

2007-08 SUSPENSION**Wheel And Tires - Repair Instructions - X5****10 WHEELS****36 10 209 CHECKING FRONT AND REAR WHEEL FOR FACE AND RADIAL RUNOUT****Special tools required:**

- 36 1 030

Necessary preliminary tasks:

- Check wheel bearings

Lift vehicle.

Check wheel with special tool 36 1 030 (measuring fixture) for lateral runout.

If applicable, remove balance weights.

Check lateral runout of rim with special tool 36 1 030 (measuring fixture).

Check radial runout of rim with special tool 36 1 030 (measuring fixture).

36 10 300 REMOVING OR INSTALLING FRONT OR REAR WHEEL**Special tools required:**

- 36 1 120
- 36 1 250
- 36 1 300

IMPORTANT: Wheel was balanced electronically.

Observe safety instructions on raising the vehicle. See **00 MAINTENANCE AND GENERAL INFORMATION** .

Follow instructions on initializing Run Flat Indicator (RPA). See **36 11 500 INITIALIZING RUN FLAT INDICATOR (RPA)**.

Observe the following procedure to prevent shift errors and imbalance:

- Loosen wheel bolts.

- Wheel positioned with valve facing down.
- If several wheels are removed simultaneously, mark the installation locations of the wheels on the tires (e.g. with chalk).
- Mark out wheel to wheel hub.
- Mark out lockable wheel bolt in relation to wheel.
- Release wheel bolts, remove wheel.

IMPORTANT: Contact surfaces between:

- **brake disk and disk wheel,**
- **brake disk and wheel hub,**

must be free from grease.

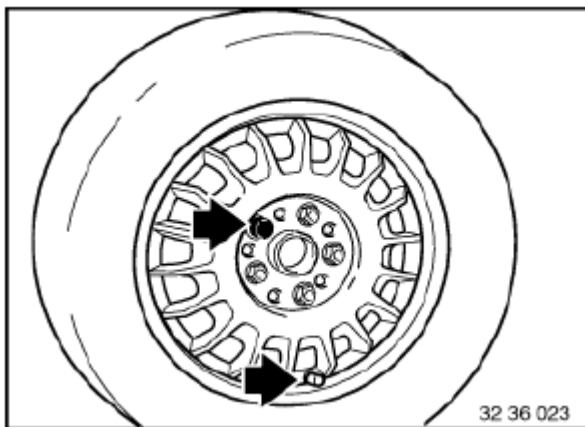


Fig. 1: Locating Wheel Bolts

Courtesy of BMW OF NORTH AMERICA, INC.

Remove dirt, grease residues and corrosion from contact face (1) with a drill and special tool 36 1 250.

IMPORTANT: Do not operate special tool 36 1 250 with an impact screwdriver!

NOTE: Degrease contact face with universal cleaner.

NOTE: If there are grease residues in the area of the wheel stud bore, the brake disk must be removed and cleaned.

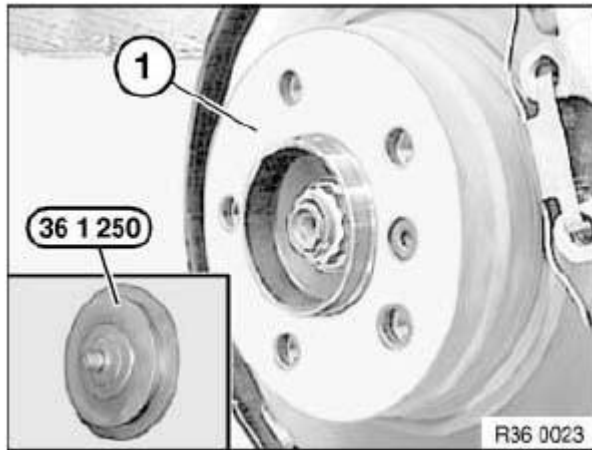


Fig. 2: Identifying Special Tool (36 1 250)
Courtesy of BMW OF NORTH AMERICA, INC.

Remove dirt, grease residues and corrosion from contact face (1) with a drill and special tool 36 1 250 .

IMPORTANT: Do not operate special tool 36 1 250 with an impact screwdriver!

NOTE: Degrease contact face with universal cleaner.

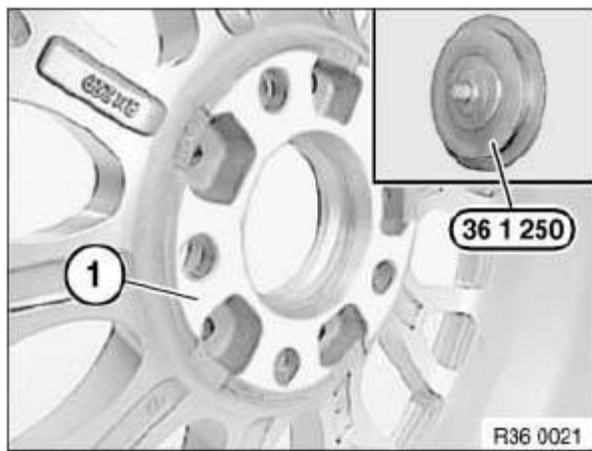


Fig. 3: Identifying Special Tool (36 1 250)
Courtesy of BMW OF NORTH AMERICA, INC.

Check brake disk retaining bolt (1) for secure seating.

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

Tightening torque brake disk retaining bolt:

Front axle 34 11 1AZ. See **WHEEL AND TIRES - TIGHTENING TORQUES** .

Rear axle 34 21 1AZ. See **WHEEL AND TIRES - TIGHTENING TORQUES** .

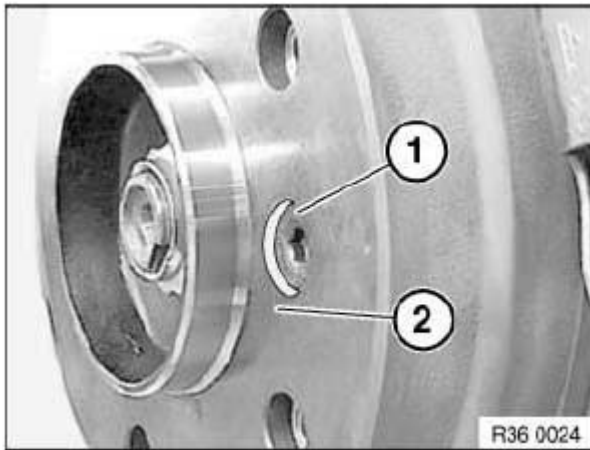


Fig. 4: Identifying Brake Disk Retaining Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

Apply a thin coat of grease to wheel centering (1) in disk wheel.

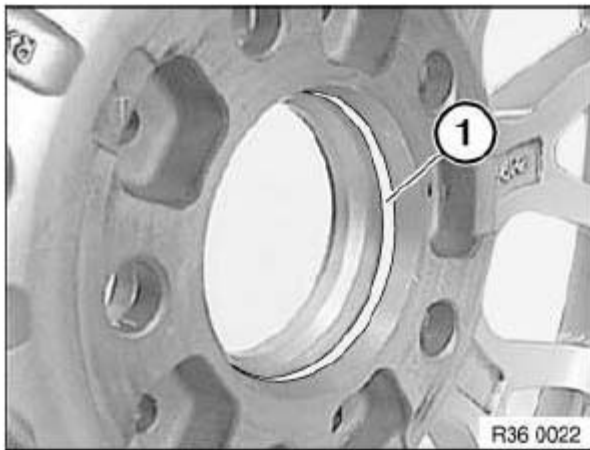


Fig. 5: Identifying Wheel Centering
Courtesy of BMW OF NORTH AMERICA, INC.

Wheel studs with taper:

- a. Wheel bolt - galvanized
- b. Wheel bolt - black chrome plated
- c. Wheel bolt - black chrome plated and lockable
- d. Lockable wheel stud with adapter, black chrome-plated

NOTE: To release and tighten down lockable wheel stud, use a matching adapter from special tool 36 1 300 .

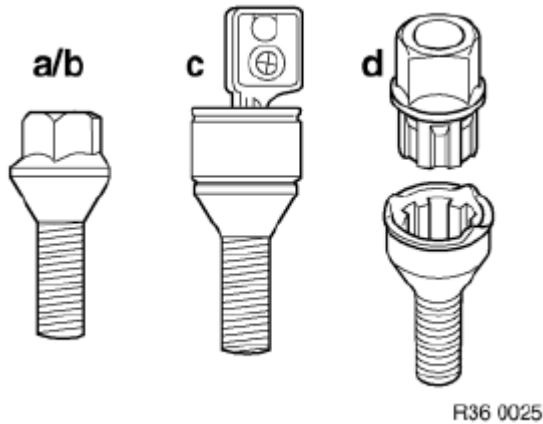


Fig. 6: Identifying Wheel Bolts

Courtesy of BMW OF NORTH AMERICA, INC.

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

Replace rusty wheel bolts.

IMPORTANT: Do not apply oil to new wheel bolts.

Apply a thin coating of engine oil to threads and tapers of used wheel studs before insertion.

IMPORTANT: Under no circumstances use pneumatic or power screwdrivers to install and tighten the wheel bolts.

Screw in wheel studs and, to center disk wheel, tighten down by hand diagonally and evenly.

Using torque wrench, firmly tighten wheel studs in diagonal and even sequence.

Tightening torque 36 10 1AZ. See **WHEEL AND TIRES - TIGHTENING TORQUES** .

IMPORTANT: Disk wheel must rest uniformly against brake disk.

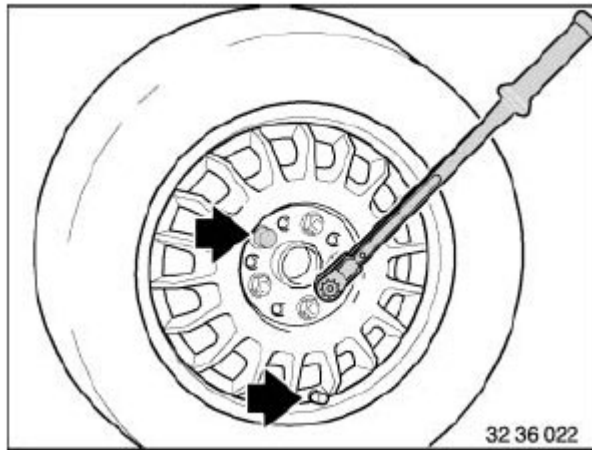


Fig. 7: Tightening Wheel Studs Using Torque Wrench
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: For wheels with Styling 90 wheel cover.
 The wheel cover can be removed for cleaning and removal of foreign objects.

Fit special tool 36 1 120 (3) as shown on rim (1) (near valve).

Engage removal fork of special tool 36 1 120 (3) in wheel cover (2).

Pull off wheel cover (2) with handle of special tool 36 1 120 (3).

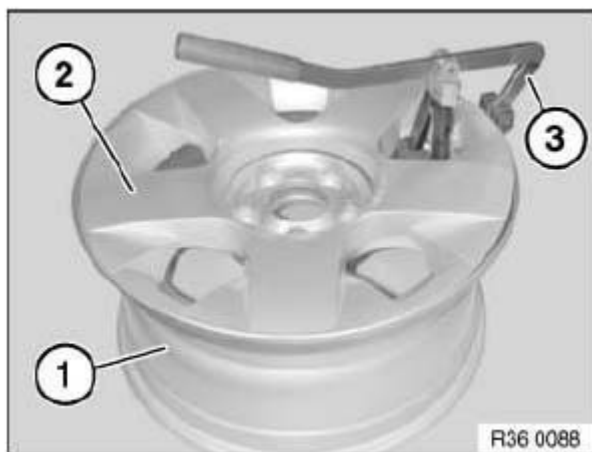


Fig. 8: Fitting Special Tool On Rim
 Courtesy of BMW OF NORTH AMERICA, INC.

36 10 508 STATIONARY WHEEL BALANCING

Special tools required:

- 36 1 010
- 36 1 020

Necessary preliminary tasks:

- Remove wheel

IMPORTANT: Use only BMW-approved balance weights.

Remove any fitted balancing weights, stones in tread pattern and larger contaminants.

Check tire pressure, check tire for condition, damage, flat spots (out-of-round caused by e.g. stopping the car with hot tires); if necessary, check wheel and tire for radial and lateral runout.

Use BMW-approved centering elements of relevant balancing machine manufacturers.

1. Basic flange
2. Wheel centering element
3. Type flange
4. Clamping 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 tire side wall with special tool 36 1 020 at appropriate point from rim flange.
2. Install retaining clip (1).
3. Remove special tool 36 1 020.

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.

Max. 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.

IMPORTANT: On the E87 with 16" tires, do not use stick-on weights; use only clamp-on weights instead.

36 10 713 CHECKING ONE ROAD WHEEL ON BALANCING MACHINE FOR FACE 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 retooling errors, fit the wheel on the balancing machine in the same way as it is also fitted on the car (valve position facing down).

Use suitable wheel centering element supplied with corresponding balancing machine.

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

Also refer to section on Workshop Equipment.

Use special tool 36 1 030 for testing.

Special tool 36 1 030 consists of:

1. Stand 36 1 031

2. Post with clamp 36 1 032
3. Holder with clamp 36 1 033
4. Clamp 36 1 034
5. Measuring roller 36 1 035
6. Dial gauge 36 1 036

Position special tool 36 1 030 on tire tread.

Turn wheel by hand and measure max. radial tire runout.

NOTE: **Measuring device must be vertical to tire tread.**

Position special tool 36 1 030 on tire side wall.

Never measure on printed text on tire!

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

36 10 715 CHECKING RIM FOR FACE AND RADIAL RUNOUT

Necessary preliminary tasks:

- Remove wheel
- Checking front and rear wheel for face and radial runout
- Pull tire off rim
- Remove fitted balance weights
- Remove dirt from rim well and rim flange

IMPORTANT: Disk wheels must not be repaired!

Mount disk wheel in balancing machine.

Use suitable wheel centering element supplied with corresponding balancing machine.

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

11 DISC WHEELS (RIMS)

Necessary preliminary tasks:

- Remove front left underbody panelling . See **51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING** .

Disconnect plug connection (1).

Gently press retaining tabs apart in direction of arrow and remove receiving antenna (2).

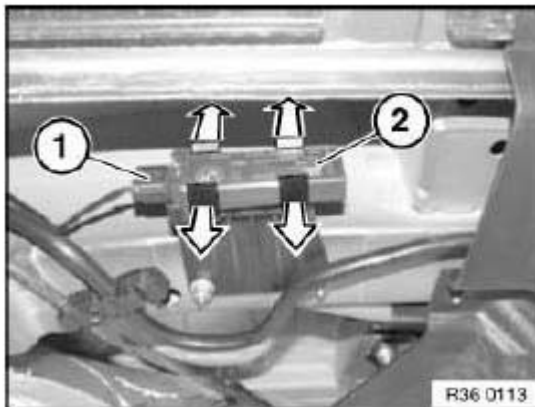


Fig. 9: Removing Receiving Antenna

Courtesy of BMW OF NORTH AMERICA, INC.

36 11 121 REMOVING AND INSTALLING/REPLACING AN RDC TRIGGER TRANSMITTER (FRONT)

Necessary preliminary tasks:

- Partially detach front wheel arch trim . See **51 71 038 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (FRONT SECTION)** .

Disconnect plug connection (1).

Release plastic nuts (2) and remove trigger transmitter (3).

Installation:

If necessary, replace plastic nuts.

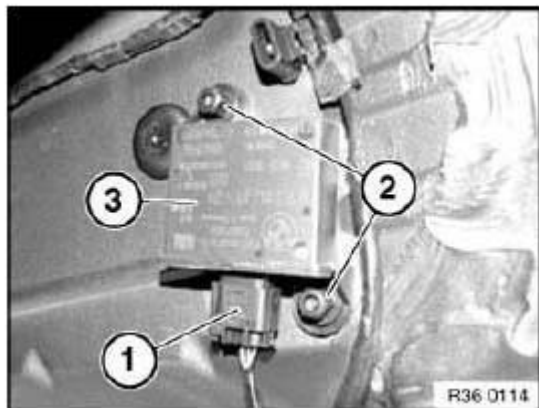


Fig. 10: Identifying Plastic Nuts And Trigger Transmitter
Courtesy of BMW OF NORTH AMERICA, INC.

36 11 500 INITIALIZING RUN FLAT INDICATOR (RPA)

NOTE: Checking the tire pressure is based on monitoring the speeds of the wheels in relation to each other. A tire puncture is detected and signalled by way of a deviation in specific speed ratios.
The four tires mounted on the vehicle are monitored while the vehicle is moving.
Initialization must be carried out in each case immediately after tire pressures have been corrected, after tires/wheels have been replaced and after repairs 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 Owner's Handbook for details of the initialization procedure.

36 11 503 RDC RESETTING

NOTE: RDC monitors the tire inflation pressure in the four wheels.
Each tire incorporates an electronic wheel circuit, which constantly monitors the tire inflation pressure.
The system signals when the inflation pressure drops in one or more tires.
Resetting must be carried out in each case immediately after tire pressures have been corrected, after tires/wheels have been replaced and after repairs to the air spring system.

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

36 11 523 REMOVING AND INSTALLING/REPLACING AN RDC TRIGGER TRANSMITTER (REAR)

Necessary preliminary tasks:

- Partially detach rear wheel arch trim . See **51 71 041 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT WHEEL ARCH COVER** .

Disconnect plug connection (1).

Gently press retaining tabs (2) apart in direction of arrow and remove trigger transmitter (3).

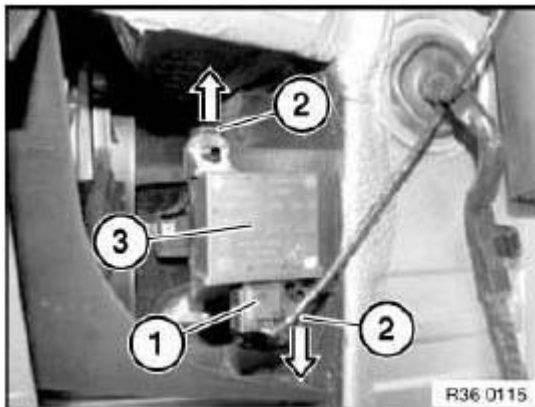


Fig. 11: Pressing Retaining Tabs

Courtesy of BMW OF NORTH AMERICA, INC.

36 11 533 REMOVING AND INSTALLING / REPLACING RDC WHEEL ELECTRONICS

Special tools required:

- 00 2 190

NOTE: If a tire sealant has been used, replace the wheel electronics.
 When a tire has been removed, do not clean the rim with installed wheel electronics with high-pressure cleaning equipment.
 Do not treat wheel electronics with solvents, cleaning agents etc. If dirty, wipe with a clean cloth only.
 Do not clean wheel electronics with compressed air.

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

Necessary preliminary tasks:

- Remove tire

1. Transmitting frequency of wheel electronics
2. Large Torx socket
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. Date of manufacture of wheel electronics

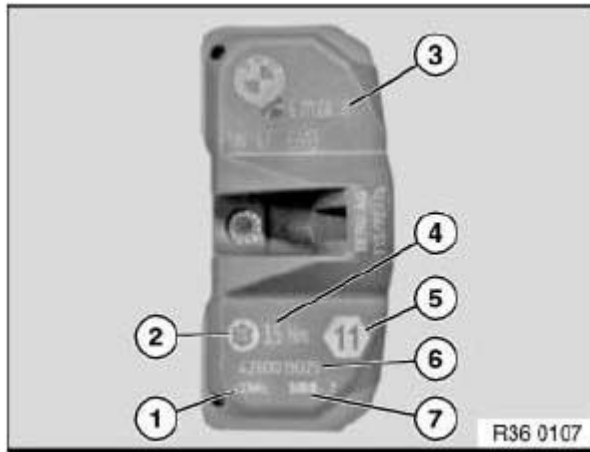


Fig. 12: Labelling Of Wheel Electronics

Courtesy of BMW OF NORTH AMERICA, INC.

Removing wheel electronics

Release Torx socket crew (1) and remove wheel electronics (2).

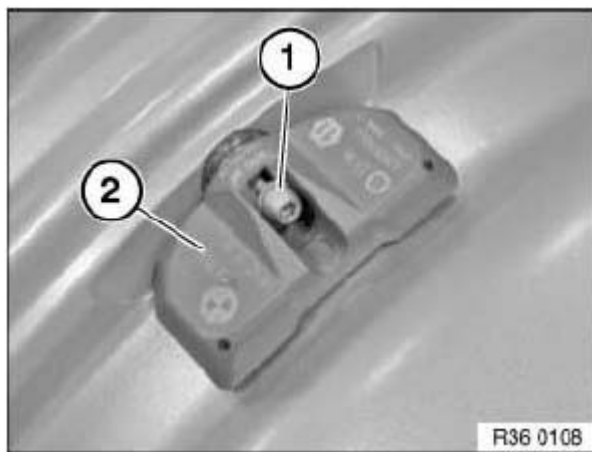


Fig. 13: Identifying Torx Socket Crew And Wheel Electronics

Courtesy of BMW OF NORTH AMERICA, INC.

Release union nut with special tool 00 2 190 ; if necessary, grip valve insert (1) at cylindrical section of ball head.

Remove valve insert from rim.

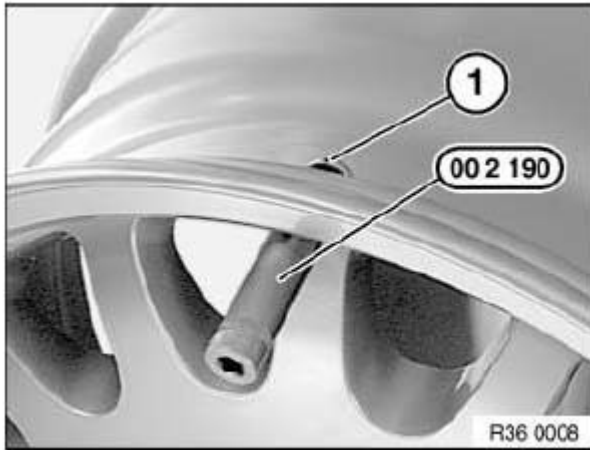


Fig. 14: Identifying Special Tool (00 2 190)
Courtesy of BMW OF NORTH AMERICA, INC.

Remove washer (1).

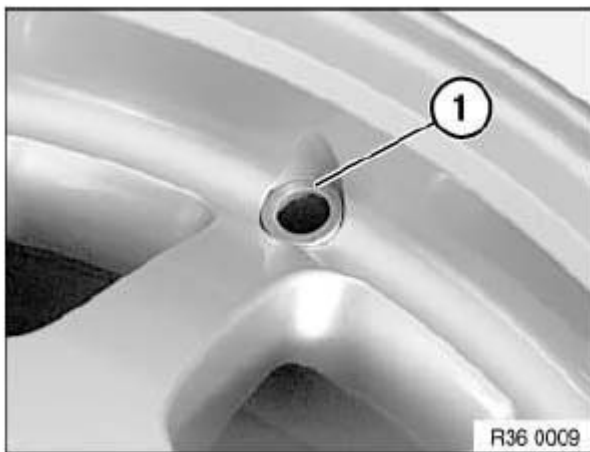


Fig. 15: Identifying Washer
Courtesy of BMW OF NORTH AMERICA, INC.

Installing wheel electronics

Insert new Torx socket screw (1) in wheel electronics (2) and secure firmly.

Twist new valve insert (3) by hand approx. 3 turns onto screw (1).

NOTE: Do not tighten screw; wheel electronics and valve insert must be loosely joined together.

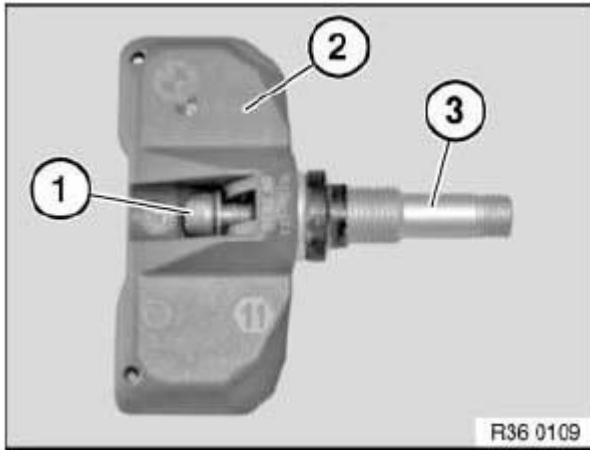


Fig. 16: Identifying Torx Socket Crew And Wheel Electronics
Courtesy of BMW OF NORTH AMERICA, INC.

Insert valve insert with wheel electronics into cleaned valve bore.

Here the radial bore (1) for gripping on the circumference of the valve insert ball head must point outwards.

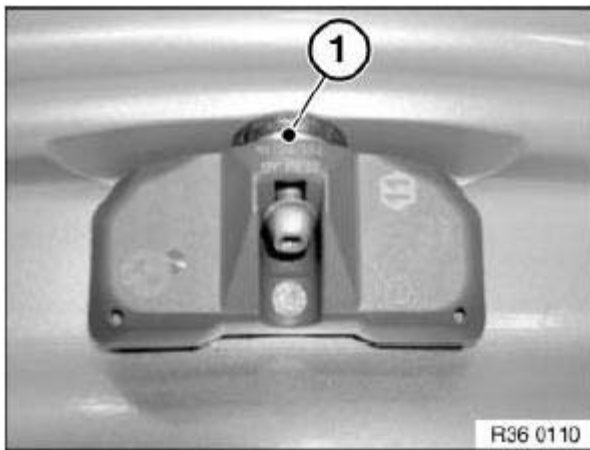


Fig. 17: Identifying Radial Bore
Courtesy of BMW OF NORTH AMERICA, INC.

Insert the brace (1) supplied with the valve into the valve insert bore.

Fit new washer and screw on new union nut (2) by hand as far as it will go.

Tighten down union nut (2) while using brace (1) to prevent valve insert from turning.

Installation:

Tightening torque 36 11 1AZ . See **WHEEL AND TIRES - TIGHTENING TORQUES** .

IMPORTANT: The screw connection must be tightened to the specified torque in one go!
Do not under any circumstances retighten the screw connection!
Remove brace, otherwise it may damage the tire.

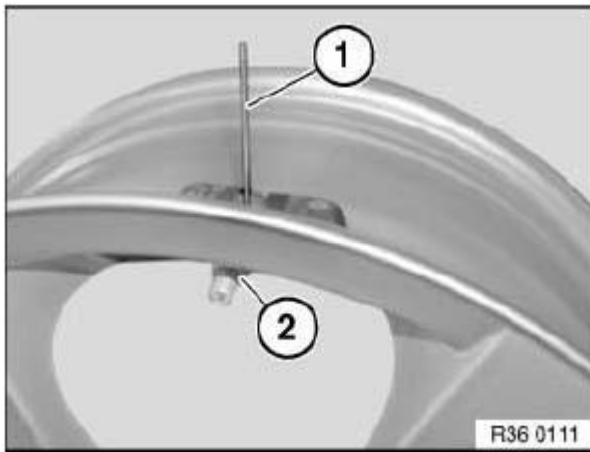


Fig. 18: Identifying Brace And Union Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Press wheel electronics gently into well base and tighten Torx socket screw (1).

Installation:

Tightening torque 36 11 2AZ . See **WHEEL AND TIRES - TIGHTENING TORQUES** .

IMPORTANT: The screw connection must be tightened to the specified torque in one go!
Do not under any circumstances retighten the screw connection!

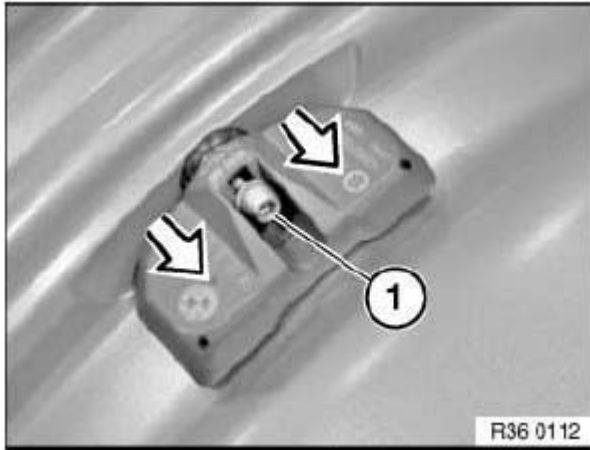


Fig. 19: Identifying Torx Socket Screw
 Courtesy of BMW OF NORTH AMERICA, INC.

12 TIRES

36 12 001 REPLACING A TIRE

Refer to the operating manual of the relevant fitting equipment manufacturer for details on how to fit the tire correctly. However, it is essential to make sure that the equipment is in proper working condition and there is no damage to the disc wheel or the tire.

NOTE: Comply with approved tires, tire sizes and optional extra. Follow instructions on initializing run flat indicator:

- Run flat indicator (RPA)

NOTE: Pay attention to different tire markings:

- Item (1) Marking denoting BMW-approved tires. Ensure that only BMW-approved tires are fitted.
- Item (2) RSC is the abbreviation for Runflat System Component (runflat tires).
- Item (3) Outside. The tire must be fitted so that the wording Outside is always situated on the outside of the rim.

IMPORTANT: Many tires are directional! The arrow on the tire must point in the direction of travel for each wheel!

Models with M Mobility system

If the tire was filled with the M-Mobility system after a puncture, it will be necessary before removal to drill an approx. 25 mm dia. hole in the side wall of the tire. Allow sealing compound to flow out through this bore and dispose of compound in compliance with environmental regulations. Clean disc wheel after removing tire.

Tire removal with a fitting machine:

Unscrew valve insert, discharge air, force off tire bead from rim flange with pressing-off horn of device on outside and inside.

If tire beads are stuck, first release the tire with the pressing-off horn at several points of the wheel before actually pressing off, apply tire mounting paste between tire and rim flange and press off the tires completely.

Pull off balance weights on rim and clean rim to remove large pieces of dirt.

Clamp wheel on mounting machine.

Narrow rim shoulder always faces upwards.

IMPORTANT: Vehicles with RDC:

To prevent the pressing-off horn from damaging the RDC wheel electronics, do not rest the pressing-off horn on both rim sides in the area of the valve.

Swing or fold mounting pillar into position and let it engage.

Adjust mounting head, pressing it on the rim edge fully, and turn down the lever for the clamp; normally the distance of the mounting head will set in automatically.

The valve should be approx. 15 cm to the right of the assembly head (so as to prevent the tire iron from damaging the wheel electronics).

Raise tire bead with tire iron over mounting finger.

NOTE: On aluminum rims, it is best to use a tire iron coated (either fully or partially) with shrink-on plastic tubing to prevent damage.

Let fitting machine run back a short distance (counterclockwise); tire bead will slip fully onto mounting finger.

Then let fitting machine run forward in stages (clockwise).

In so doing, always check whether the lower bead is fully resting in the well and allow the tire time to move.

If the bead clamps, stop the machine and let it run back slightly.

If the upper bead is pulled off the rim, also lift the bottom bead over the mounting finger with the tire iron.

Let machine run back a short distance again and then forward (clockwise) briefly until there is complete separation of the tire from the rim.

IMPORTANT: Vehicles with RDC: Tire bead must not press onto wheel electronics.

Release lock and tilt back or swing away mounting pillar.

Unclamp and clean rim.

Replace valve.

Coat rim flange and tire beads with mounting paste (refer to BMW Parts Service).

IMPORTANT: Vehicles with RDC: When the wheel electronics are installed, the rim must not be cleaned with high-pressure cleaning equipment. Visually inspect wheel electronics for external damage and check for tight fit; do not retighten screw and union nut. If one of the valve parts is loose, replace the entire valve. Keep wheel electronics free of tire mounting paste.

Clamp rim on fitting machine, valve must be located at 180° to mounting head.

Slide on tire with lower bead partially over rim flange.

Swing or tilt mounting pillar into position and lock.

Check adjustment of mounting finger, readjusting if necessary, and clamp.

Press tire under mounting finger by hand.

Tire bead should seat in rollers next to mounting finger.

Let fitting machine run forward (clockwise) a short distance.

Lower tire bead will drop into well.

IMPORTANT: Vehicles with RDC: Fit lower tire bead so that no pressure forces are exerted on wheel electronics.

Turn wheel again into fitting position so that valve is at 180° to mounting head.

Press upper tire bead under mounting finger. Tire bead should seat in rollers next to mounting finger.

IMPORTANT: Do not pinch or damage bead.

Operate fitting machine forwards (clockwise) little by little; while doing so, make sure the lower tire bead remains in the well.

IMPORTANT: Vehicles with RDC: Fit upper tire bead so that no pressure forces are exerted on wheel electronics.

IMPORTANT: Possibilities for safely securing the wheel or incorporation in inflation apparatus should be utilized! Observe national/country-specific regulations.

After mounting, first release clamps and then inflate tire (without valve).

Increase pressure up to 3.3 bar (330 kPa) in steps (jumping pressure).

If the tire bead does not slip on all round at the rim edge, do not increase pressure further but rather drain off air.

Press off tire bead again, coat rim flange again with tire mounting paste, refer to BMW Parts Service, and pump up again to 3.3 bar. When the beads are resting properly on the rim shoulders, increase inflation pressure to max. 4.0 bar to "settle" the tire.

Screw in valve insert and correct tire pressure.

36 12 005 REPLACING A RUNFLAT TIRE

Special tools required:

- 36 1 091
- 36 1 092
- 36 1 093
- 36 1 094
- 36 1 095
- 36 1 098

Follow the 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 tire.

After completion of work, balance wheels. Refer to

IMPORTANT: Only fitting machines which are approved for fitting runflat tires may be used! Please refer to the operating instructions of the respective fitting machine for details of the exact fitting procedure. Use only BMW-approved plastic-covered tire irons. Use only BMW-approved tire mounting paste. For approved wheel/tire combinations, tire makes and optional extras, refer to KSD CD.

NOTE: Pay attention to different tire markings:

- Item (1) Marking denoting BMW-approved tires. Ensure that only BMW-approved tires are fitted.
- Item (2) RSC is the abbreviation for Runflat System Component (runflat tires).
- Item (3) Outside. The tire must be fitted so that the wording Outside is always situated on the outside of

the rim.

IMPORTANT: Many tires are directional! The arrow on the tire must point in the direction of travel for each wheel!

Tire removal with a fitting machine:

IMPORTANT: Gap between unseating tool and rim flange must not exceed max. 2 cm. Do not position unseating tool in area of valve (damage to wheel pressure sensor). Turn wheel through 180° and position unseating tool on opposite side.

Pull off balance weights on rim and clean rim to remove large pieces of dirt.

Unscrew valve insert, release air.

If tire beads are stuck, first release the tire with the pressing-off horn at several points of the wheel before actually pressing off, applying tire mounting paste between the tire and the rim flange. Only then press off the tire completely.

Force off inner side of wheel, inserting special tool 36 1 098.

Force off outer side of wheel, applying a generous coating of tire mounting paste between rim flange and tire bead in so doing.

Grip wheel with outer side facing upwards on fitting machine.

Position special tool 36 1 094 and special tool 36 1 095.

Fit special tools 36 1 091 / 36 1 092 between tire bead and rim flange, move into position shown and lever tire bead over rim flange.

Secure special tools 36 1 091 / 36 1 092 with connecting cable of special tool 36 1 095.

Slide a second special tool 36 1 091 / 36 1 092 on right next to first special tool 36 1 091 / 36 1 092 between tire bead and rim flange.

Lever tire bead over rim flange.

Remove first special tool 36 1 091 / 36 1 092 and slide on right next to second special tool 36 1 091 / 36 1 092 between tire bead and rim flange and lever tire bead over rim flange.

Continue this procedure in clockwise direction until tire bead is resting fully over rim flange.

Swivel or tilt fitting head into position and allow it to snap into place.

Lever lower bead with tire iron over mounting finger.

Run fitting machine forwards clockwise until tire is completely detached from rim.

Release lock and tilt or swivel fitting head back.

Unclamp and clean rim.

Replace valve.

IMPORTANT: Coat wheel drop center, rim shoulders and rim flange with tire mounting paste.

Coat lower tire bead (1) on outside with plenty of tire mounting paste.

Coat upper tire bead (2) on inside and outside with plenty of tire mounting paste.

Mounting tires with a mounting machine:

Clamp rim on mounting machine.

Push tire with lower bead partially over rim flange.

Valve 10 cm to right of mounting head.

Swivel or tilt fitting head into position and lock into place.

Check fitting head setting, readjust and clamp down if necessary.

Press tire by hand under fitting head.

Make sure lower tire bead is correctly seated on fitting head.

Allow fitting machine to run forwards gradually in clockwise direction.

Lower tire bead will drop into well.

Position special tools 36 1 093 and 36 1 094 as shown on rim.

Make sure upper tire bead is correctly seated on fitting head.

Allow fitting machine to run forwards gradually in clockwise direction.

In so doing, position special tool 36 1 095 as shown on rim flange.

Allow fitting machine to continue running in clockwise direction. Upper tire bead jumps into the rim drop center.

IMPORTANT: Possibilities for safely securing the wheel or incorporation in inflation apparatus should be utilized! Observe national/country-specific regulations.

After completing fitting, first release clamping claws.

Inflate with air (without valve insert).

Increase pressure up to 3.3 bar (330 kPa) in stages (jumping pressure).

If the tire bead does not slip fully past the rim edge all round, do not under any circumstance increase the pressure.

Release air, force off tire bead again.

Coat rim flange with tire mounting paste again.

Inflate tire again up to 3.3 bar.

When tire beads are resting perfectly on rim shoulders, increase inflation pressure to max. 4.0 bar to "settle" tire.

Screw in valve insert and correct tire pressure.

After completion of work, balance wheels.

IMPORTANT: Advise the customer to avoid heavy acceleration in the initial period.

The mounting paste can cause the tire to turn on the rim and give rise to imbalance.

13 MOUNTING

36 13 SUBSEQUENT INSTALLATION OF WHEEL-BOLT LOCK

Loosen wheel bolts.

Raise car so that wheel can be turned freely.

Release wheel studs to such an extent that the wheel can move freely on the wheel hub.

Turn wheel so that valve is face down.

Remove top wheel stud and insert wheel stud lock.

Possible play in wheel center and wheel weight could cause imbalance.

This imbalance is reduced to a minimum by installing the somewhat heavier wheel-bolt lock in the top wheel-bolt position.

In this position - wheel stud lock at top, valve at bottom - tighten wheel studs hand-tight in diagonal sequence.

Lower car and tighten wheel bolts crosswise. Tightening torque. See **WHEEL AND TIRES - TIGHTENING TORQUES** .