32 00 601 Adjusting toe-in on front axle

TECHNICAL INFORMATION

Camber and toe-in influence each other. Adjust the toe-in first in order to simplify the adjustment procedure. The camber adjustment is performed only with the replacement of the swivel bearing. There are various swivel bearings (+/ -30') for this purpose.

TECHNICAL INFORMATION

Changes in axle geometry caused by accidents must under no circumstances be rectified by camber adjustment.

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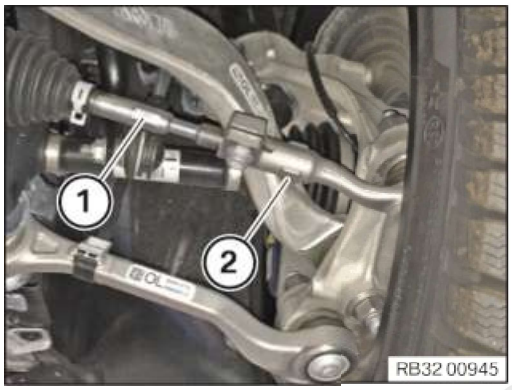
1 – Adjusting toe-in on front axle



- Bring the steering gear or steering wheel into the straight-ahead position (steering wheel centre position) and fasten it with the steering wheel clamp.

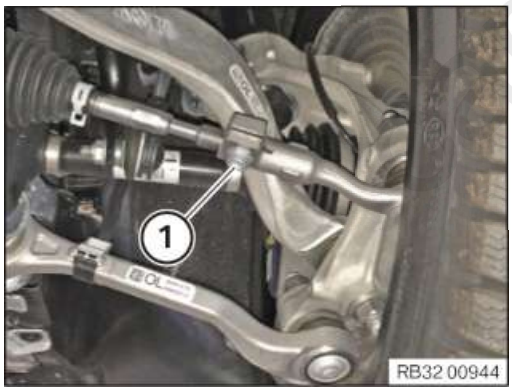


- Slacken screw (1).



- Clean thread on track rod.

  Twist track rod (1), grip track rod end (2) if necessary in order to adjust the toe-in to the setpoint value.



- Tighten down screw (1).

Track rod end to track rod

M10		Tightening torque	32 Nm

bmwdiagn.com

2 – Perform commissioning of electromechanical steering



- Connect vehicle to the diagnosis system.
- Run the service function "EPS steering start-up".

3 – Check directional stability of vehicle

Check

- Check the directional stability and straight position of the steering wheel during straight-ahead driving.

Result

» Steering wheel not straight, no directional stability.

Measure

- Check the toe-in setting!

Additional Information

Overview of Tightening Torques

Track rod end to track rod			Used in step 1
M10		Tightening torque	32 Nm

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32 00 150 Carry out Kinematics Diagnosis System wheel alignment with vehicle load up to design position

Prerequisite

- Only BMW approved wheel and tyre combinations are installed on the vehicle. The right and left tread depth differs by max 2 mm.

TECHNICAL INFORMATION

Basically a **wheel alignment must always be carried out with ride height measurement without vehicle load**.

For more information see: 32 00 155 Kinematics Diagnosis System wheel alignment with ride height measurement without loading the vehicle.

Carry out wheel alignment with vehicle load up to design position, if the technical prerequisites for a **wheel alignment with ride height measurement without vehicle load** are not fulfilled or if it is a damaged vehicle.

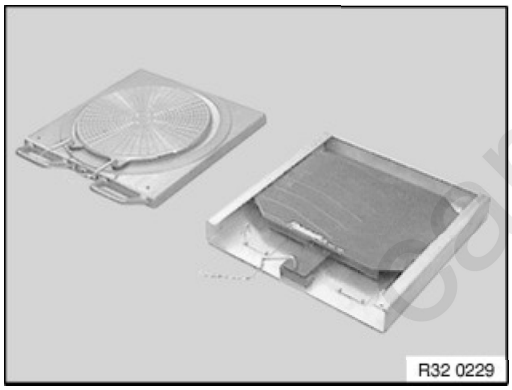
TECHNICAL INFORMATION

After a toe adjustment and after the electromechanical steering gear (EPS) has been renewed, a start-up of the electromechanical steering gear (EPS) must be carried out.

PRELIMINARY WORK

1 – Preliminary work before wheel alignment

- Correctly adjust tyre pressure.
- Check chassis components for damage and repair, if necessary.
- Drive the vehicle onto the axle alignment test stand so the front wheels and rear wheels are positioned in the centre of the rotating/sliding plates.



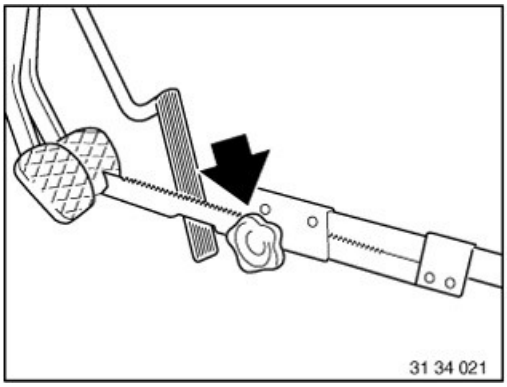
TECHNICAL INFORMATION

Please observe the regulations of the various equipment manufacturers.

- Position pickups/ride height sensors on the vehicle.
- In the Kinematics Diagnosis System, enter the customer and vehicle data.
- Identify the equipment specifications of the vehicle and select the vehicle.

  If the spring strut does not feature a label to identify the suspension, the type of chassis and suspension can be identified by the part number in the Electronic Parts Catalogue.
- Enter tyre pressure and tread depth.
- Remove locking pins from both rotating and sliding plates.

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- Install the brake pedal tensioner.

2 – Moving vehicle into normal position

- Check vehicle interior and luggage compartment (including spare wheel well) for load status, if applicable, unload vehicle.
- Place specified DIN load into motor vehicle.

DIN normal position loading

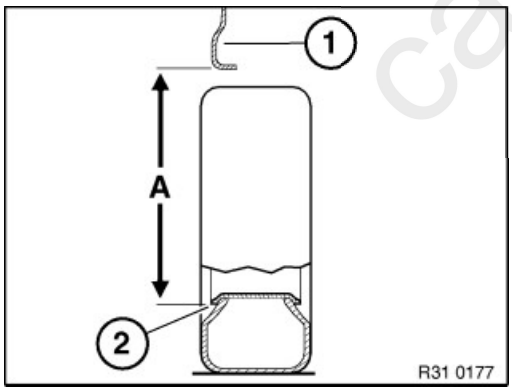
	Vehicle has a full tank.
	Vehicle is completely assembled.
Per front seat (seat in centre position)	68 kg
On the centre rear seat	68 kg
Centred in the luggage compartment	21 kg

3 – Moving vehicle into design position

- Lay weights in the area of the spring strut until the vehicle ride height is within the tolerance!

Tolerance for ride height at design level

Tolerance for setpoint value	max. 2 mm
Difference between left and right	max. 2 mm



- Measuring vehicle ride height (A): (1)Attach the tape measure to the bottom rim flange (2) and measure the distance to the lower wheel arch edge.

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MAIN WORK

4 – Perform chassis alignment check

- Perform the introductory wheel alignment in accordance with equipment manufacturer's instructions.
- If necessary, adjust the front axle and the rear axle.
- Perform the final wheel alignment in accordance with equipment manufacturer's instructions.
- Save and print out test record.

POSTPROCESSES

5 – Removing the wheel alignment equipment

- Insert locking pins into both rotary and sliding plates.
- Remove quick releases.
- Remove weights from the vehicle.

6 – After a toe adjustment: Perform commissioning of electromechanical steering

- **Additional work AW no.: 32 13 905**



- Connect vehicle to the diagnosis system.
- Run the service function "EPS steering start-up".

Additional Information

Overview Technical Data

DIN normal position loading	Used in step 2
	Vehicle has a full tank.
	Vehicle is completely assembled.
Per front seat (seat in centre position)	68 kg
On the centre rear seat	68 kg
Centred in the luggage compartment	21 kg

Tolerance for ride height at design level	Used in step 3
Tolerance for setpoint value	max. 2 mm
Difference between left and right	max. 2 mm

Links

General repair instructions	Used in step
32 00 ... KDS data statuses	

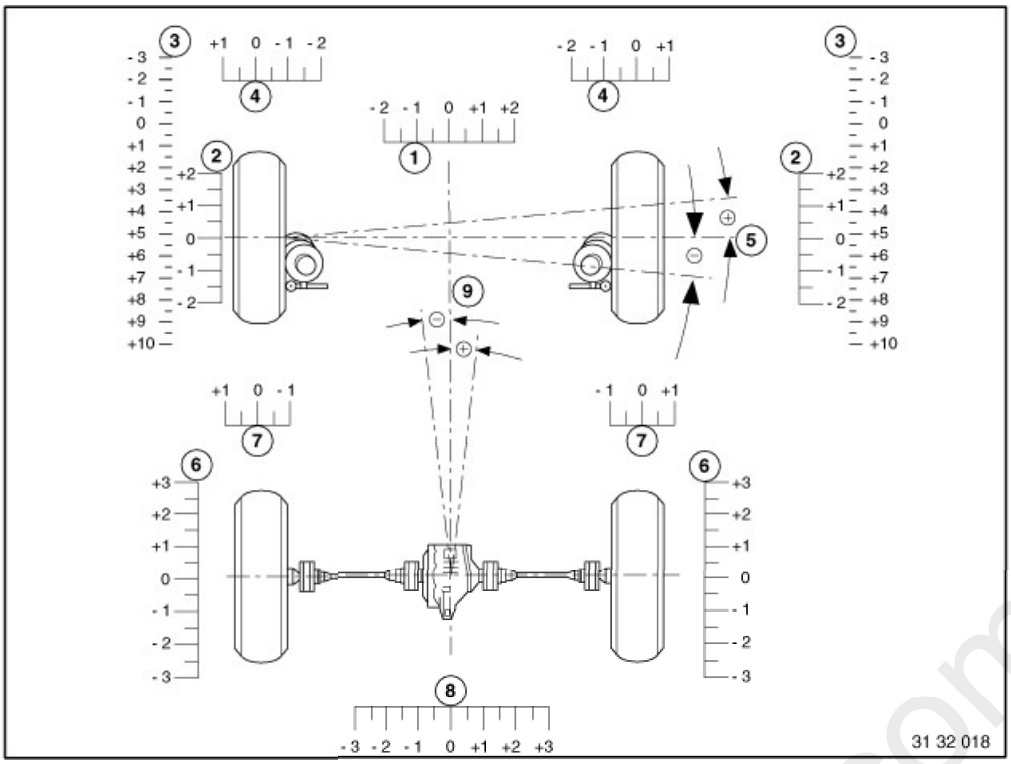
Repair instructions	Used in step
32 00 ... General information and definitions	
32 00 155 Kinematics Diagnosis System wheel alignment with ride height measurement without loading the vehicle	

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Graphic	Used in step
32 00 ... General chassis and suspension definitions	

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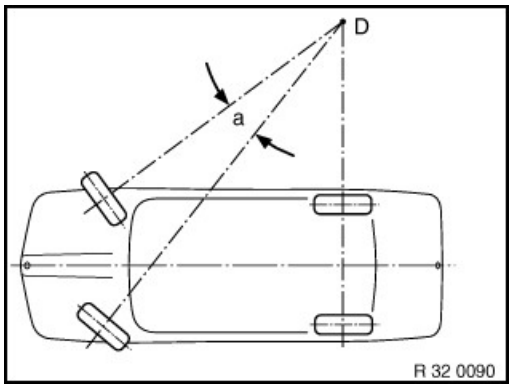
32 00 ... General chassis and suspension definitions



1. Toe
2. Camber
3. Caster (with 10° or 20° wheel lock)
4. Toe angle difference (with 20° wheel lock)
5. Wheel misalignment
6. Camber
7. Rear-wheel position
8. Toe
9. Geometrical driving axis

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32 00 ... General information and definitions



Toe angle difference

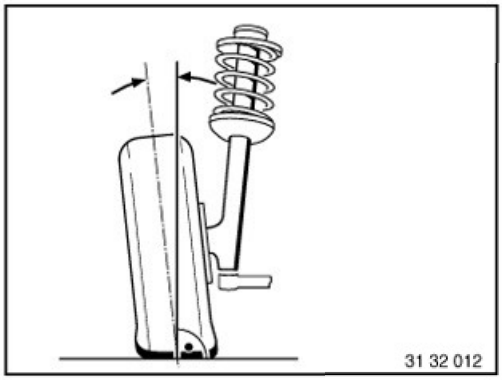
a Toe difference angle

D Centre point of operating circle

The toe angle difference is the angle adjustment of the inner cornering wheel relative to the outer cornering wheel when negotiating a curve. Steering is designed in such a way that angular position of wheels changes as steering lock progresses.

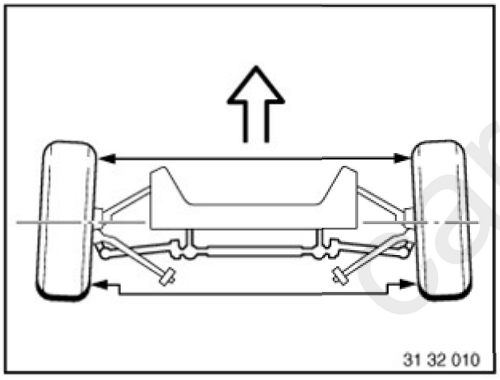
A correctly adjusted toe angle difference produces equal values for left and right lock with consideration of factory tolerances.

Toe angle difference provides information on corresponding operation of steering trapezoid for left or right steering lock from centre position.



Camber

Inclination of the wheel from the perpendicular.

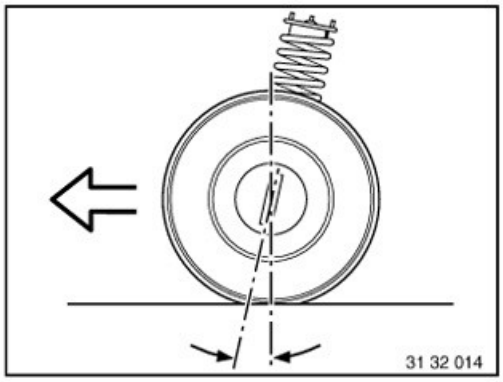


Toe

Reduction in distance of front of front wheels to rear of front wheels. The toe-in prevents the wheels from moving apart during driving and thus:

- the wheels from vibrating and grinding
- excessive tire wear
- excessive strain on the steering linkage and its links/joints
- heavy vehicle steering

Measurement is performed in ”straight-ahead mode”.

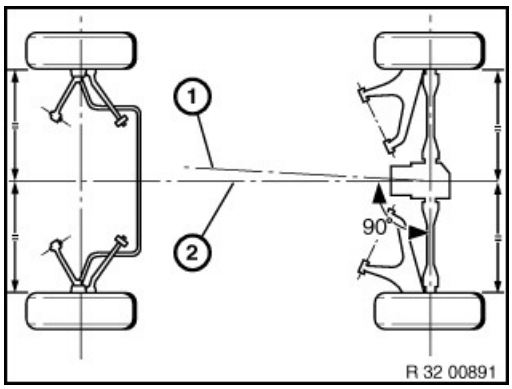


Castor

Is the inclination of the kingpin in the direction of travel viewed from the side. The line through the centre point of the spring strut support bearing and the control arm ball joint corresponds to the ”kingpin”.

Thanks to caster, wheels are pulled and not pushed. In a similar manner to king pin inclination, when driving in curves or around corners, returning forces are reproduced to help return wheels to straight-ahead position.

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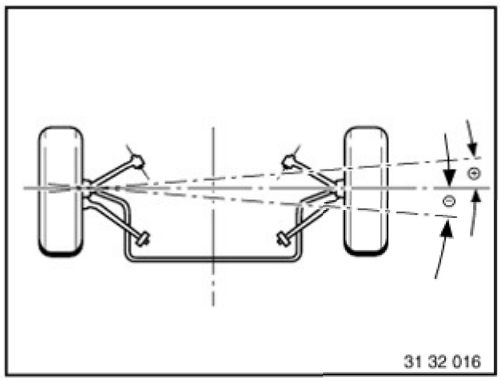
Geometrical driving axis 1

Is the angle bisector from the total rear-wheel toe.

Front-wheel measurements are taken in reference to this axis.

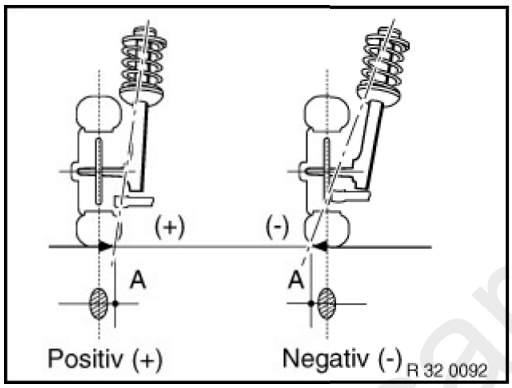
Symmetrical axis 2

Centre line running through front and rear axles.



Wheel misalignment

Angle by which one front wheel is displaced more towards front or rear than the other front wheel. The wheel offset angle is positive when the right wheel is displaced towards the front and negative when it is displaced towards the rear.



Kingpin offset/scrub radius

Is the distance from the centre of the wheel contact face to the intersection point of the kingpin extension.The line through the centre point of the spring strut support bearing and the control arm ball joint corresponds to the ”kingpin”.

The scrub radius is influenced by camber, kingpin angle and wheel offset of the wheel rim.

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32 00 ... KDS data statuses

Setpoint values for wheel alignment are not published in ISTA.

The current setpoint values are made available in the workshop equipment portal.

See:

- www.bmwbroup-wep.com
  - Workshop Equipment catalogue:
  - Select Wheel alignment
  - Select KDS nominal values
  - e.g. select "Beissbarth KDS update", copy data

Or:

- Aftersales Assistance Portal (ASAP)
  - Profile: Select Service/Technology
  - Select Workshop equipment
  - Select Start BMW
  - Select Workshop equipment catalogue
  - Select Wheel alignment
  - Select KDS nominal values
  - e.g. select "Beissbarth KDS update", copy data

We recommend that the data records are updated on a regular basis.

Please contact your subsidiary if you do not have access to the portals listed.

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32 00 155 Kinematics Diagnosis System wheel alignment with ride height measurement without loading the vehicle

Prerequisite

- Only BMW approved wheel and tyre combinations are installed on the vehicle. The tread depth on the left and right differs by a maximum of 2 millimetres.

TECHNICAL INFORMATION

Only carry out **wheel alignment using a Kinematics Diagnosis System with ride height measurement and without vehicle load** if the technical prerequisites have been complied with.

If the technical prerequisites are not complied with or this process concerns a damaged vehicle, carry out **wheel alignment using a Kinematics Diagnosis System with vehicle load up to design position**.

For more information see: 32 00 150 Carry out Kinematics Diagnosis System wheel alignment with vehicle load up to design position.

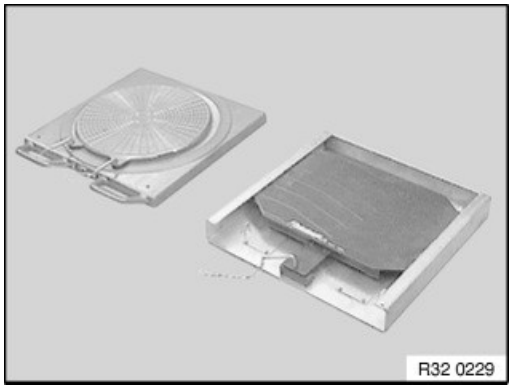
TECHNICAL INFORMATION

After a toe adjustment and after the electromechanical steering gear (EPS) has been renewed, a start-up of the electromechanical steering gear (EPS) must be carried out.

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1 – Preliminary work before wheel alignment

- Correctly adjust tyre pressure.
- Check chassis components for damage and repair, if necessary.



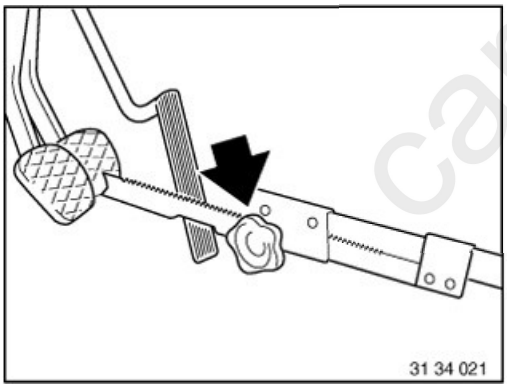
- Drive the vehicle onto the axle alignment test stand so the front wheels and rear wheels are positioned in the centre of the rotating/sliding plates.

TECHNICAL INFORMATION

Please observe the regulations of the various equipment manufacturers.

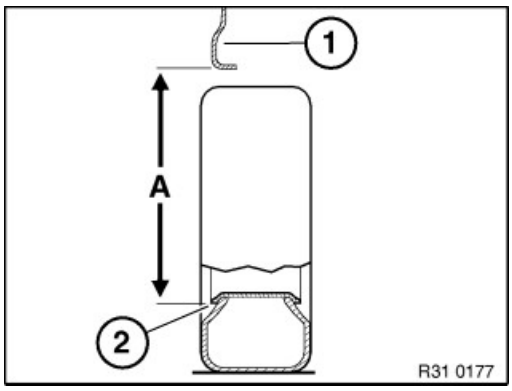
- Position pickups/ride height sensors on the vehicle.
- In the Kinematics Diagnosis System, enter the customer and vehicle data.
- Identify the equipment specifications of the vehicle and select the vehicle.

  If the spring strut does not feature a label to identify the suspension, the type of chassis and suspension can be identified by the part number in the Electronic Parts Catalogue.
- Enter tyre pressure and tread depth.
- Remove locking pins from both rotating and sliding plates.



- Install the brake pedal tensioner.

2 – Measuring vehicle ride height



- Determine ride height (A): For this purpose, attach the tape measure centrally on the rim flange (2) and measure towards the wheel arch lower edge (1).
- Load or unload the vehicle to keep the ride height within the prescribed tolerances.

Ride height with vehicle load tolerance

Minimum value	min. - 20 mm
Maximum value	max. + 40 mm

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MAIN WORK

3 – Perform chassis alignment check

- Perform the introductory wheel alignment in accordance with equipment manufacturer's instructions.
- If necessary, adjust the front axle and the rear axle.
- Perform the final wheel alignment in accordance with equipment manufacturer's instructions.
- Save and print out test record.

POSTPROCESSES

4 – Removing the wheel alignment equipment

- Insert locking pins into both rotary and sliding plates.
- Remove quick releases.
- Remove weights from the vehicle.

5 – After a toe adjustment: Perform commissioning of electromechanical steering

- **Additional work AW no.: 32 13 905**



- Connect vehicle to the diagnosis system.
- Run the service function "EPS steering start-up".

Additional Information

Overview Technical Data

Ride height with vehicle load tolerance	Used in step 2
Minimum value	min. - 20 mm
Maximum value	max. + 40 mm

Links

General repair instructions	**Used in step**
32 00 ... KDS data statuses	

Repair instructions	**Used in step**
32 00 ... General information and definitions	
32 00 150 Carry out Kinematics Diagnosis System wheel alignment with vehicle load up to design position	

Graphic	**Used in step**
32 00 ... General chassis and suspension definitions	

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32 00 ... Notes on replacement of steering gear/steering column/steering shaft following accident damage

Steering gear facts:

In the event of accidents or driving conditions similar to accidents, shock-like loads can cause different types of damage to steering boxes. When a steering box is externally undamaged, it is sometimes only possible to identify damage with great difficulty and with great effort. However, damage of this nature poses an unacceptable risk to the vehicle because it can result in failure of the steering system.

Because of the disproportionate amount of effort involved, it is generally not sensible to check thoroughly all the individual components of the steering box and as an alternative it is necessary to take into account other components which can be checked more easily.

Steering gear procedure:

The steering box must be replaced if one or more of the following points apply:

A. Visible or noticeable damage to the steering box
   - Version with electric steering box (EPS): Examine in particular the control unit with all plug connections for damage and hairline cracks.

B. Unacceptable torque increase and jamming when the steering box is turned from lock to lock (without hydraulic/electrical assistance)

C. Fire damage

D. Damage, permanent deformation or fractures to:
   - Wheel rims in the event of a negative result from the wheel alignment check
   - Spring struts, steering stubs, wheel carriers
   - Wishbones
   - Struts or trailing links or anti-roll bar with this function
   - Body-side screwing/attachment points for wheel guide/control components
   - Front axle support
   - Pitman arms
   - Track rods
   - Steering box fixtures
   - Steering column

   A lopsided steering wheel, significant deviations of camber/track values and noises when cranking the steering can be additional indications for the damage/deformations listed here.

Note:

If the steering box replacement work which is required for safety reasons is refused by the customer or an insurance company for cost reasons, a memorandum to that effect must be drawn up and countersigned by the party bearing the costs of the accident repair.

For corresponding specimen of memorandum, refer to Service Information (bulletin) 320188(828) Appendix 1

Actual situation of the steering column and steering shaft:

In the event of accidents or driving conditions similar to accidents, shock-like loads can cause different types of damage to the steering shaft and steering column. In case no external damaged of the steering column and the steering shaft can be noticed, it is sometimes only possible to identify damage with great difficulty and with great effort.

Proceedure for steering column and steering shaft:

The steering column and steering shaft must be replaced if one or more of the following points apply:

- Visible or noticeable damage, deformation or breakage of the steering column or steering shaft
- Damage, permanent deformation or breakage of the track rod
- Unacceptable torque increase and jamming when the steering column is cranked from limit position to limit position (without hydraulic/electrical assistance)

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- If the wheel alignment nominal data cannot be reached after all the damaged wheel components are changed (exceedance of the permissible wheel alignment tolerances). If required, enclose the measurement protocol of the invoice/certificate.
- Positive check for activated crash system of the steering column:
- If no damage is visible on the steering column, the mechanical steering column must be checked for an activated crash system:
    1. Open steering column lock
    2. Pull steering wheel out towards the driver (towards the body) until the physical limit position is reached, but do not use excessive force
    3. Push steering wheel towards engine compartment (approx. 20-30 mm away from body) into the comfort position and lock

       If no end stop is present when pulling out the steering column or the gaiter of the steering column shroud has tension, the crash system has activated and the steering column is to be renewed.

Note:

If the steering column/steering shaft replacement work which is required for safety reasons is rejected by the customer or an insurance company for cost reasons, a memorandum to that effect must be drawn up and countersigned by the party bearing the costs of the accident repair.

For corresponding specimen of the memorandum, refer to Service Information 320188(828) Appendix 1

Attention!

The vehicle's operating licence will be invalidated whenever the function of any of its safety components is compromised!

This guideline is binding for all accident repairs to BMW, MINI and Rolls Royce vehicles!

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00 Safety information for working on vehicles with automatic engine start-stop function (MSA)



Warning!

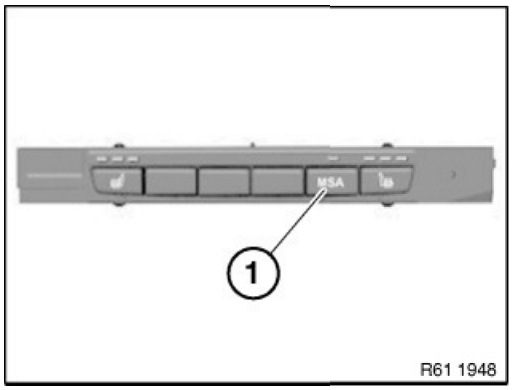
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

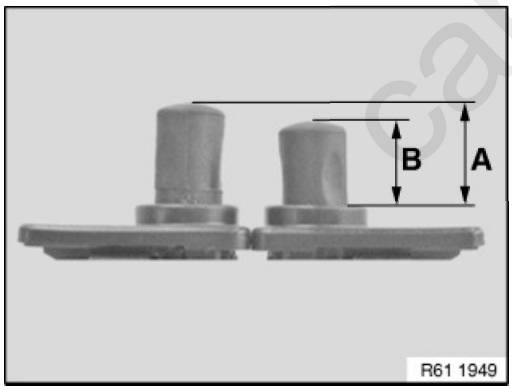
Observe safety precautions when working on MSA vehicles.

Before carrying out practical work on the engine, always ensure that the MSA functionality is deactivated so as to prevent automatic engine starting while work is being carried out in the engine compartment.

MSA function is deactivated by:



- Deactivate MSA by means of button (1) in passenger compartment
- Open seat belt buckle and driver's door



- Open engine bonnet/hood and ensure that engine hood/bonnet contact is not in workshop mode
  - Workshop mode

    A = 10 mm
  - Basic setting (engine hood/bonnet open)

    B = 7 mm

  To make sure that the engine hood/bonnet contact is at the basic setting, if necessary press the hood/bonnet contact up to the limit position before starting work and slowly release.



When working with diagnosis tools:

- Observe instructions in diagnosis tool

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Note:
For further information on automatic engine start-stop function (MSA):

- Refer to the Service Information (bulletin) (for manual transmissions) Service Information (bulletin) 61 01 07 335
- Refer to the Service Information (bulletin) (for automatic transmissions or twin-clutch gearboxes) Service Information (bulletin) 61 01 10 629

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32 00 ... Troubleshooting chassis mechanics

For "Chassis mechanics" troubleshooting, work through the troubleshooting tree with the aid of the Diagnosis and Information System.

See Diagnosis and Information System under the following structure tree:

- Activities
- Function structure
- Non-electrical diagnosis
- Chassis and suspension
- Malfunction
- Wheel alignment

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32 00 ... Notes on replacement of steering gear/steering column/steering shaft following accident damage

Steering gear facts:

In the event of accidents or driving conditions similar to accidents, shock-like loads can cause different types of damage to steering boxes. When a steering box is externally undamaged, it is sometimes only possible to identify damage with great difficulty and with great effort. However, damage of this nature poses an unacceptable risk to the vehicle because it can result in failure of the steering system.

Because of the disproportionate amount of effort involved, it is generally not sensible to check thoroughly all the individual components of the steering box and as an alternative it is necessary to take into account other components which can be checked more easily.

Steering gear procedure:

The steering box must be replaced if one or more of the following points apply:

A. Visible or noticeable damage to the steering box
   - Version with electric steering box (EPS): Examine in particular the control unit with all plug connections for damage and hairline cracks.

B. Unacceptable torque increase and jamming when the steering box is turned from lock to lock (without hydraulic/electrical assistance)

C. Fire damage

D. Damage, permanent deformation or fractures to:
   - Wheel rims in the event of a negative result from the wheel alignment check
   - Spring struts, steering stubs, wheel carriers
   - Wishbones
   - Struts or trailing links or anti-roll bar with this function
   - Body-side screwing/attachment points for wheel guide/control components
   - Front axle support
   - Pitman arms
   - Track rods
   - Steering box fixtures
   - Steering column

   A lopsided steering wheel, significant deviations of camber/track values and noises when cranking the steering can be additional indications for the damage/deformations listed here.

Note:

If the steering box replacement work which is required for safety reasons is refused by the customer or an insurance company for cost reasons, a memorandum to that effect must be drawn up and countersigned by the party bearing the costs of the accident repair.

For corresponding specimen of memorandum, refer to Service Information (bulletin) 320188(828) Appendix 1

Actual situation of the steering column and steering shaft:

In the event of accidents or driving conditions similar to accidents, shock-like loads can cause different types of damage to the steering shaft and steering column. In case no external damaged of the steering column and the steering shaft can be noticed, it is sometimes only possible to identify damage with great difficulty and with great effort.

Proceedure for steering column and steering shaft:

The steering column and steering shaft must be replaced if one or more of the following points apply:

- Visible or noticeable damage, deformation or breakage of the steering column or steering shaft
- Damage, permanent deformation or breakage of the track rod
- Unacceptable torque increase and jamming when the steering column is cranked from limit position to limit position (without hydraulic/electrical assistance)

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- If the wheel alignment nominal data cannot be reached after all the damaged wheel components are changed (exceedance of the permissible wheel alignment tolerances). If required, enclose the measurement protocol of the invoice/certificate.
- Positive check for activated crash system of the steering column:
- If no damage is visible on the steering column, the mechanical steering column must be checked for an activated crash system:
    1. Open steering column lock
    2. Pull steering wheel out towards the driver (towards the body) until the physical limit position is reached, but do not use excessive force
    3. Push steering wheel towards engine compartment (approx. 20-30 mm away from body) into the comfort position and lock

       If no end stop is present when pulling out the steering column or the gaiter of the steering column shroud has tension, the crash system has activated and the steering column is to be renewed.

Note:

If the steering column/steering shaft replacement work which is required for safety reasons is rejected by the customer or an insurance company for cost reasons, a memorandum to that effect must be drawn up and countersigned by the party bearing the costs of the accident repair.

For corresponding specimen of the memorandum, refer to Service Information 320188(828) Appendix 1

Attention!

The vehicle's operating licence will be invalidated whenever the function of any of its safety components is compromised!

This guideline is binding for all accident repairs to BMW, MINI and Rolls Royce vehicles!

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32 13 905 Electronic Power Steering (EPS) start-up (after vehicle diagnosis)

TECHNICAL INFORMATION

After a toe adjustment and after the electromechanical steering gear (EPS) has been renewed, a start-up of the electromechanical steering gear (EPS) must be carried out.

1 – Perform commissioning of electromechanical steering



- Connect vehicle to the diagnosis system.
- Run the service function "EPS steering start-up".

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32 00 ... Notes on replacement of steering gear/steering column/steering shaft following accident damage

Steering gear facts:

In the event of accidents or driving conditions similar to accidents, shock-like loads can cause different types of damage to steering boxes. When a steering box is externally undamaged, it is sometimes only possible to identify damage with great difficulty and with great effort. However, damage of this nature poses an unacceptable risk to the vehicle because it can result in failure of the steering system.

Because of the disproportionate amount of effort involved, it is generally not sensible to check thoroughly all the individual components of the steering box and as an alternative it is necessary to take into account other components which can be checked more easily.

Steering gear procedure:

The steering box must be replaced if one or more of the following points apply:

A. Visible or noticeable damage to the steering box
   - Version with electric steering box (EPS): Examine in particular the control unit with all plug connections for damage and hairline cracks.

B. Unacceptable torque increase and jamming when the steering box is turned from lock to lock (without hydraulic/electrical assistance)

C. Fire damage

D. Damage, permanent deformation or fractures to:
   - Wheel rims in the event of a negative result from the wheel alignment check
   - Spring struts, steering stubs, wheel carriers
   - Wishbones
   - Struts or trailing links or anti-roll bar with this function
   - Body-side screwing/attachment points for wheel guide/control components
   - Front axle support
   - Pitman arms
   - Track rods
   - Steering box fixtures
   - Steering column

   A lopsided steering wheel, significant deviations of camber/track values and noises when cranking the steering can be additional indications for the damage/deformations listed here.

Note:

If the steering box replacement work which is required for safety reasons is refused by the customer or an insurance company for cost reasons, a memorandum to that effect must be drawn up and countersigned by the party bearing the costs of the accident repair.

For corresponding specimen of memorandum, refer to Service Information (bulletin) 320188(828) Appendix 1

Actual situation of the steering column and steering shaft:

In the event of accidents or driving conditions similar to accidents, shock-like loads can cause different types of damage to the steering shaft and steering column. In case no external damaged of the steering column and the steering shaft can be noticed, it is sometimes only possible to identify damage with great difficulty and with great effort.

Proceedure for steering column and steering shaft:

The steering column and steering shaft must be replaced if one or more of the following points apply:

- Visible or noticeable damage, deformation or breakage of the steering column or steering shaft
- Damage, permanent deformation or breakage of the track rod
- Unacceptable torque increase and jamming when the steering column is cranked from limit position to limit position (without hydraulic/electrical assistance)

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- If the wheel alignment nominal data cannot be reached after all the damaged wheel components are changed (exceedance of the permissible wheel alignment tolerances). If required, enclose the measurement protocol of the invoice/certificate.
- Positive check for activated crash system of the steering column:
- If no damage is visible on the steering column, the mechanical steering column must be checked for an activated crash system:
    1. Open steering column lock
    2. Pull steering wheel out towards the driver (towards the body) until the physical limit position is reached, but do not use excessive force
    3. Push steering wheel towards engine compartment (approx. 20-30 mm away from body) into the comfort position and lock

       If no end stop is present when pulling out the steering column or the gaiter of the steering column shroud has tension, the crash system has activated and the steering column is to be renewed.

Note:

If the steering column/steering shaft replacement work which is required for safety reasons is rejected by the customer or an insurance company for cost reasons, a memorandum to that effect must be drawn up and countersigned by the party bearing the costs of the accident repair.

For corresponding specimen of the memorandum, refer to Service Information 320188(828) Appendix 1

Attention!

The vehicle's operating licence will be invalidated whenever the function of any of its safety components is compromised!

This guideline is binding for all accident repairs to BMW, MINI and Rolls Royce vehicles!

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32 13 572 Replace electrical steering box (EPS) (flat rate specification without wheel alignment) (after vehicle diagnosis) (flat rate specification without programming/encoding, see 61 00 ...)

WARNING

Motor vehicle may slip off the vehicle hoist where components are supported.

Danger! Life-threatening injuries!

- Secure the vehicle hoist against lowering and lifting.

WARNING

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 ... Raising the vehicle using a vehicle hoist.

WARNING

Motor vehicle may slip off the vehicle hoist if the weight is distributed unevenly.

Danger! Life-threatening injuries!

- Ensure there is a specific weight compensation on the motor vehicle.

RISK OF DAMAGE

Damage to steering column switch cluster (SZL).

The steering column switch cluster (SZL) or the coil spring cassette may be damaged by twisting of the steering wheel if the lower steering shaft (or the universal joint) is separated from the steering gear or from the steering column.

- Secure steering wheel from twisting.

TECHNICAL INFORMATION

In a warranty case, you must always provide a fault memory printout with the defective part, even if the fault memory does not contain an entry.

TECHNICAL INFORMATION

Perform wheel alignment after installation.

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1 – Bring front compartment lid in the service position

Prerequisite

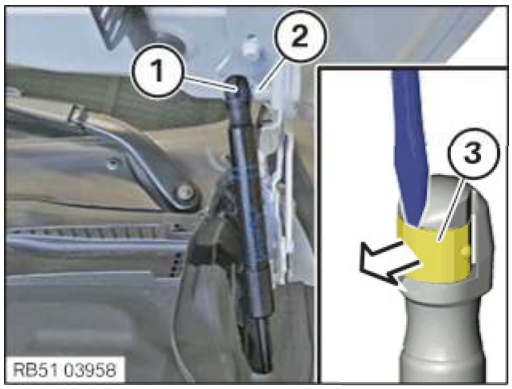
Engine compartment lid is open.

CAUTION

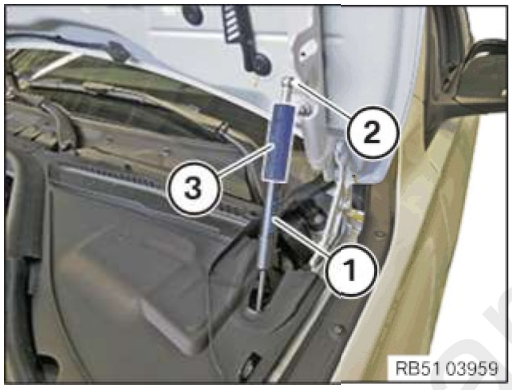
Shutting bonnet or tailgate.

Danger of injury!

- Support bonnet/tailgate in fully open position with the aid of a suitable device.



- Lift clamp (3) slightly using a screwdriver, in the direction of the arrow.
- Lift off ball socket (1) from ball pin (2).
- Repeat the operation on the other side of vehicle.



TECHNICAL INFORMATION

Conduct the following operation with the assistance of a second person.

- Remove the bonnet support and open the bonnet further.
- Push special tool or (3) over gas pressure spring (1).
- Place special tool on the ball pin (2) and engage using force.
- Repeat the operation on the other side of vehicle.

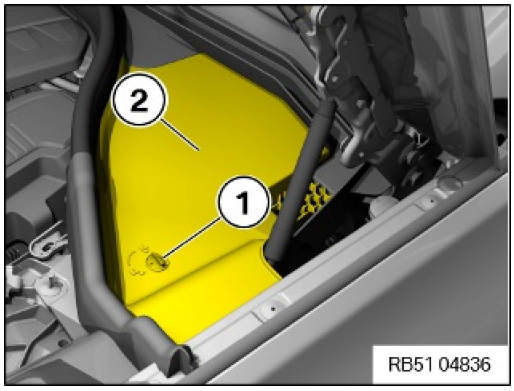
2 – Disconnecting all battery earth leads



- See additional information.

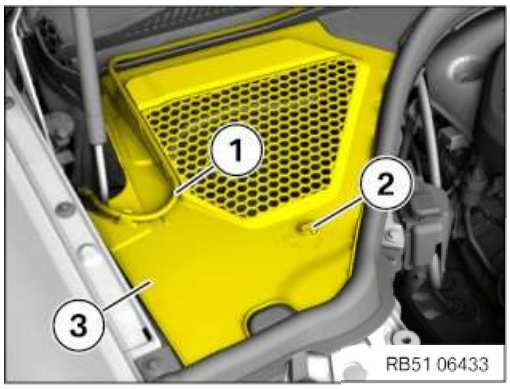
3 – Remove the cover of the engine compartment at the rear left

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

4 – Remove the cover of the rear right engine compartment

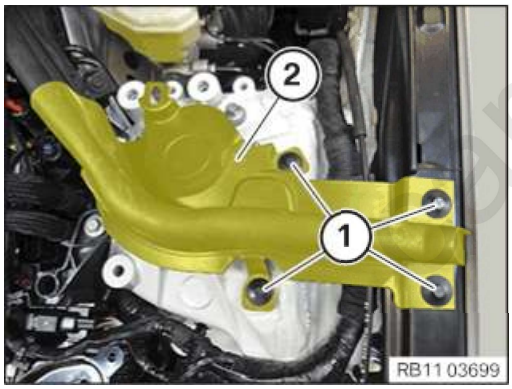


- Release washer fluid hose (1) from the guides.
- Loosen the lock (2).
- Remove the cover of rear right engine compartment (3).

5 – Removing side bonnet gaskets

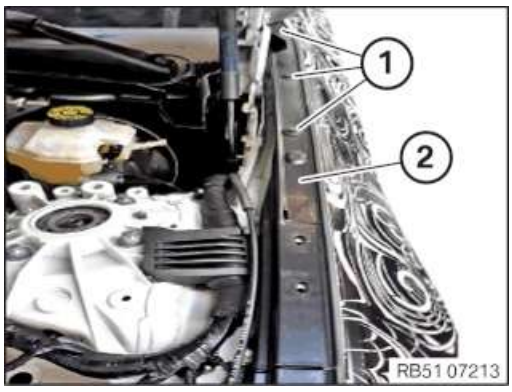
NOTICE

Perform the operations on the left and right side.



- Loosen the rivet (1).
- Remove side bonnet seal (2) from spring strut dome.

6 – Remove sealing of the side panel



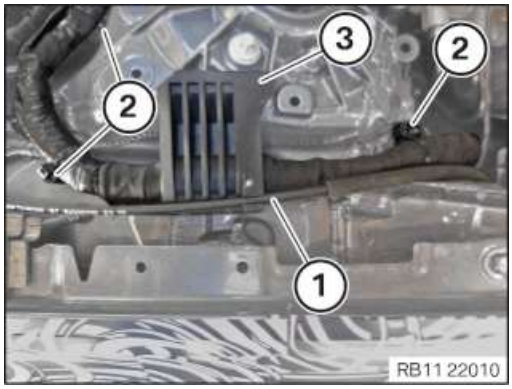
NOTICE

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

- Loosen the expanding rivet (1).
- Guide out seal (2) and remove.

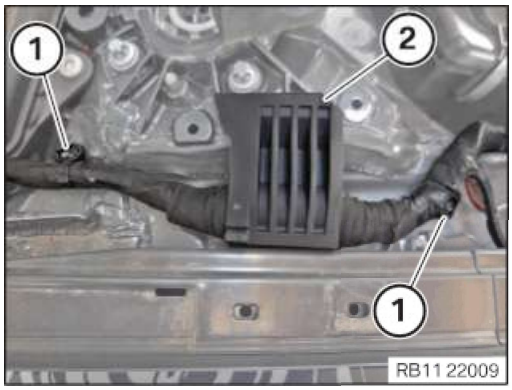
7 – Partially loosen the wiring harness section on the spring strut dome

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- Feed out the cable (1) of the front flap and set it aside.
- Loosen clamps (2).
- Feed out wiring harness section (3) on the spring strut dome on left and set it aside.

8 – Releasing the wiring harness section on the right spring strut dome



- Loosen clamps (1).
- Guide out wiring harness section (2) on the right spring strut dome and set it aside.

9 – Removing the acoustic cover

WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

Damage to the acoustic cover.

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

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

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- Unclip the acoustic cover (1) from the holders in the **marked** areas towards the top.

10 – Removing the clean air pipe with the resonator

WARNING

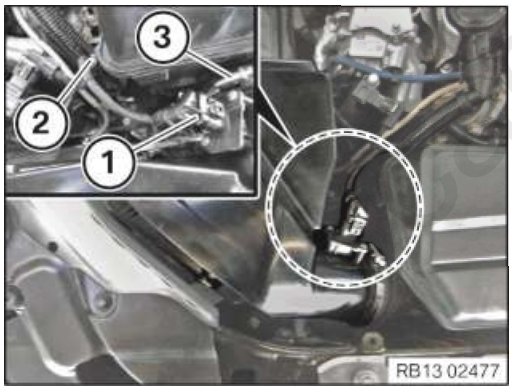
Hot surfaces.

Risk of burning!

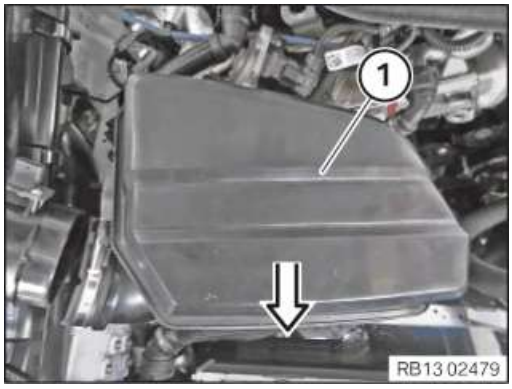
- Perform all work only on components that have cooled down.



- Unlock the locks (1).
- Feed the engine ventilation line (2) out and set it aside.

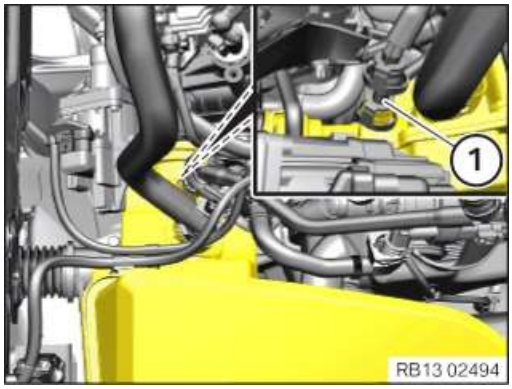


- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.

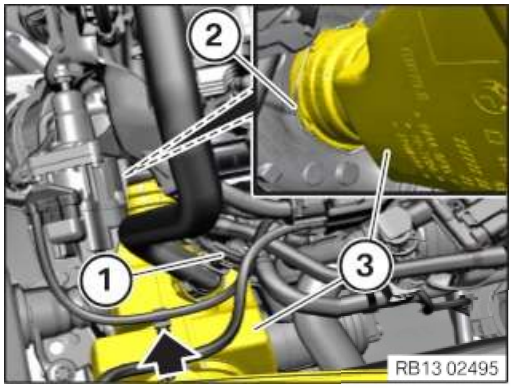


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.

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- Unlock and disconnect the tank ventilation line (1).

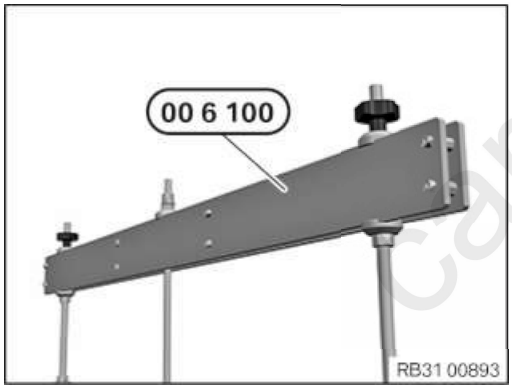


- Loosen the clamp (arrow).
- Unlock plug connection (1) and disconnect.
- Unlock the clamp (2).
- Feed out clean air pipe with resonator (3) and remove.

11 – Securing engine in installation position

TECHNICAL INFORMATION

The additional information must be observed without fail!
Proceeding further without working through the additional information is not allowed!



- See additional information in “11 00 670 - Securing engine in mounting orientation”.

12 – Removing both front wheels

▸ **Removing the wheel**

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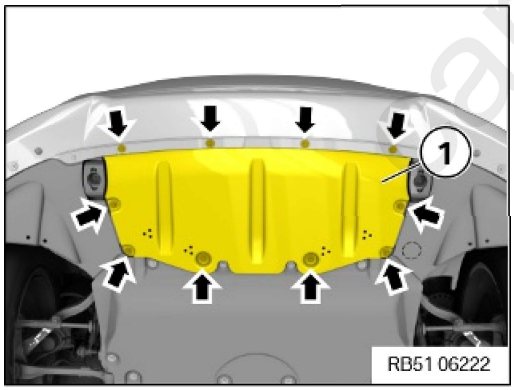
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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



- If several wheels are removed simultaneously: 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 a suitable adapter from the tool set .

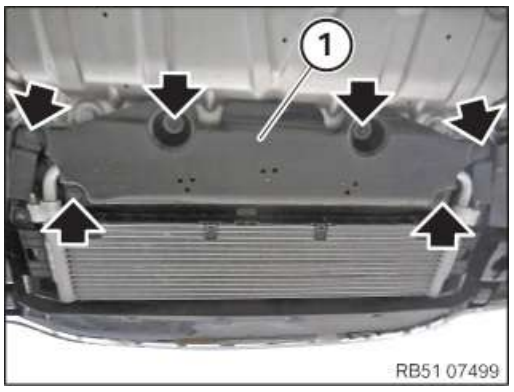
13 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed front underbody protection (1) backwards out of the bumper panel.

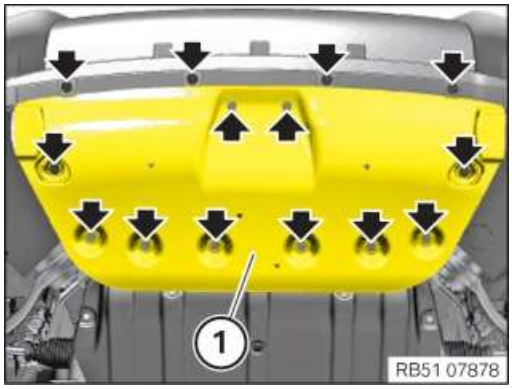


- **Version 2:**

  Remove screws (arrows).

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

mandiagn.com

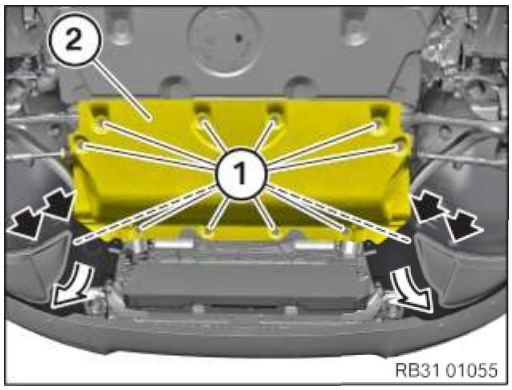


- **Version 3:**

  Remove screws (arrows).

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

14 – Remove the underbody protection of the steering gear



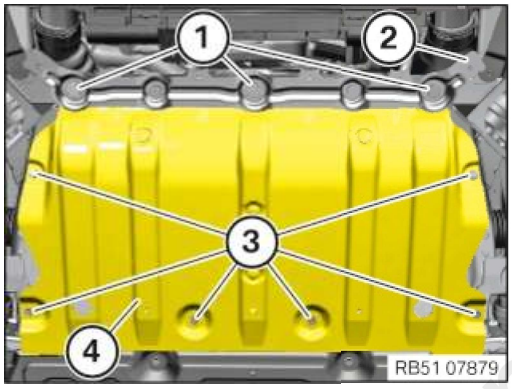
- **Version 1:**

  Unscrew the screws (arrows) of the wheel arch cover on wheel arch cover.

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove underbody protection of the steering gear (2).



- **Version 2:**

  Loosen screws (1).

  Remove the holder of the underride protection (2).

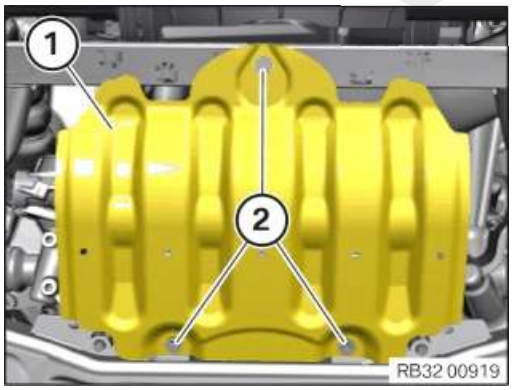
  Loosen screws (3).

  Slide the steering gear underbody protection (4) out and remove.

15 – If installed: Removing the steering start protection

Prerequisite

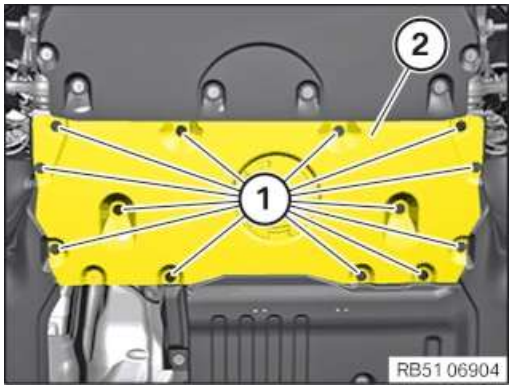
The front underbody protection is removed.



- Loosen screws (2).
- Remove guard (1).

16 – Removing the centre underbody protection

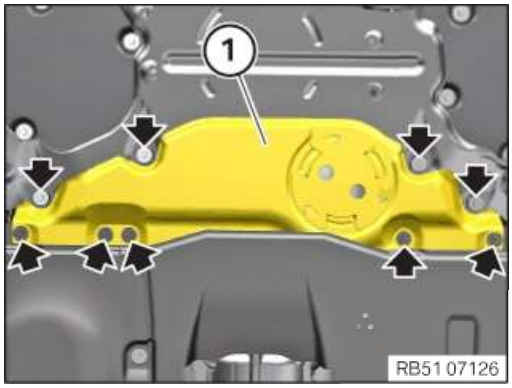
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- **Version with rear-wheel drive:**

  Loosen screws (1).

  Remove centre underbody protection (2) .

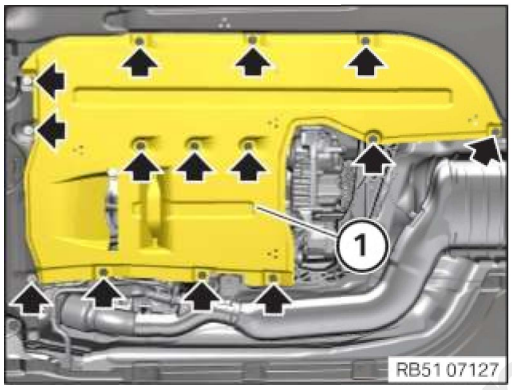


- **Version with all-wheel drive:**

  Remove screws (arrows).

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

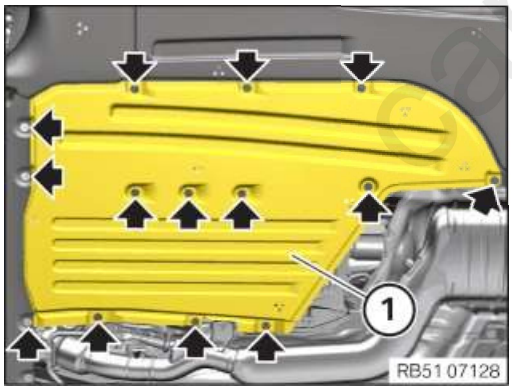
17 – Remove rear underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



- **Version 2:**

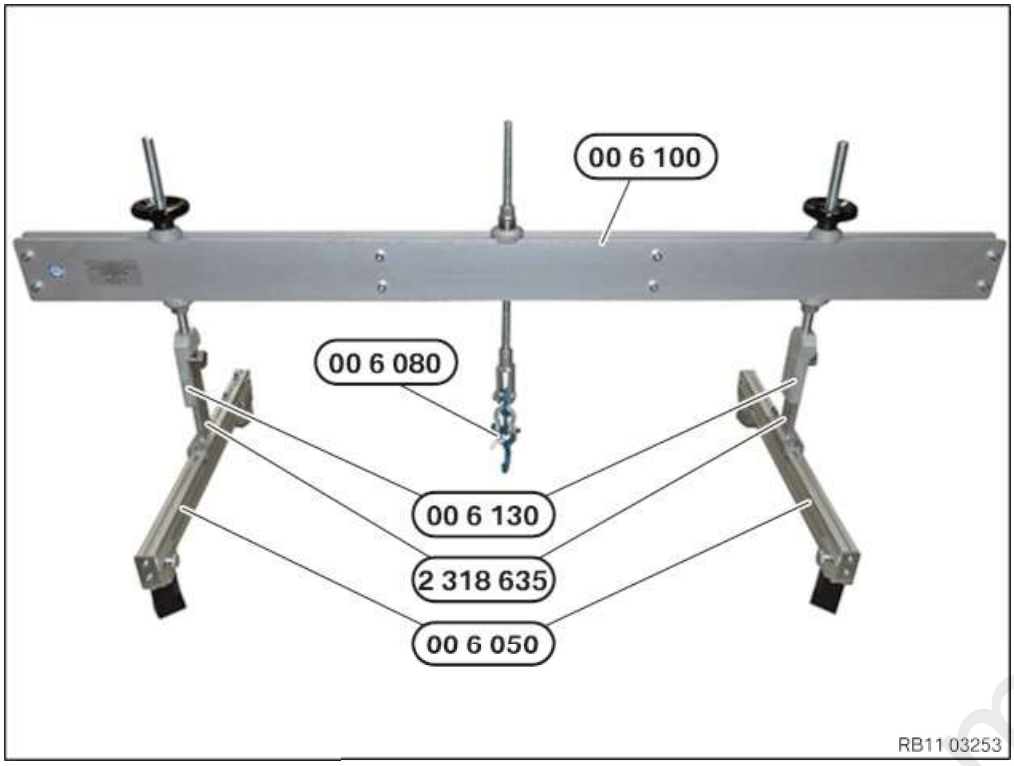
  Remove screws (arrows).

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

18 – Securing engine in installation position

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Overview: Prepared engine bridge

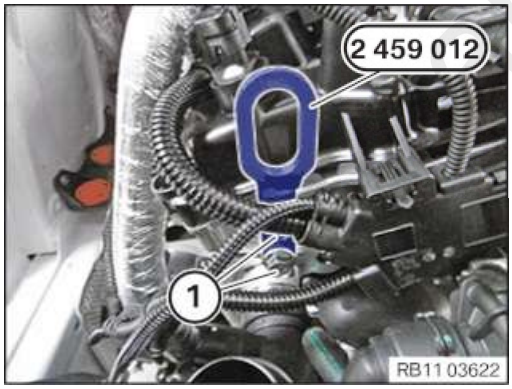


CAUTION

Components connected to the engine joint or cross member.

Danger of injury!

- Check lifting eyes and engine mounting brackets for damage, e.g. cracks.
- Attach the component to correctly mounted engine joints or cross members only.
- Exclusively lift the component, do not move it forwards, backwards or in transverse direction.



- Guide in and position special tool 2 459 012 on cylinder head.
- Tighten the screws (1) of special tool 2 459 012.

Special tool to cylinder head

M8		Tightening torque	21,5 Nm



- **Carefully** position engine bridge (1) with help from an auxiliary person.



- Make sure that special tool on the left is correctly positioned on the lock support.
- Make sure that special tool from the set of special tools , left, rests correctly on the spring strut dome.



- Make sure that special tool on the right is correctly positioned on the lock support.
- Make sure that special tool from the set of special tools , right, rests correctly on the spring strut dome.



- Align the engine bridge by moving it on the profile strips of the special tool above the engine mounting bracket (1) and screw it down.
- Align the hook above the engine mounting bracket (1).
- Connect the hook to the engine mounting bracket (1).



- Check whether the special tool on the right is correctly positioned on the lock support.



- Check whether the special tool from the special tool kit , right, rests correctly on the spring strut dome.

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- Check whether the special tool on the left is correctly positioned on the lock support.



- Check whether the special tool from the special tool kit , left, rests correctly on the spring strut dome.



- Release screw (1) on the left engine mount from the top with a commercially available tool.



- Release screw (1) on the right engine mount from the top with a commercially available tool.



- Raise the engine by turning the special tool 2 361 506 (00 6 103) (spindle) by 10 mm.

19 – Remove the cover of the steering assembly on the left and right

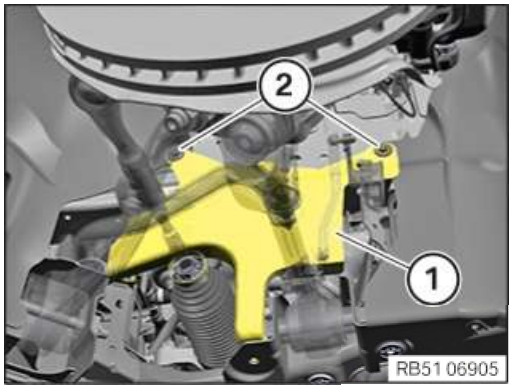
NOTICE

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

▸ **Remove the cover of the steering assembly**

Prerequisite

Underbody protection of the steering gear is removed.



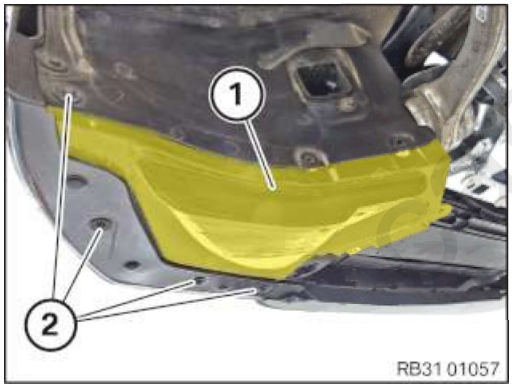
- Loosen screws (2).
- Remove the cover (1).

20 – Removing the bottom left and right wheel arch cover

NOTICE

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

▸ **Remove bottom wheel arch cover**



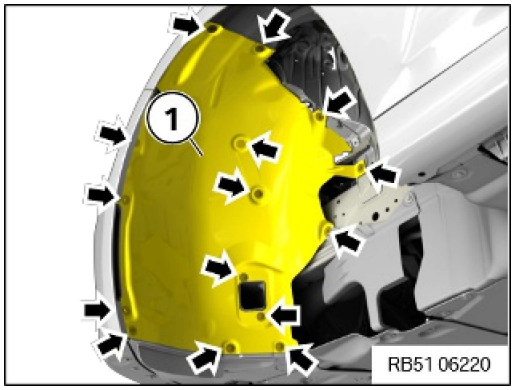
- Loosen screws (2).
- Remove bottom wheel arch cover (1)

21 – Removing the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

carfdiag.com

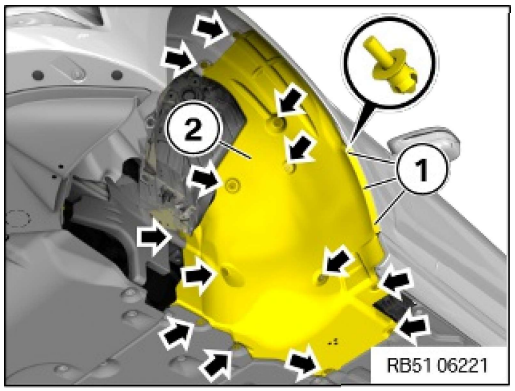


- Remove screws (arrows).
- Remove front section of the front wheel arch cover (1).

22 – Removing the rear section of the front wheel arch cover front

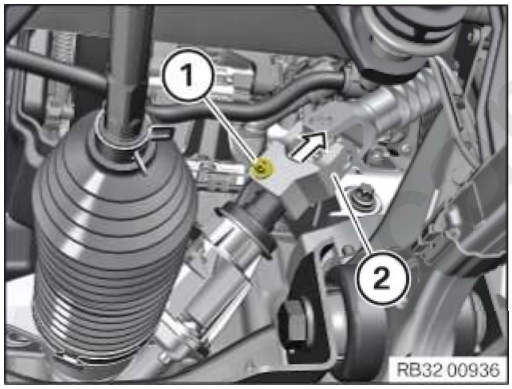
NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



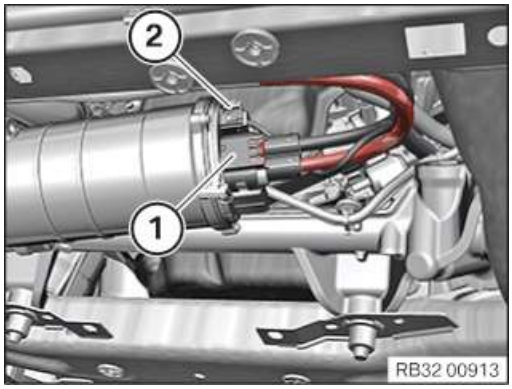
- Loosen the expanding rivet (1).
- Remove screws (arrows).
- Remove the rear section of the front wheel arch cover (2).

23 – Releasing lower steering shaft from steering gear

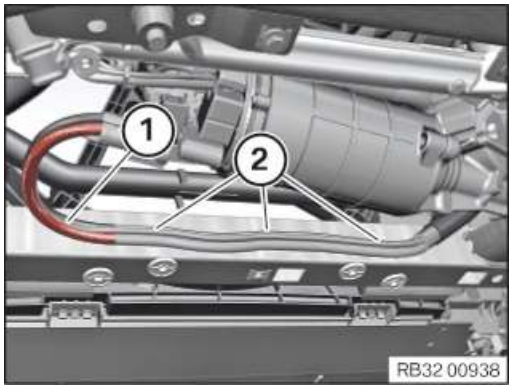


- Loosen screw (1).
- Pull off lower steering shaft (2) from steering gear in direction of arrow.

24 – Detach the wiring harness of the EPS from the front axle support

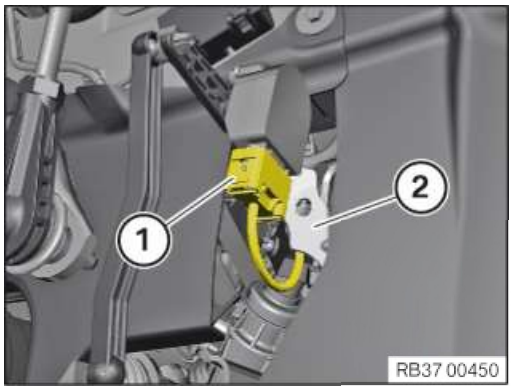


- Unlock and disconnect the plug connections (1) and (2).



- Loosen the holder (2).
- Place wiring harness (1) to one side.

25 – Detach the line connection of the ride height sensor



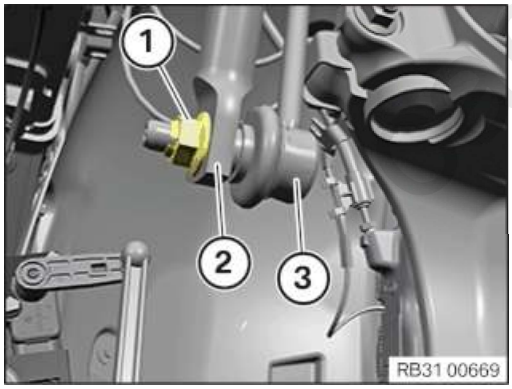
- Unlock plug connection (1) and disconnect.
- Unclip the line from holder (2).

26 – Release the left and right anti-roll bar link from the anti-roll bar

NOTICE

Perform the operations on the left and right side.

▸ **Loosening the anti-roll bar link from the anti-roll bar**



- Loosen nut (1).

Note: Use the Torx socket for counter support.

- Loosen the anti-roll bar link (3) from the anti-roll bar (2).

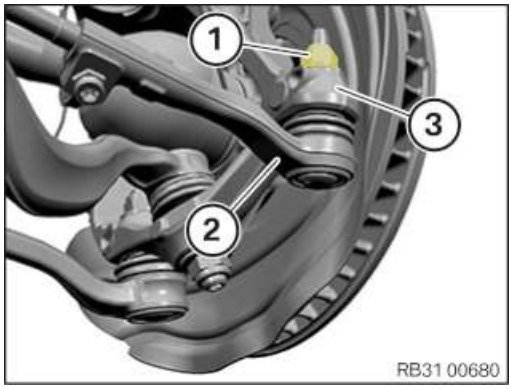
27 – Loosening the track rod on the left and right from the swivel bearing

NOTICE

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

▸ **Loosening the track rod from the swivel bearing**

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- Loosen nut (1).

Note: If necessary, counter-hold at the Torx socket.

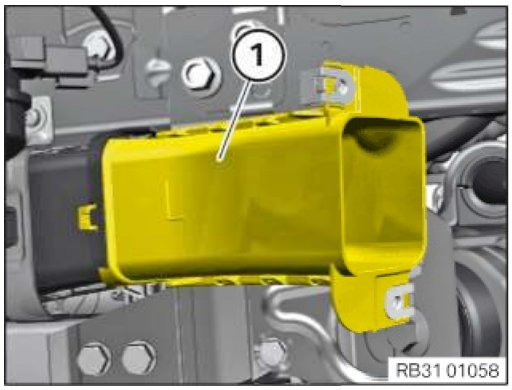
- Detach the track rod (2) from the swivel bearing (3).

28 – Removing the left and right brake air duct partially

NOTICE

Perform the operations on the left and right side.

▸ **Removing brake air duct partially**

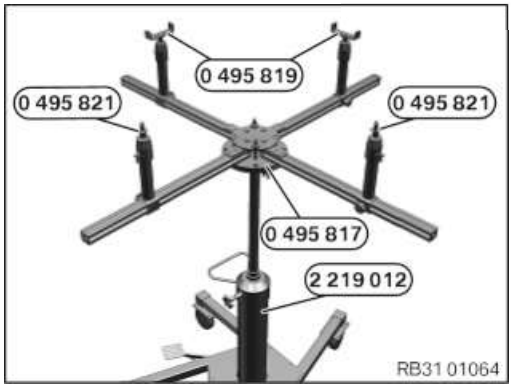


- Unclip and remove air duct (1).

29 – Preparing the special tool

TECHNICAL INFORMATION

In a profile rail pair, two profile rails are connected to one another by gearing.



- Fit the special tool completely on the universal jack 2 219 012 with the help of an auxiliary person.
- Insert special tools in telescopic supports of a profile rail pair.
- Insert special tools in telescopic supports of other profile rail pair.

30 – Lower front axle support

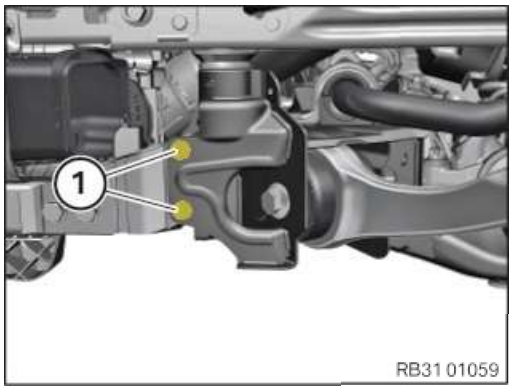
cardiagn.com

WARNING

Falling or tipping of a heavy component.

Danger! Life-threatening injuries!

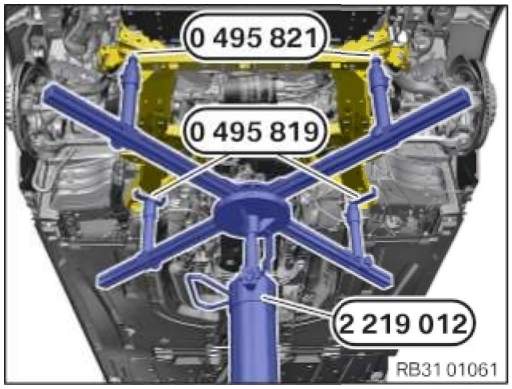
- Before lowering or removing the front axle: Secure the engine in mounting orientation.
- For additional information see: 11 00 670 Securing engine in installation position.



NOTICE

Perform the operations on the left and right side.

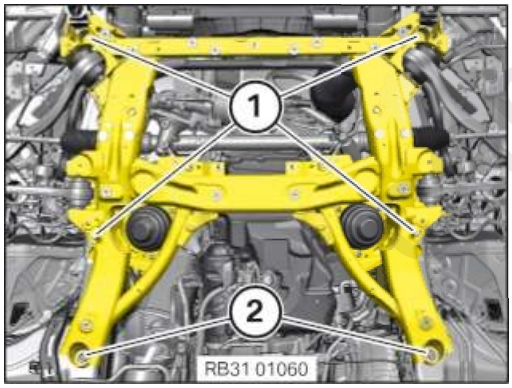
- Loosen screws (1).



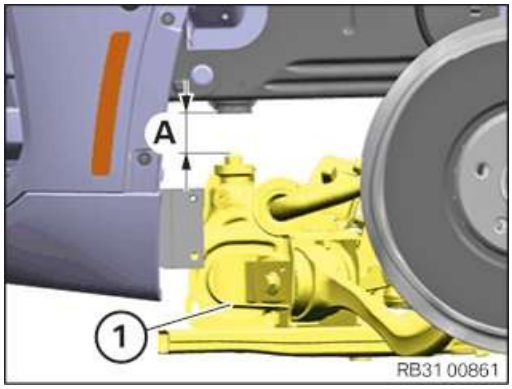
- Position the universal jack 2 219 012 with the special tools and on the front axle support.

  The centre of gravity of the front axle must be centred over the universal jack 2 219 012 !

- Support the front axle support with the universal jack 2 219 012.



- Loosen screws (1) and (2).



- Lower the front axle support (1) with the universal jack by dimension (A).

  Dimensions (A) = maximum 15 cm

MAIN WORK

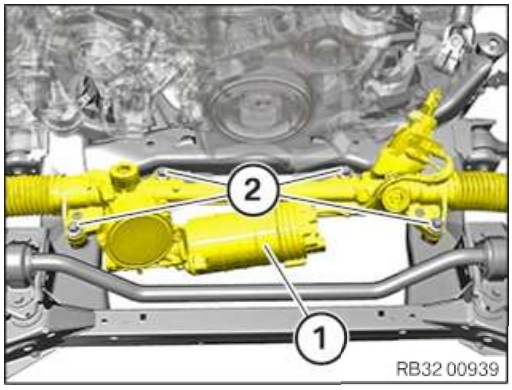
31 – Remove the electromechanical steering gear

RISK OF DAMAGE

Damage to the track rods or the electromechanical steering gear.

Holding the electromechanical steering gear by the track rods may damage the track rods and the electromechanical steering gear.

- Only hold the electromechanical steering gear by the housing.



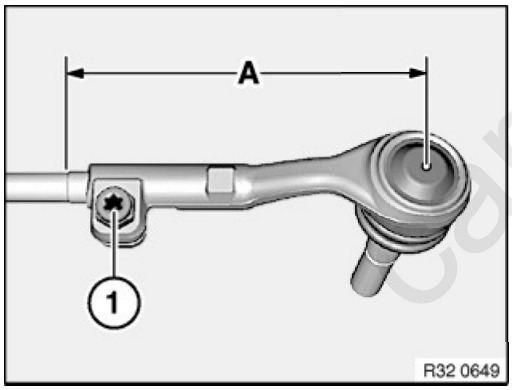
- Unscrew the bolts (2) from the electromechanical steering gear (1).
- Remove the electromechanical steering gear (1) to the side.

32 – Prepare the new electromechanical steering gear

▸ **Remounting the track rod end on left and right**

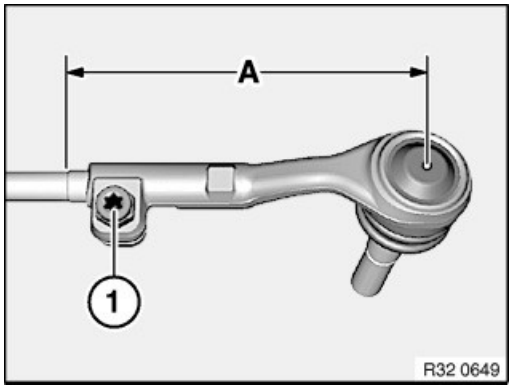
NOTICE

Perform the operations on the left and right side.



- Determine dimension (A) to simplify the following toe adjustment on the front axle.
- Slacken the screw (1) on the previous electromechanical steering gear.
- Unscrew the track rod end from the previous electromechanical steering gear.

Note: If necessary, counterhold track rod with an open-end spanner.



- Screw the track rod end onto the track rod on the new electromechanical steering gear up to dimension (A) which was determined before removal.

Note: If necessary, counterhold track rod with an open-end spanner.

- Tighten down screw (1).

Track rod end to track rod

M10		Tightening torque	32 Nm

33 – Install the electromechanical steering gear

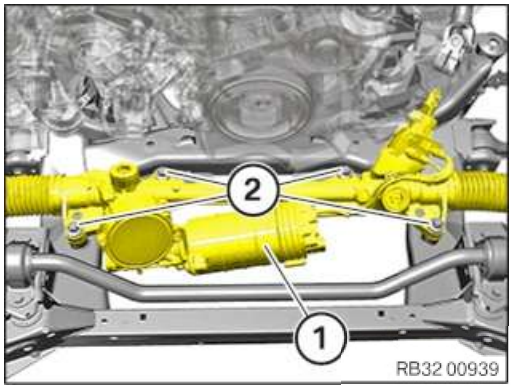
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RISK OF DAMAGE

Damage to the track rods or the electromechanical steering gear.

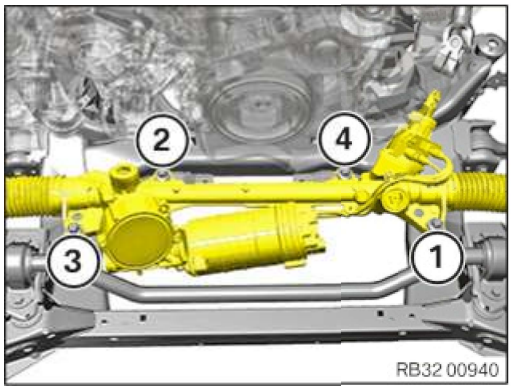
Holding the electromechanical steering gear by the track rods may damage the track rods and the electromechanical steering gear.

- Only hold the electromechanical steering gear by the housing.



- Install electromechanical steering gear (1) and position it on the front axle support.
- Renew screws (2).

  Parts: Bolts
- Screw in the screws (2) by hand.



- Tighten the screws of the electromechanical power steering in the marked sequence 1-4.

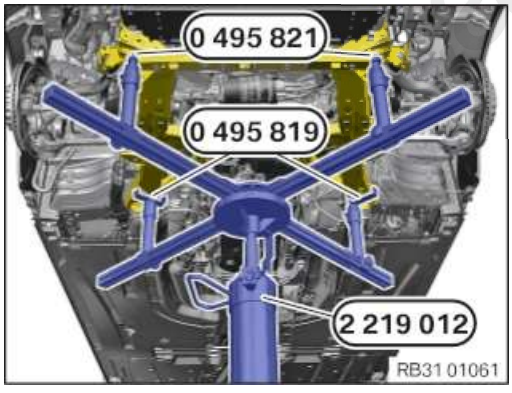
  Adherence to the tightening sequence is absolutely mandatory!

Electromechanical steering gear to front axle support

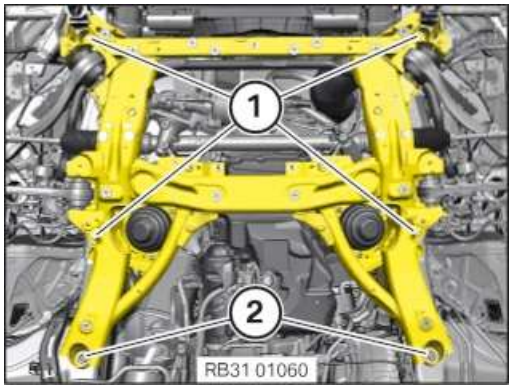
M12	Renew screws. Ensure that the tightening sequence is followed. *1: front left 2: rear right 3: front right 4: rear left*	1. Jointing torque 2. Jointing torque Angle of rotation	60 Nm 96 Nm 90 °

POSTPROCESSES

34 – Lift front axle support and fasten.



- Carefully lift the front axle support with the universal jack 2 219 012 and position on the body.



- Replace the screws (1).

  Parts: Bolts
- Tighten the screws (1).

Front axle support to front/centre of body

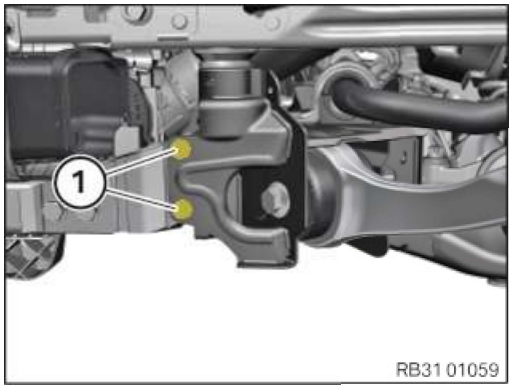
M12	Renew screws.	Jointing torque	108 Nm

- Replace the screws (2).

  Parts: Bolts
- Tighten the screws (2).

Front axle carrier to body, rear

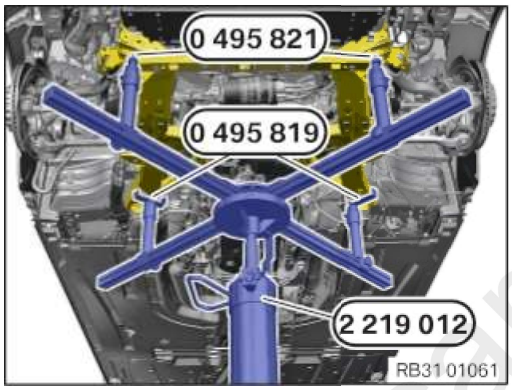
M14	Renew screws.	Tightening torque	175 Nm



- Position the adapter for the front axle support on the front axle support .
- Tighten the screws (1).

Adapter, front axle support to front axle support

M8x70		Tightening torque	19 Nm



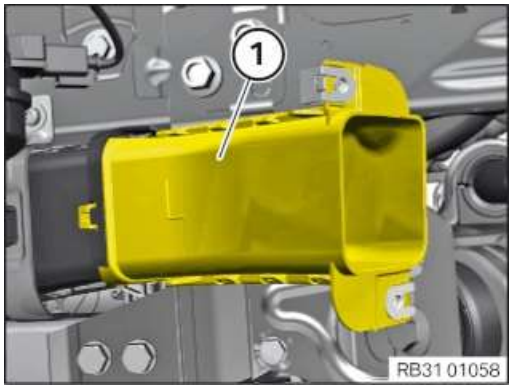
- Lower the universal jack 2 219 012 and place to one side.

35 – Partially installing the left and right brake air duct

NOTICE

Perform the operations on the left and right side.

▸ **Installing the brake air duct partially**



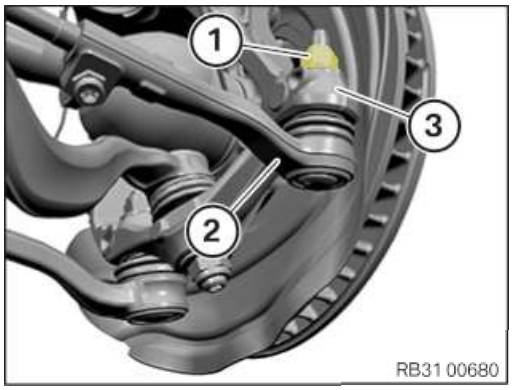
- Position and clip in air duct (1).

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36 – Securing the track rod on the left and right to the swivel bearing

NOTICE

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



▸ **Securing the track rod on the swivel bearing**

- Position the track rod (2) on the swivel bearing (3).
- Renew nut (1).

  Parts: Nut
- Tighten nut (1).

Note: If necessary, counter-hold at the Torx socket.

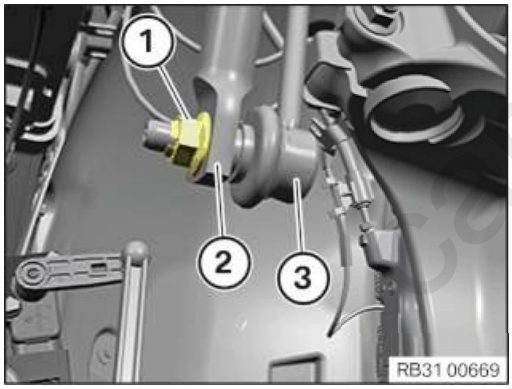
Track rod end to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

37 – Securing the anti-roll bar link to the left and right anti-roll bar

NOTICE

Perform the operations on the left and right side.



▸ **Securing the anti-roll bar link to the anti-roll bar**

- Position the anti-roll bar link (3) on the anti-roll bar (2).
- Renew nut (1).

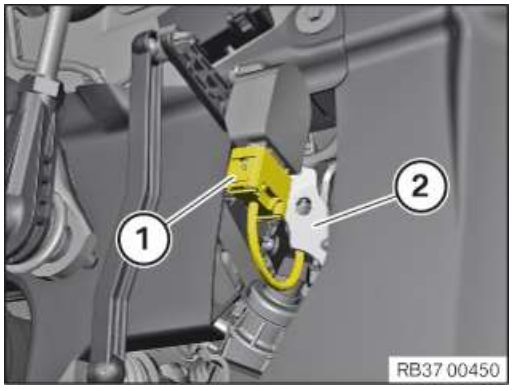
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Front anti-roll bar link to anti-roll bar/spring strut

M10	Renew nut.	Tightening torque	56 Nm

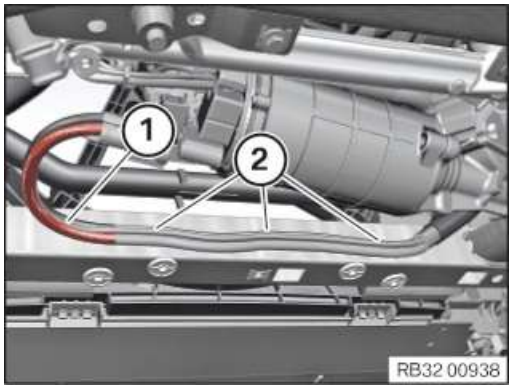
38 – Attach the line connection of the ride height sensor



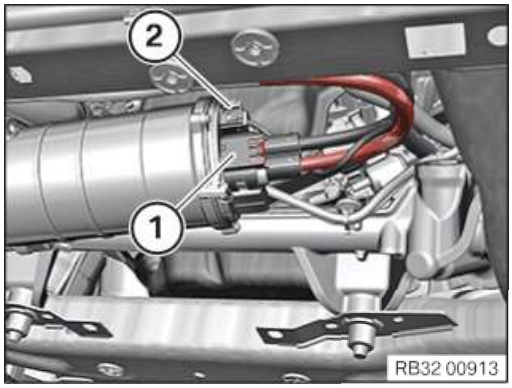
- Position the line .
- Clip in line on holder (2) .
- Connect connectors (1) and lock.

39 – Secure the wiring harness for the EPS on the front axle support

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- Position the EPS wiring harness (1) from the front axle support.
- Secure the holder (2).

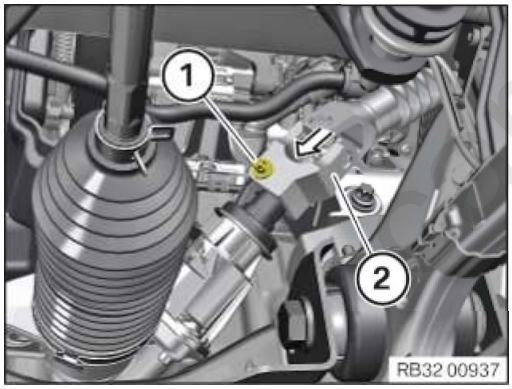


- Connect connectors (1) and (2) lock.

40 – Securing the steering shaft at the bottom on the steering gear

TECHNICAL INFORMATION

The universal joint can only be installed in one position.
The universal joint and the bottom steering gear and/or steering shaft are encoded with each other.
The clamping bolt must e positioned in the groove of the steering gear groove or the steering shaft.



- Clean the screw threads to remove all remnants of screw locking adhesive.
- Slide the lower steering shaft (2) onto the steering gear in the direction of the arrow.
- Renew the clamping bolt (1).

  Parts: Clamping bolt
- Tighten the clamping bolt (1).

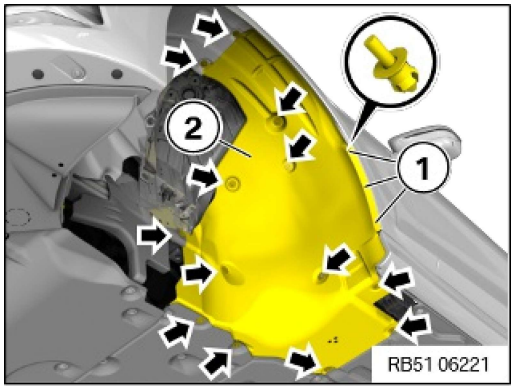
Universal joint to steering box

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

41 – Install the rear section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



- Install the rear section of the front wheel arch cover(2) .
- Tighten screws (arrows).

Wheel arch trim panel, front

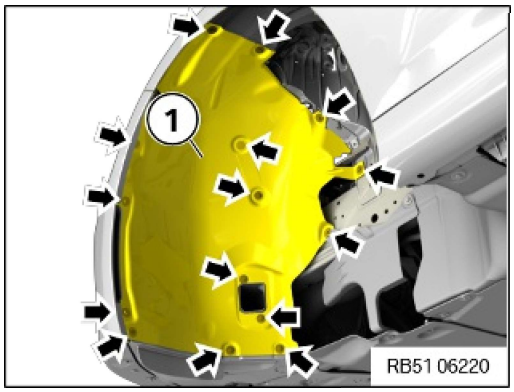
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

- Secure expanding rivet (1).

42 – Install the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



- Install the front section of the front wheel arch cover (1).
- Tighten screws (arrows).

Wheel arch trim panel, front

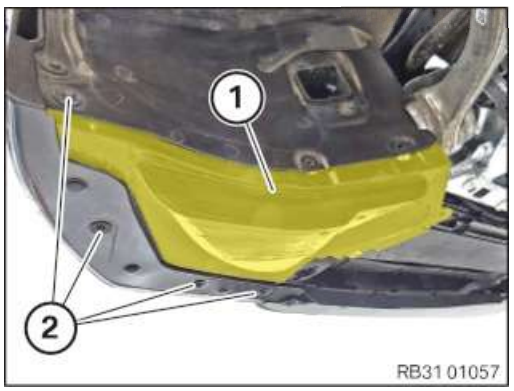
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

43 – Installing the bottom left and right wheel arch cover

NOTICE

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

▸ **Installing the bottom wheel arch cover**



- Position the bottom wheel arch cover (1).
- Tighten the screws (2).

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

44 – Install the cover of the steering assembly on the left and right

NOTICE

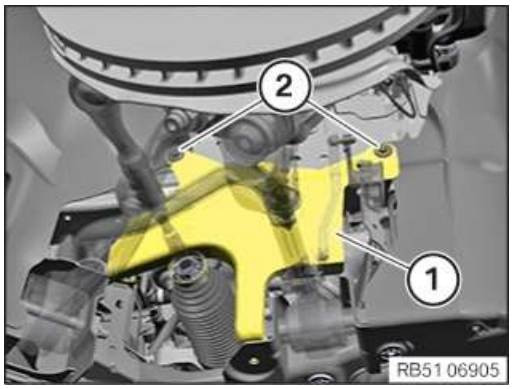
Description is for left component only. Procedure on the right side is identical.

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▶ **Install the cover of the steering assembly**

Prerequisite

The underbody protection of the steering gear is removed.



- Position the cover (1).
- Tighten the screws (2).

Cover, steering unit

Screw		Tightening torque	3 Nm

45 – Loosen the attachment of the engine in installation position



- Lower engine by turning the spindle 2 361 506 (00 6 103) until the engine lies completely on the engine supports.



TECHNICAL INFORMATION

Conduct the following operation with the assistance of a second person.

- Remove the engine bridge (1) with an auxiliary person.



- Tighten bolt (1) of the left engine mount from the bottom using a standard tool.

Engine mount to engine mounting bracket

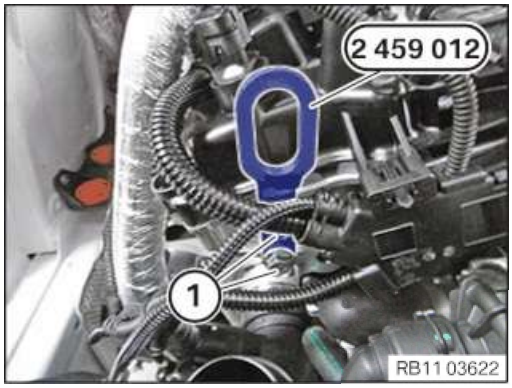
M12		Tightening torque	100 Nm



- Tighten bolt (1) of the right engine mount from the top using a standard tool.

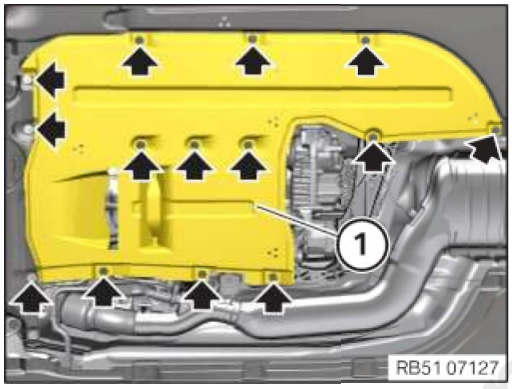
Engine mount to engine mounting bracket

M12		Tightening torque	100 Nm



- Unscrew the bolts (1) of the special tool 2 459 012.
- Feed out the special tool 2 459 012 at the cylinder head and remove.

46 – Installing underbody protection at rear



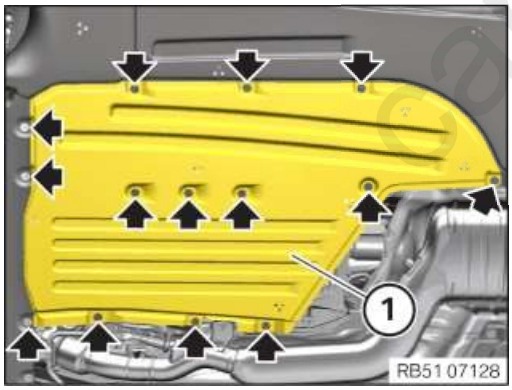
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

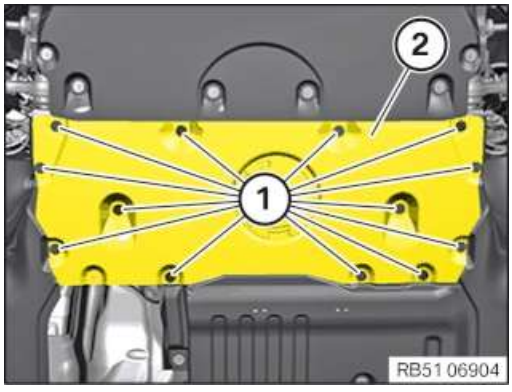
  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

47 – Installing the centre underbody protection



- **Version with rear-wheel drive:**

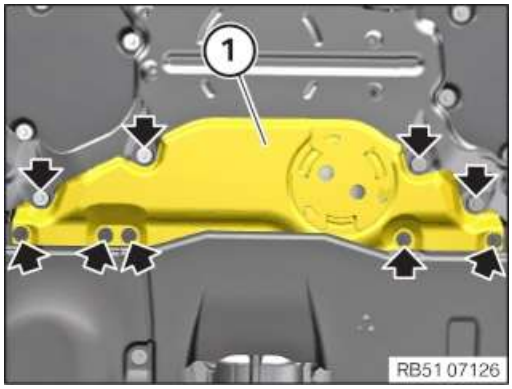
  Position central underbody protection (2).

  Tighten the screws (1).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

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

  Guide in and install the centre of underbody protection (1).

  Tighten screws (arrows).

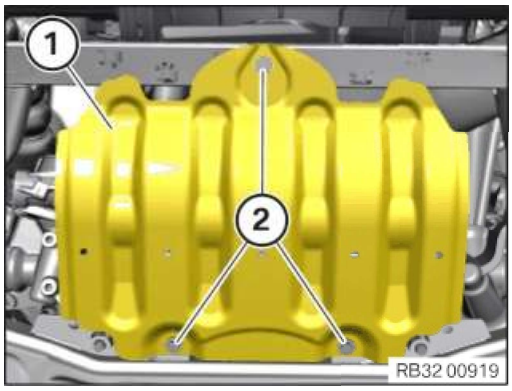
Underbody protection

Hexagon screw		Tightening torque	3 Nm

48 – If installed: Installing the steering guard

Prerequisite

The front underbody protection is removed.

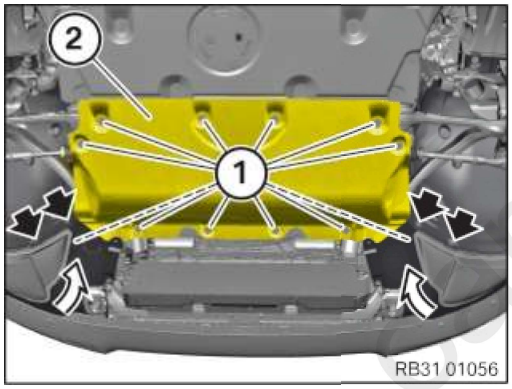


- Remove guard (1).
- Tighten the screws (2).

Bumper buffer device steering on front axle support

M10		Tightening torque	56 Nm

49 – Install the underbody protection of the steering gear



- **Version 1:**
- Position the underbody protection of the steering gear (2).
- Tighten the screws (1).

Underbody protection of the steering gear

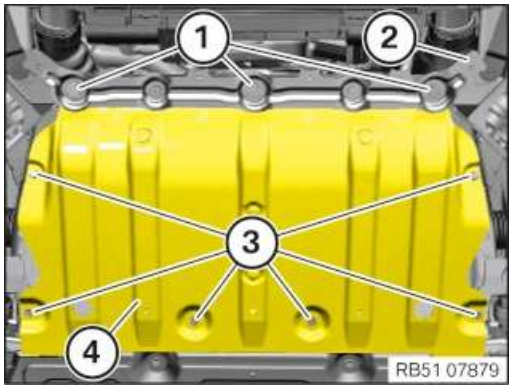
Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover.
- Tighten the screws (arrows) of the bottom wheel arch cover on the wheel arch cover.

Wheel arch cover (screws)

Thermoplastic hexagon screw		Tightening torque	3 Nm

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- **Version 2:**
- Guide in the steering gear underbody protection (4) and install.
- Tighten the screws (3).

Underbody protection of the steering gear

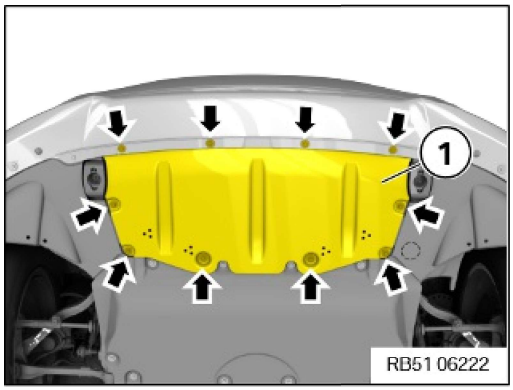
Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

- Position holder of underride protection (2).
- Tighten the screws (1).

Holder underride guard to front axle support

M10		Tightening torque	56 Nm

50 – Installing the front underbody protection



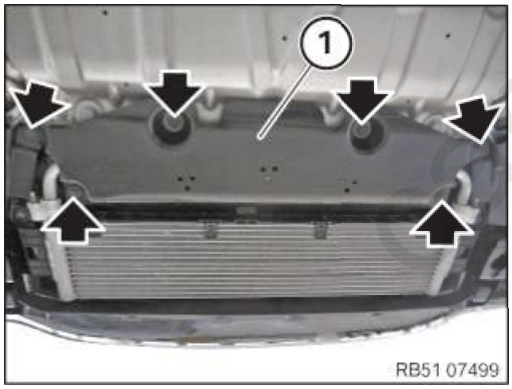
- **Version 1:**

  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



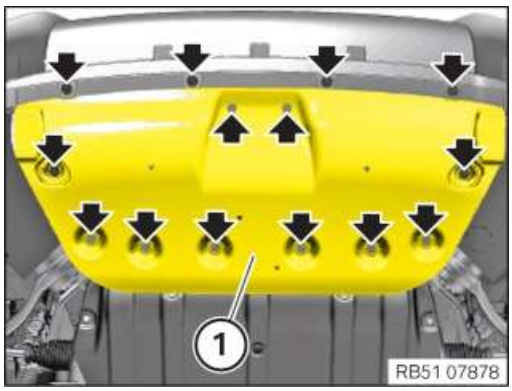
- **Version 2:**

  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

51 – Installing both front wheels

▸ **Mounting the wheel**

otdiagn.com



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.

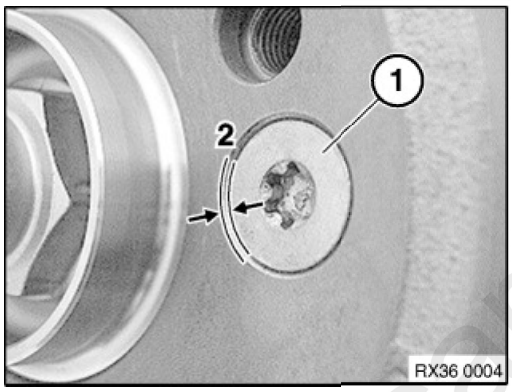
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

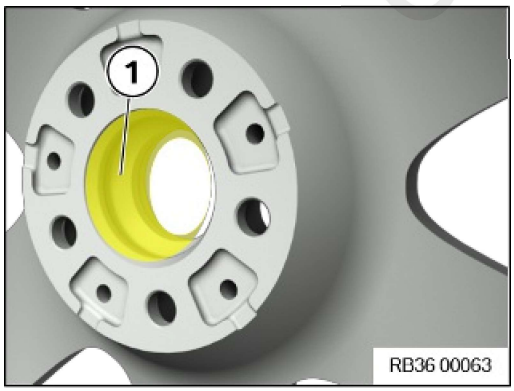
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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



- 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

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- Lightly grease the front and rear wheel hubs in this area (1) to protect from 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



- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

  Parts: Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts 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. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

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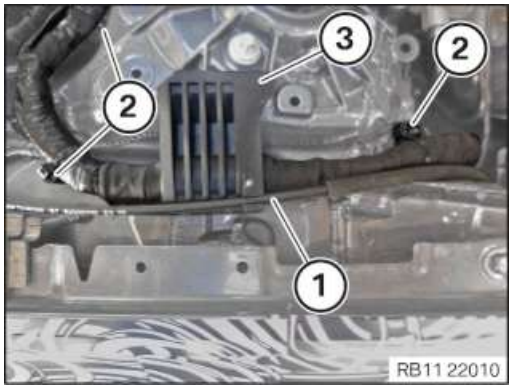
52 – Securing the wiring harness section to the left spring strut dome

RISK OF DAMAGE

Improper routing of cables and wiring harnesses.

Trapped, crushed or damaged cables may cause short circuits and malfunctions.

- Route all cables without abrasions, do not trap and crush.



- Guide in and position wiring harness section (3) on the left spring strut dome.
- Secure clamps (2).
- Guide in and install cable (1) of the front flap.

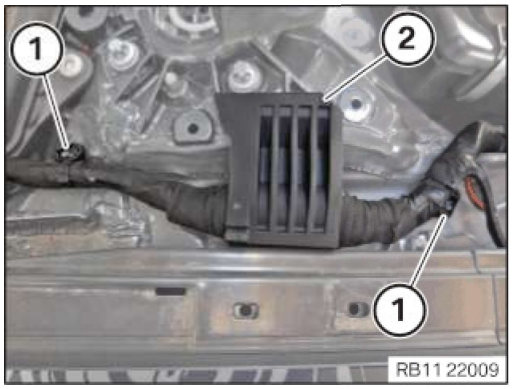
53 – Secure wiring harness section on right spring strut dome

RISK OF DAMAGE

Improper routing of cables and wiring harnesses.

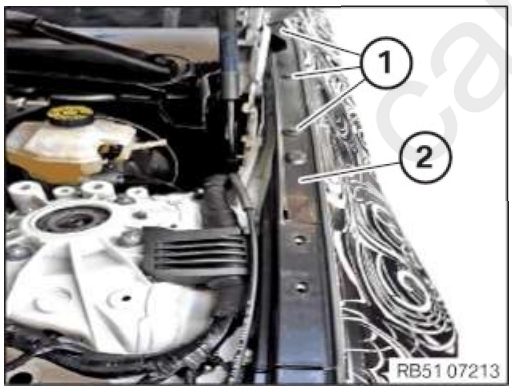
Trapped, crushed or damaged cables may cause short circuits and malfunctions.

- Route all cables without abrasions, do not trap and crush.



- Guide in and position the wiring harness section (2) of right spring strut dome.
- Secure clamps (1).

54 – Installation of side panel sealing.



NOTICE

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

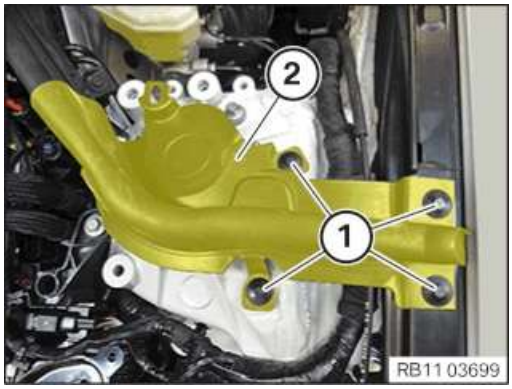
- Guide the sealing (2) in and install it.
- Mount the expanding rivets (1).

55 – Install side bonnet seals

NOTICE

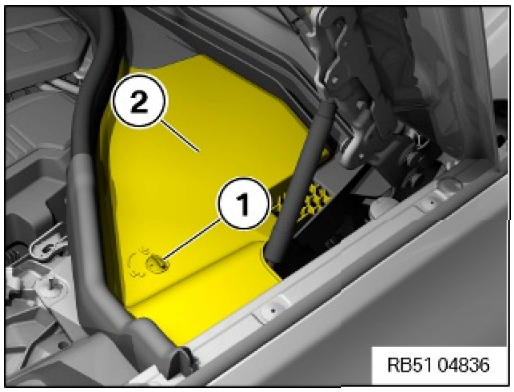
Perform the operations on the left and right side.

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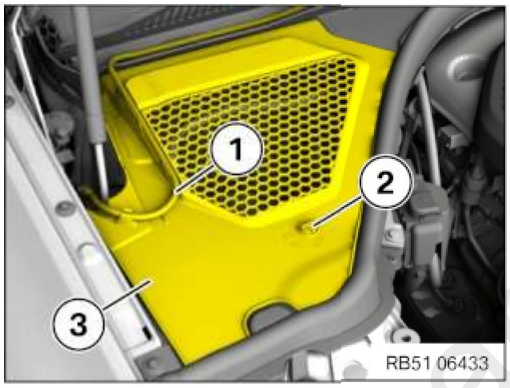
- Position the side bonnet seal (2) on the spring strut dome.
- Secure the rivet (1).

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



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

57 – Install the rear right engine compartment cover



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

58 – Installing the clean air pipe with resonator



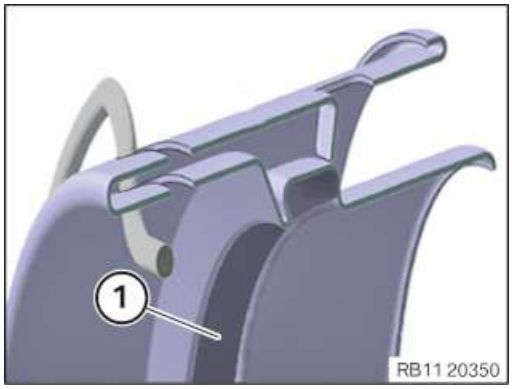
- Check the seal (1) for damages, replace if necessary.

▸ **Replace damaged gasket**

TECHNICAL INFORMATION

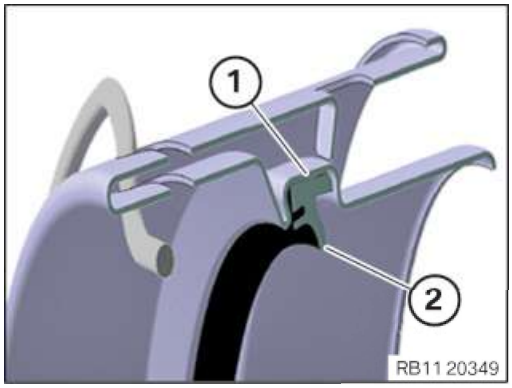
Do not use pointed or sharp-edged tools for the installation and/or removal.

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- Remove damaged seal.
- Clean gasket groove (1) with a dry towel.

  The gasket groove (1) must be clean.



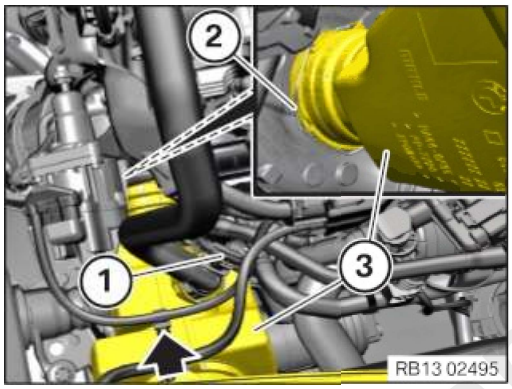
- Renew gasket.

  Parts: Gasket
- Install seal dry without lubricant or mounting agent.

TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

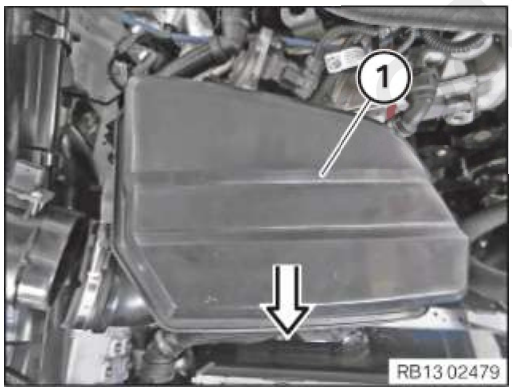
- Feed in and install the seal.
- Make sure the seal is correctly installed in the gasket groove (1).
- Make sure that the sealing lip (2) is pointing downwards (see figure).



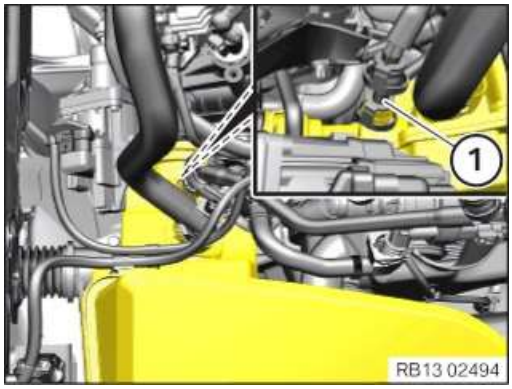
- Guide in and install the clean air pipe with resonator (3).
- Lock clamp (2).

  The clamp (2) must engage audibly.
- Connect connectors (1) and lock.

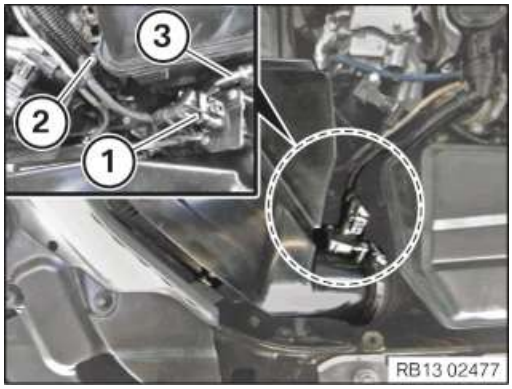
  The connector (1) must engage audibly.
- Secure clamp (arrow).



- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Connect and lock the tank ventilation line (1).



- Connect the clean air pipe with resonator to the intake filter housing.
- Tighten clamp (3).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

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

  The connector (1) must engage audibly.



- Insert and install the engine ventilation line (2).
- Ensure that the locks (1) engage audibly.

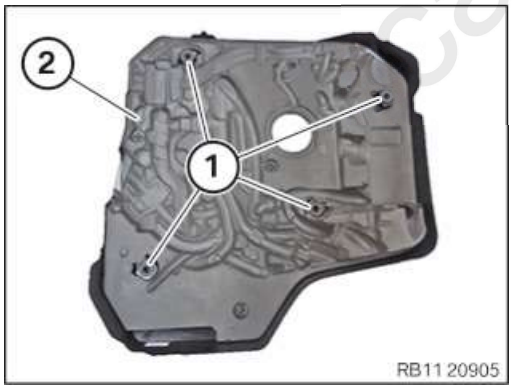
59 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover.

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

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



- Check all rubber mounts (1) of acoustic cover (2) for correct seating.



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

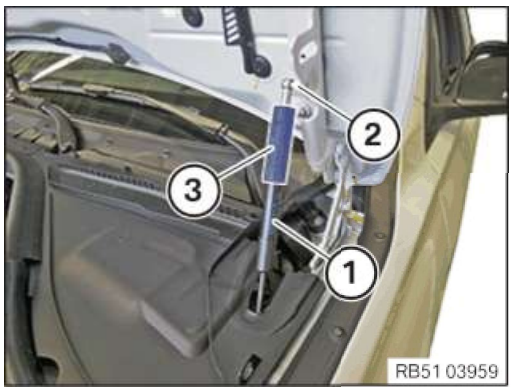
  The acoustic cover (1) must audibly engage into place.

60 – Disconnecting all battery earth leads

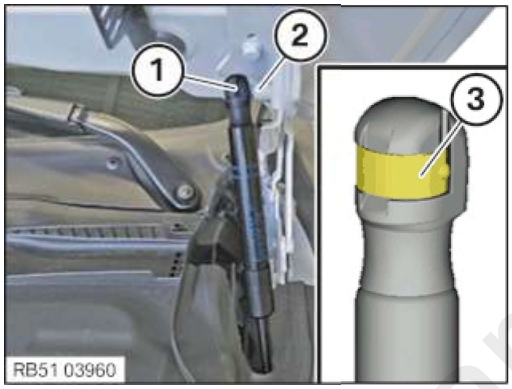


- See additional information.

61 – Take bonnet out of the service position



- Support the bonnet by hand.
- Remove the special tool (3) from the ball pin (2).
- Pull off the special tool (3) from the gas pressure spring (1).
- Continue to support the bonnet and repeat the operation on the other side of vehicle.



CAUTION

Shutting bonnet or tailgate.

Danger of injury!

- Support bonnet/tailgate in fully open position with the aid of a suitable device.

- Check the clamp (3) is fitted correctly.
- Connect ball socket (1) to ball pin (2).
- Continue to support the bonnet and repeat the operation on the other side of vehicle.

62 – Perform chassis alignment check

- Perform the introductory wheel alignment in accordance with equipment manufacturer's instructions.
- If necessary, adjust the front axle and the rear axle.
- Perform the final wheel alignment in accordance with equipment manufacturer's instructions.
- Save and print out test record.

63 – Replacement: Carry out initialisation of electromechanical power steering



- Connect vehicle to the diagnosis system.
- Run the service function "EPS steering start-up".

Additional Information

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Overview of Tightening Torques

Special tool to cylinder head — Used in step 18

M8		Tightening torque	21,5 Nm

Track rod end to track rod — Used in step 32

M10		Tightening torque	32 Nm

Electromechanical steering gear to front axle support — Used in step 33

M12	Renew screws. Ensure that the tightening sequence is followed. *1: front left 2: rear right 3: front right 4: rear left*	1. Jointing torque 2. Jointing torque Angle of rotation	60 Nm 96 Nm 90 °

Front axle support to front/centre of body — Used in step 34

M12	Renew screws.	Jointing torque	108 Nm

Front axle carrier to body, rear — Used in step 34

M14	Renew screws.	Tightening torque	175 Nm

Adapter, front axle support to front axle support — Used in step 34

M8x70		Tightening torque	19 Nm

Track rod end to swivel bearing — Used in step 36

M14	Renew nut.	Tightening torque	175 Nm

Front anti-roll bar link to anti-roll bar/spring strut — Used in step 37

M10	Renew nut.	Tightening torque	56 Nm

Universal joint to steering box — Used in step 40

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

Wheel arch trim panel, front — Used in step 4142

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Cover, front bottom on side — Used in step 43

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Cover, steering unit — Used in step 44

Screw		Tightening torque	3 Nm

Engine mount to engine mounting bracket — Used in step 45

M12		Tightening torque	100 Nm

Underbody protection — Used in step 4647

Hexagon screw		Tightening torque	3 Nm

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Bumper buffer device steering on front axle support — Used in step 48

M10		Tightening torque	56 Nm

Underbody protection of the steering gear — Used in step 49

Hexagon screw for thermoplastic		Tightening torque	3 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Wheel arch cover (screws) — Used in step 49

Thermoplastic hexagon screw		Tightening torque	3 Nm

Holder underride guard to front axle support — Used in step 49

M10		Tightening torque	56 Nm

Underbody protection front — Used in step 50

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Brake disc to front wheel hub — Used in step 51

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 51

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 51

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

Clean air pipe to upper section of intake filter housing — Used in step 58

Clamp		Tightening torque	3 Nm

Overview of Special Tools

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2 459 012 Holder



Common	Used in step 1845
Usage	For removing and installing the cylinder head. Contour-graphic silhouette foil is included in the delivery specification.
Included in the tool or work	
Storage location	A58
Replaced by	
In connection with	
SI-Number	01 07 17 (487)

2 361 506 (00 6 103) Spindle



Common	Used in step 1845
Usage	Spindle (central spindle) for Traverse 00 6 100.
Included in the tool or work	0 496 852
Storage location	
Replaced by	
In connection with	
SI-Number	01 17 10 (659)

2 219 012 Hydraulic lifter



Common	Used in step 293034
Usage	For raising and lowering various vehicle components.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 05 90 (207)

2 344 011 Tool



Common	Used in step 51
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

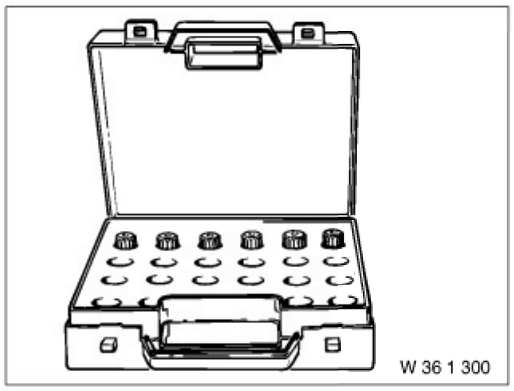
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0 495 221 (36 1 323) Wheel stud



Common	Used in step 12
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



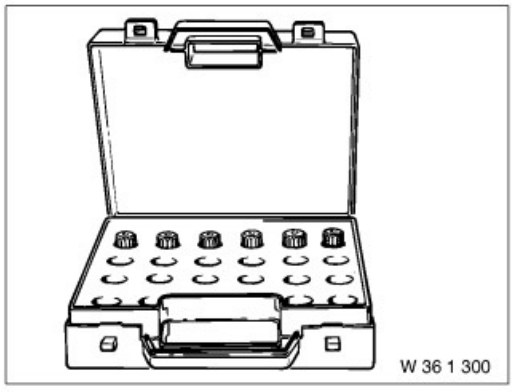
Common	Used in step 12
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 12
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 12
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

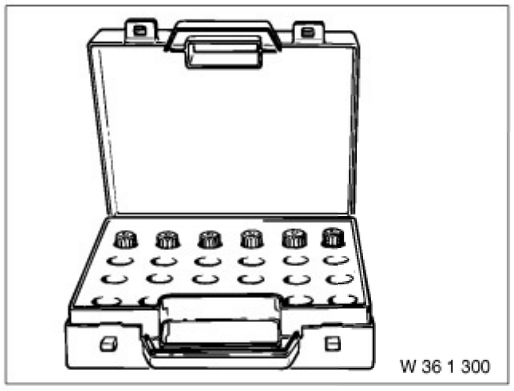
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0 495 227 (36 1 329) Wheel stud



Common	Used in step 12
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



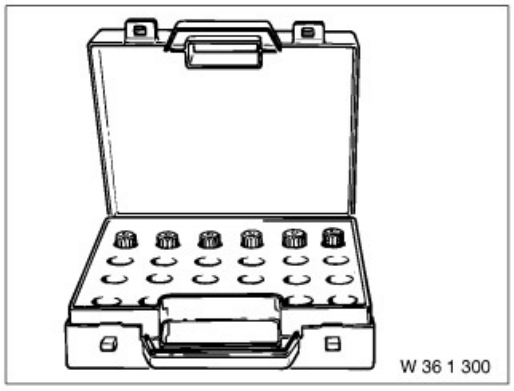
Common	Used in step 12
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 12
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 12
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

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61 20 900 Disconnecting and connecting battery earth lead	260
61 20 900 Disconnecting and connecting battery earth lead	260
61 20 900 Disconnecting and connecting battery earth lead	260
61 20 900 Disconnecting and connecting battery earth lead	260
61 20 900 Disconnecting and connecting battery earth lead	260
61 20 900 Disconnecting and connecting battery earth lead	260
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	260
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	260
61 20 900 Disconnecting and connecting battery earth lead	260
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	260
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	260
61 20 900 Disconnecting and connecting battery earth lead	260
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61 20 900 Disconnecting and connecting battery earth lead	260
61 20 900 Disconnecting and connecting battery earth lead	260

00 .. ... Raising the vehicle using a vehicle hoist

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32 21 151 Replacing left or right track rod end

TECHNICAL INFORMATION

Perform wheel alignment after installation.

NOTICE

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

PRELIMINARY WORK

1 – Remove front left or right wheel

▸ **Removing the wheel**



- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

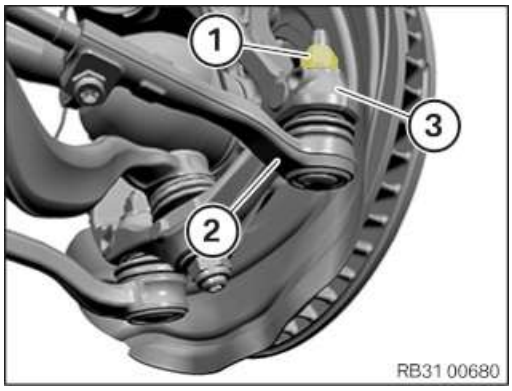
  This process is intended to prevent damage to the brake disc.



- If several wheels are removed simultaneously: 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 a suitable adapter from the tool set .

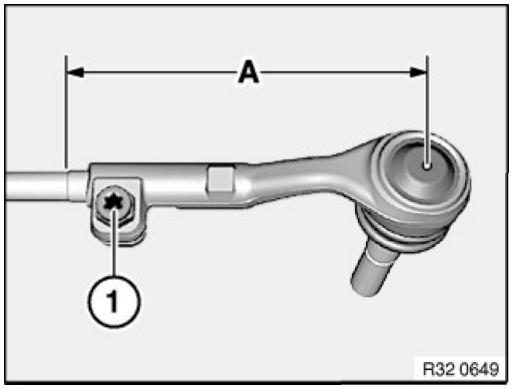
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2 – Removing the track rod end



- Loosen nut (1).

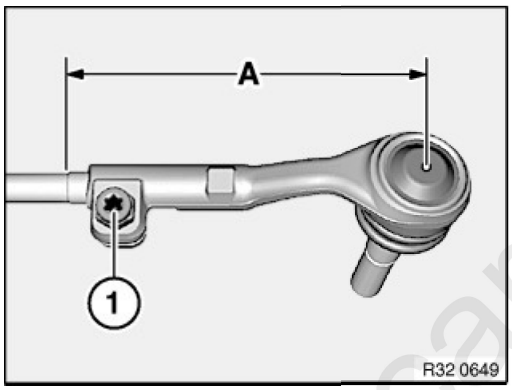
  If necessary, counter-hold at the Torx socket.
- Detach the track rod end (2) from the swivel bearing (3).



- Determine dimension (A) to simplify the subsequent toe adjustment on the front axle.
- Slacken screw (1).
- Unscrew track rod end.

  If necessary, use an open-end spanner for counter support at the track rod.

3 – Installing track rod end



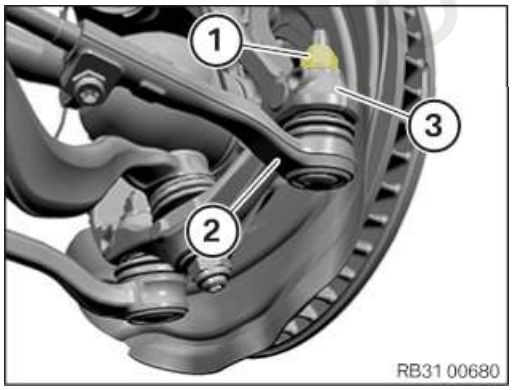
- Screw the track rod end onto the track rod up to dimension (A), which was determined before removal.

Note: If necessary, use an open-end spanner for counter support at the track rod.

- Tighten down screw (1).

Track rod end to track rod

M10		Tightening torque	32 Nm



- Position the track rod end (2) on the swivel bearing (3).
- Renew nut (1).

  Parts: Nut
- Tighten nut (1).

Note: If necessary, counter-hold at the Torx socket.

Track rod end to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

POSTPROCESSES

4 – Install front left or right wheel

▸ **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.

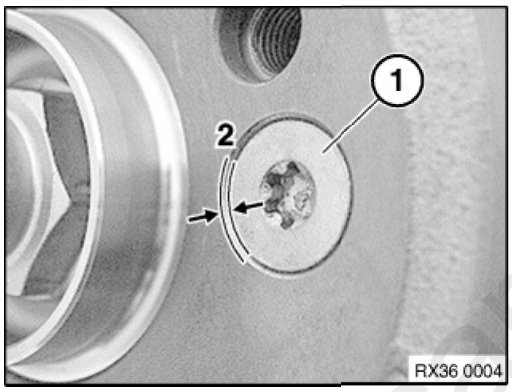
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

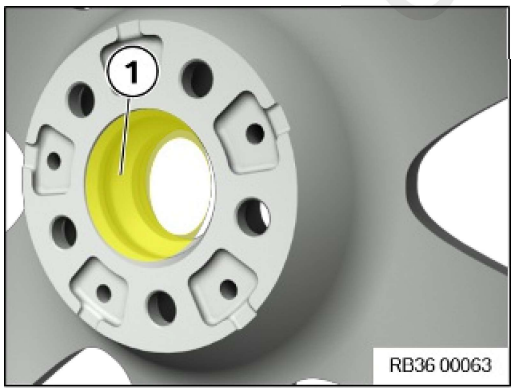
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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



- 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

catalagn.com



- Lightly grease the front and rear wheel hubs in this area (1) to protect from 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



- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

  Parts: Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts 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. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

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5 – Perform chassis alignment check

- Perform the introductory wheel alignment in accordance with equipment manufacturer's instructions.
- If necessary, adjust the front axle and the rear axle.
- Perform the final wheel alignment in accordance with equipment manufacturer's instructions.
- Save and print out test record.

Additional Information

Overview of Tightening Torques

Track rod end to track rod — Used in step 3

M10		Tightening torque	32 Nm

Track rod end to swivel bearing — Used in step 3

M14	Renew nut.	Tightening torque	175 Nm

Brake disc to front wheel hub — Used in step 4

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 4

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 4

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

Overview of Special Tools

2 344 011 Tool

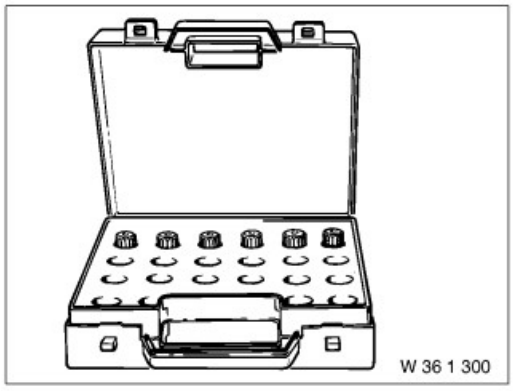


Common — Used in step 4

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	

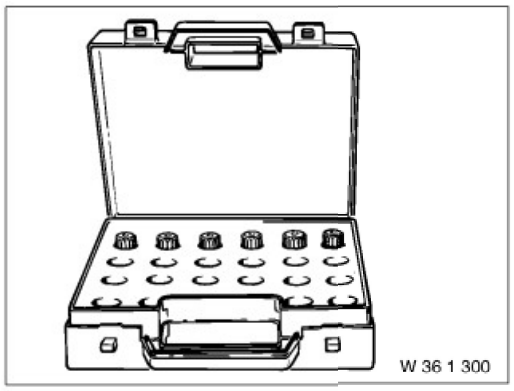
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0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



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

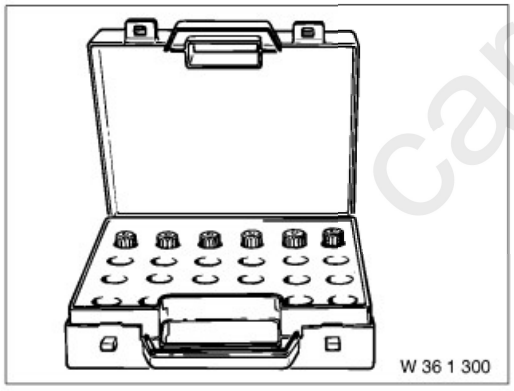
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0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



Common Used in step 1

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

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32 31 070 Removing and installing / replacing lower section of steering shaft

RISK OF DAMAGE

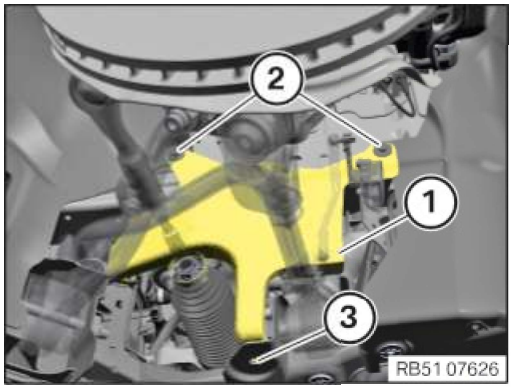
Damage to steering column switch cluster (SZL).

The steering column switch cluster (SZL) or the coil spring cassette may be damaged by twisting of the steering wheel if the lower steering shaft (or the universal joint) is separated from the steering gear or from the steering column.

- Secure steering wheel from twisting.

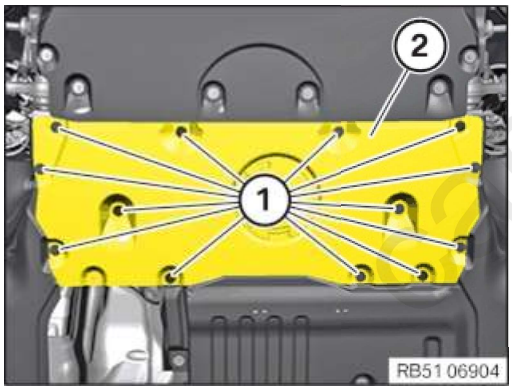
PRELIMINARY WORK

1 – Remove the cover of the steering assembly



- Loosen screws (2) and (3).
- Remove the cover (1).

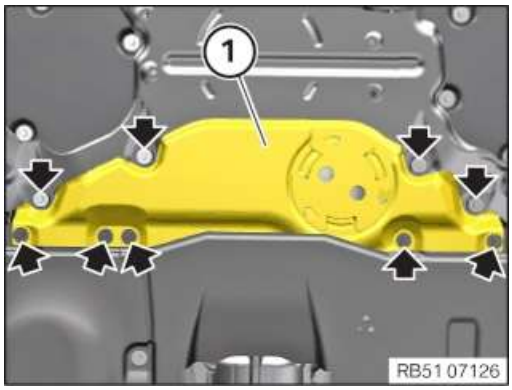
2 – Removing the centre underbody protection



- **Version with rear-wheel drive:**

  Loosen screws (1).

  Remove centre underbody protection (2) .

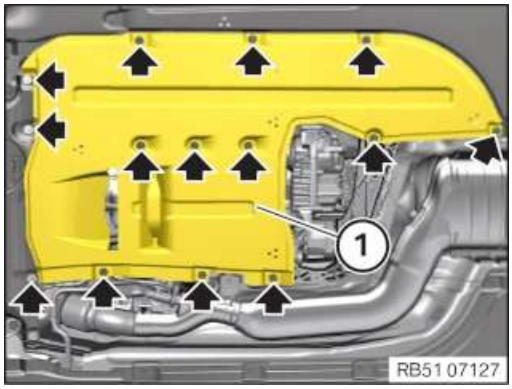


- **Version with all-wheel drive:**

  Remove screws (arrows).

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

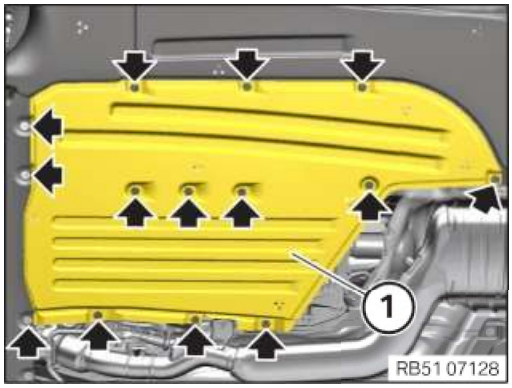
3 – Remove rear underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



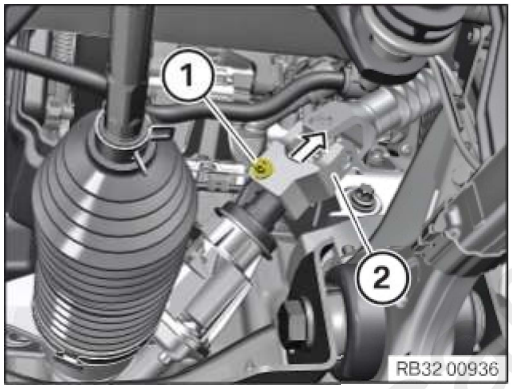
- **Version 2:**

  Remove screws (arrows).

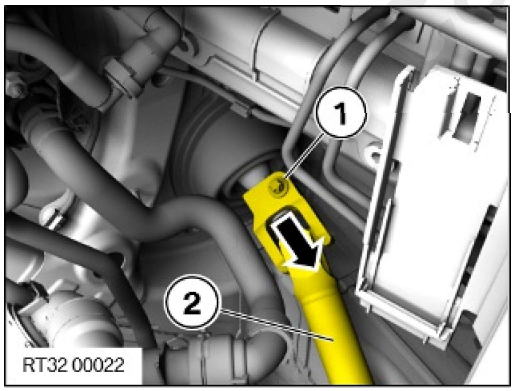
  Guide out rear underbody protection (1) and remove it.

MAIN WORK

4 – Remove lower section of steering shaft



- Loosen the clamping bolt (1).
- Pull down bottom steering shaft (2) from steering gear in direction of arrow.

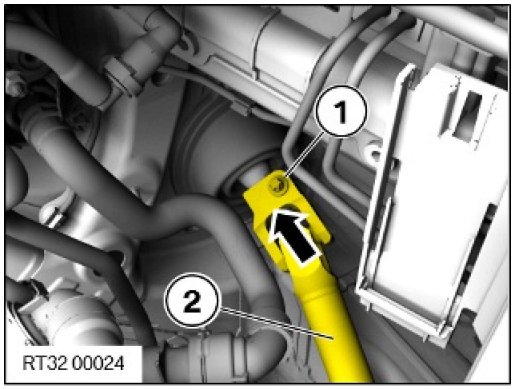


- Pull out the steering column with the bottom steering shaft to the maximum length in the direction of the arrow.
- Loosen the clamping bolt (1).
- Pull down bottom steering shaft (2) in the direction of the arrow off the steering column .
- Feed out bottom steering shaft (2) and remove.

5 – If reusing: Recut thread

- Clean the screw thread of the bottom steering shaft to remove all remnants of screw locking adhesive.
- Recut screw thread.

6 – Installing steering shaft, bottom



TECHNICAL INFORMATION

The steering shaft can only be installed in one position.

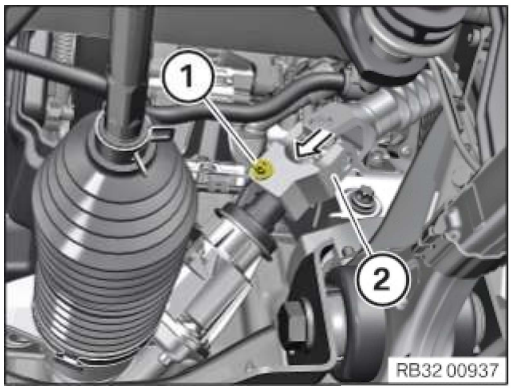
The steering shaft is encoded for the steering column and the steering gear. The clamping bolt must be positioned in the groove of the steering gear or the steering column.

- Pull the steering column out to the maximum length.
- Guide in and position bottom steering spindle (2).
- Slide the bottom steering spindle (2) onto the steering column in the direction of the arrow.
- Renew the clamping bolt (1).

  Parts: Clamping bolt
- Tighten the clamping bolt (1).

Lower steering shaft to steering column

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm



TECHNICAL INFORMATION

The steering shaft can only be installed in one position.

The steering shaft is encoded for the steering column and the steering gear. The clamping bolt must be positioned in the groove of the steering gear or the steering column.

- Slide the bottom steering spindle (2) onto the steering gear in the direction of the arrow.
- Renew the clamping bolt (1).

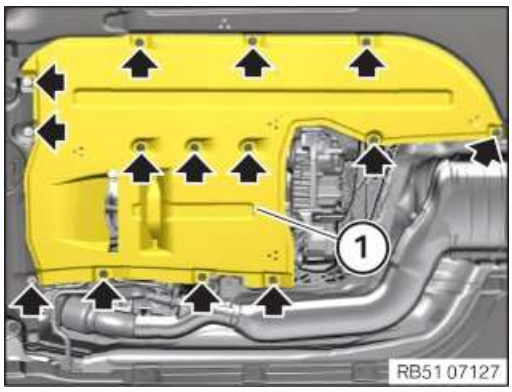
  Parts: Clamping bolt
- Tighten the clamping bolt (1).

Universal joint to steering box

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

POSTPROCESSES

7 – Installing underbody protection at rear



- **Version 1:**

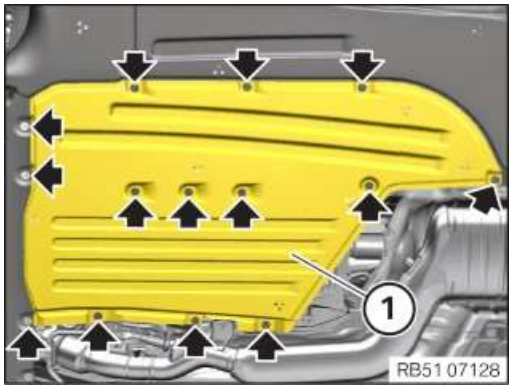
  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

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- **Version 2:**

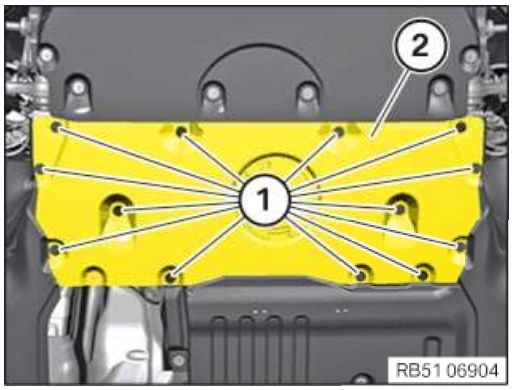
  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

8 – Installing the centre underbody protection



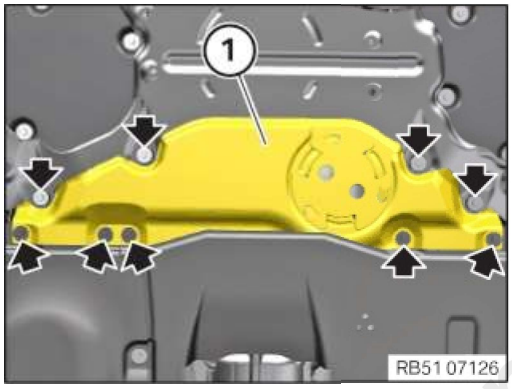
- **Version with rear-wheel drive:**

  Position central underbody protection (2).

  Tighten the screws (1).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



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

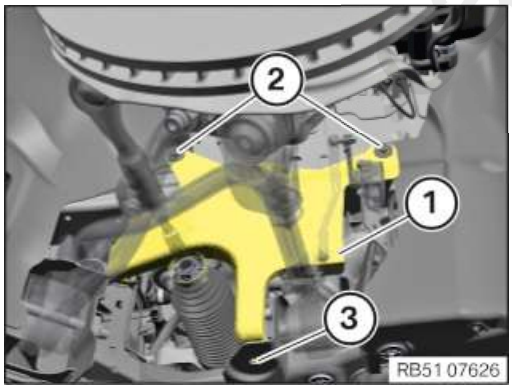
  Guide in and install the centre of underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

9 – Install the cover of the steering assembly



- Position the cover (1).
- Tighten down screws (2) and (3).

Cover, steering unit

Screw		Tightening torque	3 Nm

10 – Checking the airbag for function

Check

- Turn steering wheel in both directions to the limit position.

Result

» The airbag indicator light lights up.

Measure

- Renew the coil spring cassette.

11 – Check the straight-ahead driving position of the steering wheel

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Check

- For straight-ahead driving, check the correct straight-ahead driving position of the steering wheel.

Result

» The steering wheel has an inclination during straight-ahead driving.

Measure

- Carry out a toe adjustment at the front axle.

▸ After a toe adjustment: Perform commissioning of electromechanical steering

- **Additional work AW no.: 32 13 905**



- Connect vehicle to the diagnosis system.
- Run the service function "EPS steering start-up".

Additional Information

Overview of Tightening Torques

Lower steering shaft to steering column			Used in step 6
M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

Universal joint to steering box			Used in step 6
M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

Underbody protection			Used in step 78
Hexagon screw		Tightening torque	3 Nm

Cover, steering unit			Used in step 9
Screw		Tightening torque	3 Nm

Links

Repair instructions	**Used in step**
32 00 155 Kinematics Diagnosis System wheel alignment with ride height measurement without loading the vehicle	
32 00 601 Adjusting toe-in on front axle	

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32 31 020 Removing and installing/replacing lower section of steering column shroud

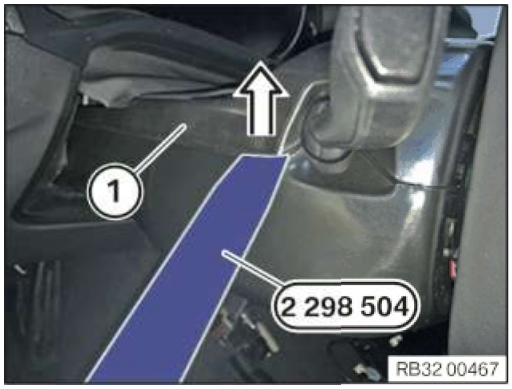
PRELIMINARY WORK

1 – Adjust the steering column position



- Adjust the length of the steering column to the maximum length in the direction of arrow (1).
- Move the steering column to the lowest steering column position in the direction of arrow (2).

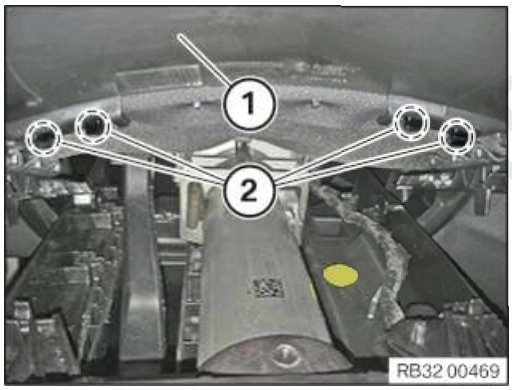
2 – Removing steering column shroud upper section



NOTICE

Perform the operations on the left and right side.

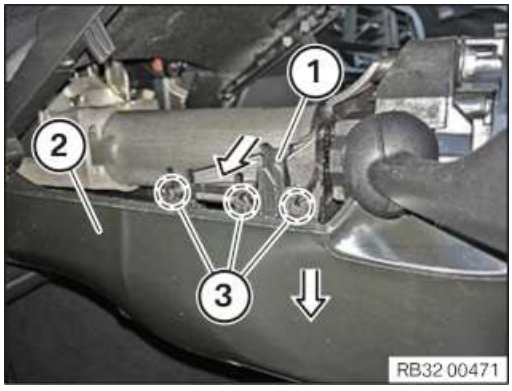
- Unlock the steering column shroud upper section (1) with the special tool 2 298 504 and fold up.



- Unclip the steering column shroud upper section (1) from the brackets (2).
- Remove the steering column shroud upper section (1).

MAIN WORK

3 – Removing steering column shroud lower section



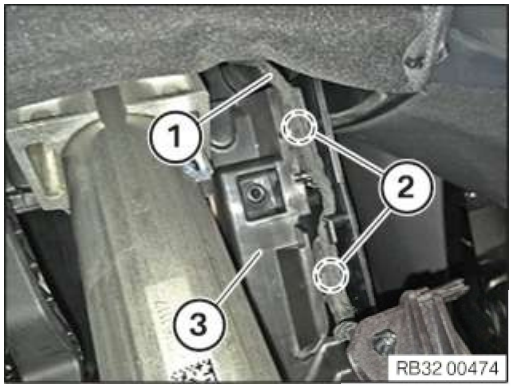
NOTICE

Perform the operations on the left and right side.

- Push the retaining lug (1) to the outside in the direction of the arrow and unclip the steering column shroud lower section (2) from the holders (3) in the direction of the arrow to the bottom at the same time.

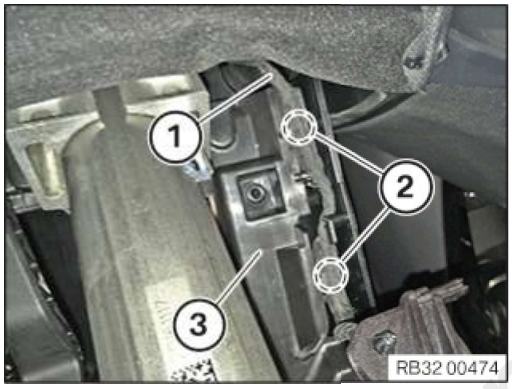


- Fold the steering column shroud lower section down.
- Unlock and disconnect connector (1).

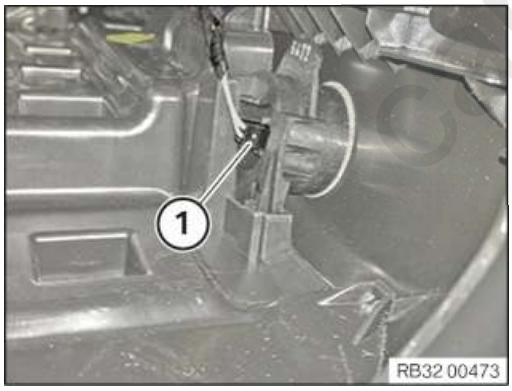


- Detach the cable (1) from the brackets (2).
- Remove the steering column shroud lower section (3).

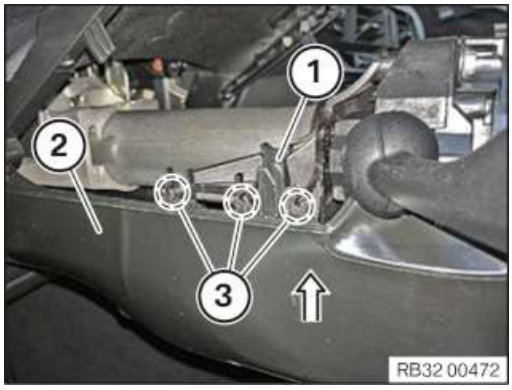
4 – Install steering column shroud lower section



- Position the steering column shroud lower section (3).
- Secure the line (1) on the brackets (2).



- Connect the connector (1).



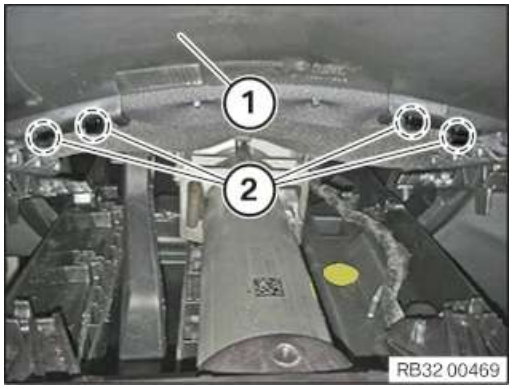
NOTICE

Perform the operations on the left and right side.

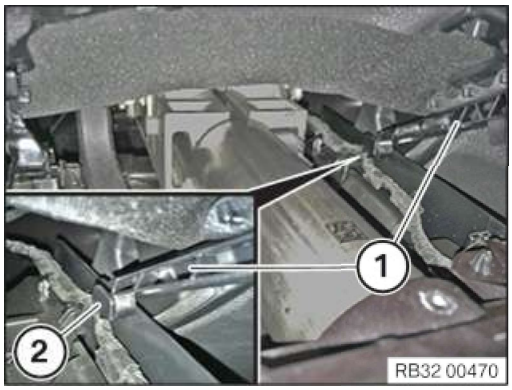
- Align the steering column shroud lower section (2) to the steering column using the retaining lug (1).
- Push the steering column shroud lower section (2) up in the direction of the arrow until the brackets (3) engage.

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5 – Fit steering column shroud upper section



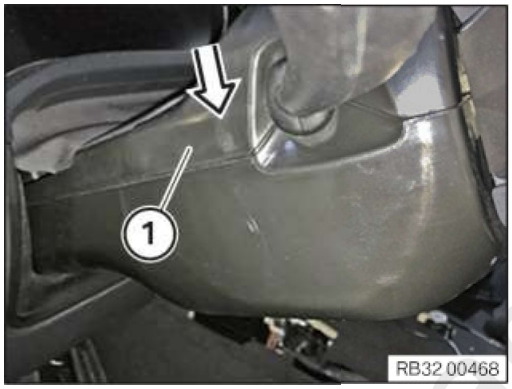
- Clip in the steering column shroud upper section (1) at the brackets (2).



NOTICE

Perform the operations on the left and right side.

- Clip in the steering column shroud upper section (1)into the guide (2).



NOTICE

Perform the operations on the left and right side.

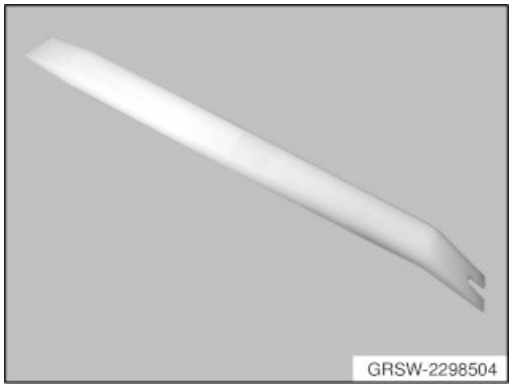
- Press the upper section of the steering column shroud (1) downwards in direction of arrow.

  The upper section of the steering column shroud must engage audibly and perceptibly.

Additional Information

Overview of Special Tools

2 298 504 Wedge



Common	Used in step 2
Usage	Wedge with angled lug
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

cardiagn.com

32 31 004 Removing and installing/replacing steering column shroud upper section

PRELIMINARY WORK

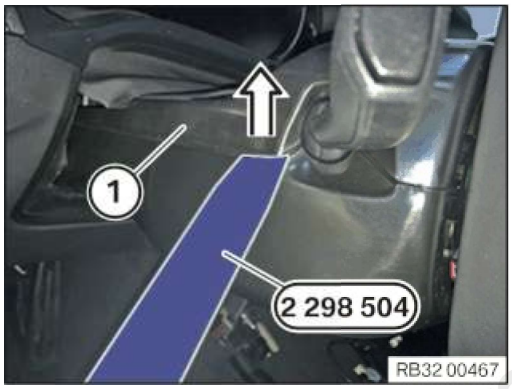
1 – Adjust the steering column position



- Adjust the length of the steering column to the maximum length in the direction of arrow (1).
- Move the steering column to the lowest steering column position in the direction of arrow (2).

MAIN WORK

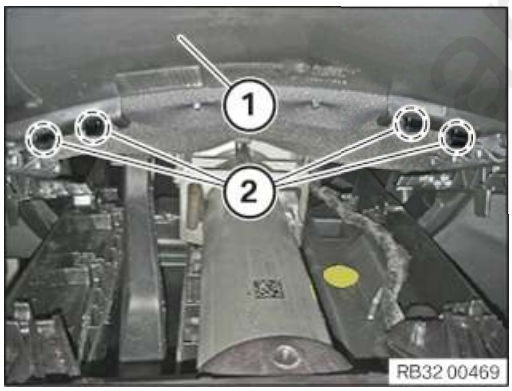
2 – Removing steering column shroud upper section



NOTICE

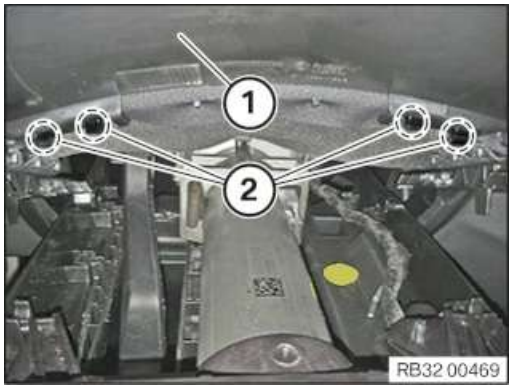
Perform the operations on the left and right side.

- Unlock the steering column shroud upper section (1) with the special tool 2 298 504 and fold up.



- Unclip the steering column shroud upper section (1) from the brackets (2).
- Remove the steering column shroud upper section (1).

3 – Fit steering column shroud upper section



- Clip in the steering column shroud upper section (1) at the brackets (2).

audiagn.com



NOTICE

Perform the operations on the left and right side.

- Clip in the steering column shroud upper section (1)into the guide (2).



NOTICE

Perform the operations on the left and right side.

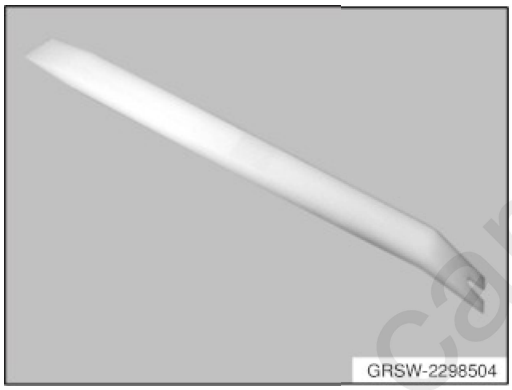
- Press the upper section of the steering column shroud (1) downwards in direction of arrow.

  The upper section of the steering column shroud must engage audibly and perceptibly.

Additional Information

Overview of Special Tools

2 298 504 Wedge



Common		Used in step 2
Usage	Wedge with angled lug	
Included in the tool or work		
Storage location	C34	
Replaced by		
In connection with		
SI-Number	01 03 12 (792)	

carmagn.com

32 31 104 Replacing steering shaft collar

RISK OF DAMAGE

Damage to steering column switch cluster (SZL).

The steering column switch cluster (SZL) or the coil spring cassette may be damaged by twisting of the steering wheel if the lower steering shaft (or the universal joint) is separated from the steering gear or from the steering column.

- Secure steering wheel from twisting.

PRELIMINARY WORK

1 – Removing the front left wheel

▸ **Removing the wheel**



- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

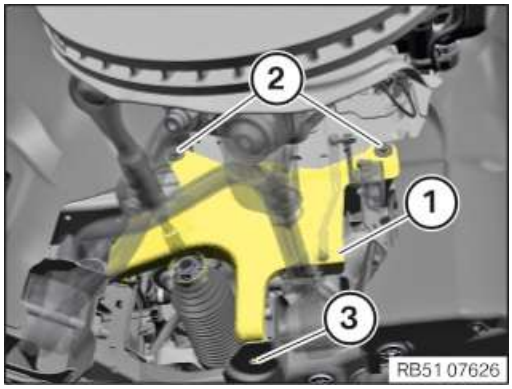
  This process is intended to prevent damage to the brake disc.



- If several wheels are removed simultaneously: 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 a suitable adapter from the tool set .

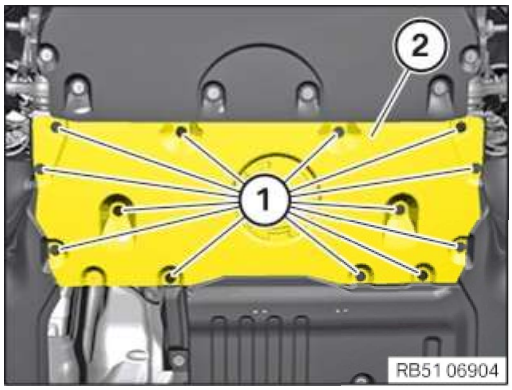
2 – Remove the cover of the steering assembly

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- Loosen screws (2) and (3).
- Remove the cover (1).

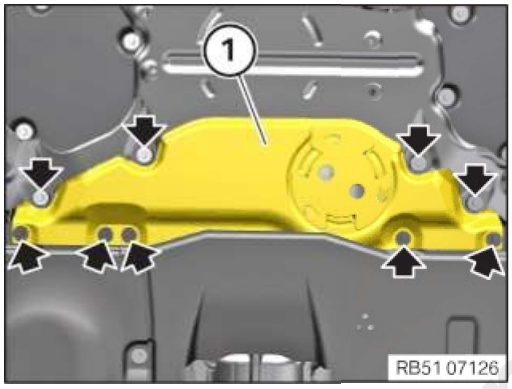
3 – Removing the centre underbody protection



- **Version with rear-wheel drive:**

  Loosen screws (1).

  Remove centre underbody protection (2) .

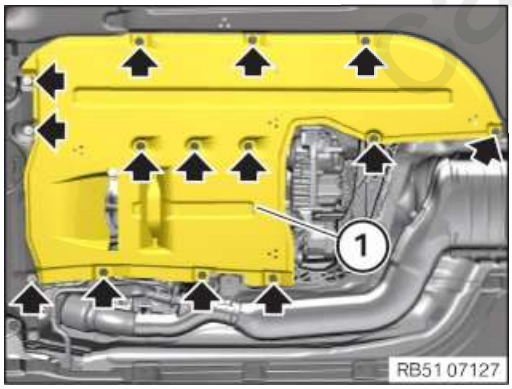


- **Version with all-wheel drive:**

  Remove screws (arrows).

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

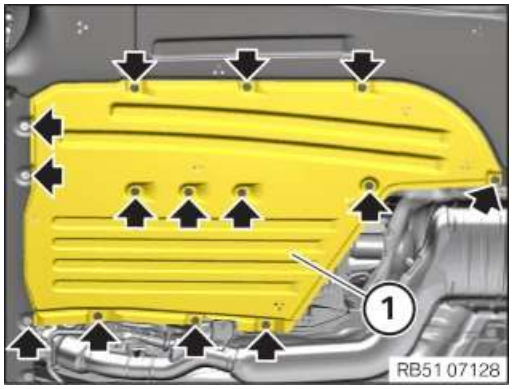
4 – Remove rear underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).



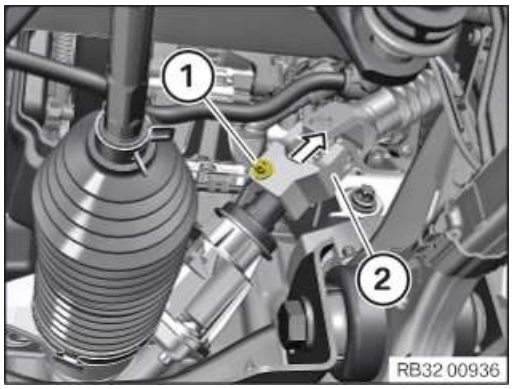
- **Version 2:**

  Remove screws (arrows).

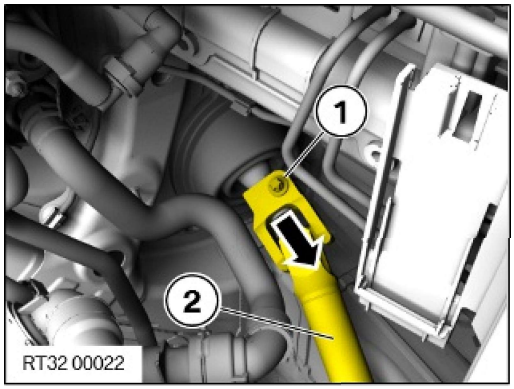
  Guide out rear underbody protection (1) and remove it.

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5 – Remove lower section of steering shaft



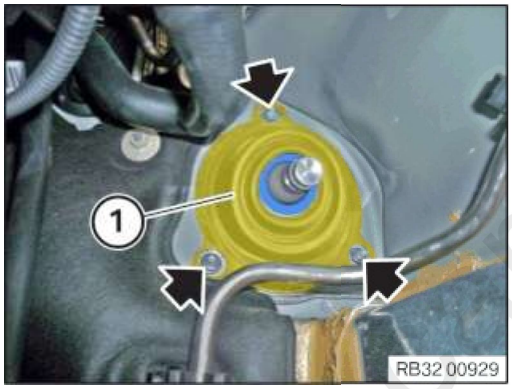
- Loosen the clamping bolt (1).
- Pull down bottom steering shaft (2) from steering gear in direction of arrow.



- Pull out the steering column with the bottom steering shaft to the maximum length in the direction of the arrow.
- Loosen the clamping bolt (1).
- Pull down bottom steering shaft (2) in the direction of the arrow off the steering column .
- Feed out bottom steering shaft (2) and remove.

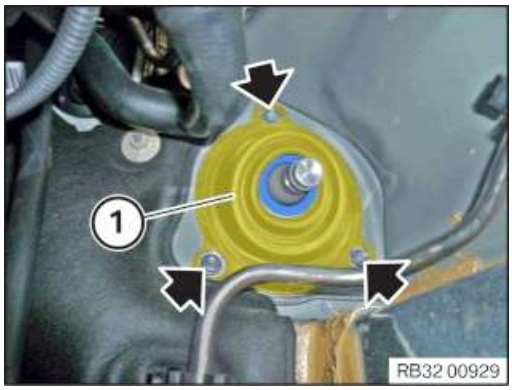
MAIN WORK

6 – Removing the steering shaft collar



- Unscrew the nuts (arrows).
- Pull the steering shaft collar down (1) from the steering column and remove.

7 – Installing the steering shaft collar



- Slide steering shaft collar (1) onto the steering column.
- Tighten the nuts (arrows).

Bearing plate to bulkhead

M6		Tightening torque	8 Nm

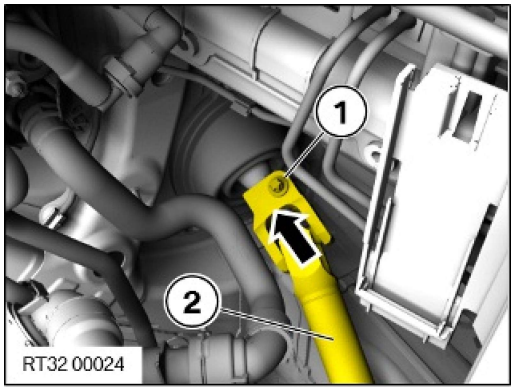
POSTPROCESSES

8 – If reusing: Recut thread

carfdiagn.com

- Clean the screw thread of the bottom steering shaft to remove all remnants of screw locking adhesive.
- Recut screw thread.

9 – Installing steering shaft, bottom



TECHNICAL INFORMATION

The steering shaft can only be installed in one position.

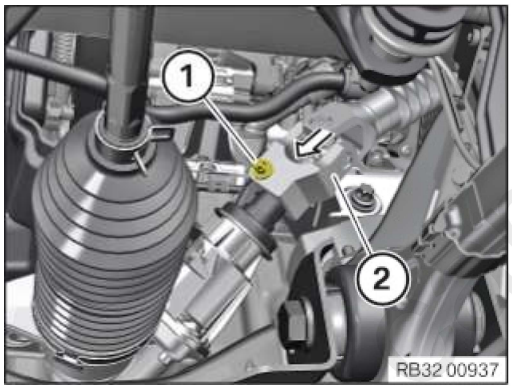
The steering shaft is encoded for the steering column and the steering gear. The clamping bolt must be positioned in the groove of the steering gear or the steering column.

- Pull the steering column out to the maximum length.
- Guide in and position bottom steering spindle (2).
- Slide the bottom steering spindle (2) onto the steering column in the direction of the arrow.
- Renew the clamping bolt (1).

  Parts: Clamping bolt
- Tighten the clamping bolt (1).

Lower steering shaft to steering column

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm



TECHNICAL INFORMATION

The steering shaft can only be installed in one position.

The steering shaft is encoded for the steering column and the steering gear. The clamping bolt must be positioned in the groove of the steering gear or the steering column.

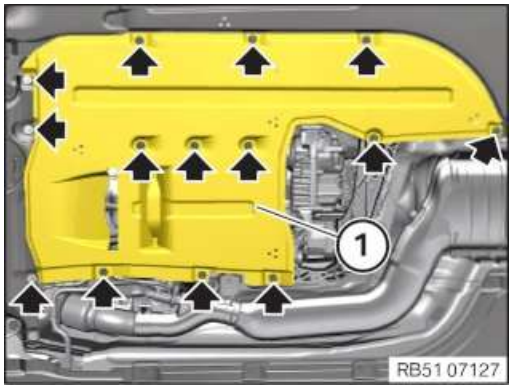
- Slide the bottom steering spindle (2) onto the steering gear in the direction of the arrow.
- Renew the clamping bolt (1).

  Parts: Clamping bolt
- Tighten the clamping bolt (1).

Universal joint to steering box

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

10 – Installing underbody protection at rear



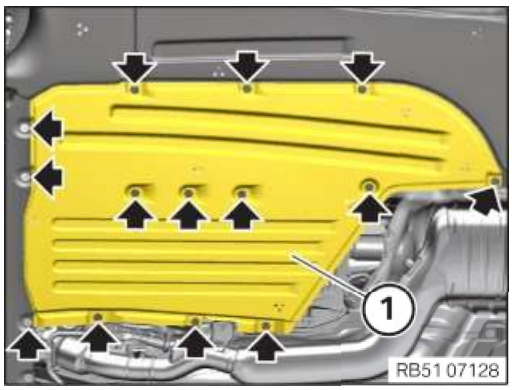
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

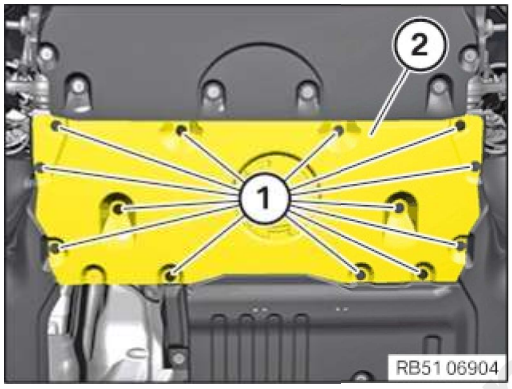
  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

11 – Installing the centre underbody protection



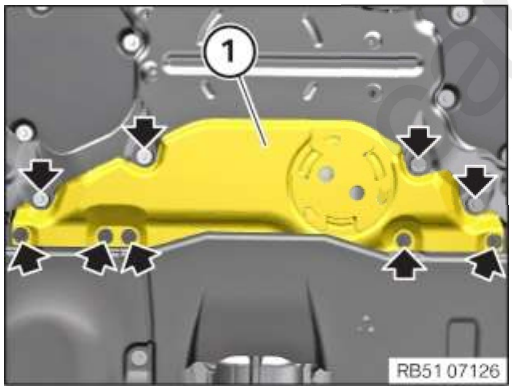
- **Version with rear-wheel drive:**

  Position central underbody protection (2).

  Tighten the screws (1).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



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

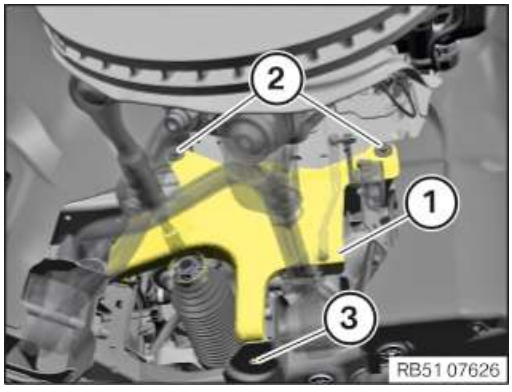
  Guide in and install the centre of underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

12 – Install the cover of the steering assembly



- Position the cover (1).
- Tighten down screws (2) and (3).

Cover, steering unit

Screw		Tightening torque	3 Nm

▸ **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.

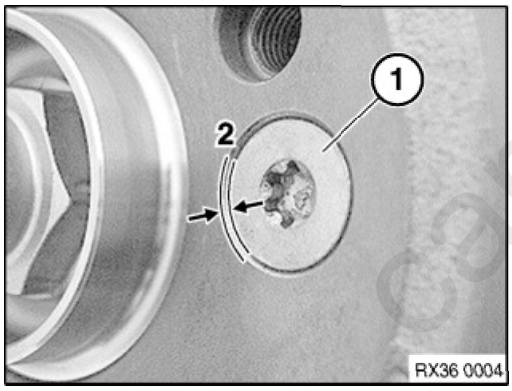
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

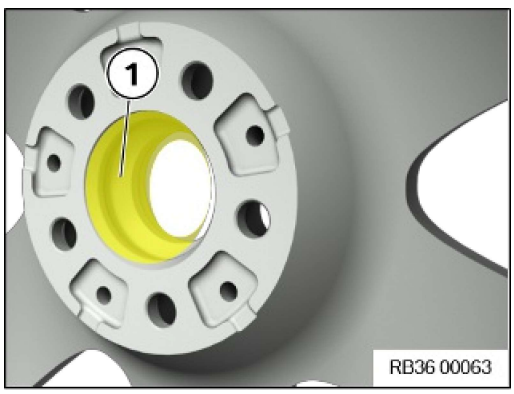
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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



- 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

carfiagn.com



- Lightly grease the front and rear wheel hubs in this area (1) to protect from 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



- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

  Parts: Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts 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. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

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14 – Checking the airbag for function

Check

- Turn steering wheel in both directions to the limit position.

Result

» The airbag indicator light lights up.

Measure

- Renew the coil spring cassette.

15 – Check the straight-ahead driving position of the steering wheel

Check

- For straight-ahead driving, check the correct straight-ahead driving position of the steering wheel.

Result

» The steering wheel has an inclination during straight-ahead driving.

Measure

- Carry out a toe adjustment at the front axle.

▸ **After a toe adjustment: Perform commissioning of electromechanical steering**

- **Additional work AW no.: 32 13 905**



- Connect vehicle to the diagnosis system.
- Run the service function "EPS steering start-up".

Additional Information

Overview of Tightening Torques

Bearing plate to bulkhead — Used in step 7

M6		Tightening torque	8 Nm

Lower steering shaft to steering column — Used in step 9

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

Universal joint to steering box — Used in step 9

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

Underbody protection — Used in step 1011

Hexagon screw		Tightening torque	3 Nm

Cover, steering unit — Used in step 12

Screw		Tightening torque	3 Nm

Brake disc to front wheel hub — Used in step 13

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 13

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 13

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

Overview of Special Tools

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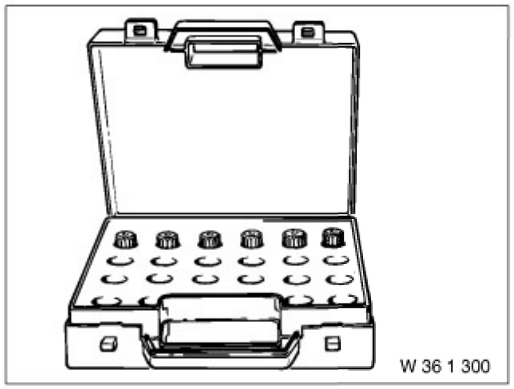
2 344 011 Tool



Common	Used in step 13
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



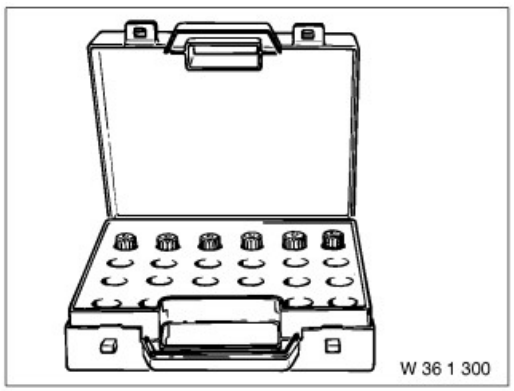
Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

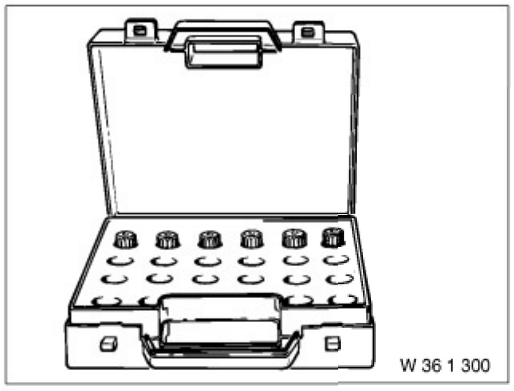
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0 495 226 (36 1 328) Wheel stud



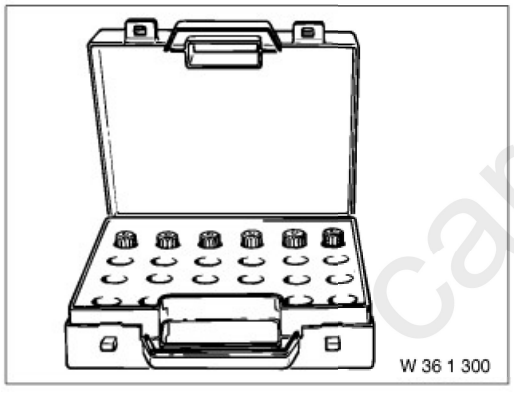
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



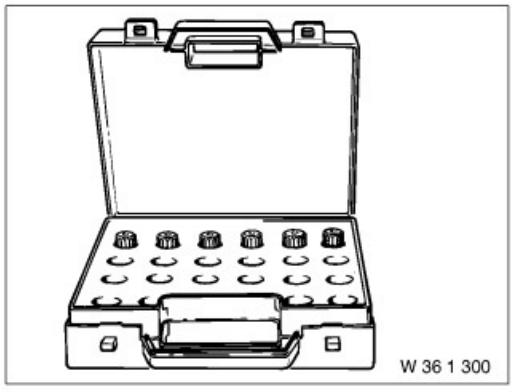
Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

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0 495 230 (36 1 333) Wheel stud



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

Links

Repair instructions	Used in step
32 00 155 Kinematics Diagnosis System wheel alignment with ride height measurement without loading the vehicle	
32 00 601 Adjusting toe-in on front axle	

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32 31 091 Replacing the steering column

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

RISK OF DAMAGE

Damage to steering column switch cluster (SZL).

The steering column switch cluster (SZL) or the coil spring cassette may be damaged by twisting of the steering wheel if the lower steering shaft (or the universal joint) is separated from the steering gear or from the steering column.

- Secure steering wheel from twisting.

PRELIMINARY WORK

1 – Adjust the steering column position



- Adjust the length of the steering column to the maximum length in the direction of arrow (1).
- Move the steering column to the lowest steering column position in the direction of arrow (2).

2 – Disconnecting all battery earth leads



- See additional information.

3 – Removing the front left wheel

▸ **Removing the wheel**



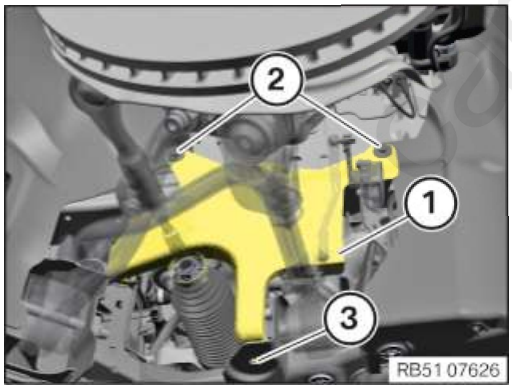
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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



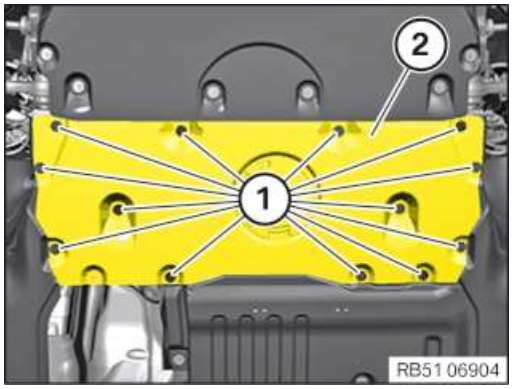
- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter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

4 – Remove the cover of the steering assembly



- Loosen screws (2) and (3).
- Remove the cover (1).

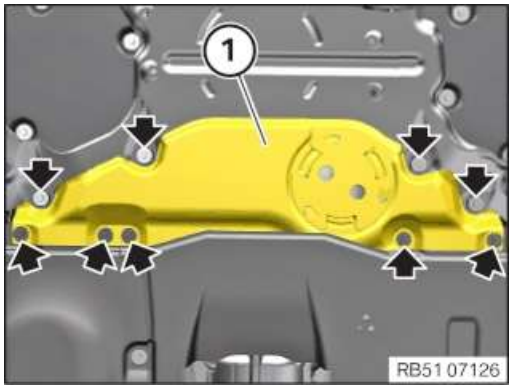
5 – Removing the centre underbody protection



- **Version with rear-wheel drive:**

  Loosen screws (1).

  Remove centre underbody protection (2) .

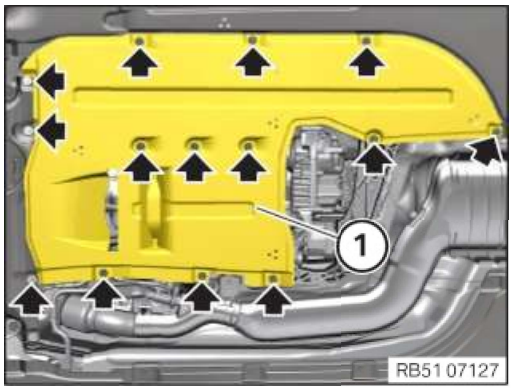


- **Version with all-wheel drive:**

  Remove screws (arrows).

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

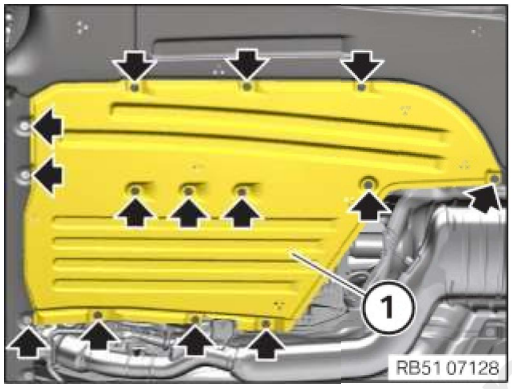
6 – Remove rear underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).

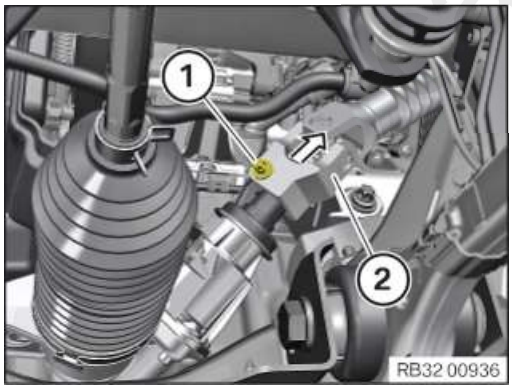


- **Version 2:**

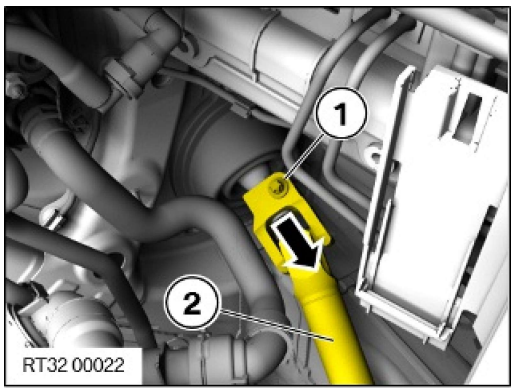
  Remove screws (arrows).

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

7 – Remove lower section of steering shaft



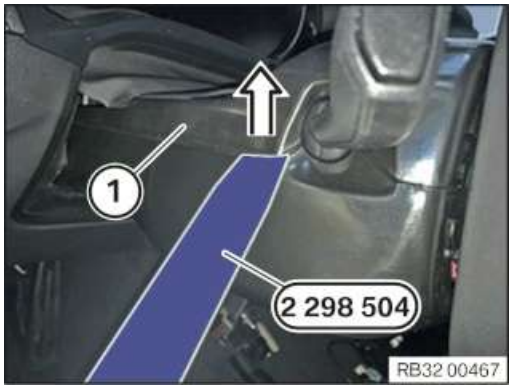
- Loosen the clamping bolt (1).
- Pull down bottom steering shaft (2) from steering gear in direction of arrow.



- Pull out the steering column with the bottom steering shaft to the maximum length in the direction of the arrow.
- Loosen the clamping bolt (1).
- Pull down bottom steering shaft (2) in the direction of the arrow off the steering column .
- Feed out bottom steering shaft (2) and remove.

erdiagr.com

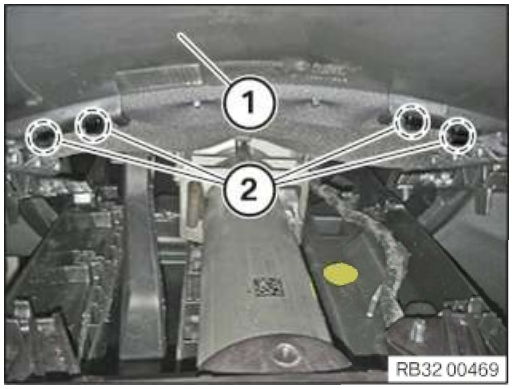
8 – Removing steering column shroud upper section



NOTICE

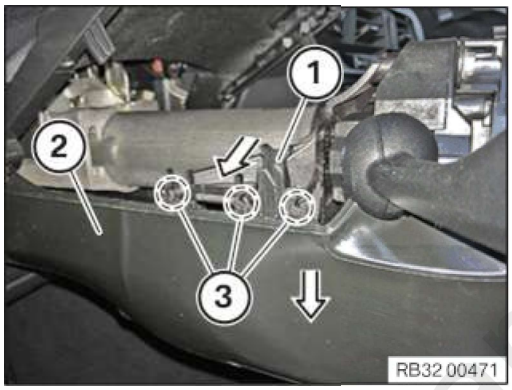
Perform the operations on the left and right side.

- Unlock the steering column shroud upper section (1) with the special tool 2 298 504 and fold up.



- Unclip the steering column shroud upper section (1) from the brackets (2).
- Remove the steering column shroud upper section (1).

9 – Removing steering column shroud lower section



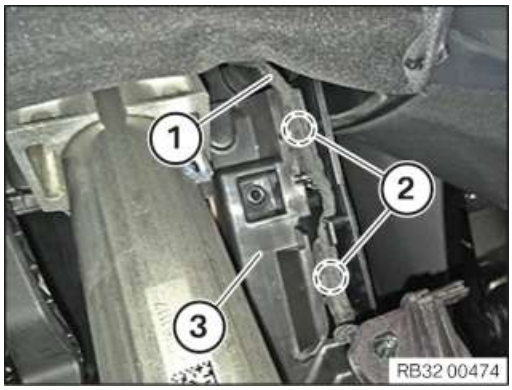
NOTICE

Perform the operations on the left and right side.

- Push the retaining lug (1) to the outside in the direction of the arrow and unclip the steering column shroud lower section (2) from the holders (3) in the direction of the arrow to the bottom at the same time.



- Fold the steering column shroud lower section down.
- Unlock and disconnect connector (1).



- Detach the cable (1) from the brackets (2).
- Remove the steering column shroud lower section (3).

10 – Removing the airbag unit

WARNING

Airbag unit.

Danger! Life-threatening injuries!

- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

RISK OF DAMAGE

Damage to the steering wheel.

Incorrect handling of the tool may damage the steering wheel.

- Ensure the tool is positioned correctly (angle and inclination).
- When unlocking, do not use "levering" action. Instead, press in the Torx screwdriver toward the centre of steering wheel only.

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Version A: Removing the airbag unit (sports steering wheel)**



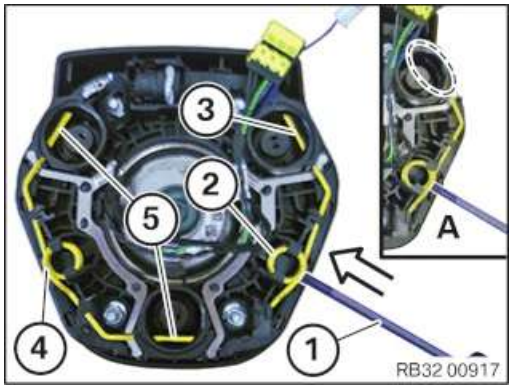
- Insert Torx screwdriver T25 (1) diagonally upwards in the hidden opening (2) on the rear side of the steering wheel until a spring resistance is felt.



NOTICE

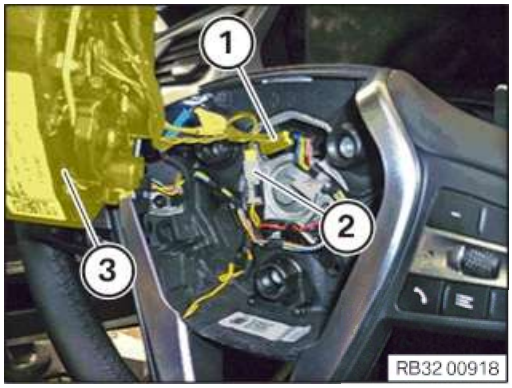
To provide a better overview: Diagram with airbag unit removed.

- To unlock the airbag unit, press Torx screwdriver T25 (1) diagonally upwards in the direction of the arrow to the centre of the steering wheel.



- Press the airbag unit over a large area of the steering wheel.
- Use Torx screwdriver T25 (1) to press wire spring clip (2) in the direction of the arrow towards the centre of the steering wheel and release lock (3).

  (A): Wire spring clip (2) is unlocked.
- Then use Torx screwdriver T25 (1) to press wire spring clip (4) in the direction of the arrow towards the centre of the steering wheel and release locks (5).
- Carefully raise the airbag unit.

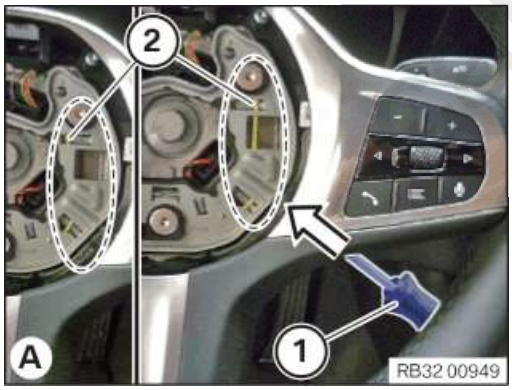


- Unlock and disconnect the plug connections (1) and (2).
- Remove airbag unit (3).

▸ **Version B: Removing airbag unit (M Sport steering wheel)**



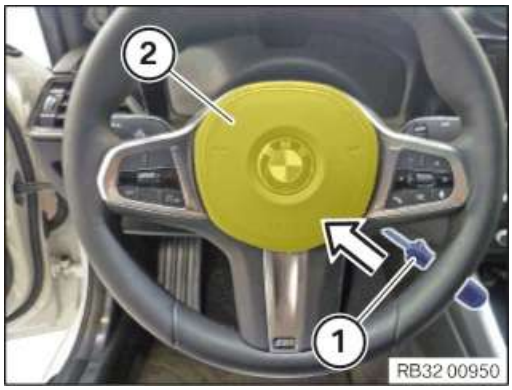
- Locate the pre-punched bore hole (1) on the rear side of the steering wheel by touch.
- Insert the Torx screwdriver T27 (2) diagonally upwards in the pre-punched bore hole (1) on the rear side of the steering wheel until a springing kind of resistance can be felt.



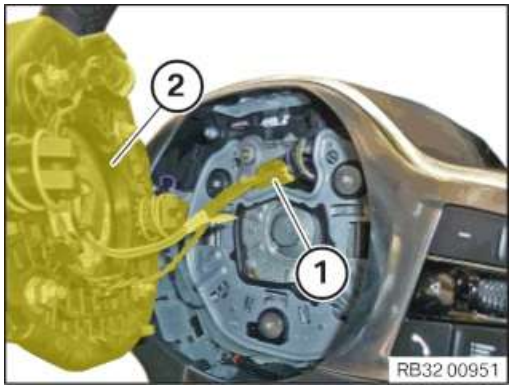
NOTICE

To provide a better overview: Diagram with airbag unit removed.

- Press in Torx screwdriver T27(1) straight in direction of arrow towards the centre of the steering wheel in order to unlock the wire spring clip (2) or to unlock the airbag unit (A).

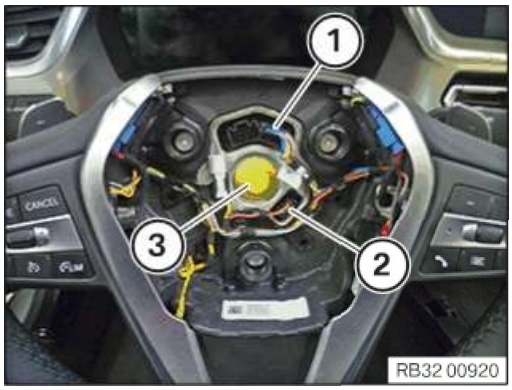


- Press in Torx screwdriver T27 (1) straight in direction of arrow towards the centre of the steering wheel and lift airbag unit (2) on the unlocked side.
- Repeat procedure on left side and carefully remove airbag unit (2) in direction of arrow off the steering wheel.



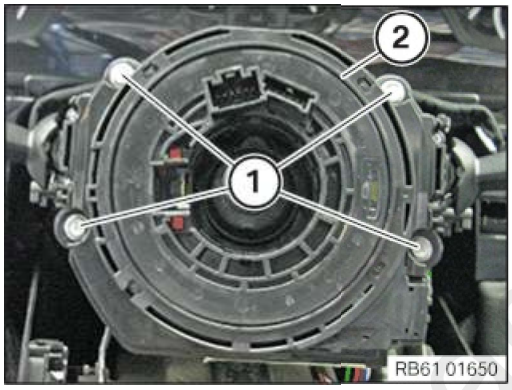
- Unlock and disconnect plug connection (1) and remove the airbag unit (2).

11 – Removing the steering wheel (sports steering wheel)

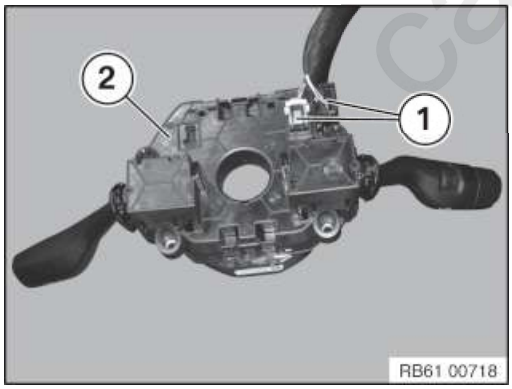


- Move the steering wheel and wheels to the straight-ahead position.
- Unlock plug connection (1) and disconnect.
- If installed: Unlock plug connection (2) and disconnect.
- Release the screw (3) and pull off and remove the steering wheel.

12 – Removing the steering column switch cluster (SZL)



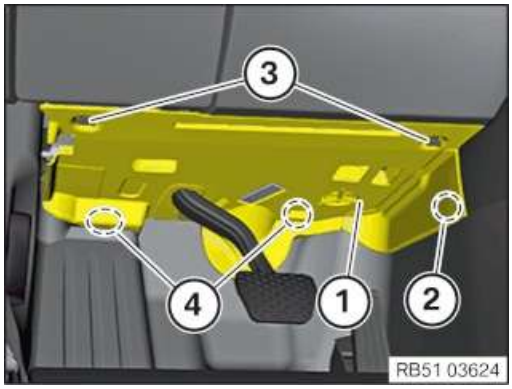
- Loosen screws (1).
- Remove the steering column switch cluster (SZL) (2).



- Unlock and disconnect the connector (1) on the steering column switch cluster (SZL) (2).

13 – Removing the trim panel for pedal mechanism

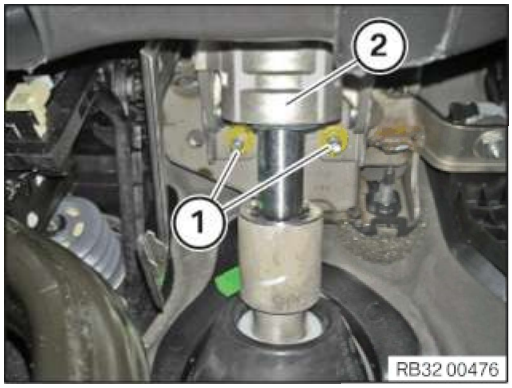
Cardiagn.com



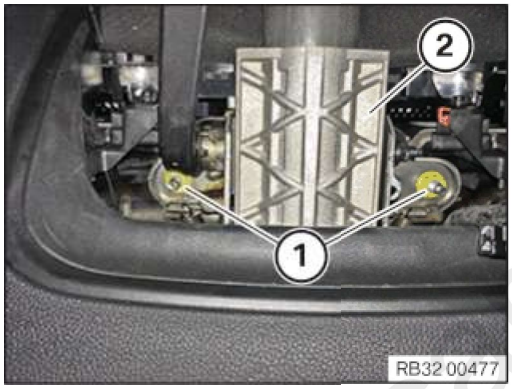
- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

MAIN WORK

14 – Remove steering column



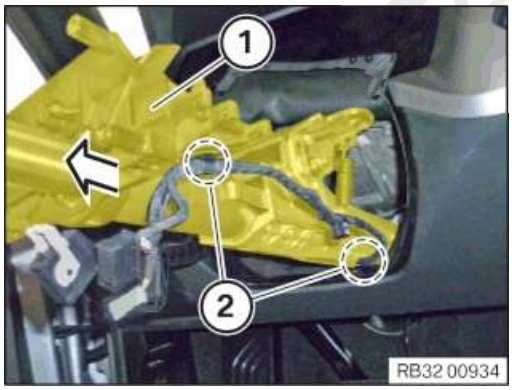
- Unscrew the nuts (1) on the steering column (2) from the footwell.



TECHNICAL INFORMATION

Secure component against falling.

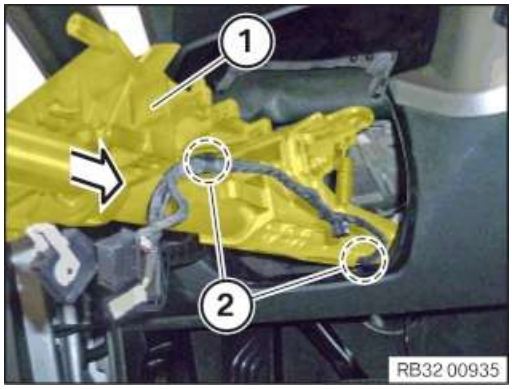
- Unscrew the nuts (1) on the steering column (2) from the footwell.



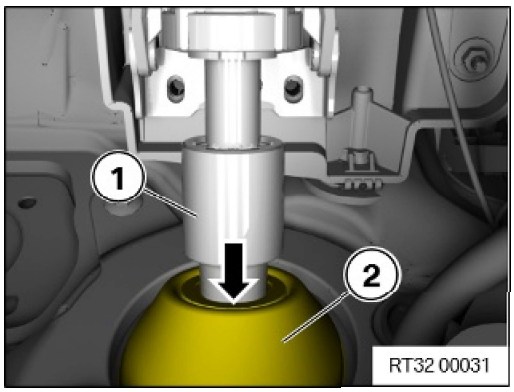
- Pull out steering column (1) slightly in the direction of the arrow.
- Release the wiring harness with the retaining brackets (2) from steering column (1).
- Guide out and remove steering column (1).

15 – Installing the steering column

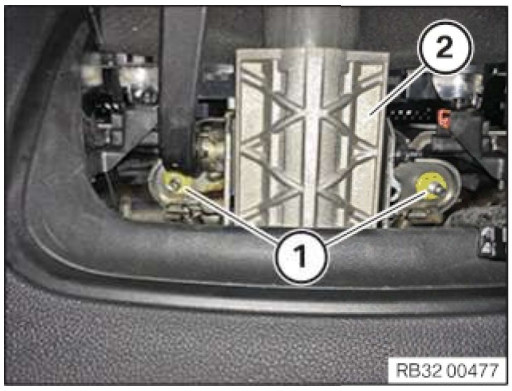
autodiag.com



- Guide the steering column (1) in carefully in the direction of the arrow.
- Secure the wiring harness with retaining brackets (2) on steering column (1).

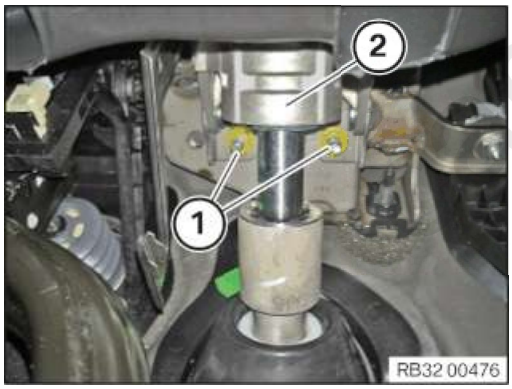


- Insert steering column (1) when installing in the steering spindle cuff (2).



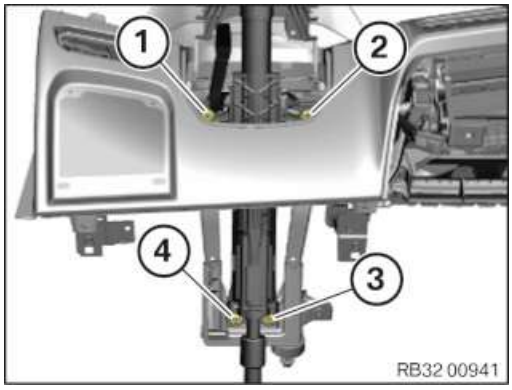
- Position nuts (1) on the steering column (2).

Note: Do not tighten the nuts yet.



- Position nuts (1) on the steering column (2).

Note: The nuts are tightened in the order shown in the next work step.



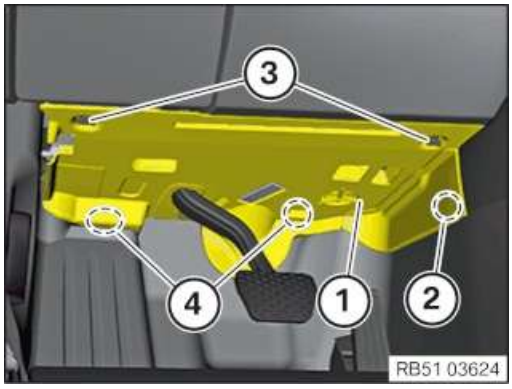
- The nuts **must** be tightened in the order (1) to (4).

Steering column to dashboard support

M8		Tightening torque	21 Nm

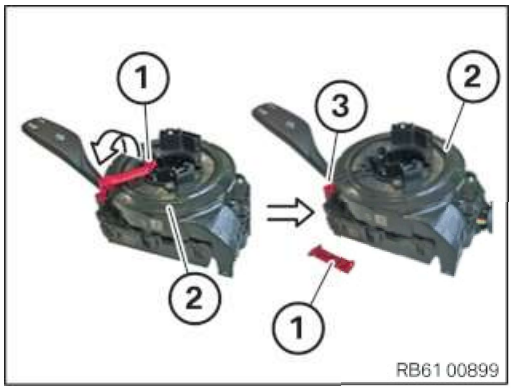
POSTPROCESSES

16 – Installing the trim panel for the pedal mechanism



- Connect associated connector.
- Attach the trim panel for the pedal mechanism (1) in the guides (4) and fold it up.
- Clip the trim panel for the pedal mechanism (1) into the centre console in this area (2).
- Insert locks (3) correctly and turn 90°.

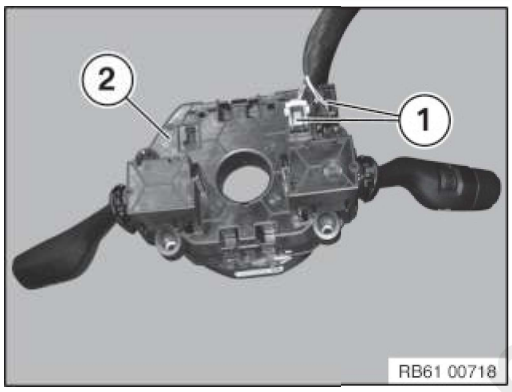
17 – Installing the steering column switch cluster (SZL)



- **Replacement:**

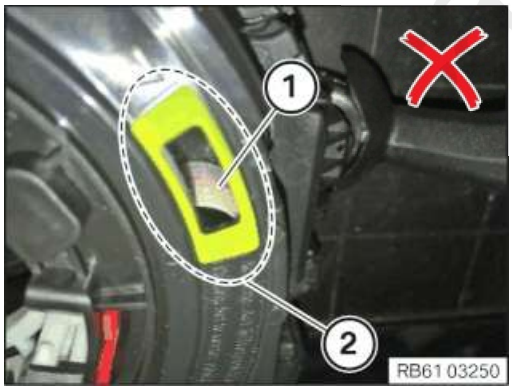
  Break off the transportation retainer (1) on the steering column switch cluster (SZL) (2) in direction of arrow.

  The broken off piece (3) of the transportation retainer (1) remains in the steering column switch cluster (SZL) (2).



- Connect the connector (1) with the steering column switch cluster (SZL) (2).

Check



- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

Result

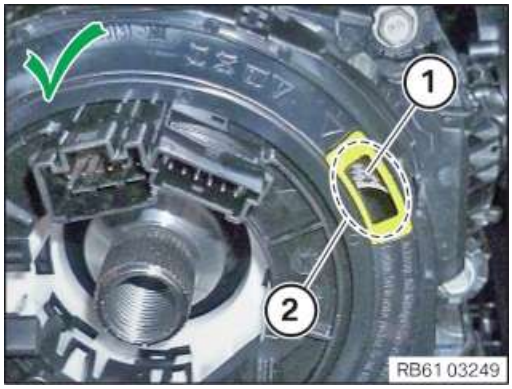
» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check

ardiagn.com



- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

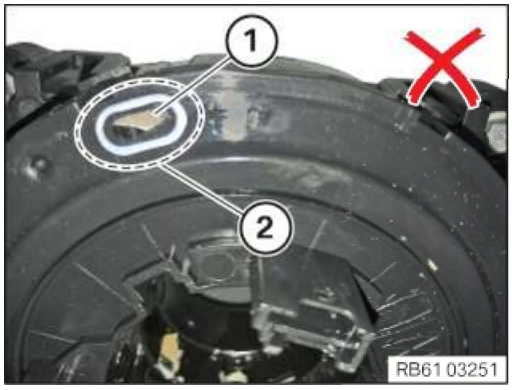
Result

» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next step.

Check



- **Version B:**

  Check whether the correct marking (1) is seen in inspection glass (2).

Result

» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check



- **Version B:**

  Check whether the correct marking (1) is seen in inspection glass (2).

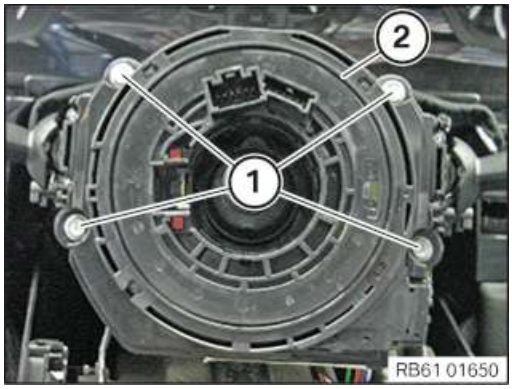
Result

» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next step.

arolagn.com



- Position the steering column switch cluster (SZL) (2).
- Tighten the screws (1).

Steering column switch cluster (SZL) on the steering column

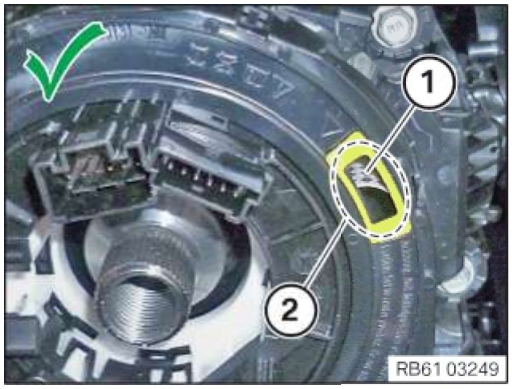
Screw TS5x20		Tightening torque	3 Nm

18 – Installing the steering wheel (sports steering wheel)

▸ **Check the neutral position of the clock spring**

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.



Check

- **Version A:**

  Check the mark (1) on the coil spring in the inspection glass (2).

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).



Check

- **Version B:**

  Check the mark (1) on the coil spring in the inspection glass (2).

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

Check

cardiagn.com



- A micro-encapsulated screw (3) may be fitted.
- Check the screw connection.

Result

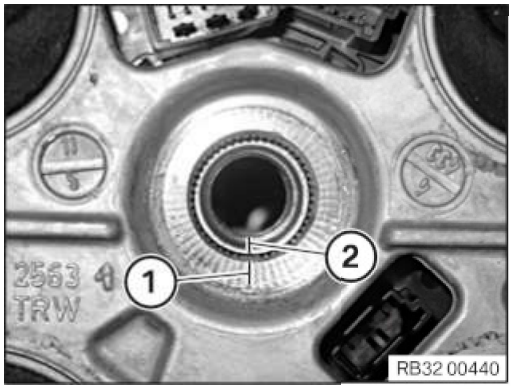
» Screw is (3) micro-encapsulated.

Measure

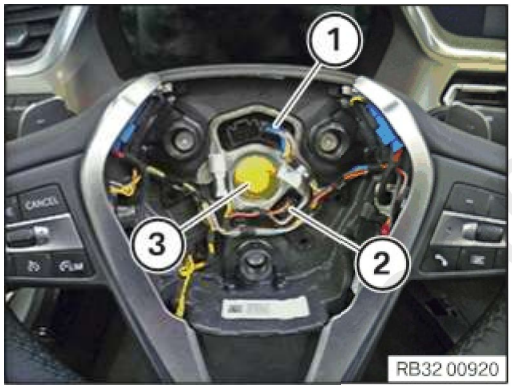
- Clean thread in the steering column.

  Renew the screw (3).

  Parts: Screw



- Align mark (1) on steering wheel to mark (2) on steering column.
- Connect steering wheel.



- Connect connectors (1) and lock.
- If installed: Connect connectors (2) and lock.
- Tighten screw (3) .

Steering wheel to steering column

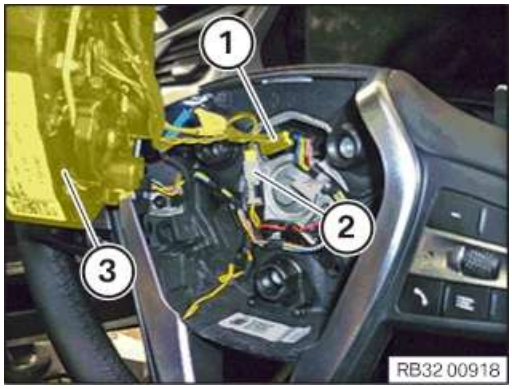
M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

19 – Installing the airbag unit

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Version A: Installing the airbag unit (sports steering wheel)**



- Position airbag unit (3).
- Connect connectors (1) and (2) lock.



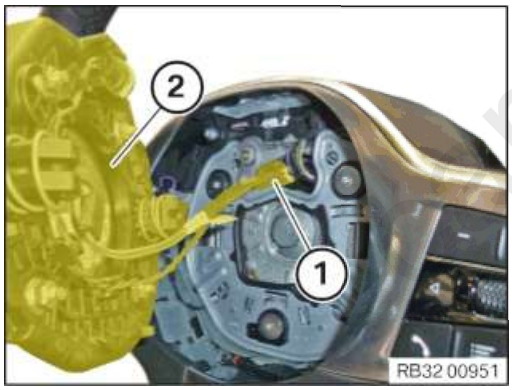
- Press the airbag unit (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

▸ **Version B: Installing the airbag unit (M Sport steering wheel)**

TECHNICAL INFORMATION

After replacing the airbag unit (M-sports steering wheel) or after a possible conversion of standard steering wheel and airbag unit to M-sports steering wheel, a software update or a programming/encoding via ISTA must be performed!



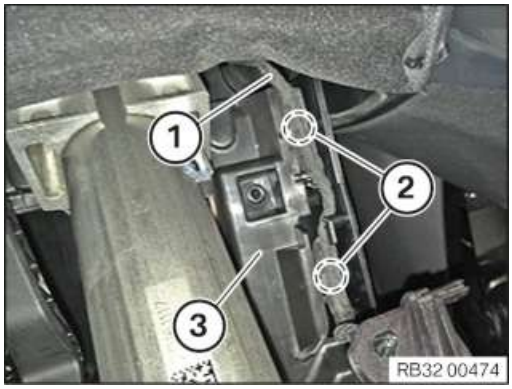
- Connect and lock connector (1) of the airbag unit (2).



- Press the airbag unit (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

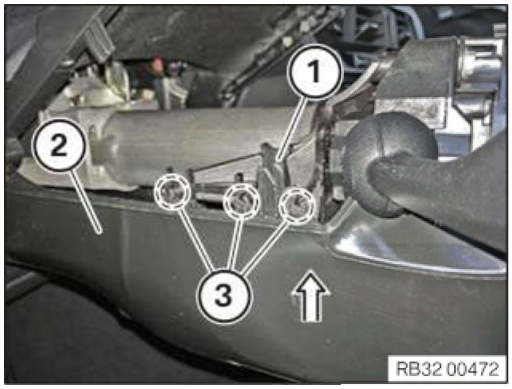
20 – Install steering column shroud lower section



- Position the steering column shroud lower section (3).
- Secure the line (1) on the brackets (2).



- Connect the connector (1).

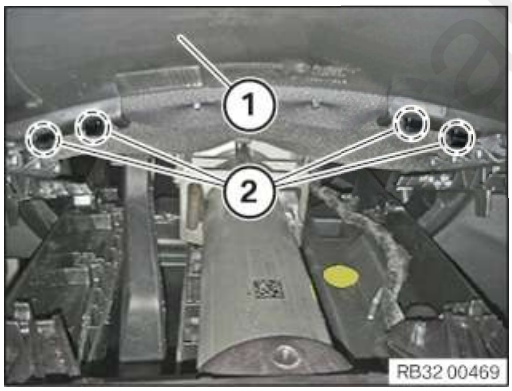


NOTICE

Perform the operations on the left and right side.

- Align the steering column shroud lower section (2) to the steering column using the retaining lug (1).
- Push the steering column shroud lower section (2) up in the direction of the arrow until the brackets (3) engage.

21 – Fit steering column shroud upper section



- Clip in the steering column shroud upper section (1) at the brackets (2).



NOTICE

Perform the operations on the left and right side.

- Clip in the steering column shroud upper section (1)into the guide (2).

ardiag.com



NOTICE

Perform the operations on the left and right side.

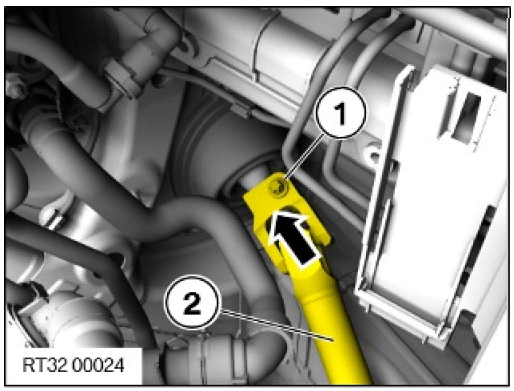
- Press the upper section of the steering column shroud (1) downwards in direction of arrow.

  The upper section of the steering column shroud must engage audibly and perceptibly.

22 – If reusing: Recut thread

- Clean the screw thread of the bottom steering shaft to remove all remnants of screw locking adhesive.
- Recut screw thread.

23 – Installing steering shaft, bottom



TECHNICAL INFORMATION

The steering shaft can only be installed in one position.

The steering shaft is encoded for the steering column and the steering gear. The clamping bolt must be positioned in the groove of the steering gear or the steering column.

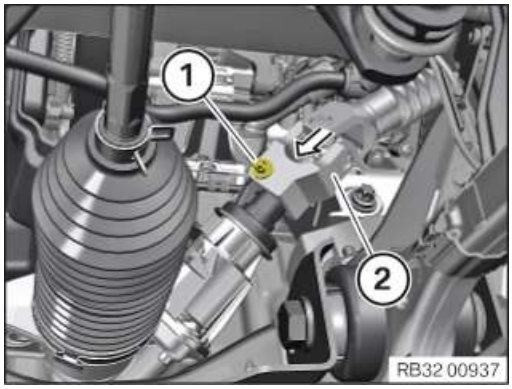
- Pull the steering column out to the maximum length.
- Guide in and position bottom steering spindle (2).
- Slide the bottom steering spindle (2) onto the steering column in the direction of the arrow.
- Renew the clamping bolt (1).

  Parts: Clamping bolt
- Tighten the clamping bolt (1).

Lower steering shaft to steering column

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

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TECHNICAL INFORMATION

The steering shaft can only be installed in one position.

The steering shaft is encoded for the steering column and the steering gear. The clamping bolt must be positioned in the groove of the steering gear or the steering column.

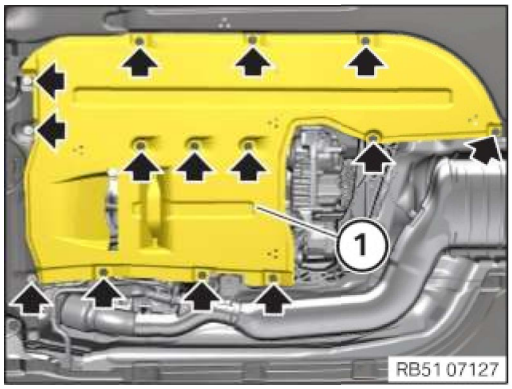
- Slide the bottom steering spindle (2) onto the steering gear in the direction of the arrow.
- Renew the clamping bolt (1).

  Parts: Clamping bolt
- Tighten the clamping bolt (1).

Universal joint to steering box

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

24 – Installing underbody protection at rear



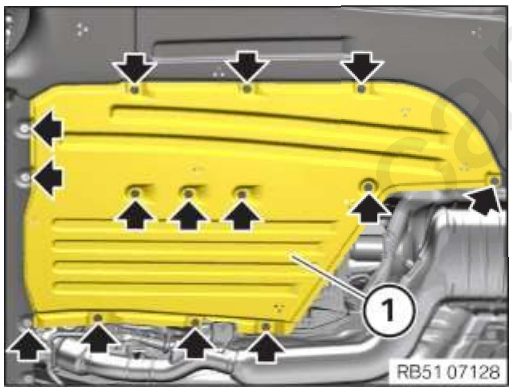
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

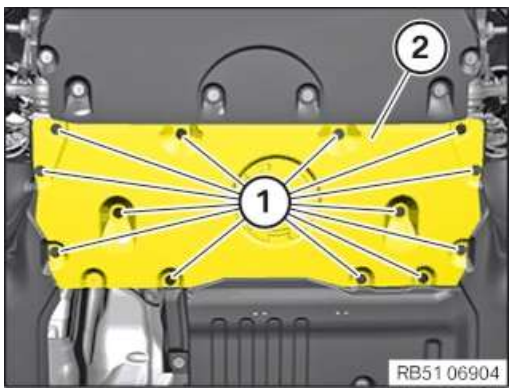
  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

25 – Installing the centre underbody protection



- **Version with rear-wheel drive:**

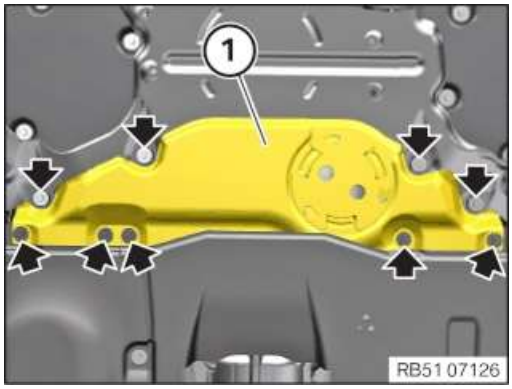
  Position central underbody protection (2).

  Tighten the screws (1).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

esrdiagr.com



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

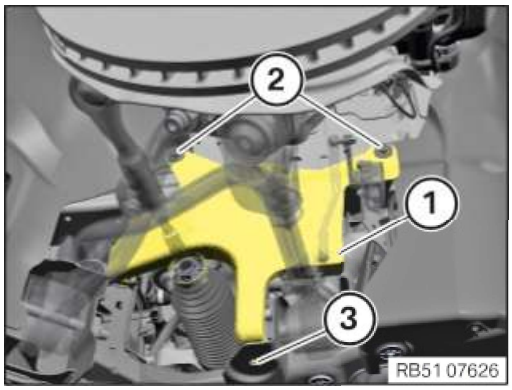
  Guide in and install the centre of underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

26 – Install the cover of the steering assembly



- Position the cover (1).
- Tighten down screws (2) and (3).

Cover, steering unit

Screw		Tightening torque	3 Nm

27 – Attaching the front left wheel

▸ **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.

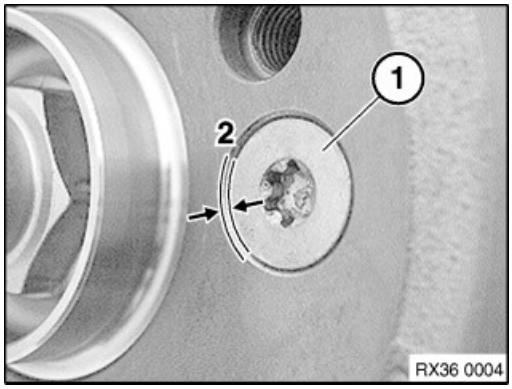
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

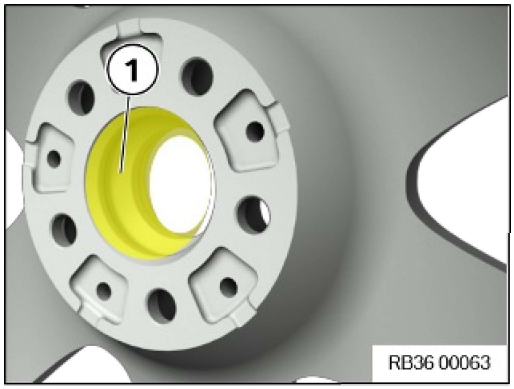
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

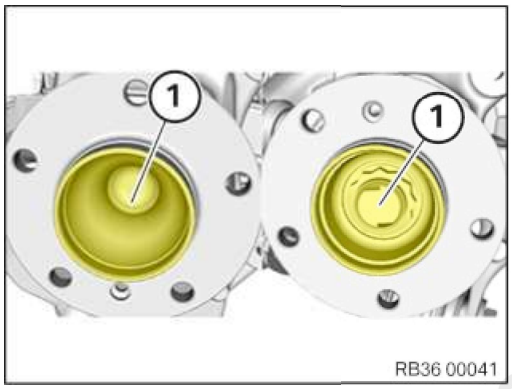
M8	Renew screw.	Tightening torque	16 Nm



- 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



- Lightly grease the front and rear wheel hubs in this area (1) to protect from 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



- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

  Parts: Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts 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. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

28 – Disconnecting all battery earth leads



- See additional information.

29 – Check the straight-ahead driving position of the steering wheel

Check

- For straight-ahead driving, check the correct straight-ahead driving position of the steering wheel.

Result

» The steering wheel has an inclination during straight-ahead driving.

Measure

- Carry out a toe adjustment at the front axle.

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▸ **After a toe adjustment: Perform commissioning of electromechanical steering**

- **Additional work AW no.: 32 13 905**



- Connect vehicle to the diagnosis system.
- Run the service function "EPS steering start-up".

30 – Checking the airbag for function

Check

- Turn steering wheel in both directions to the limit position.

Result

» The airbag indicator light lights up.

Measure

- Renew the coil spring cassette.

Additional Information

Overview of Tightening Torques

Steering column to dashboard support — Used in step 15

M8		Tightening torque	21 Nm

Steering column switch cluster (SZL) on the steering column — Used in step 17

Screw TS5x20		Tightening torque	3 Nm

Steering wheel to steering column — Used in step 18

M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

Lower steering shaft to steering column — Used in step 23

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

Universal joint to steering box — Used in step 23

M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

Underbody protection — Used in step 2425

Hexagon screw		Tightening torque	3 Nm

Cover, steering unit — Used in step 26

Screw		Tightening torque	3 Nm

Brake disc to front wheel hub — Used in step 27

M8	Renew screw.	Tightening torque	16 Nm

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Brake disc to rear wheel hub Used in step 27

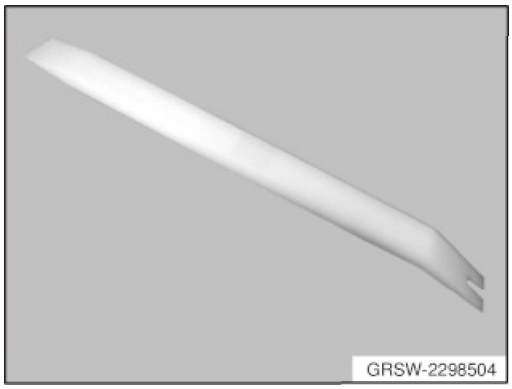
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts Used in step 27

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

Overview of Special Tools

2 298 504 Wedge



Common Used in step 8

Usage	Wedge with angled lug
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

2 344 011 Tool

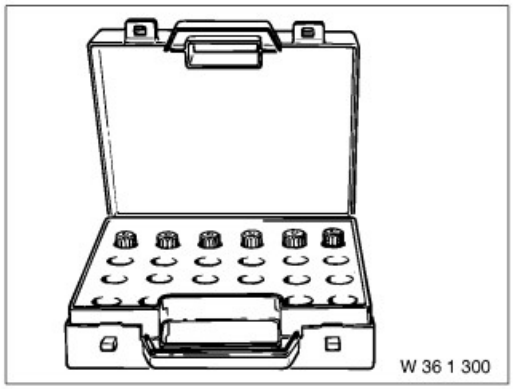


Common Used in step 27

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 3

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	

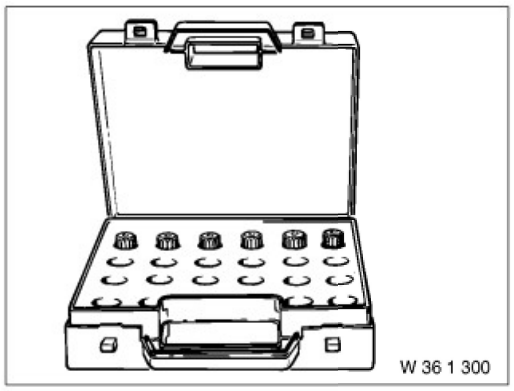
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0 495 224 (36 1 326) Wheel stud



Common	Used in step 3
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



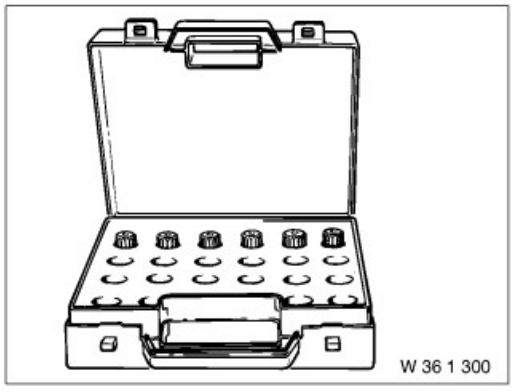
Common	Used in step 3
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 3
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 3
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	

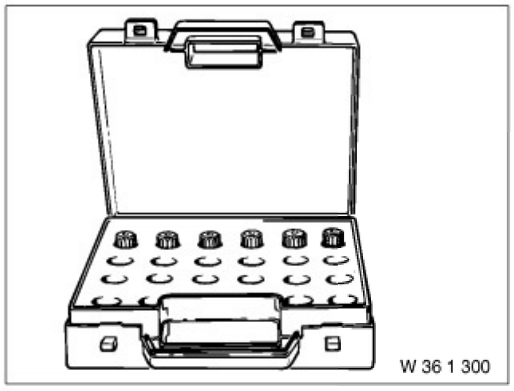
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0 495 228 (36 1 331) Wheel stud



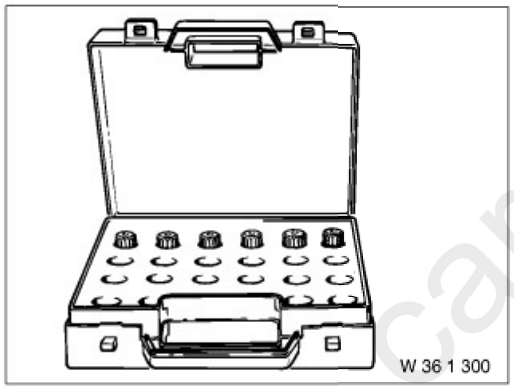
Common	Used in step 3
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 3
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 3
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

General repair instructions	Used in step
72 00 ... Safety regulations for handling components with gas generators	10

Repair instructions	Used in step
61 20 900 Disconnecting and connecting battery earth lead	228
61 20 900 Disconnecting and connecting battery earth lead	228
61 20 900 Disconnecting and connecting battery earth lead	228
61 20 900 Disconnecting and connecting battery earth lead	228
61 20 900 Disconnecting and connecting battery earth lead	228
61 20 900 Disconnecting and connecting battery earth lead	228
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	228
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	228

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61 20 900 Disconnecting and connecting battery earth lead 228
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) 228
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) 228
61 20 900 Disconnecting and connecting battery earth lead 228
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) 228
61 20 900 Disconnecting and connecting battery earth lead 228
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61 20 900 Disconnecting and connecting battery earth lead 228
61 20 900 Disconnecting and connecting battery earth lead 228
61 20 900 Disconnecting and connecting battery earth lead 228
61 20 900 Disconnecting and connecting battery earth lead 228
61 20 900 Disconnecting and connecting battery earth lead 228
32 00 155 Kinematics Diagnosis System wheel alignment with ride height measurement without loading the vehicle
32 00 601 Adjusting toe-in on front axle

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32 33 010 Removing and installing the sports steering wheel

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

TECHNICAL INFORMATION

A wheel alignment is not necessary after the removal, installation or replacement.

PRELIMINARY WORK

1 – Disconnecting all battery earth leads



- See additional information.

2 – Removing the airbag unit (sports steering wheel)

WARNING

Airbag unit.

Danger! Life-threatening injuries!

- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

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RISK OF DAMAGE

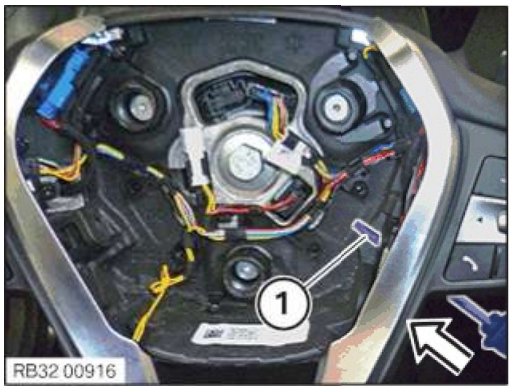
Damage to the steering wheel.

Incorrect handling of the tool may damage the steering wheel.

- Ensure the tool is positioned correctly (angle and inclination).
- When unlocking, do not use "levering" action. Instead, press in the Torx screwdriver toward the centre of steering wheel only.



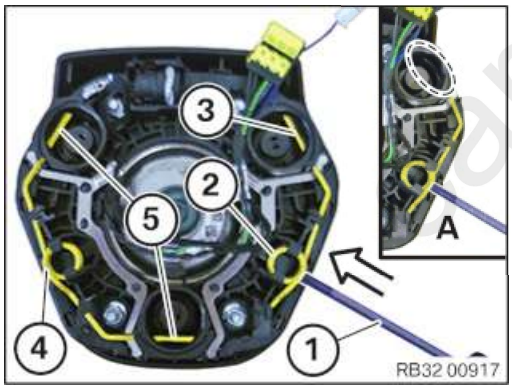
- Insert Torx screwdriver T25 (1) diagonally upwards in the hidden opening (2) on the rear side of the steering wheel until a spring resistance is felt.



NOTICE

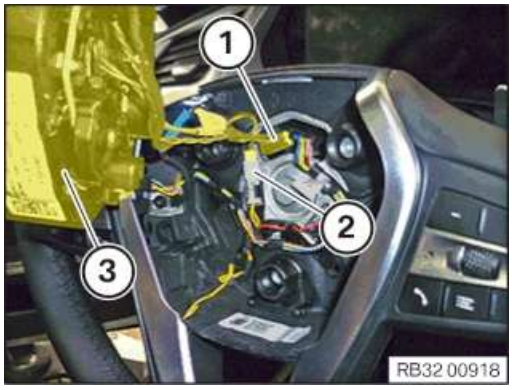
To provide a better overview: Diagram with airbag unit removed.

- To unlock the airbag unit, press Torx screwdriver T25 (1) diagonally upwards in the direction of the arrow to the centre of the steering wheel.



- Press the airbag unit over a large area of the steering wheel.
- Use Torx screwdriver T25 (1) to press wire spring clip (2) in the direction of the arrow towards the centre of the steering wheel and release lock (3).

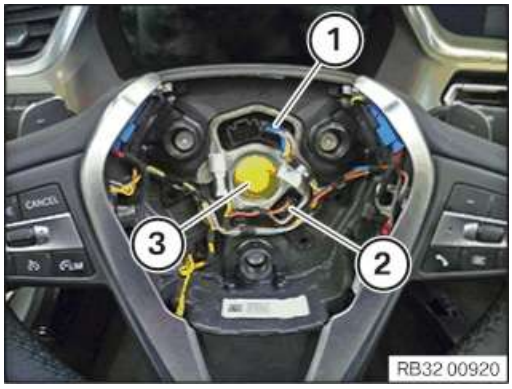
  (A): Wire spring clip (2) is unlocked.
- Then use Torx screwdriver T25 (1) to press wire spring clip (4) in the direction of the arrow towards the centre of the steering wheel and release locks (5).
- Carefully raise the airbag unit.



- Unlock and disconnect the plug connections (1) and (2).
- Remove airbag unit (3).

MAIN WORK

3 – Removing the steering wheel (sports steering wheel)



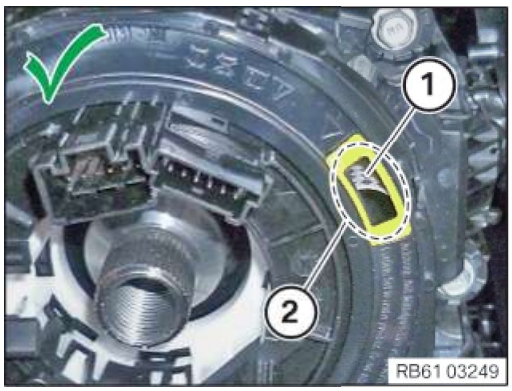
- Move the steering wheel and wheels to the straight-ahead position.
- Unlock plug connection (1) and disconnect.
- If installed: Unlock plug connection (2) and disconnect.
- Release the screw (3) and pull off and remove the steering wheel.

4 – Installing the steering wheel (sports steering wheel)

▸ **Check the neutral position of the clock spring**

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.



Check

- **Version A:**

  Check the mark (1) on the coil spring in the inspection glass (2).

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).



Check

- **Version B:**

  Check the mark (1) on the coil spring in the inspection glass (2).

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

Check

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- A micro-encapsulated screw (3) may be fitted.
- Check the screw connection.

Result

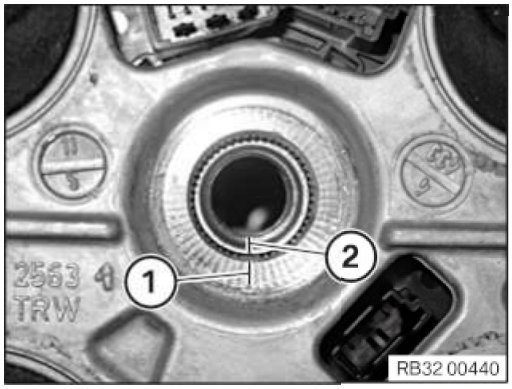
» Screw is (3) micro-encapsulated.

Measure

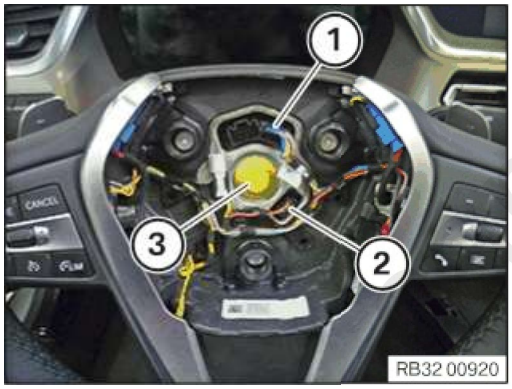
- Clean thread in the steering column.

  Renew the screw (3).

  Parts: Screw



- Align mark (1) on steering wheel to mark (2) on steering column.
- Connect steering wheel.



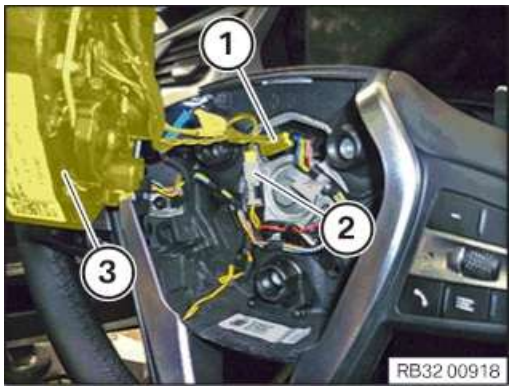
- Connect connectors (1) and lock.
- If installed: Connect connectors (2) and lock.
- Tighten screw (3) .

Steering wheel to steering column

M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

mdiagn.com

5 – Installing the airbag unit (sports steering wheel)



- Position airbag unit (3).
- Connect connectors (1) and (2) lock.



- Press the airbag unit (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

6 – Disconnecting all battery earth leads



- See additional information.

7 – Checking the airbag for function

Check

- Turn steering wheel in both directions to the limit position.

Result

» The airbag indicator light lights up.

Measure

- Renew the coil spring cassette.

Additional Information

Overview of Tightening Torques

cardiagn.com

Steering wheel to steering column			Used in step 4
M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

Links

General repair instructions	Used in step
72 00 ... Safety regulations for handling components with gas generators	2
72 12 ... Procedure after airbag deployment as result of an accident	

Repair instructions	Used in step
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	16
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	16
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
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61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	16
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61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16
61 20 900 Disconnecting and connecting battery earth lead	16

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32 33 020 Replacing the M sports steering wheel

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

TECHNICAL INFORMATION

A wheel alignment is not necessary after the removal, installation or replacement.

TECHNICAL INFORMATION

Steering wheel must be replaced if airbag unit has been deployed.
Only with M Sport steering wheel: Impact plate must be replaced if airbag unit has been deployed.
For additional information see: 72 12 ... Procedure after airbag deployment as result of an accident

PRELIMINARY WORK

1 – Disconnecting all battery earth leads



- See additional information.

2 – Removing airbag unit (M Sport steering wheel)

WARNING

Airbag unit.

Danger! Life-threatening injuries!

- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

ardiagn.com

RISK OF DAMAGE

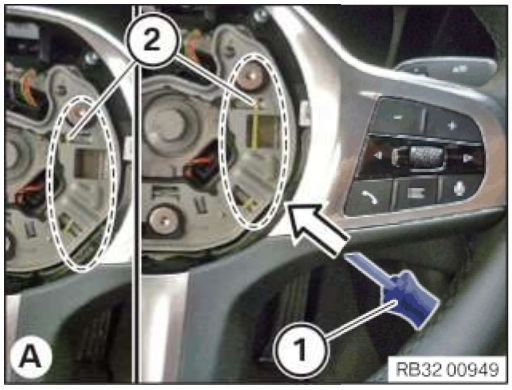
Damage to the steering wheel.

Incorrect handling of the tool may damage the steering wheel.

- Ensure the tool is positioned correctly (angle and inclination).
- When unlocking, do not use "levering" action. Instead, press in the Torx screwdriver toward the centre of steering wheel only.



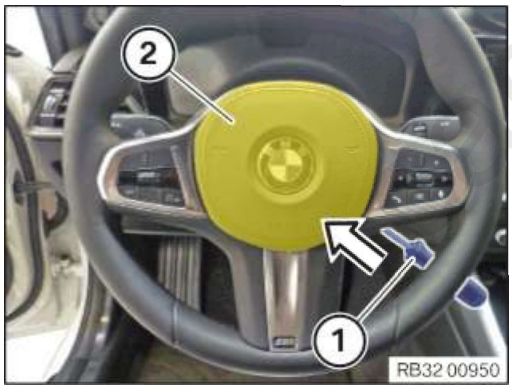
- Locate the pre-punched bore hole (1) on the rear side of the steering wheel by touch.
- Insert the Torx screwdriver T27 (2) diagonally upwards in the pre-punched bore hole (1) on the rear side of the steering wheel until a springing kind of resistance can be felt.



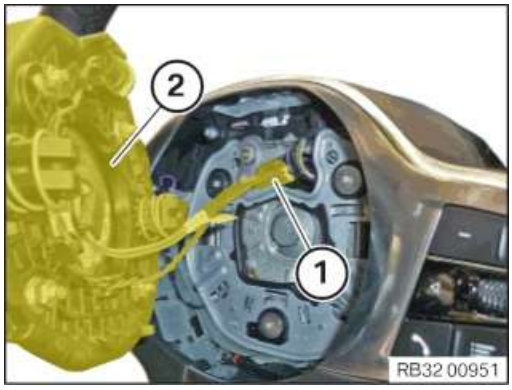
NOTICE

To provide a better overview: Diagram with airbag unit removed.

- Press in Torx screwdriver T27 (1) straight in direction of arrow towards the centre of the steering wheel in order to unlock the wire spring clip (2) or to unlock the airbag unit (A).



- Press in Torx screwdriver T27 (1) straight in direction of arrow towards the centre of the steering wheel and lift airbag unit (2) on the unlocked side.
- Repeat procedure on left side and carefully release airbag unit (2) from the steering wheel.



- Unlock and disconnect the plug connection (1) and remove the airbag unit (2).

3 – If installed: Removing the shift paddles for the automatic transmission

rdiag.com

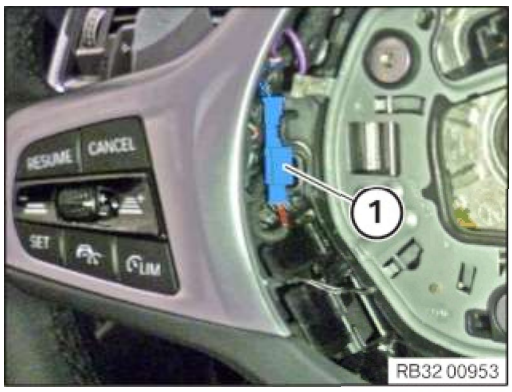
NOTICE

Perform the operations on the left and right side.

▸ **Removing the shift paddle for the automatic transmission**

NOTICE

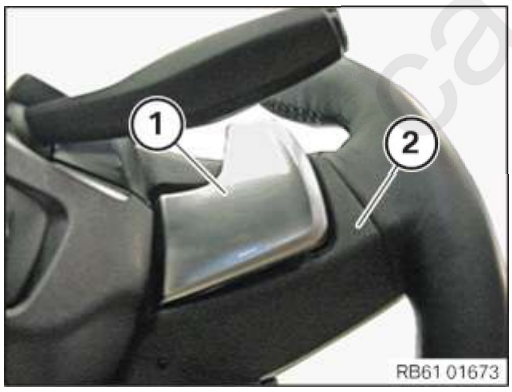
Description is for left component only. Procedure on the right side is identical.



- Release the plug connection (1) from the bracket.
- Unlock plug connection (1) and disconnect.



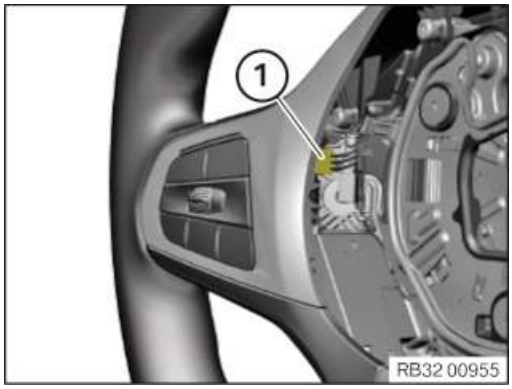
- Loosen screw (1).



- Release the shift paddle (1) from the steering wheel (2) and, with the connecting cable, guide out and remove.

4 – Removing decorative trim for the M Sport steering wheel (SA710)

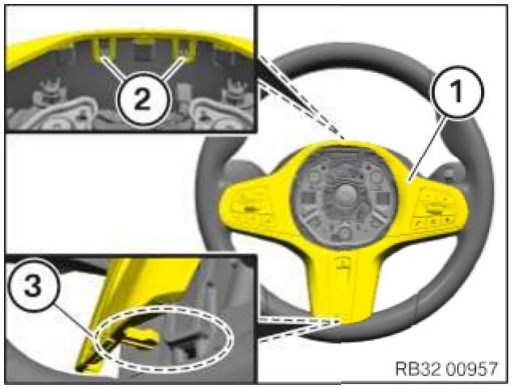
carldiagn.com



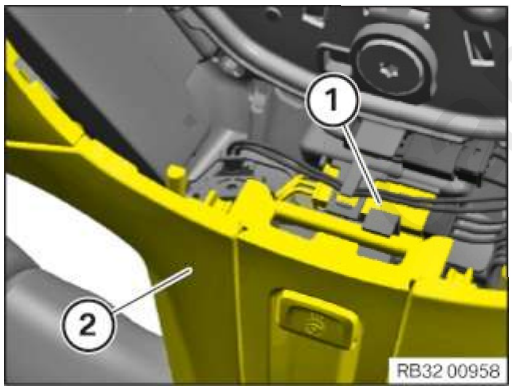
- Unlock plug connection (1) and disconnect.



- Unscrew the screws (1) on the back of the steering wheel.



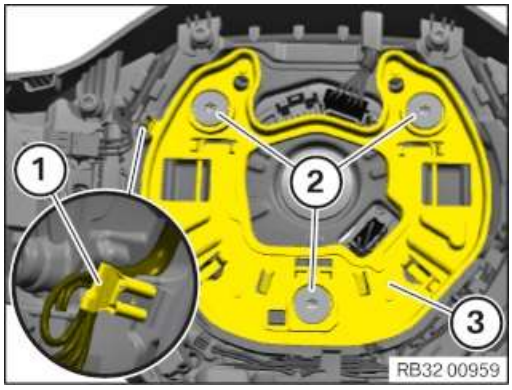
- Carefully detach the decorative trim (1) from the latch mechanisms (2).
- Carefully release the decorative trim (1) from the steering wheel in the area (3).



- **If installed:**

  Loosen the plug connection (1) for the steering wheel heating from the holder, unlock and disconnect.
- Remove decorative trim (2).

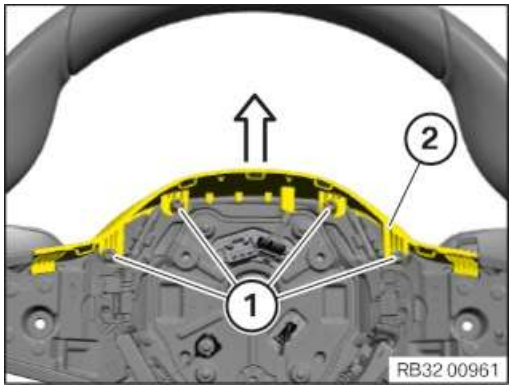
5 – Removing the impact plate (M Sport steering wheel)



- Disconnect (1) grounding cable.
- Loosen screws (2).
- Remove impact plate (3).

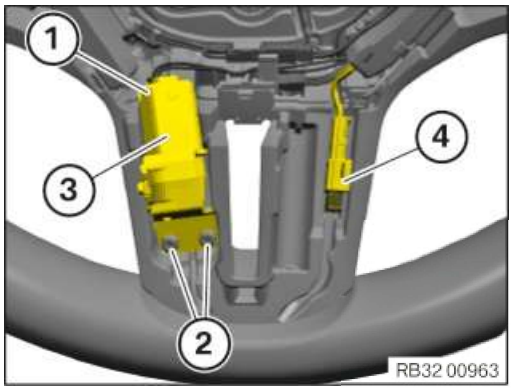
6 – Remove cover

rdiagn.com



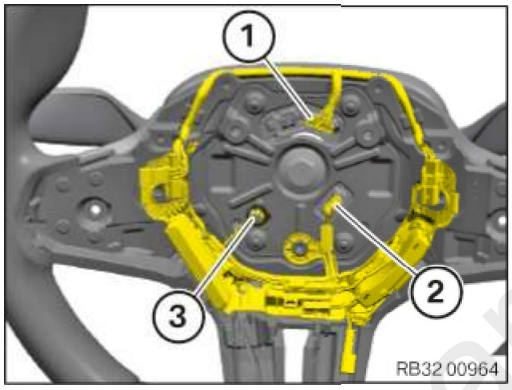
- Loosen screws (1).
- Pull down and remove cover (2) in direction of arrow.

7 – If installed: Disconnect plug connections



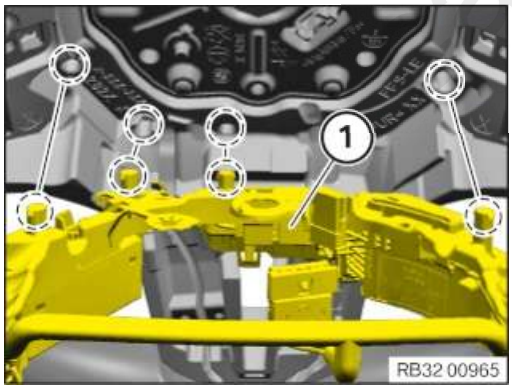
- Unlock and disconnect the plug connection (1) on the vibration actuator (3).
- Loosen screws (2).
- Remove the vibration actuator (3).
- Unlock and disconnect the plug connection (4) for the steering-wheel heating.

8 – Removing wiring harness (M Sport steering wheel)



- (1)(2)
- Release the earth cable eyelet (3) from the steering wheel.

Note: The eyelet of the earth cable has been damaged during removal and must not be reused.



- Release the wiring harness (1) from the steering wheel and remove.

MAIN WORK

9 – Removing the steering wheel (M sports steering wheel)

mrdiagn.com



- Move the steering wheel and wheels to the straight-ahead position.
- Loosen screw (1).
- Pull down the steering wheel and remove.

10 – When the airbag unit has been actuated (M Sport steering wheel)



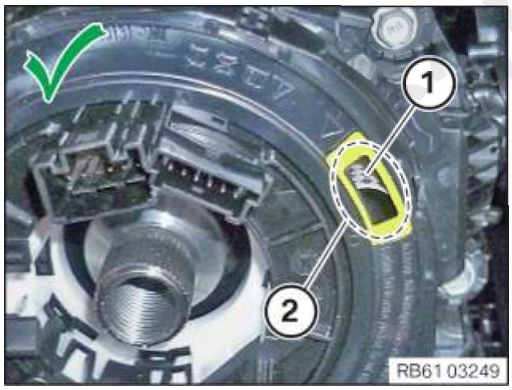
- Renew M Sport steering wheel (1) and impact plate (2).

11 – Installing the steering wheel (M Sport steering wheel)

▸ **Check the neutral position of the clock spring**

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.



Check

- **Version A:**

  Check the mark (1) on the coil spring in the inspection glass (2).

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

Check



- **Version B:**

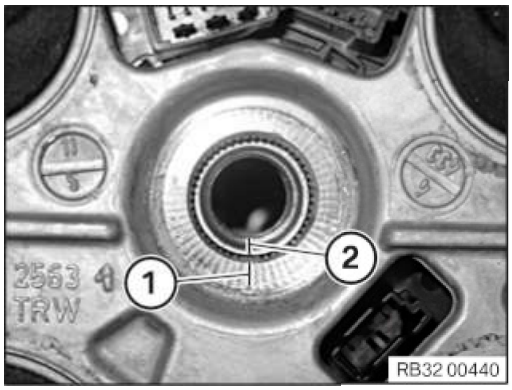
  Check the mark (1) on the coil spring in the inspection glass (2).

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).



- Align mark (1) on steering wheel to mark (2) on steering column.
- Position the steering wheel.

Check



- A micro-encapsulated screw (1) may be fitted.

  Check the screw connection.

Result

» Screw (1) is micro-encapsulated.

Measure

- Clean thread in the steering column.

  Renew the screw (1).

  Parts: Screw



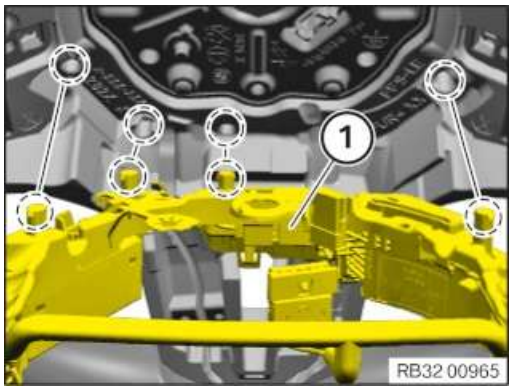
- Tighten down screw (1).

Steering wheel to steering column

M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

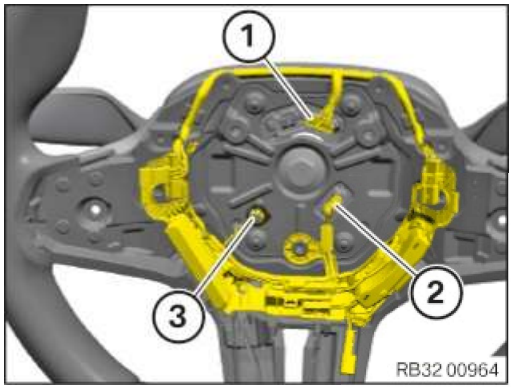
partdiagn.com

12 – Installing the wiring harness (M Sport steering wheel)



- Replace wiring harness (1).

  Parts: Wiring harness
- Position the wiring harness (1) with the brackets on the steering wheel.

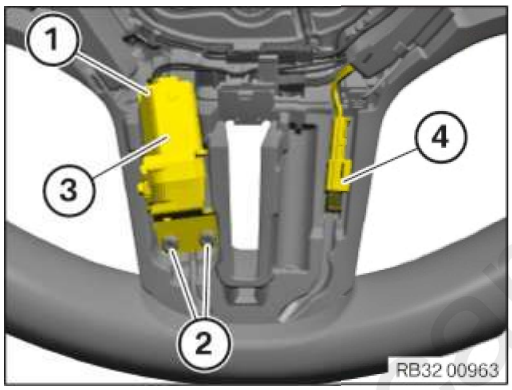


- Guide in and secure wiring harness to the steering wheel.
- Attach the earth cable eyelet (3) to the steering wheel.

Note: The eyelet of the earth cable (wiring harness) must not be reused.

- Connect and lock connectors (1) and (2).

13 – If installed: Connect connector



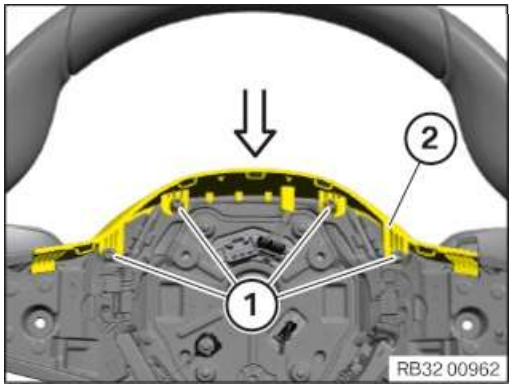
- Connect the connectors (4) for the steering-wheel heating and lock.
- Position vibration actuator (3).
- Tighten the screws (2).

Balance weight/vibration actuator on steering wheel

Screw		Tightening torque	2,2 Nm

- Connect connector (1) on the vibration actuator (3) and lock it.

14 – Install the cover



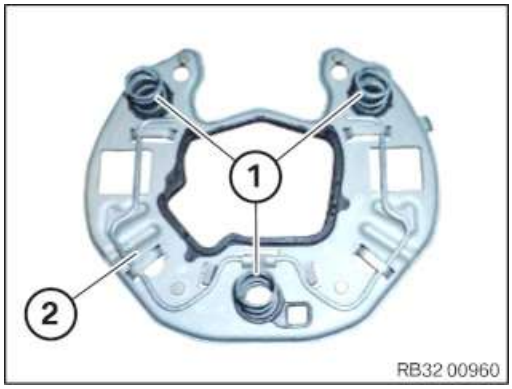
- Feed in and position cover (2) in direction of arrow.
- Tighten the screws (1).

Steering wheel cover

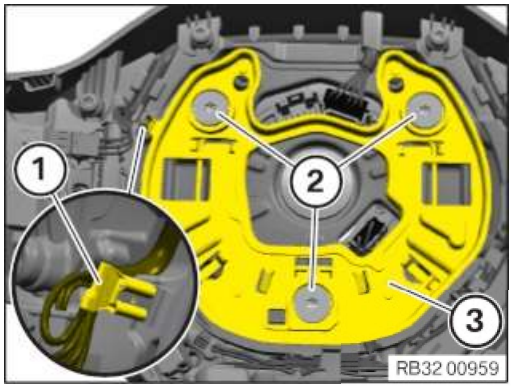
Screw TS5x12		Tightening torque	2 Nm

15 – Install the impact plate (M Sport steering wheel)

ostdieon.com



- Check the position of the springs (1) on the impact plate (2) and correct it if necessary.



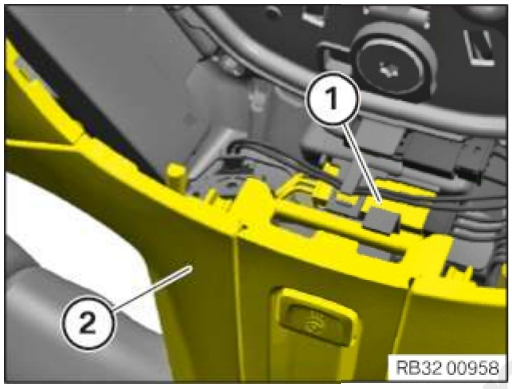
- Position impact plate (3).
- Tighten the screws (2).

Impact plate on steering wheel

Screw		Tightening torque	6,5 Nm

- Connect earth cable (1).

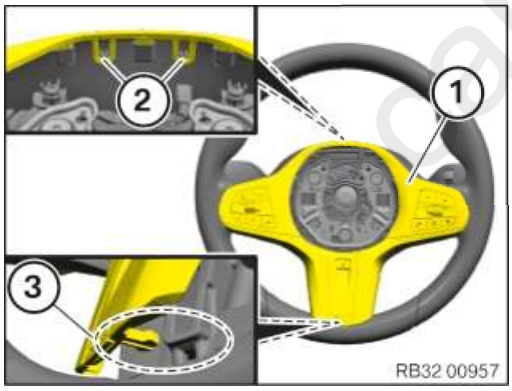
16 – Installing the decorative trim for the M Sport steering wheel (SA710)



- **If installed:**

  Connect the connector (1) for the steering-wheel heating and lock it.

  Secure plug connection (1) for the steering-wheel heating to the bracket.



- Check the latch mechanisms (2) and (3) for damage.

  The latch mechanisms (2)and (3) must not be damaged or missing.
- Carefully clip in the decorative trim (1) at the latch mechanisms (2) and (3).



- Tighten screws (1) on the back of the steering wheel.

17 – If installed: Installing the shift paddles for the automatic transmission

cardiagn.com

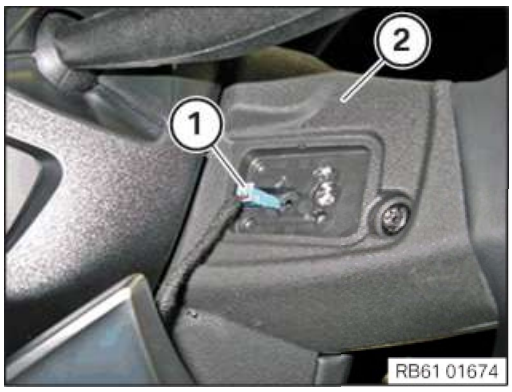
NOTICE

Perform the operations on the left and right side.

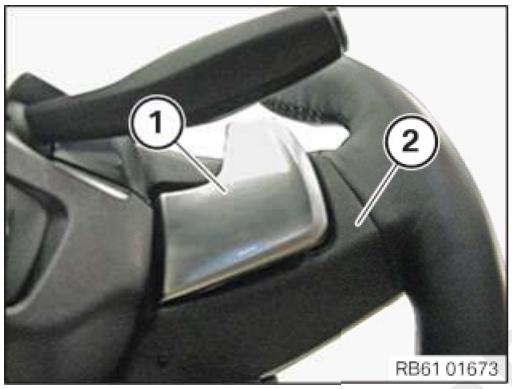
▸ **Installing the shift paddle for the automatic transmission**

NOTICE

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



- Insert the access line (1) into the rear of the steering wheel (2).



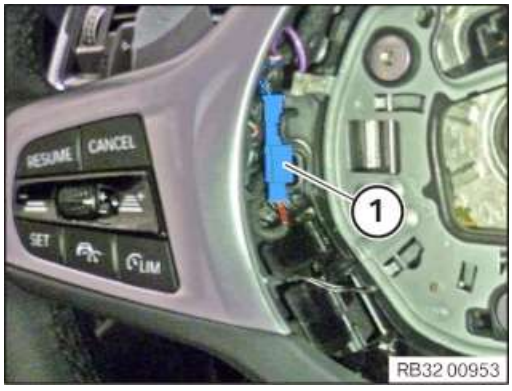
- Position the shift paddle (1) on the steering wheel (2).



- Tighten down screw (2).

Shift paddle to steering wheel

Screw TS5x12		Tightening torque	2 Nm



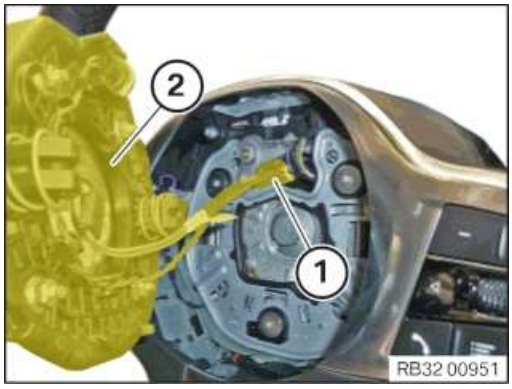
- Connect connectors (1) and lock.
- Secure plug connection (1) to the bracket.

bmwdiagn.com

.. – Installing the airbag unit (M Sport steering wheel)

TECHNICAL INFORMATION

After replacing the airbag unit (M-sports steering wheel) or after a possible conversion of standard steering wheel and airbag unit to M-sports steering wheel, a software update or a programming/encoding via ISTA must be performed!



- Connect and lock the connector (1) of the airbag unit (2).



- Press the airbag unit further (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

19 – Disconnecting all battery earth leads



- See additional information.

Additional Information

Overview of Tightening Torques

Steering wheel to steering column — Used in step 11

M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

Balance weight/vibration actuator on steering wheel — Used in step 13

Screw		Tightening torque	2,2 Nm

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Steering wheel cover			Used in step 14
Screw TS5x12		Tightening torque	2 Nm

Impact plate on steering wheel			Used in step 15
Screw		Tightening torque	6,5 Nm

Shift paddle to steering wheel			Used in step 17
Screw TS5x12		Tightening torque	2 Nm

Links

General repair instructions	Used in step
72 00 ... Safety regulations for handling components with gas generators	
72 12 ... Procedure after airbag deployment as result of an accident	

Repair instructions	Used in step
61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	119
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	119
61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	119
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	119
61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting battery earth lead	119
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	119
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61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting battery earth lead	119
61 20 900 Disconnecting and connecting battery earth lead	119

carmagn.com

72 12 ... Procedure after airbag deployment as result of an accident

Replace all components that were affected by the accident and check all others!

Check and/or replace following components after airbag deployment:

- Components
  - Sensor B-pillar (left/right)
  - Sensor front door (left/right)
  - Sensor seat, Driver-/passenger's side
  - Airbag control unit, vehicle interior
  - Sensor, pedestrian protection
  - Front sensor (engine compartment)
- Procedure
  - Inspect visually for mechanical damage (housing, plug connections). Replace damaged components.
  - Connect BMW diagnosis system
  - Read fault memory
  - Disconnect the vehicle battery and adhere to the waiting period (at least 30 seconds)
  - Rectify faults
  - Reconnect the vehicle battery and adhere to the waiting period (at least 10 seconds)
  - Delete fault memory
  - Switch off ignition and wait at least 2 minutes (no consumers may be switched on during this period such as interior light, radio, etc.)
  - Switch the ignition on (wait for at least 10 seconds)
  - Delete fault memory
  - If you cannot delete the fault memory: Replace the component that is causing the fault

Replace the airbag control unit in the following cases only:

- In the case of visible external damage
- In the case of a corresponding fault memory entry (airbag indicator light is illuminated)

Cables and connectors

- Components and procedure
  - Check cables and connectors for damage, replace if necessary.
    (e. g. corrosion, correct engagement, bent pin)

Seat belt system

- Components
  - Automatic reel
  - Seat belt tensioner
  - Seat belt height adjustment
  - End fitting pretensioner
  - Seat belt buckle
- Procedure
  - Check components, replace if necessary
  - Additional door lock: Check for foreign body, remove it if necessary.

Seats

- Components
  - Seat
  - Airbag module
  - Active head restraint
- Procedure
  - Check seats (functional check of seat mechanism), replace if necessary

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    - Check seat connection
    - Replace gas generator of active head restraint

      If the severity of the crash has not caused any other damage to the seat, only the triggered gas generator needs to be replaced.
      External feature: The triggered head restraint is folded forwards and engaged.
      The repair work can be carried out in the vehicle with the rear panel removed. The entire system can be pushed back into its original position and the new gas generator installed.
      The gas generator can be replaced up to 5 times.
    - Replace airbag module and seat cover with upholstery

Driver's airbag

- Components
    - Airbag module
    - Steering wheel
    - Steering column (if damaged)
- Procedure
    - Check components, replace if necessary
    - Replace steering wheel
    - Only with M Sport steering wheel: Replacing impact plate

Front passenger airbag

- Components
    - Airbag module
    - Dashboard trim panel (must be replaced!)
    - Supporting tube (if damaged)
- Procedure
    - Check components, replace if necessary

Side airbag, front/rear

- Components
    - Airbag module
    - Door trim panel
    - Door in white
    - Seat
- Procedure
    - Check components; replace if necessary

Head airbag

- Components
    - Airbag module
    - A-pillar trim panel
    - Roofliner
    - Cover, B-pillar (if damaged)
    - C-pillar trim panel (if damaged)
    - Connection/mount (on side frame)
- Procedure
    - Check components, replace if necessary

Knee airbag

- Components
    - Trim panel (driver's side)
    - Lower section of glove box
    - Knee protection(Driver- and passenger's side)
- Procedure

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- Check components, replace if necessary

Passive knee protection

- Components
  - Trim panel (driver's side)
  - Glove box incl. knee protection (passenger's side)
- Procedure
  - Check components for damage, replace if necessary
  - Check retaining elements

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32 34 030 Removing and installing/replacing airbag unit

Prerequisite

- Equipment specification:
  - **M Sport steering wheel**

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

WARNING

Airbag unit.

Danger! Life-threatening injuries!

- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

TECHNICAL INFORMATION

After replacing the airbag unit (M-sports steering wheel) or after a possible conversion of standard steering wheel and airbag unit to M-sports steering wheel, a software update or a programming/encoding via ISTA must be performed!

TECHNICAL INFORMATION

Steering wheel must be replaced if airbag unit has been deployed.

Only with M Sport steering wheel: Impact plate must be replaced if airbag unit has been deployed.

For additional information see: 72 12 ... Procedure after airbag deployment as result of an accident

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PRELIMINARY WORK

1 – Disconnecting all battery earth leads



- See additional information.

MAIN WORK

2 – Removing airbag unit (M Sport steering wheel)

WARNING

Airbag unit.

Danger! Life-threatening injuries!

- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

RISK OF DAMAGE

Damage to the steering wheel.

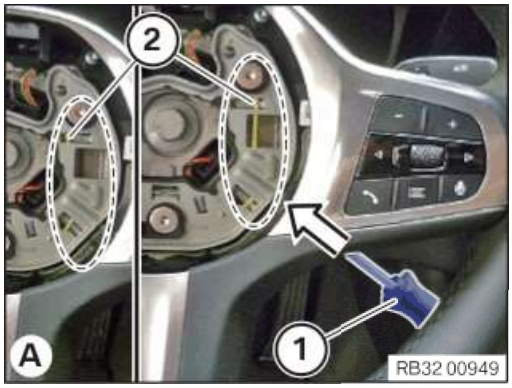
Incorrect handling of the tool may damage the steering wheel.

- Ensure the tool is positioned correctly (angle and inclination).
- When unlocking, do not use "levering" action. Instead, press in the Torx screwdriver toward the centre of steering wheel only.

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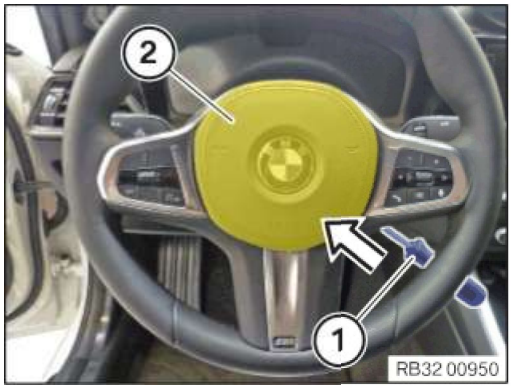
- Locate the pre-punched bore hole (1) on the rear side of the steering wheel by touch.
- Insert the Torx screwdriver T27 (2) diagonally upwards in the pre-punched bore hole (1) on the rear side of the steering wheel until a springing kind of resistance can be felt.



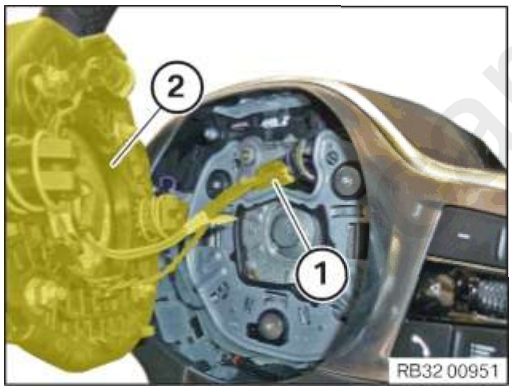
NOTICE

To provide a better overview: Diagram with airbag unit removed.

- Press in Torx screwdriver T27 (1) straight in direction of arrow towards the centre of the steering wheel in order to unlock the wire spring clip (2) or to unlock the airbag unit (A).



- Press in Torx screwdriver T27 (1) straight in direction of arrow towards the centre of the steering wheel and lift airbag unit (2) on the unlocked side.
- Repeat procedure on left side and carefully release airbag unit (2) from the steering wheel.



- Unlock and disconnect the plug connection (1) and remove the airbag unit (2).

3 – When the airbag unit has been actuated (M Sport steering wheel)



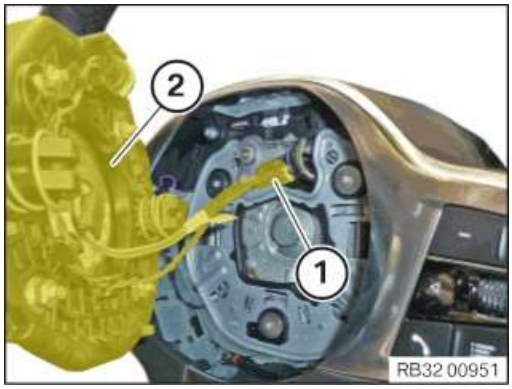
- Renew M Sport steering wheel (1) and impact plate (2).

4 – Installing the airbag unit (M Sport steering wheel)

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TECHNICAL INFORMATION

After replacing the airbag unit (M-sports steering wheel) or after a possible conversion of standard steering wheel and airbag unit to M-sports steering wheel, a software update or a programming/encoding via ISTA must be performed!



- Connect and lock the connector (1) of the airbag unit (2).



- Press the airbag unit further (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

POSTPROCESSES

5 – Disconnecting all battery earth leads



- See additional information.

Additional Information

Links

General repair instructions	Used in step
72 12 ... Procedure after airbag deployment as result of an accident	
72 00 ... Safety regulations for handling components with gas generators	

Repair instructions	Used in step
61 20 900 Disconnecting and connecting battery earth lead	15

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61 20 900 Disconnecting and connecting battery earth lead	15
61 20 900 Disconnecting and connecting battery earth lead	15
61 20 900 Disconnecting and connecting battery earth lead	15
61 20 900 Disconnecting and connecting battery earth lead	15
61 20 900 Disconnecting and connecting battery earth lead	15
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	15
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	15
61 20 900 Disconnecting and connecting battery earth lead	15
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	15
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	15
61 20 900 Disconnecting and connecting battery earth lead	15
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61 20 900 Disconnecting and connecting battery earth lead	15
61 20 900 Disconnecting and connecting battery earth lead	15
61 20 900 Disconnecting and connecting battery earth lead	15
32 33 020 Replacing the M sports steering wheel	

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32 34 030 Removing and installing/replacing airbag unit

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

TECHNICAL INFORMATION

Steering wheel must be replaced if airbag unit has been deployed.

Only with M Sport steering wheel: Impact plate must be replaced if airbag unit has been deployed.

For additional information see: 72 12 ... Procedure after airbag deployment as result of an accident

PRELIMINARY WORK

1 – Disconnecting all battery earth leads



- See additional information.

MAIN WORK

2 – Removing the airbag unit (sports steering wheel)

WARNING

Airbag unit.

Danger! Life-threatening injuries!

- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

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RISK OF DAMAGE

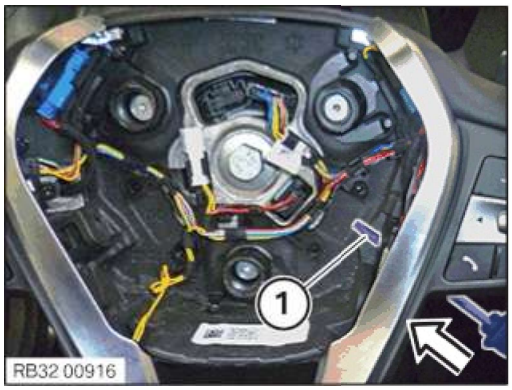
Damage to the steering wheel.

Incorrect handling of the tool may damage the steering wheel.

- Ensure the tool is positioned correctly (angle and inclination).
- When unlocking, do not use "levering" action. Instead, press in the Torx screwdriver toward the centre of steering wheel only.



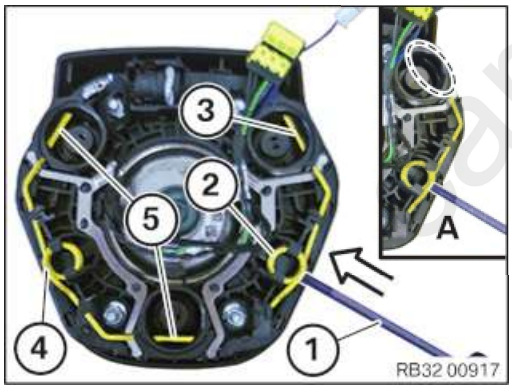
- Insert Torx screwdriver T25 (1) diagonally upwards in the hidden opening (2) on the rear side of the steering wheel until a spring resistance is felt.



NOTICE

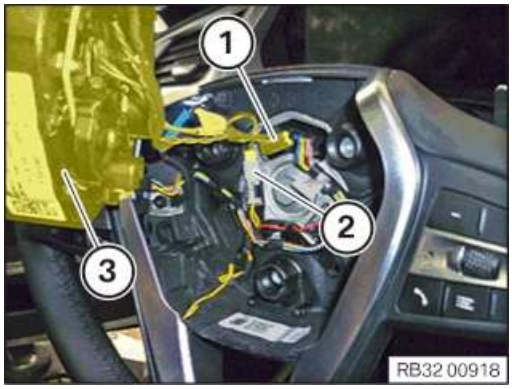
To provide a better overview: Diagram with airbag unit removed.

- To unlock the airbag unit, press Torx screwdriver T25 (1) diagonally upwards in the direction of the arrow to the centre of the steering wheel.



- Press the airbag unit over a large area of the steering wheel.
- Use Torx screwdriver T25 (1) to press wire spring clip (2) in the direction of the arrow towards the centre of the steering wheel and release lock (3).

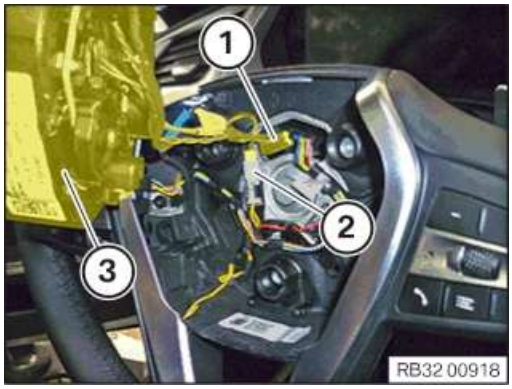
  (A): Wire spring clip (2) is unlocked.
- Then use Torx screwdriver T25 (1) to press wire spring clip (4) in the direction of the arrow towards the centre of the steering wheel and release locks (5).
- Carefully raise the airbag unit.



- Unlock and disconnect the plug connections (1) and (2).
- Remove airbag unit (3).

3 – Installing the airbag unit (sports steering wheel)

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- Position airbag unit (3).
- Connect connectors (1) and (2) lock.



- Press the airbag unit (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

POSTPROCESSES

4 – Disconnecting all battery earth leads



- See additional information.

Additional Information

Links

General repair instructions	Used in step
72 00 ... Safety regulations for handling components with gas generators	2
72 12 ... Procedure after airbag deployment as result of an accident	

Repair instructions	Used in step
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	14

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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	14
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	14
61 20 900 Disconnecting and connecting battery earth lead	14
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61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting the battery earth lead (*all* battery earth leads)	14
61 20 900 Disconnecting and connecting battery earth lead	14
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61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14
61 20 900 Disconnecting and connecting battery earth lead	14

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72 00 ... Safety regulations for handling components with gas generators

It is essential to comply with the regulations as specified in the law relating to the use of explosives when working on airbag units and seat belt tensioners.

Airbags, seat belt tensioners etc. are pyrotechnical objects. Pyrotechnical objects are assigned to different danger classes on the basis of the quantity of propellant that they contain. The assignment can be ascertained from the identification marking on the product:

Important!

> Failure to comply with the warning notices and repair instructions for gas generator components can cause accidental deployment and result in injury and vehicle damage!

This applies in particular to the following components:

- Airbag modules (driver's/front passenger airbags, side airbags)
- Seat belt tensioner
- Head airbag
- Active knee protection
- Active head restraint
- Safety battery terminal

1. Regulations

The regulations quoted in the following refer to the Federal Republic of Germany.

In all other countries, the relevant legislation and regulations must be observed in each case. Country-specific legal regulations that go beyond this information or court decisions based thereon must be followed in each case or given precedence over these regulations.

The following components used by BMW:

- Pyrotechnical restraint systems are subject to danger class PT1
- Gas generators are pyrotechnical objects belonging to danger class T1

Handling, transporting and storing non-fired gas generators are subject to the "Explosive Materials Act".

The relevant trade supervisory authority must be notified at least 2 weeks before pyrotechnical objects are handled for the first time. Here the relevant authority must be notified in writing of the person responsible (e.g. dealership owner, holder of general power of attorney or if necessary workshop supervisor). A certificate of qualification, i.e. specific training, is not required for the person responsible.

2. Dismantling and installation

- Inspection, testing and installation work may only be carried out by expert trained personnel in BMW Service.
- Work on components of the airbag system should only ever be carried out with the battery disconnected, the negative terminal post covered and the plug connection of the cable leading to the gas generator disconnected. If only the battery is disconnected, the following prescribed waiting period must be observed without fail:
  - 1 mins.
- In the event of breaks in work, a component with a gas generator that has been removed must be secured against access by other persons.
- Individual components must never be repaired. Instead, always replace them.
- Do not treat airbag system components with cleaning agents or grease.
- Components of the airbag system must not be exposed to temperatures in excess of 75 °C.
- Airbag system components, including electronic diagnostic components, which have been dropped from heights in excess of 0.5 m must not be reinstalled in the vehicles.

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- Do not remove components of the airbag system from the original packaging until immediately before they are to be installed in the vehicle.
- Before installing, subject components such as housing, connector pins ,etc. of the airbag system (including diagnosis electronics) to a visual inspection for damage and replace if necessary.
- Airbag system components may only be electrically tested while they are installed and only with the BMW ISTA.
- **Danger of injury:** The airbag module may only be set down with the airbag itself facing *upwards*. Otherwise the airbag module will be thrown upwards if the alternator is ignited.
- Do not point the ignition squib of a gas generator at other persons.
- Components with gas generators must not be fired while they are removed. They must be disposed of by special disposal companies or returned to BMW in the packaging of the new components.
- When carrying out straightening and welding work with an electric welder:
  - Disconnect battery
  - Cover negative terminal (post)
- Avoid all contact with the skin when removing a fired airbag module - wear gloves. Wash with water after contact with the skin.

3. Transport

- Components with gas generators must be sent off in the packaging of the new components.

4. Storage

- Observe the regulations of the relevant trade supervisory authority and the applicable national regulations.

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00 00 ... Microencapsulated screws



Screw securing adhesive is a means of preventing a screwed connection from being loosened by external influences.

Once the screw has been coated with adhesive, the adhesive remains inactive until such time that it is activated by the encapsulation breaking when the screw is inserted and then cures (hardens) at room temperature.



Installation note:

- Screw connection must be completed within 20 mins. (start of curing)
- Microencapsulated screws must not be retightened
- Thread of nut must be cleaned beforehand in event of repeated use

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