

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!

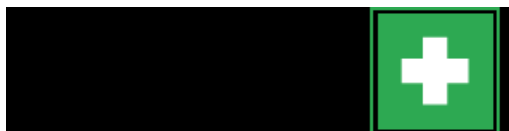
Possible symptoms are:

- 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.



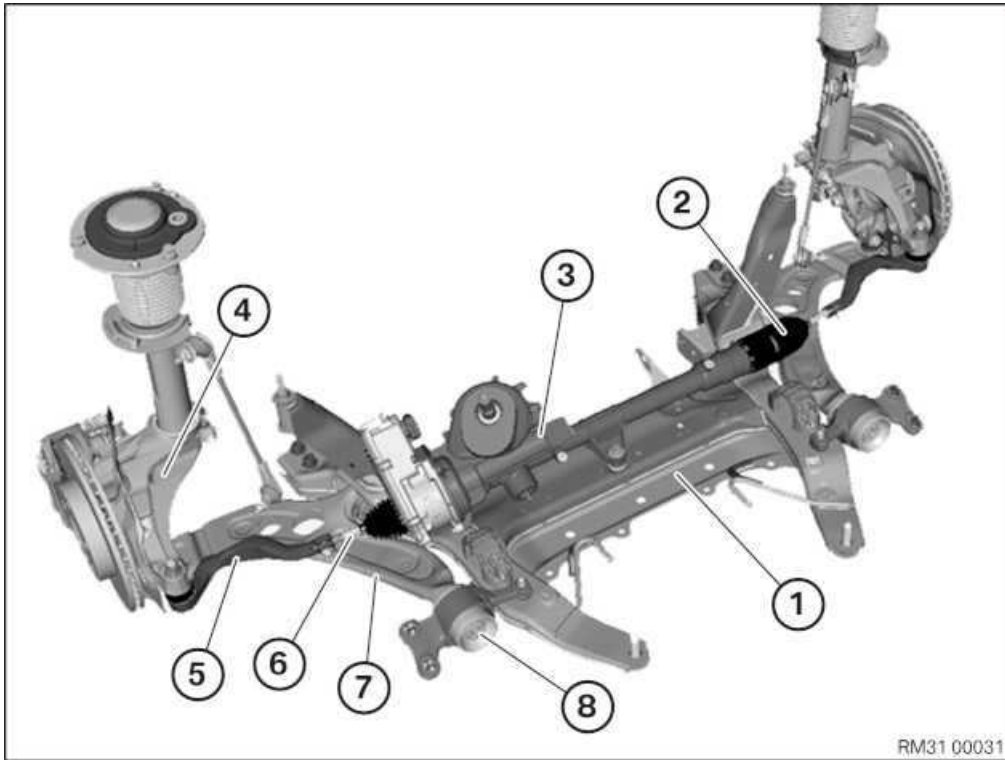
First aid measures:

- 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

31 00 ... Information on replacing shock absorbers

Situation:

When a shock absorber is faulty on one side (leaking, noises, limit values exceeded on the shock tester), often both shock absorbers on the axle in question are replaced.

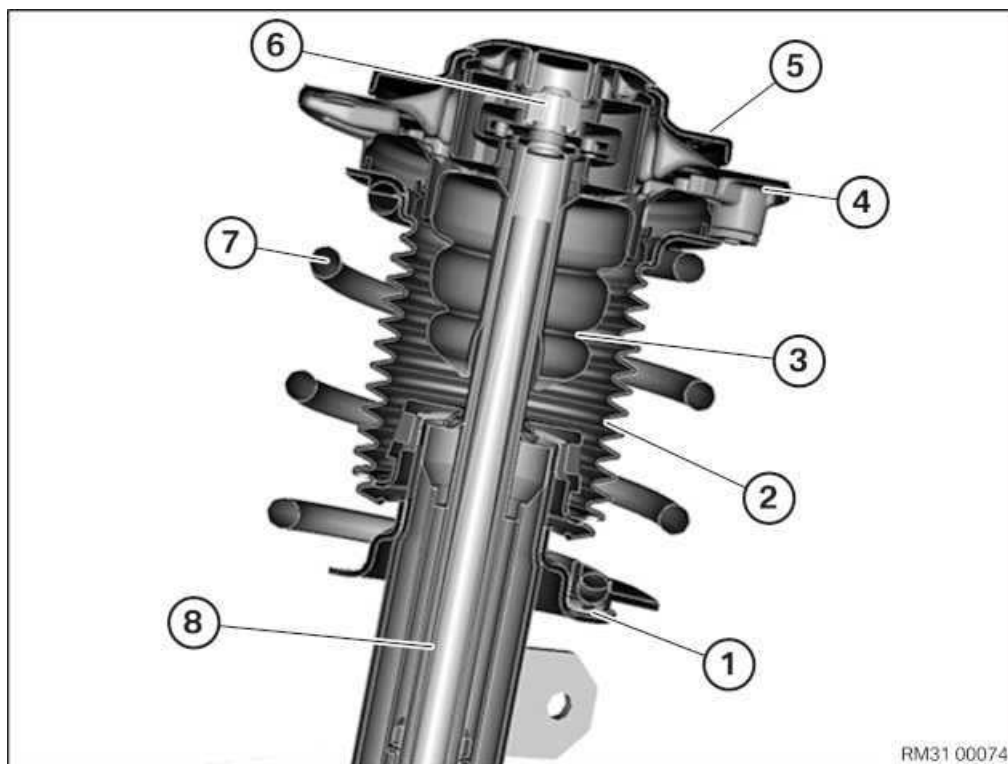
Effect:

This is not necessary for technical reasons and causes the manufacturer not to recognize the unnecessarily removed shock absorbers as defective parts. Unnecessarily high costs for the customer can be avoided by replacing the shock absorber on one side only.

Procedure:

If one shock absorber is damaged, it is only necessary to replace both shock absorbers when the car has driven in excess of 80 000 km.

31 Layout of spring strut shock absorber



- | | |
|---------------------------------------|----------------------------------|
| 1 Lower spring pad | 5 Protective cap with cover ring |
| 2 Dust boot with upper spring pad | 6 Nut |
| 3 Auxiliary damper | 7 Coil spring |
| 4 Support bearing with sealing washer | 8 Spring Struts |



Warning!

Danger of injury!

Before beginning work, position table lift with the lower frame securely on the floor.

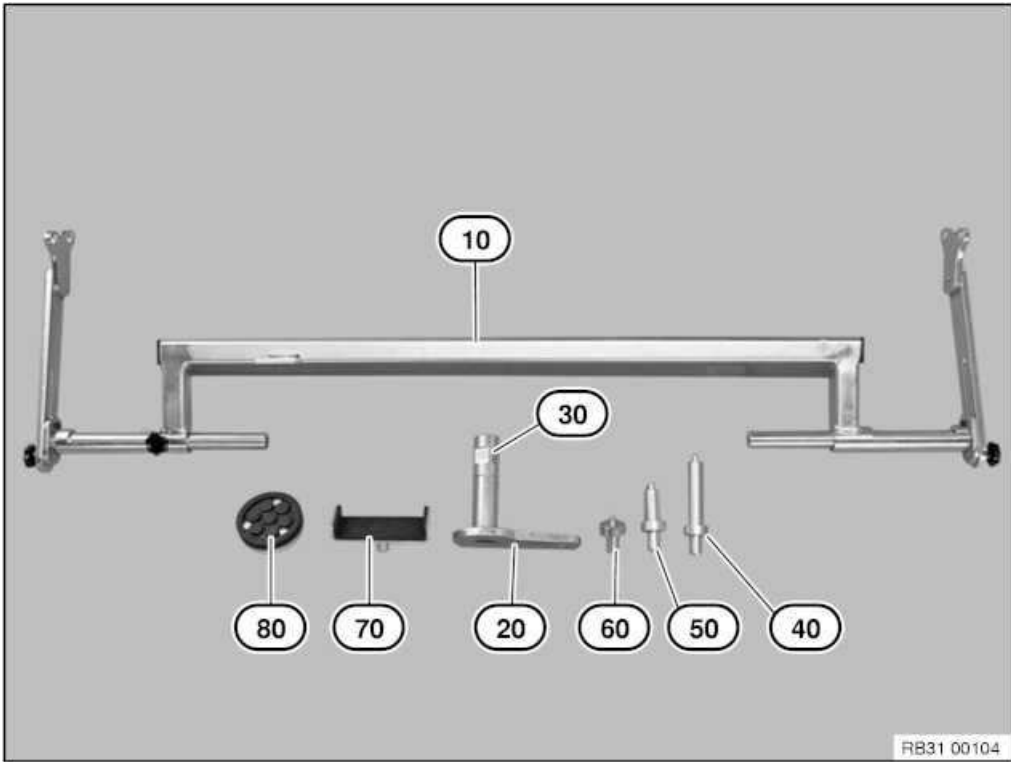
Danger area around mechanism below platform.

- Do not reach into or step into the danger area.
- Note permissible bearing capacity of table lift.
- Mount load centrally (danger of tipping) and secure against shifting.

Follow the operating instructions from the equipment manufacturer.

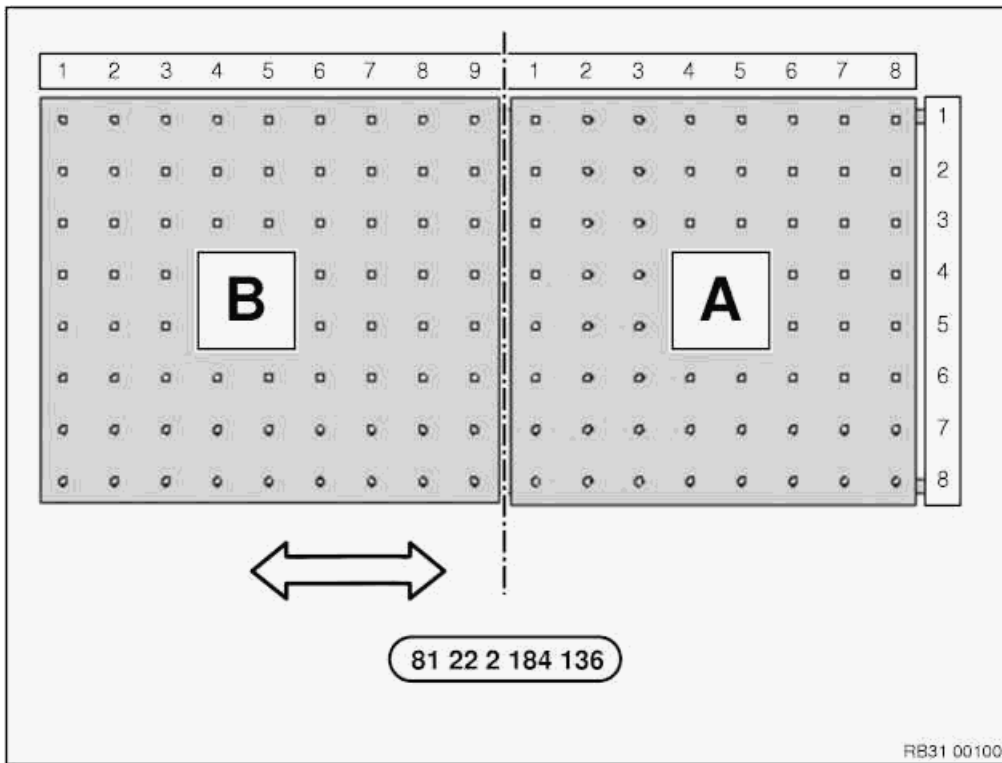


The mobile table lift is used for collision repairs and when removing large engines.



Adaptations for mounting front axle with engine and transmission.

No. 10	For mounting swivel bearing with brake disc
No. 20	Retaining element for adjustable fixture
No. 30	Adjustable fixture
No. 40	Distance pin 40 x 160 mm
No. 50	Distance pin 40 x 110 mm
No. 60	Distance pin 40 x 60 mm
No. 70	Fixture with U-profile
No. 80	Plate fixture Ø=100 mm

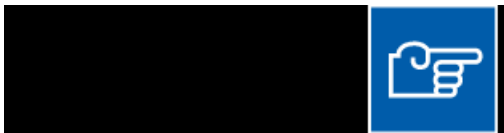


Release star knob screw on working plate (B) of table lift; the working surface (B) can be extended by approx. 310 mm.

Release all push-pull clamps and the working plates can be shifted by approx. 20 mm.

Working plate (A and B) can be raised and lowered by 3° on the long side and by 5° on the transverse side.

Working plate (A and B) is subdivided by a coordinate system and a possible installation position is recommended in the respective repair manual.



Important!

Follow the operating instructions from the equipment manufacturer.

31 00 ... Notes on repairing threads

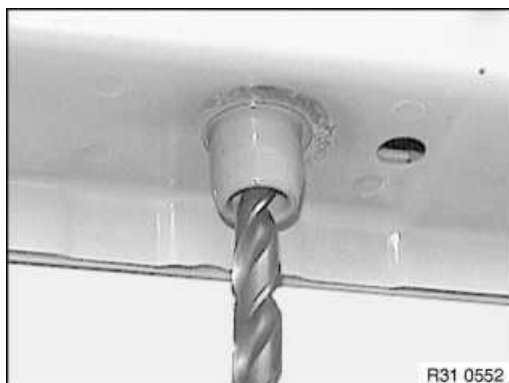


Important!

Install Helicoil thread inserts so that they are flush with the original thread.

Note:

Damaged threads on the engine support may be repaired with Helicoil thread inserts. Comply with the procedure described in the example.



Procedure:

1. Create a clean core hole; if necessary, drill out screw remnants



2. Create locating thread for Helicoil thread insert



3. Pick out Helicoil thread insert in accordance with the [table](#) and screw into the locating thread until flush with the original thread



4. Break drive pin and remove

31 00 ... Notes on wheel bearing replacement following accident damage

Wheel bearing facts:

In the event of accidents or driving conditions similar to accidents, shock-like loads to the wheel bearing units can cause slight damage to the bearing track. Despite initial running without noise, with continued use, this results in later noise generation at the wheel bearing.

Procedure:

The wheel bearing must be replaced on the damaged side of the axle if one or several of the following points apply:

- Visible or noticeable damage to the wheel bearing
- Rolling noises, radial/lateral runout on the wheel bearing
- Permissible tolerance for the wheel alignment is exceeded and no longer adjustable without the exchange of additional components
- Damage, permanent deformation or fractures to:
 - Wheel rims (major damage) and simultaneous negative result for wheel alignment
 - Spring struts, swivel bearings, wheel carriers
 - Wishbones
 - Struts or trailing links or anti-roll bar with this function
 - Body-side screwing/attachment points for wheel guide/control components
 - Track rods
 - Steering box fixtures

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

00 02 001 Raising the vehicle using a vehicle lift



Warning!

Danger to life!

Read and follow operating instructions for vehicle hoist.

Do not exceed approved load-carrying capacity and load distribution of vehicle hoist.

Weight compensation may be necessary due to the loading situation of the vehicle.

This also applies in the event of considerable removal of parts or conversions on the vehicle.

Note:

The vehicle hoist must comply with the relevant statutory/country-specific accident prevention regulations and be serviced according to the regulations.

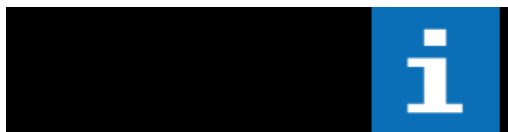


Caution!

Risk of damage!

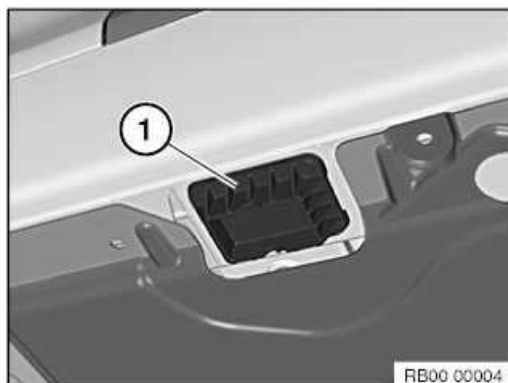
Before driving onto a vehicle hoist, make sure there is sufficient ground clearance between the vehicle hoist and the vehicle.

The vehicle may only be raised with the vehicle hoist at the four jacking points.



Necessary preliminary work:

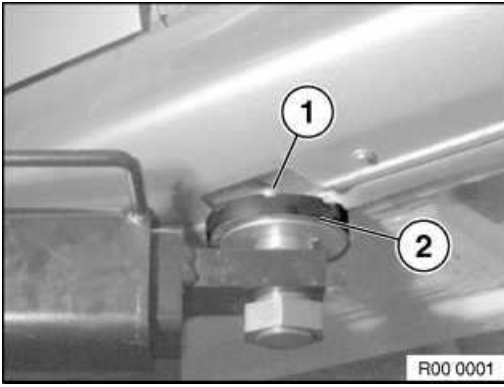
- If necessary, remove jacking points from equipment pack (with new vehicles) and insert from below into openings in front and rear sill areas



Caution!

All four jacking points (1) must be available!

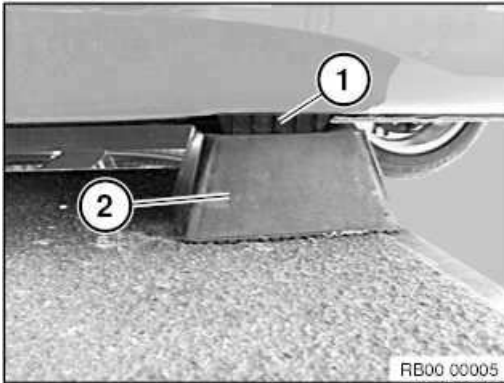
Never raise the vehicle without the jacking points (1)!



Caution!

Risk of damage!

Align support plates (2) of lifting platform arms to jacking points (1) in such a way that no adjoining components are touched and thereby damaged.



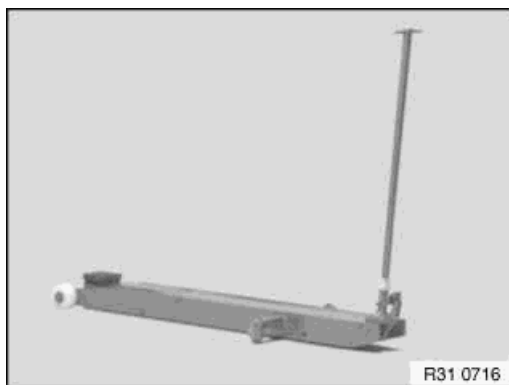
Caution!

Risk of damage!

Align the rubber block (2) with the jacking points (1) in such a way that no adjoining components are touched and thereby damaged.

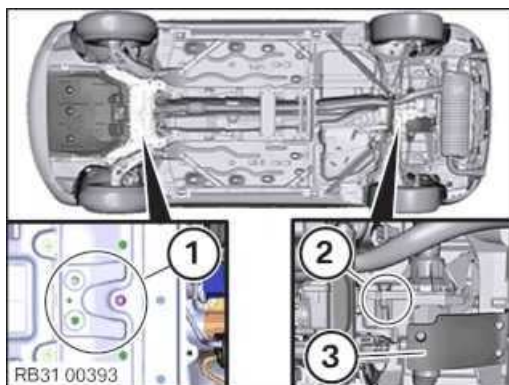
Never raise the vehicle without rubber blocks (or rigid foam blocks)!

There is a major risk of damage to the vehicle underbody!



Observe the following trolley-jack-related notes:

1. Only trolley jacks sold or approved by BMW, with a rubber plate on their mounting, may be used!
2. Trolley jacks must be regularly serviced and always checked for functional reliability before they are used!
3. Check the rubber plate on the trolley jack prior to each use, replacing if necessary.



Warning!

The vehicle may be raised with a trolley jack only at the following mounting point!

- 1 Centre of front axle support

Risk of damage!

Align the rubber plate on the trolley jack with the front axle support so as to prevent contact with and therefore damage to the underbody protection.

- 2 Rear axle final drive

Risk of damage!

Align the rubber plate on the trolley jack with the rear axle differential to prevent contact with and damage to the cover (3).

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



Warning!

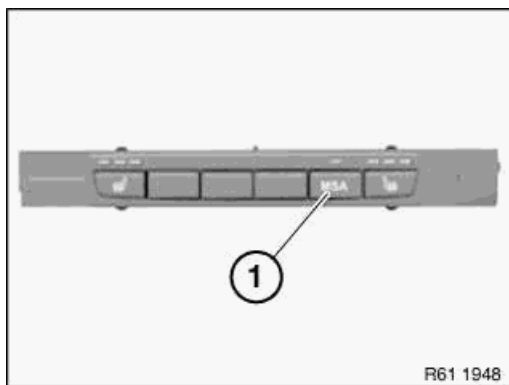
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

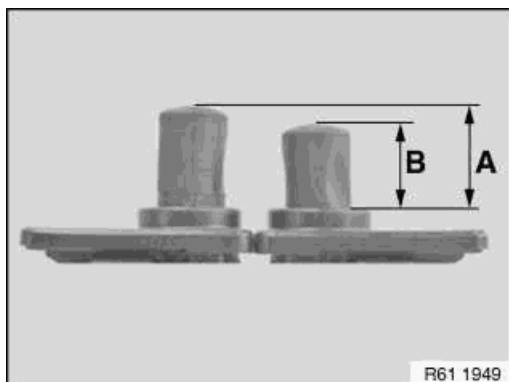
Observe safety precautions when working on MSA vehicles.

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:

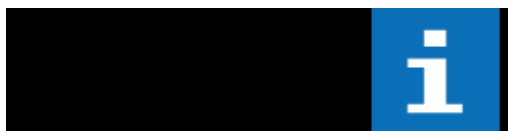
Observe country-specific waste disposal regulations.



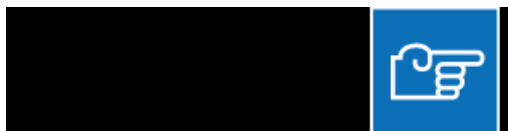
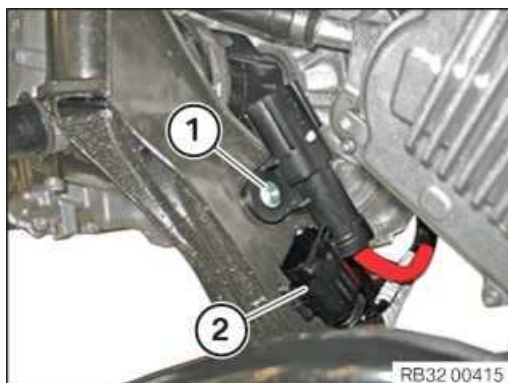
Measures if oil is unintentionally released:

- 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.

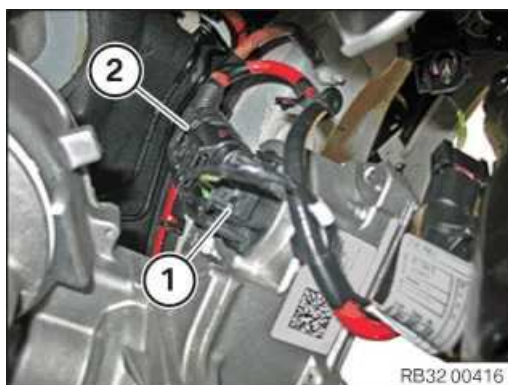
Note: Do not flush oil away with water or aqueous cleaning agents.

**Necessary preliminary tasks:**

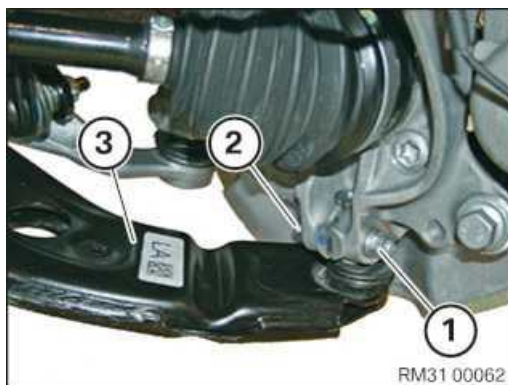
- Remove [front wheels](#).
- Lower [front axle support](#).

**Removal:**Only F45/F49 Plug-in Hybrid Electric Vehicle:

Loosen the screw (1) and unclip the connector housing (2) from the front axle support.

Only F45/F49 Plug-in Hybrid Electric Vehicle:

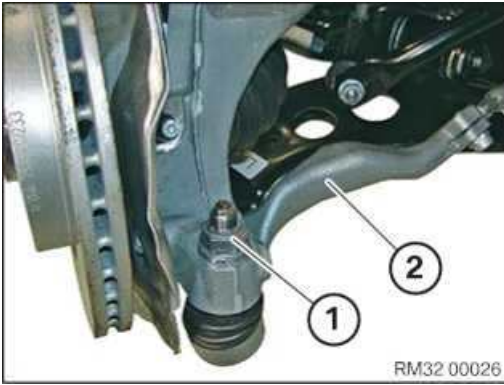
Unlock the connector (1) and (2) and pull it off the steering gear.



Release nut (1) of wishbone on left and right.

Pull out screw (2).

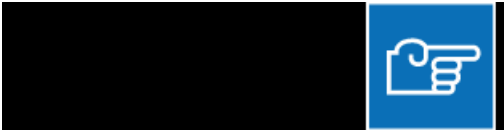
Release wishbone (3) from swivel bearing.



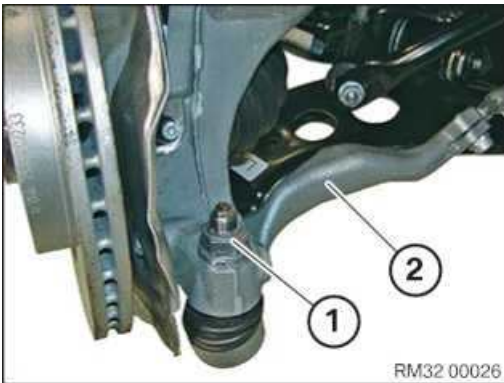
Slacken nut (1).

Release track rod (2) on left and right from swivel bearing.

Remove front axle complete.



Installation:



Position front axle completely.

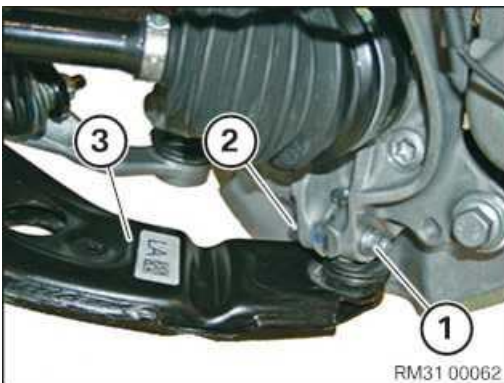
Position track rod (2) on the swivel bearing, left and right.

Replace nut (1).

Parts: Nut

Tighten nut (1), left and right.

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



Position wishbone (3) on the swivel bearing, left and right.

Replace nut (2) and bolt (1).

Parts: Bolt and nut

Insert screw (2), left and right.

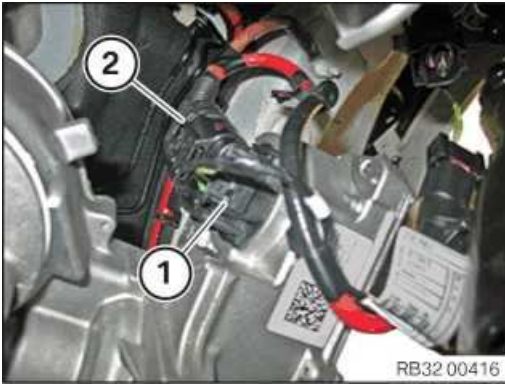
Tighten nut (1), left and right.

Tightening torque [31 12 1AZ](#).



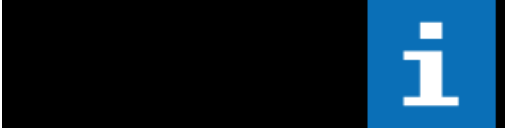
Only F45/F49 Plug-in Hybrid Electric Vehicle:

Tighten the screw (1) and clip in the connector housing (2) at the front axle support.



Only F45/F49 Plug-in Hybrid Electric Vehicle:

Connect the connectors (1) and (2) on the steering gear.



Required follow-up work:

- Raise (install) [front axle support](#).
- Install [front wheels](#).

31 10 000 Removing and installing complete front axle \PREMIUM



WARNING

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

Danger! Life-threatening injuries!

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



WARNING

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

Danger! Life-threatening injuries!

- Secure the vehicle hoist against lowering and lifting.



WARNING

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

Danger! Life-threatening injuries!

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

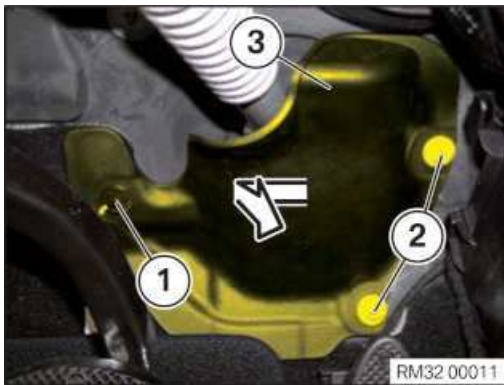
PRELIMINARY WORK

1 – Disconnecting all battery earth leads

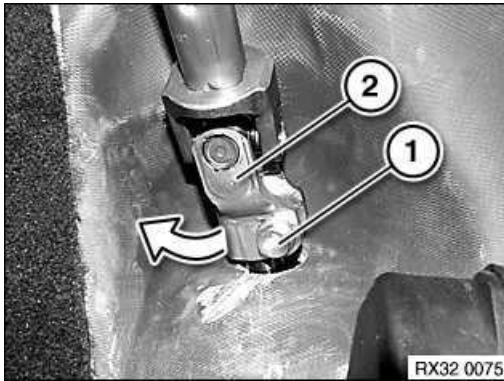


- See additional information.

2 – Releasing lower steering shaft from steering gear

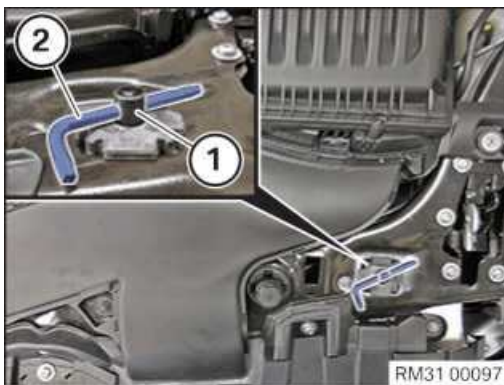


- **If installed:**
- Unfasten nut (1).
- Unscrew the nuts (2) by 1 rotation.
Do not remove the nuts (2) !
- Remove the cover (3) on the steering column in the direction of the arrow.
The side footwell trim must not be disassembled!



- Loosen screw (1).
- Swivel out the universal joint (2) of the bottom steering shaft from the steering gear in the direction of the arrow.

3 – Securing radiator on left and right



NOTICE

Perform the operations on the left and right side.

- Fasten radiator at centring pin (1) with suitable tool (2).

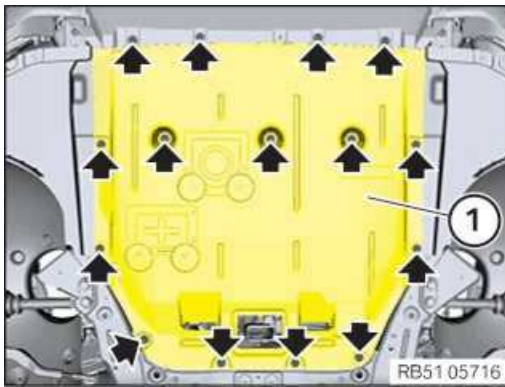
4 – Removing both front wheels



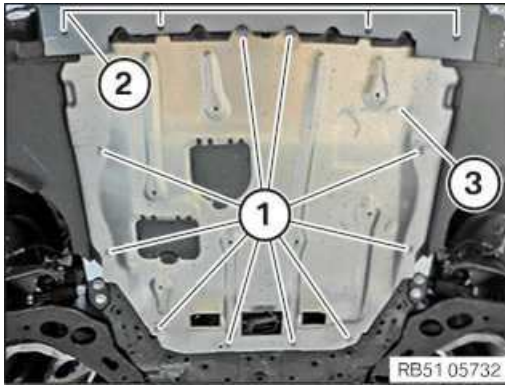
► Removing the wheel

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

5 – Removing the front underbody protection

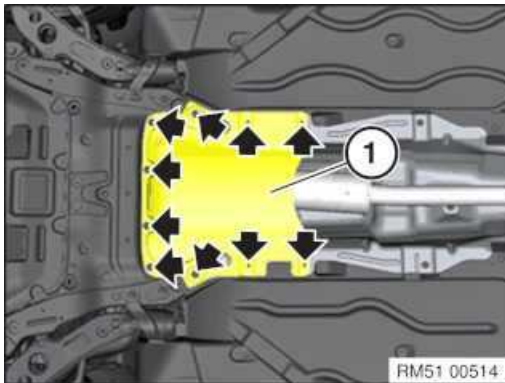


- Remove screws (arrows).
- Thread out and remove the front underbody protection (1) from the bumper panel.



- **Equipment specification with metal underide protection:**
- Loosen screws (1) and (2).
- Thread out and remove the underide protection (3).

6 – If installed: Removing rear underbody protection



- Remove screws (arrows).
- Remove the rear underbody protection (1).

7 – Removing front left and right wheel arch cover



NOTICE

Perform the operations on the left and right side.

► Remove the front wheel arch trim



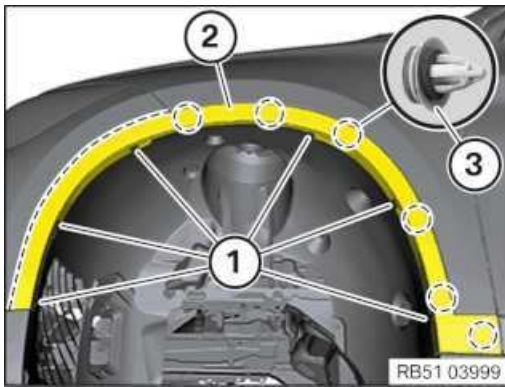
NOTICE

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



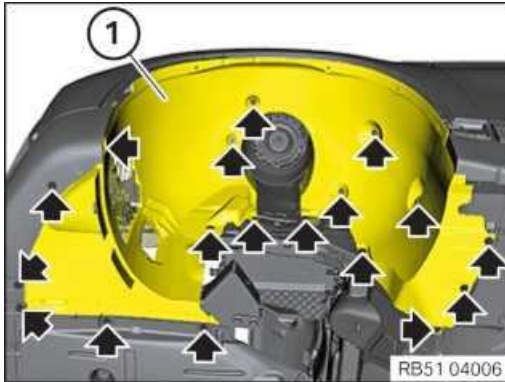
NOTICE

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



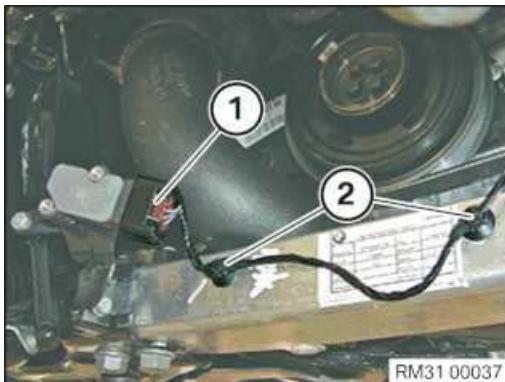
- Remove the blind rivets (1).
- Release the wheel arch trim (2) in the area of the side panel from the clips (3).
- Release the wheel arch trim (2) from the latch mechanisms on the bumper and remove.

► Remove front wheel arch cover



- Unscrew all bolts and nuts (arrows).
- Guide the wheel arch cover (1) out.

8 – With right installation: Detaching ride height sensor cable



- Unlock plug connection (1) and disconnect.
- Release cable clip (2) from deformation element adapter.

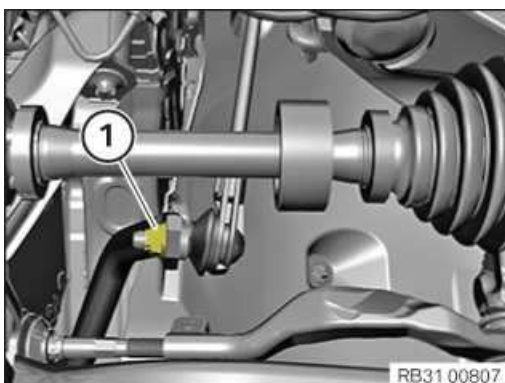
9 – Releasing anti-roll bar on left and right from anti-roll bar link



NOTICE

Perform the operations on the left and right side.

► Detach the anti-roll bar from the anti-roll bar link



- Unfasten nut (1).
- Note:** Use the Torx socket for counter support.
- Loosen the anti-roll bar link from the anti-roll bar .

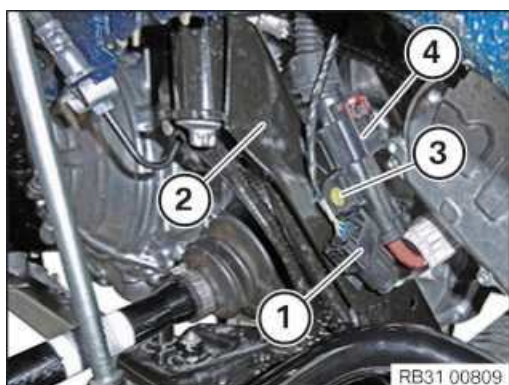
10 – Detaching rubber mount from front axle support



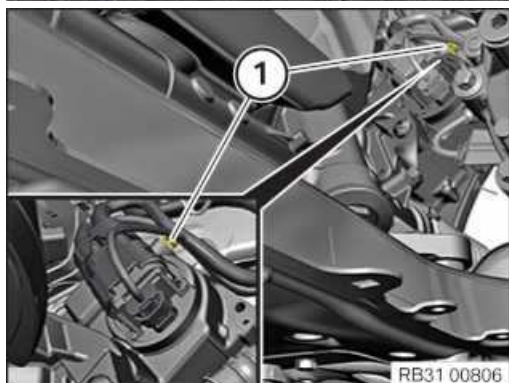
- Spray rubber mount (1) with lubricant and release from holder on front axle support.

11 – Disconnecting plug connections from steering gear

► If installed: Detach connectors from the front axle carrier



- Release the plug connection (1) from the front axle support (2).
- Loosen screw (3).
- Release the plug connection (4) from the front axle support (2).

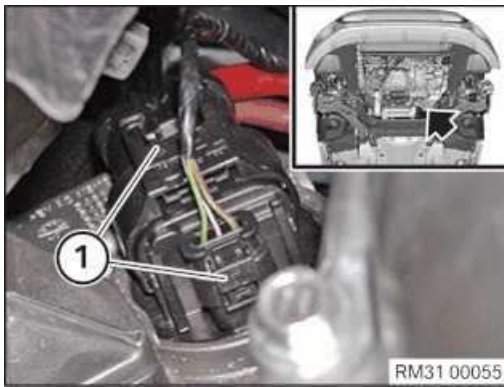


- Disconnect wiring harness (1) from steering gear.



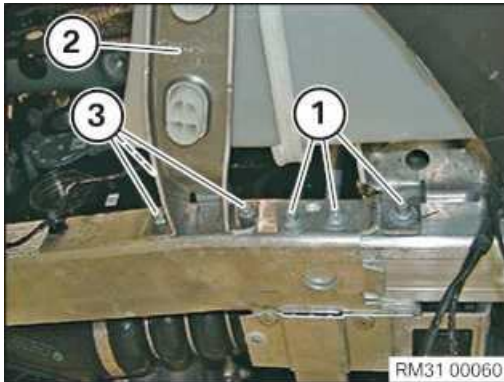
- To unlock the plug connections (see the following work step): unlock plug connections (arrow) with the right hand.

The plug connections can be reached via the left-hand output shaft.



- Unlock plug connections (arrow) (1) and disconnect from the steering gear.
- Make sure when lowering the front axle that the cables are not damaged!

12 – Releasing the mounted part from the front axle support



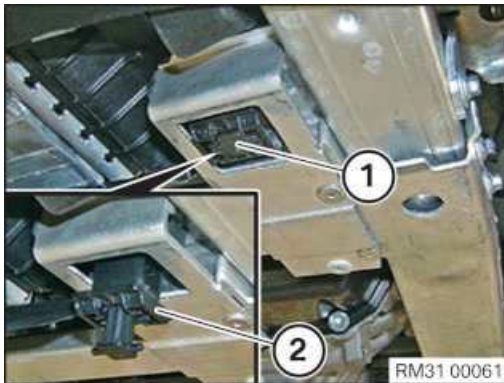
- **Only on right side:** Loosen screws (3) and remove holder for washer fluid reservoir (2).



NOTICE

Perform the operations on the left and right side.

- Loosen screws (1).



NOTICE

Perform the operations on the left and right side.

- Unlock safety catch (1) of the lock (2) from the holder for the charge air cooler.
- Completely remove locks (2).



- Loosen screw (2) of the engine support (3) on the front axle (1).

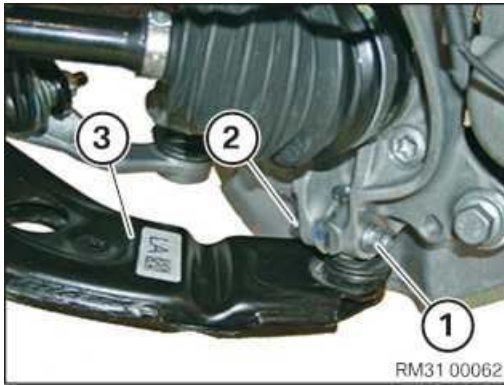


NOTICE

Perform the operations on the left and right side.

- Loosen screws (1).

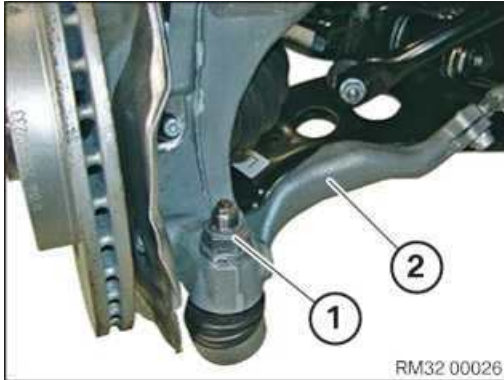
13 – Detaching and removing front axle completely



NOTICE

Perform the operations on the left and right side.

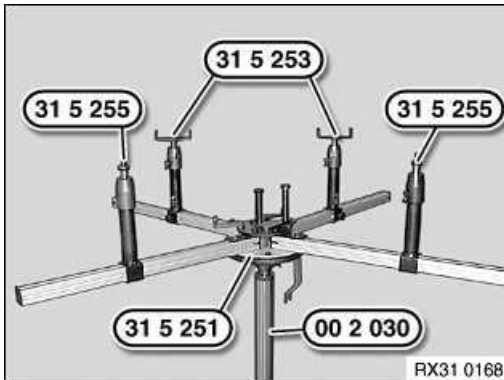
- Unfasten nut (1).
- (2) Pull out screw.
- Detach the wishbone (3) from the swivel bearing .



NOTICE

Perform the operations on the left and right side.

- Unfasten nut (1).
- Detach the track rod (2) from the swivel bearing.

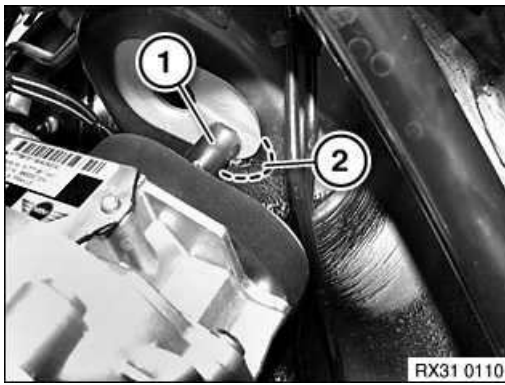


- Fit the special tool completely onto the workshop jack **0 490 133 (00 2 030)** with an auxiliary person.
- Insert special tools in telescopic supports of a profile rail pair.
- Insert special tools in telescopic supports of other profile rail pair.

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



- Align special tools and to front axle support.
 - Support front axle support by operating workshop jack **0 490 133 (00 2 030)**.
- Note:** The centre of gravity of the front axle support must be positioned centrally over the workshop jack!
- Secure front axle support with special tool to special tool .

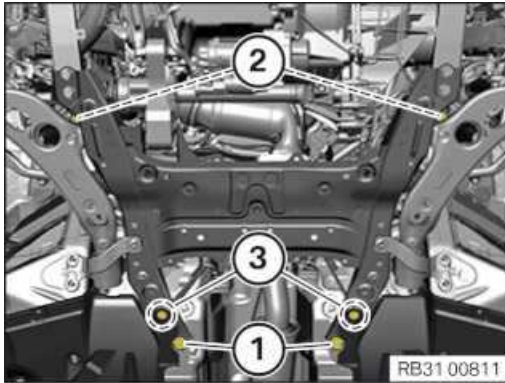


TECHNICAL INFORMATION

Non-compliance with the regulations for installation and disassembly may result in component damage. All work must be performed with care and in compliance with the regulations.

- When raising and lowering the front axle support, make sure that the torsion bar (1) of the electromechanical steering gear (EPS) in area (2) does not collide with the bulkhead!

Note: Collision with the bulkhead may result in damage to the electromechanical steering gear (EPS)!



- If applicable, release the screws in area (3).
- Release screws (1) (front axle support, rear).
- Release screws (2) (front axle support, front).
- Bend the underbody panelling to the side in area (3).
- When lowering, release charge air cooler from its rubber mounts.
- Completely lower and remove the front axle.

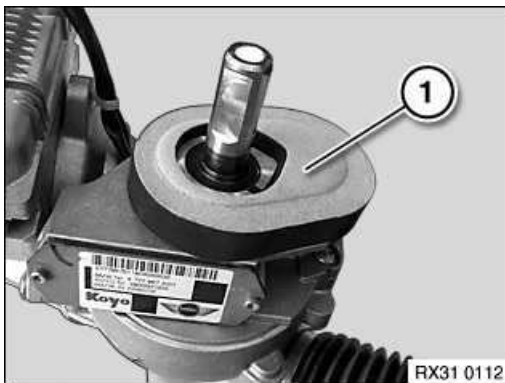


TECHNICAL INFORMATION

Note the information on thread repairs using Helicoil thread inserts. For more information see: 41 00 ... Notes on repairing threads

- Check threads for damage; if necessary, repair with Helicoil thread inserts.

14 – Mount and secure the complete front axle



- Remove the seal (1).
 - Clean surface on steering gear.
 - Renew gasket (1).
- Parts:** Gasket
- Position the seal (1) and glue it on.

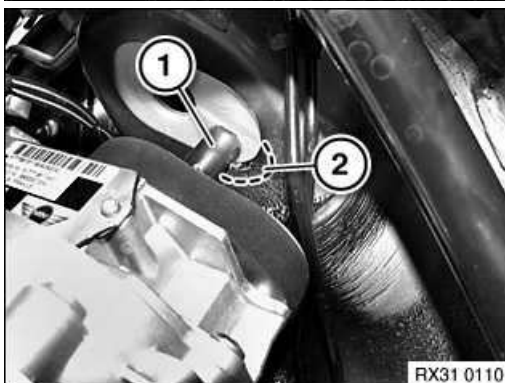


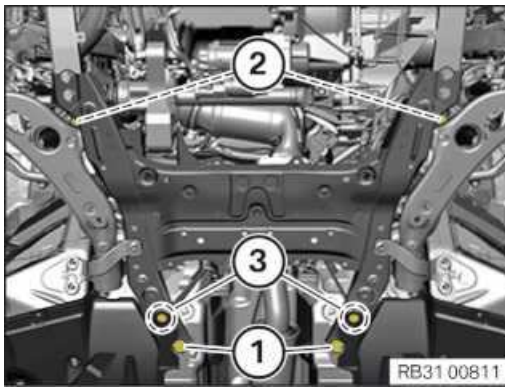
TECHNICAL INFORMATION

Non-compliance with the regulations for installation and disassembly may result in component damage. All work must be performed with care and in compliance with the regulations.

- When raising and lowering the front axle support, make sure that the torsion bar (1) of the electromechanical steering gear (EPS) in area (2) does not collide with the bulkhead!

Note: Collision with the bulkhead may result in damage to the electromechanical steering gear (EPS)!





- Position front axle support.
- Bend underbody panellings in the areas (3) to one side.
- Raise front axle support.
- When raising, insert charge air cooler into the rubber mount of the charge air cooler on cross member.
- Renew screws (1) and (2).

Parts: Bolts

- Tighten the screws (1).

Rear end of front axle support to body

M14 screw	Renew screw.	Tightening torque	175 Nm
-----------	--------------	-------------------	--------

- Tighten down screws (2).

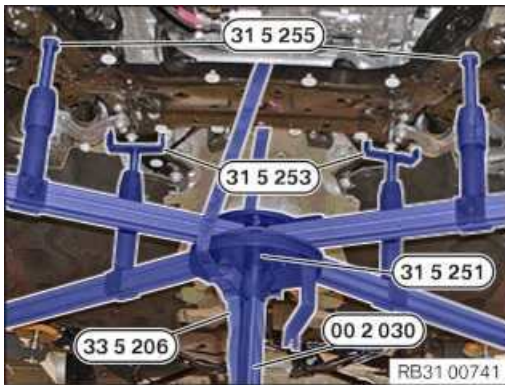
Front axle support, front to body

M12 screw	Renew screw.	Tightening torque	108 Nm
-----------	--------------	-------------------	--------

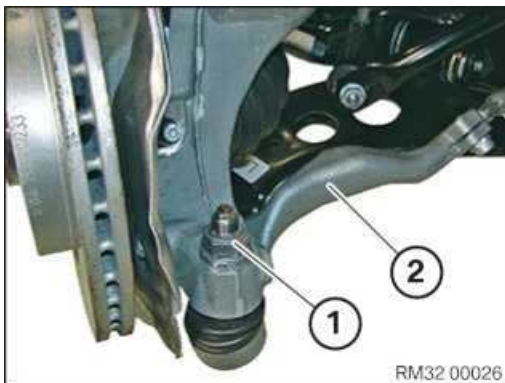
- If necessary, tighten the screws in the areas (3).

Underbody protection to body

Screw		Tightening torque	3 Nm
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- Remove special tool from special tool .
- Lower universal jack **0 490 133 (00 2 030)** with the special tool and place it to the side.



NOTICE

Perform the operations on the left and right side.

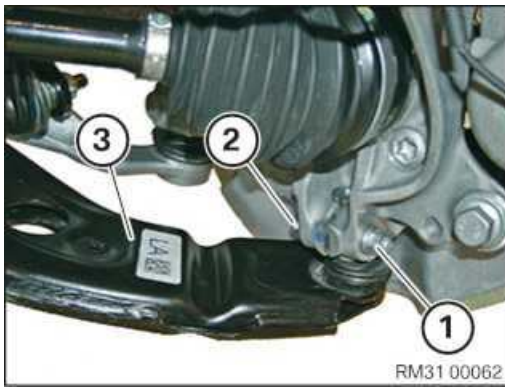
- Position the track rod (2) on the swivel bearing .
- Renew nut (1).

Parts: Nut

- Tighten nut (1).

Track rod end to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm
-----	------------	-------------------	--------



NOTICE

Perform the operations on the left and right side.

- Position the wishbone (3) on the swivel bearing .
- Renew the bolt (2) and the nut (1).

Parts: Bolt, nut

- Insert screw (2).
- Tighten nut (1).

Wishbone to swivel bearing

M10	Exclusively use the screw to tighten! Renew screw and nut.	Tightening torque	60 Nm
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POSTPROCESSES

15 – Install the mounted parts on the front axle support



NOTICE

Perform the operations on the left and right side.

- Renew screws (1).
- Tighten the screws (1).

Parts: Bolts

Holder, wishbone rubber mount, to body

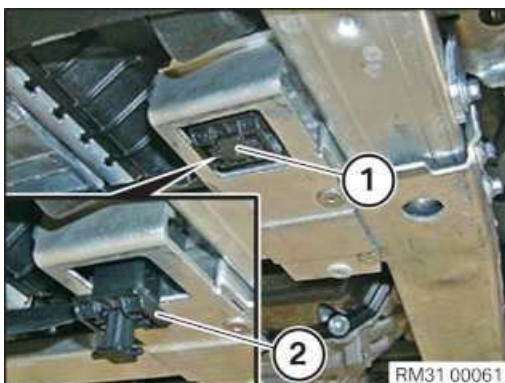
M10 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °



- Position the engine support (3) on the front axle support (1).
- Tighten down screw (2).

Holder with rubber mount to front axle support

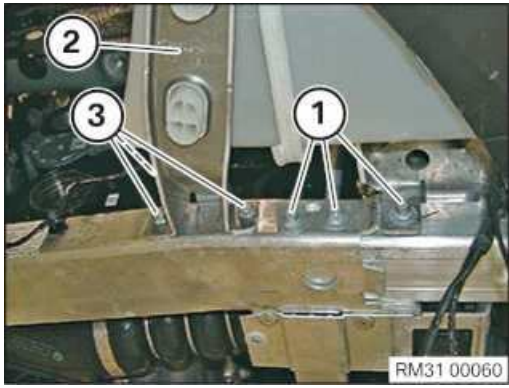
M12 screw		100 Nm
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NOTICE

Perform the operations on the left and right side.

- Position the lock (2).
- Lock the bracket (1) of the lock (2) of the holder for the charge air cooler.



- **Only on right side:** Position the holder for the washer fluid reservoir (2).
- Tighten down screws (3).

Washer fluid reservoir holder to front axle support adapter plate

		Tightening torque	10 Nm
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NOTICE

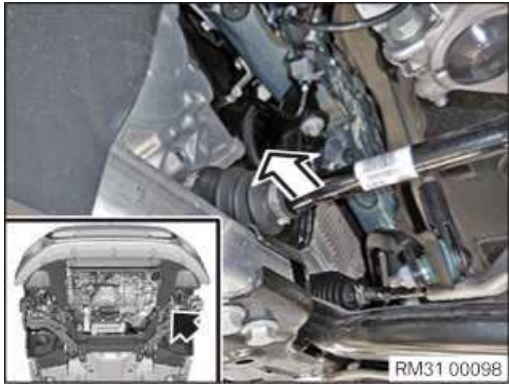
Perform the operations on the left and right side.

- Tighten the screws (1).

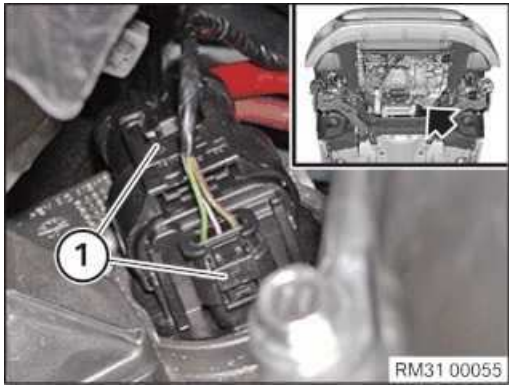
Deformation element, bottom, to adapter plate, front axle carrier

		Tightening torque	11,8 Nm
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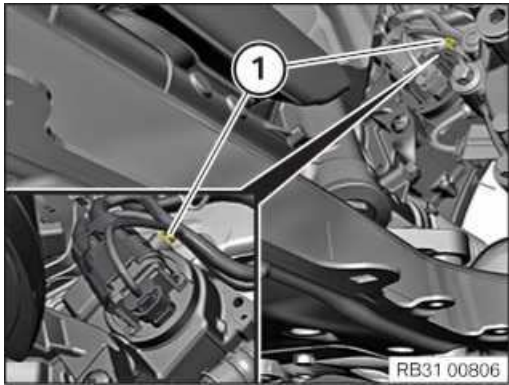
16 – Attaching connector at steering gear



- To connect the connector (see the following step): Connect the connector with the right hand.
The connectors can be accessed via the left output shaft.

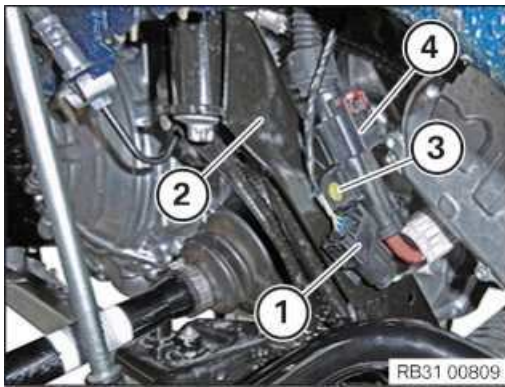


- Connect and lock connector (arrow) (1) with the steering gear.



- Fasten the wiring harness (1) on the steering gear.

► If installed: Fasten the plug connections at the front axle support



- Position the plug connection (4) at the front axle support (2).
- Tighten down screw (3).

Holder to front axle support

Oval-head screw TS5 x 16		Tightening torque	2,6 Nm
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- Fasten the plug connection (1) at the front axle support (2).

17 – Securing rubber mount on front axle support



- Check rubber mount (1), replace if necessary.

Parts: Rubber mount

- Spray rubber mount (1) with lubricant and slide onto holder on front axle support.

18 – Securing anti-roll bar on left and right on the anti-roll bar link



NOTICE

Perform the operations on the left and right side.

► Fastening anti-roll bar on the anti-roll bar link

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

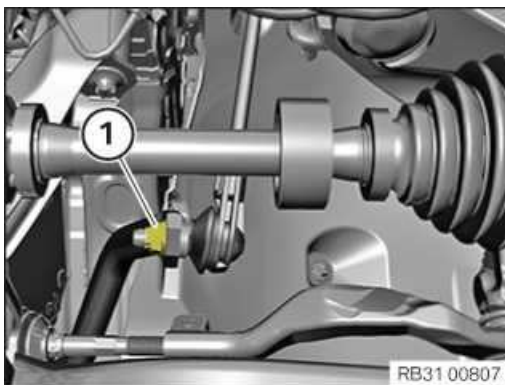
Parts: Nut

- Tighten nut (1).

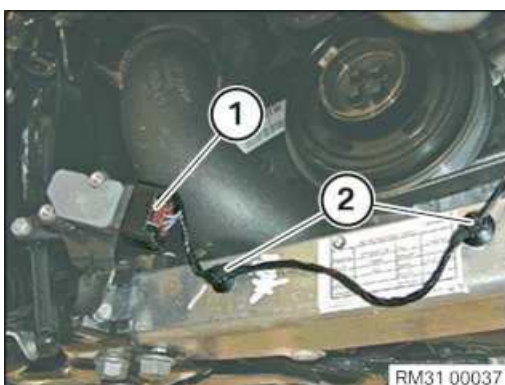
Note: Use the Torx socket for counter support.

Anti-roll bar link to anti-roll bar

M10	Renew nut.	Tightening torque	56 Nm
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19 – With right installation: Securing the cable for the ride height sensor



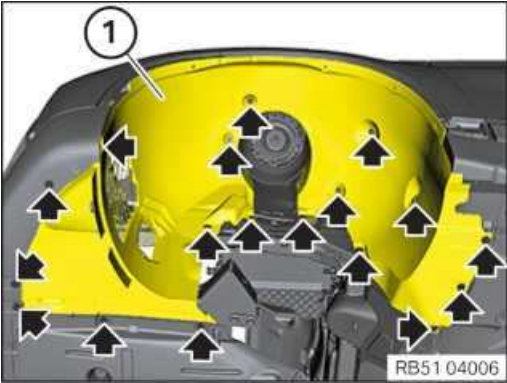
- Secure the cable clip (2) on the adapter of the deformation element.
- Connect connectors (1) and lock.

20 – Installing front left and right wheel arch cover



NOTICE

Perform the operations on the left and right side.



► Installing the front wheel arch cover

- Guide the wheel arch cover (1) in.
- Tighten all bolts and nuts (arrows).

Wheel arch cover to body

Plastic nut		Tightening torque	2,6 Nm
Screw		Tightening torque	2,6 Nm

Wheel arch cover to body

Screw		Tightening torque	2,5 Nm
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Wheel arch cover to body

Plastic nut		Tightening torque	3 Nm
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► Installing front wheel arch trim



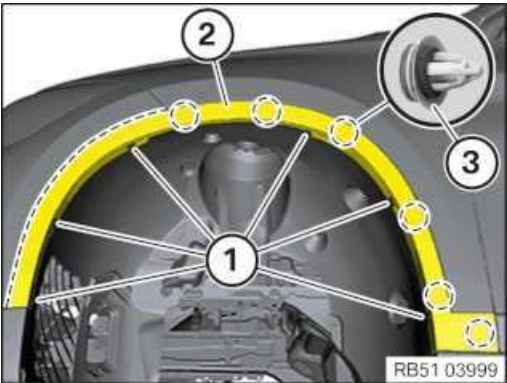
NOTICE

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



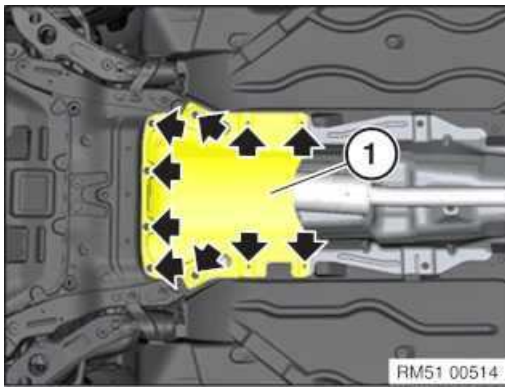
NOTICE

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



- Check the clips (3) for damage and renew where required.
The clips (3) must not be damaged or missing.
- Feed in wheel arch trim (2) and engage on the clips (3).
- Engage wheel arch trim (2) into the latch mechanisms on the bumper panel.
- Mount blind rivet (1) using the special tool **0 496 521 (00 2 230)**.

21 – If installed: Installing underbody protection at rear

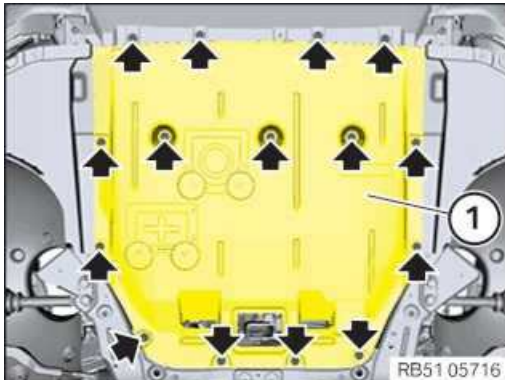


- Position rear underbody protection (1).
- Tighten screws (arrows).

Underbody protection to body

Screw		Tightening torque	3 Nm
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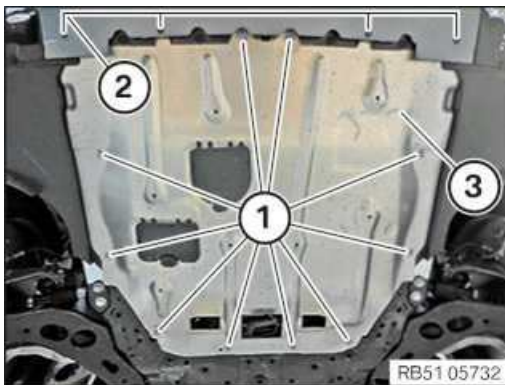
22 – Installing the front underbody protection



- Guide the front underbody protection (1) in under the bumper panel and position it at the screw points.
- Tighten screws (arrows).

Underbody protection front

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



- **Equipment specification with metal underride guard:**
- Guide in and attach the underride guard (3).
- Tighten down screws (1) and (2).

Underbody protection front

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

23 – Installing both front wheels

► Mounting the wheel

► Clean the contact surfaces between the brake disc and the wheel rim



TECHNICAL INFORMATION

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

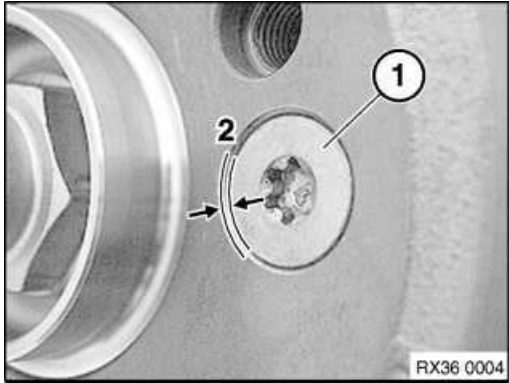
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.
Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue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



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

Do not operate special tool **2 344 011** with an impact screwdriver.

- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Renew mounting bolt (1).

Parts: Mounting bolt

- Check that the mounting bolt (1) for the brake disc is securely seated.

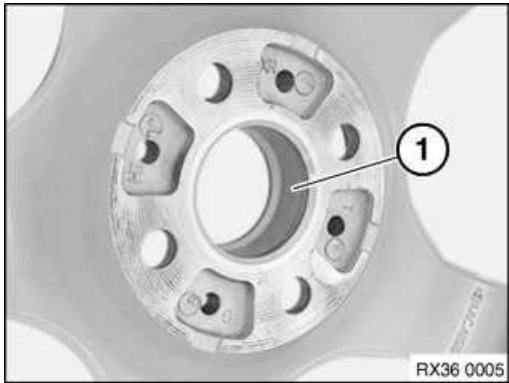
The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm
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Brake disc to front wheel hub

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



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).



TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

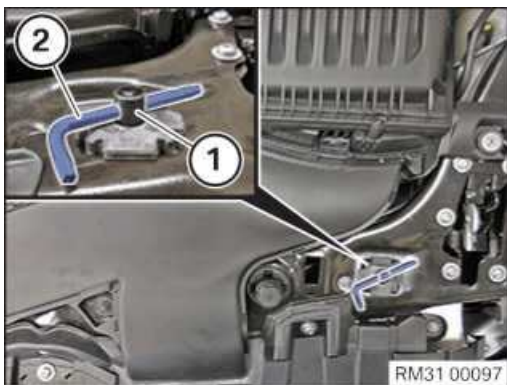
Parts: Wheel bolts

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

Wheel bolts

M 14/AF 17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Check	140 Nm

24 – Removing fastener for left and right radiator

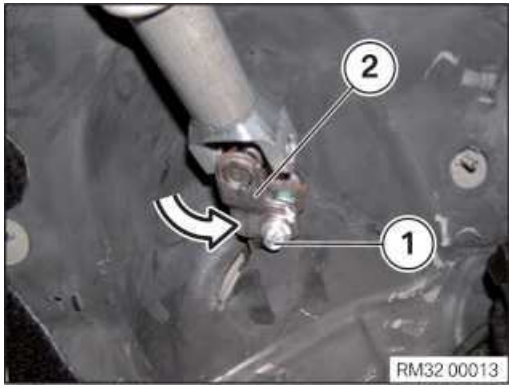


NOTICE

Perform the operations on the left and right side.

- Remove suitable tool (2) from the centering pin (1).

25 – Secure the steering shaft at the bottom on the steering gear



- Clean the screw lock residue from the screw thread in the universal joint (2).
 - Pivot the universal joint (2) in the direction of the arrow to the steering gear.
 - Renew the screw (1).
- Parts:** Screw
- Tighten down screw (1).

Lower steering shaft to steering gear

M10	Clean screw thread and remove remains of screw locking agent. Renew screw.	Tightening torque	28 Nm
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- **If installed:**
- Position the cover on the steering column (2).
- Tighten nuts (1).

Steering column cover to bulkhead

Plastic nut		Tightening torque	3 Nm
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26 – Disconnecting all battery earth leads



- See additional information.

Additional Information

Overview of Tightening Torques

Rear end of front axle support to body

Used in step [14](#)

M14 screw	Renew screw.	Tightening torque	175 Nm
-----------	--------------	-------------------	--------

Front axle support, front to body

Used in step [14](#)

M12 screw	Renew screw.	Tightening torque	108 Nm
-----------	--------------	-------------------	--------

Underbody protection to body

Used in step [14](#) [21](#)

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

Track rod end to swivel bearing

Used in step [14](#)

M14	Renew nut.	Tightening torque	175 Nm
-----	------------	-------------------	--------

Wishbone to swivel bearingUsed in step [14](#)

M10	Exclusively use the screw to tighten! Renew screw and nut.	Tightening torque	60 Nm
-----	---	-------------------	-------

Holder, wishbone rubber mount, to bodyUsed in step [15](#)

M10 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °

Holder with rubber mount to front axle supportUsed in step [15](#)

M12 screw			100 Nm
-----------	--	--	--------

Washer fluid reservoir holder to front axle support adapter plateUsed in step [15](#)

		Tightening torque	10 Nm
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Deformation element, bottom, to adapter plate, front axle carrierUsed in step [15](#)

		Tightening torque	11,8 Nm
--	--	-------------------	---------

Holder to front axle supportUsed in step [16](#)

Oval-head screw TS5 x 16		Tightening torque	2,6 Nm
--------------------------	--	-------------------	--------

Anti-roll bar link to anti-roll barUsed in step [18](#)

M10	Renew nut.	Tightening torque	56 Nm
-----	------------	-------------------	-------

Wheel arch cover to bodyUsed in step [20](#)

Plastic nut		Tightening torque	2,6 Nm
Screw		Tightening torque	2,6 Nm

Wheel arch cover to bodyUsed in step [20](#)

Screw		Tightening torque	2,5 Nm
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Wheel arch cover to bodyUsed in step [20](#)

Plastic nut		Tightening torque	3 Nm
-------------	--	-------------------	------

Underbody protection frontUsed in step [22](#)

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

Brake disc to rear wheel hubUsed in step [23](#)

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

Brake disc to front wheel hubUsed in step [23](#)

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

Wheel bolts

Used in step 23

M 14/AF 17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Check	140 Nm

Lower steering shaft to steering gear

Used in step 25

M10	Clean screw thread and remove remains of screw locking agent. Renew screw.	Tightening torque	28 Nm
-----	---	-------------------	-------

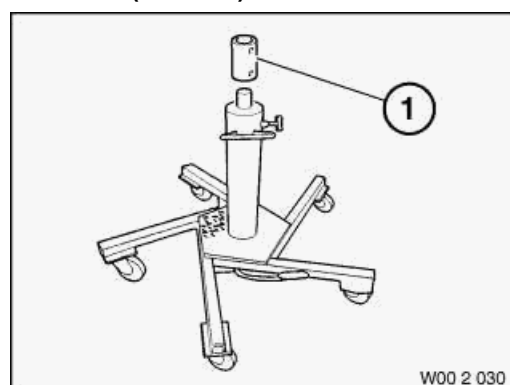
Steering column cover to bulkhead

Used in step 25

Plastic nut		Tightening torque	3 Nm
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Overview of Special Tools

0 490 133 (00 2 030) Device



Common

Used in step 13 14

Usage	(universal hydraulic lifter base unit) Chassis and hydraulic lifter - For removing and installing rear axle supports and gearboxes. Also for soft top mounts. Is replaced by 81 22 2 219 012		
Included in the tool or work			
Storage location			
Replaced by			
In connection with			
SI-Number	01 05 90 (207)		

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 490 134 (00 2 031)		Adapter (adapter for gearbox holder) Model series: E30, E31, E32, E34, E36	

0 496 521 (00 2 230) Pliers



Common

Used in step 20

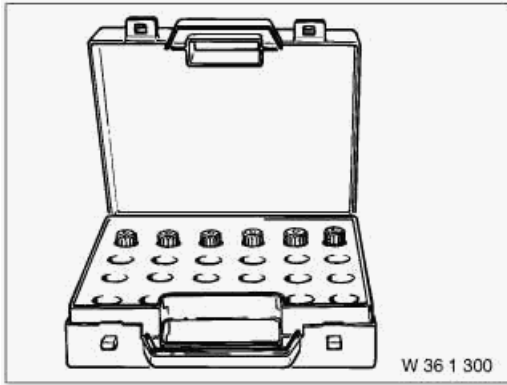
Usage	(Blind rivet pliers for plastic rivets) For shaft diameters of 3.5 mm, 3.9 mm and 4.5 mm		
Included in the tool or work			
Storage location	C25		
Replaced by			
In connection with			
SI-Number	01 17 08 (478)		

2 344 011 Tool



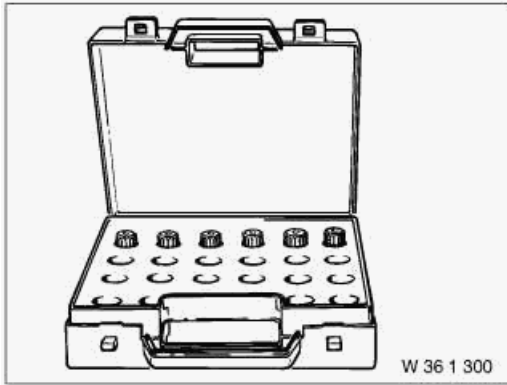
Common		Used in step	23
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.		
Included in the tool or work			
Storage location			
Replaced by			
In connection with			
SI-Number	08 08 12 (872)		

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



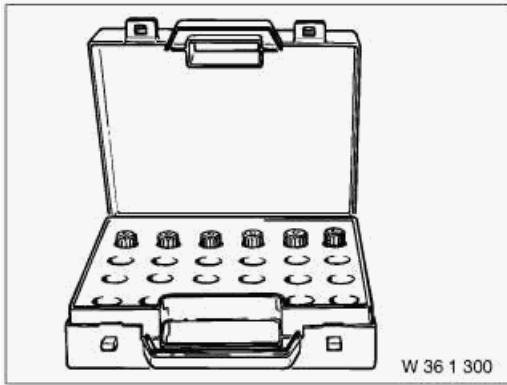
Common		Used in step	4
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259		
Included in the tool or work	0 492 518		
Storage location			
Replaced by			
In connection with			
SI-Number			

0 495 224 (36 1 326) Wheel stud



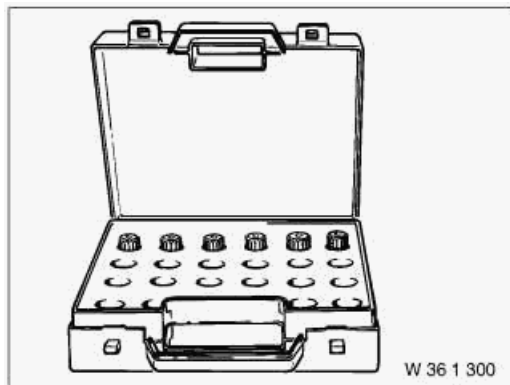
Common		Used in step	4
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546		
Included in the tool or work	0 492 518		
Storage location			
Replaced by			
In connection with			
SI-Number			

0 495 225 (36 1 327) Wheel stud



Common		Used in step	4
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547		
Included in the tool or work	0 492 518		
Storage location			
Replaced by			
In connection with			
SI-Number			

0 495 226 (36 1 328) Wheel stud



Common

Used in step 4

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

Included in the tool or work 0 492 518

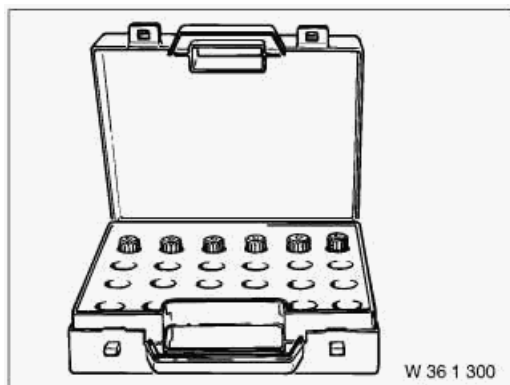
Storage location

Replaced by

In connection with

SI-Number

0 495 227 (36 1 329) Wheel stud



Common

Used in step 4

Usage (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341

Included in the tool or work 0 492 518

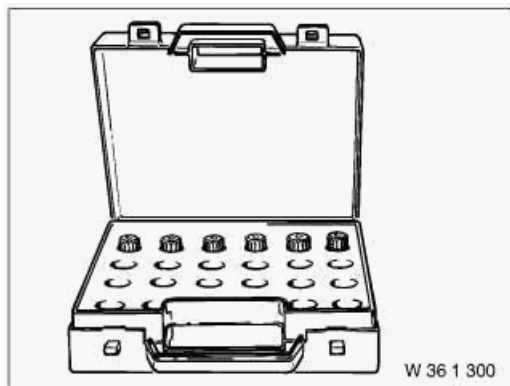
Storage location

Replaced by

In connection with

SI-Number

0 495 228 (36 1 331) Wheel stud



Common

Used in step 4

Usage (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342

Included in the tool or work 0 492 518

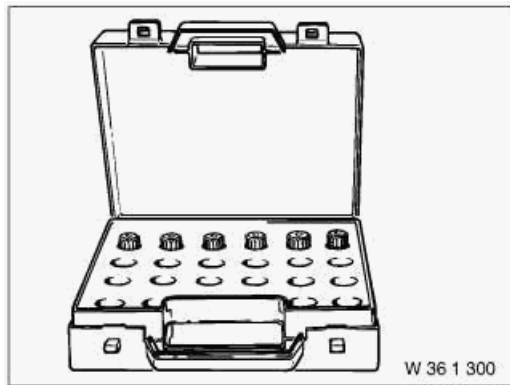
Storage location

Replaced by

In connection with

SI-Number

0 495 229 (36 1 332) Wheel stud



Common

Used in step 4

Usage (Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343

Included in the tool or work 0 492 518

Storage location

Replaced by

In connection with

SI-Number

Used in step 4

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

General repair instructions	Used in step
41 00 ... Notes on repairing threads	

[illegible]

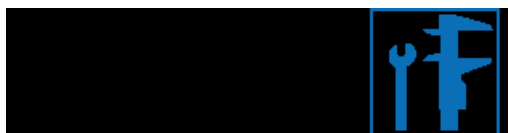
Operating materials

Used in step

[2.0 Grease for wheel centring](#)

23

31 11 506 Lowering/raising front axle support



Special tools required:

- [31 5 251](#)
- [00 2 030](#)
- [31 5 255](#)
- [31 5 253](#)



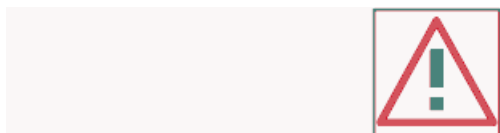
Warning!

Danger of injury!

Failure to comply with the following instructions may result in the vehicle slipping off the lifting platform and critically injuring other persons.

When supporting components, make sure that:

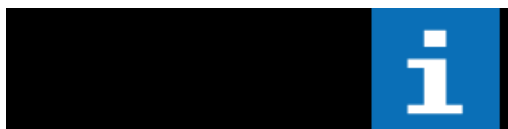
- the vehicle can no longer be raised or lowered.
- the vehicle does not lift off the locating plates on the vehicle hoist.



Attention!

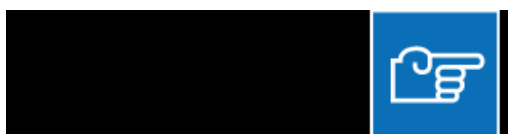
Before lowering/removing front axle support:

Observe [safety information](#) for raising the vehicle

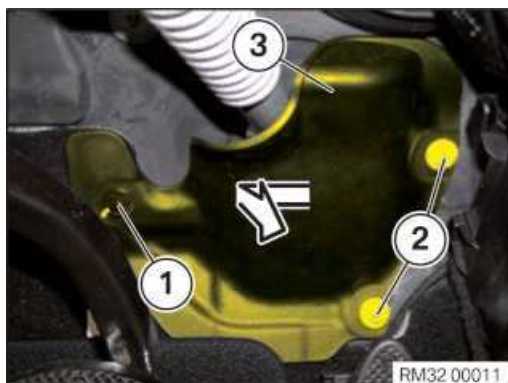


Necessary preliminary work:

- Disconnect [battery negative lead](#).



Lowering:



If installed:

Release and remove nut (1).

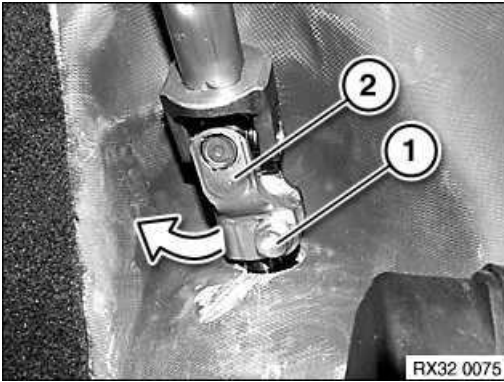
Release nuts (2) 1 rotation. (Do not remove!)

Remove steering column driver's footwell cover (3).

Note:

In order to provide a better view, the graphic does not show the side footwell trim.

Side footwell trim must not be disassembled!

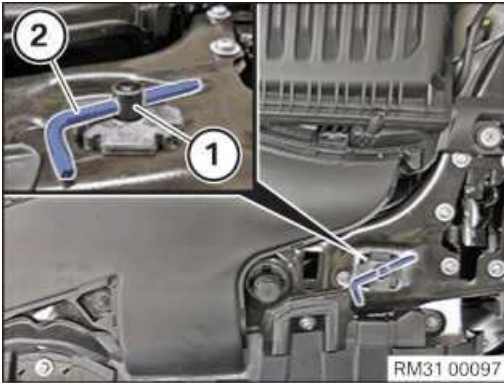


Attention!

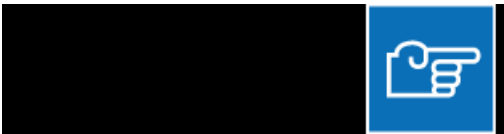
If the steering shaft is separated from the steering box, this can result in damage to the steering column switch cluster when the steering wheel is turned!

Release screw (1).

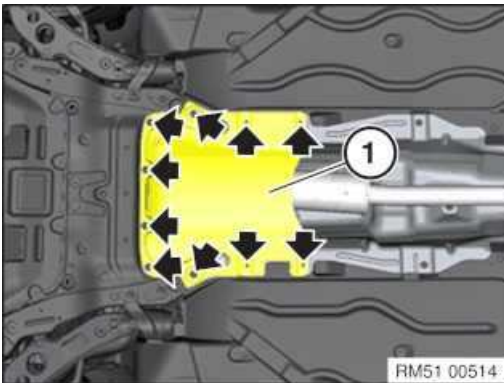
Swivel out bottom steering shaft (2) universal joint from steering gear.



Secure the radiator on the centring pin (1), **left and right** using a suitable tool (2).



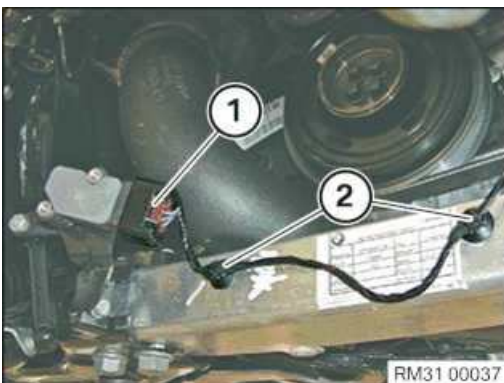
- Remove [front wheels](#).
- Remove [front underbody protection](#).
- Remove [front left and right wheel arch cover](#).



Only for rear underbody protection:

Loosen screws.

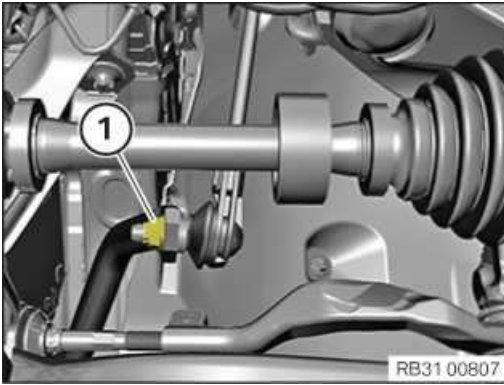
Remove cover (1).



Only for right ride height sensor:

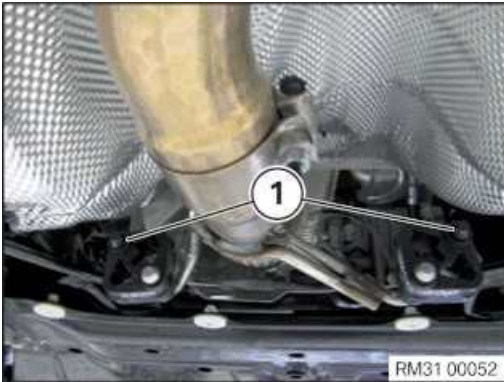
Disconnect connector (1).

Release cable clip (2) from deformation element adapter.

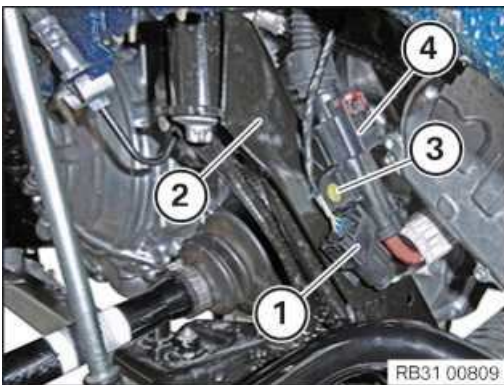


Loosen the anti-roll bar link nut (1) on the **left and right** of the anti-roll bar; counter support on the Torx socket, if required.

Loosen the anti-roll bar link on the **left and right** from the anti-roll bar.



Spray rubber mount (1) with lubricant and release from holder on front axle support.

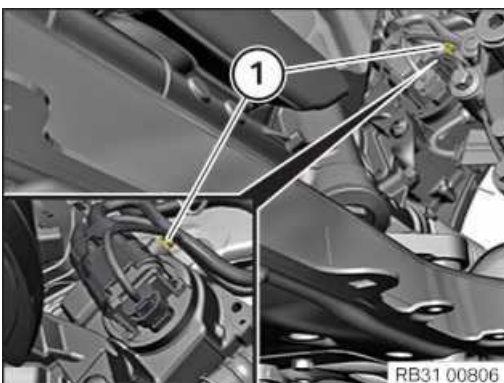


If installed:

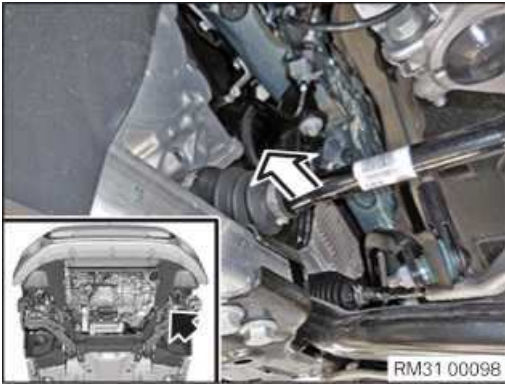
Release plug connection (1) from front axle support (2).

Release screw (3).

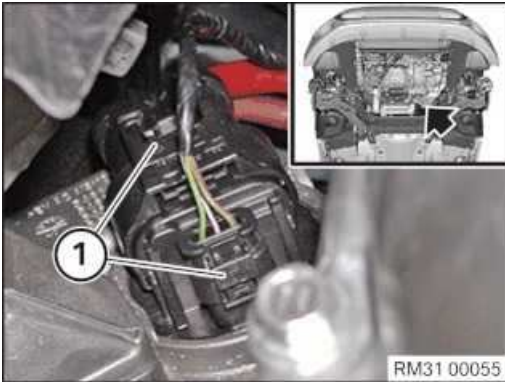
Release plug connection (4) from front axle support (2).



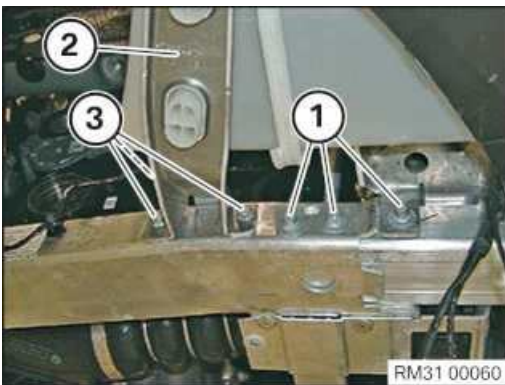
Release wiring harness (1) from the steering gear.



You can reach the subsequent plug connections with your right arm through the left output shaft.



Disconnect plug connections (1) on steering box. **Attention!**
Make sure when lowering the front axle that the cables are not damaged!



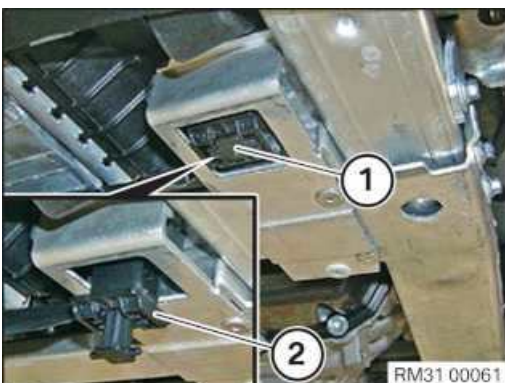
Only on right side:

Release screws (3) from washer fluid reservoir holder.

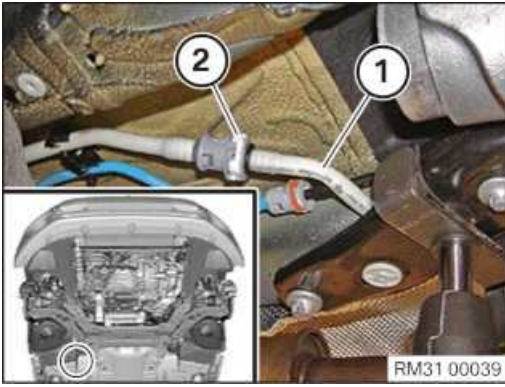
Take off holder (2).

Right and left:

Release deformation element adapter screws (1) on deformation element.



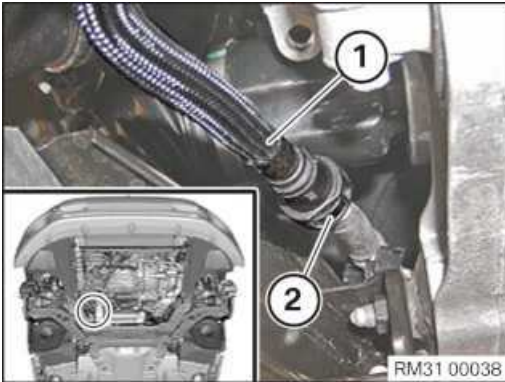
Unlock lock retainer (1) for charge air cooler holder on **left and right**.
Completely remove locks (2).



Only with petrol engines:

Press lock (2).

Disconnect purge air line (1).



Only with petrol engines:

Press lock (2).

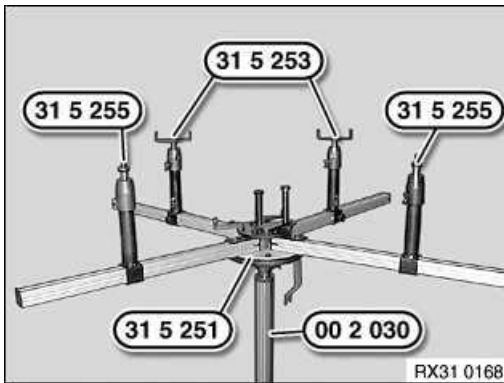
Disconnect purge air line (1).



Release screw (2) of engine support (3) on front axle (1).



Loosen screws (1) of wishbone rubber mount holder on **left and right** on body.



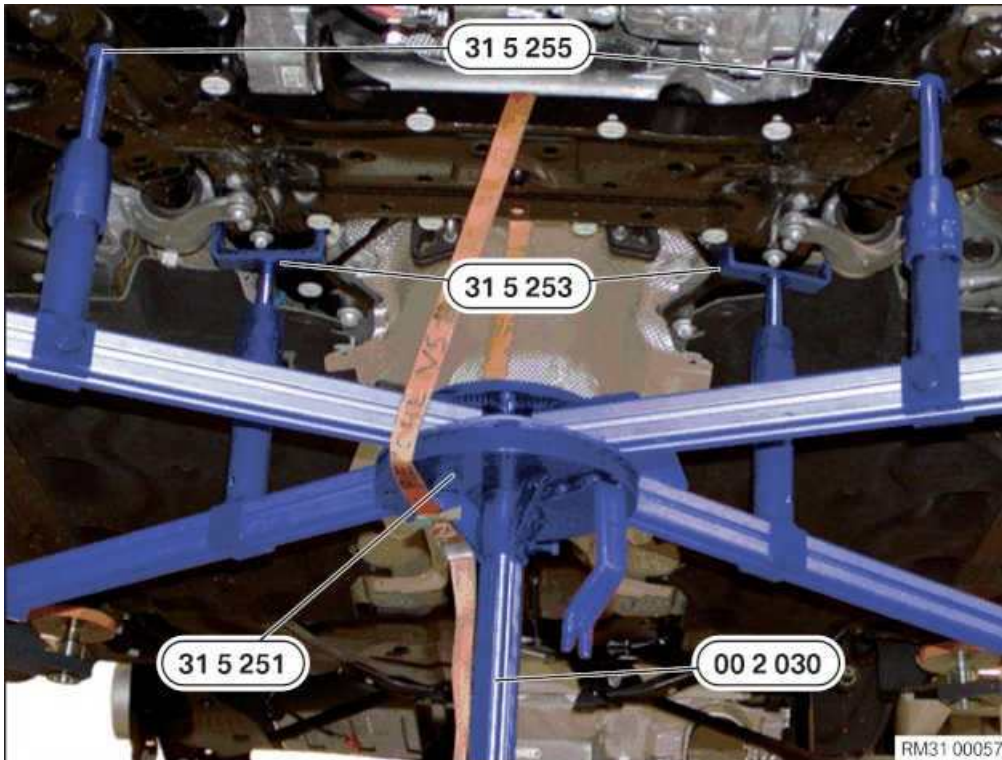
Fit the special tool [31 5 251](#) completely onto the workshop jack [00 2 030](#) with an auxiliary person.

Insert special tools [31 5 255](#) in telescopic supports of a profile rail pair.

Insert special tools [31 5 253](#) in telescopic supports of other profile rail pair.

Note:

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



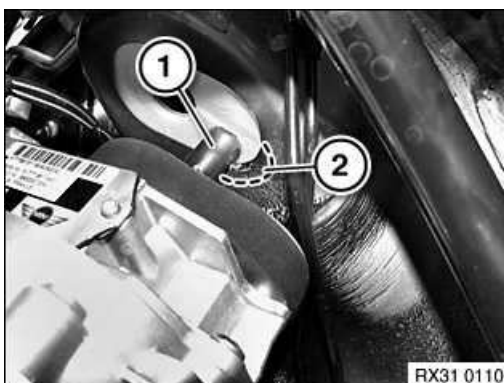
Align special tools [31 5 255](#) and [31 5 253](#) to front axle support.

Support front axle support by operating workshop jack [00 2 030](#).

Attention!

The centre of gravity of the front axle support must be positioned centrally over the workshop jack!

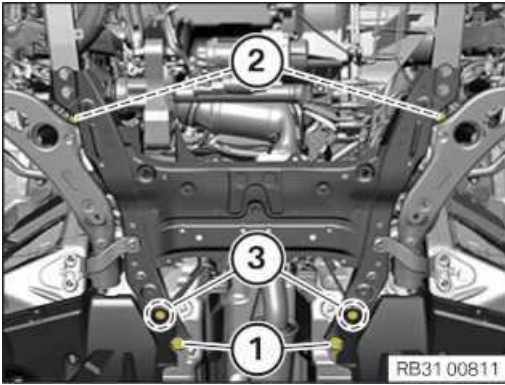
Secure front axle support with tensioning strap on special tool [31 5 251](#).



Attention! Risk of damage!

When lowering and raising the front axle support, it is absolutely essential to make sure that the torsion bar (1) of the electromechanical steering gear (EPS) does not collide with the bulkhead in the area (2)!

Collision with the bulkhead may result in damage to the electromechanical steering gear (EPS)!



Release screws in area (3) if necessary.

Release screws (1) (front axle support, rear).

Release screws (2) (front axle support, front, through eye in wishbone).

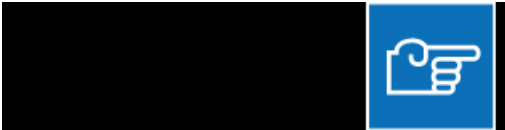
Bend the underbody panelling in area (3) to the side.

When lowering, release charge air cooler from its rubber mounts.

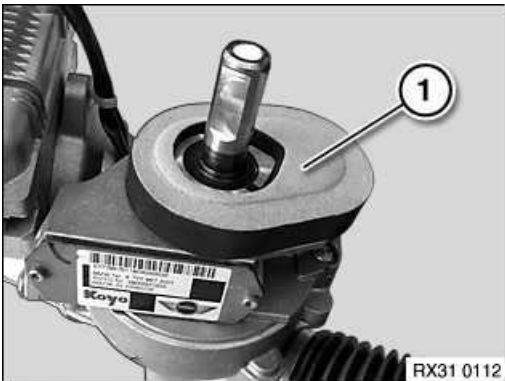
Lower front axle support (maximum 100 mm).

Installation note:

Check threads for damage; if necessary, repair with [Helicoil thread inserts](#).



Raising:



Attention!

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

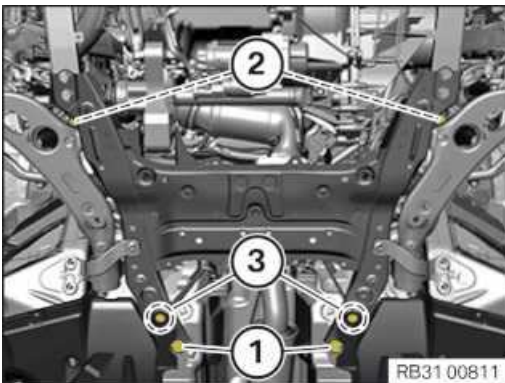
Remove gasket (1).

Clean surface on steering gear.

Renew gasket (1) of bulkhead.

Parts: Gasket

Position new gasket and stick it on.



Position front axle support.

Bend the underbody panelling to the side in the marked area (3).

Raise front axle support.

When raising, insert charge air cooler into its rubber mount on cross member.

Renew screws (1) and (2).

Parts: Bolts

Tighten down screws (1).

Tightening torque [31 11 2AZ](#).

Tighten down screws (2).

Tightening torque [31 11 1AZ](#).

Tighten screws in area (3) if necessary.

Tightening torque [51 75 1AZ](#).

Release tensioning strap from front axle support.

Lower the workshop jack [00 2 030](#) with special tool [31 5 251](#) and lay to one side.

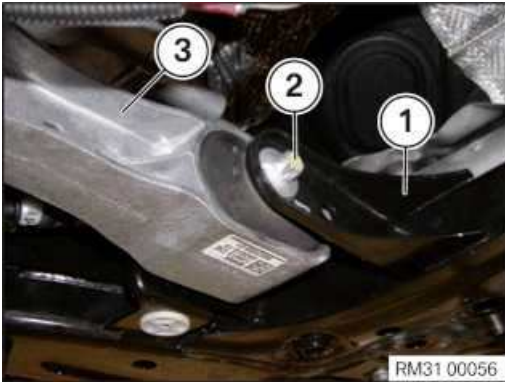


Renew screws (1).

Parts: Bolts

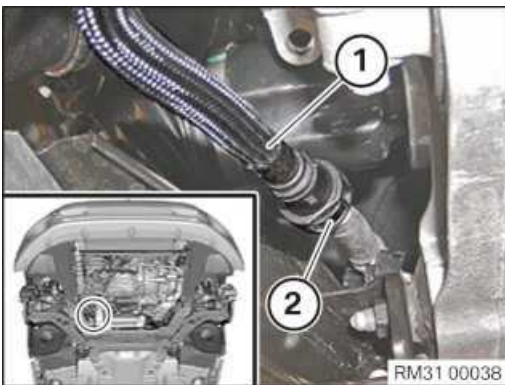
Tighten screws (1) of wishbone rubber mount holder on **left and right**.

Tightening torque [31 12 4AZ](#).



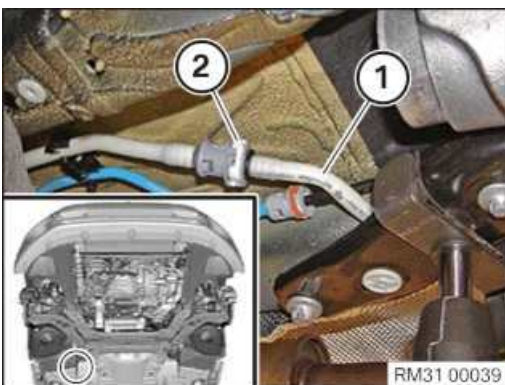
Tighten screw (2) of engine support (3) on front axle (1).

Tightening torque [22 11 5AZ](#).



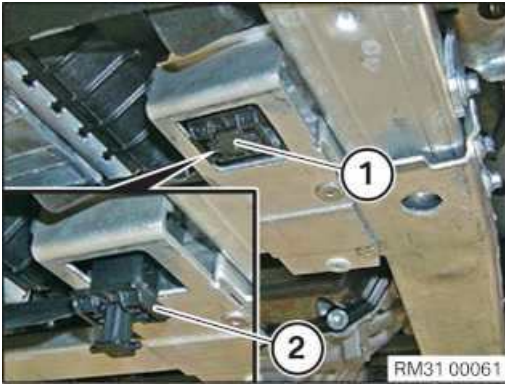
Only with petrol engines:

Connect purge air line (1).



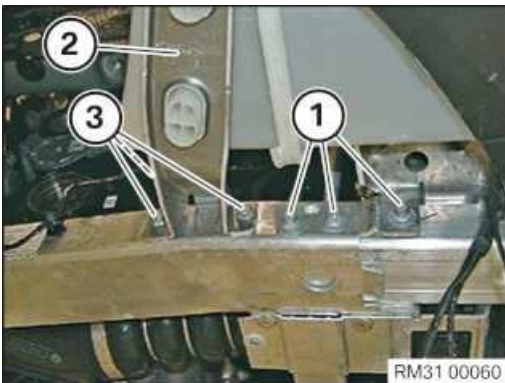
Only with petrol engines:

Connect the purge air line (1) on the vehicle underbody.



Position the lock (2).

Unlock lock (2) retainer (1) for charge air cooler holder on **left and right**.



Right and left:

Tighten deformation element adapter screws (1) on deformation element.

Tightening torque [51 11 6AZ](#).

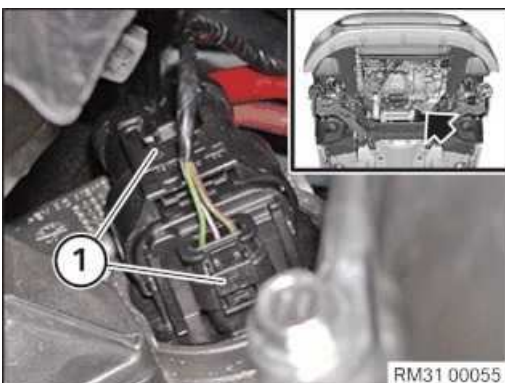
Only on right side:

Position washer fluid reservoir holder (2) on deformation element adapter.

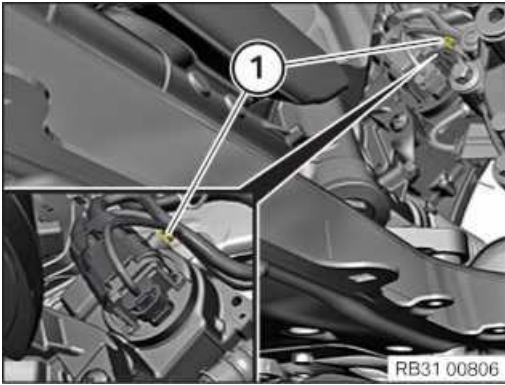
Tighten down screws (3).



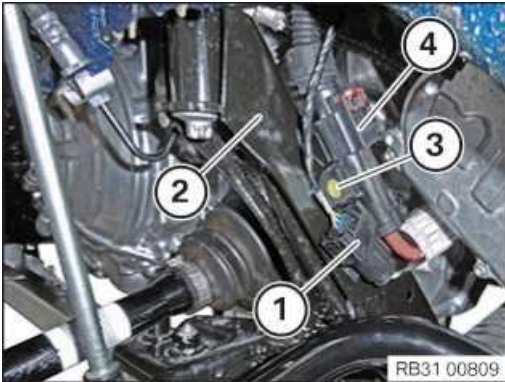
You can reach the subsequent plug connections with your right arm through the left output shaft.



Connect plug connections (1) on steering gear.



Fasten wiring harness (1) to the steering gear.

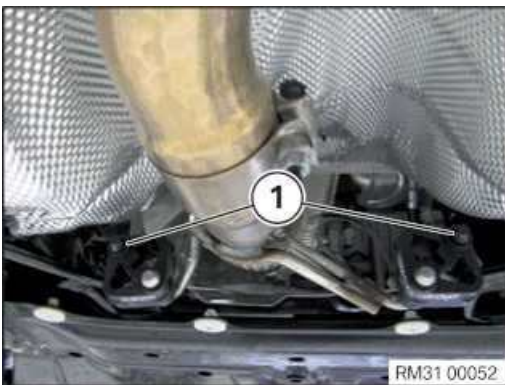


If installed:

Position plug connection (4) on front axle support (2).

Tighten screw (3).

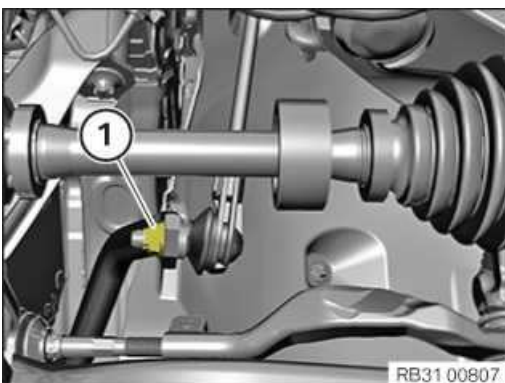
Fasten plug connection (1) to front axle support (2).



Check rubber mount for damage, replace if necessary.

Parts: Rubber mount

Spray rubber mount (1) with lubricant and slide onto holder on front axle support.



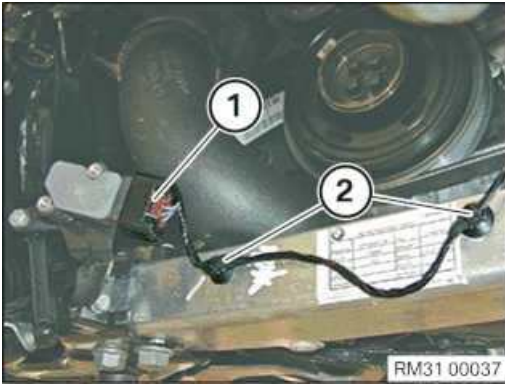
Replace nut (1).

Parts: Nut

Position **left and right** anti-roll bar link on anti-roll bar.

Tighten **left and right** nut (1).

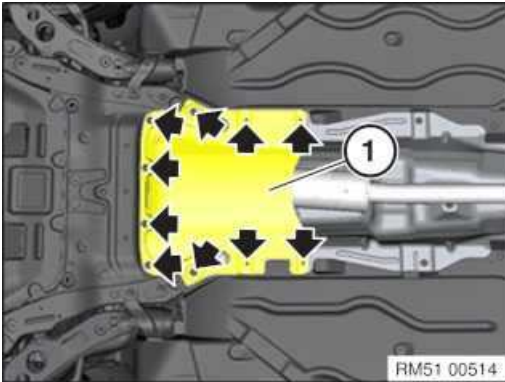
Tightening torque [31 35 1AZ](#).



Only for right ride height sensor:

Secure cable clip (2) on deformation element adapter.

Connect the connector (1).

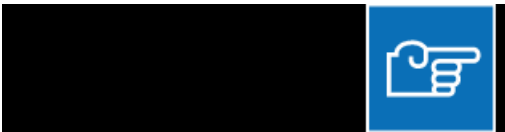


Only for rear underbody protection:

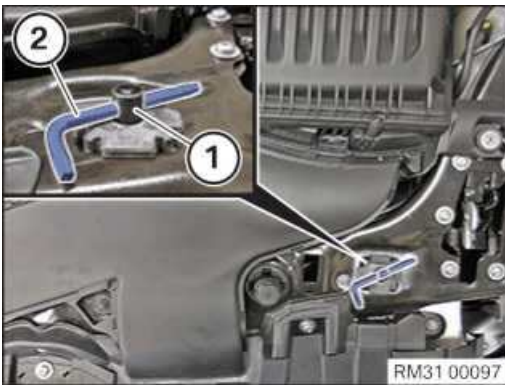
Position cover (1).

Tighten the screws.

Tightening torque [51 75 1AZ](#).



- Install [front left and right wheel arch cover](#).
- Install front [underbody protection](#).
- Install [front wheels](#).



Remove suitable tool (2) on the centering pin (1) **on left and right**.



Clean threads in universal joint to remove all remnants of screw locking agent.

Swivel universal joint (2) onto steering gear.

Renew screw (1).

Parts: Screw

Tighten screw (1).

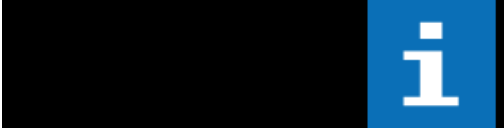
Tightening torque [32 31 2AZ](#).



If installed:

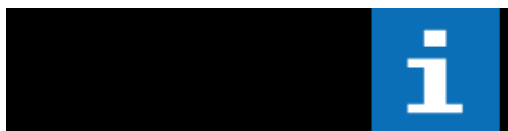
Align steering column cover (2).

Tighten cap nuts (1).

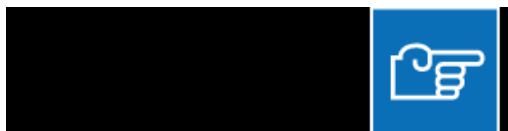
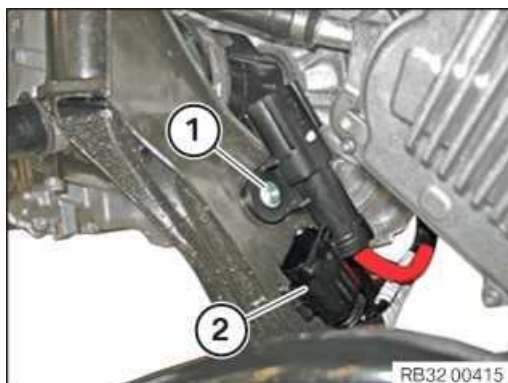


Required follow-up work:

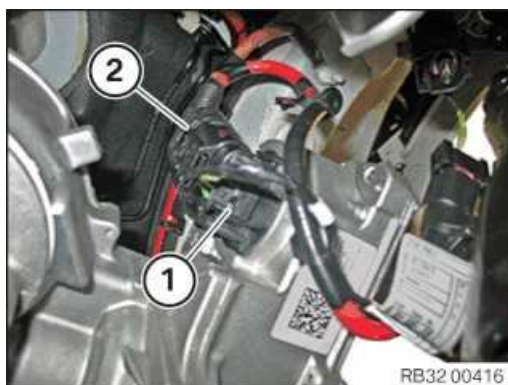
- Connect [battery earth lead](#).

**Necessary preliminary tasks:**

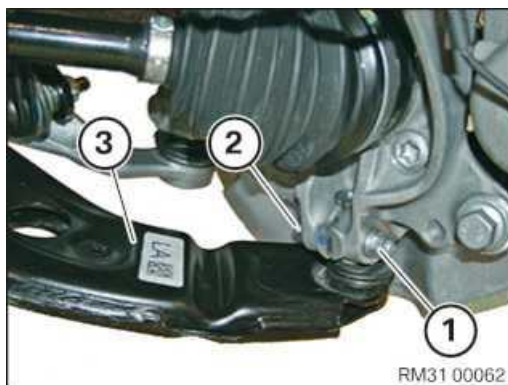
- Remove [front wheels](#).
- Lower [front axle support](#).

**Removal:**Only F45/F49 Plug-in Hybrid Electric Vehicle:

Loosen the screw (1) and unclip the connector housing (2) from the front axle support.

Only F45/F49 Plug-in Hybrid Electric Vehicle:

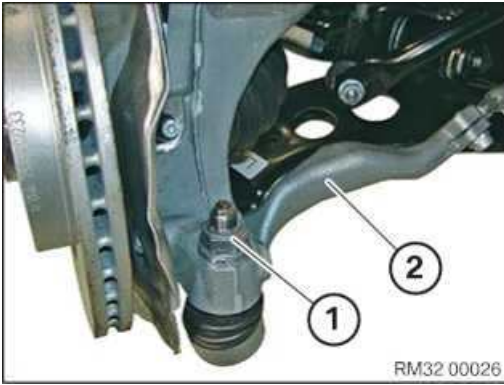
Unlock the connector (1) and (2) and pull it off the steering gear.



Release nut (1) of wishbone on left and right.

Pull out screw (2).

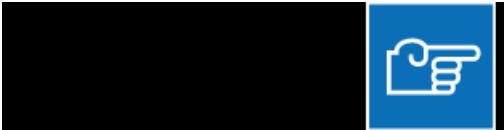
Release wishbone (3) from swivel bearing.



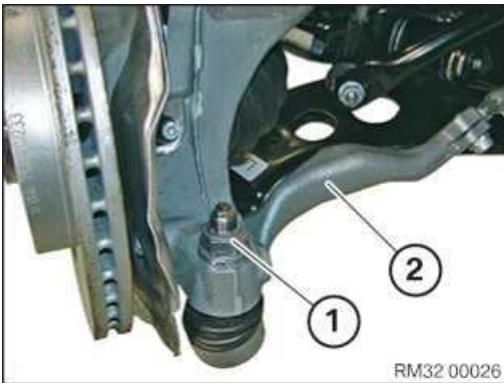
Slacken nut (1).

Release track rod (2) on left and right from swivel bearing.

Remove front axle complete.



Installation:



Position front axle completely.

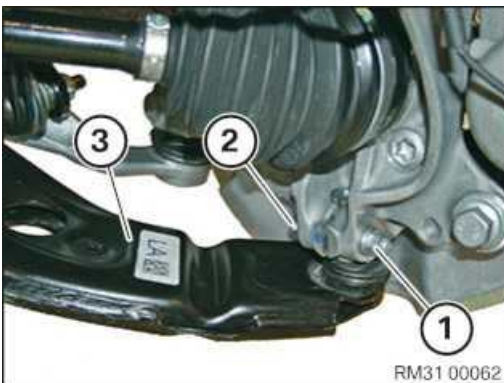
Position track rod (2) on the swivel bearing, left and right.

Replace nut (1).

Parts: Nut

Tighten nut (1), left and right.

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



Position wishbone (3) on the swivel bearing, left and right.

Replace nut (2) and bolt (1).

Parts: Bolt and nut

Insert screw (2), left and right.

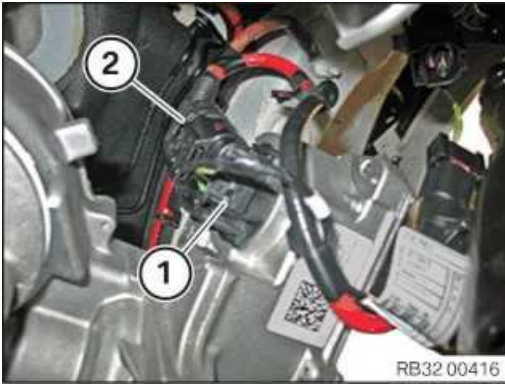
Tighten nut (1), left and right.

Tightening torque [31 12 1AZ](#).



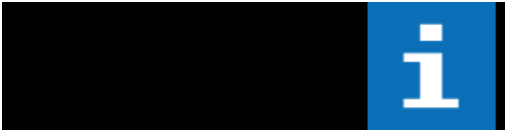
Only F45/F49 Plug-in Hybrid Electric Vehicle:

Tighten the screw (1) and clip in the connector housing (2) at the front axle support.



Only F45/F49 Plug-in Hybrid Electric Vehicle:

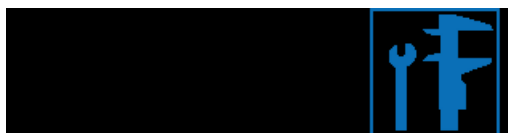
Connect the connectors (1) and (2) on the steering gear.



Required follow-up work:

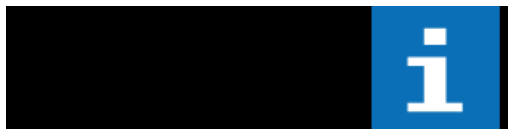
- Raise (install) [front axle support](#).
- Install [front wheels](#).

31 11 001 Replacing front axle support



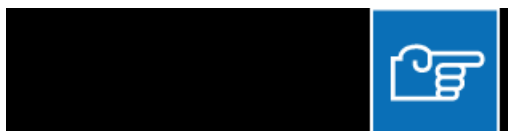
Special tools required:

- [31 5 251](#)

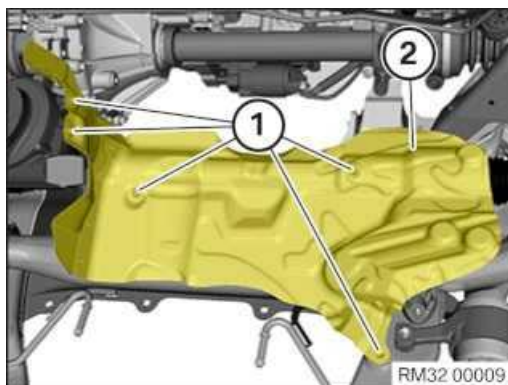


Necessary preliminary work:

- Remove [front axle complete](#).

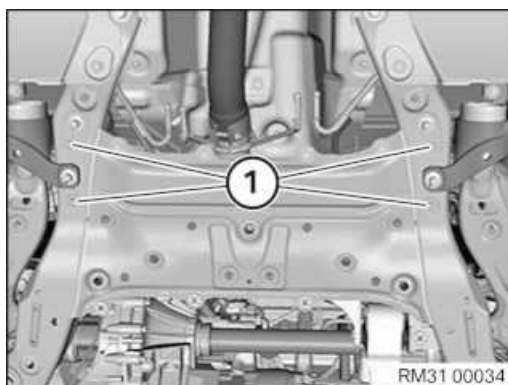


Removal:



Loosen screws (1).

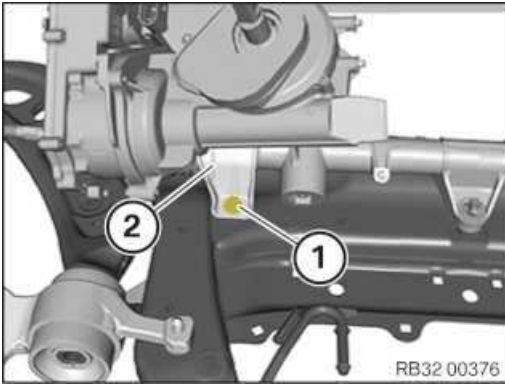
Remove heat shield (2).



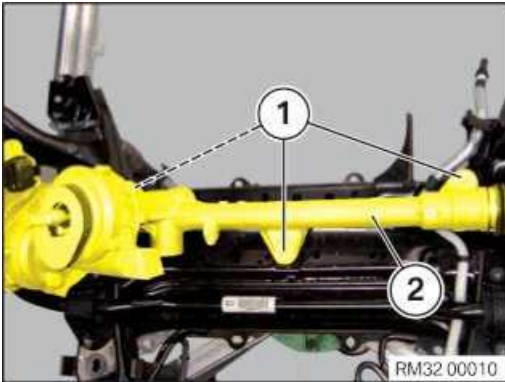
Release screws (1) from anti-roll bar.



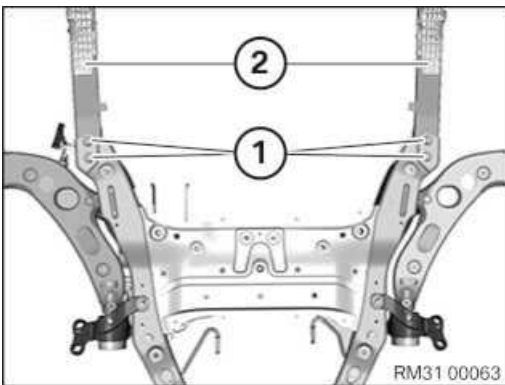
Remove anti-roll bar (1) with retaining bracket from front axle.



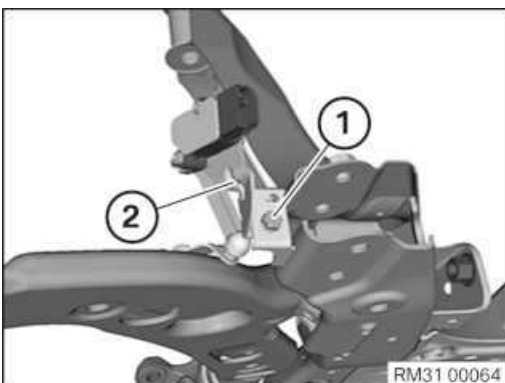
If installed: Undo screw (1) of retaining clamp (2).



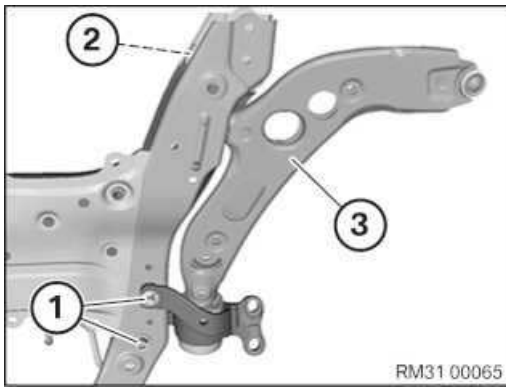
Release screws (1).
Remove steering gear (2).



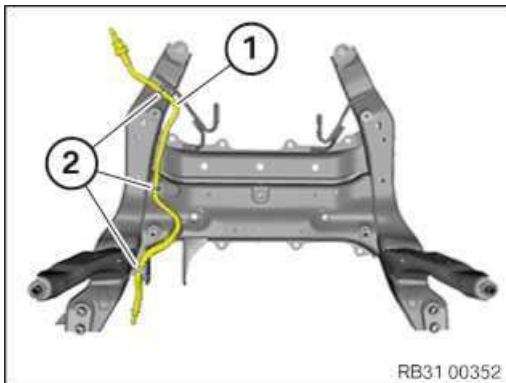
Loosen screws (1).
Remove deformation element adapter (2) from front axle support.



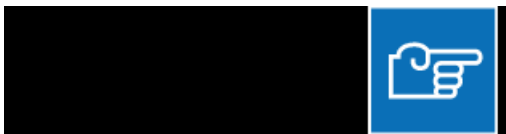
Only for right ride height sensor:
Loosen screw (1).
Release ride height sensor holder (2) from front axle support.



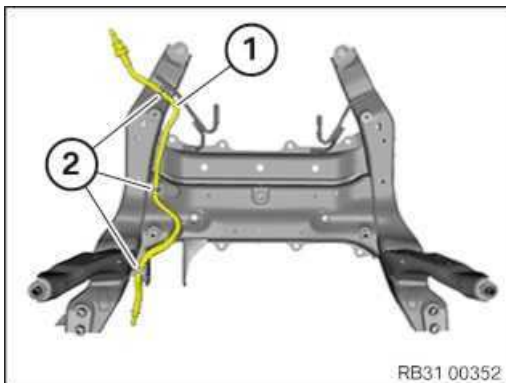
Loosen screws (1).
Release screw (2).
Remove wishbone on left and right.



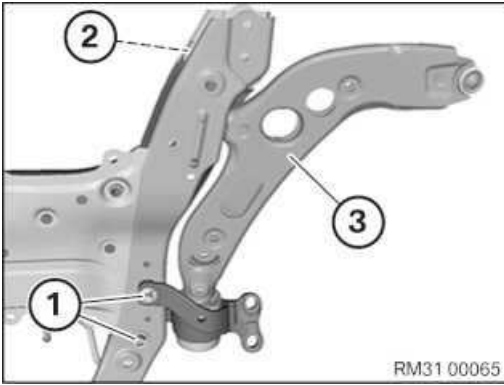
Only with petrol engines:
Loosen the clips and cable clamp (2).
Remove purge air line (1).



Installation:



Only with petrol engines:
Secure the purge air line (1) to the new front axle support using the clips and the cable clamp (2).



Place new front axle support on special tool [31 5 251](#) and secure with tensioning strap.

Align wishbone.

Replace screw (2).

Parts: Screw

Screw in screw (2).

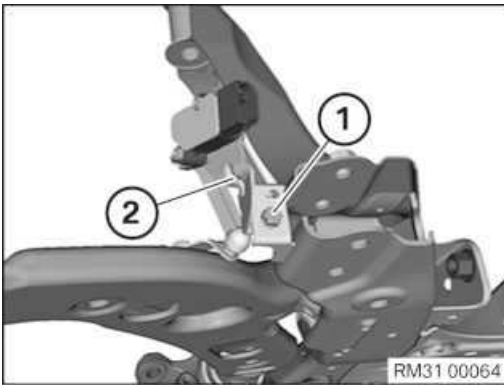
- Do not yet tighten screw (2)!

Tighten down screws (1).

Tightening torque [31 12 3AZ](#)

Tighten screw (2).

Tightening torque [31 12 2AZ](#).

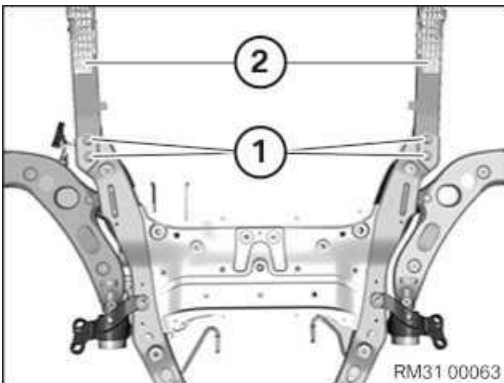


Only for right ride height sensor:

Align ride height sensor holder (2) to front axle support.

Tighten screw (1).

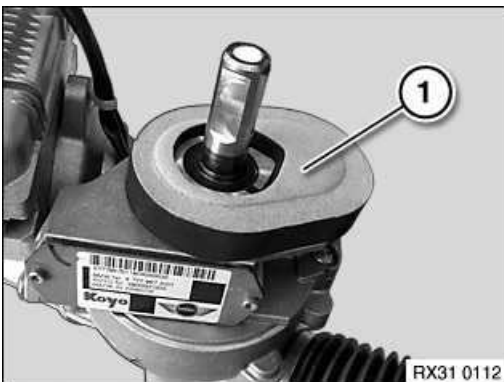
Tightening torque [37 14 2AZ](#).



Align deformation element adapter (2) to front axle support.

Tighten down screws (1).

Tightening torque [31 11 3AZ](#).



Attention!

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

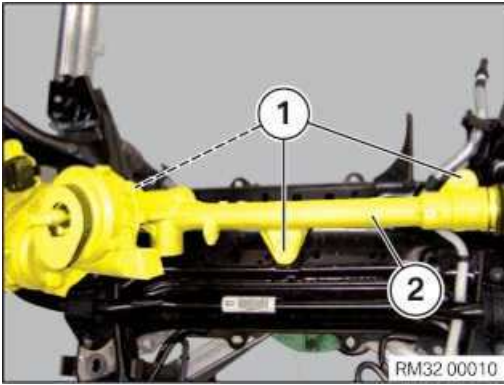
Remove gasket (1).

Clean surface on steering gear.

Replace gasket (1).

Parts: Gasket

Stick on new gasket (1).



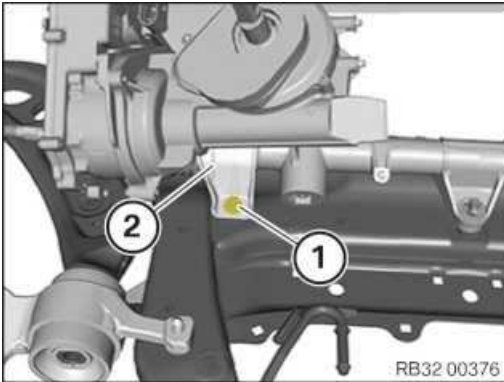
Position the steering gear (2).

Renew screws (1).

Parts: Bolts

Tighten down screws (1).

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

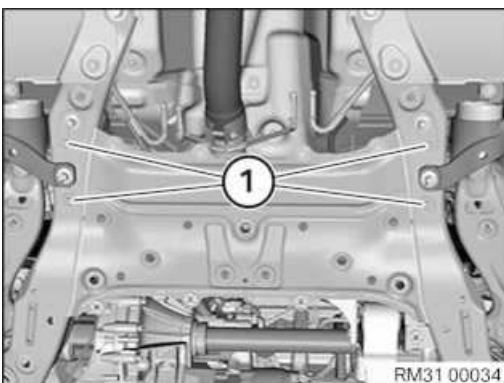


If installed: Tighten screw (1) of retaining clamp.

Tightening torque [32 00 3AZ](#)



Place anti-roll bar (1) with retaining bracket on front axle and align.

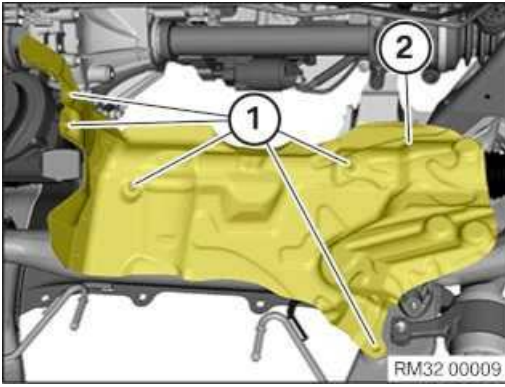


Renew screws (1).

Parts: Bolts

Tighten screws (1) on anti-roll bar.

Tightening torque [31 35 3AZ](#).



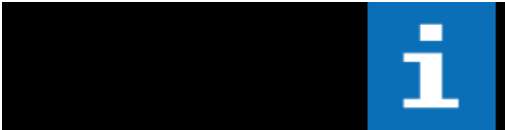
Position heat shield (2).

Renew screws (1).

Parts: Bolts

Tighten down screws (1).

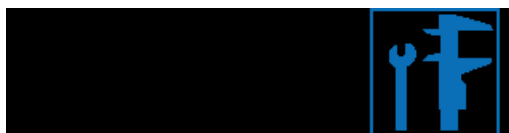
Tightening torque [32 00 2AZ](#).



Required follow-up work:

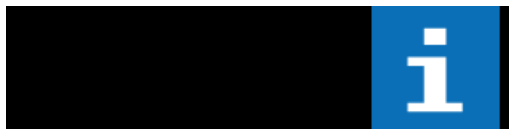
- Install [front axle](#).
- Carry out [wheel alignment procedure](#).

31 12 000 Removing and installing left or right wishbone



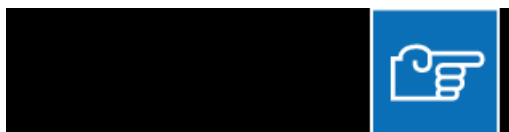
Special tools required:

- [31 2 230](#)

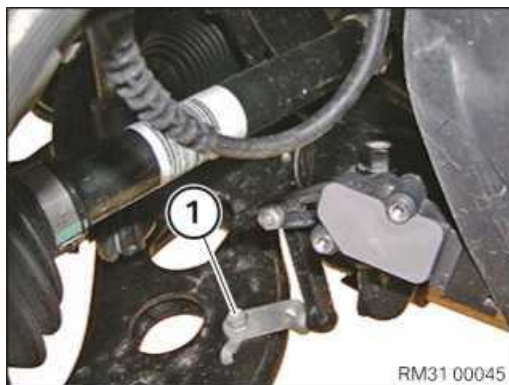


Necessary preliminary work:

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



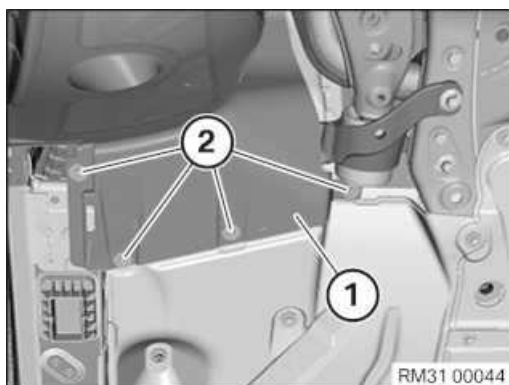
Removal:



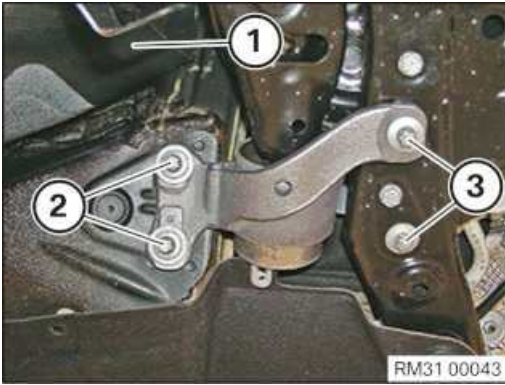
Only for right ride height sensor:

Release screw (1).

Remove holder from wishbone.



Release screws (2) from wheel arch panel (1).

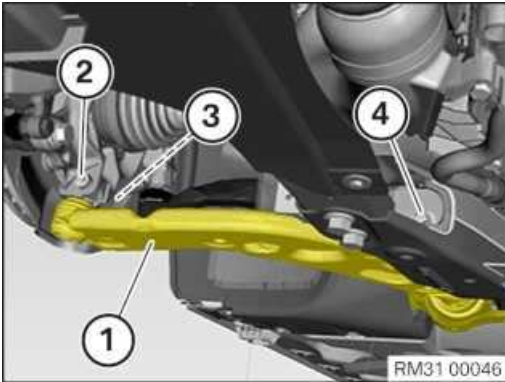


Bend wheel arch panel (1) to one side.

Release screws (2) and (3).

Attention!

Pay attention to installation position of screws (3)! Different lengths.



Release screw (4).

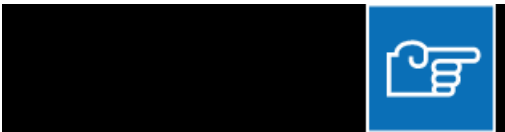
Slacken nut (2).

Pull screw (3) out of swivel bearing.

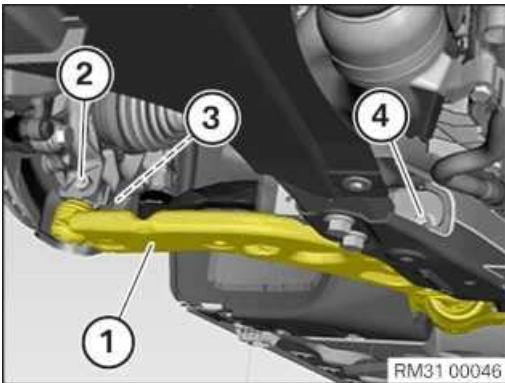
Release wishbone (1) from swivel bearing.

- If necessary, spread swivel bearing with special tool [31 2 230](#)

Remove wishbone (1).



Installation:



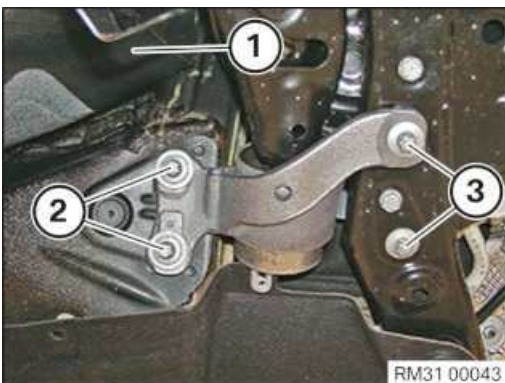
Install wishbone (1).

Align wishbone (1) thrust bearing to front axle support.

Parts: Replace screw (4).

Screw in screw (4).

- Do not tighten screw (4) yet



Parts: Replace screws (3).

Tighten down screws (3).

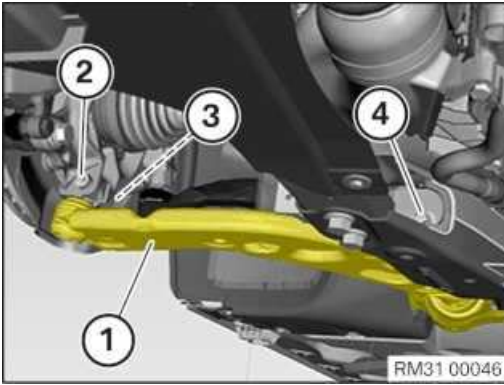
Tightening torque [31 12 3AZ](#).

Bend wheel arch panel (1) to one side.

Parts: Replace screws (2).

Tighten down screws (2).

Tightening torque [31 12 4AZ](#).



Insert guide pin of wheel guide joint into swivel bearing.

Parts: Replace screw (3).

Insert screw (3) with washer in the swivel bearing.

Attention!

The washer must lie between the screw head and the swivel bearing.

Consider the insertion direction of the screw (3). The screw (3) is inserted from the rear in the direction of travel.

Parts: Replace nut (2).

Screw on the nut (2).

Tighten screw connection.

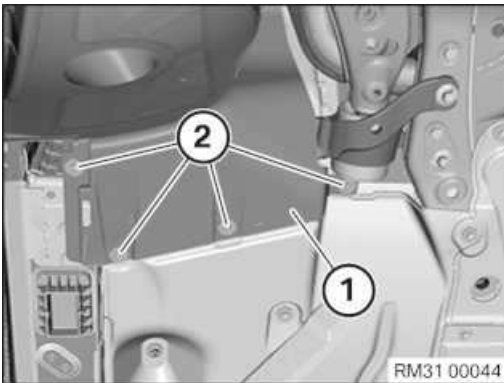
- Tightening is done via screw (3).

Tightening torque [31 12 1AZ](#).

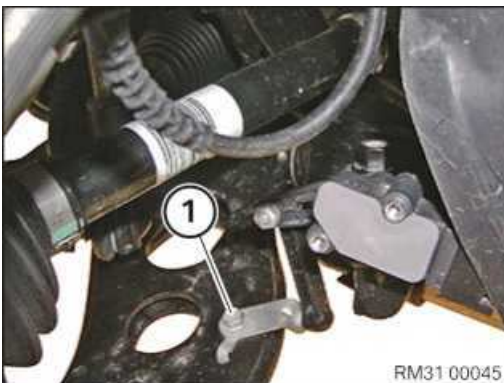
Move vehicle into [normal position](#).

Tighten screw (4).

Tightening torque [31 12 2AZ](#).



Tighten screws (2) of wheel arch panel (1).

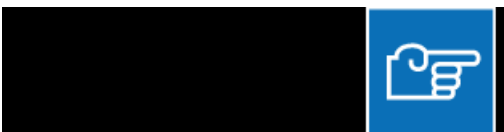


Only for right ride height sensor:

Align the holder using the lug with the corresponding opening on the wishbone.

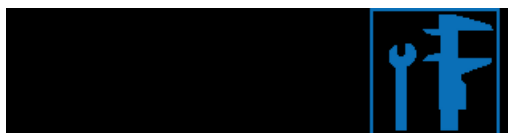
Tighten screw (1).

Tightening torque [37 14 5AZ](#).

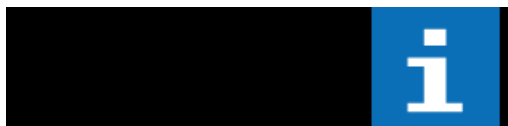


Required follow-up work:

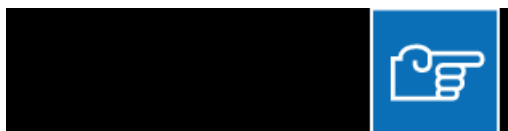
- Fit [front underbody protection](#)
- Fit [front wheel](#)
- Perform [wheel alignment](#)

**Special tools required:**

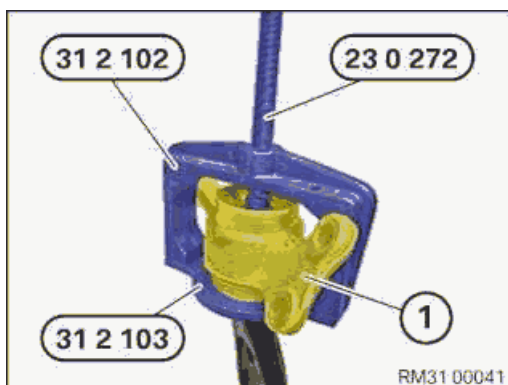
- [11 0 420](#)
- [31 2 100](#)
- [23 0 272](#)
- [31 2 103](#)
- [31 2 102](#)

**Necessary preliminary tasks:**

- Remove [wishbone](#).

**Removal:**

Insert special tool [11 0 420](#) into bore hole in wishbone pin.



Preparing special tool [31 2 100](#) :

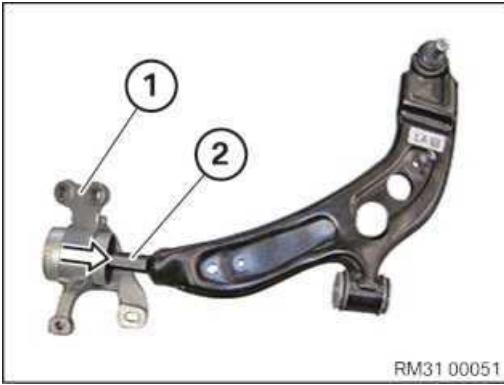
- Replace original spindle by spindle [23 0 272](#) .
- Mount special tool [31 2 103](#) on special tool [31 2 102](#) .

Position special tool [31 2 100](#) and pull off holder with rubber mount (1) with spindle [23 0 272](#) .

Note:

When pulling off the holder (with rubber mount), ensure that the inner sleeve of rubber mount does not remain on the wishbone pin.

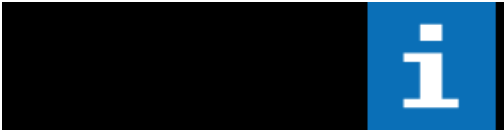
**Installation:**



Coat inside of rubber mount with lubricating oil 4 UH 1-460 N (part number: 0 306 232).

Align holder with rubber mount (1) to wishbone (see graphic).

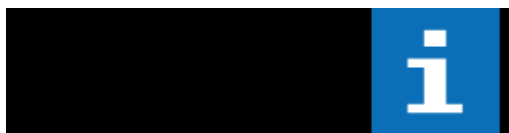
Slide on holder with rubber mount (1) onto wishbone pin (2) up to limit position.



Required follow-up work:

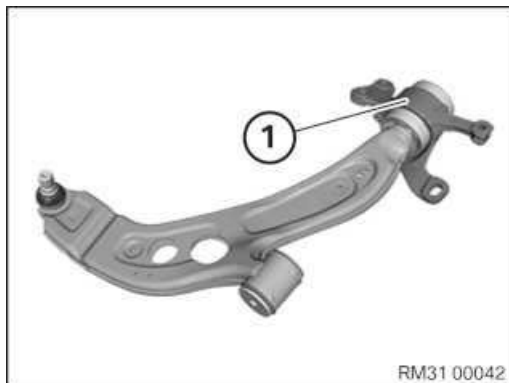
- Install [wishbone](#).

31 12 001 Replacing left or right wishbone



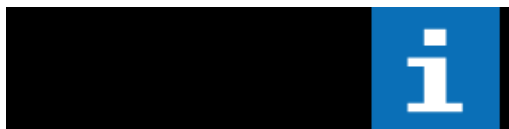
Necessary preliminary tasks:

- Remove [wishbone](#).



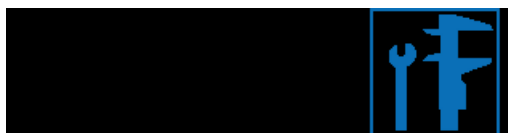
Check rubber mount for damage; replace rubber mount with holder (1) if necessary.

Pull off [holder with rubber mount \(1\) from wishbone](#) and mount on new wishbone.

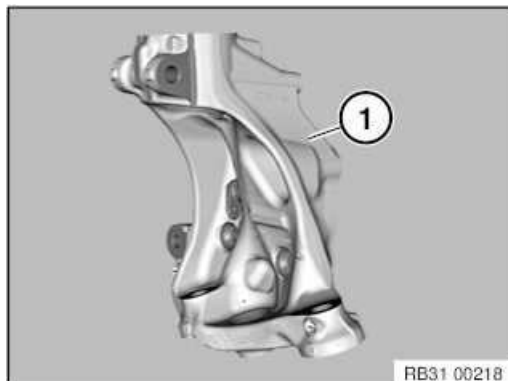


Required follow-up work:

- Install [wishbone](#).

**Special tools required:**

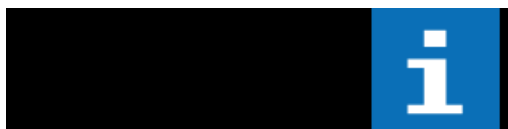
- [31 2 230](#)

**Note:**

When replacing swivel bearing pay attention to camber correction swivel bearings.

Camber correction swivel bearing are used to correct the camber values by ± 30 minutes. To be used only if the camber tolerance values are exceeded and undershot.

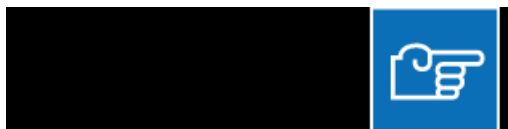
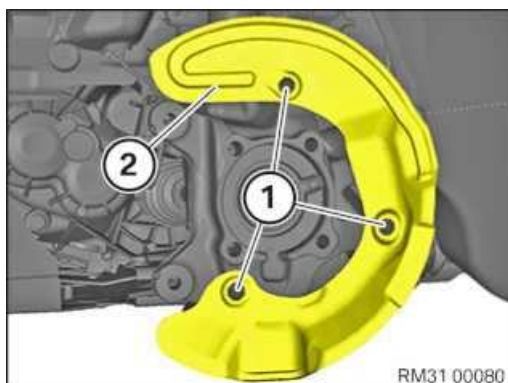
Identification is made at the [part number on swivel bearing](#).

**Necessary preliminary work:**

- Remove [wheel bearing](#)
- Remove [pulse sensor from swivel bearing](#)

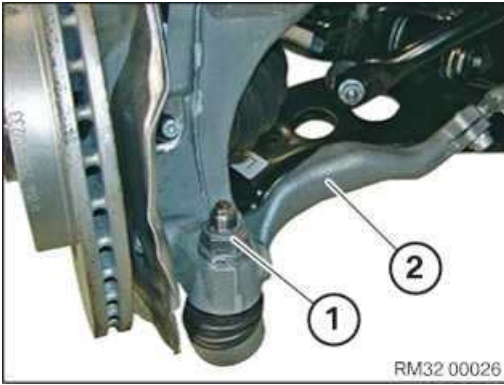
Important!

Prior to installation, check sensor head and cable from pulse sensor and renew if necessary.

**Removal:**

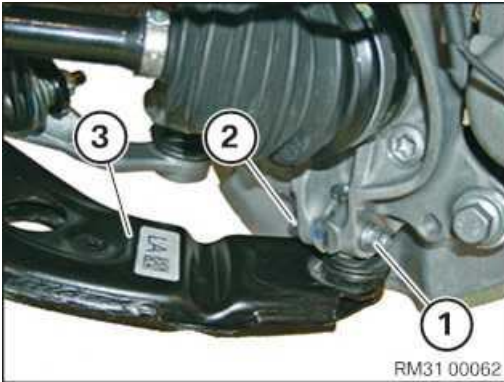
Loosen screws (1).

Remove brake guard plate (2).



Slacken nut (1).

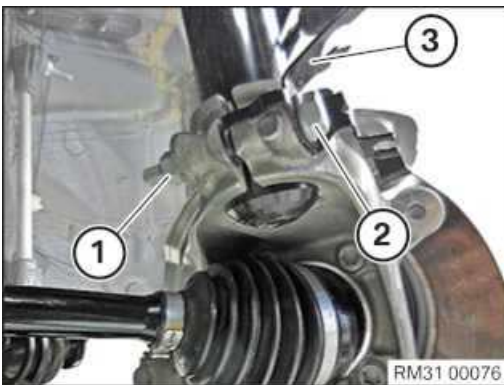
Release track rod (2) from swivel bearing.



Slacken nut (1).

Pull out screw (2).

Release wishbone (3) from swivel bearing.



If necessary, release brake pad wear sensor from holder (3).

Secure swivel bearing against falling out.

Slacken nut (1).

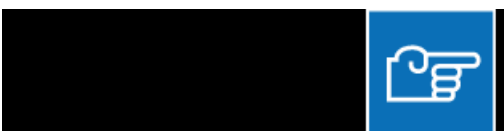
Pull out screw (2).

Take off holder (3).

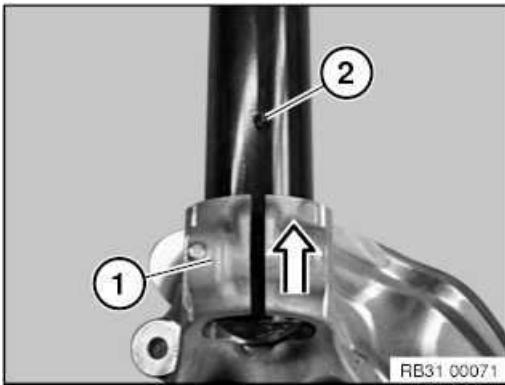


Expand swivel bearing with special tool [31 2 230](#).

Remove swivel bearing.



Installation:



Keep press fit of swivel bearing and spring strut in lower area clean and free from oil and grease.

Expand swivel bearing with special tool [31 2 230](#).

Align gap on swivel bearing (1) to positioning pin (2) on spring strut.

Slide on swivel bearing to limit position.



Position holder (3).

Part: Replace nut (2) and bolt (1).

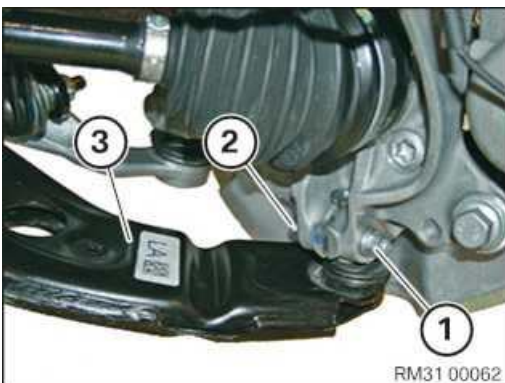
Insert bolt (2).

Tighten nut (1).

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

Installation note:

Bolt head points in direction of travel.



Join wishbone (3) to swivel bearing.

Part: Replace nut (2) and bolt (1).

Insert screw (2) with washer.

Important!

The washer must lie between the screw head and the swivel bearing.

Note insertion direction of bolt (2). The screw (2) is inserted from the rear in the direction of travel.

Screw on the nut (1).

Tighten screw connection.

- Tightening is done via screw (2).

Tightening torque [31 12 1AZ](#).

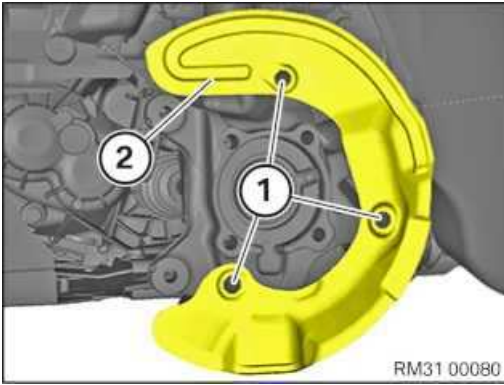


Join track rod (2) to swivel bearing.

Part: Replace nut (1).

Tighten nut (1).

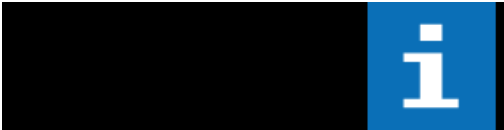
Tightening torque [32 21 1AZ](#).



Position brake guard plate (2) on swivel bearing.

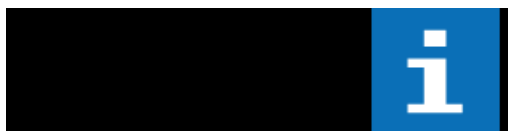
Tighten down screws (1).

Tightening torque [34 11 4AZ](#).

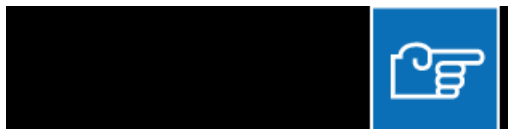
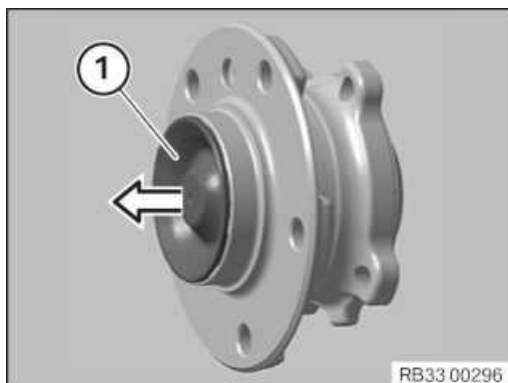


Required follow-up work:

- Install [wheel bearing](#).
- Install [pulse sensor on swivel bearing](#).
- Carry out [wheel alignment procedure](#).

**Necessary preliminary work:**

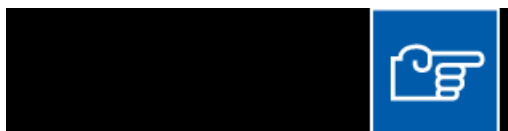
- Remove [front wheel](#)

**Removal:**

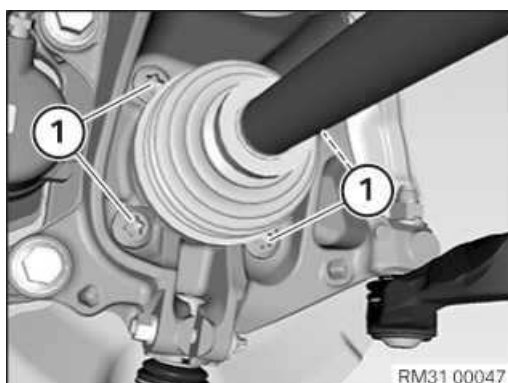
If installed: Remove protective cap (1).



Release collar bolt (1), press brake pedal to floor for this purpose.



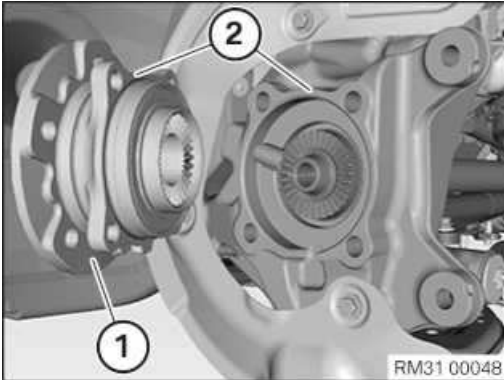
- Remove [brake disc](#)



Release screws (1).
Remove wheel bearing.

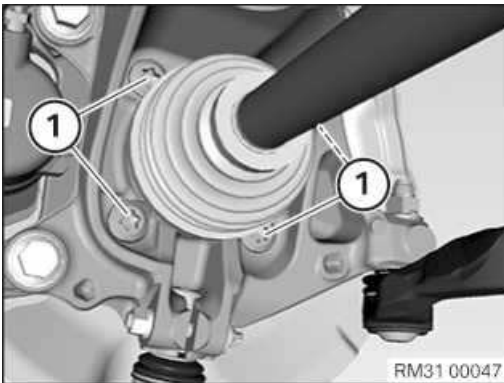


Installation:



Installation note:

- Keep contact surface (2) of wheel bearing (1) and swivel bearing clean and free from grease.



Caution!

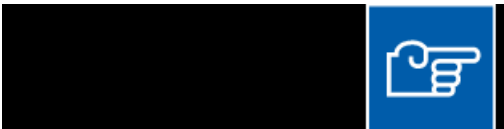
Consider the assignment of wheel bearing - collar bolt! It is possible that wheel bearing with thread M12x1.5 or M12x1.25 has been installed.

Renew screws (1).

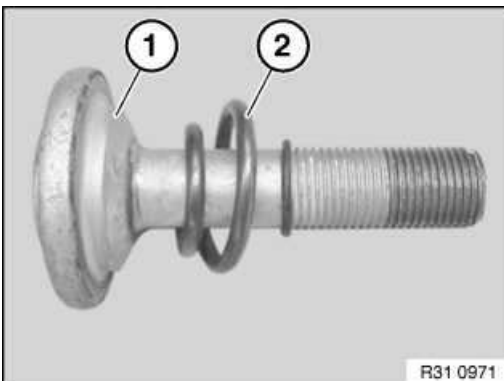
Parts: Bolts

Tighten screws (1).

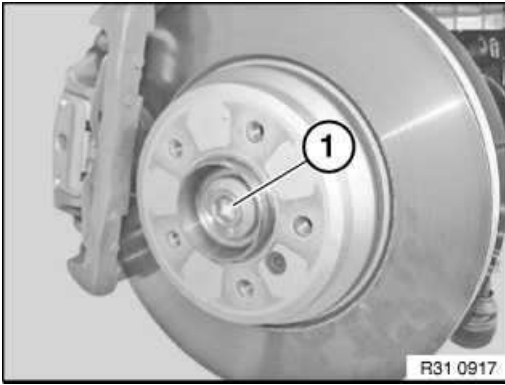
Tightening torque [31 21 1AZ](#).



- Install [brake disc](#).



- Pay attention to installation position of compression spring (2).
- Keep collar bolt (1) and spur gearing of wheel bearing/output shaft clean and free of grease



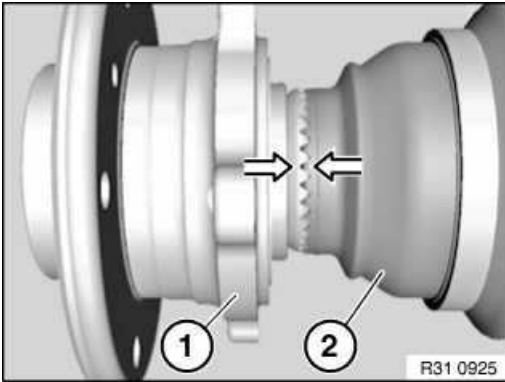
Renew the collar bolt (1) including compression spring.

Parts: Collar bolt with compression spring

Caution!

Following installation note for spur gearing must be observed without fail!

Tighten the collar bolt (1) with the compression spring hand-tight.



- Front gearing of wheel bearing (1) and output shaft (2) should be installed with positive interlocking (tooth in tooth position)!

Check whether spur gearing is locked tooth in tooth by reciprocally rotating wheel hub/output shaft.

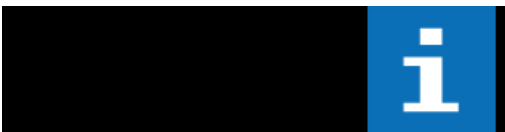
Tighten the collar bolt once positive locking has been ensured.

Tightening torque [31 60 2AZ](#)



Thinly grease the wheel hub in area (1).

Do not install the protective cap.



Required follow-up work:

- Install [front wheel](#)

31 00 ... Information on replacing shock absorbers

Situation:

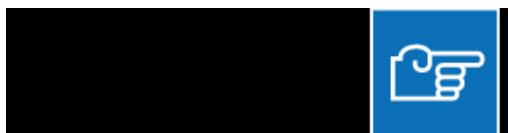
When a shock absorber is faulty on one side (leaking, noises, limit values exceeded on the shock tester), often both shock absorbers on the axle in question are replaced.

Effect:

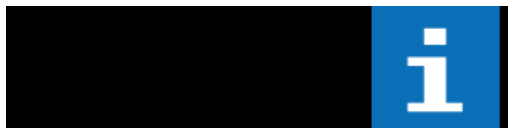
This is not necessary for technical reasons and causes the manufacturer not to recognize the unnecessarily removed shock absorbers as defective parts. Unnecessarily high costs for the customer can be avoided by replacing the shock absorber on one side only.

Procedure:

If one shock absorber is damaged, it is only necessary to replace both shock absorbers when the car has driven in excess of 80 000 km.

*Installation note:*

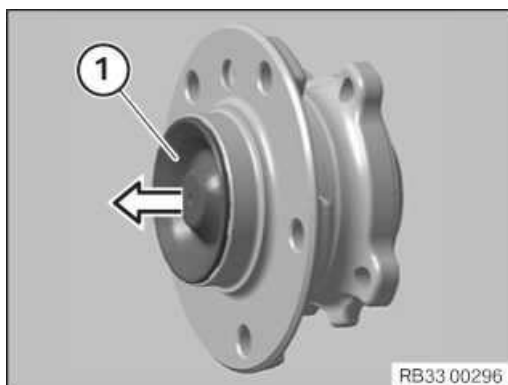
1. All screws, nuts, bolts and hose clamps removed during the repair must be replaced.
2. Mounting elements on parts of the chassis and suspension and steering must be replaced.

*Note:*

Separate procedure for [EDC spring strut](#).

Necessary preliminary work:

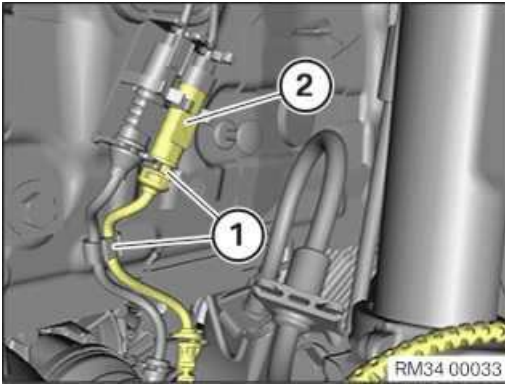
- Remove [front cowl panel cover](#).
- Remove [front wheel](#).

**Removal:**

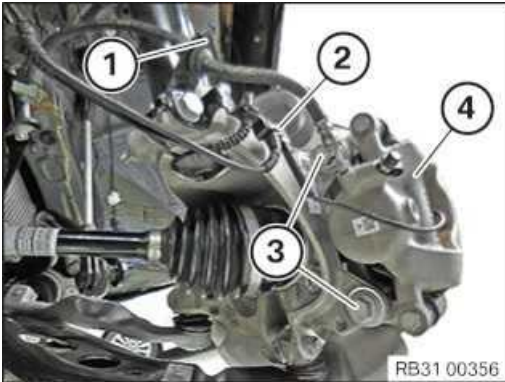
If installed: Remove protective cap (1).



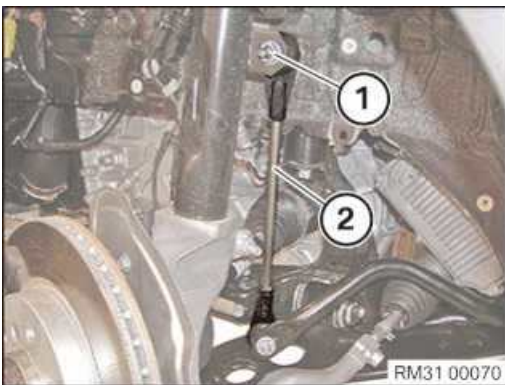
Release collar bolt (1), press brake pedal to floor for this purpose.



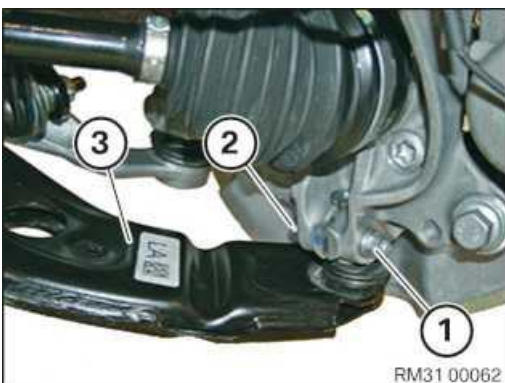
Detach pulse sensor cable from the brackets (1).
Disconnect plug connection (2).



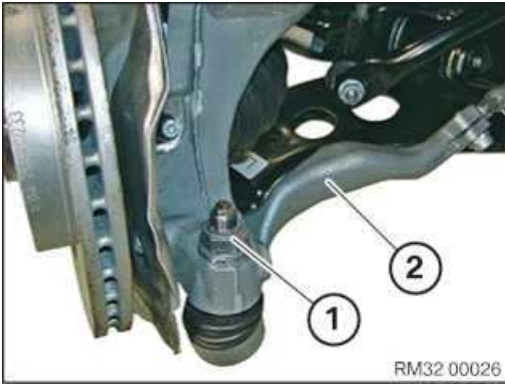
Release brake hose (1) from holder.
If necessary, release the brake pad wear indicator (2) from the bracket.
Loosen screws (3).
Lay brake caliper (4) with brake-caliper support to one side and tight up.



Slacken nut (1).
Release anti-roll bar link (2) from spring strut.

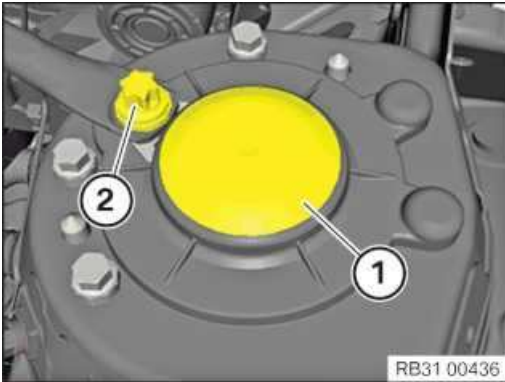


Slacken nut (1).
Pull out screw (2).
Release wishbone (3) from swivel bearing.



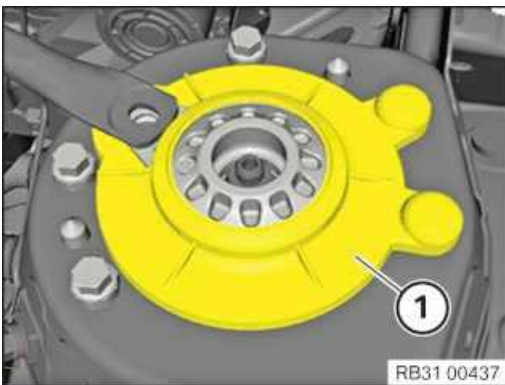
Slacken nut (1).

Release track rod (2) from swivel bearing.

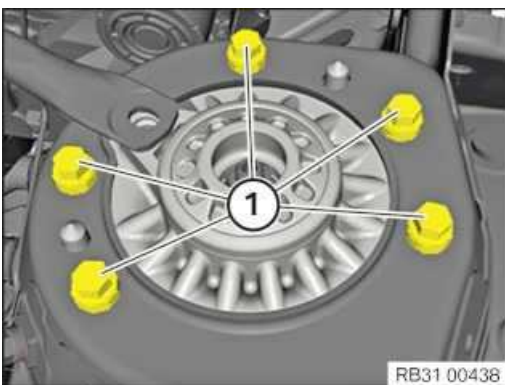


Remove protective cap (1).

Release screw (2).

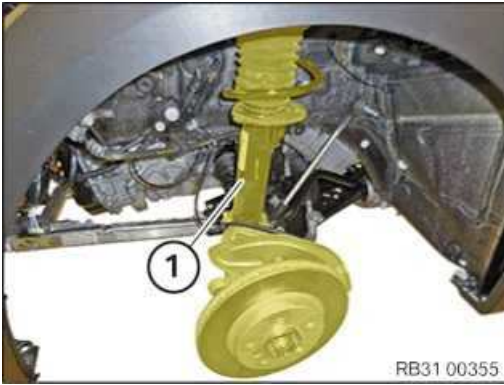


Remove cover (1).

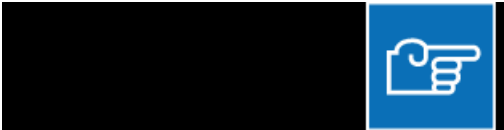


Secure spring strut against falling out.

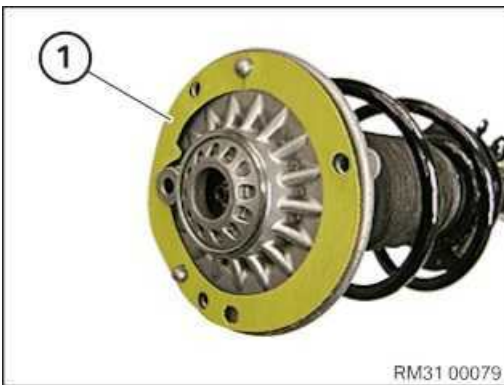
Loosen screws (1).



Remove spring strut (1) from wheel arch.



Installation:



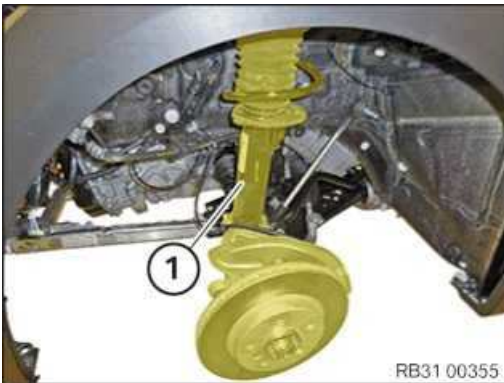
If installed: Remove and dispose of the seal (1).

Clean contact surface at spring strut dome.

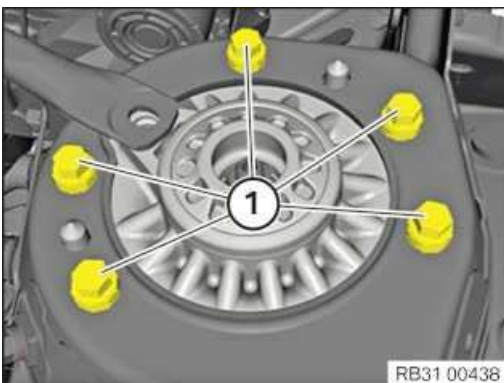
Note:

Seal (1) is no longer installed.

The seal (1) can also only be omitted on one side (left or right).



Guide the spring strut (1) into the wheel arch.



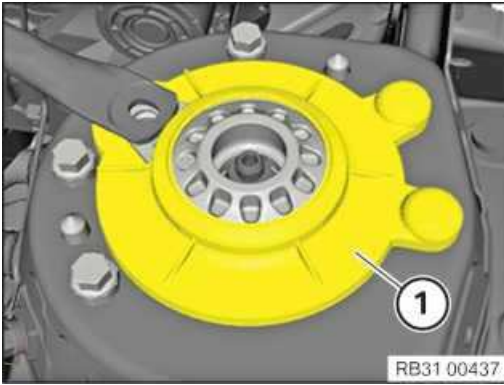
Align spring strut to the bores in the spring strut dome using the centring pins.

Renew screws (1).

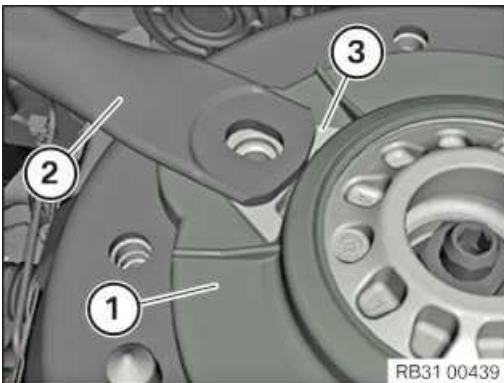
Parts: Bolts

Tighten screws (1).

Tightening torque [31 31 1AZ](#)

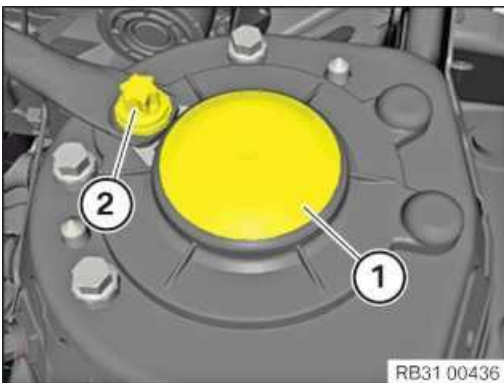


Lift the strut brace slightly and put on cover (1).



Make sure that the cover ring (1) is correctly positioned on the rest of the strut brace (3).

Cover ring (1) must not be trapped between strut brace (2) and support bearing!



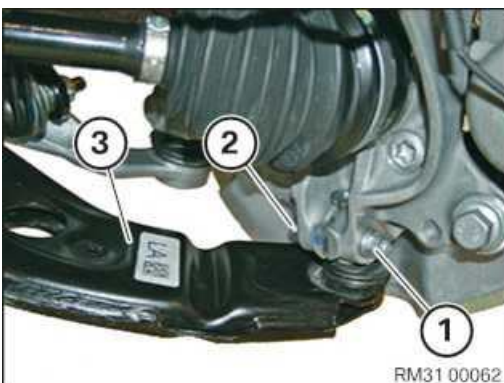
Attach and secure protective cap (1).

Renew screw (2).

Parts: Screw

Tighten screw (2).

Tightening torque [51 61 3AZ](#).



Position the wishbone (3) on the swivel bearing.

Replace screw (2) and nut (1).

Parts: Bolt and nut

Insert screw (2) with washer.

Caution!

The washer must lie between the screw head and the swivel bearing.

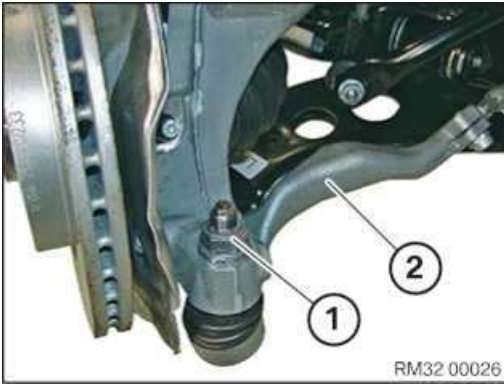
Note insertion direction of bolt (2). The screw (2) is inserted from the rear in the direction of travel.

Screw on the nut (1).

Tighten screw connection.

- Tightening is done via screw (2).

Tightening torque [31 12 1AZ](#)



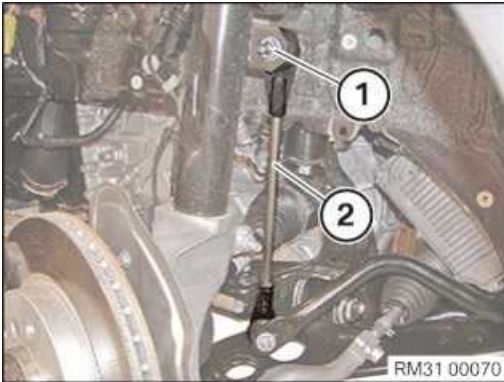
Insert track rod (2) into the swivel bearing.

Replace nut (1).

Parts: Nut

Tighten nut (1).

Tightening torque [32 21 1AZ](#)



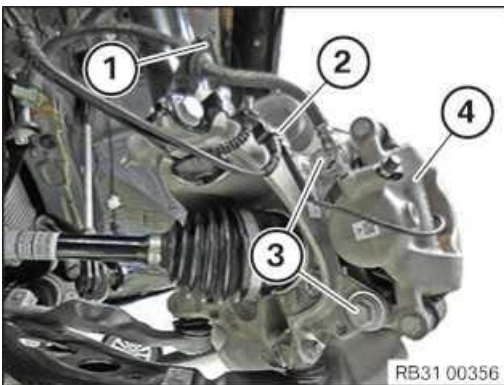
Position anti-roll bar link (2) on spring strut.

Replace nut (1).

Parts: Nut

Tighten nut (1).

Tightening torque [31 35 2AZ](#)



Position brake caliper (4) with brake-caliper support on swivel bearing.

Replace screws (3).

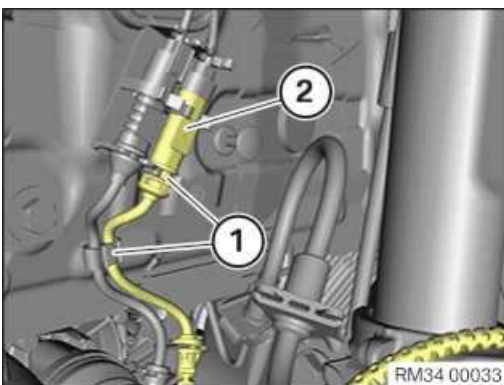
Parts: Bolts

Tighten down screws (3).

Tightening torque [34 11 2AZ](#)

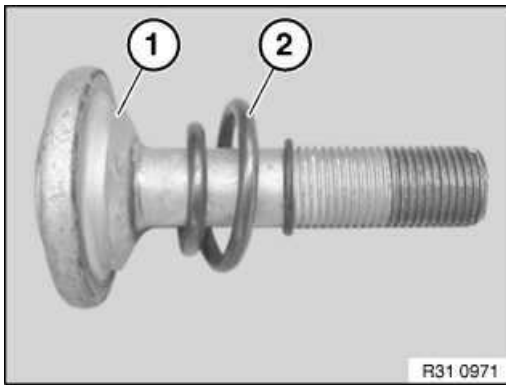
Secure brake hose (1) on holder.

If necessary, secure the brake pad wear indicator (2) to the bracket.



Connect plug connection (2).

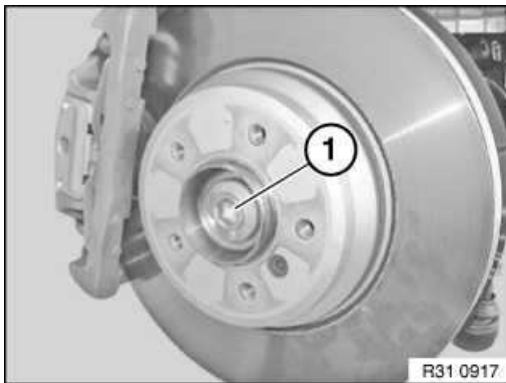
Attach the pulse sensor cable to the brackets (1).



- Pay attention to installation position of compression spring (2).
- Keep collar bolt and spur toothing of wheel hub/output shaft clean and free of grease

Caution!

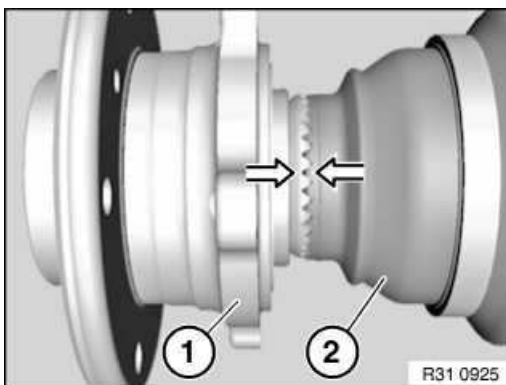
Following installation note for spur gearing must be observed without fail!



Renew the collar bolt with the compression spring.

Parts: Collar bolt with compression spring

Tighten the collar bolt (1) with the compression spring hand-tight.



- Front gearing of wheel hub (1) and output shaft (2) should be installed form-fit (tooth in tooth position).

Check whether spur gearing is locked tooth in tooth by reciprocally rotating wheel hub/output shaft.

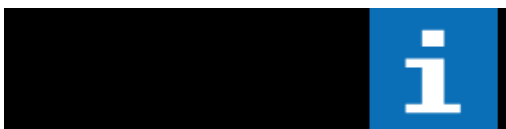
When the positive locking is ensured, tighten the collar bolt.

Tightening torque [31 60 2AZ](#)



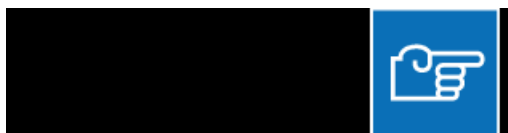
Thinly grease the wheel hub in area (1).

Do not install the protective cap.

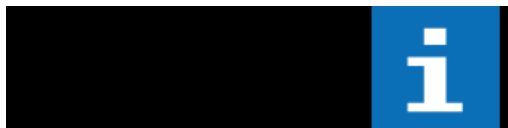


Required follow-up work:

- Install [front wheel](#).
- Attach [front cowl panel cover](#).

*Installation note:*

1. All screws, nuts, bolts and hose clamps removed during the repair must be replaced.
2. It is imperative that the retaining elements on parts of the steering and the chassis are replaced.

**Necessary preliminary work:**

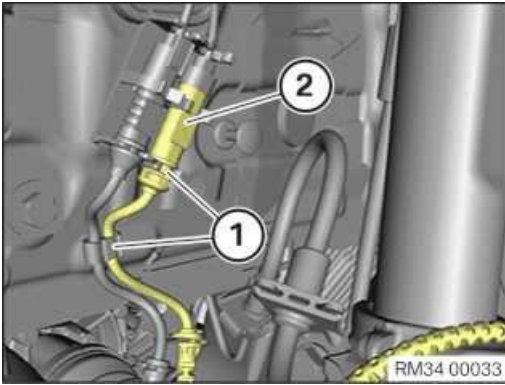
- Remove [front cowl panel cover](#).
- Remove [front wheel](#).

**Removal:**

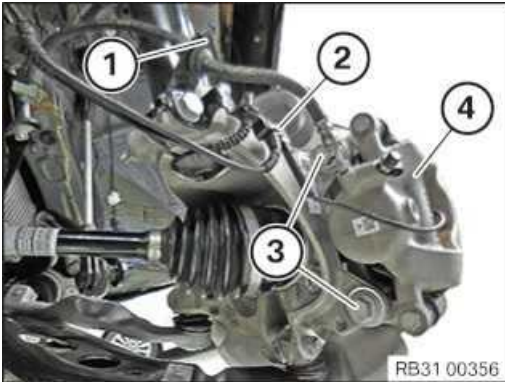
If installed: Lever off protective cap (1).



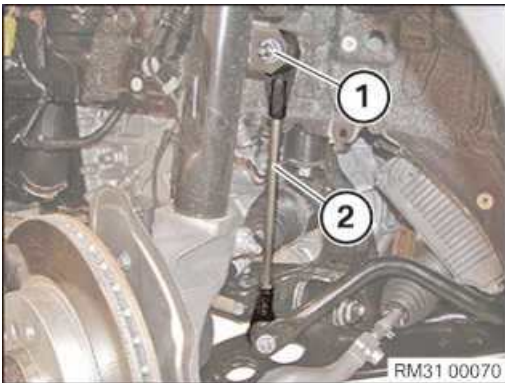
Release collar bolt (1), press brake pedal to floor for this purpose.



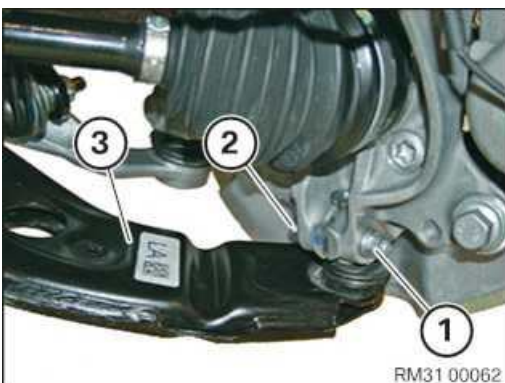
Detach the cable for the pulse sensor from the brackets (1).
Disconnect plug connection (2).



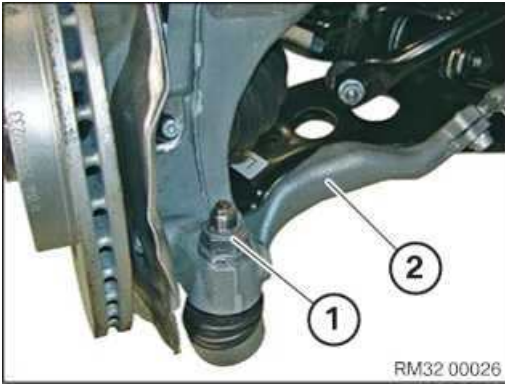
Release brake hose (1) from holder.
If necessary, disconnect the cable for the brake pad wear indicator (2) from the holder.
Loosen screws (3).
Lay brake caliper (4) with brake-caliper support to one side and tight up.



Slacken nut (1).
Release anti-roll bar link (2) from spring strut.

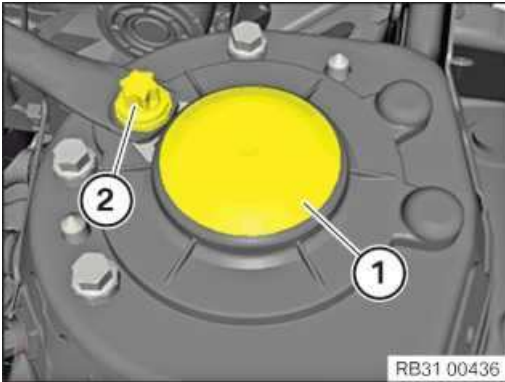


Slacken nut (1).
Pull out screw (2).
Release wishbone (3) from swivel bearing.



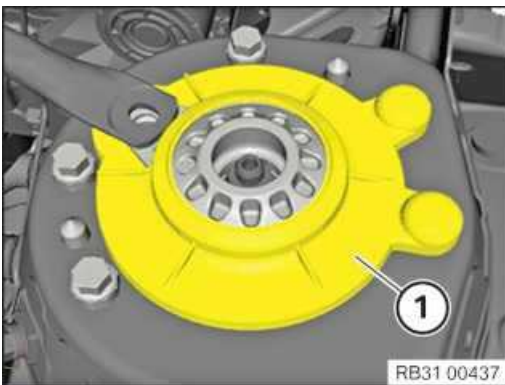
Slacken nut (1).

Release track rod (2) from swivel bearing.

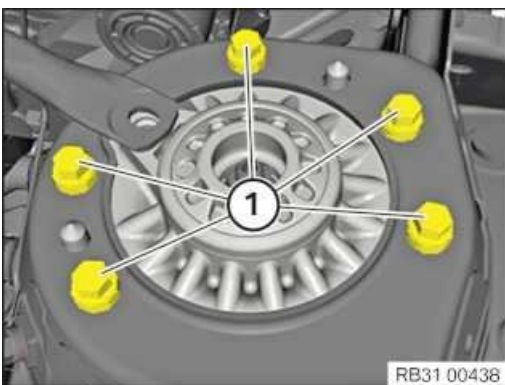


Remove protective cap (1).

Release screw (2).

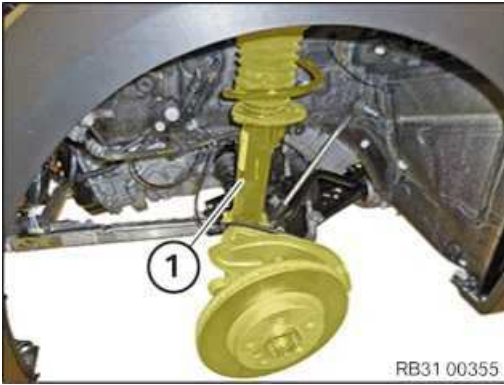


Remove cover (1).

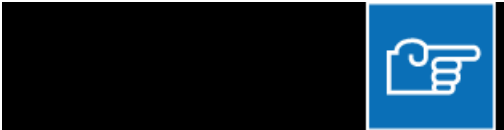


Secure spring strut against falling out.

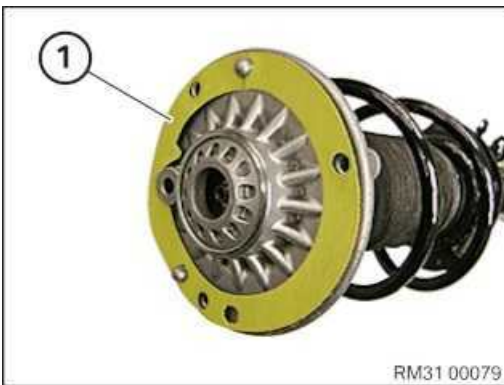
Loosen screws (1).



Remove spring strut (1) from wheel arch.



Installation:



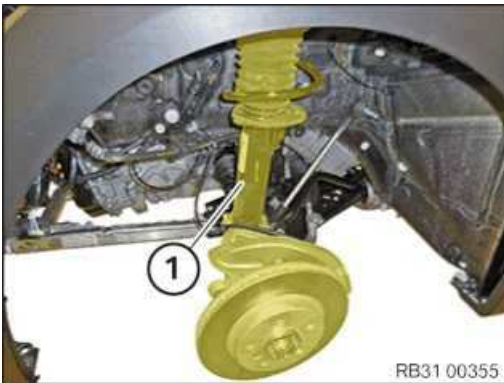
If installed: Remove and dispose of the seal (1).

Clean contact surface at spring strut dome.

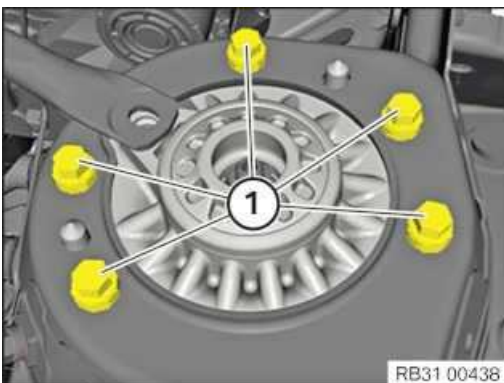
Note:

Seal (1) is no longer installed.

The seal (1) can also only be omitted on one side (left or right).



Guide the spring strut (1) into the wheel arch.

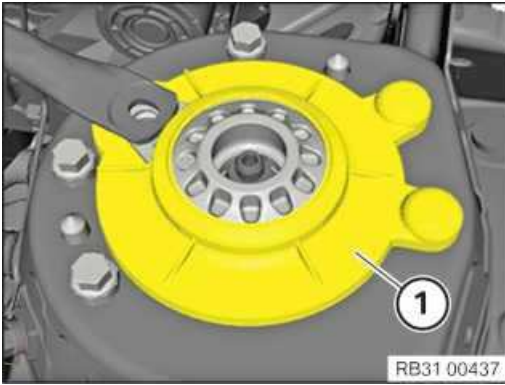


Align spring strut to the bores in the spring strut dome using the centring pins.

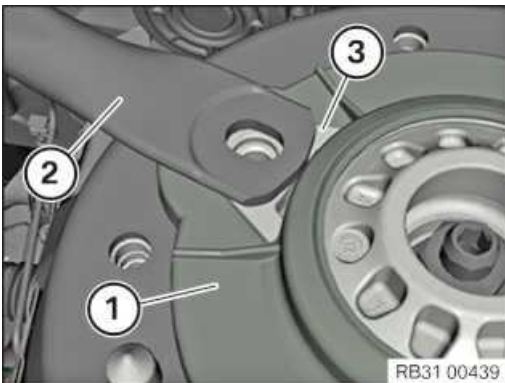
Parts: Renew screws (1).

Tighten screws (1).

Tightening torque [31 31 1AZ](#)

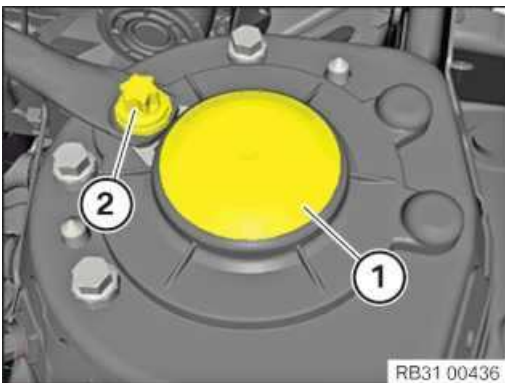


Lift the strut brace slightly and put on cover (1).



Make sure that the cover ring (1) of the facing (3) is correctly positioned at the strut brace.

Cover ring (1) must not be trapped between strut brace (2) and support bearing!

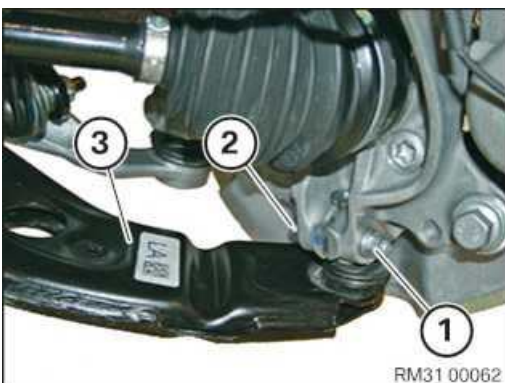


Attach and secure protective cap (1).

Parts: Renew screw (2).

Tighten screw (2).

Tightening torque [51 61 3AZ](#).



Join the wishbone (3) to the swivel bearing.

Parts: Replace screw (2) and nut (1).

Insert screw (2) with washer.

Caution!

The washer must lie between the screw head and the swivel bearing.

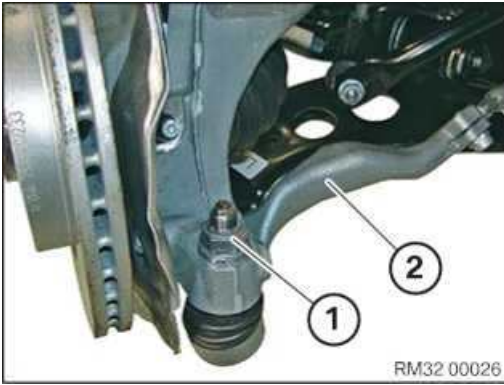
Note insertion direction of bolt (2). The screw (2) is inserted from the rear in the direction of travel.

Screw on the nut (1).

Tighten screw connection.

- Tightening is done via screw (2).

Tightening torque [31 12 1AZ](#)

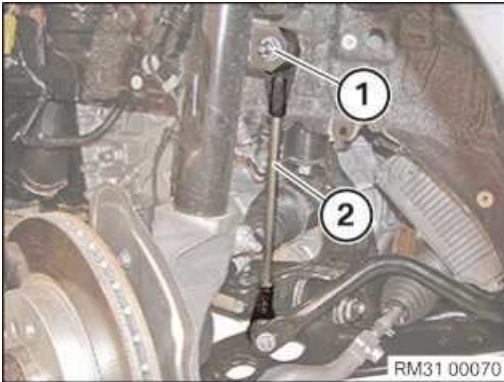


Insert track rod (2) into the swivel bearing.

Parts: Replace nut (1).

Tighten nut (1).

Tightening torque [32 21 1AZ](#)

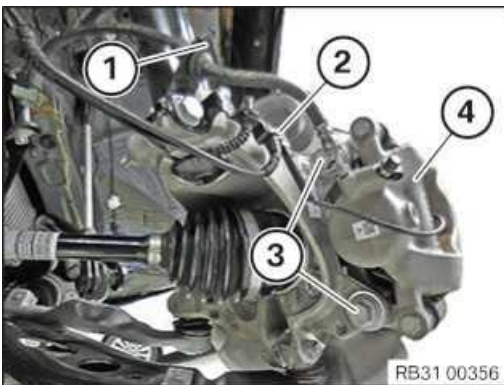


Position anti-roll bar link (2) on spring strut.

Parts: Replace nut (1).

Tighten nut (1).

Tightening torque [31 35 2AZ](#)



Position brake caliper (4) with brake-caliper support on swivel bearing.

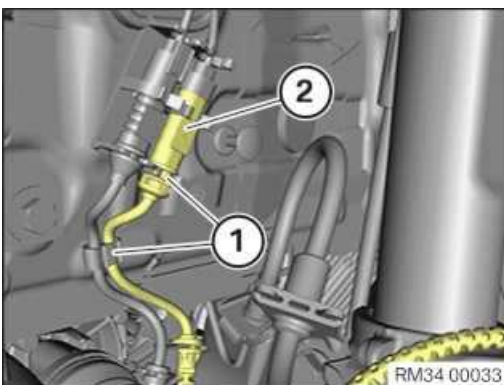
Parts: Replace screws (3).

Tighten down screws (3).

Tightening torque [34 11 2AZ](#)

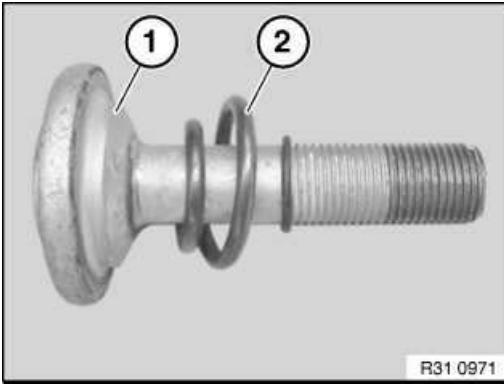
Secure brake hose (1) on holder.

If necessary, connect the cable for the brake pad wear indicator (2) on the holder.



Connect plug connection (2).

Attach the holder for the pulse sensor in the brackets (1).



- Pay attention to installation position of compression spring (2).
- Keep collar bolt and spur toothing of wheel hub/output shaft clean and free of grease

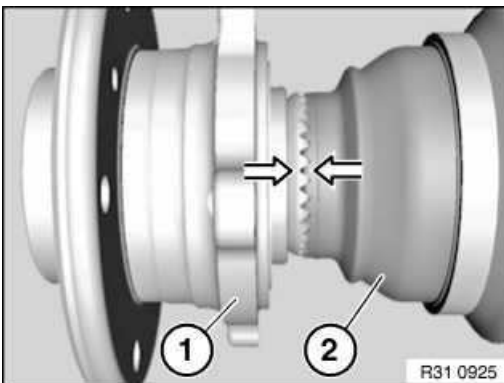
Caution!

Following installation note for spur gearing must be observed without fail!



Parts: Replace collar bolt and compression spring.

Tighten collar bolt (1) and compression spring by hand.



- Front gearing of wheel hub (1) and output shaft (2) should be installed form-fit (tooth in tooth position).

Check whether spur gearing is locked tooth in tooth by reciprocally rotating wheel hub/output shaft.

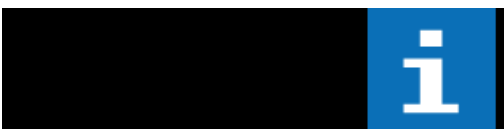
When the positive locking is ensured, tighten the collar bolt.

Tightening torque [31 60 2AZ](#)



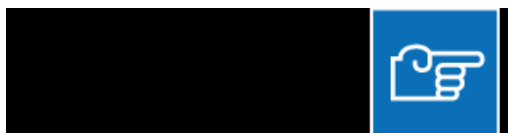
Thinly grease the wheel hub in area (1).

Do not install the protective cap.

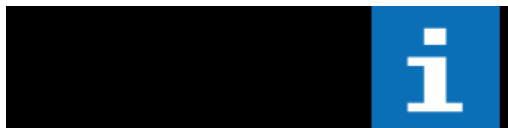


Required follow-up work:

- Install [front wheel](#).
- Attach [front cowl panel cover](#).

*Installation note:*

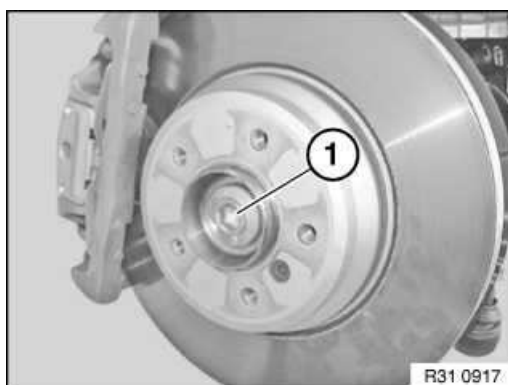
1. All screws, nuts, bolts and hose clamps removed during the repair must be replaced.
2. Retaining elements on chassis and suspension and steering parts must be replaced.

**Necessary preliminary work:**

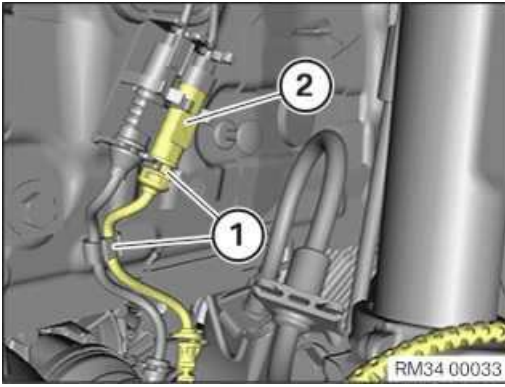
- Remove [front cowl panel cover](#).
- Remove [front wheel](#).

**Removal:**

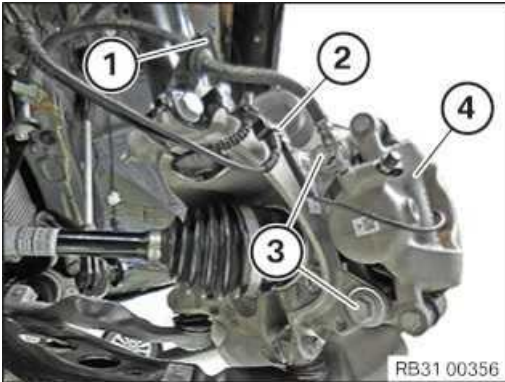
If necessary, lever off protective cap (1).



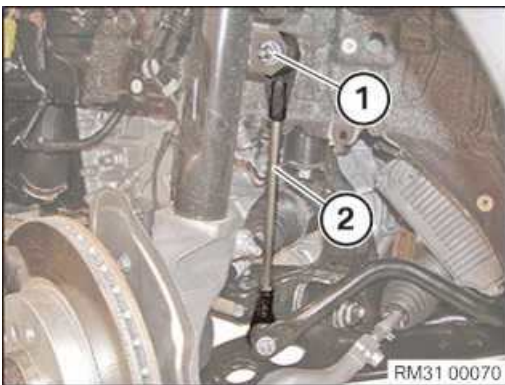
Release collar bolt (1), press brake pedal to floor for this purpose.



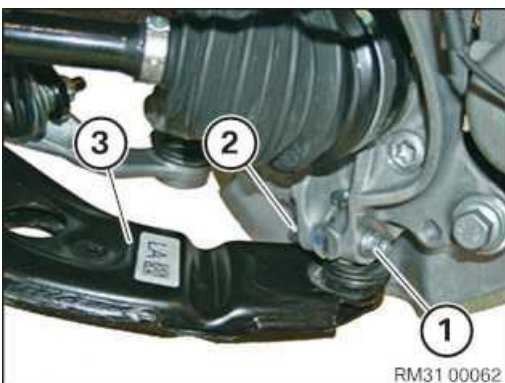
Detach pulse sensor cable from the brackets (1).
Disconnect plug connection (2).



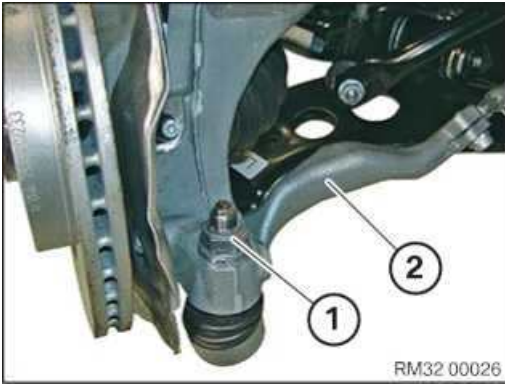
Release brake hose (1) from holder.
If necessary, release brake wear indicator (2) from holder.
Loosen screws (3).
Lay brake caliper (4) with brake-caliper support to one side and tight up.



Slacken nut (1).
Release anti-roll bar link (2) from spring strut.

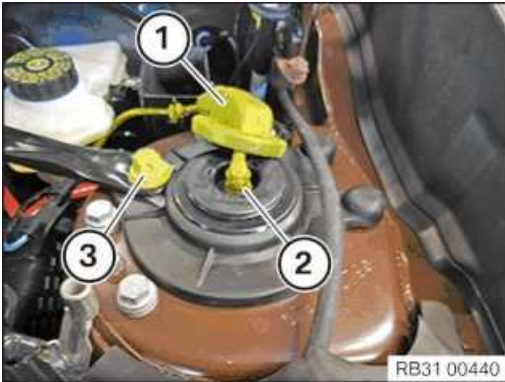


Slacken nut (1).
Pull out screw (2).
Release wishbone (3) from swivel bearing.



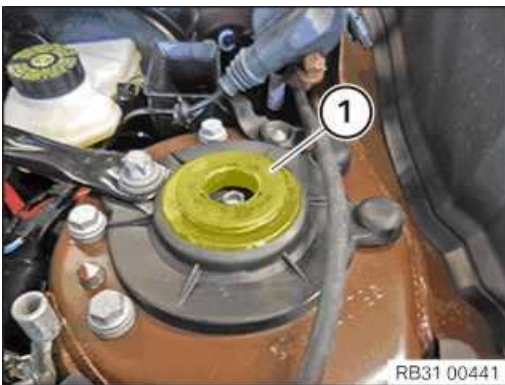
Slacken nut (1).

Release track rod (2) from swivel bearing.

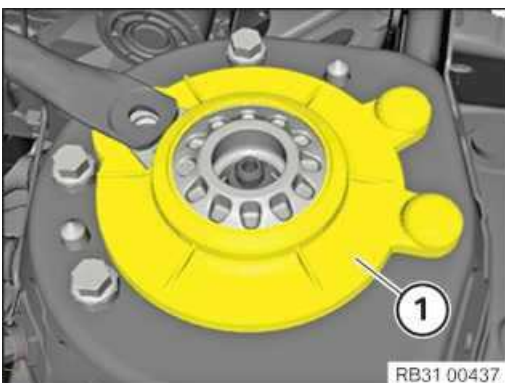


Remove protective cap (1) and unplug underlying connector (2) from the spring strut.

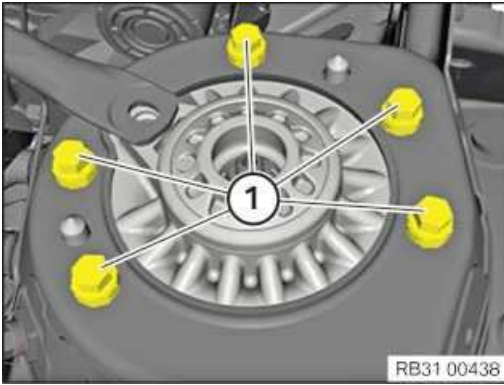
Release screw (3).



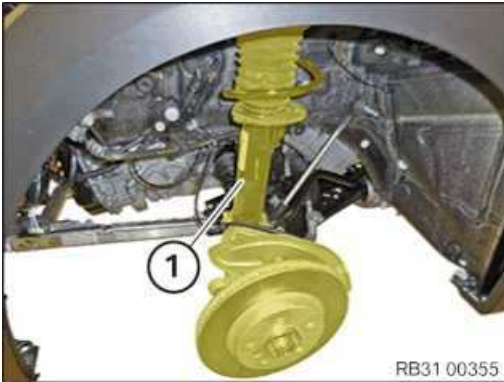
Remove adapter ring (1).



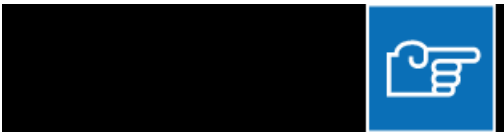
Lift the strut brace slightly and remove the cover (1).



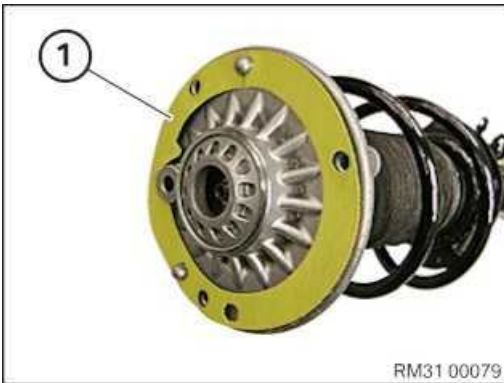
Secure spring strut against falling out.
Loosen screws (1).



Remove spring strut (1) from wheel arch.



Installation:

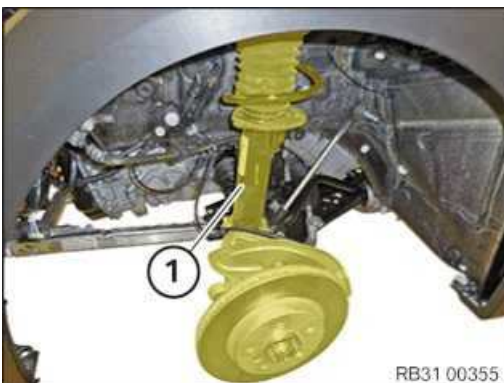


If installed: Remove and dispose of the seal (1).
Clean contact surface at spring strut dome.

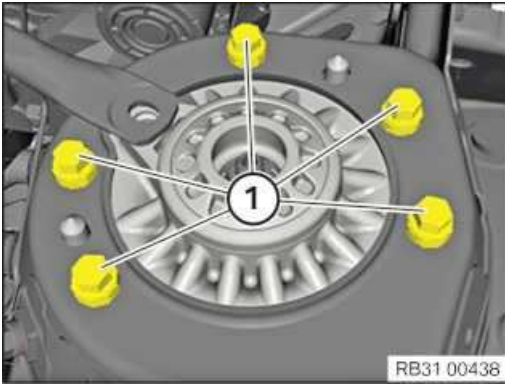
Note:

Seal (1) is no longer installed.

The seal (1) can also only be omitted on one side (left or right).



Guide the spring strut (1) into the wheel arch.

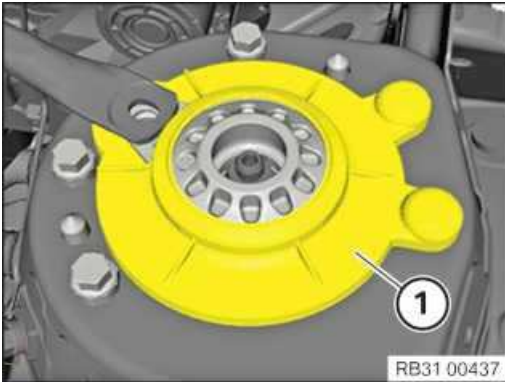


Align spring strut to the bores in the spring strut dome using the centring pins.

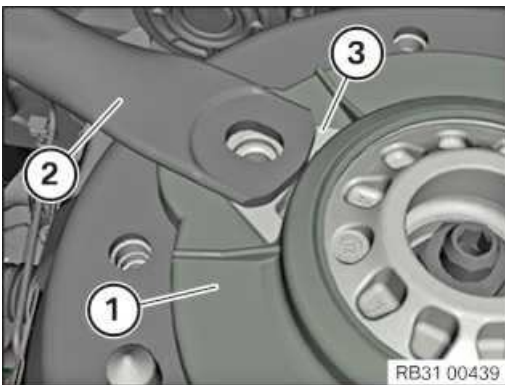
Part: Renew screws (1).

Tighten screws (1).

Tightening torque [31 31 1AZ](#)



Lift the strut brace slightly and put on cover (1).

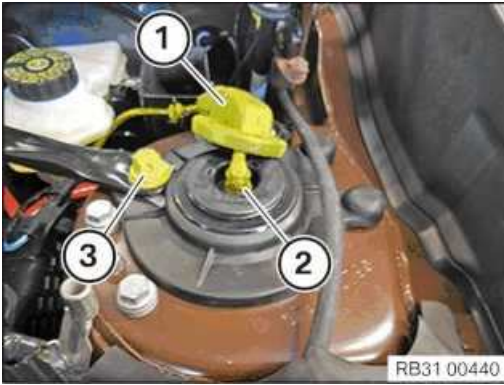


Make sure cover ring (1) is positioned correctly on strut brace facing (3).

Cover ring (1) must not be trapped between strut brace (2) and support bearing!



Put on adapter ring (1).



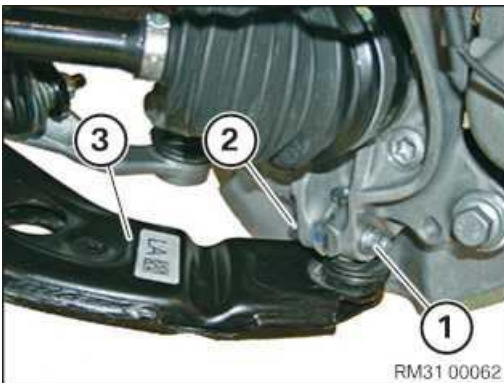
Connect connector (2) with the spring strut.

Mount protective cap (1).

Parts: Replace screw (3).

Tighten screw (3).

Tightening torque [51 61 3AZ](#).



Join the wishbone (3) to the swivel bearing.

Part: Replace screw (2) and nut (1).

Insert screw (2) with washer.

Caution!

The washer must lie between the screw head and the swivel bearing.

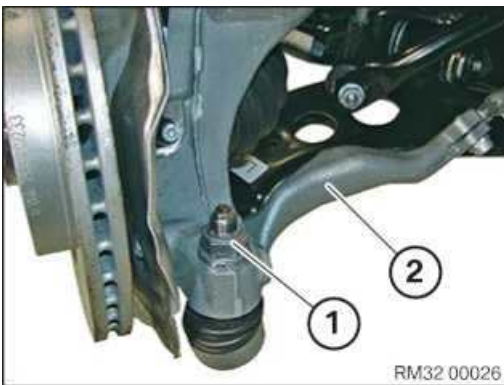
Note insertion direction of bolt (2). The screw (2) is inserted from the rear in the direction of travel.

Screw on the nut (1).

Tighten screw connection.

- Tightening is done via screw (2).

Tightening torque [31 12 1AZ](#)

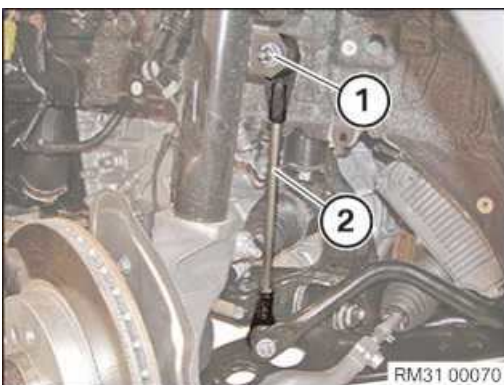


Insert track rod (2) into the swivel bearing.

Part: Replace nut (1).

Tighten nut (1).

Tightening torque [32 21 1AZ](#)

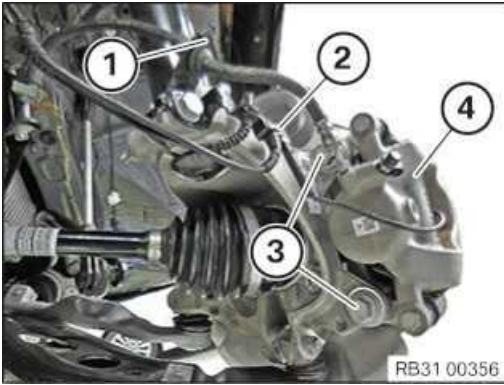


Position anti-roll bar link (2) on spring strut.

Part: Replace nut (1).

Tighten nut (1).

Tightening torque [31 35 2AZ](#)



Position brake caliper (4) with brake-caliper support on swivel bearing.

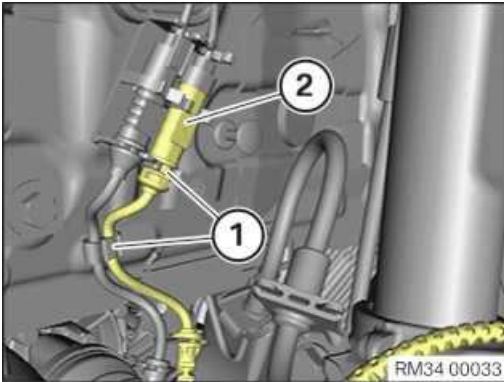
Part: Replace screws (3).

Tighten down screws (3).

Tightening torque [34 11 2AZ](#)

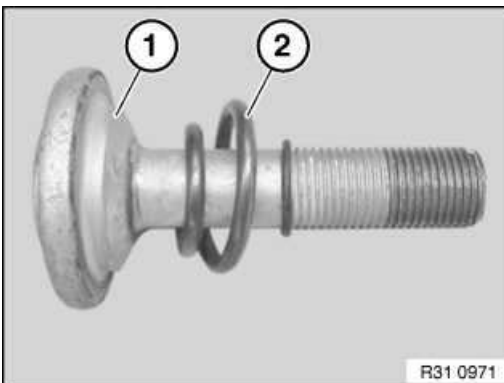
Secure brake hose (1) on holder.

If necessary, secure brake wear indicator (2) on holder.



Connect plug connection (2).

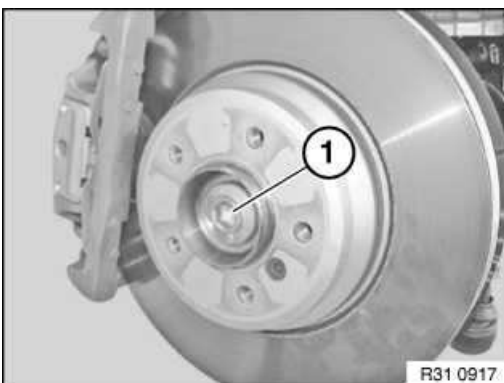
Attach the pulse sensor cable to the brackets (1).



- Pay attention to installation position of compression spring (2).
- Keep collar bolt and spur toothing of wheel hub/output shaft clean and free of grease

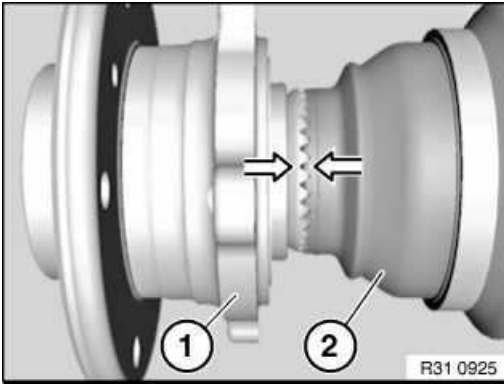
Caution!

Following installation note for spur gearing must be observed without fail!



Part: Replace collar bolt and compression spring.

Tighten collar bolt (1) and compression spring by hand.

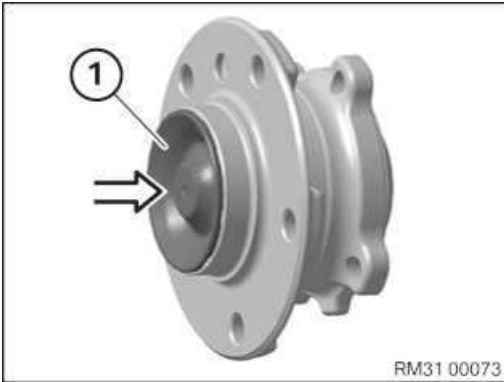


- Front gearing of wheel hub (1) and output shaft (2) should be installed form-fit (tooth in tooth position).

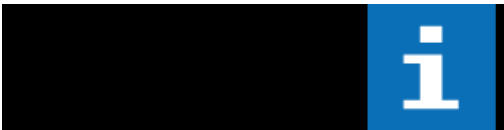
Check whether spur gearing is locked tooth in tooth by reciprocally rotating wheel hub/output shaft.

Once a form-fit has been ensured, tighten to final torque.

Tightening torque [31 60 2AZ](#)

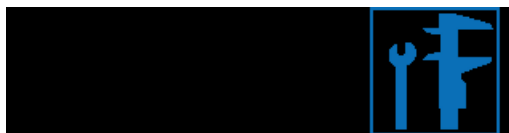


If necessary, attach protective cap (1).



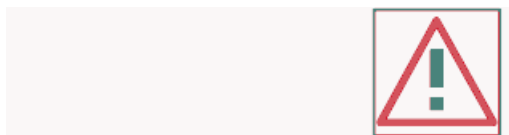
Required follow-up work:

- Install [front wheel](#).
- Attach [front cowl panel cover](#).



Special tools required:

- [31 3 340](#)
- [31 2 230](#)
- [2 240 516](#)
- [2 364 829](#)
- [31 3 341](#)
- [2 240 482](#)
- [2 364 828](#)
- [2 240 486](#)
- [2 240 487](#)
- [2 412 607](#)
- [2 240 490](#)
- [2 360 213](#)



Attention!

- When replacing shock absorber/spring strut, renew auxiliary damper!



Warning!

Before using the special tool [31 3 340](#) take care to read through the Owner's Handbook!

All the safety precautions and instructions contained in the Owner's Handbook must be strictly observed!

Failure to observe these safety precautions and instructions increases the risk of serious physical injury, damage to your health and damage to property and equipment!



Attention!

1. Use only the BMW approved special tool!
2. Prior to each use, check the special tools for defects, modifications and operational reliability.
3. Damaged/modified special tools must not be used!
4. No changes or modifications may be made to the special tools!
5. These special tools are intended solely for the purpose of tightening and relieving cylindrical and tapered suspension springs.
6. Keep special tools dry, clean and (down to the spindle) free from grease.
7. Impact screwdrivers are prohibited!
Risk of damage inside the shock absorber!
8. Do not compress coil spring to full extent.

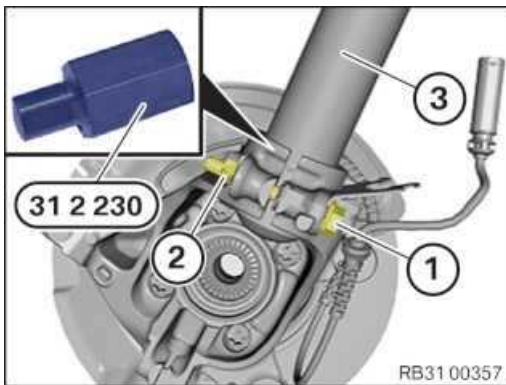


Necessary preliminary tasks:

- Remove [front spring strut \(EDC\)](#).



Removing:



Loosen the nut (2).

Pull out screw (1).

Remove brake hose holder.

Spread swivel bearing with special tool [31 2 230](#).

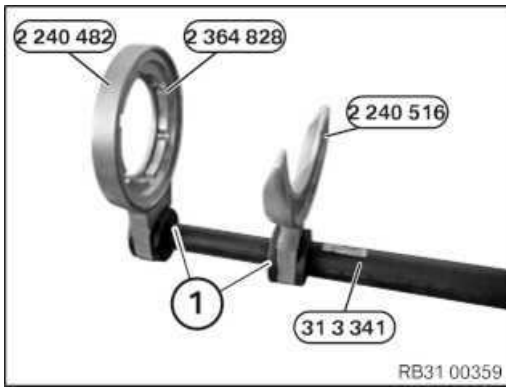
Lift the spring strut (3) out of the swivel bearing.



Attention!

Risk of damage to the coil spring protective sheath.

Use tensioning plate [2 240 516](#) without fail with protective insert [2 364 829](#).

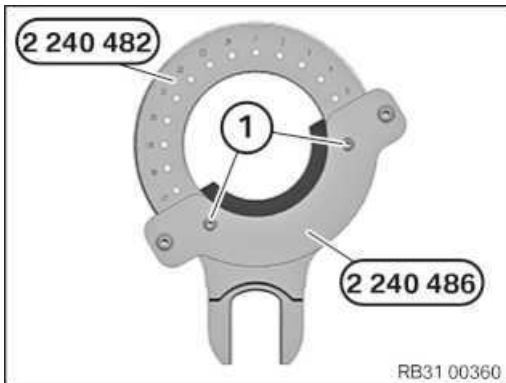


Clamp special tool [31 3 341](#) in vice.

Fit special tool [2 240 516](#) and [2 240 482](#) onto special tool [31 3 341](#) until retaining bolt (1) can be felt and heard to snap into place.

Insert the centring insert [2 364 828](#) in the round tensioning plate [2 240 482](#).

Check seating of special tools [2 240 516](#) and [2 240 482](#) with centring insert [2 364 828](#), correct if necessary.



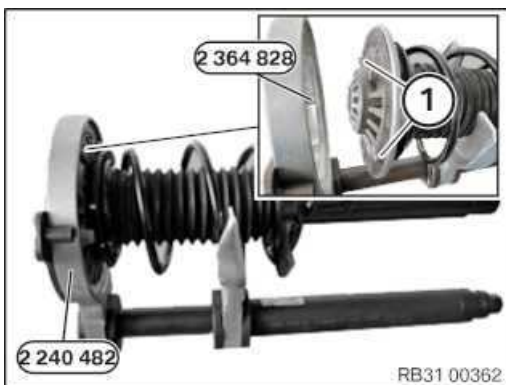
Installation of brake onto round tensioning plate:

Place counter support [2 240 486](#) in the correct position/bore hole:

- **Screw connection using bore holes 7 and 15**

Turn centring insert [2 364 828](#) until counter support [2 240 486](#) can be screwed into place at the specified position.

Screw together counter support with round tension plate and centring insert with screws (1) so they are hand-tight.



Clean coil spring to remove contamination.

Spring must be free of grease, clean and dry.

Insert spring strut into spring tensioner.

Warning!

Insert the guide pins (1) of the support bearing must fit into the recesses on the centring insert [2 364 828](#).

The support bearing must be completely fitted against the centring ring [2 364 828](#).

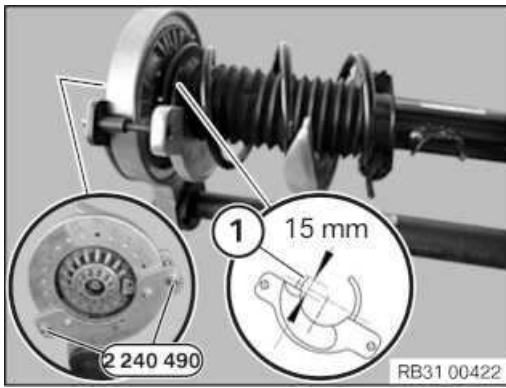
The lower spring coil must be placed completely into the recess of special tool [2 240 516](#) !



Attention!

Risk of damage to the coil spring protective sheath.

Always use the pressure plate [2 240 487](#) with protective insert [2 412 607](#).

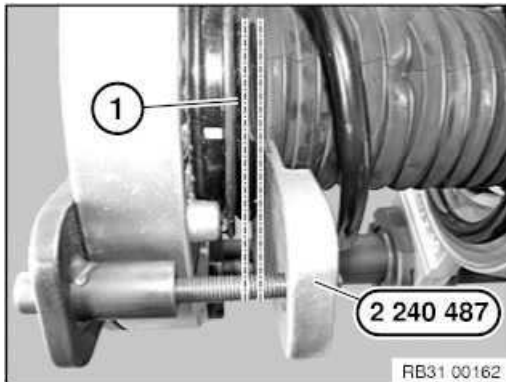


Attach pressure plate [2 240 487](#) with the screws [2 240 490](#) !

The gummed side of the pressure plate [2 240 487](#) must be fitted against the top spring coil.

Position the spring strut such that the end of the spring (1) at the pressure plate [2 240 487](#) protrudes by 15 mm.

Tighten the screws [2 240 490](#) evenly at 7 Nm.



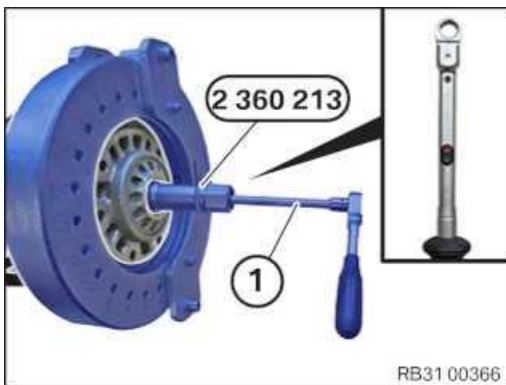
Attention!

The pressure plate [2 240 487](#) must be aligned parallel with the top spring coil (1)!

When the end of the spring begins to twist relative to the pressure plate, tensioning must be stopped immediately.

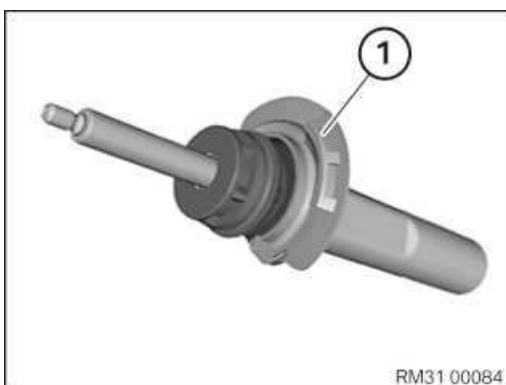
The pressure plate must be checked for correct seating and the rubber-coated facing and pressure plate also checked for wear.

Tension coil spring with spring tensioner [31 3 341](#) until stress on piston rod is relieved.

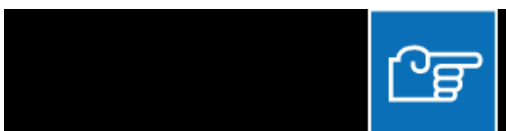


Release nut with special tool [2 360 213](#) , reversible ratchet with extension and socket SW10.

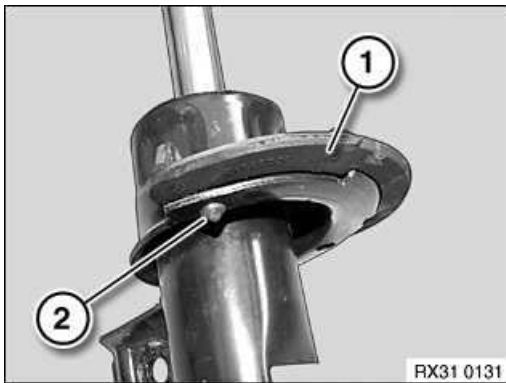
Remove shock absorber from coil spring.



Remove lower spring pad (1) from shock absorber.



Assembly:

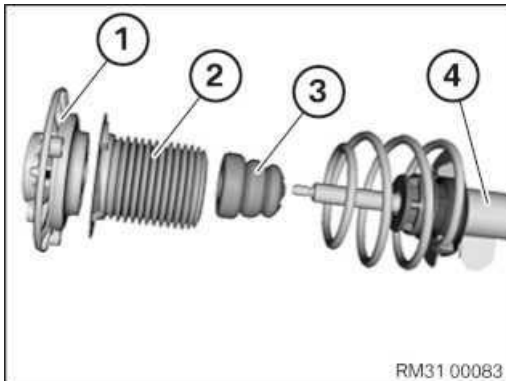


Check lower spring pad (1) for damage, replace if necessary.

Attach lower spring pad (1) to spring cup.

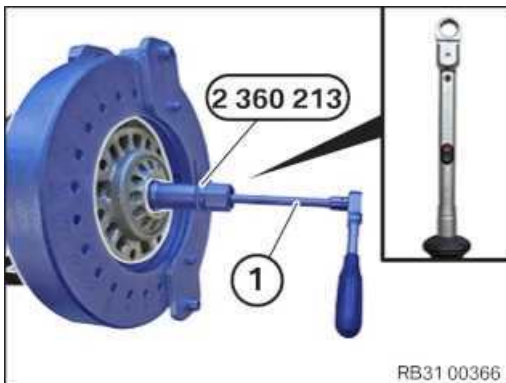
Note:

Make sure rubber knob (2) is correctly positioned in spring cup bore.



Check protective tube/upper spring pad (2) for damage, replace if necessary.

Part: Replace the auxiliary damper (3).



Insert spring strut into tensioned coil spring.

Part: Renew nut.

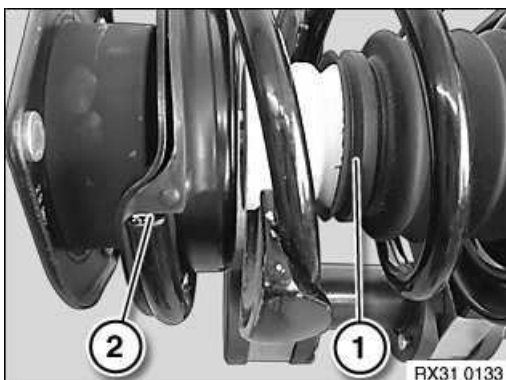
Tighten nut with special tool [2 360 213](#), reversible ratchet with extension, socket SW10 and torque wrench with ring spanner attachment SW21.

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

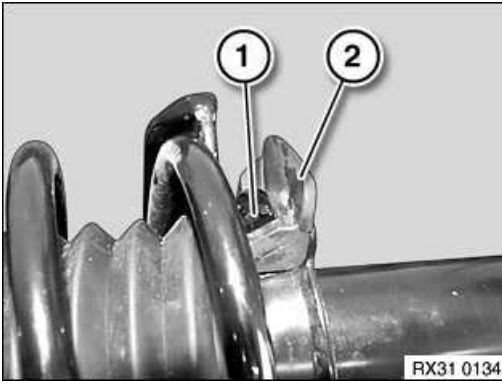


Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

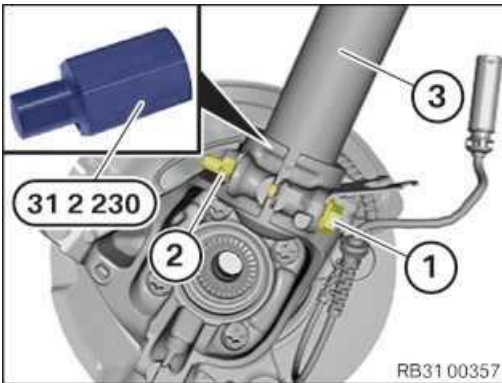


Check installation position of protective tube, correct if necessary.



End of lower coil spring (1) must rest on stop of spring pad (2).

Align all components correctly to each other and relieve tension on coil spring.



Spread swivel bearing with special tool [31 2 230](#) .

Align the swivel bearing using the gap to the positioning pin on the rear side of the spring strut (3) and push it on as far as it will go.

Remove special tool [31 2 230](#) .

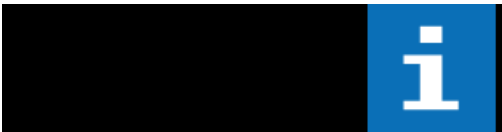
Position the brake hose holder.

Part: Renew screw (1) and nut (2).

Insert bolt (1).

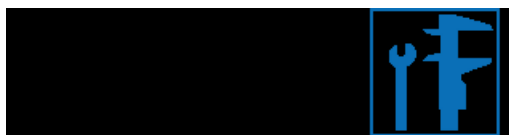
Tighten nut (2).

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

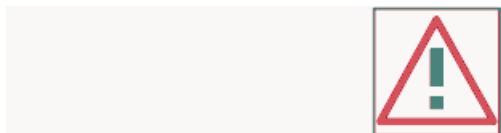


Required follow-up work:

- Install [front spring strut \(EDC\)](#).

**Special tools required:**

- [31 3 340](#)
- [31 2 230](#)
- [2 240 516](#)
- [2 364 829](#)
- [31 3 341](#)
- [2 240 482](#)
- [2 364 828](#)
- [2 240 486](#)
- [2 240 487](#)
- [2 412 607](#)
- [2 240 490](#)
- [33 0 040](#)

**Attention!**

- When replacing shock absorber/spring strut, renew auxiliary damper!

**Warning!**

Completely read the respective operating instructions before using special tools [31 3 340](#) !

Strictly adhere to all safety information and instructions in the operating instructions!

Failure to observe these safety precautions and instructions increases the risk of serious physical injury, damage to your health and damage to property and equipment!



Attention!

1. Use only the BMW approved special tool!
2. Prior to each use, check the special tools for defects, modifications and operational reliability.
3. Damaged/modified special tools must not be used!
4. No changes or modifications may be made to the special tools!
5. These special tools are intended solely for the purpose of tightening and relieving cylindrical and tapered suspension springs.
6. Keep special tools dry, clean and (down to the spindle) free from grease.
7. Impact screwdrivers are prohibited!
8. Do not compress coil spring to full extent.

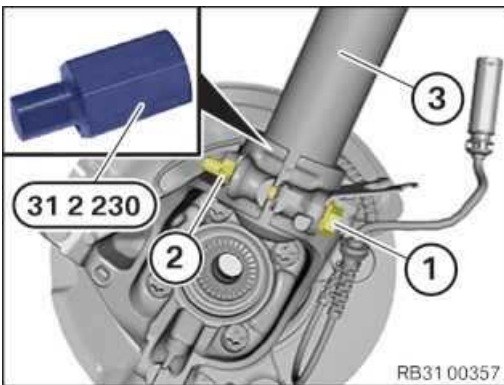


Necessary preliminary work:

- Remove [front spring strut](#).



Removing:



Slacken nut (2).

Pull out screw (1).

Remove bracket from brake hose.

Spread swivel bearing with the special tool [31 2 230](#).

Lift the spring strut (3) out of the swivel bearing.



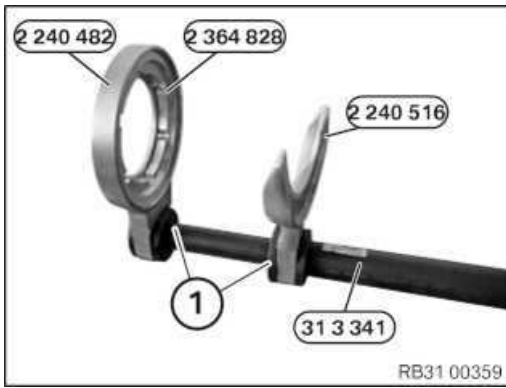
Attention!

Risk of damage to the coil spring!

Before application: Check protective insert for wear, replace if necessary.

Use of faulty protective inserts leads to coil spring damage. This can lead to coil spring breakage (corrosion).

Always use the pressure plate [2 240 516](#) with protective insert [2 364 829](#).

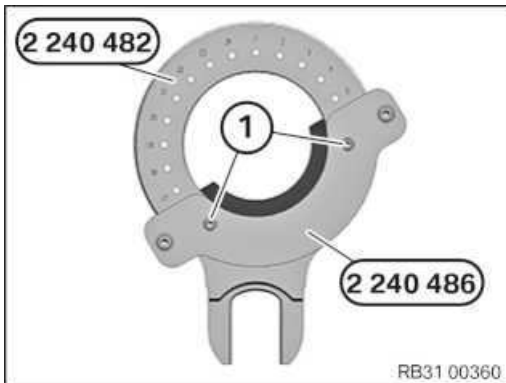


Clamp special tool [31 3 341](#) in vice.

Fit special tool [2 240 516](#) and [2 240 482](#) onto special tool [31 3 341](#) until retaining bolt (1) can be felt and heard to snap into place.

Insert centering ring [2 364 828](#) into mounting plate [2 240 482](#).

Check the seating of the special tools [2 240 516](#) and [2 240 482](#) by means of the centering ring [2 364 828](#), correct if necessary.



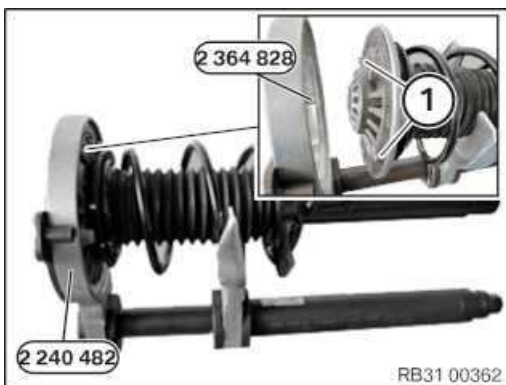
Installation of brake onto mounting plate:

Place counter support [2 240 486](#) in the correct position/bore hole:

- **Screw connection using bore holes 1 and 17**

Turn centering ring [2 364 828](#) until counter support [2 240 486](#) can be screwed into place at the specified position.

Screw the counter support with the mounting plate and the centering ring with the screws (1) hand-tight!



Clean coil spring to remove contamination.

Spring must be free of grease, clean and dry.

Insert spring strut into the spring tensioner.

Warning!

The guide pins (1) of the support bearing must fit into the recesses on the centering ring [2 364 828](#).

The support bearing must be completely fitted against the centering ring [2 364 828](#).

The lower spring coil must be placed completely into the recess of special tool [2 240 516](#) !



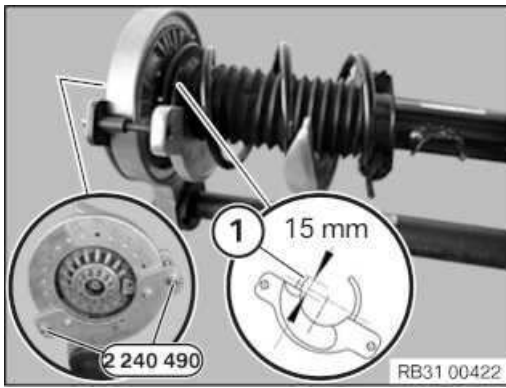
Attention!

Risk of damage to the coil spring!

Before application: Check protective insert for wear, replace if necessary.

Use of faulty protective inserts leads to coil spring damage. This can lead to coil spring breakage (corrosion).

Always use the pressure plate [2 240 487](#) with protective insert [2 412 607](#)

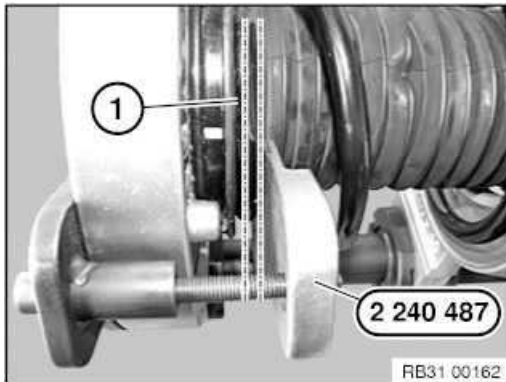


Attach the pressure plate [2 240 487](#) with the screws [2 240 490](#) !

The gummed side of the pressure plate [2 240 487](#) must be fitted against the top spring coil.

Position the spring strut such that the end of the spring (1) at the pressure plate [2 240 487](#) protrudes by 15 mm.

Tighten the screws [2 240 490](#) evenly at 8 Nm.



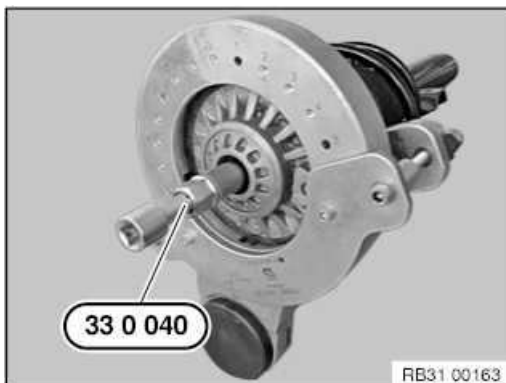
Attention!

The pressure plate [2 240 487](#) must be aligned parallel with the top spring coil (1)!

When the end of the spring begins to twist relative to the pressure plate, tensioning must be stopped immediately.

The pressure plate must be checked for correct seating and the rubber-coated facing and pressure plate also checked for wear.

Tension the coil spring with the spring tensioner [31 3 341](#) until the stress on the piston rod is relieved.



Warning!

Nut may only be released when the upper and lower coils of the coil spring are located completely in the recess of the spring holder!

Release nut with special tool [33 0 040](#) .



Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

Remove shock absorber from tensioned coil spring.



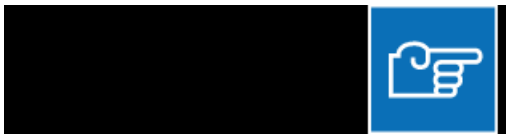
Relieve tension on coil spring.

Release special tool [2 240 487](#) .

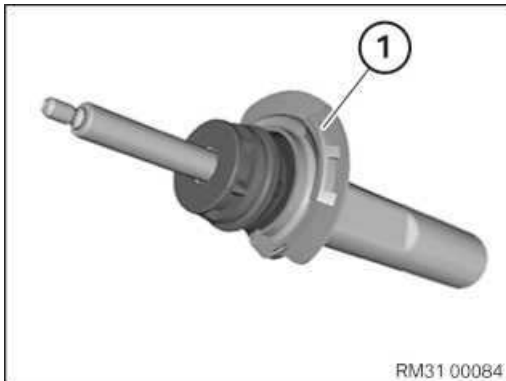
Take out the coil spring with protective tube and support bearing.

Installation note:

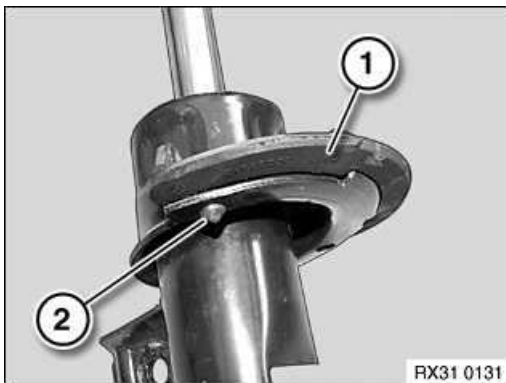
Check support bearing and protective tube for damage, replace if necessary.



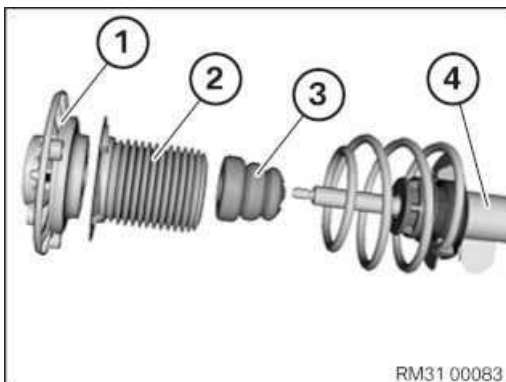
Assembly:



Check bottom spring pad (1) and replace if necessary.



Make sure the journals (2) are correctly positioned in the bore hole of the spring cup.



Apply and tension the new spring with the special tool [31 3 341](#).

Check protective tube/top spring pad (2) and support bearing (1) for damage, replace if necessary.

Insert spring strut (4) in tensioned coil spring.

Replace the auxiliary damper (3).

Parts: Auxiliary damper

Attach auxiliary damper (3), protective tube/upper spring pad (2) and support bearing (1) to piston rod.



Renew nut.

Parts: Nut

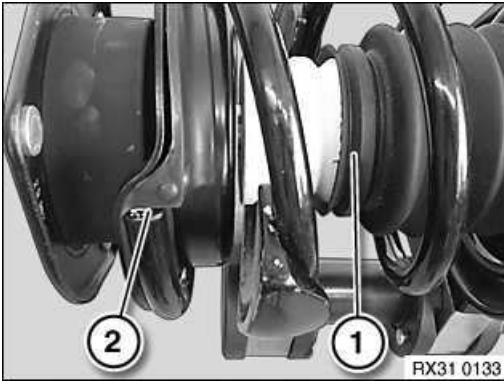
Tighten the nut using special tool [33 0 040](#) and the torque wrench featuring ring spanner insert.

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

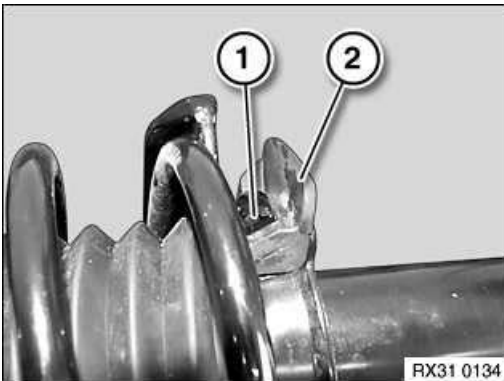


Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

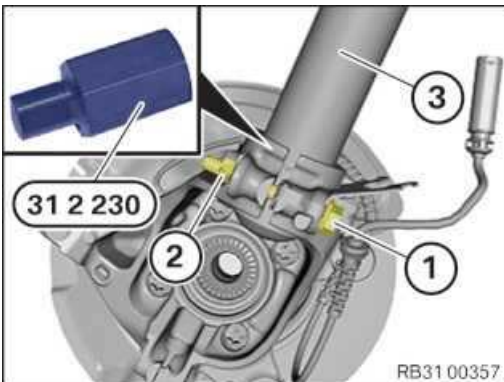


Check installation position of protective tube, correct if necessary.



End of lower coil spring (1) must rest on stop of spring pad (2).

Align all components correctly to each other and relieve tension on coil spring.



Spread swivel bearing with the special tool [31 2 230](#).

Align the swivel bearing using the gap to the positioning pin on the rear side of the spring strut (3) and push it on as far as it will go.

Remove special tool [31 2 230](#).

Position the brake hose bracket.

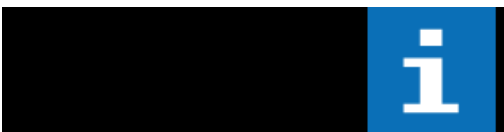
Renew screw (1) and nut (2).

Parts: Bolt and nut

Insert bolt (1).

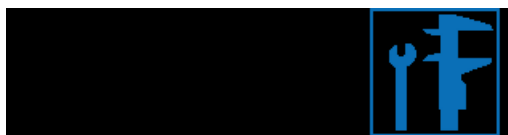
Tighten nut (2).

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

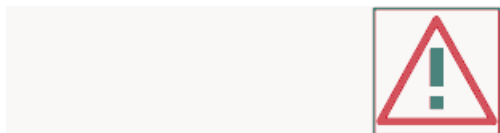


Required follow-up work:

- Install [front spring strut](#).
- Check [headlight adjustment](#), correct if necessary.

**Special tools required:**

- [31 3 340](#)
- [31 2 230](#)
- [2 240 516](#)
- [2 364 829](#)
- [31 3 341](#)
- [2 240 482](#)
- [2 364 828](#)
- [2 240 486](#)
- [2 240 487](#)
- [2 412 607](#)
- [2 240 490](#)
- [2 360 213](#)

**Attention!**

- When replacing shock absorber/spring strut, renew auxiliary damper!

**Warning!**

Completely read the respective operating instructions before using special tools [31 3 340](#) !

Strictly adhere to all safety information and instructions in the operating instructions!

Failure to observe these safety precautions and instructions increases the risk of serious physical injury, damage to your health and damage to property and equipment!



Attention!

1. Use only the BMW approved special tool!
2. Prior to each use, check the special tools for defects, modifications and operational reliability.
3. Damaged/modified special tools must not be used!
4. No changes or modifications may be made to the special tools!
5. These special tools are intended solely for the purpose of tightening and relieving cylindrical and tapered suspension springs.
6. Keep special tools dry, clean and (down to the spindle) free from grease.
7. Impact screwdrivers are prohibited!
8. Do not compress coil spring to full extent.

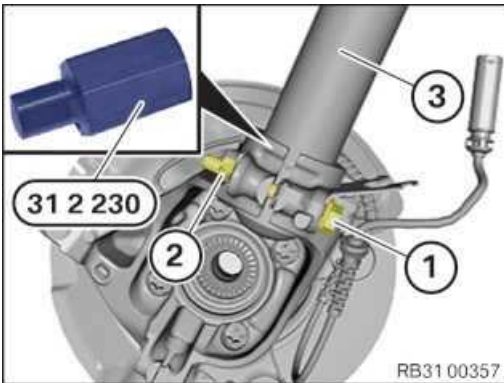


Necessary preliminary work:

- Remove [front spring strut](#).



Removing:



Slacken nut (2).

Pull out screw (1).

Remove bracket from brake hose.

Spread swivel bearing with the special tool [31 2 230](#).

Lift the spring strut (3) out of the swivel bearing.



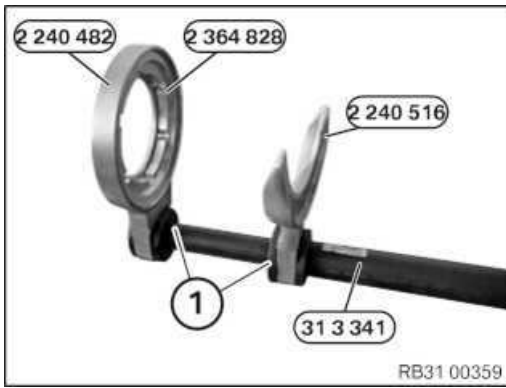
Attention!

Risk of damage to the coil spring!

Before application: Check protective insert for wear, replace if necessary.

Use of faulty protective inserts leads to coil spring damage. This can lead to coil spring breakage (corrosion).

Always use the pressure plate [2 240 516](#) with protective insert [2 364 829](#).

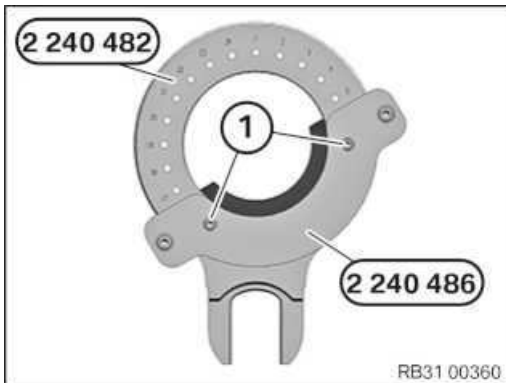


Clamp special tool [31 3 341](#) in vice.

Fit special tool [2 240 516](#) and [2 240 482](#) onto special tool [31 3 341](#) until retaining bolt (1) can be felt and heard to snap into place.

Insert centering ring [2 364 828](#) into mounting plate [2 240 482](#).

Check the seating of the special tools [2 240 516](#) and [2 240 482](#) by means of the centering ring [2 364 828](#), correct if necessary.



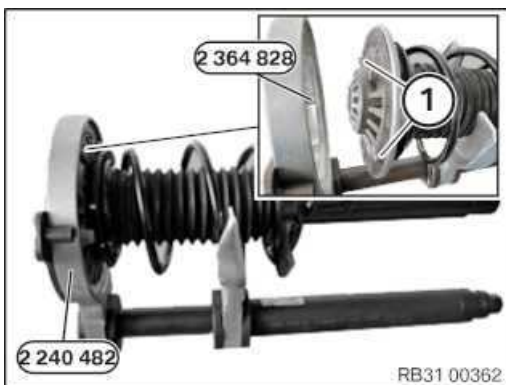
Installation of brake onto mounting plate:

Place counter support [2 240 486](#) in the correct position/bore hole:

- **Screw connection using bore holes 1 and 17**

Turn centering ring [2 364 828](#) until counter support [2 240 486](#) can be screwed into place at the specified position.

Screw together counter support with mounting plate and the centering ring with screws (1) so they are hand-tight.



Clean coil spring to remove contamination.

Spring must be free of grease, clean and dry.

Insert spring strut into the spring tensioner.

Warning!

The guide pins (1) of the support bearing must fit into the recesses on the centering ring [2 364 828](#).

The support bearing must be completely fitted against the centering ring [2 364 828](#).

The lower spring coil must be placed completely into the recess of special tool [2 240 516](#) !



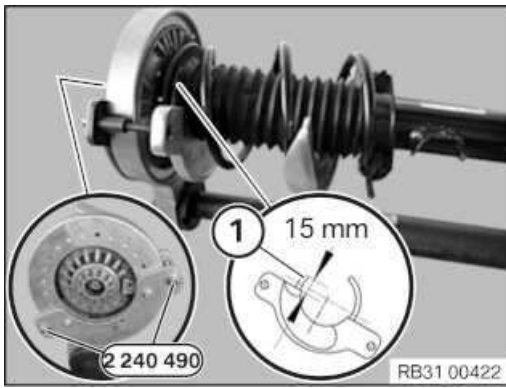
Attention!

Risk of damage to the coil spring!

Before application: Check protective insert for wear, replace if necessary.

Use of faulty protective inserts leads to coil spring damage. This can lead to coil spring breakage (corrosion).

Always use the pressure plate [2 240 487](#) with protective insert [2 412 607](#)

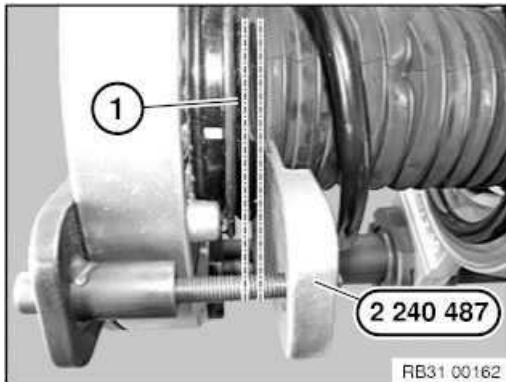


Attach pressure plate [2 240 487](#) with the screws [2 240 490](#) !

The gummed side of the pressure plate [2 240 487](#) must be fitted against the top spring coil.

Position the spring strut such that the end of the spring (1) at the pressure plate [2 240 487](#) protrudes by 15 mm.

Tighten the screws [2 240 490](#) evenly at 8 Nm.



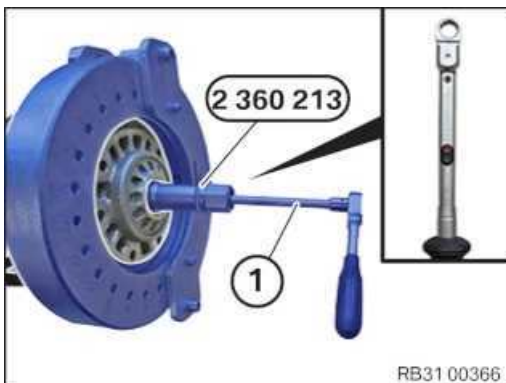
Attention!

The pressure plate [2 240 487](#) must be aligned parallel with the top spring coil (1)!

When the end of the spring begins to twist relative to the pressure plate, tensioning must be stopped immediately.

The pressure plate must be checked for correct seating and the rubber-coated facing and pressure plate also checked for wear.

Tension the coil spring with the spring tensioner [31 3 341](#) until the stress on the piston rod is relieved.



Release nut with special tool [2 360 213](#) , reversible ratchet with extension and socket SW10.



Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

Remove shock absorber from coil spring.



Relieve tension on coil spring.

Release special tool [2 240 487](#) .

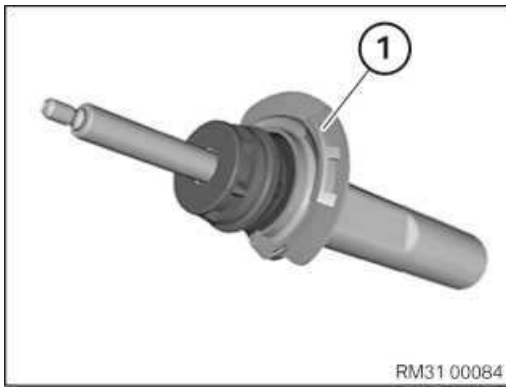
Take out the coil spring with protective tube and support bearing.

Installation note:

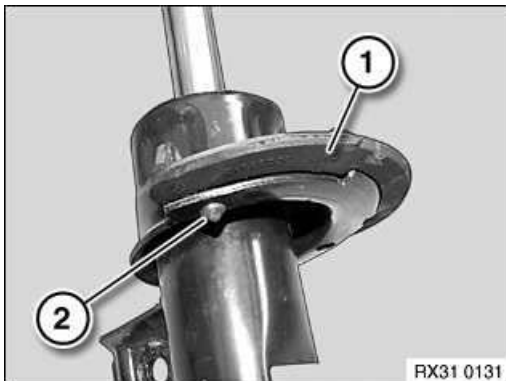
Check support bearing and protective tube for damage, replace if necessary.

Assembly:

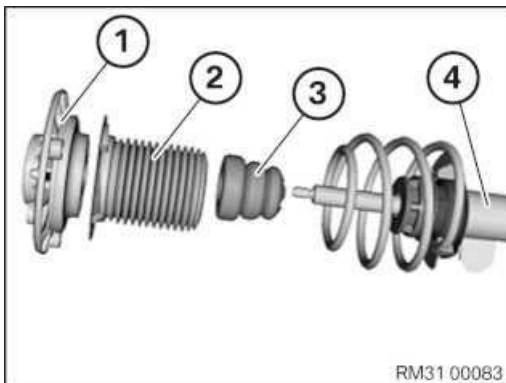




Check bottom spring pad (1) and replace if necessary.



Make sure the journal (2) is properly positioned in the bore hole of the spring cup.



Apply and tension the new spring with the special tool [31 3 341](#) .

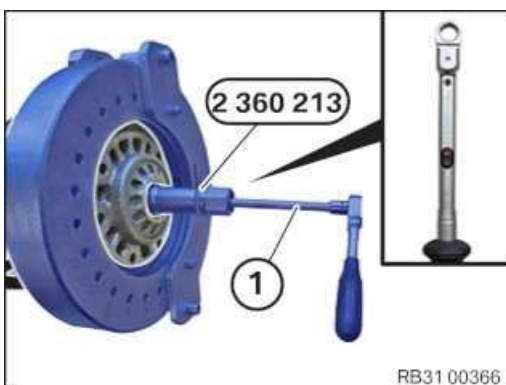
Check protective tube/top spring pad (2) and support bearing (1) for damage, replace if necessary.

Insert spring strut (4) in tensioned coil spring.

Replace the auxiliary damper (3).

Parts: Auxiliary damper

Attach auxiliary damper (3), protective tube/upper spring pad (2) and support bearing (1) to piston rod.



Insert spring strut into tensioned coil spring.

Renew nut.

Parts: Nut

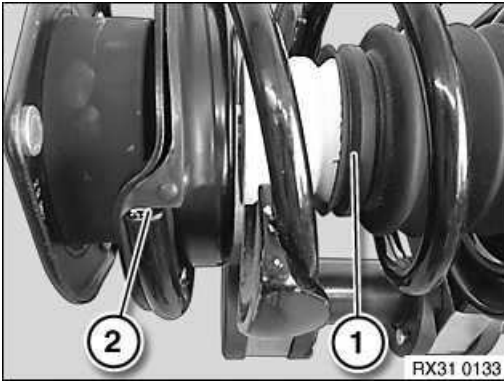
Tighten nut with special tool [2 360 213](#) , reversible ratchet with extension, socket SW10 and torque wrench with ring spanner insert SW21.

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

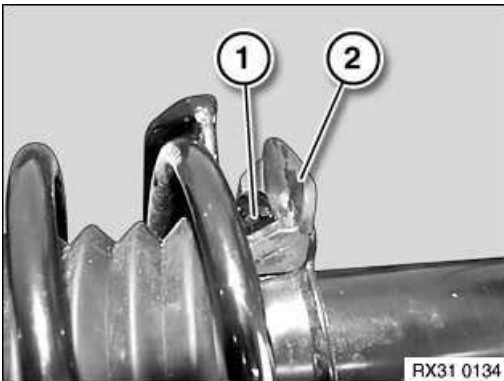


Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

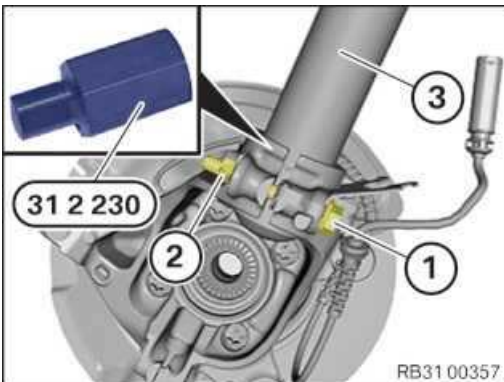


Check installation position of protective tube, correct if necessary.



End of lower coil spring (1) must rest on stop of spring pad (2).

Align all components correctly to each other and relieve tension on coil spring.



Spread swivel bearing with the special tool [31 2 230](#).

Align the swivel bearing using the gap to the positioning pin on the rear side of the spring strut (3) and push it on as far as it will go.

Remove special tool [31 2 230](#).

Position the brake hose bracket.

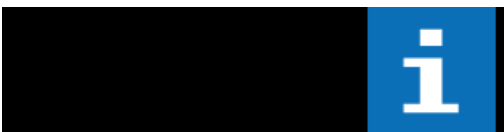
Renew screw (1) and nut (2).

Parts: Bolt and nut

Insert bolt (1).

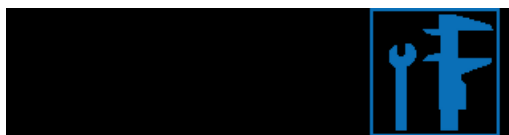
Tighten nut (2).

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

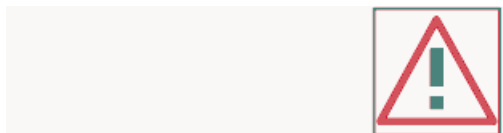


Required follow-up work:

- Install [front spring strut](#).
- Check [headlight adjustment](#), correct if necessary.

**Special tools required:**

- [31 3 340](#)
- [31 2 230](#)
- [2 240 516](#)
- [2 364 829](#)
- [31 3 341](#)
- [2 240 482](#)
- [2 364 828](#)
- [2 240 486](#)
- [2 240 487](#)
- [2 412 607](#)
- [2 240 490](#)
- [33 0 040](#)

**Attention!**

- **F48 Vehicles up to 03/2017:**

Due to the modified shock absorber setting, replace the shock absorbers only in pairs.

Failure to comply with this instruction will result in negative effects on the drivability.

**Warning!**

Completely read the respective operating instructions before using special tools [31 3 340](#) !

Strictly adhere to all safety information and instructions in the operating instructions!

Failure to observe these safety precautions and instructions increases the risk of serious physical injury, damage to your health and damage to property and equipment!



Attention!

1. Use only the BMW approved special tool!
2. Prior to each use, check the special tools for defects, modifications and operational reliability.
3. Damaged/modified special tools must not be used!
4. No changes or modifications may be made to the special tools!
5. These special tools are intended solely for the purpose of tightening and relieving cylindrical and tapered suspension springs.
6. Keep special tools dry, clean and (down to the spindle) free from grease.
7. Impact screwdrivers are prohibited!
Risk of damage inside the shock absorber!
8. Do not compress coil spring to full extent.

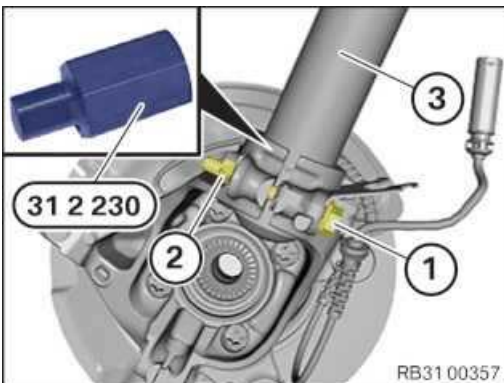


Necessary preliminary work:

- Remove [front spring strut](#).



When replacing shock absorber/spring strut, renew auxiliary damper!



Removal:

Slacken nut (2).

Pull out screw (1).

Remove brake hose holder.

Spread the swivel bearing by means of special tool [31 2 230](#).

Lift the spring strut (3) out of the swivel bearing.



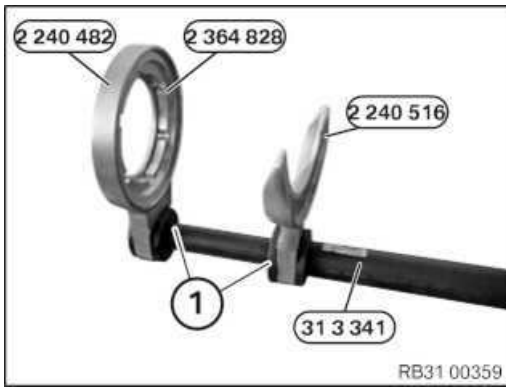
Attention!

Risk of damage to the coil spring!

Before application: Check protective insert for wear, replace if necessary.

Use of faulty protective inserts leads to coil spring damage. This can lead to coil spring breakage (corrosion).

Always use the pressure plate [2 240 516](#) with protective insert [2 364 829](#).

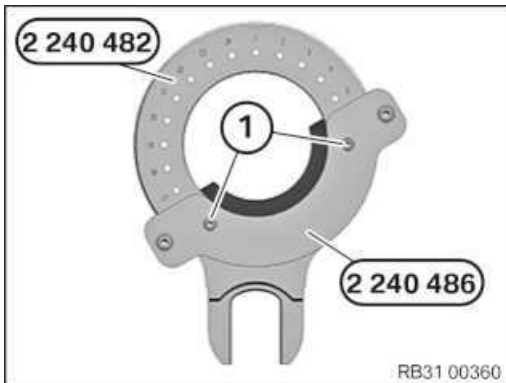


Clamp special tool [31 3 341](#) in vice.

Fit special tool [2 240 516](#) and [2 240 482](#) onto special tool [31 3 341](#) until retaining bolt (1) can be felt and heard to snap into place.

Insert the centering ring [2 364 828](#) into the mounting plate [2 240 482](#).

Check the seating of the special tools [2 240 516](#) and [2 240 482](#) by means of the centering ring [2 364 828](#), correct if necessary.



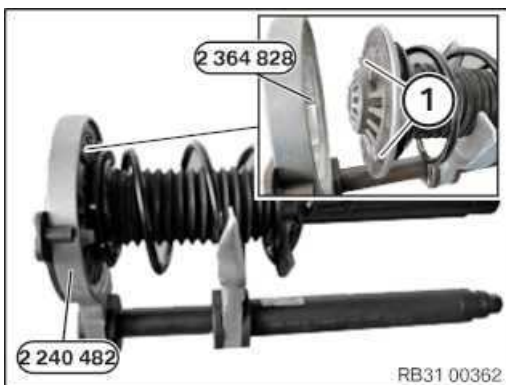
Installation of brake onto mounting plate:

Place counter support [2 240 486](#) in the correct position/bore hole:

- **Screw connection using bore holes 21 and 5**

Twist the centering ring [2 364 828](#) until the counter support [2 240 486](#) can be screwed into place at the specified position.

Screw the counter support with the mounting plate and the centering ring with the screws (1) hand-tight!



Clean coil spring to remove contamination.

Spring must be free of grease, clean and dry.

Insert spring strut into the spring tensioner.

Warning!

The guide pins (1) of the support bearing must fit into the recesses on the centering ring [2 364 828](#).

The support bearing must be completely fitted against the centering ring [2 364 828](#).

The lower spring coil must be placed completely into the recess of special tool [2 240 516](#) !



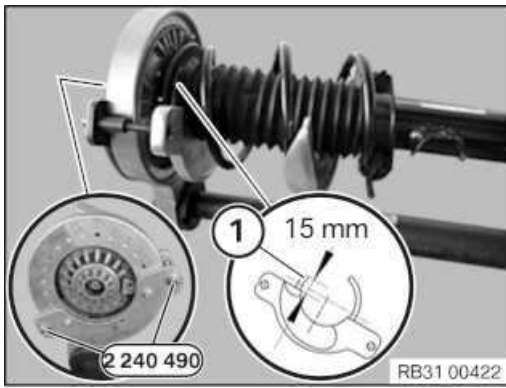
Attention!

Risk of damage to the coil spring!

Before application: Check protective insert for wear, replace if necessary.

Use of faulty protective inserts leads to coil spring damage. This can lead to coil spring breakage (corrosion).

Always use the pressure plate [2 240 487](#) with protective insert [2 412 607](#)

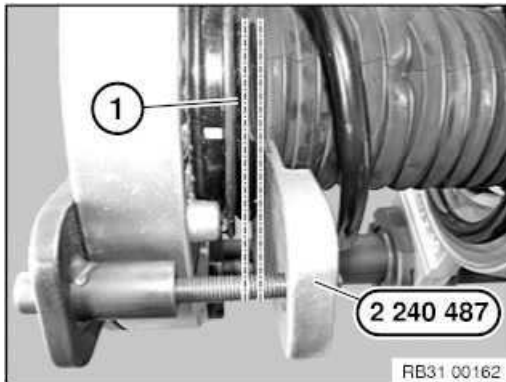


Attach the pressure plate [2 240 487](#) with the screws [2 240 490](#) !

The gummed side of the pressure plate [2 240 487](#) must be fitted against the top spring coil.

Position the spring strut such that the end of the spring (1) at the pressure plate [2 240 487](#) protrudes by 15 mm.

Tighten the screws [2 240 490](#) evenly at 8 Nm.



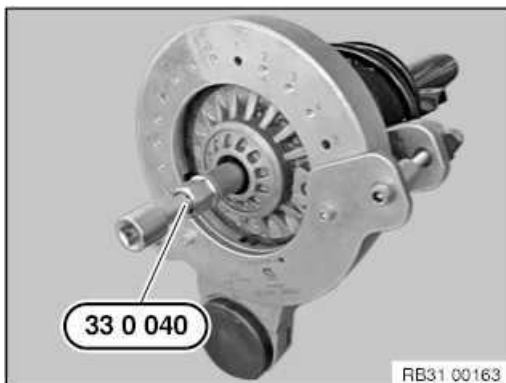
Attention!

The pressure plate [2 240 487](#) must be aligned parallel with the top spring coil (1)!

When the end of the spring begins to twist relative to the pressure plate, tensioning must be stopped immediately.

Correct seating of the pressure plate must be checked, and the rubberised mount and pressure plate must be checked for wear!

Tension the coil spring with the spring tensioner [31 3 341](#) until the stress on the piston rod is relieved.

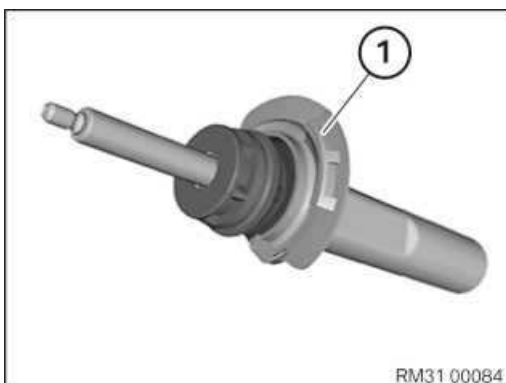


Warning!

Nut may only be released when the upper and lower coils of the coil spring are located completely in the recess of the spring holder!

Release nut with special tool [33 0 040](#) .

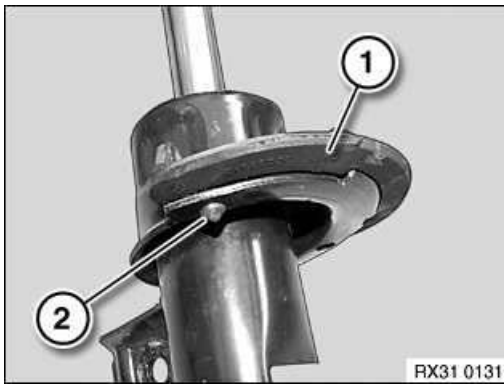
Remove shock absorber from tensioned coil spring.



Remove lower spring pad (1) from shock absorber.

Installation:



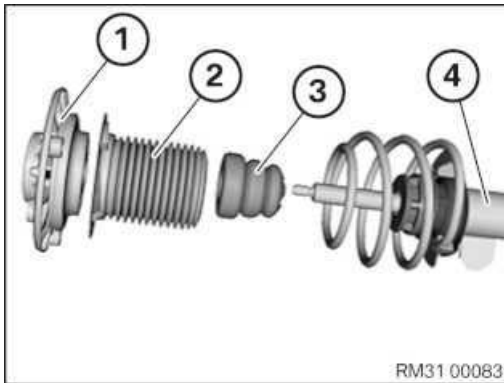


Check lower spring pad (1) for damage, replace if necessary.

Attach lower spring pad (1) to spring cup.

Note:

Make sure the journal (2) is properly positioned in the bore hole of the spring cup.



Check protective tube/upper spring pad (2) for damage, replace if necessary.

Parts: Auxiliary damper (3)

Replace the auxiliary damper (3).



Insert shock absorber in tensioned coil spring.

Parts: Nut

Tighten the new nut with special tool [33 0 040](#) and the torque wrench with the ring spanner insert.

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

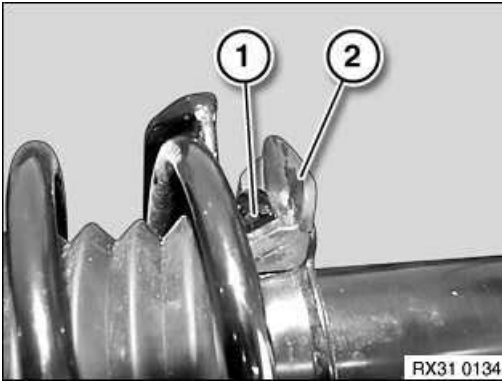


Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

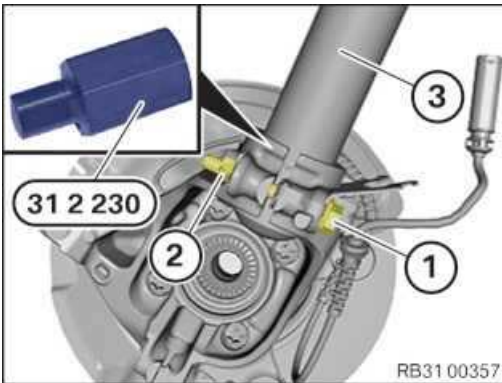


Check installation position of protective tube, correct if necessary.



End of lower coil spring (1) must rest on stop of spring pad (2).

Align all components correctly to each other and relieve tension on coil spring.



Spread swivel bearing with special tool [31 2 230](#) .

Align the swivel bearing using the gap to the positioning pin on the rear side of the spring strut (3) and push it on as far as it will go.

Remove special tool [31 2 230](#) .

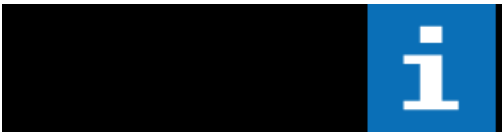
Position the brake hose holder.

Parts: Undo screw (1) and nut (2).

Insert new screw (1).

Tighten new nut (2).

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



Required follow-up work:

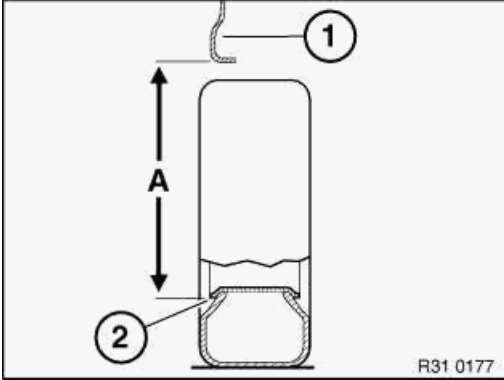
- Install [front spring strut](#).

31 33 095 Measuring vehicle ride height



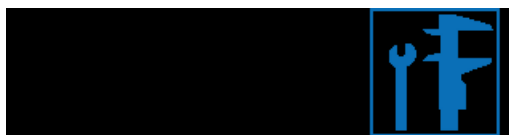
Necessary preliminary tasks:

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

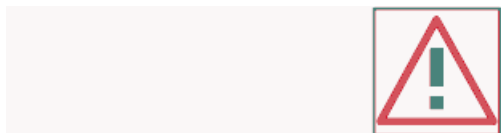


Determine actual ride height (A).

Attach tape measure to rim flange (2) at the bottom centre and measure to wheel arch lower edge (1).

**Special tools required:**

- [31 3 340](#)
- [31 2 230](#)
- [2 240 516](#)
- [2 364 829](#)
- [31 3 341](#)
- [2 240 482](#)
- [2 364 828](#)
- [2 240 486](#)
- [2 240 487](#)
- [2 412 607](#)
- [2 240 490](#)
- [33 0 040](#)

**Attention!**

- When replacing shock absorber/spring strut, renew auxiliary damper!

**Warning!**

Completely read the respective operating instructions before using special tools [31 3 340](#) !

Strictly adhere to all safety information and instructions in the operating instructions!

Failure to observe these safety precautions and instructions increases the risk of serious physical injury, damage to your health and damage to property and equipment!



Attention!

1. Use only the BMW approved special tool!
2. Prior to each use, check the special tools for defects, modifications and operational reliability.
3. Damaged/modified special tools must not be used!
4. No changes or modifications may be made to the special tools!
5. These special tools are intended solely for the purpose of tightening and relieving cylindrical and tapered suspension springs.
6. Keep special tools dry, clean and (down to the spindle) free from grease.
7. Impact screwdrivers are prohibited!
8. Do not compress coil spring to full extent.

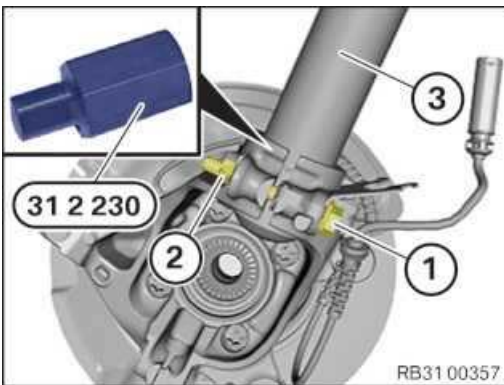


Necessary preliminary work:

- Remove [front spring strut](#).



Removing:



Slacken nut (2).

Pull out screw (1).

Remove bracket from brake hose.

Spread swivel bearing with the special tool [31 2 230](#).

Lift the spring strut (3) out of the swivel bearing.



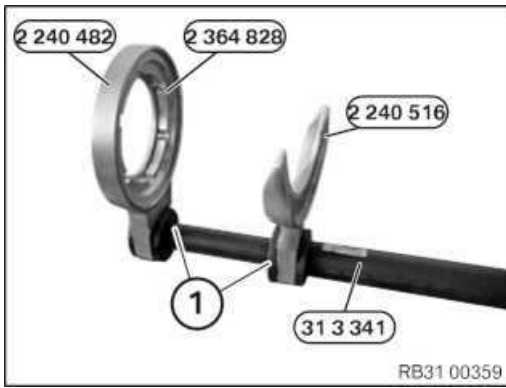
Attention!

Risk of damage to the coil spring!

Before application: Check protective insert for wear, replace if necessary.

Use of faulty protective inserts leads to coil spring damage. This can lead to coil spring breakage (corrosion).

Always use the pressure plate [2 240 516](#) with protective insert [2 364 829](#).

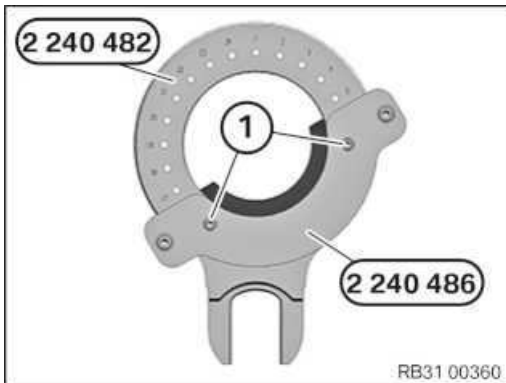


Clamp special tool [31 3 341](#) in vice.

Fit special tool [2 240 516](#) and [2 240 482](#) onto special tool [31 3 341](#) until retaining bolt (1) can be felt and heard to snap into place.

Insert centering ring [2 364 828](#) into mounting plate [2 240 482](#).

Check the seating of the special tools [2 240 516](#) and [2 240 482](#) by means of the centering ring [2 364 828](#), correct if necessary.



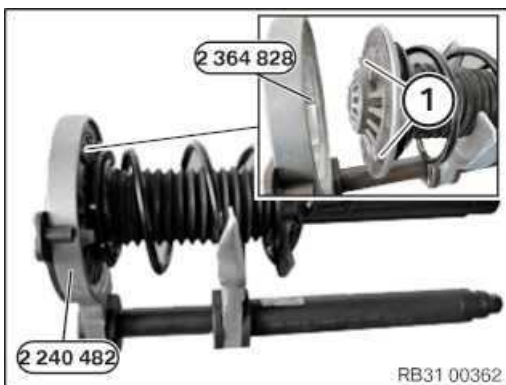
Installation of brake onto mounting plate:

Place counter support [2 240 486](#) in the correct position/bore hole:

- **Screw connection using bore holes 1 and 17**

Turn centering ring [2 364 828](#) until counter support [2 240 486](#) can be screwed into place at the specified position.

Screw the counter support with the mounting plate and the centering ring with the screws (1) hand-tight!



Clean coil spring to remove contamination.

Spring must be free of grease, clean and dry.

Insert spring strut into the spring tensioner.

Warning!

The guide pins (1) of the support bearing must fit into the recesses on the centering ring [2 364 828](#).

The support bearing must be completely fitted against the centering ring [2 364 828](#).

The lower spring coil must be placed completely into the recess of special tool [2 240 516](#) !



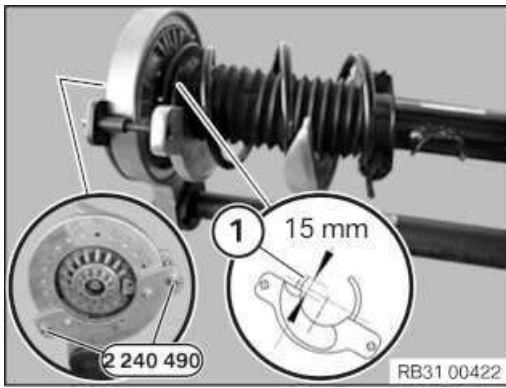
Attention!

Risk of damage to the coil spring!

Before application: Check protective insert for wear, replace if necessary.

Use of faulty protective inserts leads to coil spring damage. This can lead to coil spring breakage (corrosion).

Always use the pressure plate [2 240 487](#) with protective insert [2 412 607](#)

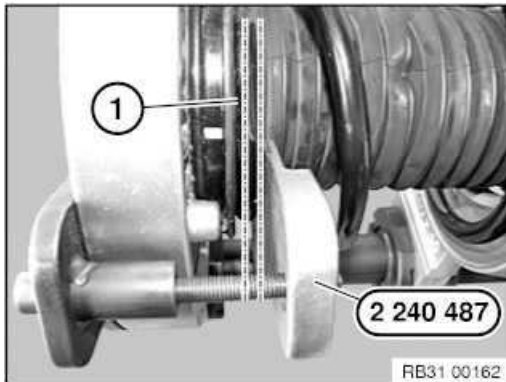


Attach the pressure plate [2 240 487](#) with the screws [2 240 490](#) !

The gummed side of the pressure plate [2 240 487](#) must be fitted against the top spring coil.

Position the spring strut such that the end of the spring (1) at the pressure plate [2 240 487](#) protrudes by 15 mm.

Tighten the screws [2 240 490](#) evenly at 8 Nm.



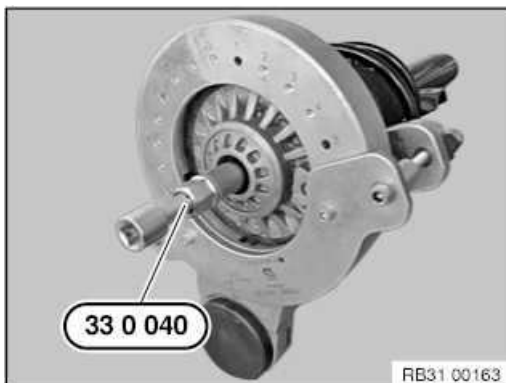
Attention!

The pressure plate [2 240 487](#) must be aligned parallel with the top spring coil (1)!

When the end of the spring begins to twist relative to the pressure plate, tensioning must be stopped immediately.

The pressure plate must be checked for correct seating and the rubber-coated facing and pressure plate also checked for wear.

Tension the coil spring with the spring tensioner [31 3 341](#) until the stress on the piston rod is relieved.



Warning!

Nut may only be released when the upper and lower coils of the coil spring are located completely in the recess of the spring holder!

Release nut with special tool [33 0 040](#) .



Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

Remove shock absorber from tensioned coil spring.



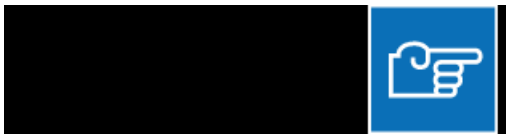
Relieve tension on coil spring.

Release special tool [2 240 487](#) .

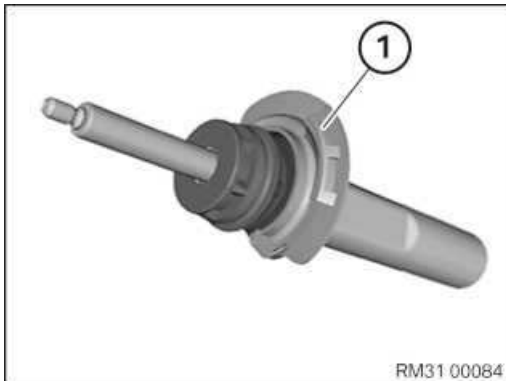
Take out the coil spring with protective tube and support bearing.

Installation note:

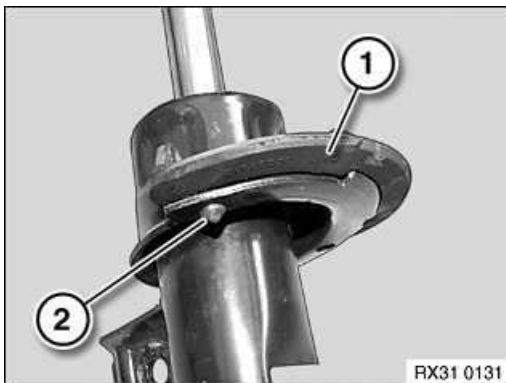
Check support bearing and protective tube for damage, replace if necessary.



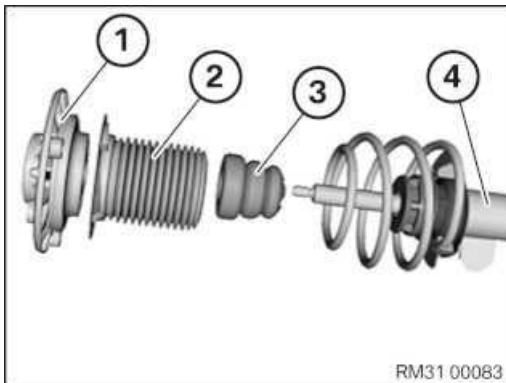
Assembly:



Check bottom spring pad (1) and replace if necessary.



Make sure the journals (2) are correctly positioned in the bore hole of the spring cup.



Apply and tension the new spring with the special tool [31 3 341](#).

Check protective tube/top spring pad (2) and support bearing (1) for damage, replace if necessary.

Insert spring strut (4) in tensioned coil spring.

Replace the auxiliary damper (3).

Parts: Auxiliary damper

Attach auxiliary damper (3), protective tube/upper spring pad (2) and support bearing (1) to piston rod.



Renew nut.

Parts: Nut

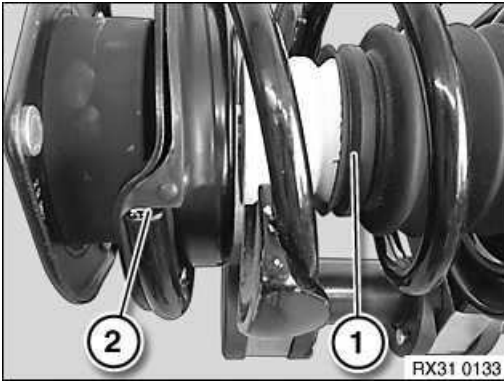
Tighten the nut using special tool [33 0 040](#) and the torque wrench featuring ring spanner insert.

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

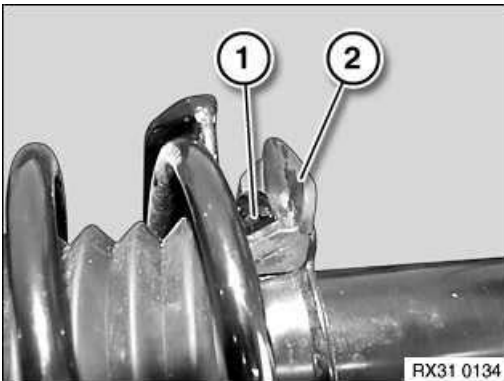


Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

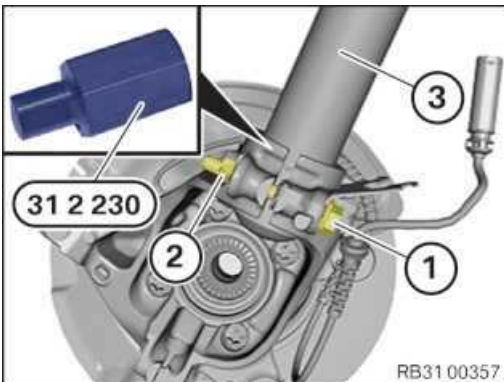


Check installation position of protective tube, correct if necessary.



End of lower coil spring (1) must rest on stop of spring pad (2).

Align all components correctly to each other and relieve tension on coil spring.



Spread swivel bearing with the special tool [31 2 230](#).

Align the swivel bearing using the gap to the positioning pin on the rear side of the spring strut (3) and push it on as far as it will go.

Remove special tool [31 2 230](#).

Position the brake hose bracket.

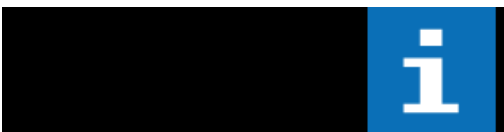
Renew screw (1) and nut (2).

Parts: Bolt and nut

Insert bolt (1).

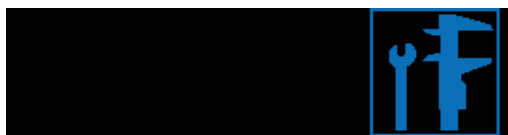
Tighten nut (2).

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

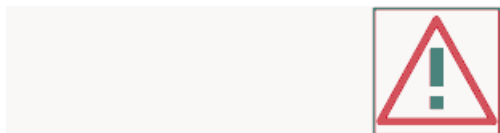


Required follow-up work:

- Install [front spring strut](#).
- Check [headlight adjustment](#), correct if necessary.

**Special tools required:**

- [31 3 340](#)
- [31 2 230](#)
- [2 240 516](#)
- [2 364 829](#)
- [31 3 341](#)
- [2 240 482](#)
- [2 364 828](#)
- [2 240 486](#)
- [2 240 487](#)
- [2 412 607](#)
- [2 240 490](#)
- [2 360 213](#)

**Attention!**

- When replacing shock absorber/spring strut, renew auxiliary damper!

**Warning!**

Completely read the respective operating instructions before using special tools [31 3 340](#) !

Strictly adhere to all safety information and instructions in the operating instructions!

Failure to observe these safety precautions and instructions increases the risk of serious physical injury, damage to your health and damage to property and equipment!



Attention!

1. Use only the BMW approved special tool!
2. Prior to each use, check the special tools for defects, modifications and operational reliability.
3. Damaged/modified special tools must not be used!
4. No changes or modifications may be made to the special tools!
5. These special tools are intended solely for the purpose of tightening and relieving cylindrical and tapered suspension springs.
6. Keep special tools dry, clean and (down to the spindle) free from grease.
7. Impact screwdrivers are prohibited!
8. Do not compress coil spring to full extent.

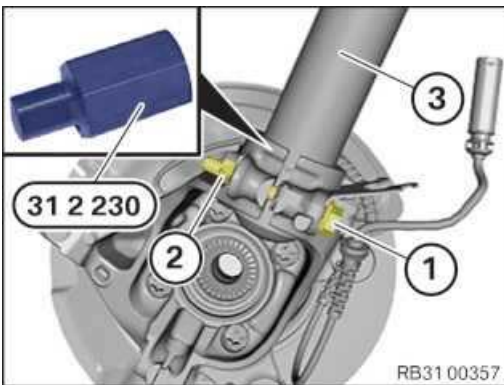


Necessary preliminary work:

- Remove [front spring strut](#).



Removing:



Slacken nut (2).

Pull out screw (1).

Remove bracket from brake hose.

Spread swivel bearing with the special tool [31 2 230](#).

Lift the spring strut (3) out of the swivel bearing.



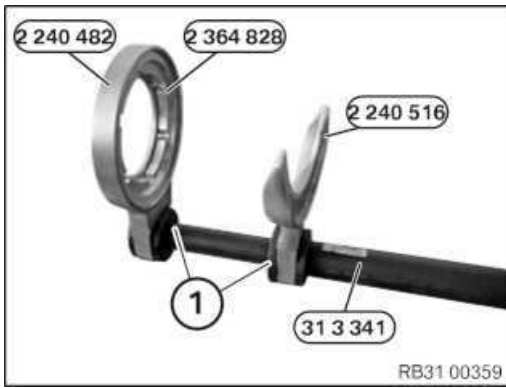
Attention!

Risk of damage to the coil spring!

Before application: Check protective insert for wear, replace if necessary.

Use of faulty protective inserts leads to coil spring damage. This can lead to coil spring breakage (corrosion).

Always use the pressure plate [2 240 516](#) with protective insert [2 364 829](#).

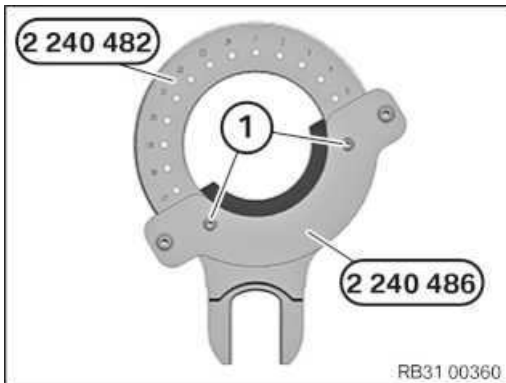


Clamp special tool [31 3 341](#) in vice.

Fit special tool [2 240 516](#) and [2 240 482](#) onto special tool [31 3 341](#) until retaining bolt (1) can be felt and heard to snap into place.

Insert centering ring [2 364 828](#) into mounting plate [2 240 482](#).

Check the seating of the special tools [2 240 516](#) and [2 240 482](#) by means of the centering ring [2 364 828](#), correct if necessary.



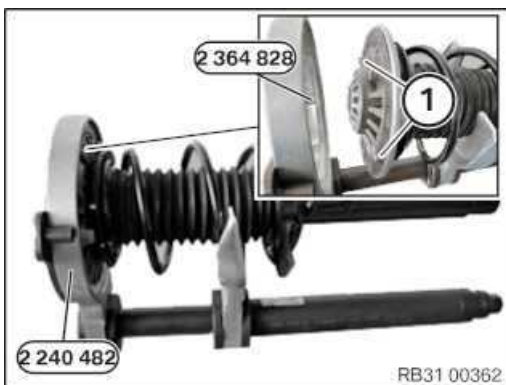
Installation of brake onto mounting plate:

Place counter support [2 240 486](#) in the correct position/bore hole:

- **Screw connection using bore holes 1 and 17**

Turn centering ring [2 364 828](#) until counter support [2 240 486](#) can be screwed into place at the specified position.

Screw together counter support with mounting plate and the centering ring with screws (1) so they are hand-tight.



Clean coil spring to remove contamination.

Spring must be free of grease, clean and dry.

Insert spring strut into the spring tensioner.

Warning!

The guide pins (1) of the support bearing must fit into the recesses on the centering ring [2 364 828](#).

The support bearing must be completely fitted against the centering ring [2 364 828](#).

The lower spring coil must be placed completely into the recess of special tool [2 240 516](#) !



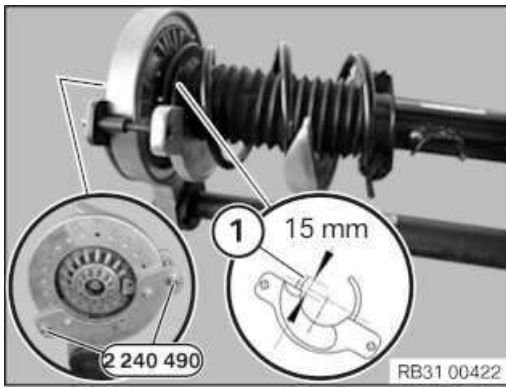
Attention!

Risk of damage to the coil spring!

Before application: Check protective insert for wear, replace if necessary.

Use of faulty protective inserts leads to coil spring damage. This can lead to coil spring breakage (corrosion).

Always use the pressure plate [2 240 487](#) with protective insert [2 412 607](#)

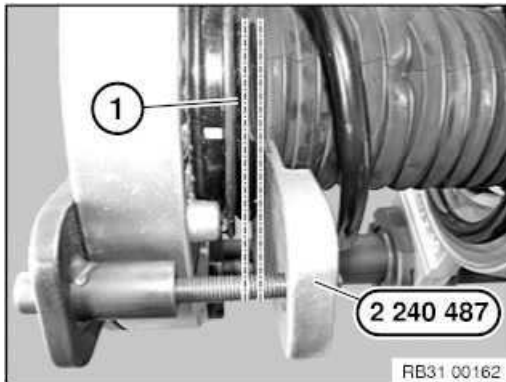


Attach pressure plate [2 240 487](#) with the screws [2 240 490](#) !

The gummed side of the pressure plate [2 240 487](#) must be fitted against the top spring coil.

Position the spring strut such that the end of the spring (1) at the pressure plate [2 240 487](#) protrudes by 15 mm.

Tighten the screws [2 240 490](#) evenly at 8 Nm.



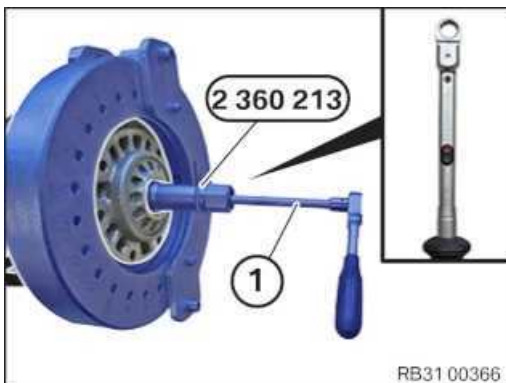
Attention!

The pressure plate [2 240 487](#) must be aligned parallel with the top spring coil (1)!

When the end of the spring begins to twist relative to the pressure plate, tensioning must be stopped immediately.

The pressure plate must be checked for correct seating and the rubber-coated facing and pressure plate also checked for wear.

Tension the coil spring with the spring tensioner [31 3 341](#) until the stress on the piston rod is relieved.



Release nut with special tool [2 360 213](#) , reversible ratchet with extension and socket SW10.



Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

Remove shock absorber from coil spring.



Relieve tension on coil spring.

Release special tool [2 240 487](#) .

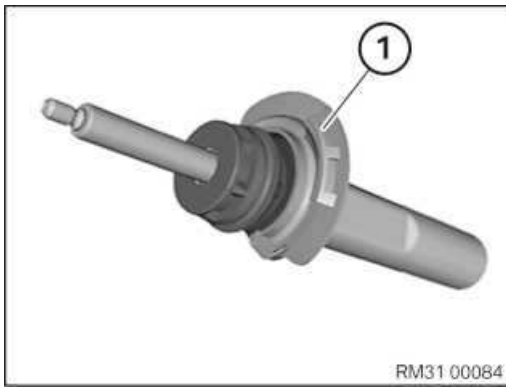
Take out the coil spring with protective tube and support bearing.

Installation note:

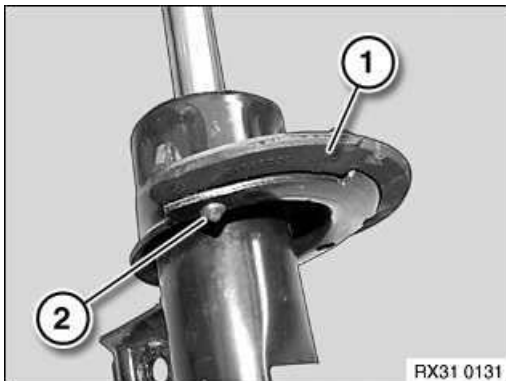
Check support bearing and protective tube for damage, replace if necessary.

Assembly:

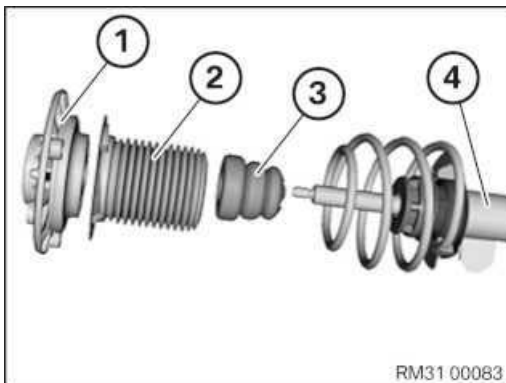




Check bottom spring pad (1) and replace if necessary.



Make sure the journal (2) is properly positioned in the bore hole of the spring cup.



Apply and tension the new spring with the special tool [31 3 341](#).

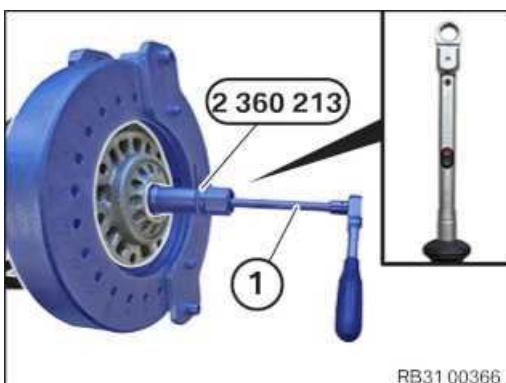
Check protective tube/top spring pad (2) and support bearing (1) for damage, replace if necessary.

Insert spring strut (4) in tensioned coil spring.

Replace the auxiliary damper (3).

Parts: Auxiliary damper

Attach auxiliary damper (3), protective tube/upper spring pad (2) and support bearing (1) to piston rod.



Insert spring strut into tensioned coil spring.

Renew nut.

Parts: Nut

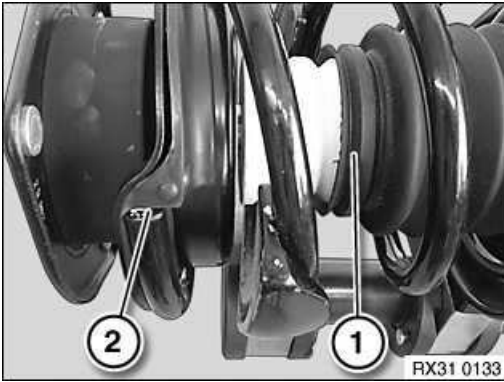
Tighten nut with special tool [2 360 213](#), reversible ratchet with extension, socket SW10 and torque wrench with ring spanner insert SW21.

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

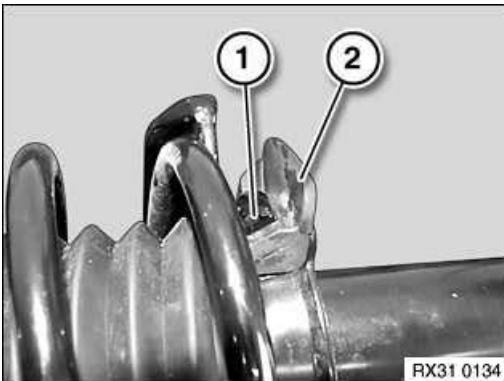


Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

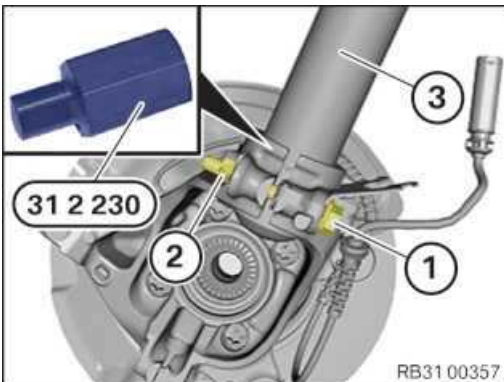


Check installation position of protective tube, correct if necessary.



End of lower coil spring (1) must rest on stop of spring pad (2).

Align all components correctly to each other and relieve tension on coil spring.



Spread swivel bearing with the special tool [31 2 230](#).

Align the swivel bearing using the gap to the positioning pin on the rear side of the spring strut (3) and push it on as far as it will go.

Remove special tool [31 2 230](#).

Position the brake hose bracket.

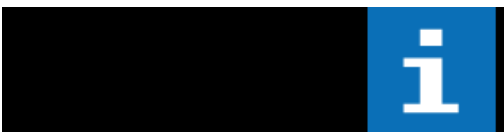
Renew screw (1) and nut (2).

Parts: Bolt and nut

Insert bolt (1).

Tighten nut (2).

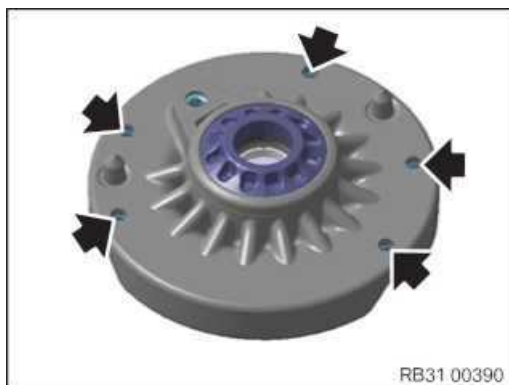
Tightening torque [31 31 3AZ](#).



Required follow-up work:

- Install [front spring strut](#).
- Check [headlight adjustment](#), correct if necessary.

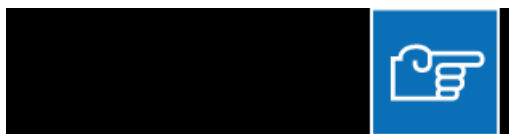
31 33 001 Replacing front left or right spring strut support bearing



Important!

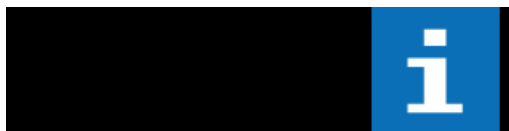
Support bearings with 5-hole screw connection (see graphic) are fitted in motor vehicles from 01/2015.

In motor vehicles up to 01/2015 (support bearings with 3-hole screw connection), in case of replacement, a support bearing matching the new version (5-hole version) can be used, but using only 3 screws.



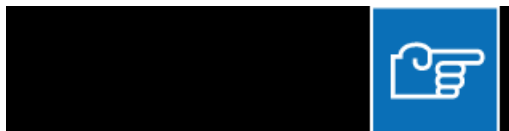
Note:

Procedure is described in the document "[Replacing front left or front right spring strut shock absorber](#)".

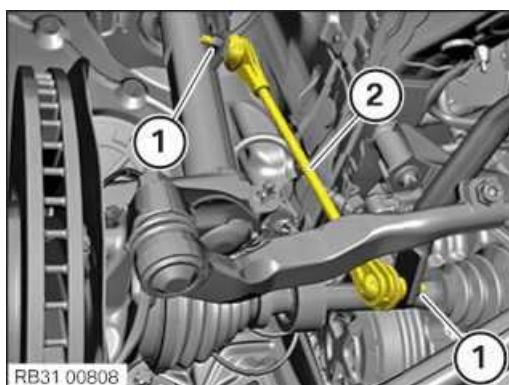


Necessary preliminary work:

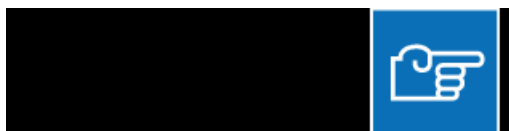
- Remove [front wheel](#).



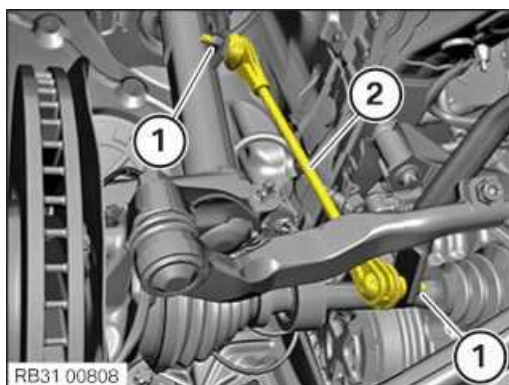
Removal:



Release nuts (1); if necessary, grip at inner Torx socket.
Remove the anti-roll bar link (2).



Installation:



Position the anti-roll bar link (2) on the anti-roll bar and on the spring strut.
Replace nuts (1).

Parts: Nuts

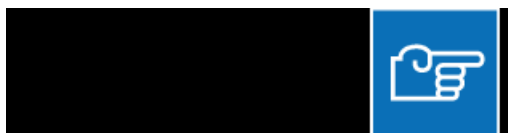
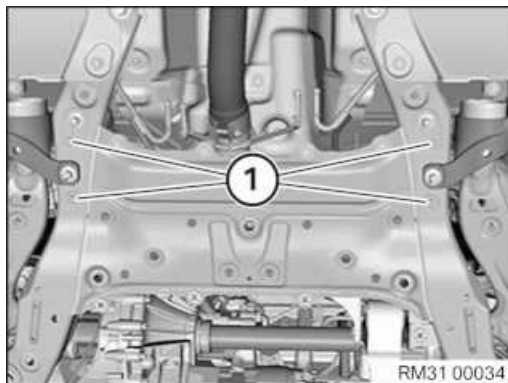
Tighten nuts (1), if required counter support at Torx socket.

Tightening torque [31 35 1/2AZ](#).



Required follow-up work:

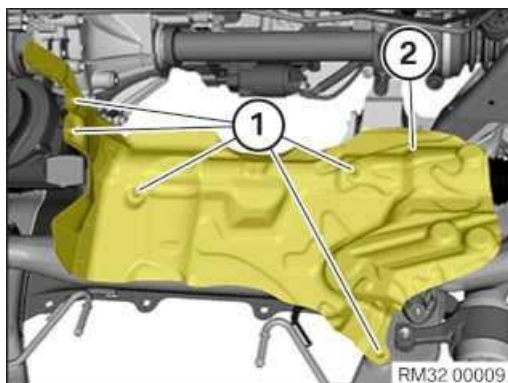
- Install [front wheel](#).

**Removal:**

Release screws (1) from anti-roll bar.



- Lower [front axle support](#).

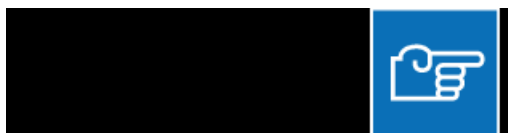


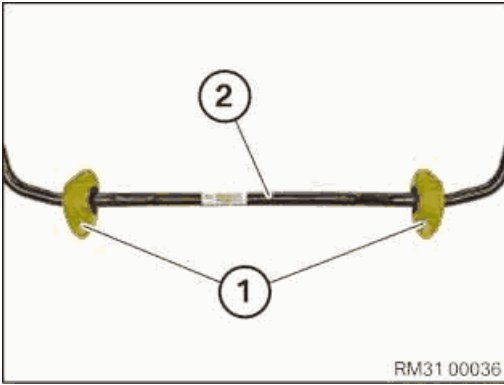
Loosen screws (1).

Remove heat shield (2).



Remove anti-roll bar (1) with retaining bracket from front axle.

**Installation:**



If necessary, remount retaining bracket (1) on new anti-roll bar (2).

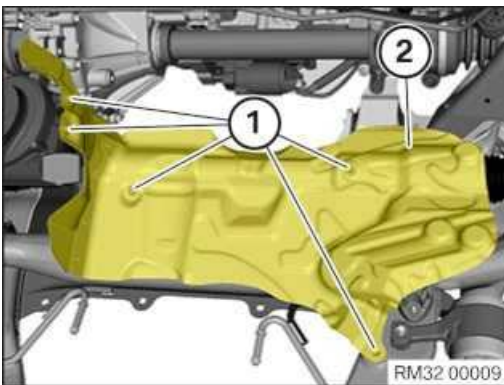


Position anti-roll bar (1) on the front axle support.

Renew screws (1).

Parts: Bolts

Screw screws into retaining bracket from below and tighten hand-tight.



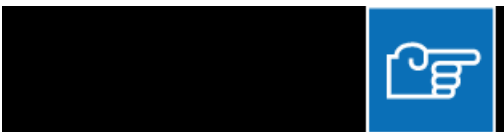
Position heat shield (2).

Renew screws (1).

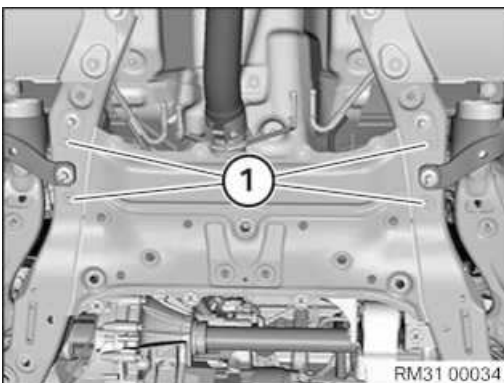
Parts: Bolts

Tighten down screws (1).

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



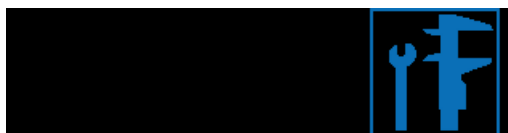
- Raise [front axle support](#).



Tighten screws (1) of anti-roll bar.

Tightening torque [31 35 3AZ](#).

31 60 ... Notes on removing and installing Low Profile band clamps



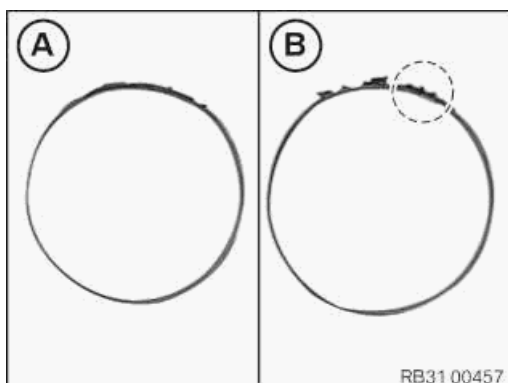
Special tools required:

- [31 5 200](#)
- [2 413 949](#)



Important!

During removal Low Profile band clamp (dotted line) is overstretched and must not be reused!

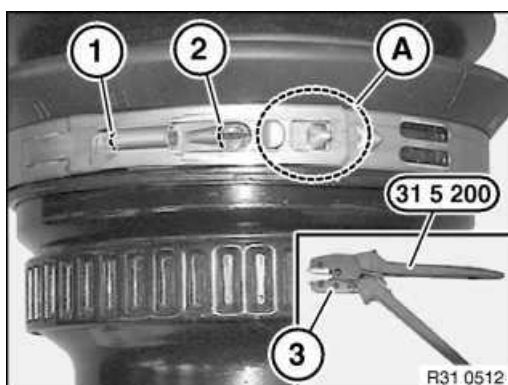


Depending on the design of the Low Profile band clamps, a different special tool (pliers) is needed for installation.

Identify band clamp and find required special tool.

Band clamp type A = pliers [31 5 200](#)

Band clamp type B = pliers [2 413 949](#)



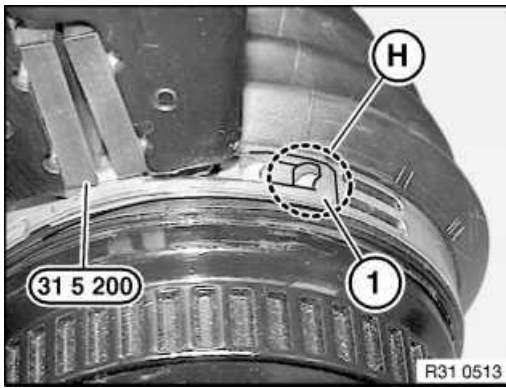
Installation (type A):

Position Low Profile band clamp in installation position (A) on gaiter.

Place special tool [31 5 200](#) on tabs (1, 2).

Note:

Make sure that the movable leg (3) of the special tool is placed on tab (1).



Check and if necessary correct positions of garter and Low Profile band clamp.

Compress Low Profile band clamp with special tool [31 5 200](#) and press on end of band clamp (1).

Relieve tension on special tool and remove.

Check hook fastener (H); if necessary, repeat operation with new Low Profile band clamp.



Installation (type B):

Position Low Profile band clamp in installation position on garter.

Place special tool [2 413 949](#) on tabs (1).



Check and if necessary correct positions of garter and Low Profile band clamp.

Press Low Profile band clamp together with the special tool [2 413 949](#) until the hook fastener engages.

Relieve tension on special tool and remove.

Check hook fastener; if necessary, repeat operation with new Low Profile band clamp.

**Caution!**

For manual gearbox and DKG only:

- After having removed the output shaft replace the [radial shaft seal in the transmission](#):

**Caution!**

Clean the transmission around the radial shaft seal prior to removing the output shaft!

For DKG only:

Transmission oil (at maximum 0.3l) may escape from the radial shaft seal opening when pulling off the output shaft!

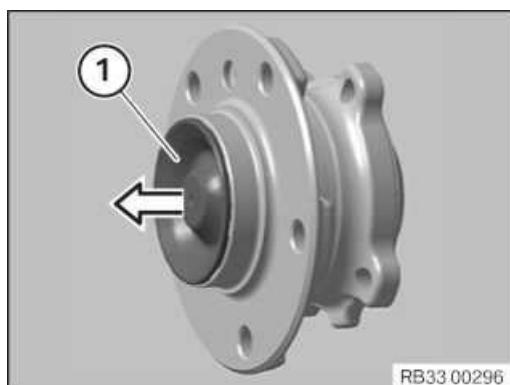
Collect and dispose of escaping transmission oil!

**Caution!**

Failure to comply with this instruction will result in serious damage to the twin-clutch gearbox (DKG).

**Necessary preliminary work:**

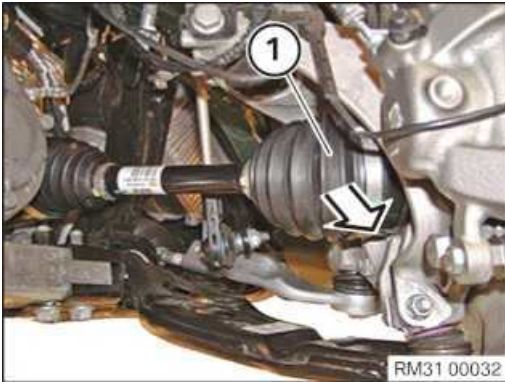
- Remove [front wheel](#).

**Removal:**

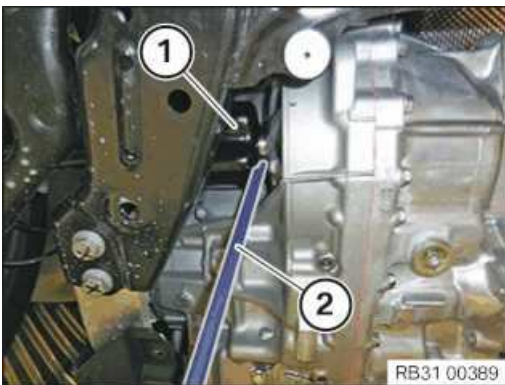
If installed: Remove protective cap (1).



Release collar bolt (1), press brake pedal to floor to do so.



Turn steering wheel to left.
Pull output shaft (1) out towards front.

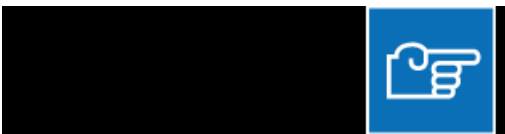


Caution!

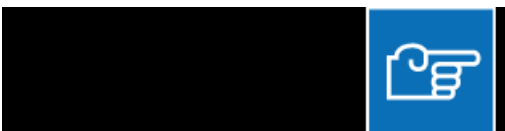
Secure output shaft (1) against falling down.

Use a mounting lever (2) to lever the output shaft (1) out of the transmission.

Remove output shaft (1).



Installation:



Caution!

For manual gearbox and DKG only:

- Replace the [radial shaft seal](#) for the transmission.



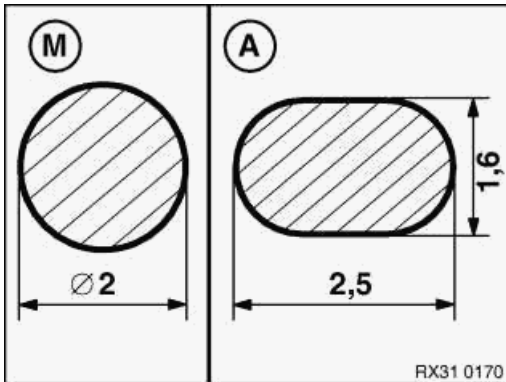
Caution!

With automatic transmission only:

- Lever out O-ring (1).
- Replace O-ring.

Parts: O-ring

- Insert new O-ring (1).

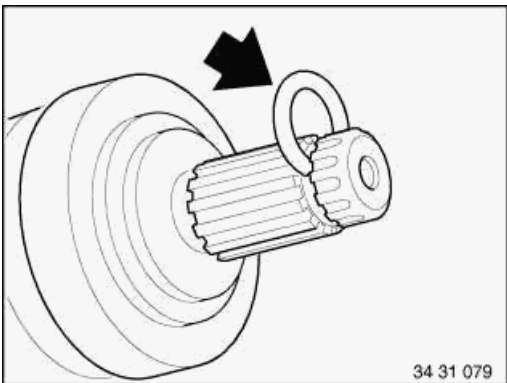


Caution!

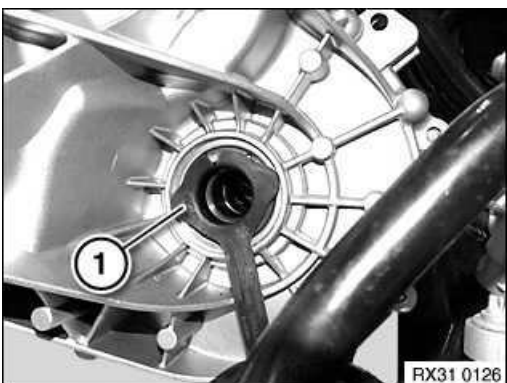
Different output shaft shapes installed! Do not mix up circlips.

M Manual transmission

A Automatic transmission



Replace circlip.

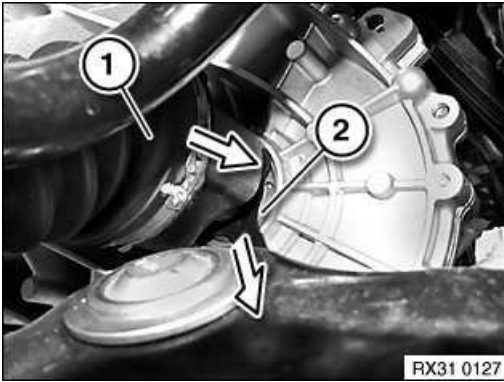


For manual gearbox and DKG only:

Insert assembly protection ring (1) into the radial shaft seal.

- Assembly protection ring (1) is supplied with the new radial shaft seal.

Make sure the tool fits over the lip of the radial shaft seal so there is no damage to sealing ring when the output shaft is inserted.



Insert output shaft (1) into gearbox.

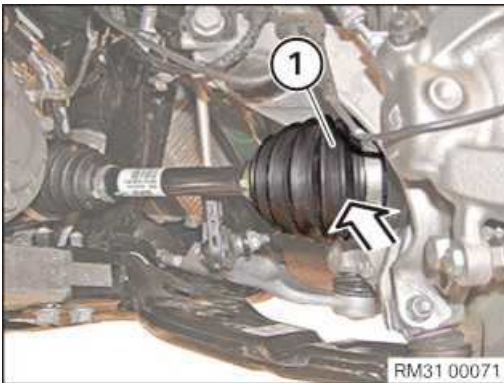
- Manual gearbox only:

Before the sealing surface is pushed into the radial shaft seal, remove assembly protection ring (2) by pulling the handle.

Slide output shaft into the transmission as far as the limit position.

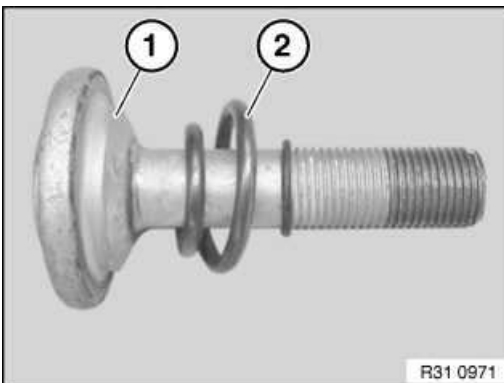
The output shaft must snap audibly into place.

Check for secure seat by levering.



Turn steering wheel to left.

Insert output shaft (1) from the front into the pivot bearing.



- Pay attention to installation position of compression spring (2).
- Keep collar bolt and spur gearing of wheel bearing/output shaft clean and free of grease.

Caution!

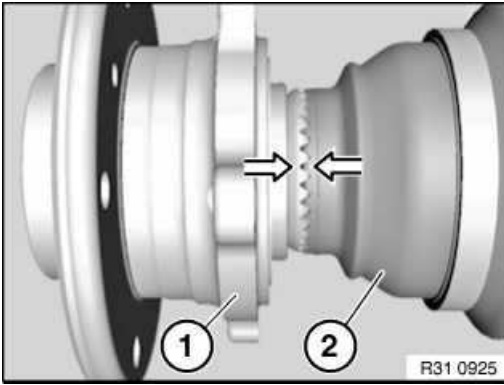
Following installation note for spur gearing must be observed without fail!



Renew collar bolt with compression spring.

Parts: Collar bolt with compression spring

Tighten the collar bolt (1) with the compression spring hand-tight.



- Spur gearing of wheel bearing (1) and output shaft (2) must be installed form-fit (tooth in tooth position)!

Check whether spur gearing is locked tooth in tooth by reciprocally rotating wheel hub/output shaft.

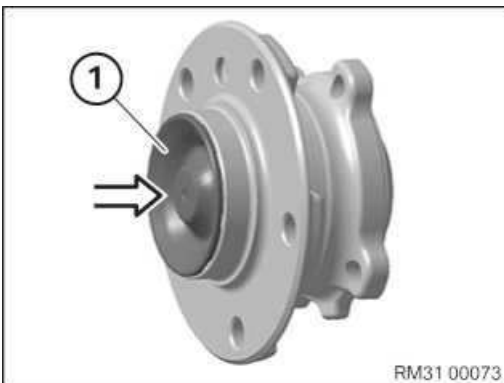
If positive locking is ensured, tighten the collar bolt with tightening torque (for this, press brake pedal to the floor).

Tightening torque [31 60 2AZ](#)

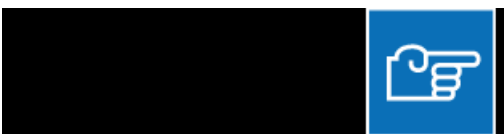


Thinly grease the wheel hub in area (1).

Do not install the protective cap.



If necessary, attach protective cap (1).



Required follow-up work:

- For manual gearbox and DKG only: [check/top up transmission oil level](#).
- Check transmission for leaks.
- Install [front wheel](#).

**Caution!**

For manual gearbox and DKG only:

- After each removal of the output shaft, the [radial shaft seal in the transmission](#) must be replaced.

**Caution!**

Clean the transmission around the radial shaft seal prior to removing the output shaft!

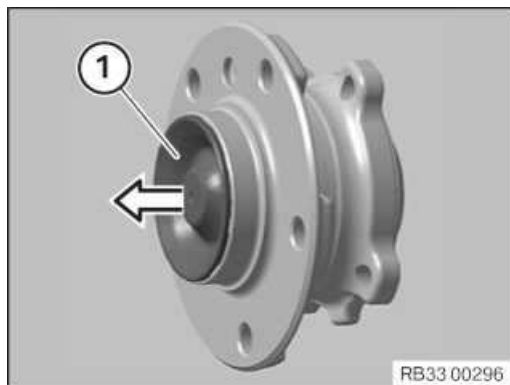
With double-clutch transmission only:

Transmission oil (at maximum 0.3l) may escape from the radial shaft seal opening when pulling off the output shaft!

Collect and dispose of escaping transmission oil!

**Necessary preliminary work:**

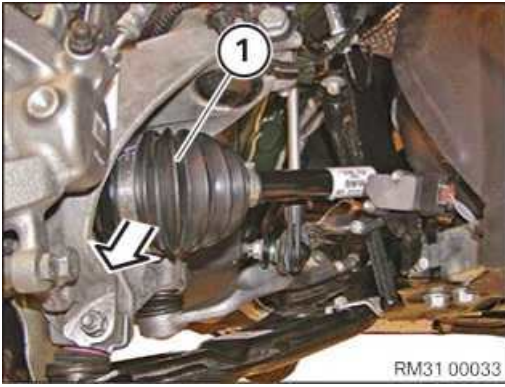
- Remove [front wheel](#).

**Removal:**

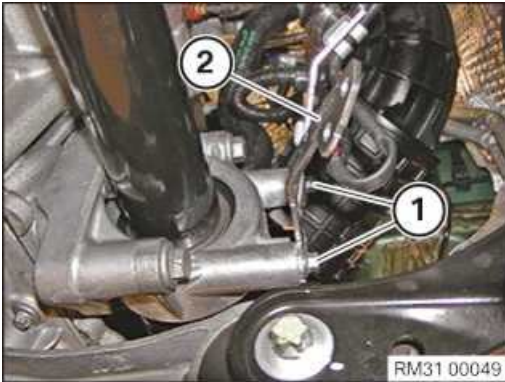
If installed: Lever off protective cap (1).



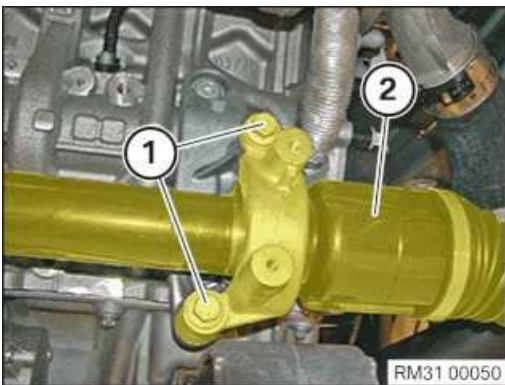
Release collar bolt (1), press brake pedal to floor for this purpose.



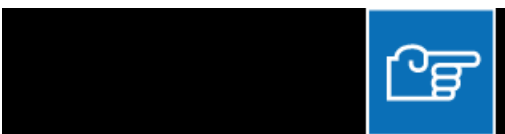
Secure output shaft against falling out.
Turn steering wheel to right.
Pull out output shaft (1).



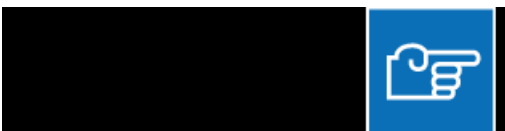
If necessary, release screws (1) and remove holder (heat shield) (2).



Release screws (1).
Pull output shaft (2) out of gearbox and remove to one side.



Installation:



Caution!

For manual gearbox and DKG only:

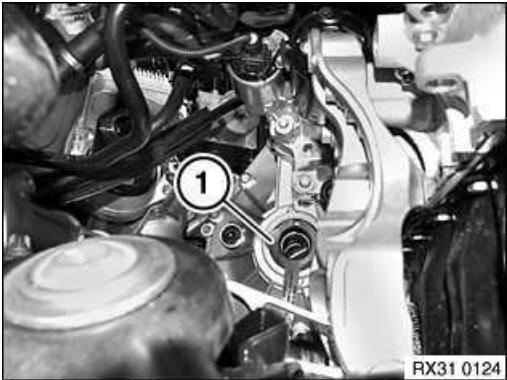
- Replace radial shaft seal at front.



Caution!

With automatic transmission only:

- Lever out O-ring (1).
- **Parts:** Replace O-ring.
- Insert new O-ring (1).

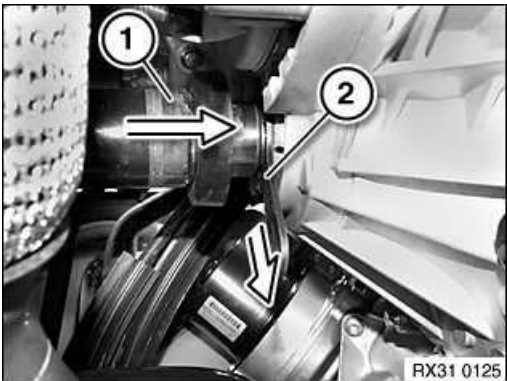


For manual gearbox and DKG only:

Insert assembly protection ring (1) into the radial shaft seal.

- The installation protection ring (1) is provided with a new radial shaft seal for the output shaft.

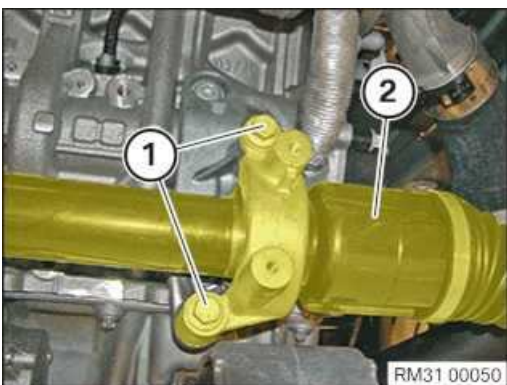
Make sure the tool fits over the lip of the radial shaft seal so there is no damage to sealing ring when the output shaft is inserted.



Insert output shaft (1) into gearbox.

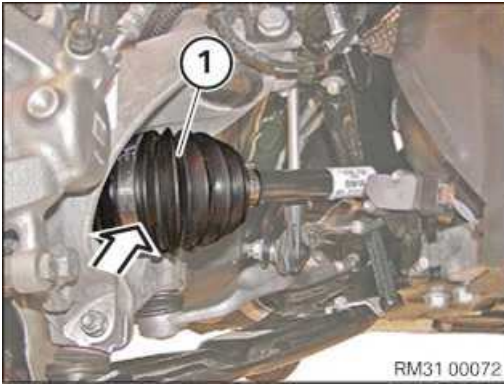
Before the sealing surface is pushed into the radial shaft seal, remove assembly protection ring (2) by pulling the handle.

Slide output shaft into gearbox up to stop.



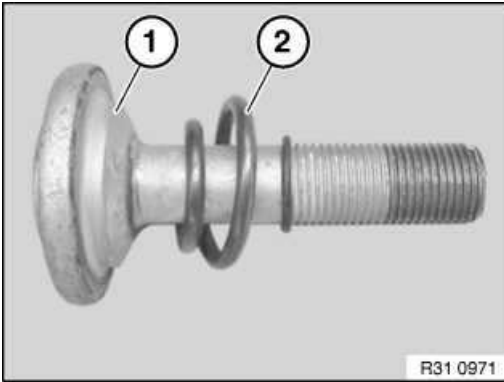
Tighten screws (1).

Tightening torque [31 60 1AZ](#)



Turn steering wheel to right.

Insert output shaft (1) from the front into the pivot bearing.



- Pay attention to installation position of compression spring (2).
- Keep collar bolt and front gearing of wheel bearing/output shaft clean and free of grease

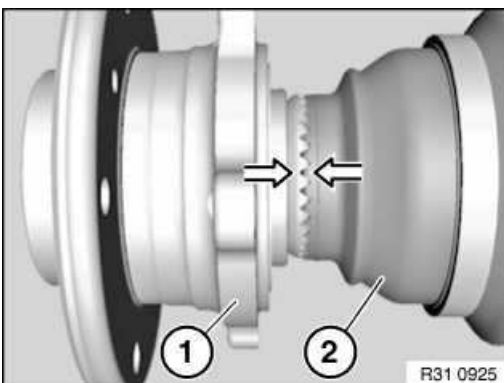
Caution!

Following installation note for spur gearing must be observed without fail!



Parts: Replace collar bolt and compression spring.

Tighten collar bolt (1) and compression spring by hand.



- Spur gearing of wheel bearing (1) and output shaft (2) must be installed form-fit (tooth in tooth position)!

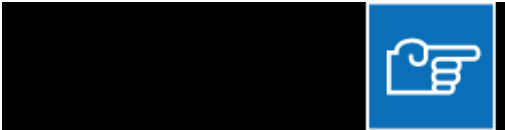
Check whether spur gearing is locked tooth in tooth by reciprocally rotating wheel hub/output shaft.

When the positive locking is ensured, tighten the collar bolt.

Tightening torque [31 60 2AZ](#)



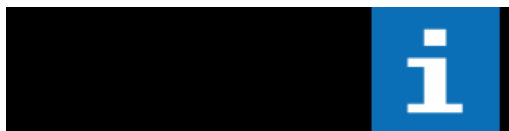
Thinly grease the wheel hub in area (1).
Do not install the protective cap.



Required follow-up work:

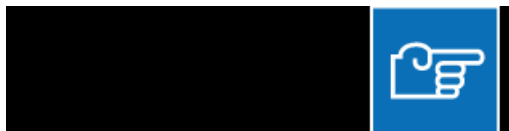
- For manual gearbox and DKG only: [Check transmission oil level / add](#)
- Check transmission for leaks.
- Install [front wheel](#).

31 60 004 Removing and installing/replacing right output shaft (all-wheel drive vehicle)

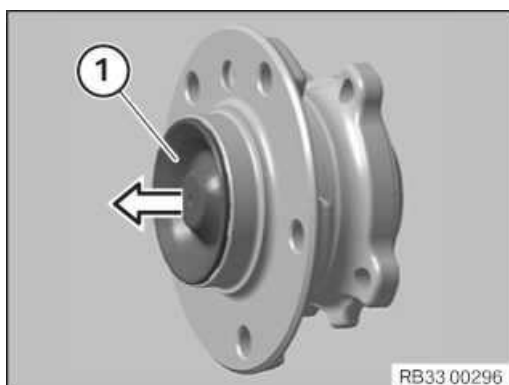


Necessary preliminary work:

- Remove [right front wheel](#).



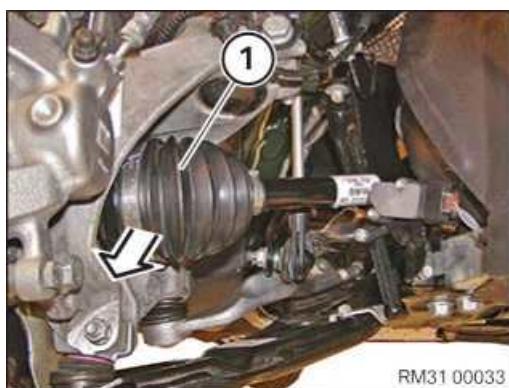
Removal:



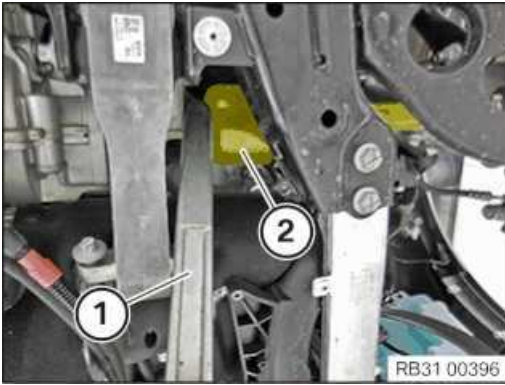
If installed: Lever off protective cap (1).



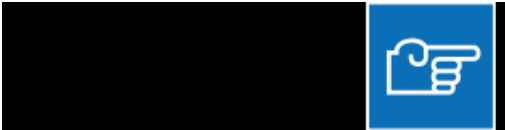
Release collar bolt (1), press brake pedal to floor for this purpose.



Secure output shaft against falling out.
Turn steering wheel to right.
Pull the output shaft (1) out of the swivel bearing.



Lever the output shaft (2) out with a mounting lever (1) and remove it from the side.

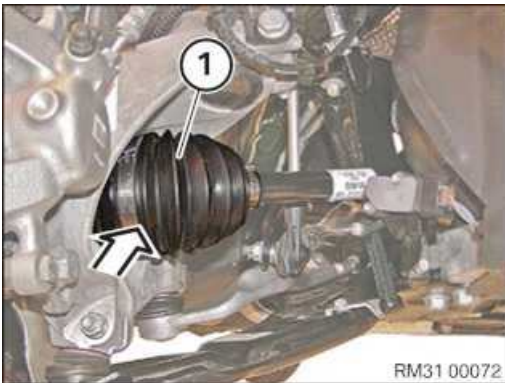


Installation:



Install retaining ring (1).

Parts: Circlip

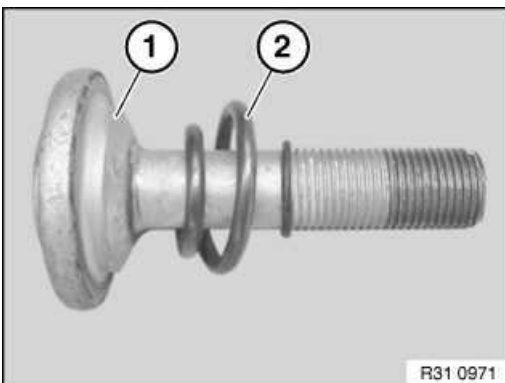


Turn steering wheel to right.

Connect the output shaft (1) from the side.

- Check the output shaft for correct locking.

Insert output shaft (1) from the front into the pivot bearing.



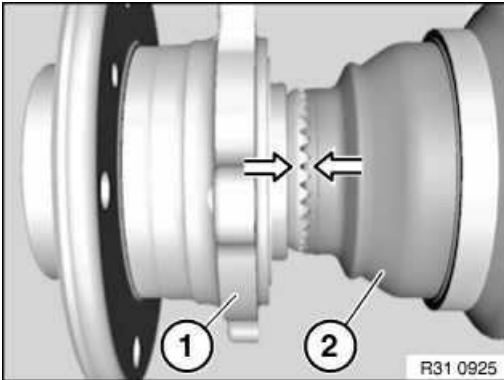
- Pay attention to installation position of compression spring (2).
- Keep collar bolt and front gearing of wheel bearing/output shaft clean and free of grease

Attention!

Following installation note for spur gearing must be observed without fail!



Parts: Replace collar bolt and compression spring.
Tighten collar bolt (1) and compression spring by hand.



- Spur gearing of wheel bearing (1) and output shaft (2) must be installed form-fit (tooth in tooth position)!

Check whether spur gearing is locked tooth in tooth by reciprocally rotating wheel hub/output shaft.

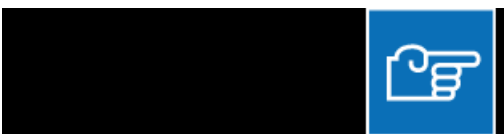
When the positive locking is ensured, tighten the collar bolt.

Tightening torque [31 60 2AZ](#)



Thinly grease the wheel hub in area (1).

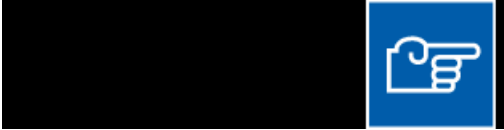
Do not install the protective cap.



Required follow-up work:

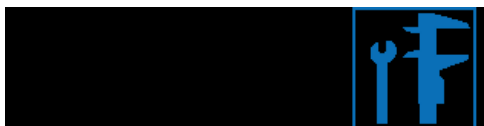
- Install [front right wheel](#).

31 60 530 Replacing an output shaft gaiter (on transmission side) (output shaft removed)

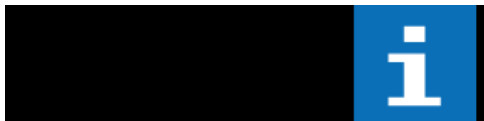


Note:

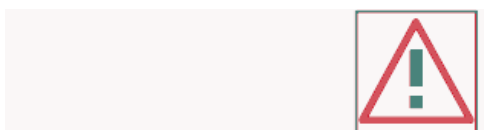
Procedure is described in the document "[both output shaft gaiters...](#)".

**Special tools required:**

- [00 5 500](#)
- [11 8 310](#)
- [31 5 200](#)
- [32 1 260](#)

**Note:**

Output shaft removed.

**Important!**

Repair may only be carried out via the inner joint! Do not press off or disassemble wheel-side joint.

The transmission-side joint may be bent by max. 18° and the wheel-side joint by max. 45°!

Remove all traces of old grease from inner joint, wipe off old grease from outer joint!

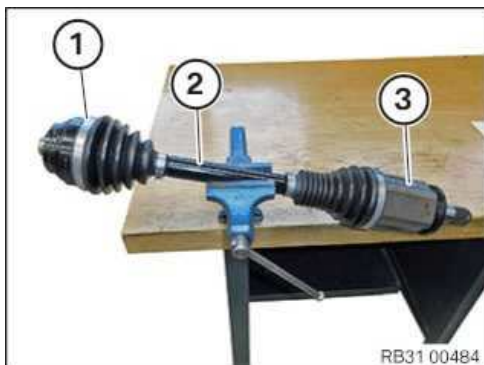
Only use dry, clean cloth free of grease and lint for cleaning!

Visible soiling of joints (e.g. by water or dirt) will cause premature failure!



The wheel-side gaiter may not be replaced with output shafts that have a dynamic damper (1)!

Output shafts with dynamic damper (1) and faulty wheel-side gaiter require a complete renewal of the [output shaft](#).

**Important!**

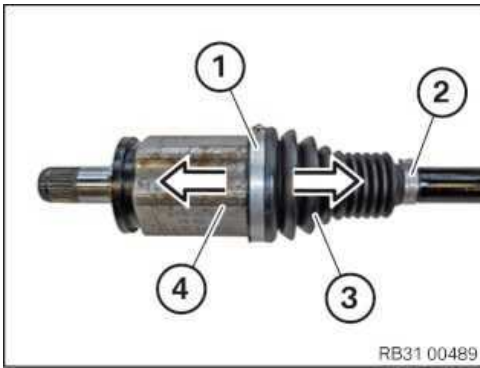
Always use plastic or aluminium vice jaw protectors when working with a vice!

Tensioning straps are not to be reused!

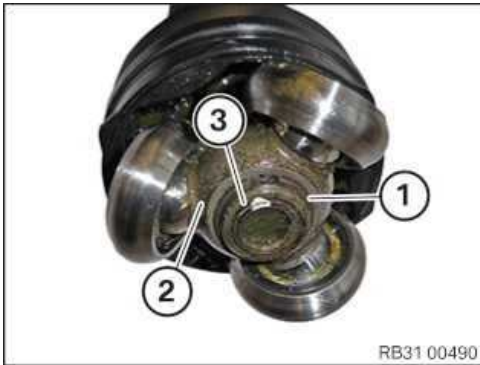
Clean the output shaft (2) and place it into the vice.

(1) = Wheel-side joint

(3) = Joint on transmission end



Detach the band clamps (1) and (2).
 Slide the gaiter (3) back.
 Detach joint housing (4).

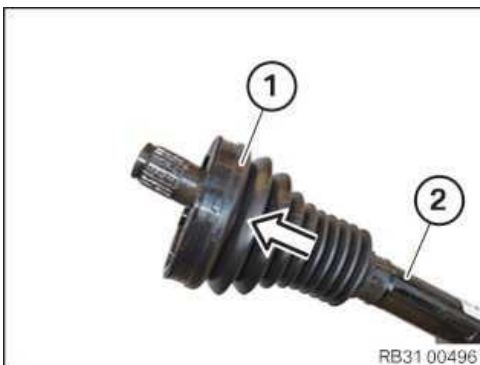


Detach the circlip (1) for the tripod (2) from the output shaft (3).



Use a three-claw extractor tool (3) to pull the tripod (1) off the output shaft and clean it carefully.

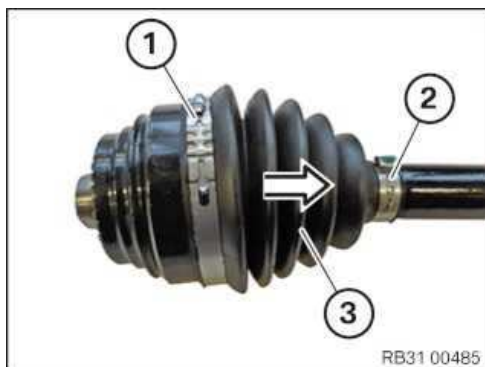
If necessary, use a suitable bolt (2) to close the bore hole.



Important!

Remove all traces of old grease. Old gaiter must not be reused!

Detach gaiter (1) of joint on transmission side and carefully clean output shaft.



Removing outer joint gaiter:

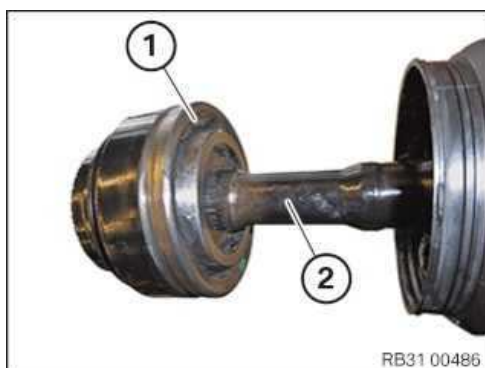
Important!

The wheel-side constant velocity joint is pressed on and secured with a snap ring. Do not press off or disassemble!

Failure to comply with this instruction will result in damage to the constant velocity joint.

Detach the tensioning straps (1) and (2).

Detach gaiter (3) of joint on wheel side.



Wipe accessible areas of joint (1) and the output shaft (2) with a clean and lint-free cloth.



Installing outer joint gaiter:

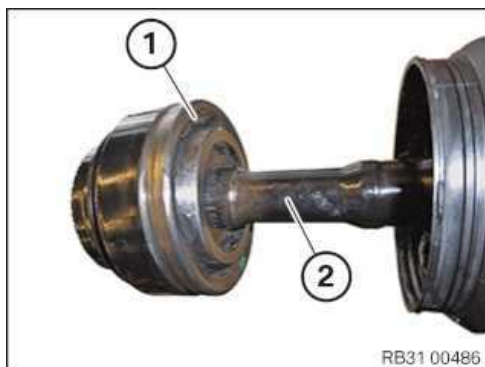
During assembly, the sealing surfaces on the gaiter and joint must be clean, dry and free of grease!

It is imperative to follow the grease and quantities listed in the table to top off the grease!

Gaiter part number	8 618 537 8 618 538	8 618 547 8 618 548	8 618 539 8 618 540	8 618 541 8 618 542	8 618 545 8 618 546	8 625 846 8 625 847
Joint on the transmission end						
Grease quantity	125 g	125 g	140 g	140 g	170 g	170 g
Grease	CX-CVM1	CX-CVM1	CX-CVM1	CX-TP1	CX-TP1	CX-TP1
Wheel-side joint						
Grease quantity	90 g	75 g	80 g	80 g	105 g	105 g
Grease	CX-CVL1	CX-CVL1	CX-CVL1	CX-CVL1	CX-CVL1	CX-CVL1

Note:

- CX-CVM1 = Part number: 2 286 016
- CX-TP1 = Part number: 2 286 018
- CX-CVL1 = Part number: 2 286 017



Push the new gaiter onto the output shaft.
Lubricate the joint with lubricant (see table).

Note:

The sealing surfaces on the inside of the gaiter and the groove on the constant velocity joint must be dry, clean and free of grease.



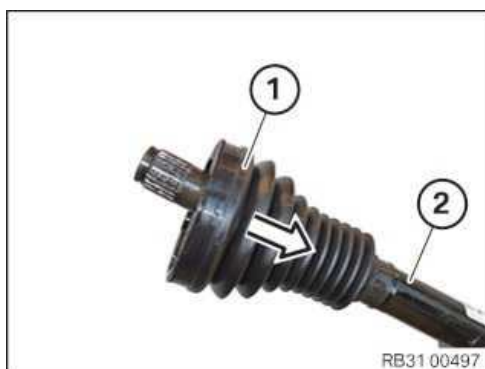
Position the gaiter (3) on the joint.

Important!

Gaiter must be bled after fitting in order to adapt the excess pressure generated during fitting to the ambient pressure!

Bleed gaiter; carefully slide a suitable tool between gaiter and output shaft for this purpose.

Position the band clamp (1) and (2) in the gaiter groove and close it with special tool [32 1 260](#).



Installing inner joint gaiter:

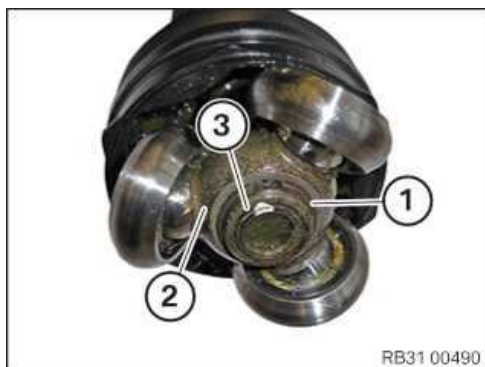
Slide the band clamp with the smaller diameter onto the output shaft (2).

Slide the new gaiter (1) onto the output shaft (2).



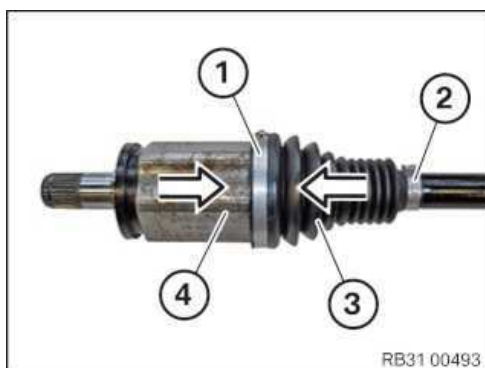
Important!

Mount the tripod (2) on the output shaft so that the flat side (1) points toward the circlip.



Drive tripod (2) with a suitable tool onto the output shaft (3) until the groove for the circlip is exposed.

Install the circlip (1).



Lubricate the joint housing (4) with lubricant (see table).

Important!

During assembly, the sealing surfaces on the gaiter and joint must be clean, dry and free of grease!

Mount the joint housing (4) on the tripod.

Mount the gaiter (3) on the joint housing (4).

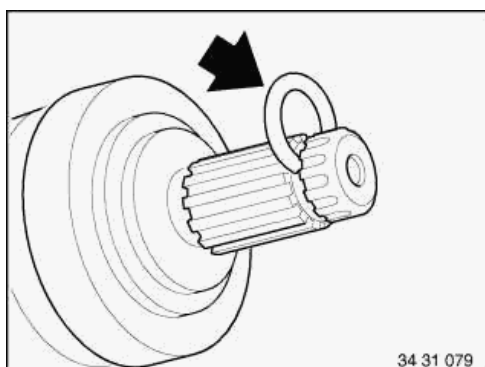
Important!

Gaiter must be bled after fitting in order to adapt the excess pressure generated during fitting to the ambient pressure!

Vent gaiter (3); carefully slide a suitable tool between gaiter and output shaft for this purpose.

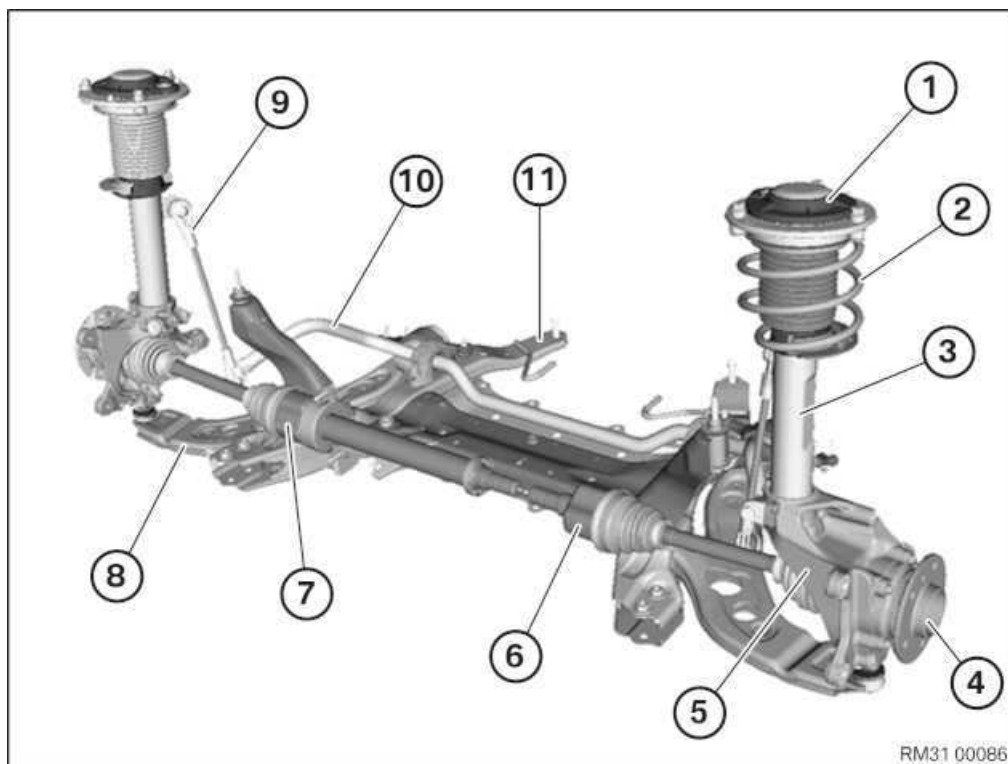
Close the band clamps with the special tool [32 1 260](#).

- If necessary, close the low-profile band clamp with special tool [31 5 200](#).



Renew transmission circlip.

31 Front axle overview



[Safety informations and general information](#)

1 [Spring strut support bearing](#)

2 [Coil spring](#)

3 [Spring strut shock absorber](#) .

4 [Wheel bearing](#)

5 [Swivel bearing](#)

6 [Left output shaft](#)

7 [Right output shaft](#)

8 [Wishbone](#)

9 [Anti-roll bar link](#)

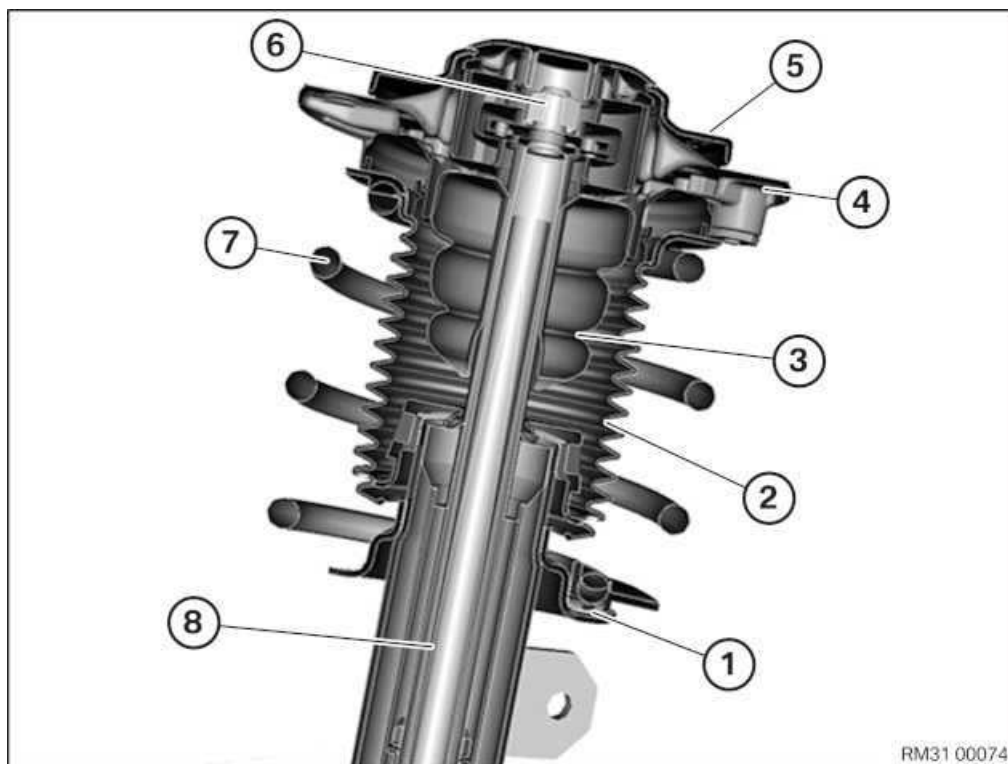
10 [Anti-roll bar](#)

11 [Front axle support](#)

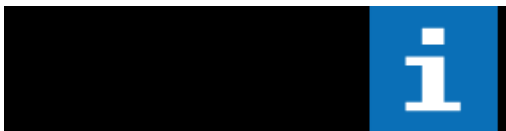
[Checking and adjustment work](#)

[Troubleshooting](#)

31 Layout of spring strut shock absorber

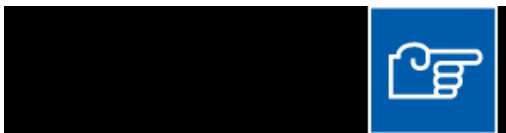


- | | |
|---------------------------------------|----------------------------------|
| 1 Lower spring pad | 5 Protective cap with cover ring |
| 2 Dust boot with upper spring pad | 6 Nut |
| 3 Auxiliary damper | 7 Coil spring |
| 4 Support bearing with sealing washer | 8 Spring Struts |



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