

36 10 713 Check one road wheel on balancing machine for lateral and radial runout (wheel removed)



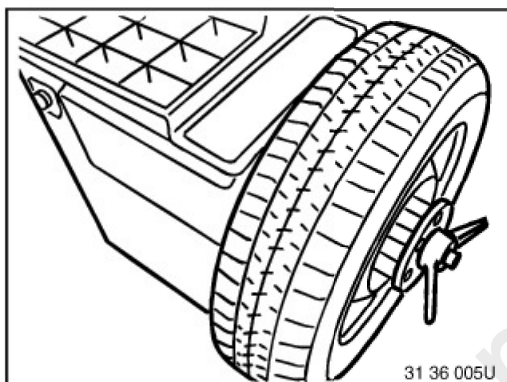
Special tools required:

- 36 1 030
- 36 1 031
- 36 1 032
- 36 1 033
- 36 1 034
- 36 1 035
- 36 1 036



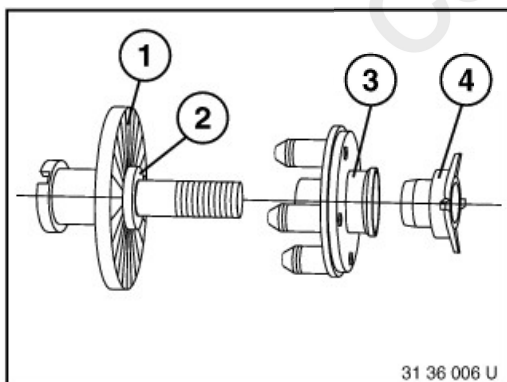
Necessary preliminary tasks:

- Remove wheel



Mount wheel in balancing machine.

To avoid clamping errors, fit the wheel on the balancing machine in the same way as it is also fitted on the vehicle (valve position facing down).

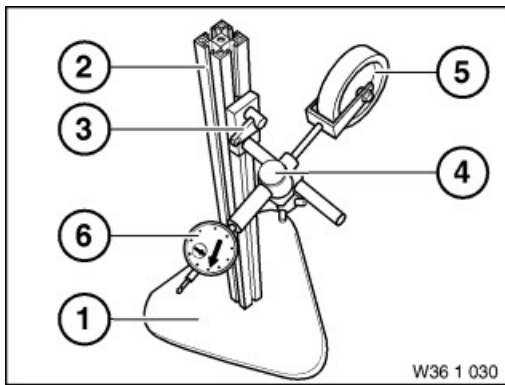


Use suitable wheel centring element supplied with corresponding balancing machine.

1. Basic flange
2. Wheel centring element
3. Type flange
4. Nut

Also refer to section on Workshop Equipment.

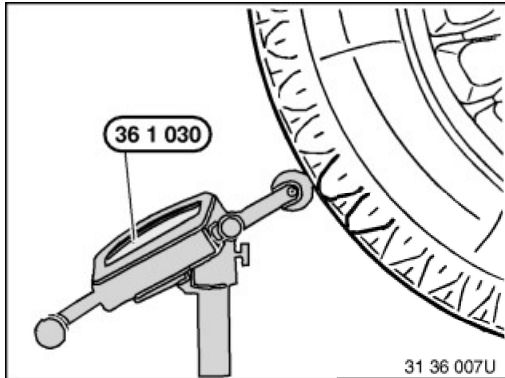




Use special tool 36 1 030 for checking.

Special tool 36 1 030 consists of:

- (1) Base 36 1 031
- (2) Post with clamp 36 1 032
- (3) Holder with clamp 36 1 033
- (4) Clamp 36 1 034
- (5) Measuring roll 36 1 035
- (6) Dial gauge 36 1 036

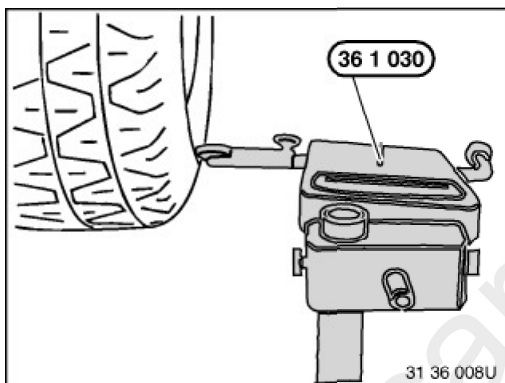


Position special tool 36 1 030 on tyre tread surface.

Spin wheel by hand and measure maximum radial tyre runout.

Note:

Measuring device must be vertical to tyre tread surface.



Position special tool 36 1 030 on tyre sidewall.

Spin wheel by hand and measure maximum radial tyre runout,

Note:

Measuring device must be vertical to tyre side wall.

Never measure on tyre inscription!

If necessary, check disc wheel (wheel rim) for radial and face runout.

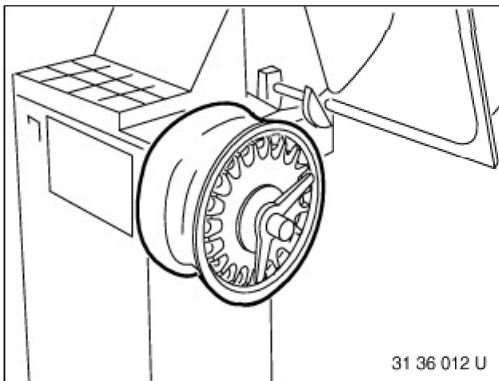


**Necessary preliminary tasks:**

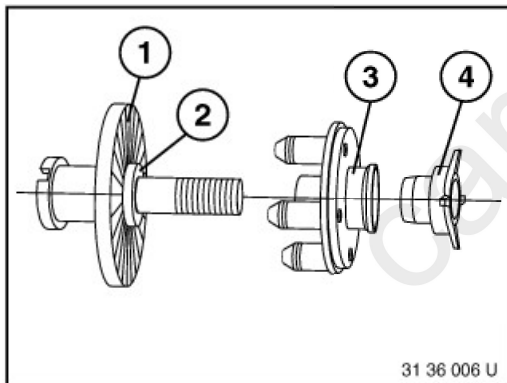
- Remove wheel
- Check wheel for lateral and radial runout
- Remove tyre from disc wheel
- Remove dirt from rim base and rim flange

**Important!**

Disc wheels are not allowed to be repaired!



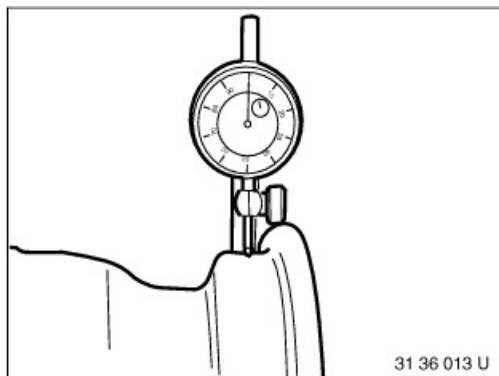
Mount disc wheel in balancing machine.



Use suitable wheel centring element supplied with corresponding balancing machine.

1. Basic flange
2. Wheel centring element
3. Type flange
4. Clamping nut

Also refer to section on Workshop Equipment.



Place dial gauge sensor on rim shoulder.

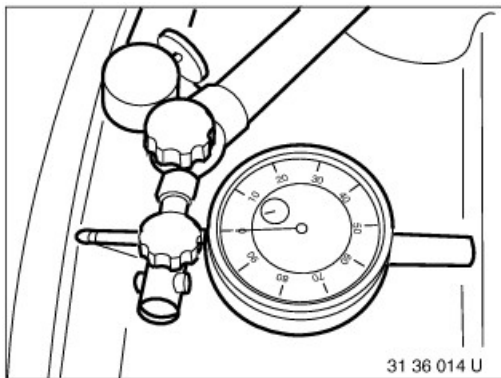
Turn wheel by hand and measure max. radial runout.

Carry out measurement on both rim shoulder sides.

Note:

Dial gauge must be vertical to rim shoulder.





Position sensor on rim flange.

Turn wheel by hand and measure max. lateral runout.

Carry out measurement on both rim flanges.

Note:

Dial gauge must be vertical to rim flange.

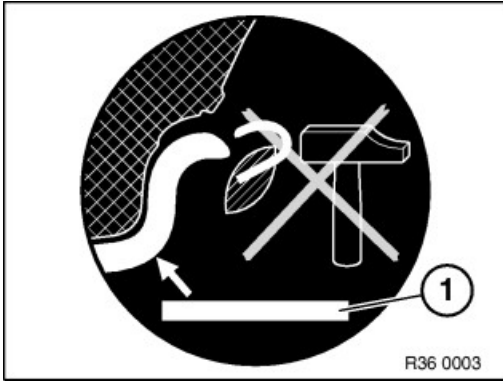


Important!

Avoid clamping errors during subsequent installation work.

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**Note:**

BMW light-alloy wheels are sometimes difficult to differentiate visually from steel disc wheels.

Identifying features:

- Label on BMW light-alloy wheel. (1) = Indication "Aluminium"
- Wall thickness of rim dish: approx. 8 mm.
- BMW light-alloy wheel is not magnetic.
- The BMW light-alloy wheel can be identified by the part number, see BMW Parts Department.

Important!

- Use BMW approved, two-piece balance weights only.
- Use specified tools only for mounting two-piece balance weights.
- Do not align BMW light-alloy wheel, replace damaged BMW light-alloy wheel.
- Notches in BMW light-alloy wheel can lead to cracking.
- Do not lubricate wheel studs.
- When fitting tyres, do not damage BMW light-alloy wheel, e.g. through use of sharp-edged retaining claws on tyre fitting machine.



General:

- The tyre size, manufacturer and tyre tread must be the same on one axle
- To meet the BMW standards, the vehicle should be equipped with tyres from the same manufacturer and with the same tyre tread (tyres approved by BMW) on all 4 wheels
- The difference in tyre tread depth on one axle must not exceed 2 mm (control quality of suspension control systems and wheel alignment requirement)
- The tyres with the higher tread depths must be mounted on the rear axle
- The DOT age difference must not exceed 4 years
- The tyre pressure must be adjusted when the tyres are exchanged
- Wheel exchange between the axles

The wheels may be exchanged between axles to achieve even abrasion. However, BMW does **not recommend** switching the front wheels to the rear or vice-versa.

The wheel exchange may lead to the following customer complaints:

- complaints regarding acoustics
- Risk of increased lane groove sensitivity

Compliance with the following requirements is required when exchanging wheels between the axles:

- Assess the wear pattern
- The tread difference between the front and rear wheels must not exceed a maximum of 2-3 mm
- Exchange the wheels between the axles every **5000 Km**

Additionally for all-wheel drive vehicles:

- The tyre size, manufacturer and tyre tread must be identical on all wheels; different tyre sizes between front and rear axles are only permissible if mixed tyres are fitted.
- The tyre tread difference between tyres in all wheel positions must not exceed **2 mm** (normal quality of the wheel control systems and wheel alignment requirement)



36 10 ... Recommendation for heating tyres before removing or installing

Recommendation for heating cold tyres to minimum installation temperature +15 °C:

To ensure injury-free tyre fitting, in particular the upper side wall and the upper tyre bead must have a temperature of at least 15 °C on the inside.

To ensure easier tyre installation, a temperature of 20° to 25° C is recommended.

This internal temperature is called the core temperature.

Rubber is a poor conductor of heat. For this reason, a cold tyre must rest for a sufficient length of time in a warmed-up environment until the inner rubber layers have warmed up to at least 15 °C.

The surface temperature of the tyre during the warm-up phase is not a measure of the internal temperature!

The room temperature is normally measured and read off at eye level. At 19 °C at eye level the temperature on the floor is approx. 16 °C. In other words, do not lay tyres directly on a cold floor to warm up; instead, lay them at least on an insulating surface, such as a pallet, or even higher.

To ensure that cold tyres absorb the heat from the ambient air as quickly as possible, they should not be stacked but rather stored individually so that they are thoroughly "immersed" in the warm ambient air.

Do not under any circumstances place tyres in front of a radiant heater or a hot air blower as harmful surface temperatures are very quickly reached in this situation. Apart from heating with warm water or with warm air (max. 50°C, no hotter), there is no other way of heating a tyre without damaging the tyre.

If a cold tyre (under 0 °C) is introduced into a warm environment (over 0 °C), a layer of frost will form immediately on the tyre surface. This frost layer shows that the tyre is absorbing heat intensively from its surroundings through condensation of the moisture in the air. When the frost layer has melted, condensation water forms; dry off this water with a cloth so that the subsequent warming-up process is not slowed down by latent heat.

Summary:

Starting from a min. room temperature of 19°C:

- Tyres at initial temperature of 0 °C and higher: store for at least 2 hours
- Tyres at initial temperature below 0 °C: store for at least 2.5 hours

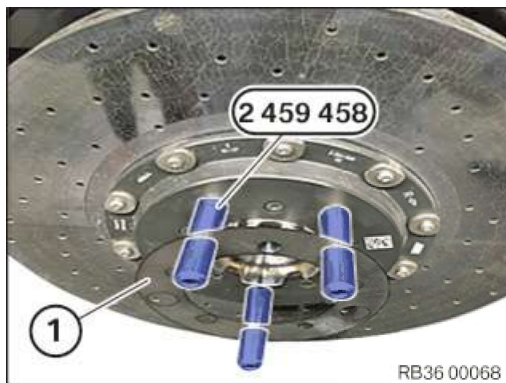
Recommendations for heating:

- Store on an insulating surface - a pallet or similar - at as high a level as possible
"Upper" bead facing upwards
- Position the tyres individually so that they are well "bathed" in the warm air..
- Wipe off condensation water
- Do not point heaters at tyres



**Special tools required:**

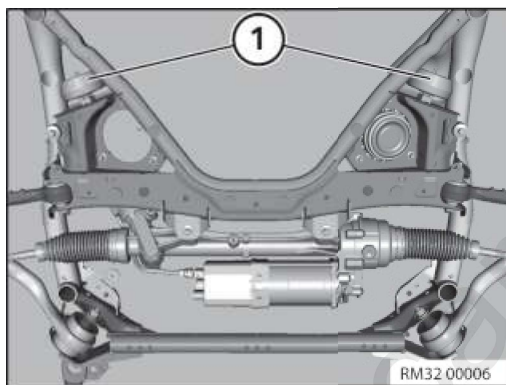
- 36 1 300
- 83 30 2 459 458
- 81 25 2 344 011
- 36 1 335
- 36 2 010

**Attention!**

In M-vehicles, **discs for increasing the coefficient of friction (1)** may be installed between the brake disc and wheel rim on the front axle (also refer to Electronic Parts Catalogue)!

This disc for increasing the coefficient of friction (1) must be installed again or, in the event of damage, be replaced!!

Centre disc for increasing the coefficient of friction (1) using special tool 83 30 2 459 458 (3 centering pins) on brake disc and install!!

**Note:**

From 02/2013 motor vehicles with rear-wheel drive and Runflat tyres are fitted with vibration absorbers (1)!

**Attention!**

The wheel is balanced electronically.

Observe safety information on raising the vehicle.

Adhere to the instructions on initializing the Run Flat Indicator (RPA).

Check the tyre pressure when installing all four wheels (e.g. when changing from summer wheels to winter wheels with tyres)!

Observe notes on compensating for tolerance of the RDC!

Notify customers to regularly check the tyre pressure (see Owner's Handbook) to prevent tyre damage!

Attention!



Observe the following procedure to prevent clamping errors and imbalance:

- Loosen the wheel studs.
- Wheel positioned with valve facing down.
- If several wheels are simultaneously removed, mark installation position of wheels on tyres (e.g. with a piece of chalk).
- Mark out wheel to wheel hub.
- Mark out lockable wheel stud in relation to wheel.
- Loosen wheel bolts. Remove wheel.



Attention!

Contact surfaces between:

- brake disc and wheel rim,
- brake disc and wheel hub,

must be clean and free from grease.



Remove dirt, grease residues and corrosion from contact surface with a drill and special tool 81 25 2 344 011. **Attention!**

Do not operate special tool 81 25 2 344 011 with an impact screwdriver!

Note:

Degrease the contact surface using universal cleaner, refer to BMW Group Parts department.

Note:

If there are grease residues in the area of the wheel stud hole, the brake disc must be removed and cleaned.



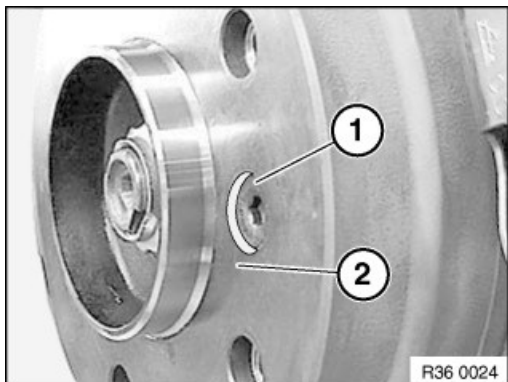
Remove dirt, grease residues and corrosion from contact surface (1) with a drill and special tool 81 25 2 344 011. **Attention!**

Do not operate special tool 81 25 2 344 011 with an impact screwdriver!

Note:

Degrease the contact surface using universal cleaner, refer to BMW Group Parts department.





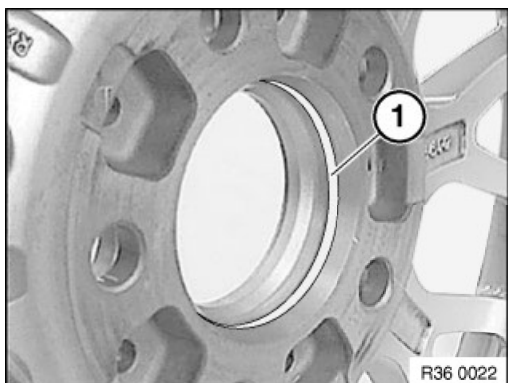
Check brake disc retaining bolt (1) for tight fit.

Attention!

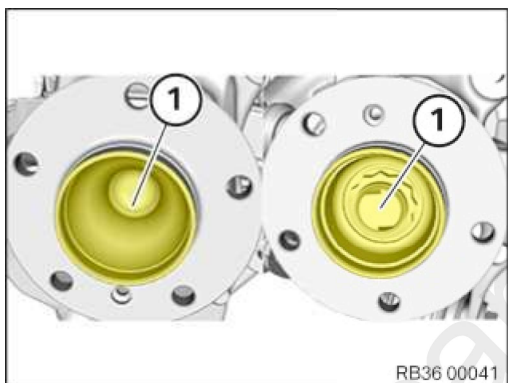
Mounting bolt (1) must not under any circumstances protrude over contact surface (2) between brake disc and wheel rim.

Tightening torque brake disc retaining bolt:

- Front axle 34 11 1AZ
- Rear axle 34 21 1AZ



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



Front and rear wheel hub in the area (1) is coated with thin layer of grease for the protection against corrosion.

Refer to BMW Operating Fluids, Main Group 36.



Note:

To release and tighten lockable wheel bolts, use a matching adapter from special tool 36 1 300 , 36 1 335 or 36 2 010 .



Clean wheel bolts and check threads for damage, renew if necessary.

Renew corroded wheel bolts.

Attention!

Do not apply oil to wheel studs.



**Attention!**

Under no circumstances use pneumatic or electric screwdrivers to screw in and tighten the wheel bolts.

**Attention!**

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel studs/rims it may be necessary to retighten the wheel studs on account of setting properties (refer to manufacturer's documents).

Tightening specifications:

1. Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.
2. Tighten down wheel studs in crosswise sequence with a calibrated torque wrench to prescribed tightening torque 36 10 1AZ.
3. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.

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36 10 108 Stationary wheel balancing

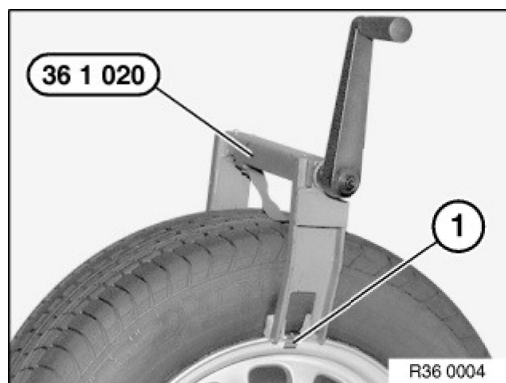
Prerequisite

- Wheel removed.

PRELIMINARY WORK

MAIN WORK

1 “ Stationary wheel balancing



- **Procedure for stationary wheel balancing must be taken from the relevant operating instructions issued by the balancing machine manufacturer!**

- On light-alloy rims with distinctive J-shape rim flange, proceed as follows.
- Gently push off tyre sidewall from rim flange at the appropriate point using special tool [0 492 516 \(36 1 020\)](#).
- Insert retaining clip (1).
- Remove special tool [0 492 516 \(36 1 020\)](#).



- Procedure for aluminium rim.
- Lift retaining clip using special tool [2 451 684](#).
- Slide balance weight underneath and allow it to engage.



- Procedure for steel rims.
- Lift retaining clip using special tool [2 451 684](#).
- Slide balance weight underneath and allow it to engage.

- When using adhesive weights, proceed as follows.
- Carefully remove any adhesive weights.
Do not damage rim when doing so.
- Select suitable bonding surface on the wheel rim.
- Thoroughly clean bonding surface.

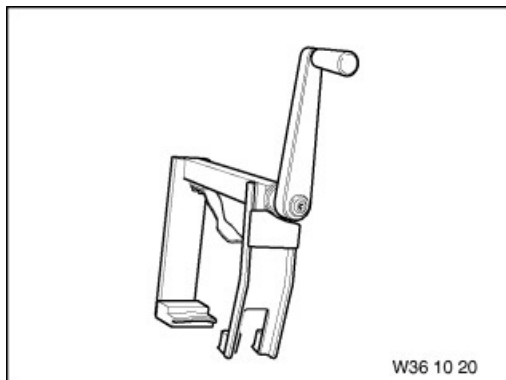
Additional Information

Overview of Special Tools



Overview of Special Tools

0 492 516 (36 1 020) Pliers



Common

Used in step 1

Usage (tyre clamp) For compressing the tyre sidewalls during fitting or removal of the retaining spring

Included in the tool or work

Storage location Individual

Replaced by

In connection with

SI-Number 01 01 96 (034)

2 451 684 Fitting aid



Common

Used in step 1

Usage For lifting the retaining spring during the installation of the balance weight. Suitable for light-alloy rim with distinctive rim flange and steel rims.

Included in the tool or work

Storage location Individual

Replaced by

In connection with

SI-Number 07 02 17 (495)



**Special tools required:**

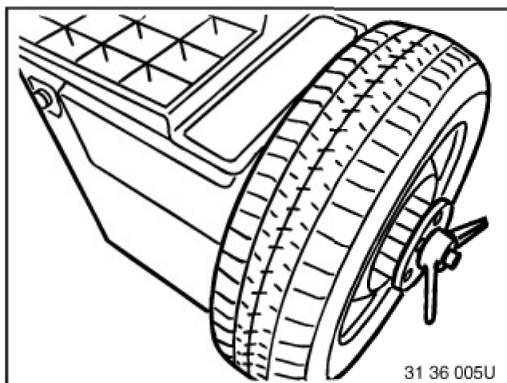
- 36 1 010
- 36 1 020

**Necessary preliminary tasks:**

- Remove wheel

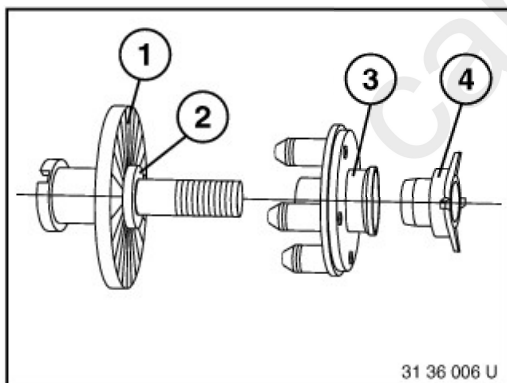
**Important!**

Use BMW approved balance weights only.



Remove any fitted balancing weights, stones in tyre tread and greater soiling.

Check tyre pressure, tyre condition, damage, flat spots (irregularities caused by, e.g. parking vehicle with overheated tyres). Where applicable, check wheel and tyres for radial and lateral runout.



Use BMW approved wheel centring for relevant balancing machine manufacturer.

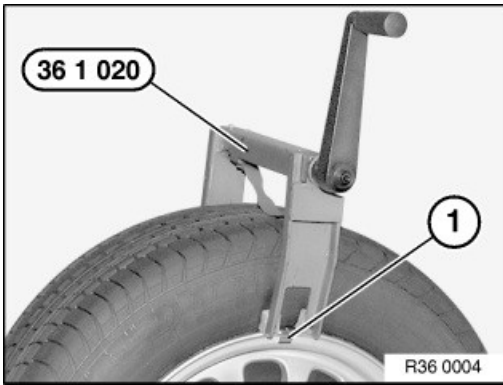
1. Basic flange
2. Wheel centring element
3. Type flange
4. Nut

Also refer to section on Workshop Equipment.

**Important!**

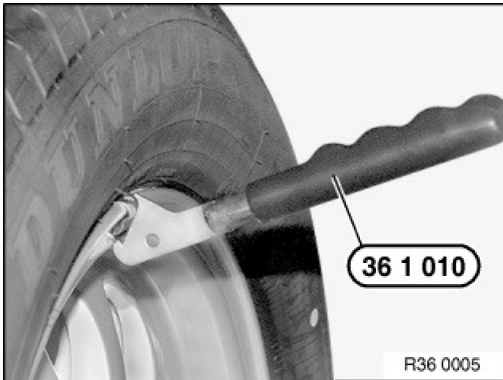
To avoid retooling errors, it will be necessary to fit the wheel on the balancing machine in the same way (e.g. valve facing down) as it is then fitted on the car. Balance wheel in accordance with operating instructions of relevant balancing machine.



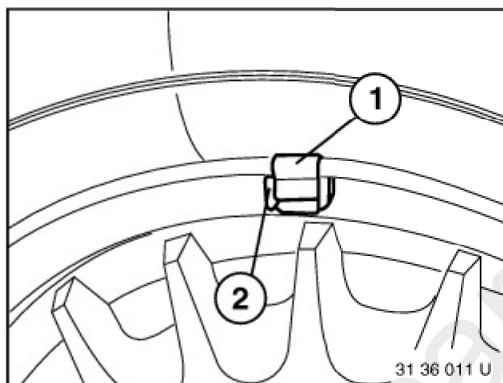


On light-alloy rims with distinctive J-shape rim flange, proceed as follows:

1. Gently force off tyre sidewall with special tool 36 1 020 at appropriate point from rim flange.
2. Install retaining clamp (1).
3. Remove special tool 36 1 020 .



Raise retaining clip with special tool .36 1 010 . Slide balance weight underneath and allow it to snap into place.



Arrangement of balance weights for light-alloy rims with distinctive J-shape rim flanges.

1. Spring retainer
2. Balance weight

Adhesive weights must be used on all other light-alloy rims.

Maximum imbalance per wheel.



Note:

When using adhesive weights, proceed as follows:

1. Carefully remove any adhesive weights. Do not damage rim when doing so.
2. Select suitable location for fitting.
3. Clean adhesive area thoroughly.

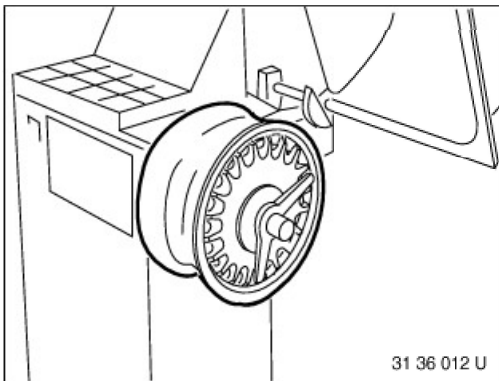


**Necessary preliminary tasks:**

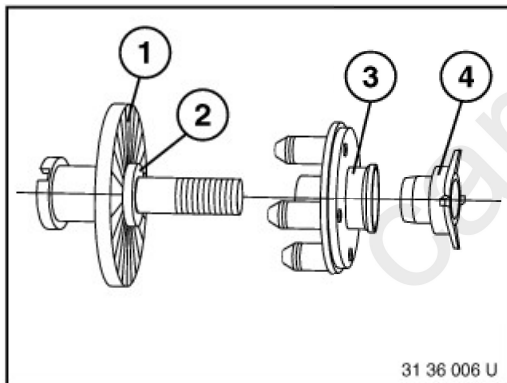
- Remove wheel
- Check wheel for lateral and radial runout
- Remove tyre from disc wheel
- Remove dirt from rim base and rim flange

**Important!**

Disc wheels are not allowed to be repaired!



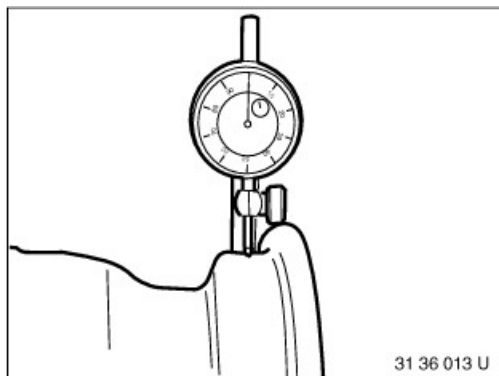
Mount disc wheel in balancing machine.



Use suitable wheel centring element supplied with corresponding balancing machine.

1. Basic flange
2. Wheel centring element
3. Type flange
4. Clamping nut

Also refer to section on Workshop Equipment.



Place dial gauge sensor on rim shoulder.

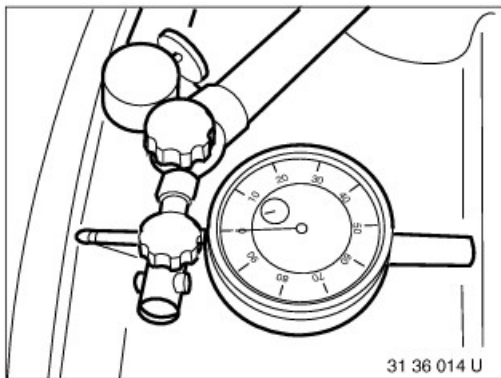
Turn wheel by hand and measure max. radial runout.

Carry out measurement on both rim shoulder sides.

Note:

Dial gauge must be vertical to rim shoulder.





Position sensor on rim flange.

Turn wheel by hand and measure max. lateral runout.

Carry out measurement on both rim flanges.

Note:

Dial gauge must be vertical to rim flange.

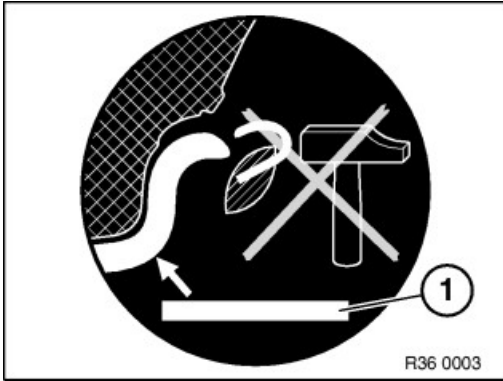


Important!

Avoid clamping errors during subsequent installation work.

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**Note:**

BMW light-alloy wheels are sometimes difficult to differentiate visually from steel disc wheels.

Identifying features:

- Label on BMW light-alloy wheel. (1) = Indication "Aluminium"
- Wall thickness of rim dish: approx. 8 mm.
- BMW light-alloy wheel is not magnetic.
- The BMW light-alloy wheel can be identified by the part number, see BMW Parts Department.

Important!

- Use BMW approved, two-piece balance weights only.
- Use specified tools only for mounting two-piece balance weights.
- Do not align BMW light-alloy wheel, replace damaged BMW light-alloy wheel.
- Notches in BMW light-alloy wheel can lead to cracking.
- Do not lubricate wheel studs.
- When fitting tyres, do not damage BMW light-alloy wheel, e.g. through use of sharp-edged retaining claws on tyre fitting machine.



**Note:**

Checking the tyre pressure is based on speed monitoring of the wheels in relation to each other. A tyre puncture is detected and signalled by way of a deviation in specific speed ratios.

The four tyres mounted on the vehicle are monitored while the vehicle is driving.

Initialisation must be carried out in each case immediately after tyre pressures have been corrected, after tyres/wheels have been exchanged and after repair work to the air spring system.

Important!

The Run Flat Indicator does not function when the vehicle is driven with the compact spare wheel.

Please refer to the relevant Owner's Handbook for details of the initialisation procedure.

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*Note:*

RDC monitors the tyre pressure in the four wheels.

Each tyre incorporates an Wheel electronics module, which constantly monitors the tyre pressure.

The system signals when the tyre pressure drops in one or more tyres.

Resetting must be carried out in each case immediately after tyre pressures have been corrected, after tyres/wheels have been replaced and after repairs to the air spring system.

Please refer to the relevant Owner's Handbook for details of the resetting procedure.

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*Note:*

The function of the RDC control unit is smoothly integrated into the DSC control unit (DSC MK100)!

The procedure is described in Removing and installing/replacing DSC control unit.

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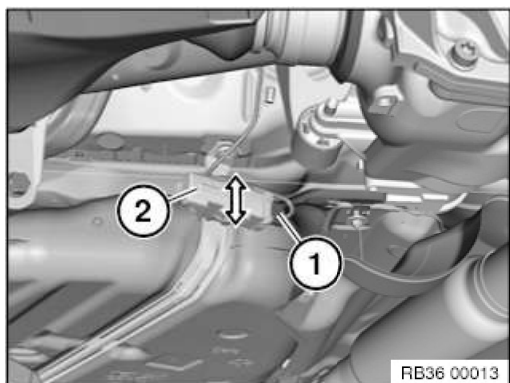
Important!

Read and comply with notes on protection against electrostatic damage (ESD protection).



Necessary preliminary tasks:

- Raise vehicle.



Disconnect plug connection (1).

Press retaining tabs (2) apart as indicated by arrow.

Pull out TPC control unit.



Replacement:

- Carry out programming/encoding



36 11 533 Removing and installing/replacing RDC wheel electronics (2nd generation/3rd generation)



Attention!

Before removing and refitting, check which generation of wheel electronics is fitted! (See BMW Electronic Parts Catalogue)

If the wheel electronics have been removed, the complete valve must be replaced.

Note:

There are two different wheel electronics. The SP303 wheel electronics module must be used with RDC-01 and RDC-02 from model year 03/06.

The Gen3 wheel electronics must be used with the RDC-LC from model year 09/2010 (all F0x/F1x vehicles).

If a tyre sealant has been used, replace the wheel electronics.

When a tyre has been removed, do not clean the rim with installed wheel electronics with high-pressure cleaning equipment.

Before the installation of new wheel electronics with valve, thoroughly clean the valve bore of the wheel rim.

Do not treat wheel electronics with solvents, cleaning agents etc. If dirt contamination, wipe with a clean cloth only.

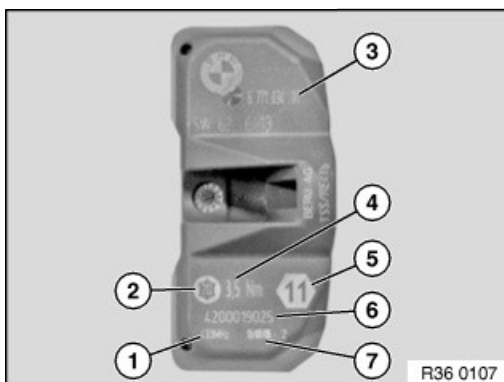
Do not clean wheel electronics with compressed air.

When tyre sealant is used, the installed wheel electronics must necessarily be replaced.



Necessary preliminary tasks:

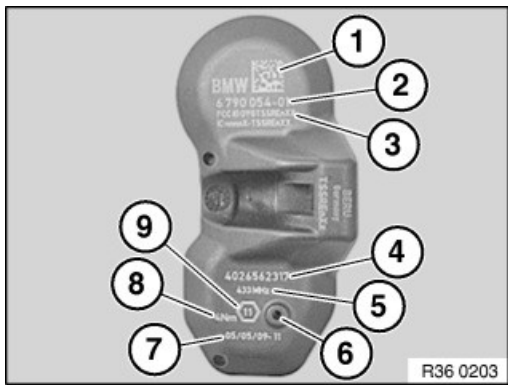
- Remove tyre



Labelling of generation 2.3 wheel electronics

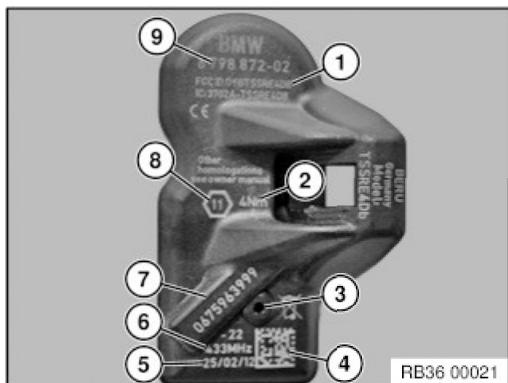
- 1 Transmission frequency of wheel electronics
- 2 Large Torx socket screw
- 3 BMW part number
- 4 Tightening torque of Torx screw and union nut
- 5 Width across flats of union nut
- 6 Serial number of wheel electronics
- 7 Production date of wheel electronics





Labelling of generation 2.4 and 3.3 wheel electronics

1. Data Matrixcode
2. BMW part number
3. FCC ID = radio authorisation
4. Wheel electronics ID
5. Transmission frequency
6. Pressure sensor
7. Production date of wheel electronics
8. Tightening torque
9. Width across flats of union nut



Labelling of generation 3.4/3.41 wheel electronics

1. FCC ID = radio authorisation
2. Tightening torque
3. Pressure sensor
4. Data Matrixcode
5. Production date of wheel electronics
6. Transmission frequency
7. Wheel electronics ID
8. Width across flats of union nut
9. BMW part number

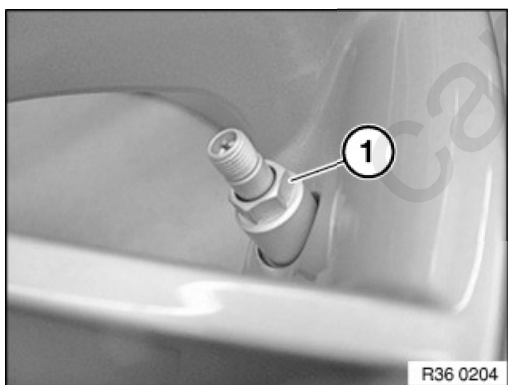


Note:

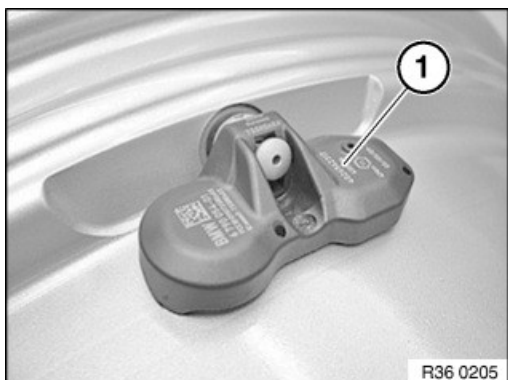
The following illustrations only show removal and refitting of the 3rd generation wheel electronics module. The instructions also apply without alteration to the 2nd generation wheel electronics.

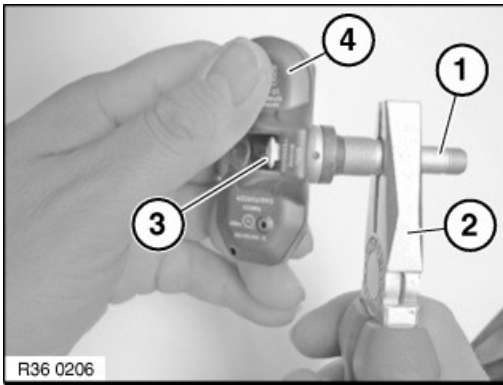
Removing wheel electronics

Release union nut (1).



Remove wheel electronics and valve (1) from valve hole.





Using suitable pliers (2), unscrew valve (1) from the thread of the square-head bolt (3), while holding the wheel electronics module (4) firm. Completely unscrew valve (1).

Remove square head screw from fixture for wheel electronics module.

Installation note:

The valve must be renewed!

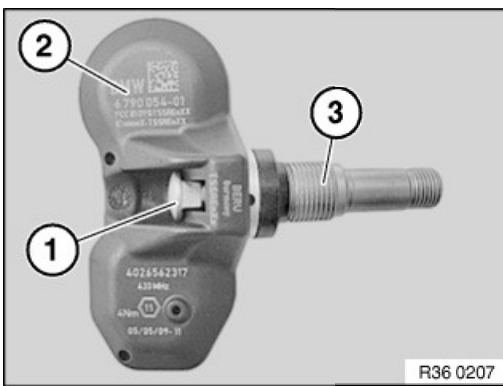
Failure to replace the part leads to leaks!



Attention!

Before the installation of new wheel electronics with valve, thoroughly clean the valve bore of the wheel rim!

Also make sure that the valve bore has been deburred.



Installing wheel electronics

Insert new square-head bolt (1) in wheel electronics module (2).

Screw single-use valve insert (3) three turns onto square-head bolt (1).

Note:

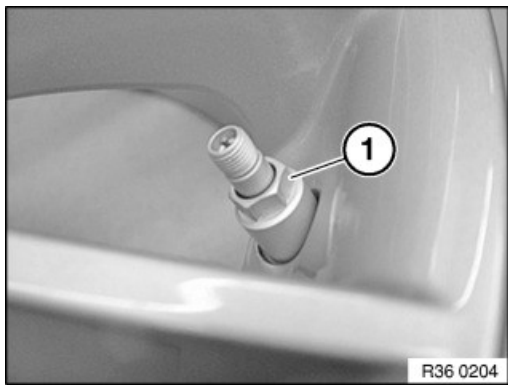
Make sure square bolt-head (1) is correctly seated in wheel electronics mounting.



Insert valve insert with wheel electronics into cleaned valve bore.

Both outer feet on the underside of the wheel electronics module must be resting against the rim wall.





Screw on union nut (1) by hand as far as it will go.

Tighten union nut until the inner strip-off ring breaks. Breakage is perceptible audibly and tangibly (momentary drop in torque resistance).

Then fully tighten union nut (1).

Tightening torque 36 11 1AZ.

Attention!

Fixing must not under any circumstances be retightened!

The square-head bolt should be located precisely in the wheel electronics mounting.

The wheel electronics should still be resting evenly against the wheel rim after tightening.

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**Attention!**

Before removing and refitting, check which generation of wheel electronics is fitted! (See BMW Electronic Parts Catalogue)

If the wheel electronics have been removed, the complete valve must be replaced.

Note:

The wheel electronics RDCi is installed as from 2013 and as from F32, F33.

If a tyre sealant has been used, replace the wheel electronics.

When a tyre has been removed, do not clean the rim with installed wheel electronics with high-pressure cleaning equipment.

Before the installation of new wheel electronics with valve, thoroughly clean the valve bore of the wheel rim.

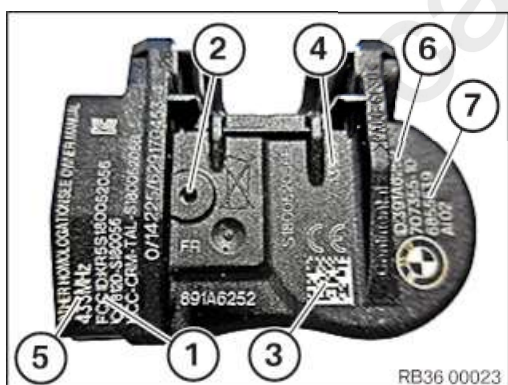
Do not treat wheel electronics with solvents, cleaning agents etc. If dirt contamination, wipe with a clean cloth only.

Do not clean wheel electronics with compressed air.

When tyre sealant is used, the installed wheel electronics must necessarily be replaced.

**Necessary preliminary tasks:**

- Remove tyre

**Labelling of wheel electronics (RDCi)**

1. FCC ID = radio authorisation
2. Pressure sensor
3. Data Matrixcode
4. Production date of wheel electronics
5. Transmission frequency
6. Wheel electronics ID
7. BMW part number

*Note:*

The following graphics only show removal and refitting of the RDCi wheel electronics.



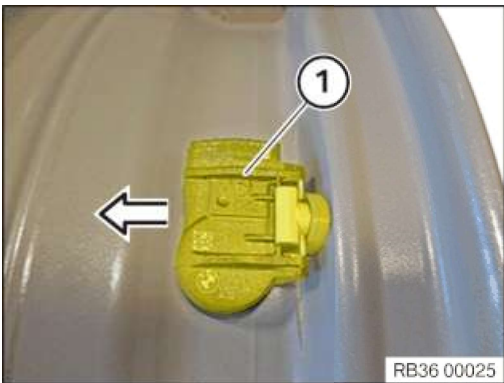


Removal:

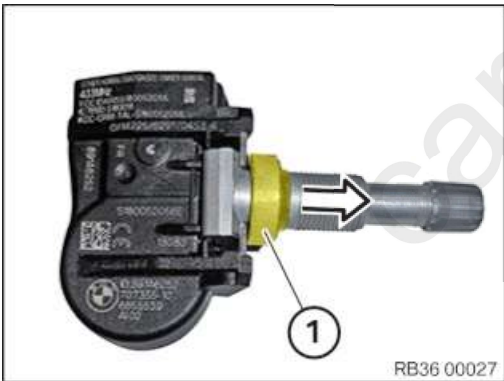


Removing wheel electronics

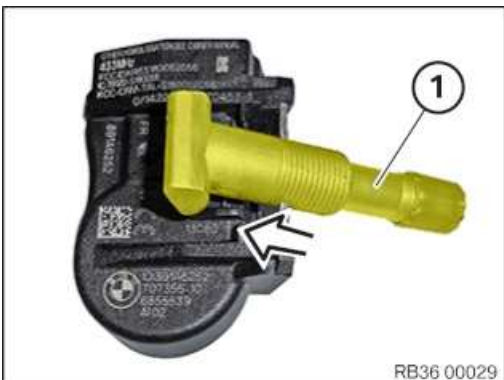
Release union nut (1).



Remove wheel electronics and valve (1) from valve hole.



Detach sealing ring (1) in the direction of the arrow.



Feed valve insert (1) in the direction of the arrow out of wheel electronics.





Installation:



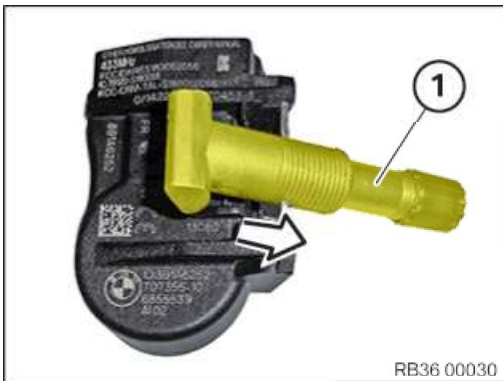
Attention!

The valve must be renewed!

Failure to replace the part leads to leaks!

Before the installation of new wheel electronics with valve, thoroughly clean the valve bore of the wheel rim!

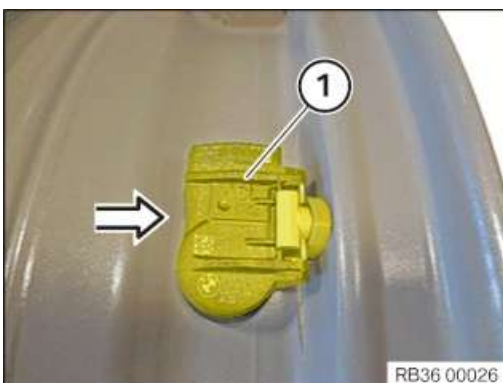
Also make sure that the valve bore has been deburred.



Insert valve insert (1) in the direction of the arrow into wheel electronics.



Fit sealing ring (1) in the direction of the arrow.



Insert valve insert with wheel electronics (1) into cleaned valve bore.
Both outer feet on the underside of the wheel electronics module must be resting against the rim wall.





Screw on union nut (1) by hand as far as it will go.

Tighten union nut (1).

Tightening torque 36 11 3AZ.

Attention!

Fixing must not under any circumstances be retightened!

The wheel electronics should still be resting evenly against the wheel rim after tightening.



Required follow-up work:

- Fit tyre.

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General:

- The tyre size, manufacturer and tyre tread must be the same on one axle
- To meet the BMW standards, the vehicle should be equipped with tyres from the same manufacturer and with the same tyre tread (tyres approved by BMW) on all 4 wheels
- The difference in tyre tread depth on one axle must not exceed 2 mm (control quality of suspension control systems and wheel alignment requirement)
- The tyres with the higher tread depths must be mounted on the rear axle
- The DOT age difference must not exceed 4 years
- The tyre pressure must be adjusted when the tyres are exchanged
- Wheel exchange between the axles

The wheels may be exchanged between axles to achieve even abrasion. However, BMW does **not recommend** switching the front wheels to the rear or vice-versa.

The wheel exchange may lead to the following customer complaints:

- complaints regarding acoustics
- Risk of increased lane groove sensitivity

Compliance with the following requirements is required when exchanging wheels between the axles:

- Assess the wear pattern
- The tread difference between the front and rear wheels must not exceed a maximum of 2-3 mm
- Exchange the wheels between the axles every **5000 Km**

Additionally for all-wheel drive vehicles:

- The tyre size, manufacturer and tyre tread must be identical on all wheels; different tyre sizes between front and rear axles are only permissible if mixed tyres are fitted.
- The tyre tread difference between tyres in all wheel positions must not exceed **2 mm** (normal quality of the wheel control systems and wheel alignment requirement)



**Note:**

Follow the tyre fitting machine manufacturer's operating instructions.

It is absolutely essential to ensure that the equipment is in proper working condition and that there is no damage to the disc wheel and tyre.

Balance wheels after completing work.

UHP tyre = Ultra High Performance tyre

UHP tyres are tyres with an aspect ratio (H:B) $\leq 45\%$ or tyres with a speed index $\geq "V"$.

**Attention!**

For installation and removal work on run-flat tyres and/or UHP tyres on certified and approved tyre fitting machines, the following successful training for the "Certified BMW tyre fitter" is required. (See BMW training programme)

For the installation run-flat tyres and/or UHP tyres, only tyre fitting machines approved and certified by WDK (Wirtschaftsverband der deutschen Kautschukindustrie) (German rubber industry) may be used.

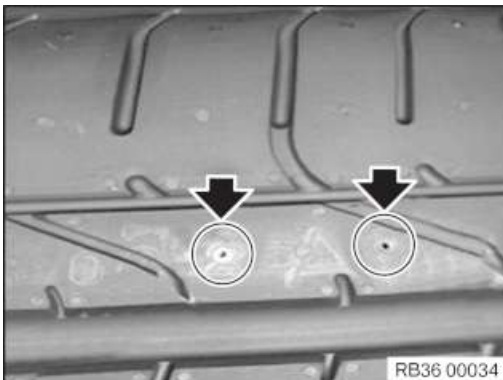
Please refer to the operating instructions of the respective tyre fitting machine for details of the exact fitting procedure.

Use only BMW-approved plastic-covered mounting levers!

Use only BMW-approved tyre-fitting paste.

For approved wheel and tyre combinations, tyre makes and optional equipment, refer to KSD CD.

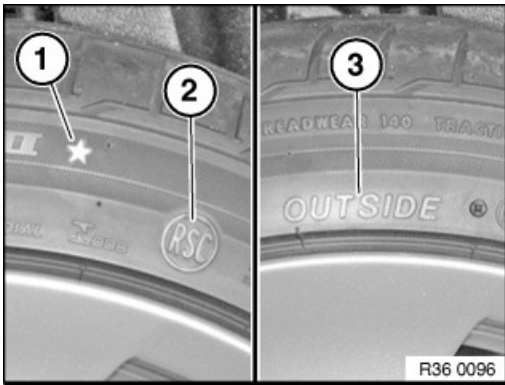
When tyre sealant is used, the installed wheel electronics must necessarily be replaced.

**Attention!**

Pirelli tyres can happen to have two little holes in the tread pattern! These two holes are production-related!

The presence of these two little holes in the tread pattern does not represent a fault and does not affect the performance and the efficiency of the tyres in any way!





Note:

Pay attention to different tyre markings:

- **Position (1)** identification of BMW-approved tyres. Make sure that only BMW approved tyres are fitted
- **Position (2)** RSC is the abbreviation for Run-flat System Component (run-flat tyres)
- **Position (3)** Outside means outer side. The tyre must be fitted so that the wording Outside is always situated on the outside of the rim

Attention!

Many tyres are directional!

The arrow on the tyre must point in the "Forward" direction of rotation!



Attention!

Before removal:

- Maintain tyre air temperature of approx. +23°C. Refer to Recommendation for heating.
- Clean wheel/tyre unit
- Remove valve insert (deflate tyre)
- Remove present balance weight



Observe before installation:

- Maintain tyre air temperature of approx. +23°C. Refer to Recommendation for heating
- Clean wheel/tyre
- Check wheel rim for burrs, wear and other damage
- Clean tyre beads and check for evidence of damage
- Check the wheel electronics for damage
- The aluminium screw valve must be renewed at the disassembly of the wheel electronics





Filling/inflating tyre:

Remove all fitting aids.

Attention!

Possibilities for safely mounting the wheel or incorporation in inflation apparatus should be utilised.

Observe instructions/conditions of trade association.

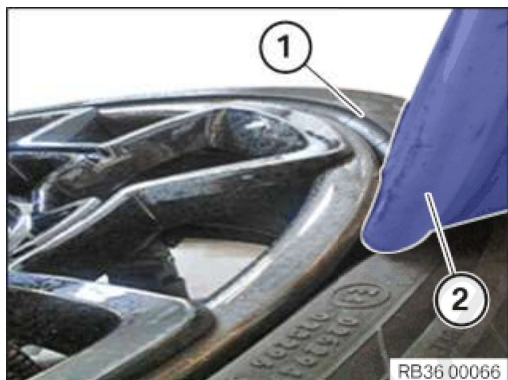
Observe national regulations!

Inflate with air (without valve insert).

- Increase pressure up to 3.3 bar in stages (fitting pressure).
- If the tyre bead does not slip fully past the rim edge all round, do not under any circumstance increase the pressure.
- If necessary, release air and force off tyre bead again.
- Coat rim flange and tyre again with tyre mounting paste.
- Inflate tyre again up to 3.3 bar.
- When tyre beads are resting perfectly on rim shoulders, increase tyre pressure to no more than 4.0 bar (settling pressure) to "settle" the tyre; in M vehicles, increase to no less than 4.0 and no more than 4.5 bar.

To achieve perfect embedding of the tyre into the wheel rim, the **settling pressure** (4 - 4.5 bar) must be maintained over a period of **at least 15 minutes**.

Screw in valve insert and correct the tyre pressure.



Optimise the tyre bead (1) fit on the inside and the outer side after inflating the tyre.

The tyre bead must lie flush against the wheel rim without air pockets. This optimises the smooth running of the tyre.

Gently press in the tyre sidewall and the wheel rim with the unseating roller (2).

Rotate the wheel, the air between the tyre and wheel rim escapes.

Balance the tyres.



Observe the information for the initialisation of the tyre pressure control (RDC). **Attention!**

Advise the customer to avoid heavy acceleration and heavy braking in the initial period.

The assembly paste can cause the tyre to turn on the wheel rim and give rise to imbalance.



General:

- The tyre size, manufacturer and tyre tread must be the same on one axle
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Compliance with the following requirements is required when exchanging wheels between the axles:

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- The tread difference between the front and rear wheels must not exceed a maximum of 2-3 mm
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Additionally for all-wheel drive vehicles:

- The tyre size, manufacturer and tyre tread must be identical on all wheels; different tyre sizes between front and rear axles are only permissible if mixed tyres are fitted.
- The tyre tread difference between tyres in all wheel positions must not exceed **2 mm** (normal quality of the wheel control systems and wheel alignment requirement)



36 10 ... Recommendation for heating tyres before removing or installing

Recommendation for heating cold tyres to minimum installation temperature +15 °C:

To ensure injury-free tyre fitting, in particular the upper side wall and the upper tyre bead must have a temperature of at least 15 °C on the inside.

To ensure easier tyre installation, a temperature of 20° to 25° C is recommended.

This internal temperature is called the core temperature.

Rubber is a poor conductor of heat. For this reason, a cold tyre must rest for a sufficient length of time in a warmed-up environment until the inner rubber layers have warmed up to at least 15 °C.

The surface temperature of the tyre during the warm-up phase is not a measure of the internal temperature!

The room temperature is normally measured and read off at eye level. At 19 °C at eye level the temperature on the floor is approx. 16 °C. In other words, do not lay tyres directly on a cold floor to warm up; instead, lay them at least on an insulating surface, such as a pallet, or even higher.

To ensure that cold tyres absorb the heat from the ambient air as quickly as possible, they should not be stacked but rather stored individually so that they are thoroughly "immersed" in the warm ambient air.

Do not under any circumstances place tyres in front of a radiant heater or a hot air blower as harmful surface temperatures are very quickly reached in this situation. Apart from heating with warm water or with warm air (max. 50°C, no hotter), there is no other way of heating a tyre without damaging the tyre.

If a cold tyre (under 0 °C) is introduced into a warm environment (over 0 °C), a layer of frost will form immediately on the tyre surface. This frost layer shows that the tyre is absorbing heat intensively from its surroundings through condensation of the moisture in the air. When the frost layer has melted, condensation water forms; dry off this water with a cloth so that the subsequent warming-up process is not slowed down by latent heat.

Summary:

Starting from a min. room temperature of 19°C:

- Tyres at initial temperature of 0 °C and higher: store for at least 2 hours
- Tyres at initial temperature below 0 °C: store for at least 2.5 hours

Recommendations for heating:

- Store on an insulating surface - a pallet or similar - at as high a level as possible
"Upper" bead facing upwards
- Position the tyres individually so that they are well "bathed" in the warm air..
- Wipe off condensation water
- Do not point heaters at tyres

