00 00 252 BMW engine oil service without supplementary service

WARNING

Hot fluids.

Risk of scalding!

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.

RISK OF DAMAGE

Engine damage caused by excessively filling the engine with engine oil.

Filling an excessive quantity of engine oil may cause engine damage.

- Observe the exact engine oil filling capacity.
- Allow engine oil to drip off when draining.

TECHNICAL INFORMATION

Make sure the vehicle is at operating temperature for engine oil service (engine oil temperature > 70 °C).

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PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

2 – Removing the oil filler cap



- Open oil filler cap (1).

MAIN WORK

3 – Remove oil filter



- Loosen the oil filter cover (1).



TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

- Guide out and remove the oil filter cover (1) with oil filter element.
- Catch and dispose of emerging engine oil.

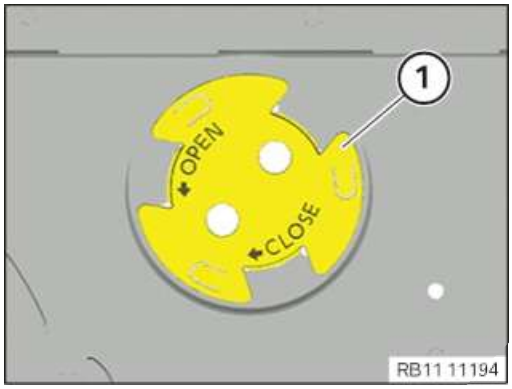
4 – Releasing the oil drain plug

WARNING

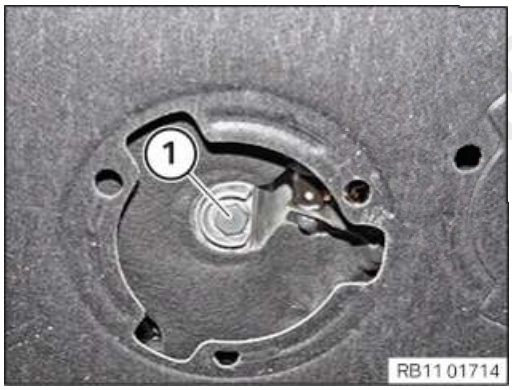
Hot fluids.

Risk of scalding!

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.



- Turn and remove service cap (1).



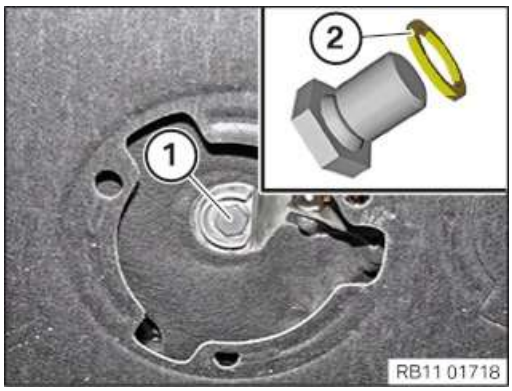
- Open oil drain plug (1) from the oil sump.

TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

- Allow the engine oil to drain out fully.

5 – Tightening the oil drain plug



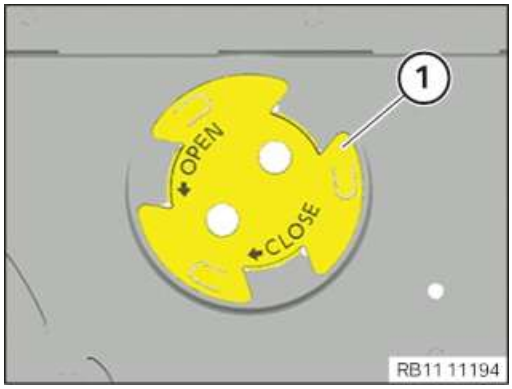
- Renew sealing ring (2).

  Parts: Sealing ring
- Position oil drain plug (1) on the oil sump and tighten.

Oil drain plug

M12x16	Renew the sealing ring.	Tightening torque	25 Nm

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- Install service cap (1).

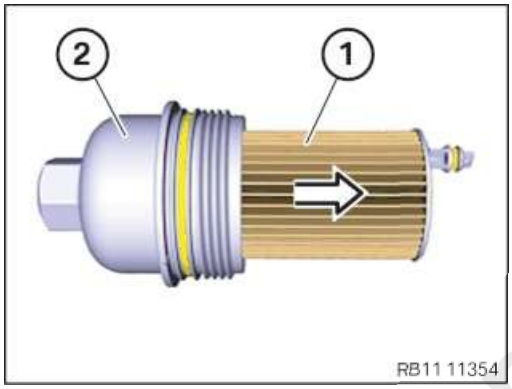
6 – Replace oil filter element

RISK OF DAMAGE

Contaminant or foreign body.

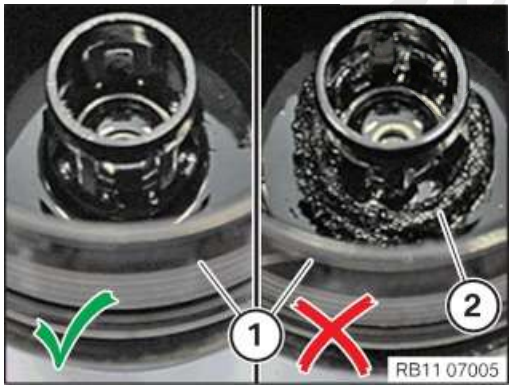
Contamination can result in malfunctions, operating failure or leaks.

- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.



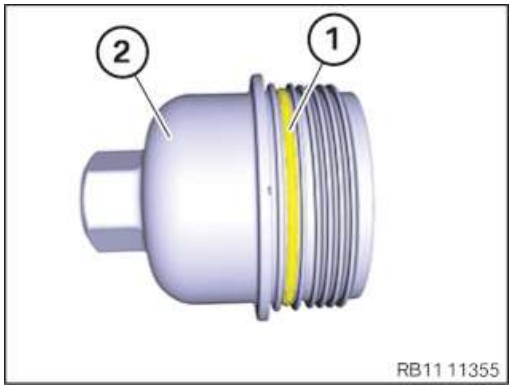
- Guide the fuel filter element (1) out of the fuel filter cover (2) in the direction of the arrow and remove.

▸ **Checking the inner oil filter cover for filter residues**



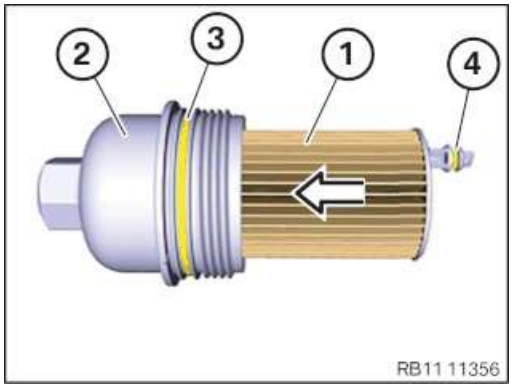
- Check whether there are residues (2) of the previous oil filter on the inside of oil filter cover (1) and, if necessary, remove filter residues (2).

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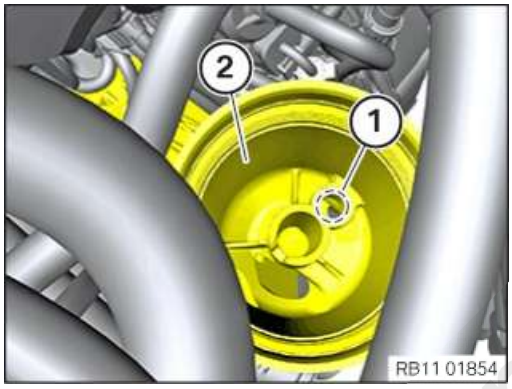
- Guide the sealing ring (1) out at the oil filter cover (2) and remove.
- Renew sealing ring (1).

  Parts: Sealing ring
- Feed in sealing ring (1) on oil filter cover (2) and install.



- Insert and install the oil filter element (1) on the oil filter cover (2) in the direction of the arrow.
- Make sure the oil filter element (1) engages audibly at the oil filter cover (2).
- Coat sealing rings (3) and (4) with engine oil.

7 – Install the oil filter



- Position the oil filter cover with the oil filter element correctly in the guide bore hole (1) in the oil filter housing (2).



- Feed in and install the oil filter cover (1) with the oil filter element.



- Tighten the oil filter cover (1).

Oil filter cover to oil filter module

O-ring lightly oiled.	Tightening torque	25 Nm

8 – Topping up the engine oil

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RISK OF DAMAGE

Engine damage caused by excessively filling the engine with engine oil.

Filling an excessive quantity of engine oil may cause engine damage.

- Observe the exact engine oil filling capacity.
- Allow engine oil to drip off when draining.

- Pour in engine oil.

Engine oil B47D20U1 / B47D20O1 / B47D20T1

Filling capacity, engine oil change with oil filter element	5,5 l

Engine oil: Technically suitable engine oils for BMW Group engines

POSTPROCESSES

9 – Installing the oil filler cap



- Close oil filler cap (1).

10 – Check engine oil level

TECHNICAL INFORMATION

Always check the engine oil level when the engine is at operating temperature (engine oil temperature > 70°C).

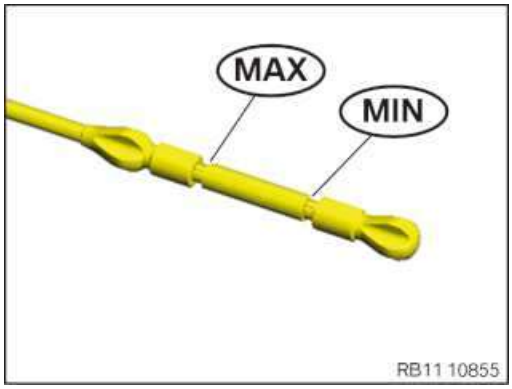
- Park vehicle on a horizontal surface.
- Stop the engine and wait for 5 minutes.
- Pull out the oil dipstick and wipe off using a lint-free cloth.

TECHNICAL INFORMATION

Do not pull out or insert the oil dipstick into the guide tube too quickly or slowly.

- Push the oil dipstick into the guide tube up to the limit position and pull it out again.

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TECHNICAL INFORMATION

The engine oil level must be between the minimum mark and the maximum mark of the oil dipstick.

- Read the engine oil level on the oil dipstick.
- Top up engine oil if necessary.

Oil quantity between the two markings MIN and MAX of the oil dipstick

1.0 l

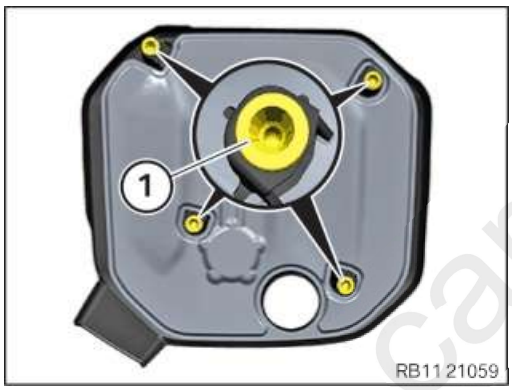
11 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Check the acoustic cover for correct fit of the rubber mounts (1).



- Clip in the acoustic cover (1) into the holders in the indicated areas.

Additional Information

Overview of Tightening Torques

Oil drain plug Used in step 5

M12x16	Renew the sealing ring.	Tightening torque	25 Nm

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Oil filter cover to oil filter module		Used in step 7
O-ring lightly oiled.	Tightening torque	25 Nm

Overview Technical Data

Engine oil B47D20U1 / B47D20O1 / B47D20T1	Used in step 8
Filling capacity, engine oil change with oil filter element	5,5 l
Engine oil: Technically suitable engine oils for BMW Group engines	

Oil quantity between the two markings MIN and MAX of the oil dipstick	Used in step 10
	1.0 l

Links

Operating materials	**Used in step**
3.0 Technically appropriate engine oils for BMW Group engines	8

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00 00 262 BMW rapid inspection

1 Carry out a quick inspection

NOTICE

A checklist can be printed off for quick inspection. See Additional Information.

- Print out document.
- Work through check list.
- Hand over the checklist to the customer.

Additional Information

Links

Technical service information	Used in step
BMW quick inspection	1
BMW i quick inspection	1
MINI quick inspection	1

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00 00 ... Driving on a race track

Caution!

The customer must be informed that, in particular, the brake pads, wear indicator and the flat tyre monitor installed as standard are not designed for race track operation. The vehicle is also not designed for motor sport competition racing.

Excessive loading of the vehicle, e.g. by operating it on a race track or in motor sport competition racing, is not covered by the warranty.

If the customer still wants to drive on a race track, the following aspects must be considered/checked:

The vehicle, in particular the engine and the drivetrain, must be carefully run in before it is driven it on a race track. A running-in period of at least 2000 km.

In the case of M vehicles, it is absolutely essential to have carried out the service running-in check after 2000 km.

In the case of BMW AG vehicles, it is also recommended to carry out an oil change after the running-in period.

The duration of the highly dynamic runs on the race track must be gradually increased, as the rear axle differential still has to run in in high-load operation. During this time, the temperature increases.

It is possible to exceed the limit temperatures in the rear axle differential and in the steering gear in this phase under extreme loads and very high outside temperatures. This is indicated by a Check Control message. For component protection reasons, the electrohydraulic lock is deactivated in the rear axle differential. With the steering gear, the steering assistance is gradually reduced, which makes the steering experience less smooth.

After a cooling-down period, both the systems will recalibrate and function again as usual.

In these cases, this is not a component fault. There is no need for workshop visit.

For driving on a race track, the following extensions must be considered and implemented on the vehicle.

Model: .....

Vehicle identification number: .....

Scope of checks before driving on the race track:		
Vehicle check	**OK.**	**Comment**
Perform a comprehensive vehicle check service. -> Scope of the vehicle check service		
Engine	**OK.**	**Comment**
Recommendation: Carry out an engine oil change. For the high demands placed on the racetrack and to ensure the full power development, the use of the BMW M TwinPower Turbo engine oil LL-12 FE 0W-30 is recommended if technically suitable for the engine. = > See technically suitable engine oils for BMW Group engines		
Transfer box (concerns only those vehicles with rear axle differential with HOC)	**OK.**	**Comment**
Perform transfer box oil change.		
Cooling	**OK.**	**Comment**
Visual inspection of the radiator for contamination. -> Draw off contamination.		
Brake system	**OK.**	**Comment**

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Check the age of the brake fluid - see Service Booklet/Service history. -> The age of the brake fluid should not exceed 1 year.		
Check filling level in brake fluid expansion tank. -> If necessary, top up to the maximum level.		
Check the brake pad thickness on the front axle. -> Wear material thickness ≥ 9 mm -> Ideally, install new brake pads. **Recommendation for M vehicles:** Use Sport brake pads, if available for that model.		
Check the brake pad thickness on the rear axle. -> Wear material thickness ≥ rear axle ≥ 8 mm -> Ideally, install new brake pads. **Recommendation for M vehicles:** Use Sport brake pads, if available for that model.		
Check the brake disc thickness on the front axle. -> Minimum brake disc thickness: ≥ Minimum brake disc thickness + 1 mm -> Ideally, install new brake discs.		
Check the brake disc thickness on the rear axle. -> Minimum brake disc thickness: ≥ Minimum brake disc thickness + 1 mm -> Ideally, install new brake discs.		
Visual inspection of the brake line and brake hose for tightness, damage and porosity.		
If installed, remove the covers for the brake air ducts in the front section of the front wheel arch covers and keep them in a safe place. • M2 (F87), only for versions with carbon ceramic brakes • M3 (G80), for all brake systems • M4 (G82, G83), for all brake systems • M5 (F10, F90), only for versions with carbon ceramic brakes • M6 (F06, F12, F13), only for versions with carbon ceramic brakes • M8 (F91, F92, F93), only for versions with carbon ceramic brakes *Note:* To improve the cooling of the brake system, it is necessary to remove the covers from the brake air ducts before driving on the race track. Before driving on public roads later, the covers of the brake air ducts must be reinstalled.		
Wheels / tyres	**OK.**	**Comment**
Check wheels/tyres for suitability for operation on the race track -> Winter tyres, all-season tyres and tyres on steel rims are absolutely unsuitable. **Recommendation:** Use Sport tyres.		

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Check the tyre pressure of all the tyres and adjust, if required. -> In order to increase the service life and tyre performance, a reduction in the tyre pressure is recommended for the race track. To do this, proceed as follows: 1. Drive the tyres warm. 2. Set the tyre pressure according to the prescribed value on the tyre pressure label for partial loads. 3. In the Tyres menu of the head unit, select the entry “Summer tyres, other tyres / race track”. 4. Initialise TPM. **Note:** The display of tyre inflation pressure is possible only up to an operating temperature of systems of 120 °C. At higher temperatures, which can be reached during racing operation, the display is suppressed and a CC message is issued. After cooling down, the system functions again without limitations.		

Background: The tyre pressure increases due to the increase in temperature in the tyre when operated on the race track. This reduces the contact surface of the tyre to the road, leading to an increased temperature load on the running surface. The adjustment of the tyre pressure in tyres that have been driven warm as opposed to tyres in a cold state leads to a reduction in the pressure and thus, due to an increased tyre contact area, to a more equal load on the tyre.

Extensions when driving on a race track:		
Warm up	**OK.**	**Comment**
Drive a warming up lap. > Bring the engine up to operating temperature. Fast driving at a medium rpm level and medium dynamics.		
Cool down	**OK.**	**Comment**
Drive a cooling down lap. -> Fast driving at a medium rpm level and medium dynamics. Avoid brake load as far as possible.		

Scope of checks after driving on the race track:		
Engine	**OK.**	**Comment**
Carry out an oil-level check according to the Owner's Handbook. -> If necessary, top up to the maximum oil level.		
Front axle transmission (only affects G15 with N63 engine)	**OK.**	**Comment**
Perform oil change on front axle transmission.		
Transfer box (concerns only M vehicles)	**OK.**	**Comment**
Perform transfer box oil change.		
Rear axle differential	**OK.**	**Comment**
If a rear axle differential with lock is installed. -> Change the oil.		
Cooling	**OK.**	**Comment**
Visual inspection of the radiator for contamination. -> Draw off contamination.		
Brake system	**OK.**	**Comment**

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Check filling level in brake fluid expansion tank. -> If necessary, top up to the maximum level. *Note (concerns F91, F92, F93, F95, F96, G8x):* When the vehicle is operated on a racetrack, the brake fluid may leak slightly through the sealing cap of the brake fluid expansion tank (droplets form in the area of the expansion tank). Check this area after driving on a racetrack and clean it if necessary.		
Check the brake pad thickness on the front axle. -> Replace brake pads when the remaining brake pad thickness is undershot (min. thickness 3.7 mm)		
Check the dust boots on the brake calipers of the front axle for damage.		
Check the brake pad thickness on the rear axle. -> Replace brake pads when the remaining brake pad thickness is undershot (min. thickness 3.7 mm)		
Check the dust boots on the brake calipers of the rear axle for damage.		
Check the brake disc thickness and their state on the front axle. -> Replace brake discs when: • Drop below the minimum brake disc thickness • Scoring • Heat cracks • Thickness difference		
Check the brake disc thickness and their state on the rear axle. -> Replace brake discs when: • Drop below the minimum brake disc thickness • Scoring • Heat cracks • Thickness difference		
If removed, reinstall the covers for the brake air ducts in the front section of the front wheel arch covers. • M2 (F87), only for versions with carbon ceramic brakes • M3 (G80), for all brake systems • M4 (G82, G83), for all brake systems • M5 (F10, F90), only for versions with carbon ceramic brakes • M6 (F06, F12, F13), only for versions with carbon ceramic brakes • M8 (F91, F92, F93), only for versions with carbon ceramic brakes *Note:* Before driving on public roads, it is essential to reinstall the covers on the brake air ducts.		
Wheels / tyres **Note to customer:** Perform the following points for wheels/tyres immediately after the racing track operation and before driving on public streets!	**OK.**	**Comment**
Check wheels/tyres for damage.		
Check wheels/tyres for minimum tread depth.		

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Check the tyre pressure of all the tyres and adjust, if required. 1. Allow tyres to cool down. 2. Set the tyre pressure according to the prescribed value on the tyre pressure label. 3. Initialise TPM. **Background:** Adjustment of the tyre pressure in cold tyres, as otherwise it can lead to tyre pressure control warning messages due to the low pressure.		

Vehicle check	**OK.**	**Comment**
Perform a comprehensive vehicle check service. -> Scope of the vehicle check service		

....

Date Mechanic Workshop Supervisor

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11 00 300 Engine oil consumption measurement

Attention!

This procedure for measuring oil consumption may not be used for the S 85 due to the oil pan design.

Many complaints about oil consumption are caused by the oil level being measured using the wrong method.

The oil consumption should be measured after a distance of 7,500 km at the earliest, as the process of running in the engine will not have been essentially completed and the engine oil consumption stabilised until this distance has been covered.

Engine oil consumption that may occur in an engine can only be determined by the customer on the basis of the refilled engine oil quantity. As soon as the engine oil level falls below the MAX mark on the dipstick, many customers top up the engine oil without paying attention to a number of basic rules, such as the vehicle must be standing on level ground, a certain period of time must be left to allow the oil to flow back to the sump. In such cases, the available container sizes (e. g. 1-litre can) make it easy to top up above the MAX mark. Too much added engine oil is damaging to the engine and is consumed more quickly due to the splash effect.

It is therefore recommended to allow the engine oil level to the MIN mark and only then to add the required engine oil quantity. The distance between the marks is equivalent to approx. 1.0 to 1.5 litres.

The procedure for checking the oil level is given in the Owner's Handbook for the vehicle concerned.

The service delegates will only deal with claims made under warranty if exact measurements by weighing are available (see below).

Measuring oil consumption by weighing:

To assess a warranty or goodwill claim, only the following oil consumption measurement method by weighing can be accepted (this must have been carried out by a BMW contractual partner):

Note:

The engine must not leak any oil.

Engine oil may only be drained off when the engine is at its normal operating temperature. The engine oil temperature must be at least 90 °C and read off on the diagnosis system.

Preparation:

1. Eliminate any leaks and traces of oil before measuring the engine oil consumption.
2. Allow the engine to run at idling speed for 5 minutes, during which the engine oil temperature must not drop below 90 °C.
3. Unscrew the main flow oil filter cover (the engine oil will flow back into the oil sump from the oil filter housing).
4. Unscrew the oil drain plug.
5. Allow the engine oil to drain off for 15 minutes.
   If necessary, remove the fan/fan cowl.
6. Turn the engine once through 360 degrees by the vibration damper.
7. Allow the engine oil to drain off for 15 minutes.
8. Retighten the primary flow oil filter.
9. Pour in the specified engine oil quantity for the engine type in question (with filter change).
10. Drive the vehicle for a distance of at least 1,000 km/500 miles. Increasing the mileage will produce significantly better measuring results.
    Measurement procedure:
11. Check the engine for leaks; if the engine is not tight, the examination will not be meaningful.
12. Prepare the measuring container to be able to capture the oil quantity.
13. Allow the engine to run at idling speed for 5 minutes, during which the engine oil temperature must not drop below 90 °C.
14. Unscrew the main flow oil filter cover (the engine oil will flow back into the oil sump from the oil filter housing).
15. Unscrew the oil drain plug.

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16. Allow the engine oil to drain off for 15 minutes.
    If necessary, remove the fan/fan cowl.
17. Turn the engine once through 360 degrees by the vibration damper.
18. Allow the engine oil to drain off for 15 minutes.
19. Weight the **amount of drained engine oil**. (Engine oil has a density of about 0.86 g/cm³ at room temperature.)

$$\text{Engine oil consumption} = \frac{\text{Amount of oil added (cm³) - amount of oil drained off (g): 0.86 g/cm³}}{\text{mileage reading when draining - mileage reading when adding engine oil}}$$

Example:

Volume of oil added at mileage reading 44,800: 4.000 cm³

Weight of oil added at mileage reading 45,900: 2.700 g

$$\text{Engine oil consumption} = \frac{\text{4.000 cm3 - 2.700 g : 0.86 g/cm³}}{\text{45,900 km - 44,800 km}} = 0.78 \text{ cm³/km}$$

0.78 cm³/km = 0.78 l/1,000 km

Test certificate for engine oil consumption:

Vehicle data: _____

BMW (type): _____

Chassis number: _____

Added oil quantity (in ccm):	_____ ccm	at kilometre reading:_____
less drained off oil quantity (in g) : 0.86 (g/ccm)	_____ ccm	at kilometre reading:_____
=> oil consumption:	_____ ccm	=> mileage: _____ km

Oil consumption [l/1000 km] =

_____ *[ccm] oil consumption* _____ [km] mileage

Oil consumption after balancing out: _____ l/1000 km

Oil grade: _____

Oil grade: _____

Viscosity: _____

Cause of damage: _____

_____ _____

Dealer address Signature

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00 00 610 Engine oil service

WARNING

Hot fluids.

Risk of scalding!

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.

RISK OF DAMAGE

Engine damage caused by excessively filling the engine with engine oil.

Filling an excessive quantity of engine oil may cause engine damage.

- Observe the exact engine oil filling capacity.
- Allow engine oil to drip off when draining.

TECHNICAL INFORMATION

Make sure the vehicle is at operating temperature for engine oil service (engine oil temperature > 70 °C).

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PRELIMINARY WORK

1 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

2 – Removing the oil filler cap



- Open oil filler cap (1).

MAIN WORK

3 – Remove oil filter



- Loosen the oil filter cover (1).



TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

- Guide out and remove the oil filter cover (1) with oil filter element.
- Catch and dispose of emerging engine oil.

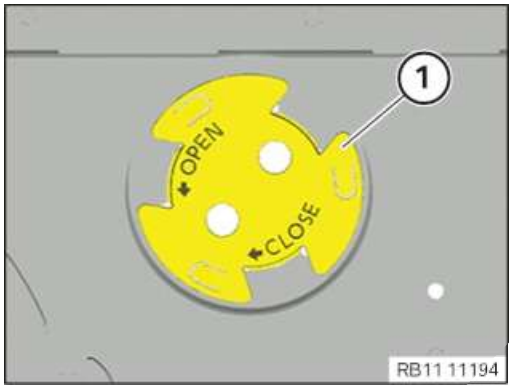
4 – Releasing the oil drain plug

WARNING

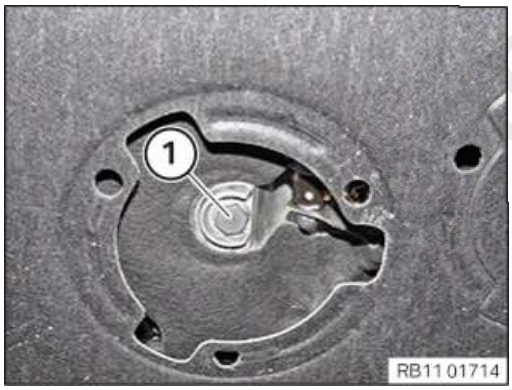
Hot fluids.

Risk of scalding!

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.



- Turn and remove service cap (1).



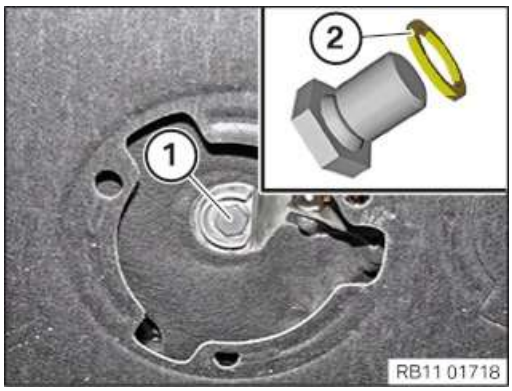
- Open oil drain plug (1) from the oil sump.

TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

- Allow the engine oil to drain out fully.

5 – Tightening the oil drain plug



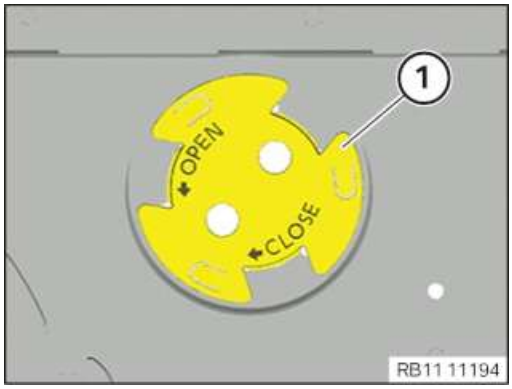
- Renew sealing ring (2).

  Parts: Sealing ring
- Position oil drain plug (1) on the oil sump and tighten.

Oil drain plug

M12x16	Renew the sealing ring.	Tightening torque	25 Nm

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- Install service cap (1).

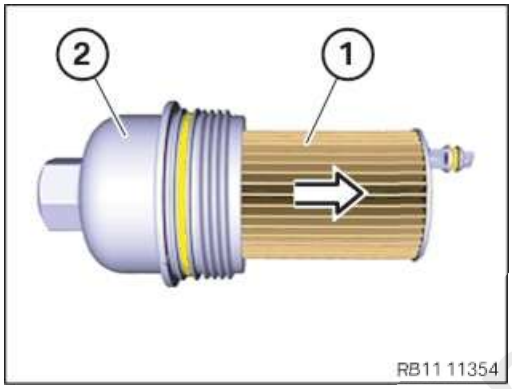
6 – Replace oil filter element

RISK OF DAMAGE

Contaminant or foreign body.

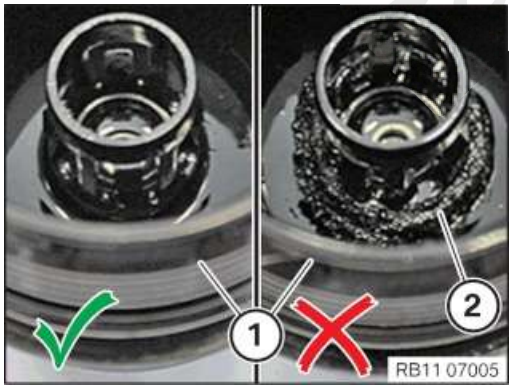
Contamination can result in malfunctions, operating failure or leaks.

- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.



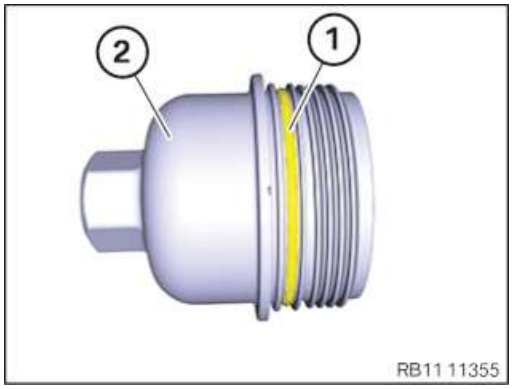
- Guide the fuel filter element (1) out of the fuel filter cover (2) in the direction of the arrow and remove.

▸ **Checking the inner oil filter cover for filter residues**



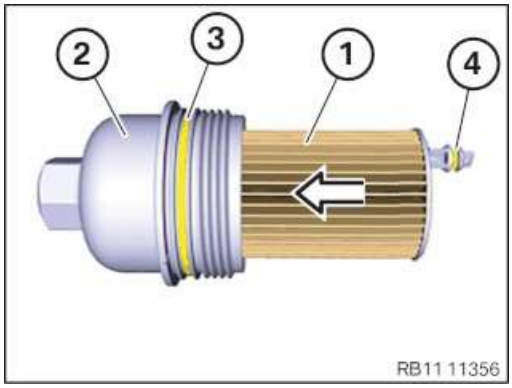
- Check whether there are residues (2) of the previous oil filter on the inside of oil filter cover (1) and, if necessary, remove filter residues (2).

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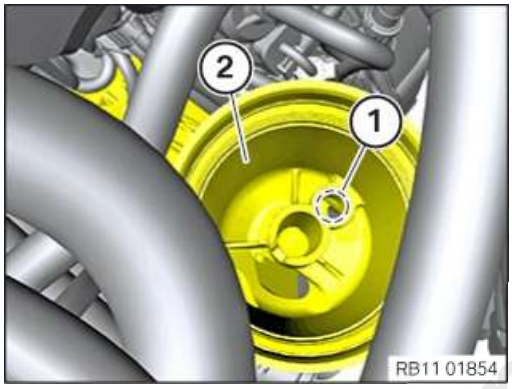
- Guide the sealing ring (1) out at the oil filter cover (2) and remove.
- Renew sealing ring (1).

  Parts: Sealing ring
- Feed in sealing ring (1) on oil filter cover (2) and install.



- Insert and install the oil filter element (1) on the oil filter cover (2) in the direction of the arrow.
- Make sure the oil filter element (1) engages audibly at the oil filter cover (2).
- Coat sealing rings (3) and (4) with engine oil.

7 – Install the oil filter



- Position the oil filter cover with the oil filter element correctly in the guide bore hole (1) in the oil filter housing (2).



- Feed in and install the oil filter cover (1) with the oil filter element.



- Tighten the oil filter cover (1).

Oil filter cover to oil filter module

O-ring lightly oiled.	Tightening torque	25 Nm

8 – Topping up the engine oil

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RISK OF DAMAGE

Engine damage caused by excessively filling the engine with engine oil.

Filling an excessive quantity of engine oil may cause engine damage.

- Observe the exact engine oil filling capacity.
- Allow engine oil to drip off when draining.

- Pour in engine oil.

Engine oil B47D20U1 / B47D20O1 / B47D20T1

Filling capacity, engine oil change with oil filter element	5,5 l

Engine oil: Technically suitable engine oils for BMW Group engines

POSTPROCESSES

9 – Installing the oil filler cap



- Close oil filler cap (1).

10 – Check engine oil level

TECHNICAL INFORMATION

Always check the engine oil level when the engine is at operating temperature (engine oil temperature > 70°C).

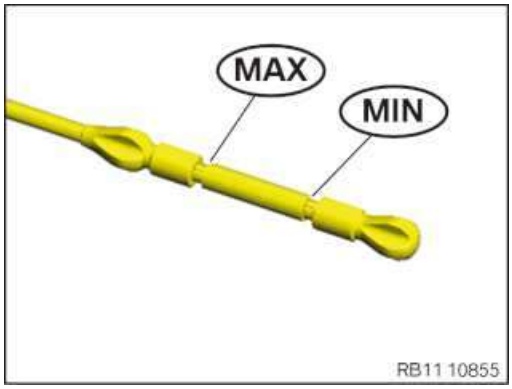
- Park vehicle on a horizontal surface.
- Stop the engine and wait for 5 minutes.
- Pull out the oil dipstick and wipe off using a lint-free cloth.

TECHNICAL INFORMATION

Do not pull out or insert the oil dipstick into the guide tube too quickly or slowly.

- Push the oil dipstick into the guide tube up to the limit position and pull it out again.

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TECHNICAL INFORMATION

The engine oil level must be between the minimum mark and the maximum mark of the oil dipstick.

- Read the engine oil level on the oil dipstick.
- Top up engine oil if necessary.

Oil quantity between the two markings MIN and MAX of the oil dipstick

1.0 l

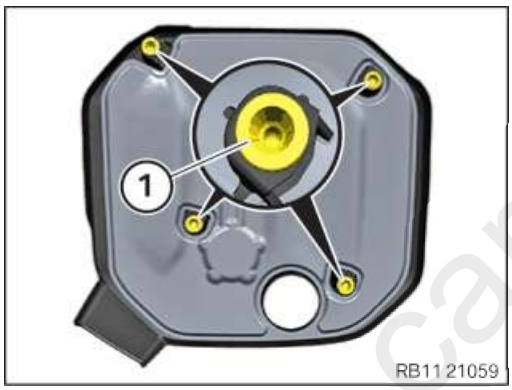
11 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Check the acoustic cover for correct fit of the rubber mounts (1).



- Clip in the acoustic cover (1) into the holders in the indicated areas.

12 – Renew battery of the remote key(s)

- Renew the battery of the remote key(s).

▸ In case of shorter oil change intervals: Renew battery of the remote key(s)

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TECHNICAL INFORMATION

For vehicles with a shortened oil service interval SA8KM. SA8KL and SA8KP the battery of all radio remote controls must be renewed with every 2nd engine oil service.

- Renew the battery of the remote key(s) at every 2nd engine oil service.

13 – Perform CBS reset

Prerequisite

Scope of maintenance work is performed.

On-board date is set correctly.

No CC message is present.

Remaining distance or remaining service life of the service interval is below 90%.

TECHNICAL INFORMATION

The CBS scope of maintenance work can be reset in the car. In general, however, the reset of CBS functions (CBS reset) with the diagnosis system is recommended.

It is only possible to code the country-specific statutory intervals with the diagnosis system.

TECHNICAL INFORMATION

Information for the occurrence of a failed CBS reset:

For front/rear brake service:

- A CBS reset is possible in the vehicle only with a sanded brake pad wear sensor (CBS display in the CID, active).
- In case of a brake pad wear sensor that is not sanded, (no CBS display in the CID) a CBS reset is possible only with the diagnosis system.

Other known causes of CBS reset problems:

- Parking brake applied.
- Brake pedal applied.
- Automatic Hold function activated.

TECHNICAL INFORMATION

The reset procedure (CBS reset) is cancelled due to a timeout or a terminal change.

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- **Equipment specification with the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press trip distance recorder reset button (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

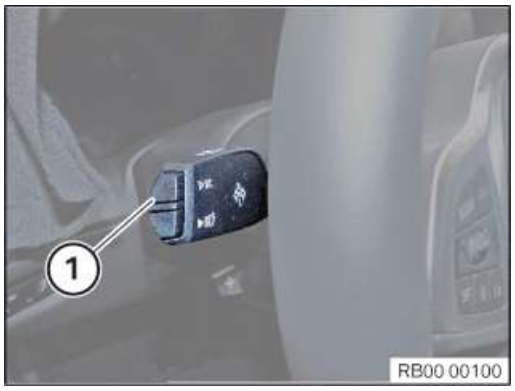
  The next position is reached by briefly pressing the trip distance recorder reset button (1) again.

  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. To do so, press the trip distance recorder reset button (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.



- **Equipment specification without the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press on-board computer button on the turn signal/high beam switch (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

  The next position is reached by briefly pressing the on-board computer button on the turn signal/high beam switch (1)again.

  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. For this, press the on-board computer button on the turn signal/high beam switch (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.

Additional Information

Overview of Tightening Torques

Oil drain plug — Used in step 5

M12x16	Renew the sealing ring.	Tightening torque	25 Nm

Oil filter cover to oil filter module — Used in step 7

O-ring lightly oiled.	Tightening torque	25 Nm

Overview Technical Data

Engine oil B47D20U1 / B47D20O1 / B47D20T1 — Used in step 8

Filling capacity, engine oil change with oil filter element	5,5 l

Engine oil: Technically suitable engine oils for BMW Group engines

Oil quantity between the two markings MIN and MAX of the oil dipstick — Used in step 10

1.0 l

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Links

Operating materials	Used in step
3.0 Technically appropriate engine oils for BMW Group engines	8

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00 00 009 Free pre-delivery check

PRELIMINARY WORK

1 – If fitted: Removing the outer skin protection

- For a separate charge: Remove outer skin protection at least 48 h before handover to customer.

2 – Checking the vehicle for transportation damage

Check

- Check the body, the underbody and the interior equipment for transport damage.

Result

» Transport damage present.

Measure

- Rectify transport damage.

3 – Check if the motor vehicle has spring blockers installed

Check

- Check if the spring struts have spring blockers installed.

Result

» Spring blockers installed.

Measure

- Remove the spring blockers (charge separately).

00 00 741 Pre-delivery check, spring blockers

4 – Check the indicator lights and warning lights

Check

- Check the indicator lights and warning lights in the instrument cluster (KOMBI).

Result

» The indicator lights and/or warning lights in the instrument cluster (KOMBI) are illuminated.

Measure

- Eliminate the causes for the warning messages.

5 – Checking Check Control messages

Check

- Check for Check Control messages in the CID.

Result

» Check Control messages are present in the CID.

Measure

-

▸ **Reading out the fault memory**

- Connect diagnosis system.



Check

- Read out fault memory.

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Result

» A fault memory entry is present.

Measure

- Delete the fault memory, work through the test module if applicable.

MAIN WORK

6 – Resetting transport mode and the performing pre-delivery check with the diagnosis system



- Connect diagnosis system:
  - Service functions
  - Maintenance
  - CBS pre-delivery check
- Perform the pre-delivery check with the diagnosis system.

  The transport mode is reset.

7 – Enabling the navigation map and checking the version

- Enable the navigation map via ISTA.

Check

- Check the navigation map is up to date.

Result

» Navigation map in the vehicle not up to date.

Measure

- For a separate charge: Install the most recent navigation map.

▸ **Navigation map enabling with the USB stick**

- Insert the USB stick into the PC slot.
- Download the enabling code.
  - Open the S-Gate portal.
  - Select ENCS.

TECHNICAL INFORMATION

In order to use the USB stick to enable several vehicles, simply save all the enabling code files on the USB stick.

- Enable the navigation map.

» It is paramount to exactly follow the steps as described above to successfully enable the component on the motor vehicle.

8 – Programming wheel electronics (only while using Tyre Pressure Monitor SA2VB)

Check

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- Using the special tool 2 456 858 check, whether the wheel electronics (1) have already been programmed.

Result

» Wheel electronics were (1) not programmed yet.

Measure

- Program the wheel electronics (1).

▸ **Program the wheel electronics**

NOTICE

The training video is only available in English.

Your browser doesn't support HTML5 video.

TECHNICAL INFORMATION

The training video illustrates the programming of wheel electronics using special RDC tool.

The training video does not replace the repair instructions.

The training video is not subject to the update service.

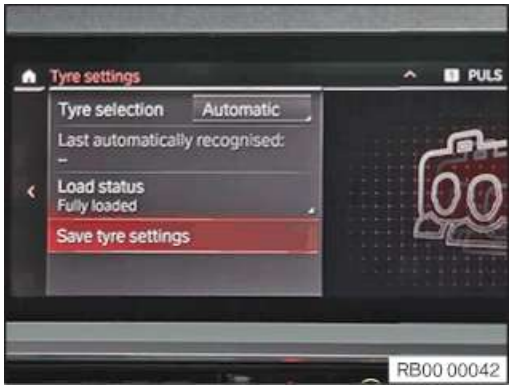
We can assume no liability for printing errors or inaccuracies in this document and reserve the right to introduce technical modifications at any time.

- Follow repair instructions!



- Program wheel electronics (1) using the special tool 2 456 858.

▸ **Adjusting the tyre setting in the CID (in case of equipment specification with ID7)**



- Adjust the tyre setting in the central information display (CID).
- Open the menu:
  - Select **My vehicle** in the menu.
  - Select **Vehicle status** in the menu.
  - Select **Tyre pressure control (RDC)** from the menu.

  Enter the settings:
  - Select **Tyre settings** from the menu.
  - Select tyres: Automatic.
  - Select the load status of the vehicle.
  - Confirm the settings.

TECHNICAL INFORMATION

The stored tyre data is automatically transferred to the vehicle by the wheel electronics.
The vehicle must be driven for this purpose.

- Drive the vehicle to measure the current tyre inflation pressure.

▸ Adjusting the tyre setting in the CID (in case of equipment specification with ID8)



- Adjust the tyre setting in the central information display (CID).
- Open the menu:
  - Select **Menu**
  - Select **Live Vehicle**
  - Select **Tyre Pressure Monitor**
  - Select **Tyre Settings**

  Enter the settings:
  - Select tyres: Automatic.
  - Select the load status of the vehicle.
  - Confirm the settings.

TECHNICAL INFORMATION

The stored tyre data is automatically transferred to the vehicle by the wheel electronics.
The vehicle must be driven for this purpose.

- Drive the vehicle to measure the current tyre inflation pressure.

9 – Checking tyre inflation pressure (only while using tyre pressure monitor SA2VB)

TECHNICAL INFORMATION

It is essential to observe the notes on tolerance compensation.
For more information see: Service Information 00 02 14 (064) Inflation pressure measurement on vehicles with tyre pressure indicator RDC (SA2VB)

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TECHNICAL INFORMATION

The vehicle has an electronic tyre pressure specification in the central information display (CID).

For the system to work properly, the vehicle must be driven. This training drive initialises the system.

Since this may not yet have taken place in sufficient form at the time of the pre-delivery check, the nominal pressure must be taken from the sign on the vehicle or the Owner's Handbook in order to check the tyre inflation pressure.

- Determine and note the tyre size of the fitted tyres.
- Determine and note the load status set in the RDC menu in the Central Information Display (CID).
- Find out the nominal pressure on the sign on the vehicle and/or in the Owner's Handbook and make a note.
- Measure the tyre inflation pressure of each tyre using a tyre pressure gauge.
- Adjust tyre inflation pressure if necessary

10 – Checking the tyre inflation pressure and resetting the flat tyre monitor (RPA)

- Determine and note the tyre size of the installed tyres.
- Determine and note the load status.
- Take out and note the nominal pressure from the sign on the vehicle or the Owner's Handbook.
- Measure the tyre inflation pressure of each tyre with a tyre pressure gauge.
- Adjust the tyre inflation pressure if necessary.
- Go (to) the menu in the central information display (CID):
  - Select "My vehicle" in the menu.
  - Select "Vehicle status" in the menu.
  - Select "Flat tyre monitor (RPA)" in the menu.
  - Perform reset.

11 – Activating automatic driving lights control

- Activate button for the automatic driving lights control on the light operating unit.

12 – Top up the washer fluid for the window washer system

- Top up the fluid tank for the window washer system up to the maximum mark.

POSTPROCESSES

13 – Installing accessory items

- Place, install or fasten all enclosed parts scope (towing eye, BMW Mobility System, first-aid kit, warning triangle, toolkit, if necessary, floor mats, etc.) at the respective installation locations in the vehicle.

14 – If part of the accessories kit package: Charge the BMW display key

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- Connect the charging cable (3) to the BMW display key (1) and the USB port in the vehicle.
- Place the BMW display key (1) into the oddments tray (2) below the centre armrest.

15 – If part of the accessories kit package: Depositing the radio remote control in the centre console

- Remove the radio remote control from the accessories kit package in the luggage compartment.
- Deposit the radio remote control in the centre console of the vehicle.

16 – Enclosing documents

- Place documents in glove box:
  - Rider's Manual
  - Accident hotline booklet
  - 2nd remote control with integrated key
  - Country-specific documents where applicable

17 – Attaching the label for BMW breakdown assistance

- Attach the label for BMW breakdown assistance at the specified place in the vehicle.

18 – For winter tyres: Attach the label for maximum speed

- Attach the label for maximum speed at the edge of the driver's field of view.

19 – Clean vehicle

- Check engine compartment for cleanliness.
- Clean motor vehicle exterior.
- Clean the vehicle interior, in particular the displays and high-gloss surfaces.

20 – Korea national-market version: Enter pre-delivery check in Service Booklet

- Stamp pre-delivery check in the Service Booklet.
- Enter vehicle identification number in Service Booklet.

Additional Information

Overview of Special Tools

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2 456 858 RDC Tool



Common	Used in step 8
Usage	With the help of tyre pressure indicator tool, the tyre data (which is found on the tyre via a QR code) can be recorded and tyre pressure indicator sensors can be programmed.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	07 04 18 (584)

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Links

Appendices	Used in step
Installation instructions for on-board device for electronic toll collection	
Operating instructions for on-board device for electronic toll collection	

Functional descriptions	Used in step
Tyre pressure control	89

Functional descriptions	Used in step
Terminal control, Parking-Residing-Driving	15

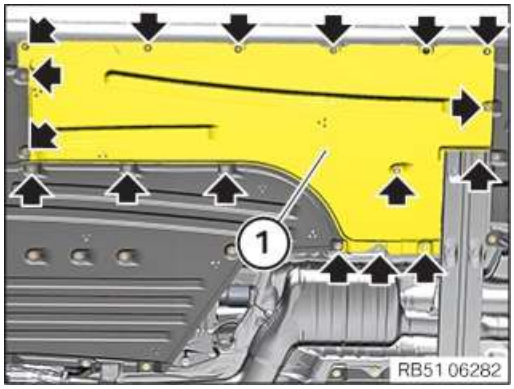
Repair instructions	Used in step
00 00 ... Work instruction for removing the protective film	1
00 00 741 Pre-delivery check, spring blockers	3

Technical service information	Used in step
Inflation pressure measurement in vehicles with tyre pressure display RDC (SA2VB)	9

00 00 604 Fuel filter service

PRELIMINARY WORK

1 – Remove side underbody panelling



- Unscrew all bolts and nuts (arrows).
- Remove the underbody panelling (1).

MAIN WORK

2 – Removing the fuel filter

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

RISK OF DAMAGE

Contaminant or foreign body.

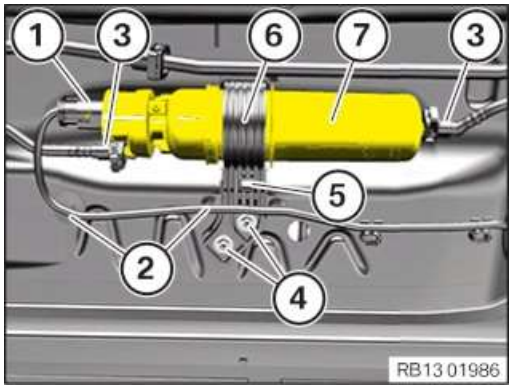
Contamination can result in malfunctions, operating failure or leaks.

- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.

TECHNICAL INFORMATION

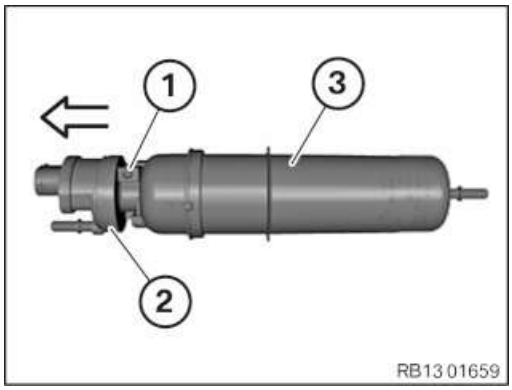
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

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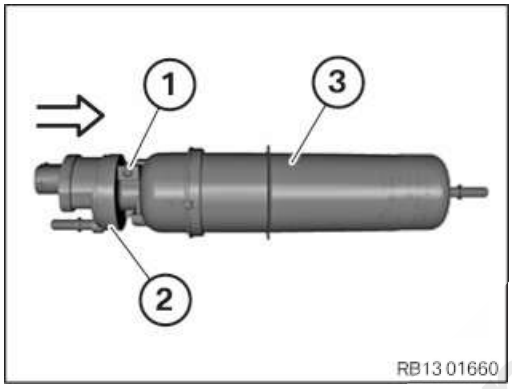
- Unlock plug connection (1) and disconnect.
- Release the line from the connector (1) from the clips (2) and expose it.
- Unlock and loosen fuel lines (3).
- Loosen nut (4).
- Unlock lock (5).
- Guide out and remove holder (6).
- Guide out and remove fuel filter (7).

3 – Replacing the fuel filter



- Loosen screw (1).
- Guide the fuel preheating (2) out of the fuel filter (3) in the direction of the arrow and remove.
- Renew fuel filter (3).

  Parts: Fuel filter

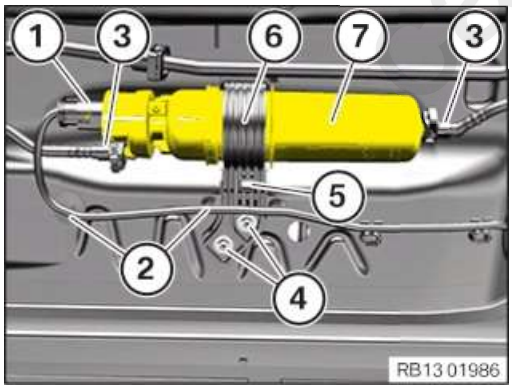


- Guide the fuel preheating (2) into the fuel filter (3) in the direction of the arrow and remove.
- Tighten down screw (1).

Fuel preheating on fuel filter

	Tightening torque	2 Nm

4 – Installing the fuel filter



- Insert and install the fuel filter (7).
- Insert and install the holder (6).

  The lock (5) must audibly engage.
- Tighten nut (4).

Fuel filter on vehicle underbody

M6	Renew nuts.	Tightening torque	6 Nm

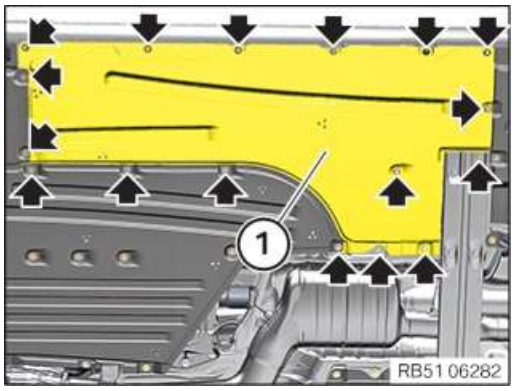
- Connect and lock fuel lines (3).

  The fuel lines (3) must audibly engage.
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.
- Secure the line of connector (1) on the clips (2).
- Check fuel system for leak tightness.

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5 – Installing the underbody panelling on the sides



- Insert the underbody panelling (1).
- Tighten all bolts and nuts (arrows).

Underbody panelling, side

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

Additional Information

Overview of Tightening Torques

Fuel preheating on fuel filter — Used in step 3

		Tightening torque	2 Nm

Fuel filter on vehicle underbody — Used in step 4

M6	Renew nuts.	Tightening torque	6 Nm

Underbody panelling, side — Used in step 5

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

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00 00 744 Pre-delivery check of service and electromechanical holding brake for transport and immobilisation periods of more than 6 weeks

1 Bedding in the service and parking brake

- Check service and parking brakes.

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00 00 742 Pre-delivery check of service and parking brakes with transport and immobilisation periods of 3-6 weeks

1 Checking the service and parking brake for function

Check

- Check that the service and parking brakes are functioning properly.

Result

» Function limitations.

Measure

- Service the service and parking brake.

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00 00 602 Service - air filter element

WARNING

Hot surfaces.

Risk of burning!

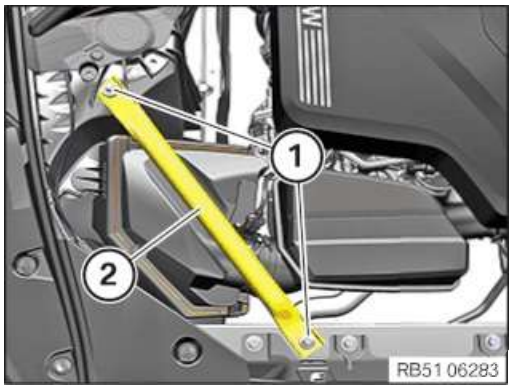
- Perform all work only on components that have cooled down.

PRELIMINARY WORK

1 – Remove right front-end strut

TECHNICAL INFORMATION

Driving without the strut brace/front-end strut or tension strut is not permitted.



- Loosen screws (1).
- Remove the front-end strut (2).

MAIN WORK

2 – Removing air filter element

Prerequisite

Ignition is switched off.

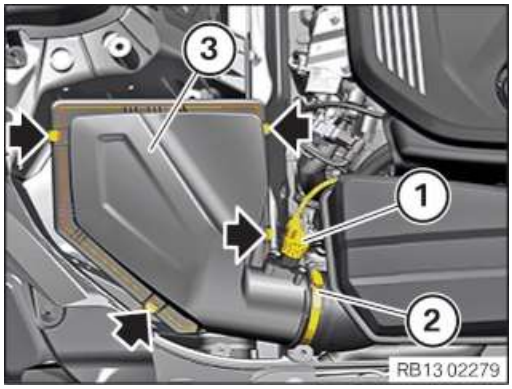
RISK OF DAMAGE

Damage to the clean air line. Damage to the air filter.

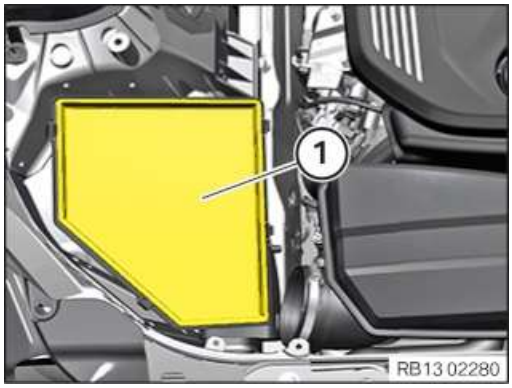
For changing the air filter insert, if the upper section of intake filter housing is only raised and not completely removed, the clean air line and the air filter insert may be damaged.

- Do not lift upper section of intake filter housing by force.
- Unfasten clamp.
- Remove upper section of intake filter housing completely.

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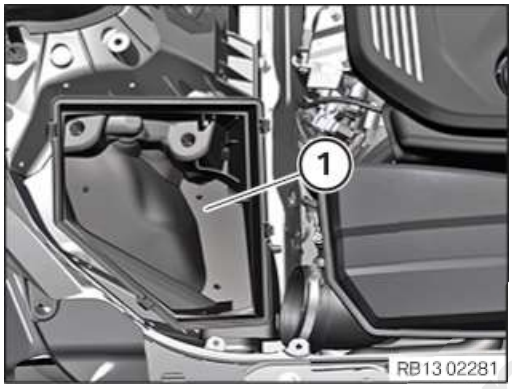


- Unlock plug connection (1) and disconnect.
- Unfasten clamp (2).
- Unlock clamps (arrows).
- Remove the upper section of the intake filter housing (3).

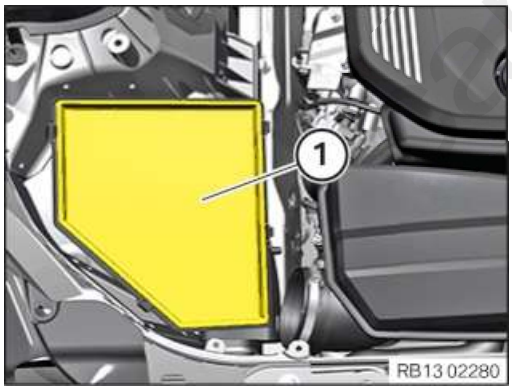


- Remove the air filter element (1).

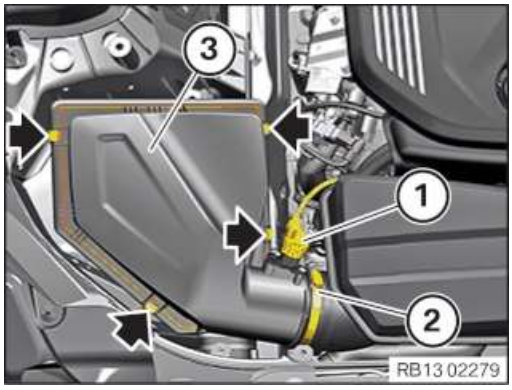
3 – Installing the air filter element



- Clean lower section of intake filter housing (1).



- Install the air filter element (1).



- Insert and install the upper section of the intake filter housing (3).
- Lock clamps (arrows).

  The clamps (arrows) must engage audibly.
- Tighten clamp (2).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

- Connect connectors (1) and lock.

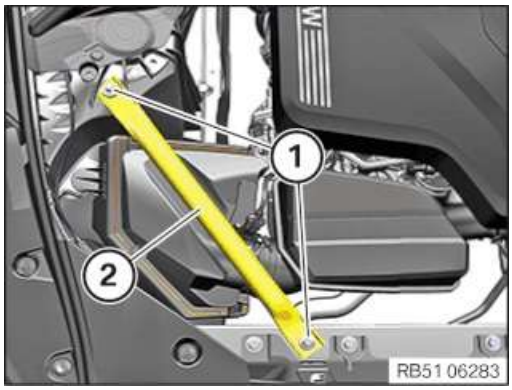
  The connector (1) must engage audibly.

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4 – Install the right front-end strut

TECHNICAL INFORMATION

Driving without the strut brace/front-end strut or tension strut is not permitted.



- Install the front-end strut (2).
- Renew screws (1).

  Parts: Screws
- Tighten the screws (1).

Front end strut

Screw		Tightening torque	56 Nm

Additional Information

Overview of Tightening Torques

Clean air pipe to upper section of intake filter housing — Used in step 3

Clamp		Tightening torque	3 Nm

Front end strut — Used in step 4

Screw		Tightening torque	56 Nm

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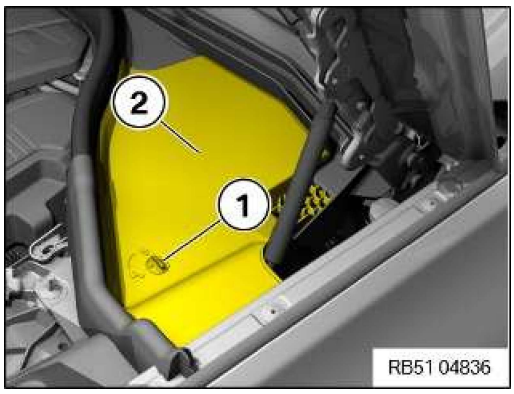
00 00 618 Service - brake fluid

TECHNICAL INFORMATION

Use only BMW-approved brake fluids.
For additional information see: SBS-ANL-SBS1996-340396150...

PRELIMINARY WORK

1 – Remove the cover of the engine compartment at the rear left



- Loosen the lock (1).
- Remove the cover (2) of the rear left engine compartment.

2 – Connect bleeder unit for brake fluid





- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.

TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

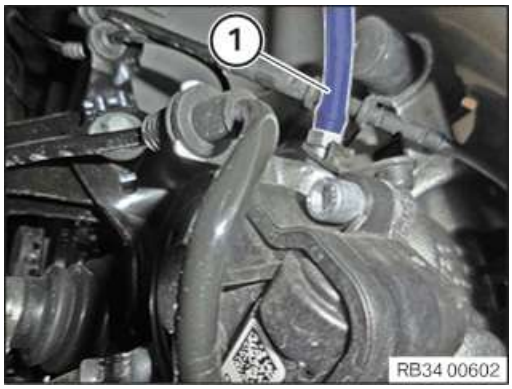
.com

MAIN WORK

3 – Rinsing and bleeding the rear axle brake circuit

NOTICE

Description is for right component only. The procedure on the left side is identical.



- **Start flushing at the rear right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on rear right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve.

Vent valve of the rear brake caliper, made of aluminium and not painted

Vent valve		Tightening torque	10 Nm

Vent valve of the rear brake caliper, made of steel and always painted

Vent valve		Tightening torque	17 Nm

- Carry out the same procedure on the rear left wheel brake.

4 – Flushing and bleeding the front axle brake circuit

NOTICE

Description is for right component only. The procedure on the left side is identical.



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Vent valve

		Tightening torque	10 Nm

POSTPROCESSES

5 – Disconnecting the bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

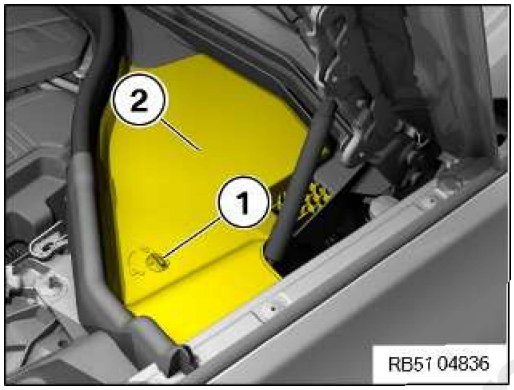


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) of sealing cap for damage and renew it if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

6 – Install the cover of the engine compartment on the rear left



- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

7 – If installed: Check the gas pressure spring for bonnet (only for versions with active pedestrian protection (SA8TF))



Check

TECHNICAL INFORMATION

For vehicles with active pedestrian protection (SA8TF), both gas-filled shock absorbers of the hood must be regularly renewed as part of preventive service.

With some gas-filled shock absorbers, the expiry date is printed on. For all others, only the production date is printed on.

Regardless of the printing, both gas-filled shock absorbers of the hood must be regularly renewed as part of preventive service.

- Check designation for gas pressure springs for engine compartment lid.
- If necessary, note the expiration date (1).
- If necessary, note the production date (days / year) (2).

desired state

- The expiry date of both gas pressure springs for bonnet must be after the next brake fluid service (24 months).

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Result

» The expiration date (1) of the gas pressure springs for engine compartment lid does not extend to the time of the next brake fluid service (24 months).

Measure

- Renew both gas pressure springs for bonnet.

Result

» Production date (days / year) (2) of the gas pressure springs for engine compartment lid + 5 years does not extend to the time of the next brake fluid service (24 months).

Measure

- Renew both gas pressure springs for bonnet.

51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid
51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid
51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid
51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid
51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid
51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid

8 – Perform CBS reset

Prerequisite

Scope of maintenance work is performed.

On-board date is set correctly.

No CC message is present.

Remaining distance or remaining service life of the service interval is below 90%.

TECHNICAL INFORMATION

The CBS scope of maintenance work can be reset in the car. In general, however, the reset of CBS functions (CBS reset) with the diagnosis system is recommended.

It is only possible to code the country-specific statutory intervals with the diagnosis system.

TECHNICAL INFORMATION

Information for the occurrence of a failed CBS reset:

For front/rear brake service:

- A CBS reset is possible in the vehicle only with a sanded brake pad wear sensor (CBS display in the CID, active).

- In case of a brake pad wear sensor that is not sanded, (no CBS display in the CID) a CBS reset is possible only with the diagnosis system.

Other known causes of CBS reset problems:

- Parking brake applied.

- Brake pedal applied.

- Automatic Hold function activated.

TECHNICAL INFORMATION

The reset procedure (CBS reset) is cancelled due to a timeout or a terminal change.

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- **Equipment specification with the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press trip distance recorder reset button (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

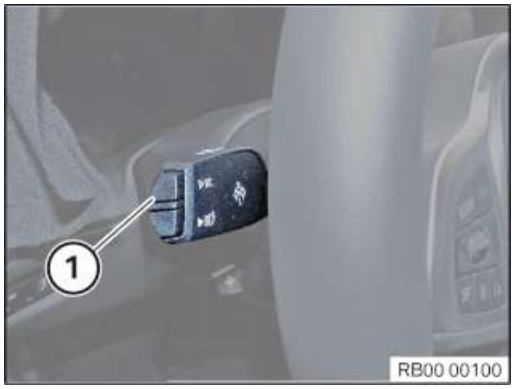
  The next position is reached by briefly pressing the trip distance recorder reset button (1) again.

  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. To do so, press the trip distance recorder reset button (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.



- **Equipment specification without the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press on-board computer button on the turn signal/high beam switch (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

  The next position is reached by briefly pressing the on-board computer button on the turn signal/high beam switch (1)again.

  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. For this, press the on-board computer button on the turn signal/high beam switch (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.

Additional Information

Overview of Tightening Torques

Vent valve of the rear brake caliper, made of aluminium and not painted — Used in step 3

Vent valve		Tightening torque	10 Nm

Vent valve of the rear brake caliper, made of steel and always painted — Used in step 3

Vent valve		Tightening torque	17 Nm

Vent valve — Used in step 4

		Tightening torque	10 Nm

Links

Repair instructions	Used in step
51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid	7
51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid	7
51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid	7

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51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid 7
51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid 7
51 23 265 Removing and installing/replacing left or right gas pressure spring for engine compartment lid 7

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00 00 612 Service - front brakes

WARNING

Vehicle may slip off the vehicle hoist if the vehicle hoist is handled incorrectly.

Danger! Life-threatening injuries!

- Observe safety information on raising the vehicle using a vehicle hoist.
- For additional information see: 00 ... Raise the vehicle using a vehicle lift.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

PRELIMINARY WORK

1 – Remove the front left and right wheels

NOTICE

Perform the operations on the left and right side.

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

  This process is intended to prevent damage to the brake disc.



- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

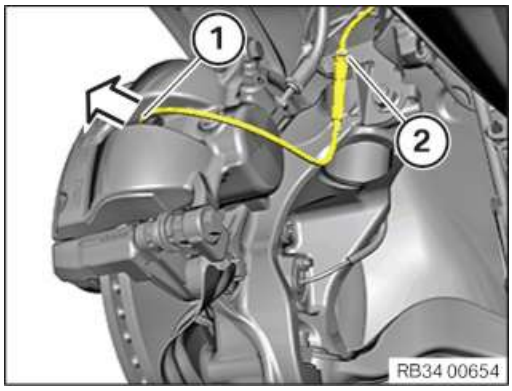
2 – Remove brake pad wear sensor to the front

TECHNICAL INFORMATION

The brake pad wear sensor must be renewed immediately once it has been removed because the brake pad wear sensor loses its retention capacity in its brake pad.

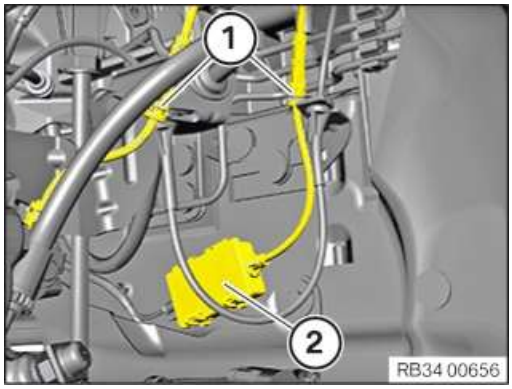
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



- Remove the brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the cable of the brake pad wear sensor (1) from the holders (2).

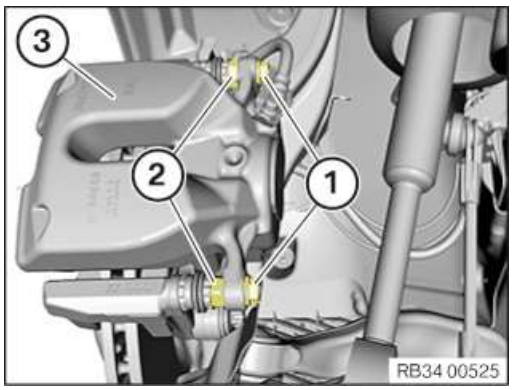
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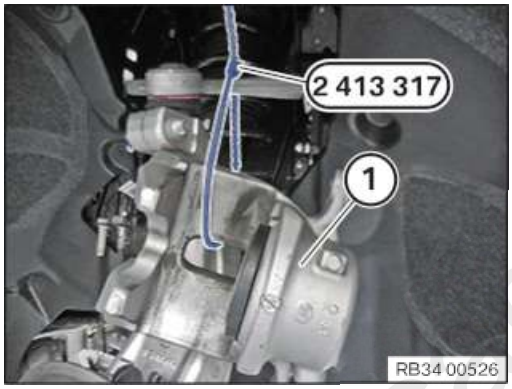
- Detach the brake pad wear sensor from the holders (1).
- Open the sealing cap (2) and unlock and disconnect the plug connection.

MAIN WORK

3 – Remove front brake pads

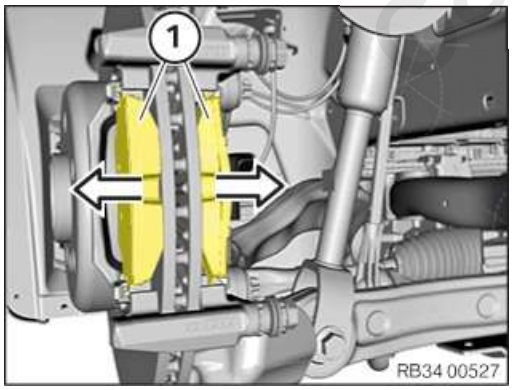


- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove the brake caliper (3).



- Tie up the brake caliper (1) using the special tool (cable strap) 2 413 317.

  The brake caliper must not hang on the brake hose.



- Remove the brake pads (1) in the direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.



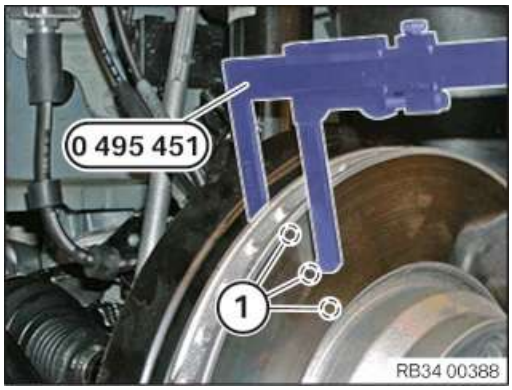
TECHNICAL INFORMATION

When pressing the brake piston back, note the brake fluid level in the expansion tank.

Overflowing brake fluid will damage the paintwork.

- Push the brake pistons (1) back with the special tool 2 352 960.

4 – Measure minimum brake disc thickness (front brake)



- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

  Compare measuring result and lowest value with setpoint value.

  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 348x30)

Minimum brake disc thickness (brake disc 348x30)	28,4 mm

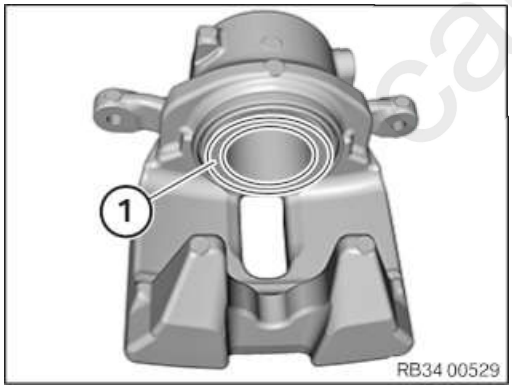
Minimum brake disc thickness (nominal dimension 348x36)

Minimum brake disc thickness (brake disc 348x36)	34,4 mm

Minimum brake disc thickness (nominal dimension 330x24)

Minimum brake disc thickness (brake disc 330x24)	22,4 mm

5 – Grease the brake pads, caliper carriers and brake calipers with brake pad paste (17-inch brake)

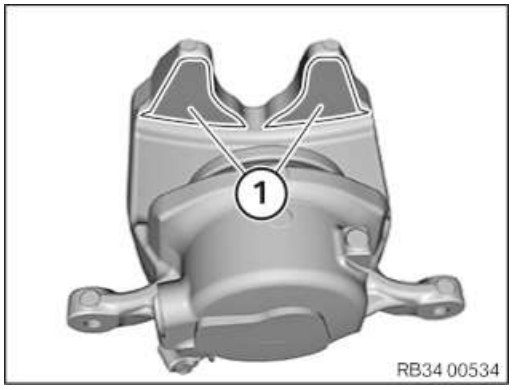


- Clean the contact surfaces (1) of the brake piston using brake cleaner.

Expendable materials

Brake cleaner2.0	500 ml, Spray can	83192365214
	20 , Canister	83192365215

- Check dust boots for damage; renew if necessary.

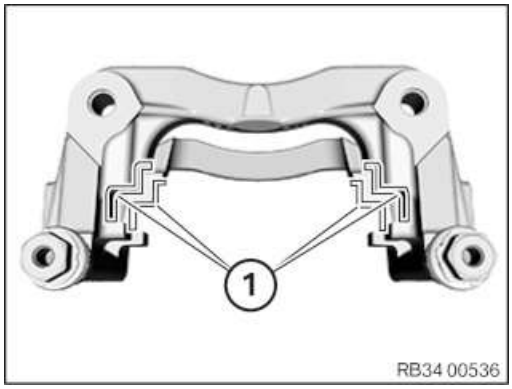


- Clean contact surfaces (1) of the brake caliper with brake cleaner and apply a thin layer of brake pad paste.

Expendable materials

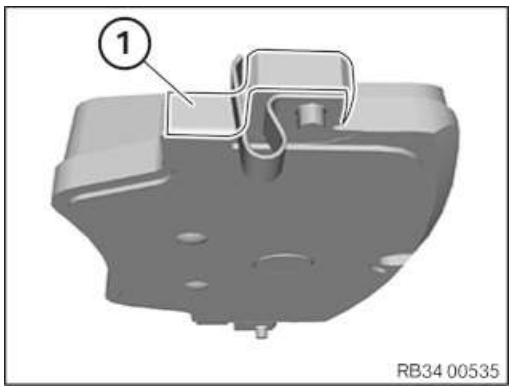
Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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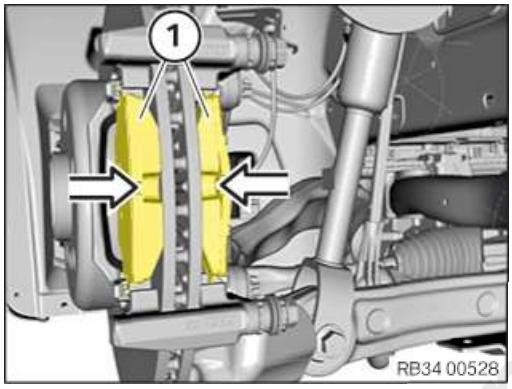
- Clean contact surfaces with brake cleaner.

  The contact surfaces (1) for the brake pads should not be cleaned mechanically if possible in order to avoid damaging the surface coating.
- Carefully clean highly contaminated contact surfaces (1) using a suitable tool (e.g. brass wire brush, nylon brush).
- Coat contact surfaces (1) thinly with brake pad paste.



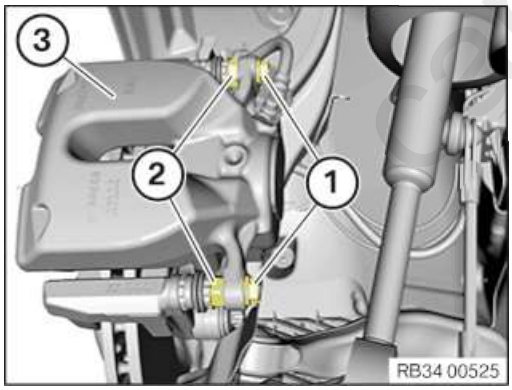
- Apply a thin coating of brake pad paste to both sides of the T-head of the brake pad in area (1).

6 – Installing the front brake pads



- If applicable, observe the identification of the removed brake pads.

  If the brake pads are worn on one side, they must not be mixed up.
- Install the brake pads (1) in the brake calliper in the direction of the arrow.



- Remove the special tool (cable strap) 2 413 317.
- Install the brake caliper (3).
- Renew screws.

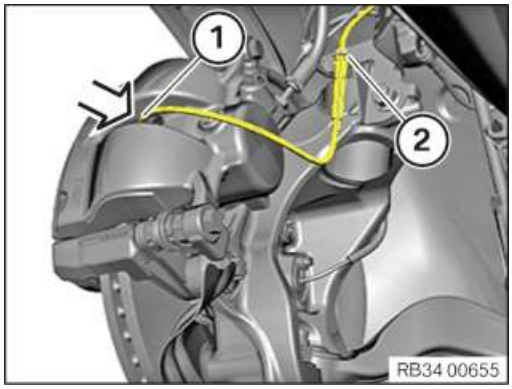
  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

Guide bolt (brake caliper on caliper carrier)

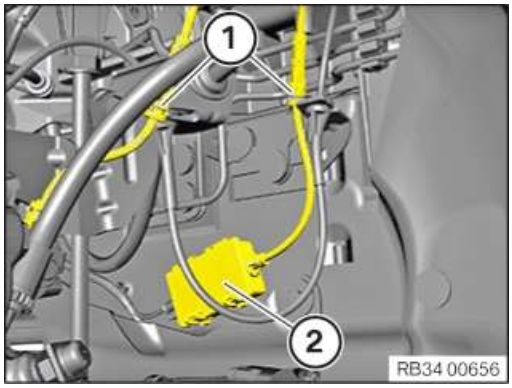
M8	Renew screws.		35 Nm

POSTPROCESSES

7 – Installing the front brake pad wear sensor



- Hook the brake pad wear sensor (1) into the holder (2).
- Install the brake pad wear sensor (1) in the brake pad in the direction of the arrow and ensure correct fit.



- Attach the cable of the brake pad wear sensor to the holder (1).
- Connect connectors and lock.
- Close sealing cap (2).

8 – Mount the front left and right wheels

NOTICE

Perform the operations on the left and right side.

▸ **Mounting the wheel**



TECHNICAL INFORMATION

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

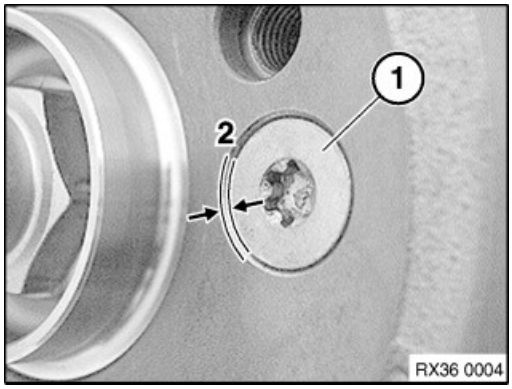
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Check that the mounting bolt (1) for the brake disc is securely seated.

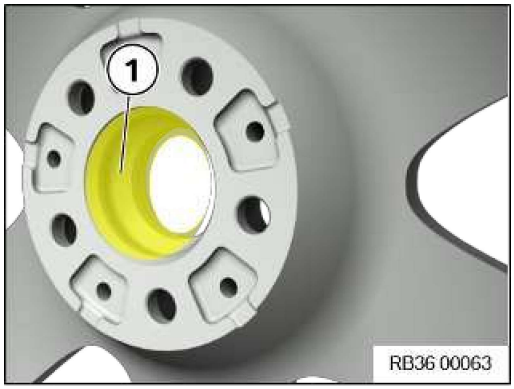
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against corrosion.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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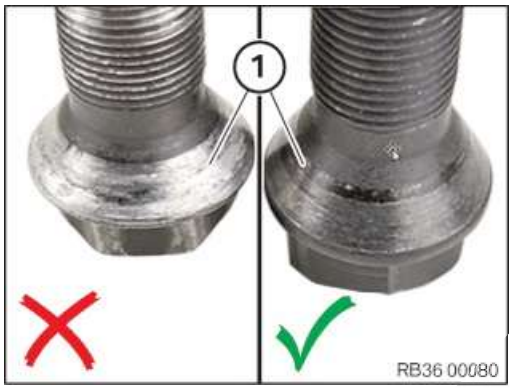


TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

  This process is intended to prevent damage to the brake disc.



Check

- **Check wheel bolts for wear.**

Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts

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TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

9 – Commissioning/bedding in new brake pads and brake discs

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

10 – Perform CBS reset

Prerequisite

Scope of maintenance work is performed.

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On-board date is set correctly.

No CC message is present.

Remaining distance or remaining service life of the service interval is below 90%.

TECHNICAL INFORMATION

The CBS scope of maintenance work can be reset in the car. In general, however, the reset of CBS functions (CBS reset) with the diagnosis system is recommended.

It is only possible to code the country-specific statutory intervals with the diagnosis system.

TECHNICAL INFORMATION

Information for the occurrence of a failed CBS reset:

For front/rear brake service:

- A CBS reset is possible in the vehicle only with a sanded brake pad wear sensor (CBS display in the CID, active).
- In case of a brake pad wear sensor that is not sanded, (no CBS display in the CID) a CBS reset is possible only with the diagnosis system.

Other known causes of CBS reset problems:

- Parking brake applied.
- Brake pedal applied.
- Automatic Hold function activated.

TECHNICAL INFORMATION

The reset procedure (CBS reset) is cancelled due to a timeout or a terminal change.



- **Equipment specification with the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press trip distance recorder reset button (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

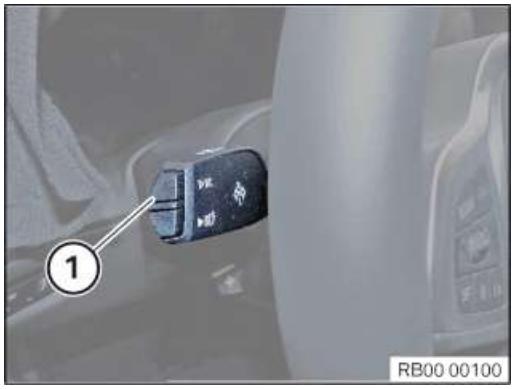
  The next position is reached by briefly pressing the trip distance recorder reset button (1) again.

  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. To do so, press the trip distance recorder reset button (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.



- **Equipment specification without the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press on-board computer button on the turn signal/high beam switch (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

  The next position is reached by briefly pressing the on-board computer button on the turn signal/high beam switch (1)again.

  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. For this, press the on-board computer button on the turn signal/high beam switch (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.

Additional Information

Overview of Tightening Torques

Guide bolt (brake caliper on caliper carrier)			Used in step 6
M8	Renew screws.		35 Nm

Brake disc to front wheel hub			Used in step 8
M8	Renew screw.	Tightening torque	16 Nm

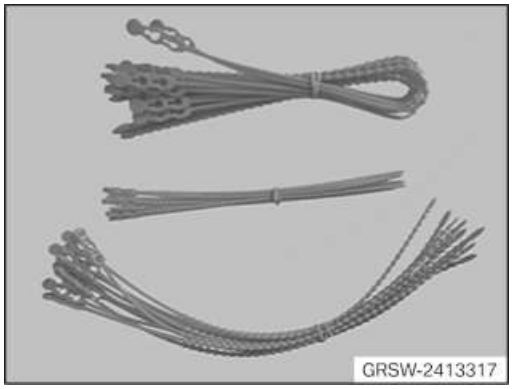
Brake disc to rear wheel hub			Used in step 8
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts			Used in step 8
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

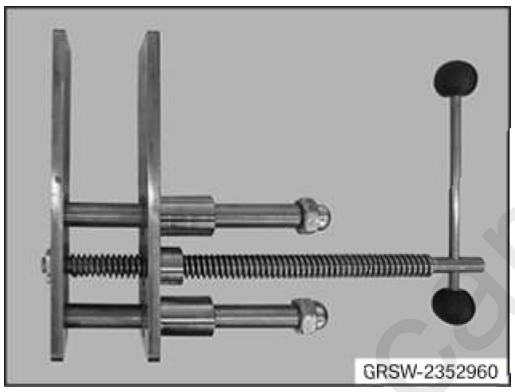
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2 413 317 Cable strap



Common	Used in step 36
Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

2 352 960 Reset



Common	Used in step 3
Usage	Set back to brake piston. Replacement for 34 1 050 (83300492455). (Classic SWZ)
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	

2 344 011 Tool



Common	Used in step 8
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

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0 495 221 (36 1 323) Wheel stud



Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

Overview Technical Data

Minimum brake disc thickness (nominal dimension 348x30) Used in step 4

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Minimum brake disc thickness (brake disc 348x30)	28,4 mm

Minimum brake disc thickness (nominal dimension 348x36) Used in step 4

Minimum brake disc thickness (brake disc 348x36)	34,4 mm

Minimum brake disc thickness (nominal dimension 330x24) Used in step 4

Minimum brake disc thickness (brake disc 330x24)	22,4 mm

Links

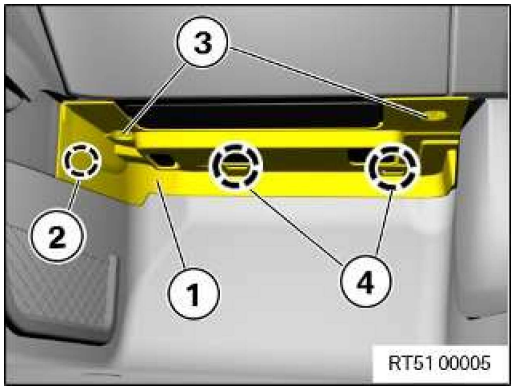
Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	18
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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00 00 616 Service - microfilter

PRELIMINARY WORK

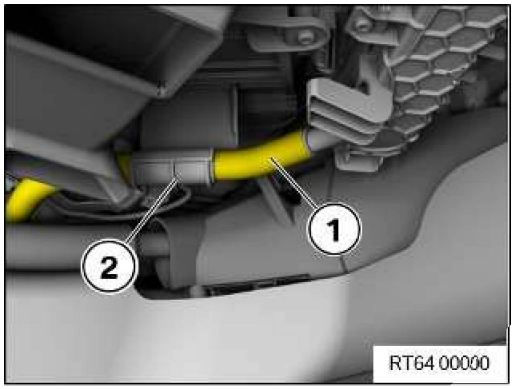
1 – Remove the right footwell trim



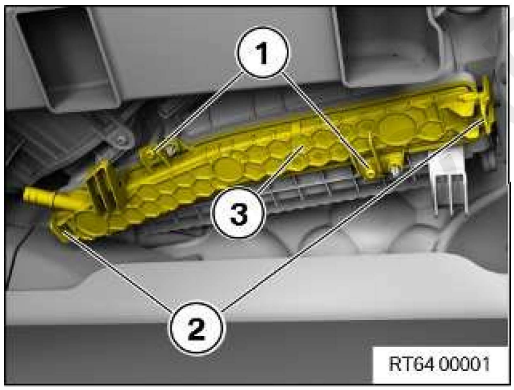
- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

MAIN WORK

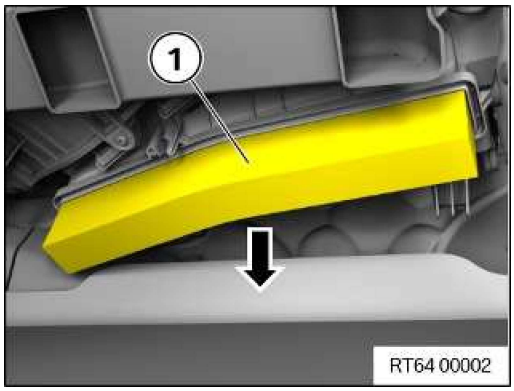
2 – Remove microfilter



- Pull off the water drain hose (1).
- Thread the water drain hose (1) out of the bracket (2).



- Loosen screws (1).
- Release latch mechanisms (2) and remove cover (3).



- Remove microfilter (1).

3 – Install microfilter

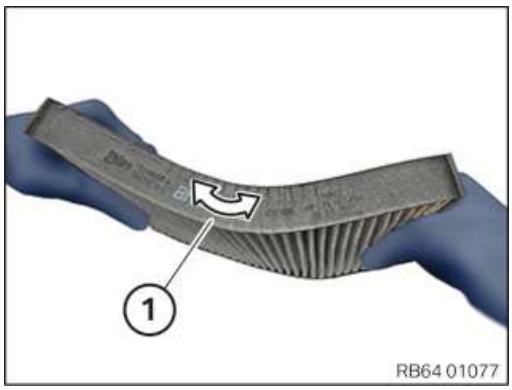
.com

RISK OF DAMAGE

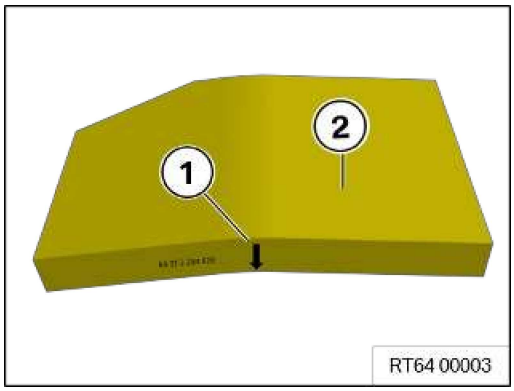
Damage to the heating and air conditioning system.

Use of unapproved microfilters may cause impairment of functions in the air conditioning.

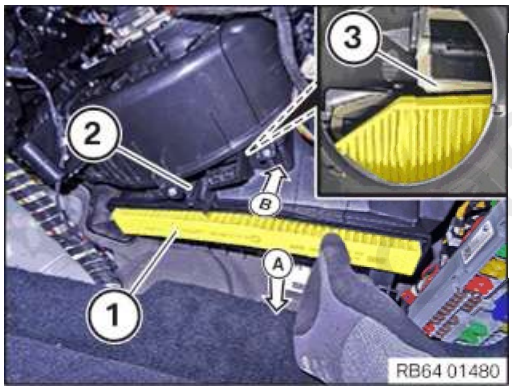
- Only operate the heating and air conditioning system with the specified microfilter.



- Pre-bend microfilter (1) slightly as shown in the graphic.



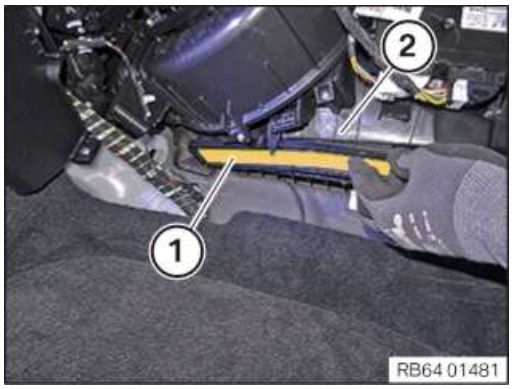
- Please note that the arrow (1) on the microfilter (2) must always point in the direction of travel during installation.



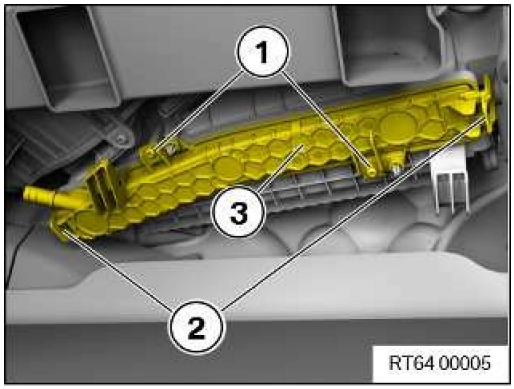
TECHNICAL INFORMATION

Mount the components correctly. Non-compliance with the instructions can lead to an impairment of function or component damage.

- Feed in the micro-filter (1) in the heating and air-conditioning unit (2) and press slightly forwards in the direction of arrow (A).
- Slide the micro-filter (1) upwards in the direction of arrow (B) in the heating and air-conditioning unit (2).
- It should be ensured that while sliding the micro-filter (1) into the heating and air-conditioning unit (2) does not lie up against the recirculated air flap (3).



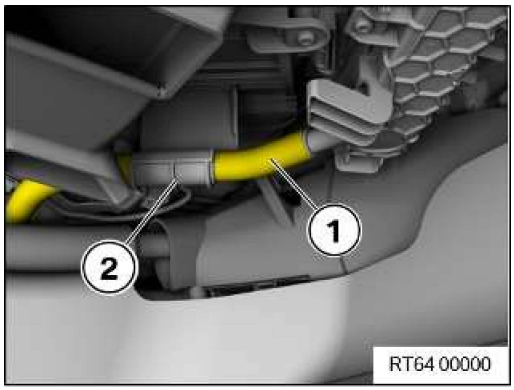
- Slide the micro-filter (1) without too much effort up to the limit position into the heating and air-conditioning unit (2) as shown.



- Make sure that the cover (3) is correctly inserted into the latch mechanisms (2) of the blower housing.
- Tighten the screws (1).

Microfilter lid on heating and air-conditioning unit

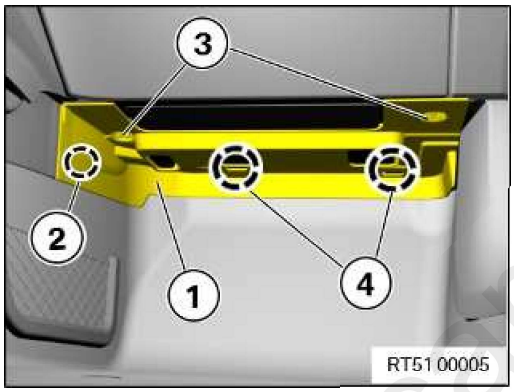
Screw		Tightening torque	2.8 Nm



- Connect water drain hose (1).
- Insert the water drain hose (1) into the holder (2).

POSTPROCESSES

4 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

Additional Information

Overview of Tightening Torques

Microfilter lid on heating and air-conditioning unit Used in step 3

Screw		Tightening torque	2.8 Nm

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00 00 614 Service - rear brakes

WARNING

Vehicle may slip off the vehicle hoist if the vehicle hoist is handled incorrectly.

Danger! Life-threatening injuries!

- Observe safety information on raising the vehicle using a vehicle hoist.
- For additional information see: 00 ... Raise the vehicle using a vehicle lift.

CAUTION

Effects on other persons.

Danger of injury! Risk of damage!

- Make sure that no other persons are in or around the vehicle.

TECHNICAL INFORMATION

During work on the rear brake, it must be ensured that the button for the electromechanical parking brake cannot be pressed.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

PRELIMINARY WORK

1 – Removing the rear left and right wheels

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NOTICE

Perform the operations on the left and right side.

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

  This process is intended to prevent damage to the brake disc.



- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Remove rear brake pad wear sensor

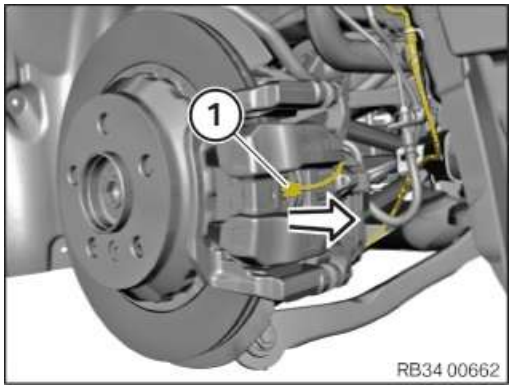
TECHNICAL INFORMATION

The brake pad wear sensor must be renewed immediately once it has been removed because the brake pad wear sensor loses its retention capacity in its brake pad.

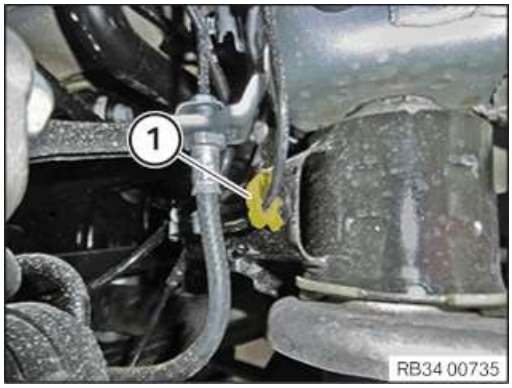
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

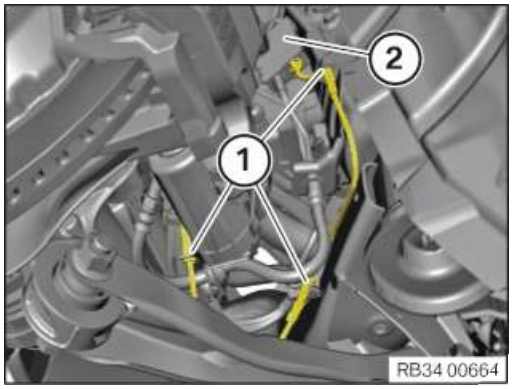
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- Remove the brake pad wear sensor (1) out of the brake pad in the direction of the arrow.



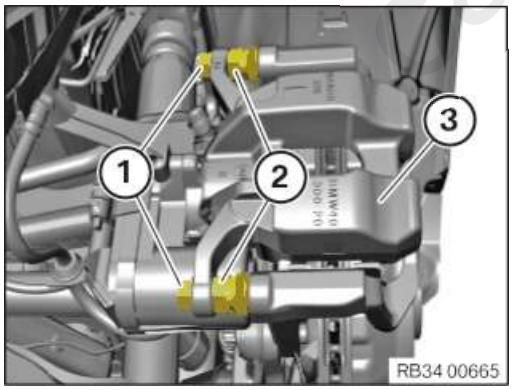
- Detach the cable of the brake pad wear sensor from the holder (1).



- Detach the brake pad wear sensor from the holders (1).
- Open the cover (2) and unlock and disconnect the plug connection.

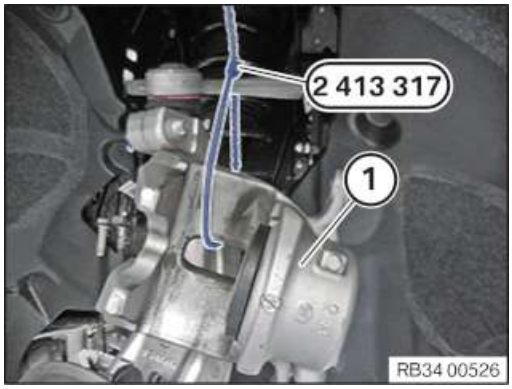
MAIN WORK

3 – Remove rear brake pads



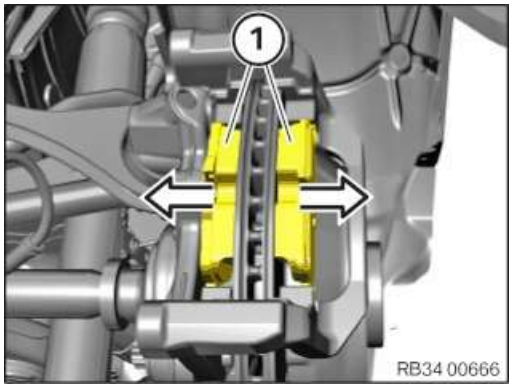
- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove brake caliper (3).

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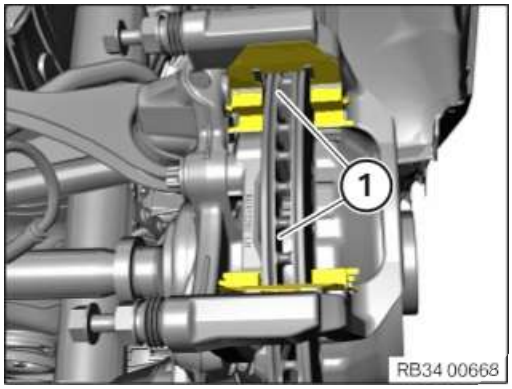
- Tie up brake calliper (1) using special tool (cable strap) 2 413 317.

  The brake caliper must not hang on the brake hose.

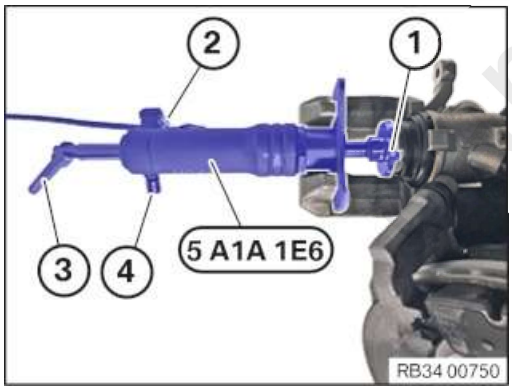


- Remove the brake pads (1) from the brake caliper in direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.



- Remove the sliding plates (1).



TECHNICAL INFORMATION

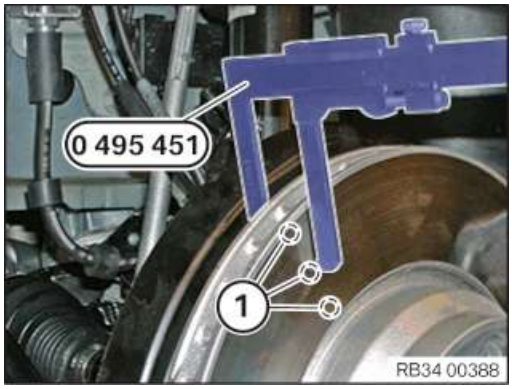
When pressing the brake piston back, note the brake fluid level in the expansion tank.

Overflowing brake fluid will damage the paintwork.

- Position the brake reset 5 A1A 1E6 in the brake caliper and hook the adapter plate (1) in the brake piston.
- Bring the brake reset 5 A1A 1E6 to the limit position by pressing the release button (2).
- Press and hold the release button (2) and turn the operating lever (3) in a clockwise direction until the brake piston is completely turned back.
- Release the brake reset 5 A1A 1E6 by pressing the release button (4) and remove it from the brake caliper.

4 – Measure minimum brake disc thickness (rear brake)

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- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

  Compare measuring result and lowest value with setpoint value.

  New brake pads may only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x20)

Minimum brake disc thickness (brake disc 330x20)	18,4 mm

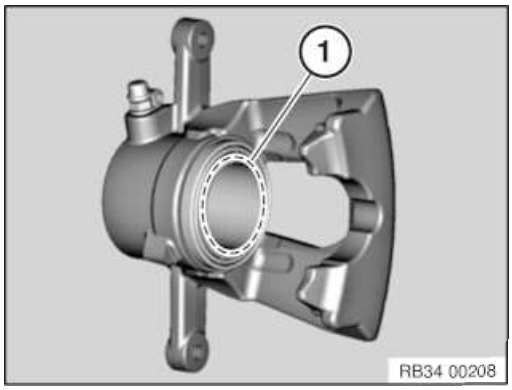
Minimum brake disc thickness (nominal dimension 345x24)

Minimum brake disc thickness (brake disc 345x24)	22,4 mm

Minimum brake disc thickness (nominal dimension 370x24)

Minimum brake disc thickness (brake disc 370x24)	22,4 mm

5 – Grease brake pads, caliper carrier and brake caliper with brake pad paste



TECHNICAL INFORMATION

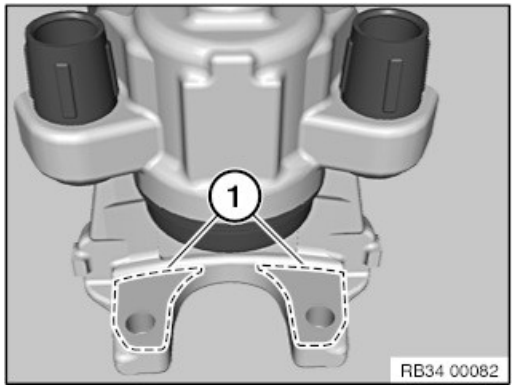
If brake pads are installed with an adhesive film, this area may only be cleaned and must **not** be greased with brake pad paste!

- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

- Check dust boots for damage; renew if necessary.



TECHNICAL INFORMATION

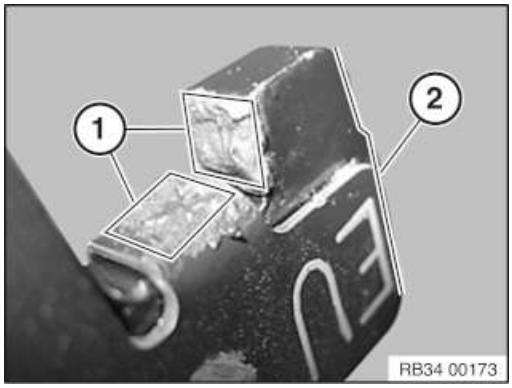
If brake pads are installed with an adhesive film, this area may only be cleaned and must **not** be greased with brake pad paste!

- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

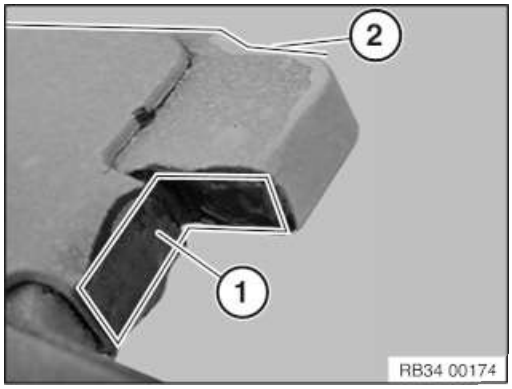
carflash.com



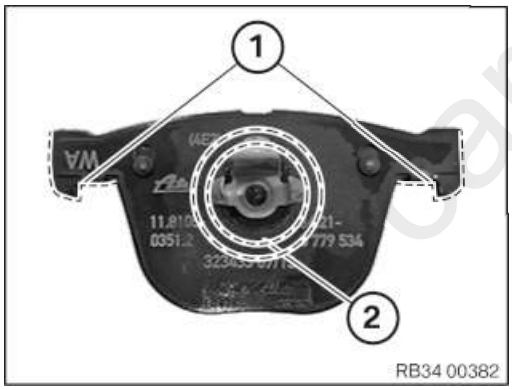
- Mount the sliding plates (1).



- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).



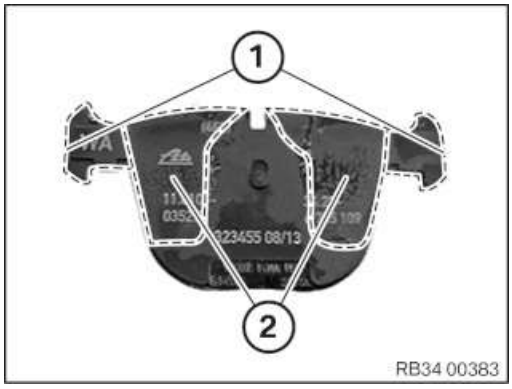
- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).



TECHNICAL INFORMATION

If brake pads are installed with an adhesive film, position 2 must **not** be greased with brake pad paste!

- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).



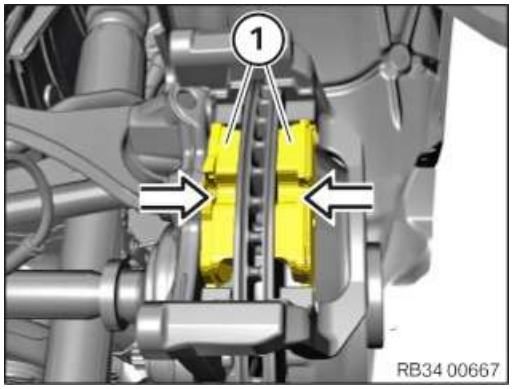
TECHNICAL INFORMATION

If brake pads are installed with an adhesive film, position 2 must **not** be greased with brake pad paste!

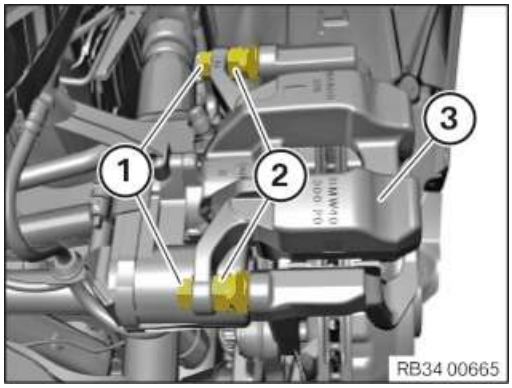
- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).

6 – Install rear brake pads

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- Install the brake pads (1) in the direction of the arrow.



- Remove the special tool (cable strap) 2 413 317.
- Mount brake caliper (3).
- Renew screws (1).

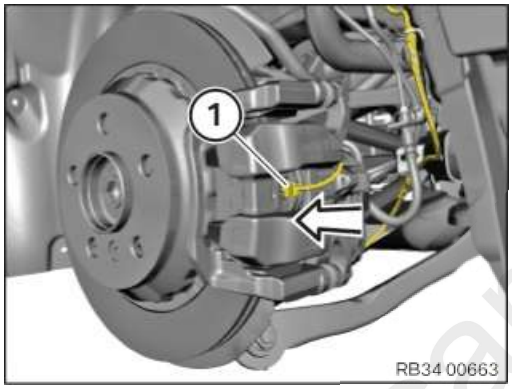
  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

Guide bolt (brake caliper on caliper carrier)

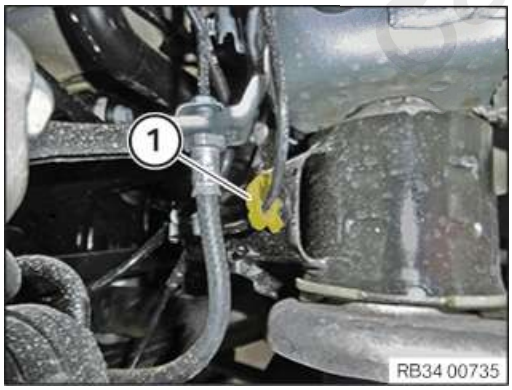
M8			35 Nm

POSTPROCESSES

7 – Install rear brake pad wear sensor



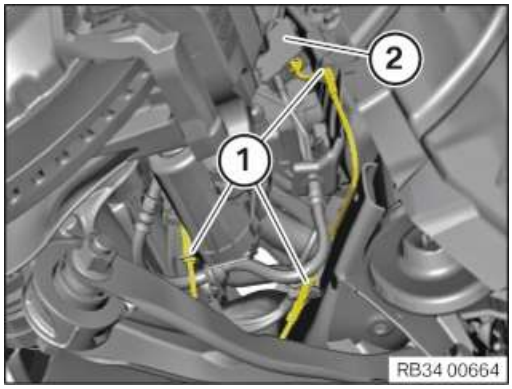
- Install the brake pad wear sensor (2) in the direction of arrow in the brake pad and ensure its correct fit.



- Hook the cable of the brake pad wear sensor into holder (1).

  If holder (1) **is not present, holder** (1) **must be installed later!**

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- Hook the cable of the brake pad wear sensor into holders (1).
- Connector and lock the connector and seal the cover (2) .

8 – Installing the rear wheel on the left and right

NOTICE

Perform the operations on the left and right side.

▸ **Mounting the wheel**



TECHNICAL INFORMATION

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

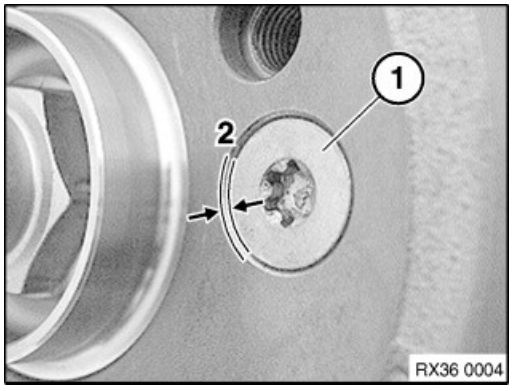
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Check that the mounting bolt (1) for the brake disc is securely seated.

  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

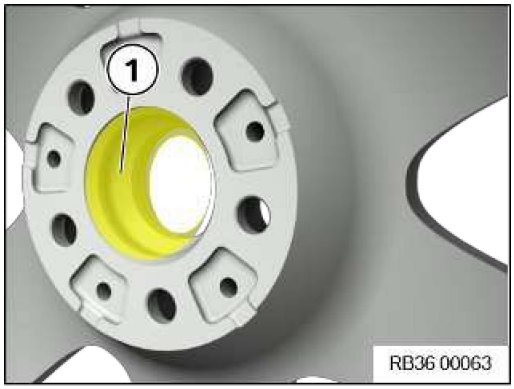
Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against corrosion.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



TECHNICAL INFORMATION

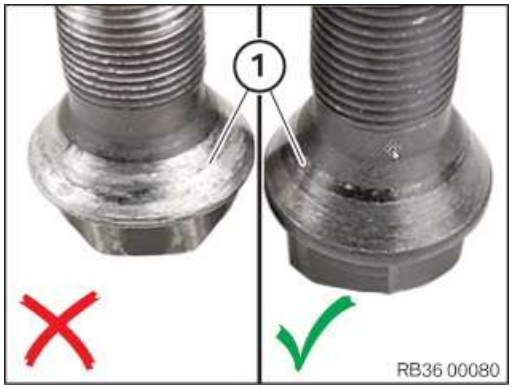
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

  This process is intended to prevent damage to the brake disc.

Check

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- **Check wheel bolts for wear.**

Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts

- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

9 – Start-up or bedding-in of new brake pads and discs (rear brake)

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TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Switch the ignition on.

  Use the parking brake button to open, close and open the parking brake again.
- Switch off ignition.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

10 – Perform CBS reset

Prerequisite

Scope of maintenance work is performed.

On-board date is set correctly.

No CC message is present.

Remaining distance or remaining service life of the service interval is below 90%.

TECHNICAL INFORMATION

The CBS scope of maintenance work can be reset in the car. In general, however, the reset of CBS functions (CBS reset) with the diagnosis system is recommended.

It is only possible to code the country-specific statutory intervals with the diagnosis system.

TECHNICAL INFORMATION

Information for the occurrence of a failed CBS reset:

For front/rear brake service:

- A CBS reset is possible in the vehicle only with a sanded brake pad wear sensor (CBS display in the CID, active).

- In case of a brake pad wear sensor that is not sanded, (no CBS display in the CID) a CBS reset is possible only with the diagnosis system.

Other known causes of CBS reset problems:

- Parking brake applied.

- Brake pedal applied.

- Automatic Hold function activated.

TECHNICAL INFORMATION

The reset procedure (CBS reset) is cancelled due to a timeout or a terminal change.

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- **Equipment specification with the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press trip distance recorder reset button (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

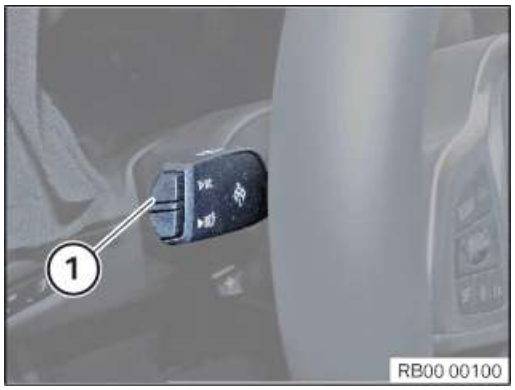
  The next position is reached by briefly pressing the trip distance recorder reset button (1) again.

  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. To do so, press the trip distance recorder reset button (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.



- **Equipment specification without the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press on-board computer button on the turn signal/high beam switch (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

  The next position is reached by briefly pressing the on-board computer button on the turn signal/high beam switch (1)again.

  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. For this, press the on-board computer button on the turn signal/high beam switch (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.

Additional Information

Overview of Tightening Torques

Guide bolt (brake caliper on caliper carrier) — Used in step 6

M8			35 Nm

Brake disc to front wheel hub — Used in step 8

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 8

M8	Renew screw.	Tightening torque	16 Nm

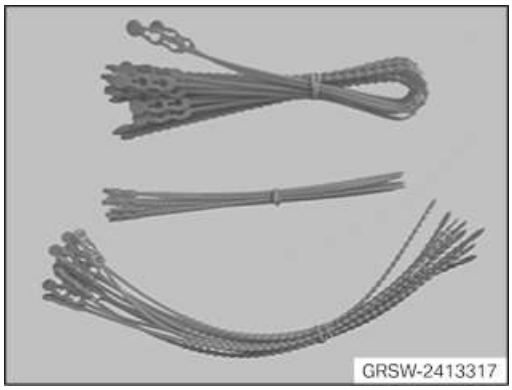
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Wheel bolts Used in step 8

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

2 413 317 Cable strap



Common Used in step 36

Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

5 A1A 1E6 Reset



Common Used in step 3

Usage	Universal brake piston reset device for resetting the brake caliper with an electromechanical parking brake on the rear axle. This special tool replaces the following special tools from 07/2020: 83302285574, 83302320871 and 83300494003.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 19 20 (748)

2 344 011 Tool



Common Used in step 8

Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

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Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x20)	Used in step 4
Minimum brake disc thickness (brake disc 330x20)	18,4 mm

Minimum brake disc thickness (nominal dimension 345x24)	Used in step 4
Minimum brake disc thickness (brake disc 345x24)	22,4 mm

Minimum brake disc thickness (nominal dimension 370x24)	Used in step 4
Minimum brake disc thickness (brake disc 370x24)	22,4 mm

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	18
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

00 00 624 Service - vehicle check

TECHNICAL INFORMATION

Repair possible defects for a separate charge after discussion with the customer.

PRELIMINARY WORK

1 – Check lighting system

Check

- Check function of the front and rear lights.
- Check function of the motor vehicle number plate light.
- Check headlight adjustment.

Result

» Functional limitation of the lighting system.

Measure

- Repair lighting system.

  If necessary, adjust headlight and charge separately.

63 10 014 Adjusting fog lights
63 10 004 Adjusting headlights
63 10 004 Adjusting headlights
63 10 014 Adjusting fog lights
63 10 004 Adjusting headlights
63 10 014 Adjusting fog lights
63 10 ... Adjusting glare-free high-beam headlight (with headlight adjustment device MAHA Lite 3)
63 10 ... Adjusting dazzle-free high-beam headlights (using non-electronic headlight tester)
63 10 004 Adjusting headlights
63 10 004 Adjusting headlights
63 10 014 Adjusting fog lights
63 10 ... Adjusting glare-free high-beam headlight (with headlight adjustment device MAHA Lite 3)
63 10 ... Adjusting dazzle-free high-beam headlights (using non-electronic headlight tester)

2 – Check horn, headlight flashers and hazard warning flashers

- Operate the horn and check the function of both fanfares.
- Operate the headlight flasher, check the function of the high beam headlight and blue indicator light in the instrument cluster (KOMBI).
- Check function of hazard warning lights system.

3 – Check the wiper and window washer system

Check

- Check the wiper range for streaks.

Result

» Streaks in the wiper range.

Measure

- For a separate charge: Renew the wiper blades.

Check

- Check the washer jets and spray jet.

Result

» The spray jet does not exit or exits unevenly.

Measure

- Adjust the washer jets.

Measure

- For a separate charge: If applicable, renew the washer jets.

4 – Check blower

- Check function of blower.
- Check air distribution and air leak for all blower speeds.

5 – Check the interior lighting

- Check the function of the operating element.
- Check the function of the indicator lights and warning lights.
- If applicable, check the function of additional instrument lighting.
- Check the function of the inscription lighting of the light switch.
- If applicable, check the function of additional inscription lighting.
- Check the function of the interior lighting.
- Check the function of the glove box light.
- Check the function of the luggage compartment lights.

6 – Check seat belts

Check

- Check condition of seat belt strap.
- Check function of automatic reel.
- Check seat belt locking reel, seat belt buckle, seat belt clip and, if necessary, seat belt clasp for damage.

Result

» Damage or functional limitations.

Measure

- Repair damage and functional limitations.

72 00 ... Replacing the seat belt clip

7 – Checking the warning triangle, high-visibility jacket and first-aid kit

Check

- Check whether or not the warning triangle, high-visibility jacket and first-aid kit are available.
- Check expiry date on the first-aid kit.

Result

» Warning triangle, high-visibility jacket and first-aid kit not present.

» First-aid kit has expired.

» First-aid kit will expire prior to the next vehicle check.

Measure

- Install the warning triangle, high-visibility jacket and first-aid kit.

Measure

- Renew first-aid kit.

8 – Check Mobility Set

Check

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- Check expiry date on the tyre sealant bottle.

Result

» Expiry date exceeded.

» Expiry date exceeded before next vehicle check.

Measure

- Replace tyre sealant bottle and charge separately.

MAIN WORK

9 – Check tyres (if available, compact spare wheel also)

Check

- Check the tread depth of all tyres with the tyre tread gauge.
- Check the tyre tread surface and flanks for cuts and foreign objects such as nails or screws.
- Check tread wear pattern for worn out areas and for one-sided wear.

Result

» Tyres worn or damaged.

Measure

- Replace the tyres against a separate invoice and, if required, carry out the wheel alignment.

Check

- If fitted: Check the tyre inflation pressure in the emergency spare wheel.

Result

» Tyre pressure too low or too high.

Measure

- Adjust the tyre inflation pressure as per the specification.

10 – Checking the undercarriage and all visible components

Check

- Perform a visual inspection of the undercarriage.
  - Check for tightness (transmission, fuel system, brake components, steering).
  - Check for correct routing of the electrical wires (e.g. brake pad wear sensor).
  - Check for tightness (shock absorber).
  - Check installation of the extended springs and check for corrosion.
  - Check the undercarriage for damage.
  - Check all the mountings of the mounted parts (e.g. underbody panelling).

Result

» Damage or leak on the undercarriage.

Measure

- If necessary, remove the trim panels from underbody.

  Check brackets, brake lines and fuel lines for damage and correct mounting orientation.

Measure

- Eliminate possible defects for a separate charge after discussion with the customer.

11 – Check brake lines and the brake line connections

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Check

- In the visible areas, perform visual connection for:
  - Leakages
  - traces of fluid
  - damage
  - pinched areas
  - correct routing of brake lines
  - correct seating of brake lines in holders
- Check brake fluid level in brake fluid expansion tank

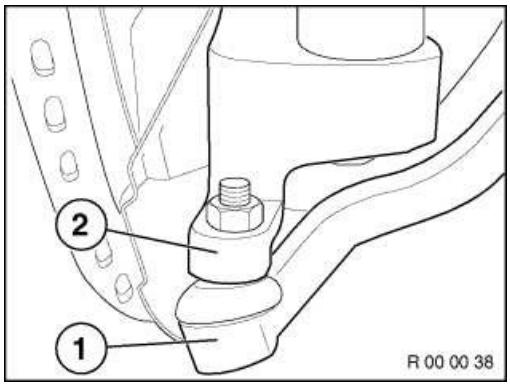
Result

» Leaks, damage.

Measure

- Repair detected defects for a separate charge after discussion with the customer.

12 – Check the components of the steering



Check

- Move the steering wheel in both directions while checking for play.

desired state

- There is no play between the track rod joint (1) and track rod arm (2).

Result

» There is play.

Measure

- Eliminate possible defects for a separate charge after discussion with the customer.

Check

- Check gaiters and sleeves for damage (e.g. cracks and holes) and tightness.
- Check gaiter for missing tensioning straps.

Result

» Damage or leaks.

Measure

- Eliminate possible defects for a separate charge after discussion with the customer.

POSTPROCESSES

13 – Topping up the coolant level and checking the coolant composition

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- Park vehicle on a horizontal surface.
- Stop engine.
- Visual inspection of the engine compartment for traces of coolant.
- Check coolant composition in all coolant expansion tanks.

Expendable materials

Technically suitable antifreeze and corrosion inhibitor	

Main group 17

TECHNICAL INFORMATION

The test conditions must be observed.

- Check the coolant level in all coolant expansion tanks.

Test conditions for coolant level

Coolant must be cooled down

- The coolant level in all coolant expansion tanks must be filled above the max mark for a separate charge.

Coolant level

Overfill quantity of coolant (above the maximum mark) in the high-temperature expansion tank	+ 200 ml
Overfill quantity of coolant (above the maximum mark) in the low-temperature expansion tank (if installed)	+ 100 ml

14 – Check the engine compartment for leakage from the top

Check

- Carry out visual inspection of the engine compartment.
  - Check general leak-tightness (engine, cooling system, fuel system, hoses and pipes)
  - Check the electric cables are correctly routed.

Result

» Damage or leakage present.

Measure

- Eliminate possible defects for a separate charge after discussion with the customer.

15 – Top up the washer fluid for the window washer system

- Top up the fluid tank for the window washer system up to the maximum mark.

16 – Programming wheel electronics (only while using Tyre Pressure Monitor SA2VB)

Check

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- Using the special tool 2 456 858 check, whether the wheel electronics (1) have already been programmed.

Result

» Wheel electronics were (1) not programmed yet.

Measure

- Program the wheel electronics (1).

▸ **Program the wheel electronics**

NOTICE

The training video is only available in English.

Your browser doesn't support HTML5 video.

TECHNICAL INFORMATION

The training video illustrates the programming of wheel electronics using special RDC tool.

The training video does not replace the repair instructions.

The training video is not subject to the update service.

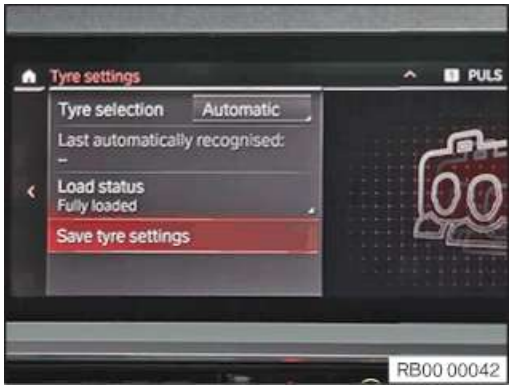
We can assume no liability for printing errors or inaccuracies in this document and reserve the right to introduce technical modifications at any time.

- Follow repair instructions!



- Program wheel electronics (1) using the special tool 2 456 858.

▸ **Adjusting the tyre setting in the CID (in case of equipment specification with ID7)**



- Adjust the tyre setting in the central information display (CID).
- Open the menu:
  - Select **My vehicle** in the menu.
  - Select **Vehicle status** in the menu.
  - Select **Tyre pressure control (RDC)** from the menu.

  Enter the settings:
  - Select **Tyre settings** from the menu.
  - Select tyres: Automatic.
  - Select the load status of the vehicle.
  - Confirm the settings.

TECHNICAL INFORMATION

The stored tyre data is automatically transferred to the vehicle by the wheel electronics.

The vehicle must be driven for this purpose.

- Drive the vehicle to measure the current tyre inflation pressure.

▸ Adjusting the tyre setting in the CID (in case of equipment specification with ID8)



- Adjust the tyre setting in the central information display (CID).
- Open the menu:
  - Select **Menu**
  - Select **Live Vehicle**
  - Select **Tyre Pressure Monitor**
  - Select **Tyre Settings**

  Enter the settings:
  - Select tyres: Automatic.
  - Select the load status of the vehicle.
  - Confirm the settings.

TECHNICAL INFORMATION

The stored tyre data is automatically transferred to the vehicle by the wheel electronics.

The vehicle must be driven for this purpose.

- Drive the vehicle to measure the current tyre inflation pressure.

17 – Perform CBS reset

Prerequisite

Scope of maintenance work is performed.

On-board date is set correctly.

No CC message is present.

Remaining distance or remaining service life of the service interval is below 90%.

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TECHNICAL INFORMATION

The CBS scope of maintenance work can be reset in the car. In general, however, the reset of CBS functions (CBS reset) with the diagnosis system is recommended.

It is only possible to code the country-specific statutory intervals with the diagnosis system.

TECHNICAL INFORMATION

Information for the occurrence of a failed CBS reset:

For front/rear brake service:

- A CBS reset is possible in the vehicle only with a sanded brake pad wear sensor (CBS display in the CID, active).
- In case of a brake pad wear sensor that is not sanded, (no CBS display in the CID) a CBS reset is possible only with the diagnosis system.

Other known causes of CBS reset problems:

- Parking brake applied.
- Brake pedal applied.
- Automatic Hold function activated.

TECHNICAL INFORMATION

The reset procedure (CBS reset) is cancelled due to a timeout or a terminal change.



- **Equipment specification with the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press trip distance recorder reset button (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

  The next position is reached by briefly pressing the trip distance recorder reset button (1) again.

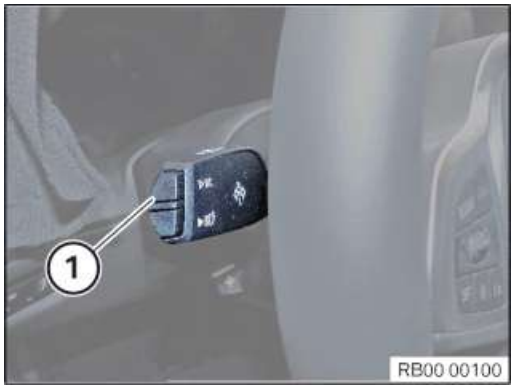
  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. To do so, press the trip distance recorder reset button (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.

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- **Equipment specification without the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press on-board computer button on the turn signal/high beam switch (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

  The next position is reached by briefly pressing the on-board computer button on the turn signal/high beam switch (1)again.

  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. For this, press the on-board computer button on the turn signal/high beam switch (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.

18 – Checking for road safety and performing test drive

Check

- Check the service brake and the parking brake.
- Check steering for play, ease of movement and correct straight-ahead driving.
- Inspect the shock absorbers visually for leaks.
- Check that the indicator lights, the warning lights and the Check Control function correctly.
- Check the due date on the German Technical Inspection Agency (TÜV) badge and, if necessary, inform the customer of the due date for the inspection.

Result

» Defects were detected.

Measure

- Eliminate possible defects for a separate charge after discussion with the customer.

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Additional Information

Overview of Special Tools

2 456 858 RDC Tool



Common	Used in step 16
Usage	With the help of tyre pressure indicator tool, the tyre data (which is found on the tyre via a QR code) can be recorded and tyre pressure indicator sensors can be programmed.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	07 04 18 (584)

Overview Technical Data

Test conditions for coolant level Used in step 13

Coolant must be cooled down

Coolant level	Used in step 13
Overfill quantity of coolant (above the maximum mark) in the high-temperature expansion tank	+ 200 ml
Overfill quantity of coolant (above the maximum mark) in the low-temperature expansion tank (if installed)	+ 100 ml

Links

Functional descriptions	**Used in step**
Tyre pressure control	16

Repair instructions	**Used in step**
63 10 014 Adjusting fog lights	1
63 10 004 Adjusting headlights	1
63 10 004 Adjusting headlights	1
63 10 014 Adjusting fog lights	1
63 10 004 Adjusting headlights	1
63 10 014 Adjusting fog lights	1
63 10 ... Adjusting glare-free high-beam headlight (with headlight adjustment device MAHA Lite 3)	1
63 10 ... Adjusting dazzle-free high-beam headlights (using non-electronic headlight tester)	1
63 10 004 Adjusting headlights	1
63 10 004 Adjusting headlights	1
63 10 014 Adjusting fog lights	1
63 10 ... Adjusting glare-free high-beam headlight (with headlight adjustment device MAHA Lite 3)	1
63 10 ... Adjusting dazzle-free high-beam headlights (using non-electronic headlight tester)	1
61 61 041 Replacing both wiper blades	3
61 61 021 Replacing left or right windscreen wiper blade	3
61 61 041 Replacing both wiper blades	3
61 61 041 Replacing both wiper blades	3
61 61 021 Replacing the wiper blade on the left or right	3
72 00 ... Replacing the seat belt clip	6

Operating materials	**Used in step**

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00 00 101 Service, Seasonal Check (only for German market)

1 Seasonal check

NOTICE

A checklist can be printed off for the Seasonal Check, see Additional Information.

- Print out document.
- Work through check list.
- Hand over the checklist to the customer.

Additional Information

Links

Appendices	Used in step
Checklist for BMW seasonal check	1

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00 00 606 Servicing particulate filter

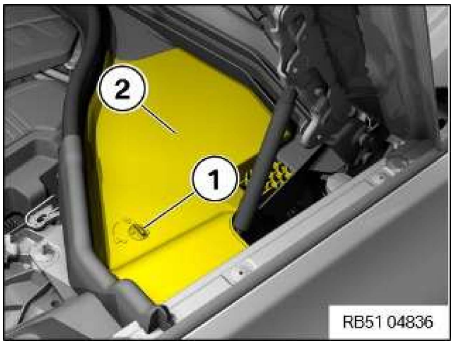
PRELIMINARY WORK

1 – Remove the seal for the rear bonnet



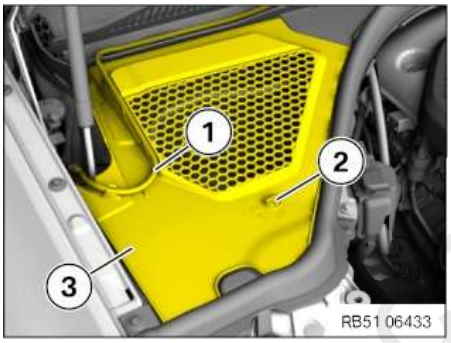
- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

2 – Remove the cover of the engine compartment at the rear left



- Loosen the lock (1).
- Remove the cover (2) of the rear left engine compartment.

3 – Remove the cover of the rear right engine compartment



- Release washer fluid hose (1) from the guides.
- Loosen the lock (2).
- Remove the cover (3) of the rear right engine compartment.

4 – Removing the wiper arm on the left and right

NOTICE

Description is for left component only. Procedure on the right side is identical.

▸ **Remove the wiper arm**

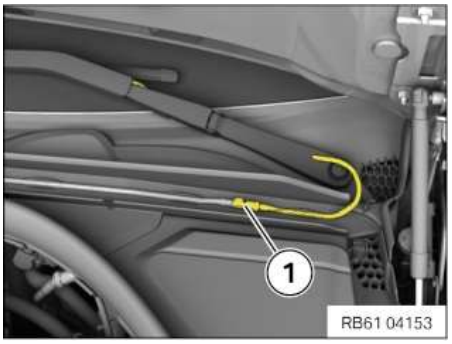
RISK OF DAMAGE

Damage to wiper console.

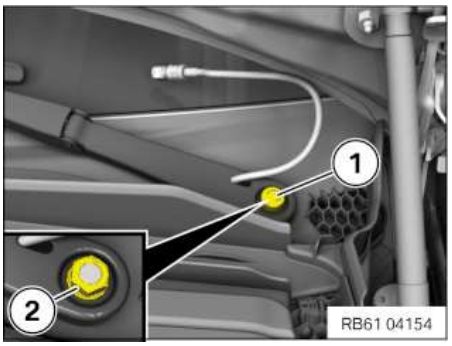
While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.

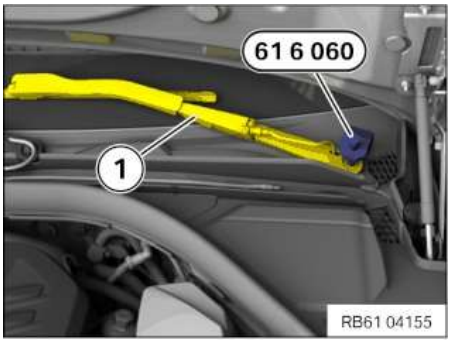
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- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.

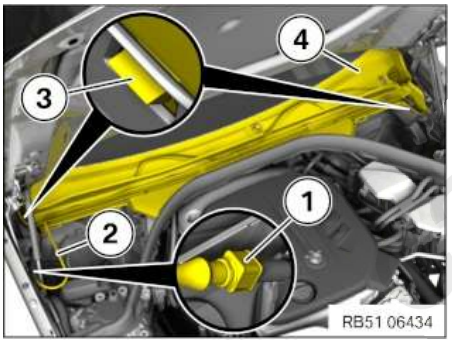


- Remove the protective cap (1).
- Loosen nut (2).

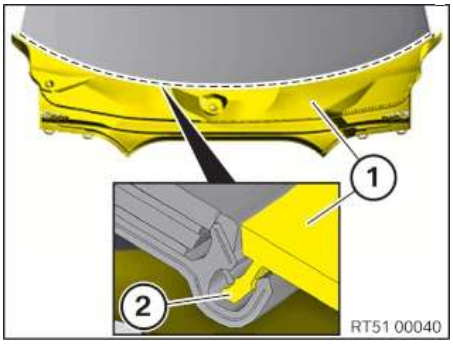


- Pull off the wiper arm (1) using special tool .

5 – Remove cowl panel cover



- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).



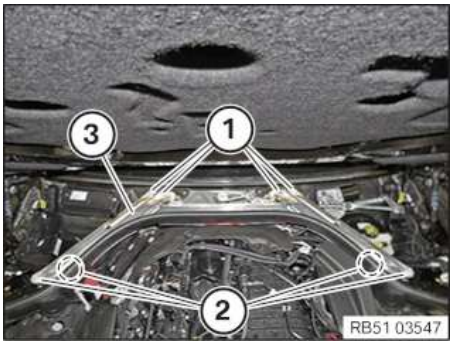
- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

6 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

Driving without the strut brace/front-end strut or tension strut is not permitted.

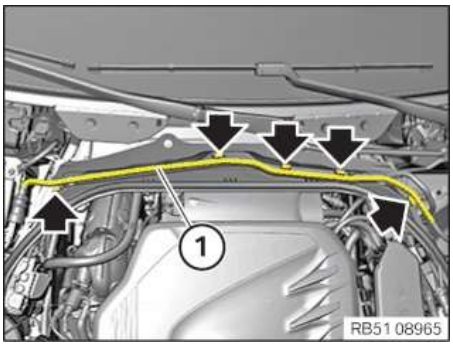
cardiagn.com



NOTICE

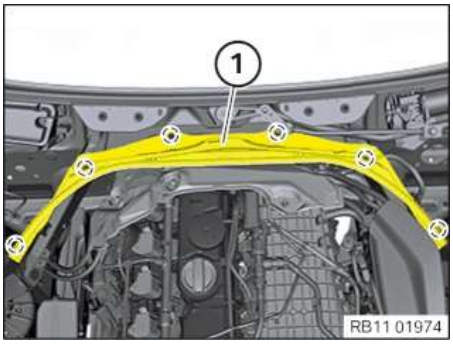
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.



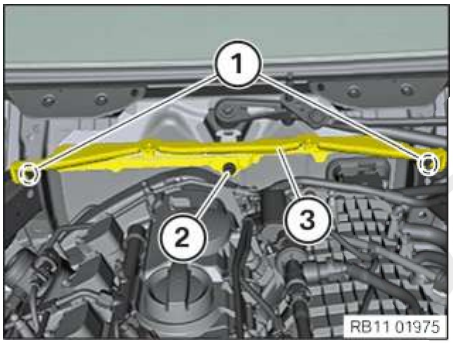
- **Version with mild hybrid technology:**

  Unclip the wire (1) at the holders (arrows).



- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

7 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

8 – Remove differential pressure sensor for the diesel particulate filter

WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.

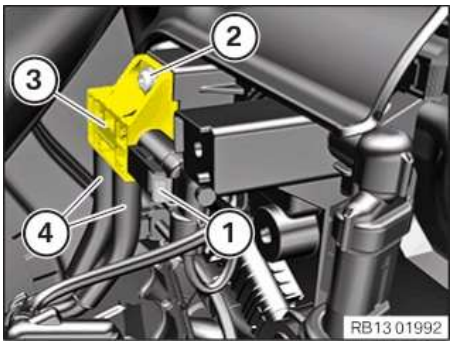
parts4agn.com

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Unlock plug connection (1) and disconnect.
- Loosen screw (2).
- Pull off pressure hose (4).
- Feed out differential pressure sensor (3) and remove.

9 – Remove the exhaust temperature sensor on the diesel particulate filter

WARNING

Hot surfaces.

Risk of burning!

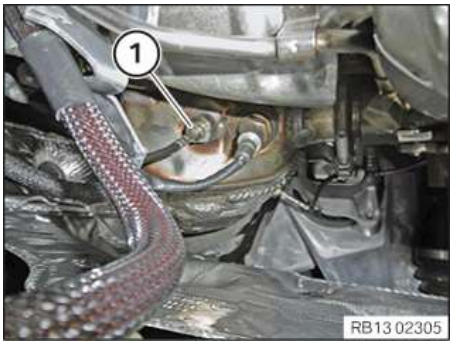
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Electrostatic discharge.

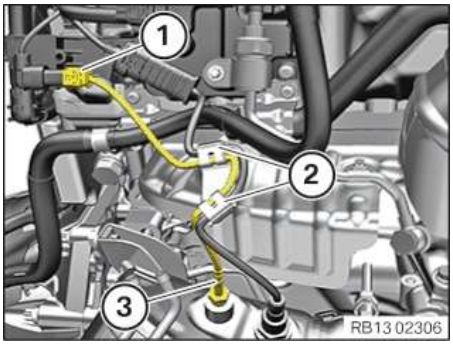
Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Release exhaust temperature sensor (1) using special tool .

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- Unlock plug connection (1) and disconnect.
- Remove the exhaust temperature sensor (3) from the clamps (2).
- Feed out and remove exhaust temperature sensor (3).

10 – Removing the front oxygen sensor on the diesel particulate filter on top

WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

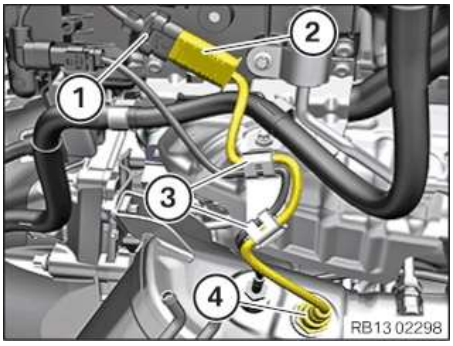
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

Damage to the front oxygen sensor or monitoring oxygen sensor.

Failure of the front oxygen sensor or monitoring oxygen sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.



- Unlock plug connection (1) and disconnect.
- Unlock and disconnect connector (2).
- Pull the front oxygen sensor (4) out from the clamps (3) and remove it.

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- Release the front oxygen sensor (1) with the standard tools and remove it.

11 – Removing the exhaust temperature sensor for the exhaust system downstream the catalytic converter at the diesel particulate filter

WARNING

Hot surfaces.

Risk of burning!

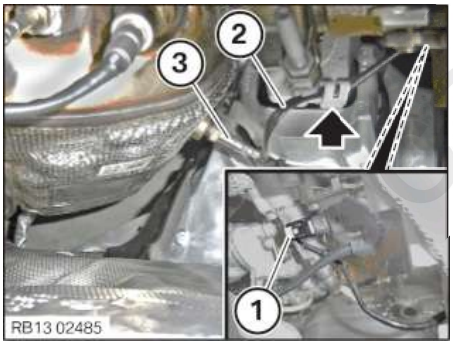
- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Unlock plug connection (1) and disconnect.

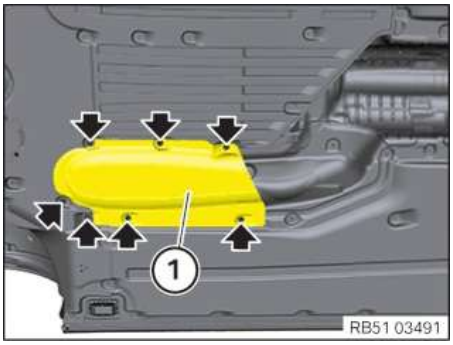
Note: The exhaust temperature sensor is located near the right engine mount.

- Release cable (2) from the clamps (arrow).
- Loosen exhaust temperature sensor (3).
- Feed out and remove exhaust temperature sensor (3).

12 – Remove the underbody panelling of the transmission on the side

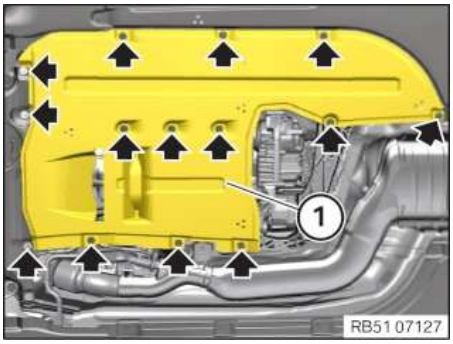
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Remove screws (arrows).
- Remove the underbody panelling (1).

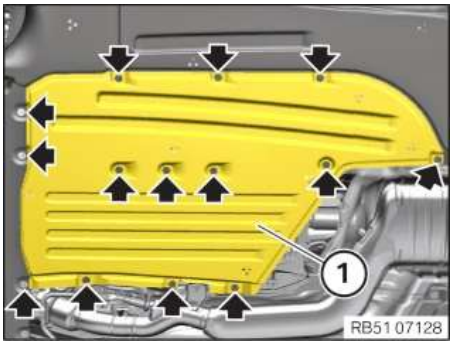
13 – Remove rear underbody protection



- **Version A:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).

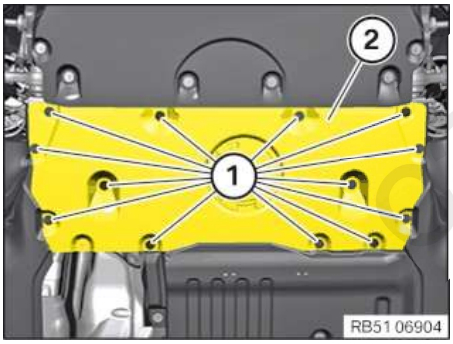


- **Version B:**

  Remove screws (arrows).

  Guide out rear underbody protection (1) and remove it.

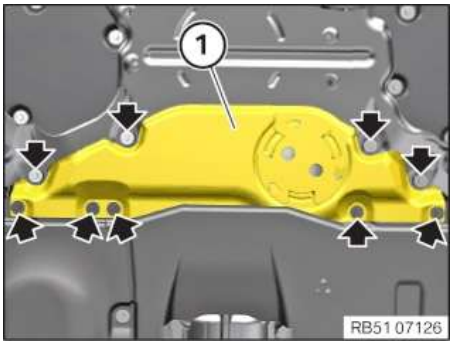
14 – Removing the centre underbody protection



- **Variant with rear wheel drive:**

  Loosen screws (1).

  Remove centre underbody protection (2) .



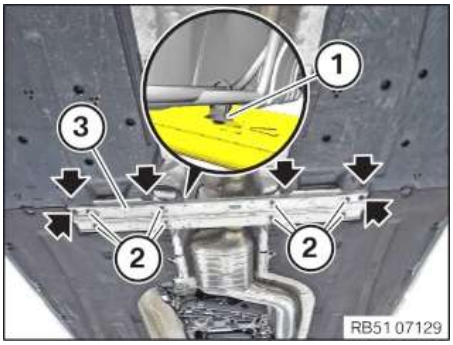
- **Version with all-wheel drive:**

  Remove screws (arrows).

  Feed out and remove the centre underbody protection (1).

15 – Remove the connecting support from the tunnel

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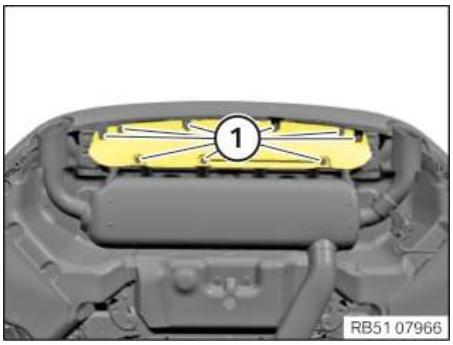
- Remove screws (arrows).

NOTICE

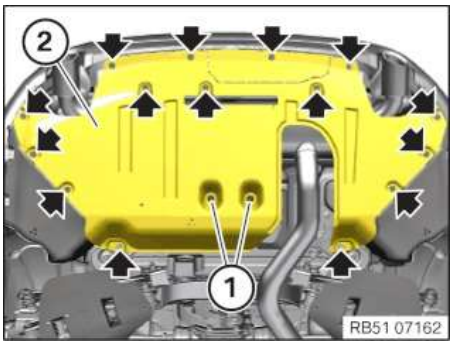
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Loosen clamp (1).
- Loosen screws (2).
- Guide out and remove connecting support (3) on the tunnel.

16 – Removing the rear diffuser



- **Version 1:**
- Release the screws and nuts (1).
- Remove the diffuser.



- **Version 2:**
- Loosen nuts (1).
- Remove screws (arrows).
- Guide out and remove rear diffuser (2).

17 – Remove exhaust system

WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.

CAUTION

Component with heavy weight.

Danger of injury!

- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

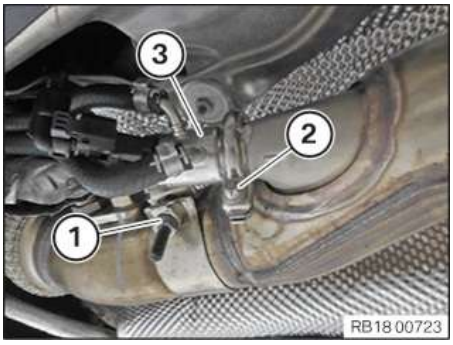
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CAUTION

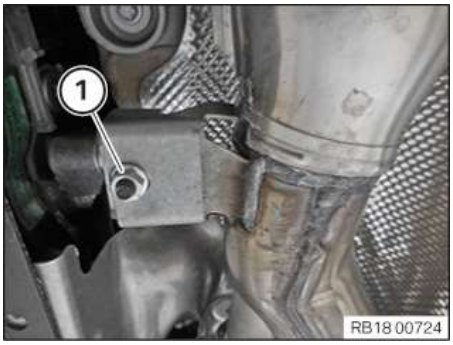
Heavy component.

Heavy components can lead to injury or damage.

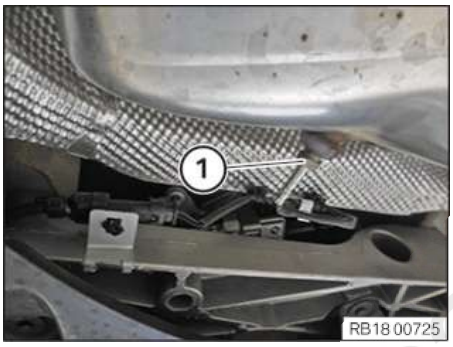
- Remove and install heavy components with the aid of another person/other persons.



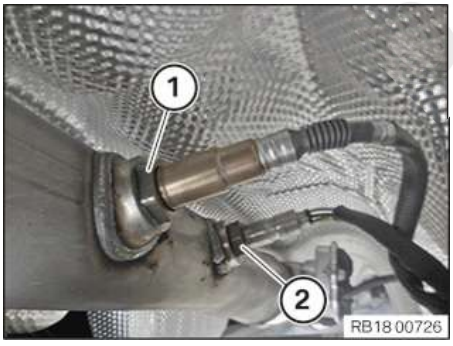
- Unfasten clamp (1).
- Detach the clamp (2) of the SCR metering module (3).
- Detach the SCR metering module (3)from the exhaust system and place to one side.



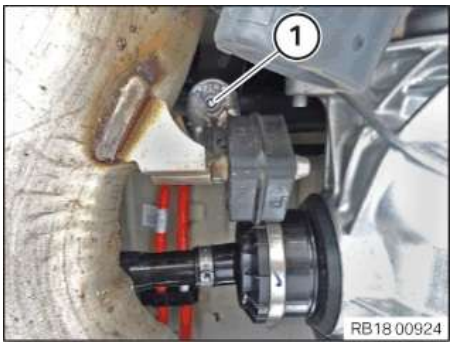
- Loosen nut (1).



- Detach the exhaust temperature sensor (1) from the exhaust system.

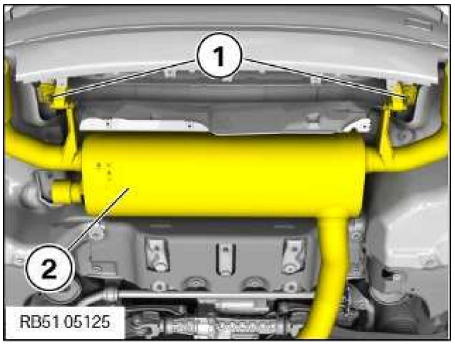


- Release the diesel particulate sensor (1) from the exhaust system and place to one side.
- Release the nitrogen oxide sensor (2) from the exhaust system and place to one side.



- Release the nut (1) on the rear axle support.

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- Loosen nuts (1).
- Lower and remove the exhaust system (2) with the assistance of a second person.

18 – Removing the monitoring oxygen sensor after the diesel particulate filter

WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

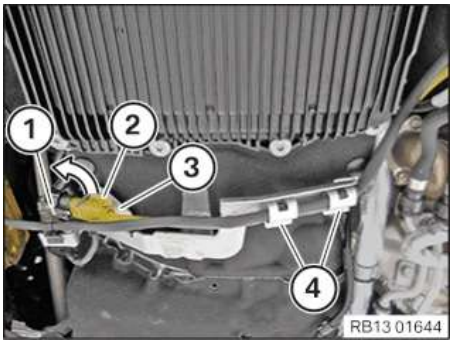
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

Damage to the front oxygen sensor or monitoring oxygen sensor.

Failure of the front oxygen sensor or monitoring oxygen sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.

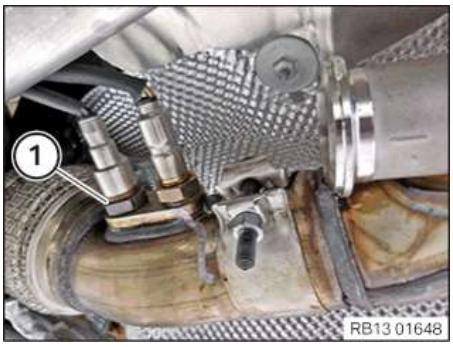


- Unlock and loosen connector (1).
- Loosen connector (2) from the holder (3) in direction of arrow.
- Release the monitoring oxygen sensor from the clamps (4).

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- Release the monitoring oxygen sensor (1) with the standard tools.



- Thread out the monitoring oxygen sensor (1) and remove it.

19 – Removing the nitrogen oxide sensor before SCR catalytic converter

WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

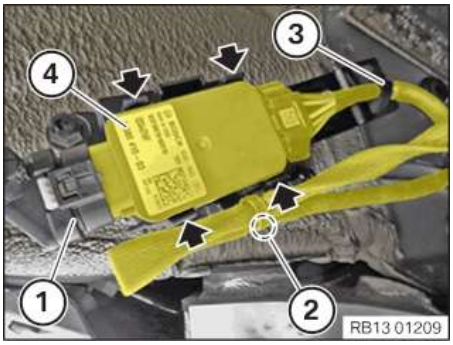
RISK OF DAMAGE

Damage to the nitrogen oxide sensor.

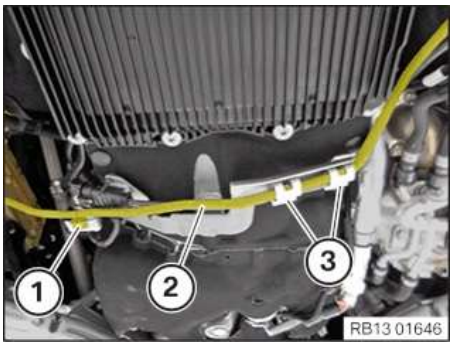
Failure of the nitrogen oxide sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.

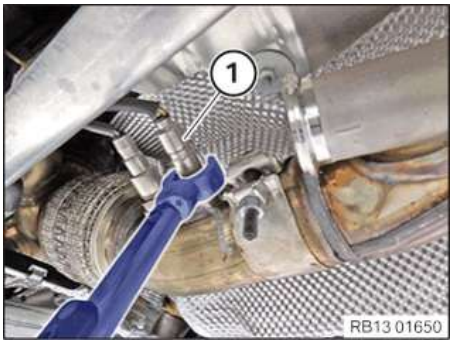
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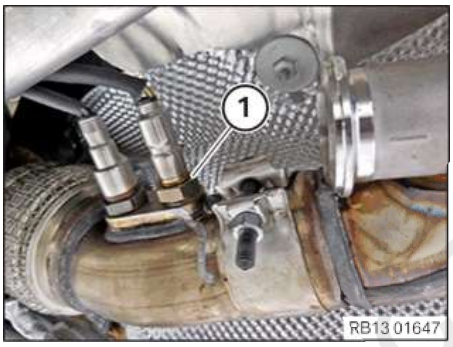
- Unlock plug connection (1) and disconnect.
- Release cable clip in area (2).
- Release line from the holder (3).
- Unclip control unit (4).



- Loosen clamp (1).
- Loosen the cables (2) from the clamps (3).



- Loosen the nitrogen oxide sensor (1) using commercially available tools.



- Feed out and remove the nitrogen oxide sensor (1).

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MAIN WORK

20 – Removing the diesel particulate filter

WARNING

Hot surfaces.

Risk of burning!

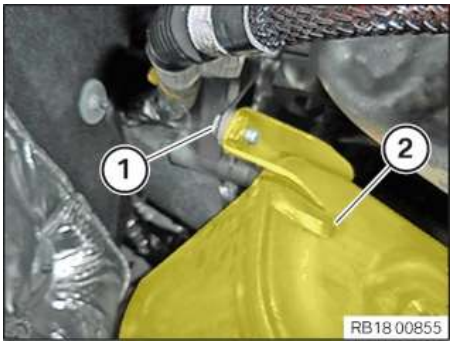
- Perform all work only on components that have cooled down.

CAUTION

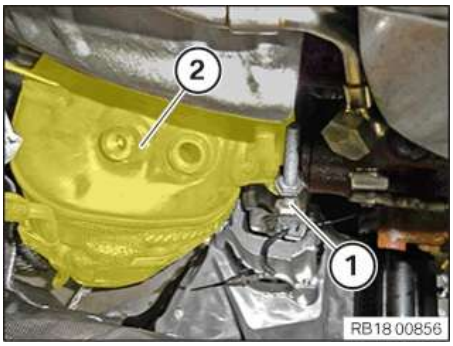
Heavy component.

Heavy components can lead to injury or damage.

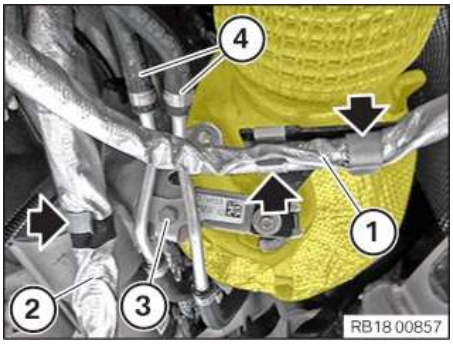
- Remove and install heavy components with the aid of another person/other persons.



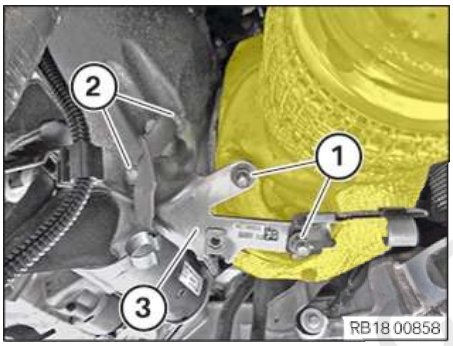
- Release bolt (1) from the holder of diesel particulate filter (2).



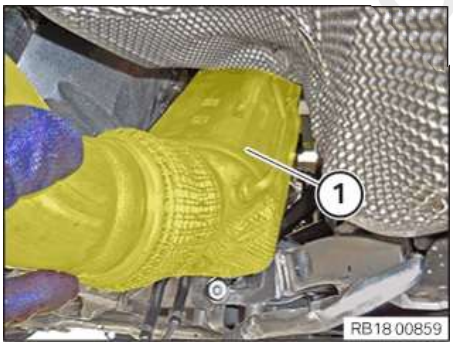
- Loosen V-band clamp (1).
- Feed V-clip (1) out from diesel particulate filter (2) and remove.



- Release the metering line (1) from clamps (Arrows).
- Release positive battery cable (2) from starter motor from clamp (Arrow).
- Loosen screw (3).
- Thread off coolant line (4) and place to the side.



- Loosen nuts (1).
- Loosen screws (2).
- Guide out and remove holder (3).



- Guide out and remove diesel particulate filter (1).

21 – Prepare for the installation of the diesel particulate filter

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- Renew the V-clip (1).

  Parts: V-band clamp



- Renew gasket (1).

  Parts: Gasket

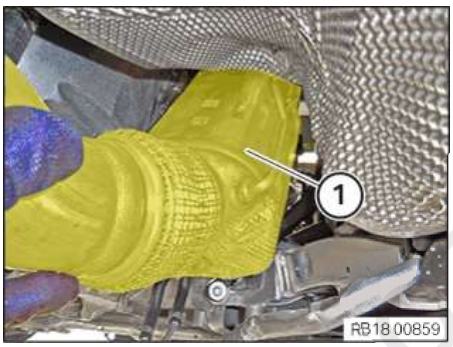
22 – Installing the diesel particulate filter

CAUTION

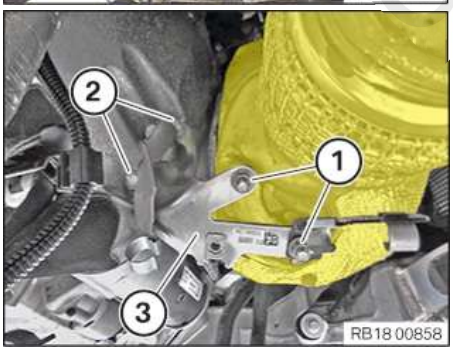
Heavy component.

Heavy components can lead to injury or damage.

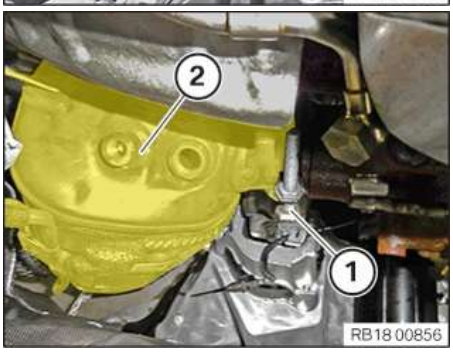
- Remove and install heavy components with the aid of another person/other persons.



- Insert and install the diesel particulate filter (1).



- Insert and install the holder (3).
- **Hand-tighten** the bolts (2).
- Apply the nuts (1) **hand-tight**.



- Renew the V-clip (1).

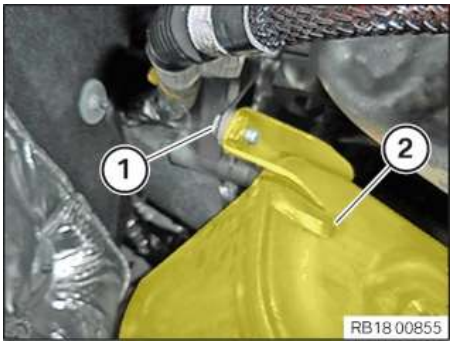
  Parts: V-band clamp

- Feed in and install V-band clamp (1).

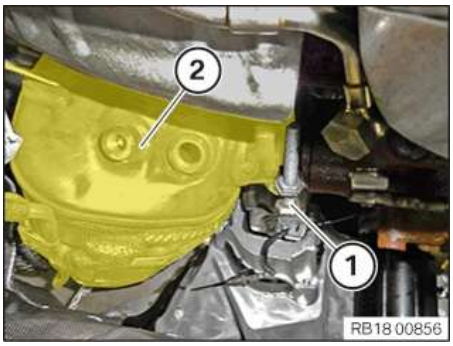
Note: Make sure that the seal between the diesel particulate filter and the exhaust turbocharger is installed correctly.

- Position the diesel particulate filter (2) on the exhaust turbocharger .
- Position V-clip (1).
- Apply the V-clip (1) **hand-tight**.

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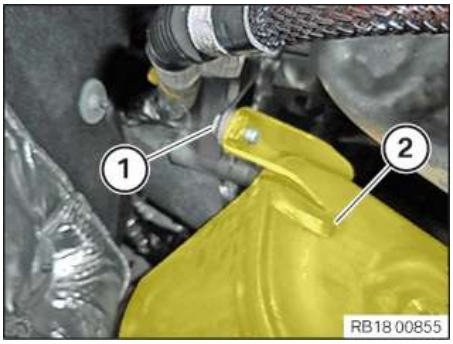
- Feed in screw (1) on the holder of the diesel particulate filter (2) and tighten **hand-tight**.



- Tighten the V-clip (1) of the diesel particulate filter (2).

Diesel particulate filter V-clip to exhaust turbocharger

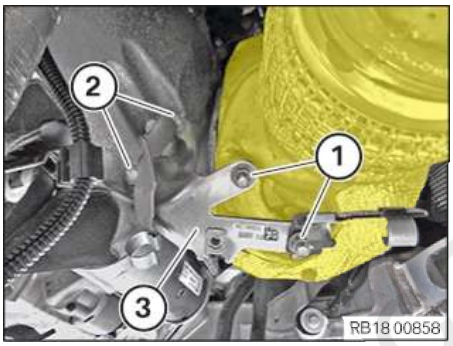
V-band clamp	Renew V-band clamp.	Tightening torque	15 Nm



- Tighten the bolt (1) on the bracket of the diesel particulate filter (2).

Bracket to diesel particulate filter top

M8		Tightening torque	19 Nm



- Tighten the screws (2) on the holder (3).

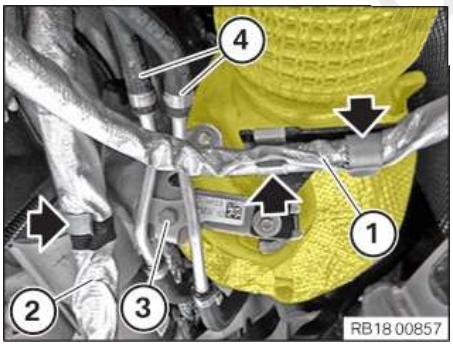
Bracket to transmission for diesel particulate filter holder bottom

M8X20	Tightening torque	19 Nm

- Tighten the nuts (1) on the holder (3).

Lower holder to diesel particulate filter

M8	Tightening torque	19 Nm



- Thread in and install coolant line (4).
- Tighten down screw (3).

Coolant lines for SCR metering module

M6X16	Tightening torque	8 Nm

- Secure the positive battery cable (2) of the starter motor at the clamp (arrow).
- Fasten the metering line (1) on the clamps (arrows).

POSTPROCESSES

23 – Installing the nitrogen oxide sensor upstream of SCR catalytic converter

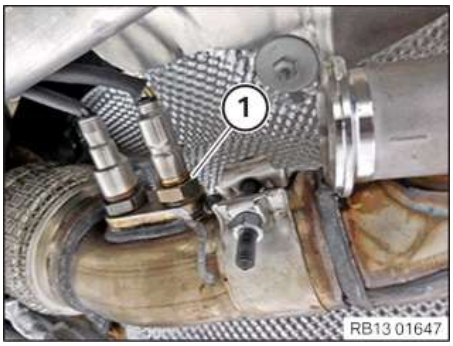
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RISK OF DAMAGE

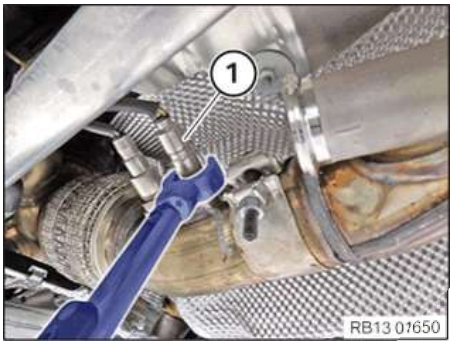
Damage to the nitrogen oxide sensor.

Failure of the nitrogen oxide sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.



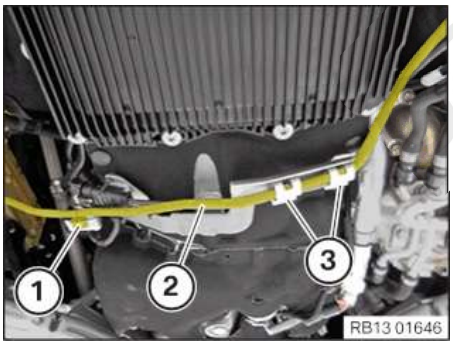
- Feed in and install the nitrogen oxide sensor (1).



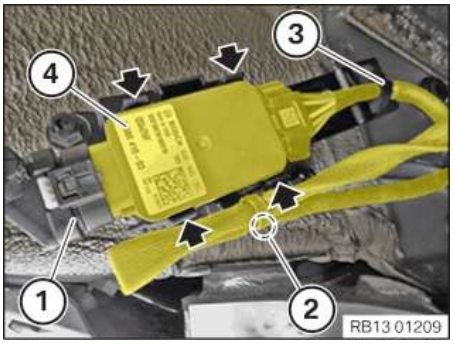
- Tighten the nitrogen oxide sensor (1) using commercially available tools.

Nitrogen oxide sensor before SCR catalytic converter

Sensor		Tightening torque	50 Nm



- Secure the cables (2) to the clamps (3).
- Secure clamps (1).



- Clip in the control unit (4) (arrows).
- Fasten the cable in the holder (3).
- Secure the cable holder (2).
- Plug in the connector (1) and lock audibly.

24 – Installing the monitoring oxygen sensor after the diesel particulate filter

RISK OF DAMAGE

Damage to the front oxygen sensor or monitoring oxygen sensor.

Failure of the front oxygen sensor or monitoring oxygen sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
  - The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.

TECHNICAL INFORMATION

New oxygen sensors are to be greased lightly and evenly on the thread.

For oxygen sensors that are reused, the following should be observed:

Lightly and evenly grease the oxygen sensor only on the thread. Do not clean and grease that part of the oxygen sensor which protrudes in the exhaust branch (sensor ceramics).

For additional information see: 11 00 ... Overview of consumables in Electronic Parts Catalogue



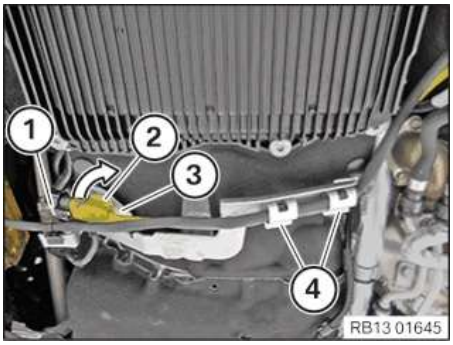
- Insert the monitoring oxygen sensor (1) and install it.



- Tighten the monitoring oxygen sensor (1) with standard tools.

Monitoring oxygen sensor

Sensor		Tightening torque	50 Nm



- Fasten the monitoring oxygen sensor to the clamps (4).
- Secure the connector (2) on the holder (3) in direction of arrow.
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

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CAUTION

Component with heavy weight.

Danger of injury!

- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

CAUTION

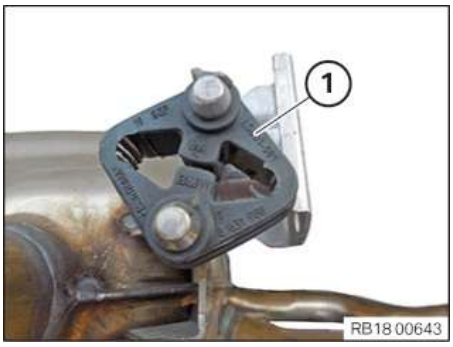
Heavy component.

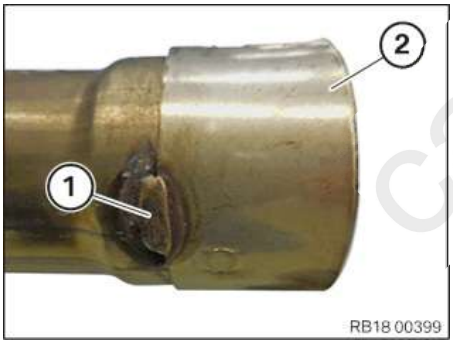
Heavy components can lead to injury or damage.

- Remove and install heavy components with the aid of another person/other persons.

TECHNICAL INFORMATION

Mount the exhaust system in voltage-free state, maintaining the tightening sequence from the rear silencer towards the exhaust manifold.





NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.

- Check all the rubber mounts (1) of the exhaust system for damage.
- Replaced damaged rubber mounts.

  Parts: Rubber mount

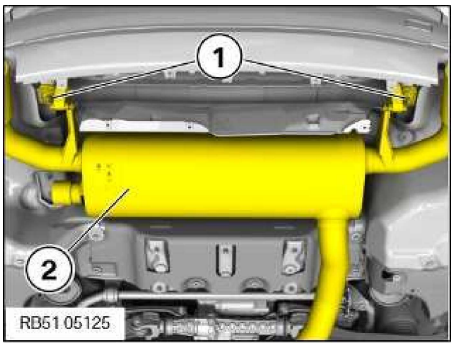
CAUTION

Swarf resulting from sawing or grinding components.

Danger of injury!

- Conduct all work in appropriate personal protective equipment only.
- Wear safety goggles and protective gloves.

- Open the weld seam (1) with a conventional tool.
- Remove the clamp (2).



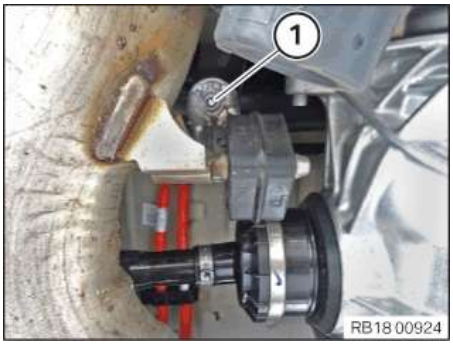
- Insert and install the exhaust system (2).
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Rear silencer to body / bumper support

M8	Replace nuts.	Tightening torque	19 Nm

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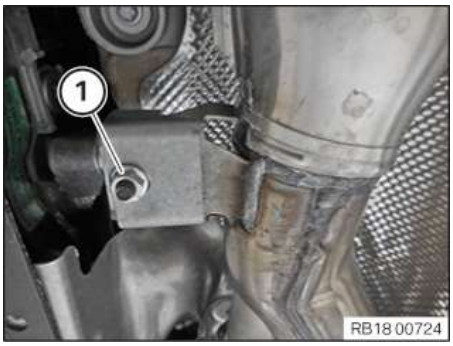


- Renew nut (1) on the rear axle support.

  Parts: Nut
- Tighten nut (1).

Exhaust system to rear axle carrier

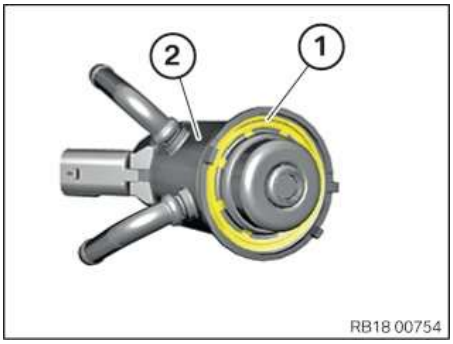
M8 nut		Tightening torque	19 Nm



- Tighten nut (1).

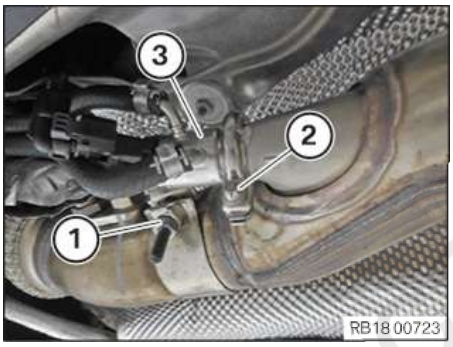
Exhaust system to transmission

M8		Tightening torque	19 Nm



- Renew sealing ring (1) of the SCR metering module (2).

  Parts: Sealing ring



- If necessary, renew clamp (1).

  Parts: Clamp
- Tighten clamp (1).

Exhaust system to diesel particle filter

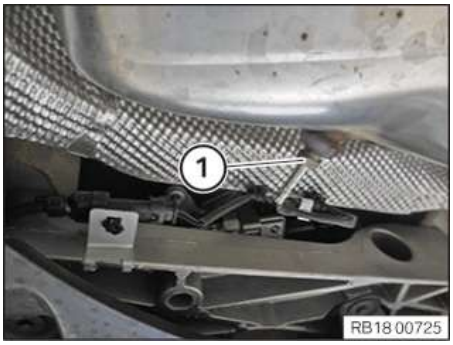
M8	If necessary, renew clamp.	Tightening torque	26 ±2 Nm

- Renew the V-clip (2).

  Parts: V-band clamp
- Install the SCR metering module (3) in the exhaust system.
- Tighten the V-clip (2) of the SCR metering module (3).

SCR metering module V-clip to exhaust system

V-band clamp	Renew V-band clamp.	Tightening torque	8 Nm

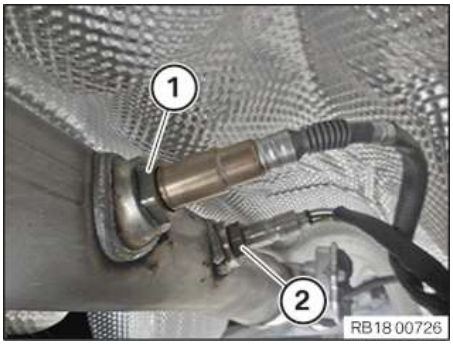


- Install the exhaust temperature sensor (1) in the exhaust system and tighten.

Exhaust-gas temperature sensor upstream of SCR catalytic converter

Sensor		Tightening torque	30 Nm

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- Install the diesel particulate sensor (1) in the exhaust system and tighten.

Diesel particulate sensor to exhaust system

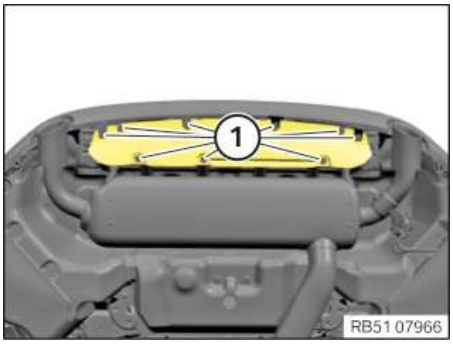
Sensor		Tightening torque	50 Nm

- Install the nitrogen oxide sensor (2) in the exhaust system and tighten.

Nitrogen oxide sensor downstream of SCR catalytic converter

Sensor		Tightening torque	55 Nm

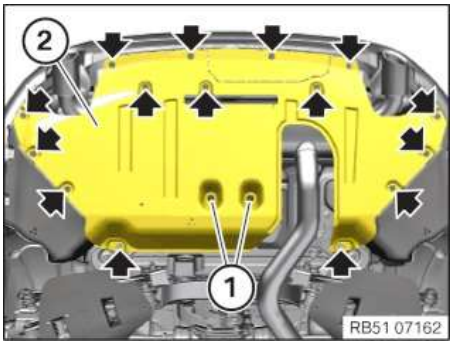
26 – Installing the rear diffuser



- **Version 1:**
- Install the diffuser and tighten the nuts (1).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm



- **Version 2:**
- Feed in and position the diffuser (2)
- Tighten screws (arrows).

Diffuser / underbody panelling

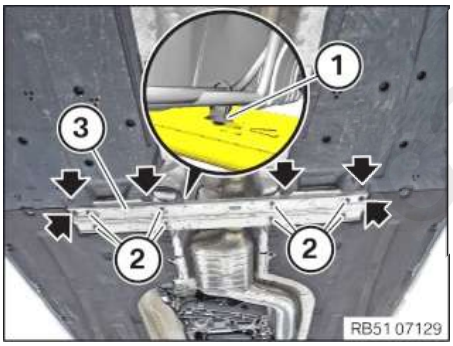
Nuts and screws		Tightening torque	3 Nm

- Tighten nuts (1).

Diffuser / underbody panelling

Nuts and screws		Tightening torque	3 Nm

27 – Install the connecting supports on the tunnel



- Guide in and install connecting support (3) on the tunnel.
- Tighten the screws (2).
- Tighten screws (arrows).

Connecting support to tunnel

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

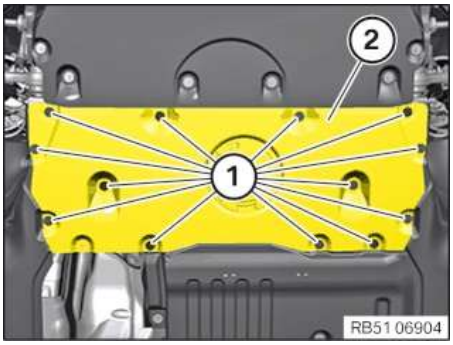
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Secure the clamp (1).

28 – Installing the centre underbody protection

bmwdiagn.com



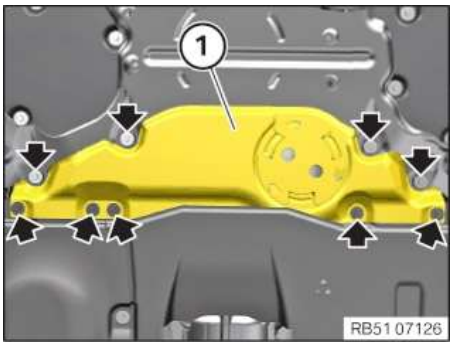
- **Variant with rear wheel drive:**

  Position central underbody protection (2).

  Tighten the screws (1).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version with all-wheel drive:**

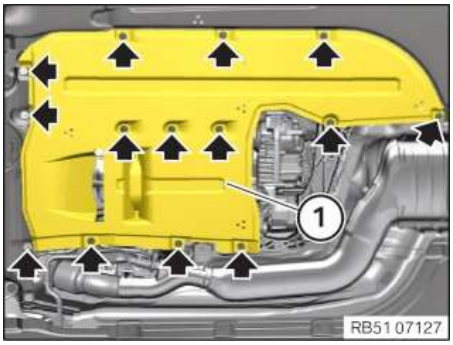
  Guide in centre underbody protection (1) and install.

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

29 – Installing underbody protection at rear



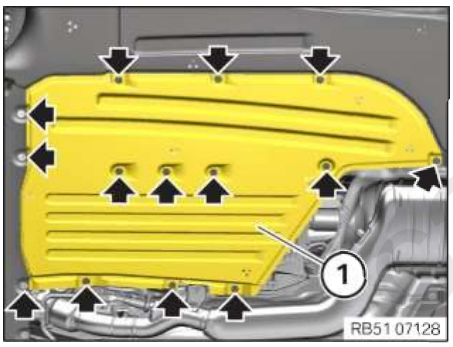
- **Version A:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version B:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

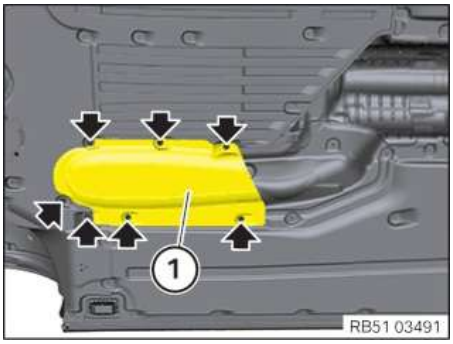
Underbody protection

Hexagon screw		Tightening torque	3 Nm

30 – Install the underbody panelling of the transmission on the side

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



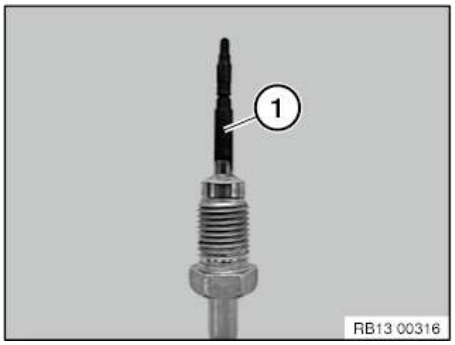
- Insert the underbody panelling (1).
- Tighten screws (arrows).

Underbody panelling

Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

carsdiagn.com

31 – Installing the exhaust temperature sensor for the exhaust system downstream the catalytic converter on the diesel particulate filter



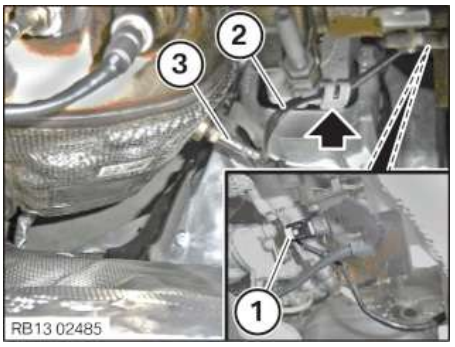
RISK OF DAMAGE

Damage of exhaust temperature sensor.

Damage to exhaust temperature sensors leads to malfunctions.

- Make sure that the gauge tip is not damaged.

- Check the gauge tip (1) for damage.



- Feed in and install the exhaust temperature sensor (3).
- Tighten the exhaust temperature sensor (3).

Exhaust temperature sensor for the exhaust system after catalytic converter before diesel particulate filter

Sensor		Tightening torque	30 Nm

- Secure cable (2) to the clamp (arrow).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

32 – Installing the front oxygen sensor on the diesel particulate filter

RISK OF DAMAGE

Damage to the front oxygen sensor or monitoring oxygen sensor.

Failure of the front oxygen sensor or monitoring oxygen sensor due to contamination or preliminary mechanical damage.

- Remove the protective cap on the sensor only when screwing the sensor on to the exhaust system.
- Do not use mounting aids, cleaning agents, gaseous and liquid agents in workplaces, storage areas and during transport.
- Contaminations (particles, dust exposure, moisture, etc.) in the area of the plug and socket connection and the sensor must be avoided.
- Mechanical loads (impacts on the sensor or the control unit, tensile loads on the cable, etc.) must be avoided.
- Do not continue using component if these specifications are deviated from.
- The installation location (exhaust system) must be dry. If necessary, dry the installation location with compressed air.

TECHNICAL INFORMATION

New oxygen sensors are to be greased lightly and evenly on the thread.

For oxygen sensors that are reused, the following should be observed:

Lightly and evenly grease the oxygen sensor only on the thread. Do not clean and grease that part of the oxygen sensor which protrudes in the exhaust branch (sensor ceramics).

For additional information see: 11 00 ... Overview of consumables in Electronic Parts Catalogue

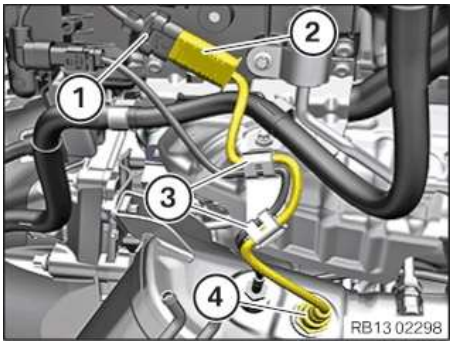


- Insert and install the front oxygen sensor (1).
- Tighten the front oxygen sensor (1) with standard tools.

Front oxygen sensor to top of diesel particulate filter

Sensor		Tightening torque	50 Nm

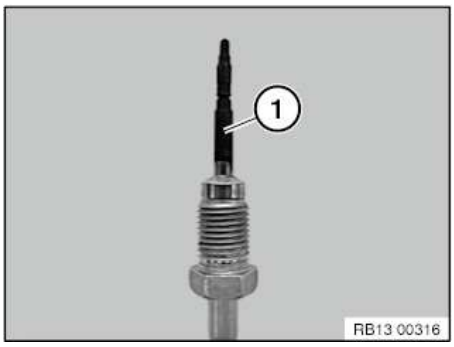
carDiagn.com



- Fasten the front oxygen sensor (4) to the clamps (3).
- Connect connectors (2) and lock.
- Connect connectors (1) and lock.

  The connectors (1) and (2) must audibly engage.

33 – Install the exhaust-gas temperature sensor on the diesel particulate filter



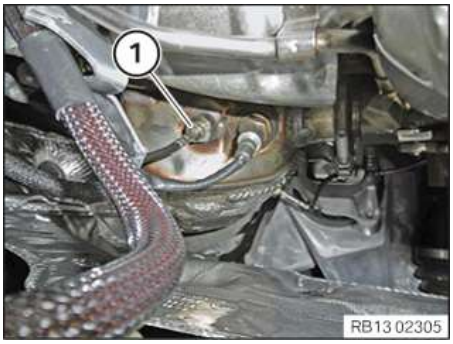
RISK OF DAMAGE

Damage of exhaust temperature sensor.

Damage to exhaust temperature sensors leads to malfunctions.

- Make sure that the gauge tip is not damaged.

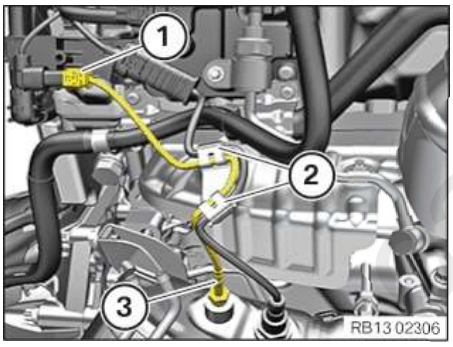
- Check gauge tip (1) for damage.



- Feed in and install the exhaust temperature sensor (1).
- Tighten the exhaust temperature sensor (1) with the special tool .

Exhaust-gas temperature sensor to diesel particulate filter

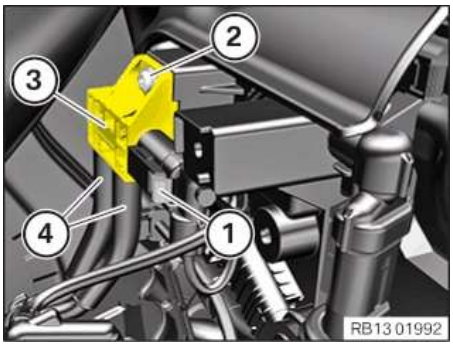
Sensor		Tightening torque	30 Nm



- Secure the exhaust temperature sensor (3) to the clamp (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

34 – Installing the differential pressure sensor for the diesel particulate filter



- Feed in and install the differential pressure sensor (3).
- Tighten down screw (2).

Differential pressure sensor of diesel particulate filter on cylinder head cover

TS5x20		Tightening torque	4 Nm

- Check the pressure hoses (4) for hardening and damage, renew if necessary.
- Connect the pressure hoses (4) and secure them using 15 mm to 19 mm screw clamps.

Clamp for the pressure hose on the differential pressure sensor

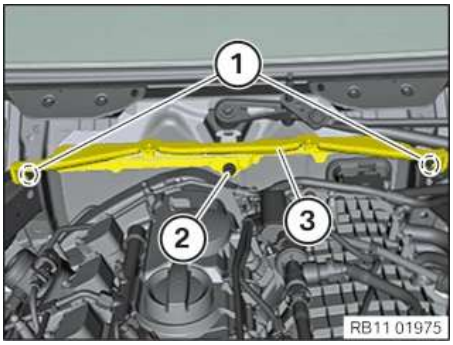
Clamp 15–19mm		Tightening torque	3 Nm

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

35 – Installing centre bulkhead lower section

carsign.com

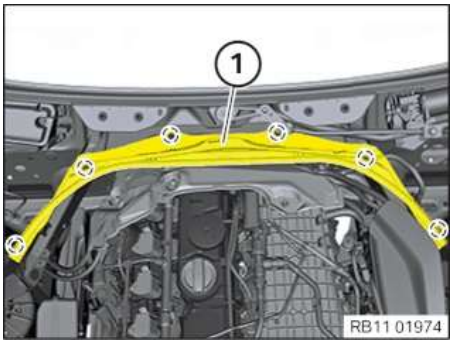


- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

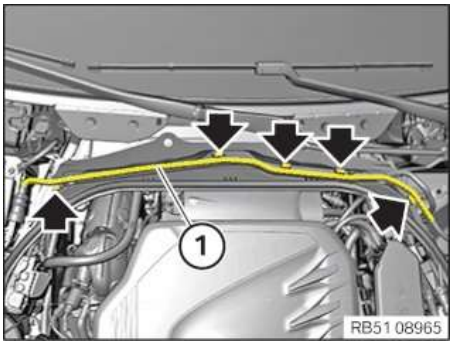
36 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

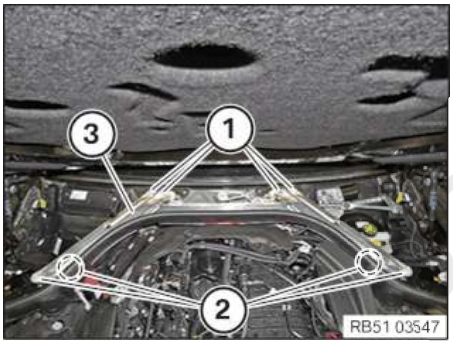
Bulkhead upper part to bottom bulkhead

		Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

37 – Installing cowl panel cover

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RISK OF DAMAGE

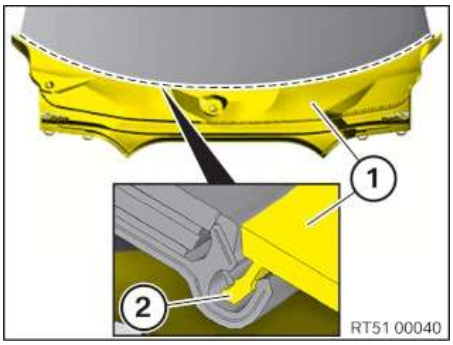
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

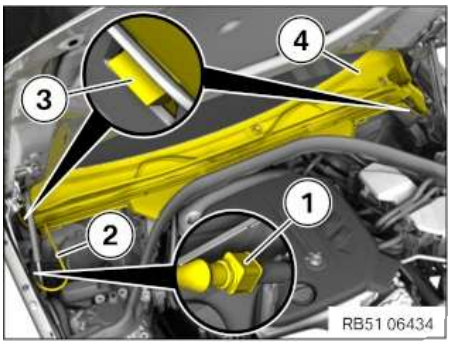
- Ensure correct installation of the components.
- Only use undamaged components.

TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.



- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

38 – Install left and right wiper arm

NOTICE

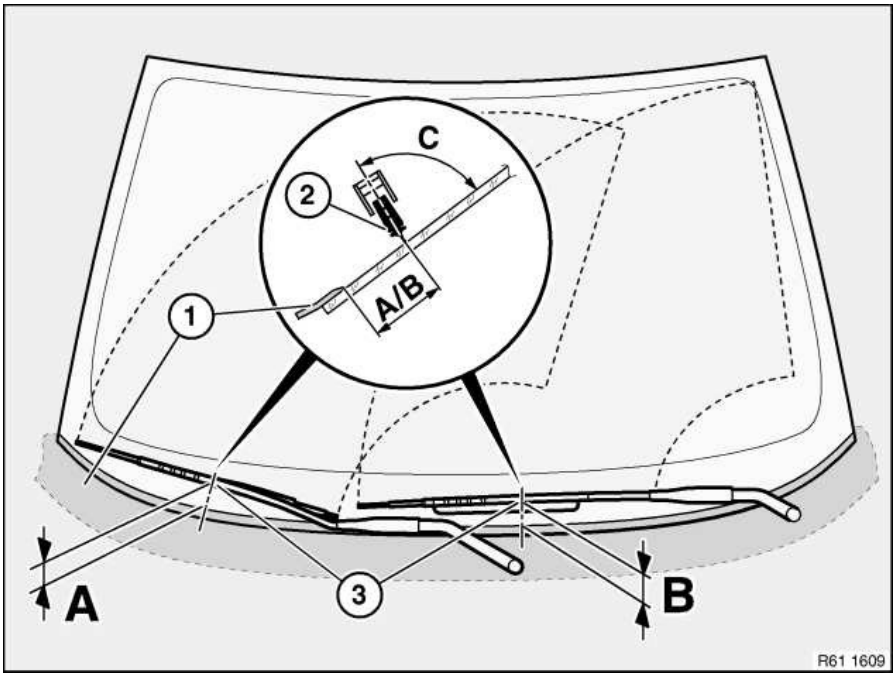
Description is for left component only. Procedure on the right side is identical.

▸ **Installing left and right wiper arm**

TECHNICAL INFORMATION

The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.

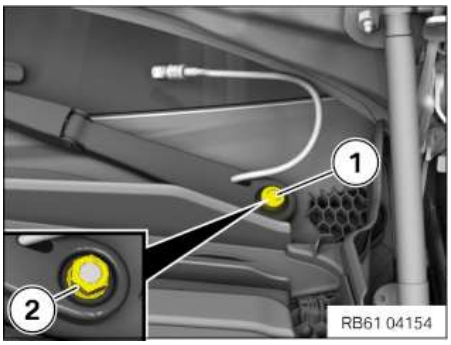
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- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

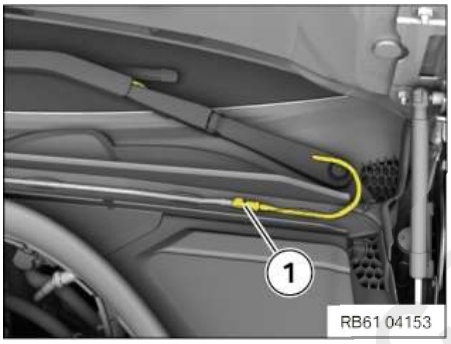


- Tighten nut (2).

Windscreen wiper arm

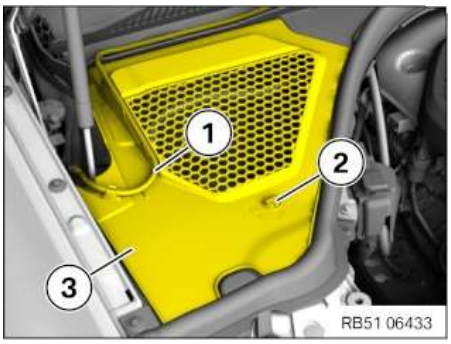
Combination hexagon nut		Tightening torque	35 Nm

- Connect the protective cap (1).



- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

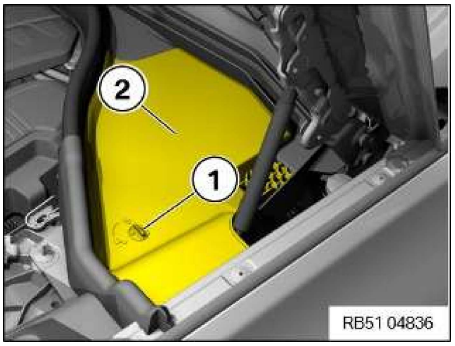
39 – Install the rear right engine compartment cover



- Position the cover of the engine compartment on the rear right (3).
- Close lock (2).
- Insert washer fluid hose (1) into the guides.

40 – Install the cover of the engine compartment on the rear left

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- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

41 – Install the seal for the bonnet



- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

42 – For diesel particulate filter replacements: Reset adaptation values

NOTICE

This job item is not contained in the flat rate 18 31 080 and must be invoiced separately.

▸ **For diesel particulate filter replacements: register the diesel particulate filter**

TECHNICAL INFORMATION



- Registration of the diesel particulate filter **must** be carried out after exchanging the diesel particulate filter and before delivering the vehicle to the customer!



- Register the diesel particulate filter with the diagnosis system.

  The registration of the diesel particulate filter is only possible with the diagnosis system.
  - Service functions
  - Power train
  - DDE
  - Register exchange of diesel particulate filter

43 – Perform CBS reset

Prerequisite

Scope of maintenance work is performed.

On-board date is set correctly.

No CC message is present.

Remaining distance or remaining service life of the service interval is below 90%.

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TECHNICAL INFORMATION

The CBS scope of maintenance work can be reset in the car. In general, however, the reset of CBS functions (CBS reset) with the diagnosis system is recommended.

It is only possible to code the country-specific statutory intervals with the diagnosis system.

TECHNICAL INFORMATION

Information for the occurrence of a failed CBS reset:

For front/rear brake service:

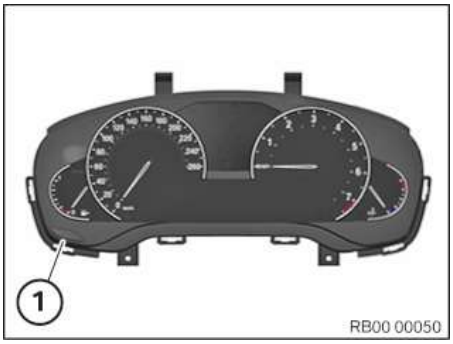
- A CBS reset is possible in the vehicle only with a sanded brake pad wear sensor (CBS display in the CID, active).
- In case of a brake pad wear sensor that is not sanded, (no CBS display in the CID) a CBS reset is possible only with the diagnosis system.

Other known causes of CBS reset problems:

- Parking brake applied.
- Brake pedal applied.
- Automatic Hold function activated.

TECHNICAL INFORMATION

The reset procedure (CBS reset) is cancelled due to a timeout or a terminal change.



- **Equipment specification with the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press trip distance recorder reset button (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

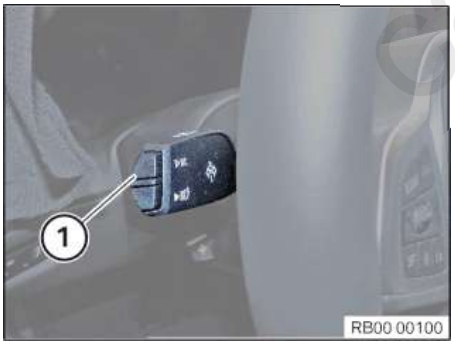
  The next position is reached by briefly pressing the trip distance recorder reset button (1) again.

  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. To do so, press the trip distance recorder reset button (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.



- **Equipment specification without the reset button for the trip odometer in the instrument cluster (KOMBI)**

  Generate PWF status "Residing".

  Generate PWF status "PAD": To do so, press the START-STOP button 3 times.

  Press on-board computer button on the turn signal/high beam switch (1) for approx. 10 s, until the 1st scope of maintenance work appears on the display.

  The next position is reached by briefly pressing the on-board computer button on the turn signal/high beam switch (1)again.

  Select the desired service job.

  If a CBS reset is possible, "Reset possible" is displayed on the instrument cluster (KOMBI).

  Confirm the "Perform reset?" text message. For this, press the on-board computer button on the turn signal/high beam switch (1) for 3 s.

  The CBS reset is confirmed as "Reset successful" after it is performed.

Additional Information

Overview of Tightening Torques

Diesel particulate filter V-clip to exhaust turbocharger Used in step 22

V-band clamp	Renew V-band clamp.	Tightening torque	15 Nm

Bracket to diesel particulate filter top			Used in step 22
M8		Tightening torque	19 Nm

Bracket to transmission for diesel particulate filter holder bottom			Used in step 22
M8X20		Tightening torque	19 Nm

Lower holder to diesel particulate filter			Used in step 22
M8		Tightening torque	19 Nm

Coolant lines for SCR metering module			Used in step 22
M6X16		Tightening torque	8 Nm

Nitrogen oxide sensor before SCR catalytic converter			Used in step 23
Sensor		Tightening torque	50 Nm

Monitoring oxygen sensor			Used in step 24
Sensor		Tightening torque	50 Nm

Rear silencer to body / bumper support			Used in step 25
M8	Replace nuts.	Tightening torque	19 Nm

Exhaust system to rear axle carrier			Used in step 25
M8 nut		Tightening torque	19 Nm

Exhaust system to transmission			Used in step 25
M8		Tightening torque	19 Nm

Exhaust system to diesel particle filter			Used in step 25
M8	If necessary, renew clamp.	Tightening torque	26 ±2 Nm

SCR metering module V-clip to exhaust system			Used in step 25
V-band clamp	Renew V-band clamp.	Tightening torque	8 Nm

Exhaust-gas temperature sensor upstream of SCR catalytic converter			Used in step 25
Sensor		Tightening torque	30 Nm

Diesel particulate sensor to exhaust system			Used in step 25
Sensor		Tightening torque	50 Nm

Nitrogen oxide sensor downstream of SCR catalytic converter			Used in step 25
Sensor		Tightening torque	55 Nm

Diffuser / underbody panelling			Used in step 26
Nuts and screws		Tightening torque	3 Nm

Connecting support to tunnel			Used in step 27
M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

Underbody protection			Used in step 2829
Hexagon screw		Tightening torque	3 Nm

Underbody panelling			Used in step 30
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Exhaust temperature sensor for the exhaust system after catalytic converter before diesel particulate filter			Used in step 31
Sensor		Tightening torque	30 Nm

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Front oxygen sensor to top of diesel particulate filter			Used in step 32
Sensor		Tightening torque	50 Nm

Exhaust-gas temperature sensor to diesel particulate filter			Used in step 33
Sensor		Tightening torque	30 Nm

Differential pressure sensor of diesel particulate filter on cylinder head cover			Used in step 34
TS5x20		Tightening torque	4 Nm

Clamp for the pressure hose on the differential pressure sensor			Used in step 34
Clamp 15–19mm		Tightening torque	3 Nm

Bulkhead lower part to body			Used in step 35
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Bulkhead upper part to bottom bulkhead			Used in step 36
		Tightening torque	3 Nm

Tension strut on bulkhead			Used in step 36
M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome			Used in step 36
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 38
Combination hexagon nut		Tightening torque	35 Nm

Overview of Special Tools

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 38
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	8910111819
61 35 ... Notes on ESD protection (Electro Static Discharge)	8910111819

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00 00 105 Standard scope of service

TECHNICAL INFORMATION

Repair possible defects for a separate charge after discussion with the customer.

1 – Check the function of the parking brake without roller est stand

Check

- Check the function of the parking brake, e.g., when the vehicle is driven into the workshop.

Result

» Function of the parking brake is limited.

Measure

- Repair parking brake.

2 – Check the indicator lights and warning lights

Check

- Check the indicator lights and warning lights in the instrument cluster (KOMBI).

Result

» The indicator lights and/or warning lights in the instrument cluster (KOMBI) are illuminated.

Measure

- Eliminate the causes for the warning messages.

3 – Checking Check Control messages

Check

- Check for Check Control messages in the CID.

Result

» Check Control messages are present in the CID.

Measure

-

▸ **Reading out the fault memory**

- Connect diagnosis system.



Check

- Read out fault memory.

Result

» A fault memory entry is present.

Measure

- Delete the fault memory, work through the test module if applicable.

4 – Checking the AdBlue filling level

Check

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- Check the AdBlue filling level in the CID.
  - Select **My vehicle** in the menu.
  - Select **Vehicle status** in the menu.
  - Select **Urea/water mixture (AdBlue)** in the menu.

Result

» Filling level too low. Limited range for the customer.

Measure

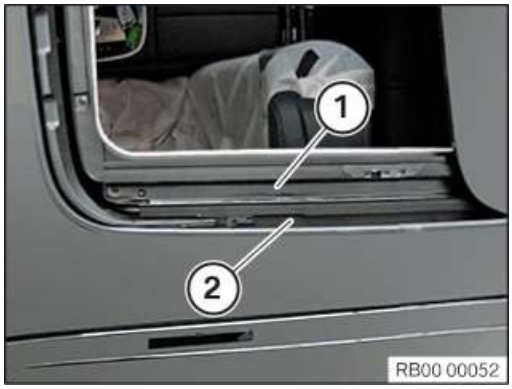
- After consultation with the customer, add the displayed AdBlue refill quantity.

  Filling of the tank is charged separately.

5 – For slide/tilt sunroof or panorama glass roof: Check the guide rails and water drain channels for contamination

Prerequisite

The glass slide/tilt sunroof panel is open.



Check

- Check guide rail (1) and water drain channel (2) on left and right for contamination.

Result

» Guide rails and water drain channels are contaminated.

Measure

- Clean guide rails and water drain channels and issue a separate invoice.

  Check whether water drain hoses are clear.

6 – Recommendation: Check tyres

▸ **Check tyres (if available, compact spare wheel also)**

Check

- Check the tread depth of all tyres with the tyre tread gauge.
- Check the tyre tread surface and flanks for cuts and foreign objects such as nails or screws.
- Check tread wear pattern for worn out areas and for one-sided wear.

Result

» Tyres worn or damaged.

Measure

- Replace the tyres against a separate invoice and, if required, carry out the wheel alignment.

Check

- If fitted: Check the tyre inflation pressure in the emergency spare wheel.

Result

» Tyre pressure too low or too high.

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Measure

- Adjust the tyre inflation pressure as per the specification.

7 – Transferring service history

Prerequisite

All completed maintenance work is documented in the Service History.



- Transfer the completed maintenance work from the Service History to the vehicle.
- Connect diagnosis system:
  - Service functions
  - Maintenance
  - Transferring service history

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00 00 741 Suspension block delivery inspection

1 Removing the spring blocker

- Remove the spring blocker.

Note: Observe the disassembly instructions on the label for vehicle loading / pre-delivery check.

- Remove the label for vehicle loading / pre-delivery check.

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00 00 ... Vehicle care measures for inventory vehicles (new and used vehicles) as well as vehicles to be taken off the road that are in the hands of customers

Solution	Vehicles	Implementation
Remove the transportation protective film	New vehicles	Do not remove the protective film if the vehicle is kept outdoors; Note the instructions on how to remove protective film
Release parking brake	New vehicles	In general
	Used vehicles	In general
	Customer vehicles to be taken off the road (note to customers)	In general
Engage gear or selector lever position "P" for automatic transmission	New vehicles	In general
	Used vehicles	In general
	Customer vehicles to be taken off the road (note to customers)	In general
Check the covers of the interior equipment	New vehicles	In general
Increase the tyre pressure to 3.5 bar	New vehicles	In general
	Used vehicles	In general
	Customer vehicles to be taken off the road (note to customers)	In general
Charge battery	New vehicles	see battery charging calendar
	Used vehicles	see battery charging calendar

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	Customer vehicles to be taken off the road (note to customers)	Every 6 weeks; Every 12 weeks for vehicle batteries that have been disconnected from the vehicle electrical system; Notify customers of vehicle-specific procedures for electric or hybrid vehicles
Change the brake fluid and reset CBS	Used vehicles	Change before vehicle handover to customer if service is due shortly (see CBS display -> Brake fluid service)
Check convertible top for potential damage	New vehicles	Generally before handover to the customer
	Used vehicles	Generally before handover to the customer
If possible, keep convertibles in roofed areas	New vehicles	In general
	Used vehicles	In general
	Customer vehicles to be taken off the road (note to customers)	In general
Check for damage to paint, the exterior or interior	New vehicles	Generally before handover to the customer
	Used vehicles	Generally before handover to the customer
Change engine oil and oil filter at engine operating temperature ***Caution!*** Do not perform a CBS reset!	New vehicles	No change
	Used vehicles (not applicable to vehicles with Premium Selection certificate)	Prior to handover to customers as from a 12 month immobilisation period
	Customer vehicles to be taken off the road (note to customers)	Prior to handover to customers as from a 12 month immobilisation period
Allow the engine to warm up for 60 min (surroundings > 0°C) or 80 min (surroundings < 0°C) (exception: the vehicle is not started during the entire stationary period)	New vehicles (only vehicles with petrol engines)	every 3 months

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	Used vehicles (not applicable to vehicles with Premium Selection certificate) (only for vehicles with petrol engine)	every 3 months
	Customer vehicles to be decommissioned (note to customers) (only for vehicles with petrol engines)	every 3 months
Change engine oil and oil filter at engine operating temperature (exception: the vehicle is not started during the entire stationary period) ***Caution!*** Do not perform a CBS reset!	New vehicles (only vehicles with petrol engines)	every 6 months
	Used vehicles (not applicable to vehicles with Premium Selection certificate) (only for vehicles with petrol engine)	every 6 months
	Customer vehicles to be decommissioned (note to customers) (only for vehicles with petrol engines)	every 6 months
Check coolant composition	Used vehicles	In general
	Customer vehicles to be taken off the road (note to customers)	In general
Dry the parking brake and footbrake by applying the brake	New vehicles	In general
	Used vehicles	In general
	Customer vehicles to be taken off the road (note to customers)	In general
Apply surface protection: vehicle surface wash including interior vehicle cleaning and subsequent paint and chrome-part care. Clean the rubber seals of the flaps and doors and apply talc or rubber care product. Use materials approved by BMW for cleaning and vehicle preservation to recondition engines, engine compartments, vehicle underbodies, axles and assemblies.	Used vehicles	In general
	Customer vehicles to be taken off the road (note to customers)	In general
Switch on the air conditioning for approximately 10 min each month	New vehicles	Required to ensure circulation of the refrigerant oil
	Used vehicles	Required to ensure circulation of the refrigerant oil

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	Customer vehicles to be taken off the road (note to customers)	Required to ensure circulation of the refrigerant oil

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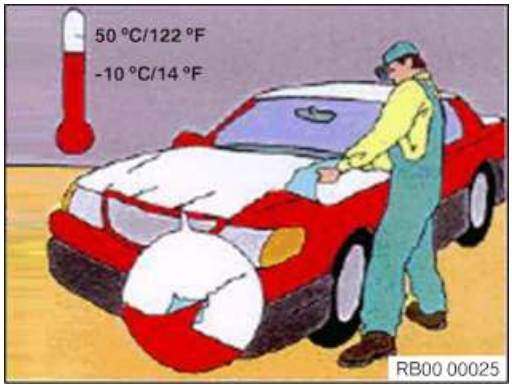
00 00 ... Work instruction for removing the protective film

Note:
The protective film is applied to new vehicles at the works. The dealer must guarantee only expert removal of the protective film.

The protective film should be removed 48 hours before vehicle handover to the customer.

The protective film can be easily removed from the affected surfaces. Polishing is necessary only in exceptional cases.

Further information on the protective film is available in the document "Frequently asked questions on surface protection".

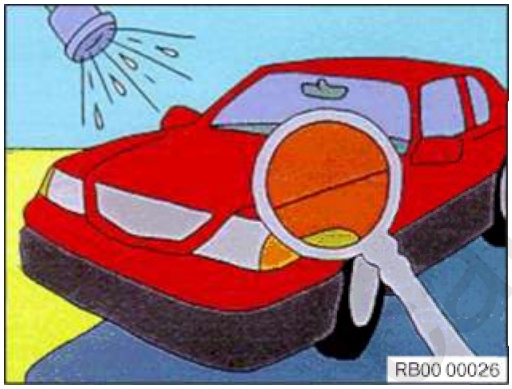


Instructions for removing the protective film:

- In order to reduce the amount of force required, the film can be torn at the edge and pulled off in narrower strips.
- Remove the film in a surface temperature range of -10 °C to +50 °C.

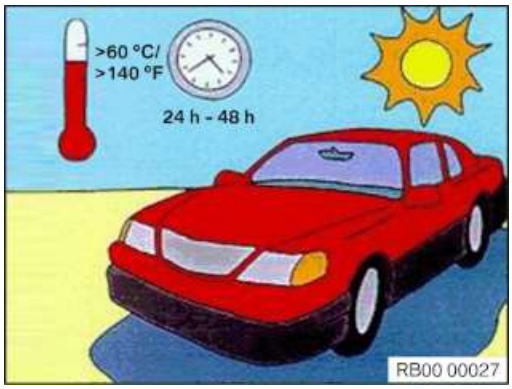
  Excessively high temperatures can lead to adhesive residue being left on the surface.

  In order to achieve the recommended temperature for pulling off the adhesive film from the vehicle after direct exposure to the sun, it is possible to carry out a car wash with applied protective film in order to cool the vehicle down.



Car wash and surface inspection:

- Check vehicle surface after the car wash.
- Any adhesive residue left on the vehicle surface can be removed by rubbing by hand or using a cleaning agent R2 (part number 83 19 0 417 324) or stain remover (part number 83 11 9 407 816) and a lint-free cloth.



Procedure in the event of paint swelling:

- Any paint swelling normally disappears within 48 hours.
- Higher temperatures (infrared lamp) accelerate this process.
- Polishing of the surfaces is necessary only in rare cases if the heat treatment does not result in success.

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64 00 ... Information on using cleaning agent/paints (personal protection equipment)



Warning!

Use of cleaning agents/paints not compliant with instructions can cause serious injuries or burns!

Handling cleaning agents/paints can trigger allergic skin and respiratory reactions!



Important!

Observe following instructions:

- Store cleaning agents/paints only in a secure cabinet.
- Keep cleaning agents/paints away from naked flames and other sources of ignition.
- Protect cleaning agents/paints from high temperatures and direct sunlight.
- Always keep an eye douche on hand, change the water regularly (once a month).



Important!

Observe following instructions before use:

- Manufacturer's instructions (on container/packaging)
- Hazard warnings (on container/packaging)
- Manufacturer's instructions on package insert
- Material safety data sheet of manufacturer
- Product information in EPC
- National market regulations



Important!

Observe following instructions during use:

- Do not eat, drink or smoke while working with these products.
- Avoid direct contact with skin and eyes.
- Wear personal protective clothing/equipment.
- Ensure that all enclosed areas are well ventilated or extract fumes directly.
- Immediately change working clothes soiled with cleaning agent/paint.
- After finishing work, wash your hands and apply protective skin cream.



Important!

Follow hazard warnings and wear personal protection equipment!

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First Aid:

- If product comes in contact with eyes, immediately flush with running water for about 10 - 15 minutes. Seek the advice of eye specialist.
- In the event of skin contact and where applicable an allergic skin reaction, clean the affected areas immediately with soap and water and then apply silicone-free skin cream. Seek advice of physician.
- If an adhesive product is swallowed, rinse mouth/parts of mouth thoroughly with running water. Drink 1-2 glasses of water. Do not induce vomiting. Consult a doctor.
- After inhaling vapours ensure ample supply of fresh air. Keep calm, keep respiratory tracks clear and call doctor.



Recycling:

Dispose of cleaning agents/paints in a professional manner!

Observe national/country-specific disposal regulations.

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64 53 ... Instructions for desiccant insert replacement



Special tools required:

- 32 1 270

A desiccant insert need **not** be changed at regular inspection intervals in a well functioning, sealed air conditioning system.

However, the dryer flask or desiccant insert must absolutely be replaced in the event of:

- the refrigerant being dirty by swarfs (e.g. when the compressor is clamped).
- With depressurised and/or completely drained refrigerant circuit.
- In case of a refrigerant circuit which was closed using special tool 32 1 270 but remains open for more than 24 hours.

The desiccant insert cannot be replaced in the following vehicles:

- *1-Series E8x, 3-Series E9x* from 12/2008
- *E84, E89*
- *F-series*
- *G model series*
- *BMW i without heat pump*

In these vehicles, the condenser for the heating and air conditioning system must be replaced.

- *BMW i 01 with heat pump*

On this vehicle the low pressure battery must be replaced.

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61 00 ... Notes on handling the high pressure cleaner



Warning!

Only used a high pressure cleaner approved by BMW!

Only specially trained persons of 16 years of age or older may work with the high pressure cleaner.

Check the high pressure cleaner and electrical wiring for visible damage.

Only use at a suitable location.



Attention!

Pay attention to following hazard warnings:

- Danger of injury due to water jet
- Contact with hazardous substances in spray
- Risk of skidding on wet floor
- Risk of stumbling due to hoses and cables
- Comply with notes and instructions on handling cleaning agents !
- Risk of scalding when cleaning with hot water.
- On electric or hybrid cars, the safety instructions for handling with hybrid cars are to be complied with.



Warning!

The following personal protective equipment is to be used:

- Safety goggles/face guard
- Suitable gloves
- Apron
- Rubber boots
- Ear protectors
- Safety shoes



Attention!

Notes on washing a vehicle with a high pressure cleaner:

- Do not wash directly on gaskets and control units during engine washes.
- A minimum distance of 30 cm must be adhered to for tyres and tyre valves.
- A minimum distance of 30 cm must be adhered to for the soft top and painted parts.
- Do not use if engine is still hot.
- Do not exceed maximum water temperature of 60 degrees.
- Do not spray directly onto cameras/sensors.

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Attention!

- For your own safety, we recommend that you do not wash on the high-voltage components in electric or hybrid vehicles.

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00 Safety information for working on vehicles with automatic engine start-stop function (MSA)

Warning!

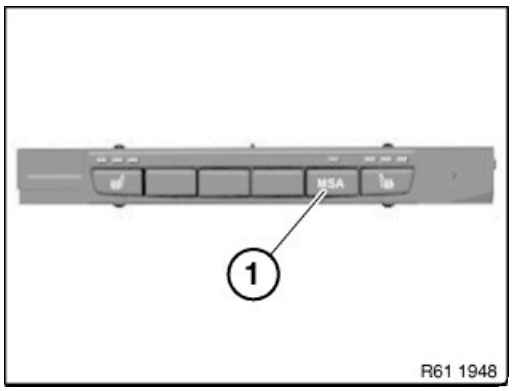
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

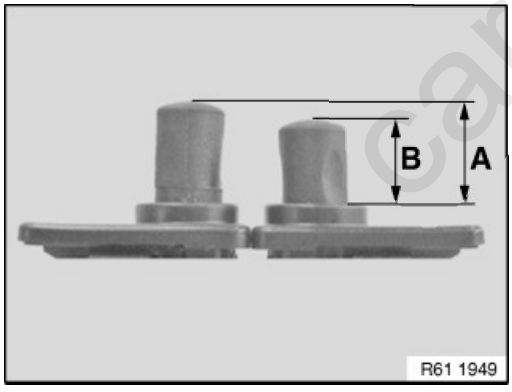
Observe safety precautions when working on MSA vehicles.

Before carrying out practical work on the engine, always ensure that the MSA functionality is deactivated so as to prevent automatic engine starting while work is being carried out in the engine compartment.

MSA function is deactivated by:



- Deactivate MSA by means of button (1) in passenger compartment
- Open seat belt buckle and driver's door



- Open engine bonnet/hood and ensure that engine hood/bonnet contact is not in workshop mode
  - Workshop mode

    A = 10 mm
  - Basic setting (engine hood/bonnet open)

    B = 7 mm

  To make sure that the engine hood/bonnet contact is at the basic setting, if necessary press the hood/bonnet contact up to the limit position before starting work and slowly release.

When working with diagnosis tools:

- Observe instructions in diagnosis tool

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Note:
For further information on automatic engine start-stop function (MSA):

- Refer to the Service Information (bulletin) (for manual transmissions) Service Information (bulletin) 61 01 07 335
- Refer to the Service Information (bulletin) (for automatic transmissions or twin-clutch gearboxes) Service Information (bulletin) 61 01 10 629

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00 01 ... Symbols used and information in repair instructions



Warning!

Precautionary rules and measures which protect mechanics and other personnel against injury (including life-threatening injuries).

For example: **Warning!**

Risk of scalding!

Only perform this work after engine has cooled down.



Important!

Specific instructions and precautionary measures which prevent damage to the vehicle or to vehicle parts. Failure to comply with the above will invalidate any warranty claims.

The caution symbol is used in all repair instructions.

However, use of the warning word ”Caution!” is not binding in every case.

The notes, instructions and precautionary measures mentioned above retain their validity.



Warning!

High-voltage system - danger to life!

Before beginning work, follow the applicable safety rules and perform the necessary preliminary work.

Note:
High-voltage symbol for hybrid cars (electrically powered vehicles) E72 and MINI E.



Warning!

High-voltage system - danger to life!

Before beginning work, follow the applicable safety rules and perform the necessary preliminary work.

Note:
High-voltage symbol for hybrid car (electrically powered vehicle) from F04.



Note:
Particular information on improved procedures for operation, testing, adjustment and upkeep.

Also indicates the end of a repair section.



Recycling:

Observe country-specific waste disposal regulations

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General information:
Refers to other instructions: such as e.g.:

Necessary preliminary tasks;

Further instructions: refer to operating instructions for balancing machine.



Replacement:

Carry out programming/encoding.

Note:
Many electronic control units must be programmed/coded (e.g. when replaced).



Note (symbol for diagnosis system):

- Connect BMW diagnosis system



Important!
Read and comply with notes on protection against damage from electrostatic discharge (ESD protection).

Note:
Electronic control units and other electronic components - if handled incorrectly - can be damaged or destroyed by electrostatic discharge.



Special tools required: *Note:*
List of special tools needed in these repair instructions.



Important!
Do not oil or grease component or tool.

Note:
Oil and grease will impair or damage the function of the component or tool.



Warning!
Laser beam!

For example:

Adjusting device emits laser beam. Do not look into the beam!

Note on laser class.



Important!
Use eye protection for the following operations.

For example:

Fuel can emerge spontaneously at high speed when the fuel delivery line is released!

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Important!
Use ear protection for the following operations.



Important!
Use eye protection and ear protection for the following operations.



Important!
Use face protection for the following operations.



Important!
Use protective gloves for the following operations.
Avoid skin contact.



Important!
Use eye protection and protective gloves for the following operations.
Avoid eye contact and skin contact.



Warning!
Danger of explosion!



First aid measures:
Note on first aid measures that need to be administered immediately.

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00 02 001 Raising the vehicle using a vehicle lift

DANGER

Vehicle falling down from a vehicle lift.

Danger to life!

- Observe Owner's Handbook for vehicle hoist.
- Do not exceed the approved load-carrying capacity and weight distribution of the vehicle lift.
- Depending on the load situation of the vehicle: Perform weight compensation, particularly during removal of heavy components, e.g. engine.
- Make sure the vehicle lift complies with the relevant statutory or country-specific accident prevention regulations and is serviced according to the regulations.
- Observe the instructions of the repair instructions when positioning the swivel arms.

WARNING

Motor vehicle may slip off the vehicle hoist where components are supported.

Danger! Life-threatening injuries!

- Secure the vehicle hoist against lowering and lifting.

WARNING

Motor vehicle may slip off the vehicle hoist if the weight is distributed unevenly.

Danger! Life-threatening injuries!

- Ensure there is a specific weight compensation on the motor vehicle.

RISK OF DAMAGE

Component damage when raising the vehicle using a vehicle lift.

Components can become damaged when lifting a vehicle with a vehicle lift.

- Observe the instructions of the repair instructions when positioning the swivel arms.
- Before driving onto a vehicle lift, make sure there is sufficient ground clearance between the vehicle lift and the vehicle.

1 – Raising the vehicle using a vehicle hoist with rails

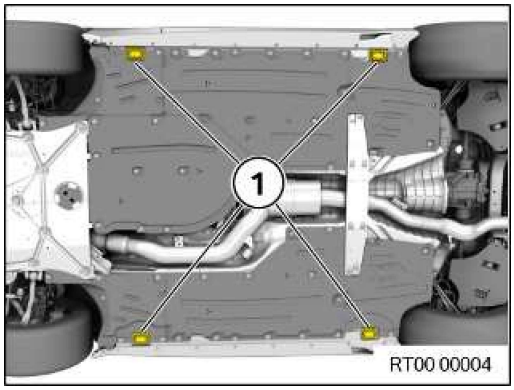
RISK OF DAMAGE

Component damage when driving onto a vehicle lift with rails

Components on the vehicle can be damaged when driving onto a vehicle lift with rails.

- Ensure safety when driving onto a vehicle lift with a second person.

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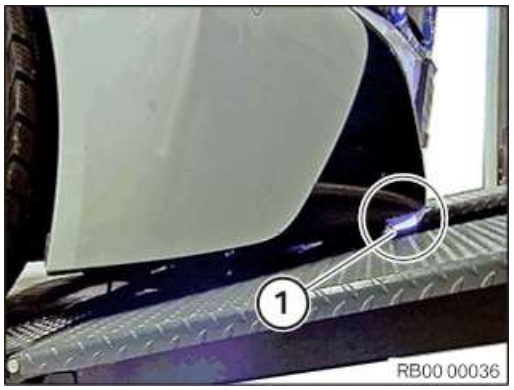


TECHNICAL INFORMATION

Vehicles can be lifted at the jacking points with trolley jacks and vehicle lifts.

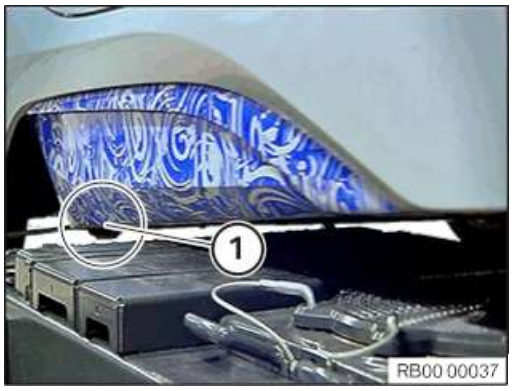
- Check the jacking points (1) for damage; renew if necessary.

  Parts: Jacking points



- Slowly drive onto approach ramp of the vehicle lift with rails.

  The lower edge (1) of the bumper panel must not be damaged.

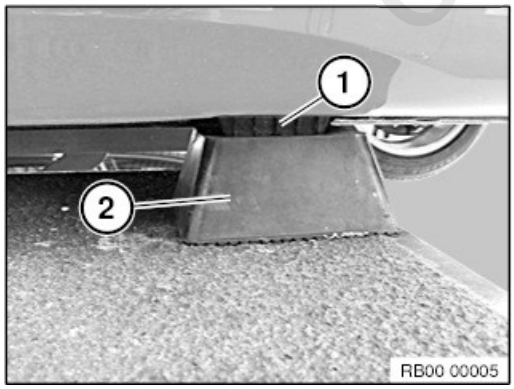


- Slowly drive onto the rails of the vehicle lift.

  The lower edge (1) of the side sill trim panel must not be damaged.

- Drive the vehicle centrally onto the rails of the vehicle lift and stop.
- Secure vehicle to prevent it rolling.
- Raise vehicle.

» The vehicle is supported on wheels.



TECHNICAL INFORMATION

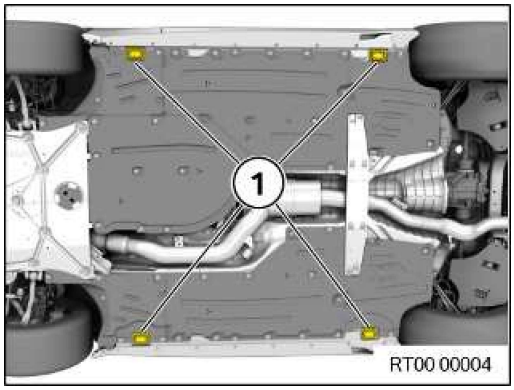
Rubber blocks must be paced under the jacking points when lifting vehicles with vehicle lifts with rails and secondary stroke.

- Position rubber block (2) under the jacking point (1). Make sure that adjacent components are not damaged.
- Raise the vehicle with the post-stroke device of the vehicle lift with rails.

» The wheels are in the air.

2 – Raising the vehicle using a vehicle hoist with swivel arms

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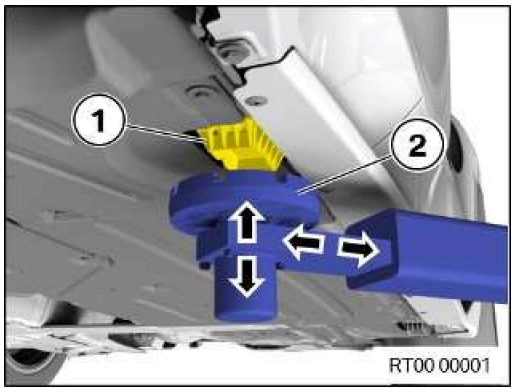
TECHNICAL INFORMATION

Vehicles can be lifted at the jacking points with trolley jacks and vehicle lifts.

- Check the jacking points (1) for damage; renew if necessary.

  Parts: Jacking points

- Park the vehicle centrally between the swivel arms.
- Secure vehicle to prevent it rolling.



- Position the mounting plate (2) of the swivel arm of the vehicle lift in the centre below the jacking point (1). Make sure that adjacent components are not damaged.
- Repeat this operation on the other swivel arm.
- Raise vehicle.

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00 02 001 Raising the vehicle using a vehicle lift



Warning!

Danger to life!

Read and follow operating instructions for vehicle hoist.

Do not exceed approved load-carrying capacity and load distribution of vehicle hoist.

Weight compensation may be necessary due to the loading situation of the vehicle.

This also applies in the event of considerable removal of parts or conversions on the vehicle.

Note:

The vehicle hoist must comply with the relevant statutory/country-specific accident prevention regulations and be serviced according to the regulations.



Caution!

Risk of damage!

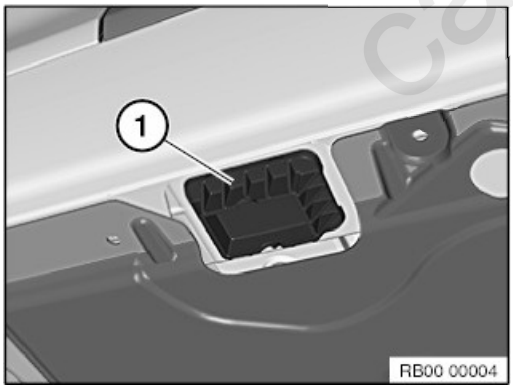
Before driving onto a vehicle hoist, make sure there is sufficient ground clearance between the vehicle hoist and the vehicle.

The vehicle may only be raised with the vehicle hoist at the four jacking points.



Necessary preliminary work:

- For new vehicles: If necessary, remove jacking points from equipment pack and insert from below into openings in front and rear sill areas

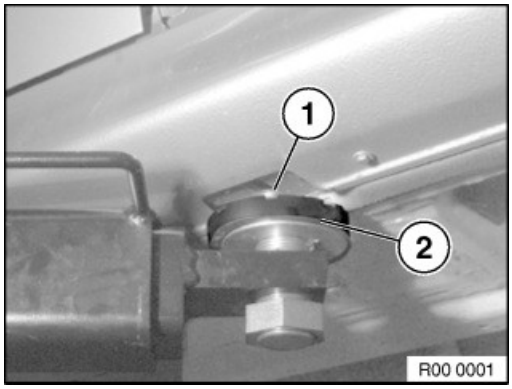


Caution!

All four jacking points (1) must be available!

Never raise the vehicle without the jacking points (1)!

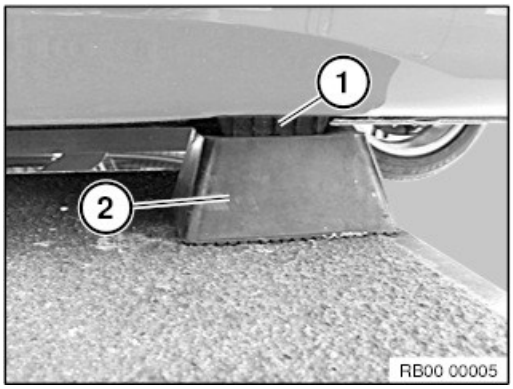
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Caution!

Risk of damage!

Align support plates (2) of lifting platform arms to jacking points (1) in such a way that no adjoining components are touched and thereby damaged.



Caution!

Risk of damage!

Align the rubber block (2) with the jacking points (1) in such a way that no adjoining components are touched and thereby damaged.

Never raise the vehicle without rubber blocks (or rigid foam blocks)!

There is a major risk of damage to the vehicle underbody!

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00 02 000 Raising vehicle with trolley jack

PRELIMINARY WORK

1 – Carrying out work preparation



RISK OF DAMAGE

Component damage while lifting the vehicle with a trolley jack.

Components can become damaged when lifting a vehicle with the trolley jack.

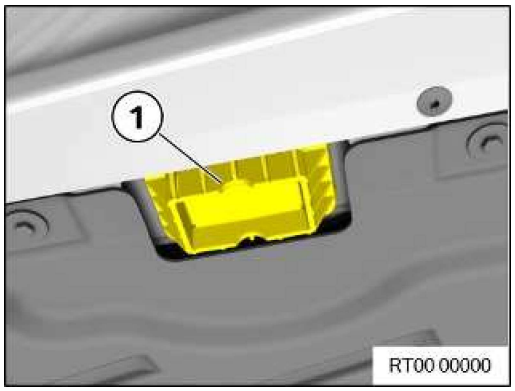
- Only use BMW distributed/approved trolley jacks, whose mounting plates are furnished with a rubber part.
- Perform regular maintenance on the trolley jack and check for proper function before each use.
- Check the mounting plate on the trolley jack for damage prior to each use, replace if necessary.
- Observe the instructions of the repair instructions when positioning the trolley jack.

- Prepare the trolley jack.
- Secure wheels that will not be raised with chocks (1).



MAIN WORK

2 – Raising the vehicle at the side with a trolley jack



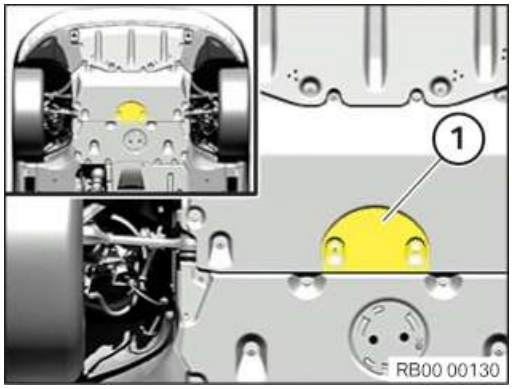
TECHNICAL INFORMATION

Vehicles can be lifted at the jacking points with trolley jacks and vehicle lifts.

- Check the jacking points (1) for damage; renew if necessary.
- Position the mounting plate on the trolley jack below the jacking point (1). Make sure that adjacent components are not damaged.
- Raise vehicle.

3 – Lifting the vehicle with a trolley jack

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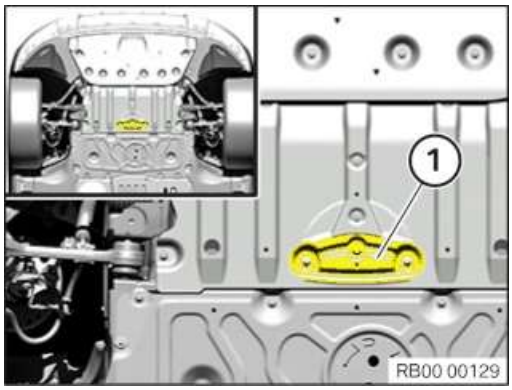
TECHNICAL INFORMATION

Vehicles can be lifted using trolley jacks in the defined area on the underbody panelling.

The front axle support is located below the defined area.

- Position mounting plate of trolley jack in the marked area (1) on the underbody panelling.
- Raise vehicle.

4 – If installed: Lifting the vehicle using the trolley jack (for equipment specification with underride protection)



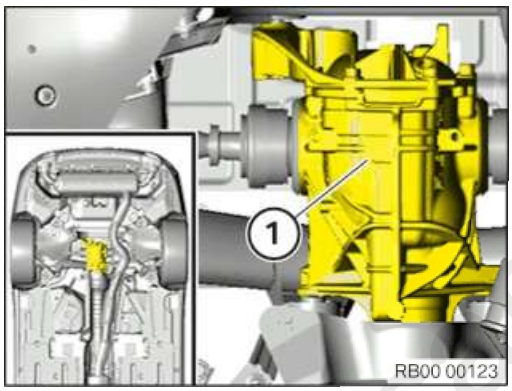
TECHNICAL INFORMATION

Vehicles can be lifted using trolley jacks in the defined area on the underbody panelling.

The front axle support is located below the defined area.

- Position mounting plate of trolley jack in the marked area (1) on the underbody panelling.
- Raise vehicle.

5 – Lifting the vehicle at the rear with a trolley jack



TECHNICAL INFORMATION

Vehicles can be lifted with trolley jacks at the rear axle differential.

- Position the mounting plate on the trolley jack centrally below the rear axle differential (1).
- Raise vehicle.

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00 00 ... Microencapsulated screws

Screw securing adhesive is a means of preventing a screwed connection from being loosened by external influences.

Once the screw has been coated with adhesive, the adhesive remains inactive until such time that it is activated by the encapsulation breaking when the screw is inserted and then cures (hardens) at room temperature.

Installation note:

- Screw connection must be completed within 20 mins. (start of curing)
- Microencapsulated screws must not be retightened
- Thread of nut must be cleaned beforehand in event of repeated use

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61 12 ... Information on intelligent battery sensor (IBS)

Notice! Do not connect the charger to the 12 V charging socket

The 12 V charging socket is supplied with voltage by the rear power distribution box via relay. This relay drops out after terminal 15 OFF. This means that a trickle charger connected at the 12 V charging socket will be disconnected from the battery. Only charge the battery via the jump start terminal point. Only then can the voltage supply be registered by the vehicle.

Warning! Danger of destruction in event of mechanical strain

- Do not introduce any additional connections at the battery negative terminal.
- Do not modify the grounding cable. The ground cable also serves heat dissipation.
- Do not establish any connection between the IBS and the sensor screw.
- Do not use force when disconnecting the pole shoe from the battery terminal:
  - Do not pull on the ground cable.
  - Do not place any tools under the IBS to lever off the pole shoe.
- Do not use IBS connections as levers.
- Use a torque wrench and set tightening torque in accordance with repair instructions.
- Do not release or tighten down sensor screw (Torx screw).
- Avoid contact between IBS and ground.

Warning! Danger of destruction to IBS and wiring upon battery replacement

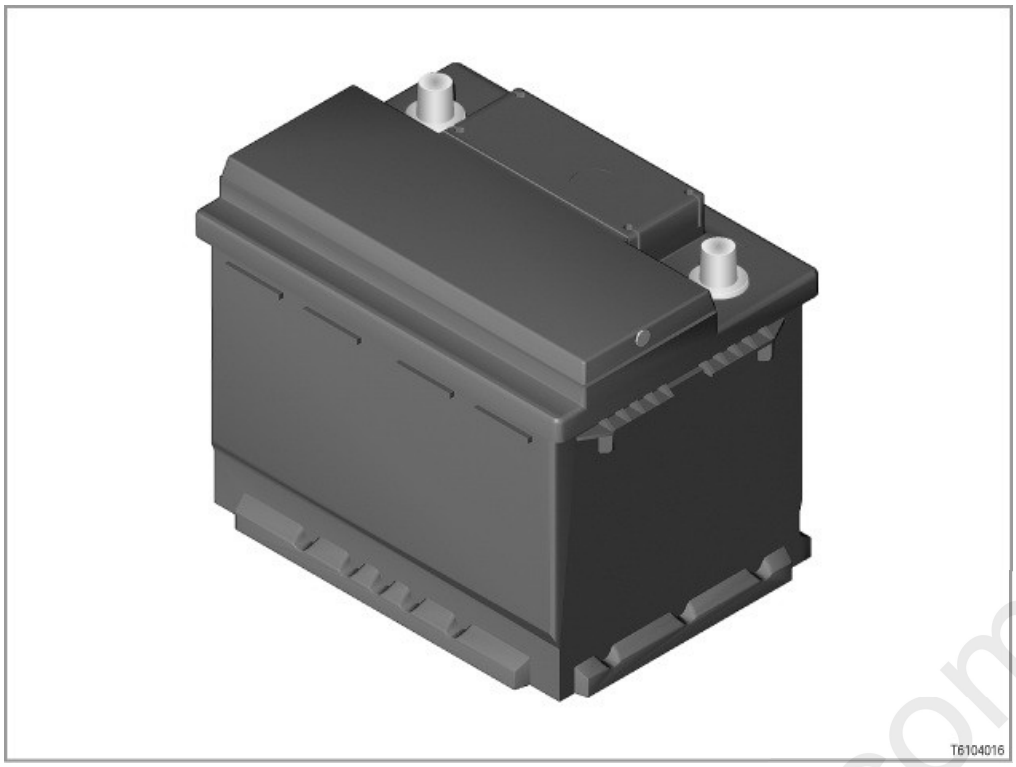
- The IBS and wiring can be destroyed by mechanical strain upon battery replacement. Therefore avoid mechanical strain.
- The size (capacity) of the battery required for the car is coded in the Car Access System (CAS).
- Use the battery size (capacity) installed as standard upon battery replacement.
- Recode the Car Access System (CAS) when installing a battery with a different capacity.
- Register battery replacement via Service functions in diagnosis system.
- Delete fault code entries in the Digital Engine Electronics (DME) associated with battery replacement.
- Always proceed in accordance with the repair instructions.

Note: Battery draining possible in spite of the intelligent battery sensor IBS being fault-free.

- A battery can be drained (e.g. with lights or radio switched on) even when the IBS functions perfectly in conjunction with power management.
- **For this reason, only exchange the IBS when there is a corresponding fault code entry!**

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61 20 ... Notes on AGM battery



Introduction

In September 2002, the first so-called VRLA batteries, better known as **AGM batteries** came into use. (VRLA stands for **V**alve **R**egulated **L**ead **A**cid, i.e. lead-acid battery with pressure relief valve; **AGM stands for A**bsorbent **G**lass **M**at, i.e. absorbent glass-fibre fleece).

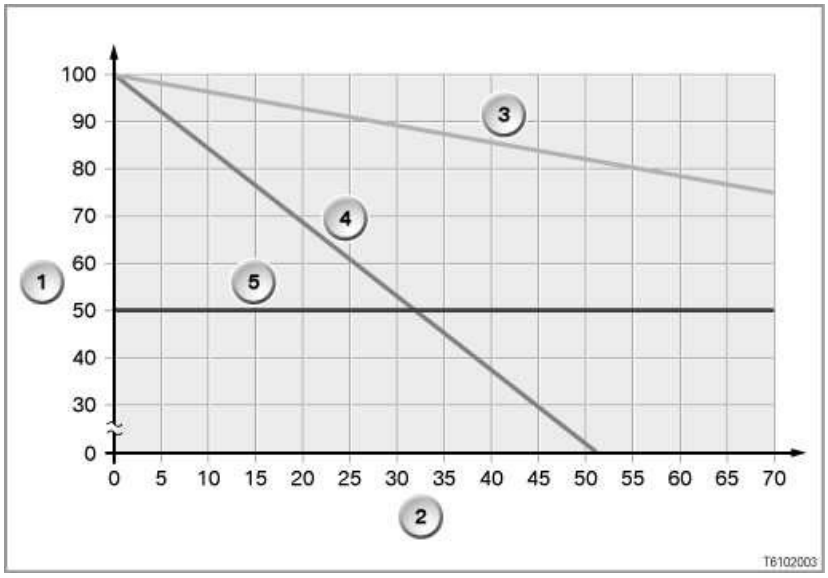
The constantly increasing energy demand of modern vehicle electrical systems calls for ever more powerful battery solutions. A modern luxury-class vehicle has some 100 actuator motors that have to be fed with electrical current. Added to these are safety, environmental and comfort elements which are increasingly becoming standard features, such as e.g. Antilock Brake System (ABS), Dynamic Stability Control (DSC), steering assistance (EPS), electronic chassis and suspension control, air conditioning and navigation system. Current consumption is considerable even when the vehicle is not in use.

The somewhat higher price compared with a battery of similar size is fully balanced by the following benefits:

- greatly longer service life
- improved starting reliability at low temperatures
- Safe starting of engines with high starting power requirements, for example high-performance diesel engines
- 100 % freedom from maintenance
- low risk in the event of an accident (reduced environmental risk)

Service life of AGM batteries

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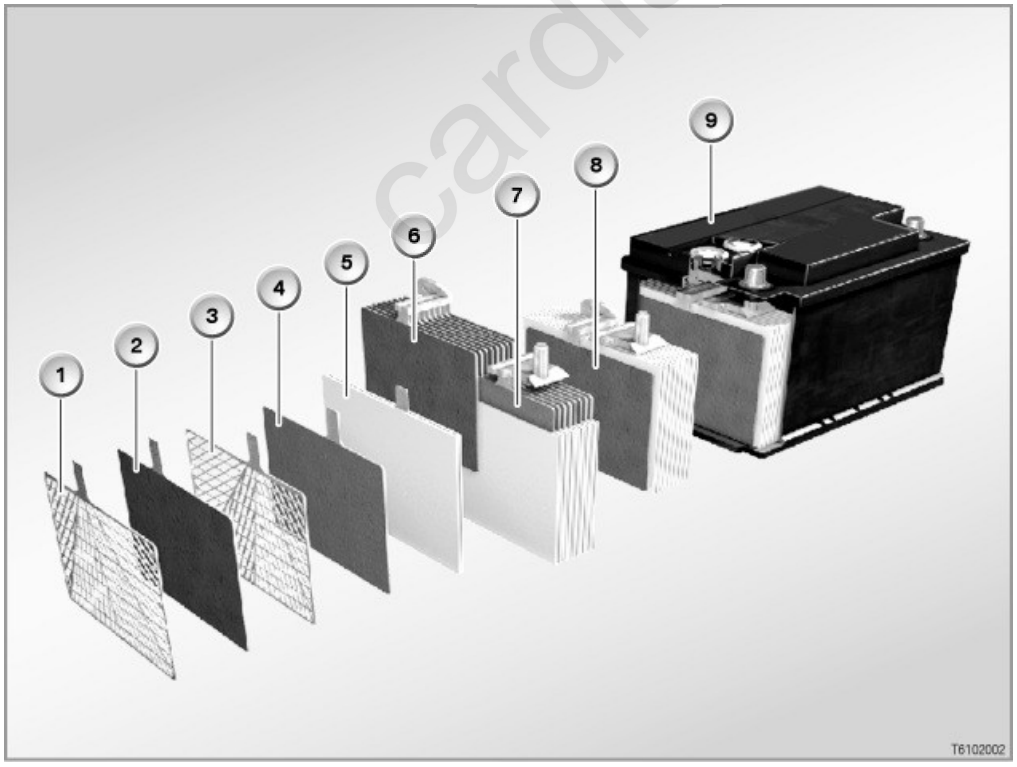


Index	Explanation	Index	Explanation
1	Available capacity [%]	2	Mileage [thousand km]
3	AGM battery	4	Lead-calcium battery
5	50 % capacity limit		

In contrast to conventional lead-calcium batteries, the sulphuric acid in a battery with fleece technology is not held freely in the battery housing. Rather, 100% of the sulphuric acid is bound into the mats of the glass-fibre fleece (separators). For this reason, no battery acid can escape if the battery housing is damaged. In addition, the AGM battery is sealed to be airtight. This is possible because the gases are converted back into water as a result of the separator permeability.

Brief component description

The AGM battery has a black housing and the so-called "Magic Eye" is missing.



Index	Explanation	Index	Explanation

1	Positive grille with silver alloy	2	Positive plate
3	Negative grille	4	Negative plate
5	Separator made of glass-fibre fleece	6	Set of positive plates
7	Set of negative plates	8	Block of plates
9	Block box with base strips		

Construction

The AGM battery differs from the conventional lead calcium battery as follows:

- larger plates: Larger plates allow a 25% larger power density.
- Separators made of glass-fibre fleece: These can cause an up to 3-times higher cycle stability to be reached. This improves the cold starting capability, the power consumption and service life.
- Airtight housing with pressure relief valve (please refer to ”How it works”):
  The inspection plugs are sealed and can not be opened.
- Battery acid bound in glass-fibre fleece: Battery acid is not found free in the housing as before, but is rather bound 100% in the glass-fibre fleece. This gives increased security against the acid escaping and thus reduces the environmental risk.

How it works

The AGM battery differs from conventional batteries in its non-polluting and substance-retaining behaviour during charging.

When a battery is charged, the electrolysis process emits the gases oxygen and hydrogen.

- In a conventional wet lead calcium battery, the two gases hydrogen and oxygen are dissipated into the atmosphere.
- In an AGM battery, the two gases are converted back into water: The oxygen which is created at the positive electrode during charging passes through the permeable glass fibre fleece to the negative electrode. At the negative electrode the oxygen reacts with the arriving hydrogen ions in the electrolyte to form water (oxygen cycle).

In this manner, the gas and thus also the electrolyte are not lost.

Only in the event of an excessively heavy build-up of gas, i.e. excessively high pressure build-up (20 to 200 mbar), does the pressure relief valve discharge the gas. In this process, the pressure relief valve does not allow any oxygen in the air to enter. Because the pressure in the battery is regulated by a valve, the AGM battery is also known as the VRLA battery (valve-regulated lead acid).

Notes for Service department

It is necessary when handling an AGM battery to observe some particular points pertaining to battery changing and installation location.

Charge

Warning! Do not charge the AGM battery with > 14.8 V. Do not use rapid-charging programs!

> When charging removed batteries (so-called stand-alone batteries), do not exceed the maximum charging voltage of 14.8 V at room temperature. Also, for charging via the external start connection point, the maximum charging voltage of 14.8 V at room temperature must not be exceeded. The battery can be damaged even if the AGM battery is only briefly charged with a charging voltage higher than 14.8 V. A charging voltage of more than 14.8 V is usually used in quick-charging routines.

Installation location

Warning! Do not install the AGM battery in the engine compartment.

> The AGM battery must not be installed in the engine compartment on account of the high spatial temperature differences, otherwise its service life will be significantly shortened.

Housing

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Warning! Do not open AGM batteries.

On no account may AGM batteries be opened, as the ingress of oxygen from the atmosphere would cause the battery to lose its chemical balance, rendering it unserviceable.

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61 00 ... Notes on handling optical fibres



Important!

To avoid damage when handling optical fibres, comply with the following points:

- The minimum permitted bending radius is 25 mm
- Do not subject optical fibres to compressive and tensile load
- Protect optical fibres against the effects of heat ≥85 °C (e.g. during welding work, drying work with infrared beams or hot air blower)
- Fibre-optic cables are permitted to show only one junction point (bridge), replace fibre-optic cables if necessary



Note:
The optical fibres are coloured differently as follows:

- Green = **MOST** (**M**edia **O**riented **S**ystems **T**ransport) optical fibre
- Yellow = **ISIS** (**I**ntelligent **S**afety and **I**ntegration **S**ystem) optical fibre
- Orange=repair fibre-optic cables

Follow notes for processing cables and optical fibres.

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61 00 ... Notes on handling wiring harnesses and cables



The following applies in general:

To avoid damage, observe the following notes:

- Avoid compressive and tensile loads
- To ensure professional repairs, perform repair work only with BMW-approved or recommended special tools and spare parts
- Make sure cables are laid without kinks or abrasions
- Ensure non-contacting routing at sharp-edged body components; use edge protection if necessary
- Secure additionally laid cables/leads with cable ties

The following additionally applies

Shielded lines

Interference radiation and interference resistance can lead to neutral zones at contact points in the shielding. Consequently, distinctions have to be drawn between the following types:

Coaxial cable

- Shielded coaxial cables RTK031 may only be repaired with a special crimping tool.
- For aerial lines only the bushing contact may be repaired.
- RG174 Lines and the bushing contact may not be repaired.

CVBS cables

- CVBS cables may not be repaired.
- CVBS cables must be replaced in their entirety.

HSD cables

- HSD cables may not be repaired.
- HSD cables must be replaced in their entirety.

Fibre-optic cables:

Note:
Fibre-optic cables are coloured differently as follows:

- Green = **MOST** (**M**edia **O**riented **S**ystems **T**ransport) optical fibres
- Yellow = **ISIS** (**I**ntelligent **S**afety and **I**ntegration **S**ystem) optical fibres
- Orange=repair fibre-optic cables

Caution!

- Optical fibres are permitted to show only one junction point (bridge). Replace optical fibres if necessary
- Smallest permissible bending radius is 25 mm
- Avoid effects of heat ≥ 85 °

Treating cables and optical fibres

FlexRay (twisted cables):

It is possible to repair the FlexRay. In the event of damage, the cables can be joined with conventional butt connectors and heat-shrink tubing.

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Note:

- FlexRay lines may only reveal one separation point (bride); renew complete line if necessary.
- If possible, maintain twisted cable after repair.
- After repairs, twist cables as close as possible to the connector/separation point.
- Twisting must be as symmetrical as possible.

Airbag lines:

Repairing airbag cables

Ribbon cables:

Repairing ribbon cables

Replacing wiring harnesses

Repair wiring harnesses mainly cover the full equipment of the vehicle. If certain optional equipment is not installed in the vehicle, note the following:

- If necessary, secure the remaining connectors.
- If necessary, seal the remaining connectors outside the vehicle interior, for example, with butyl tape in such a way that moisture ingress can be eliminated permanently.
- If necessary, repin the connector of the repair wiring harness.

Note:
Repair wiring harnesses can be equipped with an **additional socket housing** (30-pin, for example), **which was not provided on the previous vehicle-side wiring harness**. This socket housing also cannot be found in the wiring diagram.

Procedure

The separation point between the vehicle-side wiring harness and the repair wiring harness is located **in the vehicle interior** (in the footwell, for example):

- Cut the additional socket housing and connect the lines to the vehicle-side wiring harness using a butt connector.
- Alternatively, a suitable pin housing can be fitted on the vehicle-side wiring harness and connected to the additional socket housing.

  However, this is permitted only if the following conditions are met:

  - Carpets must not protrude visibly or become deformed due to the installation of the additional plug connection.
  - It must be possible to install the adjacent components (for example, trims, trim panels, etc.) correctly after installing the additional plug connection.
  - All the attachment points of the adjacent components (for example, trims, trim panels, etc.) must engage correctly.
  - There must be no rattling noise due to the installation of the additional plug connection.
  - The additional plug connection must not damage the adjacent components/wiring harnesses, etc..

The separation point between the vehicle-side wiring harness and the repair wiring harness is located **outside the vehicle interior** (in the wheel arch, for example):

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- Cut the additional socket housing and connect the lines to the vehicle-side wiring harness using a butt connector.
- **Using the additional socket housing is not permitted with a separation point outside the vehicle interior.**

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64 52 ... Instructions for opening and part exchange in refrigerant circuit



Special tools required:

- 00 9 030
- 32 1 270

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety informations for handling refrigerant
- Follow safety information for handling refrigerant oil

Attention!

- Always use new O-rings each time A/C connections are opened (refer to Electronic Parts Catalogue)
  They must **not** be coated.
  Use special tool 00 9 030 to install sealing rings without damaging them.
- Open the referigerant circuit for as short of a period as possible.
- Close all components and lines in the refrigerant circuit and return parts **immediately** following the removals at openings with special tool 32 1 270 to prevent penetration of moisture or foreign objects.
- If the refrigerant circuit was closed at the openings with special tool 32 1 270 but it remains open for more than 24 h, the dryer insert for the air conditioning must be replaced.

I. **Part replacement as preliminary work fur further repair work and part replacement based on gradual leakage.**
(minor leak, e.g. hairline crack)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 10 ml
  - Condenser: 20 ml
  - Desiccant insert / dryer flask: 20 ml
  - Each replaced refrigerant line: 10 ml
  - Condenser with integrated dryer flask: 40 ml
  - Safety pressure switch and gasket: no additional refrigerant oil
  - Only l01: Radiator, high-voltage battery unit: 20 ml
- Evacuate and fill air conditioning system

II. **Part replacement due to sudden leakage**
(major leak, e.g. line disconnection due to accident)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 35 ml
  - Condenser: 35 ml
  - Desiccant insert / dryer flask: 55 ml
  - Each replaced refrigerant line: 35 ml

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    - Condenser with integrated dryer flask: 55 ml
    - Safety pressure switch and gasket: no additional refrigerant oil
    - Only I01: Radiator, high-voltage battery unit: 35 ml
- Evacuate and fill A/C system

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64 53 ... Instructions for replacement of air conditioning condensers and radiator/coolers

Attention!

Even when they are correctly installed or due to normal driving, radiators (oil cooler, radiator, charge air cooler) or air conditioning condensers may show slight impressions or deformations on their discs (1).

A slight sag with a large radius for the air conditioning condenser is also permissible.

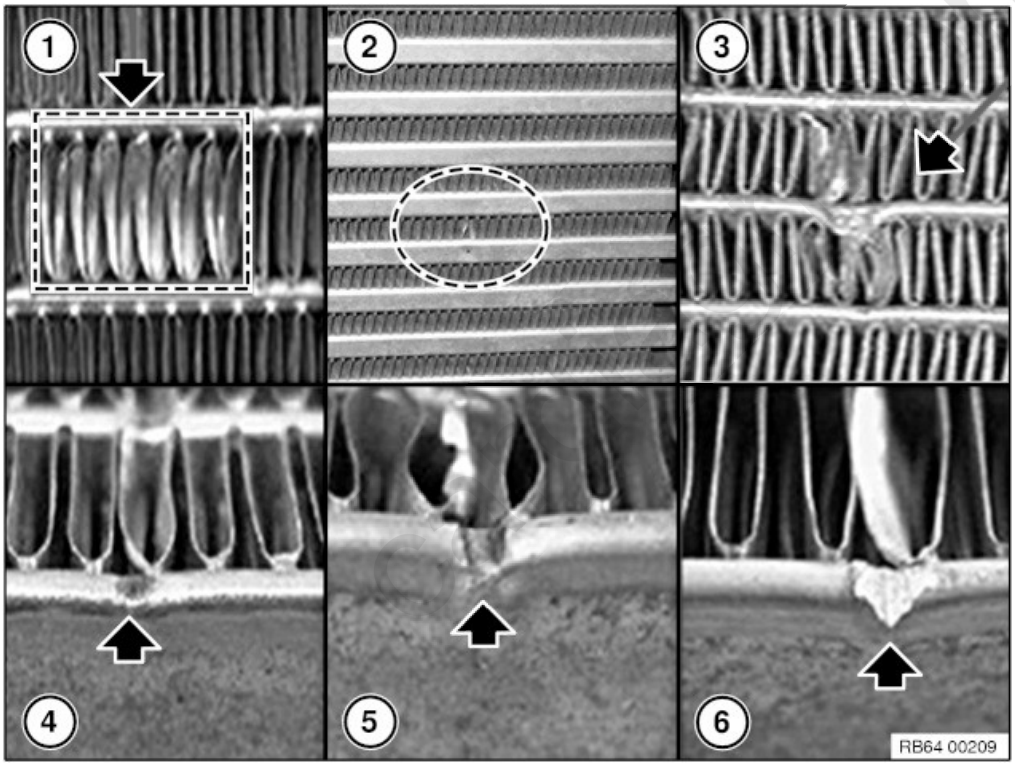
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

Radiators or air conditioning condensers are not to be replaced in these cases!

Note:

The deformations shown in Fig. (1) can be bent back with a standard fin comb..

Damage to lines carrying media or on the flat pipe require exchange of the radiator or air conditioning condenser (2-6).



Dryer flask (integrated in the air conditioning condenser):

Round dents/depressions are permitted.

The air conditioning condenser is not to be replaced in this case.

64 50 ... Instructions for handling R1234yf refrigerant

Work on the refrigerant circuit may only be carried out by experts!

Avoid all contact with liquid or gaseous R1234yf. Wear protective goggles and gloves when working on the refrigerant circuit.

- Follow safety information for handling refrigerant R1234yf!

Warning!

> Although R1234yf at normal temperature is non-toxic, non-flammable and not explosive in air in any mixture ratio, it is still essential to follow various safety precautions. **At higher temperatures, R1234yf is inflammable.**

As a gas, R1234yf is colourless, odourless and heavier than air. If it enters the atmosphere, this may result in an imperceptible danger of asphyxiation or in cardiac palpitations, especially in workshop pits. Ventilate rooms adequately; if necessary, turn on installed extractor systems.

Store filled refrigerant pressure flasks so that they are not subject to direct sunlight or other heat sources (at maximum 45 °C). Also avoid exposing them to mechanical stress (e.g. by dropping).

Do not weld or solder on to filled air conditioning systems or in rooms into which R1234yf may have leaked. Exposure to flames or high temperatures (≥ 50 °C) may give rise to toxic products of decomposition (hydrofluoric acid). For this reason, do not smoke either.

In the event of fire, carbon dioxide (CO2), extinguishing powder and a sprayed water jet are deemed to be suitable extinguishing agents. Cool reservoirs at risk with a sprayed water jet (risk of bursting!).

If the protective caps on the filler valves are difficult to open, there is a risk of injury from leaking valve inserts (high pressure).

The filled refrigerant circuit of the A/C system is subject to excess pressure. Before carrying out repairs on the A/C system, it is absolutely essential to draw off the refrigerant.

- Before conducting repairs, check the actual pressure drop on the pressure gauge of the A/C service station

R1234yf must be drawn off, cleaned and returned to the A/C system using an A/C service station following the relevant operating instructions.

For a properly functioning A/C system, it is essential to have the greatest possible levels of cleanliness when working on the A/C system and the longest possible evacuation (at least 30 minutes dehumidification from refrigerant circuit) before each filling of the A/C system.

R1234yf easily absorbs moisture. Therefore, seal off opened pipes, air conditioning condenser, evaporator, air conditioning compressor and dryer flask immediately with seal plugs.

- If air conditioning has been completely drained by a leak, accident or repair, the desiccant insert must be replaced as excessive moisture may have entered the system.

With replacement parts, the plugs may only be removed immediately before the lines are connected. In the event of warranty claims, the old parts must be provided with plugs to be able to determine the cause of the damage.

Installation note:

After each refilling of an air conditioning, check that protective caps of filling valves are hand-tight. They serve as additional seals.

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64 50 ... Notes on the refrigerant (R134a, R1234yf) and refrigerant oil



Attention!

Specific to the country , **2 different refrigerants** (R134a, R1234yf) are used.

Specific to the country, the vehicle and the year of manufacture **2 different refrigerant oils** (ND-8, Sanden SP-A2) are used.

Before carrying out repairs on the refrigerant circuit, always determine which refrigerant/refrigerant oil is used in the vehicle!

Refrigerant: This information can be found on the **type plate** on the bonnet.

Refrigerant oil: This information can be found on the **type plate** on the front flap in vehicles with a production date from 2013.

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R1234yf refrigerant is used **in the following countries**:

Observe notes on handling R1234yf refrigerant!

Europe				Asia	America
Belgium	Great Britain	Malta	Sweden	Israel	USA
Bosnia and Herzegovina	Ireland	Macedonia	Switzerland	Turkey	Canada
Bulgaria	Iceland	The Netherlands	Slovakia	India*	
Denmark	Italy	Norway	Slovenia	South Korea	
Germany	Croatia	Austria	Spain		
Estonia	Latvia	Poland	Czech Republic		
Finland	Liechtenstein	Portugal	Hungary		
France	Lithuania	Romania	Cyprus		
Greece	Luxembourg	Serbia			

*Only applies to vehicle models with Europe version. All other vehicle models have R134a.

Introduction of R1234yf refrigerant:

European countries listed in the table, Turkey and Israel:

- BMW i as of 09/2013
- from 07/2016, BMW, MINI, RR

USA and Canada:

- from 07/2016 BMW, BMW i, MINI

South Korea:

- from 11/2018 BMW, BMW i, MINI

The introduction date may vary slightly according to the specific country and model.

The refrigerant R134a will continue to be used **in all other countries**.

Observe notes on handling R134a refrigerant!

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Refrigerant oil Sanden SP-A2 is used for both, R1234yf and R134a.

Observe notes on handling refrigerant oil!

Attention!

I01, I12 with production date up to 08/2014:

In the national-market version with R134a a **wrong refrigerant oil** is present on the type plate

Always use Sanden SP-A2

(Part number of Sanden SP-A2: 2 339 920)

Attention!

Only vehicles with a production date from 09/2013 and **R1234yf** refrigerant/Sanden **SP-A2** refrigerant oil can be filled using the A/C service station for **R1234yf**.

In addition to vehicles with a production date from 09/2013, also all previous vehicles **without the electric A/C compressor** with **R134a** refrigerant and both **ND-8** and Sanden **SP-A2** refrigerant oil can be filled using the A/C service station for **R134a**.

Exception:

BMW i and hybrid vehicles (with an electric A/C compressor) that are filled with **R134a** refrigerant/Sanden **SP-A2** refrigerant oil. These vehicles must be injected with Sanden **SP-A2** refrigerant oil.

When filling the refrigerant circuit with R134a, always ensure you use the correct, vehicle-specific refrigerant oil type!

The previous ND-8 refrigerant oil must not be mixed with Sanden SP-A2 refrigerant oil!

In other words, the refrigerant oil ND-8 must not be filled in refrigerant circuits which were filled with Sanden SP-A2 in the factory.

Sanden SP-A2 refrigerant oil may be mixed with ND-8 refrigerant oil in vehicles without an electric A/C compressor.

In other words, the refrigerant oil Sanden SP-A2 must be filled in refrigerant circuits which were filled with ND-8 in the factory.

However, this is permitted **only** in vehicles **starting from** F-series.

Note the overview of the refrigerant oil to be filled.

To prevent inadmissibly mixing the different refrigerant oil types, rinse the A/C service station hoses after each drawing off/filling procedure!

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64 50 ... Safety information for handling refrigerant R1234yf



R1234yf is non-toxic at normal temperature, non-flammable and not explosive in conjunction with air at any mixture ratio.

As a gas, R1234yf is colourless, odourless and heavier than air. If it enters the atmosphere, this may result in an imperceptible danger of asphyxiation or in cardiac palpitations, especially in workshop pits. Ventilate rooms adequately; if necessary, turn on installed extractor systems.

Store filled refrigerant pressure flasks so that they are not subject to direct sunlight or other heat sources (at maximum 45 °C). Also avoid exposing them to mechanical stress (e.g. by dropping).

Do not weld or solder on to filled air conditioning systems or in rooms into which R1234yf may have leaked. Exposure to flames or high temperatures (≥ 50 °C) may give rise to toxic products of decomposition (hydrofluoric acid). For this reason, do not smoke either.

In the event of fire, carbon dioxide (CO2), extinguishing powder and a sprayed water jet are deemed to be suitable extinguishing agents. Cool reservoirs at risk with a sprayed water jet (risk of bursting!).

If the protective caps on the filler valves are difficult to open, there is a risk of injury from leaking valve inserts (high pressure).

The filled refrigerant circuit of the A/C system is subject to excess pressure. Before carrying out repairs on the A/C system, it is absolutely essential to draw off the refrigerant.

After each refilling of an air conditioning, check that protective caps of the filling valves are hand-tight. They serve as additional seals.



Warning!

Work on the refrigerant circuit may only be carried out by experts!

Danger of injury!

Refrigerant circuit is under high pressure!

Draw off the refrigerant **before** any repairs on the refrigerant circuit!

The refrigerant circuit is only depressurised **after** drawing off.

- Check the pressure gauge on the A/C service station for actual pressure drops before repair.

The corresponding operating instructions of the A/C service station used must be observed!

Avoid all contact with liquid or gaseous R1234yf.

At high temperatures, R1234yf is inflammable!



Protective measures/rules of conduct:

- Wear safety goggles
- Wear oil-resistant protective gloves
- Do not smoke!
- Observe country-specific safety regulations.

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First aid measures:

- Eye contact: In the event of contact with the eyes, rinse immediately with plenty of running water and consult an ophthalmologist.
- Skin contact: In the event of contact with skin, remove affected clothing immediately and rinse with plenty of water.
- After inhalation: If refrigerant vapours are inhaled in greater concentrations, remove the person affected to an area of fresh air and keep them under supervision. Call for a doctor. If breathing problems are experienced, breathe additional oxygen. If the person affected is breathing with difficulty or has stopped breathing, incline the person's head at the neck and administer the kiss of life.

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64 50 ... Safety informations for handling tetrafluorethane refrigerant R134a



Warning!

Danger of injury!

Refrigerant circuit is under high pressure! Work on the refrigerant circuit may only be carried out by experts!

Draw off refrigerant without fail BEFORE all repair work on the refrigerant circuit.

The refrigerant circuit is depressurised AFTER drawing off.

- The pressure gauge on the A/C service unit must be checked for the actual pressure drop prior to repair work.

It is absolutely essential to read and observe the relevant operating instructions for the A/C service unit used!



Protective measures/rules of conduct:

- Wear safety goggles
- Wear oil-resistant protective gloves
- Do not smoke!
- Observe country-specific safety regulations.



First aid measures:

- Eye contact: In the event of contact with the eyes, rinse immediately with plenty of running water and consult an ophthalmologist.
- Skin contact: In the event of contact with skin, remove affected clothing immediately and rinse with plenty of water.
- After inhalation: If refrigerant vapours are inhaled in greater concentrations, remove the person affected to an area of fresh air and keep them under supervision. Call for a doctor. If breathing problems are experienced, breathe additional oxygen. If the person affected is breathing with difficulty or has stopped breathing, incline the person's head at the neck and administer the kiss of life.

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64 53 ... Instructions for desiccant insert replacement



Special tools required:

- 32 1 270

A desiccant insert need **not** be changed at regular inspection intervals in a well functioning, sealed air conditioning system.

However, the dryer flask or desiccant insert must absolutely be replaced in the event of:

- the refrigerant being dirty by swarfs (e.g. when the compressor is clamped).
- With depressurised and/or completely drained refrigerant circuit.
- In case of a refrigerant circuit which was closed using special tool 32 1 270 but remains open for more than 24 hours.

The desiccant insert cannot be replaced in the following vehicles:

- *1-Series E8x, 3-Series E9x* from 12/2008
- *E84, E89*
- *F-series*
- *G model series*
- *BMW i without heat pump*

In these vehicles, the condenser for the heating and air conditioning system must be replaced.

- *BMW i 01 with heat pump*

On this vehicle the low pressure battery must be replaced.

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64 50 ... Instructions for handling R1234yf refrigerant

Work on the refrigerant circuit may only be carried out by experts!

Avoid all contact with liquid or gaseous R1234yf. Wear protective goggles and gloves when working on the refrigerant circuit.

- Follow safety information for handling refrigerant R1234yf!

Warning!

> Although R1234yf at normal temperature is non-toxic, non-flammable and not explosive in air in any mixture ratio, it is still essential to follow various safety precautions. **At higher temperatures, R1234yf is inflammable.**

As a gas, R1234yf is colourless, odourless and heavier than air. If it enters the atmosphere, this may result in an imperceptible danger of asphyxiation or in cardiac palpitations, especially in workshop pits. Ventilate rooms adequately; if necessary, turn on installed extractor systems.

Store filled refrigerant pressure flasks so that they are not subject to direct sunlight or other heat sources (at maximum 45 °C). Also avoid exposing them to mechanical stress (e.g. by dropping).

Do not weld or solder on to filled air conditioning systems or in rooms into which R1234yf may have leaked. Exposure to flames or high temperatures (≥ 50 °C) may give rise to toxic products of decomposition (hydrofluoric acid). For this reason, do not smoke either.

In the event of fire, carbon dioxide (CO2), extinguishing powder and a sprayed water jet are deemed to be suitable extinguishing agents. Cool reservoirs at risk with a sprayed water jet (risk of bursting!).

If the protective caps on the filler valves are difficult to open, there is a risk of injury from leaking valve inserts (high pressure).

The filled refrigerant circuit of the A/C system is subject to excess pressure. Before carrying out repairs on the A/C system, it is absolutely essential to draw off the refrigerant.

- Before conducting repairs, check the actual pressure drop on the pressure gauge of the A/C service station

R1234yf must be drawn off, cleaned and returned to the A/C system using an A/C service station following the relevant operating instructions.

For a properly functioning A/C system, it is essential to have the greatest possible levels of cleanliness when working on the A/C system and the longest possible evacuation (at least 30 minutes dehumidification from refrigerant circuit) before each filling of the A/C system.

R1234yf easily absorbs moisture. Therefore, seal off opened pipes, air conditioning condenser, evaporator, air conditioning compressor and dryer flask immediately with seal plugs.

- If air conditioning has been completely drained by a leak, accident or repair, the desiccant insert must be replaced as excessive moisture may have entered the system.

With replacement parts, the plugs may only be removed immediately before the lines are connected. In the event of warranty claims, the old parts must be provided with plugs to be able to determine the cause of the damage.

Installation note:

After each refilling of an air conditioning, check that protective caps of filling valves are hand-tight. They serve as additional seals.

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64 52 ... Instructions for opening and part exchange in refrigerant circuit



Special tools required:

- 00 9 030
- 32 1 270

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety informations for handling refrigerant
- Follow safety information for handling refrigerant oil

Attention!

- Always use new O-rings each time A/C connections are opened (refer to Electronic Parts Catalogue)
  They must **not** be coated.
  Use special tool 00 9 030 to install sealing rings without damaging them.
- Open the referigerant circuit for as short of a period as possible.
- Close all components and lines in the refrigerant circuit and return parts **immediately** following the removals at openings with special tool 32 1 270 to prevent penetration of moisture or foreign objects.
- If the refrigerant circuit was closed at the openings with special tool 32 1 270 but it remains open for more than 24 h, the dryer insert for the air conditioning must be replaced.

I. **Part replacement as preliminary work fur further repair work and part replacement based on gradual leakage.**
(minor leak, e.g. hairline crack)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 10 ml
  - Condenser: 20 ml
  - Desiccant insert / dryer flask: 20 ml
  - Each replaced refrigerant line: 10 ml
  - Condenser with integrated dryer flask: 40 ml
  - Safety pressure switch and gasket: no additional refrigerant oil
  - Only l01: Radiator, high-voltage battery unit: 20 ml
- Evacuate and fill air conditioning system

II. **Part replacement due to sudden leakage**
(major leak, e.g. line disconnection due to accident)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 35 ml
  - Condenser: 35 ml
  - Desiccant insert / dryer flask: 55 ml
  - Each replaced refrigerant line: 35 ml

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    - Condenser with integrated dryer flask: 55 ml
    - Safety pressure switch and gasket: no additional refrigerant oil
    - Only I01: Radiator, high-voltage battery unit: 35 ml
- Evacuate and fill A/C system

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64 53 ... Instructions for replacement of air conditioning condensers and radiator/coolers

Attention!

Even when they are correctly installed or due to normal driving, radiators (oil cooler, radiator, charge air cooler) or air conditioning condensers may show slight impressions or deformations on their discs (1).

A slight sag with a large radius for the air conditioning condenser is also permissible.

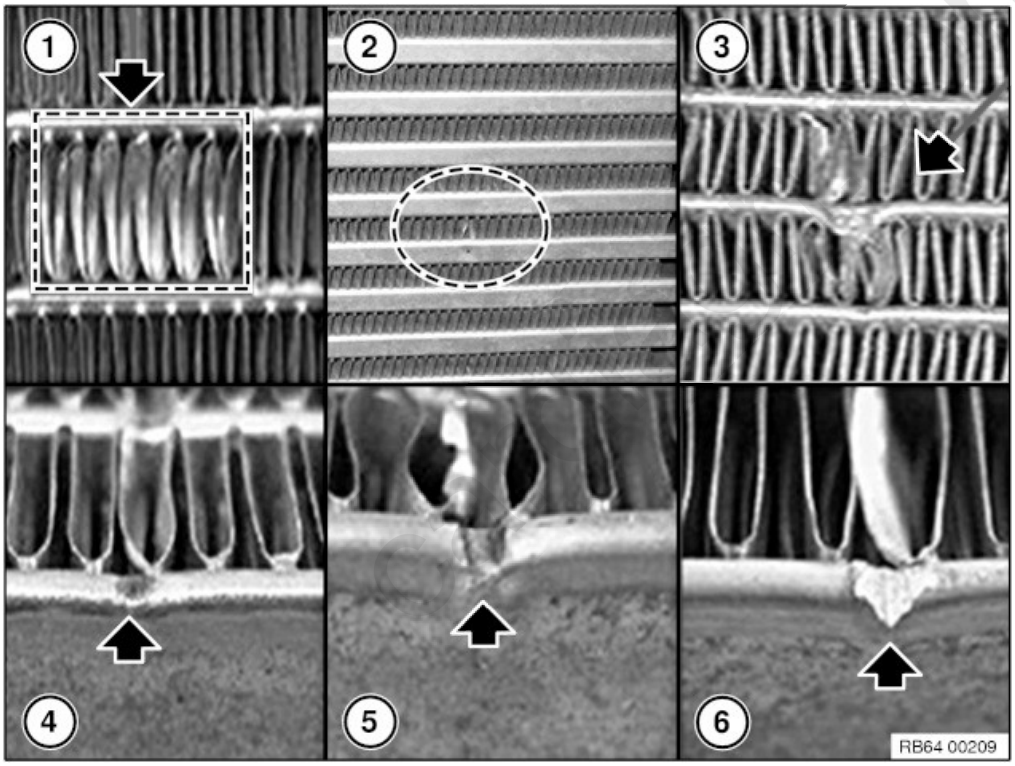
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

Radiators or air conditioning condensers are not to be replaced in these cases!

Note:

The deformations shown in Fig. (1) can be bent back with a standard fin comb..

Damage to lines carrying media or on the flat pipe require exchange of the radiator or air conditioning condenser (2-6).



Dryer flask (integrated in the air conditioning condenser):

Round dents/depressions are permitted.

The air conditioning condenser is not to be replaced in this case.

64 50 ... Notes on the refrigerant (R134a, R1234yf) and refrigerant oil



Attention!

Specific to the country , **2 different refrigerants** (R134a, R1234yf) are used.

Specific to the country, the vehicle and the year of manufacture **2 different refrigerant oils** (ND-8, Sanden SP-A2) are used.

Before carrying out repairs on the refrigerant circuit, always determine which refrigerant/refrigerant oil is used in the vehicle!

Refrigerant: This information can be found on the **type plate** on the bonnet.

Refrigerant oil: This information can be found on the **type plate** on the front flap in vehicles with a production date from 2013.

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R1234yf refrigerant is used **in the following countries**:

Observe notes on handling R1234yf refrigerant!

Europe				Asia	America
Belgium	Great Britain	Malta	Sweden	Israel	USA
Bosnia and Herzegovina	Ireland	Macedonia	Switzerland	Turkey	Canada
Bulgaria	Iceland	The Netherlands	Slovakia	India*	
Denmark	Italy	Norway	Slovenia	South Korea	
Germany	Croatia	Austria	Spain		
Estonia	Latvia	Poland	Czech Republic		
Finland	Liechtenstein	Portugal	Hungary		
France	Lithuania	Romania	Cyprus		
Greece	Luxembourg	Serbia			

*Only applies to vehicle models with Europe version. All other vehicle models have R134a.

Introduction of R1234yf refrigerant:

European countries listed in the table, Turkey and Israel:

- BMW i as of 09/2013
- from 07/2016, BMW, MINI, RR

USA and Canada:

- from 07/2016 BMW, BMW i, MINI

South Korea:

- from 11/2018 BMW, BMW i, MINI

The introduction date may vary slightly according to the specific country and model.

The refrigerant R134a will continue to be used **in all other countries**.

Observe notes on handling R134a refrigerant!

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Refrigerant oil Sanden SP-A2 is used for both, R1234yf and R134a.

Observe notes on handling refrigerant oil!

Attention!

I01, I12 with production date up to 08/2014:

In the national-market version with R134a a **wrong refrigerant oil** is present on the type plate

Always use Sanden SP-A2

(Part number of Sanden SP-A2: 2 339 920)

Attention!

Only vehicles with a production date from 09/2013 and **R1234yf** refrigerant/Sanden **SP-A2** refrigerant oil can be filled using the A/C service station for **R1234yf**.

In addition to vehicles with a production date from 09/2013, also all previous vehicles **without the electric A/C compressor** with **R134a** refrigerant and both **ND-8** and Sanden **SP-A2** refrigerant oil can be filled using the A/C service station for **R134a**.

Exception:

BMW i and hybrid vehicles (with an electric A/C compressor) that are filled with **R134a** refrigerant/Sanden **SP-A2** refrigerant oil. These vehicles must be injected with Sanden **SP-A2** refrigerant oil.

When filling the refrigerant circuit with R134a, always ensure you use the correct, vehicle-specific refrigerant oil type!

The previous ND-8 refrigerant oil must not be mixed with Sanden SP-A2 refrigerant oil!

In other words, the refrigerant oil ND-8 must not be filled in refrigerant circuits which were filled with Sanden SP-A2 in the factory.

Sanden SP-A2 refrigerant oil may be mixed with ND-8 refrigerant oil in vehicles without an electric A/C compressor.

In other words, the refrigerant oil Sanden SP-A2 must be filled in refrigerant circuits which were filled with ND-8 in the factory.

However, this is permitted **only** in vehicles **starting from** F-series.

Note the overview of the refrigerant oil to be filled.

To prevent inadmissibly mixing the different refrigerant oil types, rinse the A/C service station hoses after each drawing off/filling procedure!

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64 50 ... Safety information for handling refrigerant R1234yf



R1234yf is non-toxic at normal temperature, non-flammable and not explosive in conjunction with air at any mixture ratio.

As a gas, R1234yf is colourless, odourless and heavier than air. If it enters the atmosphere, this may result in an imperceptible danger of asphyxiation or in cardiac palpitations, especially in workshop pits. Ventilate rooms adequately; if necessary, turn on installed extractor systems.

Store filled refrigerant pressure flasks so that they are not subject to direct sunlight or other heat sources (at maximum 45 °C). Also avoid exposing them to mechanical stress (e.g. by dropping).

Do not weld or solder on to filled air conditioning systems or in rooms into which R1234yf may have leaked. Exposure to flames or high temperatures (≥ 50 °C) may give rise to toxic products of decomposition (hydrofluoric acid). For this reason, do not smoke either.

In the event of fire, carbon dioxide (CO2), extinguishing powder and a sprayed water jet are deemed to be suitable extinguishing agents. Cool reservoirs at risk with a sprayed water jet (risk of bursting!).

If the protective caps on the filler valves are difficult to open, there is a risk of injury from leaking valve inserts (high pressure).

The filled refrigerant circuit of the A/C system is subject to excess pressure. Before carrying out repairs on the A/C system, it is absolutely essential to draw off the refrigerant.

After each refilling of an air conditioning, check that protective caps of the filling valves are hand-tight. They serve as additional seals.



Warning!

Work on the refrigerant circuit may only be carried out by experts!

Danger of injury!

Refrigerant circuit is under high pressure!

Draw off the refrigerant **before** any repairs on the refrigerant circuit!

The refrigerant circuit is only depressurised **after** drawing off.

- Check the pressure gauge on the A/C service station for actual pressure drops before repair.

The corresponding operating instructions of the A/C service station used must be observed!

Avoid all contact with liquid or gaseous R1234yf.

At high temperatures, R1234yf is inflammable!



Protective measures/rules of conduct:

- Wear safety goggles
- Wear oil-resistant protective gloves
- Do not smoke!
- Observe country-specific safety regulations.

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First aid measures:

- Eye contact: In the event of contact with the eyes, rinse immediately with plenty of running water and consult an ophthalmologist.
- Skin contact: In the event of contact with skin, remove affected clothing immediately and rinse with plenty of water.
- After inhalation: If refrigerant vapours are inhaled in greater concentrations, remove the person affected to an area of fresh air and keep them under supervision. Call for a doctor. If breathing problems are experienced, breathe additional oxygen. If the person affected is breathing with difficulty or has stopped breathing, incline the person's head at the neck and administer the kiss of life.

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64 50 ... Safety informations for handling tetrafluorethane refrigerant R134a



Warning!

Danger of injury!

Refrigerant circuit is under high pressure! Work on the refrigerant circuit may only be carried out by experts!

Draw off refrigerant without fail BEFORE all repair work on the refrigerant circuit.

The refrigerant circuit is depressurised AFTER drawing off.

- The pressure gauge on the A/C service unit must be checked for the actual pressure drop prior to repair work.

It is absolutely essential to read and observe the relevant operating instructions for the A/C service unit used!



Protective measures/rules of conduct:

- Wear safety goggles
- Wear oil-resistant protective gloves
- Do not smoke!
- Observe country-specific safety regulations.



First aid measures:

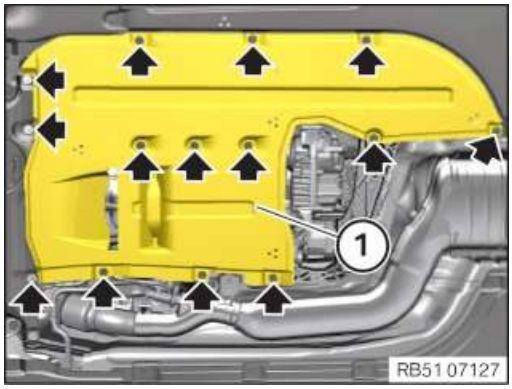
- Eye contact: In the event of contact with the eyes, rinse immediately with plenty of running water and consult an ophthalmologist.
- Skin contact: In the event of contact with skin, remove affected clothing immediately and rinse with plenty of water.
- After inhalation: If refrigerant vapours are inhaled in greater concentrations, remove the person affected to an area of fresh air and keep them under supervision. Call for a doctor. If breathing problems are experienced, breathe additional oxygen. If the person affected is breathing with difficulty or has stopped breathing, incline the person's head at the neck and administer the kiss of life.

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00 11 237 Checking/topping up oil level in automatic transmission

PRELIMINARY WORK

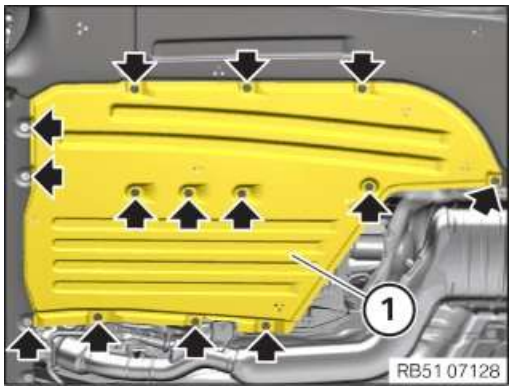
1 – Remove rear underbody protection



- **Version A:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



- **Version B:**

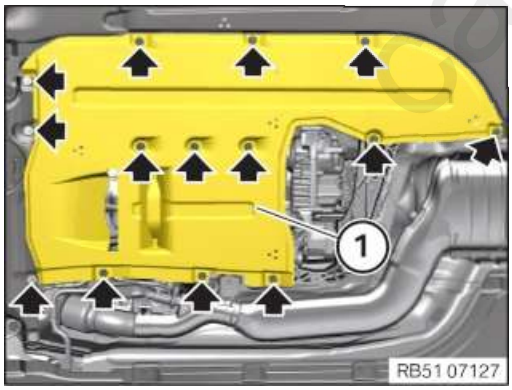
  Remove screws (arrows).

  Guide out rear underbody protection (1) and remove it.

MAIN WORK

POSTPROCESSES

2 – Installing underbody protection at rear



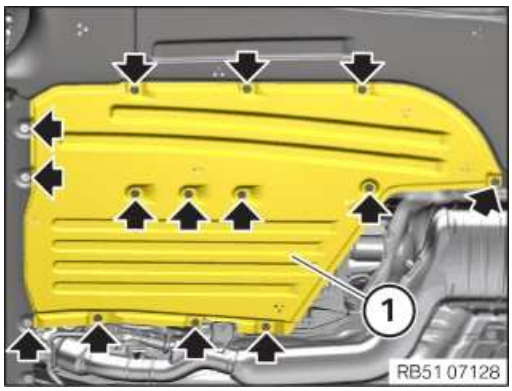
- **Version A:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version B:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

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Additional Information

Overview of Tightening Torques

Underbody protection			Used in step 2
Hexagon screw		Tightening torque	3 Nm

Overview of Special Tools

Overview Technical Data

Links

Operating materials	Used in step
14.0 Automatic transmission fluid for ZF-transmission GA8HP45Z / GA8HP50Z / GA8HP70Z / GA8HP90Z / GA8P70H / GA8P75H / GA8HP75Z	

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00 11 259 Oil change in rear axle final drive incl. used oil disposal

WARNING

Hot fluids.

Risk of scalding!

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.

WARNING

Contact with hazardous fluids.

Hazardous to health!

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

RISK OF DAMAGE

Damage to rear axle differential.

Failure to comply with the oil specifications can result in serious damage to the rear axle differential.

- After completion of repair work, check the transmission oil level in the rear axle differential.
- Use only the approved final drive transmission oil.

TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

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1 – Drawing off oil in the rear axle differential

CAUTION

Materials harmful to health.

Health risks in the event of contact with substances that are harmful to health!

- Observe and comply with the Safety Information on the containers and the notes on the manufacturer's safety data sheet.
- Conduct all work in appropriate personal protective equipment only.

CAUTION

Acid burns may result from skin contact with oil or inhaling oil vapours.

Risk of acid burns from contact with oil!

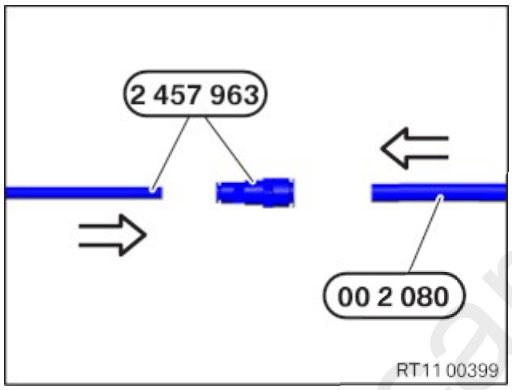
- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

NOTICE

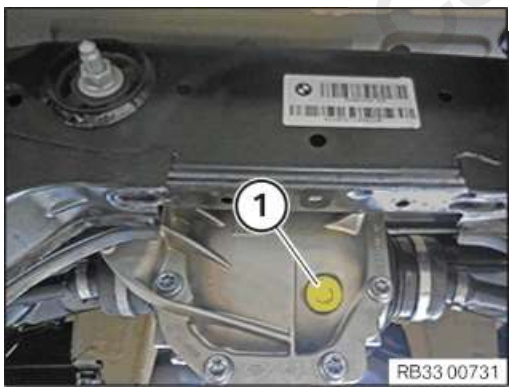
Schematic diagram is for example purposes. Some parts may differ in certain details.



- Use the special tool 0 493 337 (00 2 080) for drawing off the rear axle differential oil.



- Connect the special tool with the special tool 0 493 337 (00 2 080).



- Open the oil filler plug (1).
- Draw off rear axle differential oil.

2 – Check/top up oil level in the rear axle differential

CAUTION

Materials harmful to health.

Health risks in the event of contact with substances that are harmful to health!

- Observe and comply with the Safety Information on the containers and the notes on the manufacturer's safety data sheet.
- Conduct all work in appropriate personal protective equipment only.

CAUTION

Acid burns may result from skin contact with oil or inhaling oil vapours.

Risk of acid burns from contact with oil!

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

RISK OF DAMAGE

Damage to rear axle differential.

Failure to comply with the oil specifications can result in serious damage to the rear axle differential.

- Only use approved oil in the rear axle differential.

TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

▸ **Supplement the rear axle differential oil change/oil level with oil gun**

Your browser doesn't support HTML5 video.

TECHNICAL INFORMATION

The training video illustrates the methodology for changing the rear axle differential oil using the oil gun special tool.

The training video does not replace the repair instructions.

The training video is not subject to the update service.

No liability can be accepted for printing or other faults. Subject to changes of a technical nature

- Follow repair instructions!

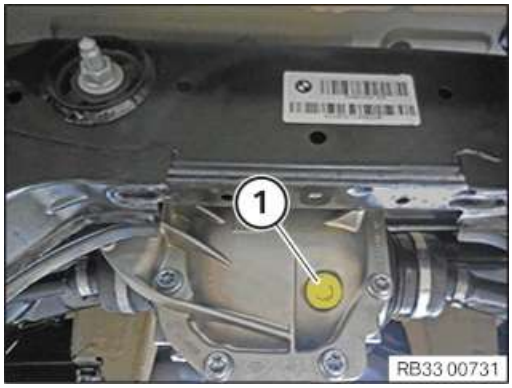
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TECHNICAL INFORMATION

With the specified capacity, it is imperative to take into account the capacity of the hose of the special tool.

- Use the special tool 2 460 340 to top up the rear axle differential oil.



- Open the oil filler plug (1).
- Check oil level:

  The oil level at the rear axle differential has been adjusted correctly once a small quantity of oil escapes from the opening of the oil filler plug.

  If necessary, top up final drive transmission oil.

Rear axle differential oil: Capacity overview (all)

168LW	0,75 l
190AL	0,8 l
205AL	0,8 l
215LW	0,9 l
215LWS	1.0 l
225AL	0,9 l
225ALS	1.0 l
225M	1.0 l
235LK	1,2 l

Transmission oil: Technically suitable rear axle differential oils

- Replace the oil filler plug (1).

  Parts: Oil filler plug
- Screw in and tighten the oil filler plug (1).

Rear axle differential oil filler plug

M22	Renew the oil filler plug.	Tightening torque	60 Nm

Additional Information

Overview of Tightening Torques

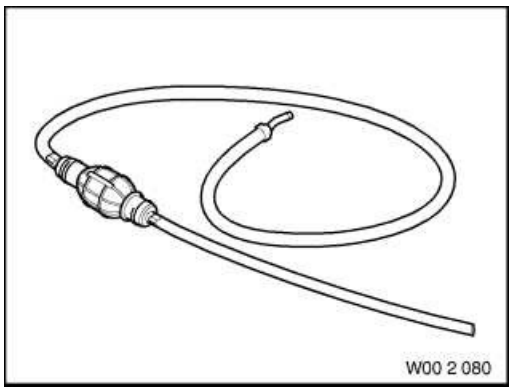
Rear axle differential oil filler plug Used in step 2

M22	Renew the oil filler plug.	Tightening torque	60 Nm

Overview of Special Tools

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0 493 337 (00 2 080) Pump



Common	Used in step 1
Usage	(Hand pump) For lifetime oil filling
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 01 98 (294)

2 460 340 Pump



Common	Used in step 2
Usage	Oil gun to fill rear axle differentials or differentials with 1 litre containers.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 09 18 (553)

Overview Technical Data

Rear axle differential oil: Capacity overview (all) Used in step 2

168LW	0,75 l
190AL	0,8 l
205AL	0,8 l
215LW	0,9 l
215LWS	1.0 l
225AL	0,9 l
225ALS	1.0 l
225M	1.0 l
235LK	1,2 l

Transmission oil: Technically suitable rear axle differential oils

Links

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Operating materials	Used in step
Main group 33	2

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00 12 200 (Annual) vehicle inspection within framework of DGUV Regulation 70

1 (Annual) vehicle inspection within framework of DGUV Regulation 70

NOTICE

A checklist is available to print out for the (annual) vehicle inspection as part of DGUV regulation 70, see further information.

- Print out document.
- Work through check list.
- Hand over the checklist to the customer.

Additional Information

Links

Appendices	Used in step
Checklist for DGUV regulation 70	1

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