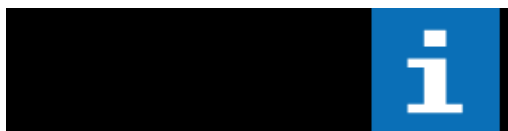
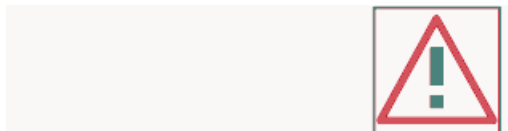


32 00 ... Additional work for camber correction



Note:

The camber adjustment is performed only with the [replacement of the swivel bearing](#). There are 3 different swivel bearings for this!



Attention!

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

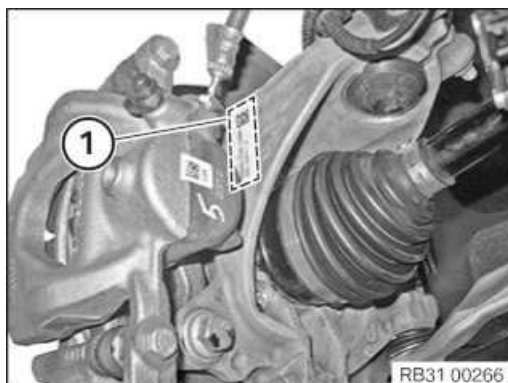
Note:

The swivel bearing may only be replaced if the camber is outside the specified tolerance after toe adjustment.



Necessary preliminary work:

Adjust [toe-in](#).



Check camber values; if necessary, replace installed [swivel bearing](#) with swivel bearing for camber correction. *Note:*

Swivel bearings for camber correction can only be identified by reference to the BMW part number (1).

Also refer to the BMW Electronic Parts Catalogue!

Version	BMW part number
Standard	Left: 6 870 837 or 6 876 645 / right: 6 870 838 or 6 876 646
+ 30'	Left: 6 860 991 or 6 876 851 / right: 6 860 992 or 6 876 852
- 30'	Left: 6 860 993 or 6 876 853 / right: 6 860 994 or 6 876 854

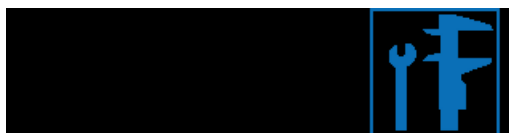
These swivel bearings for camber correction are used to correct the camber values by 30 min. To be used only if the tolerance values are exceeded or undershot!



After Installation note:

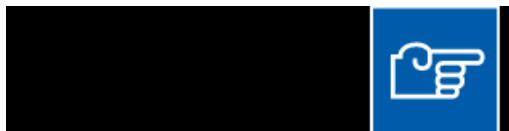
- Check the directional stability of car; if necessary, repeat [toe-in](#) adjustment.

32 00 620 Adjusting rear axle



Special tools required:

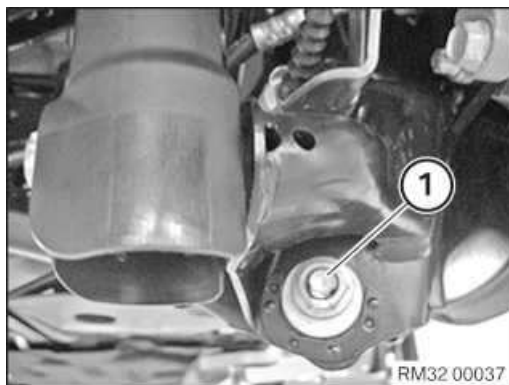
- [32 4 200](#)



Note:

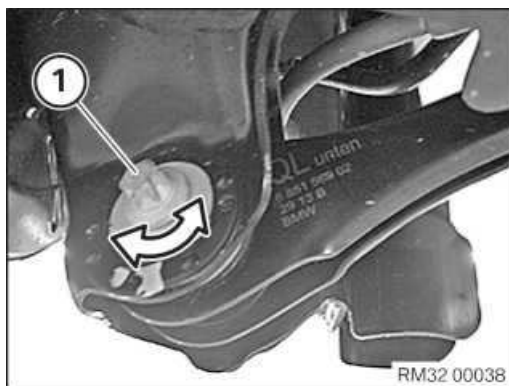
A camber change always means a toe change as well. The camber must therefore be adjusted first.

If camber and toe-in are not adjustable within setpoint range:
Troubleshooting at rear axle.

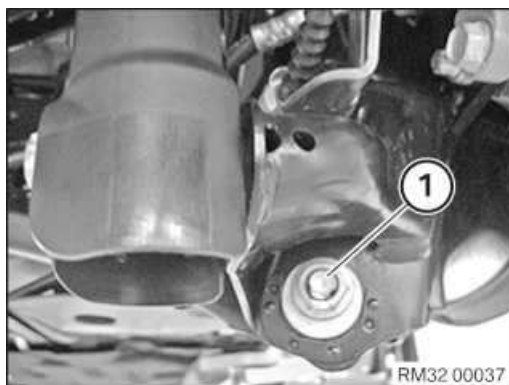


Adjusting camber:

Replace nut (1) prior to eccentric bolt adjustment and tighten to 5 Nm.



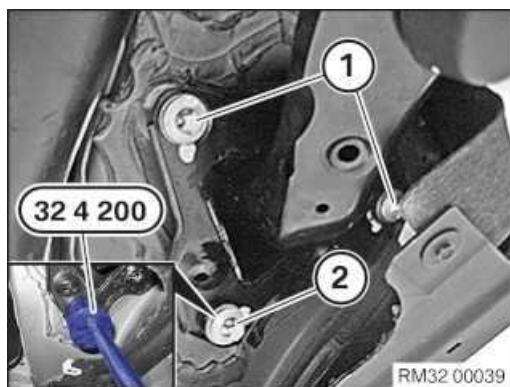
Turn screw (1) and adjust camber to setpoint value.



Tighten nut (1).

Parts: Replace screw and nut

Tightening torque [33 32 2AZ](#).

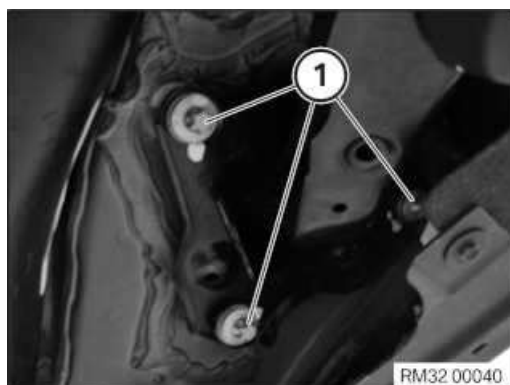


Adjusting toe:

Renew the screw (1) and nut (2) and tighten with about 5 Nm.

Mount special tool [32 4 200](#) on screw (2).

Turn special tool [32 4 200](#) and adjust toe-in to setpoint value.



Tighten down screws (1).

Parts: Replace screws

Tightening torque [33 32 5AZ](#).

**Attention!**

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

Note:

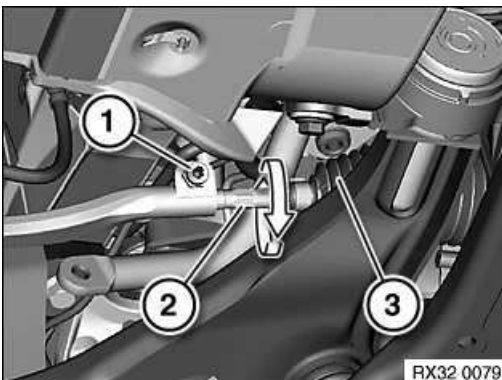
Camber and toe-in influence each other. Adjust the toe-in first in order to simplify the adjustment procedure.

The camber adjustment is performed only with the replacement of the swivel bearing. There are various swivel bearings (+/-30') for this purpose.

-> See also [Additional work for camber correction](#) and BMW Parts Catalogue!



Bring the steering wheel into the straight-ahead position and secure with steering wheel arrester.

**Adjust toe-in:**

Clean thread on track rod.

Slacken bolt (1).

Turn track rod (2) to adjust toe-in to setpoint value, if necessary counterhold track rod end.

Tighten screw (1).

Tightening torque [32 21 2AZ](#).

If necessary, correct installation position of gaiter (3).

**After setting:**

- Check directional stability of vehicle; if necessary, repeat toe-in adjustment
- After adjustment work on the front axle/steering, **"EPS start-up"** must be carried out.

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



Danger of injury!

Contact with eyes or skin may result in injury!

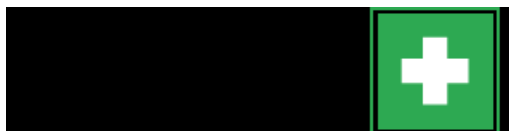
Possible symptoms are:

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



Protective measures/rules of conduct:

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



First aid measures:

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

Note: Do not use solvents/thinners.

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



Danger of poisoning!

Ingesting oil or absorbing through the skin may cause poisoning!

Possible symptoms are:

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



Protective measures/rules of conduct:

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



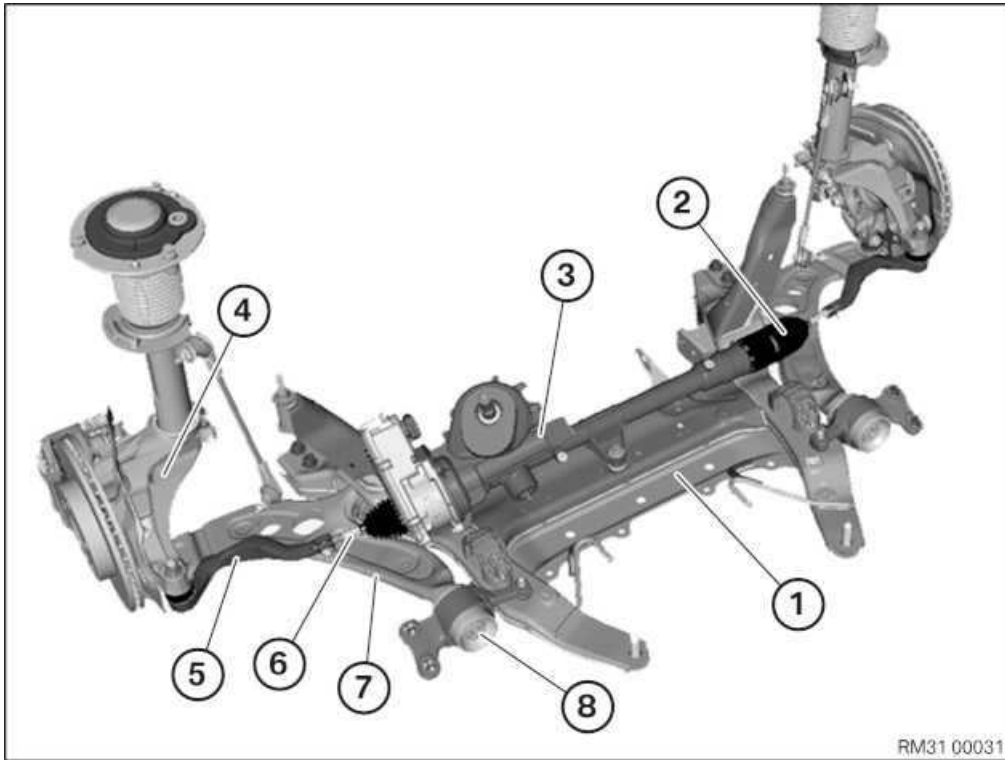
First aid measures:

- Do not induce vomiting.

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

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

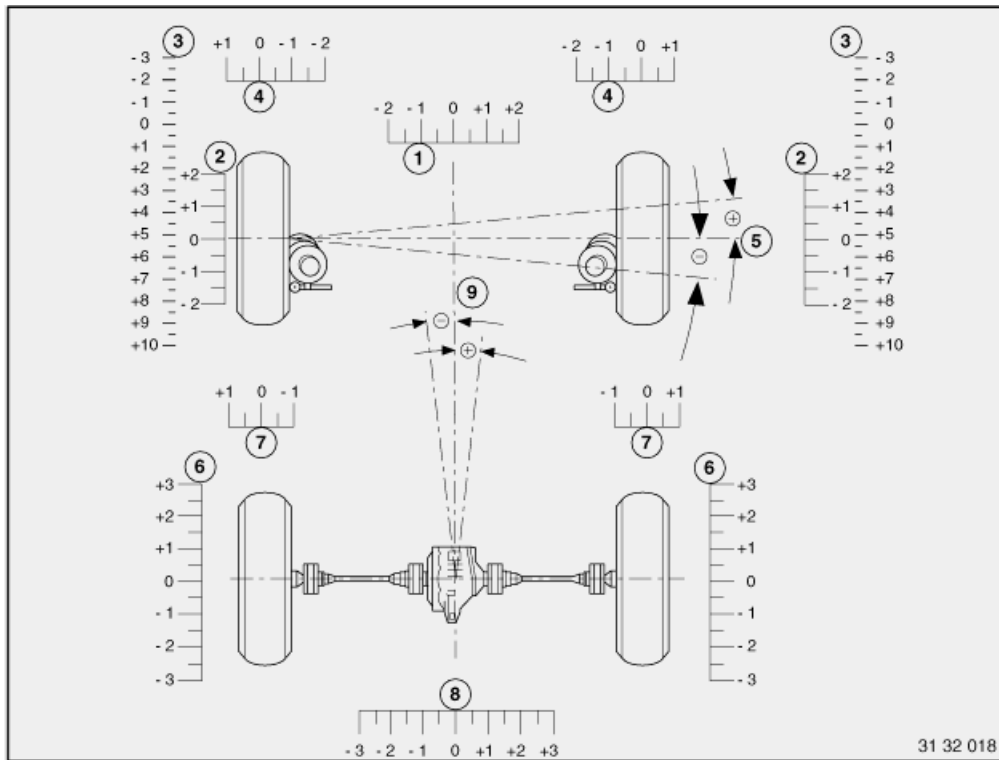
31 00 ... Front axle + steering: Perform wheel alignment after the following repair work



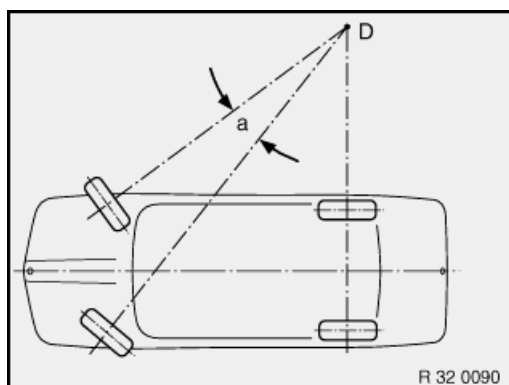
Perform [wheel alignment](#) after the following repair work:

- Release the following screw connection:
 - Steering box to front axle support
 - Track rod end to track rod
 - Wishbone to front axle support
- Replacement of following parts:
 1. Front axle support
 2. Gaiter (if the track rod end has to be screwed off)
 3. Steering box
 4. Swivel bearing
 5. Track rod end
 6. Track rod
 7. Wishbone
 8. Rubber mount with holder for wishbone

32 00 ... General chassis and suspension definitions



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



Toe angle difference

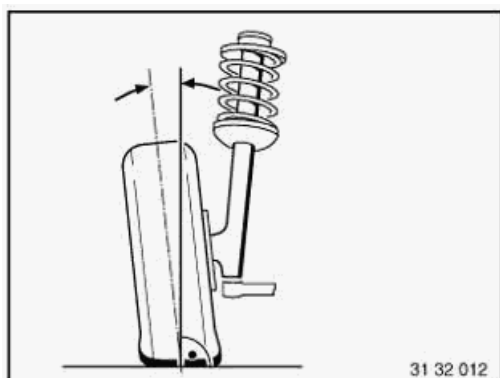
a Toe difference angle

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.

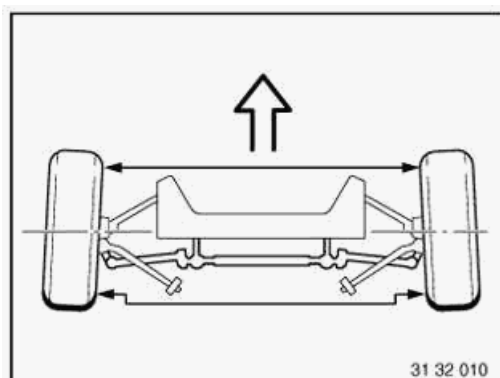
A correctly adjusted toe angle difference produces equal values for left and right lock with consideration of factory tolerances.

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.

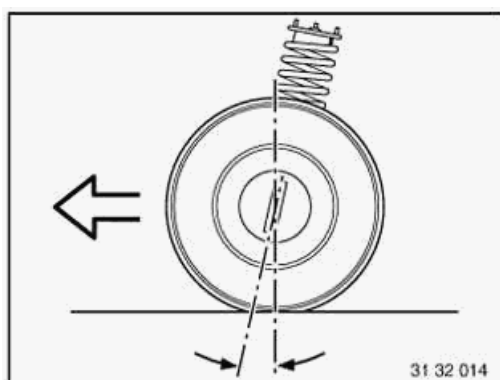


Toe

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

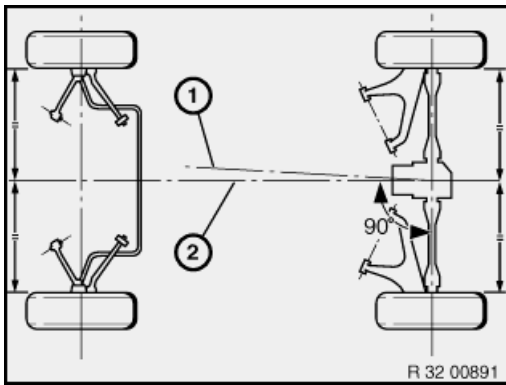
Measurement is performed in "straight-ahead mode".



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.



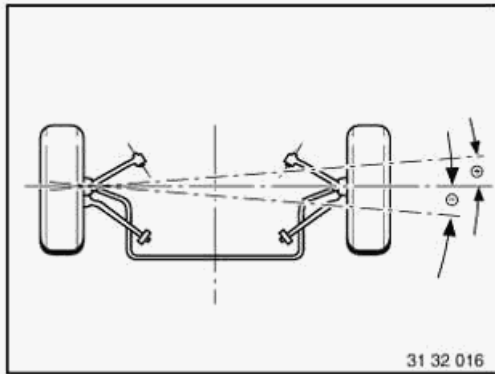
Geometrical driving axis 1

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

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

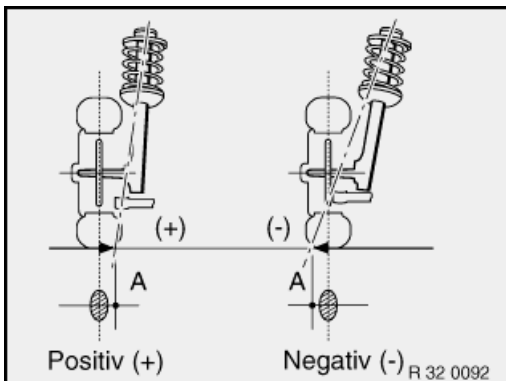
Symmetrical axis 2

Centre line running through front and rear axles.



Wheel misalignment

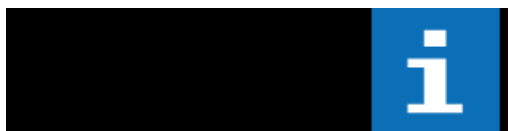
Angle by which one front wheel is displaced more towards front or rear than the other front wheel. The wheel offset angle is positive when the right wheel is displaced towards the front and negative when it is displaced towards the rear.



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.

*Note:*

If the front spring strut does not have a label for suspension identification, the type of suspension can be identified from the part number in the Electronic Parts Catalogue.

32 00 150 KDS chassis/wheel alignment check with vehicle load up to design position



Important!

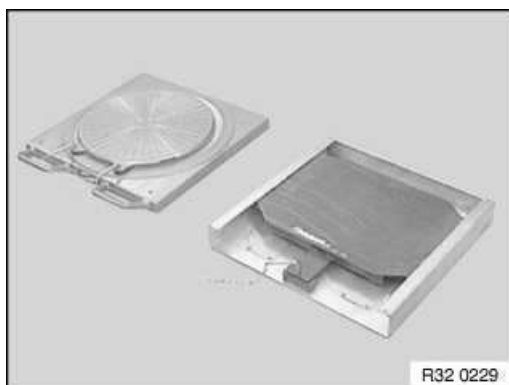
Perform wheel alignment only while vehicle is loaded:

- If the technical prerequisites for alignment with ride height input are not fulfilled
- If the vehicle in question is a damaged vehicle



Note:

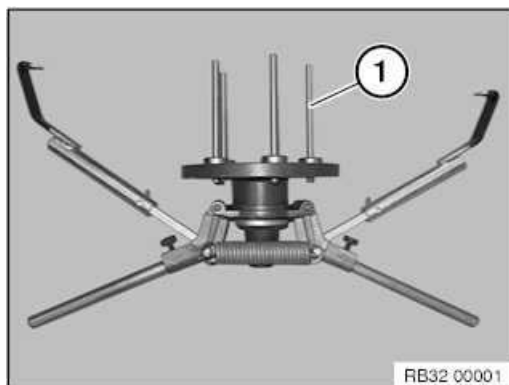
- Read and comply with [General information and definitions](#).
- Read and comply with [General chassis definition](#).
- Update [KDS data states](#)
- Check compliance with [test conditions](#), repair vehicle if necessary.



- If necessary, prepare vehicle hoist.
- Drive vehicle onto vehicle hoist.

Note: The front and rear wheels must be positioned centrally on the rotary and sliding plates.

Note: Rotary plates may vary from illustration depending on the manufacturer!



Attach pickup/ride height marks to vehicle (observe specifications from the various equipment manufacturers). **Important!**

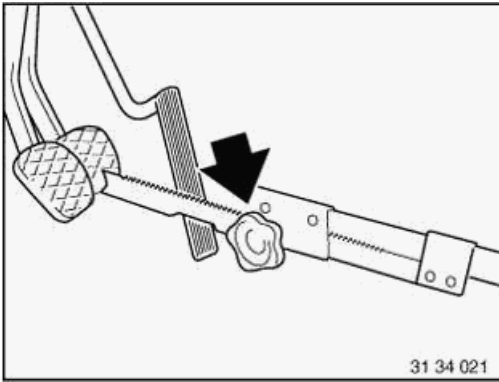
Use only quick connectors with poly control pins (1).

No other quick connect units without poly control pins are permitted due to measuring inaccuracies that are too great!

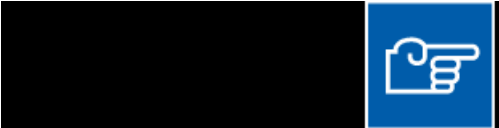
Graphic of KDS II pickup



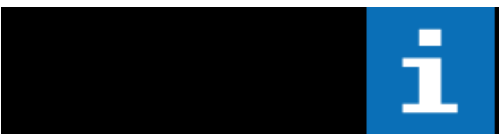
- Enter customer and vehicle data
- Identify [chassis version](#) and select vehicle
- Enter tyre inflation pressure and tread depth
- Move [vehicle into design position](#)



- Install brake tensioner.



- Remove locking pins from both rotary and sliding plates.
- Perform input measurement in accordance with equipment manufacturer's instructions.
- If necessary, adjust [front axle and rear axle](#)
- Perform output measurement in accordance with equipment manufacturer's instructions.
- Save and print out test record.
- Insert locking pins into both rotary and sliding plates
- Remove chassis/wheel alignment system



Only in event of customer complaint (e.g. poor driving performance):

Important!

Do not remove screws/bolts (front axle support to engine support or body)!

Slacken all screws/bolts (front axle support to engine support or body) and then retighten to specified torque.

See [lower front axle support](#)

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.bmwgroup-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.

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



Caution!

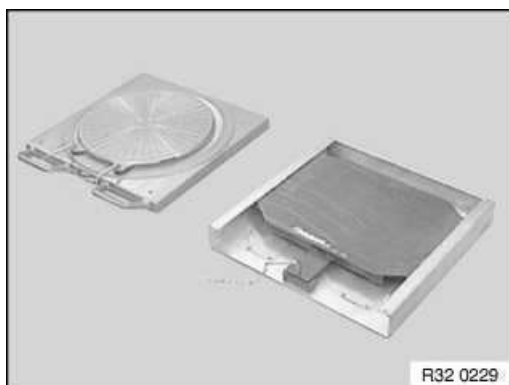
Do not perform wheel alignment without loading the vehicle:

- If the technical prerequisites for measurement with ride height input are not fulfilled.
- If the vehicle in question is a damaged vehicle



Note:

- Read and comply with [General information and definitions](#).
- Read and comply with [General chassis definition](#).
- Update [KDS data states](#)
- Check compliance with [test conditions](#), repair vehicle if necessary.



- If necessary, prepare vehicle hoist.
- Drive vehicle onto vehicle hoist.

Note: The front and rear wheels must be positioned centrally on the rotary and sliding plates.

Note: Rotary plates may vary from graphic depending on the manufacturer



Note:

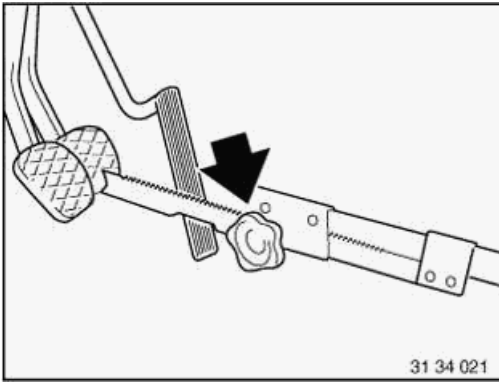
Vehicles with active steering:

Start up active steering prior to wheel alignment!

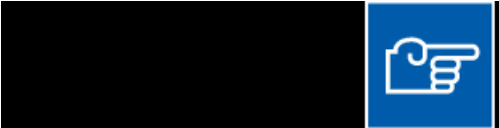


- Apply pickup/ride height marks to vehicle (observe specifications from the various equipment manufacturers)
- Enter customer and vehicle data
- Identify the [chassis version](#) and select the vehicle
- Enter tyre inflation pressure and tread depth
- [Measure vehicle ride height](#) using a tape measure and input the result (Beissbarth KDS II wheel alignment equipment only)

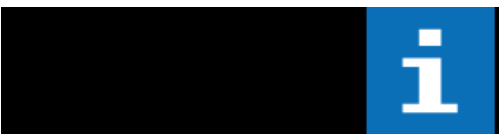
If the ride height is outside the tolerance range (+40/-20 mm), load or unload vehicle accordingly to adjust the vehicle in this ride-height window



- Install brake pedal tensioner



- Remove locking pins from both rotary and sliding plates.
- Perform input alignment in accordance with equipment manufacturer's instructions
- If necessary, adjust [front axle and rear axle](#)
- Perform output alignment in accordance with equipment manufacturer's instructions
- Save and print out test record.
- Insert locking pins into both rotary and sliding plates
- Remove the chassis and suspension measuring system



Only in event of customer complaint (e.g. poor driving performance):

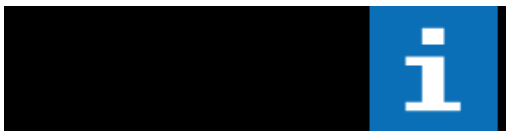
Caution!

Do not remove screws/bolts (front axle support to engine support or body)!

Slacken all screws/bolts (front axle support to engine support or body) and then retighten to specified torque.

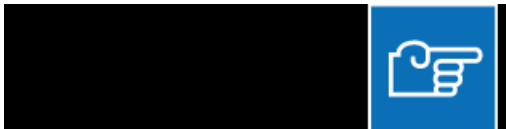
Refer to [Lowering front axle support](#).

32 00 ... Moving vehicle into design position



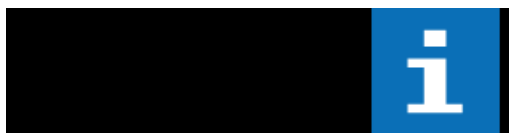
Necessary preliminary tasks:

- Move [vehicle to normal position](#).



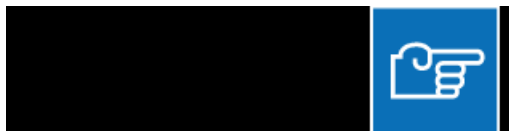
- Add/distribute weights in area of spring struts until the vehicle ride height is within the tolerance (refer to Technical Data).
Measure [vehicle ride height](#).

32 00 ... Moving vehicle into normal position



Necessary preliminary work:

- Check compliance with [test conditions](#), repair vehicle if necessary.



- Check the vehicle interior and luggage compartment (incl. luggage compartment well) for load and unload the vehicle, if required.
- Place the DIN load (see [Technical Data](#)) in the vehicle.
- Determine the [vehicle ride height](#).

Note: If the vehicle ride height is not inside the tolerance (refer to Technical Data), the vehicle must be repaired (coil spring/leakage).

32 00 ... Notes and specifications for the replacement of the steering gear, steering column and the 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 which 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
 - Drop arm
 - 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.

Procedure 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)
- 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, mechanical steering columns 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.

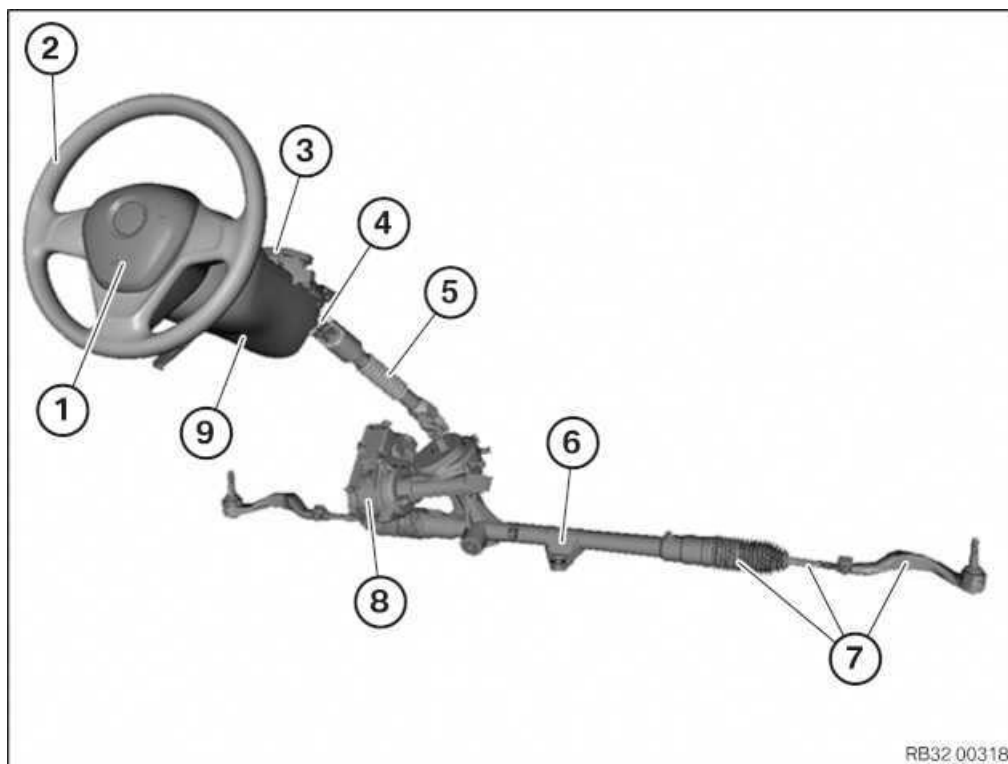
For corresponding specimen of the memorandum, [refer to Service Information 320188\(828\) Appendix 1](#)

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!

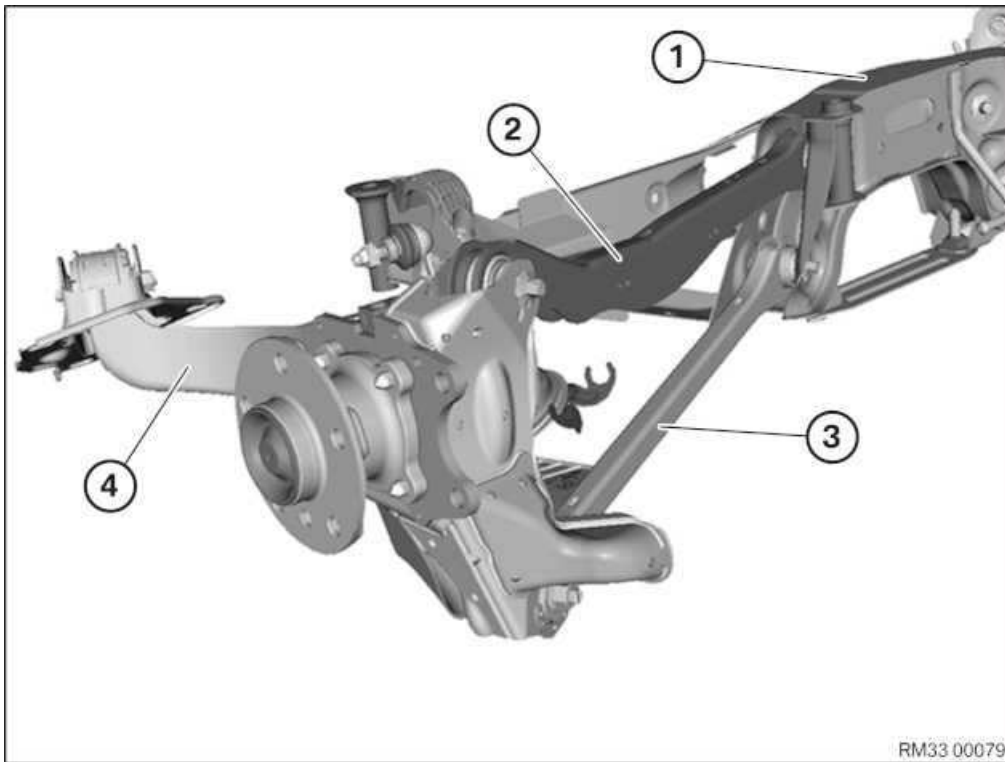
32 Overview of steering



Safety informations and general information

- | | | | |
|---|---|---|---|
| 1 | Airbag unit | 6 | Steering gear (EPS) |
| 2 | Steering wheel | 7 | Track rod end, track rod, gaiter |
| 3 | Upper section of steering column shroud | 8 | Electric motor with control unit |
| 4 | Steering column | 9 | Lower section of steering column shroud |
| 5 | Steering shaft | | Adjustment work |
| | | | Troubleshooting |

33 00 ... Rear axle: Perform wheel alignment after the following repair work



Perform [wheel alignment](#) after the following repair work:

- Release the following screw connection:
 - Trailing arm bearing support to body
 - Trailing arm bearing support to trailing arm rubber mount
 - Upper wishbone to rear axle carrier
 - Bottom wishbone at the rear axle support/trailing arm
- Replacement of following parts:
 1. Rear axle support
 2. Upper wishbone
 3. Lower wishbone
 4. Trailing arm/trailing arm bearing support/rubber mount

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



Warning!

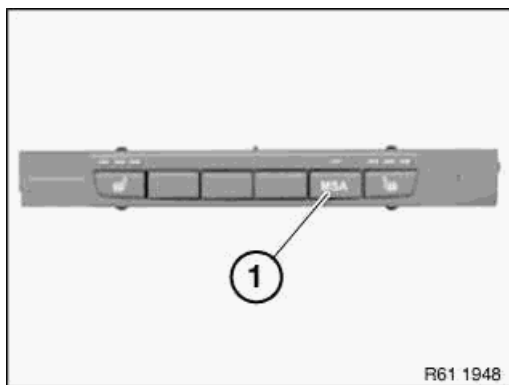
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

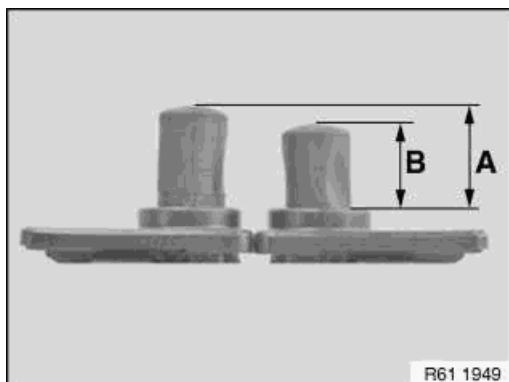
Observe safety precautions when working on MSA vehicles.

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



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](#)

00 Safety instructions for handling oil



Warning!

[Danger of poisoning](#) if oil is ingested/absorbed through the skin!

[Risk of injury](#) if oil comes into contact with eyes and skin!



Recycling:

Observe country-specific waste disposal regulations.



Measures if oil is unintentionally released:

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

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

32 00 ... Test conditions for chassis/wheel alignment check

Observe the following test conditions prior to the chassis/wheel alignment check:

1. Only BMW approved wheel and tyre combinations are installed on the vehicle.
2. Correct tread depth. The tread depth for each axle may differ from left to right by max. 1-2 mm.
3. Correct tyre pressure (see label on vehicle).
4. All chassis and suspension components must be technically OK.
5. Condition of suspension and shock absorbers OK: Visually inspect for breakage, etc.

32 00 ... Notes and specifications for the replacement of the steering gear, steering column and the 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 which 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
 - Drop arm
 - 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.

Procedure 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)
- 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, mechanical steering columns 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.

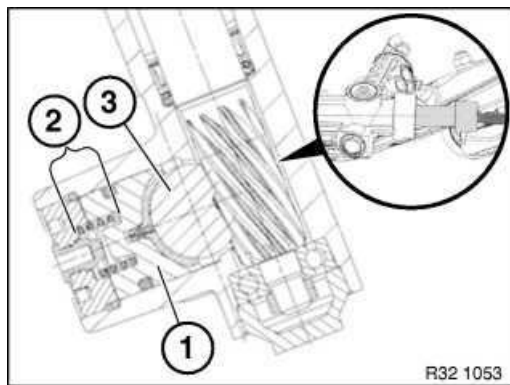
For corresponding specimen of the memorandum, [refer to Service Information 320188\(828\) Appendix 1](#)

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!

32 11 ... Notes on checking steering backlash on vehicles with rack-and-pinion steering



Note:

The evaluation "steering backlash" is made usually when the front axle is raised, where the track rod is angled.

The force introduced via the track rod is divided into a horizontal force and a vertical force relieving the thrust member (1) against the spring (2).

The steering box is depressurised on account of no hydraulic assistance due to engine standstill and is thus not preloaded!

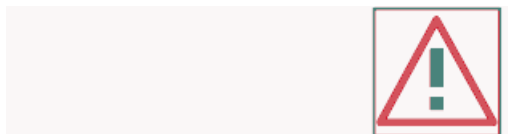
The play created in this way is incorrectly referred to as steering backlash.

3 = Rack



Solution:

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



Desired state:

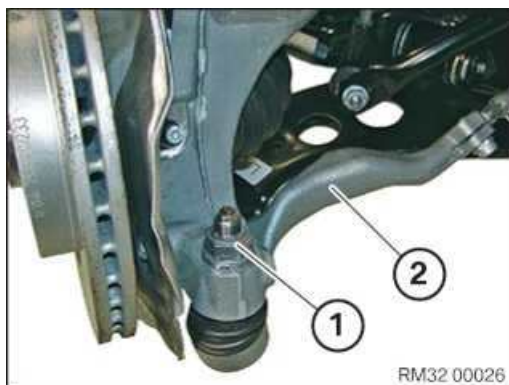
The steering must be backlash-free in all components!

**Important!**

The steering box must be replaced if the polished surface of the rack is damaged (e.g. corrosion)!

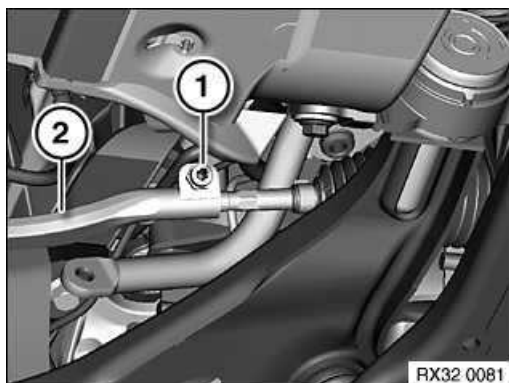
**Necessary preliminary tasks:**

- Remove [front wheel](#).
- Remove [front underbody protection](#).

**Removal:**

Slacken nut (1).

Release track rod (2) from swivel bearing.

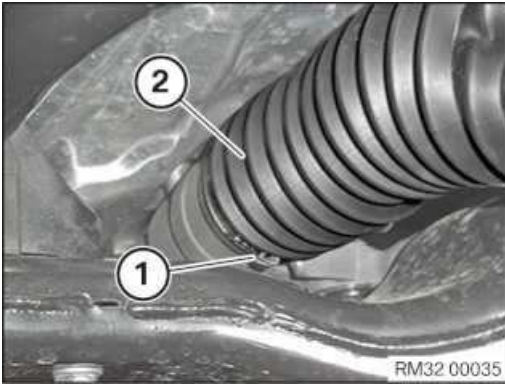


Mark thread depth of track rod end to simplify subsequent adjustment of front axle.

Release screw (1).

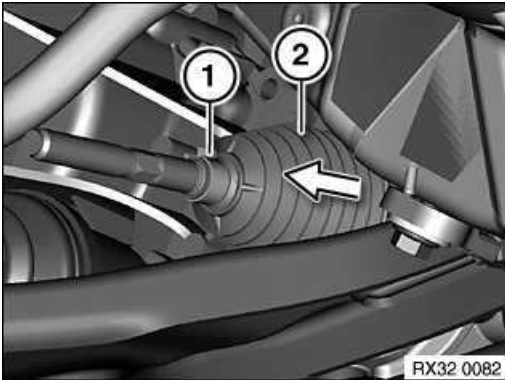
Unscrew track rod end (2).

- Counterhold track rod with open-end spanner if necessary.

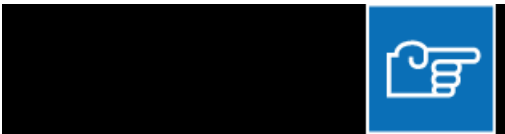


Clean track rod.

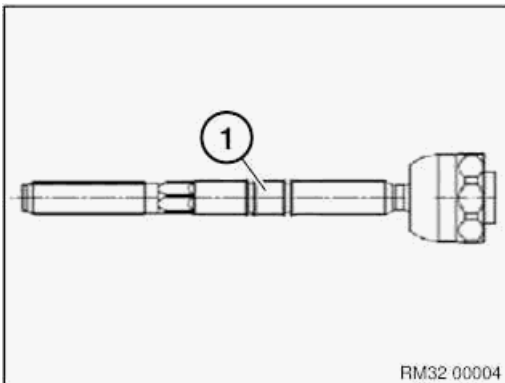
Release [ear clip](#) (1).



Release band clamp (1) and detach gaiter (2) from track rod.



Installation:



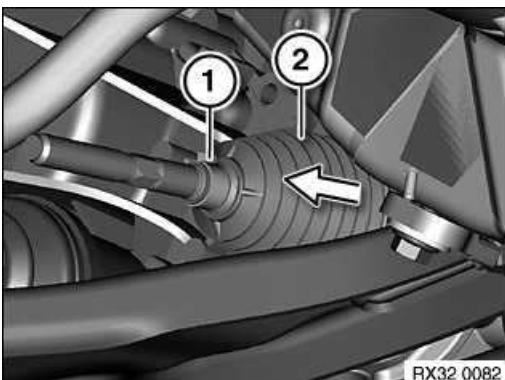
Clean track rod and apply grease to taper.

Grease track rod where gaiter (1) is fitted with grease "Renolit JP 1619, part number 6 778 561".

- This ensures that the gaiter is not rotated when the track rod is rotated.

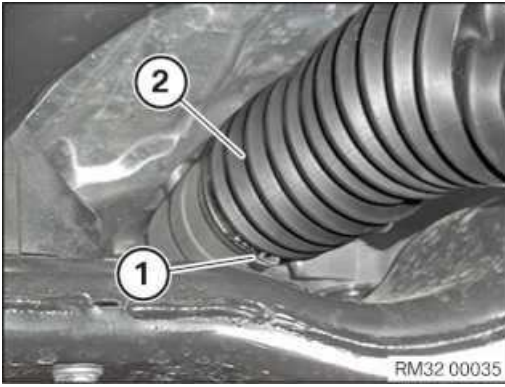
Clean the rack of the steering gear and check surface for damage (e.g. by corrosion).

Grease rack (refer to [Service Operating Fluids](#)).



Position the gaiter (2) on the track rod.

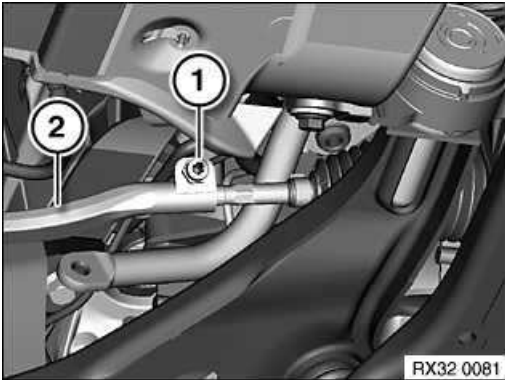
Mount band clamp (1).



Position the gaiter (2) on the steering gear.

Part: Release ear clip (1).

Mount [ear clamp](#) (1).

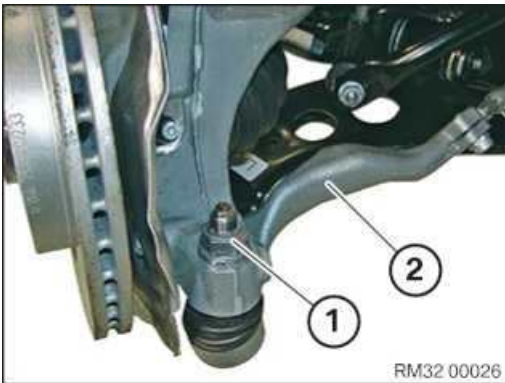


Screw the track rod end (2) onto the track rod up to the mark.

- Counterhold track rod with open-end spanner if necessary.

Tighten screw (1).

Tightening torque [32 21 2AZ](#).



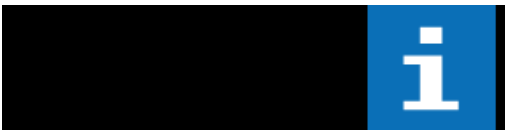
Keep track rod end to swivel bearing connection clean and free from oil and grease.

Insert track rod (2) into swivel bearing.

Part: Replace nut (1).

Tighten nut (1).

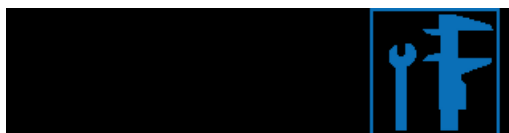
Tightening torque [32 21 1AZ](#).



Required follow-up work:

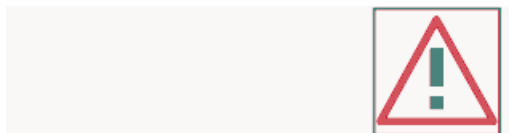
- Install [front wheel](#).
- Install [front underbody protection](#).
- Carry out [wheel alignment procedure](#).

32 21 231 Replacing left or right tie rod



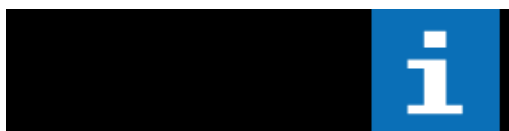
Special tools required:

- [2 287 009](#)



Important!

The steering box must be replaced if the polished surface of the rack is damaged (e.g. by corrosion)!

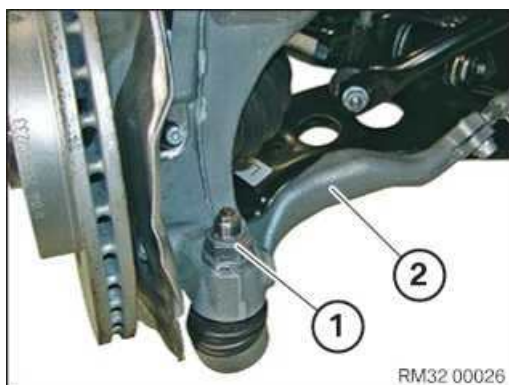


Necessary preliminary tasks:

- Remove [wishbone](#).

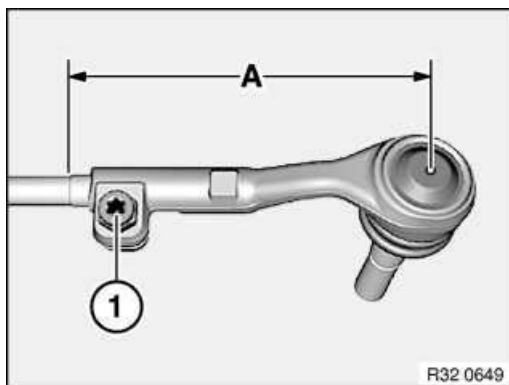


Removal:



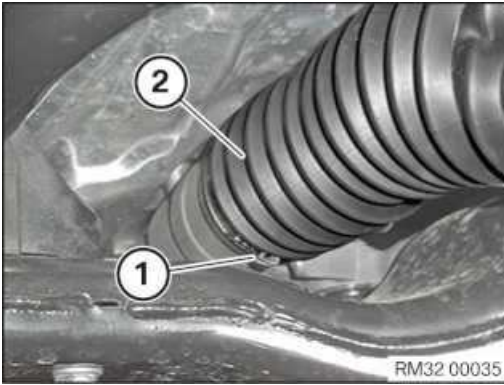
Slacken nut (1).

Release track rod (2) from swivel bearing.



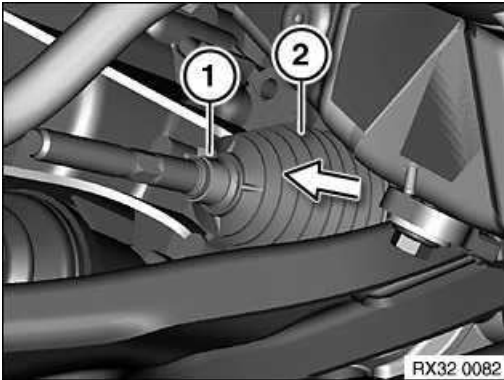
- Determine dimension (A) to simplify following adjustment of front axle

Slacken clamping bolt (1) and screw off track rod end.



Release [ear clip](#) (1).

Pull off the gaiter (2) from the steering gear.



Clean track rod.

Release band clamp (1).

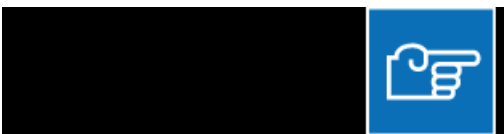
Detach gaiter (2) from track rod.



Important!

To avoid damage to the rack and to the suspension mounting, move out the rack only as far as necessary!

Release the track rod (axial joint) from the rack of the steering gear by means of special tool [2 287 009](#).



Installation:

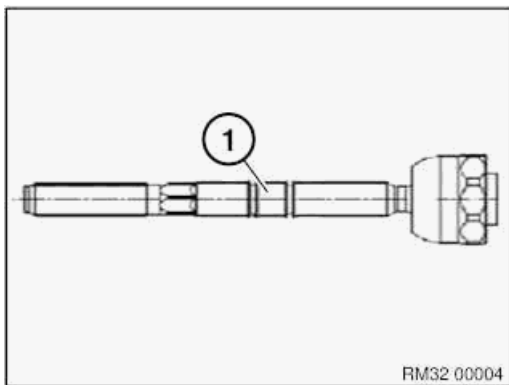


Unscrew the track rod end from the new track rod.

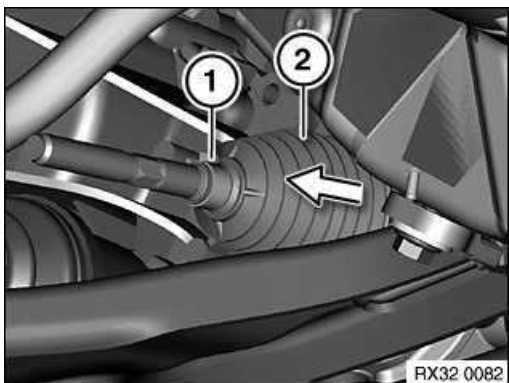
Screw on the track rod (axial joint) on the rack.

Tighten the track rod (axial joint) by means of special tool [2 287 009](#).

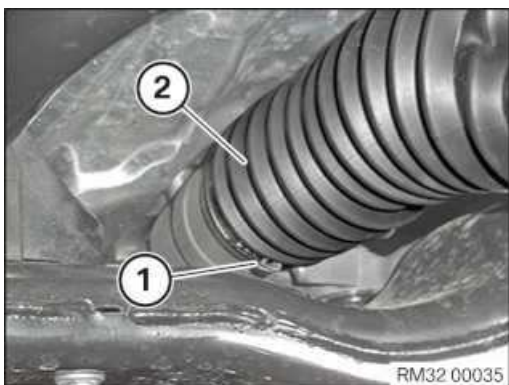
Tightening torque [32 21 3AZ](#).



Grease track rod at the fit of the gaiter (1) with grease "FB-1 part number 2 208 093".



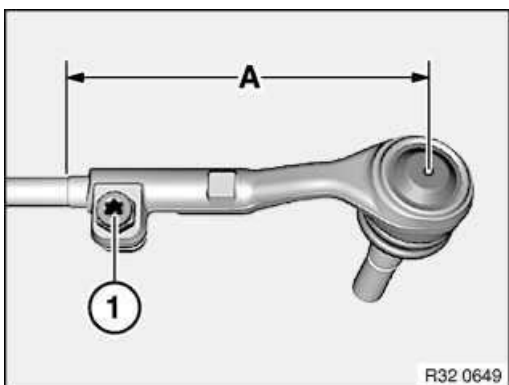
Position the gaiter (2) on the track rod.
Secure band clamp (1).



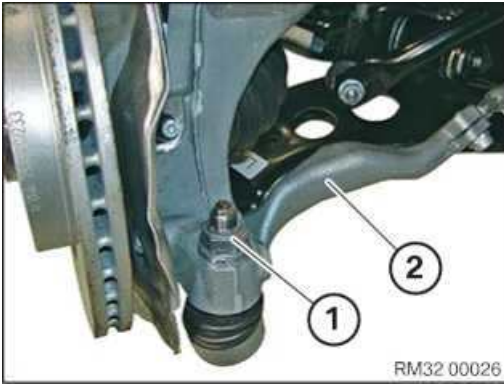
Mount the gaiter (2) to the steering gear.

Part: Renew the ear clamp (1).

Secure the [ear clamp](#) (1).



Screw on track rod end on the track rod until the dimension (A) is reached.

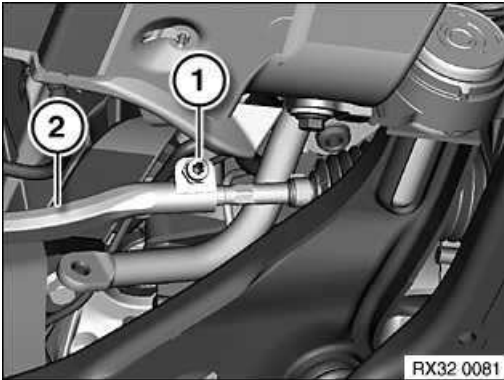


Insert track rod (2) into the swivel bearing.

Part: Replace nut (1).

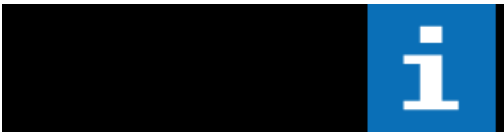
Tighten nut (1).

Tightening torque [32 21 1AZ](#).



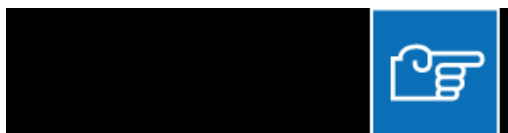
Tighten clamping bolt (1).

Tightening torque [32 21 2AZ](#).

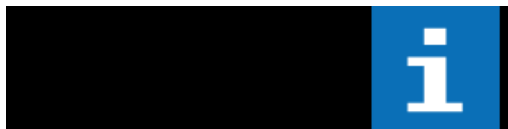


Required follow-up work:

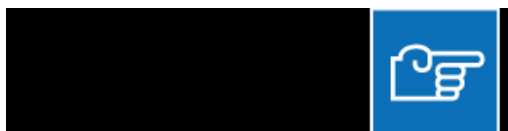
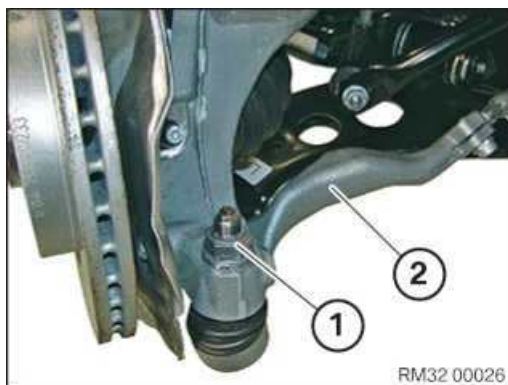
- Install [wishbone](#).
- Carry out [wheel alignment procedure](#).

**Note:**

If the track rod end to track rod screw connection is released, it is necessary after reinstallation to carry out a chassis / wheel alignment check.

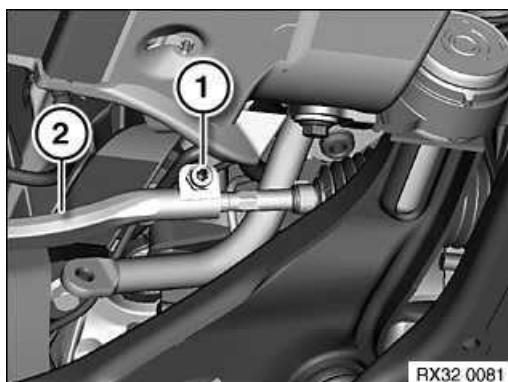
**Necessary preliminary tasks:**

- Remove [front wheel](#).

**Removal:**

Slacken nut (1).

Release track rod (2) from swivel bearing.



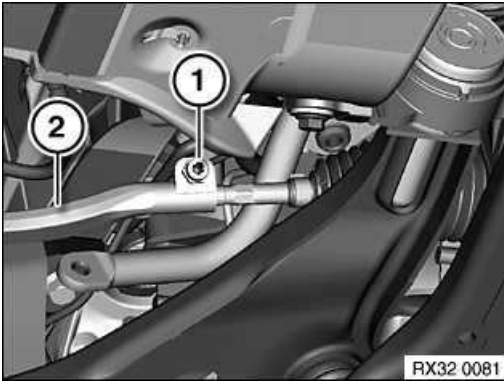
Mark thread depth of track rod end to simplify subsequent adjustment of front axle.

Release screw (1).

Unscrew track rod end (2).

- Counterhold track rod with open-end spanner if necessary.

**Installation:**



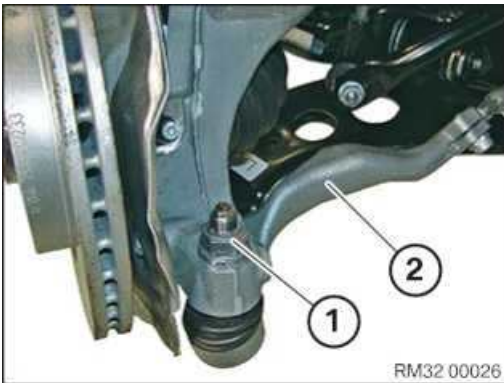
Check [gaiter](#) for damage and replace if necessary.

Screw track rod end onto tie rod up to marking.

- Counterhold track rod with open-end spanner if necessary.

Tighten screw (1).

Tightening torque [32 21 2AZ](#).



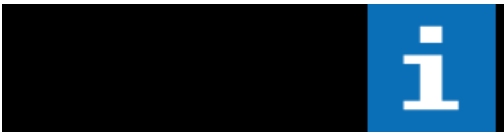
Keep track rod end to swivel bearing connection clean and free from oil and grease.

Insert track rod (2) into swivel bearing.

Part: Replace nut (1).

Tighten nut (1).

Tightening torque [32 21 1AZ](#).



Required follow-up work:

- Install [front wheel](#).
- Carry out [wheel alignment procedure](#).

32 00 ... Notes and specifications for the replacement of the steering gear, steering column and the 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 which 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
 - Drop arm
 - 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.

Procedure 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)
- 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, mechanical steering columns 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!

**Attention!**Steering box:

Check connection of steering box for corrosion, clean contacts if necessary. [Steering gear must be replaced](#) if the corrosion is too far advanced.

Connecting line:

In the event of moisture/corrosion inside the two plug connections, check the insulation of the connecting line. If the insulation reveals any noticeable/striking features, partial replacement will be necessary. Otherwise it will be sufficient to replace the contacts or connector housing.

**Attention!**

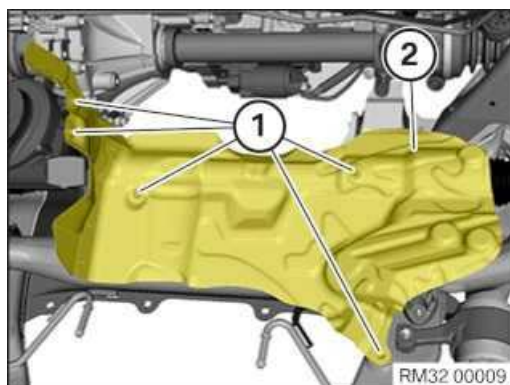
The torsion bar of the steering gear must not under any circumstances strike other components!

Collision with other components may result in damage to the steering box!

Do not turn the steering wheel once the steering shaft has been detached from the steering box/steering column! If the lower section of the steering shaft is separated from the steering gear/steering column, the steering column switch cluster may be damaged when the steering wheel is turned!

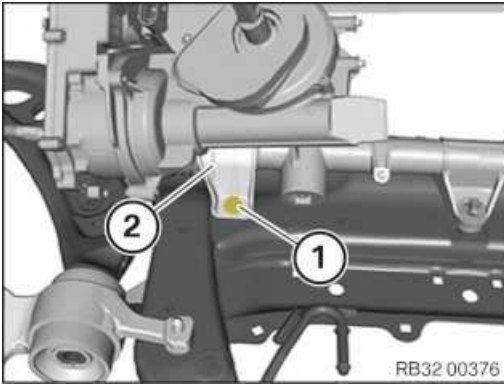
**Necessary preliminary work:**

- Remove [front axle](#) complete.

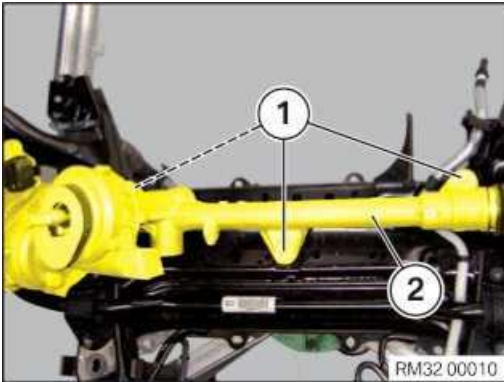
**Removal:**

Loosen screws (1).

Remove heat shield (2).



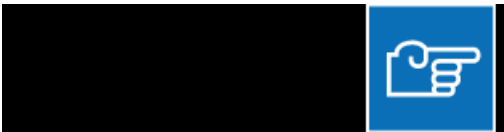
If installed: Undo screw (1) of retaining clamp (2).



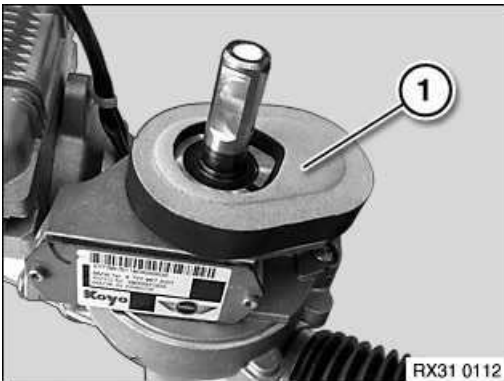
Release screws (1).

If installed: Remove retaining clamp.

Remove steering gear (2).



Installation:



Attention!

Bulkhead seal (1) of electromechanical steering gear (EPS) must always be replaced!

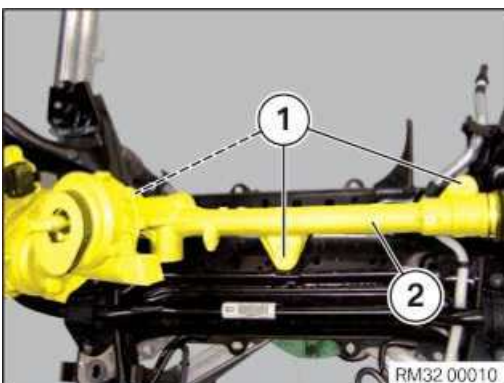
Remove gasket (1).

Clean surface on steering gear.

Renew the bulkhead seal (1).

Parts: Gasket

Stick on new gasket (1).



Align steering gear (2).

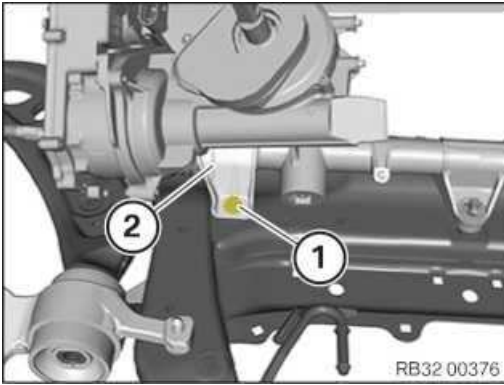
If installed: Position retaining clamp.

Renew screws (1).

Parts: Bolts

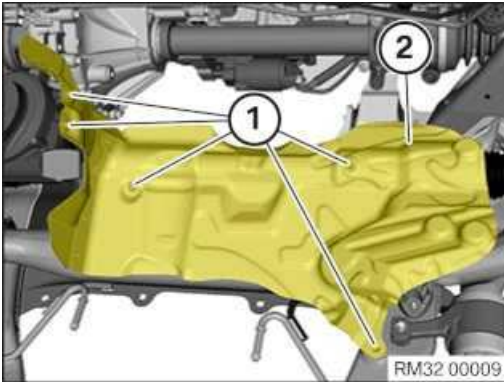
Tighten down screws (1).

Tightening torque [32 00 1AZ](#).



If installed: Tighten screw (1) of retaining clamp.

Tightening torque [32 00 3AZ](#)

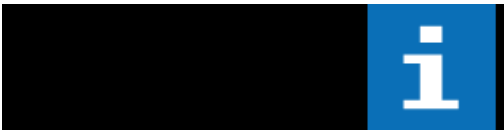


Position heat shield (2).

Renew screws (1).

Parts: Bolts

Tightening torque [32 00 2AZ](#).



Required follow-up work:

- Install [front axle](#).
- Turn steering wheel in both directions to the limit position. The airbag indicator light must not light up in the process.
- Carry out [wheel alignment procedure](#).

**Attention!**Connecting line:

In the event of moisture/corrosion inside the plug connections, check the insulation of the connecting line. If the insulation reveals any noticeable/striking features, partial replacement will be necessary. Otherwise it will be sufficient to replace the contacts or connector housing.

*Note:*

In a warranty case you must always provide a fault memory printout, even where there is no fault entry, with the defective part.

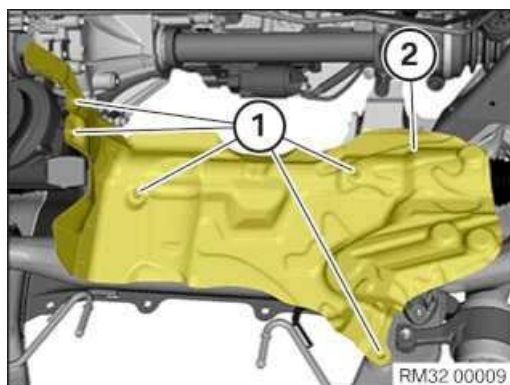
**Attention!**

The torsion bar of the steering gear must not under any circumstances strike other components!

Collision with other components may result in damage to the steering box!

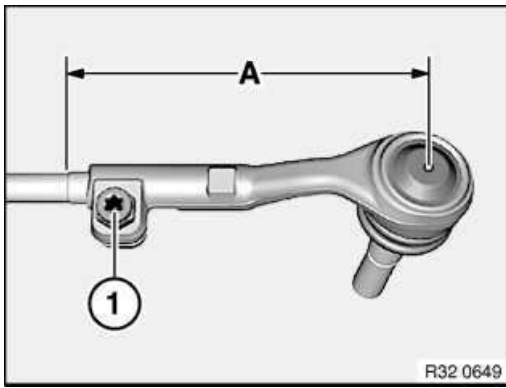
**Necessary preliminary work:**

- Remove [front axle](#) complete.

**Removal:**

Loosen screws (1).

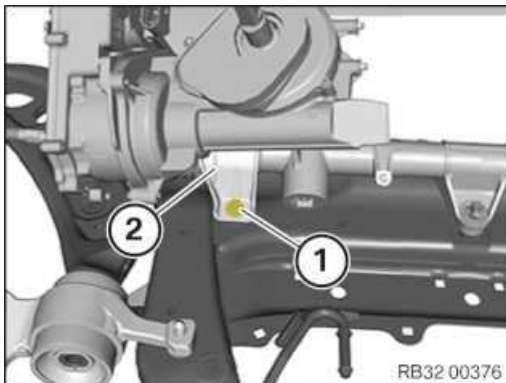
Remove heat shield (2).



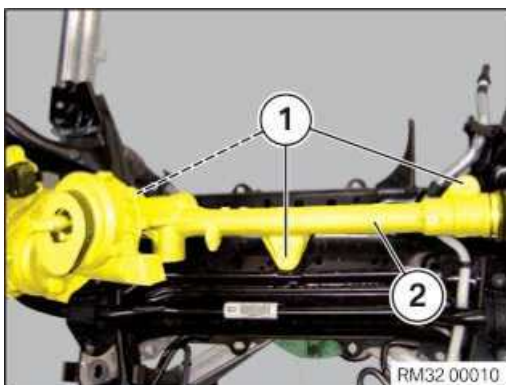
Determine dimension (A) to simplify following adjustment of front axle.

Slacken bolt (1).

Screw off track rod end; if necessary, grip track rod with open-end spanner.

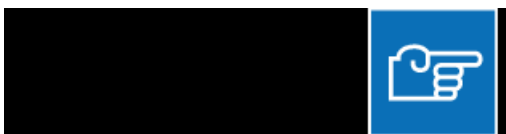


If installed: Undo screw (1) of retaining clamp (2).

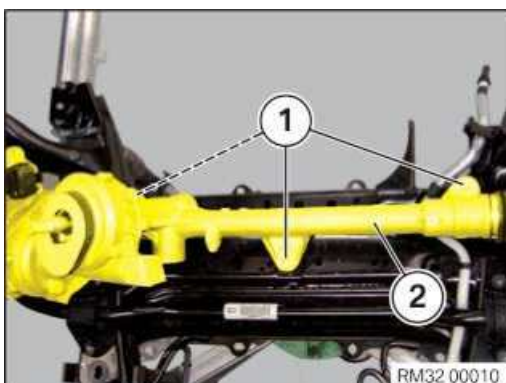


Release screws (1).

Remove steering gear (2).



Installation:



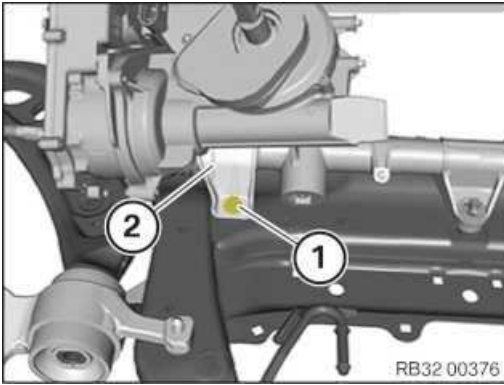
Position the steering gear (2).

Renew screws (1).

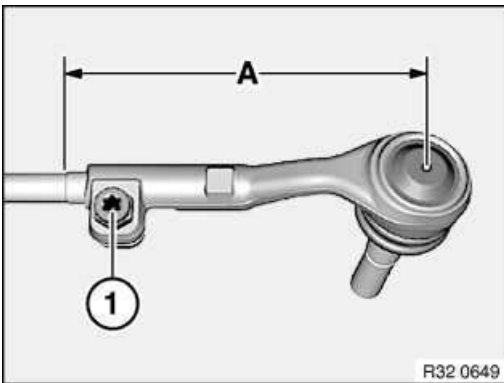
Parts: Bolts

Tighten down screws (1).

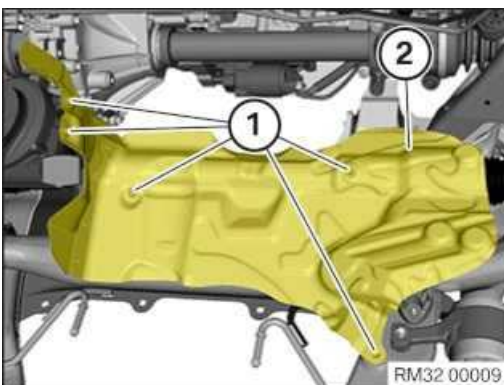
Tightening torque [32 00 1AZ](#).



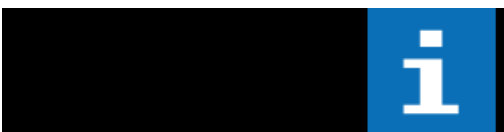
If installed: Tighten screw (1) of retaining clamp.
Tightening torque [32 00 3AZ](#)



Screw track rod end onto track rod to dimension (A).
Tighten screw (1).
Tightening torque [32 21 2AZ](#)



Position heat shield (2).
Renew screws (1).
Parts: Bolts
Tighten down screws (1).
Tightening torque [32 00 2AZ](#).



Required follow-up work:

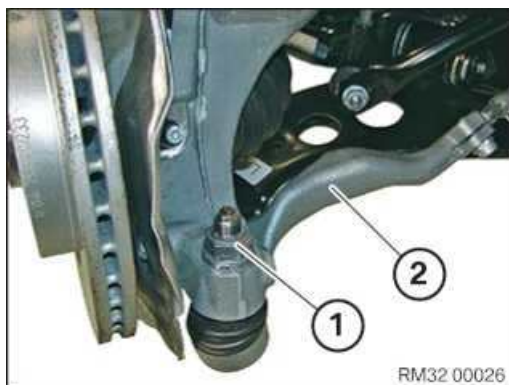
- Install [front axle](#).
- Carry out [programming/encoding](#).
- Teach in [end stop software](#).
- Carry out [wheel alignment procedure](#).

**Important!**

The steering box must be replaced if the polished surface of the rack is damaged (e.g. corrosion)!

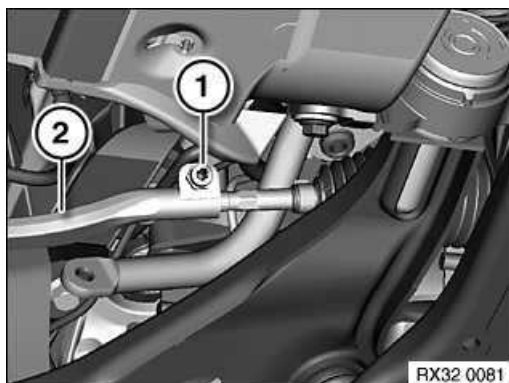
**Necessary preliminary tasks:**

- Remove [front wheel](#).
- Remove [front underbody protection](#).

**Removal:**

Slacken nut (1).

Release track rod (2) from swivel bearing.

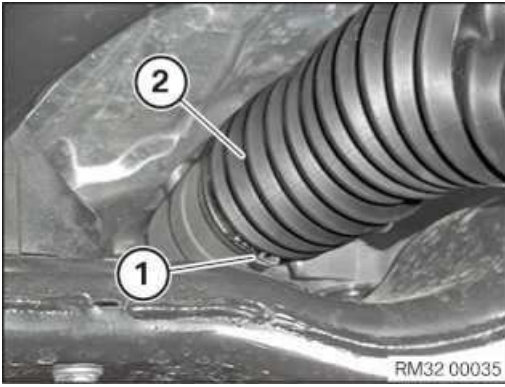


Mark thread depth of track rod end to simplify subsequent adjustment of front axle.

Release screw (1).

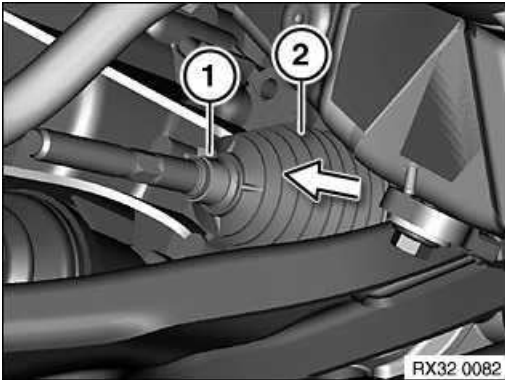
Unscrew track rod end (2).

- Counterhold track rod with open-end spanner if necessary.

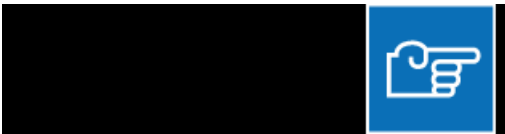


Clean track rod.

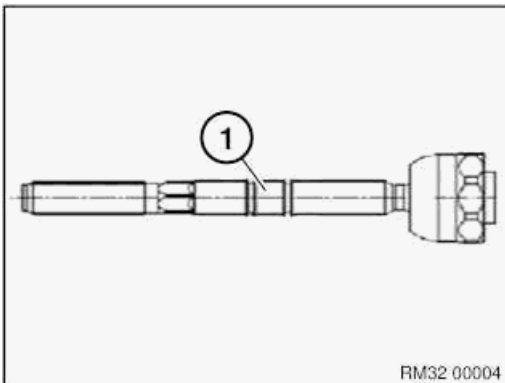
Release [ear clip](#) (1).



Release band clamp (1) and detach gaiter (2) from track rod.



Installation:



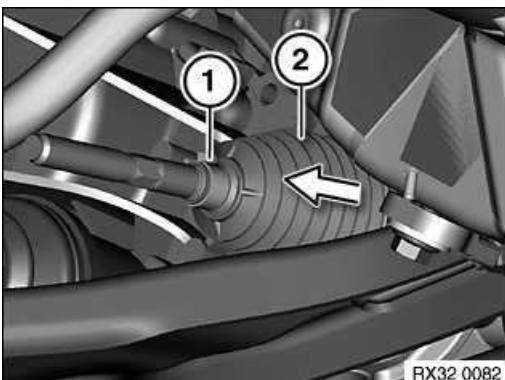
Clean track rod and apply grease to taper.

Grease track rod where gaiter (1) is fitted with grease "Renolit JP 1619, part number 6 778 561".

- This ensures that the gaiter is not rotated when the track rod is rotated.

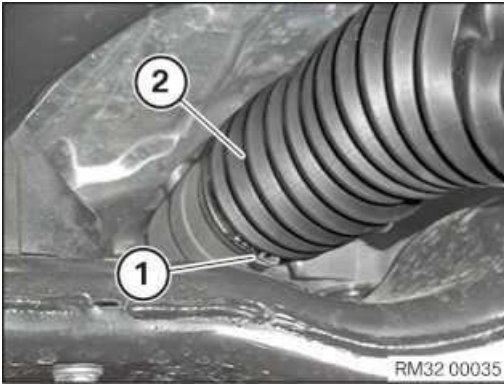
Clean the rack of the steering gear and check surface for damage (e.g. by corrosion).

Grease rack (refer to [Service Operating Fluids](#)).



Position the gaiter (2) on the track rod.

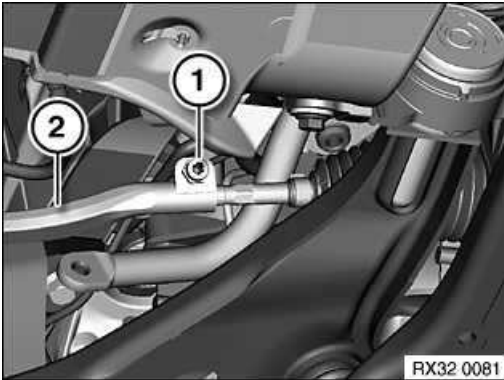
Mount band clamp (1).



Position the gaiter (2) on the steering gear.

Part: Release ear clip (1).

Mount [ear clamp](#) (1).

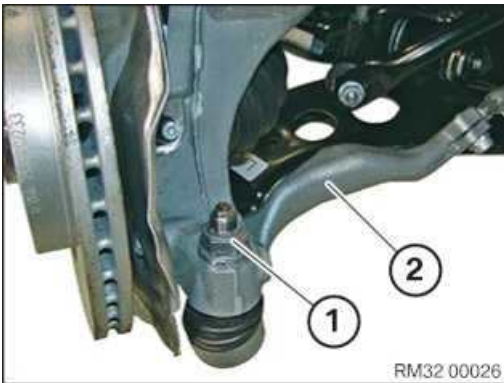


Screw the track rod end (2) onto the track rod up to the mark.

- Counterhold track rod with open-end spanner if necessary.

Tighten screw (1).

Tightening torque [32 21 2AZ](#).



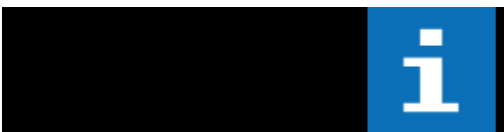
Keep track rod end to swivel bearing connection clean and free from oil and grease.

Insert track rod (2) into swivel bearing.

Part: Replace nut (1).

Tighten nut (1).

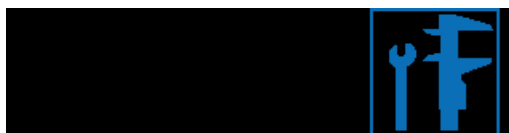
Tightening torque [32 21 1AZ](#).



Required follow-up work:

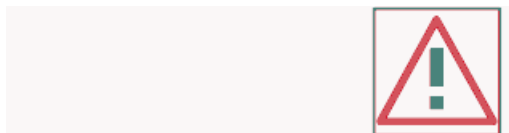
- Install [front wheel](#).
- Install [front underbody protection](#).
- Carry out [wheel alignment procedure](#).

32 21 231 Replacing left or right tie rod



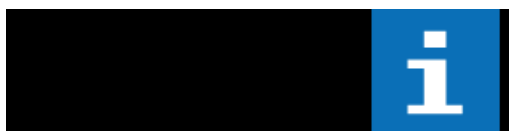
Special tools required:

- [2 287 009](#)



Important!

The steering box must be replaced if the polished surface of the rack is damaged (e.g. by corrosion)!

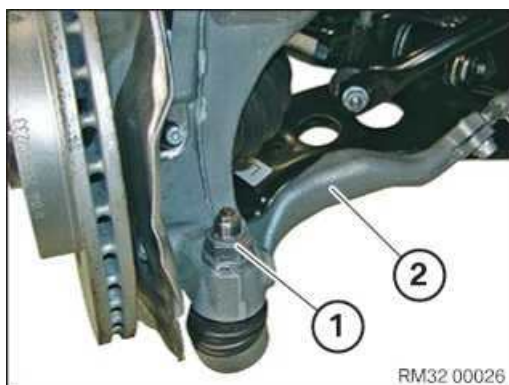


Necessary preliminary tasks:

- Remove [wishbone](#).

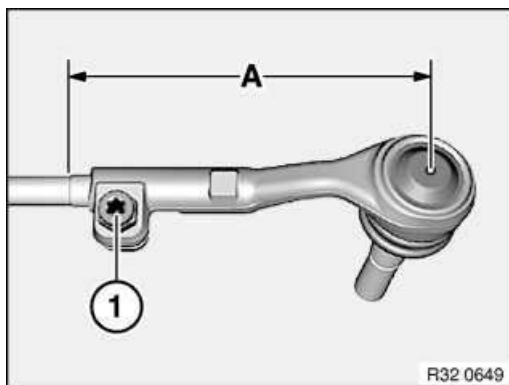


Removal:



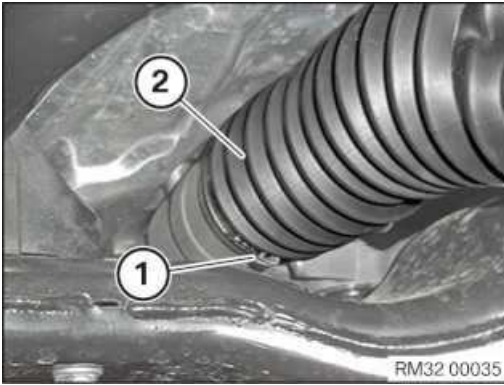
Slacken nut (1).

Release track rod (2) from swivel bearing.



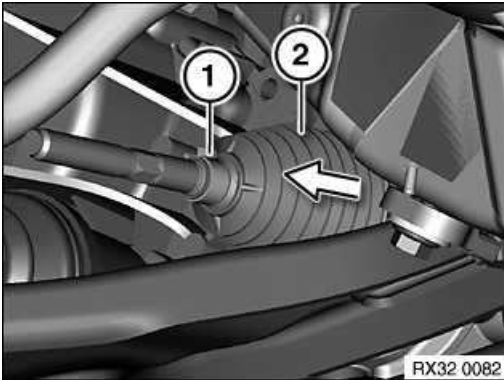
- Determine dimension (A) to simplify following adjustment of front axle

Slacken clamping bolt (1) and screw off track rod end.



Release [ear clip](#) (1).

Pull off the gaiter (2) from the steering gear.



Clean track rod.

Release band clamp (1).

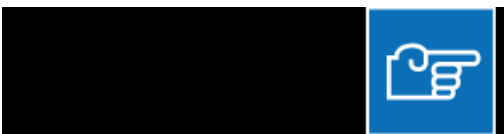
Detach gaiter (2) from track rod.



Important!

To avoid damage to the rack and to the suspension mounting, move out the rack only as far as necessary!

Release the track rod (axial joint) from the rack of the steering gear by means of special tool [2 287 009](#).



Installation:

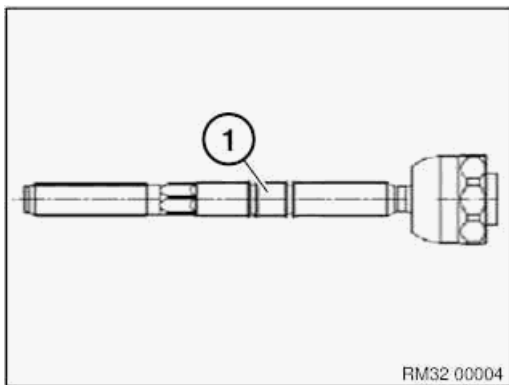


Unscrew the track rod end from the new track rod.

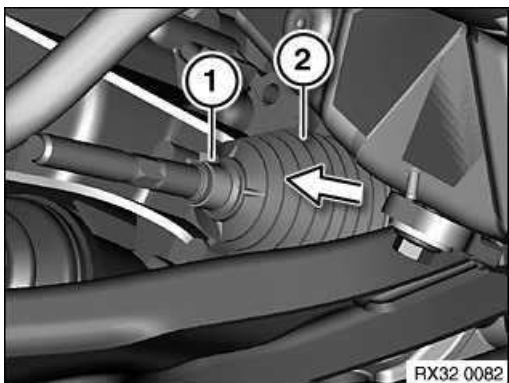
Screw on the track rod (axial joint) on the rack.

Tighten the track rod (axial joint) by means of special tool [2 287 009](#).

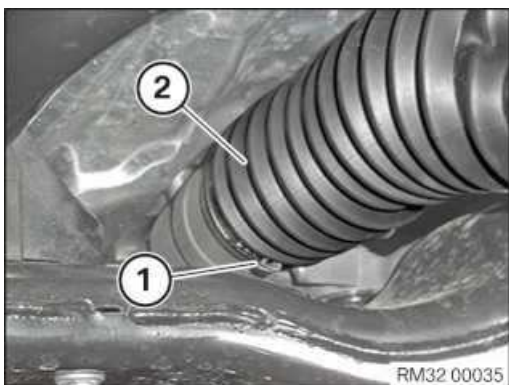
Tightening torque [32 21 3AZ](#).



Grease track rod at the fit of the gaiter (1) with grease "FB-1 part number 2 208 093".



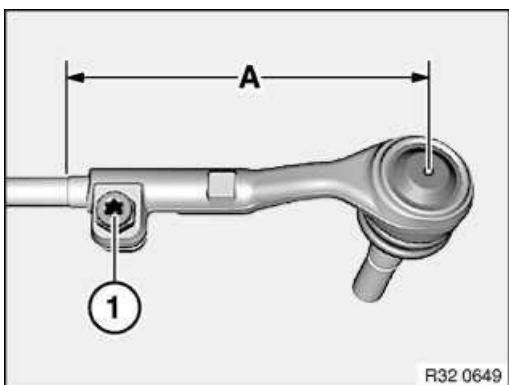
Position the gaiter (2) on the track rod.
Secure band clamp (1).



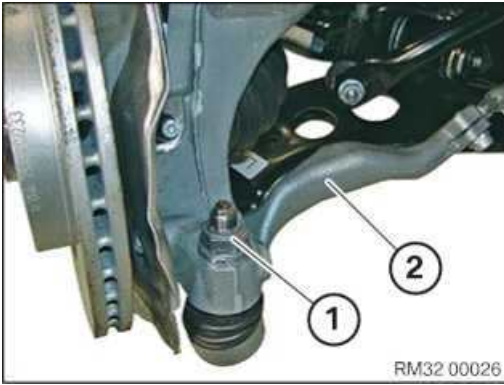
Mount the gaiter (2) to the steering gear.

Part: Renew the ear clamp (1).

Secure the [ear clamp](#) (1).



Screw on track rod end on the track rod until the dimension (A) is reached.

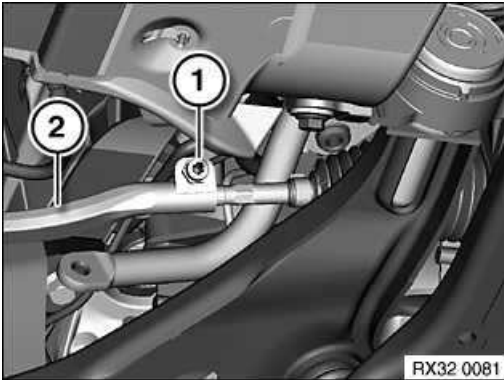


Insert track rod (2) into the swivel bearing.

Part: Replace nut (1).

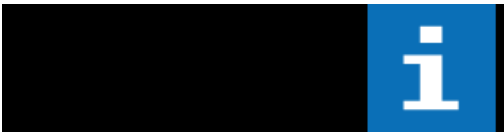
Tighten nut (1).

Tightening torque [32 21 1AZ](#).



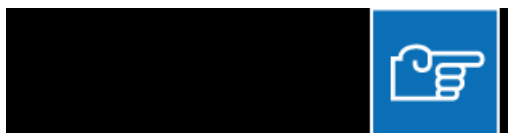
Tighten clamping bolt (1).

Tightening torque [32 21 2AZ](#).

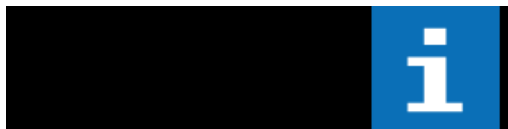


Required follow-up work:

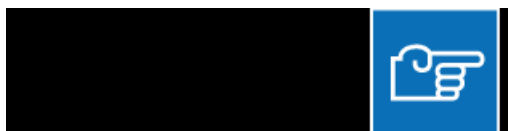
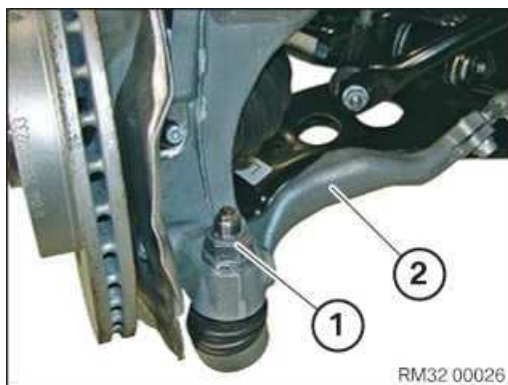
- Install [wishbone](#).
- Carry out [wheel alignment procedure](#).

**Note:**

If the track rod end to track rod screw connection is released, it is necessary after reinstallation to carry out a chassis / wheel alignment check.

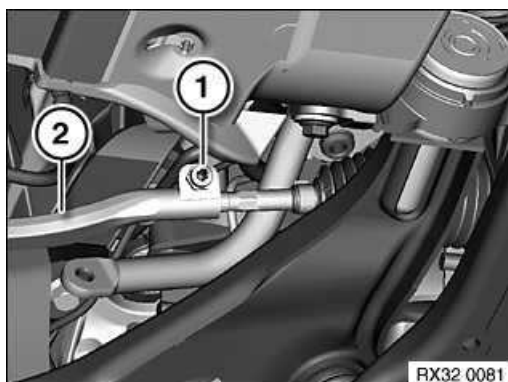
**Necessary preliminary tasks:**

- Remove [front wheel](#).

**Removal:**

Slacken nut (1).

Release track rod (2) from swivel bearing.



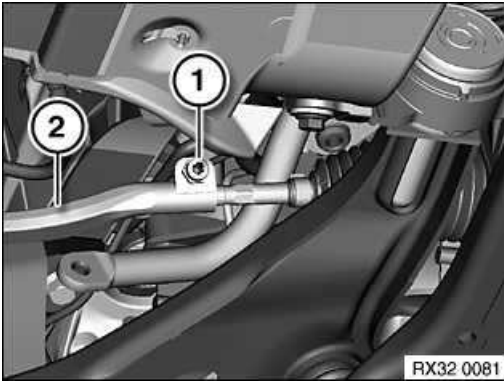
Mark thread depth of track rod end to simplify subsequent adjustment of front axle.

Release screw (1).

Unscrew track rod end (2).

- Counterhold track rod with open-end spanner if necessary.

**Installation:**



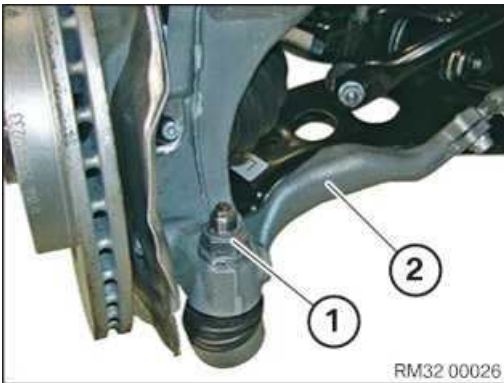
Check [gaiter](#) for damage and replace if necessary.

Screw track rod end onto tie rod up to marking.

- Counterhold track rod with open-end spanner if necessary.

Tighten screw (1).

Tightening torque [32 21 2AZ](#).



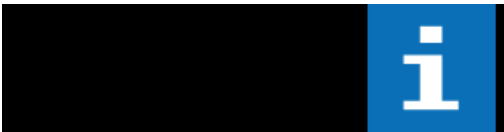
Keep track rod end to swivel bearing connection clean and free from oil and grease.

Insert track rod (2) into swivel bearing.

Part: Replace nut (1).

Tighten nut (1).

Tightening torque [32 21 1AZ](#).



Required follow-up work:

- Install [front wheel](#).
- Carry out [wheel alignment procedure](#).

*Note:*

The end stop software must be taught in:

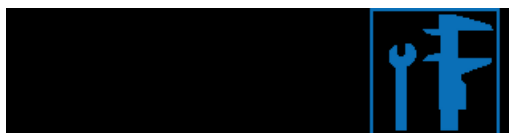
- after the steering gear is replaced
- after programming/coding



Connect vehicle to BMW diagnosis system.

Select and perform end stop under Service functions.

32 41 ... Instructions for removing and installing ear clips



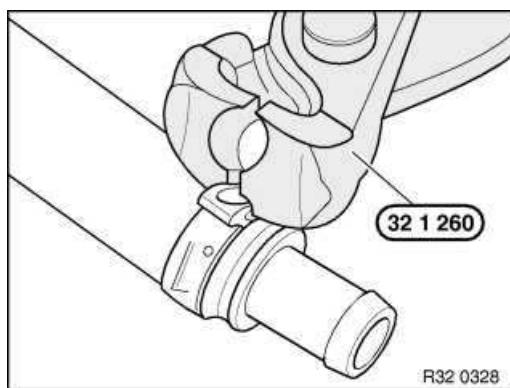
Special tools required:

- [32 1 260](#)

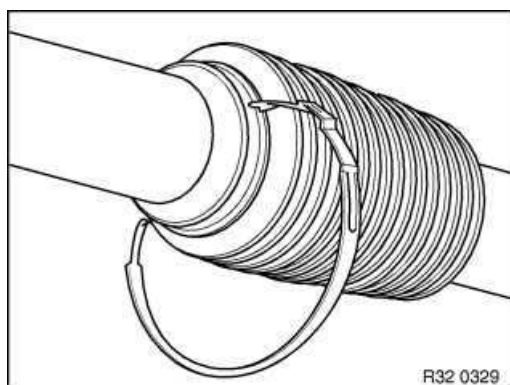
Note:

The work steps are show on assorted components.

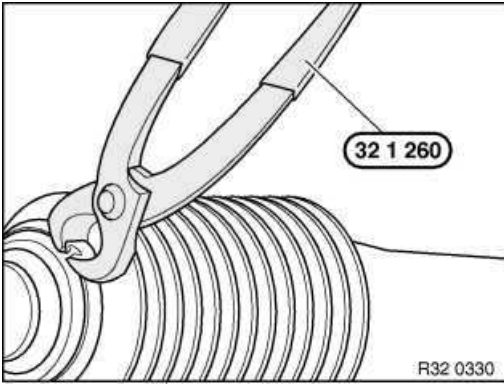
Ear clip must always be replaced.



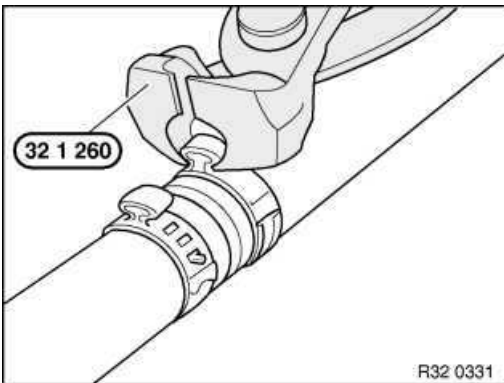
To remove an ear clip, place special tool [32 1 260](#) at right angles to ear and cut ear open.



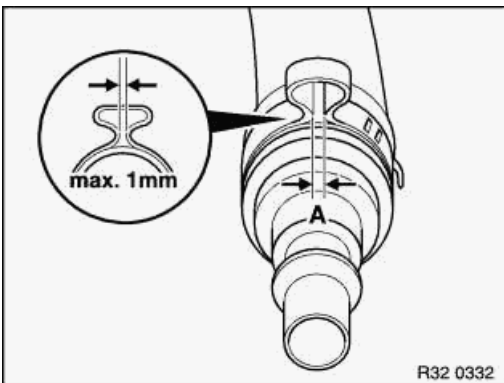
The ear clip can be fitted not only axially but also radially after the hook fastener has been opened.



Attach hook fastener and press ear together with special tool [32 1 260](#) .



The diagonal cutting pliers of special tool [32 1 260](#) can be used in areas which are difficult to access.



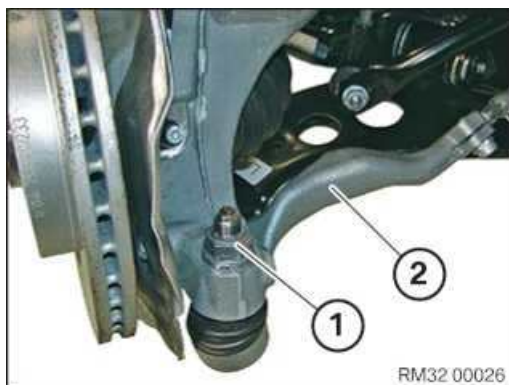
Important!
Gap (A) max. 1 mm!

**Important!**

The steering box must be replaced if the polished surface of the rack is damaged (e.g. corrosion)!

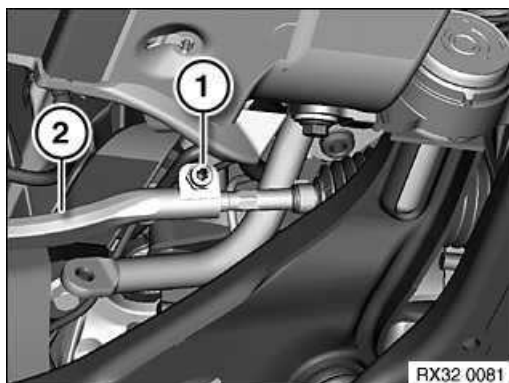
**Necessary preliminary tasks:**

- Remove [front wheel](#).
- Remove [front underbody protection](#).

**Removal:**

Slacken nut (1).

Release track rod (2) from swivel bearing.

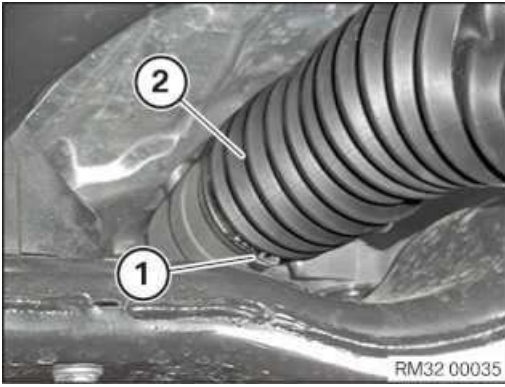


Mark thread depth of track rod end to simplify subsequent adjustment of front axle.

Release screw (1).

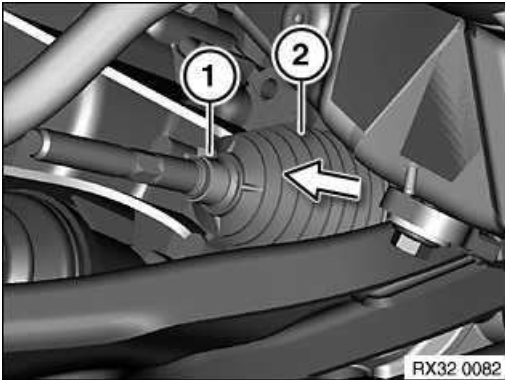
Unscrew track rod end (2).

- Counterhold track rod with open-end spanner if necessary.

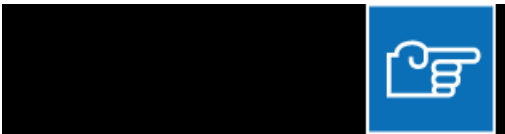


Clean track rod.

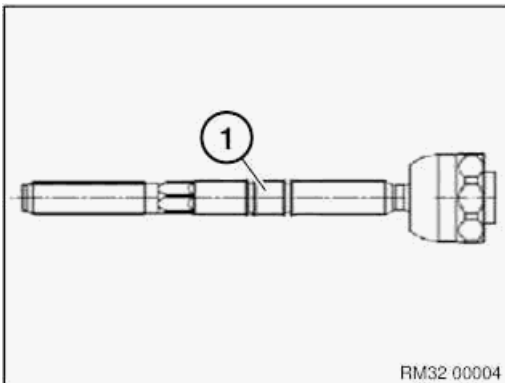
Release [ear clip](#) (1).



Release band clamp (1) and detach gaiter (2) from track rod.



Installation:



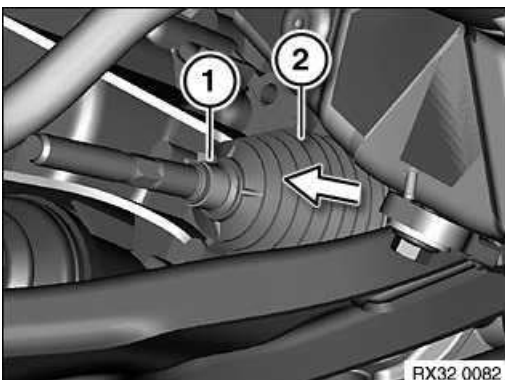
Clean track rod and apply grease to taper.

Grease track rod where gaiter (1) is fitted with grease "Renolit JP 1619, part number 6 778 561".

- This ensures that the gaiter is not rotated when the track rod is rotated.

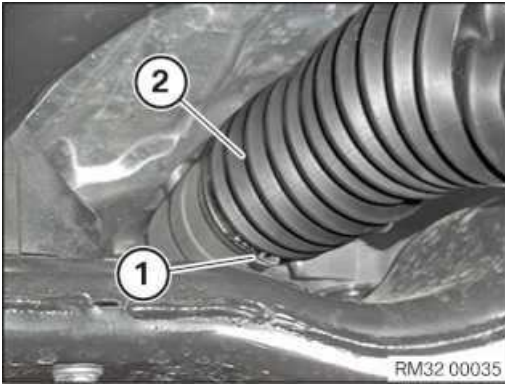
Clean the rack of the steering gear and check surface for damage (e.g. by corrosion).

Grease rack (refer to [Service Operating Fluids](#)).



Position the gaiter (2) on the track rod.

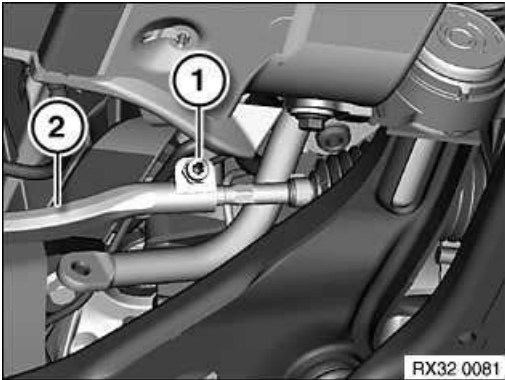
Mount band clamp (1).



Position the gaiter (2) on the steering gear.

Part: Release ear clip (1).

Mount [ear clamp](#) (1).

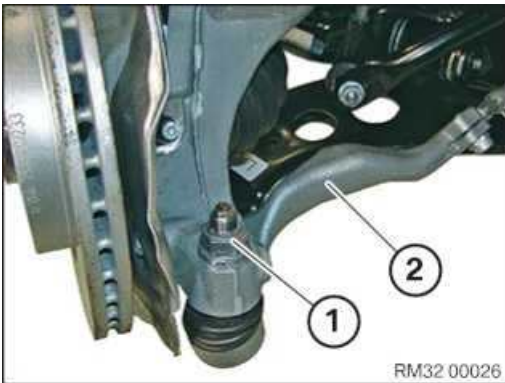


Screw the track rod end (2) onto the track rod up to the mark.

- Counterhold track rod with open-end spanner if necessary.

Tighten screw (1).

Tightening torque [32 21 2AZ](#).



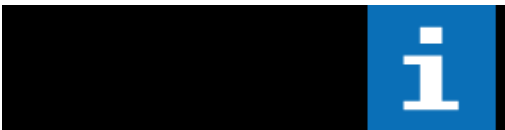
Keep track rod end to swivel bearing connection clean and free from oil and grease.

Insert track rod (2) into swivel bearing.

Part: Replace nut (1).

Tighten nut (1).

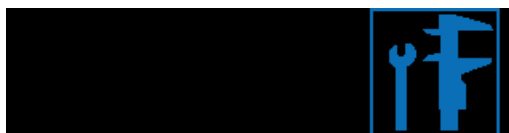
Tightening torque [32 21 1AZ](#).



Required follow-up work:

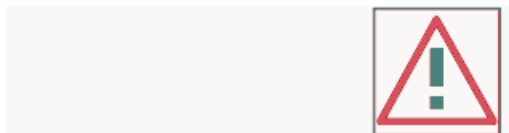
- Install [front wheel](#).
- Install [front underbody protection](#).
- Carry out [wheel alignment procedure](#).

32 21 231 Replacing left or right tie rod



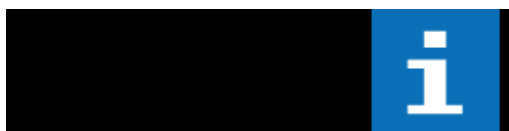
Special tools required:

- [2 287 009](#)



Important!

The steering box must be replaced if the polished surface of the rack is damaged (e.g. by corrosion)!

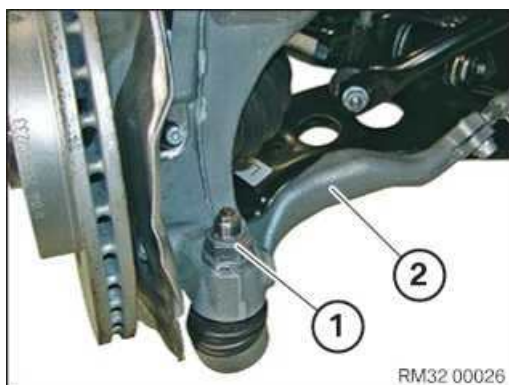


Necessary preliminary tasks:

- Remove [wishbone](#).

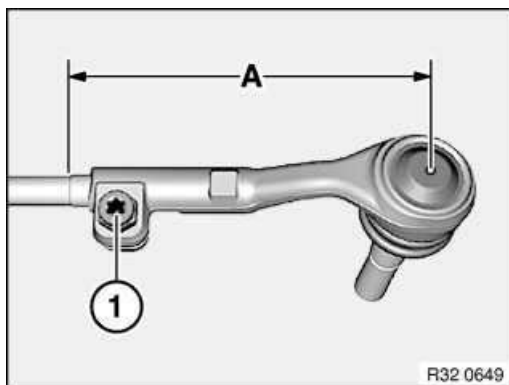


Removal:



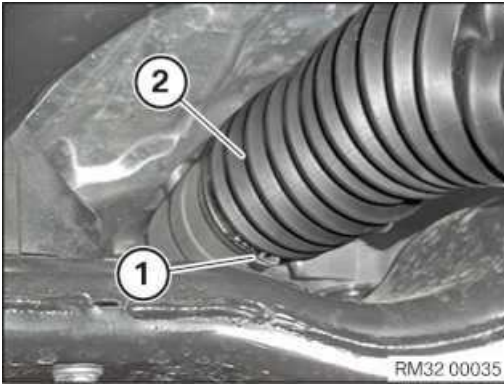
Slacken nut (1).

Release track rod (2) from swivel bearing.



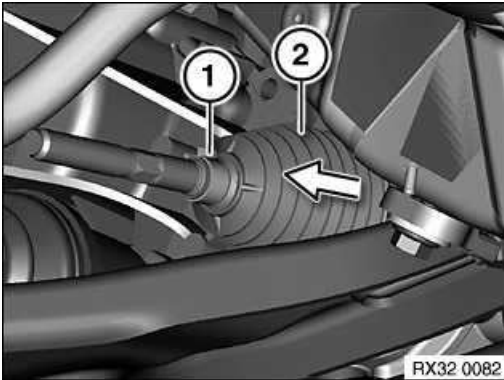
- Determine dimension (A) to simplify following adjustment of front axle

Slacken clamping bolt (1) and screw off track rod end.



Release [ear clip](#) (1).

Pull off the gaiter (2) from the steering gear.



Clean track rod.

Release band clamp (1).

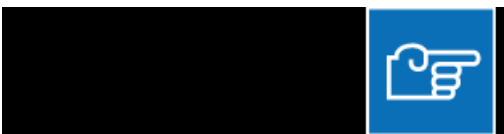
Detach gaiter (2) from track rod.



Important!

To avoid damage to the rack and to the suspension mounting, move out the rack only as far as necessary!

Release the track rod (axial joint) from the rack of the steering gear by means of special tool [2 287 009](#).



Installation:

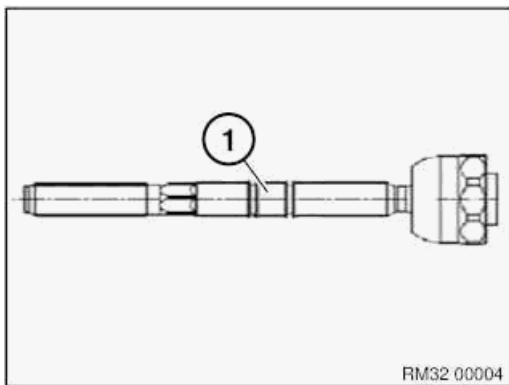


Unscrew the track rod end from the new track rod.

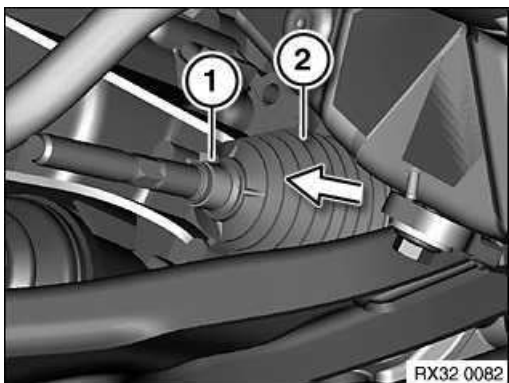
Screw on the track rod (axial joint) on the rack.

Tighten the track rod (axial joint) by means of special tool [2 287 009](#).

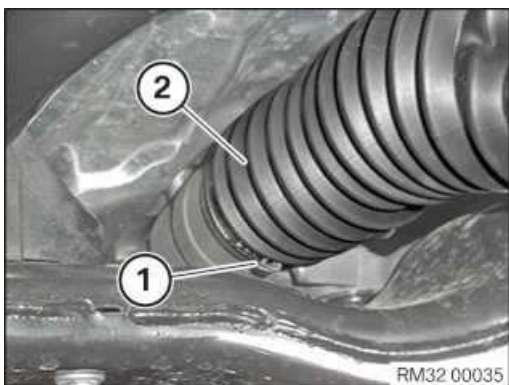
Tightening torque [32 21 3AZ](#).



Grease track rod at the fit of the gaiter (1) with grease "FB-1 part number 2 208 093".



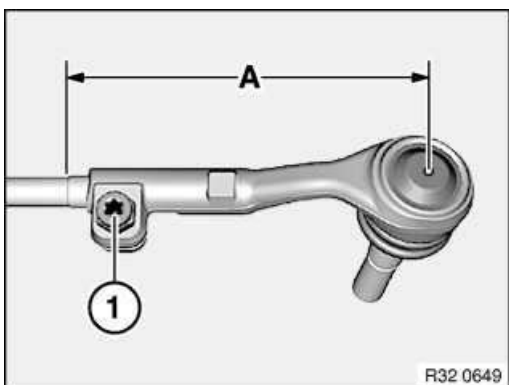
Position the gaiter (2) on the track rod.
Secure band clamp (1).



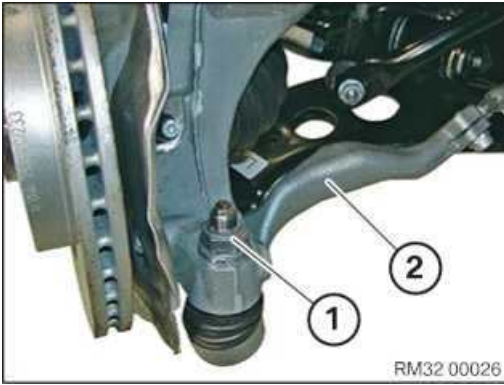
Mount the gaiter (2) to the steering gear.

Part: Renew the ear clamp (1).

Secure the [ear clamp](#) (1).



Screw on track rod end on the track rod until the dimension (A) is reached.

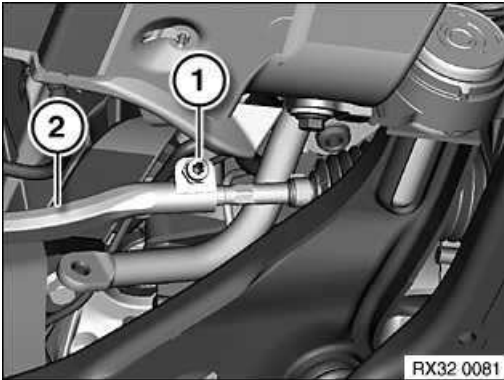


Insert track rod (2) into the swivel bearing.

Part: Replace nut (1).

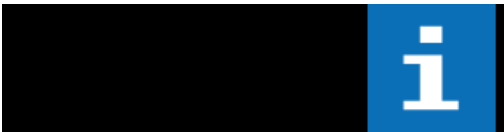
Tighten nut (1).

Tightening torque [32 21 1AZ](#).



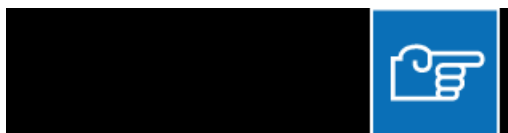
Tighten clamping bolt (1).

Tightening torque [32 21 2AZ](#).

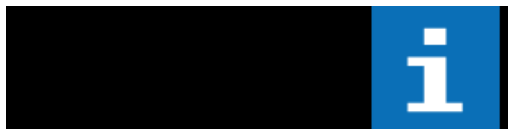


Required follow-up work:

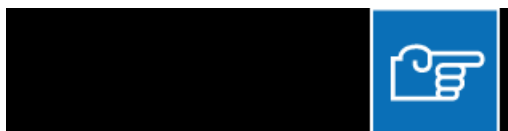
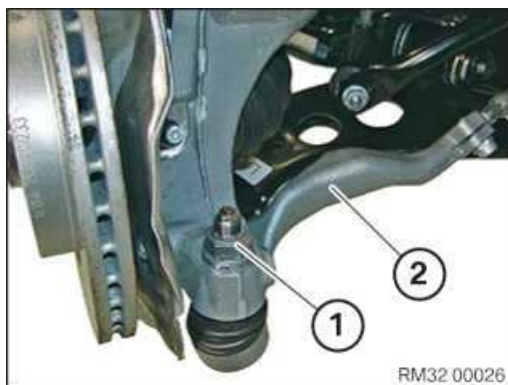
- Install [wishbone](#).
- Carry out [wheel alignment procedure](#).

**Note:**

If the track rod end to track rod screw connection is released, it is necessary after reinstallation to carry out a chassis / wheel alignment check.

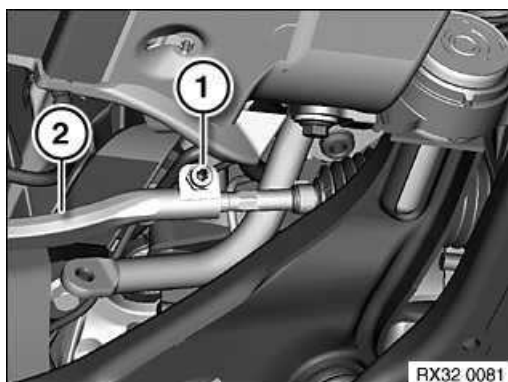
**Necessary preliminary tasks:**

- Remove [front wheel](#).

**Removal:**

Slacken nut (1).

Release track rod (2) from swivel bearing.



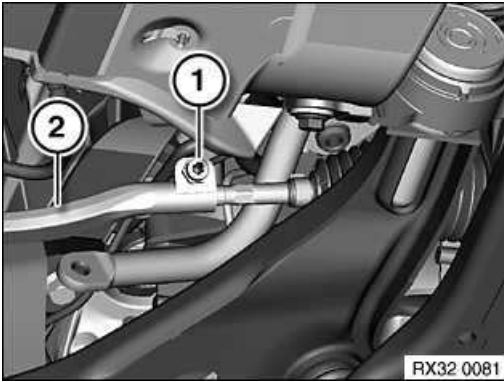
Mark thread depth of track rod end to simplify subsequent adjustment of front axle.

Release screw (1).

Unscrew track rod end (2).

- Counterhold track rod with open-end spanner if necessary.

**Installation:**



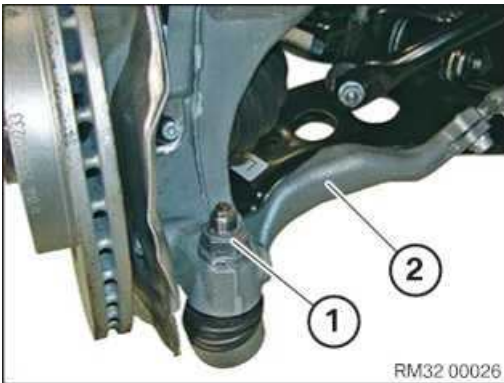
Check [gaiter](#) for damage and replace if necessary.

Screw track rod end onto tie rod up to marking.

- Counterhold track rod with open-end spanner if necessary.

Tighten screw (1).

Tightening torque [32 21 2AZ](#).



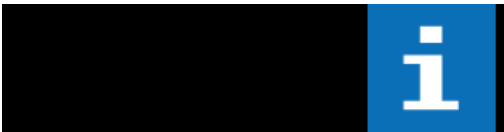
Keep track rod end to swivel bearing connection clean and free from oil and grease.

Insert track rod (2) into swivel bearing.

Part: Replace nut (1).

Tighten nut (1).

Tightening torque [32 21 1AZ](#).



Required follow-up work:

- Install [front wheel](#).
- Carry out [wheel alignment procedure](#).

32 31 020 Remove and install / replace the steering column shroud lower section \PREMIUM

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



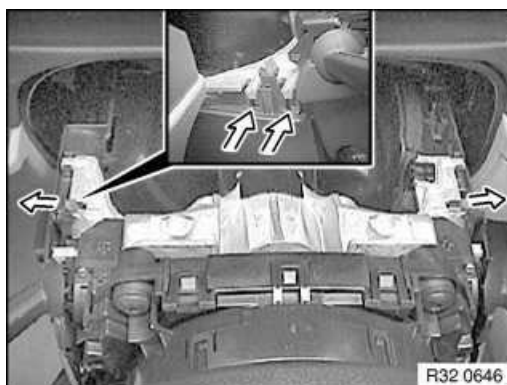
NOTICE

Perform the operations on the left and right side.

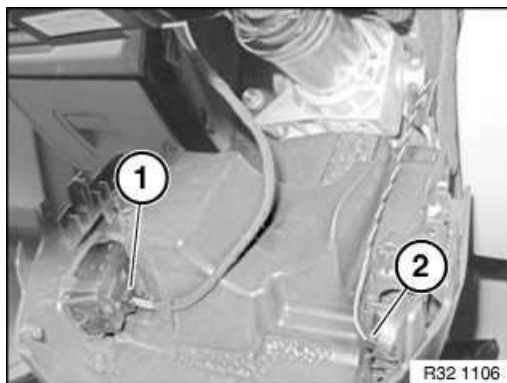
- Unclip the steering column shroud upper section (1) with the special tool **2 298 504** in area (2).
- Fold the steering column shroud upper section (1) up.
- Release the gap cover of the steering column (1) from the brackets (arrows) of the steering column shroud upper section.
- Remove steering column shroud upper section.



3 – Removing steering column shroud lower section

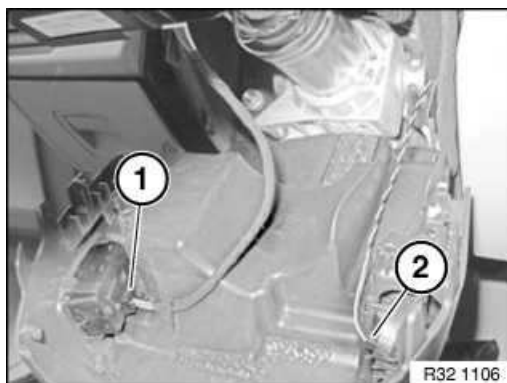


- Press the retaining lugs (arrows) a little outwards and unclip the steering column shroud lower section in a downward direction.



- Tilt steering column shroud lower section in downward direction.
- Unlock and disconnect the plug connections (1) and (2).
- Remove steering column shroud lower section.

4 – Install steering column shroud lower section



- Position the steering column shroud lower section .
- Connect available connectors (1) and (2) and lock.

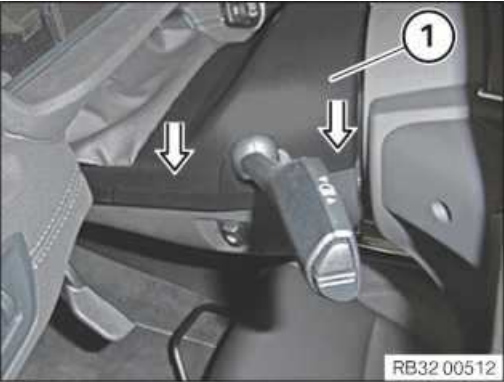


- Position the steering column shroud lower section with the retaining lugs (arrows).
- Press steering column shroud lower section completely towards the top until the retaining lugs (arrows) engage.

5 – Fit steering column shroud upper section



- Position the steering column shroud upper section.
- Attach gap cover of the steering column (1) on the brackets (arrows).



- Position the steering column shroud upper section (1).



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

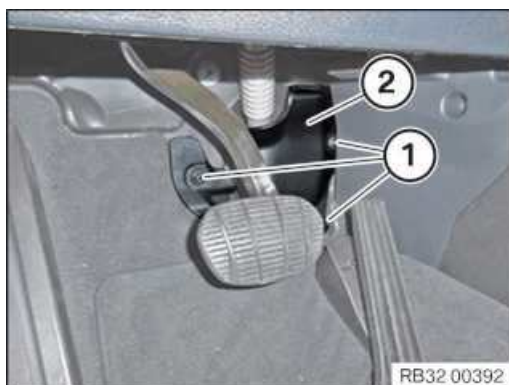
2 298 504 Wedge



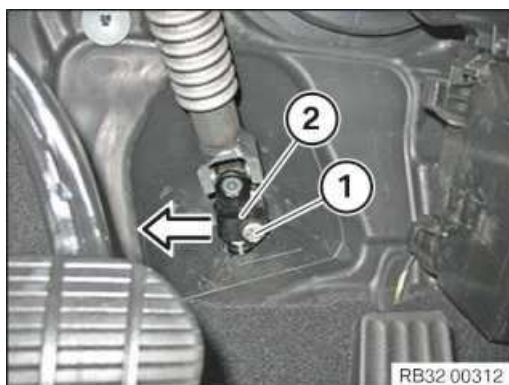
Common		Used in step	2
Usage	Wedge with angled lug		
Included in the tool or work			
Storage location	C34		
Replaced by			
In connection with			
SI-Number	01 03 12 (792)		

**Important!**

Do not turn the steering wheel once the steering shaft has been detached from the steering box/steering column! If the lower section of the steering shaft is separated from the steering gear/steering column, the steering column switch cluster (SZL) may be damaged when the steering wheel is turned!

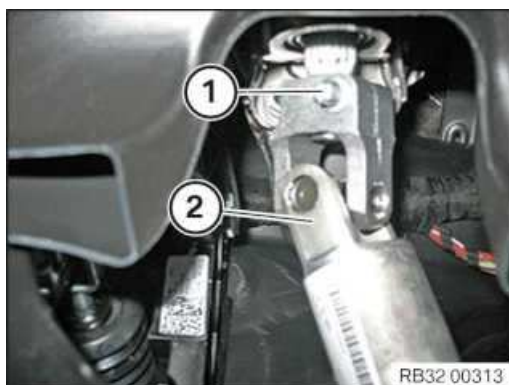
**Removal:**

Release nuts (1) and remove cover (2).



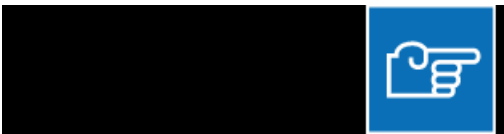
Release screw (1).

Swivel out bottom steering shaft universal joint (2) from steering gear.

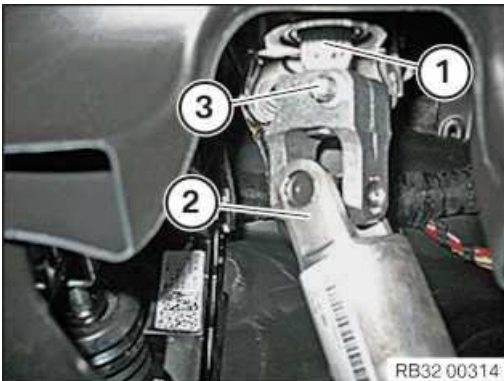


Release clamping bolt (1).

Release the steering shaft (2) from the steering column pull off steering shaft.



Installation:



Important!

The spindle (1) cannot be fully inserted in the steering column - **there is no limit stop!**

When installing the steering shaft (2), counter the spindle (1) in the steering column!

Installation note:

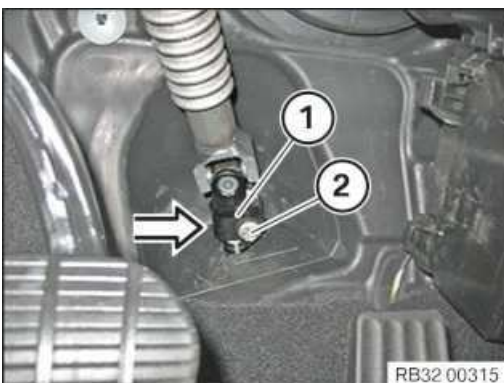
- When steering shaft is to be reused, clean both threads in steering shaft to remove all remnants of screw locking agent.
- Clamping bolt must rest in groove of steering column.

Counter the steering shaft (1) in the steering column, push the steering shaft (2) onto the steering column (1).

Tighten screw (3).

Part: Replace screw (3).

Tightening torque [32 31 3AZ](#).

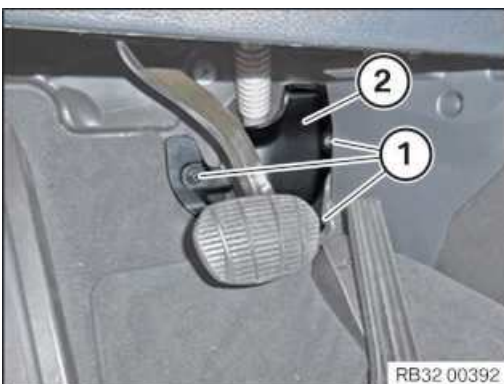


Swivel universal joint (1) onto steering gear.

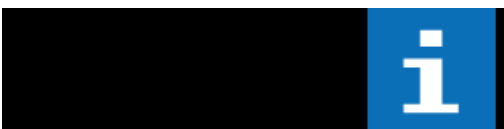
Tighten screw (2).

Part: Replace screw (2).

Tightening torque [32 31 2AZ](#).



Install cover (2) and tighten nuts (1).



Required follow-up work:

- Turn steering wheel in both directions to the limit position. The airbag indicator light must not light up!

32 31 090 Removing and installing the steering column \PREMIUM



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

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



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 – 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).

3 – Removing airbag unit of the steering wheel/sports steering wheel



WARNING

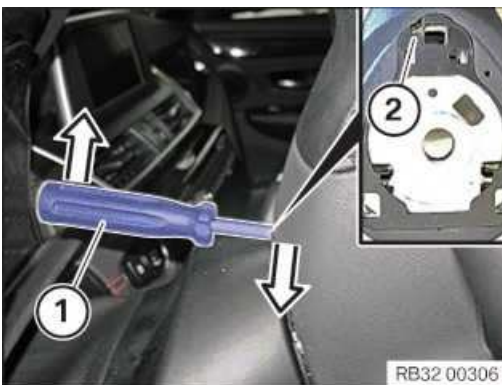
Airbag unit.

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



- Turn the steering wheel (1) through 180° from the "straight-ahead driving position".

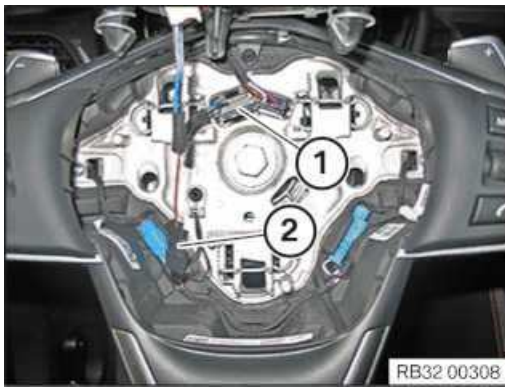


- Insert the slotted screwdriver (1) into the elongated hole on the rear side on the steering wheel.
- Push the slotted screwdriver (1) up and thereby push the retaining spring down (2).

The airbag unit is unlocked.



- (1) Push unlocked airbag unit up.
- (2) At the same time, pull off the top airbag unit in the opposite direction of travel.



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

4 – Removing steering wheel/sports steering wheel



- Move the steering wheel/sports steering wheels to the straight-ahead position.
- **Unlock plug connection and disconnect.**
- Release the screw (1) and remove the steering wheel/sports steering wheel.

5 – Removing steering column shroud upper section



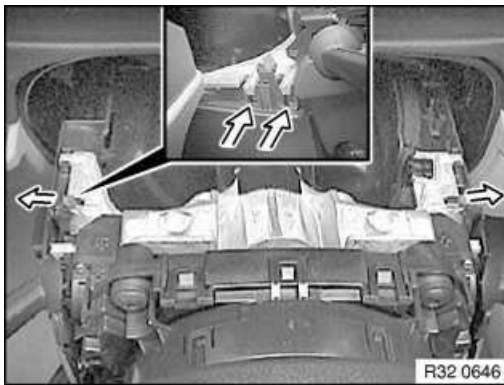
NOTICE

Perform the operations on the left and right side.

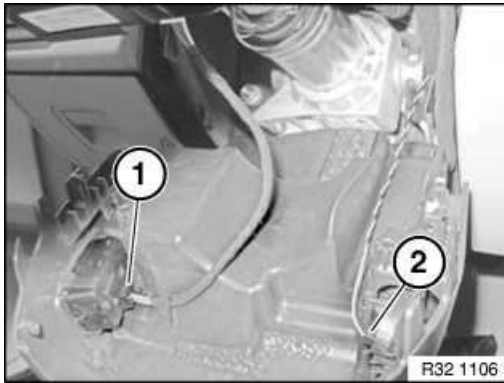
- Unclip the steering column shroud upper section (1) with the special tool **2 298 504** in area (2).
- Fold the steering column shroud upper section (1) up.
- Release the gap cover of the steering column (1) from the brackets (arrows) of the steering column shroud upper section.
- Remove steering column shroud upper section.



6 – Removing steering column shroud lower section

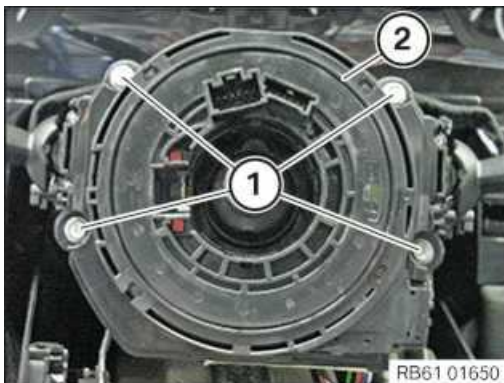


- Press the retaining lugs (arrows) a little outwards and unclip the steering column shroud lower section in a downward direction.

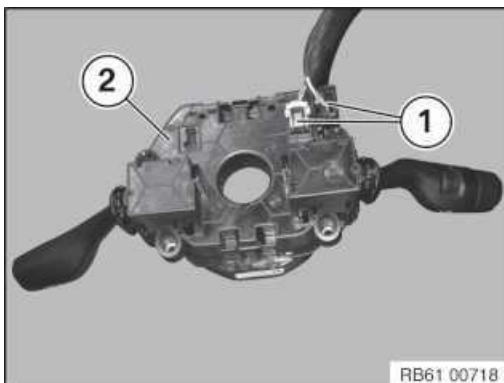


- Tilt steering column shroud lower section in downward direction.
- Unlock and disconnect the plug connections (1) and (2).
- Remove steering column shroud lower section.

7 – Removing the steering column switch cluster (SZL)



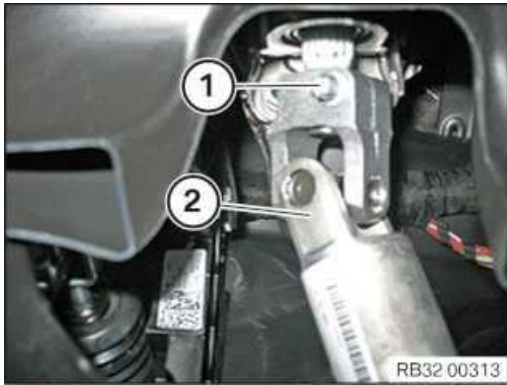
- Loosen screws (1).
- Remove the steering column switch cluster (SZL) (2).



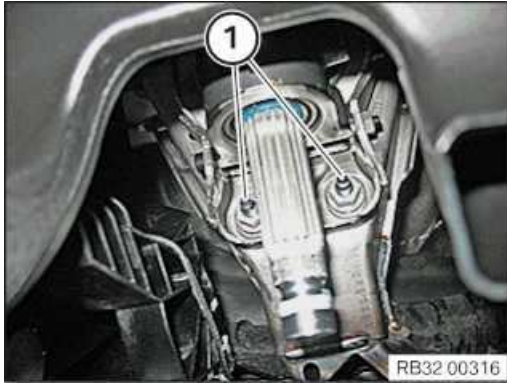
- Unlock and disconnect the connector (1) on the steering column switch cluster (SZL) (2).

MAIN WORK

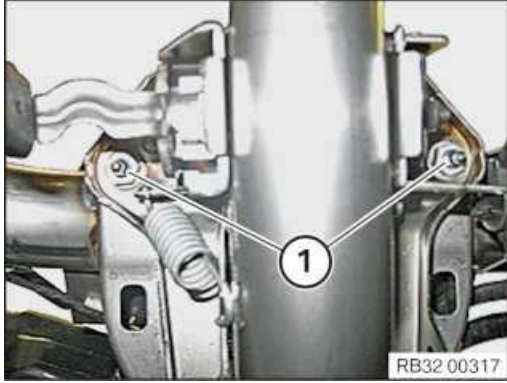
8 – Remove steering column



- Loosen the clamping bolt (1).
- Pull steering shaft (2) from steering column.

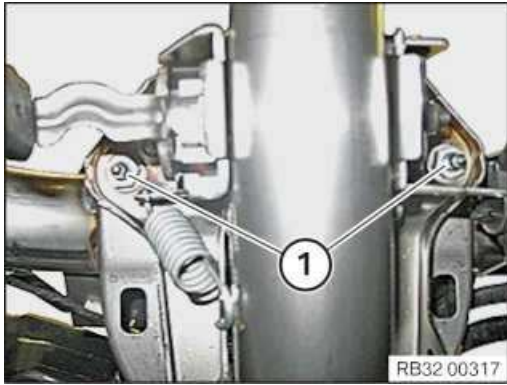


- Loosen the nuts (1) on the bottom of the steering column.



- Loosen nuts (1).
- Unclip wiring harness holder from the steering column.
- Carefully thread out and remove the steering column.

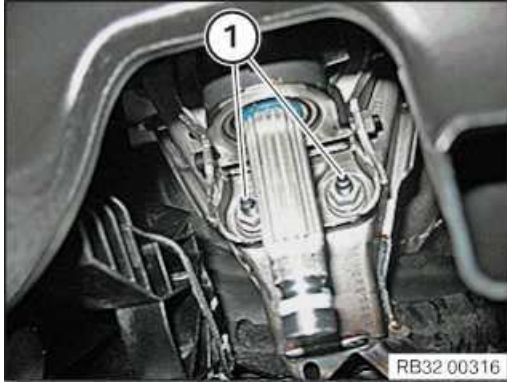
9 – Installing the steering column



- Carefully insert and position steering column in instrument panel trim.
- Secure wiring harness on steering column.
- Tighten nuts (1).

Steering column to dashboard support

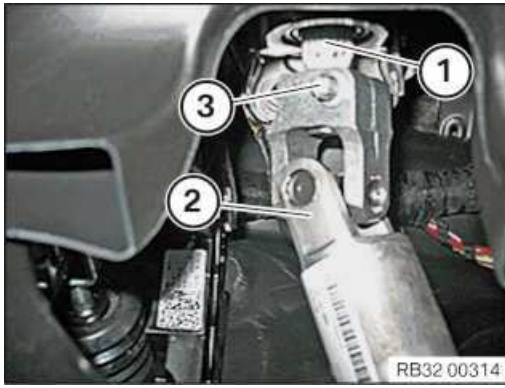
M8		Tightening torque	21 Nm
----	--	-------------------	-------



- Tighten the nuts (1) on the steering column at the bottom.

Steering column to dashboard support

M8		Tightening torque	21 Nm
----	--	-------------------	-------



- Pull the steering column spindle (1) out to the maximum length.
- Push universal joint (2) onto the spindle of the steering column (1).

Note: Counter-hold spindle (1) at the steering column when pushing the steering shaft on.

- Renew the clamping bolt (3).

Parts: Clamping bolt

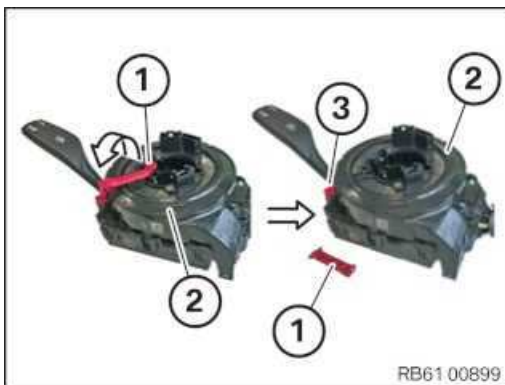
- Tighten the clamping bolt (3).

Lower steering shaft to steering column

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

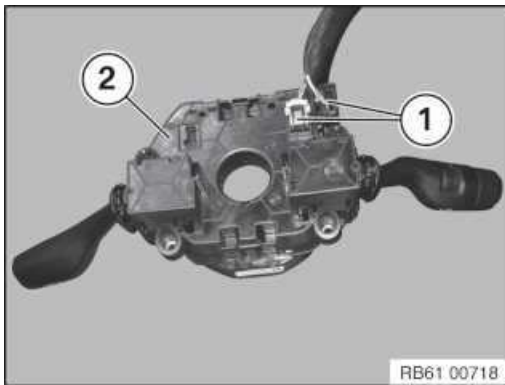
POSTPROCESSES

10 – 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 of (3) 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).

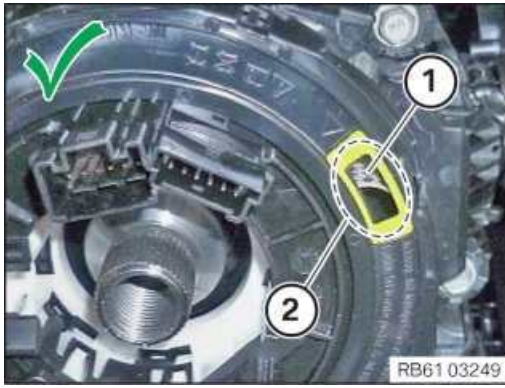
► Check the neutral position of the clock spring



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.

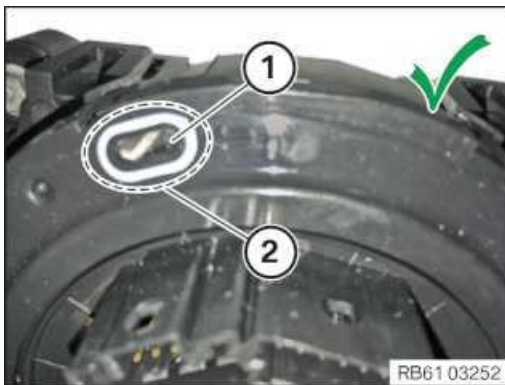
Measure

- 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).

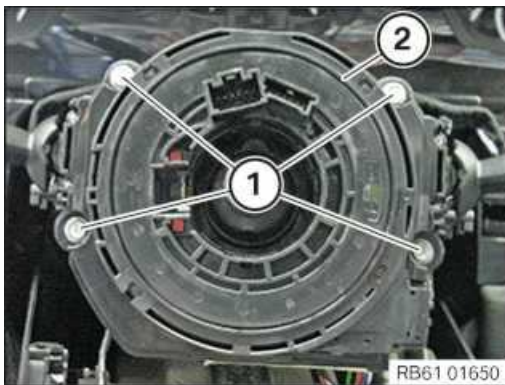


Result

» 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).

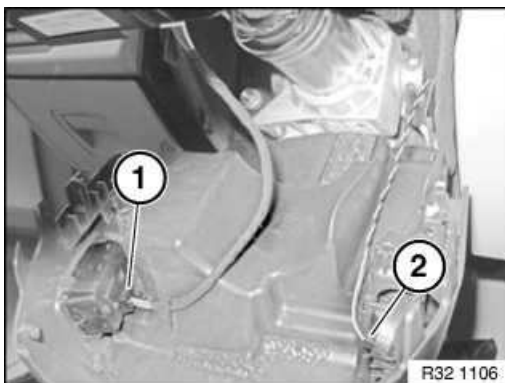


- Position the steering column switch cluster (SZL) (2).
- Tighten the screws (1).

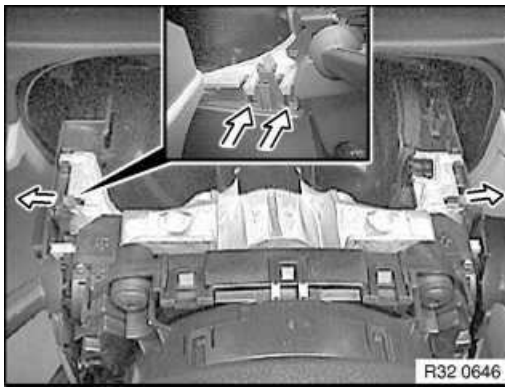
Steering column switch cluster (SZL) on the steering column

Screw TS5x20		Tightening torque	3 Nm
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11 – Install steering column shroud lower section



- Position the steering column shroud lower section .
- Connect available connectors (1) and (2) and lock.

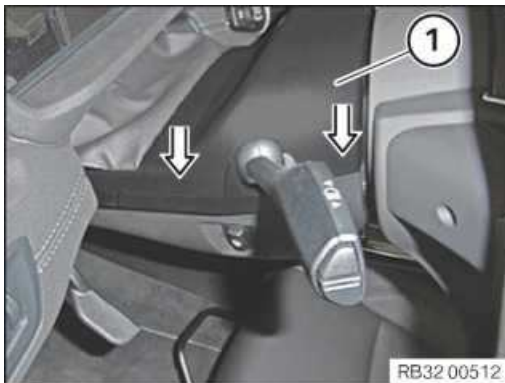


- Position the steering column shroud lower section with the retaining lugs (arrows).
- Press steering column shroud lower section completely towards the top until the retaining lugs (arrows) engage.

12 – Fit steering column shroud upper section



- Position the steering column shroud upper section.
- Attach gap cover of the steering column (1) on the brackets (arrows).



- Position the steering column shroud upper section (1).



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.

13 – Installing the steering wheel/sports steering wheel

► Check the neutral position of the clock spring

- Ensure that the coil spring is not twisted.

There are clock springs installed without a mechanical anti-twist lock.

Coil springs without a mechanical anti-twist lock are identifiable on the inspection glass for the neutral position mark.

- Check the neutral position of the clock spring on the steering column switch cluster (SZL).

The neutral position is correct if the yellow or green mark (1) is clearly visible.

Check



- Check the mark (1) in the inspection glass.

Result

» The mark (1) is not visible.

Measure

- Turn the coil spring until mark (1) is visible in the inspection glass.

Check

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



Result

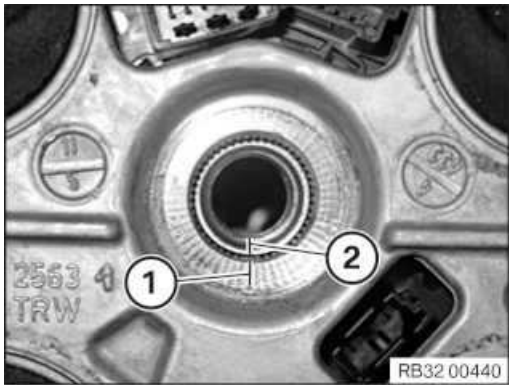
» Screw (1) is micro-encapsulated.

Measure

- Clean thread in the steering column.

Renew the screw (1).

Parts: Screw



- Align and connect the steering wheel/sports steering wheel according to the mark (1) with the steering column mark (2).



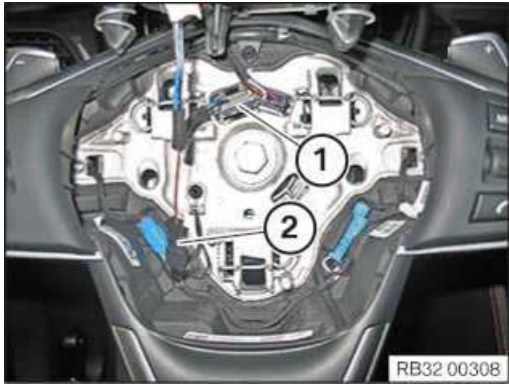
- Tighten down screw (1).

Steering wheel to steering column

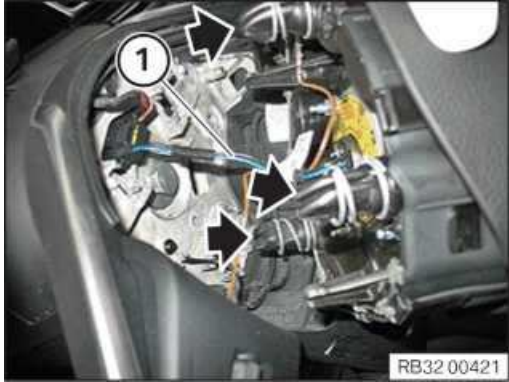
M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm
-----	---	-------------------	---------

- **Connect connectors and lock.**

Make sure connecting lines are correctly routed.



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



- Before installing the airbag unit, align the wiring harness (1) to the centre so that the latch mechanisms (arrows) are exposed!



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

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

15 – Disconnecting all battery earth leads



- See additional information.

Additional Information

Overview of Tightening Torques

Steering column to dashboard support

Used in step 9

M8	Tightening torque	21 Nm
----	-------------------	-------

Lower steering shaft to steering column

Used in step 9

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

Steering column switch cluster (SZL) on the steering column

Used in step 10

Screw TS5x20		Tightening torque	3 Nm
--------------	--	-------------------	------

Steering wheel to steering column

Used in step 13

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

Overview of Special Tools**2 298 504 Wedge****Common**

Used in step 5

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)

Links**General repair instructions**

Used in step

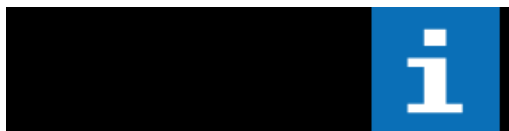
[72 12 ... Procedure after airbag deployment as result of an accident](#)
[72 00 ... Safety regulations for handling components with gas generators](#)
Repair instructions

Used in step

61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1 15
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1 15
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15

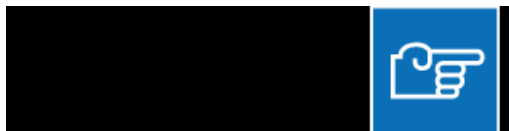
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15
61 20 900 Disconnecting and connecting battery earth lead	1 15

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

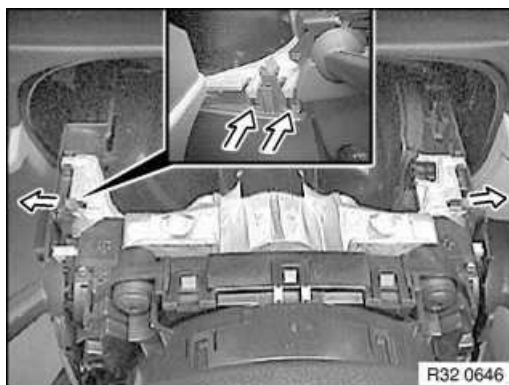


Necessary preliminary tasks:

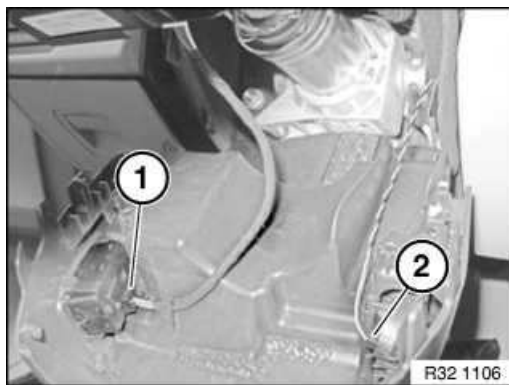
- Remove [top section of steering column casing](#).
- Move steering column in "top" and "extended" position.



Removal:



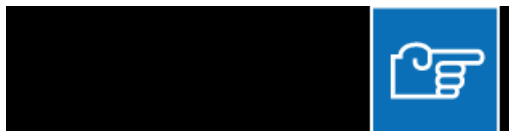
Press retaining lugs outwards a little and unclip steering column shroud downwards.



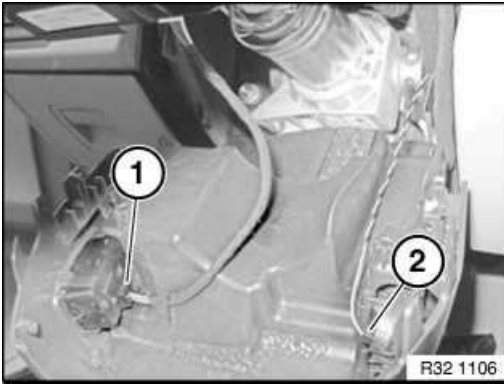
Tilt steering column shroud in downward direction.

If necessary, unlock plug connection (1) from "steering column adjustment" switch and plug connection (2) of emergency start aerial and disconnect.

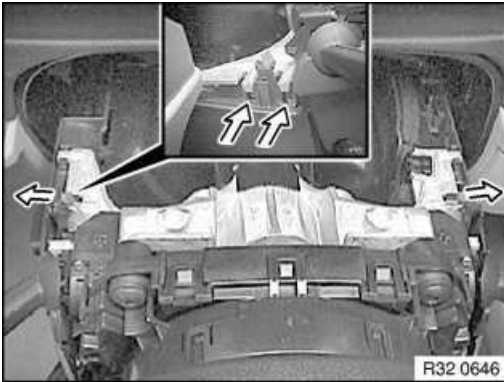
Remove steering column shroud lower section.



Installation:



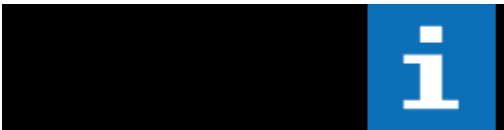
Connect connector (1) to the steering column adjustment switch and plug connection (2) of emergency start aerial.



Align steering column shroud by means of retaining lugs with steering column and push them apart a little.

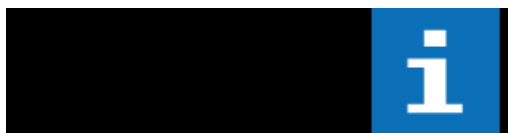
Press steering column shroud completely towards the top until the retaining lugs engage.

Check installation position, correct if necessary.

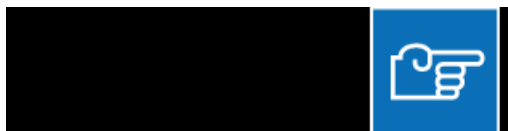
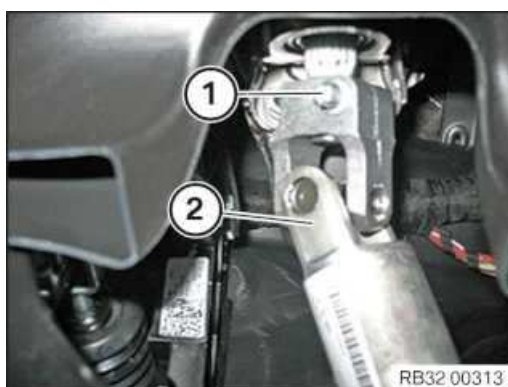


Required reworking:

- Install [steering column shroud upper section](#)

**Necessary preliminary work:**

- Remove [steering wheel](#).
- Remove [steering column shroud upper section](#).
- Remove [steering column shroud lower section](#).
- Remove [steering column switch cluster](#).

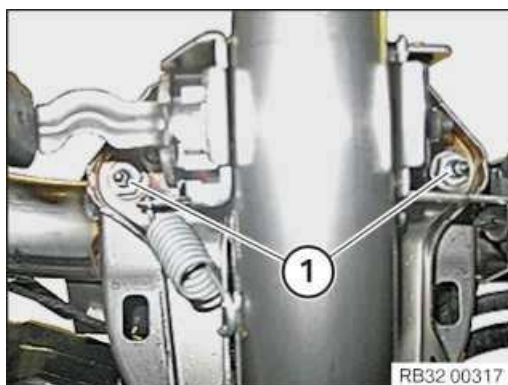
**Removal:**

Release clamping bolt (1).

Pull steering shaft (2) from steering column.



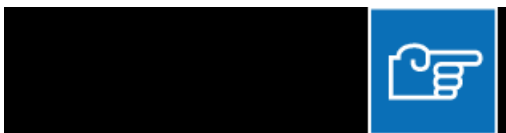
Release nuts (1) at bottom of the steering column.



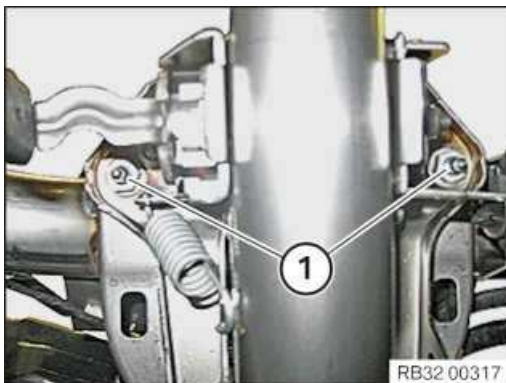
Unscrew nuts (1).

Unclip wiring harness holder from steering column.

Carefully remove steering column towards the front.



Installation:



Carefully insert and position steering column in instrument panel trim.
Secure wiring harness on steering column.

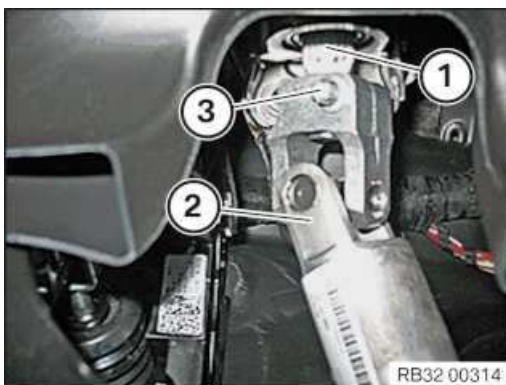
Tighten down nuts (1).

Tightening torque [32 31 1AZ](#).



Tighten nuts (1) at bottom of steering column.

Tightening torque [32 31 1AZ](#).



Attention!

Counter-hold shaft at the steering column when pushing the steering shaft on. The steering column shaft must not be inserted fully into the steering column.

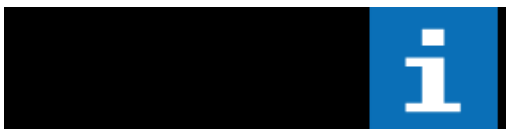
Push universal joint (2) onto the spindle of the steering column (1).

Renew clamping bolt (3).

Parts: Clamping bolt

Tighten clamping bolt (3).

Tightening torque [32 31 3AZ](#).



Required follow-up work:

- Install [steering column switch cluster](#).
- Install the [steering column shroud lower section](#).
- Install [steering column shroud upper section](#).
- Install [steering wheel](#).

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

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.

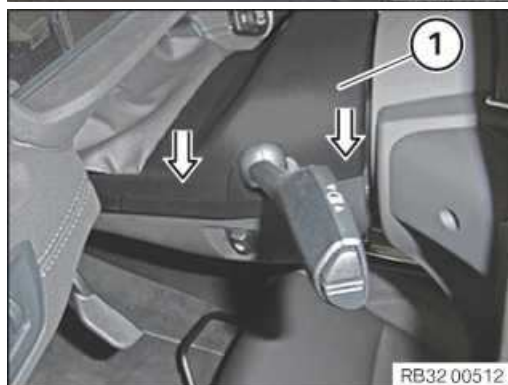
- Unclip the steering column shroud upper section (1) with the special tool **2 298 504** in area (2).
- Fold the steering column shroud upper section (1) up.
- Release the gap cover of the steering column (1) from the brackets (arrows) of the steering column shroud upper section.
- Remove steering column shroud upper section.



3 – Fit steering column shroud upper section



- Position the steering column shroud upper section.
- Attach gap cover of the steering column (1) on the brackets (arrows).



- Position the steering column shroud upper section (1).



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](#)

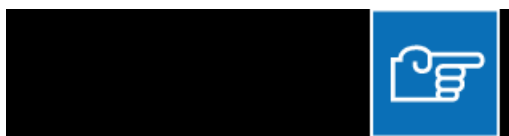
Usage	Wedge with angled lug
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)



Move steering column in "bottom" and "extended" position.
Push steering column shroud (1) upwards at rear and unclip.
Repeat process on right side.

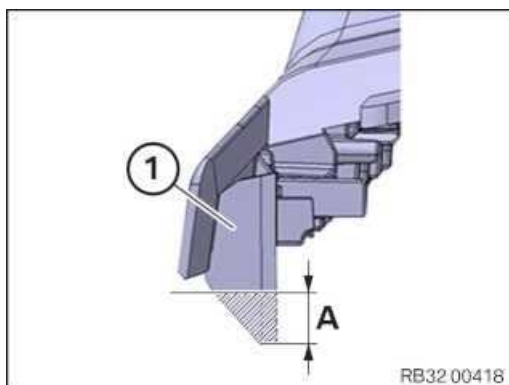


Unclip steering column gap cover (1) out of steering column shroud upper section.



Installation note:

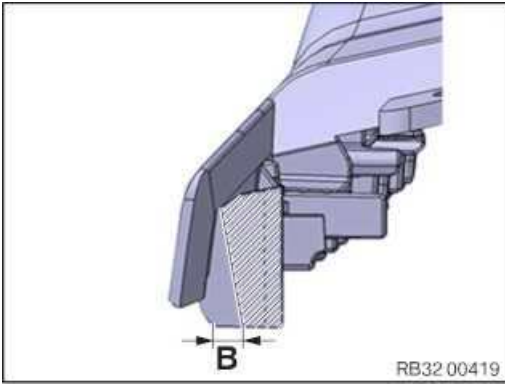
To prevent rolling out of the gap cover, the guide rib (1) on the steering column shroud upper section must be trimmed in F48 vehicles up to 04/2016.



1st trim:

Cut off the shaded area of the guide rib (1).

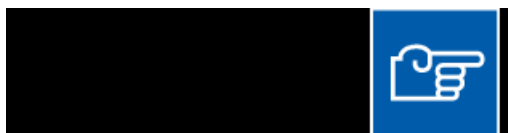
Dimension A = approx. 5 mm



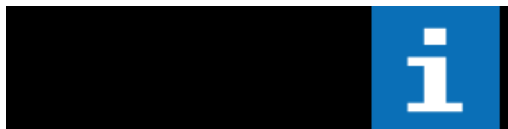
2nd trim:

Cut off the shaded area of the guide rib.

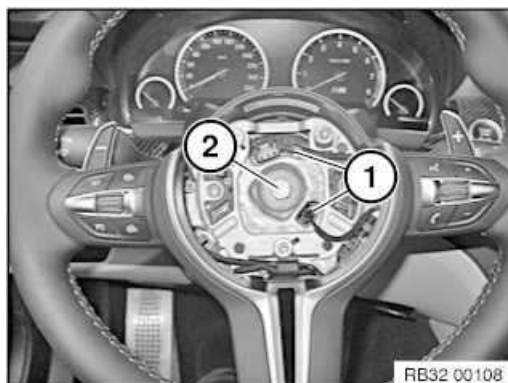
Dimension B = approx. 3 mm

*Note:*

Wheel alignment is not necessary after the steering wheel has been removed and installed or replaced.

**Necessary preliminary work:**

- Remove [airbag unit](#)



Move wheels/sport steering wheel into straight-ahead position.

Disconnect and detach plug connections (1).

Release screw (2) and remove sport steering wheel.

Installation note:

Only on vehicles with microencapsulated screw (2): Clean thread in the steering column and replace screw (2)!

Tightening torque [32 33 1AZ](#).

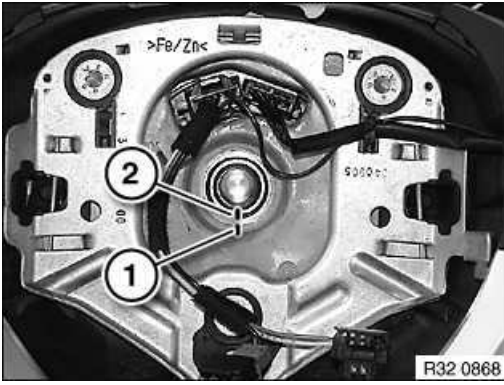
Make sure connecting line(s) is/are correctly laid.

*Note:*

There are clock springs installed with and without a mechanical anti-twist lock.

Clock spring without mechanical anti-twist lock:
(recognisable at the inspection glass for the mark of the neutral position)

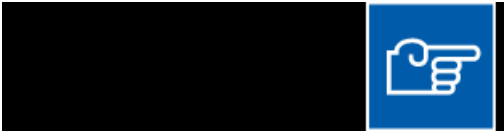
- Do not twist the clock spring
- Check zero position of clock spring on steering column switch cluster
- Zero position is correct only when yellow mark (1) is clearly visible



Installation note:

Before fitting sport steering wheel on steering column, ensure correct cable routing.

Align sport steering wheel by way of marking (1) to steering column marking (2) and attach.



Replacement:

- Remount [shift paddles](#)
- Remount both [multifunction steering wheel switches](#)
- Remount [design cover](#) for sports steering wheel at front and rear
- If necessary, remount the [lane departure warning](#) engine electrical system

32 33 001 Removing and installing the steering wheel \PREMIUM



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

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



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 – 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).

3 – Removing airbag unit of the steering wheel/sports steering wheel



WARNING

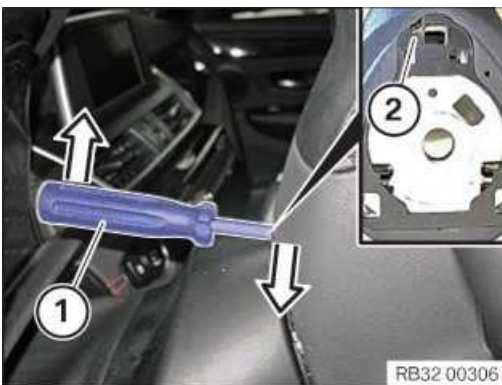
Airbag unit.

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



- Turn the steering wheel (1) through 180° from the "straight-ahead driving position".

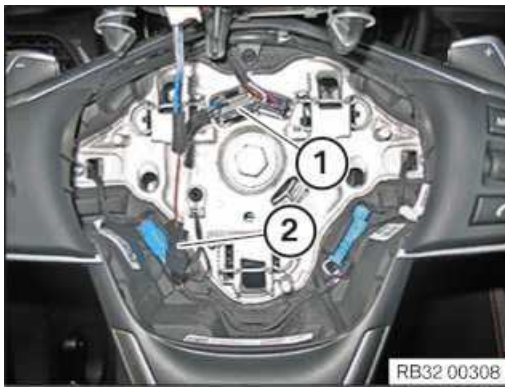


- Insert the slotted screwdriver (1) into the elongated hole on the rear side on the steering wheel.
- Push the slotted screwdriver (1) up and thereby push the retaining spring down (2).

The airbag unit is unlocked.



- (1) Push unlocked airbag unit up.
- (2) At the same time, pull off the top airbag unit in the opposite direction of travel.



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

MAIN WORK

4 – Removing steering wheel/sports steering wheel



- Move the steering wheel/sports steering wheels to the straight-ahead position.
- **Unlock plug connection and disconnect.**
- Release the screw (1) and remove the steering wheel/sports steering wheel.

5 – Installing the steering wheel/sports steering wheel

► Check the neutral position of the clock spring

- Ensure that the coil spring is not twisted.
There are clock springs installed without a mechanical anti-twist lock.
Coil springs without a mechanical anti-twist lock are identifiable on the inspection glass for the neutral position mark.
- Check the neutral position of the clock spring on the steering column switch cluster (SZL).
The neutral position is correct if the yellow or green mark (1) is clearly visible.

Check

- Check the mark (1) in the inspection glass.



Result

- » The mark (1) is not visible.

Measure

- Turn the coil spring until mark (1) is visible in the inspection glass.

Check



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

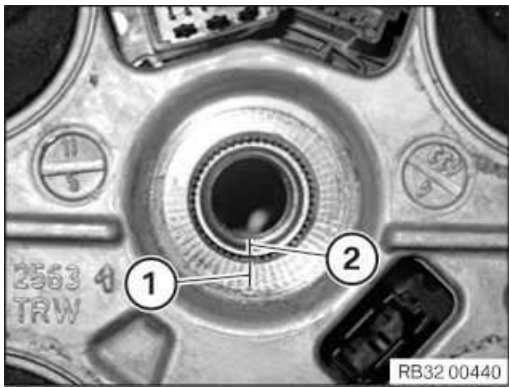
Result

» Screw (1) is micro-encapsulated.

Measure

- Clean thread in the steering column.
Renew the screw (1).

Parts: Screw



- Align and connect the steering wheel/sports steering wheel according to the mark (1) with the steering column mark (2).



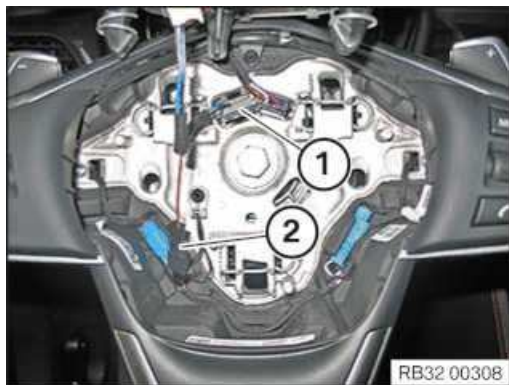
- Tighten down screw (1).

Steering wheel to steering column

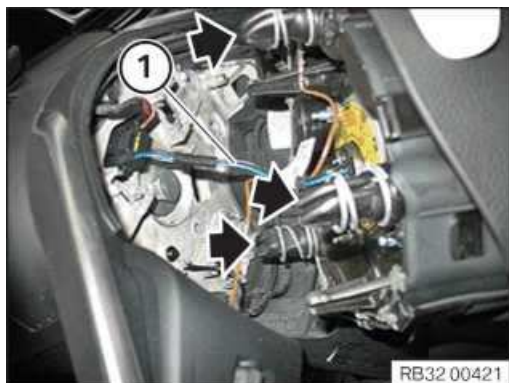
M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm
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- **Connect connectors and lock.**
Make sure connecting lines are correctly routed.

6 – Installing airbag unit of steering wheel/sports steering wheel



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



- Before installing the airbag unit, align the wiring harness (1) to the centre so that the latch mechanisms (arrows) are exposed!



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

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

7 – Disconnecting all battery earth leads



- See additional information.

Additional Information

Overview of Tightening Torques

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

Links

[illegible]

[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
1. Turn the engine off.	1
2. Remove the air filter.	2
3. Check the oil level.	3
4. Add oil if needed.	4
5. Replace the air filter.	5
6. Turn the engine on.	6

61 20 900	Disconnecting and connecting battery earth lead	1	7
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61 20 900	Disconnecting and connecting battery earth lead	1	7
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61 20 000	Disconnecting and connecting battery earth lead	1.7
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01-20-900 Disconnecting and connecting battery earth lead	17
01-20-920 Blowing out the hose from the bottom of the lead	17

[61 20 900 Disconnecting and connecting battery earth lead](#) 1 7

[61 20 900 Disconnecting and connecting battery earth lead](#) 1 7

[61 20 900 Disconnecting and connecting battery earth lead](#) 1 7

61 20 900	Disconnecting and connecting the battery earth lead (all battery earth leads)	1.7
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61.25.000 Disconnecting and connecting the battery earth lead (all battery earth leads)	1.7
61.00.000 Disconnecting and connecting the battery earth lead (all battery earth leads)	1.7

61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)

61 20 900	Disconnecting and connecting battery earth lead	1	7
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) 1 7

61 20 900	Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	1	7
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61 20 900	Disconnecting and connecting battery earth lead	1	3
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01 20 500 Disconnecting and connecting battery earth lead	1.7
01 20 600 Dis	1.5

[61 20 900 Disconnecting and connecting battery earth lead](#)

61 20 900 Disconnecting and connecting battery earth lead 1 7

[61 20 900 Disconnecting and connecting battery earth lead](#) 1 7

61 20 900	Disconnecting and connecting battery earth lead	1	7
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61.20.000 Disconnecting and connecting battery earth lead	1.7
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61 20 900 Disconnecting and connecting battery earth lead

61 20 900 Disconnecting and connecting battery earth lead 1 7

[61 20 900 Disconnecting and connecting battery earth lead](#) 1 7

61 20 900	Disconnecting and connecting battery earth lead	1 7
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61 20 900	Disconnecting and connecting battery earth lead	1.7
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01.20.000 Disconnecting and connecting battery earth lead	1.7
01.20.000 Disconnecting and connecting the battery earth lead (all battery earth leads)	1.7

61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)

61 20 900	Disconnecting and connecting battery earth lead	1	7
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61 20 900 Disconnecting and connecting battery earth lead 1 7

61 20 900	Disconnecting and connecting battery earth lead	1	7
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61 20 900	Disconnecting and connecting battery earth lead	1	3
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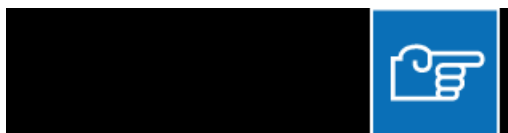
01.20.500 Disconnecting and connecting battery earth lead	17
01.20.530 Disconnecting and connecting battery earth lead	17

[61 20 900 Disconnecting and connecting battery earth lead](#) 1 7

[61 20 900 Disconnecting and connecting battery earth lead](#) 1 7

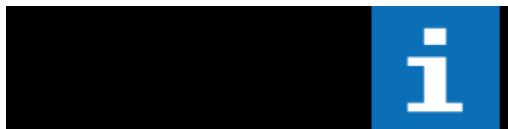
[61 20 900 Disconnecting and connecting battery earth lead](#) 1 7

32 33 005 Replace steering wheel



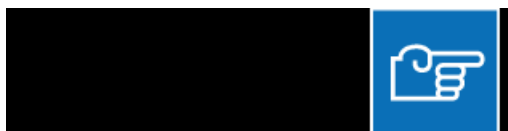
Note:

Wheel alignment is not necessary after the steering wheel has been removed and installed or replaced.



Necessary preliminary work:

- Remove [airbag unit](#)



Removal:



Move the wheels (steering wheel) to straight-ahead driving position.
Disconnect plug connection.

Release screw (1) and remove steering wheel.



Remounting work:

- If necessary, remount both [shift paddles](#)
- Remount the [design cover](#)
- Remount both [switches on the sports steering wheel](#)
- If necessary, remount the [engine electrical system of the lane departure warning](#)
- If necessary, remount the [steering wheel heating control unit](#)



Installation:

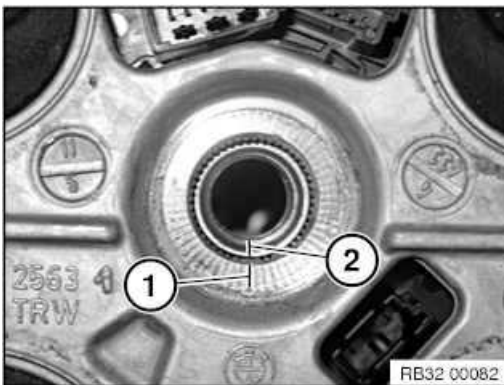


Note:

There are clock springs installed without a mechanical anti-twist lock.

Clock spring without mechanical anti-twist lock:
(recognisable at the inspection glass for the mark of the neutral position)

- Do not twist the clock spring
- Check the neutral position of the coil spring at the steering column switch cluster (SZL)
- Neutral position is correct only when the green or yellow mark (1) is clearly visible



Align sport steering wheel by way of marking (1) to steering column marking (2) and attach.



Connect connector.

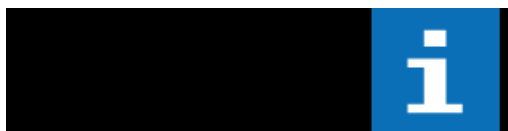
Installation note:

Only on vehicles with microencapsulated screw (1): Clean thread in the steering column and replace screw (1)!

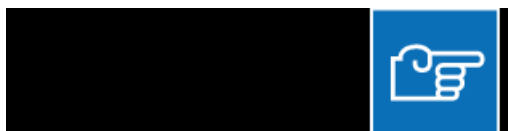
Tighten the screw (1)!

Tightening torque [32 33 1AZ](#).

Make sure connecting line(s) is/are correctly laid.

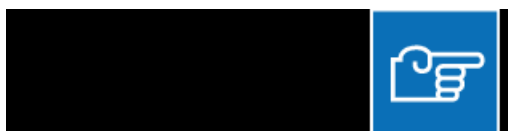
**Necessary preliminary work:**

- Remove [airbag unit](#)
- If necessary, remove [both shift paddles for automatic transmission](#)
- [Remove both multifunction steering wheel switches](#)

**Removal:**

Release screw (1) at design trim (2).

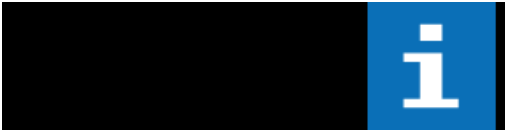
Unclip design trim (2) carefully upwards and remove.

**Installation:****Note:**

The retaining lug at the design trim (1) may not be damaged or missing.

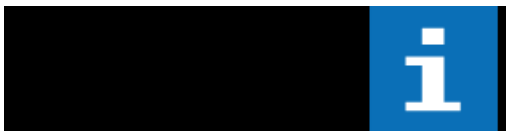


Carefully clip in design trim (2) and tighten with screw (1).

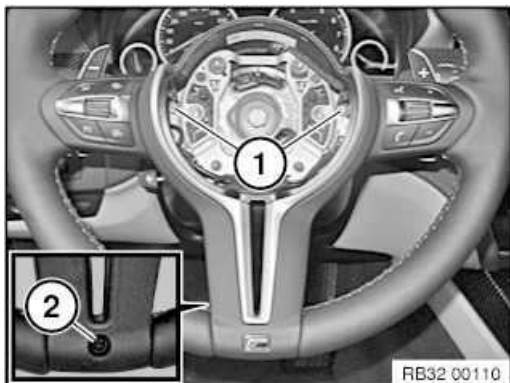


Required reworking:

- [Install both multifunction steering wheel switches](#)
- [If necessary, install both shift paddles](#)
- [Install airbag unit](#)

**Necessary preliminary tasks:**

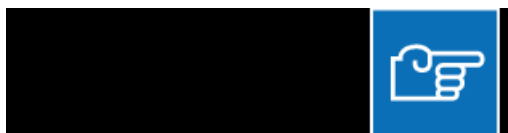
- Remove [airbag unit](#)



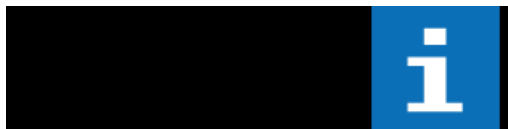
Release screws (1) on steering wheel.

Release screw (2) on rear side of steering wheel.

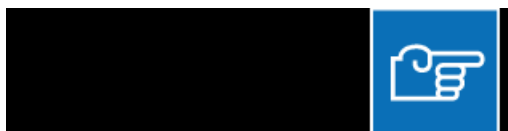
Remove design cover.

**Note:**

Wheel alignment is not necessary after the steering wheel has been removed and installed or replaced.

**Necessary preliminary work:**

- Remove [airbag unit](#)

**Removal:**

Move wheels/sport steering wheel into straight-ahead position.

Disconnect plug connection.

Release screw (1) and remove sport steering wheel.

**Assembly sequence:**

- If necessary, remount both [shift paddles](#)
- Remount the [design cover](#)
- Remount both [switches on the sports steering wheel](#)
- If necessary, remount the [engine electrical system of the lane departure warning](#)
- If necessary, remount the [steering wheel heating control unit](#)

**Installation:**

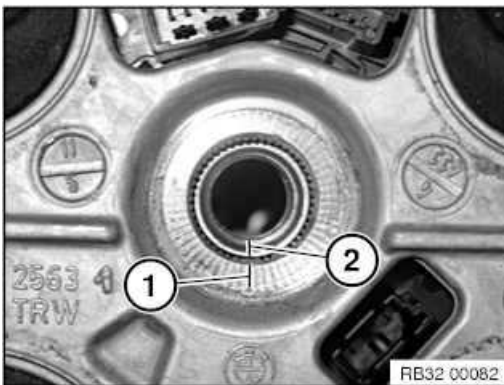


Note:

There are clock springs installed without a mechanical anti-twist lock.

Clock spring without mechanical anti-twist lock: (recognisable at the inspection glass for the mark of the neutral position)

- Do not twist the clock spring
- Check the neutral position of the coil spring at the steering column switch cluster (SZL).
- Neutral position is correct only when the green or yellow mark (1) is clearly visible



Align sport steering wheel by way of marking (1) to steering column marking (2) and attach.



Connect the plug connection .

Installation note:

Only on vehicles with microencapsulated screw (1): Clean thread in the steering column and replace screw (1)!

Tighten the screw (1)!

Tightening torque [32 33 1AZ](#).

Make sure connecting lines are correctly routed.

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
 - Safety battery terminal
 - Sensor B-pillar (left/right)
 - Sensor front door (left/right)
 - Sensor seat, Driver-/passenger's side
 - Airbag control unit, vehicle interior
 - Pedestrian protection sensor
 - Front sensor (engine compartment)
- Procedure
 - Inspect visually for mechanical damage (housing, plug connections). Replace damaged components
 - Connect diagnosis system
 - Read fault memory
 - Disconnect the vehicle battery and adhere to the waiting period (at least 30 seconds)
 - Inspect visually for mechanical damage
 - 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

- 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
- **I01 only:** If one of the following criteria is met, the backrest frame must be replaced
(Part number of backrest frame: 52 10 7 388 646)
 - Activated belt tensioner
 - Activated end fitting pretensioner
 - Outer cover unclipped by a side collision
 - Outer cover ripped off by a side collision
 - Faulty clip connection on outer cover caused by a side collision

Driver's airbag

- Components
 - Airbag module
 - Steering wheel
 - Steering column (if damaged)
- Procedure
 - Check components, replace if necessary
 - Replace steering wheel

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
 - B-pillar trim panel (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
 - Check components, replace if necessary

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



Warning!

Observe the following instructions to avoid any danger of injury by the airbag unit.

- Comply with [safety regulations](#) for handling components with gas generators.
- Do not exert any force on the airbag unit.
- Use only specified tools for releasing the airbag unit.

Note: Incorrect handling may result in triggering of the airbag unit and thereby cause serious injury.



Caution!

After the replacement of the airbag unit or any conversion of the steering wheel and airbag unit, a software update or programming/encoding must be carried out via ISTA!



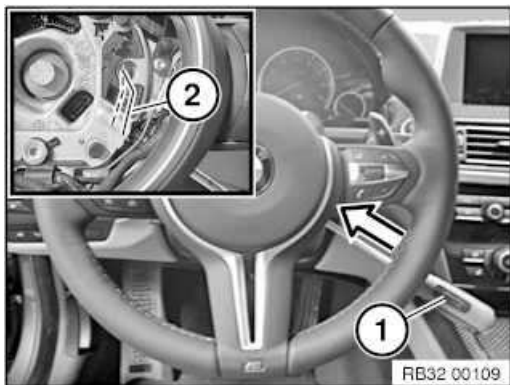
Caution!

[Steering wheel](#) must be replaced if airbag unit has been triggered!
Follow [procedure after airbag deployment](#).



Necessary preliminary work:

- Disconnect [battery negative cable](#)



Insert Torx screwdriver T27 (1) straight into concealed opening until a spring resistance can be felt.

Press in wire spring clip (2) with Torx screwdriver T27 (1) in direction of arrow until the airbag unit is unlocked.

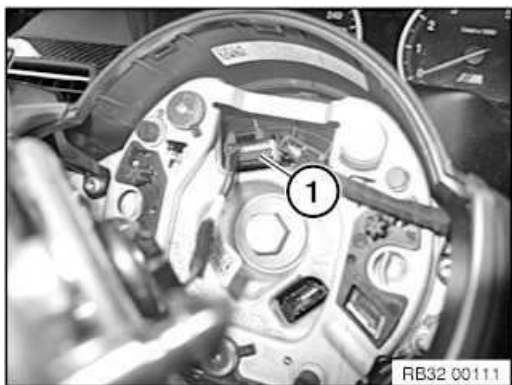
Repeat the procedure on the left steering wheel side and carefully raise the airbag unit.



Warning!

Danger of injury!

Airbag unit may only be set down with the airbag itself facing upwards.



Raise airbag unit towards rear.

Disconnect plug connections (1) and remove airbag unit.

Installation note:

Make sure electrical leads are correctly positioned.

Carefully press airbag unit plane-parallel in direction of steering column shaft into steering wheel with uniform pressing force until it engages noticeably and audibly.

32 34 030 Removing and installing/replacing airbag unit (M sports steering wheel) \PREMIUM



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

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 – 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

3 – Removing airbag unit of the M 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



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 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.



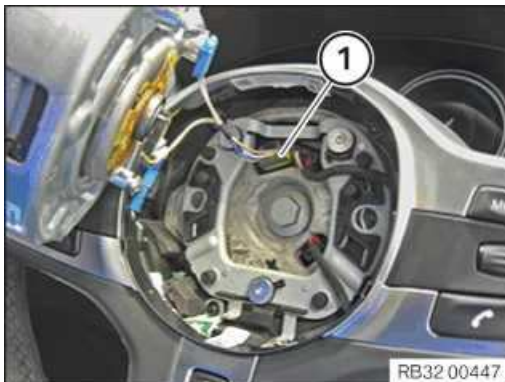
NOTICE

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.



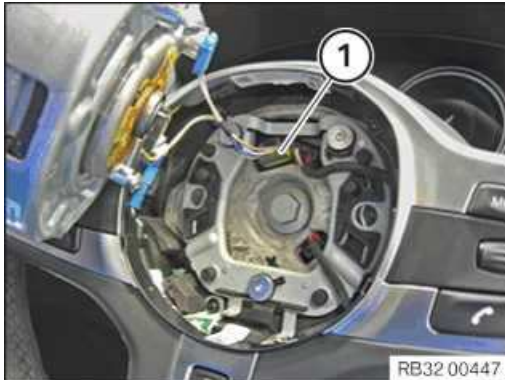
- Press in Torx screwdriver T27 (1) straight in direction of arrow towards the centre of the steering wheel and lift up the airbag unit.
- Repeat procedure on left side and carefully remove airbag unit (2) in direction of arrow.



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

4 – Installing airbag unit of the M sports steering wheel

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 connectors (1) and 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

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](#)

1 5

[61 20 900 Disconnecting and connecting battery earth lead](#)

1 5

61 20 900 Disconnecting and connecting battery earth lead	1 5
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1 5
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1 5
61 20 900 Disconnecting and connecting battery earth lead	1 5
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1 5
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	1 5
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Warning!

Observe the following instructions without fail to avoid any risk of injury by the airbag unit.

- Comply with [safety regulations](#) when handling components with gas generators.
- Do not exert any force on the airbag unit.
- Use only specified release tool for the airbag unit.

Note: Incorrect handling can lead to airbag deployment and cause serious injury!



Attention!

[Steering wheel](#) must be replaced if airbag unit has been triggered!

Follow [procedure after airbag deployment](#).



Necessary preliminary work:

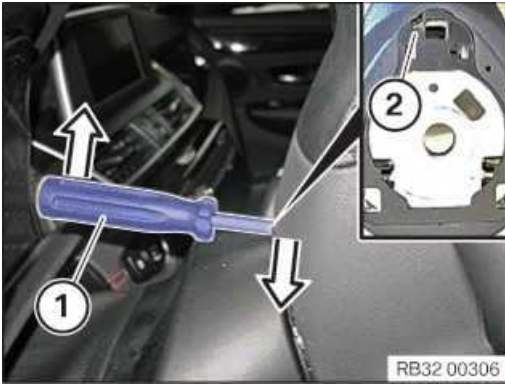
- Disconnect [negative battery cable](#).
- Move steering column in "bottom" and "extended" position.



Removal:



Turn the steering wheel through 180° from the "straight-ahead driving position".



Insert the slotted screwdriver (1) (from the toolkit) into the elongated hole (2) on the rear side of the steering wheel.

Press the slotted screwdriver upwards. This means that the retaining spring is pressed down and the lower airbag unit can be felt to unlock.



1. Push the unlocked airbag (lower) upwards.

2. At the same time, pull off the top airbag unit in the direction of travel.



Disconnect plug connections (1) and (2).

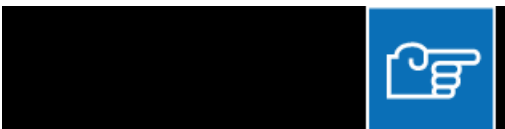
Remove airbag unit.



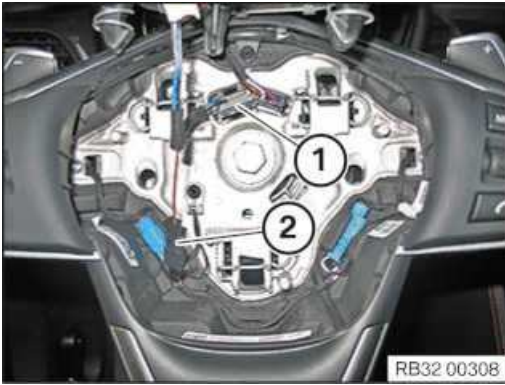
Warning!

Danger of injury!

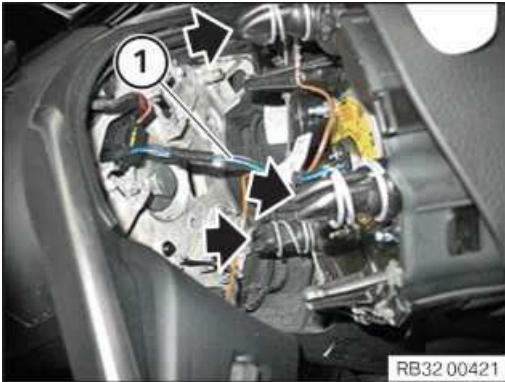
The airbag unit may only be set down with the airbag facing up.



Installation:



Connect plug connections (1) and (2).



Installation note:

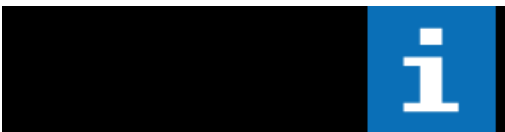
Before installing the airbag, move the wiring harness (1) to the centre so that the latch mechanisms are exposed.



Position airbag unit (1).

Press evenly on the airbag unit until the airbag unit can be felt and heard to engage!

Pull on the airbag unit to check the latch mechanism.



Required follow-up work:

- Connect [battery earth lead](#).

32 34 030 Removing and installing/replacing airbag unit (steering wheel/sports steering wheel) \PREMIUM



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

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 – 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

3 – Removing airbag unit of the steering wheel/sports steering wheel



WARNING

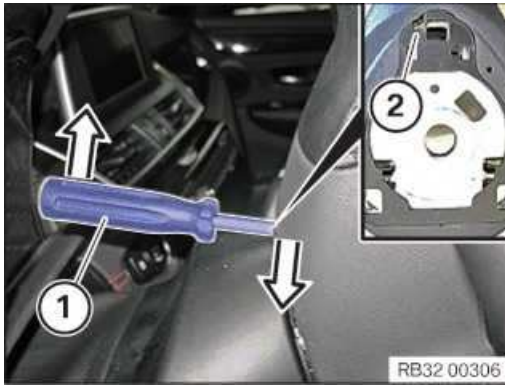
Airbag unit.

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

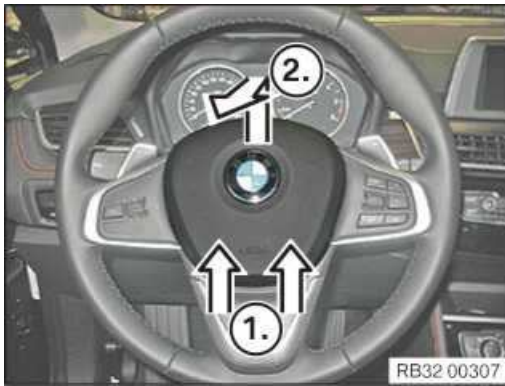


- Turn the steering wheel (1) through 180° from the "straight-ahead driving position".

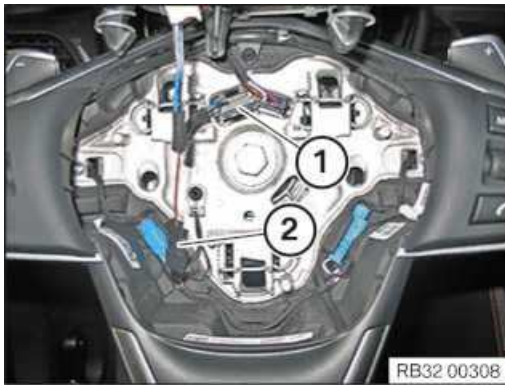


- Insert the slotted screwdriver (1) into the elongated hole on the rear side on the steering wheel.
- Push the slotted screwdriver (1) up and thereby push the retaining spring down (2).

The airbag unit is unlocked.

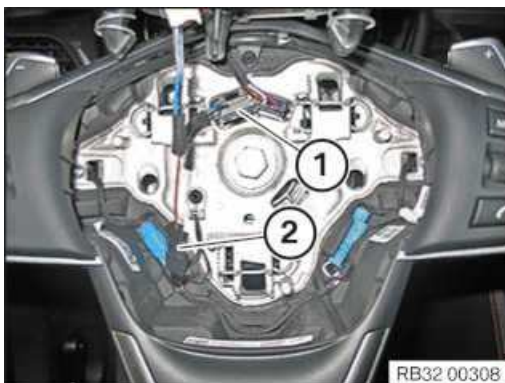


- (1) Push unlocked airbag unit up.
- (2) At the same time, pull off the top airbag unit in the opposite direction of travel.

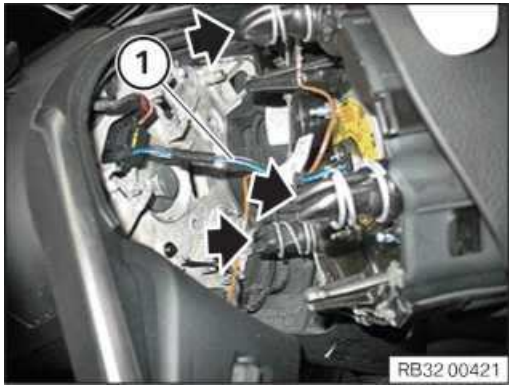


- Unlock and disconnect the plug connections (1) and (2).
- Remove airbag unit.

4 – Installing airbag unit of steering wheel/sports steering wheel



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



- Before installing the airbag unit, align the wiring harness (1) to the centre so that the latch mechanisms (arrows) are exposed!



- Position airbag unit (1).
 - Press the airbag unit (1) with even pressure in each case 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	1 5
61 20 900 Disconnecting and connecting battery earth lead	1 5
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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:

Attention!

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.

- 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" (law relating to the use of explosives dated 13/09/1976).

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

2. Dismantling and installation

- Checking and installation work must be carried out by professionally trained personnel only.
- Work on airbag system components must only ever be carried out with a disconnected vehicle battery, covered negative terminal and disconnected plug connection of the cable leading to the gas generator. Observe the specified waiting period if merely the vehicle battery is disconnected:
 - 30 min. for vehicles up to 9/93
 - 1 min. for vehicles from 9/93 onward
- 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.
- 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 diagnosis system.
- **Danger of injury:** The airbag module may only be set down with the airbag itself facing *upwards*. Otherwise the gas generator may be propelled upwards upon potential ignition of the gas generator.
- 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 in the packaging of the new parts.
- When carrying out straightening and welding work with an electric welder:
 - Disconnect the vehicle 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.

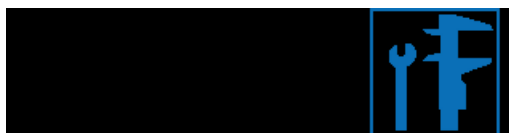
3. Transport

- 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.

32 41 ... Instructions for removing and installing ear clips



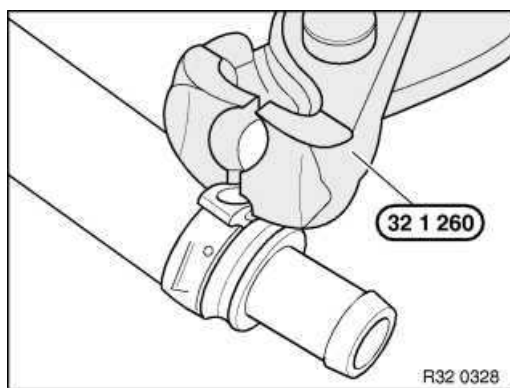
Special tools required:

- [32 1 260](#)

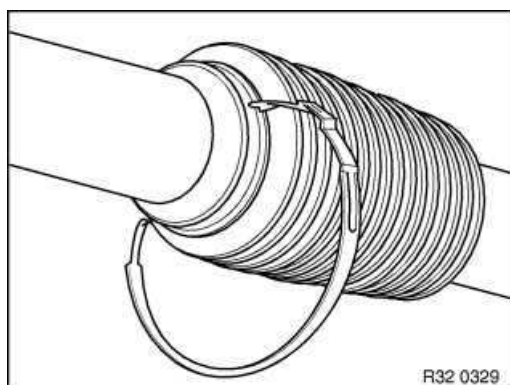
Note:

The work steps are show on assorted components.

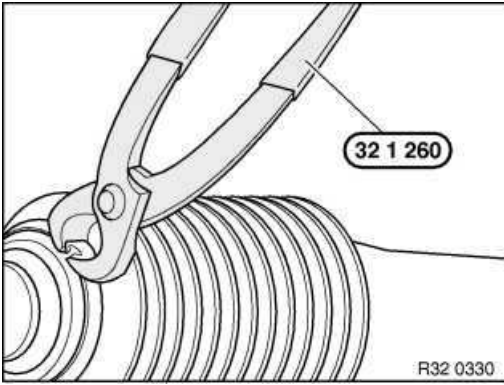
Ear clip must always be replaced.



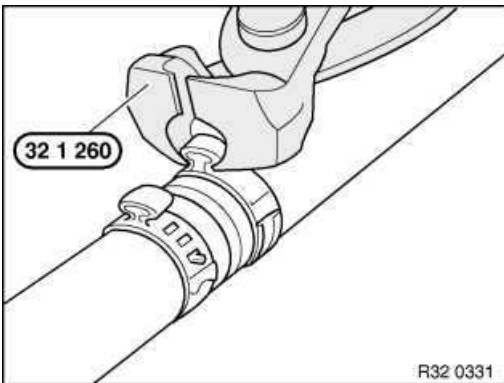
To remove an ear clip, place special tool [32 1 260](#) at right angles to ear and cut ear open.



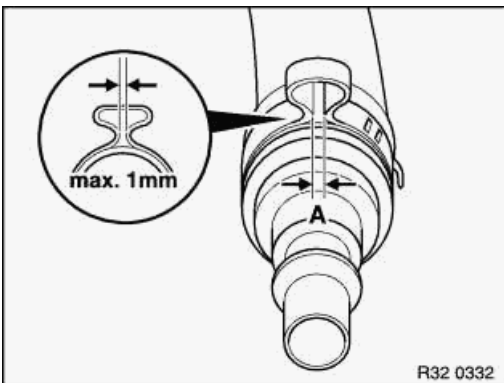
The ear clip can be fitted not only axially but also radially after the hook fastener has been opened.



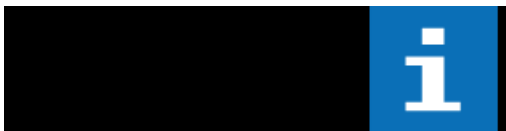
Attach hook fastener and press ear together with special tool [32 1 260](#) .



The diagonal cutting pliers of special tool [32 1 260](#) can be used in areas which are difficult to access.

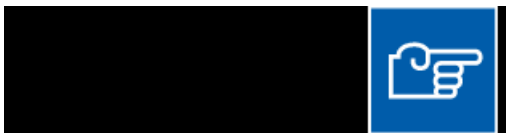


Important!
Gap (A) max. 1 mm!



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

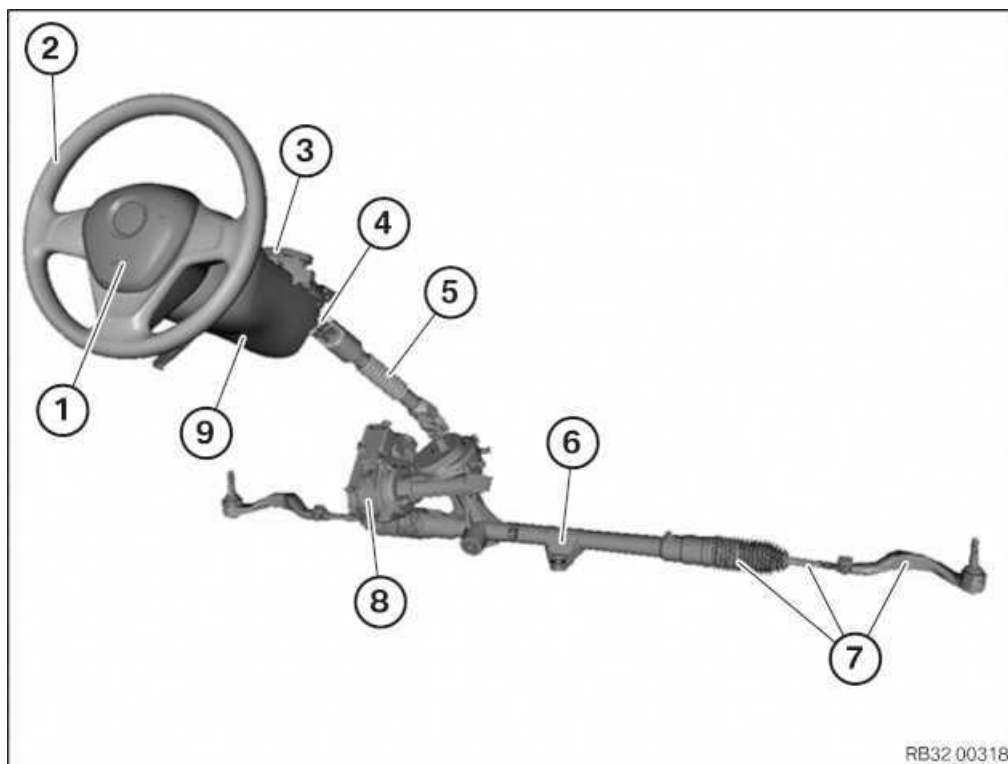
Once the screw has been coated with adhesive, the adhesive remains inactive until such time that it is activated by the encapsulation breaking when the screw is inserted and then cures (hardens) at room temperature.



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

32 Overview of steering



Safety informations and general information

- | | | | |
|---|---|---|---|
| 1 | Airbag unit | 6 | Steering gear (EPS) |
| 2 | Steering wheel | 7 | Track rod end, track rod, gaiter |
| 3 | Upper section of steering column shroud | 8 | Electric motor with control unit |
| 4 | Steering column | 9 | Lower section of steering column shroud |
| 5 | Steering shaft | | Adjustment work |
| | | | Troubleshooting |

32 00 ... Test conditions for chassis/wheel alignment check

Observe the following test conditions prior to the chassis/wheel alignment check:

1. Only BMW approved wheel and tyre combinations are installed on the vehicle.
2. Correct tread depth. The tread depth for each axle may differ from left to right by max. 1-2 mm.
3. Correct tyre pressure (see label on vehicle).
4. All chassis and suspension components must be technically OK.
5. Condition of suspension and shock absorbers OK: Visually inspect for breakage, etc.