described as follows: ⇒ Vehicle electrics; Rep. gr. 27 ; Starter, current supply

4.12 Battery: Check battery terminal clamps for secure seating

Special tools and workshop equipment required



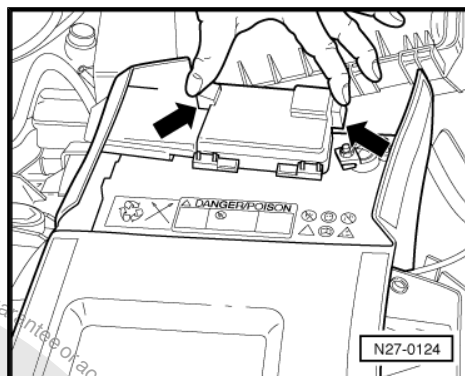
- ◆ Torque wrench -V.A.G 1331-



Note

A securely seated battery clamp ensures trouble free function and long service life of the battery.

- Open heat protective jacket arrow (if fitted).



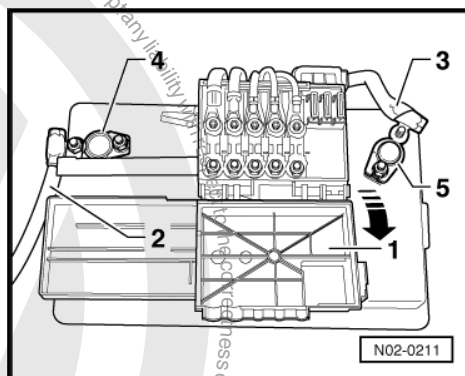
Press lugs -arrows- together and open cover out forwards.

- Check whether battery clamps -4- and -5- are secure on battery terminals by moving battery positive cable -2- and battery negative cable -3- back and forth.



WARNING

If the battery clamp is not seated securely on the positive terminal, first disconnect battery clamp from battery negative terminal to prevent possible accidents.

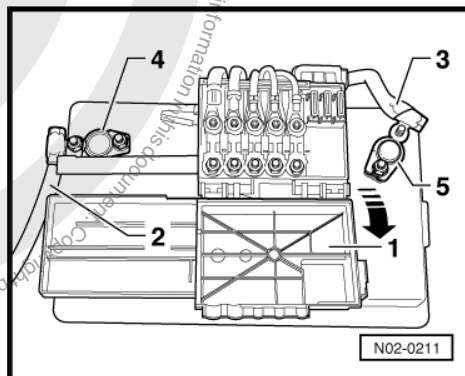


If the battery clamp is not seated securely on positive terminal:

- Disconnect battery terminal clamp -5- from battery negative terminal first.
- Tighten battery terminal clamp on battery positive terminal to 5 Nm.
- Reconnect battery clamp -5- to battery negative terminal and tighten to 5 Nm.

If the battery clamp on negative terminal is not seated securely:

- Tighten battery clamp -5- on battery negative terminal to 5 Nm.





4.13 Checking tyres: Condition, wear pattern, inflation pressures, tread depth

Checking condition of tyre ➔ [page 41](#) .

Checking wear pattern ➔ [page 41](#) .

Tread depth (including spare wheel): Check ➔ [page 42](#) .

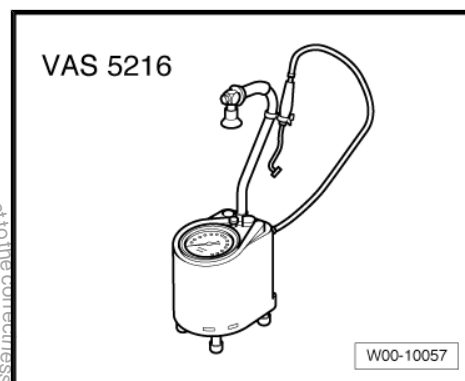
General notes ➔ [page 42](#) .

Checking tyre inflation pressure, correcting if necessary, (for rest of the world market territories) ➔ [page 44](#) .

Checking tyre inflation pressure, correcting if necessary, (for North American and Mexican markets) ➔ [page 43](#) .

Special tools and workshop equipment required

- ◆ Tyre inflator -VAS 5216-



4.13.1 Checking condition of tyre



WARNING

If damage is determined, always check to see if a new tyre should be fitted.

Tests at delivery inspection

- Check tyre treads and side walls for damage and remove foreign bodies such as, for example, nails or glass splinters.

Tests at inspection service

- Check tyre treads and side walls for damage and remove foreign bodies such as, for example, nails or glass splinters.
- Check tyres for cupping, one-sided wear, porous side walls, cuts and punctures.

4.13.2 Checking wear pattern

The wear pattern on the front tyres will indicate, for example, if toe and camber settings should be checked:

- ◆ Feathering on tread indicates incorrect toe setting.
- ◆ One-sided tread wear is mainly attributed to incorrect camber.

When wear of this nature is detected, determine cause by checking alignment (repair measure).



4.13.3 Tread depth (including spare wheel): Checking

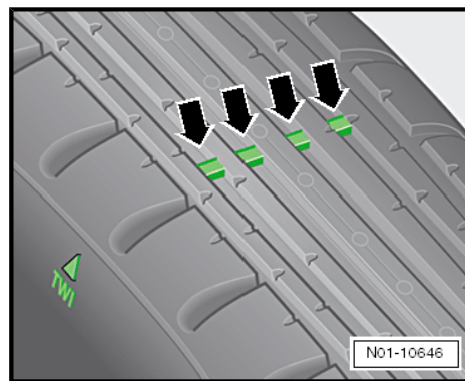
- Check tyre tread depth.

Minimum tread depth: 1.6 mm



Note

- ◆ *This figure may vary according to legislation in individual countries.*
- ◆ *The minimum tread depth is reached when the tyres have worn down level with the 1.6 mm high tread wear indicators -arrows- positioned at intervals around the tyre.*
- ◆ *If the tread depth is approaching the minimum allowed depth, inform the customer.*



4.13.4 General notes



WARNING

- ◆ *For safety reasons, only tyres of same type and tread pattern should be fitted on a vehicle!*
- ◆ *On four-wheel drive vehicles, tyres of the same type and tread pattern must be used. Otherwise the centre differential may be damaged.*



Note

- ◆ *The tyre pressure table is valid for standard tyres for all tyre sizes fitted at the factory.*
- ◆ *The pressures in the table apply to cold tyres. Do not reduce increased pressures of warm tyres.*
- ◆ *Tyre inflation pressures for the relevant model are on a sticker attached to the inside of fuel tank flap or on the driver side B-pillar.*
- ◆ *Adjust the tyre pressure to suit the vehicle load.*
- ◆ *The spare wheel should have the highest tyre pressure determined for the vehicle.*

Winter tyres



Note

- ◆ *Important information on recommended winter tyres can be found in ➔ Wheels and Tyres Guide - Standard; Rep. gr. 44; Recommended winter tyres »Recommended winter tyres«.*
- ◆ *For winter tyres the tyre pressures for standard tyres are valid.*



4.13.5 Checking tyre inflation pressure, correcting if necessary, (for North American and Mexican markets)

Petrol engines

1.8 l / 132 kW ➤ [page 43](#)

2.0 l / 85 kW ➤ [page 43](#)

2.5 l / 110 kW ➤ [page 43](#)

2.0 l / 147 kW FSI ➤ [page 44](#)

Diesel engines

1.9 l / TDI ➤ [page 44](#)

Petrol engine

Capacity / output				
1.8 l / 132 kW				
Tyre sizes	Half load		Full load	
	front (bar)	rear (bar)	front (bar)	rear (bar)
195/65 R 15	2.2	2.2	2.4	2.9
205/55 R 16	2.2	2.2	2.4	2.9
225/45 R 17	2.2	2.2	2.4	2.9
Temporary spare wheel (collapsible spare wheel)	4.2	4.2	4.2	4.2

Petrol engine

Capacity / output				
2.0 l / 85 kW				
Tyre sizes	Half load		Full load	
	front (bar)	rear (bar)	front (bar)	rear (bar)
195/65 R 15	2.2	2.2	2.4	2.9
205/55 R 16	2.2	2.2	2.4	2.9
225/45 R 17	2.2	2.2	2.4	2.9
Temporary spare wheel (collapsible spare wheel)	4.2	4.2	4.2	4.2

Capacity / output				
2.5 l / 110 kW				
Tyre sizes	Half load		Full load	
	front	rear	front	rear
	(bar / kPa / psi)	(bar / kPa / psi)	(bar / kPa / psi)	(bar / kPa / psi)
195/65 R 15	2.3 / 230 / 33	2.3 / 230 / 33	2.3 / 230 / 33	2.3 / 230 / 33
205/55 R 16	2.3 / 230 / 33	2.3 / 230 / 33	2.3 / 230 / 33	2.3 / 230 / 33
225/45 R 17	2.3 / 230 / 33	2.3 / 230 / 33	2.3 / 230 / 33	2.3 / 230 / 33
225/40 R 18	2.4	2.4	2.6	3.0



Capacity / output				
2.5 l / 110 kW				
Tyre sizes	Half load		Full load	
	front	rear	front	rear
	(bar / kPa / psi)	(bar / kPa / psi)	(bar / kPa / psi)	(bar / kPa / psi)
Temporary spare wheel (collapsible spare wheel)				
	4.2	4.2	4.2	4.2

Petrol engine

Capacity / output				
2.0 l / 147 kW				
Tyre sizes	Half load		Full load	
	front (bar)	rear (bar)	front (bar)	rear (bar)
205/55 R 16	2.4	2.4	2.6	3.0
225/45 R 17	2.4	2.4	2.6	3.0
225/40 R 18	2.4	2.4	2.6	3.0
Temporary spare wheel (collapsible spare wheel)				
	4.2	4.2	4.2	4.2

Diesel engine

Capacity / output				
1.9 l / TDI				
Tyre sizes	Half load		Full load	
	front	rear	front	rear
	(bar / kPa / psi)	(bar / kPa / psi)	(bar / kPa / psi)	(bar / kPa / psi)
195/65 R 15	2.2 / 220 / 32	2.0 / 200 / 29	2.4 / 240 / 34	2.9 / 290 / 42
205/55 R 16	2.2 / 220 / 32	2.0 / 200 / 29	2.4 / 240 / 34	2.9 / 290 / 42
225/45 R 17	2.2 / 220 / 32	2.0 / 200 / 29	2.4 / 240 / 34	2.9 / 290 / 42
Temporary spare wheel (collapsible spare wheel)				
	4.2	4.2	4.2	4.2

4.13.6 Checking tyre inflation pressure, correcting if necessary, (for rest of the world markets)

Petrol engines

1.4 l / 55 kW ➔ [page 45](#)

2.0 l / 85 kW ➔ [page 45](#)

1.6 l / 75 kW ➔ [page 45](#)

1.8 l / 110 kW ➔ [page 45](#)



Diesel engines

1.9 l / SDI, TDI ➔ [page 46](#)

Petrol engine

Capacity / output				
1.6 l / 75 kW				
Tyre sizes	Half load		Full load	
	front (bar)	rear (bar)	front (bar)	rear (bar)
205/55 R 16	2.0	2.1	2.0	2.5
225/45 R 17	2.0	2.1	2.0	2.5
225/40 R 18	2.0	2.1	2.0	2.5

Petrol engine

Capacity / output				
1.4 l / 55 kW				
Tyre sizes	Half load		Full load	
	front (bar)	rear (bar)	front (bar)	rear (bar)
205/55 R 16	2.0	2.1	2.0	2.5
225/45 R 17	2.0	2.1	2.0	2.5
225/40 R 18	2.0	2.1	2.0	2.5

Petrol engine

Capacity / output				
2.0 l / 85 kW				
Tyre sizes	Half load		Full load	
	front (bar)	rear (bar)	front (bar)	rear (bar)
195/65 R 15	2.1	2.0	2.2	2.7
205/55 R 16	2.1	2.0	2.2	2.7
225/45 R 17	2.1	2.0	2.2	2.7
225/40 R 18	2.1	2.0	2.2	2.7

Petrol engine

Capacity / output				
1.8 l / 110 kW				
Tyre sizes	Half load		Full load	
	front (bar)	rear (bar)	front (bar)	rear (bar)
195/65 R 15	2.2	2.0	2.3	2.7
205/55 R 16	2.2	2.0	2.3	2.7
225/45 R 17	2.2	2.0	2.3	2.7
225/40 R 18	2.2	2.0	2.3	2.7



Diesel engine

Capacity / output				
1.9 l / SDI, TDI				
Tyre sizes	Half load		Full load	
	front (bar)	rear (bar)	front (bar)	rear (bar)
195/65 R 15	2.1	2.0	2.2	2.7
205/55 R 16	2.1	2.0	2.2	2.7
225/45 R 17	2.1	2.0	2.2	2.7
225/40 R 18	2.1	2.0	2.2	2.7

4.14 Brake system: Perform visual check for leaks and damage

Check following components for leaks and damage:

- ◆ Brake master cylinder
- ◆ Brake servo (for anti-lock brake system: hydraulic unit)
- ◆ Brake pressure regulator and
- ◆ Brake calipers
- Ensure that brake hoses are not twisted.
- Additionally ensure that brake hoses do not touch any vehicle components when steering is at full lock.
- Check brake hoses are not porous or brittle.
- Check brake hoses and lines for chafing.
- Check brake connections and fastenings for correct seating, leaks and corrosion.



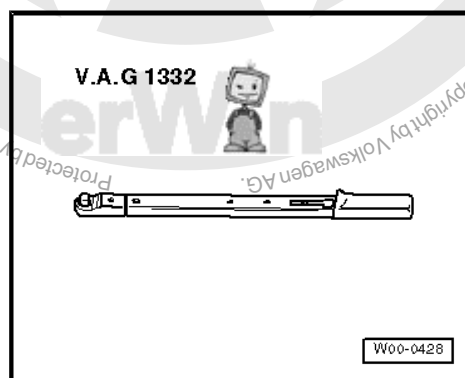
WARNING

Faults found must always be rectified (repair measure).

4.15 Front and rear brake pads/linings: Checking thickness

Special tools and workshop equipment required

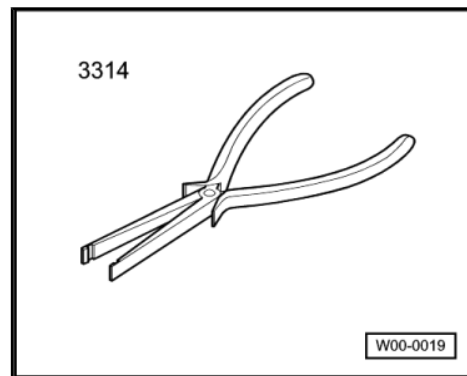
- ◆ Torque wrench -V.A.G 1332-



- ◆ Electric hand torch and mirror



◆ Pliers -3314-



Removing full sized wheel trims

The puller hooks to remove the wheel trims are located in the vehicle tool kit.

Wheel bolts

The adapter to loosen and tighten the anti-theft wheel bolts can be found in the vehicle tool kit.

Carry out the following procedure:

4.15.1 Front brake pads:



Note

The adapter to loosen and tighten the anti-theft wheel bolts can be found in the vehicle tool kit. Please ask the customer if the adapter is not available.

- For better evaluation of remaining pad thickness, remove the front wheel on the driver side.
- If necessary, pull wheel bolt covers off with pliers -3314- or pull full sized wheel trim off with puller hooks.
- Mark position of wheel relative to brake disc.
- Unbolt wheel bolts and remove wheel.



- Measure thickness of inner and outer pads.

a - Pad thickness without backplate

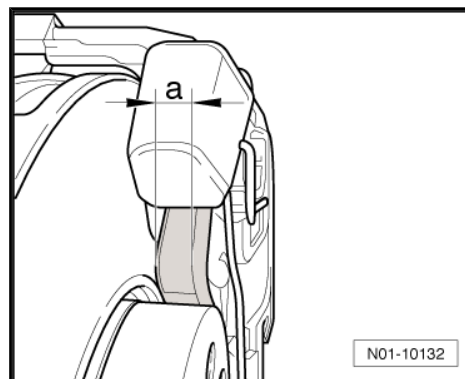
Wear limit: 2 mm

The brake pads have reached their wear limit at a pad thickness of 2 mm (without backplate) and must be renewed (repair measure). Inform customer!



Note

When replacing brake pads, always check brake discs as well for wear! Checking and if necessary replacing the brake discs is a repair measure.



- Check brake disc for wear ⇒ Brake system; Rep. gr. 46 ; Repairing front brakes »Repairing front brakes«
- Install wheel in marked position.
- Tighten wheel bolts diagonally and alternately to following torque setting:

Specified torque: 120 Nm

- Place puller hooks and adapter with vehicle tool kit after completing work.

Installing full sized wheel trim

- Install full sized wheel trim so that the tyre filler valve is guided through the cut-out provided.
- Reinstall wheel bolt covers if necessary.

4.15.2 Rear brake pads:

- Remove full sized wheel trim with puller hooks if necessary.
- Illuminate area behind hole in wheel using an electric hand torch.
- Determine thickness of outer pad by checking visually.
- Illuminate inner pad with an electric hand torch and mirror.
- Determine thickness of inner pad by checking visually.

a - Inner and outer pad thickness without backplate

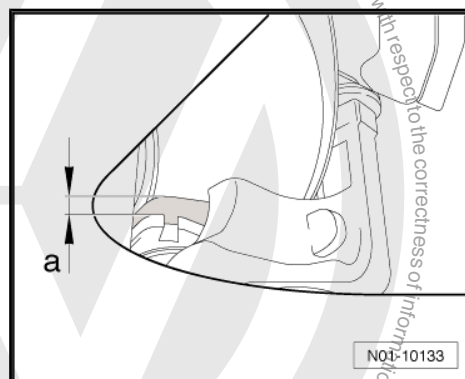
Wear limit: 2 mm

The brake pads have reached their wear limit at a pad thickness of 2 mm (without backplate) and must be renewed (repair measure). Inform customer!



Note

When replacing brake pads, always check brake discs as well for wear! Checking and if necessary replacing the brake discs is a repair measure.



- Check brake disc for wear ⇒ Brake system; Rep. gr. 46 ; Repairing rear brakes »Repairing rear brakes«
- Install full sized wheel trim.



4.15.3 Rear drum brake pads:

- Remove full sized wheel trim with puller hooks if necessary.
- Check brake pad thickness through inspection hole in brake backplate -arrow- (using electric hand torch).

Wear limit: 2.5 mm (pad thickness only)

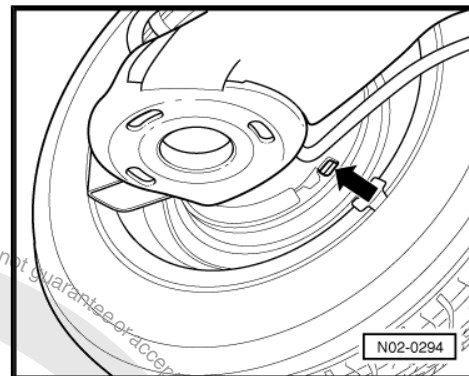
At a pad thickness of 2.5 mm the brake pads have reached their wear limit and must be replaced (repair measure). Inform customer!



Note

Check pads for brake fluid or grease contamination.

- Install full sized wheel trim.



4.16 Brake and clutch system: Change brake fluid

Instructions for use and safety ➔ [page 49](#) .

Brake fluid specification ➔ [page 49](#) .

Procedure, changing brake fluid ➔ [page 50](#)

4.16.1 Instructions for use and safety



Note

- ◆ *From model year 2006 a new brake fluid will be introduced.*
- ◆ *The new brake fluid can also be used for older vehicles.*
- ◆ *For this purpose it can be mixed with the previous brake fluid.*



WARNING

- ◆ *Brake fluid must under no circumstances come into contact with fluids containing mineral oils (oil, petrol, cleaning solutions). Mineral oils will damage seals and sleeves of brake system.*
- ◆ *Brake fluid is poisonous. In addition, due to its corrosive nature, it must not come into contact with paint.*
- ◆ *Brake fluid is hygroscopic, i.e. it attracts moisture from the surrounding air and therefore must always be stored in air-tight containers.*
- ◆ *Wash away spilt brake fluid using plenty of water.*
- ◆ *Do not reuse extracted (used) brake fluid.*
- ◆ *Observe disposal regulations!*

Carry out the following procedure:

4.16.2 Brake fluid specification

Permissible specifications:

- ◆ Brake fluid conforming to US standard FMVSS 116 DOT 4 (previous brake fluid)

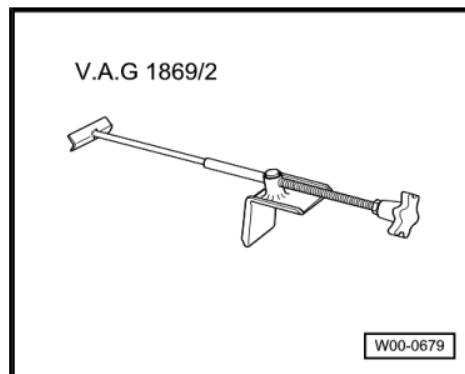


- ◆ Brake fluid conforming to VW standard, VW 501 14 (new brake fluid).

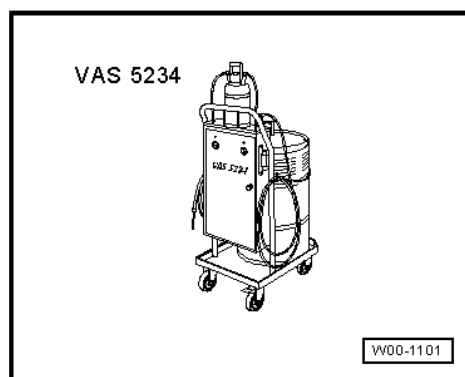
4.16.3 Procedure, changing brake fluid

Special tools and workshop equipment required

- ◆ Brake pedal depressor -V.A.G 1869/2-

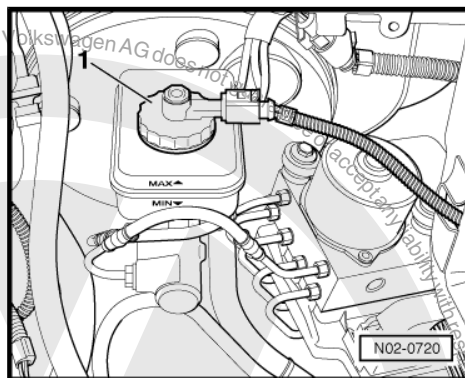


- ◆ Brake filling and bleeding unit -VAS 5234-



Observe instruction manual for -VAS 5234- !

- Unbolt cap from brake fluid reservoir.





- Extract as much brake fluid as possible using suction hose from -VAS 5234- -1- or using a suction bottle with built-in strainer.



Note

Ensure that no brake fluid runs through the strainer after completing the extraction (the brake fluid level in the reservoir must be even with the lower edge of the strainer).



WARNING

Do not reuse extracted (used) brake fluid.

- Fit brake pedal actuator -V.A.G 1869/2- between driver seat and brake pedal and pretension.
- Connect adapter -1- to brake fluid reservoir.



Note

If the adapter -1- cannot be fitted due to space limitations, use adapter -VAS 5234/1-.



Note

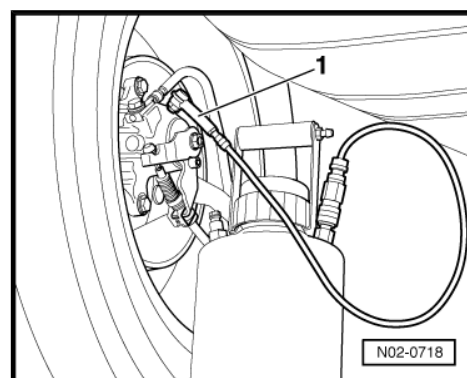
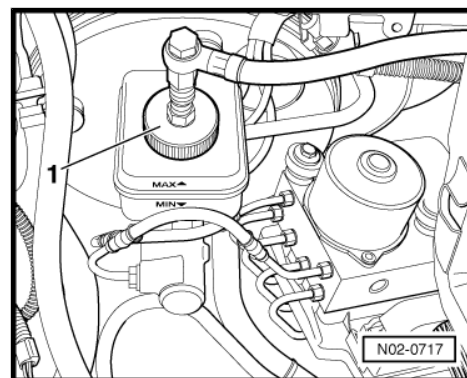
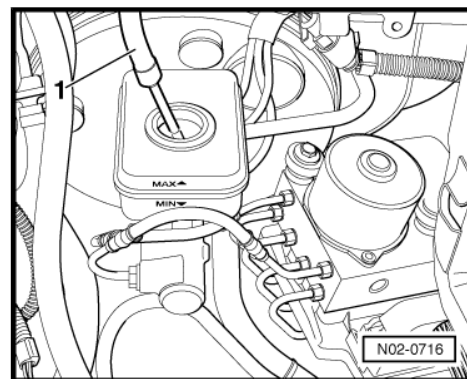
Use an appropriate bleeder hose. It must seat tightly on bleeder screw so that no air can enter the brake system.

Connect filling hose of -VAS 5234- to adapter.

Continued for all vehicles (left-hand drive)

- Remove caps from bleeder screws.
- Connect collector bottle bleeder hose -1- to rear bleeder screw, open bleeder screw and allow the appropriate amount of brake fluid to flow out (see table). Close bleeder screw, specified torque ➔ Running gear; Rep. gr. 47 ; Servicing rear brake calipers »Servicing rear brake calipers«.

Repeat procedure on left-hand side of vehicle at rear.





- Push bleeder hose -1- of collector bottle onto front bleeder screw, open bleeder screw and let appropriate quantity of brake fluid run out (see table). Close bleeder screw, specified torque ⇒ Running gear; Rep. gr. 47 ; Servicing front brake calipers »Servicing front brake calipers«.

Repeat procedure on left-hand side of vehicle at front.

Vehicles with manual gearbox:

- Remove cover cap from bleeder screw of clutch slave cylinder.

- Connect bleeder hose -arrow- to clutch slave cylinder -1-.
- Open valve and allow approx. 100 ml of brake fluid to flow out.
- Close valve and depress clutch pedal 10 to 15 times quickly in succession.
- Open valve again and allow approx. 50 ml of brake fluid to flow out.
- Close valve, remove bleeder hose and depress clutch pedal several times.

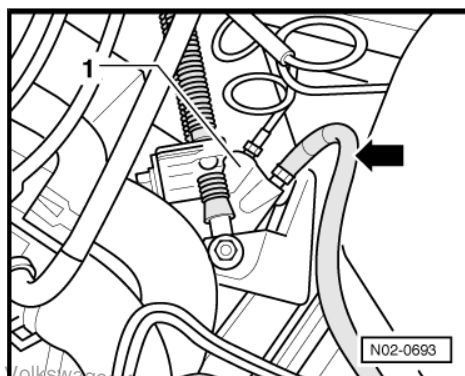
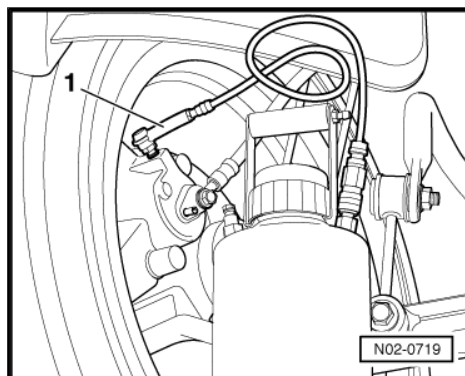


Table - Sequence and quantity of brake fluid

Sequence bleeder valves:	Brake fluid quantity which must flow out of bleeder valves:
Wheel brake cylinder/ brake caliper	
Rear right	0.25 litre (250 ml)
Rear left	0.25 litre (250 ml)
Brake caliper	
Front right	0.25 litre (250 ml)
Front left	0.25 litre (250 ml)
Clutch slave cylinder	0.15 litre (150 ml)

Total quantity: approx. 1.15 litre

- Fit cover caps on wheel brake cylinder and brake caliper bleeder screws.
- Set fill lever of -VAS 5234- to position -B- (see ⇒ operating instructions).
- Remove filler hose from adapter.
- Unscrew adapter from brake fluid reservoir.
- Check brake fluid level and correct if necessary.
- Screw in cap of brake fluid reservoir.
- Remove brake pedal depressor.
- Check pressure and free travel of brake pedal. Free travel: max. 13 of pedal travel.

4.17 Brake fluid level: Check

Instructions for use and safety ⇒ [page 49](#) .

Brake fluid specification ⇒ [page 49](#) .

Procedure, brake fluid level: Check ⇒ [page 53](#)



4.17.1 Procedure, brake fluid level: Check

Brake fluid level at delivery inspection:

At delivery inspection the fluid level must be at MAX. marking -1-.



Note

To prevent that brake fluid flows out of reservoir, the MAX marking must not be exceeded.

Brake fluid level at inspection service:

The fluid level must always be judged in conjunction with lining/pad wear.

When vehicle is in use, fluid level tends to drop slightly due to lining/pad wear and automatic adjustment.

- Recommended brake fluid level, if brake pads are almost at wear limit:

„At MIN. marking or just above“ „REPLENISHING IS NOT REQUIRED“.

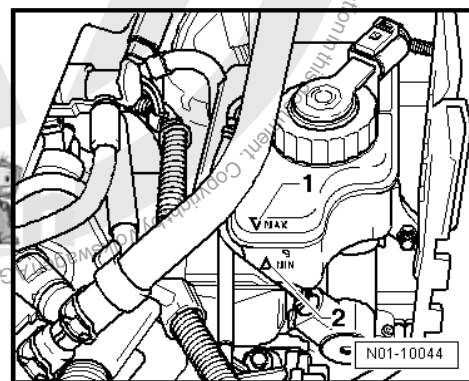
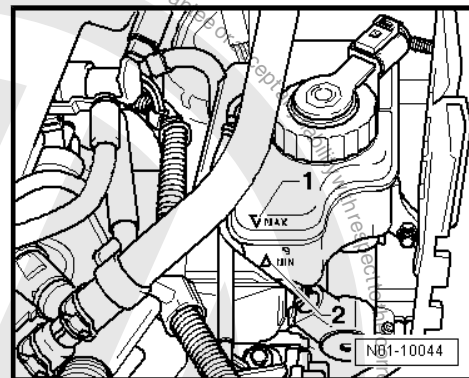
- Recommended brake fluid level when brake pads are new or well within wear limit:

„Between MIN and MAX marking“.



WARNING

If the fluid level is below MIN. marking, the brake system must be checked before fluid is topped up „repair measure“.

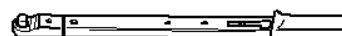


4.18 Anti-theft wheel bolts: Installing

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-

V.A.G 1332



W00-0428

A set of anti-theft wheel bolts is included on models with alloy wheels.

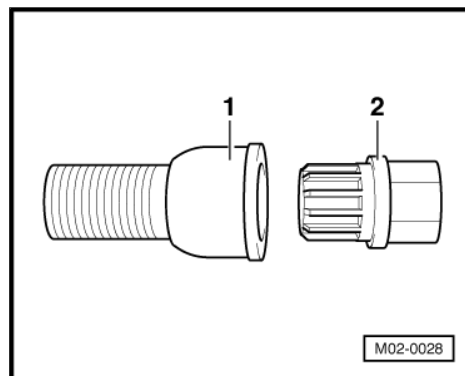


The set of theft inhibiting wheel bolts comprises:

- 1 - Theft inhibiting wheel bolt (install using special adapter)
 - 2 - Adapter for wheel bolt
- Install the four theft inhibiting wheel bolts as follows:
 - ◆ Remove one wheel bolt from each wheel rim and replace it with an anti-theft wheel bolt.
 - ◆ Insert adapter fully into head of theft inhibiting wheel bolt and tighten to prescribed torque using a torque wrench.
 - ◆ Then tighten all wheel bolts to specified torque.

Wheel bolts: Tighten to specified torque ➤ [page 83](#) .

- Place adapter in vehicle tool kit after completing work.



4.19 Digital clock: Set time and display mode



Note

- ◆ The digital clock is located above the rear view mirror on the left-hand side of the display.
- ◆ 12 and 24 hour display modes are available.
- ◆ The time and display modes are set using two buttons (on the left and right-hand side of the display).

Set time

Carry out adjustment as follows:

- Switch on ignition.

Setting hours and minutes:

To set the time, buttons are located on left and right-hand side of the display -arrows-. The left-hand button -h- sets the hours and the right-hand button (min) sets the minutes.

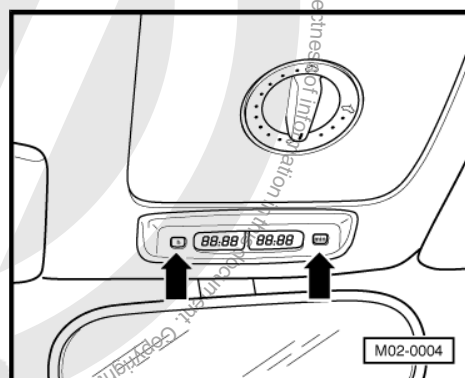
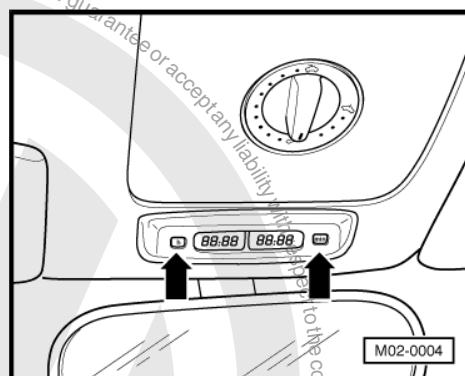
- Pressing the button briefly advances the hours or minutes by one. Pressing the button continuously speeds up selection of hours or minutes.

Setting to the second:

With the **minute** button the clock can be set exactly to the second:

- Press (min) button until time is one minute before time to be set.
- Press (min) button at the moment when the seconds indicator of an accurate clock shows the full minute or when the time signal is heard on the radio.

Selecting 12 hour or 24 hour display mode:

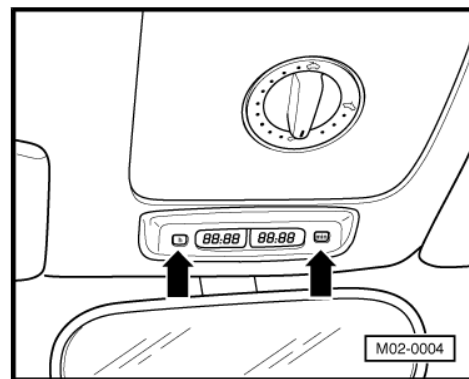




- Switch off ignition.
- Press and hold both buttons (-h- and (min)) down simultaneously for at least 3 seconds.

The new mode will appear on the display.

- Select the display mode desired by the customer.



4.20 Direct shift gearbox - DSG -: Change oil and oil filter (02E gearbox)

Changing oil and filter of direct shift gearbox ⇒ 6-speed direct shift gearbox 02E; Rep. gr. 34 ; Changing oil and filter of direct shift gearbox ; Changing oil and filter of direct shift gearbox

4.21 Window regulators: Perform initialisation (activation)



Note

The automatic opening and closing features for the electric windows do not function after disconnecting and reconnecting the vehicle battery. The electric windows must be initialised before a new vehicle is delivered. The vehicle battery must not be disconnected after initialisation.



WARNING

After vehicle battery has been disconnected and reconnected the roll-back function of the electric window regulators is disabled. Severe pinching injuries could result! It is very important to inform the customer!

Perform the following procedure to initialise the electric windows:

- Close all doors and windows completely.
- Lock vehicle from outside at driver door or front passenger door.
- Unlock vehicle.
- Lock vehicle again from outside at driver door or front passenger door. Hold key in lock position for at least 1 second.

4.22 Performing vehicle system test

- Connect vehicle diagnosis tester ⇒ [page 28](#)
- Switch on ignition.
- Select operating mode „Guided fault finding“ on display.
- Then perform vehicle identification on tester.

The programme now automatically performs a vehicle system test and reads all control units available for this vehicle type.

- Press button.



Now all faults are listed.



Note

- ◆ *At this point it is useful to change to operating mode guided functions to carry out further operations with VAS 5051 and to prevent a second vehicle identification on tester.*
- ◆ *To do this, press button operating mode and then guided functions.*
- ◆ *For further procedure see respective work descriptions.*
- ◆ *To return to guided fault finding, press button operating mode and then guided fault finding.*



Caution


The vehicle must always be delivered to the customer with fault memory cleared.

Static faults

If one or more static faults are found in the fault memory, we recommend in agreement with the customer to rectify these faults using guided fault finding.

Sporadic faults

If only sporadic faults or notes are stored in the fault memory and the customer has no complaints in conjunction with the electronic vehicle system, clear fault memory.

- Press  button again to reach the test plan.
- Now finish guided fault finding using GoTo button and then End.

All fault memories are read again.

Then the diagnosis log is sent „online“ or stored on the tester.



Note

- ◆ *If the tester is not connected to the network, the diagnosis log is stored and will be sent when the tester is connected to the network.*
- ◆ *Logs stored and which are more than 40 days old will be cleared automatically.*

The vehicle system test is completed.

4.23 Protective bellows: Visual check

Carry out the following procedure:

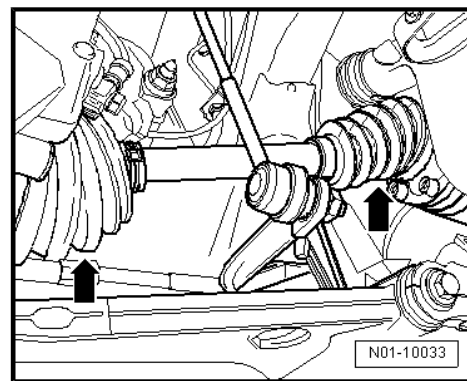


- Check outer and inner CV joint boots -arrows- for leaks and damage.



Note

On vehicles with four-wheel drive also check boots on rear axle.



4.24 Checking first aid box expiry date

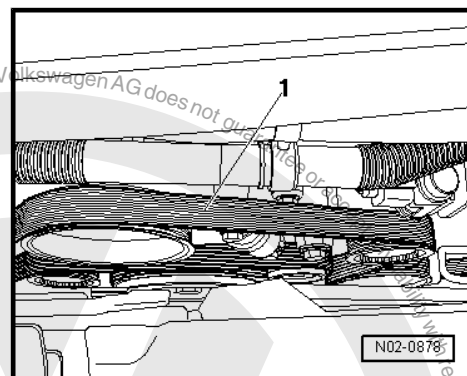
With immediate effect, the expiry date of the first aid box must be checked at every inspection service.

Inform customer if date has been exceeded.

4.25 Poly V-belt: Check condition

Carry out the following procedure:

- Crank engine at vibration damper on belt pulley using a socket.
- Raise vehicle and check poly V-belt -1- from below for:
 - ◆ Substructure cracks (cracks, core ruptures, cross sectional breaks)
 - ◆ Layer separation (top layer, cord strands), sub-surface break-up
 - ◆ Fraying of cord strands
 - ◆ Flank wear (material wear, frayed flanks, brittle flanks -glassy flanks-, surface cracks)
 - ◆ Traces of oil and grease



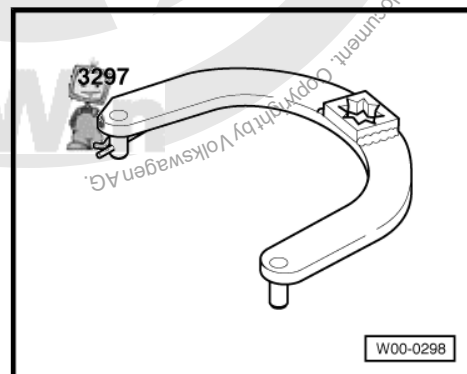
Note

If faults are found it is absolutely necessary to renew the poly V-belt. This will avoid possible breakdowns or operating problems. Renewing the poly V-belt is a repair measure.

4.26 Poly V-belt: Adjust tension on engines without automatic tensioning roller

Special tools and workshop equipment required

- ◆ Tensioning lever -3297-

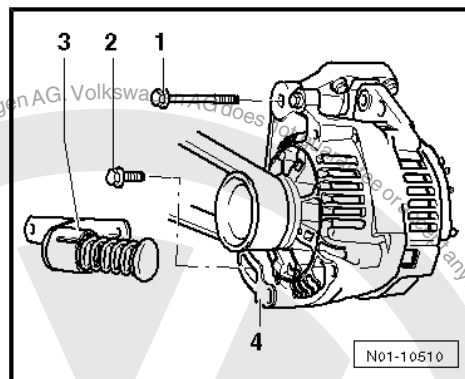




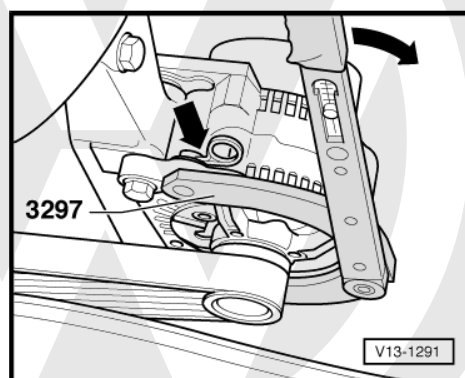
– Loosen securing bolts -1 + 2-.

3 - Tensioning arm

4 - Alternator

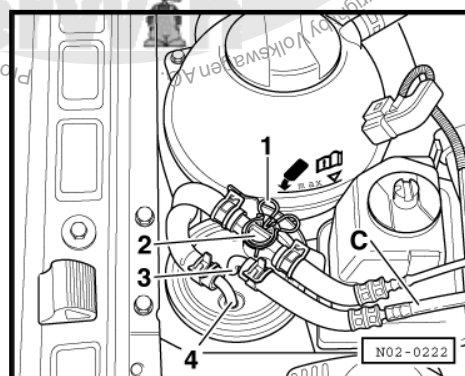


- Fit tensioning lever, secure with pin -arrow- and swing alternator downwards (use torque wrench as drive for 3297).
- Press alternator with tensioning lever to stop of tensioning arm at least three times, to ensure optimum ease of movement.
- First tighten lower and then upper alternator bolt to 25 Nm.



4.27 Fuel filter: Renew (diesel engine)

Carry out the following procedure:



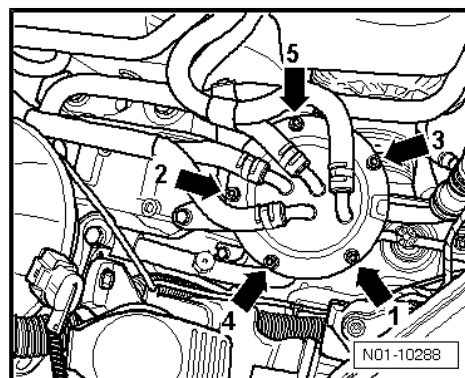
Note

- ◆ There are two different fuel filter systems.
- ◆ System 1 is fitted with a regulating valve -1-, descriptions of work ➔ [page 59](#).
- ◆ System 2 is „not“ fitted with a regulating valve, see illustration N01-10288, descriptions of work ➔ [page 60](#).



Note

- ◆ Ensure that no diesel fuel contacts coolant hoses. If necessary, clean hoses immediately.
- ◆ Observe disposal regulations!

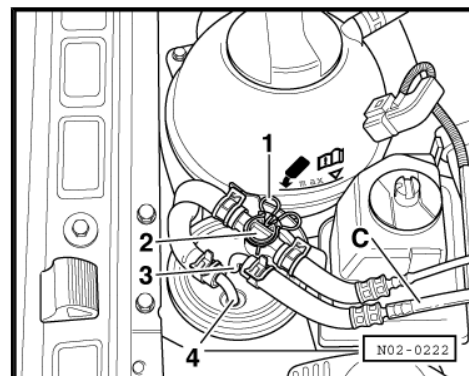




4.27.1 Renewing fuel filter: Fuel filter system with regulating valve

Removing:

- Pull off retaining clip -1- and remove regulating valve -2- with fuel lines connected.
- Pull fuel hoses off hose connections -3- and -4-.



- Loosen bolt -arrow- on filter mounting and pull filter out upwards.

Installing new filter:

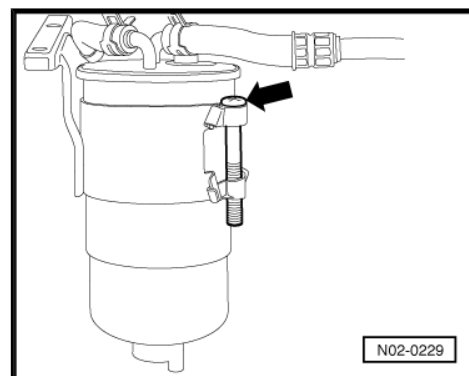
- Fit new O-ring to seal regulating valve.



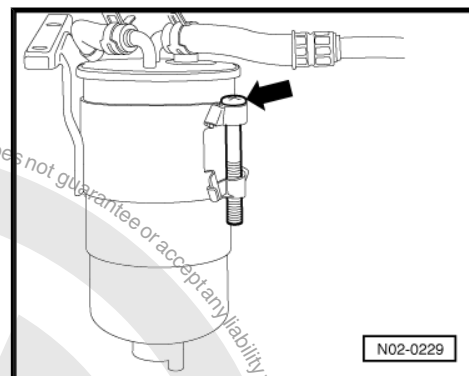
Note

Fuel through-flow direction is marked on the connections by arrows (do not interchange connections).

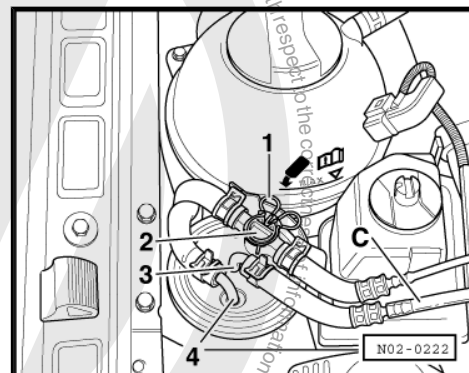
- Fill new filter with clean Diesel. This allows the engine to start quicker.



- Slide filter downwards into filter mounting and tighten bolt -arrow-.



- Install regulating valve -2- and fit retaining clip -1-.
- Push fuel hoses over hose connections -3- and -4- and secure hoses with hose clips.
- Start engine and check fuel system for leaks (visual check).
- Operate throttle several times. Then fuel must flow bubble-free through the transparent line -C- when engine is at idling speed.





4.27.2 Renewing fuel filter: Fuel filter system without regulating valve

Removing:

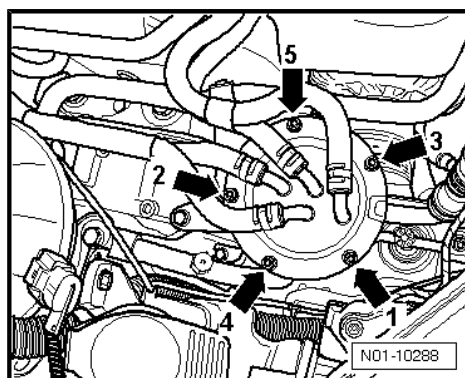


Note

- ◆ Ensure that no diesel fuel contacts coolant hoses.
- ◆ If necessary, clean hoses immediately.
- ◆ Observe disposal regulations!

Carry out the following procedure:

- Loosen all bolts -arrows- of fuel filter upper part in a diagonal pattern approx. 1.5 to 2 turns.

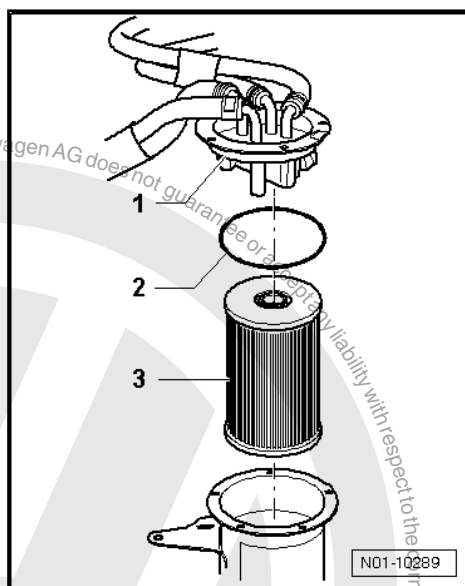


- Remove screws completely and remove fuel filter upper part.
- Remove old seal -2- from fuel filter upper part -1-.
- Take easy change filter -3- out of fuel filter lower part.



Caution

If necessary, remove dirt and water residues from fuel filter lower part.

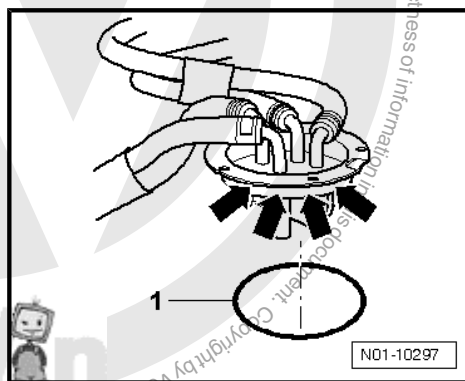


Note

Observe disposal regulations!

Installing:

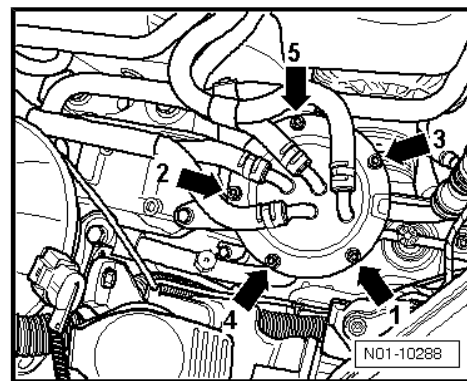
- Insert new easy change filter into fuel filter lower part.





- Insert new seal -1- into groove of fuel filter upper part -arrows-.
- Fit fuel filter upper part and seal on fuel filter lower part and screw in bolts approx. one turn.
- Tighten fuel filter upper part to fuel filter lower part.
- Tighten bolts according to sequence shown in illustration.
- Tighten bolts to 5 Nm torque.

The tightening sequence prevents, that the fuel filter upper part is canted and the seal could be damaged.



4.28 Fuel filter: Drain water (diesel engine)

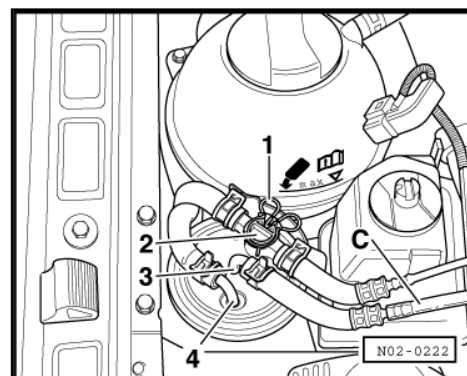


Note

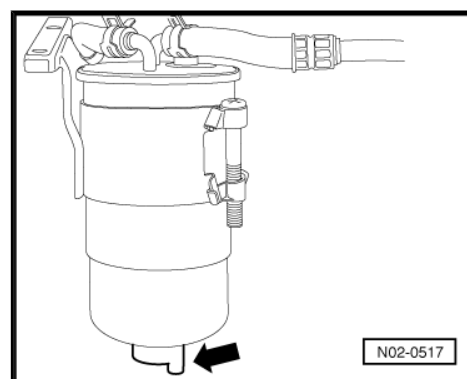
- ◆ *Ensure that no diesel fuel contacts coolant hoses. If necessary, clean hoses immediately.*
- ◆ *Observe disposal regulations!*

Carry out the following procedure:

- Pull off retaining clip -1- and remove regulating valve -2- with fuel lines connected.

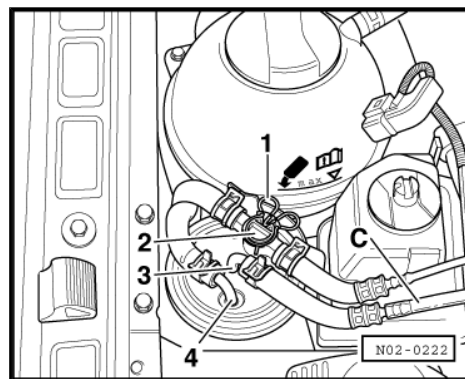


- Fit hose onto water drain screw connection -arrow-, open screw and drain approx. 0.1 l of fluid.
- Tighten water drain screw -arrow- and remove hose.
- Fit new O-ring to seal regulating valve.





- Install regulating valve -2- and fit retaining clip -1-.
- Start engine and check fuel system for leaks (visual check).
- Operate throttle several times. Then fuel must flow bubble-free through the transparent line -C- when engine is at idling speed.



4.29 Cooling system: Check frost protection and coolant level



Note

- ♦ For vehicles from model year 2008 only use coolant additive -G 12 Plus Plus- in accordance with TL VW 774 G.
- ♦ In vehicles up to and including model year 2007 use coolant additive G12 Plus in accordance with TL VW 774 F and G 12 plus-plus in accordance with TL VW 774 G.
- ♦ Coolant additive -G 12 Plus Plus- may only be mixed with -G 12 Plus-. Both can be identified by their purple colour.
- ♦ Coolant additives marked „in accordance with TL VW 774 G“ or „in accordance with TL VW 774 F“ prevent frost and corrosion damage, scaling and also raise boiling point of coolant. For these reasons, the cooling system must be filled all-year-round with a frost and corrosion protection additive.
- ♦ Because of its high boiling point, the coolant improves engine reliability under heavy loads, particularly in countries with tropical climates.
- ♦ Frost protection must be assured to about -25 °C (in arctic climatic countries to about -35 °C).
- ♦ The coolant concentration must not be reduced by adding water even in warmer seasons and in warmer countries. The coolant additive ratio must be at least 40 %.
- ♦ If for climatic reasons greater frost protection is required, the amount of -G 12 Plus Plus- can be increased, but only up to 60 % (frost protection to about -40°C), as otherwise frost protection is reduced again and cooling effectiveness is also reduced.
- ♦ The refractometer -T10007- is recommended to determine the current frost protection density.
- ♦ If radiator, heat exchanger, cylinder head or cylinder head gasket is replaced, do not reuse old coolant.

Checking frost protection, replenishing coolant additive if necessary ⇒ [page 62](#).

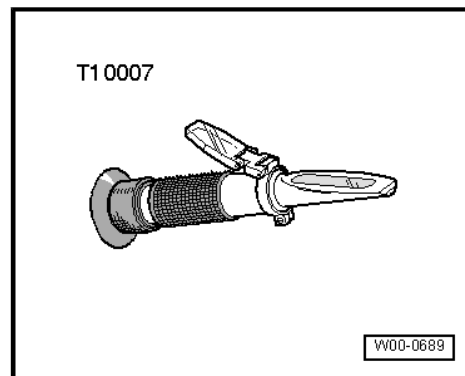
Checking coolant level, replenishing coolant if necessary ⇒ [page 63](#)

4.29.1 Checking frost protection, replenish coolant additive if necessary

Special tools and workshop equipment required



◆ Refractometer -T10007-



Note

Read precise value for the following tests at bright/dark boundary. Using a pipette, place a drop of water on the glass to improve the readability of the bright/dark boundary. The bright/dark boundary can be clearly recognised on the „WATERLINE“.

- Check concentration of coolant additive using refractometer - T10007- (refer to operating instructions).

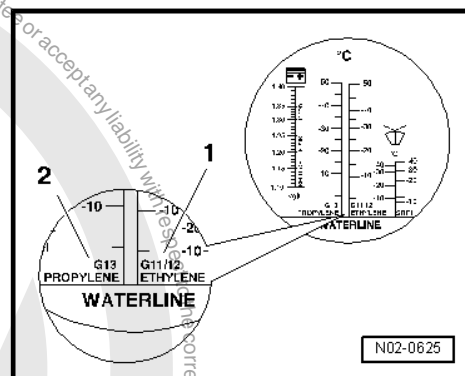
The scale -1- of the refractometer is calibrated for coolant additives -G 12- and -G 11-.



Note

- ◆ *Frost protection must be guaranteed to approx. -25 °C.*
- ◆ *If, due to climatic reasons, greater frost protection is required, the amount of -G 12 Plus- or -G 12 Plus Plus- can be increased, but only up to 60 % (frost protection to about -40 °C), as otherwise frost protection is reduced again and cooling effectiveness is also reduced.*

- If frost protection is too low, you must drain coolant and add coolant additive -G 12 Plus Plus- ➔ [page 63](#) .



Note

Observe disposal regulations!



Caution

Only distilled water may be used for mixing. Tap or well water does not have the required quality to ensure the effectiveness of coolant.

- Check coolant additive concentration after road test again.

4.29.2 Check coolant level, replenish coolant if necessary

- Check coolant level on expansion tank with engine cold.

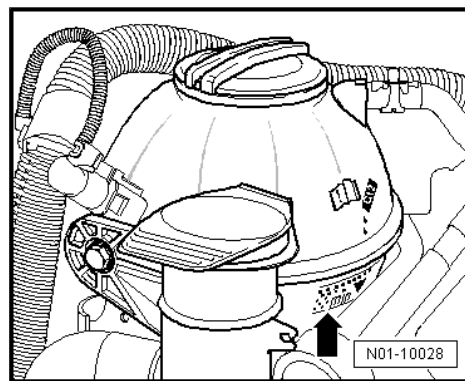


- ◆ Delivery inspection: Coolant level at max. marking -arrow-.
- ◆ Inspection service: Coolant level between max. and min. markings.
- If coolant is too low, add required amount according to mixture ratio.



Note

If fluid loss is greater than can be expected through normal use, determine source and rectify (repair measure).



Mixture ratio:



Caution

Only distilled water may be used for mixing. Tap or well water does not have the required quality to ensure the effectiveness of coolant.

Frost protection to	Coolant additive -G 12 Plus- and -G 12 Plus Plus-	Distilled water ⁶⁾
-25 °C	approx. 40 %	approx. 60 %
-35 °C	approx. 50 %	approx. 50 %
-40 °C	approx. 60 %	approx. 40 %

6) Use clean tap water only.



Note

- ◆ *Coolant additive -G 12 Plus- and -G 12 Plus Plus- prevents frost and corrosion damage, scaling and also raises boiling point of coolant. For these reasons, the cooling system must be filled all-year-round with a frost and corrosion protection additive.*
- ◆ *Because of its high boiling point, the coolant improves engine reliability under heavy loads, particularly in countries with tropical climates.*
- ◆ *The coolant concentration must not be reduced by adding water even in warmer seasons and in warmer countries. The antifreeze portion must be at least 40 %.*



4.30 Air filter: Clean housing and renew filter element

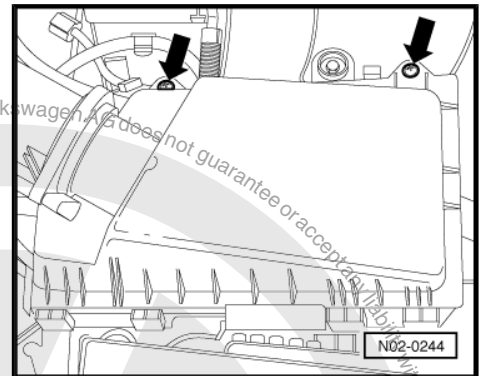
4.30.1 Air filter: Cleaning housing and renewing filter element, cleaning strainer if fitted



Note

- ◆ Depending on vehicle equipment, a screen is installed in the air duct, in air filter housing lower part near the air intake system.
- ◆ This strainer is designed to catch snow and ice in the winter months so that the air filter element is not blocked.
- ◆ When grasping at front into the air intake system it can be felt whether a snow screen is fitted.

- Remove securing bolts -arrows-.
- Lift filter housing upper part and remove upwards.
- Take out used filter element -arrow-.



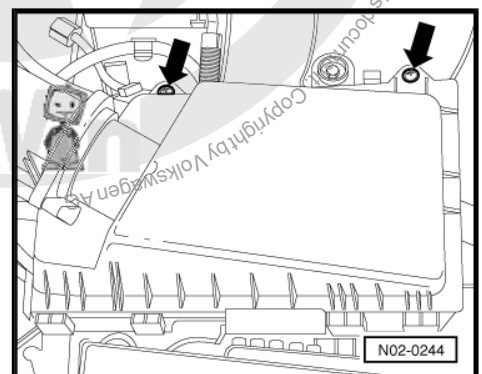
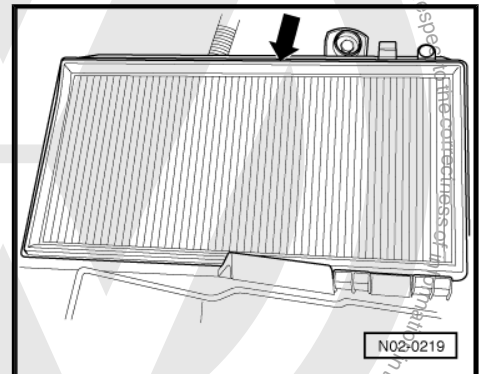
- Removing and installing snow screen ➔ [page 66](#) .



Note

Observe disposal regulations!

- Clean filter housing and install new filter element.
- Insert filter housing upper part and tighten bolts -arrows-.





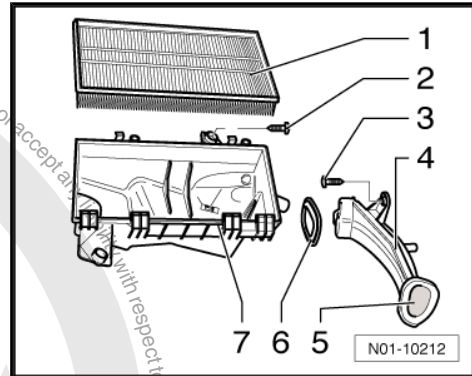
4.30.2 Cleaning snow screen (only vehicles with 2.0 l engine)

The snow screen is located in the air intake system -4-.

- Remove air filter upper part ➔ [page 65](#) .
- Remove air filter element -1-.
- Remove air filter lower part -7-.
- Remove air intake system -4- and remove snow screen -5- from air intake system.
- Clean snow screen.

Install in reverse order.

- ◆ Torque setting -item 2- 10 Nm.
- ◆ Torque setting -item 3- 3 Nm.



4.31 Engine cover panel -top-: Removing and installing



Caution

- ◆ **Do not push with the fist or a tool on the engine cover panel when it is installed or engaged at securing points, it could be damaged.**

Removing and installing engine cover, 1.4l injection engines
➔ [page 66](#) .

Removing and installing engine cover, 1.6 l injection engines
➔ [page 67](#) .

Removing and installing engine cover, 1.8l injection engines
➔ [page 67](#) .

Removing and installing engine cover, 2.0l injection engines,
➔ [page 69](#)

Removing and installing engine cover, 2.3l injection engines
➔ [page 69](#) .

Removing and installing engine cover, 2.5l injection engines
➔ [page 70](#) .

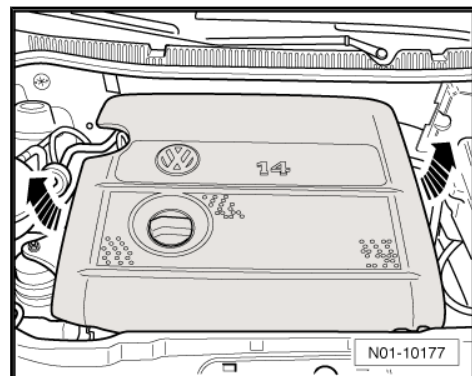
Removing and installing engine cover, 4-cylinder TDI diesel engines
➔ [page 70](#) .

Removing and installing engine cover, 4-cylinder TDI unit injector diesel engines
➔ [page 70](#) .

4.31.1 Removing and installing engine cover, 1.4l injection engines

Removing:

- Pull hose off oil separator or non-return valve off air filter housing upper part.

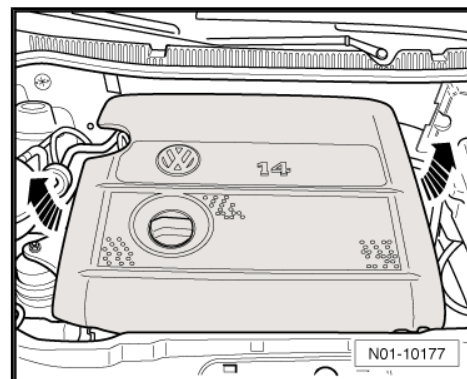




- Disengage engine cover -arrows-, pull cover off throttle valve module and take out upwards.

Installing:

- Fit engine cover on throttle valve control part at securing points and press on, so that it engages.
- Fit connector and hose connection below engine cover together.



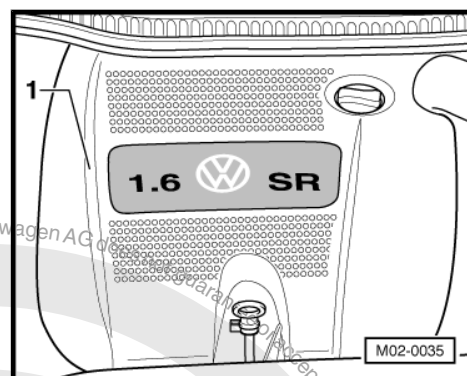
4.31.2 Removing and installing engine cover, 1.6l injection engines

Removing:

- Pull out oil dipstick.
- Unclip engine cover -1- at securing points and remove upwards.

Installing:

Install in reverse order.



4.31.3 Removing and installing engine cover, 1.8l injection engines

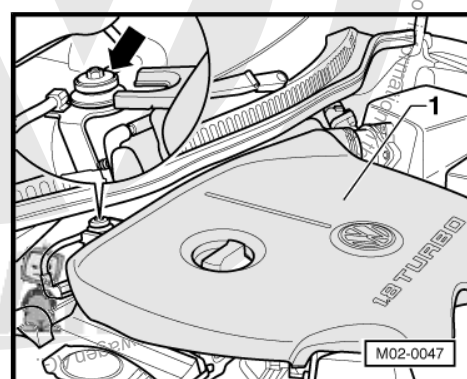


Note

- ◆ Two different fasteners exist for the engine cover.
- ◆ One version is bolted with two threaded studs.
- ◆ The other version is mounted on fulcrum pins.

Removing:

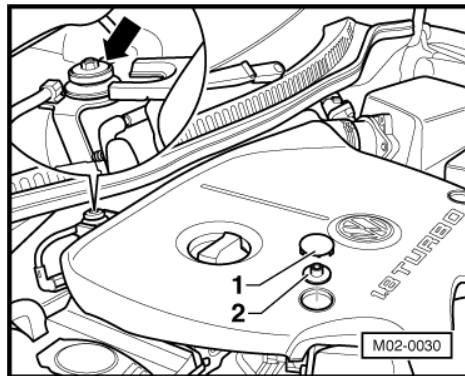
- Pull engine cover -1- upwards to disengage. Then pull forwards out of retainers -arrow-





Or

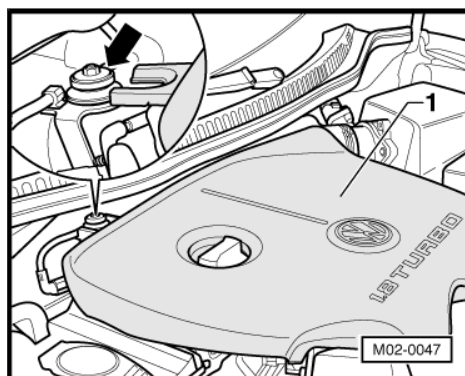
- Lever off cover caps -1- for securing nuts in engine cover and unscrew collared nuts -2-.



- Pull engine cover from bracket -arrow- and remove upwards.

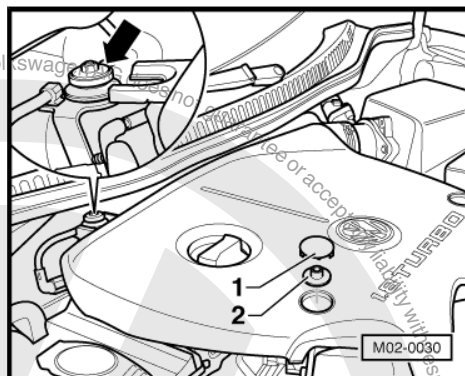
Installing:

- Slide engine cover into retainer -arrow- and fit engine cover -1- onto mountings and audibly engage in position.



Or

- Slide engine cover into bracket -arrow- and position onto front threaded studs.
- Tighten collared nut -2- to 7 Nm.
- Seal flange nut with cap.





4.31.4 Removing and installing engine cover, 2.0l injection engines

Removing:

- Lever out cover -arrows- and loosen nuts below.
- Remove nuts -1-.
- Pull out oil dipstick.
- Raise engine cover and pull off forwards.

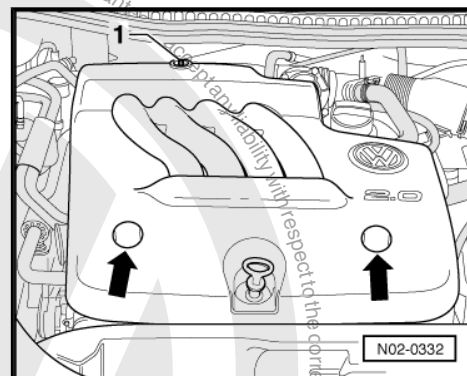
Installing:

- Tighten flange nut to 7 Nm.
- Seal flange nut with cap.



Note

The remaining assembly steps are basically a reverse of the dismantling procedure.



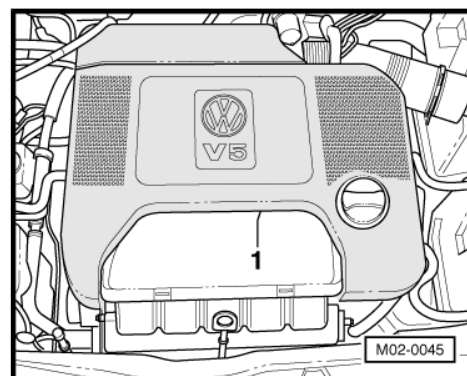
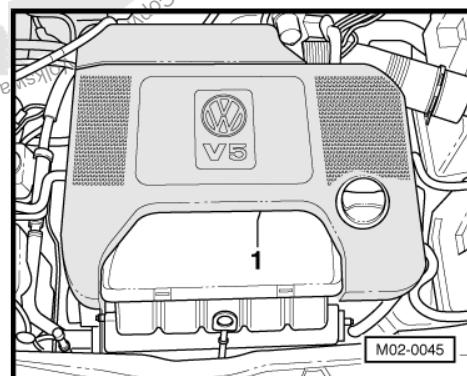
4.31.5 Removing and installing engine cover, 2.3l injection engines

Removing:

- Pull engine cover -1- off upwards and remove.

Installing:

- Fit engine cover -1- at securing points and press on, so that it engages.

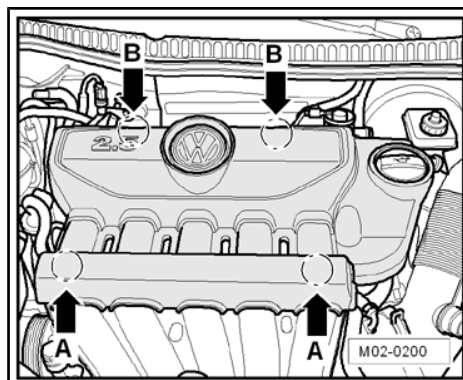




4.31.6 Removing and installing engine cover, 2.5l injection engines

Removing

- First pull engine cover carefully out of detents at securing points -arrows A-.
- Then disengage engine cover at securing points -arrows B- and carefully remove from fastenings.



Installing

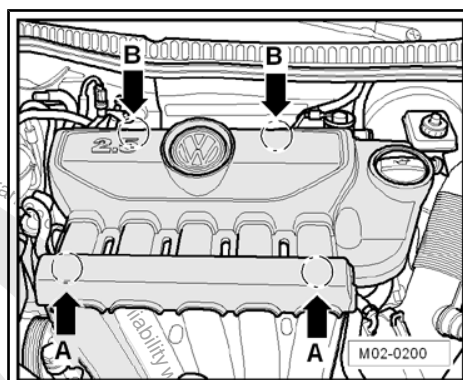
- First fit engine cover onto rear securing points -arrows B-, then onto front securing points -arrows A-.

Carefully press on securing points by hand until the engine cover noticeably engages.



Note

The remaining assembly steps are basically a reverse of the dismantling procedure.



4.31.7 Removing and installing engine cover, 4-cylinder TDI diesel engines

Removing:

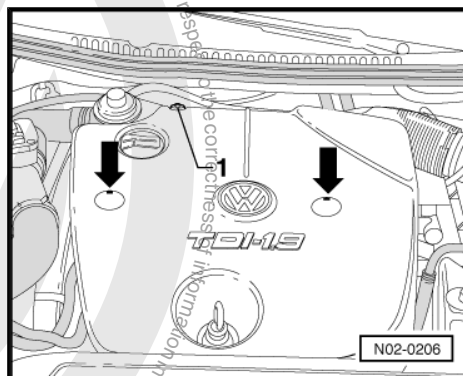
- Lever out cover -arrows- and loosen nuts below.
- Remove nuts -1-.
- Pull out oil dipstick.
- Raise engine cover and pull off forwards.

Installing:



Note

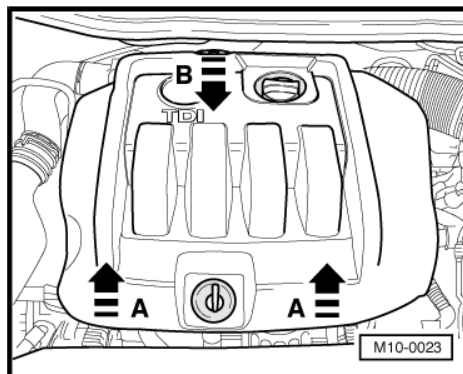
The remaining assembly steps are basically a reverse of the dismantling procedure.



4.31.8 Removing and installing engine cover, 4-cylinder TDI unit injector diesel engines

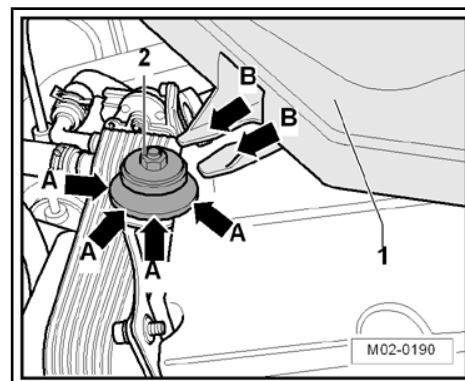
Removing:

- Disengage engine cover -A- and lift.
- Then pull off forwards.

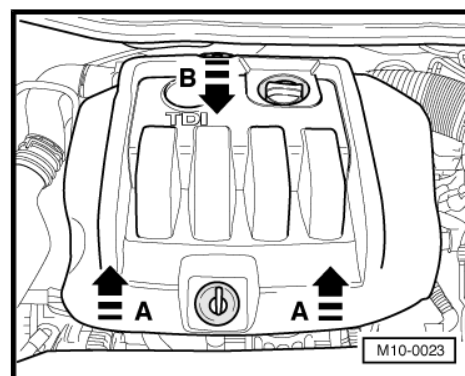




Installing:



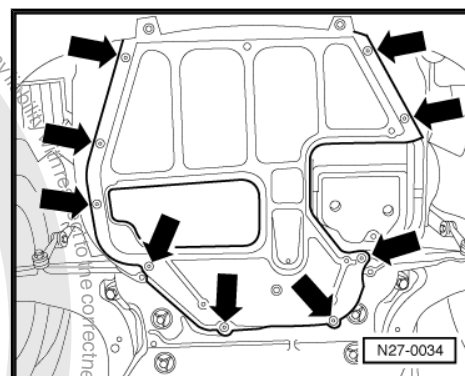
- First slide engine cover -1- in at securing point -2- -arrows B- and -arrows A-.
- Fit engine cover at securing points and press on, so that the cover engages.



4.32 Engine compartment cover (noise insulation) -bottom-: Removing and installing

Carry out the following procedure:

- Remove bolts -arrows- and take off engine compartment centre cover.



- Unclip securing clips -arrows- and remove bolt -1-.
- Take off left and right engine compartment covers.

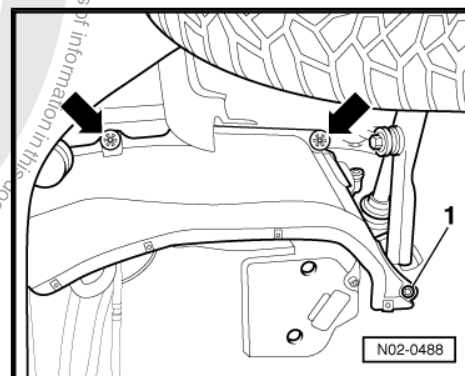


Note

Do not reuse securing clips, they must be renewed each time the engine compartment covers are removed.

Install in reverse order.

There are different types of engine covers, information on other covers can be obtained ➤ Rep. gr. 50 ; Body front; Noise insulation.





4.33 Engine oil level: Check

Please note the following:

- After shutting off engine, wait at least 3 minutes so that the oil can flow back into the sump.
- Pull out dipstick and clean with a clean cloth and then push dipstick in again onto stop.



Note

Observe disposal regulations!

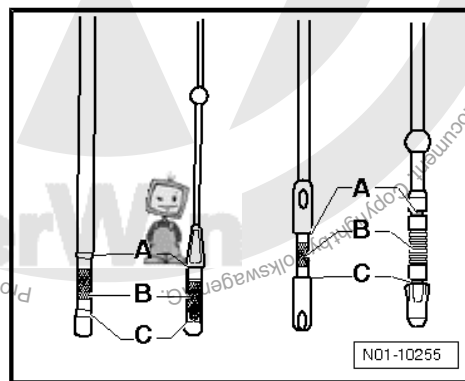
- Pull dipstick out again and read oil level.

For dipstick as illustrated:

- | | |
|-------|--|
| - A - | Oil must not be replenished. |
| - B - | Oil may be replenished. It may happen that the oil level afterwards is in the -A- region. |
| - C - | Oil must be replenished. It is sufficient if the oil level is in the -B- region (hatched area) afterwards. |

There is a danger of damaging the catalytic converter if the oil level is above the -A- marking.

- If oil level is below -C- marking, replenish oil to -A- marking.
Oil specification ➔ [page 31](#)



4.34 Engine oil: Drain or extract; renew oil filter and replenish engine oil

Engine oil: Drain or extract and replenish ➔ [page 72](#) .

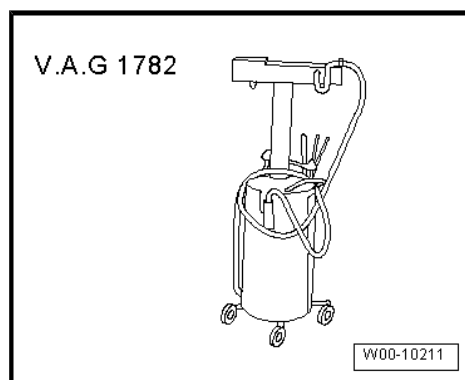
Renew oil filter ➔ [page 73](#) .

Replenish engine oil ➔ [page 82](#) .

4.34.1 Draining or extracting engine oil

Special tools and workshop equipment required

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



- ♦ Oil spill cloth -VAS 6204/1-
- ♦ ➔ Data sheets for exhaust emissions test

Draining or extracting engine oil

Carry out the following procedure:



Note

- ◆ *For engines with standing oil filter the oil filter must be renewed before changing the engine oil ➔ [page 73](#) . When removing the filter element a valve is opened, the oil in the filter housing automatically flows into crankcase.*
- ◆ *If the engine oil is drained and not extracted with an oil extractor, replace drain plug. This prevents leaks.*
- ◆ *Observe disposal regulations!*

- Extract engine oil using used oil collection and extraction unit -V.A.G 1782- .

Or

- Remove oil drain plug.
- Let engine oil drain.



Note

Observe disposal regulations!

- Screw in oil drain plug together with seal hand-tight and then tighten to specified torque.

Specified torques for oil drain plug:

The torques depend on engine codes and can be found in ➔ Engine mechanics; Rep. gr. 17 ; Removing and installing parts of lubrication system .



WARNING

- ◆ *Torque specifications must not be exceeded.*
- ◆ *Excessive torque can cause leaks in the area of the oil drain plug or even damage.*

Capacities and filter change: ➔ Maintenance tables or ➔ Power unit; Rep. gr. 17 ; Engine oil

- Replenish engine oil, specification ➔ [page 8](#) .

4.34.2 Renewing oil filter

Renewing oil filter, 1.4l injection engines ➔ [page 74](#) .

Renewing oil filter, 1.6l, 1.8l, 2.0l injection engines ➔ [page 74](#) .

Renewing oil filter, 2.3l injection engines ➔ [page 75](#) .

Renewing oil filter, SDI/TDI diesel engines ➔ [page 76](#) .

Renewing oil filter, 2.5l injection engines ➔ [page 77](#) .

Renewing oil filter. TDI unit injector diesel engines ➔ [page 81](#) .



4.34.3 Renewing oil filter, 1.4 l injection engine

Removing



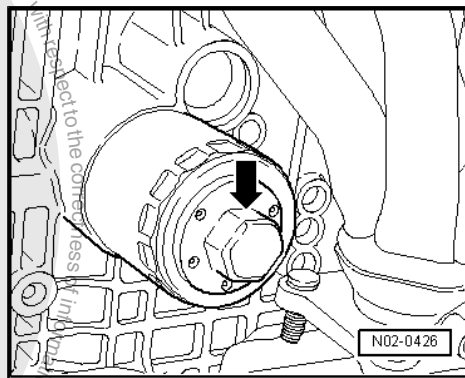
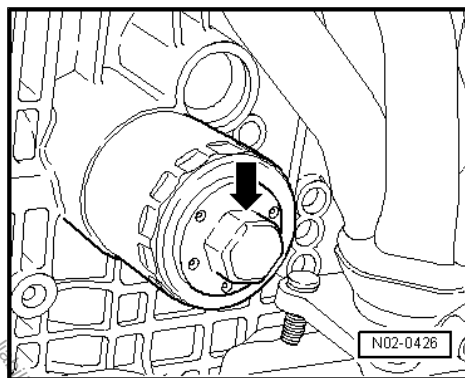
Note

- ♦ *Two different air conditioner compressors have been fitted. Short AC compressor design and long AC compressor design.*
- ♦ *In vehicles with the long AC compressor, the AC compressor must be released to change the oil filter.*
- ♦ *⇒ Heater, air conditioner; Rep. gr. 87 ; Air conditioner with manual regulation*



Caution

- ♦ *Observe disposal regulations!*
 - ♦ *Oil new O-rings before installing.*
 - ♦ *Prevent engine oil from dripping onto components in engine compartment.*
- Loosen oil filter -arrow- e.g. using combination spanner, AF 30 -VAS 5399- or ring spanner, 30x32mm -VAS 5410- and remove oil filter.
 - Clean engine sealing surface.



Installing

- Oil rubber seal lightly on new filter.
 - Screw in filter and tighten hand-tight.
- The remaining assembly steps are basically a reverse of the dismantling procedure.

4.34.4 Renewing oil filter, 1.6l, 1.8l, 2.0l injection engines

Special tools and workshop equipment required



◆ Oil filter tool -VAS 3417-

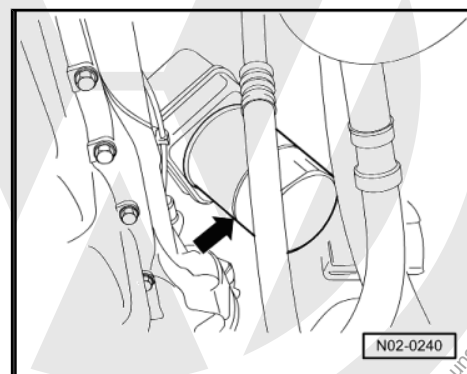
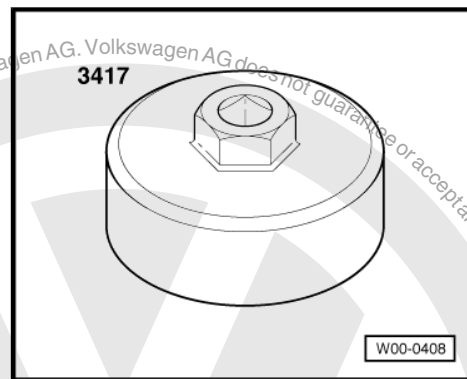
- Loosen oil filter -arrow- from below using a strap or oil filter tool -VAS 3417-



Note

Observe disposal regulations!

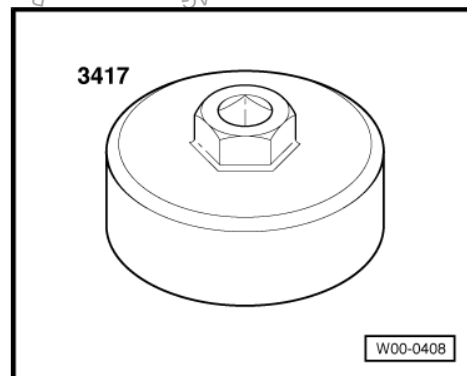
- Clean oil cooler sealing surface.
- Oil rubber seal lightly on new filter. This ensures best possible sealing when the filter is tightened.
- Tighten filter by hand.



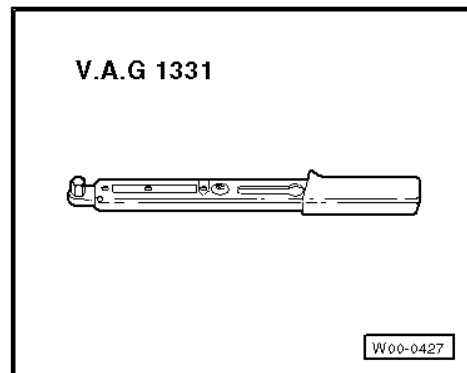
4.34.5 Renewing oil filter, 2.3l petrol engines:

Special tools and workshop equipment required

◆ Oil filter tool -3417-



◆ Torque wrench -V.A.G 1331-





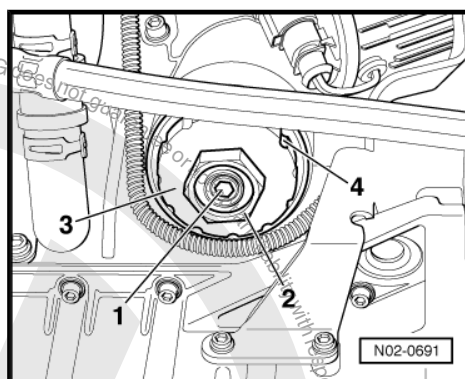
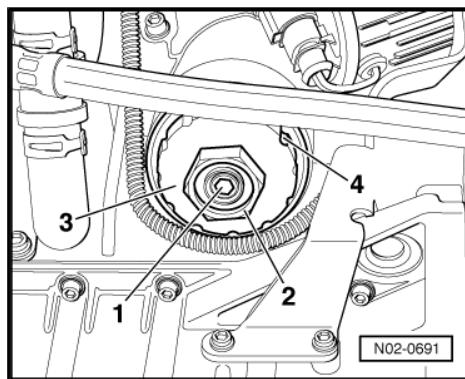
- Drain oil via plug -1-.



Note

Observe disposal regulations!

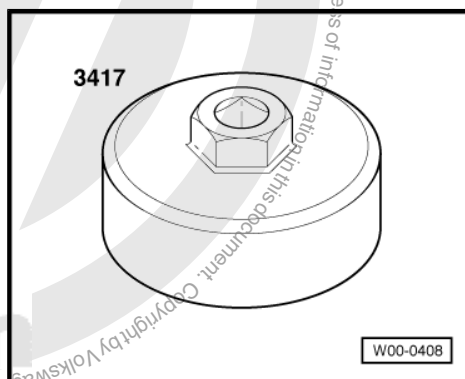
- Loosen filter lower part -3- on hexagon -2- or on circumference -4- and remove.
- Take out used filter element.
- Clean filter housing.
- Use new O-ring and moisten with oil.
- Install new filter element and new O-ring.
- Tighten filter lower part -3- on hexagon -2- to 30 Nm.
- Install drain plug -1- fitted with new seal and tighten to 10 Nm.



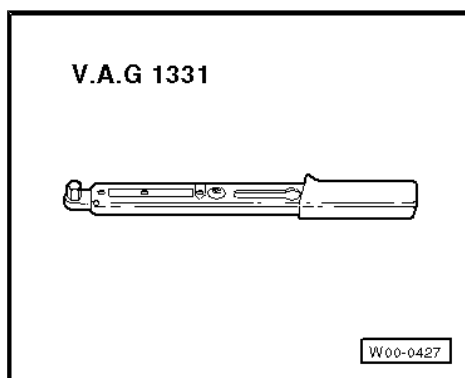
4.34.6 Renewing oil filter, SDI/TDI diesel engines:

Special tools and workshop equipment required

- ◆ Oil filter tool -3417-



- ◆ Torque wrench -V.A.G 1331-





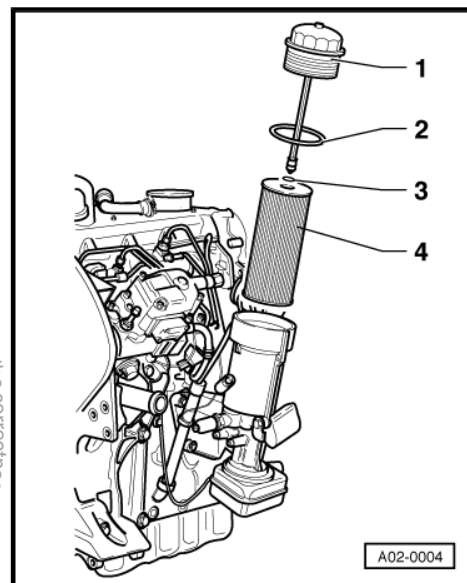
- Release sealing cap -1- with oil filter key -3417- .
- Renew O rings -2- and -3- as well as oil filter element -4-.



Note

Observe disposal regulations!

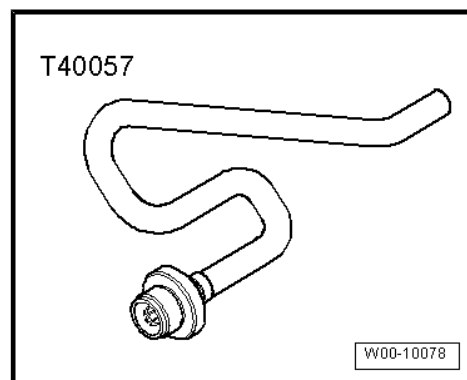
- Tighten sealing cap -1- with oil filter key -3417- .
- Cover cap torque setting: 25 Nm



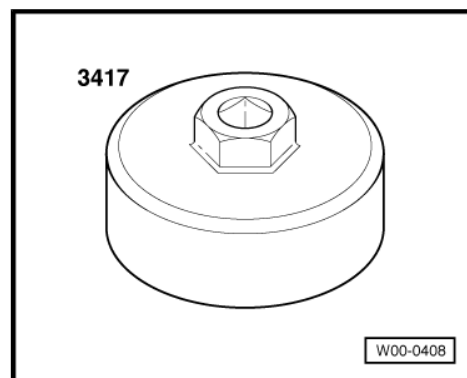
4.34.7 Renewing oil filter, 2.5l injection engines

Special tools and workshop equipment required

- ◆ Oil drain adapter -T40057-



- ◆ Oil filter tool -VAS 3417-



- ◆ Torque wrench -V.A.G 1331/-
- ◆ Pointed pliers

Drain oil filter housing



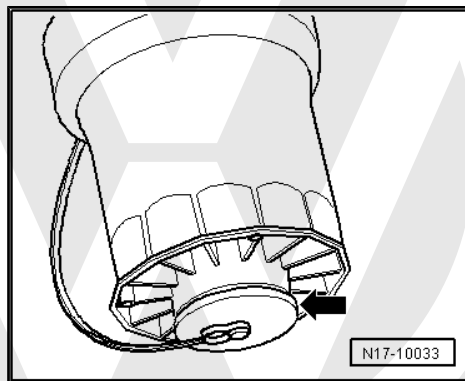
Caution

- ◆ *Before removing the oil filter housing, it must be drained.*

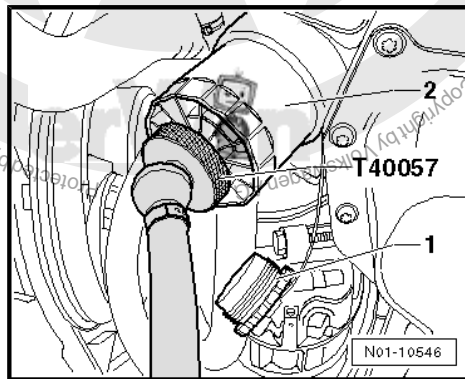


Note

- ◆ When the oil drain adapter -T40057- is screwed in, a valve is opened in oil filter housing.
- ◆ When the oil drain adapter -T40057- is removed again, the valve closes automatically.
- Remove dust cap -arrow- from oil filter housing.



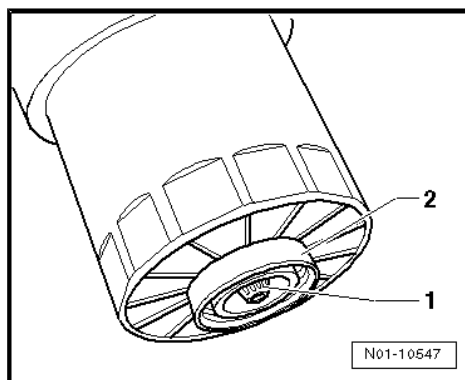
- Insert oil drain adapter -T40057- into oil filter housing and hold hose in oil drip tray.
- Drain engine oil.
- Unscrew oil drain adapter -T40057- again.



The drain valve -1- should be flush with oil filter housing lower part -2-.

Removing oil filter element

- Loosen oil filter housing using oil filter tool -VAS 3417- .
- Then unscrew by hand and remove together with oil filter element.





- Remove oil filter element -2- from centre pipe of oil filter housing -4-.

Removing seal

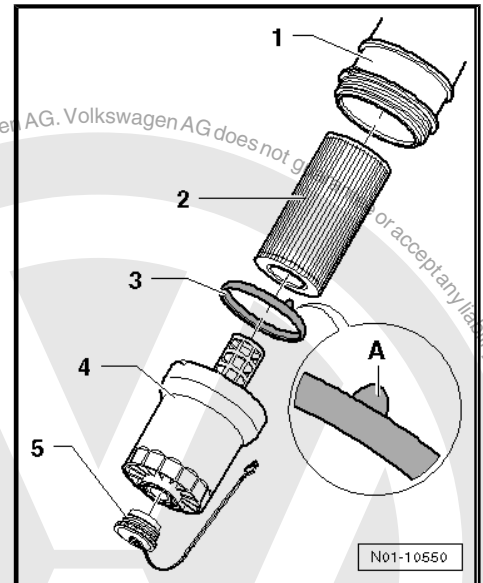


Caution

The seal of oil filter housing -3- must be renewed every time the oil filter element -2- is changed or the oil filter housing is loosened.

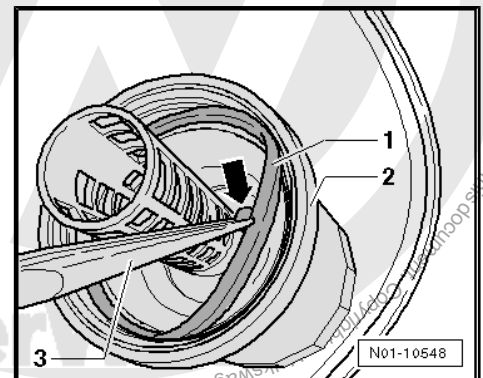
The seal is fitted with a so-called „service tag“ -A-.

- ◆ *Using a suitable tool the seal can be pulled out of sealing groove at the „service tag“ -A-.*

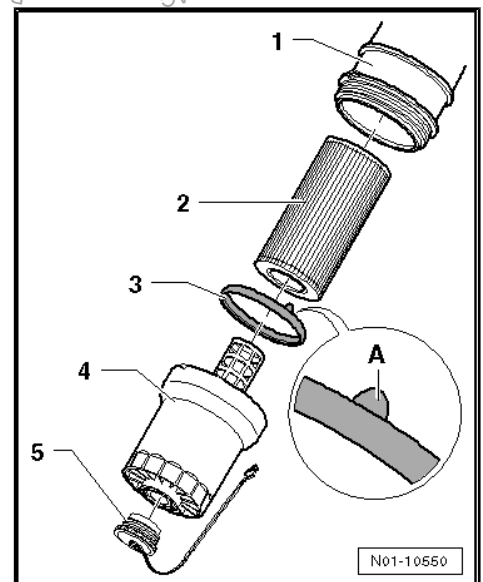


- Remove seal -1- from sealing groove of oil filter housing -2- by pulling seal out at the „service tag“ -arrow-, using pointed pliers -3-.

Installing seal

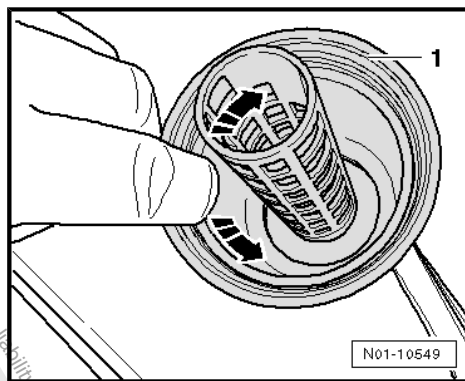


- Oil seal -3-.
- Place seal into sealing groove of oil filter housing, so that the service tag -A- faces upwards.





- Push seal into sealing groove and check by touching with finger, if the seal in sealing groove contacts evenly -arrows-.

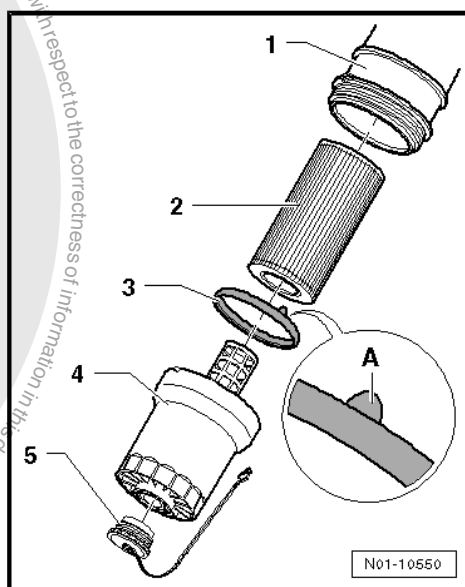


Installing oil filter element

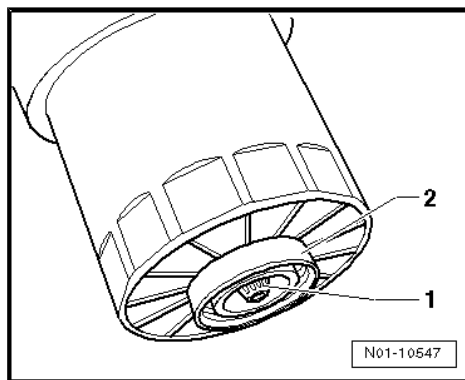
- Press new oil filter element -2- on centre pipe of oil filter housing -4- until limit stop.

Installing oil filter housing

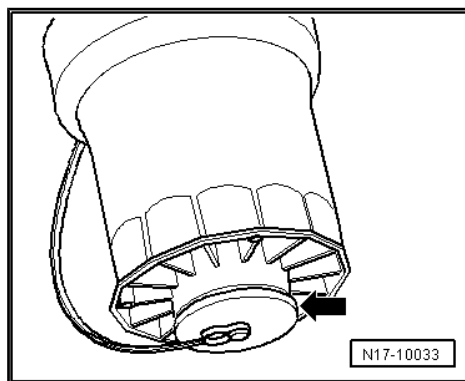
Screw oil filter housing -4- with new seal -3- and new oil filter element -2- nearly onto stop of oil filter bracket -1- by hand.



- Tighten oil filter housing -2- to 25 Nm.



- Insert dust cap -arrow- into oil filter housing hand-tight.





4.34.8 Renewing oil filter, TDI unit injector diesel engines

Removing



Note

- ◆ *Observe disposal regulations!*
- ◆ *Oil new O-rings before installing.*

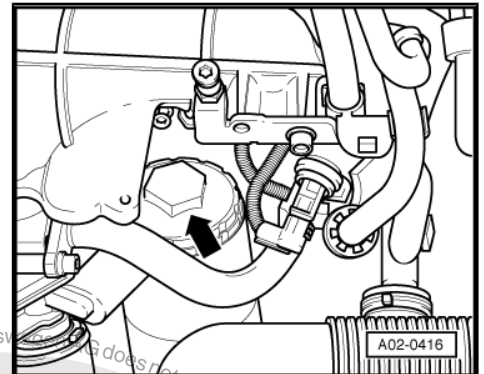
Loosen cap -arrow- e.g. using combination spanner, AF 36 or socket AF 36 -T10125- .



Note

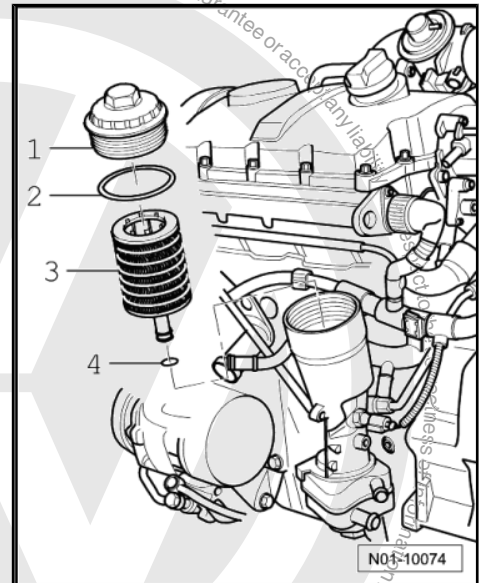
Before draining or extracting release sealing cap, so that the engine oil can flow out of filter housing.

- Clean sealing surfaces on threaded cap and oil filter housing.



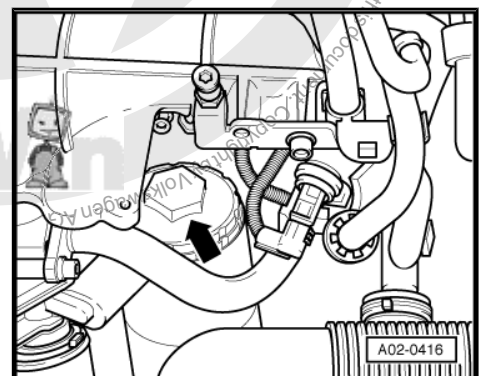
Installing

- Renew filter element -3-.
- Renew O-rings -2 and 4-.



- Install threaded cap -arrow- and tighten to 25 Nm.

The remaining assembly steps are basically a reverse of the dismantling procedure.





4.34.9 Replenishing engine oil

Oil specifications, see ➤ [page 31](#)

General notes



Note

Observe disposal regulations!

- After replenishing with oil, wait at least 3 minutes and then check oil level.
- Pull out dipstick, wipe with a clean cloth and push dipstick in again to limit stop.
- Pull dipstick out again and read oil level.

For dipstick as illustrated:

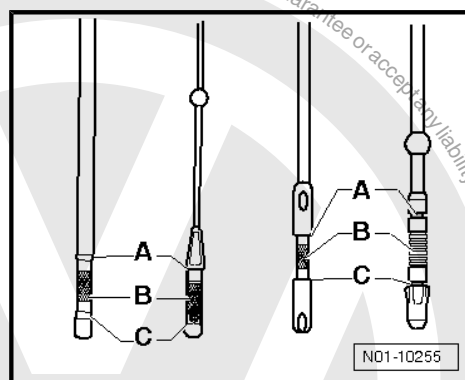
A - Oil must not be replenished.

B - Oil may be replenished. It may happen that the oil level afterwards is in the -A- region.

C - Oil must be replenished. It is sufficient if the oil level is in the -B- region (hatched area) afterwards.

There is a danger of damaging the catalytic converter if the oil level is above the -A- marking.

- If oil level is below -C- marking, replenish oil to -A- marking.
Oil specification ➤ [page 31](#)



4.35 Engine and components in engine compartment (from above and below): Perform visual check for leaks and damage

Perform visual check as follows:

- Check engine and components in engine compartment for leaks and damage.
- Check lines, hoses and connections of
 - ♦ Fuel system
 - ♦ Cooling and heating system
 - ♦ And brake system

For leaks, abrasions, porosity and brittleness.



Note

- ♦ *Arrange for defects to be rectified as repair measures.*
- ♦ *If fluid loss is greater than can be expected through normal use, determine source and rectify (repair measure).*

4.36 Performing road test

Which of the following can be checked depends on vehicle equipment and local conditions (urban/country).

Check the following during a road test:

- Engine: Output, misfiring, idling speed, acceleration.



- Clutch: Pulling away, pedal pressure, odours.
- Gear selection: Ease of operation, stick position.
- Automatic gearbox: Selector lever position, shift lock/ignition key removal lock, shift behaviour, dash panel insert display.
- Foot brake and handbrake: Function, free travel and effectiveness, pulling to one side, juddering, squeal.
- ABS function: Pulsing must be felt at the brake pedal during ABS-regulated braking.
- Steering: Function, steering free clearance, steering wheel centred when vehicle is travelling straight ahead
- Tilting roof: Function
- Radio: Reception, GALA, interference
- Multi-function indicator (MFI): Functions
- Air conditioning system: Function
- Vehicle: Pulling to one side when travelling straight-ahead (level road)
- Imbalance: Wheels, drive shafts, propshaft
- Wheel bearings: Noises
- Engine: Hot starting behaviour

4.37 Wheel securing bolts: Tighten to specified torque

Removing and installing wheel bolt caps



Note

Depending on vehicle equipment, the wheel bolts could be covered by the following components:

- ◆ Wheel bolt caps
- ◆ Hub cap
- ◆ Full wheel trim
- Remove the respective wheel bolt cover, if fitted.



Note

The puller hook to remove the cover caps or the wheel hub trim is located in the vehicle tool kit.



Example, removing hub cap

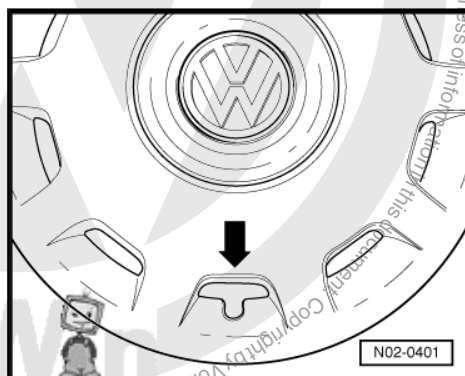
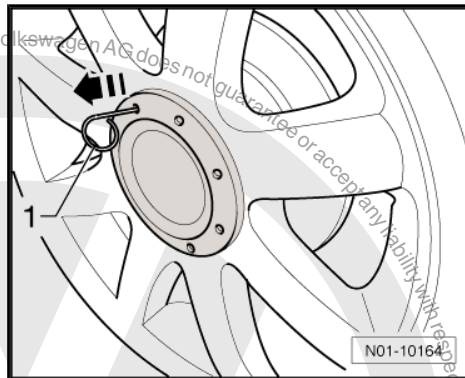
- Hook puller hook into one drilling of wheel hub trim and pull off in -direction of arrow-.

Fitting instructions



Note

- ♦ The cover caps protect the wheel bolts and should be reconnected after the wheel securing bolts have been retightened.
 - ♦ Ensure that on some rims the lug of the wheel hub trim locates in the groove of the rim.
 - ♦ After completing work, place adapter and puller hooks with vehicle tool kit.
- On vehicles with full wheel trim install full wheel trim so that the tyre filler valve is guided through the cut-out provided -arrow-.

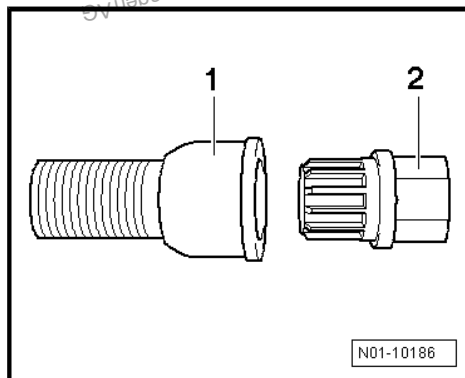


Loosening or tightening anti-theft wheel bolts



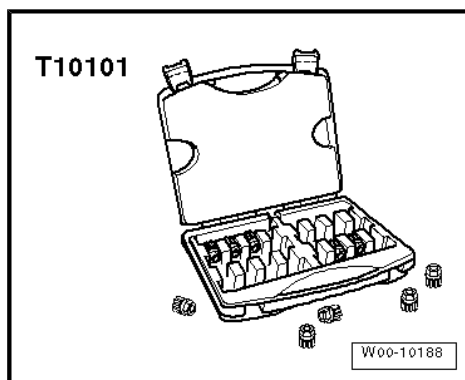
Note

- ♦ The adapter to loosen and tighten the anti-theft wheel bolts can be found in the vehicle tool kit.
- ♦ If the adapter to loosen or tighten the anti-theft wheel bolts is not available in the vehicle, use the adapter set for tamper-proof wheel bolts -T10101-.
- ♦ If the adapter is not available, a new replacement adapter can only be obtained via the code number.



Special tools and workshop equipment required

- ♦ Adapter set for tamper-proof wheel bolts -T10101-



- Slide adapter into anti-theft wheel bolt onto stop.

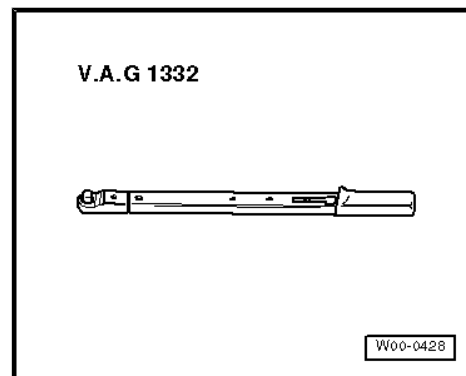


- Slide the wheel bolt wrench onto adapter onto stop.
- Retighten the wheel securing bolts to correct torque setting.

Retightening wheel securing bolts

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-



Note

Ensure that wheel bolts are tightened diagonally and alternately.

Specified torque: 120 Nm

4.38 Reading radio code with fault reader

Authorization prerequisites for fault reader


- The fault reader is connected via the Central Partner Network (CPN) with the central database (Carport, Fazit).
- Available access for the user of the system „GeKo“ (secrecy and component protection)



Note

- ◆ *The radio codes are also called security codes, they can be read in the central database and can be displayed on display of fault reader.*
- ◆ *For radio activation the codes must be entered via radio buttons, as previously ➔ [page 86](#).*

Procedure

- Connect fault reader ➔ [page 28](#).
- Switch on ignition.
- Touch the field or button on the screen for »GUIDED FUNCTIONS«.
- Confirm with  button.
- Select one after the other:
 - ◆ Brand
 - ◆ Type
 - ◆ Model year
 - ◆ Engine code
- Confirm vehicle identification.



- Select one after the other:
 - ◆ „Radio system“.
 - ◆ „Reading radio code“
- Read code according to the information of „GUIDED FUNCTIONS“.
- Finish code reading as follows:
 - Press »GoTo« button on display -arrow-.
 - Press the »End« button on display.
 - Press »End« button in End menu.
- Switch off ignition and separate diagnosis connections.

4.39 Radio: Activate anti-theft coding

- ◆ General information ➔ [page 86](#)
- ◆ Activate anti-theft coding on Volkswagen radio systems
➔ [page 86](#)

4.39.1 General information

The anti-theft coding electronically prevents unauthorized persons from operating the unit after it has been removed from vehicle.

The anti-theft codes are also called radio codes or security codes.

Security code means that each unit with an anti-theft coding is programmed with its own code number.

This security code is not active when leaving the factory.

The security code is found on the unit card, if fitted.

Or, the security code can be read with a fault reader of a central database, if the unit card is not fitted ➔ [page 85](#).



Note

- ◆ If **SAFE** appears on display when the unit is switched on, the unit is locked!
- ◆ The unit must remain switched on for one hour, the lock will then be released. The code can now be entered again.
- ◆ If the incorrect security code has been entered twice, the unit is locked for an hour.
- ◆ Note: Always two attempts to enter the code, then the unit will be locked for one hour.
- ◆ The units are fitted with an electronic convenience anti-theft system, which is activated in conjunction with the dash panel insert.
- ◆ After disconnecting the voltage supply of the radio or navigation system, it is operational when reconnecting to voltage supply, without entering the security code again.
- ◆ Prerequisite: the electronic anti-theft system has been initially activated, and the unit is reconnected in same vehicle.

4.39.2 Activating anti-theft coding on Volkswagen radio systems

Activate fixed code as follows:



- Switch radio unit on.
- „SAFE“ appears on digital display.
- „1000“ appears on the digital display after 3 seconds.



Note

If „SAFE“ along with a small „2“ on the left-hand side of the display appears the radio is blocked. The radio must remain switched off for 1 hour to be released (unblocked).

Display and controls:

A - Search rocker

B - Station buttons

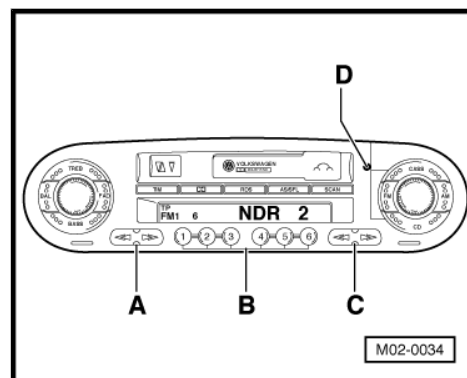
C - Manual control rocker

D - Light emitting diode

- Enter code number (located on radio card) using station buttons -B-. Key 1 is used to enter the first position of the code number, key 2 is used for the second position and so on.
- Then press the search rocker -A- or manual control rocker -C- for longer than 2 seconds. Release button.

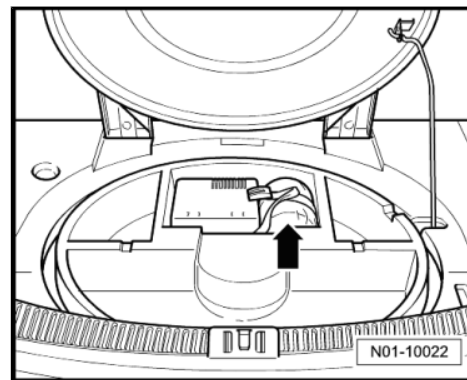
If the correct code has been entered, the actual radio frequency will appear after a short „learning phase“. During this pause the stations with the best reception will be automatically stored to an internal memory list and can be called up.

The light emitting diode (LED) -D- must flash once the ignition is switched off and the ignition key has been withdrawn from the lock. If the diode flashes the radio is ready-for-use and the anti-theft coding is activated.



4.40 Tyre repair set: Check

The tyre repair set is located in the spare wheel well -arrow-





The tyre repair set consists of the compressor and a tyre filler bottle with sealant.



Note

- ◆ The tyre sealant in the bottle has a limited expiry date.
- ◆ Therefore the expiry date is indicated on the bottle -arrow-.

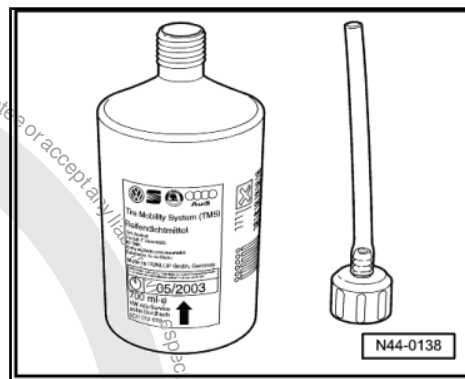
This example shows that the expiry date 05/2003 has been exceeded, then the bottle has to be renewed.

- Check the expiry date.
- Renew tyre sealant if the expiry date has been reached.



Caution

- ◆ The tyre sealant must not be more than 4 years old.
- ◆ When the bottle has been opened e.g. at a "flat tyre", it has also to be renewed.



Note

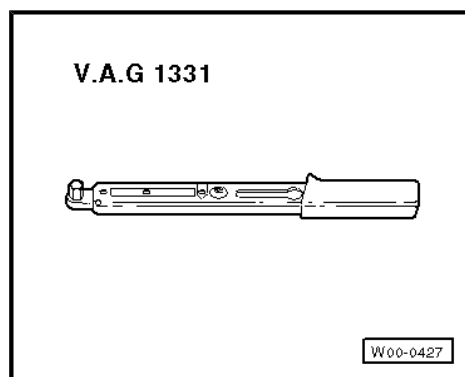
- ◆ Residual tyre sealant or bottles which are filled and the expiry date has been exceeded, must be disposed of.
- ◆ Old tyre sealant or residual sealant must not be mixed and disposed of with other fluids.

Disposing of tyre sealant ⇒ Handbook Service Organisation; Environment protection and disposal practice; Chapter 3 Fundamentals; Chapter. 6.5

4.41 Manual gearbox/final drive: Check oil level

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



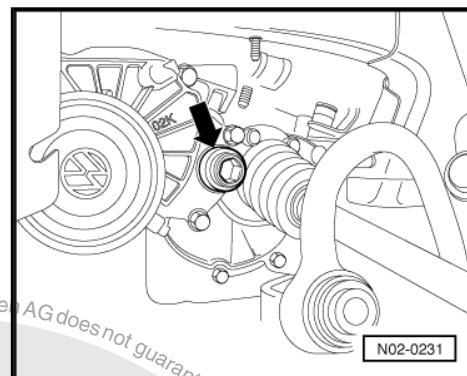
Carry out the following procedure:

4.41.1 5-speed manual gearbox 02K

- Turn steering wheel left onto stop.

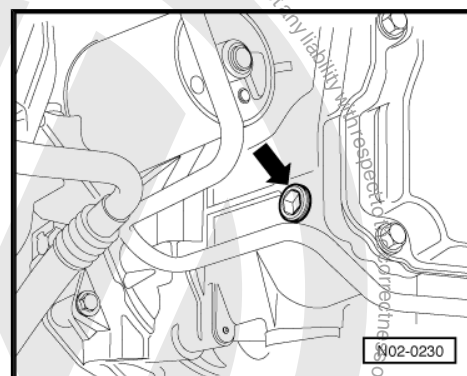


- Remove oil filler plug -arrow- (for example with a 17 mm hexagon socket insert, universal joint, extension and socket wrench).
- Checking oil level: The oil level must be to lower edge of filler plug drilling.
- If necessary top up gearbox oil „Specification G 50 SAE 75W90 (synthetic oil)“ to lower edge of filler plug drilling.
- Fit oil filler plug and tighten to 25 Nm.

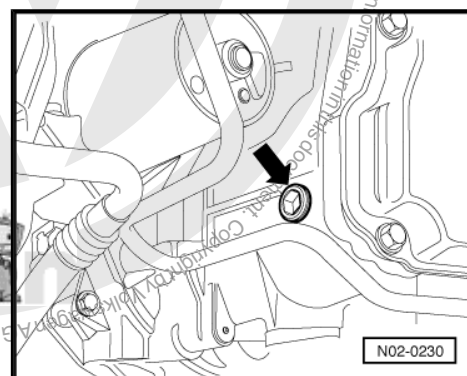


4.41.2 5-speed manual gearbox 02J

- Remove oil filler plug -arrow-.
- Checking oil level: The oil level must be to lower edge of filler plug drilling.
- If necessary top up gearbox oil „Specification G 50 SAE 75W90 (synthetic oil)“ to lower edge of filler plug drilling.



- Fit oil filler plug -arrow- and tighten to 25 Nm.



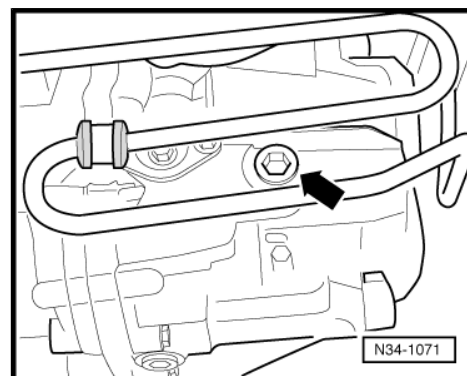
4.41.3 5 and 6-speed manual gearbox 02M

- Remove oil filler plug -arrow-.
- Checking oil level: The oil level must be to lower edge of filler plug drilling.
- If necessary top up gearbox oil level „Specification G 50 SAE 75W90 (synthetic oil)“ or G51 SAE 75W90 (synthetic oil) “to lower edge of filler plug drilling.



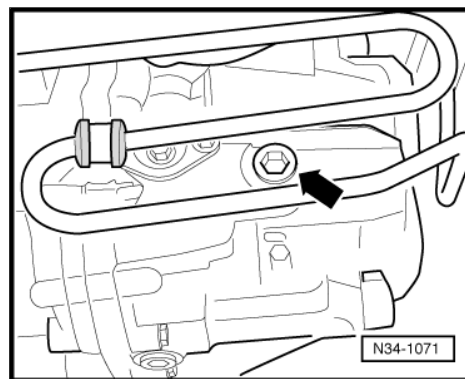
Note

The oil specification depends on gearbox code. ➔ 5- and 6-speed manual gearbox 02M; Rep. gr. 00; Gearbox identification »Gearbox identification«





- Fit oil filler plug -arrow- and tighten to 25 Nm.



4.42 Window wash/wipe system and headlight washer system: Check function

Checking anti-freeze concentration of windscreen wash/wipe system, replenishing with fluid if necessary ➔ [page 90](#) .

Windscreen washer system: Checking jet setting, adjusting jets if necessary ➔ [page 91](#) .

Headlight washer system: Checking jet setting, adjusting jets if necessary ➔ [page 93](#) .



Note

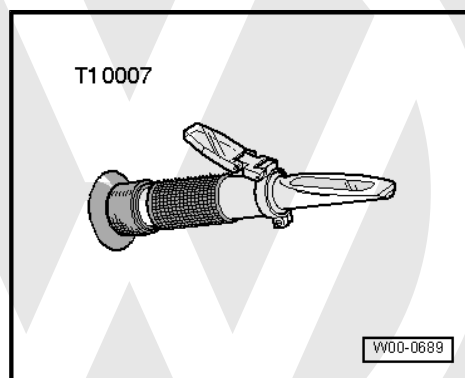
When during a functional test it is determined that the wiper blades »judder« or make noises, check wiper blade setting angle ➔ [page 93](#) .

4.42.1 Checking windscreen wash/wipe system anti-freeze concentration and replenishing fluid if necessary

Checking anti-freeze concentration:

Special tools and workshop equipment required

- ◆ Refractometer -T10007-



Read precise value for the following tests at bright/dark boundary. Using a pipette, place a drop of water on the glass to improve the readability of the bright/dark boundary. The bright/dark boundary can be clearly recognised on the „WATERLINE“.

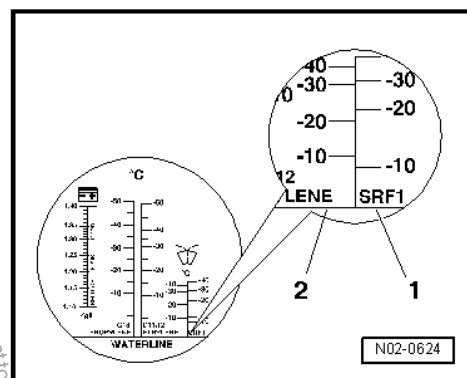
- Check concentration of anti-freeze additive using refractometer -T10007- (refer to operating instructions).



The scale -1- of the refractometer -T10007- is calibrated for Genuine Volkswagen Windscreen Clear -G052164-

The scale -2- is designed for commercially available windscreen cleanser as well as a mixture of commercially available windscreen cleanser and -G052164-.

Mixture ratio:



Frost protection to	Windscreen washer concentrate G 052 164	Water
In summer	1 part	4 parts
-16 °C	1 part	2 parts
-35 °C	1 part	1 part
-40 °C	2 parts	1 part

Replenishing fluid:

The fluid reservoir of the window washer system must be filled completely.

Starting immediately, use only „Genuine Volkswagen Windscreen Clear“ all-year-round when replenishing window wash/wipe system.



Note

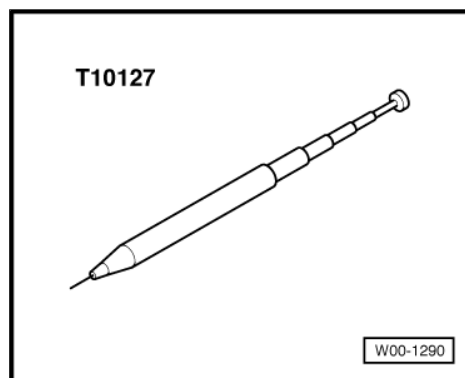
- ◆ All models have fan-type spray jets and the reservoir must be filled with „Genuine Volkswagen windscreen cleanser“ as this fluid has a low viscosity at minus temperatures. Otherwise the complicated spray jet system can become blocked by the crystallised washer fluid, which affects the spray pattern of the spray jet. „Genuine Volkswagen window cleaner“ ensures that the fan -type washer jets remain fully functional at low temperatures.
- ◆ Genuine Volkswagen Windscreen Clear -G 052 164- protects the spray jets, fluid reservoir and hoses from freezing.
- ◆ Use Genuine Volkswagen Windscreen Clear in the warmer periods of the year also. The powerful cleanser removes wax and oil residue from the glass.
- ◆ Frost protection must be guaranteed to approx. -15 °C (approx. -35 °C in countries with an arctic climate) in the washer system.

4.42.2 Window washer system: Check jet setting, adjust jets if necessary

Special tools and workshop equipment required



- ♦ Adjusting tool -T10127- equipped with needle 3125/5 A



Windscreen



Note

The spray jets must not be cleaned opposite to direction of spray, e.g. blown through from front.

The washer jets are preset. However, small height differences can be compensated for.

If both spray fields are not at same height -A- and -B-, adjust spray direction upwards as follows:



Note

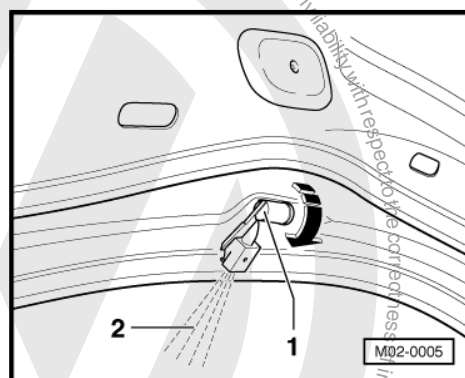
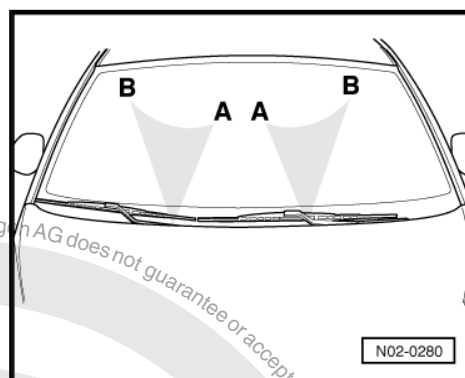
Two different types of washer jets have been installed.

Spray jet type 1:

- Turn eccentric -1- on spray jet in direction of arrow with a screwdriver. The height adjustment of the spray jet -2- will thereby be changed.

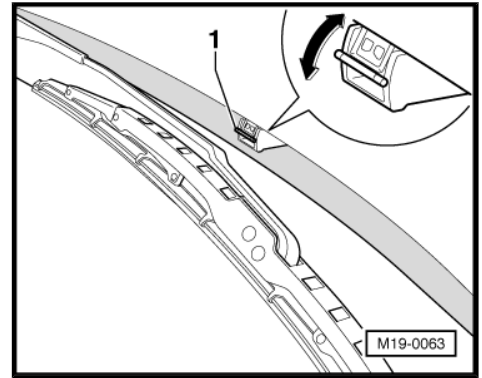
Or

Spray jet type 2:





- Adjust spray jet at adjuster -1- by hand upwards or downwards.



4.42.3 Headlight washer system: Check jet setting, adjust jets if necessary

The spray field should be aligned to the centre of the headlight glass lens.



Note

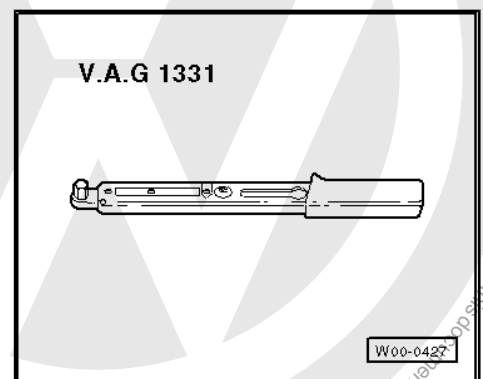
- ◆ The spray jets are preset and are not adjustable.
- ◆ If the spray jet is uneven or is not spraying the centre of the headlight glass lens, the spray jet must be renewed (repair measure).

4.43 Windscreen wiper blades: Checking park position, if wiper blades »judder«: Checking setting angle

4.43.1 Wiper blades: Checking park position and adjusting if necessary

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



Windscreen of LHD vehicles:



Note

For RHD vehicles the wiper blades are aligned as a mirror image.

- Check park position.

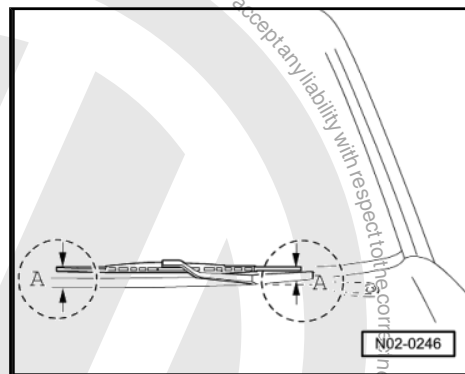


Driver side:

The distance -A- between wiper blade and lower edge of wind-screen must be 20 mm.

- Adjust park position by moving wiper arm if necessary.

Wiper arm tightening torque: 20 Nm

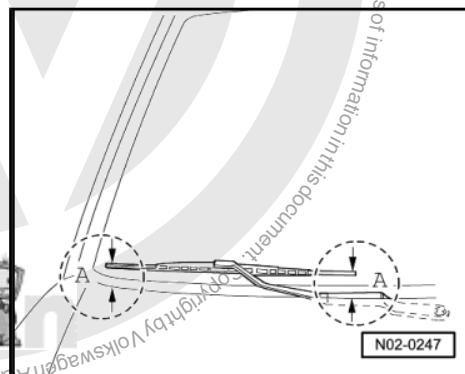


Front passenger side:

The distance -A- between wiper blade and lower edge of wind-screen must be 20 mm.

- Adjust park position by moving wiper arm if necessary.

Wiper arm tightening torque: 20 Nm



4.43.2 Wiper blades: Check setting angle, adjust if necessary

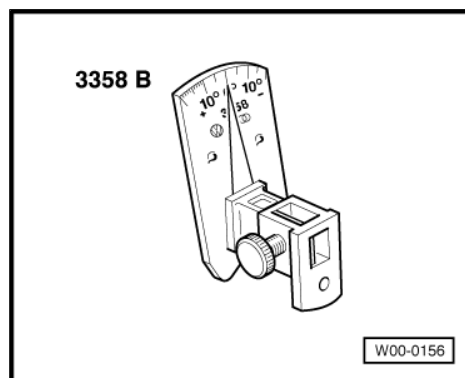


Note

Check setting angle only if wiper blades »judder« or make noises.

Special tools and workshop equipment required

- ♦ Wiper arm setting device -3358 B-



Carry out the following procedure:

- Bring wiper arms to park position.
- Remove wiper blade.

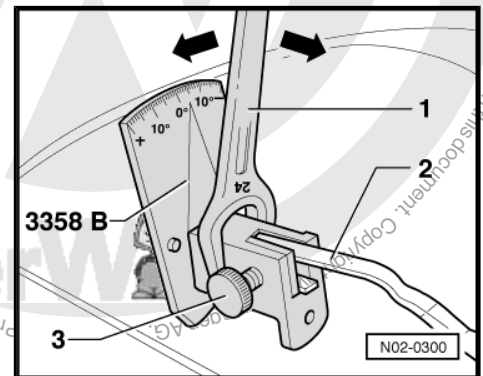
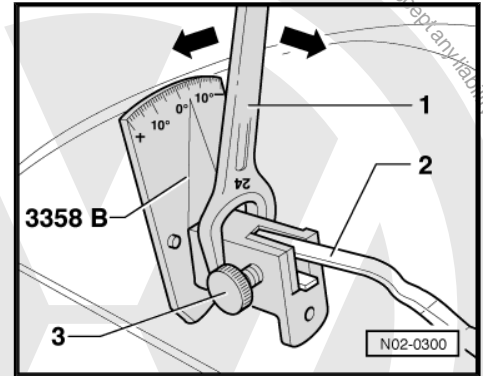


- Insert wiper arm -2- into wiper arm setting device -3358 B- and secure with locking screw -3-.
- Check setting angle.

Setting angle (specification) for		
	LHD vehicles	RHD vehicles
Driver side	- 3,0°	+ 3,0°
Front passenger side	- 3,0°	+ 3,0°
Tolerance	± 2°	± 2°

Adjust setting angle to specification, if required, as follows:

- Fit 24 mm AF open jaw spanner -1- on setting device and adjust wiper arm -2- to specification -arrows-.
- Release wiper arm -2- from setting device and then resecure with locking screw -3-.
- Check setting value according to table. Repeat adjustment and check sequence until specifications are achieved.
- Remove setting device and fit wiper blade.
- Check if window wiper system operates without juddering.



4.44 Wiper blade protection: Remove



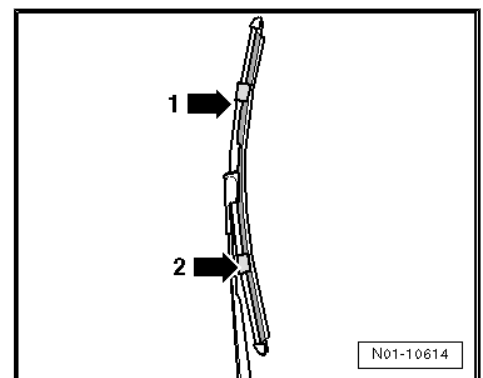
Note

There are 3 different versions of wiper blade protection:

1. Blade protector with 2 securing clips

- ◆ Identification, blade protector with two securing clips -arrows 1 + 2-.

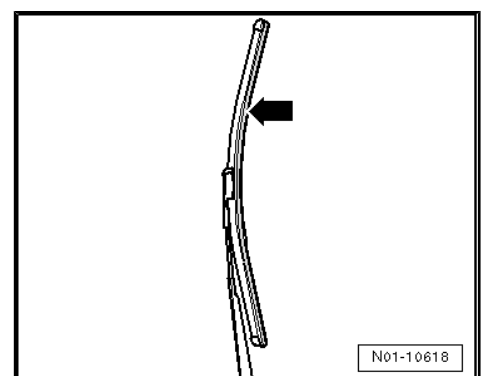
⇒ „4.44.1 Removing wiper blade protection, version 1“, page 96



2. Blade protector to slide on

- ◆ Identification, the blade protector -arrow- is slid on the wiper blade.

⇒ „4.44.2 Removing wiper blade protection, version 2“, page 97

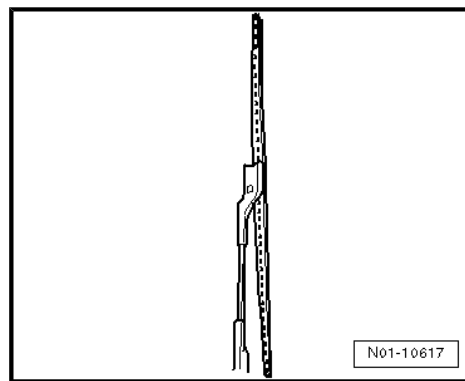




3. Transport wiper blade

- ◆ Identification, the transport wiper blade is fitted without wind deflector, it must be replaced by the standard wiper blade.

⇒ „4.44.3 Changing wiper blade protection, version 3 -transport wiper blade-“, page 97



4.44.1 Removing wiper blade protection, version 1

- Switch ignition on and off briefly with bonnet closed.
- When engine is switched off move wiper lever down to touch-wipe function within 10 seconds.

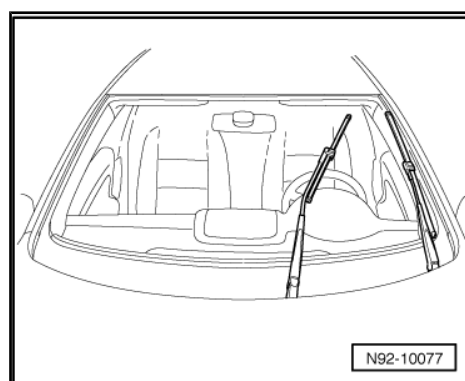
The wipers move in service position.

- Lift the wiper arm away from windscreen.

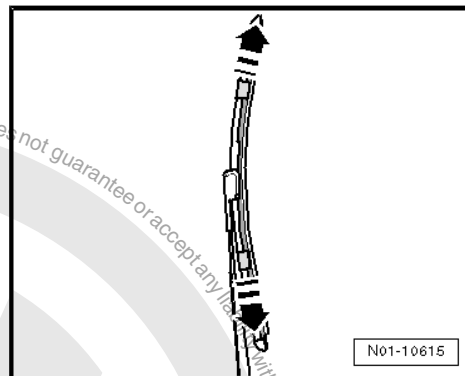


Caution

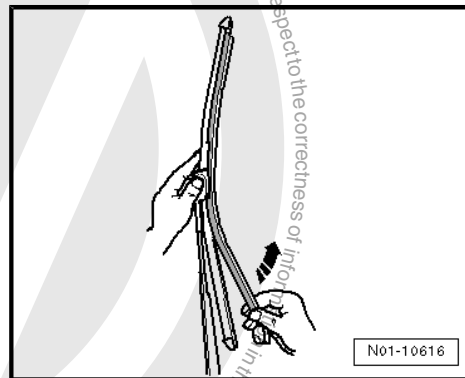
When doing this, do not touch the wiper blade to prevent damage.



- Remove upper securing clip upwards and lower securing clip downwards -arrows-.



- Pull blade protector off wiper blade from bottom to top, as shown in illustration.
- Carefully place wiper arm back onto windscreen.
- Switch ignition on and briefly operate the wiper lever to move the wipers back to park position. Switch ignition off again.





4.44.2 Removing wiper blade protection, version 2

- Switch ignition on and off briefly with bonnet closed.
- When engine is switched off move wiper lever down to touch-wipe function within 10 seconds.

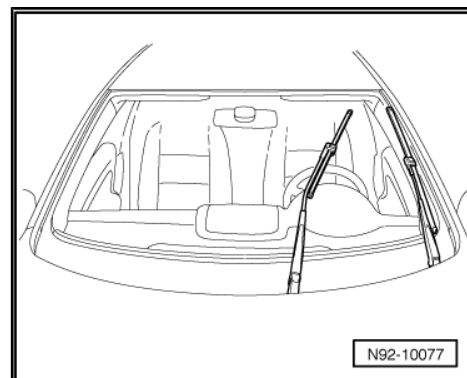
The wipers move in service position.

- Lift the wiper arm away from windscreen.

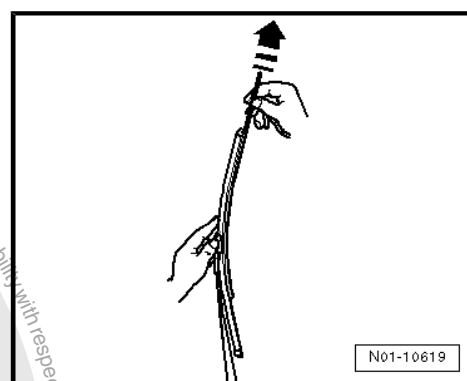


Caution

When doing this, do not touch the wiper blade to prevent damage.



- Pull blade protector off wiper blade upwards, as shown in illustration.
- Carefully place wiper arm back onto windscreen.
- Switch ignition on and briefly operate the wiper lever to move the wipers back to park position. Switch ignition off again.

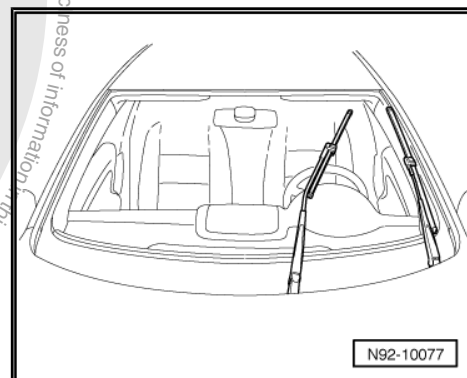


4.44.3 Changing wiper blade protection, version 3 -transport wiper blade-

- Switch ignition on and off briefly with bonnet closed.
- When engine is switched off move wiper lever down to touch-wipe function within 10 seconds.

The wipers move in service position.

- Lift the wiper arm away from windscreen.



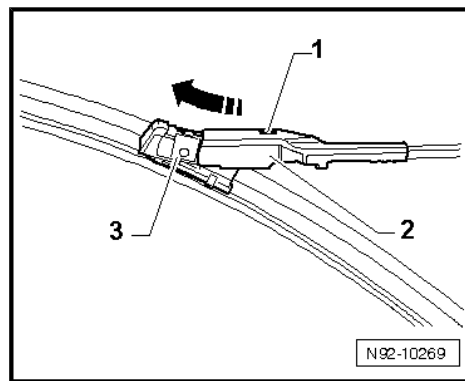


- Depending on version, turn wiper blade with lip upwards and pull off, or release wiper blade at joint -3- by pushing locking device -1- into mounting -2- and pull wiper blade out.
- Slide standard wiper blade into mounting and ensure that it audibly engages, or turn wiper blade with lip down onto stop.



Caution

When doing this, do not touch the wiper blade to prevent damage.



- Carefully place wiper arm back onto windscreen.
- Switch ignition on and briefly operate the wiper lever to move the wipers back to park position. Switch ignition off again.

4.45 Headlight setting: Check, if necessary adjust

Adjust headlights with gas discharge bulbs, ➔ [page 102](#)

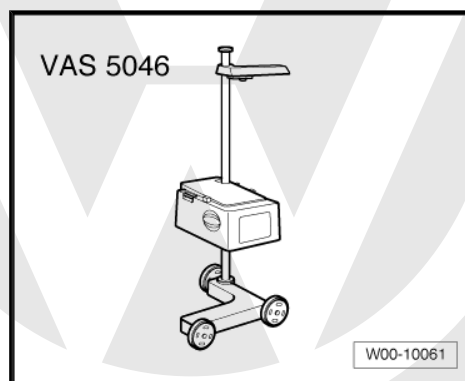
Adjusting headlights with halogen bulbs ➔ [page 101](#)

Adjusting fog lights and other additional lights ➔ [page 105](#)

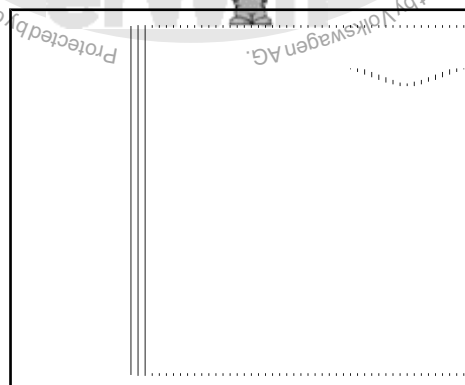
4.45.1 Headlight adjustment: Check

Special tools and workshop equipment required

- ◆ Headlight adjustment unit -VAS 5046- or

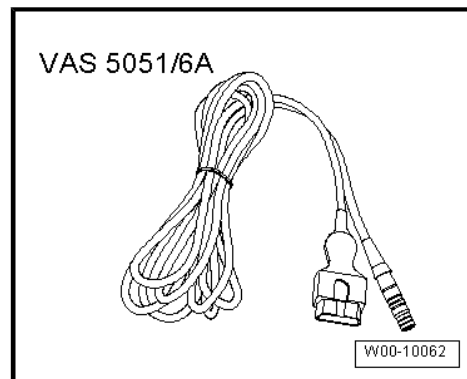


- ◆ Headlight adjustment unit -VAS 5047-
- ◆ Vehicle diagnosis, testing and information system





◆ Diagnosis cable



Checking and adjusting prerequisites:

- ◆ Tyre pressures OK.
- ◆ Lenses must not be damaged or dirty.
- ◆ Reflectors and bulbs OK.
- ◆ Vehicle must be loaded.
- ◆ The vehicle must be rolled forward or backward several metres or front and rear springs must be bounced fully several times so that springs settle.

Loading: With one person or 75 kg on the driver seat and the vehicle otherwise unloaded (unladen weight).

The unladen weight is the weight of vehicle ready for operation with a full fuel tank (at least 90 %) including weight of all equipment usually carried (e.g. spare wheel, tools, jack, fire extinguisher etc.).

If the fuel tank is not at least 90 % full, then load as follows:

- Read level of fuel in fuel tank on fuel gauge. Determine additional weight from following table and place weight in luggage compartment.

Fuel gauge table

Fuel gauge	Additional weight in kg
1/4	30
1/2	20
3/4	10
Full	0

Example:

When the fuel tank is half full an additional weight of 20 kg must be placed in the luggage compartment.



Note

The additional weight is best produced using fuel canisters filled with water (a 5 litre fuel canister filled with water weighs approx. 5 kg).

- ◆ Vehicle and headlight adjuster must be on a level surface. ⇒ Operating instructions for headlight adjustment unit -VAS 5046- or ⇒ Operating instructions for headlight adjustment unit -VAS 5047-
- ◆ Vehicle and headlight adjuster must be aligned.



- ◆ Inclination must be set.



Note

For NAR vehicles the side adjustment of headlight is not permitted, therefore the adjustment bolt is secured against turning.

Inclination information in „%“ is stamped into trim above headlight. Headlights must be adjusted according to this information. Percentage given is based on a projection distance of 10 metres. For example: inclination of 1.0 % converts to approx. 10 cm.



Note

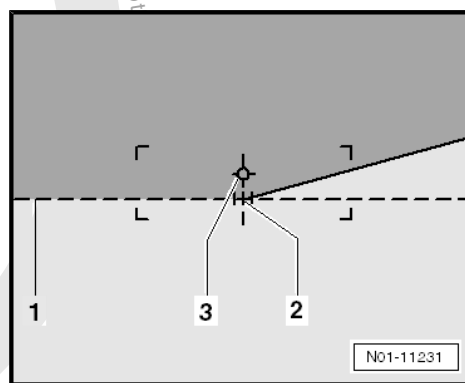
For certain export markets halogen headlights with manually regulated headlight range control are not offered.

- ◆ The headlight range adjuster thumb wheel must be in basic setting -0-.

Checking headlights:

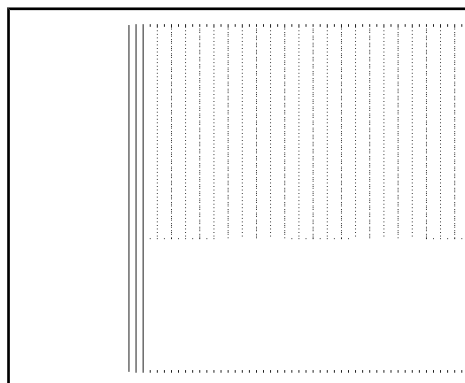
Please check the following:

- Whether, with the dipped beam switched on, the horizontal bright/dark boundary contacts the dividing line -1- of the test area and
- Whether the breaking point -2- between the horizontal part of the bright/dark boundary on the left and the rising part on the right lies on the vertical line of the central point -3-. The bright core of the light beam must be to the right of the vertical line.



Note

- ◆ *To simplify finding the breaking point -2-, cover and uncover left (from driver perspective) half of the headlight a few times. Then check dipped beam again.*
- ◆ *After correct adjustment of dipped beams, the centre point of the main beam must lie on the centre mark -3-.*
- ◆ *For the previous test screens with 15° setting line, adjust as for new test screen. To avoid incorrect settings, ignore the 15° setting line.*



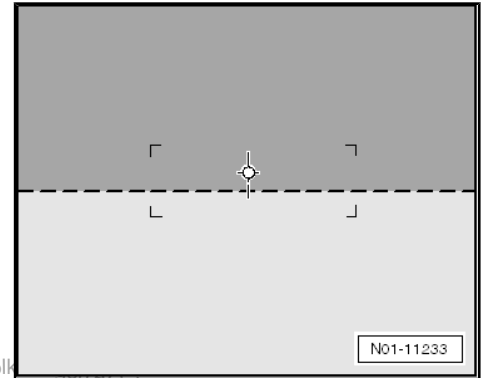


Fog lights:

- Check whether the upper bright/dark boundary touches the setting line and runs horizontally over the entire width of the test screen.

Other additional lights:

Additionally retrofitted lights of other systems must be checked and set according to valid guidelines.



4.45.2 Adjusting headlights with halogen bulbs

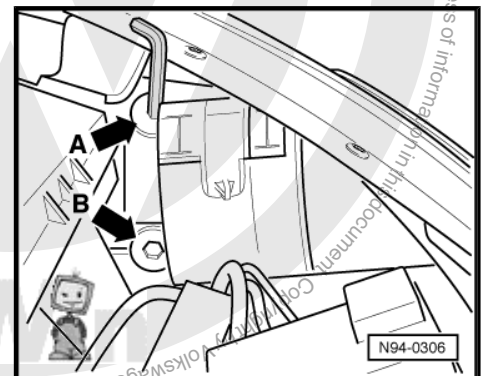


Note

- ◆ For NAR vehicles the side adjustment of headlight is not permitted.
- ◆ For this reason, adjustment bolt -B- is secured against turning.
- ◆ Please check that both headlights move evenly when the manually operated headlight range control is operated.
- ◆ If the vehicle is equipped with separate dipped and main beam, adjust main beam additionally. When adjusting main beam ensure that the adjustment unit is set to 0 %.

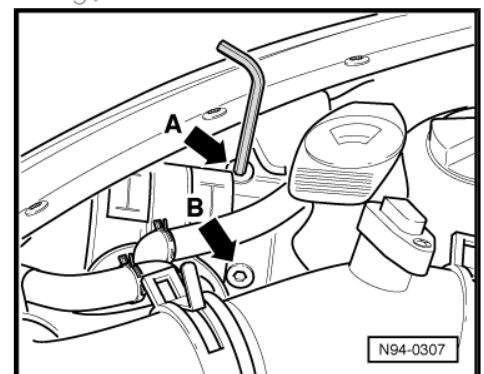
Adjusting left headlight:

- A - Height adjustment
- B - Lateral adjustment



Adjusting right headlight:

- A - Height adjustment
- B - Lateral adjustment
- Using a hexagon socket or a suitable cross slotted screwdriver, turn the adjustment screw/bolt for lateral adjustment -B- and height adjustment -A- until the correct settings are achieved.





4.45.3 Adjusting headlights with gas discharge lamps in „Guided Functions“ operating mode

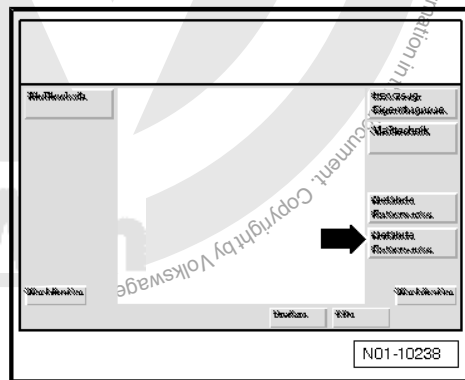
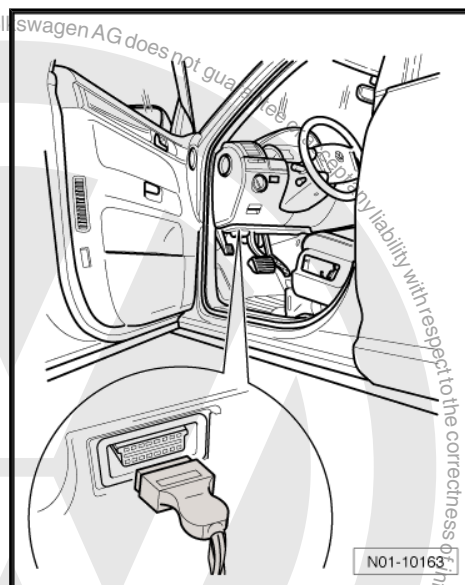
Test prerequisites for gas discharge headlights with dynamic headlight range control:

- Before every headlight adjustment on vehicles with gas discharge headlights, the fault memory should be read and cleared using diagnostic tester and the headlight range control should be set to basic setting.

Adjusting headlights:

- Connect diagnostic tester ⇒ [page 28](#) .
- Select operating mode „guided functions“ -arrow- on display of diagnosis tester.
- Then perform vehicle identification on vehicle diagnosis tester.
- Press „Automatic headlight range control“.
- Press „Right light control system“.
- Press „Performing basic setting“.
- Press „Continue“.
- Perform test according to the information of „Guided functions“.
- Check headlight setting and adjust headlights if necessary ⇒ [page 101](#) .

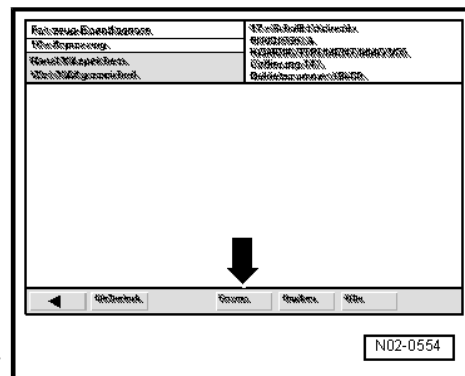
Ending adaption





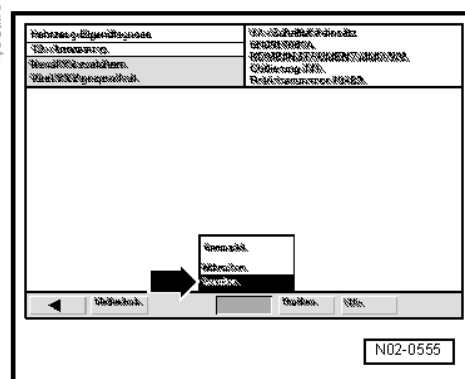
Indicated on display:

- Press „GoTo“ button on display -arrow-.



Indicated on display:

- Press the „End“ button on display -arrow-.
- Switch off ignition and separate diagnosis connections.

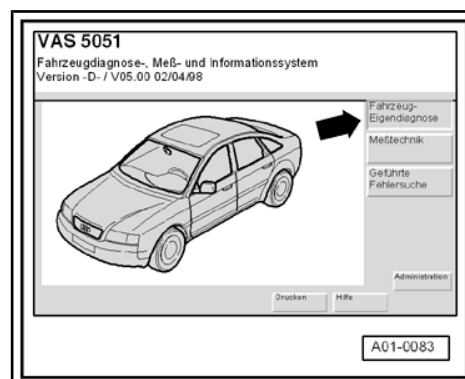


4.45.4 Adjusting headlights with gas discharge lamps in „Vehicle Self-diagnosis“ operating mode

- Connect vehicle diagnosis tester ➔ [page 28](#) .

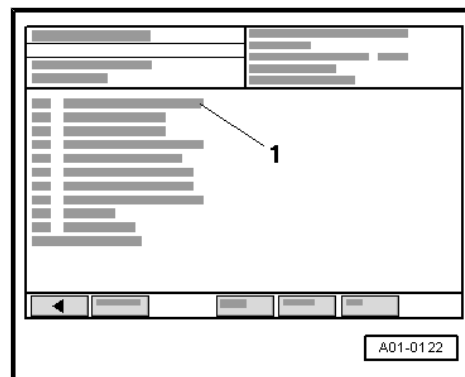
Display on -VAS 5051- :

- Press button for „Vehicle self-diagnosis“ on display -arrow-.





Display on -VAS 5051- :

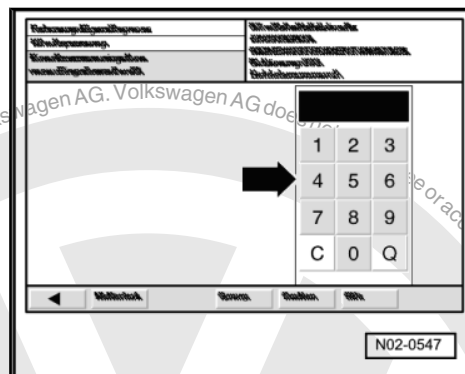
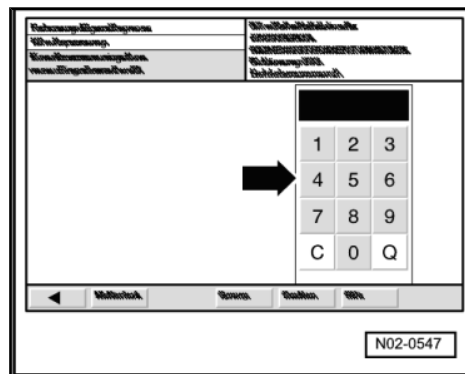
- In selection -1- press „Automatic headlight range control“ diagnostic function.







Display on -VAS 5051- :

- In the button field -arrow-, enter numbers „2 and 9“ for „Left light control system“ and confirm by pressing the  button.
- In the button field -arrow-, enter numbers „0 and 4“ for „Basic setting“ and confirm by pressing the  button.




- In the button field -arrow-, enter numbers „0, 0, 1“ for „Display group number“ and confirm by pressing the  button.

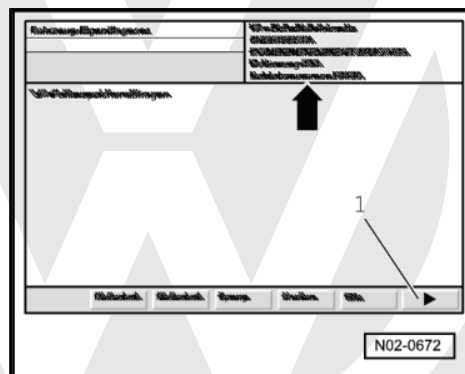
- On the display, press the  button „Continue“-item 1-.

The headlights will be moved into the adjustment position.

- Perform test according to the information of „Guided functions“.

- Check headlight setting and adjust headlights if necessary
⇒ [page 101](#) .

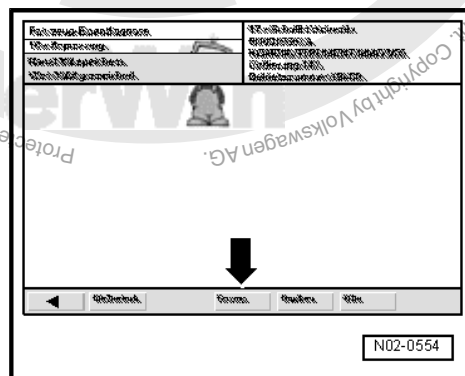
- On the display, press the  button „Continue“.



Ending adaption

Indicated on display:

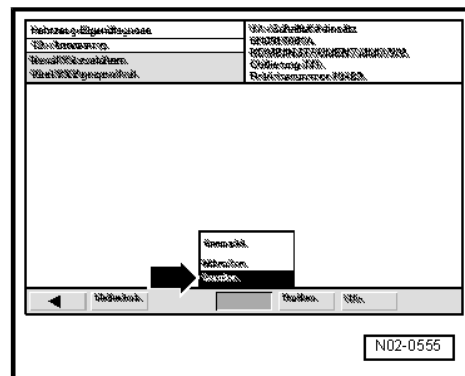
- Press „GoTo“ button on display -arrow-.





Indicated on display:

- Press the „End“ button on display -arrow-.
- Switch off ignition and separate diagnosis connections.



4.45.5 Adjusting fog lights and other additional lights

Adjusting fog lights in headlight:



Note

Adjustment of fog lights is performed automatically when adjusting headlights.

Fog light in left bumper:



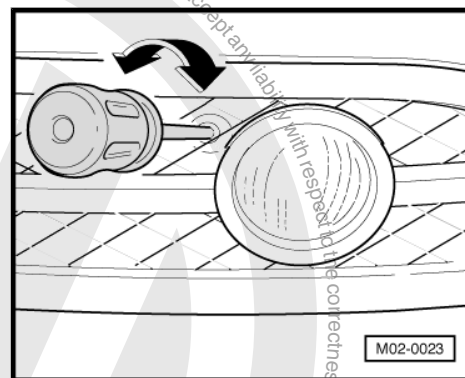
Note

- ◆ There are two different fog light versions.
- ◆ In version 1, adjustment is carried out from the front
⇒ [page 105](#).
- ◆ In version 2, adjustment is carried out at the adjuster in the rear area of the headlight ⇒ [page 106](#)

Version 1

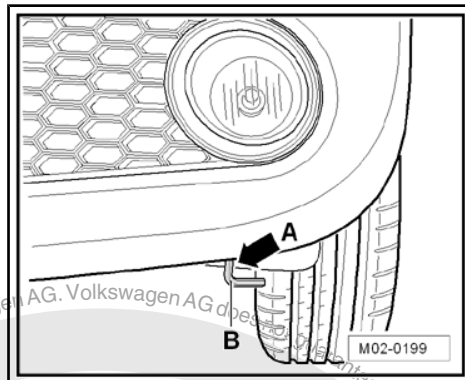
Location of adjustment screw on right fog light is a mirror image.

- Turn adjustment screw/bolt -arrow- to correct the beam range. A lateral adjustment is not possible.





Version 2



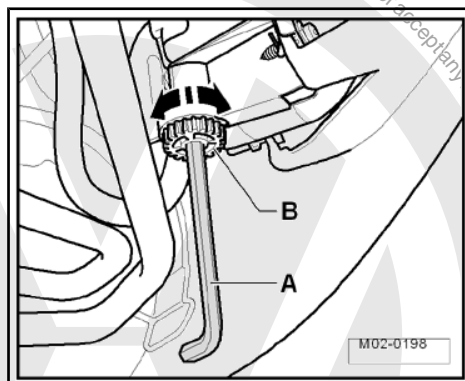
Adjuster is located on rear of fog light -arrow A- and can be adjusted with an Allen key -B-.

Adjustment is carried out with Allen key -A- by turning adjuster -B-.

A lateral adjustment is not possible.

Other additional lights

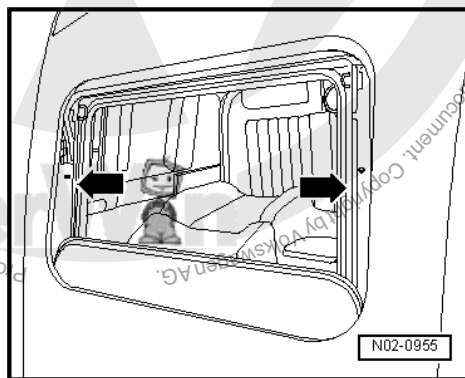
Additionally retrofitted lights of other systems must be checked and set according to valid guidelines.



4.46 Sunroof: Check function, clean and grease guide rails

Carry out the following procedure:

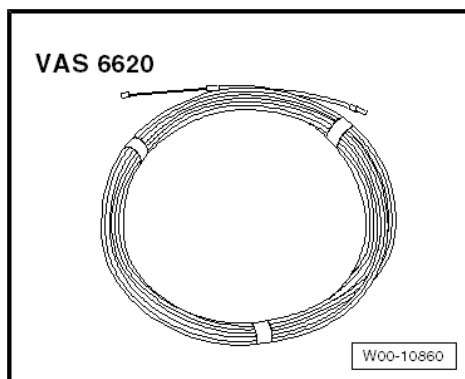
- Check function of sunroof.
- Clean guide rails -arrows- and lubricate with special grease - G 000 450 02- .



4.47 Sliding sunroof drains: Check flow and clean if necessary

Special tools and workshop equipment required

- ◆ Cleaning and fitting tool -VAS 6620-





Carry out the following procedure:

- Open sliding sunroof.
- Check sliding sunroof drain holes -arrows- for dirt and clean if necessary.
- Pour tap water into sliding sunroof drains and check if almost the same quantity of water flows out of the wheel housings.

If this is the case, the test is completed. If only a small quantity of water or no water at all flows out of the wheel housings, perform the following procedure:

- Removing plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Plenum chamber cover .

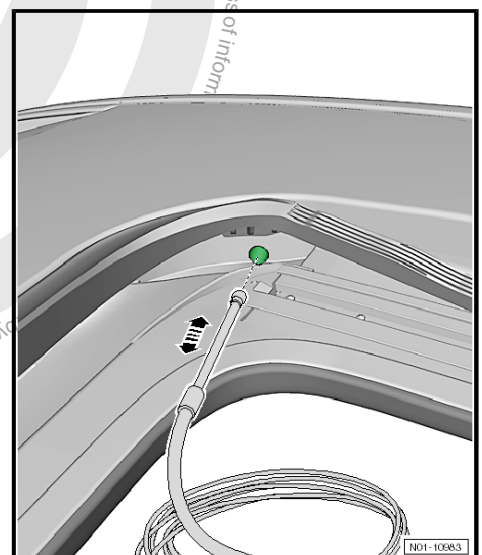
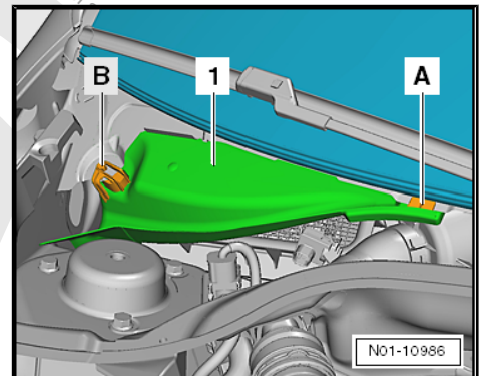
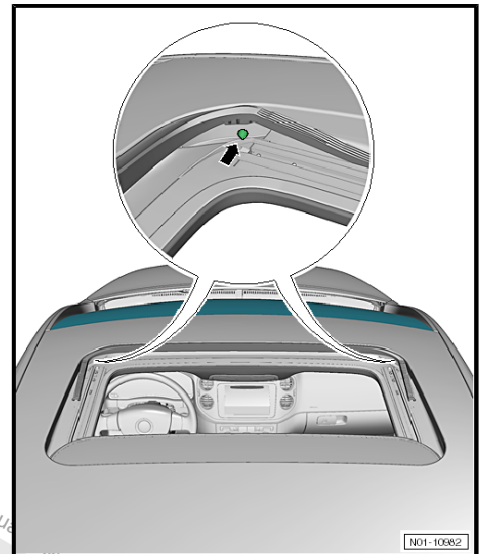


Note

Removal and installation of plenum chamber is performed as a separate charge.

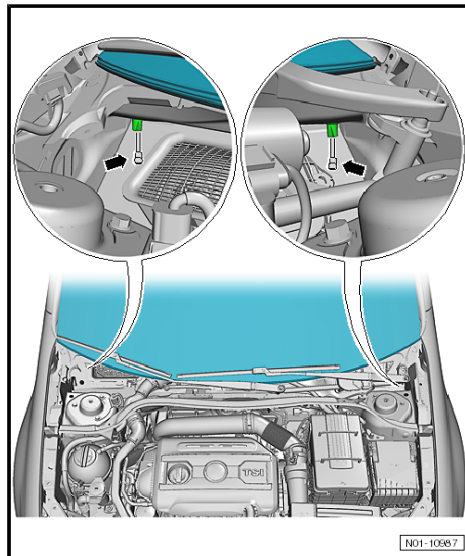
- If fitted, remove cover -1- by loosening fasteners -A and B-.

- To press out dirt, guide cleaning and fitting tool -VAS 6620- onto drain valves by pushing and pulling it slowly.



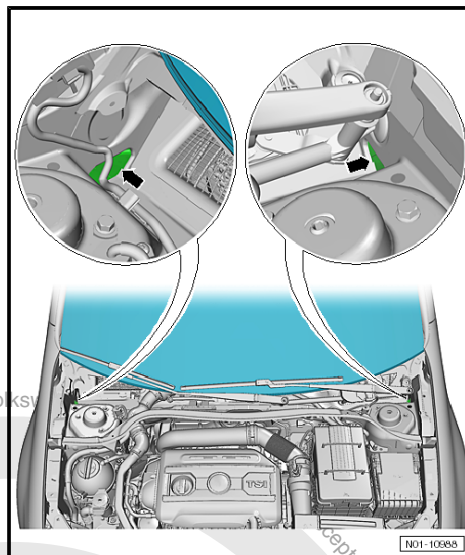


- Drains -arrows- are located on the left and right side, inside the plenum chamber.



- Check then plenum chamber drains -arrows- for dirt and clean if necessary.
- To check, pour tap water again through the sliding sunroof drain holes.

Install in reverse order.



4.48 Service interval display: Reset

The service interval display must be reset (adapted) at

- ♦ delivery inspection
- ♦ Every service
- ♦ Service interval display: Resetting in vehicles ➤04.1999
⇒ [page 108](#)
- ♦ Service interval display: Resetting in vehicles 05.1999 ➤
⇒ [page 109](#)

4.48.1 Service interval display: Resetting in vehicles ➤04.1999

Procedure: ⇒ Electrical system; Rep. gr. 01 ; Dash panel insert self-diagnosis .

Procedure ⇒ Vehicle diagnostic tester.



4.48.2 Service interval display: Resetting in vehicles 05.1999 ➤

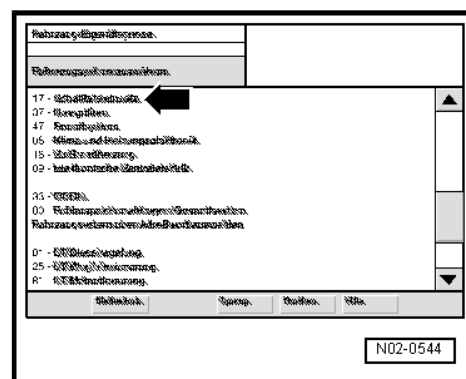
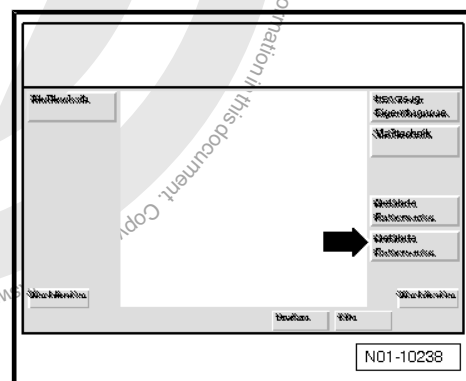
- ◆ Resetting service interval display using diagnostic tester in „Guided Functions“ operating mode ➤ [page 109](#)
- ◆ Resetting service interval display with adjustment buttons for distance display and clock on dash panel insert ➤ [page 110](#)
- ◆ Resetting service interval display using diagnostic tester in „Vehicle Self-diagnosis“ operating mode ➤ [page 111](#)

Resetting service interval display using diagnostic tester in „Guided Functions“ operating mode

- Connect vehicle diagnosis tester ➤ [page 28](#) .
- Touch the field or button on the screen for „GUIDED FUNCTIONS“ -arrow-.

If the display is not as shown in the procedure ➤ Operating instructions for vehicle diagnosis, testing and information system -5051 A- .

- Confirm with button.
- Select one after the other:
 - ◆ Brand
 - ◆ Type
 - ◆ Model year
 - ◆ Engine code
- Confirm vehicle identification.
- Select one after the other:
 - ◆ „Dash panel“ -ARROW-.
 - ◆ „Resetting the service interval display“.

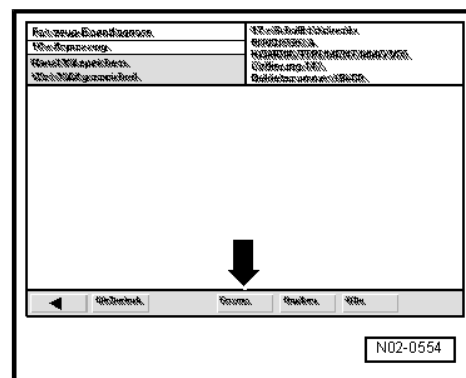


- Perform adaption according to the information of „GUIDED FUNCTIONS“.

Ending adaption

Indicated on display:

- Press »GoTo« button on display -arrow-.





Indicated on display:

- Press the »End« button on display -arrow-.
- Switch off ignition and separate diagnosis connections.
- Switch on ignition.

After the ignition is switched on, the type of service is no longer displayed in the distance display in the dash panel insert.

Resetting service interval display with adjustment buttons for distance display and clock on dash panel insert



Note

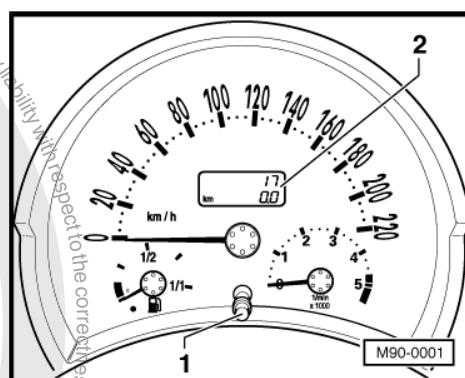
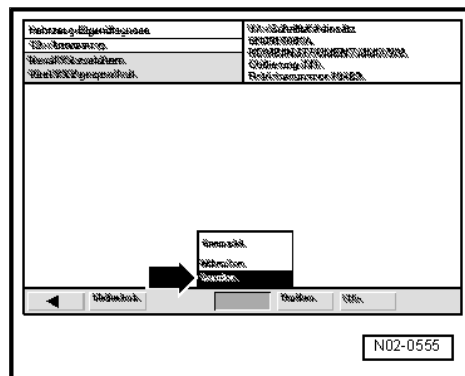
- ♦ At delivery inspection for vehicles with long-life service (PR number QG1), the service interval display must not be reset using the distance display and clock adjustment buttons. Reason: When the service interval display is reset using the adjustment buttons for distance and clock on dash panel insert, the dash panel insert is automatically coded to non-flexible, i.e. to „time or distance dependent“ service.
- ♦ If vehicles with „LongLife service“ (PR number QG1) are filled with an engine oil conforming to VW standard 503 00 (petrol engine), VW standard 506 00 (TDI) or 506 01 (TDI unit injector) during inspection service, the service interval display must not be reset using the distance display and clock adjustment buttons on dash panel insert. Reason: When the service interval display is reset using the adjustment buttons for distance and clock on dash panel insert, the dash panel insert is automatically coded to non-flexible, i.e. to „time or distance dependent“ service.
- ♦ Vehicles with LongLife service (PR number QG 1), which have an oil change service at approx. 15,000 km or 12 months must have the service interval display recoded to non-flexible. Reason: This ensures that these vehicles resume the normal long-life service rhythm.

Reset the display as follows:

Reset service interval display using trip recorder reset press button -1- when the dash panel insert is in the „reset mode“.

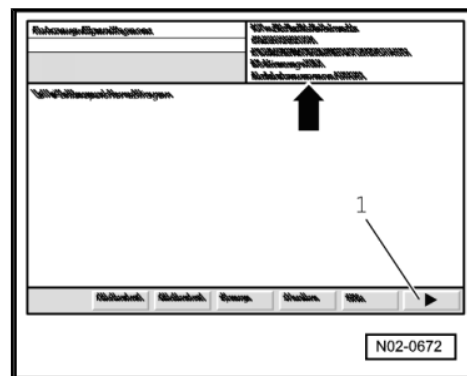
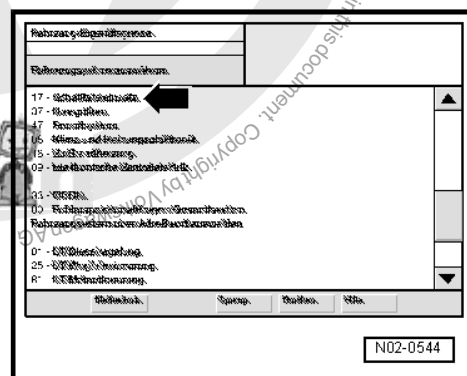
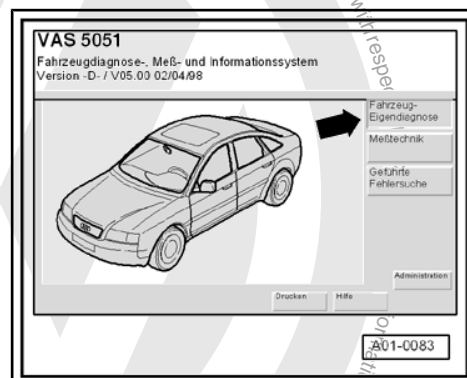
Initiate basic (default) settings:

- Switch off ignition.
- Press and hold button -1- to zero trip recorder.
- Switch on ignition.



- 

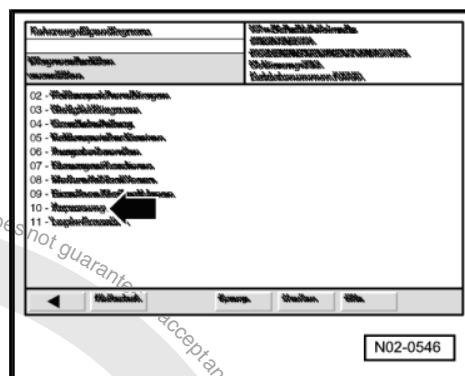
Diagram of the instrument cluster showing the speedometer, tachometer, and fuel gauge. The speedometer has a needle pointing to 170 km/h and a digital display showing 17 km and 0.0. The tachometer has a needle pointing to 1/2. The fuel gauge has a needle pointing to 1/4. The diagram is labeled with '1' and '2'.





Indicated on display:

- Press „10 - Adaption“ on display -arrow-.

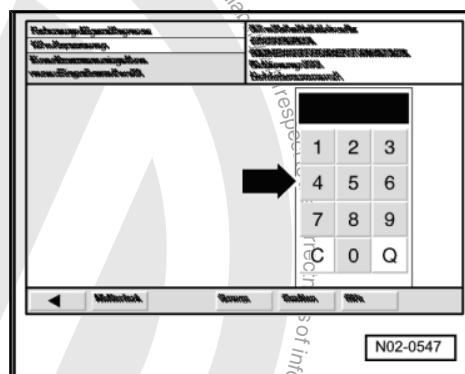


Indicated on display:

- Press buttons **0** and **2** on display number block -arrow-.

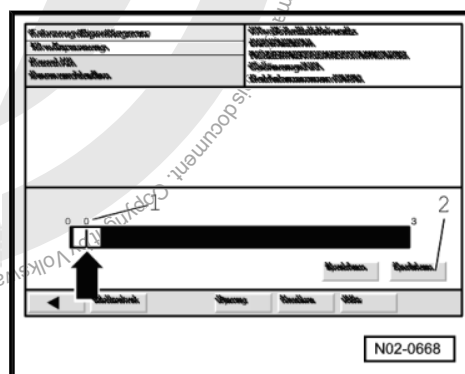
The service interval display is reset via the adaption channel 02.

- Confirm entry with „Q“ button on display number block.



Indicated on display:

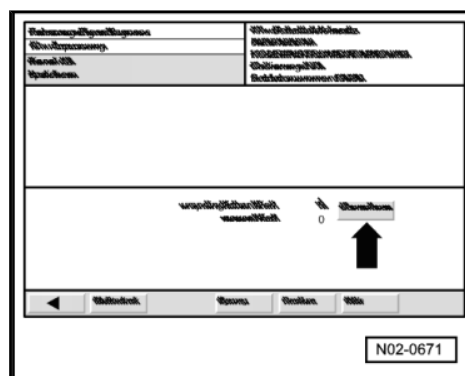
- Move position indicator -arrow- on display to left until -1- 0 is displayed above scroll bar.
- Press the „Save“ button on display -2-.



Indicated on display:

- Press the „Accept“ button on display -arrow-.

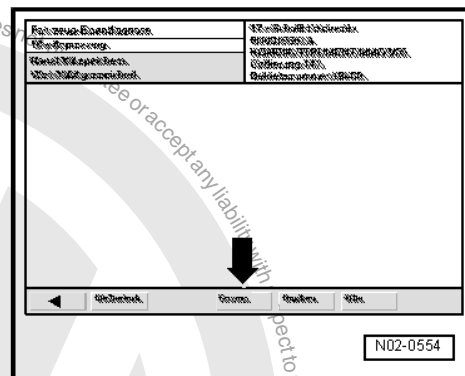
Ending output





Indicated on display:

- Press „GoTo“ button on display -arrow-.

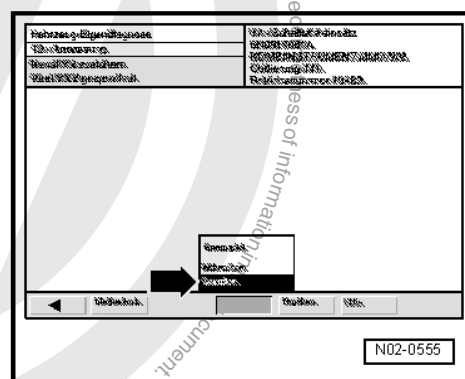


Indicated on display:

- Press the „End“ button on display -arrow-.
- Press „End“ button in End menu.
- Switch off ignition and separate diagnosis connections.
- Switch on ignition.

After the ignition is switched on, the type of service is no longer displayed in the distance display in the dash panel insert.

- Switch off ignition.



4.49 Service interval display: Recoding / adapting

Recoding service interval display using diagnostic tester in „Vehicle Self-diagnosis“ operating mode ➔ [page 113](#) .

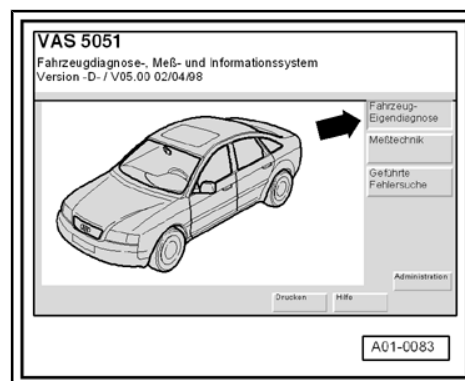
4.49.1 Recoding (adapting) service interval display using diagnostic tester in „Vehicle Self-diagnosis“ operating mode

- Press button for „Vehicle self-diagnosis“ on display -arrow-.



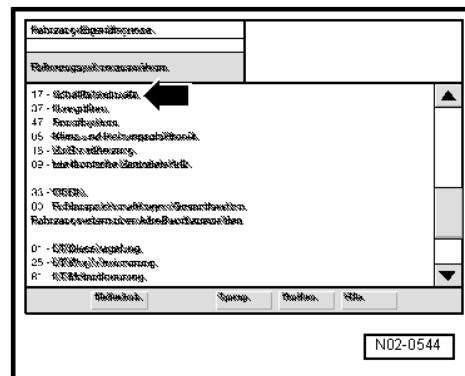
Note

If the display is not as shown in the procedure ➔ Operating instructions for vehicle diagnosis, testing and information system VAS 5051



Indicated on display:

- Press „17 - Dash panel insert“ on display -arrow-.

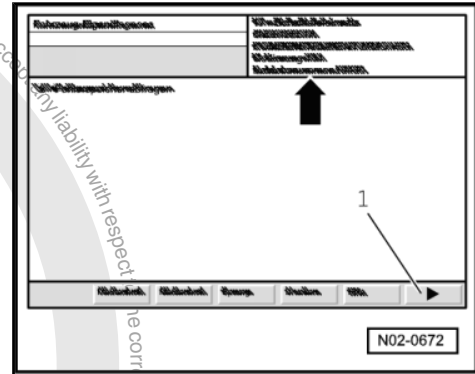




Indicated on display:

The control unit identification and coding are displayed -arrow-.

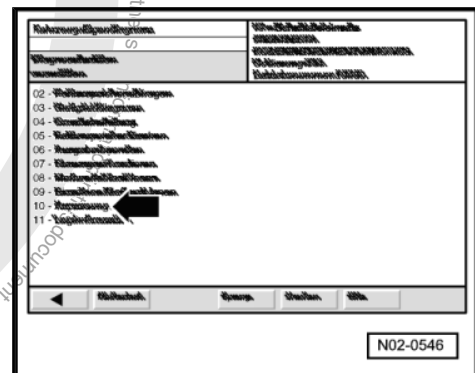
- Press the arrow button -1- on display.



Indicated on display:

Adapting engine oil grade:

- Press „10 - Adaption“ on display -arrow-.

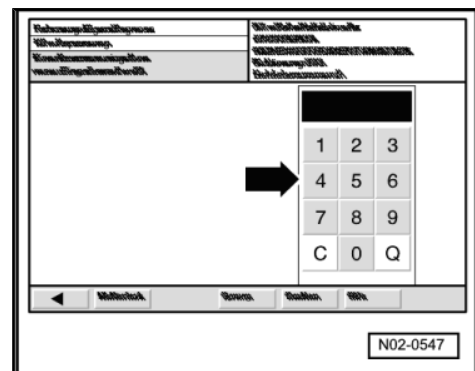


Indicated on display:

- Press buttons [4] and [5] on display number block -arrow-.

Adaption channel 45 adapts the dash panel insert to the quality of oil.

- Confirm entry with „Q“ button on display number block.





Indicated on display:

- Move position indicator -arrow- on display to left until adaption value 1 is displayed above scroll bar -1-.



Note

The adaption value indicates the current status of the engine oil quality:

4 - LongLife service - diesel engines: Engine oil conforming to VW standard 506 00 (TDI) or VW standard 506 01 (TDI unit injector)

2 - Long-life service - petrol engines: engine oil conforming to VW standard 503 00

1 - Time or distance dependent service: Not using an engine oil conforming to VW standard 503 00 (petrol engine), 506 00 (TDI) or 506 01 (TDI unit injector)

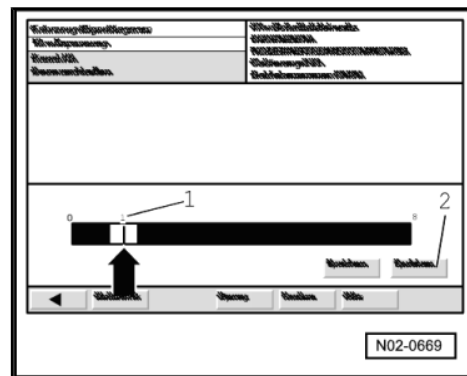


Note

If the dash panel insert is to be coded to „flexible“ (LongLife service), the adaption value 4 must be entered for diesel engines and adaption value 2 entered for petrol engines.

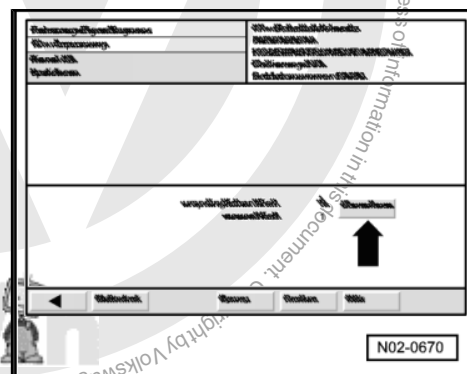
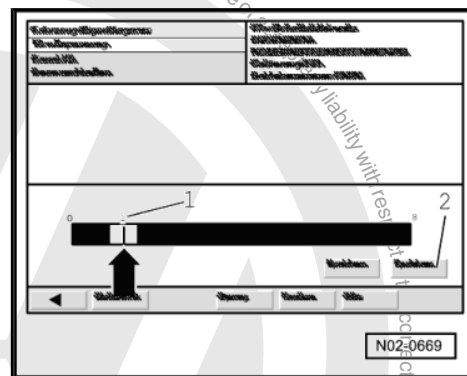
Entering the adaption value 1 sets the dash panel insert to „non-flexible“, that is, „time or distance dependent service“.

- Press the „Save“ button on display -2-.



Indicated on display:

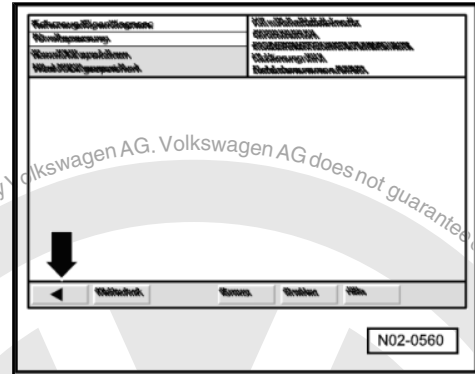
- Press the „Accept“ button on display -arrow-.





Indicated on display:

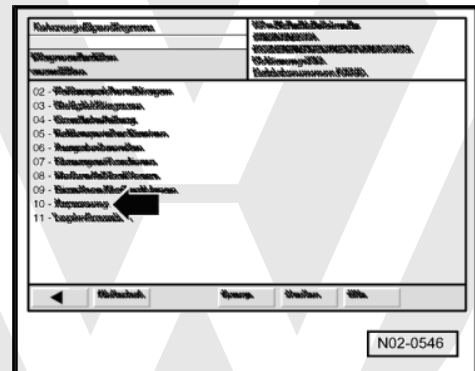
- Press -arrow- button on display.



Indicated on display:

Adapting due service:

- Press „10 - Adaption“ on display -arrow-.

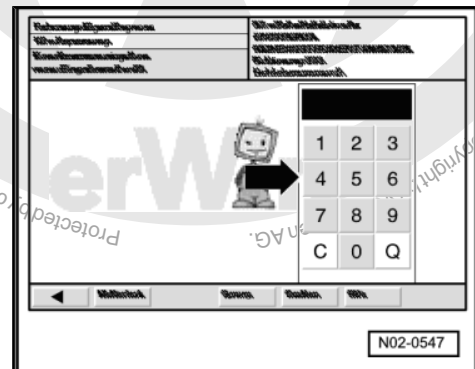


Indicated on display:

- Press buttons [4] and [4] on display number block -arrow-.

Adaptation channel 44 adapts the time to the next service.

- Confirm entry with „Q“ button on display number block.





Indicated on display:

- Move position indicator -arrow- on display to left until adaption value 365 is displayed above scroll bar -1-.



Note

The adaption value indicates the maximum time until the next service is due (365 = 365 days = 12 months).

- 730 - Long-life service (maximum 24 months until the next service is due)
- 365 - Time or distance dependent service (max. 12 months until the next service is due)

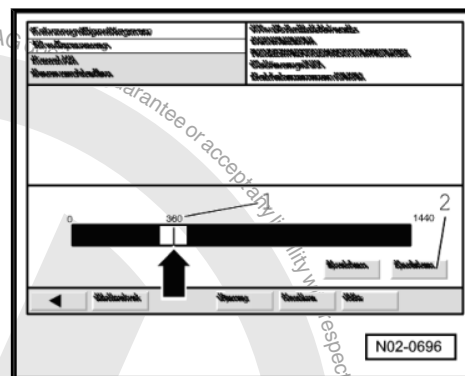
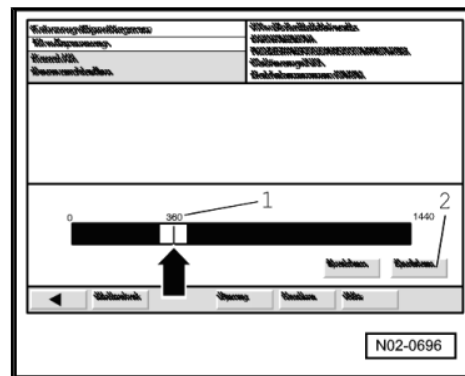


Note

If the dash panel insert must be coded to „flexible“ (long-life service), the adaption value 730 is to be entered.

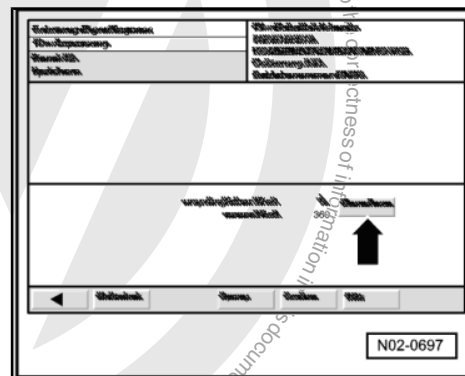
Entering the adaption value 365 sets the dash panel insert to „non-flexible“, that is, „time or distance dependent service“.

- Press the „Save“ button on display -2-.



Indicated on display:

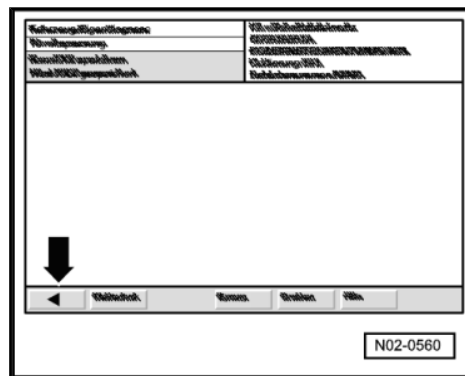
- Press the „Accept“ button on display -arrow-.





Indicated on display:

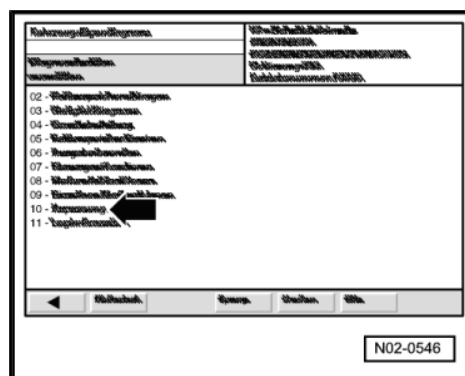
- Press -arrow- button on display.



Indicated on display:

Adapting maximum mileage until next service is due:

- Press „10 - Adaption“ on display -arrow-.

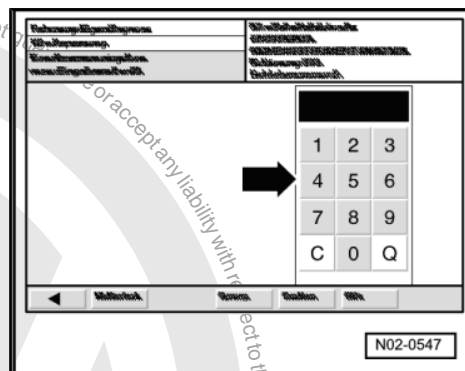


Indicated on display:

- Press buttons [4] and [3] on display number block -arrow-.

Adaptation channel 43 adapts the maximum distance which can be travelled until the next service is due.

- Confirm entry with „Q“ button on display number block.





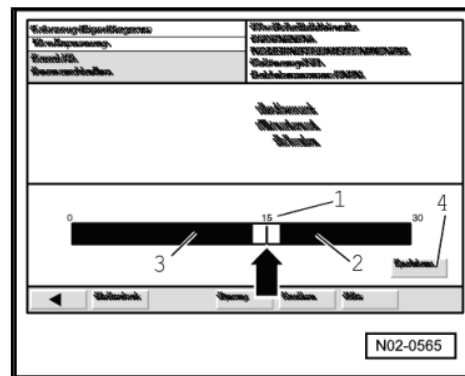
Indicated on display:

- Move position indicator -arrow- on display to left until adaption value 15 is displayed above scroll bar -1-.



Note

- ◆ Pressing the scroll bar briefly to the right -2- of the position indicator moves the value to the next number.
- ◆ Pressing the scroll bar briefly on the left -3- of the position indicator moves the value to the previous number.
- ◆ The adaption value in the upper line shows the maximum distance to the next service due (15 = 15,000 km, 30 = 30,000 km, 50 = 50,000 km).



50 - LongLife service - 4 cylinder diesel engines: Engine oil conforming to VW standard 506 00 (TDI) or VW standard 506 01 (TDI unit injector)

30 - Long-life service - petrol engines: engine oil conforming to VW standard 503 00

15 - Time or distance dependent service: Not using an engine oil conforming to VW standard 503 00 (petrol engine), 506 00 (TDI) or 506 01 (TDI unit injector)

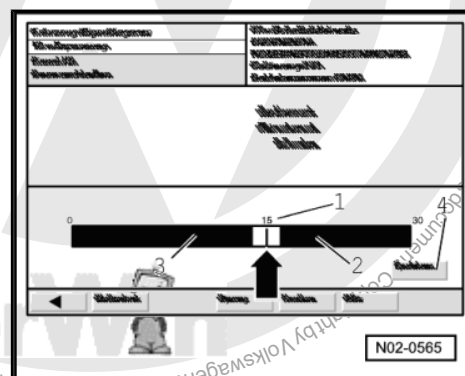
Entering the adaption value 15 sets the dash panel insert to „non-flexible“, that is, „time or distance dependent service“.



Note

If the dash panel insert is to be coded to „flexible“ (LongLife service), the adaption value 30 must be entered for petrol engines and adaption value 50 entered for diesel engines.

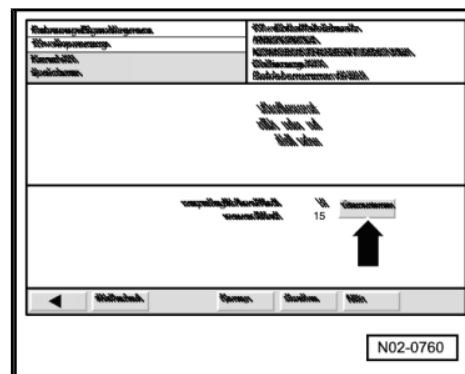
- Press the „Save“ button on display -4-.



Indicated on display:

- Press the „Accept“ button on display -arrow-.

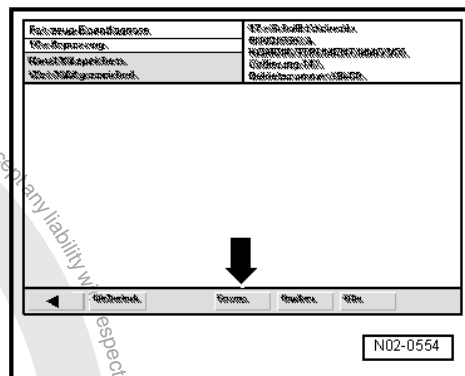
Ending output





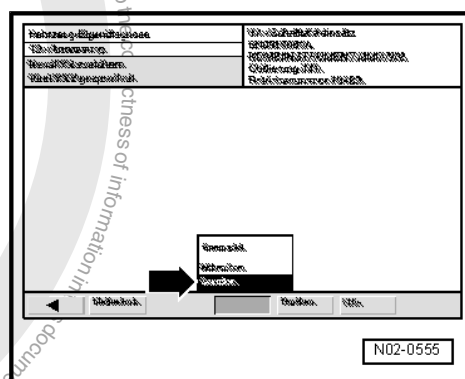
Indicated on display:

- Press „GoTo“ button on display -arrow-.



Indicated on display:

- Press the „End“ button on display -arrow-.
- Switch off ignition and separate diagnosis connections.



4.50 Power assisted steering: Check oil level

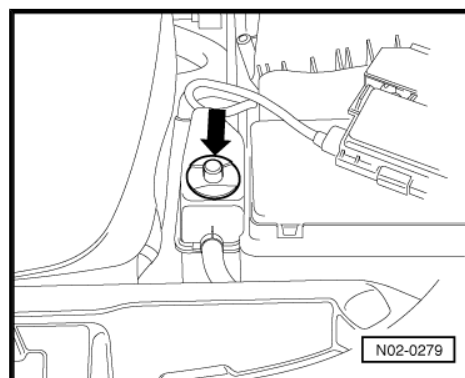
Carry out the following procedure:

4.50.1 Fluid cold

- Do not start engine but bring front wheels to straight-ahead position.

4-cylinder engines:

- Fit a suitable screwdriver into cap recess -arrow- and unscrew cap with oil dipstick.





5-cylinder engines:

- Fit a suitable screwdriver into cap recess -arrow- and unscrew cap with oil dipstick.

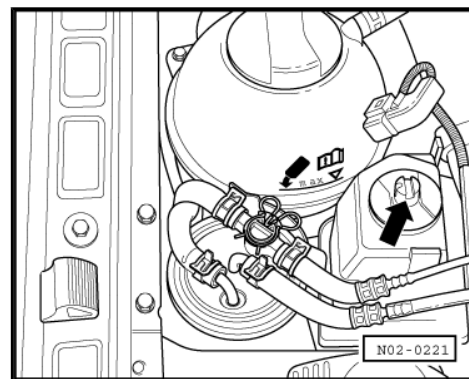
Continuation for all engines:

- Wipe off dipstick using a clean cloth.
- Screw cap on hand tight and unscrew again.



Note

The cap must be fully screwed on in order to obtain an accurate oil level.

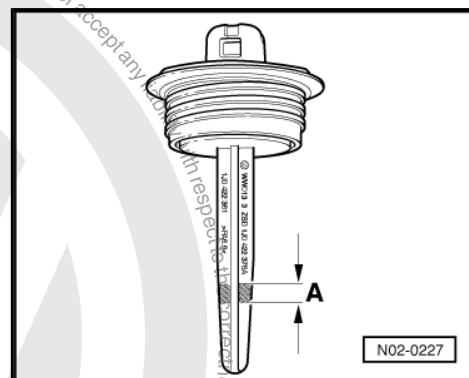


- Checking oil level: The oil level must be within the area of the grid -A-.



Note

- ♦ *If the fluid level is above the area specified, the excessive fluid must be extracted.*
- ♦ *If fluid level is below specified area, hydraulic system must be checked for leaks (repair measure). It is not sufficient merely to top up with oil. If the hydraulic system is not leaking, top up with oil -G 002 000- .*



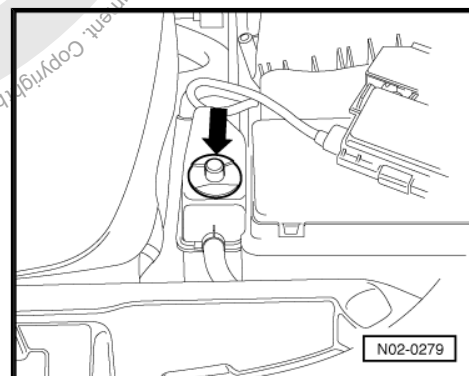
- Screw cap on hand tight (with a screwdriver).

4.50.2 Oil at operating temperature (above approx. 50 °C):

- Do not start engine but bring front wheels to straight-ahead position.

4-cylinder engines:

- Fit a suitable screwdriver into cap recess -arrow- and unscrew cap with oil dipstick.





5-cylinder engines:

- Fit a suitable screwdriver into cap recess -arrow- and unscrew cap with oil dipstick.

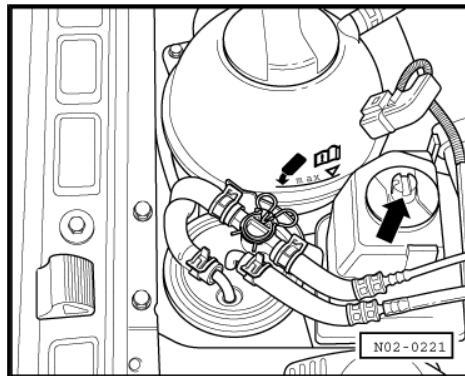
Continuation for all engines:

- Wipe off dipstick using a clean cloth.
- Screw cap on hand tight and unscrew again.



Note

The cap must be fully screwed on in order to obtain an accurate oil level.

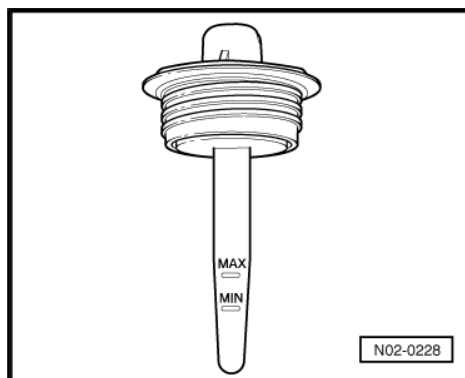


- Checking oil level: The oil level must be between min. and max. markings.



Note

- ♦ *If oil level is above max. marking, the excessive oil must be extracted.*
- ♦ *If oil level is below min. marking, the hydraulic system must be checked for leaks (repair measure). It is not sufficient merely to top up with oil. If the hydraulic system is not leaking, top up with oil -G 002 000-.*



- Screw cap on hand tight (with a screwdriver).

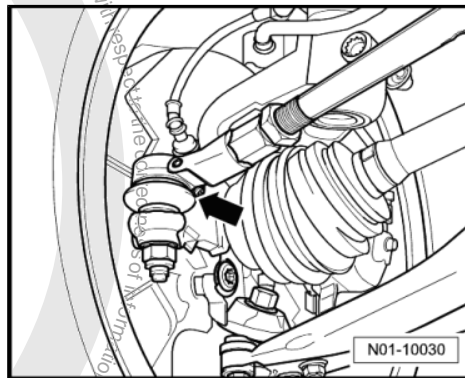
4.51 Track rod ends: Check clearance, security and boots

Carry out the following procedure:

- With vehicle raised (wheels hanging free), check play by moving track rods and wheels.

Clearance: Zero clearance

- Check mountings.
- Check boots -arrow- for damage and correct seating.



4.52 Dust and pollen filter: Renew filter element

The filter is located below the inner plenum chamber cover on right.

Remove inner plenum chamber cover, then right end plate, ➤ Internal body repairs; Rep. gr. 68; Storage compartments, covers and trims

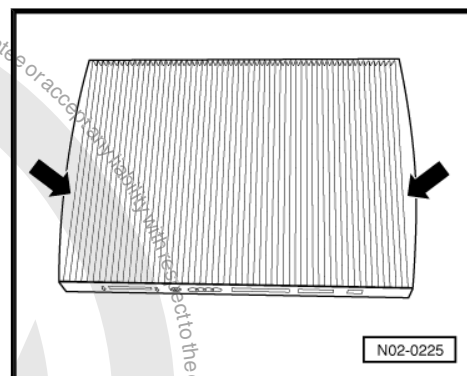
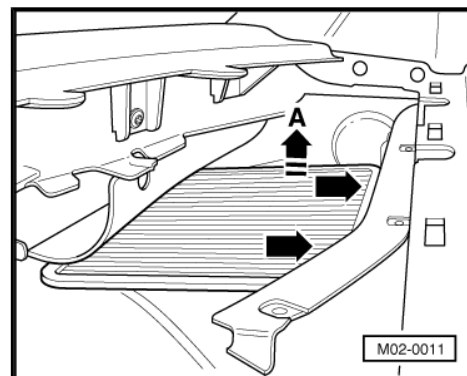


- Press filter housing clips -arrows- in direction of arrow and take filter element with frame out upwards -arrow A-.
- Take filter element out of frame.



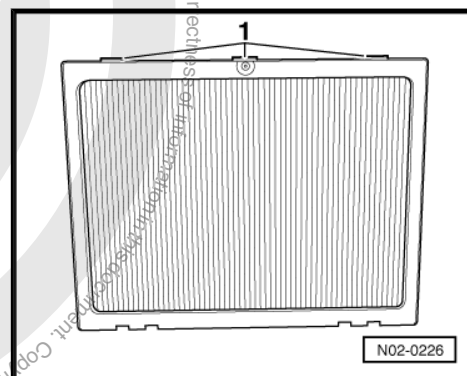
Note

Observe disposal regulations!



- Guide left and right edges of the frame into the first lamination -arrows- of the new filter element.
- Locate frame lugs -1- in respective filter housing recesses and press frame with filter element downwards.

The remaining assembly steps are basically a reverse of the dismantling procedure.



4.53 Transportation devices: Remove blocking pieces from front axle springs



Note

- ◆ *On some models blocking pieces are fitted to the suspension strut piston rod.*
- ◆ *Other models have blocking pieces fitted to the front axle coil springs.*
- ◆ *The blocking pieces prevent the springs compressing and possible damage to the vehicle when being driven onto a vehicle transporter or railway wagon.*



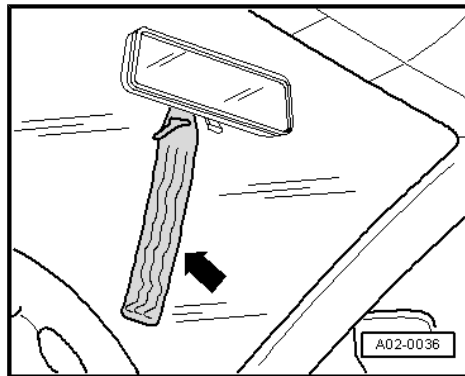
Caution

The blocking pieces must be removed without reservation before delivering the vehicle. A „Warning“ notice, attached to the interior mirror, specifically reminds of this.

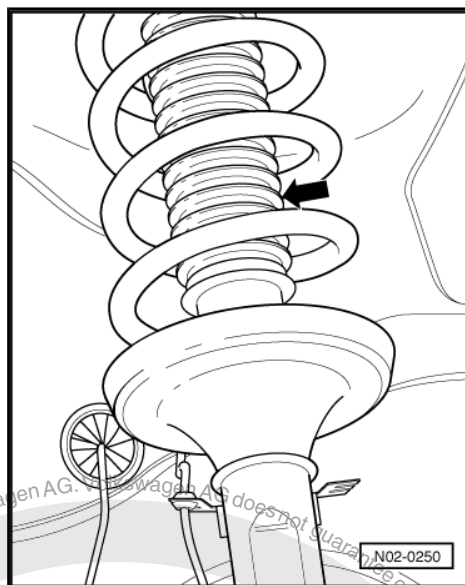


- Vehicles with blocking pieces fitted to the suspension struts have a label hanging from the mirror -arrow-.

Removing blocking pieces on piston rod



- Slide suspension strut protective sleeve -arrow- upwards.



- Push blocking piece -arrow- off piston rod.
- Slide suspension strut protective sleeve downwards onto suspension strut.

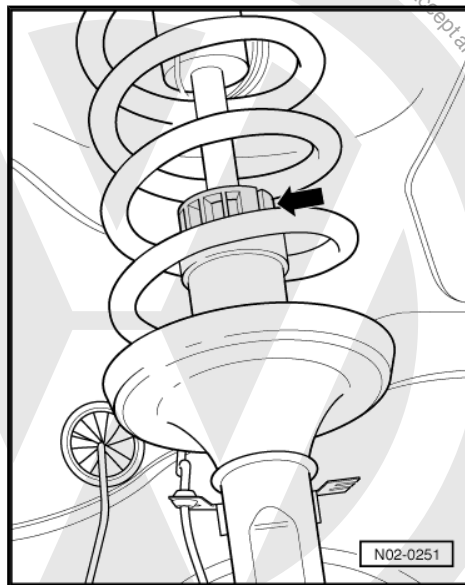
Removing blocking pieces on the coil spring

Carry out the following procedure:



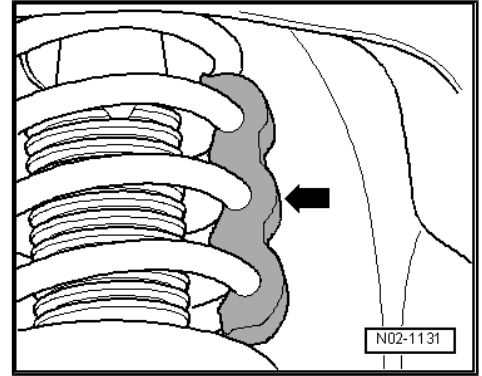
Note

- ◆ *It is necessary to remove the wheels.*
- ◆ *Ensure the surface of the springs is not damaged.*
- Relieve weight on coil springs by raising vehicle with a hoist.





- Push blocking piece -arrow- off piston rod.

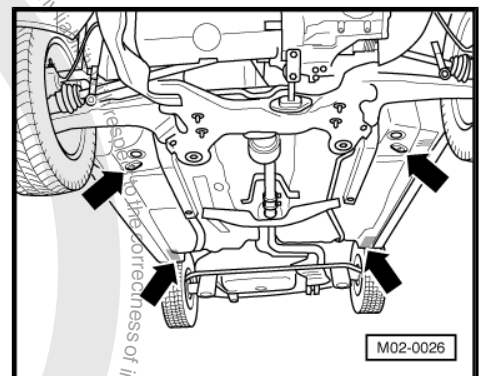


4.54 Transportation anchorage openings: Sealing with caps

On the underside of the vehicle floor pan there are 4 oval openings in the vicinity of the workshop lifting platform/trolley jack mounting points.

These 4 oval openings are used to anchor the vehicle during transportation.

- Seal these 4 opening using the caps included with the vehicle pack.

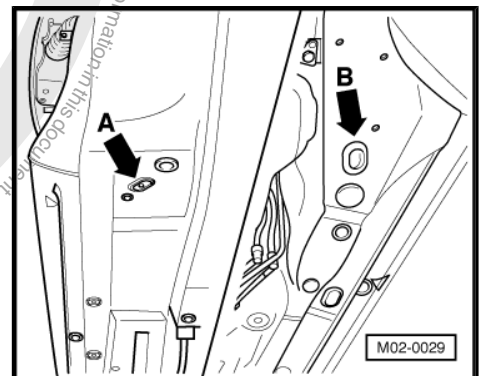


Installation position of front caps arrow -A- and rear caps arrow -B-.



Note

If the 4 caps are not available or no longer available in sufficient quantity, they can be ordered in Kassel as spare parts with part No. -N 904 028 01- .

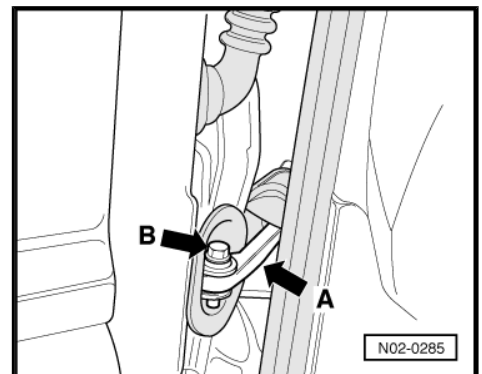


4.55 Door arrester: Grease

Carry out the following procedure:

- Grease door arrester at points shown -arrows-.

Use lubricant -G 000 150- .





4.56 Underbody sealant: Visual check for damage to underbody sealant, underbody panels, routing of lines and plugs

During visual check, also check floor pan, wheel housings and sills.

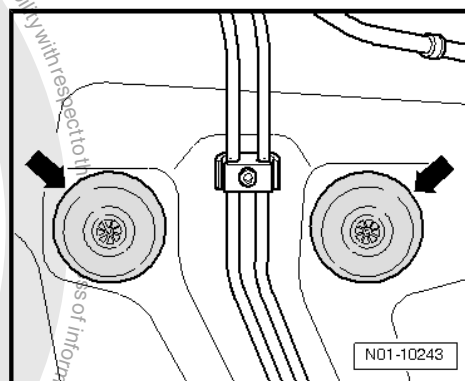
Always ensure that all lines are secured in their mountings, all plugs are available and that there is no visible damage on the underbody.

Always ensure that there are no cracks, detachments and corrosion of underbody protection on the sealing caps -arrows-.



Note

Faults found must always be rectified (repair measure). This inhibits corrosion and rusting through.



4.57 Convertible top end position latch (with electric convertible top actuation): Visual check with convertible top open



Note

When open, the convertible top is locked in its end position with two locks. The two locks hold the convertible top in the open position in the event that the vehicle rolls over. The function of this locking mechanism must be guaranteed.

Check condition

- The convertible top must be completely open, (convertible top warning lamp must not light up).

Carry out the following procedure:

- Switch on ignition.
- Open the two moving covers at the rear side windows by pressing the convertible top switch in the centre console down until the two covers have opened and are almost vertical.
- Then immediately switch off the ignition.



Note

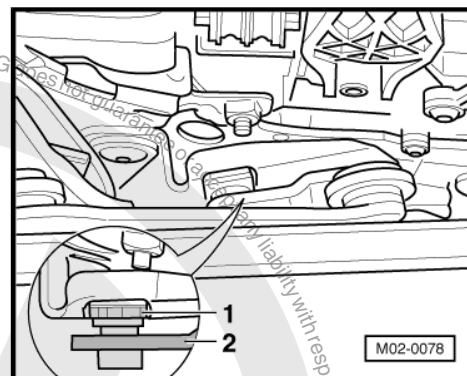
The convertible top closing process must not yet have been activated in this case.

- Look in the open flaps.



Example, rear right latch.

The latch -2- must grip the pin -1- on both sides.



4.58 Convertible top protective film: Removing (convertible)

4.58.1 Opening convertible top electrically



Note

- ◆ Observe safety instructions for handling the electric convertible top:
- ◆ Before opening or closing the convertible top, make sure that sufficient space is available above the convertible top.

Safety instructions for handling the electric convertible top



WARNING

- ◆ For safety reasons the convertible top may only be opened or closed when the vehicle is stationary.
- ◆ If the opening or closing process is aborted, the convertible top may spring and therefore lower under certain circumstances.
- ◆ Never drive when the convertible top is not properly open or closed.
- ◆ Do not attempt to close the convertible top when the roll bars have triggered.



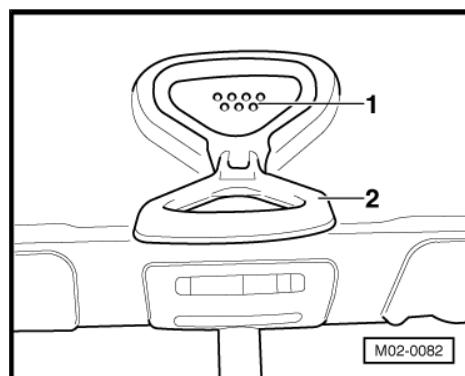
WARNING

- ◆ When opening or closing the convertible top, make sure that no persons are injured by the convertible top, the convertible top linkage or the two moving covers at the rear side windows.
- ◆ Do not open or close the convertible top whilst the vehicle is standing on a lifting platform, with one side on the kerb or on a vehicle jack.

- Pull on handbrake.
- Automatic gearbox: Selector lever in position „P“ or „N“.
- Manual gearbox: Gear lever in neutral.



- Switch on the ignition and leave switched on during the opening process.
- Press the lock button -1- and fold the locking handle down -2-.

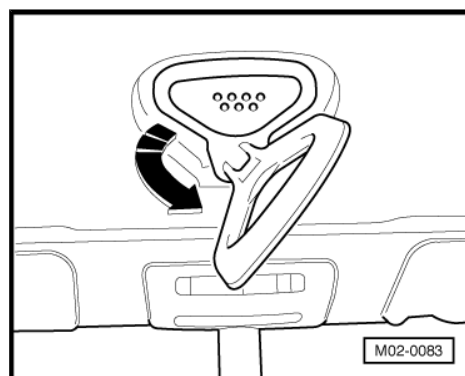


- Turn the locking handle to stop in the direction of the arrow and press it up slightly to release the convertible top.

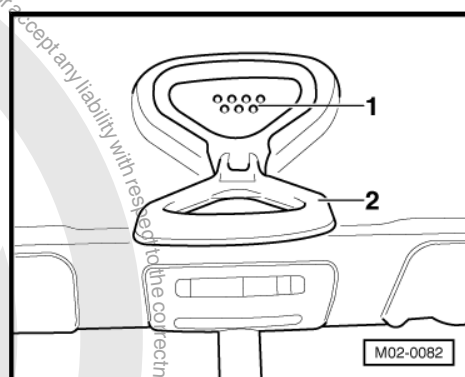


Note

When the lock is released, all windows are lowered slightly and the two covers at the rear windows open. The convertible top warning lamp additionally lights up.

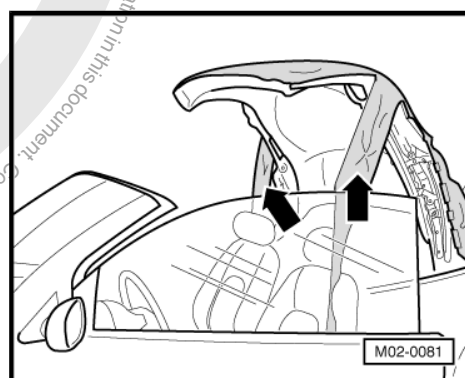


- Fold the locking handle -2- back into the recess.
- Press the convertible top switch in the centre console up and hold it until the convertible top has opened half way.



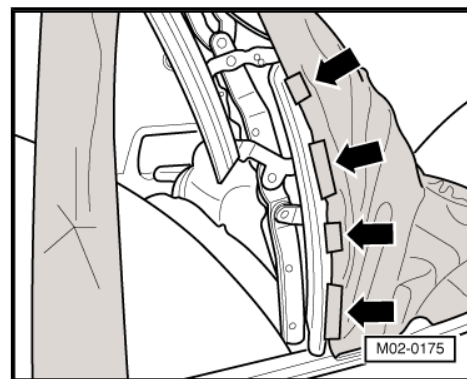
4.58.2 Removing convertible top protective film

- Open the two securing straps' Velcro fastenings.
- Pull the two tensioning straps out from the convertible top fabric's intermediate layer -arrows-.

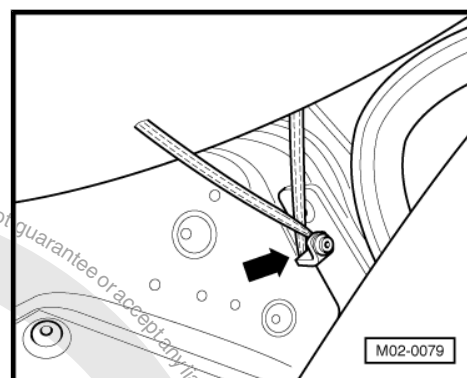




- On the relevant side, release the 4 retaining profiles on the convertible top fabric -arrows-.
- Open rear lid.



- Release the tensioning rubbers from the rear lid stops -arrow-.
- Remove the convertible top protective film.



4.59 Camshaft drive toothed belt: Check

4.59.1 Checking toothed belt condition

- Open clips for upper toothed belt guard and remove cover.
- Check condition of toothed belt for:
 - ◆ Cracks, cross sectional breaks
 - ◆ Layer separation (toothed belt body, draw strands)
 - ◆ Toothed belt body breakup
 - ◆ Fraying of cord strands
 - ◆ Surface cracks (synthetic coating)
 - ◆ Traces of oil and grease



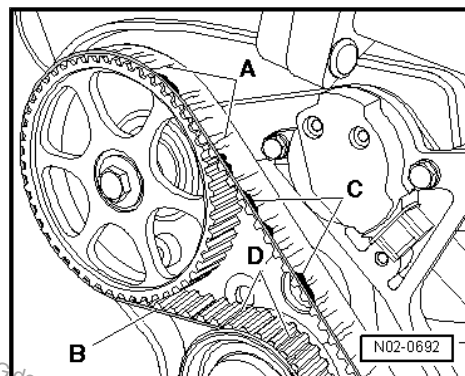
Note

If faults are found always renew toothed belt. This will avoid possible breakdowns or operating problems. The replacement of a toothed belt is a repair measure.



When checking condition, especially watch for following damage:

- A - Cracks (coating)
- B - Side contact
- C - Fraying
- D - Cracks (in teeth base)



4.60 Camshaft drive toothed belt: Checking for wear (SDI/TDI diesel engines)

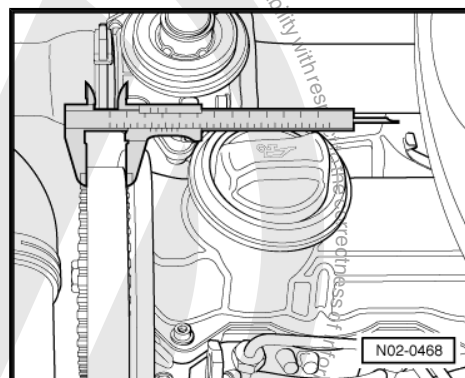
Special tools, testers, measuring instruments and auxiliary items required

- ◆ Vernier caliper (commercially available)

Carry out the following procedure:

- Remove engine cover.
- Open clips on upper toothed belt guard.
- Pull upper toothed belt guard to side or remove.
- Measure the width of the toothed belt with a vernier caliper.

Engine code	Wear limit
ALH	22 mm



Note

When a toothed belt has reached a width of 22 mm, the wear limit has been reached and it must be renewed (repair measure). Inform customer!



WARNING

The engine must never under any circumstances be turned over using the camshaft when checking and making adjustments. Not observing this can lead to severe engine damage.

4.61 Toothed belt and idler roller for camshaft drive: Renewing, SDI / TDI diesel engines



Note

Generally it is not necessary to renew the toothed belt before the actual change interval is reached. Especially cracks on the belt side are not relevant for service life and cannot be covered by goodwill or warranty processing.

- ⇒ 4-cylinder diesel engine; Rep. gr. 15 ; Removing and installing cylinder head; Removing, installing and tensioning toothed belt



4.62 Camshaft drive toothed belt: Renewing (unit injector diesel engines)



Note

Generally it is not necessary to renew the toothed belt before the actual change interval is reached. Especially cracks on the belt side are not relevant for service life and cannot be covered by goodwill or warranty processing.

Work sequence, ⇒ 4-cylinder diesel engine with unit injector, mechanical system; Rep. gr. 15 ; Engine - cylinder head, valve gear

4.63 Camshaft drive belt tensioner: Renewing (unit injector diesel engines)

Work sequence, ⇒ 4-cylinder diesel engine with unit injector, mechanical system; Rep. gr. 15 ; Engine - cylinder head, valve gear

4.64 Camshaft drive toothed belt and toothed belt tensioner: Renewing (4-cylinder 5-valve petrol engines)

- Removing and installing toothed belt: ⇒ 4-cylinder injection engine (5-valve), mechanical system; Rep. gr. 15 ; Cylinder head, valve gear; Removing and installing cylinder head »Removing, installing and tensioning toothed belt«

4.65 Spark plugs: Renew

Renewing spark plugs, 1.4l engine ⇒ [page 133](#) .

Renewing spark plugs, 2.3l engine ⇒ [page 134](#) .

Renewing spark plugs, 1.8l engine ⇒ [page 136](#) .

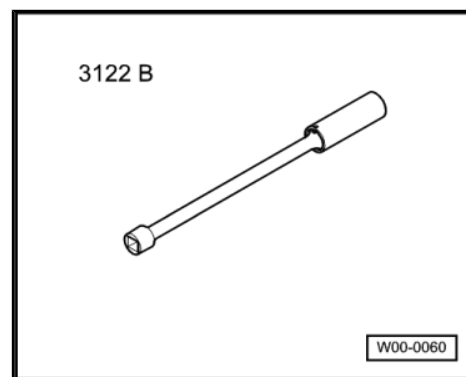
Renewing spark plugs, 1.6l engine ⇒ [page 137](#) .

Renewing spark plugs, 2.0l engine ⇒ [page 137](#) .

Renewing spark plugs, 2.5 l petrol injection engines
⇒ [page 138](#) .

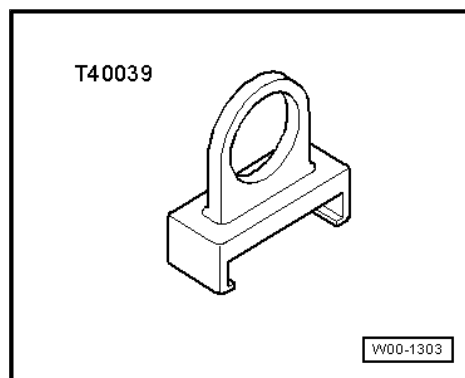
Special tools and workshop equipment required

- ◆ Spark plug socket and extension -3122 B-

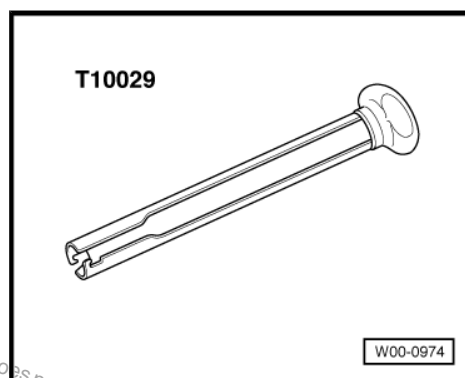




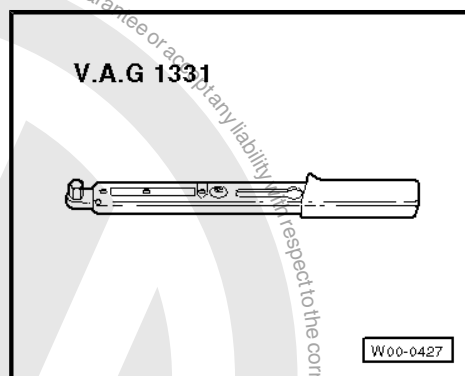
◆ Puller -T40039-



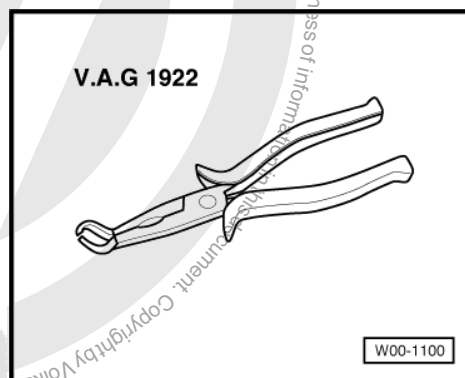
◆ Assembly tool -T10029-



◆ Torque wrench -V.A.G 1331-



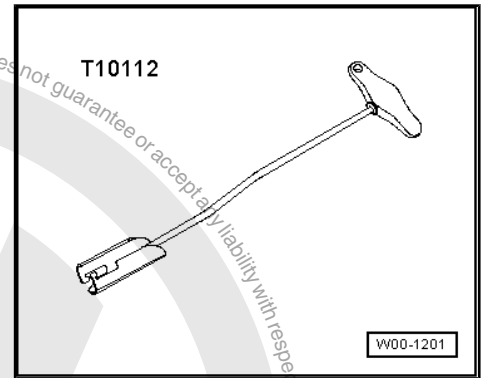
◆ Spark plug connector pliers -V.A.G 1922-



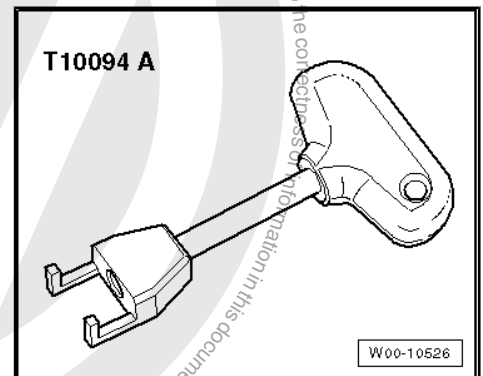
◆ Folder ➔ Data sheets for exhaust emissions test



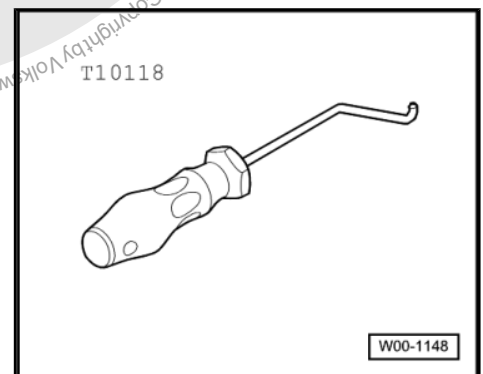
◆ Puller -T10112-



◆ Puller -T10094 A-



◆ Seal puller -T10118-



4.65.1 Renewing spark plugs, 1.4l engine



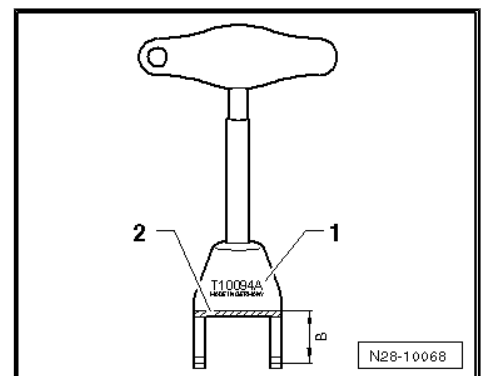
Note

The ignition coil housings with output stages have changed. As a result, these ignition coils can only be removed and installed with puller -T10094 A-. The previous puller -T10094- can further be used if adapted as described below.

- Using suitable workshop tools mill marked area -2- to reach new nominal dimension -B- of 18 mm.
- Also mark tool identification with letter A -1-.

Removing:

Removing and installing engine cover -top- ➔ [page 66](#) .





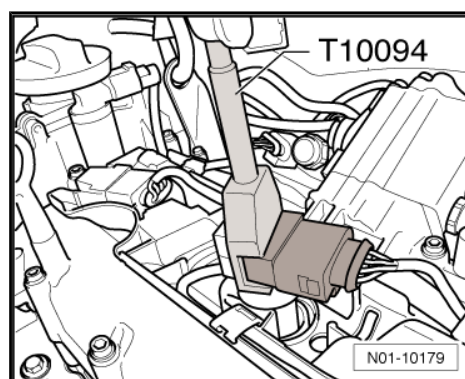
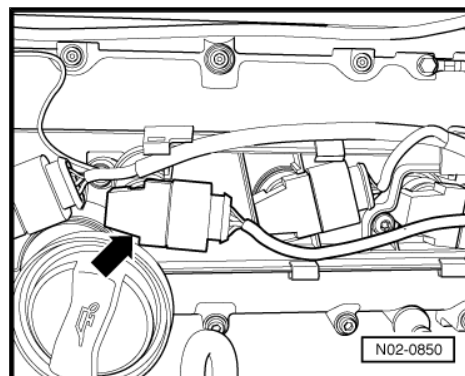
The spark plugs are located under ignition coils with output stages -arrow-.



Note

Note installation position of ignition coils with output stages.

- Pull ignition coils with output stages off spark plugs using the puller -T10094- .
- Press connector in direction of ignition coils with output stage, press onto catch by hand and pull off.

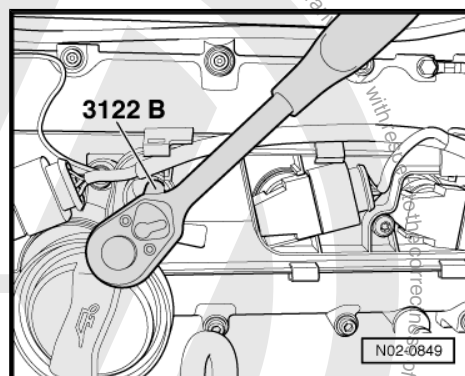
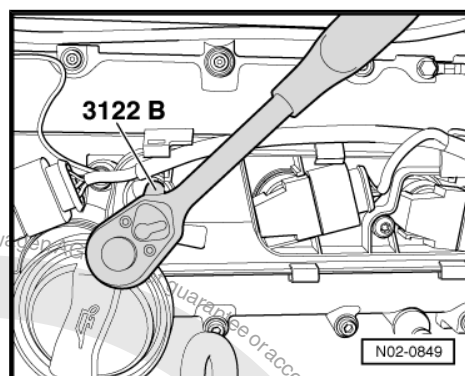


- Unscrew spark plugs using spark plug socket and extension -3122 B- .



Note

- ◆ *Spark plug designation and torque setting ⇒ Power unit; Rep. gr. 28 ; Test data, spark plugs*
- ◆ *Observe disposal regulations!*



Installing

- Screw in new spark plugs using spark plug socket and extension -3122 B- .
- Connect connector to ignition coils with output stage and guide ignition coils with output stage into cylinder head.
- Align ignition coils with output stages in respective recesses of cylinder head cover.
- Fit ignition coils with output stage on spark plugs by hand. They must be felt to engage.
- Installing engine cover, ⇒ [page 66](#) .

4.65.2 Renewing spark plugs, 2.3l engine

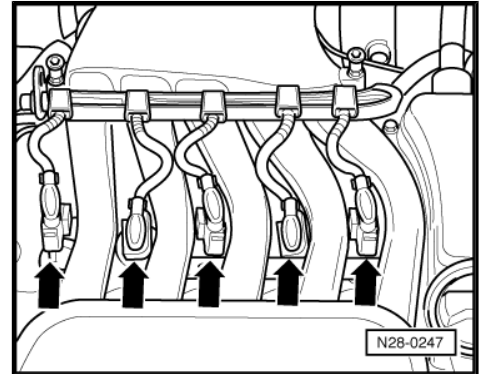
Removing and installing engine cover -top- ⇒ [page 66](#)



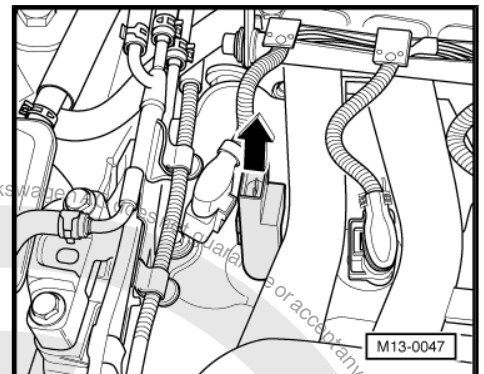
Note

Note installation position when pulling out the ignition coils with output stages.

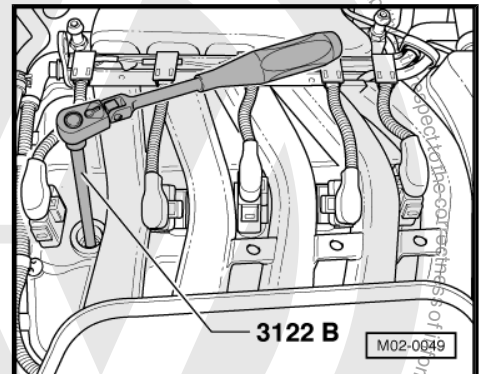
- Pull off ignition coil connector with final output stages -arrows-.



- Pull ignition coil with output stage off upwards using puller - T10095 A- .



- Unscrew spark plugs using spark plug socket and extension -3122 B- .

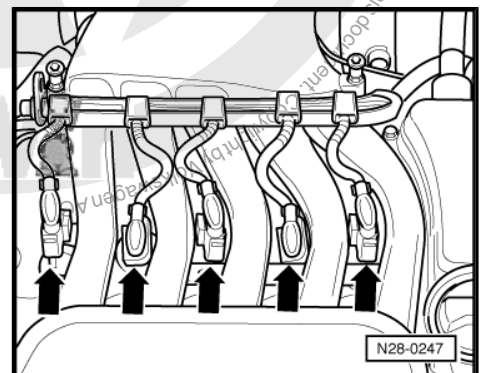


Note

- ◆ *Spark plug designation and torque setting ➔ Power unit; Rep. gr. 28 ; Test data, spark plugs*

- ◆ *Observe disposal regulations!*

- Screw in new spark plugs using spark plug socket and extension -3122 B- .
- Carefully set ignition coils with final output stages onto spark plug by hand.
- Connect ignition coil connector with final output stages -arrows-.



Note

Note installation position.

- Installing engine cover, ➔ [page 66](#) .



4.65.3 Renewing spark plugs, 1.8l engine

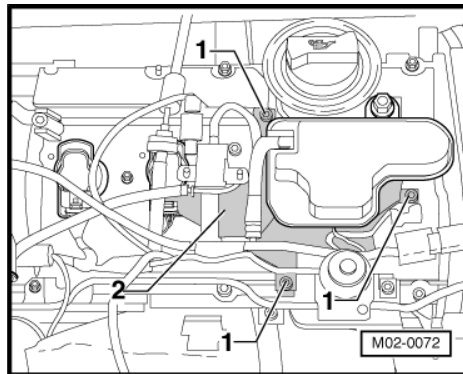
Removing and installing engine cover -top- ➔ [page 66](#)



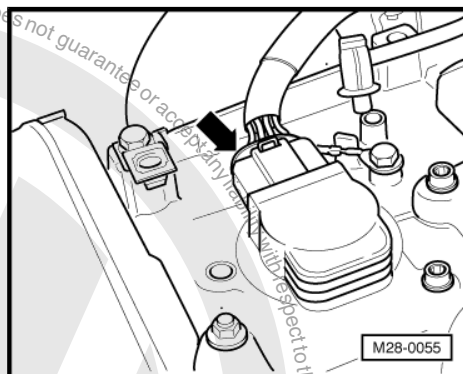
Note

Note installation position when pulling out the ignition coils with output stages.

- Unscrew bolts -1- from vacuum reservoir -2- and place vacuum reservoir to side with lines connected.



- Pull connectors off ignition coils with final output stage -arrow- and pull ignition coils with final output stage carefully off spark plugs by hand.

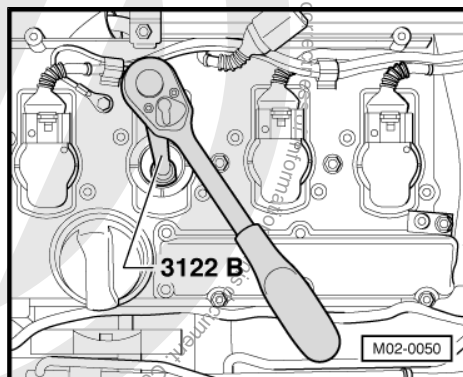


- Unscrew spark plugs using spark plug socket and extension -3122 B- .



Note

- ◆ *Spark plug designation and torque setting ➔ Power unit; Rep. gr. 28 ; Test data, spark plugs*
- ◆ *Observe disposal regulations!*
- Screw in new spark plugs using spark plug socket and extension -3122 B- .
- Fit ignition coil with final output stage carefully onto spark plug by hand.



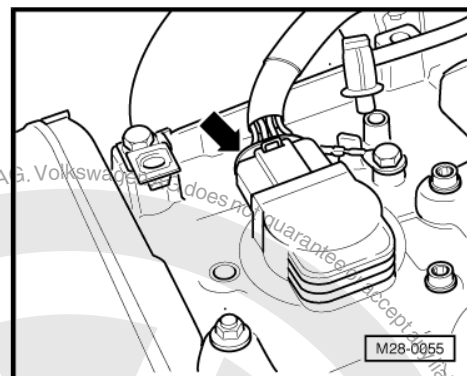


- Fit connectors for ignition coils with final output stage.



Note

- ◆ *Note installation position.*
- ◆ *Further installation is carried out in reverse order.*
- Installing engine cover, ⇒ [page 66](#) .

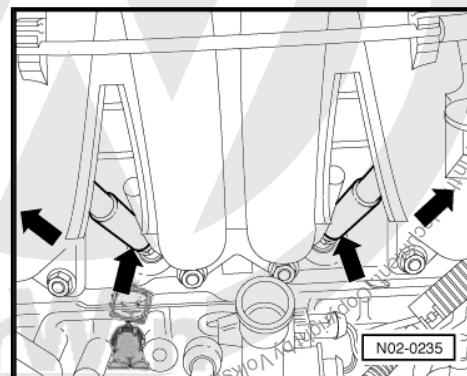


4.65.4 Renewing spark plugs, 1.6l engine

Removing and installing engine cover top- ⇒ [page 66](#)

Special tools and workshop equipment required

- ◆
- Remove connectors from outer injectors.
- The two outer connectors -arrows- (left and right) point to the hidden spark plug connectors.
- Remove spark plug connectors from cylinders 1 and 4 using assembly tool -T10029- -arrow- (outer), and spark plug connectors from cylinders 2 and 3 using spark plug connector pliers -V.A.G 1922- -arrows- (inner).

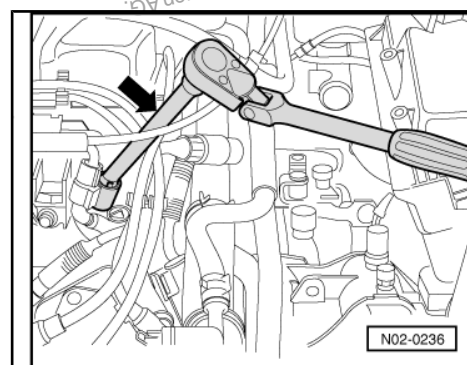


- Unscrew spark plugs using spark plug socket and extension -3122 B- .



Note

- ◆ *Spark plug designation and torque setting ⇒ Power unit; Rep. gr. 28 ; Test data, spark plugs*
- ◆ *Observe disposal regulations!*
- Screw in new spark plugs using spark plug socket and extension -3122 B- .
- Connect spark plug connector using assembly tool -T10029- or spark plug connector pliers -V.A.G 1922- .
- Check that ignition cables and spark plug connectors are fitted securely.
- Installing engine cover, ⇒ [page 66](#) .



4.65.5 Renewing spark plugs, 2.0l engine

Special tools and workshop equipment required

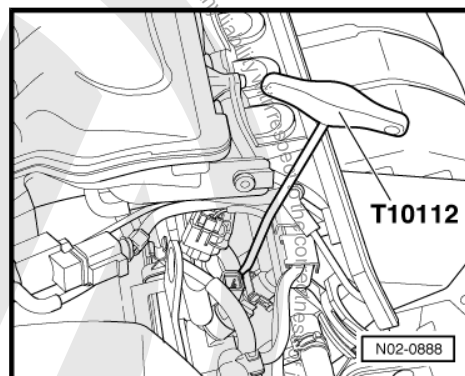
◆

Carry out the following procedure:

- Release clamps and take engine cover off upwards.



- Pull off injector connectors of first and fourth cylinder.
- Pull off spark plug connector using puller -T10112- .

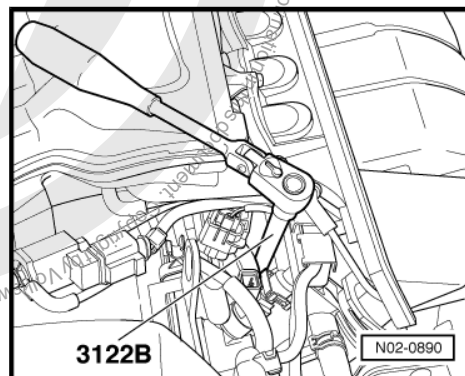


- Unscrew spark plugs using spark plug socket and extension -3122 B- .



Note

- ♦ *Spark plug designation and torque setting ⇒ Power unit; Rep. gr. 28 ; Test data, spark plugs*
- ♦ *Observe disposal regulations!*
- Screw in new spark plugs using spark plug socket and extension -3122 B- .
- Fit spark plug connectors using puller -T10112- .
- Check that ignition cables and spark plug connectors are fitted securely.
- Fit engine cover and secure clamps.



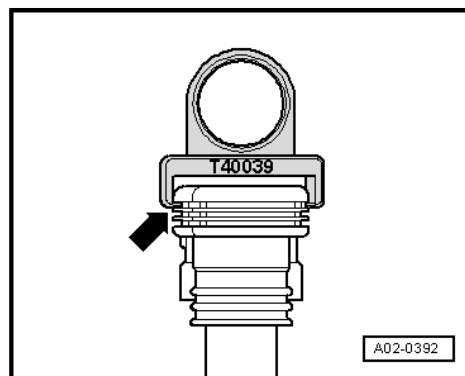
4.65.6 Renewing spark plugs, 2.5 l petrol injection engines

Removing:



Note

- ♦ *To pull off spark plugs, fit puller -T40039- on top, thick rib -arrow- of ignition coils with output stages.*
- ♦ *If the lower ribs are used, they could be damaged.*
- Remove engine cover ⇒ [page 66](#) .





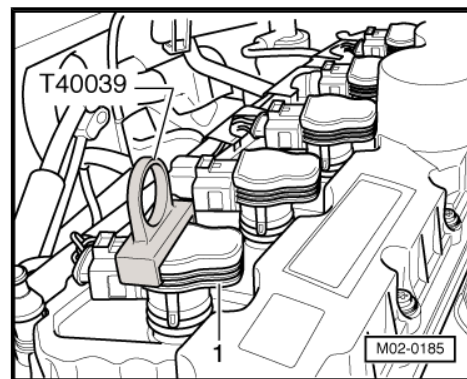
The spark plugs are located below the ignition coils with output stages.

- Remove all ignition coils with output stages -1- upwards using puller -T40039- .



Note

- ◆ *When pulling out the ignition coils with output stages, the cables or the ignition coil connectors can remain connected.*
- ◆ *Note installation position of ignition coils with output stages.*
- Carefully place ignition coils with output stages and cables connected to side.



Caution

Ensure that the cables are not kinked or damaged.

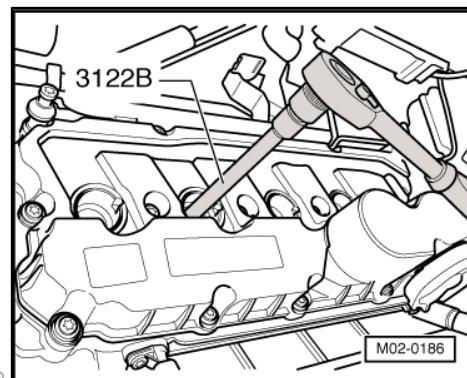
- Unscrew spark plugs using spark plug socket and extension -3122 B- .

Installing



Note

- ◆ *Spark plug designation and torque setting ⇒ Power unit; Rep. gr. 28 ; Test data, spark plugs*
- ◆ *Observe disposal regulations!*
- Screw in new spark plugs using spark plug wrench -3122 B- and tighten to 20 Nm.
- Insert ignition coils with output stages in cylinder head and align ignition coils in respective recesses of cylinder head cover.
- Push ignition coils with output stages onto spark plugs until stop, they must be felt to engage.



Note

Ensure that the cable guide for ignition coils with output stages is routed correctly.

- Install engine cover ⇒ [page 66](#) .



5 Exhaust emissions test



Note

- ◆ Please observe the country specific legal regulations.
- ◆ The exhaust emissions test described below has been created according to the legal regulations valid in Germany.

Emissions test intervals:

Vehicles with regulated catalytic converter or vehicles with diesel engine:

- ◆ 3 years after initial registration and then every 2 years.
- ◆ Vehicles for commercial passenger transport, e.g. taxis: every 12 months.
- Exhaust emissions test for petrol engines without OBD
⇒ [page 140](#)
- Exhaust emissions test for petrol engines with OBD
⇒ [page 148](#)
- Exhaust emissions test for petrol engines, methods to activate disturbance variable for control circuit test according to basic procedure ⇒ [page 156](#)
- Exhaust emissions test for diesel engines ⇒ [page 158](#)

5.1 Exhaust emissions test for petrol engines without OBD



Caution

- Observe „SAFETY AND DAMAGE AVOIDANCE PRE-CAUTIONS“ in the operating instructions for VAS 6300.

Vehicles which are fitted with or without onboard diagnosis can be found in the engine list ⇒ [page 1](#) .

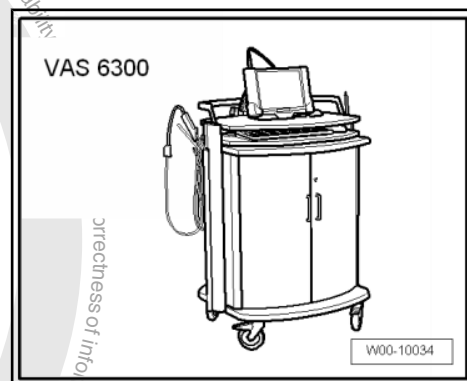


Note

- ◆ All test conditions and data required for exhaust emissions test: ➔ Data sheets for exhaust emissions test
- ◆ The ignition timing is determined by the control unit and cannot be displayed. Adjustment is not possible.
- ◆ Idling speed and CO content are not adjustable (only check). For deviations from test value: carry out repair measures.
- ◆ The CO content is regulated by the lambda regulation. Faults in the lambda regulation are detected in self-diagnosis and stored in fault memory.
- ◆ Faults identified (engine electronics) when fault memory is read must be rectified and the fault memory then cleared.
- ◆ To prevent injuries to personnel and/or damage to ignition and injection system, the ignition system wiring (including high voltage wiring) should be connected and disconnected only with ignition switched off.
- ◆ The following description refers to vehicles equipped without OBD with regulated catalytic converter.

Special tools and workshop equipment required

- ◆ Emissions testing station -VAS 6300-



- ◆ Diagnosis cable -VAS 5051/6A-
- ◆ Adapter for older vehicles -VAS 5051/2-

Or



- ◆ Engine speed adapter -VAS 5087 A-
- ◆ ⇒ Data sheets for exhaust emissions test



Note

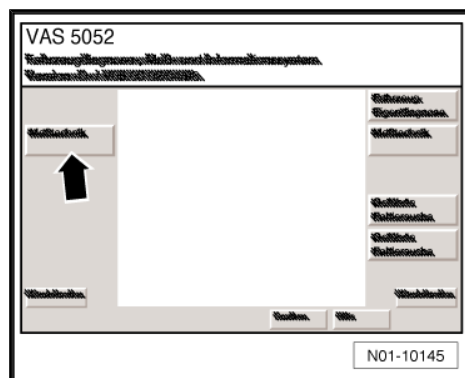
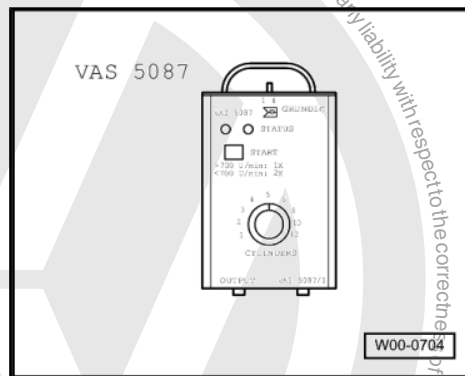
- ◆ *It is only possible to carry out an exhaust emissions test when all units of the emissions testing station -VAS 6300- are connected properly and combined with each other according to the operating instructions.*
- ◆ *All work to be performed is displayed by the emissions testing station -VAS 6300-.*

Test prerequisites:

- All test conditions and data required for exhaust emissions test are found on EET data sheet for the respective engine.
- For bar code reading of specified data for EET, the EET data sheet must be printed out.
- Automatic gearbox: Selector lever in position „P“ or „N“.
- Manual gearbox: Gear lever in neutral
- Handbrake pulled on
- Perform exhaust emissions test according to instructions on display.

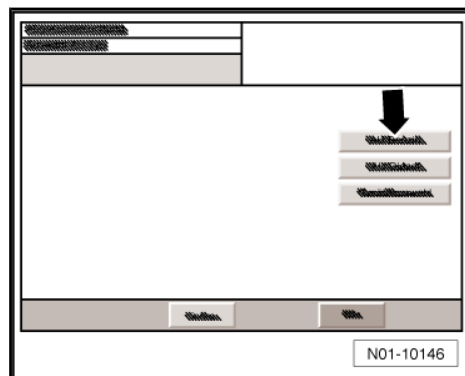
Initial screen:

- Select button -arrow- „exhaust emissions test“.



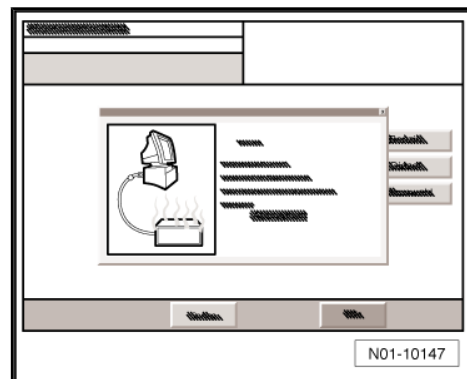
An overview is displayed to select the respective EET type.

- Select „EET petrol“ -arrow-.





The display for warm-up phase appears.



- Continue exhaust emissions test according to instructions on display.
- If the EET specification selection is displayed, select respective „EET specification selection“ arrow.
- ◆ When exhaust emissions test is performed for the first time, either select „Standard values“,
- ◆ Or „Last vehicle“ when an exhaust emissions test is to be carried out again.
- Select „Continue“ on display, see -item 1-.

Vehicle data input:

The vehicle data input menu is displayed.



Note

- ◆ *For new models the document previously known as the vehicle registration document is now called the vehicle registration certificate part 1.*
- ◆ *For new models the document previously known as the vehicle log book is now called the vehicle registration certificate part 2.*



- ◆ -1- Vehicle manufacturer: „e.g. VOLKSWAGEN - VW“
- ◆ -2- Vehicle type: „e.g. Golf“
- ◆ -3- Key number to 1: „e.g. 11“
- ◆ -4- Key number to 2: „e.g. 0603“ (vehicle registration document)
- ◆ -4- Key number to 2.1 (code to 2): „e.g. 0603“ (vehicle registration certificate part 1)
- ◆ -5- Key number for 3: „e.g. 358“ (vehicle registration document)
- ◆ -5- Key number for 2.2 (code to D2): „e.g. 358“ (vehicle registration certificate part 1)
- ◆ -6- Engine code „e.g. AQY“
- ◆ -7- Registration number: „e.g. WOB-HH 1234“
- ◆ -8- Vehicle identification number: „e.g. WVVZZZ1JZYW123456“
- Enter odometer reading at -item 9- „e.g. 32000“.



Note

- ◆ *Further functions can be called up using „GoTo“ button.*
- ◆ *The test can be interrupted using „GoTo“ button.*

Specified data input for EET:

There are different ways to enter the specified data:

- ◆ 1. Manual input
- ◆ 2. Bar code input of EET data sheet
- ◆ 3. ELSA web service



Note

- ◆ *To use the ELSA web service, the VAS 5052 which is used for the exhaust emissions test, must be integrated in the workshop network.*
- ◆ *For the ELSA web service the vehicle specified data are automatically transmitted via the network to the respective mask.*

Manual specified data input for EET:



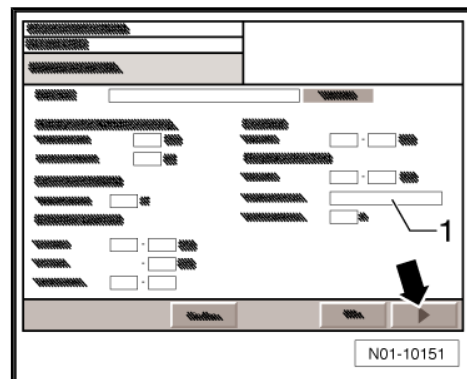
Note

*All test conditions and data required for exhaust emissions test
⇒ Data sheets for exhaust emissions test for respective engine*

- Perform manual data input according to instructions on display.



- Enter displayed values on EET data sheet in column „Test values for exhaust emissions test“ on display as follows:
- 1 - Test speed (idling speed)
- 2 - Warm-up phase for catalytic converter
- 3 - Ignition timing point can / cannot be displayed
- 4 - Engine temperature
- 5 - Increased idling speed
- 6 - CO content at increased idling speed
- 7 - Lambda at increased idling speed
- 8 - Idling speed
- 9 - Type of control circuit test (alternative process; basic process; reserve process; VW alternative process [Read fault memory]) -1-
- 10 - Lambda probe value
- When all data have been entered properly, press »Continue« button -arrow-.



Specified data input for EET as bar code:

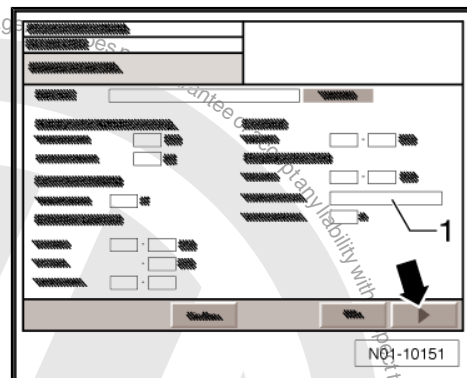
- If specified data for EET are available as bar code, read bar code of EET data sheet with bar code reader.

All data required are shown on display

- Press  button -arrow- to continue the process.

Visual check:

- Follow instructions on display.
- Perform visual check.





- If visual check is OK press „OK“ button. -arrow-.

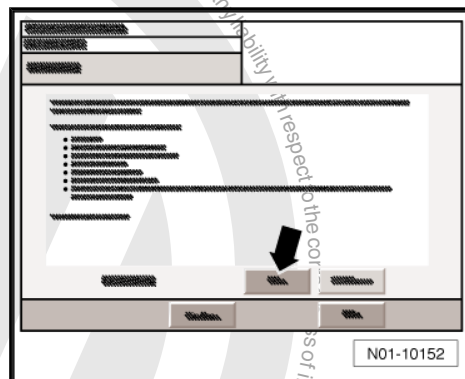


Note

When "not OK" button is pressed a check will be carried out

The visual check is displayed with the request to connect the cables to the vehicle.

- Follow instructions on display.
- Switch off ignition.
- Connect adapter for older vehicles -VAS 5051/2- or engine speed adapter -VAS 5087/- or diagnosis cable -VAS 5051/6A- to the vehicle.



Note

- ◆ *On some engines the inductive sender for cylinder 1 cannot be connected.*
- ◆ *The engine speed adapter -VAS 5087/- can be used for these engines.*
- ◆ *For vehicles with engine code AWH the engine speed adapter -VAS 5087/- must be used.*

- Switch on ignition.
- Insert emission probe in exhaust tail pipe.



Note

The exhaust emissions test is only continued when the test probe is in the exhaust tail pipe.

It is automatically switched to test for readiness of operation.

Catalytic converter conditioning:

It is automatically switched to warm-up phase of catalytic converter.

- Follow instructions on display.

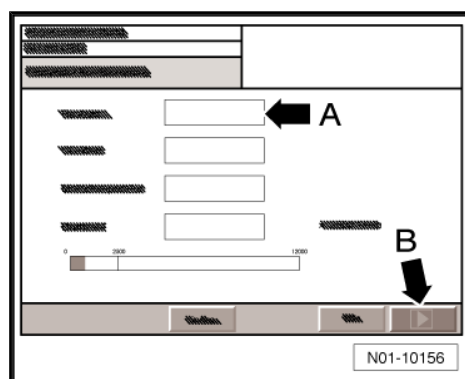
Measurement starts when the engine speed has reached the required level.

- Maintain engine speed in required engine speed range.

The remaining time to perform the warm-up phase is displayed - arrow A -.

It is automatically switched to display for measuring engine temperature.

Warm-up phase:





- Follow instructions on display.



Note

This is only indicated on display if engine temperature has not reached 80 °C.

- Bring engine to required temperature.

It is automatically switched to display for measuring increased idling speed.



Measurement at increased idling speed:

- Follow instructions on display.

Measurement starts when the engine speed has reached the required level.



Note

- ◆ *Measurement can be skipped using  button, i.e. the exhaust emissions test has failed.*
- ◆ *Measured values are reset using the  button and the test can be repeated.*

- Maintain engine speed in required engine speed range.

The remaining time to perform measurement is displayed -arrow A-.

It is automatically switched to display for measuring the idling speed and CO content.

Measuring idling speed and CO content:

Measurement starts when the engine speed has reached the required level.

The remaining time to perform measurement is displayed -arrow A-.

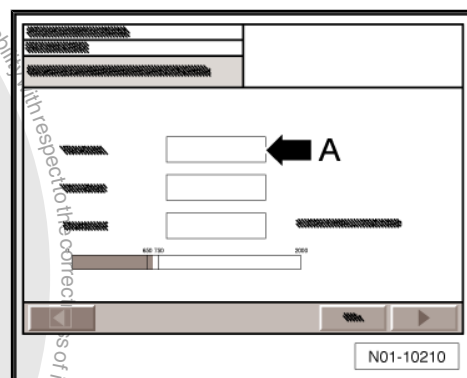
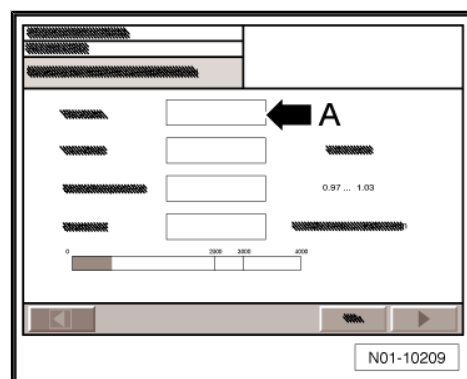
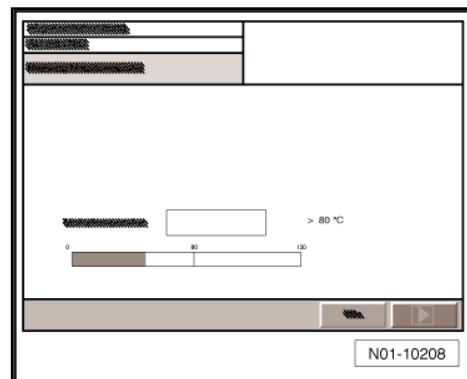
It is automatically switched to display for control circuit test.

Control circuit test

The fault memory of the engine control unit is read.

If a fault is found it must be rectified using guided fault finding, otherwise the exhaust emissions test has failed.

If „no fault found“ is indicated on display, confirm and then the log of the exhaust emissions test is shown.



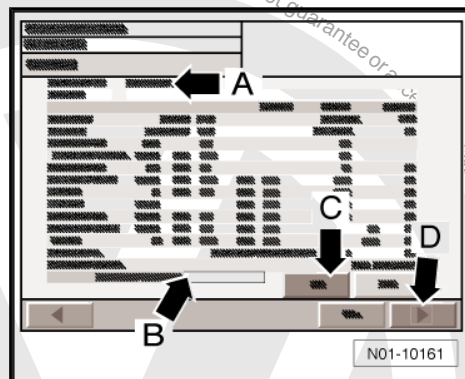


Evaluation:


The test result is displayed.

Now remarks concerning the exhaust emissions test can be entered -arrow A-. They will then be included in the test log.

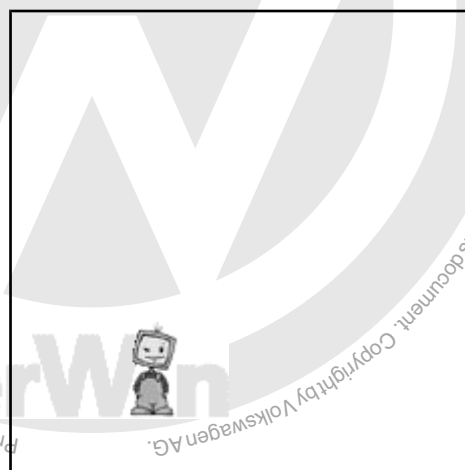
- When the exhaust emissions test is classed as passed, select -arrow B- „EET sticker issued“ in drop-down menu and date.
- Then confirm with „Yes“, see -arrow C-.



After confirming, the two „TEST CERTIFICATES“ are printed out automatically.

- If a further test certificate is required, press -arrow A- „Print“ button.
- Follow instructions on display.
- Take emission probe out of exhaust tail pipe.
- Then press  button -arrow B-.

The exhaust emissions test is completed, a new exhaust emissions test can be performed.



5.2 Exhaust emissions test for petrol engines with OBD

Vehicles which are fitted with or without „Onboard diagnosis“ can be found in the engine list ➔ [page 1](#) .



Caution

- **Observe „SAFETY AND DAMAGE AVOIDANCE PRECAUTIONS“ in the operating instructions for VAS 6300.**



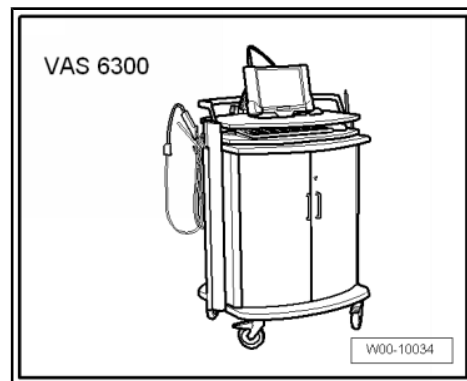
Note

- ♦ The following description refers to vehicles fitted with „On-board diagnosis“ OBD with regulated catalytic converter.
- ♦ The OBD monitors all components and part systems influencing the exhaust emissions quality.

Special tools and workshop equipment required



◆ Emissions testing station -VAS 6300-



◆ OBD adapter cable -VAS 5052/16-



Note

- ◆ *It is only possible to carry out an exhaust emissions test when all units of the emissions testing station -VAS 6300- are connected properly and combined with each other according to the operating instructions.*
- ◆ *All work to be performed is displayed by the emissions testing station -VAS 6300-.*

Test prerequisites:

- All test conditions and data required for exhaust emissions test are found on EET data sheet for the respective engine.
- For bar code reading of specified data for EET, the EET data sheet must be printed out.
- Automatic gearbox: Selector lever in position „P“ or „N“.
- Manual gearbox: Gear lever in neutral
- Handbrake pulled on
- Perform exhaust emissions test according to instructions on display.

Initial screen:

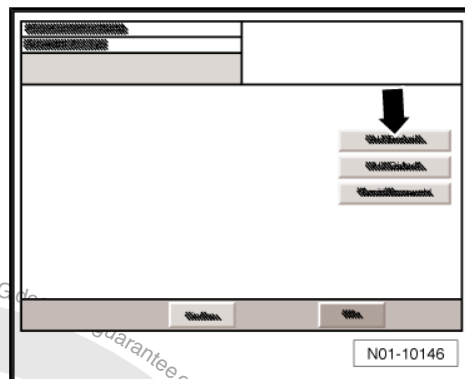
- Select button -arrow- „exhaust emissions test“.



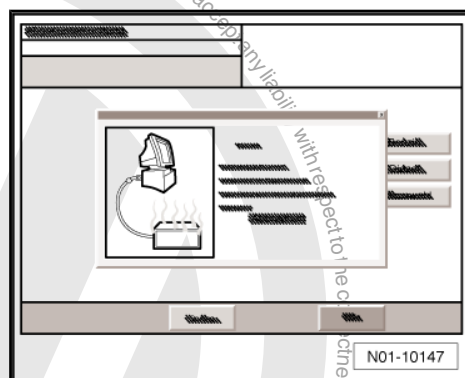


An overview is displayed to select the respective EET type.

- Select „EET petrol“ -arrow-.



The display for warm-up phase appears.



- Continue exhaust emissions test according to instructions on display.
- If the EET specification selection is displayed, select respective „EET specification selection“ -arrow-.
- ◆ When exhaust emissions test is performed for the first time, either select „Standard values“,
- ◆ Or „Last vehicle“ when an exhaust emissions test is to be carried out again.
- Select „Continue“ on display, see -item 1-.

Vehicle data input:

The vehicle data input menu is displayed.



Note

- ◆ For new models the document previously known as the vehicle registration document is now called the vehicle registration certificate part 1.
- ◆ For new models the document previously known as the vehicle log book is now called the vehicle registration certificate part 2.



- ◆ -1- Vehicle manufacturer: „e.g. VOLKSWAGEN - VW“
- ◆ -2- Vehicle type: „e.g. Golf“
- ◆ -3- Key number to 1: „e.g. 11“
- ◆ -4- Key number to 2: „e.g. 0603“ (vehicle registration document)
- ◆ -4- Key number to 2.1 (code to 2): „e.g. 0603“ (vehicle registration certificate part 1)
- ◆ -5- Key number for 3: „e.g. 358“ (vehicle registration document)
- ◆ -5- Key number for 2.2 (code to D2): „e.g. 358“ (vehicle registration certificate part 1)
- ◆ -6- Engine code „e.g. AQY“
- ◆ -7- Registration number: „e.g. WOB-HH 1234“
- ◆ -8- Vehicle identification number: „e.g. WVVZZZ1JZYW123456“
- Enter odometer reading at -item 9- „e.g. 32000“.



Note

- ◆ Further functions can be called up using „GoTo“ button.
- ◆ The test can be interrupted using „GoTo“ button.

– Select „with OBD“, -arrow-.

Specified data input for EET:

There are different ways to enter the specified data:

- ◆ 1. Manual input
- ◆ 2. Bar code input of EET data sheet
- ◆ 3. ELSA web service



Note

- ◆ To use the ELSA web service, the VAS 5052 which is used for the exhaust emissions test, must be integrated in the workshop network.
- ◆ For the ELSA web service the vehicle specified data are automatically transmitted via the network to the respective mask.

Manual specified data input for EET:



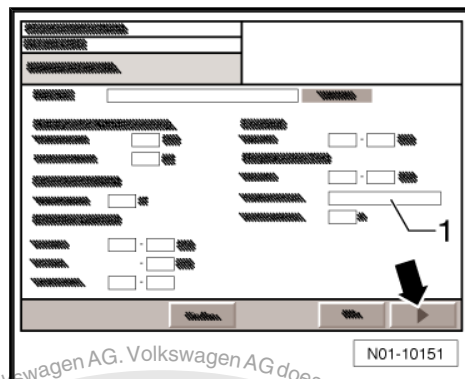
Note

All test conditions and data required for exhaust emissions test
⇒ Data sheets for exhaust emissions test for respective engine

- Perform manual data input according to instructions on display.



- Enter displayed values on EET data sheet in column „Test values for exhaust emissions test“ on display as follows:
- 1 - Test speed (idling speed)
- 2 - Warm-up phase for catalytic converter
- 3 - Engine temperature
- 4 - Increased idling speed
- 5 - CO content at increased idling speed
- 6 - Lambda at increased idling speed
- 7 - Idling speed
- 8 - Select regulating probe type, either »step-type probe«, or »broad-band probe« -item 1-.
- 9 - Lambda probe value
- When all data have been entered properly, press »Continue« button -arrow-.

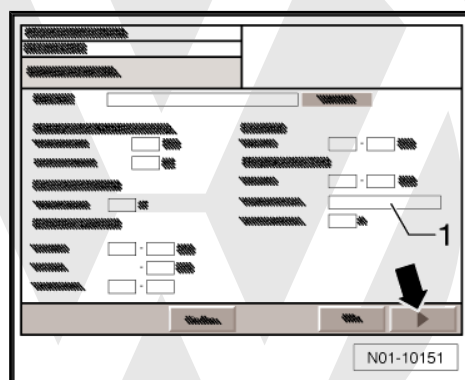


Specified data input for EET as bar code:

- If specified data for EET are available as bar code, read bar code of EET data sheet with bar code reader.

All data required are shown on display.

- Press  button -arrow- to continue the process.



Visual check:

- Follow instructions on display.
- Perform visual check.
- If visual check is OK press „OK“ button. -arrow-.



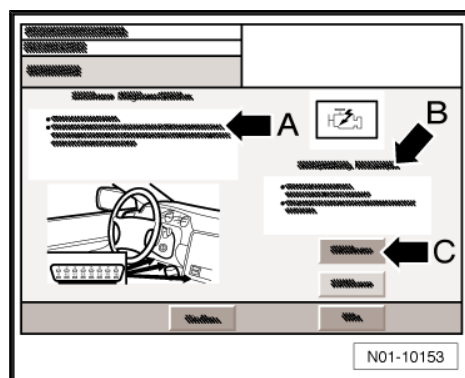
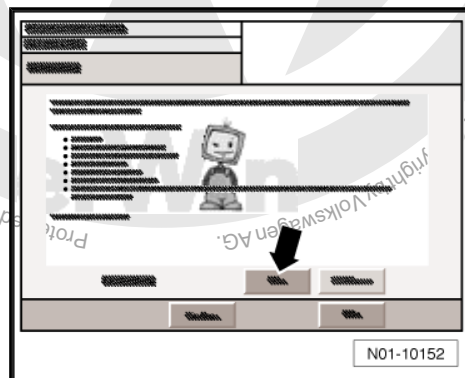
Note

When "not OK" button is pressed a check will be carried out

Connecting diagnostic connector:

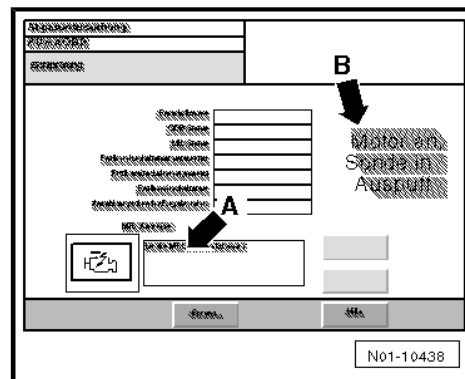
- Ignition is switched off.

The visual check is displayed with the request to connect the diagnostic connector -arrow A- and to check the MI lamp -arrow B-.





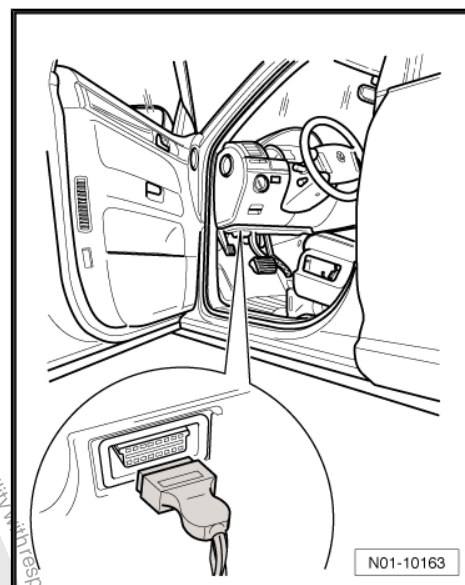
- Follow instructions on display -arrow A- and -arrow B-.



- Connect diagnosis cable connector to EOBD connection.

Visual check of MI lamp with ignition switched off:

- Switch on ignition.
- Perform visual check of „MI lamp“.



- If lamp lights up, press „Lamp On“ button -arrow C-.

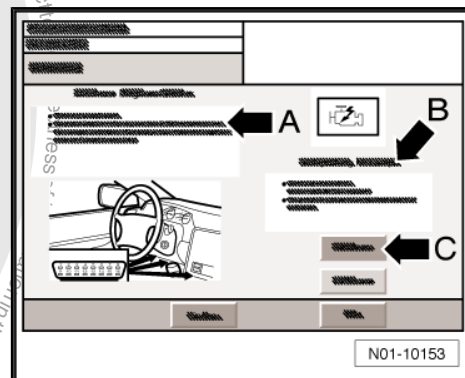


Note

If the MI lamp does not light up during visual check, the result of the exhaust emissions test is „Failed“.

Visual check of MI lamp with engine running:

- Start engine and confirm engine running on display with „Yes“.
- Perform visual check of „MI lamp“, lamp must no longer light up or flash.





- Confirm condition of „MI lamp“ -arrow-.

It is automatically switched to test for readiness of operation.

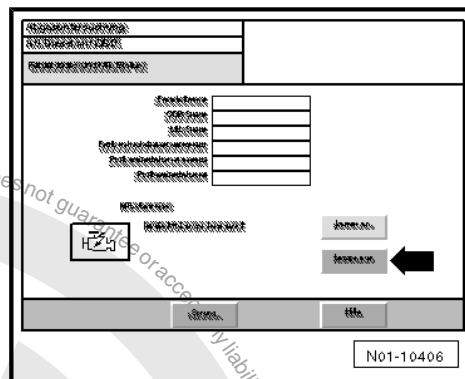
It is checked here if all tests for readiness of operation supported by the control unit have been performed.

- Insert emission probe in exhaust tail pipe.



Note

The exhaust emissions test is only continued when the test probe is in the exhaust tail pipe.



Note

- ♦ If all display values are set to zero, a regulating probe test is not performed.
- ♦ If not all display values are set to zero, a regulating probe test will be performed later.

Catalytic converter conditioning:

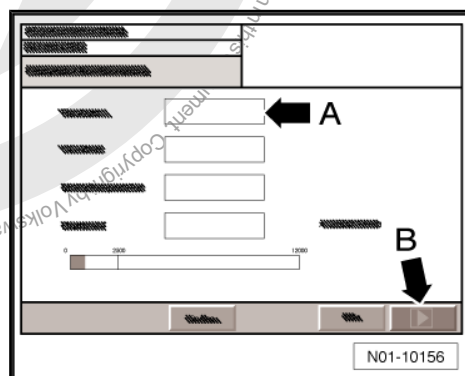
It is automatically switched to warm-up phase of catalytic converter.

- Follow instructions on display.

Measurement starts when the engine speed has reached the required level.

- Maintain engine speed in required engine speed range.

The remaining time to perform the warm-up phase is displayed - arrow A -.



Warm-up phase:

It is automatically switched to display for measuring engine temperature.

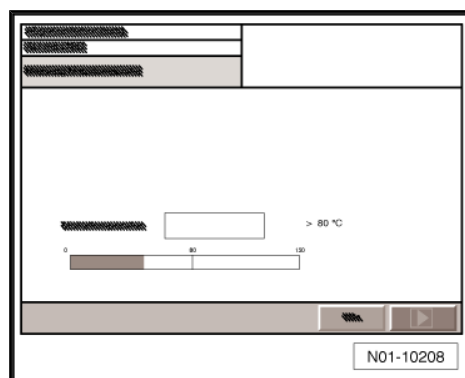
- Follow instructions on display.



Note

This is only indicated on display if engine temperature has not reached 80 °C.

- Bring engine to required temperature.





Measurement at increased idling speed:

It is automatically switched to display for measuring increased idling speed.

- Follow instructions on display.

Measurement starts when the engine speed has reached the required level.



Note

- ◆ *Measurement can be skipped using button, i.e. the exhaust emissions test has failed.*
- ◆ *Measured values are reset using the button and the test can be repeated.*

Maintain engine speed in required engine speed range.

The remaining time to perform measurement is displayed -arrow A-.

Measuring idling speed and CO content:

It is automatically switched to display for measuring the idling speed and CO content.

Measurement starts when the engine speed has reached the required level.

The remaining time to perform measurement is displayed -arrow A-.

Regulating probe test:



Note

The regulating probe test is only performed, when „NOT“ all display values are set to zero at the test for readiness of operation.

It is automatically switched to display for regulating probe test.

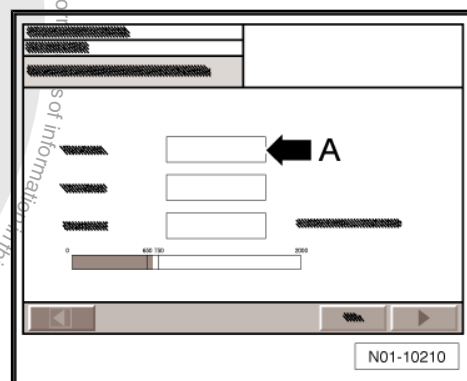
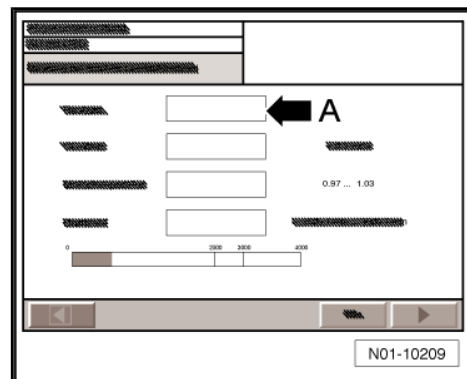


Note

The regulating probe test is performed for every lambda probe individually.

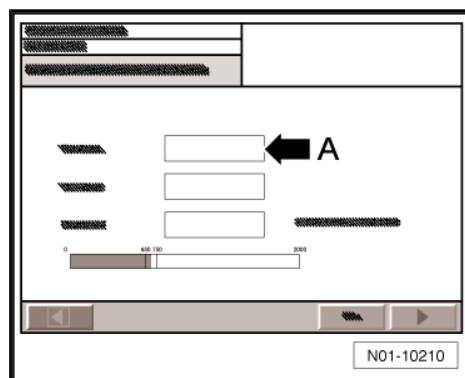
Measurement starts when the engine speed has reached the required level.

- Maintain engine speed in required engine speed range.





The remaining time to perform measurement is displayed
-arrow A-.



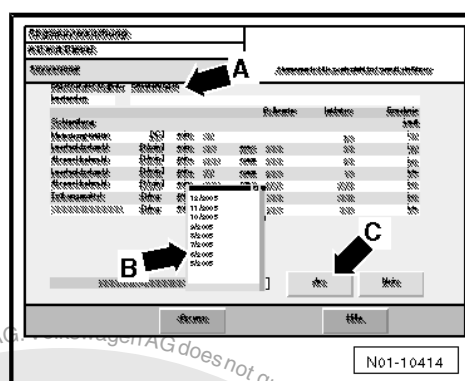
Evaluation:

When the exhaust emissions test has been performed, the log is shown on display.

The test result is displayed.

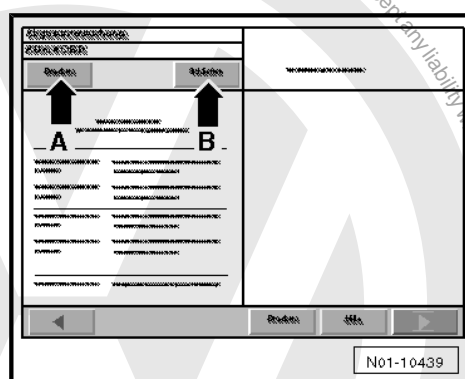
Now remarks concerning the exhaust emissions test can be entered -arrow A-. They will then be included in the test log.

- When the exhaust emissions test is classed as passed, select -arrow B- „EET sticker issued“ in drop-down menu and date.
- Then confirm with „Yes“ -arrow C-.



The exhaust emissions test log is shown on display and can be printed out as often as required in the menu „Print preview“ using „Print“ button -arrow A-.

- Press button „Close“ -arrow B- to close the menu „Print preview“.
- Follow instructions on display.
- Take emission probe out of exhaust tail pipe.



- Then press button -arrow B-.

The exhaust emissions test is completed, a new exhaust emissions test can be performed.



5.3 Exhaust emissions test for petrol engines, methods to activate disturbance




variable for control circuit test according to basic procedure

5.3.1 Engine code: AWH

It is automatically switched to display for control circuit test.

Measurement starts when the engine speed has reached the required level.

- Maintain engine speed in required engine speed range.
- Activate disturbance variable within 60 seconds as follows:
- Switch off engine.
- Pull off fuse 10 and wait for approx. 2 seconds.
- Reinsert fuse.
- Start engine but do not operate throttle.
- Then run engine for approx. 60 seconds.
- Press  button, control circuit test will be initiated.
- Activate disturbance variable within 60 seconds as follows:
- Pull 4-pin connector -1- off coolant temperature sender (G62) -2-.

The control unit must recognise the disturbance variable and eliminate through regulation within 60 seconds.

- Fit connector to coolant temperature sender.

The remaining time to perform measurement is displayed.

Evaluation:

The evaluation is identical to the evaluation for exhaust emissions test with control circuit test according to VW alternative process.

⇒ [page 140](#)

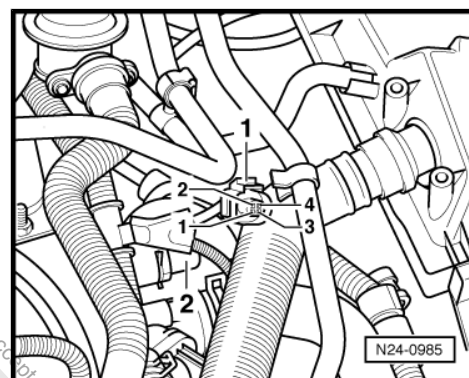
If actual figures deviate from specifications: Repair measures and again perform exhaust emissions test!

After completing exhaust emissions test note the following:



Note

- ◆ The control circuit test is also completed when the disturbance variable has been recognised only in one direction.
- ◆ If actual figures deviate from specifications: Repair measures and again perform exhaust emissions test!
- ◆ If the disturbance variable has not been recognised (lambda change insufficient) repeat lambda control circuit test.
- ◆ Reconnect all hoses and connections that have been disconnected or separated for checking and adjusting purposes.
- ◆ Operate assemblies e.g. power assisted steering, automatic gearbox, air conditioning system and check that the engine operates smoothly under these load conditions.





5.4 Exhaust emissions test for diesel engines

Exhaust emissions test for diesel engines without OBD with diesel tester V.A.G 1743 ➔ [page 158](#)

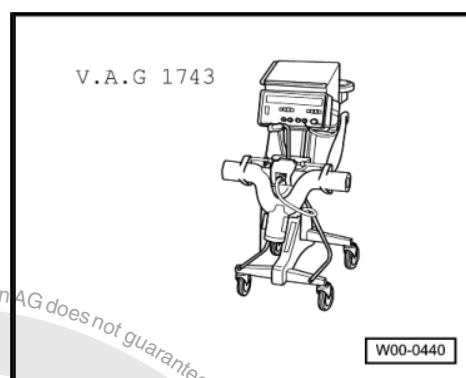
Exhaust emissions test for diesel engines without OBD with emissions testing station VAS 6300 ➔ [page 162](#)

Exhaust emissions test for diesel engines with OBD with exhaust emissions station VAS 6300 ➔ [page 170](#)

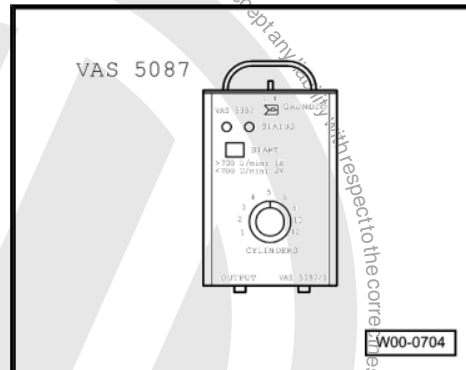
5.4.1 Exhaust emissions test for diesel engines without OBD with diesel tester V.A.G 1743

Special tools and workshop equipment required

- ◆ Diesel tester -V.A.G 1743-



- ◆ Engine speed adapter -VAS 5087-



- ◆ Adapter cable -VAS 5087/3-



Note

- ◆ *All test conditions and data required for emissions test ➔ Data sheets for exhaust emissions test*
- ◆ *If possible, the test should be completed outdoors following a road test. If this is not possible for various reasons (weather, excessive noise in residential areas), then the test can be carried out in a workshop.*
- ◆ *To reduce noise levels, the bonnet should be closed on first catch during tests.*

Performing visual check of components influencing emissions:

⇒ Data sheets for exhaust emissions test, ⇒ Data sheets for exhaust emissions test



- Perform visual check for:
- ◆ Installation
- ◆ Completeness
- ◆ Leakage
- ◆ Damage



Note

Faults found are to be rectified.

With ignition switched off, connect testers as follows:

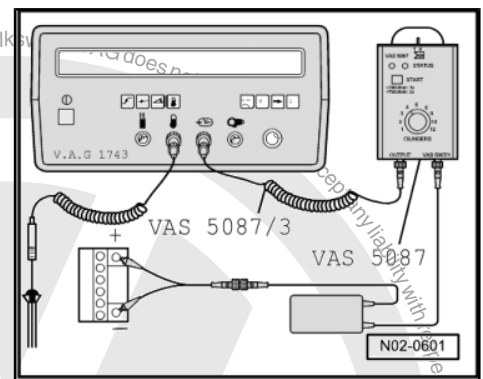
- Pull on handbrake.
- Manual gearbox: Gear lever in neutral.
- Automatic gearbox: Selector lever in position „P“ or „N“.
- Connect diesel tester -V.A.G 1743- according to operating instructions with ignition switched off.

Connect engine speed adapter -VAS 5087- as follows:



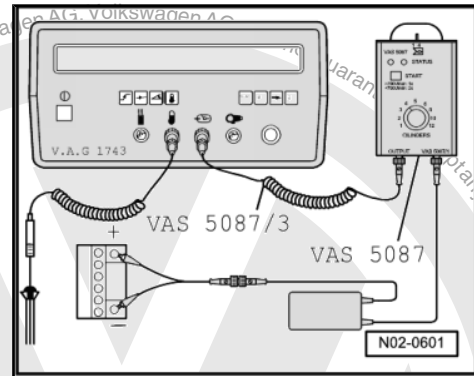
Note

- ◆ *Observe ⇒ operating instructions for engine speed adapter -VAS 5087- !*
- ◆ *Strictly follow the safety precautions in the operating instructions!*





- Using adapter cable -VAS 5087/3- , connect „Output“ of engine speed adapter -VAS 5087- to pick-up clamp input of diesel tester -V.A.G 1743- .
- Turn switch for number of cylinders to respective number of cylinders.
- Connect a wire from adapter -VAS 5087/1- to -VAS 5087- (socket -VAS 5087/1-) .
- Using the other wires from adapter -VAS 5087/1- make a connection to the vehicle battery, by connecting:
 - ◆ Red clamp on positive
 - ◆ Black clamp on negative
- Start engine and run at idling speed.
- Press the **Start** button on engine speed adapter -VAS 5087- . The red signal lamp must flash for about 10 seconds. Then the green signal lamp must light up.



The engine speed must now be displayed on diesel tester - V.A.G 1743- .

If the engine speed is displayed incorrectly or not at all: ⇒ Operating instructions for VAS 5087 .

Perform exhaust emissions test according to instructions on diesel tester -V.A.G 1743- display.

If the following is indicated on display:

n rpm	mode	k l/m	T °C
XXX XXXX	B	X.XX	XX

Unit ready to carry out measurements.

Checking idling speed:

Idling speed not within specified range:



Note

The idling speed and maximum speed can be checked but not adjusted.

- If the values are not within specified range, a repair measure must be made.

Perform acceleration test:

- Press button for »Acceleration test«.

First, a fresh air comparison is performed.

If the following is indicated on display:

n rpm	tB s	k l/m	Gas	T °C	M
XXX XXXX	-. -	X.XX	0	XX	-

Current values for temperature and speed are displayed.

The arrow pointing upwards indicates that the unit is waiting for the throttle burst.

- Depress accelerator pedal fully and hold for specified time.
- Check maximum engine speed (not adjustable).



WARNING

If the governed speed (maximum speed) is exceeded, lift off accelerator pedal immediately and perform repair measures.

- If the values are not within specified range, a repair measure must be made.

If the unit detects a valid throttle burst (the speed increases continually during measuring period tx), the following is indicated on display:

If the following is indicated on display:

n rpm	tB s	k l/m	Gas T °C	M
XXX XXXX	-. -	-. -	1 XX	-

The display remains „frozen“ during the evaluation phase (approx. 15 seconds).

After the evaluation phase, the display changes to:

n rpm	tB s	k l/m	Gas T °C	M
XXX XXXX	X.XX	X.XX	1 XX	-

The arrow pointing upwards indicates that the unit is waiting for the next throttle burst.

Repeat test 4 times.

The following is indicated on display after each throttle burst:

n rpm	tB s	k l/m	Gas T °C	M
XXX XXXX	X.XX	X.XX	X XX	-

In this way, the unit measures and registers at least four throttle bursts. After the fourth and for each further throttle burst sequence, an average of the last three measurements is performed.

The following is indicated on display after each throttle burst:

n rpm	tB s	k l/m	Gas T °C	M
XXX XXXX	X.XX	X.XX	X XX	-

After 10 seconds, this display changes to:

Average	tB s	k l/m	band width	M
	X.XX	X.XX	X.XX	-

After 5 seconds, this display changes to:

Average	tB s	k l/m	band width	M
	X.XX	X.XX	XX	-

The display remains until a further throttle burst is performed or another measurement is called up.

If the opacity figures are equal to or less than the prescribed figures, cease measurements.

If the determined opacity figure is above the prescribed figure, locate fault within repair measure framework ➔ Fault finding engine



5.4.2 Exhaust emissions test for diesel engines without OBD with emissions testing station VAS 6300



Caution

- Observe „SAFETY AND DAMAGE AVOIDANCE PRECAUTIONS“ in the operating instructions for VAS 6300.

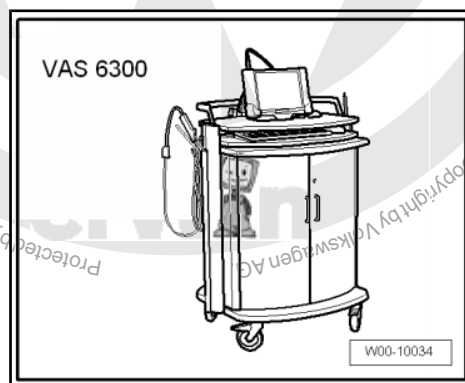


Note

The following description refers to vehicles not fitted with „On-board diagnosis“, OBD.

Special tools and workshop equipment required

- ◆ Emissions testing station -VAS 6300-



- ◆ OBD adapter cable -VAS 5052/16-



Note

- ◆ It is only possible to carry out an exhaust emissions test when all units of the emissions testing station -VAS 6300- are connected properly and combined with each other according to the operating instructions.
- ◆ All work to be performed is displayed by the emissions testing station -VAS 6300-.

Test prerequisites:

- All test conditions and data required for exhaust emissions test are found on EET data sheet for the respective engine.
- For bar code reading of specified data for EET, the EET data sheet must be printed out.
- Automatic gearbox: Selector lever in position „P“ or „N“.
- Manual gearbox: Gear lever in neutral
- Handbrake pulled on
- Perform exhaust emissions test according to instructions on display.

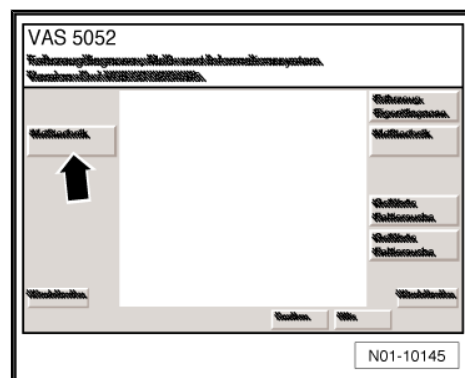


Initial screen:

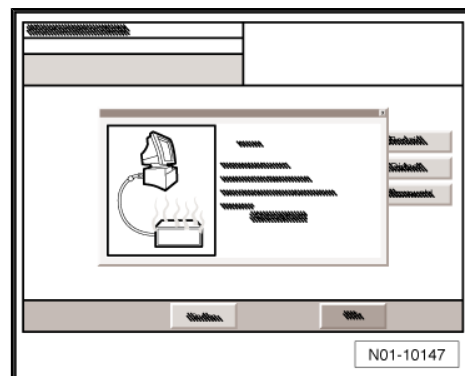
- Select button „Exhaust emissions test“ -arrow-.

An overview is displayed to select the respective EET type.

- Select „EET diesel“ -arrow-.



The display for warm-up phase appears.



- Continue exhaust emissions test according to instructions on display.
- If the EET specification selection is displayed, select respective „EET specification selection“ -arrow-.
- ◆ When exhaust emissions test is performed for the first time, either select „Standard values“,
- ◆ Or „Last vehicle“ when an exhaust emissions test is to be carried out again.
- Select „Continue“ -item 1- on display.

Vehicle data input:

The vehicle data input menu is displayed.



Note

- ◆ For new models the document previously known as the vehicle registration document is now called the vehicle registration certificate part 1.
- ◆ For new models the document previously known as the vehicle log book is now called the vehicle registration certificate part 2.



- ◆ -1- Vehicle manufacturer: „e.g. VOLKSWAGEN - VW“
- ◆ -2- Vehicle type: „e.g. Golf“
- ◆ -3- Key number to 1: „e.g. 11“
- ◆ -4- Key number to 2: „e.g. 0603“ (vehicle registration document)
- ◆ -4- Key number to 2.1 (code to 2): „e.g. 0603“ (vehicle registration certificate part 1)
- ◆ -5- Key number for 3: „e.g. 358“ (vehicle registration document)
- ◆ -5- Key number for 2.2 (code to D2): „e.g. 358“ (vehicle registration certificate part 1)
- ◆ -6- Engine code „e.g. AQY“
- ◆ -7- Registration number: „e.g. WOB-HH 1234“
- ◆ -8- Vehicle identification number: „e.g. WVVZZZ1JZYW123456“
- Enter odometer reading at -item 9- „e.g. 32000“.



Note

- ◆ Further functions can be called up using **GoTo** button.
- ◆ The test can be interrupted using **GoTo** button.
- Select „diesel below 3.5t“ or „diesel above 3.5t“ -arrow-.

Specified data input for EET:

There are different ways to enter the specified data:

- ◆ 1. Manual input
- ◆ 2. Bar code input of EET data sheet
- ◆ 3. ELSA web service



Note

- ◆ To use the ELSA web service, the VAS 5052 which is used for the exhaust emissions test, must be integrated in the workshop network.
- ◆ For the ELSA web service the vehicle specified data are automatically transmitted via the network to the respective mask.

Manual specified data input for EET:



Note

All test conditions and data required for exhaust emissions test
⇒ Data sheets for exhaust emissions test for respective engine



– Perform manual data input according to instructions on display.

– Enter displayed values on EET data sheet in column „Test values for exhaust emissions test“ on display as follows:

- 1 - Speed for conditioning
- 2 - Number of throttle bursts for conditioning
- 3 - Engine oil temperature (min. value)
- 4 - Select engine oil temperature measurement procedure
- 5 - Idling speed
- 6 - Rev limit
- 7 - Rev limit measuring period (1 second)
- 8 - Opacity figure (average)
- 9 - Select probe type (No. of probe)
- 10 - Select measuring mode
- 11 - Measured period portion

– When all data have been entered properly, press button -arrow-.

Specified data input for EET as bar code:

- If specified data for EET are available as bar code, read bar code of EET data sheet with bar code reader.

All data required are shown on display -1-.

- Press button -arrow- to continue the process.

Visual check:

- Follow instructions on display.
- Perform visual check.
- If visual check is OK press „OK“ button -arrow-.



Note

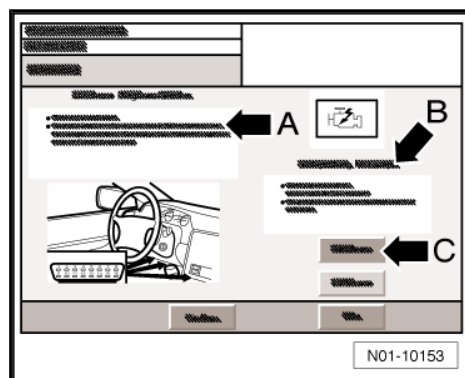
When the "not OK" button is pressed, a check will be carried out.

Connecting diagnostic connector:

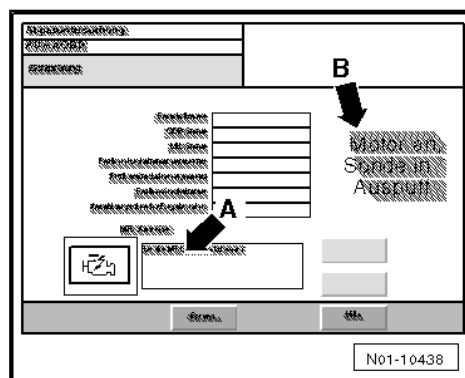
- Ignition is switched off.



The visual check is displayed with the request to connect the diagnostic connector -arrow A-



- Follow instructions on display -arrow A- and -arrow B-.

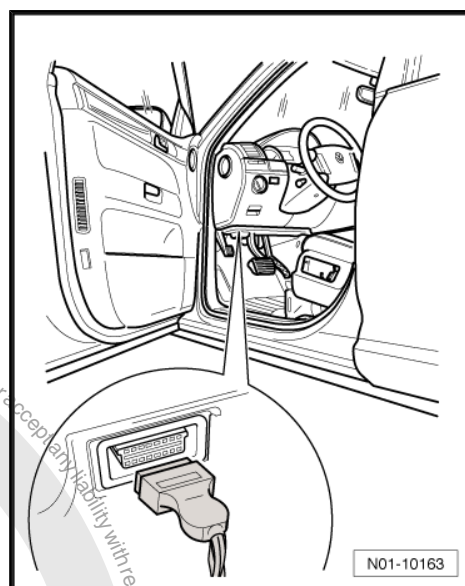


- Connect diagnosis cable connector to EOBD connection.

Conditioning:

- Start engine.

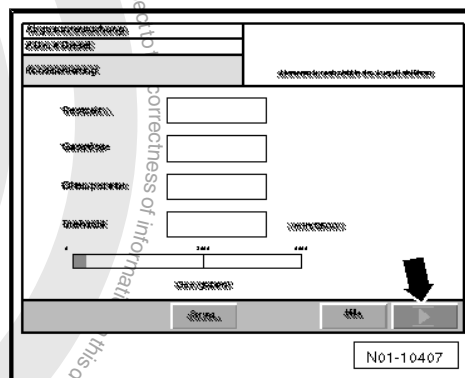
In the conditioning phase the engine and, if necessary, the emission control systems are brought to operating temperature by throttle bursts and are prepared for the exhaust emissions test.



- Follow instructions on display.
- Maintain engine speed in required engine speed range.

If no conditioning is necessary, press the button -arrow- to proceed to the next measurement.

Measuring engine temperature:





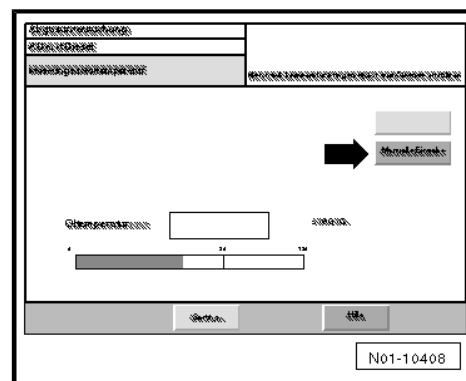
It is automatically switched to display for measuring engine temperature.

- Follow instructions on display.



Note

- ◆ *This is only indicated on display if engine temperature has not reached 80 °C.*
- ◆ *Do not insert emission probe into exhaust tail pipe.*
- ◆ *Using button „Alternative input“ -arrow- other measured value inputs can be selected to measure the engine temperature. The measured value must then be entered by hand. At end of exhaust emissions test the measured value is marked by # in the evaluating mask and in the log print-out.*
- ◆ *The button „Alternative input“ is only active, if previously a different method has been selected at specified data input for EET for „Engine oil measurement“.*



Caution

Measuring the engine temperature is normally carried out via the oil temperature probe. The engine temperature must not be determined with engine running, otherwise the engine and probe could be damaged!

- Bring engine to required temperature.

Measuring idling speed:



It is automatically switched to display for measuring the idling speed.

- Follow instructions on display.

Measurement starts when the engine speed has reached the required level.



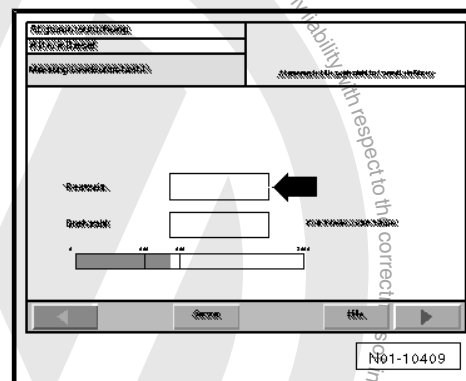
Note

- ◆ *Do not insert emission probe into exhaust tail pipe.*
- ◆ *The measurement can be skipped by pressing the  button, i.e. the exhaust emissions test has not been passed.*
- ◆ *Measured values are reset using the  button and the test can be repeated.*

- Maintain engine speed in required engine speed range.

The remaining time to perform measurement is displayed -arrow-.

Measuring rev limit:





It is automatically switched to display for measuring rev limit.


Measurement starts when the engine speed has reached the required level.

- Operate throttle until the measurement is carried out. To do this, immediately depress accelerator pedal.

The remaining time to perform measurement is displayed -arrow-.



Note

- ♦ Do not insert emission probe into exhaust tail pipe.
- ♦ The measurement can be skipped by pressing the  button, i.e. the exhaust emissions test has not been passed.

Air quality check:

An air quality check is carried out before starting the free acceleration. When doing this, no emission probe must be in the exhaust tail pipe. Otherwise measuring errors or faulty signals could occur during further measurements.

- When the air quality check is carried out, insert emission probe into exhaust tail pipe

Free acceleration:

It is automatically switched to display for „Free acceleration“.

During „Free acceleration“ the engine is revved up to rev limit without load as quickly as possible.

The „Free acceleration“ test consists of at least four throttle bursts.


Free acceleration - phase 1:

- Follow instructions on display -arrow A- and -arrow C-.
- Maintain idling speed in engine speed range indicated -arrow D-.

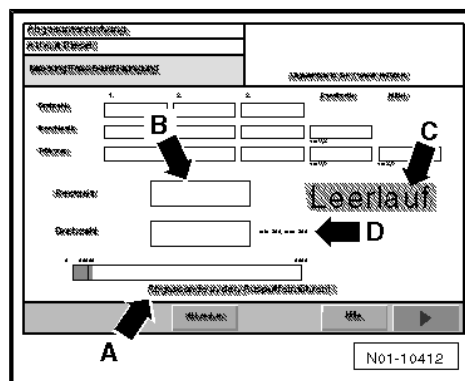
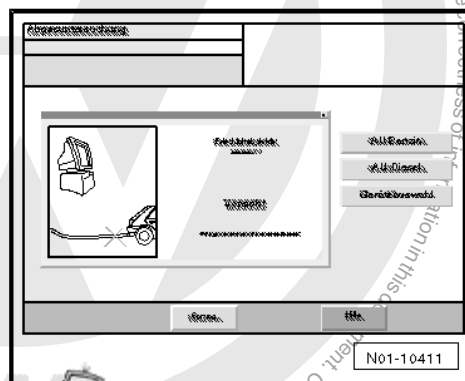
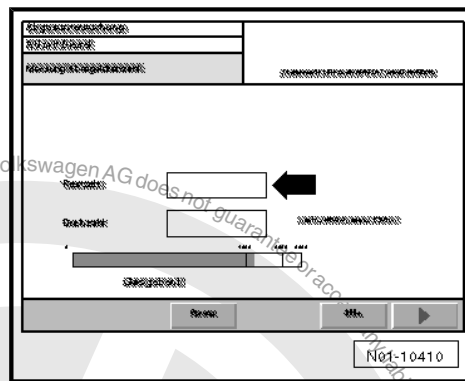
The remaining time to perform measurement is displayed -arrow B-.



Note

- ♦ The emissions probe must be in the exhaust tail pipe.
- ♦ If the speed deviates from engine speed range indicated, the measurement starts again.
- ♦ The measurement can be skipped by pressing the  button, i.e. the exhaust emissions test has not been passed.

Free acceleration - phase 2:



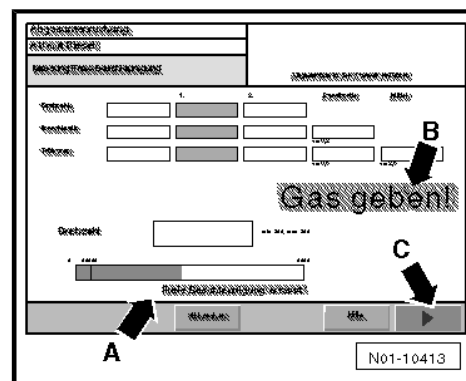


- Follow instructions on display -arrow B-.
- Depress accelerator pedal fully when prompted and hold until the prompt for idling is shown on display.

Free acceleration - phase 3:

- Remove foot from accelerator pedal as soon as the prompt for idling is shown on display -arrow B- and run engine at idling speed.

The test results and information on the latest „Free acceleration“ are shown on display -arrow A-. If the measured values are not OK, here you can obtain information why the „Free acceleration“ has failed.



Note

- ◆ If the field is coloured white the measured value is within tolerance.
- ◆ If the field is coloured red the measured value is outside tolerance.
- ◆ If the field is coloured yellow the measured value is outside tolerance, but can be assessed by the operator.

Further throttle bursts:

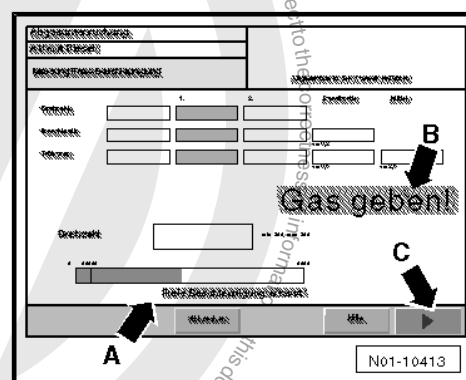
- Follow instructions on display -arrow B-.

Now the next throttle burst follows, starting with phase 1 of „Free acceleration“.

Many „Free accelerations“ can be carried out until:

- ◆ Three „Free accelerations“ have been completed in succession and the range of acceleration is OK.
- ◆ All values are OK, with the exception of range of acceleration, and the test is continued by pressing the button -arrow C-. (In this case, the operator assesses if the value is OK).
- ◆ The values are not OK and the measurement is terminated/ skipped by pressing the button -arrow C-.

If the measured values are OK after three throttle bursts in succession, i.e. all fields are coloured white, the exhaust emissions test is completed.



Evaluation:

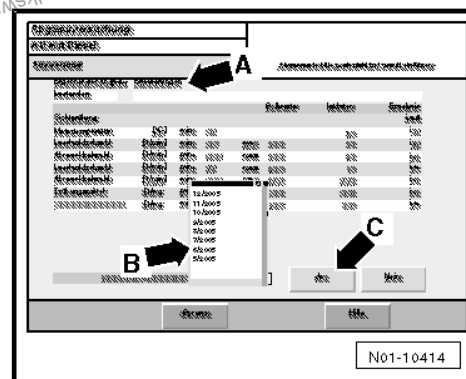
When the exhaust emissions test has been performed, the log is shown on display.

The test result is displayed.

Now remarks concerning the exhaust emissions test can be entered -arrow A-. They will then be included in the test log.

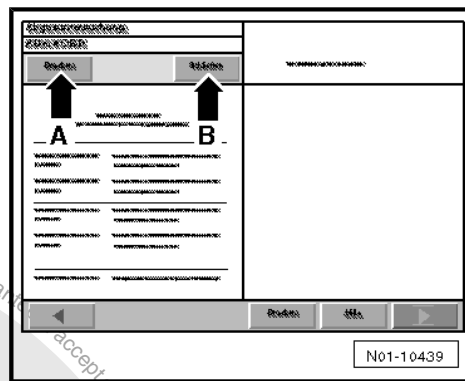
- When the exhaust emissions test is classed as passed, select -arrow B- „EET sticker issued“ in drop-down menu and date.
- Then confirm with „Yes“ -arrow C-.

The exhaust emissions test log is shown on display and can be printed out as often as required in the menu „Print preview“ using „Print“ button -arrow A-.





- Press button „Close“ -arrow B- to close the menu „Print preview“.
- Follow instructions on display.
- Take emission probe out of exhaust tail pipe.



- Then press  button -arrow B-.

The exhaust emissions test is completed, a new exhaust emissions test can be performed.

5.4.3 Exhaust emissions test for diesel engines with OBD with emissions testing station VAS 6300



Caution

- **Observe „SAFETY AND DAMAGE AVOIDANCE PRECAUTIONS“ in the operating instructions for VAS 6300.**



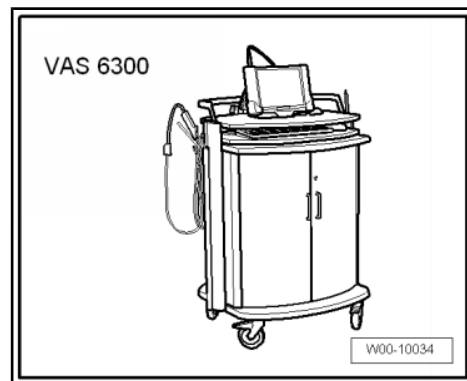
Note

- ◆ *The following description refers to vehicles fitted with „On-board diagnosis“, OBD.*
- ◆ *The OBD monitors all components and part systems influencing the exhaust emissions quality.*

Special tools and workshop equipment required



◆ Emissions testing station -VAS 6300-



◆ OBD adapter cable -VAS 5052/16-



Note

- ◆ *It is only possible to carry out an exhaust emissions test when all units of the emissions testing station -VAS 6300- are connected properly and combined with each other according to the operating instructions.*
- ◆ *All work to be performed is displayed by the emissions testing station -VAS 6300- .*

Test prerequisites:

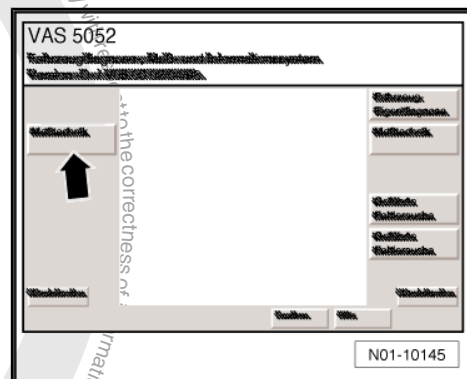
- All test conditions and data required for exhaust emissions test are found on EET data sheet for the respective engine.
- For bar code reading of specified data for EET, the EET data sheet must be printed out.
- Automatic gearbox: Selector lever in position „P“ or „N“.
- Manual gearbox: Gear lever in neutral
- Handbrake pulled on
- Perform exhaust emissions test according to instructions on display

Initial screen:

- Select button „Exhaust emissions test“ -arrow-.

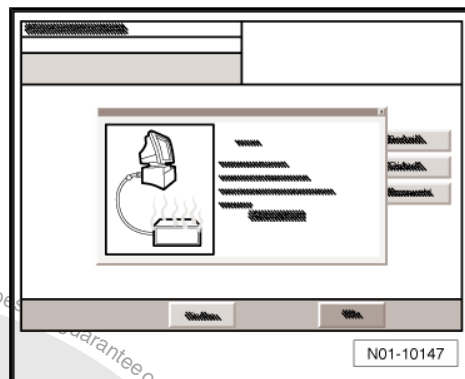
An overview is displayed to select the respective EET type.

- Select „EET diesel“ -arrow-.





The display for warm-up phase appears.



- Continue exhaust emissions test according to instructions on display.
- If the EET specification selection is displayed, select respective „EET specification selection“ -arrow-.
- ◆ When exhaust emissions test is performed for the first time, either select „Standard values“,
- ◆ Or „Last vehicle“ when an exhaust emissions test is to be carried out again.
- Select „Continue“ -item 1- on display.

Vehicle data input:

The vehicle data input menu is displayed.



Note

- ◆ For new models the document previously known as the vehicle registration document is now called the vehicle registration certificate part 1.
- ◆ For new models the document previously known as the vehicle log book is now called the vehicle registration certificate part 2.



- ◆ -1- Vehicle manufacturer: „e.g. VOLKSWAGEN - VW“
- ◆ -2- Vehicle type: „e.g. Golf“
- ◆ -3- Key number to 1: „e.g. 11“
- ◆ -4- Key number to 2: „e.g. 0603“ (vehicle registration document)
- ◆ -4- Key number to 2.1 (code to 2): „e.g. 0603“ (vehicle registration certificate part 1)
- ◆ -5- Key number for 3: „e.g. 358“ (vehicle registration document)
- ◆ -5- Key number for 2.2 (code to D2): „e.g. 358“ (vehicle registration certificate part 1)
- ◆ -6- Engine code „e.g. AQY“
- ◆ -7- Registration number: „e.g. WOB-HH 1234“
- ◆ -8- Vehicle identification number: „e.g. WVWZZZ1JZYW123456“
- Enter odometer reading at -item 9- „e.g. 32000“.



Note

- ◆ Further functions can be called up using **GoTo** button.
- ◆ The test can be interrupted using **GoTo** button.

– Select „Diesel OBD“, arrow-.

Specified data input for EET:

There are different ways to enter the specified data:

- ◆ 1. Manual input
- ◆ 2. Bar code input of EET data sheet
- ◆ 3. ELSA web service



Note

- ◆ To use the ELSA web service, the VAS 5052 which is used for the exhaust emissions test, must be integrated in the workshop network.
- ◆ For the ELSA web service the vehicle specified data are automatically transmitted via the network to the respective mask.

Manual specified data input for EET:



Note

All test conditions and data required for exhaust emissions test
⇒ Data sheets for exhaust emissions test for respective engine



- Perform manual data input according to instructions on display.

- Enter displayed values on EET data sheet in column „Test values for exhaust emissions test“ on display as follows:

- 1 - Speed for conditioning
- 2 - Number of throttle bursts for conditioning
- 3 - Engine oil temperature (min. value)
- 4 - Select engine oil temperature measurement procedure
- 5 - Idling speed
- 6 - Rev limit
- 7 - Rev limit measuring period (1 second)
- 8 - Opacity figure (average)
- 9 - Select probe type (No. of probe)
- 10 - Select measuring mode
- 11 - Measured period portion

- When all data have been entered properly, press button -arrow-.

Specified data input for EET as bar code:

- If specified data for EET are available as bar code, read bar code of EET data sheet with bar code reader.

All data required are shown on display -1-.

- Press button -arrow- to continue the process.

Visual check:

- Follow instructions on display.
- Perform visual check.
- If visual check is OK press „OK“ button -arrow-.



Note

When the "not OK" button is pressed, a check will be carried out.

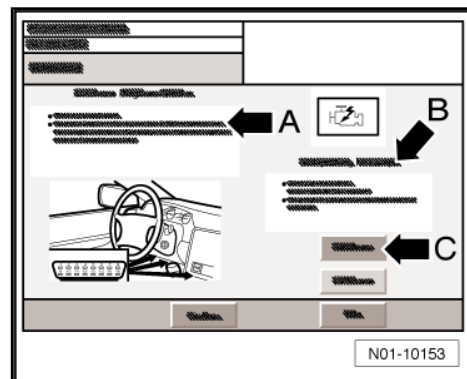
Connecting diagnostic connector:

- Ignition is switched off.



The visual check is displayed with the prompt to connect the diagnostic connector -arrow A- and to check the „MI lamp“ -arrow B-.

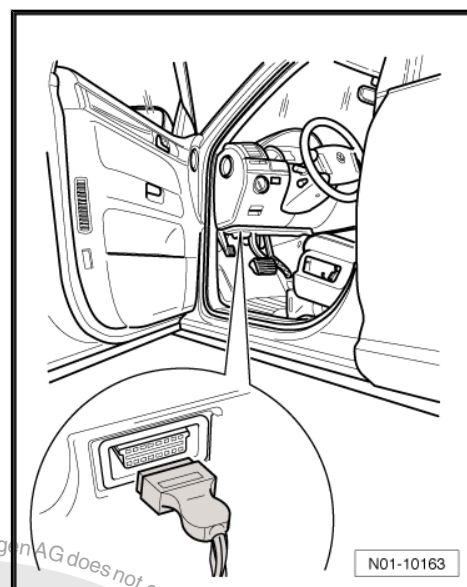
- Follow instructions on display.



- Connect diagnosis cable connector to EOBD connection.

Visual check of MI lamp with ignition switched off:

- Switch on ignition.
- Perform visual check of „MI lamp“.



- If lamp lights up, press button „Lamp On“ -arrow C-.



Note

If the MI lamp does not light up during visual check, the result of the exhaust emissions test is „Failed“.

Visual check of MI lamp with engine running:

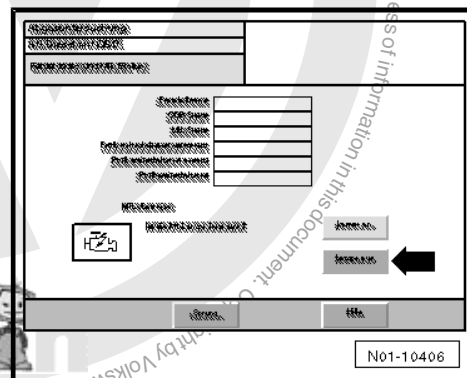
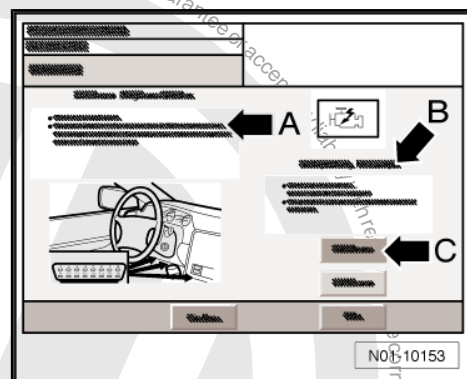
- Start engine and confirm engine running on display with „Yes“.
- Perform visual check of „MI lamp“, lamp must no longer light up or flash.
- Confirm condition of „MI lamp“ -arrow-.

It is automatically switched to test for readiness of operation.

It is checked here if all tests for readiness of operation supported by the control unit have been performed.

Conditioning:

In the conditioning phase the engine and, if necessary, the emission control systems are brought to operating temperature by throttle bursts and are prepared for the exhaust emissions test.





- Follow instructions on display.
- Maintain engine speed in required engine speed range.

If no conditioning is necessary, press the button -arrow- to proceed to the next measurement.

Reading engine temperature:

The engine temperature is read via the diagnostic connector of engine control unit.

When the required engine temperature is reached, it is automatically switched to display for measuring the idling speed.

Measuring idling speed:

- Follow instructions on display.

Measurement starts when the engine speed has reached the required level.



Note

- ◆ Do not insert emission probe into exhaust tail pipe.
- ◆ The measurement can be skipped by pressing the button, i.e. the exhaust emissions test has not been passed.
- ◆ Measured values are reset using the button and the test can be repeated.

- Maintain engine speed in required engine speed range.

The remaining time to perform measurement is displayed -arrow-.

Measuring rev limit:

It is automatically switched to display for measuring rev limit.

Measurement starts when the engine speed has reached the required level.

- Operate throttle until the measurement is carried out. To do this, immediately depress accelerator pedal.

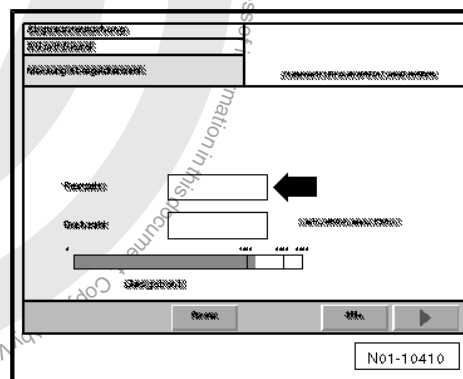
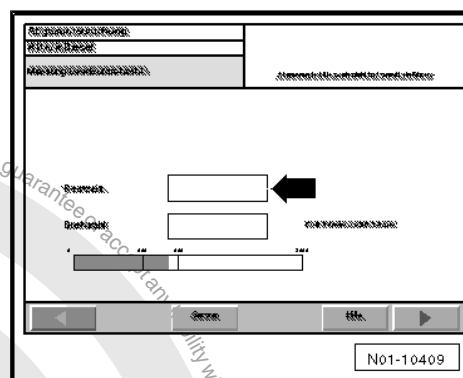
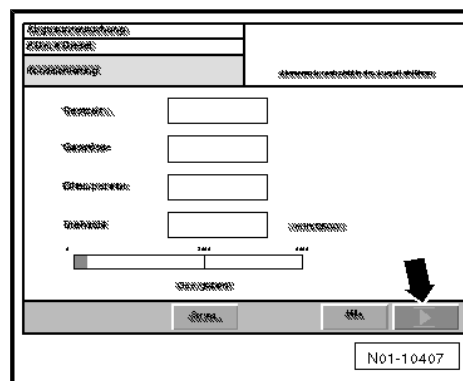
The remaining time to perform measurement is displayed -arrow-.



Note

- ◆ Do not insert emission probe into exhaust tail pipe.
- ◆ The measurement can be skipped by pressing the button, i.e. the exhaust emissions test has not been passed.

Air quality check:





An air quality check is carried out before starting the free acceleration. When doing this, no emission probe must be in the exhaust tail pipe. Otherwise measuring errors or faulty signals could occur during further measurements.

- When the air quality check is carried out, insert emission probe into exhaust tail pipe

Free acceleration:

It is automatically switched to display for „Free acceleration“.

During „Free acceleration“ the engine is revved up to rev limit without load as quickly as possible.

The „Free acceleration“ test consists of at least four throttle bursts.

Free acceleration - phase 1:

- Follow instructions on display -arrow A- and -arrow C-.
- Maintain idling speed in engine speed range indicated -arrow D-.

The remaining time to perform measurement is displayed -arrow B-.



Note

- ◆ The emissions probe must be in the exhaust tail pipe.
- ◆ If the speed deviates from engine speed range indicated, the measurement starts again.
- ◆ The measurement can be skipped by pressing the button, i.e. the exhaust emissions test has not been passed.

Free acceleration - phase 2:

- Follow instructions on display -arrow B-.

Depress accelerator pedal fully when prompted and hold until the prompt for idling is shown on display.

Free acceleration - phase 3:

Remove foot from accelerator pedal as soon as the prompt for idling is shown on display -arrow B- and run engine at idling speed.

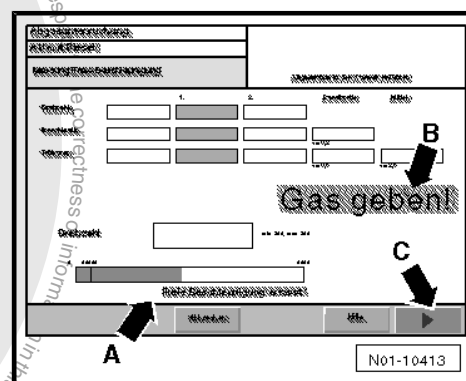
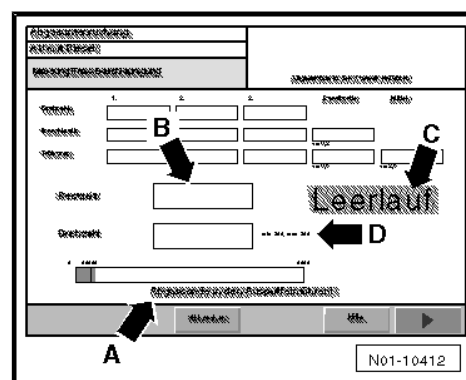
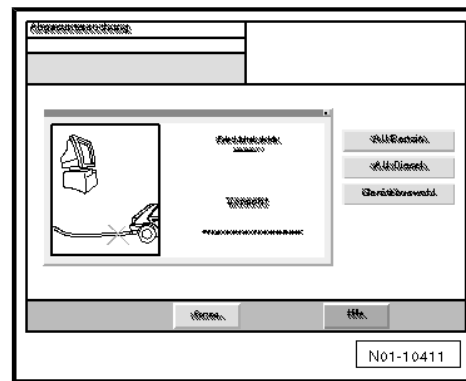
The test results and information on the latest „Free acceleration“ are shown on display -arrow A-. If the measured values are not OK, here you can obtain information why the „Free acceleration“ has failed.



Note

- ◆ If the field is coloured white the measured value is within tolerance.
- ◆ If the field is coloured red the measured value is outside tolerance.
- ◆ If the field is coloured yellow the measured value is outside tolerance, but can be assessed by the operator.

Further throttle bursts:





- Follow instructions on display -arrow B-

Now the next throttle burst follows, starting with phase 1 of „Free acceleration“.

Many „Free accelerations“ can be carried out until:

- ◆ Three „Free accelerations“ have been completed in succession and the range of acceleration is OK.
- ◆ All values are OK, with the exception of range of acceleration, and the test is continued by pressing the ☐ button -arrow C-. (In this case, the operator assesses if the value is OK).
- ◆ The values are not OK and the measurement is terminated/skipped by pressing the ☐ button -arrow C-.

If the measured values are OK after three throttle bursts in succession, i.e. all fields are coloured white, the exhaust emissions test is completed.

Evaluation:

When the exhaust emissions test has been performed, the log is shown on display.

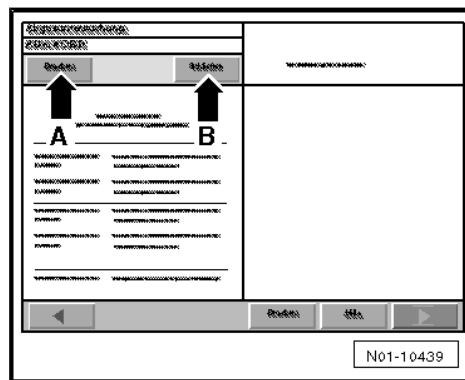
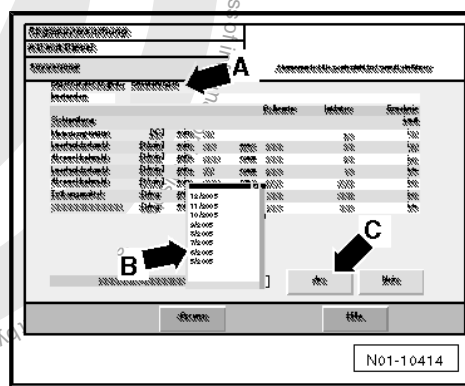
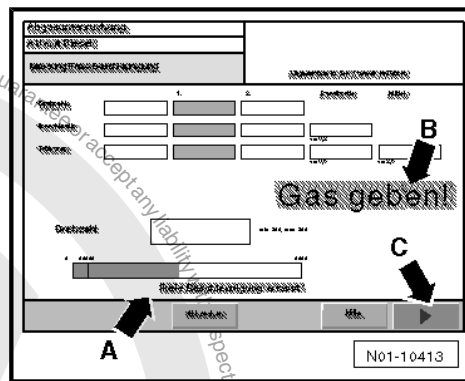
The test result is displayed.

Now remarks concerning the exhaust emissions test can be entered -arrow A-. They will then be included in the test log.

- When the exhaust emissions test is classed as passed, select -arrow B- EET sticker issued in drop-down menu and date.
- Then confirm with „Yes“ -arrow C-.

The exhaust emissions test log is shown on display and can be printed out as often as required in the menu „Print preview“ using „Print“ button -arrow A-.

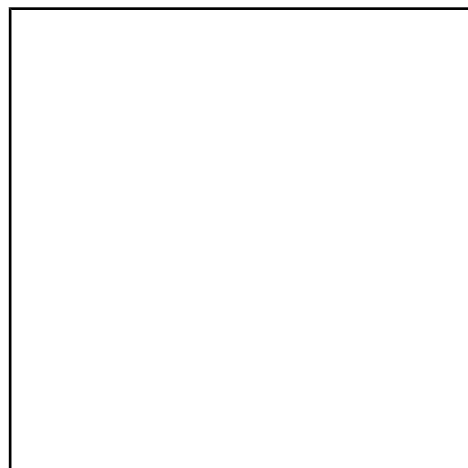
- Press button „Close“ -arrow B- to close the menu „Print preview“.
- Follow instructions on display.
- Take emission probe out of exhaust tail pipe.





- Then press  button -arrow B-.

The exhaust emissions test is completed, a new exhaust emissions test can be performed.





6 Glossary

These explanations only apply to „Maintenance Manual“. They are not necessarily generally valid!

Term	Explanation
ABS	„Anti-lock brake system“, the ABS is a regulating system in the brake system that prevents locking when braking. This helps to maintain directional stability and steerability.
ATF	„Automatic Transmission Fluid“ gear oil for automatic gearboxes
ATF level	„Filling level“ of ATF in gearbox.
ACF	Activated charcoal filter
CO	„Carbon monoxide:“ occurs when fuels containing carbon are not combusted completely.
Common rail „CR“	Refers to a common high-pressure injection line „rail“, which supplies all cylinders of the relevant cylinder bank with fuel
DIN	Deutsches Institut für Normung e.V (German institute for standardization)
DS	Direct shift
DSG	Dual clutch gearbox
ATA	Anti-theft alarm system
Part No.	Abbreviation for part number
EN	European standard
ETKA	Electronic parts catalogue - successor to microfiche
EOBD	European onboard diagnosis
FAME	Fatty acid methyl ester
FSI	„Fuel Stratified Injection“, see also TSI ➔ page 181 , TFSI ➔ page 181
MM	Maintenance Manual
LongLife service	The LongLife service enables extremely long inspection or oil change intervals depending on personal driving style and corresponding operating conditions. LongLife service requires special engine oil.
LED	Light emitting diode
MIL	„Malfunction indicator light“ American designation for exhaust emissions warning lamp K83
MPI	Multi-point injection
NAR	North American region
OBD	Onboard diagnosis, the OBD monitors all components influencing the exhaust emissions quality.
OBD-II	American onboard diagnosis
Unit injector	Unit injector for diesel engines
PR No.	Abbreviation for production control number. Identifies among other things optional equipment and country-specific deviations
PM	„Particulate matter:“ soot particulate value for diesel engine emissions
PPM	„Parts per million“ e.g. for sulphur content in diesel fuel
QG0	Vehicles are „not“ factory-fitted with components for LongLife service. For maintenance, the time and distance dependent intervals „non-flexible intervals“ apply.
QG1	Vehicles are factory-fitted with active LongLife service. This means, vehicles have a flexible service interval display and are fitted with the following components: <ul style="list-style-type: none"> ◆ Flexible service interval display in dash panel insert ◆ Engine oil level sensor ◆ Brake pad wear indicator



Term	Explanation
QG2	The LongLife service is not factory-activated. This means that vehicles have a non-flexible service interval display „time and distance dependent service intervals“ and are fitted with the following components: <ul style="list-style-type: none"> ◆ Non-flexible service interval display in dash panel insert ◆ Engine oil level sensor ◆ Brake pad wear indicator
Readiness code	8-digit binary code which indicates if all exhaust relevant diagnoses have been performed by the engine management.
RON	„Research Octane Number“ measurement of the knock resistance of petrol
RME	Biodiesel
SPF	Soot particulate filter
RDK, RKA	Tyre pressure monitoring, tyre monitor display
SAE	„Society of Automotive Engineers“, society which prepares proposals/guidelines on how the legal requirements can be implemented, e.g. standards
SD	Naturally aspirated diesel engine
SDI	Naturally aspirated diesel engine - direct injection
SRE	Intake manifold injection system
TFSI	Turbo „fuel stratified injection“
TSI	From model year 2008 the designation TFSI is replaced by TSI. Therefore the designation TSI is given to TSI turbocharger and TSI twincharger. TSI turbocharger: charging only with turbocharger TSI twincharger: charging with turbocharger and compressor
TDI	Turbo diesel engine - direct injection
DP	Distributor injection pump
ULEV	Ultra-low emission vehicle
ESI	Extended service interval
ASSY	Assembly