## 00 00 ... Battery: Check battery. If necessary, recharging battery.

***Important!***

Observe safety instructions for handling vehicle battery.

- If necessary (issue a separate invoice ):
  - Recharge battery

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# 00 00 010 BMW Quality Certification I

## Additional Information

### Links

| Appendices | Used in step |
| --- | --- |
| ANL-PDF-QC1_2-7_SERIES_2019 | |

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# 00 00 262 BMW rapid inspection

**1 â€“ 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 ... Body: Check for corrosion (except cavities)

- Visually inspect underbody and add-on parts (brake lines, exhaust branch, sills) for corrosion and check for damage.
- Check wheel arches for corrosion.
- Open doors and check A-, B- and C-pillars for corrosion, especially door hinges.
- Check door window frame for corrosion, folding back door seal slightly if necessary.
- Check outer body for stone chipping, scratches or damage to paintwork and associated corrosion.

***Important!***

If damage to the underbody is identified:

- If necessary, remove trim panels from underbody.
- Check bracket as well as brake- and fuel lines for damage, corrosion and correct installation position.

Rectify identified faults after consulting with customer and issue a separate invoice.

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# 00 00 ... Brake lines and connections: visual inspection for leaks, damage, attachment and correct position

**Check brake lines and connections**

- Visual inspection in visible area for:
  - Check brake fluid level in expansion tank
  - leaks
  - traces of fluid
  - damage
  - pinched areas
  - correct routing of brake lines
  - correct seating of brake lines in holders

*Note:*

**Detected faults must urgently be repaired after consultation with the customer!**

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# 00 00 ... CBS reset

**Attention!**

The CBS maintenance jobs can be reset in the car. It is always recommended to reset the CBS jobs via the diagnosis system. It is only possible to code the statutory intervals specific to individual countries with the diagnosis system.

**CBS reset with diagnosis system Attention!**

To be able to check and/or correct the car's on-board date properly, the diagnosis system requires the correctly set tester system date!

The jobs may only be reset after the service measure has been completed.

The brake pads can only be reset with a new brake pad wear sensor.

The CBS jobs can be reset via the diagnosis system on the following path:

- Start diagnosis
- Carry out vehicle identification
- Function selection
- Service functions
- Maintenance
- CBS reset

**CBS reset in the car**

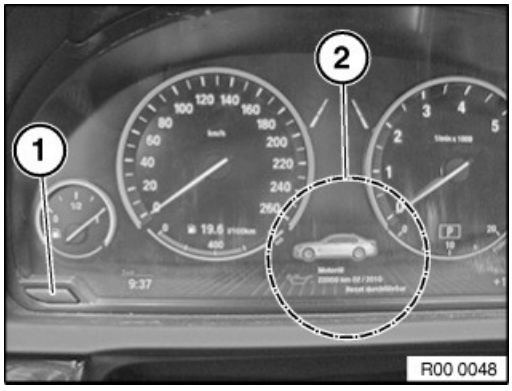
On the vehicle, service operations can be reset at the instrument panel.

*Note:*
A reset is only possible in the car if:

- there is no Check Control message
- availability of the service job is under 90 %
- on-board date must be correctly set

Resetting of a service job must always be carried out **after** a maintenance measure has been completed.

The resetting process is interrupted it the time is exceeded or if a terminal is changed.




**Attention!**

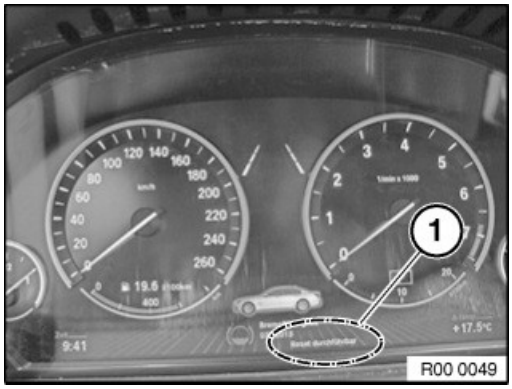
If engine oil and vehicle check are reset at the same time, **always reset engine oil first**.

Switch the ignition on.

Press the trip distance recorder reset button (1) (referred to as button in the following) for approx. 10 seconds until the 1st service job appears in the display (2).

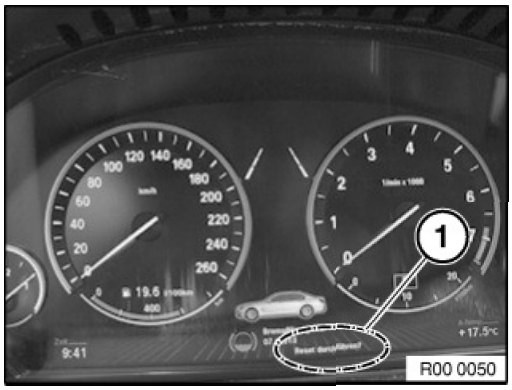
Bring up the next item by briefly pressing the button again. Select the desired service job.

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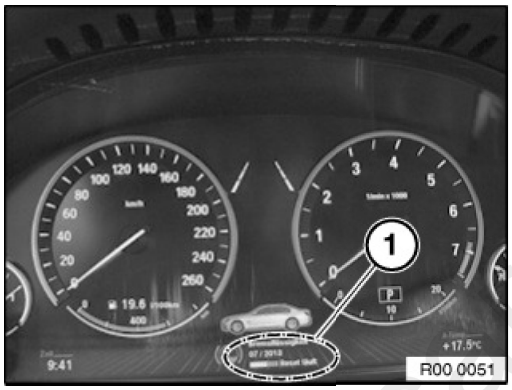



If a reset is possible, this is displayed in the instrument panel as "Reset executable" (1).

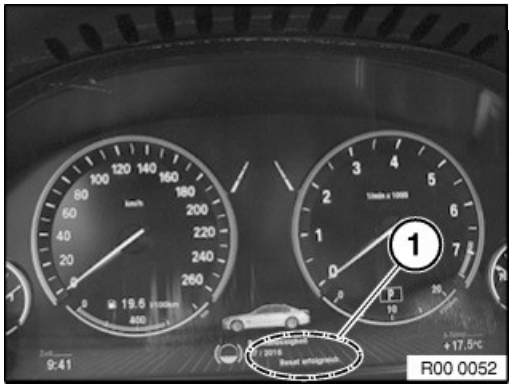
Start the reset by pressing the button for 3 seconds.




Confirm text message "Execute reset?" (1) by pressing the button for 3 seconds again.




The status of the reset is indicated in the display by a progress bar and in text as "Reset running" (1).




The reset is confirmed after completion as "Reset successful" (1).

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**CBS reset of inspections/tests required by law**

The input of the target date for the statutory deadlines (vehicle inspection/exhaust-gas test) is done by clicking on the scope with the controller in the CBS menu of the control display under:

- Select **main menu** and press controller
- Select **vehicle information** and press controller
- Select **vehicle status** and press controller
- Select **Service requirements** and press controller
- Select **vehicle inspection** and press controller
- Select **Schedule date for service** and press controller
- The target month or the target year can be set and acknowledged by turning and pressing

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# 00 00 ... Check horn, headlight flashers and hazard warning flashers

**Horn**

Check function.

*Note:*

In the case of twin-tone fanfares, make sure that both fanfares are working properly.

**Headlight flasher**

Activate headlight flashers, check high-beam headlights and blue indicator light in instrument panel for correct operation.

**Hazard warning lights**

Check function.

*Note:*

After consultation with the customer, rectify faults and issue a separate invoice.

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## 00 00 ... Check windscreen wash/wipe system

- Check wiper range for streaks; if necessary, replace wiper blades after consulting with customer
- The spray jet must emerge uniformly from the washer jet, adjust nozzle or replace if necessary and issue a separate invoice

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## 00 00 ... Checking coolant level and concentration, correcting if necessary

- Check connections, hose clamps and hoses for coolant residues and damage such as e.g. cracks.
- Check coolant composition in expansion tank: Should be -35 °C to -40 °C.
- Check coolant level in expansion tank. Coolant level must be between Min. and Max. marks. If necessary, top up coolant to max. fill level. If there is no coolant, also identify the cause and notify the customer.
- During refill (for special allocation):
  - If needed, drain coolant volume difference
  - Top up prescribed coolant

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# 00 00 ... Checking instrument/inscription lighting, interior/luggage compartment/glove box lights and blower

**Instrument lighting**

Check function of instrument and indicator/warning lights.

**Inscription lighting**

Check function of light switches; dimmer; controls; heater/air conditioning; rear window demister; radio; (depending on equipment) on-board computer; power windows; electric slide/tilt sunroof; fog lamp.

**Interior lighting, glove box light and luggage compartment lights**

Check function of footwell lighting, front and rear reading lights, make-up mirror light, mood lighting (door handles, exit, etc.), glove box light, luggage compartment lights, etc..

Note: Lighting may vary, depending on the equipment specification.

**Heating**

Check function of all blower stages, air distribution and air outlet.

**Note**

After consultation with the customer, rectify faults and issue a separate invoice.

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## 00 00 ... Checking lighting system

- Check lighting system for correct operation:
  - Check headlights, rear lights and associated indicator lights
  - Check headlight adjustment
  - Check side lights, parking lights, low-beam headlight and high-beam headlight for correct operation
  - Check headlight flasher for correct operation
  - Check left/right turn indicators and hazard warning flashers for correct operation
  - Check brake lights for correct operation
  - Check reversing lights and number plate lights for correct operation
  - Check front and rear fog lights for correct operation
  - If necessary ground lights of outside door handles

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# 00 00 ... Checking of road safety (test drive)

- **Checking of road safety**
  - Carry out a test drive in order to check the service and Automatic Hold brakes
  - Check steering for play, ease of movement and directional stability
  - If necessary, check that clutch disengages cleanly and that the vehicle drives off smoothly with the engine at operating temperature
  - Visually inspect shock absorbers for leaks
  - Check indicator/warning lamps and Check Control system for correct operation
  - Check due date for statutory roadworthiness and exhaust emission tests and advise customer of test dates

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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).

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15. Unscrew the oil drain plug.
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: _____

_____ _____

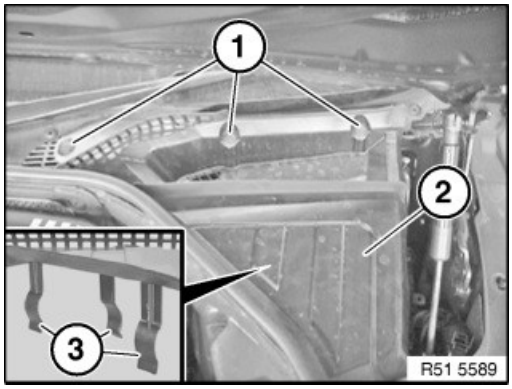
Dealer address Signature

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# 00 00 ... Greasing positive battery connection point

**Necessary preliminary tasks:**

- Remove acoustic cover




Lift expanding rivets (1) out of cover (2) on right.

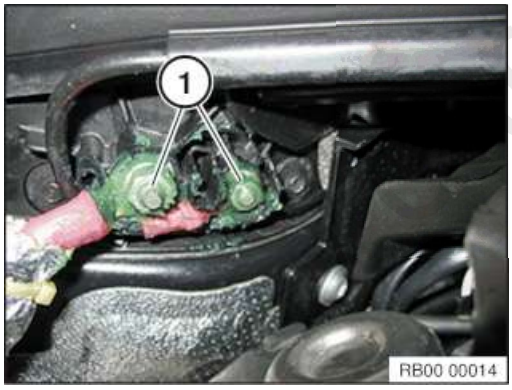
Remove cover (2).

*Installation note:*
If necessary, replace damaged expanding rivets.

Make sure holders (3) are correctly seated.




Pull out protective cap (1).




Coat B+ terminal (1) with terminal grease.*Note:*
Use a standard flat brush with a width of approx. 2.5 cm to apply the grease.

Sourcing reference: obtainable from BMW Parts Department.

Contact-protection greaseKF1

- Part number: 83 19 2 295 229




Coat B+ terminal (1) with terminal grease.*Note:*
Use a standard flat brush with a width of approx. 2.5 cm to apply the grease.

Sourcing reference: obtainable from BMW Parts Department.

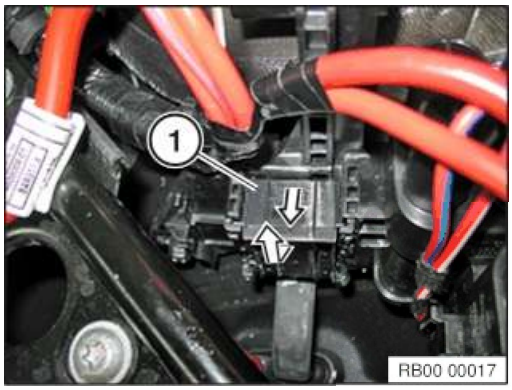
Contact-protection greaseKF1

- Part number: 83 19 2 295 229

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Take out the relay holder (1) and set to one side.




Pull out protective cap (1) in direction of arrow.

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# 00 00 009 Pre-delivery check

**Quality assurance by BMW Service**

Model:

Vehicle identification number:

(Please tick where appropriate)

If necessary Quick Reference Guide: Discussed and handed over

Included with the vehicle:
- Owner's Handbook(s)
- Maintenance record booklet (with national-market version Korea only)
- Vehicle key/remote key
- If necessary - spare key

The vehicle document case is left in vehicle

the vehicle:
- Glove box
- Storage box
- Luggage compartment

I hereby confirm that I have received the vehicle in perfect condition.

..... .....

Place and date Signature of vehicle owner

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**Pre-delivery check by BMW Service**

**Scopes of inspection:** To be kept with the workshop documents

The following work must be carried out on the vehicle by BMW Service prior to delivery.

Model:

Vehicle identification number:

*** Denotes optional extra or national-market version. Observe possible changes in this regard.**

| **Scopes of inspection:** to be kept with the vehicle documents | | | |
|---|---|---|---|
| **Accessory items** | **OK** | **Not OK** | **not present** |

| | | | |
|---|---|---|---|
| For F01, F02 and F03 only:<br><br>ECE: Place cup holder insert in glove box<br><br>US: Insert cup holder insert into cup holder receptacle | | | |
| For M6 only (F06 and F13): Install front spoiler | | | |
| install other enclosed parts scope (only in Market China: Take high-visibility jacket out of the luggage compartment and stow it in the storage compartment of the driver's door) | | | |
| **Using BMW Group diagnosis system** | **OK** | **Not OK** | **not present** |
| Carry out "CBS pre-delivery check" in the Service Function path under Maintenance | | | |
| Deactivate transportation mode | | | |
| Perform the following additional work only with SA5GB : Activating stolen vehicle tracking* | | | |
| Reset average mileage/kilometres driven | | | |
| Enter first registration | | | |
| Set on-board date | | | |
| Set statutory inspection dates* | | | |
| Enter service telephone numbers | | | |
| BMW TeleServices*: Activate | | | |
| Navigation system*: Activate the roadmap. Check the up-to-dateness of the roadmap and update if necessary. | | | |
| Check battery, observe notes in the diagnosis system, if applicable, charge battery | | | |
| Delete fault memory | | | |
| Carry out vehicle test, eliminate faults if necessary | | | |
| **Engine compartment** | **OK** | **Not OK** | **not present** |
| Check for cleanliness | | | |
| Note: It is possible that the cooling system has been filled above the maximum mark ex works. Do not adjust the coolant level. The normal coolant level is reached while driving the vehicle. | | | |
| **Fluid tank for washer fluid** | **OK** | **Not OK** | **not present** |
| Check fluid level and top up if necessary, where required with antifreeze additive | | | |
| **Labels** | **OK** | **Not OK** | **not present** |
| Apply label for BMW Group Mobile Service | | | |
| **Body, interior equipment, vehicle underbody** | **OK** | **Not OK** | **not present** |
| Check for transportation damage | | | |
| For F10, F11 and F18 with automatic transmission:<br><br>Check that the cupholder cover is functioning correctly and engage the cupholder insert correctly if necessary | | | |
| **Spring blocker*** | **OK** | **Not OK** | **not present** |
| Remove | | | |
| **Tyres** | **OK** | **Not OK** | **not present** |
| Checking tyre pressure<br><br>Observe the information on tolerance compensation for RDC. | | | |

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| | | | |
|---|---|---|---|
| Initialise Run Flat Indicator (RPA) or tyre pressure control (RDC) | | | |
| For winter tyres* attach the label V-max. | | | |
| **Maintenance record booklet* (with national-market version Korea only)** | **OK** | **Not OK** | **not present** |
| Stamp pre-delivery check / enter vehicle identification number | | | |
| **Attach documentation (glove box/storage box/luggage compartment)** | **OK** | **Not OK** | **not present** |
| Rider's Manual | | | |
| Maintenance record booklet (with national-market version Korea only) | | | |
| Contact booklet | | | |
| BMW Group Mobile Service brochure | | | |
| Include key/remote control (make note of number) | | | |
| **Indicator/warning lights and Check Control** | **OK** | **Not OK** | **not present** |
| Check and remove fault if applicable | | | |
| **Service and parking brake** | **OK** | **Not OK** | **not present** |
| Transport and immobilisation periods of 3-6 weeks:<br>Check for correct operation | | | |
| In event of transportation and immobilisation periods of more than 6 weeks:<br>Brake in | | | |
| **Interior mirror with digital compass*** | **OK** | **Not OK** | **not present** |
| Calibrate system | | | |
| **Transportation lock* and vehicle cleaning** | **OK** | **Not OK** | **not present** |
| Remove the transportation protective film | | | |
| Clean inside and outside of vehicle | | | |
| **Notes:** | | | |

..... ..... .....

Date Mechanic Workshop Supervisor

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# 00 00 ... Seat belts: Check condition of seat belt strap, check function of automatic reel, seat belt locking reel, seat belt buckle, seat belt clip and, if necessary, seat belt clasp

**Seat belt strap, automatic reel, seat belt locking reel**

Pull out seat belt strap and make sure it emerges without jerking.

Check seat belt strap for damage:

- folding
- unravelling
- pinches
- cracks and tears
- traces of melting

Check the seat belt clip (retaining button) and, if necessary, seat belt clasp of belt tongue on seat belt strap for damage and installation.

Retract seat belt strap; here the automatic reel must retract the seat belt strap automatically and without squeaking noises; the last section of the strap may have to be fed in.

Pull out seat belt strap in short tugs - seat belt locking reel must lock.

**Seat belt buckle**

The belt tongue on the seat belt strap must easily snap into place with an audible click.

When the "Press" button is pressed, the belt tongue must be ejected from the buckle under spring pressure.

*Note:*

> If the seat belt is damaged, you must replace the seat belt completely after consulting the customer; issue a separate invoice for this work.
>
> Instructions on how to proceed, refer to Checking automatic seat belt.

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# 00 00 602 Service - air filter element

- **Service air filter element**
  - Replace ail filter element or elements
    Shorten change intervals for vehicles operated in dusty regions.

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# 00 00 618 Service - brake fluid

- **Service - brake fluid**
  - Changing brake fluid
  - Replace microfilter for interior blower.
    **Note:** This job item is not included in the brake fluid service. Invoicing is separate from the brake fluid service.
  - Reset CBS display according to factory specification

***Important!***

Read and comply with general notes and information on brakes

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# 00 00 618 Service - brake fluid

- **Service - brake fluid**
  - Change brake fluid.
  - Reset CBS display according to factory specification.
  - **For vehicles with electronic service booklet:**
    Carry over maintenance works in **electronic service booklet** .

***Important!***

Read and comply with general notes and information on brakes

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# 00 00 618 Service - brake fluid

- **Service - brake fluid**
  - Change brake fluid
  - Reset CBS display according to factory specification
  - **For vehicles with electronic service booklet:**
    Carry over maintenance works in **electronic service booklet** .

***Important!***

Read and comply with general notes and information on brakes

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# 00 00 610 Service - engine oil

- Renew engine oil and oil filter
- Reset CBS display according to factory specification
- For F22, F23 with CID and all F30, F31, F32, F33, F34 and F36:
  Transfer maintenance work to the **Service history**

***Attention!***

The job items specified below always refer to the maximum possible scope of a engine oil service. These job items are coupled to the engine oil service. The multipliers refer to the ECE standard intervals. Country specific deviations may apply.

The linked job items are not included in the engine oil service. Invoicing is separate from the engine oil service.

The change interval (motor oil change multiplier) can be taken from the following matrix: The vehicle-specific scope must be read out via ISPA (KeyReader) and printed out.

| Component: | Microfilter | Air filter | Spark plugs | Fuel filter | Automatic transmission fluid |
|---|---|---|---|---|---|
| Model series | Multiplier<br><br>Engine oil change | Multiplier<br><br>Engine oil change | Multiplier<br><br>Engine oil change | Multiplier<br><br>Engine oil change | Multiplier<br><br>Engine oil change |
| F20, F21, F22, F23, F30, F31, F32, F33, F34, F36<br><br>Petrol and diesel | 1<br><br>(approx. 30 tkm) | 2<br><br>(approx. 60 tkm) | 2<br><br>(approx. 60 tkm) | 2<br><br>(approx. 60 tkm) | --- |
| F30 Hybrid drive (without PHEV) | 1<br><br>(approx. 30 tkm) | 2<br><br>(approx. 60 tkm) | 2<br><br>(approx. 60 tkm) | --- | 2<br><br>(approx. 60 tkm) |

- Renew microfilter
- Replace air filter element
- **Petrol vehicles only:**
  Replace spark plugs
- **Diesel vehicles only:**
  Replace fuel filter
- **Only for hybrid drive:**
  Replace automatic transmission fluid

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# 00 00 612 Service - front brakes

- **Service - front brakes**
  - Replace brake pads,
    - Replace the brake pad wear sensor
    - Clean brake air ducts
    - Apply a thin coating of grease to wheel centring on light alloy wheels
  - Brake discs
    - Check surface and thickness
    - If necessary: Replace
  - Reset CBS display according to factory specification
  - **For vehicles with electronic service booklet:**
    Carry over maintenance works in **electronic service booklet** .

*Note:*

- Replace brake discs when:
  - Drop below the minimum brake disc thickness
  - Scoring
  - Heat cracks
  - Thickness difference
- Issue a separate invoice for replacement of brake disc

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# 00 00 616 Service - microfilter

- **Service - microfilter**
  - Replace microfilter for interior ventilation

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# 00 00 614 Service - rear brakes

- **Service - rear brakes**
  - Change brake pads,
    - Replace the brake pad wear sensor
    - Clean brake air ducts
    - Apply a thin coat of grease to wheel centring on light alloy wheels, refer to Service Information Operating Fluids.
  - Brake discs
    - Check surfaces and thickness.
    - If necessary: Replace and charge separately
  - Function check of parking brake with roller dynamometer
    - If necessary: Charged for separately, removal of brake disc and parking brake repair
  - Reset CBS display according to factory specification
  - **For vehicles with electronic service booklet:**
    Carry over maintenance works in **electronic service booklet** .

*Note:*

- Replace brake discs if they drop below minimum thickness (refer to Technical Data) and in event of scoring, heat cracks or thickness difference.
- Issue a separate invoice for replacing the brake discs.

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# 00 00 622 Service - spark plugs

- **Service - spark plugs**
  - Replace spark plugs

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# 00 00 624 Service - vehicle check

- **Service - vehicle check**
  *Passenger compartment:*
  - Check horn, headlight flashers and hazard warning flashers
  - Check instrument and inscription lighting, passenger compartment and glovebox lighting, blower
  - Check lighting system: if necessary, charge separately to adjust the headlights, function of front/rear and vehicle number plate lighting
  - Seat belts: 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
  - Check windscreen wiper and washer system for function and setting
  - Convertible only:
    Activate the rollover protection system manually. **Note:** Open the soft top prior to the triggering process!

  *Rear/tyres:*
  - Check tyres (incl. compact spare wheel if present):
    - Tread depth
    - Tread wear pattern
    - External condition
    - Check inflation pressure and correct if necessary.
      Observe the information on tolerance compensation for RDC.
  - If fitted:
    BMW Mobility System: Check expiry date on sealant bottle. Replace sealant bottle if necessary (charge separately).
  - Check that warning triangle, high-visibility jacket and first-aid kit are present. Check expiry date on first-aid kit (observe national legislation where applicable).
  - Initialise Run Flat Indicator or tyre pressure control

  *Engine compartment:*
  - Check the left and right of the units compartment for water and leaves and bill separately for clean-up, if applicable.
  - Check coolant level and concentration, top up where necessary (check both coolant levels on F01, F02, F10 and F30 hybrid cars). Inform customer in event of incorrect fluid level and, if necessary, troubleshoot (charged separately).
  - Window glass and headlight cleaning system: checking fluid level, topping up if necessary
  - If fitted:
    Steering fluid reservoir: Check oil level, top up if necessary. Inform customer in event of incorrect fluid level and, if necessary, troubleshoot (charged separately).

  *Underfloor:*
  - Brake lines and connections: Check for tightness, damage, mounting and correct position
  - Vehicle underbody including all visible components: Check for damage, correct position, tightness and corrosion
  - Steering components: Check for play, tightness is applicable, damage and wear

  *Test drive:*
  - Check for road safety:
    - Brakes
    - Steering
    - Shock Absorbers
    - Transmission
  - Reset CBS display according to factory specification
  - **For vehicles with electronic service history:**
    Record maintenance work in the **electronic service history**.

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# 00 00 610 Service engine oil (US version only)

- Renew engine oil and oil filter
- **for diesel-engine cars:**
  Top up urea to the maximum fill level
- **For vehicles from model year 2013:**
  At every 2nd engine oil change: Replace battery in radio remote control
- Reset CBS display according to factory specification
- Transfer maintenance work to the **Service history**

***Important!***

The job items specified below always refer to the maximum possible scope of a engine oil service. These job items are coupled to the engine oil service. The multipliers refer to the US standard intervals. Country specific deviations may apply.

The linked job items are not included in the engine oil service. Invoicing is separate from the engine oil service.

The change interval (motor oil change multiplier) can be taken from the following matrix: The vehicle-specific scope must be read out via ISPA (KeyReader) and printed out.

| Component: | Microfilter | Air filter | Spark plugs | Fuel filter | Automatic transmission fluid |
|---|---|---|---|---|---|
| Model series | Multiplier<br><br>Engine oil change | Multiplier<br><br>Engine oil change | Multiplier<br><br>Engine oil change | Multiplier<br><br>Engine oil change | Multiplier<br><br>Engine oil change |
| F30, F31, F34<br><br>Petrol up to production date 07/2013 | --- | 3<br><br>(approx. 45,000 mi) | 4<br><br>(approx. 60,000 mi) | --- | --- |
| F30<br><br>328i with engine N20 until production date 03/2012<br><br>Note: Interval change from 03/2012 | --- | 3<br><br>(approx. 45,000 mi) | 2<br><br>(approx. 30,000 mi) | --- | --- |
| F22, F23, F30, F31, F32, F33, F34, F36<br><br>Petrol from production date 07/2013 | 2<br><br>(approx. 20,000 mi) | 5<br><br>(approx. 50,000 mi) | 6<br><br>(approx. 60,000 mi) | --- | --- |
| F30, F31<br><br>Diesel from production date 07/2013 | 2<br><br>(approx. 20,000 mi) | 3<br><br>(approx. 30,000 mi) | --- | 4<br><br>(approx. 40,000 mi) | --- |
| F30 Hybrid drive up to production date 07/2013 | --- | 3<br><br>(approx. 45,000 mi) | 4<br><br>(approx. 60,000 mi) | --- | 2<br><br>(approx. 30,000 mi) |
| F30 Hybrid drive from production date 07/2013 | 2<br><br>(approx. 20,000 mi) | 5<br><br>(approx. 50,000 mi) | 6<br><br>(approx. 60,000 mi) | --- | 3<br><br>(approx. 30,000 mi) |

- **On vehicles from 07/2013:**
  Renew microfilter
- Replace air filter element
- **Petrol vehicles only:**

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Replace spark plugs

- **Diesel vehicles only:**
  Replace fuel filter
- **Only for hybrid drive:**
  Replace automatic transmission fluid

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# 00 00 105 Standard scope of service

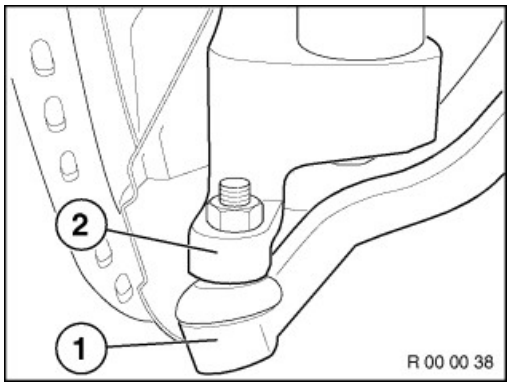
- **Standard scope of service**
  - Function check of parking brake without roller dynamometer
  - Check Check Control messages
  - Check indicator and warning lights
  - For vehicles with slide/tilt sunroof/panorama glass roof:
    Check the slide/tilt sunroof guide rails for dirt contamination. Clean if necessary (charged separately).

**Recommendation:**

- Check tyres:
  - Tread depth
  - Tread wear pattern
  - External condition
  - Check inflation pressure and correct if necessary.
    Note the information on tolerance compensation for tyre pressure control (RDC).
- After correction of the tyre pressure: Initialise Run Flat IndicatorÂ (RPA)or tyre pressure control (RDC)

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# 00 00 ... Steering components: Check for play, damage and, if nec., tightness




**Checking play:**

*Note:*
Observe notes on checking the steering backlash!

1. Check the tie rod backlash only in loaded condition or in the design position.
2. Checking with front axle raised:
   - To evaluate the play of the steering gear, it is necessary to pressurise the steering gear via its servo system!
   - The combustion engine must be running during hydraulically or electrically assisted steering for this purpose

**Steering wheel:**

Move steering wheel back and forth and check for play.

**Track rod joint:**

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

**Check for damage:**

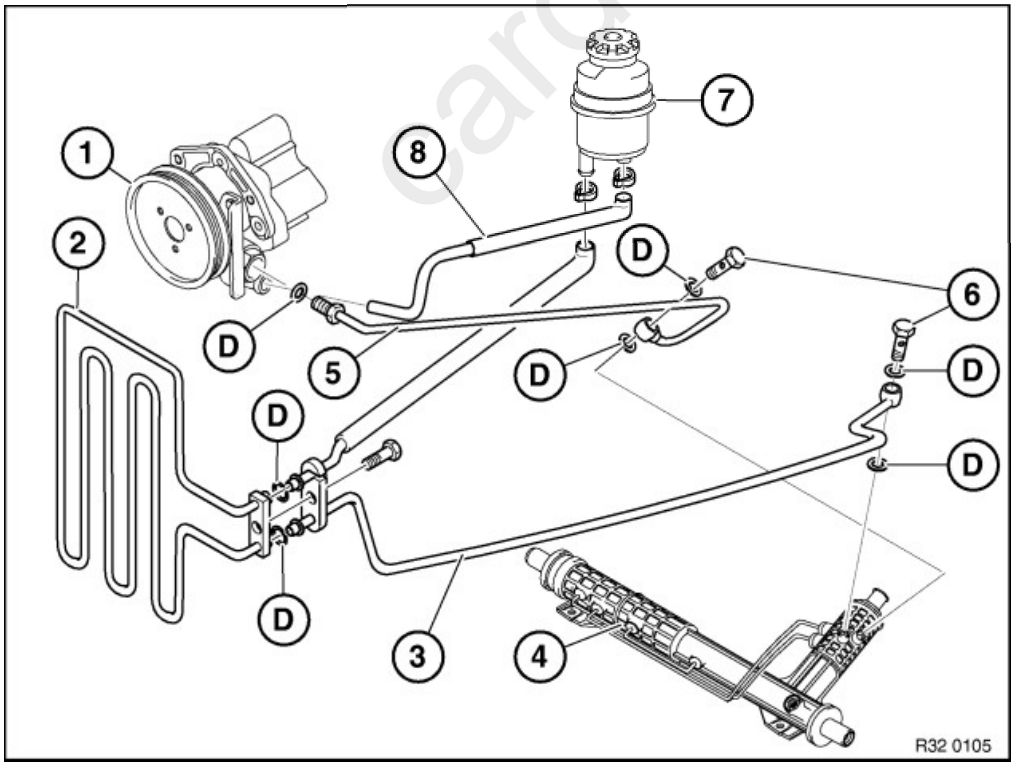
Check gaiter, axle and gaiter for damage (e.g. cracks, holes) and leaks.

Check gaiter for missing tensioning straps.

**Check for tightness (only for hydraulically supported steering):**

Check all visible connections, hoses, lines and steering box for traces of fluid.

The following image shows the principal arrangement of the hydraulic steering components and lines.




| | | | |
|---|---|---|---|
| 1 | Pump | 6 | Hollow bolt |

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| | | | |
|---|---|---|---|
| 2 | Power steering cooler | 7 | Expansion tank |
| 3 | Return line | 8 | Suction hose |
| 4 | Steering box | {D} | Sealing ring |
| 5 | Pressure line | | |

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# 00 00 ... Tyres: checking and if necessary correcting inflation pressure, checking condition, tread depth and pattern

- **Checking tyre pressure:**
  - Check tyre pressure in accordance with label on B-pillar

- **Check tyre condition:**
  - Check tread depth of all tyres with tyre tread gauge
  - Check tyre tread surfaces and side walls for incisions and foreign particles such as nails or screws
  - Check tread wear pattern for localized flattening and wear on one side; if necessary, carry out wheel/chassis alignment after consulting with customer and issue a separate invoice for this work

*Note:*

- For details of approved wheel and tyre combinations, refer to KSD CD
- For reasons of driving safety, only use tyres of the same design and tyre tread on a single vehicle
- Inform customer of any incorrect or worn tyres

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## 00 00 ... Underbody incl. all visible components: Check for damage, correct position, tightness, corrosion

- Visually inspect underbody:
  - For leaks (transmission, fuel system, brake components, steering)
  - For correct routing of electrical line (e.g. brake pad wear sensor, pulse sensor)
  - Check tightness of shock absorber, installation and spring corrosion - rebound
  - Damage to underbody
  - Corrosion on underbody
  - Complete mounting of add-on parts (e.g. underbody panelling)

***Important!***

If damage to the underbody is identified:

- If necessary, remove trim panels from underbody.
- Check brackets as well as brake- and fuel lines for damage and correct installation position.

Rectify identified faults after consulting with customer and issue a separate invoice.

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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

| Action | Vehicles | Execution |
|---|---|---|
| Remove the protective transportation film | New vehicles | Do not remove the protective film if the vehicle is kept outdoors;<br>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;<br><br>Every 12 weeks for vehicle batteries that have been disconnected from the vehicle electrical system;<br><br>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 | 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 |

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| | | |
|---|---|---|
| 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 10Â min each month | New vehicles | Required to ensure circulation of the refrigerant oil |
| | Used vehicles | Required to ensure circulation of the refrigerant oil |
| | 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 ... When 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, at least:

The vehicle, or rather the engine, should be carefully run in before operating it on the race track. A run in period of at least 2000 km.

**Recommendation:** Carry out an oil change after the run in period.

**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.<br>-> Scope of the vehicle check service | | |
| **Engine** | **OK** | **Comment** |
| Perform oil-level check..<br>-> If necessary, top up to the maximum level. | | |
| **Transfer box (affects only F39 X2 M35i / F40 M135i xDrive / F54 JCW ALL4 / F60 JCW ALL4)** | **OK** | **Comment** |
| Perform transfer box oil change. | | |
| **Cooling** | **OK** | **Comment** |
| Visual inspection of the radiator for contamination.<br>-> Draw off contamination. | | |
| **Brake system** | **OK** | **Comment** |
| Check the age of the brake fluid - see Service Booklet/Service history.<br>-> The age of the brake fluid should not exceed 1 year. | | |
| Check filling level in brake fluid expansion tank.<br>-> If necessary, top up to the maximum level. | | |
| Check the brake pad thickness on the front axle.<br>-> Wear material thickness ≥ 9 mm<br>-> 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.<br>-> Wear material thickness ≥ rear axle ≥ 8 mm<br>-> Ideally, install new brake pads. | | |

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| | | |
|---|---|---|
| **Recommendation for M-vehicles:** Use Sport brake pads, if available for that model. | | |
| Check the brake disc thickness on the front axle.<br><br>-> Minimum brake disc thickness: ≥ Minimum brake disc thickness + 1 mm<br><br>-> Ideally, install new brake discs. | | |
| Check the brake disc thickness on the rear axle.<br><br>-> Minimum brake disc thickness: ≥ Minimum brake disc thickness + 1 mm<br><br>-> Ideally, install new brake discs. | | |
| Visual inspection of the brake line and brake hose for tightness, damage and porosity. | | |
| **Wheels / tyres** | **OK** | **Comment** |
| Check wheels/tyres for suitability for operation on the race track<br><br>-> Winter tyres, all-season tyres and tyres on steel rims are absolutely unsuitable.<br>**Recommendation:** Use Sport tyres. | | |
| Check the tyre pressure of all the tyres and adjust, if required.<br><br>-> 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:<br><br>1. Drive the tyres warm.<br>2. Set the tyre pressure according to the prescribed value on the tyre pressure label for partial loads.<br>3. Initialise RDC.<br>**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.<br><br>**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.<br><br>> 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.<br><br>-> 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.<br><br>-> 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. | | |

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| **Transfer box (affects only F39 X2 M35i / F40 M135i xDrive / F54 JCW ALL4 / F60 JCW ALL4)** | **OK** | **Comment** |
|---|---|---|
| Perform transfer box oil change. | | |
| **Rear axle differential (only affects G29 Z4 M40i / G20 M340i / G20 M340i xDrive )** | **OK** | **Comment** |
| If an adjusted rear axle differential is installed.<br><br>-> Perform oil change. | | |
| **Cooling** | **OK** | **Comment** |
| Visual inspection of the radiator for contamination.<br><br>-> Draw off contamination. | | |
| **Brake system** | **OK** | **Comment** |
| Check filling level in brake fluid expansion tank.<br><br>-> If necessary, top up to the maximum level. | | |
| Check the brake pad thickness on the front axle.<br><br>-> 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.<br><br>-> 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.<br><br>-> Replace brake discs when:<br>• Drop below the minimum brake disc thickness<br>• Scoring<br>• Heat cracks<br>• Thickness difference | | |
| Check the brake disc thickness and their state on the rear axle.<br><br>-> Replace brake discs when:<br>• Drop below the minimum brake disc thickness<br>• Scoring<br>• Heat cracks<br>• Thickness difference | | |
| **Wheels / tyres**<br><br>**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. | | |
| Check the tyre pressure of all the tyres and adjust, if required.<br><br>1. Allow tyres to cool down.<br>2. Set the tyre pressure according to the prescribed value on the tyre pressure label.<br>3. Initialise RDC. | | |

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| **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.<br><br>-> Scope of the vehicle check service | | |

..... ..... .....

Date Mechanic Workshop Supervisor

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## 00 00 ... Windscreen washer system: checking fluid level, topping up if necessary

- Top up washer fluid reservoir up to edge or mark.

***Important!***

A pH-neutral BMW window cleaning fluid (antifreeze in winter) must always be added to the water.

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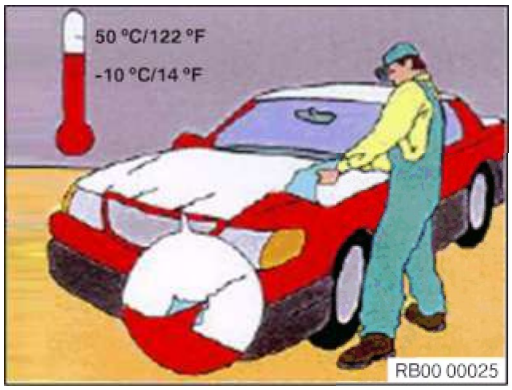
# 00 00 ... Work instruction for removing the protective film

*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".

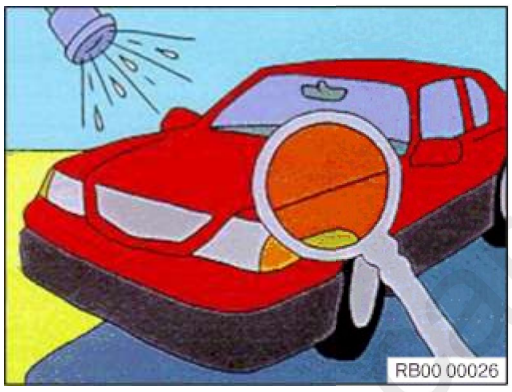



**Instructions for removing the protective film:**

- 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.

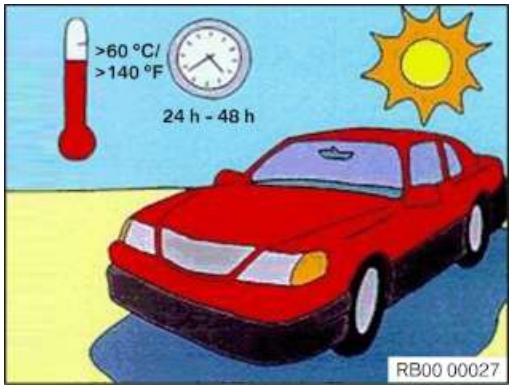
  Excessively high temperatures can lead to adhesive residue being left on the surface.

  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.

# 00 Danger of injury if oil comes into contact with eyes and skin




**Danger of injury!**

Contact with eyes or skin may result in injury!

Possible symptoms are:

- Impaired sight
- Irritation of the eyes
- Reddening of the skin
- Rough and cracked skin



**Protective measures/rules of conduct:**

- Wear safety goggles.
- Wear oil-resistant protective gloves.
- Observe country-specific safety regulations.



**First aid measures:**

- Eye contact: Immediately flush eyes with lots of water for at least 15 minutes. In the case that it is available, use an eye wash bottle. If eye irritation persists, consult a doctor.
- Skin contact: Wash off with soap and water immediately. If irritation persists, consult a doctor.

  Note: Do not use solvents/thinners.

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# 00 Danger of poisoning if oil is ingested/absorbed through the skin




**Danger of poisoning!**

Ingesting oil or absorbing through the skin may cause poisoning!

Possible symptoms are:

- Headaches
- Dizziness
- Stomach aches
- Vomiting
- Diarrhoea
- Cramps/fits
- Unconsciousness



**Protective measures/rules of conduct:**

- Fill oil in appropriately marked containers only.
- Do not fill oil in containers meant for drinking out of. (bottles for beverages, glasses or cups)
- Observe country-specific safety regulations.



**First aid measures:**

- Do not induce vomiting.

  If the person affected is still conscious, he/she must rinse out their mouth with water, drink plenty of water and consult a doctor immediately.

  Do not administer anything to an unconscious person via their mouth; place them in a stable position on their side. Call the emergency doctor immediately.

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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 that is in a correctly functioning, sealed heating and air conditioning system does **not** have to be changed at regular service-inspection intervals.

**However, the dryer flask or desiccant insert must absolutely be replaced in the event of:**

- contamination of the refrigerant with swarf (e.g. when the compressor is clamped).
- With depressurised and/or completely drained refrigerant circuit.
- With 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*
- *1-Series F2x, 3-Series F3x*
- *BMW i 01 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 60Â 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!**

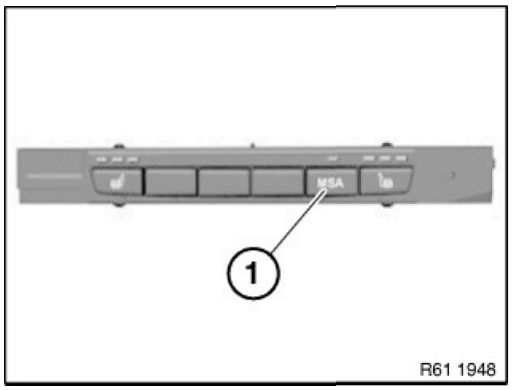
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

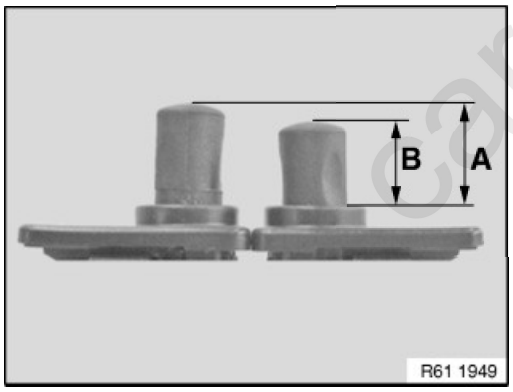
**Observe safety precautions when working on MSA vehicles.**

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 Safety instructions for handling oil




**Warning!**

Danger of poisoning if oil is ingested/absorbed through the skin!

Risk of injury if oil comes into contact with eyes and skin!



**Recycling:**

Observe country-specific waste disposal regulations.



**Measures if oil is unintentionally released:**

- Personal precautionary measures: Danger of slipping! Keep non-involved persons away from the work area. Wear personal protective clothing/equipment.
- Environmental protection measures: Prevent oil from draining into drain channels, sewerage systems, pits, cellars, water and the ground.
- Limiting spread: Use oil blocks to prevent the surface spread of oil.
- Cleaning procedure: Bind and dispose of escaped oil with nonflammable absorbents.

  Note: Do not flush oil away with water or aqueous cleaning agents.

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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.



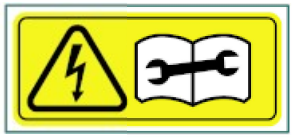
**Important!**

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




**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!

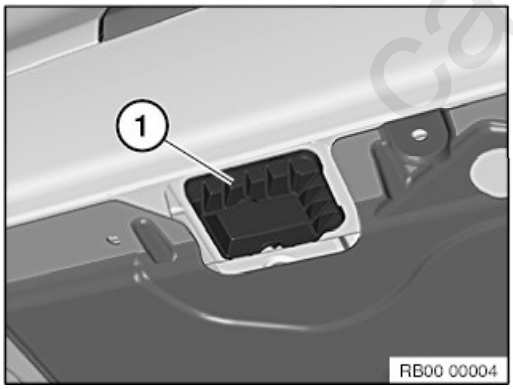
Before driving onto a vehicle hoist, make sure there is sufficient ground clearance between the vehicle hoist and the vehicle.

The vehicle may only be raised with the vehicle hoist at the four jacking points.



**Necessary preliminary work:**

- If necessary, remove jacking points from equipment pack (with new vehicles) and insert from below into openings in front and rear sill areas

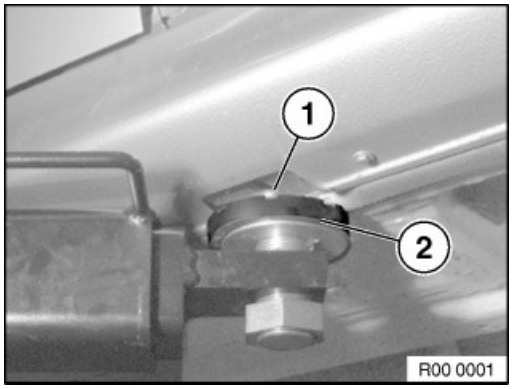



**Caution!**

All four jacking points (1) must be available!

Never raise the vehicle without the jacking points (1)!

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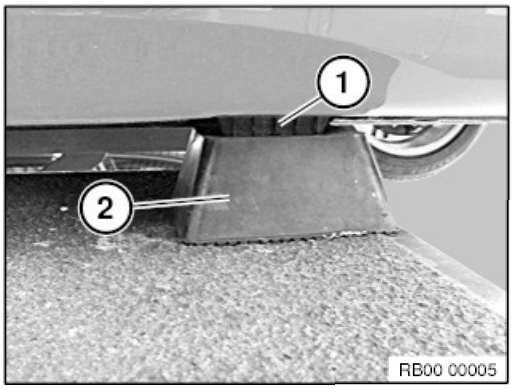



**Caution!**

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.

**In hybrid cars there is a risk of damage to the high-voltage component behind the underbody panelling!**




**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.

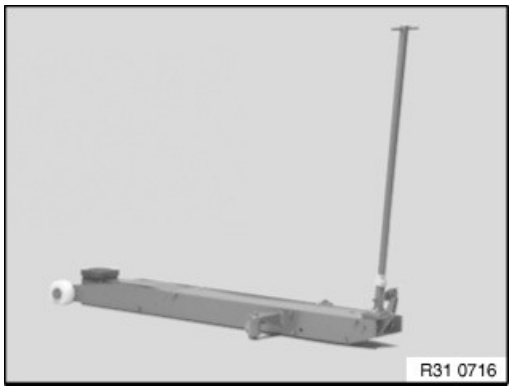
**Never raise the vehicle without rubber blocks (or rigid foam blocks)!**

There is a major risk of damage to the vehicle underbody!

**In hybrid cars there is a risk of damage to the high-voltage component behind the underbody panelling!**

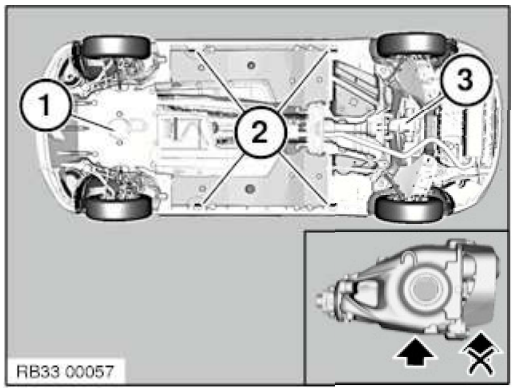
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# 00 02 000 Raising vehicle with trolley jack




Observe the following trolley-jack-related notes:

1. Only trolley jacks sold or approved by BMW, with a rubber plate on their mounting, may be used!
2. Trolley jacks must be regularly serviced and always checked for functional reliability before they are used!
3. Check the rubber plate on the trolley jack prior to each use, replacing if necessary.




**Warning!**

The vehicle may be raised with a trolley jack only at the following mounting point!

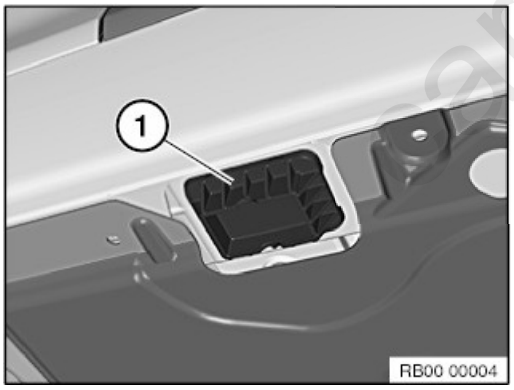
1 Car jacking point

Note: When raising, the underbody panelling is pressed against the front axle support.

2 Side car jacking points

3 Rear axle final drive

Note: It is not permitted to raise the vehicle at the rear differential cover!




**Risk of damage!**

Jacking point (1) must be present!

Align the rubber plate on the trolley jack to the jacking pointÂ (1) in such a way that there is no contact to adjacent components and that they are therefore not damaged.

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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***

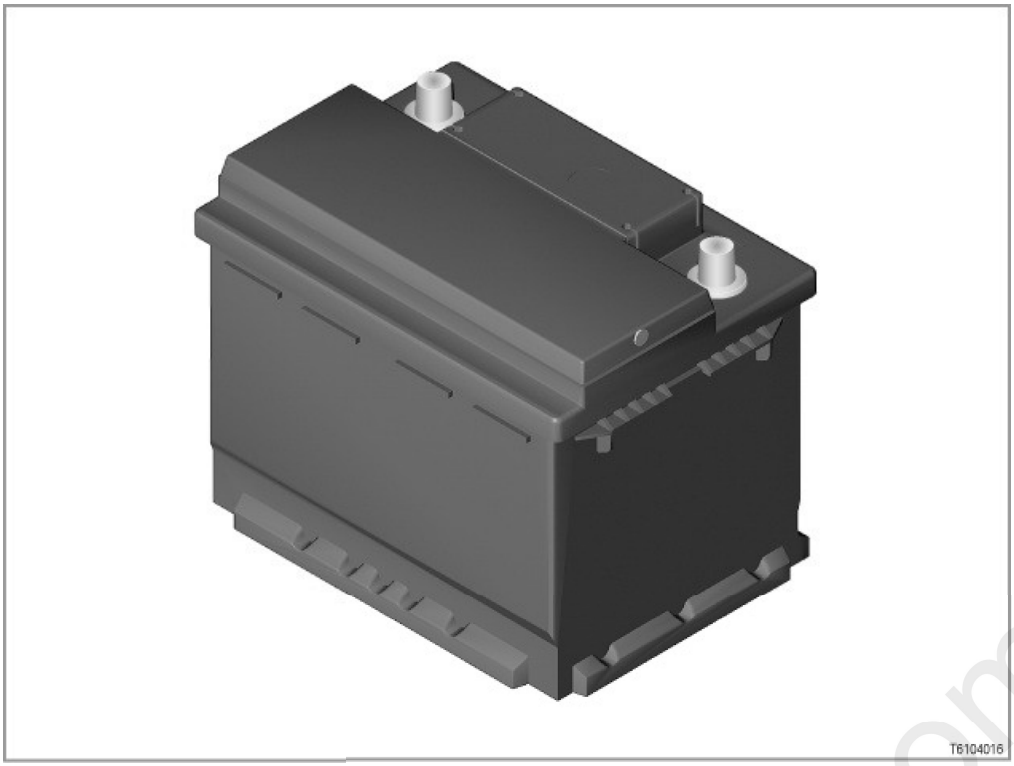
- The IBS and wiring can be destroyed by mechanical strain upon battery replacement. Therefore avoid mechanical strain.
- The size (capacity) of the battery required for the car is coded in the Car Access System (CAS).
- Use the battery size (capacity) installed as standard upon battery replacement.
- 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**

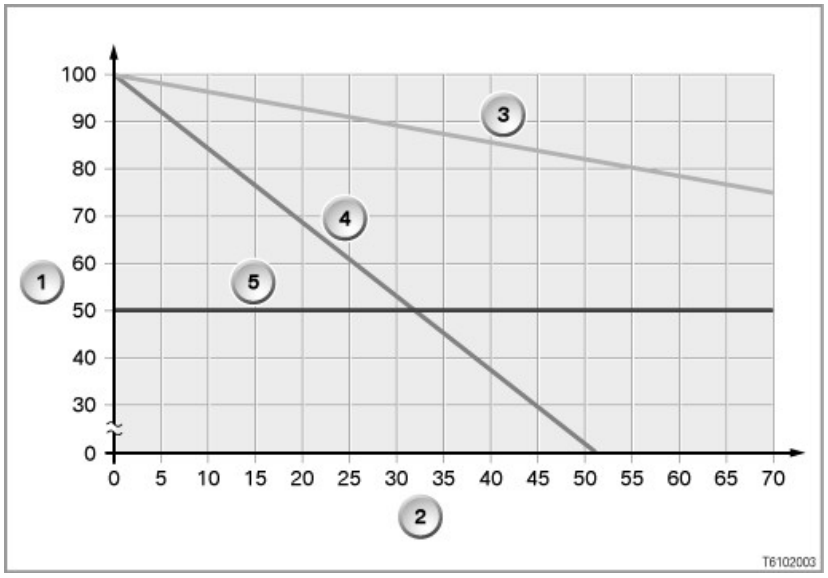
In September 2002, the first so-called VRLA batteries, better known as **AGM batteries** came into use. (VRLA stands for **V**alve **R**egulated **L**ead **A**cid, i.e. lead-acid battery with pressure relief valve; **AGM stands for A**bsorbent **G**lass **M**at, i.e. absorbent glass-fibre fleece).

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
- reliable starting of engines with high starting current requirements, e.g. high-performance diesel engines
- 100 % freedom from maintenance
- low risk in the event of an accident (reduced environmental risk)

**Service life of AGM batteries**

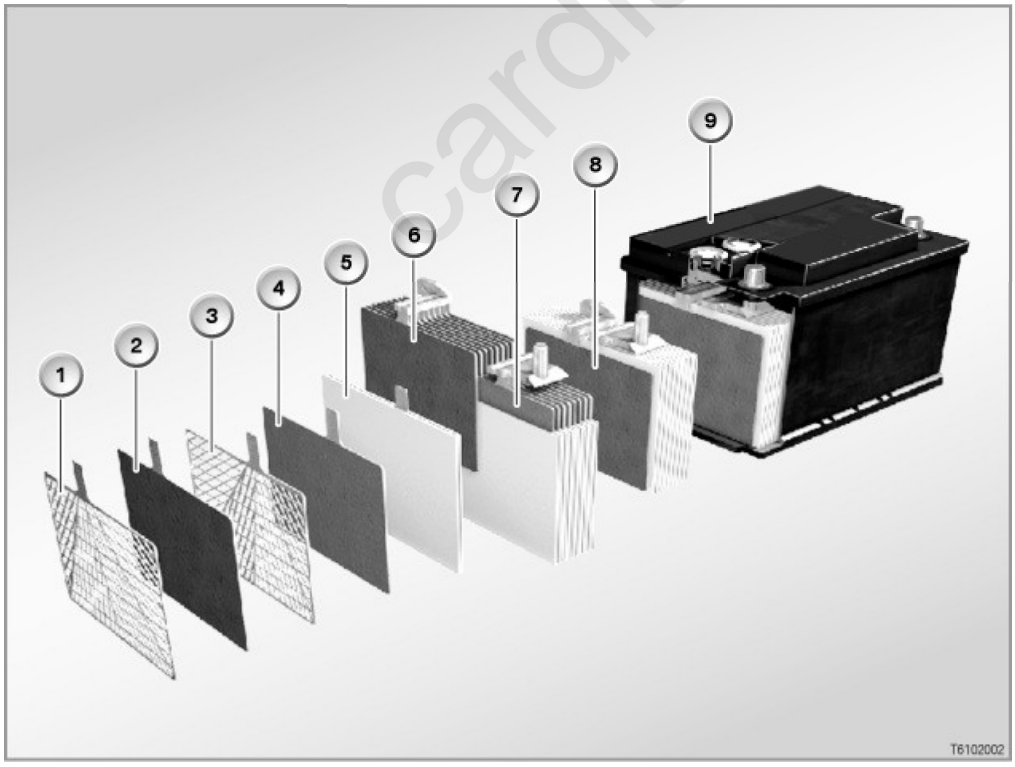



| Item | Explanation | Item | Explanation |
|---|---|---|---|
| 1 | Available capacity [%] | 2 | Mileage [thousand km] |
| 3 | AGM battery | 4 | Lead-calcium battery |
| 5 | 50 % capacity limit | | |

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 by the permeability of the separators.

**Brief component description**

The AGM battery has a black housing and the so-called "Magic Eye" is missing.




| Item | Explanation | Item | 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.

*Howit 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.

*Charging*

**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*

**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 instructions:

- 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 parts; 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 lines

- 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 lines

- CVBS cables may not be repaired.
- CVBS cables must be replaced in their entirety.

HSD lines

- HSD cables may not be repaired.
- HSD cables must be replaced in their entirety.

Optical fibre cable:

*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

**Attention!**

- 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 fibre-optic cables

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..

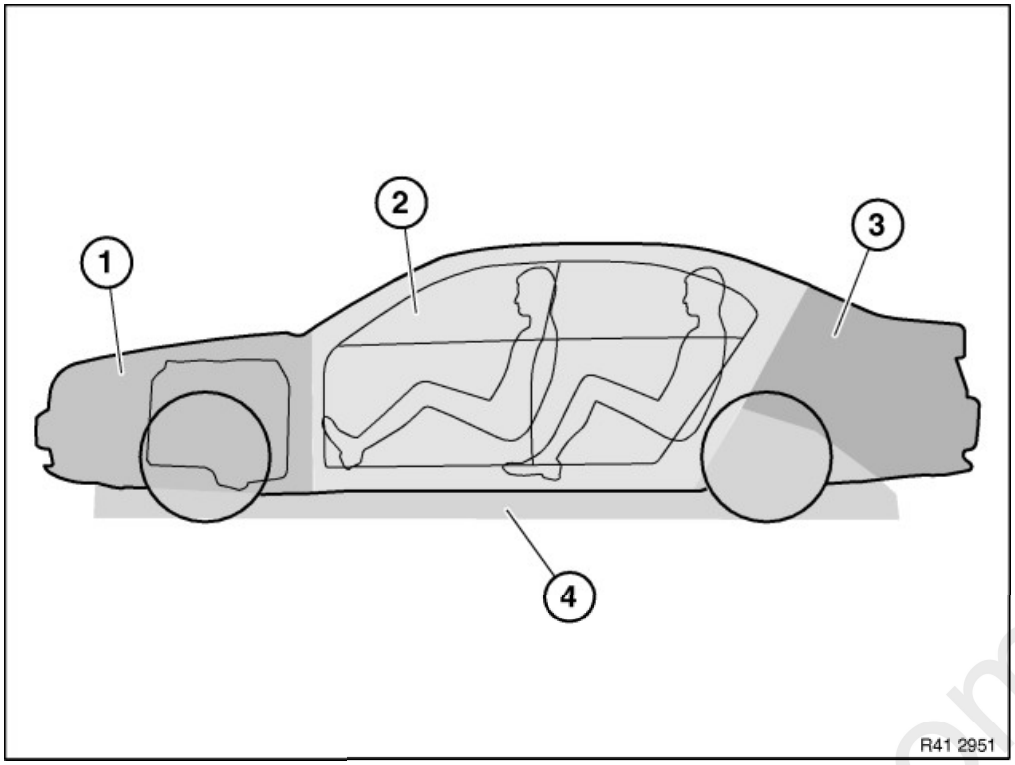
The separation point between the vehicle-side wiring harness and the repair wiring harness is located **outside the vehicle interior** (in the wheel arch, for example):

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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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# 00 00 ... Information/warning labels




| | | | |
|---|---|---|---|
| 1 | Engine compartment | 3 | Rear end |
| 2 | Interior | 4 | Underfloor |

**Location: Information/warning label: Country:**

| **Engine compartment (1):** | | |
|---|---|---|
| Carrier support, wheel arch front left top, front passenger side | Vehicle identification number | India only |
| Connection, top front | BMW Individual | Only Individual U490, SA940, Z1XX, SABI |
| Connection, front top left and right | Warning label, xenon light | Worldwide |
| Connection, top front | Aluminium screws/bolts | China, N5X, see TAIS |
| Cylinder head cover | Ignition coil | see TAIS |
| Connection, top front | BMW High Performance Oil | US only |
| Connection, top left | Retaining hook | Worldwide |
| Sealing cap of coolant expansion tank | Coolant cap, China | China only |
| Engine compartment lid, inner panel | Refrigerant | Worldwide |
| Engine compartment lid, inner panel | Production date | Australia, Great Britain |
| Engine compartment lid, inner panel | Exhaust gas | US only |
| Dome bulkhead cross-brace, left | Brake fluid | Canada only |
| Connection, top front | Exterior paint | Only US, CDN version, Japan version, Australia version, Gulf version, China version and for all SKDs |
| Control unit, 12-cylinder engine: 2 devices = 2 labels | Type plate for engine control unit | China only |

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| | | |
|---|---|---|
| Engine compartment lid, inner panel | Duplicate type plate independent heating | Only optional equipment SA 536 and only petrol or diesel |

| **Interior (2):** | | |
|---|---|---|
| Windscreen | CCC | China only |
| Trim, hot-air routing | Vehicle identification number | US, Canada or SA8SM |
| Decor strip | Front passenger airbag | US only |
| Windscreen, inner, driver's side, top | Maximum speed M+S | Car rental SA931, Dispatch, BMW World SA9WR |
| Bottle holder | Parking brake emergency release | see TAIS |

| **Complete vehicle, bodyshell:** | | |
|---|---|---|
| B-pillar, driver's side | Manufacturer's certificate | US, CDN, Gulf States |
| B-pillar, driver's side | Tyre inflation pressure | Worldwide |
| B-pillar, driver's side | Tyre inflation pressure monitoring system | US only |
| B-pillar, driver's side | Runflat indicator | Worldwide (not US, CDN) |
| B-pillar, driver's side | Warning labels, side airbag | see TAIS |
| B-pillar, right | Nameplate | China only |
| B-pillar, driver's side | EC type plate with model designation, vehicle identification number, colour code | Worldwide, not US, CDN, China, Japan, Korea, Australia, Gulf States, SA8AC, SKDs |
| B-pillar, driver's side | Towing | Four-wheel drive vehicles only |

| **Rear end (3):** | | |
|---|---|---|
| Fuel filler cap, inner | Independent heating | Europe, only SA536 |
| Fuel filler flap, inner | Unleaded petrol ROZ95 | N54/N63/N74 only |
| Fuel filler flap, inner | Premium unleaded | China, US |
| Enclosure for Owner's Handbook | Efficient Dynamics | SA1CD only |
| Power distribution box, rear | Fastening stickers, rear | Worldwide |
| Luggage compartment floor, front | Parking brake emergency release | Worldwide |
| Rear lid, outer | Barcode | US, Great Britain, China |
| Toolkit cover | BMW Group Mobile Service | US, LA801 |
| Toolkit | Transmission | see TAIS |

| **Underfloor (4):** | | |
|---|---|---|
| Front axle support under steering gear drive | Airbag (basic setting) | For all optional equipment/national-market versions |
| Link and right tension struts | Do not lash down | see TAIS |

<u>Key:</u>

US = United States

CDN = Canada

CCC = Car Communication Computer

OBD = On-Board Diagnosis

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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
  - Air conditioning condenser: 20 ml
  - Desiccant insert / dryer flask: 20 ml
  - Each replaced refrigerant line: 10 ml
  - Air conditioning condenser with integrated dryer flask: 40 ml
  - Safety pressure switch and gasket: no additional refrigerant oil
  - Only I01: Radiator, high-voltage battery unit: 20 ml
- Evacuate and fill air conditioning system

II. **Part replacement due to sudden leakage**
(major leak, e.g. pipe break 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
  - Air conditioning condenser: 35 ml
  - Desiccant insert / dryer flask: 55 ml
  - Each replaced refrigerant line: 35 ml
  - Air conditioning condenser with integrated dryer flask: 55 ml

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    - 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 capacitors 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.

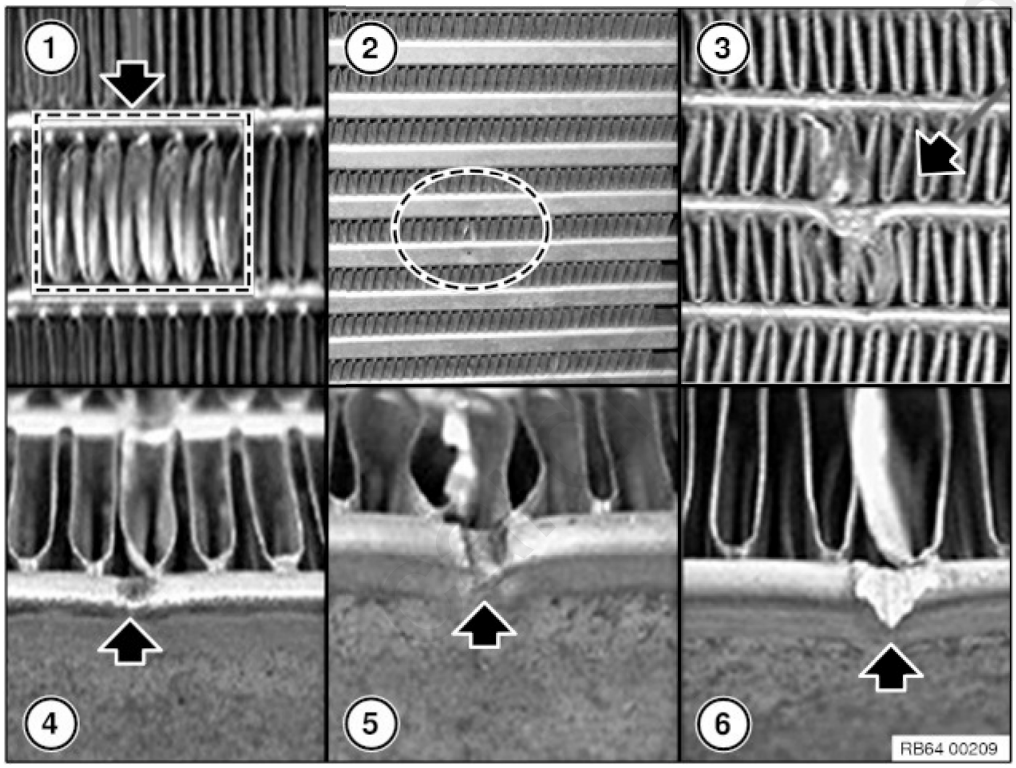
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

**Radiators or air conditioning condensers are not to be replaced in these cases!**

*Note:*

*The deformations shown in Fig.Â (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 ... Note for handling R134a refrigerant

**Work on the refrigerant circuit may only be carried out by experts!**

Avoid all contact with liquid or gaseous R134a. Wear protective goggles and gloves when working on the refrigerant circuit.

- Follow safety information for handling R134a refrigerant

**Warning!**

> Although R134a at normal temperature is non-toxic, not inflammable and not explosive in air in any mixture ratio, it is still essential to follow various safety precautions.

As a gas, R134a 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 heating and air conditioning systems or in rooms into which R134a may have escaped. Exposure to flames or high temperatures (≥ 50 °C) may give rise to toxic decomposition products (fluorine gas). 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

R134a must be drawn off, cleaned and returned to the air conditioning 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.

R134a absorbs very small amounts of 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.



**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




**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!

**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.



**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 refrigerant oil




**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!

- Before conducting repairs, check the actual pressure drop on the pressure gauge of the A/C service station

Read and comply with the relevant operating instructions for the A/C service station 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:**

- If swallowed: Do NOT induce vomiting, unless expressly instructed to do so by medical personnel. Do not administer anything to an unconscious person through their mouth. Consult a doctor immediately if larger quantities of this substance are swallowed. Loosen tight-fitting items of clothing (e.g. collar, tie, belt or similar).
- Eye contact: Remove contact lenses if worn. In the event of eye contact, rinse eyes for at least 15Â minutes with plenty of water. It is essential to use WARM WATER. Consult a doctor.
- Skin contact: In the event of skin contact, rinse immediately with plenty of water. Remove contaminated clothes and shoes. Wash affected clothes before wearing again. Clean shoes thoroughly before reusing. **Call for a doctor**.
- After inhalation: If inhaled, take the person affected outside into fresh air immediately and keep them under supervision. **Call for a doctor**. If breathing difficulties are experienced, administer additional oxygen. If the person affected stops breathing, administer the kiss of life.



**Important!**

Refrigerant is hygroscopic and must therefore be stored in suitable containers that are sealed airtight!

refrigerant oil is non-combustible and non-explosive at normal temperatures. Nevertheless, the following points must be observed:

- Do not store in the vicinity of flames, heat sources or strongly oxidising materials
- Suitable extinguishants are carbon dioxide ($CO_2$) dry extinguishant and foam

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**Recycling**

Catch and dispose of emerging refrigerant oil.

Observe country-specific waste disposal regulations.

Absorb escaping refrigerant oil with fluid-binding material.

Notify the relevant authorities if larger amounts of refrigerant are discharged into aboveground water supplies, drainage systems or subsoil.

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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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# 34 00 ... Testing of service brakes at the official periodic vehicle check according to EU Directive 2010/48/EU and Germany § 29_StVZO for vehicles with first registration beginning on July 28, 2010.

Series: 1: E81-E88; F20-F21 / 3: E90-E93; F30-F31 / 5: F07-F11; F18 / 6: F06,F12-F13 / 7: F01-F04; X1: E84 / X3: F25 / X5: E70 / X6: E71-E72 / Z4: E89 / MINI: R55-R61 / Rolls Royce

Situation:

For official periodic vehicle inspections according to EU Directive 2010/48/EU and § 29 of the German road traffic licensing regulations (StVZO) as per the revised directive, new inspection specifications apply beginning on 01.07.2012 for the functional test of the service brakes on EU Class M1 vehicles (passenger car up to 3.5 t permitted total weight) and first registered from 28.07.2010 onwards.

**Prior the mechanical brake force measurement** the electronic function check for the corresponding brake system must always be performed by way of evaluation of the system specific function control gauges in the instrument cluster and/or messages on the Check Control display (ABS, DSC, and brake pad wear and brake fluid display)!

**Functional check of the service brake:**

**Prior to the brake test, the service brake must be conditioned** by braking 2 or 3 times from increased walking speed to vehicle standstill.

For vehicles with combustion engines, the engine must run to maintain the vacuum for the power assistance of the service brake. For the same reason, the driving readiness ("ignition") must be switched on with electrical vehicles to ensure the electrical vacuum generation.

**EU and Germany:**

**Vehicle braking** (z) with the service brake **at least 58 % of the authorized vehicle total weight**, instead of the previous 50 %.

**Reference value** for this minimum braking action **is**, according to ECE Directive 13H, is a **brake pedal operating force of max. 500 N.**

Note: For M1 vehicles with a first registration date prior to July 28, 2010, a minimum brake force of 50% continues to be valid!

**Braking according to the guidelines listed above is defined as:**

$$z = \frac{\text{Total of brake forces of all wheels at the wheel output}}{\text{Weight force of the vehicle (zGG)}} \times 100\ (\%)$$

**Example:** BMW X3 F25: approved total weight (zGG.).: 2300 kg.

Measured brake force values on brake test stand:

| Service brake | Front | Rear |
|---|---|---|
| Left | 435 daN | 335 daN |
| Right | 434 daN | 336 daN |

**Evaluation of service brake:**

$$z = \frac{1540}{2300} \times 100\ (\%) = 66.96\ \%$$ **is OK because greater than 58%**

**Note:**

Since the vehicles to be tested usually do not indicate the approved total weight at the time of the test, and the test stand rollers may prematurely switch off due to the lower axle weight before the possible higher brake

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forces are reached as a result of the wheel roll slipping limit, the determined total brake force is often below the total brake force that is required to meet the statutory minimum braking.

This may result in a false evaluation (not OK) even though the brake system is intact.

To prevent such a "mis-evaluation" and eliminate the need for a general vehicle load to the approved total weight, the vehicle manufacturers will provide **a maximum pedal force as reference value for minimum brake action** type and/or series-specific in the future. See table in Appendix 1.

To correspond to the actual conditions especially when checking on the brake test stand, the vehicle manufactures are enhancing the series-specific input specification values, which means the brake pedal forces, with additional **"test stand suitable" brake pedal forces**, in which the actual measurements must be performed.

These are usually low brake pedal force reference values that are generally in front of the banding point of the brake servo reference line.

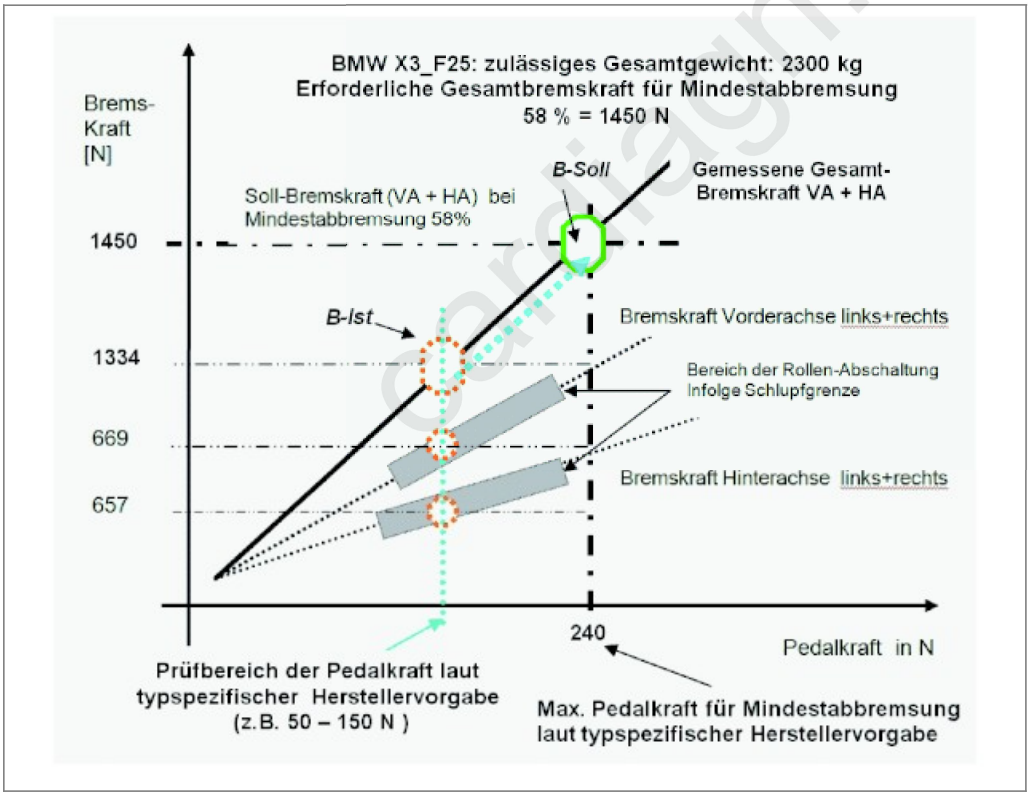
The brake force can thereby be measured in front of the blocking limit in most cases, which serves to preserve the tyres and provides a significantly more accurate approved right / left deviation in the upper test range.

**In practice, this means:**

When the measured total brake force "B Actual" is below the total value "B Target" for the required minimum braking due to premature shut down of the brake test stand or a vehicle test weight near the vehicle kerb weight, this actual value must be extrapolated on the line of the total brake force to the specified brake pedal force and then entered in reference to the approved total weight of the vehicle to be tested (see vehicle documentation). This new total value "B Target" will now be used to calculate the braking.

**If this total brake value that was extrapolated to the specified maximum brake pedal force does not meet the required minimum brake force of 58%, the braking effect must be rated not OK.**

The schematic graphic below clarifies this correlation:




**Other statutory specifications EU and Germany:**

Just as for vehicles first registered **before** 01.07.2012, the deviation of the wheel brake forces of each axle to each other may not exceed 25%.

**Also valid for vehicles in Germany first registered from 01.07.2012 onwards:**

**Evaluation of the minimum brake force share of the front and rear axle** in % to the total brake force of all wheels according to the vehicle manufacturer's specified values. See formulas below and type or series specific manufacturer values according the table in Appendix 1.

| | |
|---|---|
| **1. Front axle share=** | **Total front axle brake forces ---------- x 100 (%) Total brake force of all axles** |

**Manufacturer specification:**

The following calculation results from the previous example for the BMW X3:

| | |
|---|---|
| **Front axle brake force share=** | **435 daN + 434 daN ---------- x 100 (%) =56% is OK because greater than 51.3% - 435+434+335 +336daN** |

| | |
|---|---|
| **2. Rear axle brake share=** | **Total rear axle brake forces ---------- x 100 (%) Total brake force of all axles** |

**Manufacturer specification:**

The following calculation results from the previous example for the BMW X3:

| | |
|---|---|
| **Rear axle brake force share=** | **335 daN + 336 daN ---------- x 100 (%) =44% is OK because greater than 21% 435+434+335 +336 daN** |

**General note:**

This means that the official test of the service brake **absolutely requires the use of a brake pedal force measuring sensor.**

The manufacturers of brake test stands have been offering these items for many years as test stand accessory.

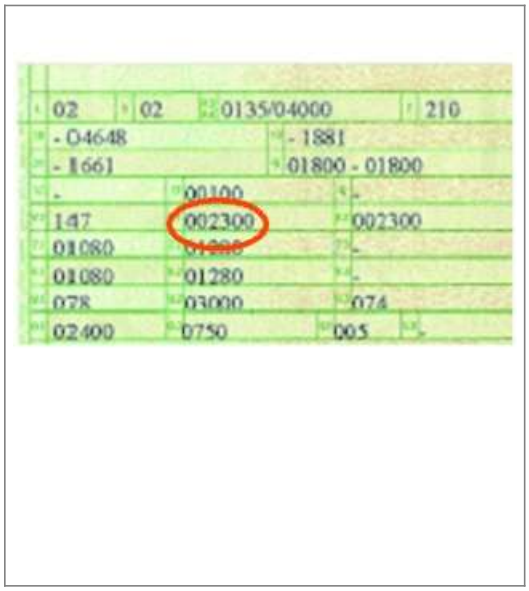
Examples are:




Position 1: MAHA, Haldenwang

Position 2: AHS, Bremen

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| | | | |
|---|---|---|---|
| 02 | 02 | 0135/04000 | 210 |
| - 04648 | | - 1881 | |
| - 1661 | | 01800 - 01800 | |
| - | 00100 | | - |
| 147 | 002300 | | 002300 |
| 01080 | | | - |
| 01080 | 01280 | | - |
| 078 | 03000 | | 074 |
| 02400 | 0750 | | 005 |

The approved total weight of the vehicle must be derived from the registration Part 1 from column F1 or F2.

Since the law primarily requires that brake effect tests are performed on brake test stands, BMW Group vehicles **must be tested on roller test stands!**

Next, the statutory tolerance of the axle "right-left deviation, limit value max. 25%, must be determined in the upper range of the measured brake forces.

In addition, the minimum brake force shares must be determined separately for the front and rear axle in compliance with the additional German specifications and referenced to the manufacturer specifications.

**General notes:**

It is recommended to check the brakes as part of the manufacturer required vehicle inspection and **before** the official vehicle inspection according to the specified values indicated here.

To make work easier for the **referencing: Brake pedal force to brake force** we urgently recommend to have your test stand manufacturer set up an electronic measured value transmission from the brake pedal force measuring tool to the test stand computer.

The installation of a calculation program to determine the minimum total braking on the test stand computer to achieve the correct evaluation - especially when it is necessary to extrapolate the actual brake force in relation to the setpoint value at the corresponding brake pedal force - is also deemed absolutely necessary.

The integration of a database for the type specific vehicle specifications (brake pedal forces, front and rear axle brake shares) simplifies the overall brake test.

These specification will also be indicated in the technical data and/or repair instructions in the future as minimum values, which will only be updated and/or maintained model-specific there.

The test procedure for the mechanical or electrical operated parking brakes, and/or the regenerative valve for hybrid or electric vehicles are listed in the corresponding repair instructions.

In the event of specifications for the brake test that deviate from country authorities of EU states and/or newer issues of the German road traffic licensing regulations, or the application of manufacturer and/or type specific target data is prohibited, compliance with same is required.

In this case, we request that you will send the corresponding information to the publisher of this service information.

- Enclosure 1: Type specific specifications to test the service brake
- Enclosure 2: Manual calculation of braking when this is not supported by the test stand.

# 64 53 ... Instructions for desiccant insert replacement



**Special tools required:**

- 32 1 270

A desiccant insert that is in a correctly functioning, sealed heating and air conditioning system does **not** have to be changed at regular service-inspection intervals.

**However, the dryer flask or desiccant insert must absolutely be replaced in the event of:**

- contamination of the refrigerant with swarf (e.g. when the compressor is clamped).
- With depressurised and/or completely drained refrigerant circuit.
- With 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*
- *1-Series F2x, 3-Series F3x*
- *BMW i 01 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
  - Air conditioning condenser: 20 ml
  - Desiccant insert / dryer flask: 20 ml
  - Each replaced refrigerant line: 10 ml
  - Air conditioning condenser with integrated dryer flask: 40 ml
  - Safety pressure switch and gasket: no additional refrigerant oil
  - Only I01: Radiator, high-voltage battery unit: 20 ml
- Evacuate and fill air conditioning system

II. **Part replacement due to sudden leakage**
(major leak, e.g. pipe break 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
  - Air conditioning condenser: 35 ml
  - Desiccant insert / dryer flask: 55 ml
  - Each replaced refrigerant line: 35 ml
  - Air conditioning condenser with integrated dryer flask: 55 ml

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    - 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 capacitors 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.

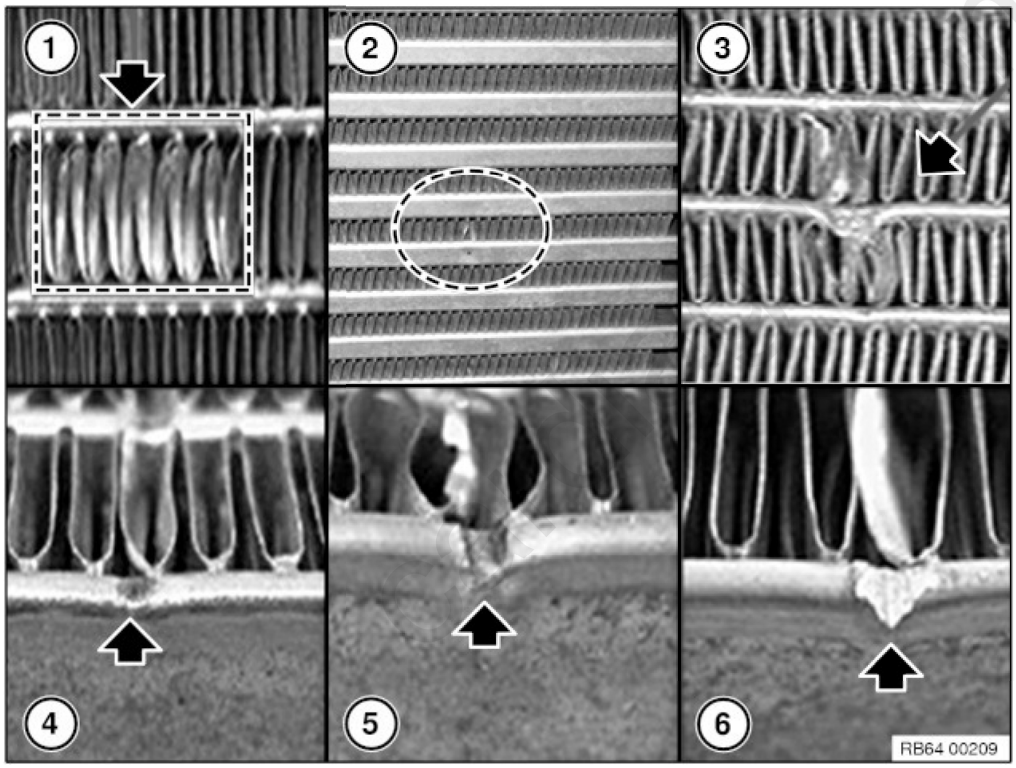
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

**Radiators or air conditioning condensers are not to be replaced in these cases!**

*Note:*

*The deformations shown in Fig.Â (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 ... Note for handling R134a refrigerant

**Work on the refrigerant circuit may only be carried out by experts!**

Avoid all contact with liquid or gaseous R134a. Wear protective goggles and gloves when working on the refrigerant circuit.

- Follow safety information for handling R134a refrigerant

**Warning!**

> Although R134a at normal temperature is non-toxic, not inflammable and not explosive in air in any mixture ratio, it is still essential to follow various safety precautions.

As a gas, R134a 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 heating and air conditioning systems or in rooms into which R134a may have escaped. Exposure to flames or high temperatures (≥ 50 °C) may give rise to toxic decomposition products (fluorine gas). 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

R134a must be drawn off, cleaned and returned to the air conditioning 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.

R134a absorbs very small amounts of 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.



**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




**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!

**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.



**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 refrigerant oil




**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!

- Before conducting repairs, check the actual pressure drop on the pressure gauge of the A/C service station

Read and comply with the relevant operating instructions for the A/C service station 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:**

- If swallowed: Do NOT induce vomiting, unless expressly instructed to do so by medical personnel. Do not administer anything to an unconscious person through their mouth. Consult a doctor immediately if larger quantities of this substance are swallowed. Loosen tight-fitting items of clothing (e.g. collar, tie, belt or similar).
- Eye contact: Remove contact lenses if worn. In the event of eye contact, rinse eyes for at least 15Â minutes with plenty of water. It is essential to use WARM WATER. Consult a doctor.
- Skin contact: In the event of skin contact, rinse immediately with plenty of water. Remove contaminated clothes and shoes. Wash affected clothes before wearing again. Clean shoes thoroughly before reusing. **Call for a doctor**.
- After inhalation: If inhaled, take the person affected outside into fresh air immediately and keep them under supervision. **Call for a doctor**. If breathing difficulties are experienced, administer additional oxygen. If the person affected stops breathing, administer the kiss of life.



**Important!**

Refrigerant is hygroscopic and must therefore be stored in suitable containers that are sealed airtight!

refrigerant oil is non-combustible and non-explosive at normal temperatures. Nevertheless, the following points must be observed:

- Do not store in the vicinity of flames, heat sources or strongly oxidising materials
- Suitable extinguishants are carbon dioxide ($CO_2$) dry extinguishant and foam

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**Recycling**

Catch and dispose of emerging refrigerant oil.

Observe country-specific waste disposal regulations.

Absorb escaping refrigerant oil with fluid-binding material.

Notify the relevant authorities if larger amounts of refrigerant are discharged into aboveground water supplies, drainage systems or subsoil.

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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 ... Checking/topping up oil level in rear axle final drive

**Warning!**

Danger of poisoning if oil is ingested/absorbed through the skin!

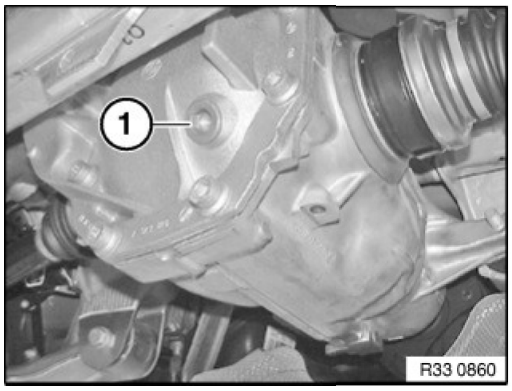
Risk of injury if oil comes into contact with eyes and skin!

**Risk of damage!**

To avoid serious damage to the rear axle final drive, it is essential to use only approved gearbox oils in the rear axle final drive.

**Necessary preliminary work:**

- If necessary, remove trailing links.
- If necessary, remove vibration absorber on the rear axle differential.




Open screw plug (1).

Tightening torque 33 11 2AZ.

Check oil level.

If necessary, pour in final drive oil up to lower edge of opening for screw plug (1).

*Installation note:*
Renew screw plug (1) with O-ring.

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# 00 11 ... Draining/topping up transmission oil in manual transmission

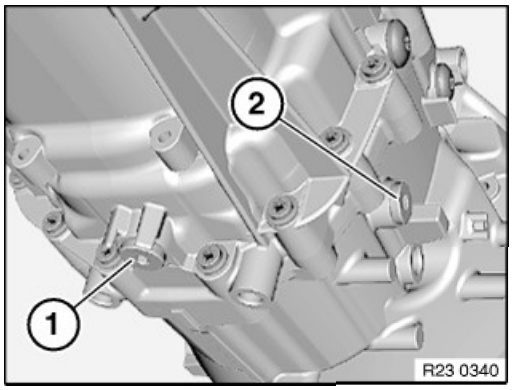
**Note:**
Transmission must be at operating temperature.

Transmission oil:

- refer to BMW Service Operating Fluids.

Filling capacities:

- Refer to Technical Data.




Draining transmission oil:

- Release oil drain plug (1) and oil filler plug (2).
- Clean oil drain plug (1) and screw in.
  Tightening torque 23 00 2AZ.

Adding transmission oil:

- Undo oil filler plug (2).
- Pour in gear oil until overflowing.
- Screw in oil filler plug (2).
  Tightening torque: 23 00 2AZ.

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# 00 11 500 GA8HP70ZChecking/topping up oil level in automatic transmission (GA8HP45Z,GA8HP50Z,GA8HP90Z)



**Special tools required:**

- 2 405 614



**Important!**

- Do not let skin come in contact with transmission oil and do not inhale fuel vapours.
- Wear protective gloves.
- Ensure adequate ventilation



**Important!**

Use only the approved transmission oil.

To set the correct level, it is **mandatory** that the service function "Transmission control unit: oil adjustment" is performed using the diagnosis system.

**Failure to comply with this requirement will result in serious damage to the automatic transmission.**

Conditions for the oil adjustment:

- Initial condition: Transmission oil temperature 30 °C to 40 °C
- Final condition: Transmission oil temperature 40 °C to 50 °C

**Important! Transmission GA8HP70Z with N57 engine from 03/2011!!**

Precondition for oil adjustment

- Transmission oil temperature 30°C to maximum 40°C.

(The transmission oil temperature **must** be maintained. This will increase the oil quantity in the transmission.)



Performing oil-level adjustment:

An oil-level adjustment is necessary for certain fault code entries in the automatic transmission and after repair (e. g. mechatronic replacement, converter replacement, transmission replacement).

- Connect diagnosis and information system.
- Service function (transmission control unit: Oil adjustment) call up
- Carry out oil level check in accordance with instructions

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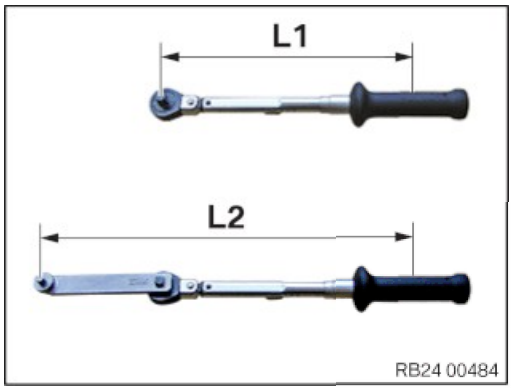



**Adding transmission oil:**

Stand vehicle on a level surface and secure against rolling off.

Release oil filler screw (1) by means of special tool 2 405 614 .

Add automatic transmission fluid according to instructions in the BMW diagnosis system.




**Important!**

When using special tool 2 405 614 , the setpoint torque deviates from the torque to be set.

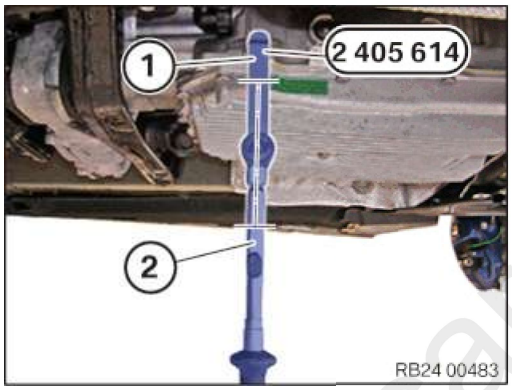
Conversion of setpoint torque -> torque to be set:

(setpoint torque x L1) : L2 =torque to be set.

L1 = Length of handle centre to the ratchet head.

L2 = Length of the handle centre to the action point of special tool.

Desired tightening torque: 24 11 3AZ




**Parts:** Replace oil filler plug and sealing ring.

**Note:** Special tool (1) and torque wrench must be aligned in a line at the time of tightening.

Tighten down oil filler plug using

1. Special tool2 405 614 .
2. Torque wrench

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# 00 Danger of injury if oil comes into contact with eyes and skin




**Danger of injury!**

Contact with eyes or skin may result in injury!

Possible symptoms are:

- Impaired sight
- Irritation of the eyes
- Reddening of the skin
- Rough and cracked skin



**Protective measures/rules of conduct:**

- Wear safety goggles.
- Wear oil-resistant protective gloves.
- Observe country-specific safety regulations.



**First aid measures:**

- Eye contact: Immediately flush eyes with lots of water for at least 15 minutes. In the case that it is available, use an eye wash bottle. If eye irritation persists, consult a doctor.
- Skin contact: Wash off with soap and water immediately. If irritation persists, consult a doctor.

  Note: Do not use solvents/thinners.

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# 00 Danger of poisoning if oil is ingested/absorbed through the skin




**Danger of poisoning!**

Ingesting oil or absorbing through the skin may cause poisoning!

Possible symptoms are:

- Headaches
- Dizziness
- Stomach aches
- Vomiting
- Diarrhoea
- Cramps/fits
- Unconsciousness



**Protective measures/rules of conduct:**

- Fill oil in appropriately marked containers only.
- Do not fill oil in containers meant for drinking out of. (bottles for beverages, glasses or cups)
- Observe country-specific safety regulations.



**First aid measures:**

- Do not induce vomiting.

  If the person affected is still conscious, he/she must rinse out their mouth with water, drink plenty of water and consult a doctor immediately.

  Do not administer anything to an unconscious person via their mouth; place them in a stable position on their side. Call the emergency doctor immediately.

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