

36 12 ... Notes and specifications for tyre / wheel exchange

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 10 300 Remove or install front or rear wheel



WARNING

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

Danger! Life-threatening injuries!

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



TECHNICAL INFORMATION

Look out for different rim widths on M vehicles with winter tyres!

Different rim widths can be installed in the case of identical tyre sizes!

It is essential to ensure that the wider wheel rims are mounted solely on the rear axle!



TECHNICAL INFORMATION

During the installation of all four wheels (e.g. when changing from summer to winter wheels), the tyre pressure must be checked!

1 – Removing the wheel



TECHNICAL INFORMATION

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

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

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





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

2 – Mounting the wheel



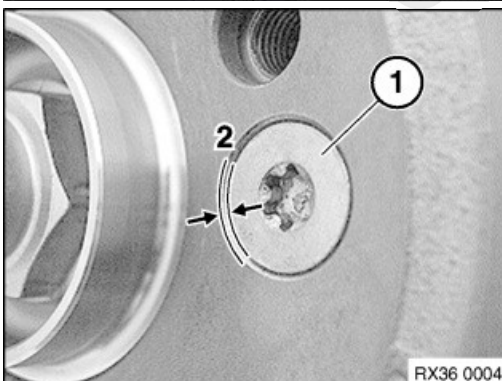
TECHNICAL INFORMATION

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

- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool [2 344 011](#).
Do not operate special tool [2 344 011](#) with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool [2 344 011](#).
Do not operate special tool [2 344 011](#) with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Check that the mounting bolt (1) for the brake disc is securely seated.
The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm





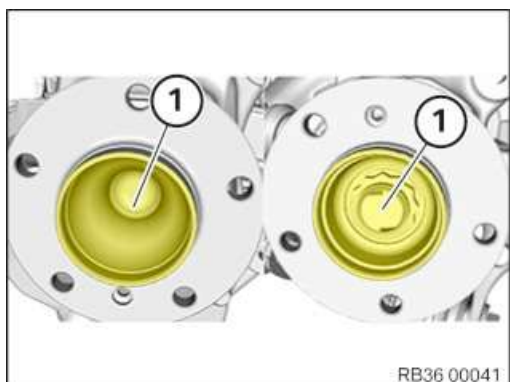
TECHNICAL INFORMATION

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

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

Expendable materials

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



TECHNICAL INFORMATION

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

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

Expendable materials

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



TECHNICAL INFORMATION

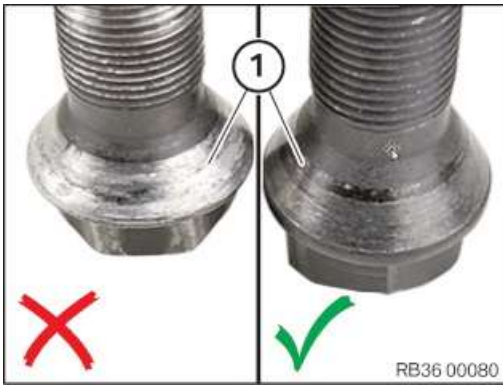
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

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

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

Check





- Check wheel bolts for wear.

Result

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

Measure

- Replace wheel bolts.

Parts: Wheel bolts



TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

Parts: Wheel bolts

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

Wheel bolts

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



3 – Resetting the Tyre Pressure Monitor



TECHNICAL INFORMATION

The Tyre Pressure Monitor checks the tyre inflation pressure in all 4 wheels.

Each tyre incorporates a wheel electronics module, which constantly monitors the tyre pressure.

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

The reset must be carried out in each case immediately after tyre pressure has been corrected, after tyres/wheels have been changed and after repairs to the air spring system.

Please refer to the corresponding motor vehicle's Owner's Handbook for details on the reset procedure.

- Reset the Tyre Pressure Monitor.

Additional Information

Overview of Tightening Torques

Brake disc to front wheel hub

Used in step 2

M8	Renew screw.	Tightening torque	16 Nm
----	--------------	-------------------	-------

Brake disc to rear wheel hub

Used in step 2

M8	Renew screw.	Tightening torque	16 Nm
----	--------------	-------------------	-------

Wheel bolts

Used in step 2

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

Overview of Special Tools

2 344 011 Tool



Common

Used in step 2

Usage Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.

Included in the tool or work

Storage location

Replaced by

In connection with

SI-Number 08 08 12 (872)



Replacement tools:
0 495 221 (36 1 323) Wheel stud



Common

Used in step 1

Usage (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259

Included in the tool or work 0 492 518

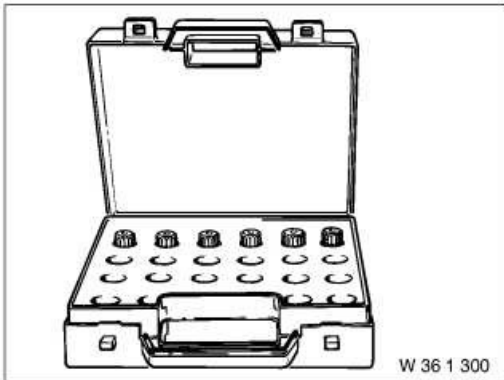
Storage location

Replaced by

In connection with

SI-Number

0 495 224 (36 1 326) Wheel stud



Common

Used in step 1

Usage (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546

Included in the tool or work 0 492 518

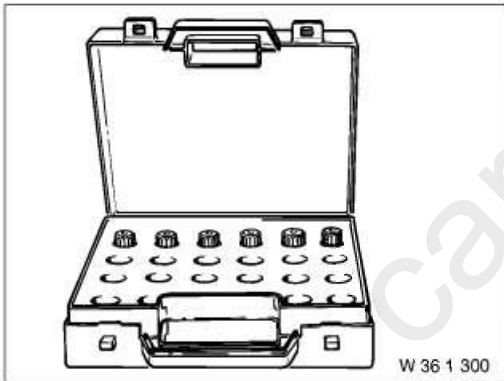
Storage location

Replaced by

In connection with

SI-Number

0 495 225 (36 1 327) Wheel stud



Common

Used in step 1

Usage (Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547

Included in the tool or work 0 492 518

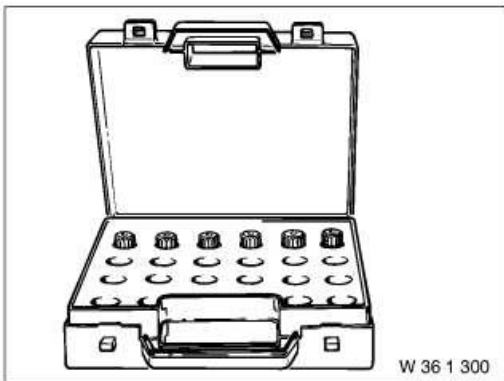
Storage location

Replaced by

In connection with

SI-Number

0 495 226 (36 1 328) Wheel stud



Common

Used in step 1

Usage (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340

Included in the tool or work 0 492 518

Storage location

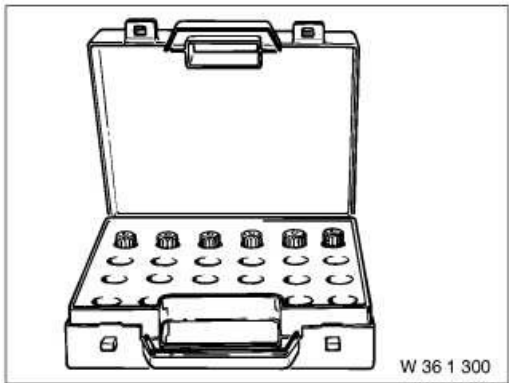
Replaced by

In connection with

SI-Number

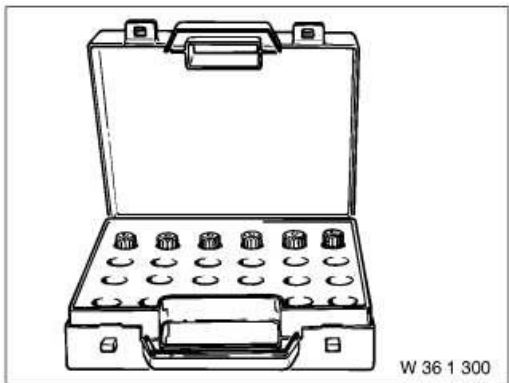


0 495 227 (36 1 329) Wheel stud



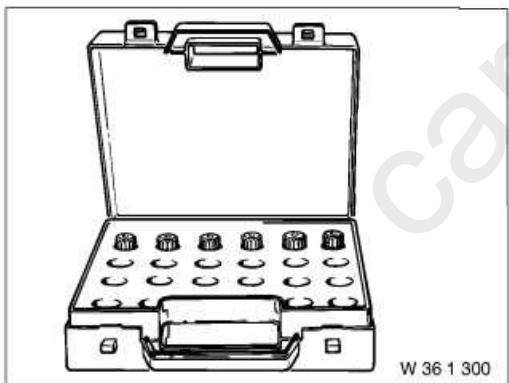
Common		Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341	
Included in the tool or work	0 492 518	
Storage location		
Replaced by		
In connection with		
SI-Number		

0 495 228 (36 1 331) Wheel stud



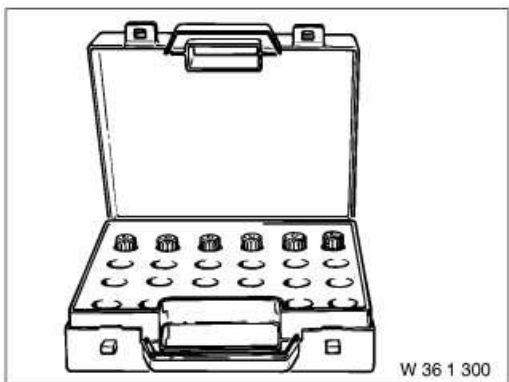
Common		Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342	
Included in the tool or work	0 492 518	
Storage location		
Replaced by		
In connection with		
SI-Number		

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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



Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	12

cardiagn.com



36 10 108 Stationary wheel balancing

Prerequisite

- Wheel removed.

PRELIMINARY WORK

1 – Prepare the wheel for balancing



TECHNICAL INFORMATION

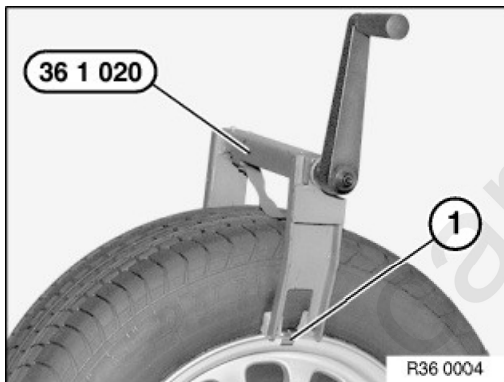
Use only balancing machines that are approved by BMW.

The corresponding Owner's Handbook must be observed.

- Remove any balancing weights, stones in the tyre tread and major soiling.
- Check the tyre pressure.
- Check tyres for damage.
- Check the wheel for radial runout and lateral runout.

MAIN WORK

2 – 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 .
- Insert retaining clip (1).
- Remove special tool .
- 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

2 451 684 Fitting aid



Common		Used in step 2
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)	



36 11 003 initialize Tyre Pressure Control

1 Resetting the Tyre Pressure Monitor



TECHNICAL INFORMATION

The Tyre Pressure Monitor checks the tyre inflation pressure in all 4 wheels.

Each tyre incorporates a wheel electronics module, which constantly monitors the tyre pressure.

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

The reset must be carried out in each case immediately after tyre pressure has been corrected, after tyres/wheels have been changed and after repairs to the air spring system.

Please refer to the corresponding motor vehicle's Owner's Handbook for details on the reset procedure.

- Reset the Tyre Pressure Monitor.

cardiagn.com



36 11 535 Removing and installing/replacing a wheel electronics tyre pressure control (RDC) (for work no.: 36 11 100) (tyre removed)

Prerequisite

- Tyre is dismounted from the wheel rim.



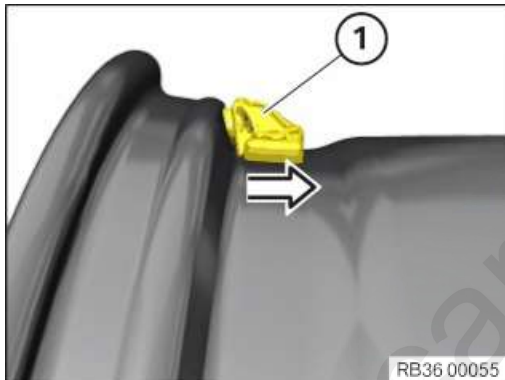
TECHNICAL INFORMATION

You should successfully complete the "RDC Tool" Web-based Training before working with the special tool (RDC Tool) for the first time. The "RDC Tool" Web-based Training must be started in your Learning Management System (TMSi) for this purpose.

1 – Removing wheel electronics



- Loosen union nut (1).



- Remove the wheel electronics with the valve insert (1) from the bore hole in the wheel rim.

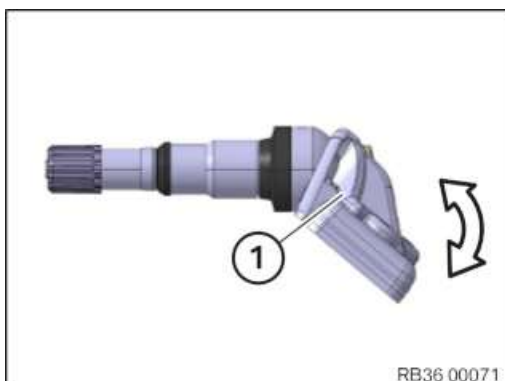
2 – Installing wheel electronics



TECHNICAL INFORMATION

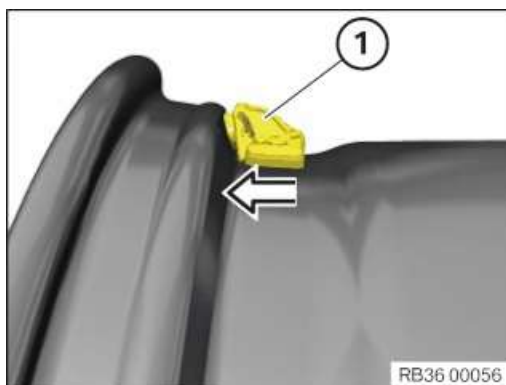
It is absolutely necessary to renew the tyre valve to prevent leaks.

Before installing the tyre valve: Clean the bore hole in the wheel rim thoroughly and deburr where required.



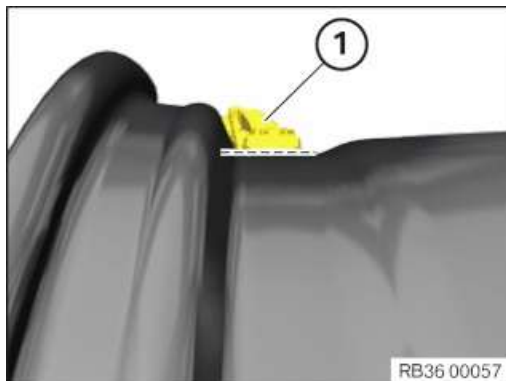
- Prior to installation, wheel electronics (1) must be released from the tight fitting at the valve so free movement over the entire angular range is ensured.





- Insert the valve insert with the wheel electronics (1) into the cleaned bore hole in the wheel rim.

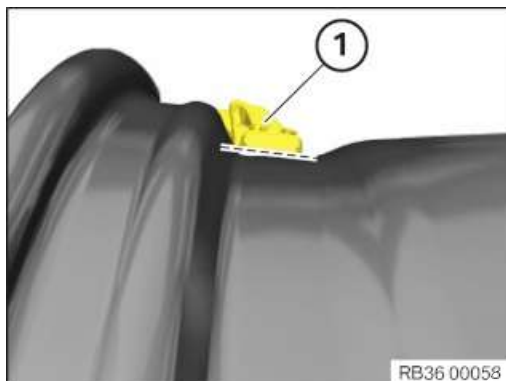
The wheel electronics must rest against the wheel rim.



- Make sure the wheel electronics (1) have the correct mounting orientation in the rim base.

The installation is OK if the wheel electronics (1) rests flat and parallel in the rim base.

The distance between wheel electronics and rim base must be a maximum of 2 mm.



- Make sure the wheel electronics (1) have the correct mounting orientation in the rim base.

The installation is OK if the rear edge of the wheel electronics (1) rests in the rim base.



- Renew the union nut (1).

Parts: Coupling nut

- Screw on the union nut (1) by hand until it abuts.
- Press the wheel electronics evenly into the rim base.
- Tighten union nut (1) until the inner strip-off ring breaks. Breakage must be noticeable and audible.

Then tighten union nut (1) to torque.

Tyre valve to wheel rim

Replace union nut. Tighten screw connection in one go. Do not retighten the screw connection.	Tightening torque	8 Nm
---	-------------------	------

- Make sure the wheel electronics rest evenly against the wheel rim after tightening.
- Mount the tyre on the rim.





- The broken strip-off ring (1) can protrude out of the union nut visibly after installation. This is normal and depends, among other things, on the rim wall thickness.

3 – Programming the tyre data (wheel electronics)



TECHNICAL INFORMATION

After replacing a tyre or a wheel electronics unit, it is necessary to reprogram the wheel electronics for the tyre!

As soon as the programmable wheel electronics units are depressurised for longer than 2 minutes (tyre removed) the tyre data record written on them is deleted.

The programmable wheel electronics units must be reprogrammed with the tyre data record from the QR code on the tyre sidewall using the special tool (RDC Tool).

Refer to the operating instructions for the special tool (RDC Tool) for the exact procedure.



- Scan the tyre data (QR code) on the tyre with the special tool [2 456 858](#).
- Program the tyre data on the wheel electronics (1) with the special tool [2 456 858](#).
- Adjust the tyre inflation pressure.
- Start the tyre recognition in the central information display (CID).

Additional Information

Overview of Tightening Torques

Tyre valve to wheel rim

Used in step 2

Replace union nut. Tighten screw connection in one go. Do not retighten the screw connection.	Tightening torque	8 Nm
---	-------------------	------

Overview of Special Tools



2 456 858 RDC Tool



Common

Used in step 3

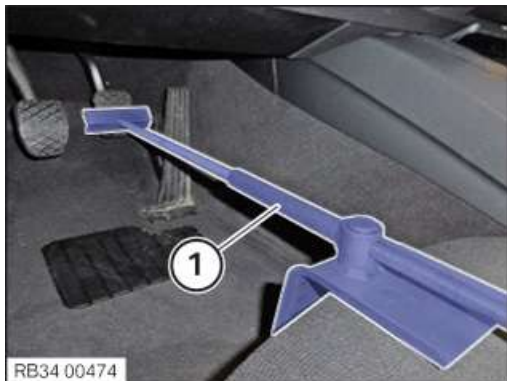
Usage	With the help of tyre pressure indicator tool, the tyre data (which is found on the tyre via a QR code) can be recorded and tyre pressure indicator sensors can be programmed.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	07 04 18 (584)



36 11 520 Replacing the RDC control unit

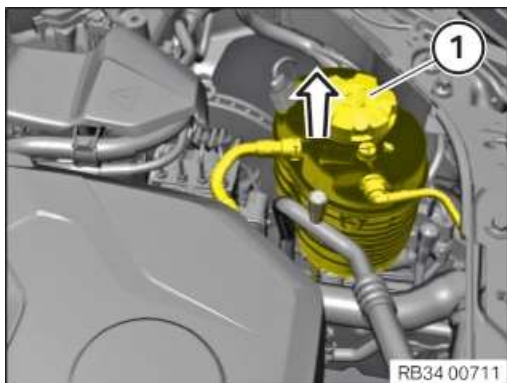
PRELIMINARY WORK

1 – Install brake pedal tensioner



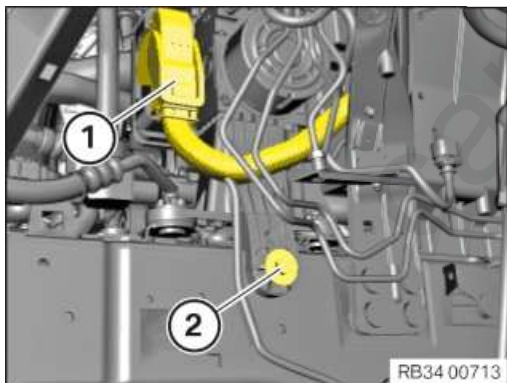
- Press the brake pedal to the floor and fix the brake pedal tensioner (1).
Do not release the brake pedal tensioner (1) until the brake lines have been reconnected. This prevents brake fluid from emerging from the expansion tank when the brake lines are opened.

2 – Detaching coolant expansion tank

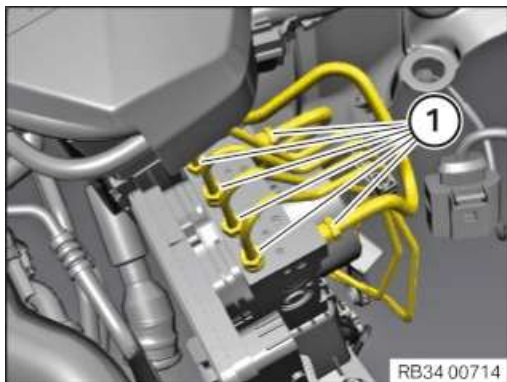


- Detach coolant expansion tank (1) from the top.
Coolant circuit remains closed.

3 – Remove hydraulic unit



- Disconnect plug connection (1).
- Loosen screw (2).



i

TECHNICAL INFORMATION

Do not interchange brake lines. If necessary, mark the brake lines before disassembly.

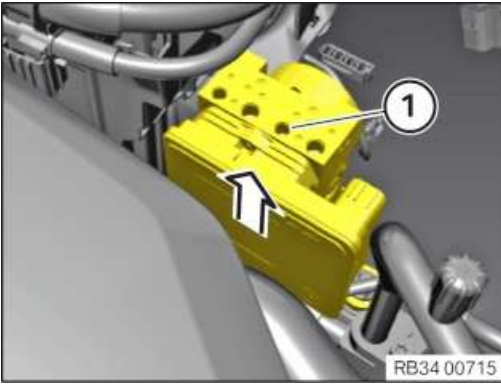
Note various equipment specifications with different line seizure.

Do not bend brake lines.

Close off connecting bores with seal plugs.

- (1)Unfasten brake lines.

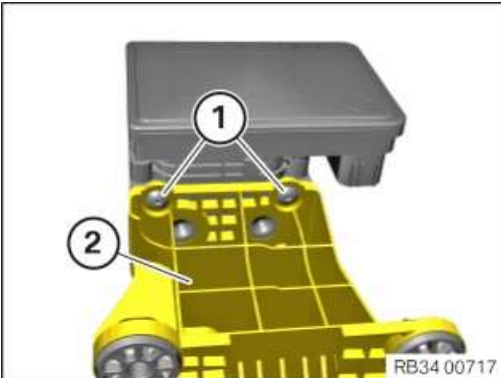




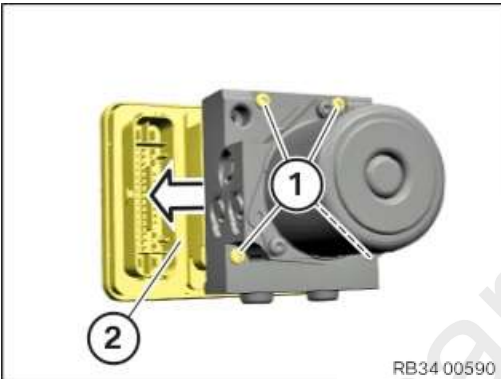
- Remove the hydraulic unit (1).

MAIN WORK

4 – Remove the DSC control unit



- Release screws (1) and remove the holder (2).



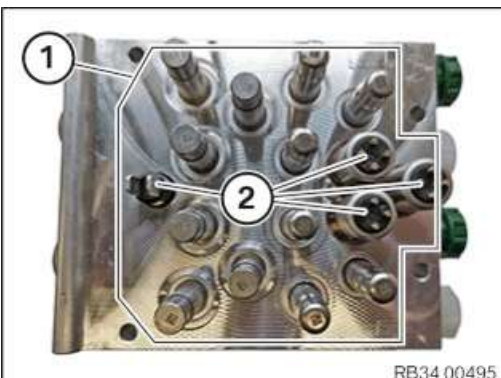
- Loosen screws (1).
 - Remove DSC control unit (2) carefully.
- When removing the DSC control unit, no contacts must be bent!

5 – Prepare for the installation of the DSC control unit



TECHNICAL INFORMATION

Maintain conditions of absolute cleanliness.



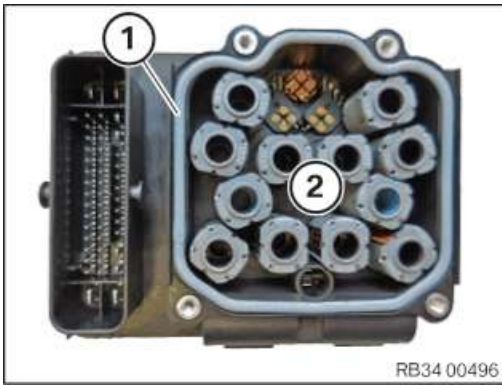
TECHNICAL INFORMATION

Do not clean the sealing surface with compressed air, chemical solvents or sharp-edged objects.

Do not touch or clean the pressure sensor contacts with your fingers.

- Clean the sealing surface (1) if necessary, with plastic scraper or a lint-free cloth.
- Ensure that the contacts (2) are not damaged.





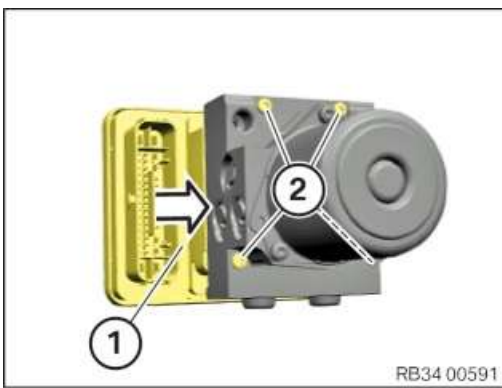
- For renewed use of the hydraulic unit (valve block), an add-on control unit repair kit is required.
The repair kit contains a new silicone seal (1) and bolts.
- Make sure that the valve coils (2) are not damaged.
Do not clean, readjust or touch the valve coils with your fingers.

6 – Install the DSC control unit



TECHNICAL INFORMATION

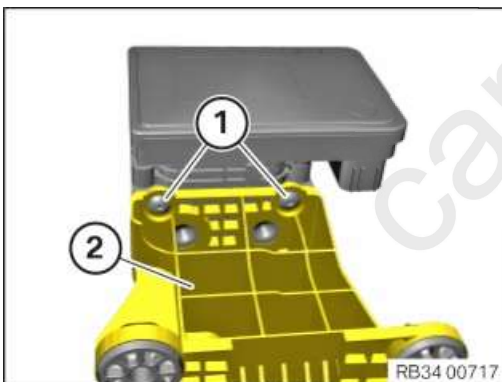
Maintain conditions of absolute cleanliness.



- Carefully connect the DSC control unit (1) to the hydraulic unit.
 - Renew screws(2).
- Parts:** Screws
- Tighten the screws (2) crosswise, step by step.

DSC control unit on hydraulic unit

Screw	Renew screws. <i>Screw in screws and evenly tighten crosswise.</i>	1. Tightening torque	1,5 Nm
		2. Tightening torque	2.5 Nm
		3. Tightening torque	3,5 Nm



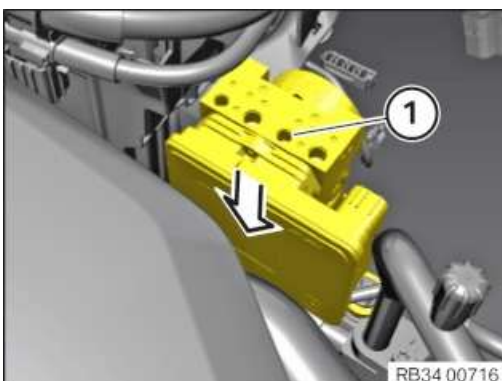
- Install holder (2).
 - Renew screws (1).
- Parts:** Screws
- Insert screws (1) and tighten.

Hydraulic control unit to holder

M6	Renew screws.	8 Nm
----	---------------	------

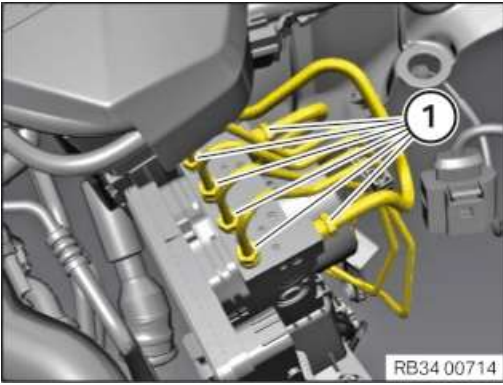
POSTPROCESSES

7 – Install hydraulic unit



- Position hydraulic unit (1).





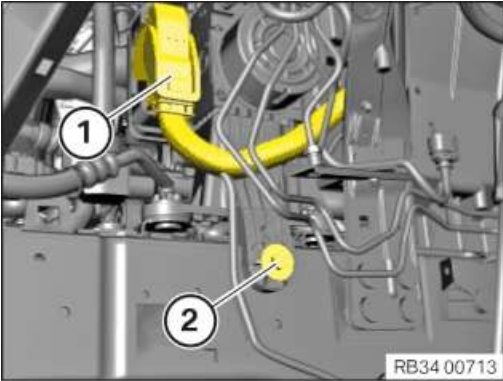
TECHNICAL INFORMATION

Do not interchange brake lines. If necessary, mark the brake lines before disassembly.
 Note various equipment specifications with different line seizure.
 Do not bend brake lines.
 Close off connecting bores with seal plugs.

- (1) Fit brake lines () and tighten.

Brake pipe screw connection / Union screws

	Tightening torque	17 Nm
--	-------------------	-------



- Connect connector (1).
- Renew the screw (2).

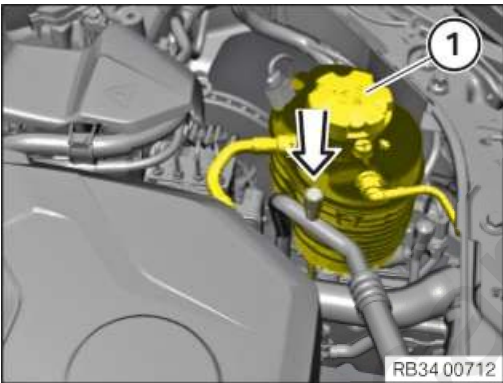
Parts: Screw.

- Position and tighten the screw (2).

Hydraulic unit with holder on body

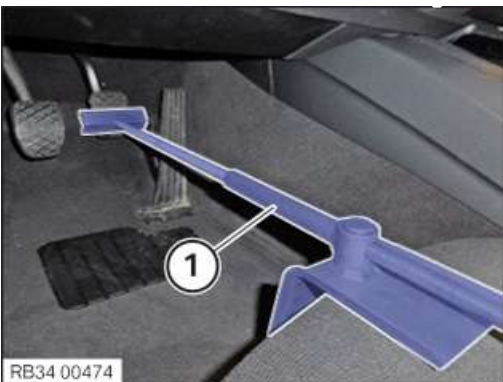
	Renew screws.	8 Nm
--	---------------	------

8 – Installing coolant expansion tank



- Clip coolant expansion tank (1) into the brackets.

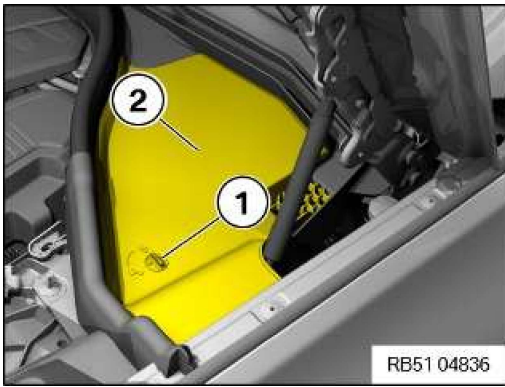
9 – Remove the brake pedal tensioner



- Remove the brake pedal tensioner (1).

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





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

11 – Connect bleeder unit for brake fluid



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



TECHNICAL INFORMATION

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



RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on. Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of 2 bar.**

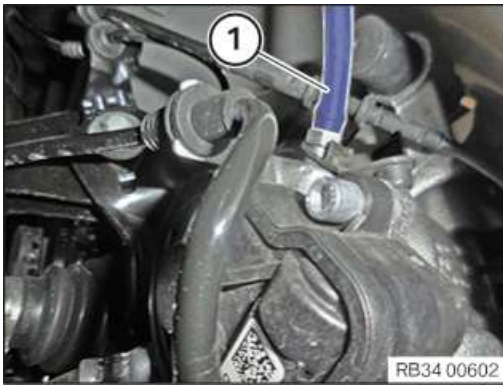
12 – Rinsing and bleeding the rear axle brake circuit



NOTICE

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





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

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

Vent valve		Tightening torque	10 Nm
------------	--	-------------------	-------

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

Vent valve		Tightening torque	17 Nm
------------	--	-------------------	-------

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

13 – Flushing and bleeding the front axle brake circuit



NOTICE

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



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

Vent valve

		Tightening torque	10 Nm
--	--	-------------------	-------

14 – Flush and bleed the front axle brake circuit (brake, high)



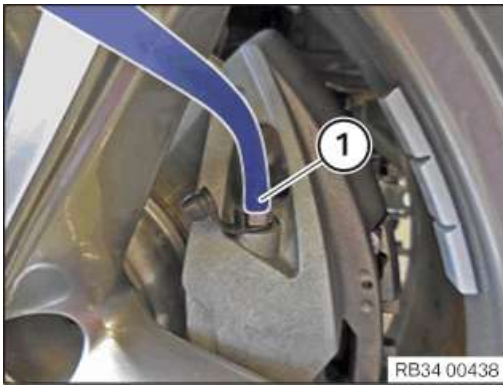
NOTICE

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



- Two fixed brake callipers are fitted!
- For both variants, first outer (1) must be bled. Then bleed inner (2).





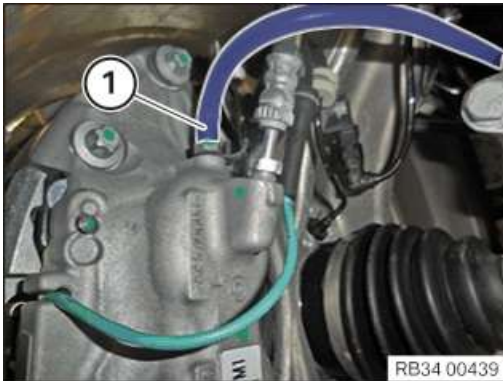
- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on the front right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm
------------	--	-------------------	-------

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm
------------	--	-------------------	-------



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

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm
------------	--	-------------------	-------

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm
------------	--	-------------------	-------

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

15 – Disconnecting the bleeder unit for brake fluid



RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.



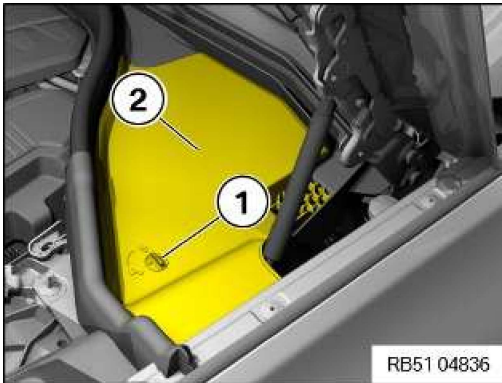
- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.





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

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



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

17 – DSC unit start-up/driving dynamics sensor adjustment/programming the control unit

► Encode/program control unit(s)

Prerequisite

Component has been replaced.



TECHNICAL INFORMATION

Use the most recent software version to prevent faults during programming/encoding.
The battery voltage must not fall below 13.0 V during programming.
Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.



TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.



- Connect the battery charger to the vehicle.
- Connect the programming system with the vehicle.
- Determine the action plan.
- Accept and fully process the measures plan.
- If applicable, connect the workshop system to the vehicle, depending on the reworking list.
- Carry out vehicle test.
- Delete the fault memory.
- The information about programming the workshop system and the corresponding notes in the user documentation must be observed.
- Wait until programming/encoding has been completed.
- Disconnect the programming system from the vehicle.
- Disconnect the battery charger from the vehicle.
- Connect diagnosis system:
 - Carry out the DSC unit start-up service function
 - Carry out the driving dynamics sensor adjustment service function
 - Perform the service function for the brake line mix-up test



Additional Information

Overview of Tightening Torques

DSC control unit on hydraulic unit

Used in step 6

Screw	Renew screws. <i>Screw in screws and evenly tighten crosswise.</i>	1. Tightening torque	1,5 Nm
		2. Tightening torque	2.5 Nm
		3. Tightening torque	3,5 Nm

Hydraulic control unit to holder

Used in step 6

M6	Renew screws.	8 Nm
----	---------------	------

Brake pipe screw connection / Union screws

Used in step 7

	Tightening torque	17 Nm
--	-------------------	-------

Hydraulic unit with holder on body

Used in step 7

	Renew screws.	8 Nm
--	---------------	------

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

Used in step 12

Vent valve	Tightening torque	10 Nm
------------	-------------------	-------

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

Used in step 12

Vent valve	Tightening torque	17 Nm
------------	-------------------	-------

Vent valve

Used in step 13

	Tightening torque	10 Nm
--	-------------------	-------

Front ventilation valve Brake calliper manufacturer Brembo

Used in step 14

Vent valve	Tightening torque	18 Nm
------------	-------------------	-------



Vent valve		Tightening torque	15 Nm
------------	--	-------------------	-------

cardiagn.com



36 12 ... Notes and specifications for tyre / wheel exchange

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 12 001 Replacing a tyre



TECHNICAL INFORMATION

You should successfully complete the "RDC Tool" Web-based Training before working with the special tool (RDC Tool) for the first time. The "RDC Tool" Web-based Training must be started in your Learning Management System (TMSi) for this purpose.



TECHNICAL INFORMATION

Note the following for the installation and disassembly of run-flat tyres and UHP tyres:

Only technicians that possess the "Certified BMW Tyre Technician" certificate are authorized to perform this work (see BMW Training Program).

Use only tyre fitting machines that are approved and certified by BMW.

Use only mounting levers with a plastic cover that are approved by BMW and only tyre-fitting paste products that are approved by BMW.

The procedure for the installation must follow and comply with the instructions in the Owner's Handbook for the tyre fitting machine.

If tyre sealant has been used, it is absolutely necessary that the installed wheel electronics and the valve are renewed.

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



TECHNICAL INFORMATION

Follow the Owner's Handbook provided by the manufacturer of the tyre fitting machine.

Use only tyre fitting machines that are in perfect condition to prevent damage to the wheel rim and/or the tyre.



TECHNICAL INFORMATION

The customer is to be informed that strong acceleration or strong braking should be avoided for the first time.

The assembly paste can cause the tyre to turn on the wheel rim and result in an imbalance.

PRELIMINARY WORK

1 – Prepare the tyres for disassembly

- Clean the wheel and tyre.
- Remove the valve insert.
This will bleed the tyre.
- Remove balance weights where required.



MAIN WORK

2 – Prepare the tyres for installation

- Clean the wheel and tyre.
- Check wheel rim for wear, damage and burrs.
- Clean the tyre beads and check for damage.
- Check the wheel electronics for damage and renew, if necessary.

The tyre valve must be renewed after the wheel electronics have been disassembled.

3 – Mount tyres

- **The procedure for mounting the tyre can be found in the operating instructions of the mounting machine manufacturer!**

POSTPROCESSES

4 – Fill/inflate tyre



- Remove all fitting aids.



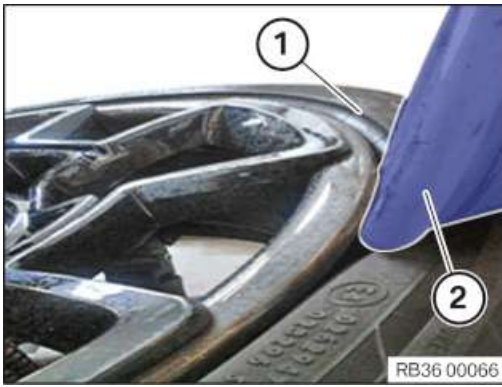
TECHNICAL INFORMATION

Observe country-specific regulations and the regulations of the trade associations.

- Use the options to mount the wheel securely: Place the wheel into a holding device.
- Inflate tyre with air (without valve insert).
- Increase the pressure up to 3.3 bar in stages (fitting pressure).
- Never increase the pressure further if the tyre bead does not slip all round rim flange.
- If necessary, release air and force off tyre bead again.
- Coat the rim flange and the tyres with tyre-fitting paste.
- Inflate the tyre up to 3.3 bar .
- Increase the tyre inflation pressure to a maximum setting pressure of 4.0 bar when the tyre bead rests properly on the rim flange:
- **Only M vehicles:** Increase tyre pressure to 4.0 to 4.5 bar setting pressure.
To achieve perfect embedding of the tyre in the rim, the tyre pressure of 4.0 to 4.5 bar must be maintained for a minimum period of 15 minutes .
- Screw in the valve insert and tighten it using special tool [2 456 828](#).
- Correct tyre pressure.

5 – Optimising the tyre bead fit





- 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).
- Turn the wheel.
The air between the tyre and wheel rim escapes.
- Balance the tyres.

6 – Programming the tyre data (wheel electronics)



TECHNICAL INFORMATION

After replacing a tyre or a wheel electronics unit, it is necessary to reprogram the wheel electronics for the tyre!

As soon as the programmable wheel electronics units are depressurised for longer than 2 minutes (tyre removed) the tyre data record written on them is deleted.

The programmable wheel electronics units must be reprogrammed with the tyre data record from the QR code on the tyre sidewall using the special tool (RDC Tool).

Refer to the operating instructions for the special tool (RDC Tool) for the exact procedure.



- Scan the tyre data (QR code) on the tyre with the special tool [2 456 858](#).
- Program the tyre data on the wheel electronics (1) with the special tool [2 456 858](#).
- Adjust the tyre inflation pressure.
- Start the tyre recognition in the central information display (CID).

Additional Information

Overview of Special Tools

2 456 828 Torque wrench



Common

Used in step 4

Usage	For tyre valve inserts and torque range of 0.45 Nm and tolerance range 0.23 to 0.56 Nm
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	07 03 17 (505)



2 456 858 RDC Tool



Common		Used in step	6
Usage	With the help of tyre pressure indicator tool, the tyre data (which is found on the tyre via a QR code) can be recorded and tyre pressure indicator sensors can be programmed.		
Included in the tool or work			
Storage location			
Replaced by			
In connection with			
SI-Number	07 04 18 (584)		

Links

Special tool service information	Used in step
Torque wrench	4



36 12 005 Replacing a tyre with run-flat technology



TECHNICAL INFORMATION

You should successfully complete the "RDC Tool" Web-based Training before working with the special tool (RDC Tool) for the first time. The "RDC Tool" Web-based Training must be started in your Learning Management System (TMSi) for this purpose.



TECHNICAL INFORMATION

Note the following for the installation and disassembly of run-flat tyres and UHP tyres:

Only technicians that possess the "Certified BMW Tyre Technician" certificate are authorized to perform this work (see BMW Training Program).

Use only tyre fitting machines that are approved and certified by BMW.

Use only mounting levers with a plastic cover that are approved by BMW and only tyre-fitting paste products that are approved by BMW.

The procedure for the installation must follow and comply with the instructions in the Owner's Handbook for the tyre fitting machine.

If tyre sealant has been used, it is absolutely necessary that the installed wheel electronics and the valve are renewed.

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



TECHNICAL INFORMATION

Follow the Owner's Handbook provided by the manufacturer of the tyre fitting machine.

Use only tyre fitting machines that are in perfect condition to prevent damage to the wheel rim and/or the tyre.



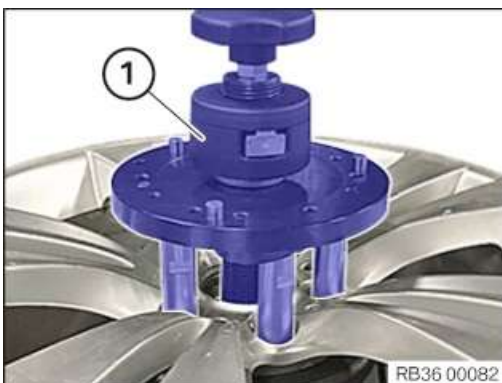
TECHNICAL INFORMATION

The customer is to be informed that strong acceleration or strong braking should be avoided for the first time.

The assembly paste can cause the tyre to turn on the wheel rim and result in an imbalance.

PRELIMINARY WORK

1 – Observe the notes on mounting run-flat tyres

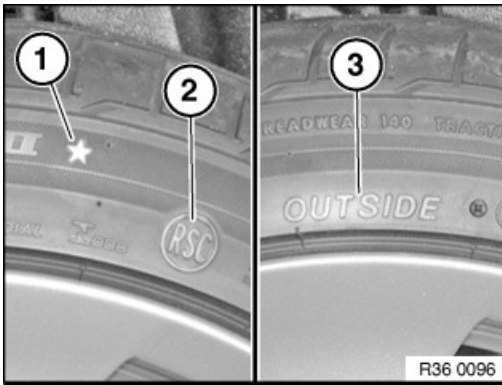


RISK OF DAMAGE

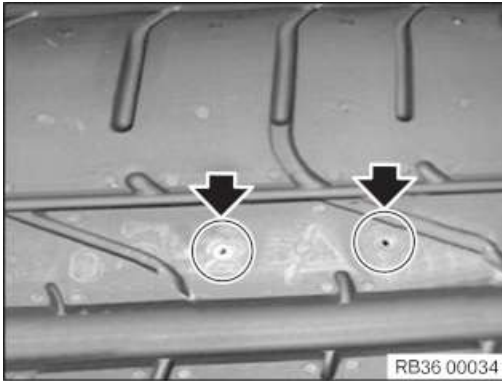
Damage to the wheel rim

- In order to avoid damage such as pressure marks/scratches on the wheel centering, it is recommended that the wheel rim is fixed to the tyre fitting machine with 5-hole clamping flange.
- Use the clamping flange according to the manufacturer's specifications (figure as an example).

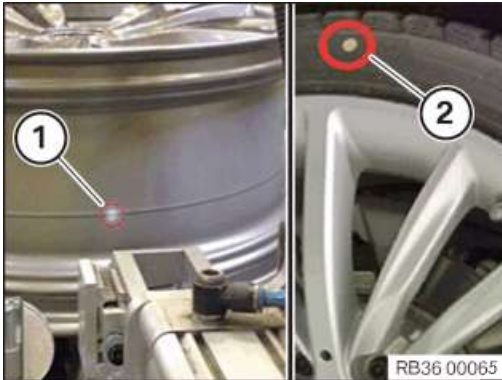




- Observe the following identifications of the tyres:
Star (1): Identification of BMW-approved tyres. Use only BMW-approved tyres.
RSC (2): Identification of run-flat tyres
OUTSIDE (3): Identification of the outer side of the tyre. The tyres must be mounted with the word OUTSIDE on the outer side of the wheel rim.
- Note that many tyres are directional.
The arrow on the tyre must point in the "Forward" direction of rotation.



- In case of Pirelli tyres, note:
Two small production-related holes (arrows) may be visible in the tyre tread.
The holes are not a defect. This does not impact the performance and efficiency of the tyres in any way.



i

TECHNICAL INFORMATION

If tyres on rims are fitted without a match point, it is possible for 'radial force fluctuations' to arise in an unfavourable position which will be felt by the driver at high speed in the form of vibrations.

Radial force fluctuations cannot be removed by balancing the wheel as a whole.

The vibrational effect can be reduced to a minimum using suitable tyre mounting and wheel balancing machines.

- If present, position the white dot (1) on the wheel rim in relation to the white dot (2) on the tyre.

2 – Preparing the tyres for disassembly

- Make sure that the tyre has a temperature of at least 23°C.
- Clean the wheel and tyre.
- Remove the valve insert.
The tyre is deflated.
- Remove balance weights where required.



MAIN WORK

3 – Prepare the tyres for installation

- Make sure that the tyre has a temperature of at least 23°C.
- Clean the wheel and tyre.
- Check wheel rim for wear, damage and burrs.
- Clean the tyre beads and check for damage.
- Check the wheel electronics for damage and renew where required.
The tyre valve must be renewed after the wheel electronics have been disassembled.

4 – Mount tyres

- **The procedure for mounting the tyre can be found in the operating instructions of the mounting machine manufacturer!**

POSTPROCESSES

5 – Fill/inflate tyre



- Remove all fitting aids.



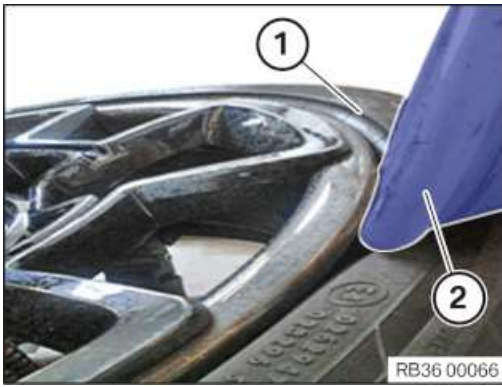
TECHNICAL INFORMATION

Observe country-specific regulations and the regulations of the trade associations.

- Use the options to mount the wheel securely: Place the wheel into a holding device.
- Inflate tyre with air (without valve insert).
- Increase the pressure up to 3.3 bar in stages (fitting pressure).
- Never increase the pressure further if the tyre bead does not slip all round rim flange.
- If necessary, release air and force off tyre bead again.
- Coat the rim flange and the tyres with tyre-fitting paste.
- Inflate the tyre up to 3.3 bar .
- Increase the tyre inflation pressure to a maximum setting pressure of 4.0 bar when the tyre bead rests properly on the rim flange:
- **Only M vehicles:** Increase tyre pressure to 4.0 to 4.5 bar setting pressure.
To achieve perfect embedding of the tyre in the rim, the tyre pressure of 4.0 to 4.5 bar must be maintained for a minimum period of 15 minutes .
- Screw in the valve insert and tighten it using special tool [2 456 828](#).
- Correct tyre pressure.

6 – Optimising the tyre bead fit





- 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).
- Turn the wheel.
The air between the tyre and wheel rim escapes.
- Balance the tyres.

7 – Programming the tyre data (wheel electronics)



TECHNICAL INFORMATION

After replacing a tyre or a wheel electronics unit, it is necessary to reprogram the wheel electronics for the tyre!

As soon as the programmable wheel electronics units are depressurised for longer than 2 minutes (tyre removed) the tyre data record written on them is deleted.

The programmable wheel electronics units must be reprogrammed with the tyre data record from the QR code on the tyre sidewall using the special tool (RDC Tool).

Refer to the operating instructions for the special tool (RDC Tool) for the exact procedure.



- Scan the tyre data (QR code) on the tyre with the special tool [2 456 858](#).
- Program the tyre data on the wheel electronics (1) with the special tool [2 456 858](#).
- Adjust the tyre inflation pressure.
- Start the tyre recognition in the central information display (CID).

Additional Information

Overview of Special Tools

2 456 828 Torque wrench



Common

Used in step 5

Usage	For tyre valve inserts and torque range of 0.45 Nm and tolerance range 0.23 to 0.56 Nm
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	07 03 17 (505)



2 456 858 RDC Tool



Common		Used in step	7
Usage	With the help of tyre pressure indicator tool, the tyre data (which is found on the tyre via a QR code) can be recorded and tyre pressure indicator sensors can be programmed.		
Included in the tool or work			
Storage location			
Replaced by			
In connection with			
SI-Number	07 04 18 (584)		

Links

Special tool service information	Used in step
Torque wrench	5



36 12 ... Notes and specifications for tyre / wheel exchange

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)

