31 00 ... Information on replacing shock absorbers

Situation:

When a shock absorber is faulty on one side (leaking, noises, etc.), 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.

Exception: On all M-GmbH models, when a limit value is exceeded on one side, it is still necessary always to replace both shock absorbers on the relevant axle.

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31 00 Mobile table lift

Warning!

Danger of injury!

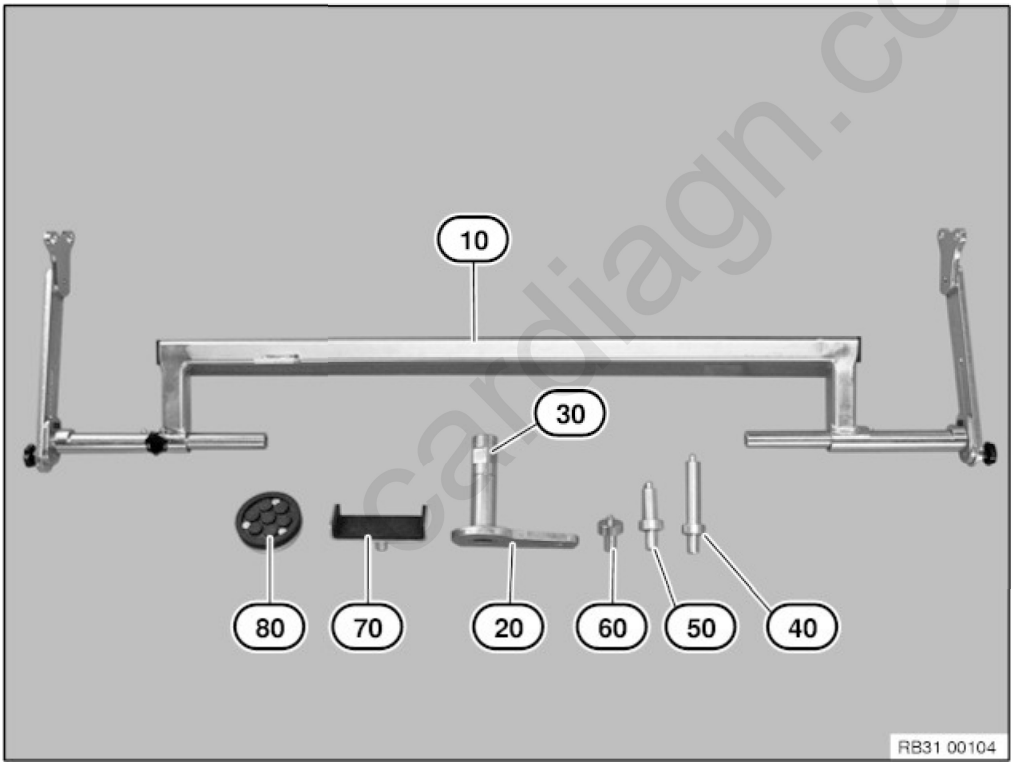
Before beginning work, position table lift with the lower frame securely on the floor.

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.

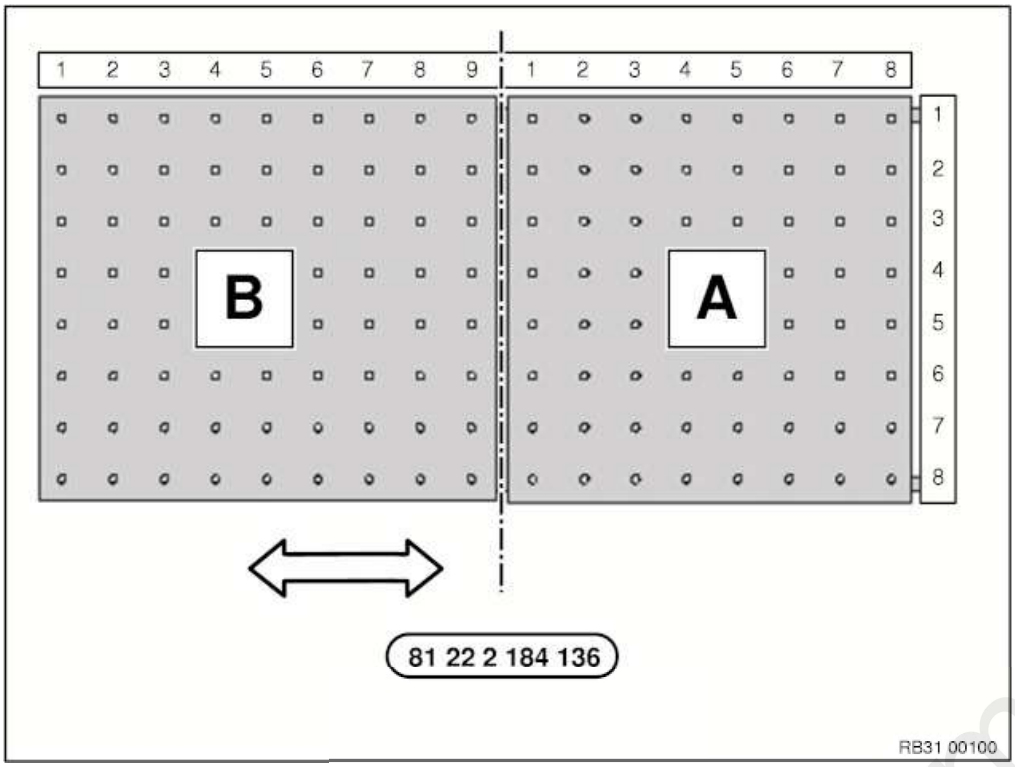
The mobile table lift is used for collision repairs and when removing large engines.



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

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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.

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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!

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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!

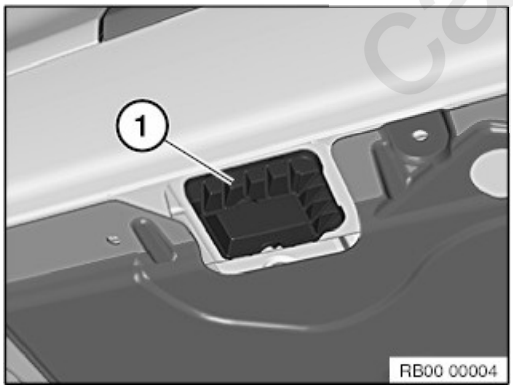
Before driving onto a vehicle hoist, make sure there is sufficient ground clearance between the vehicle hoist and the vehicle.

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



Necessary preliminary work:

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

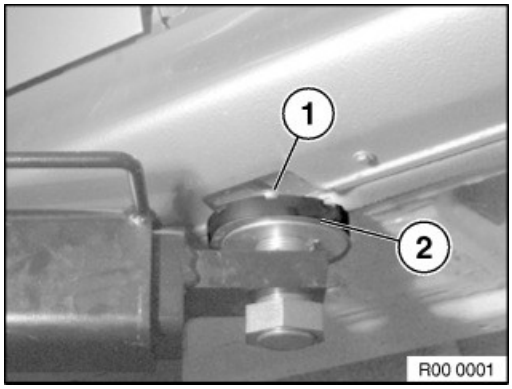


Caution!

All four jacking points (1) must be available!

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

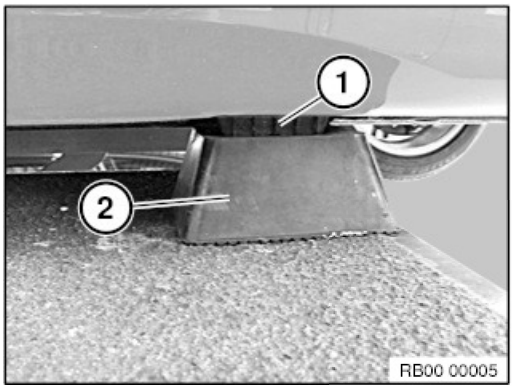
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Caution!

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!

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

Warning!

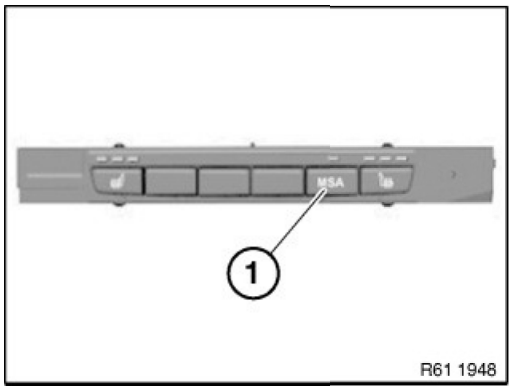
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

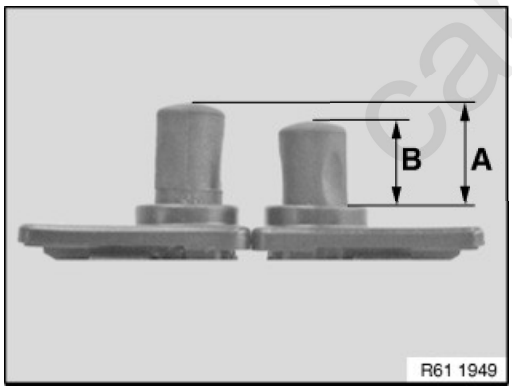
Observe safety precautions when working on MSA vehicles.

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

MSA function is deactivated by:



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



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

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

    B = 7 mm

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

When working with diagnosis tools:

- Observe instructions in diagnosis tool

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

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

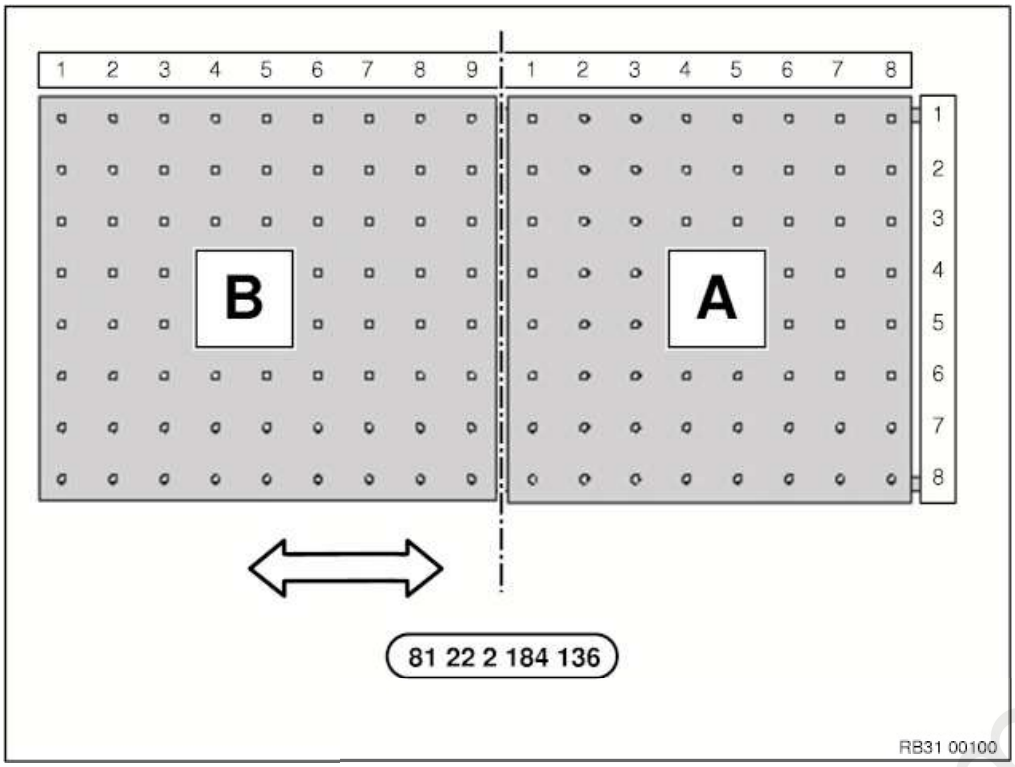
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31 10 001 Completely removing and installing front axle with engine and transmission

Necessary preliminary work:

- Disconnecting the battery earth lead
- Move engine compartment lid into working position
- Drawing off the air conditioning
- Remove electronics box
- Removing the stiffening plate
- Remove the underbody protection at the front, centre and rear
- Remove transmission oil cooler
- Remove coolant radiator
- Remove both covers of the coolant radiator
- Removing intake silencer housing
- Removing clean air pipe
- Remove condenser
- Disconnect positive battery cable in engine compartment
- Release the vacuum hose on the brake servo
- Release the fuel feed line
- Removing purge air line
- Detach intake pipe on air conditioning compressor to refrigerant line
- Remove charge air pipe
- Remove propeller shaft
- Completely remove both front wheel arch covers
- Remove both front crash wedges (US design only)
- Remove both front covers on the vehicle underbody
- Remove left and right brake air duct rear part
- Detach EPS cable from front axle support
- Detach lower steering shaft from steering gear
- Remove transmission support bracket
- Detach grounding cable from transmission
- Release left and right brake caliper and tie away
- Detach wheel speed sensor, left and right

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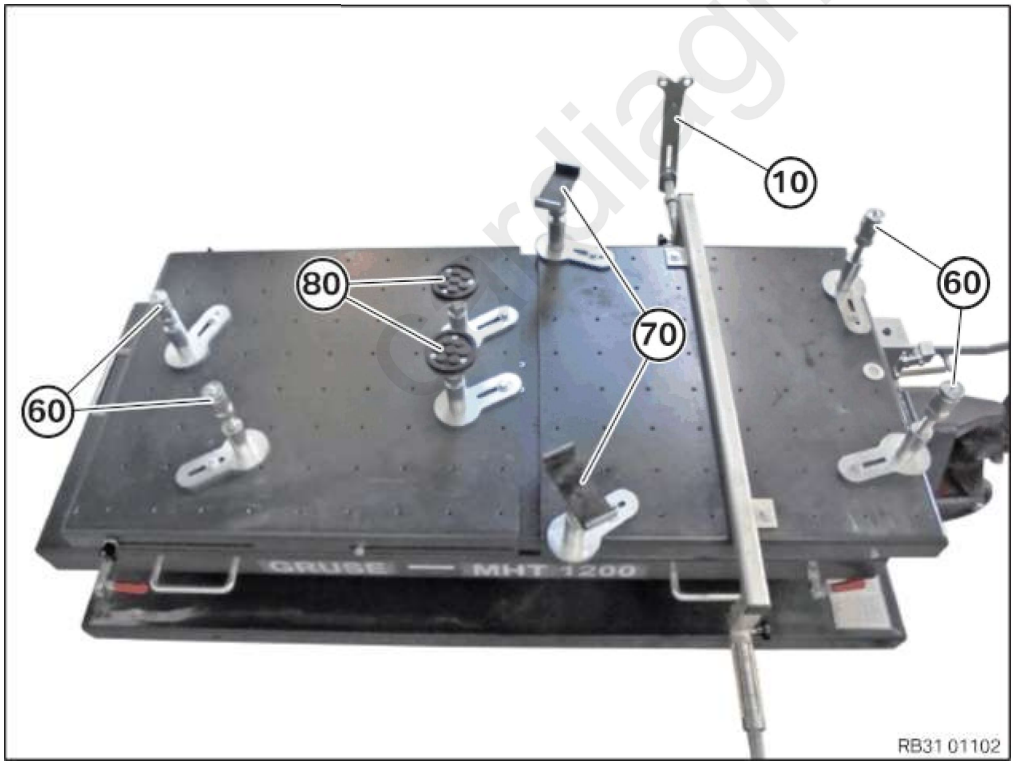


Caution!
Coordinate determination always begins at the top.

Position engine assembly on table top **A**.

Position transmission on table top **B** .

Table top is adjustable in the longitudinal direction (see arrow).



Structure of table lift.

Position the mounting elements with the fixtures (60) on the work surface **A** at coordinates **8/3** and **7/7**.

Position the fixture (10) on work surface **A** for the swivel bearings at coordinates **4/1** and **5/8**.

Position the mounting elements with the fixtures (70) on the work surface **A** at coordinates **2/1** and **2/8**.

Position the mounting elements with the fixtures (80) on the work surface **B** at coordinates **9/3** and **9/5**.

Position the mounting elements with the fixtures (60) on the work surface **B** at coordinates **2/3** and **3/7**.

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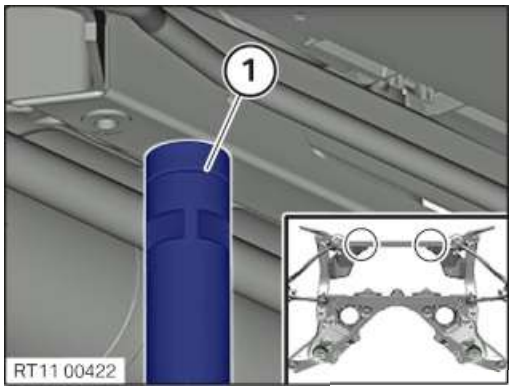
Caution!

Removal weight approx. 150 kg to 300 kg.

Check the payload of the vehicle and unload as needed.

Load front footwell with sandbags if necessary, approx. 100 kg.

Note safety instructions of table lift.



Position the mounting elements (1) with the fixtures (60) on the front left and right at the front axle support.

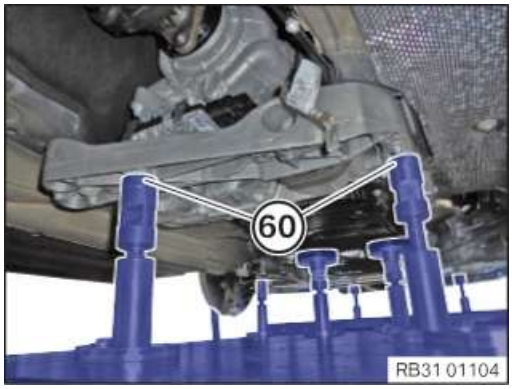


Position the mounting elements with the fixtures (70) on the rear left and right at the front axle support.

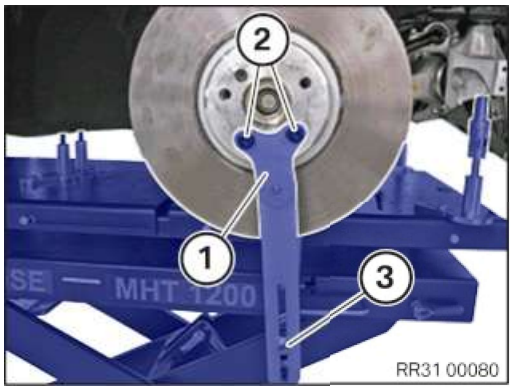


Position the mounting elements with the fixture (80) at the transmission.

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Position the mounting elements with the fixtures (60) at the transmission cross member.



Secure the fixture for the swivel bearing (1) at the brake disc with the wheel bolts (2).

Secure adjusting screw (3).

- Detach suspension struts
- Disassemble the front axle support
- Detach transmission cross member
- Slowly lower the lifting table and see that all components have freedom of movement

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31 10 000 Removing and installing complete front axle

WARNING

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

Danger! Life-threatening injuries!

- Secure the vehicle hoist against lowering and lifting.

WARNING

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

Danger! Life-threatening injuries!

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

WARNING

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

Danger! Life-threatening injuries!

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

PRELIMINARY WORK

1 – Disconnecting all battery earth leads



- See additional information.

2 – Bring front compartment lid in the service position

Prerequisite

Engine compartment lid is open.

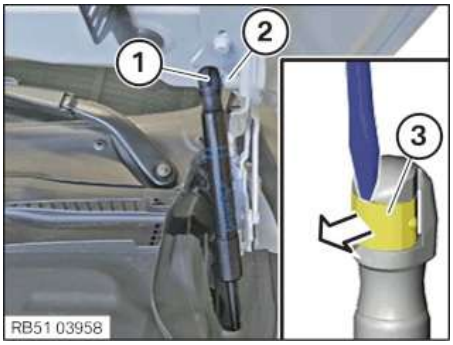
CAUTION

Shutting bonnet or tailgate.

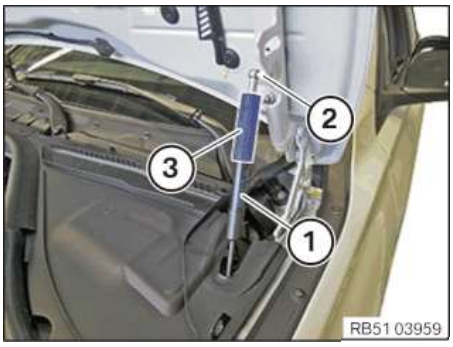
Danger of injury!

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

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

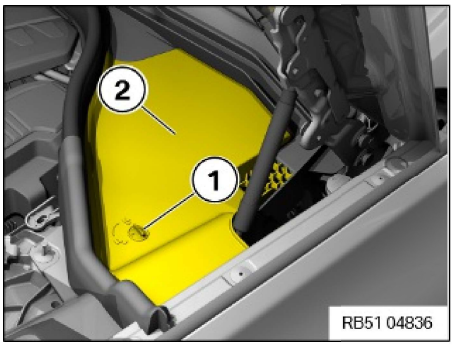


TECHNICAL INFORMATION

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

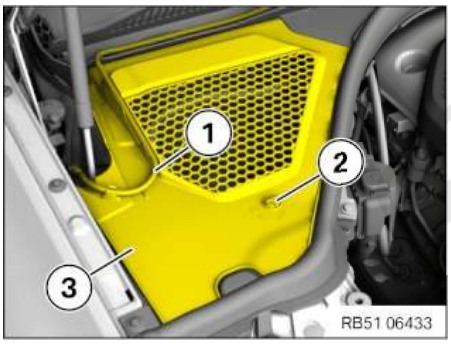
- Remove the bonnet support and open the bonnet further.
- Push special tool or (3) over gas pressure spring (1).
- Place special tool on the ball pin (2) and engage using force.
- Repeat the operation on the other side of vehicle.

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



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

4 – Remove the cover of the rear right engine compartment



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

5 – Remove the seal for the rear bonnet



- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

6 – Removing both wiper arms

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NOTICE

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

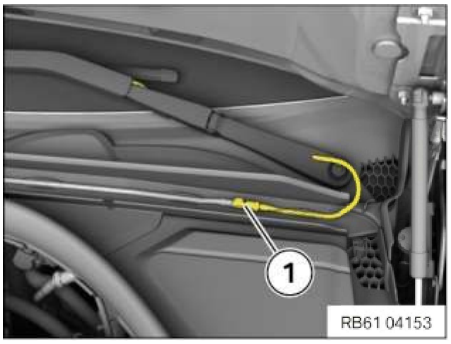
▸ **Remove the wiper arm**

RISK OF DAMAGE

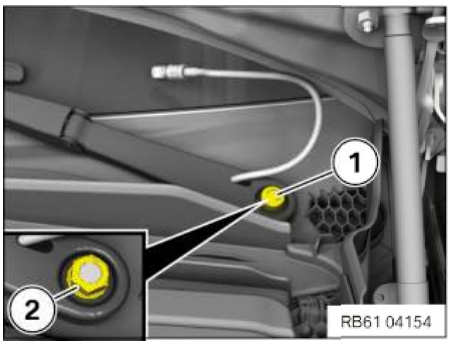
Damage to wiper console

While removing the wiper arms without using special tool, the wiper console can break.

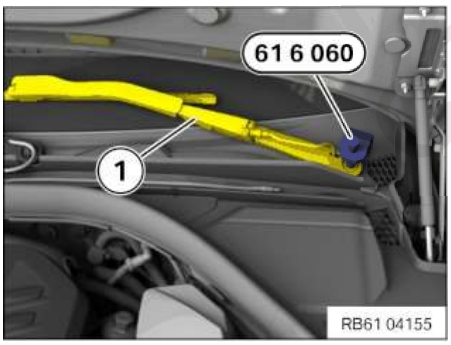
- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do not lift off wiper arm, else the wiper console may break on the predetermined breaking point for the pedestrian protection.



- Disconnect the windscreen wash hose(1) at the separation point and remove from the cowl guide.

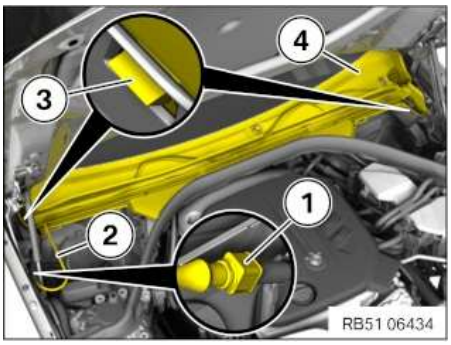


- Remove the protective cap (1).
- Loosen nut (2).



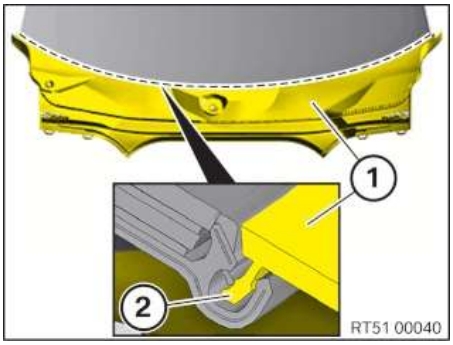
- Pull off the wiper arm (1) using special tool .

7 – Remove cowl panel cover



- Release snap fastener of the washer fluid hose (1) and put the washer fluid hose(2) to one side.
- Unclip clips (3) on the cowl panel cover (4).

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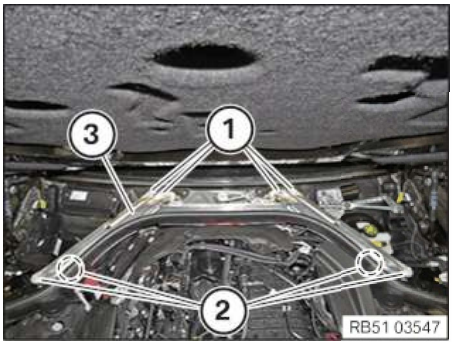


- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

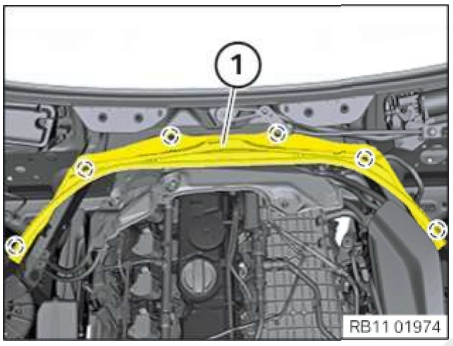
8 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

Driving without the strut brace/front end or tension strut is not permitted.



- **If installed:** Remove tension strut on spring strut dome.
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.

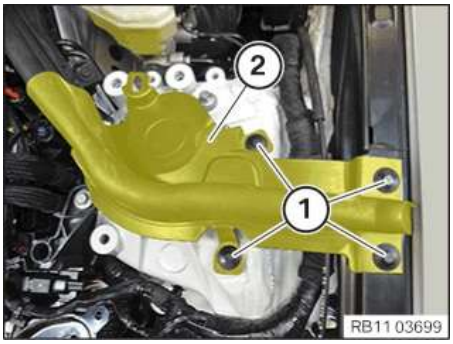


- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

9 – Removing side bonnet gaskets

NOTICE

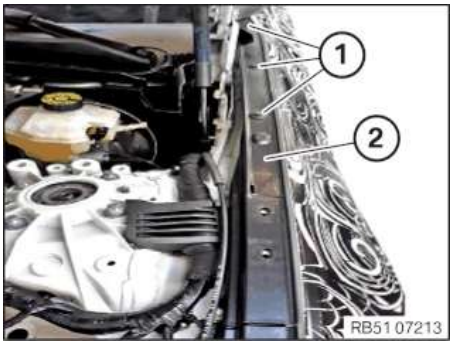
Perform the operations on the left and right side.



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

10 – Remove sealing of the side panel

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NOTICE

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

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

11 – Removing the acoustic cover

WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

Damage to the acoustic cover.

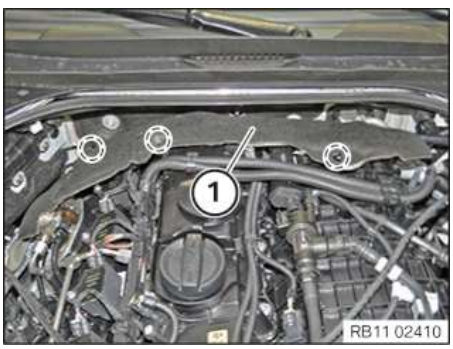
Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover.

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



- Release the acoustic cover (1) towards the top from the rubber mounts (marks).

12 – Removing acoustic cover at rear



- Unclip the acoustic cover (1) in the marked areas and remove it to the top.

13 – Remove all ignition coils.

NOTICE

The description is for one component only. The procedure is identical for all further components.

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▸ **Removing the ignition coil**

WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

Damage to the ignition coil.

The silicone hose of the ignition coil must not be contaminated by fuel as this can lead to failure of the ignition coil.

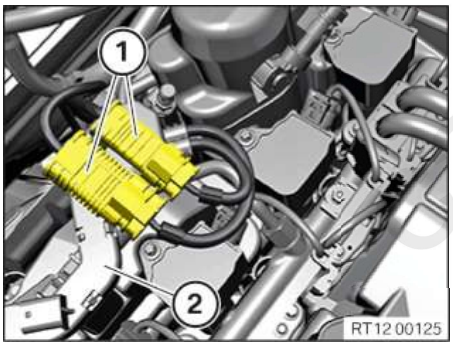
- Cover ignition coils using suitable covers when working on the fuel system, if necessary remove them.
- Do not oil or grease the silicone tube of the spark plug connector. The silicone tube is coated with talc to reduce the pulling forces.

RISK OF DAMAGE

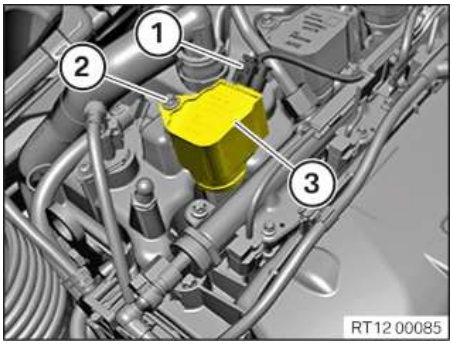
Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 Information on electrostatic discharge (ESD) protection.



- Disconnect the connector (1) of the front oxygen sensor and the monitoring oxygen sensor from the cable channel (2) and set aside.



- Unlock plug connection (1) and disconnect.
- Loosen screw (2).
- Remove ignition coil (3).

14 – Remove fuel delivery line

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

RISK OF DAMAGE

Damage to the ignition coil.

The silicone hose of the ignition coil must not be contaminated by fuel as this can lead to failure of the ignition coil.

- Cover ignition coils using suitable covers when working on the fuel system, if necessary remove them.
- Do not oil or grease the silicone tube of the spark plug connector. The silicone tube is coated with talc to reduce the pulling forces.

RISK OF DAMAGE

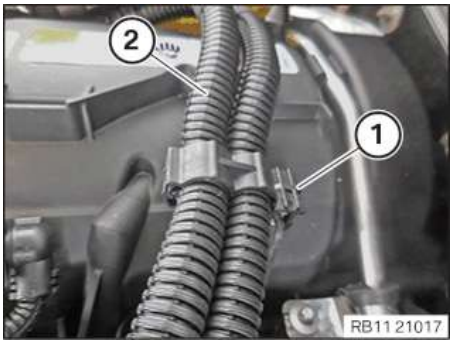
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.

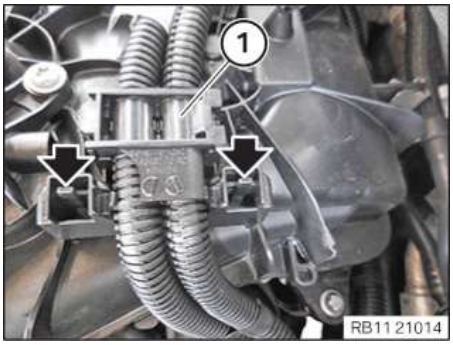
TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.

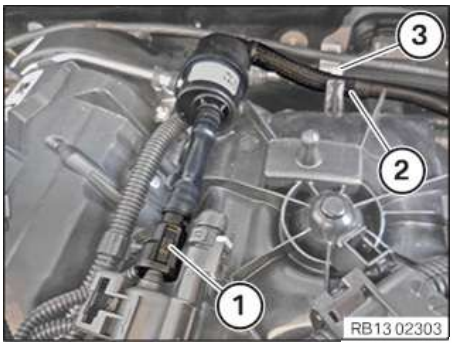


- Loosen clamp (1).
- Guide out wiring harness section (2) for the injectors and ignition coils and place it aside.

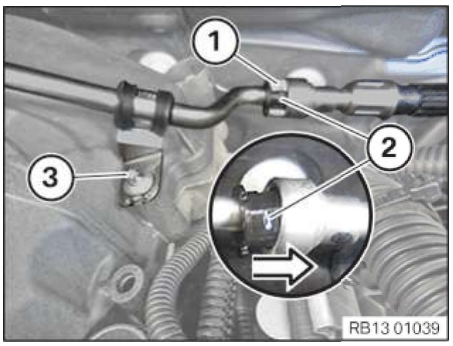
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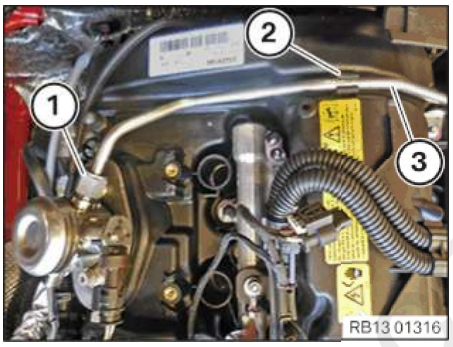
- Unlock the locks (arrows).
- Guide out wiring harness section (1) for the injectors and ignition coils and place it aside.



- Unlock and loosen lock (1).
- Guide tank ventilation line (2) out of clamp (3) and place it aside.



- Unlock and loosen clamp (1).
- Unlock and remove the snap fastener (2) in the direction of the arrow.
- Catch and dispose of escaping fuel.
- Seal the fuel lines with special tools 0 496 567 (13 5 161) and 0 496 568 (13 5 162) from the set of special tools 0 496 565 (13 5 160).
- Loosen screw (3).



- Slacken the union nut (1) on the high pressure pump.
- Catch and dispose of escaping fuel.
- Seal all openings with the special tool .
- Guide the fuel feed line (3) out and remove.
- Make sure that the rubber damper (2) is not lost.

15 – Removing intake silencer housing

RISK OF DAMAGE

Damage to the clean air line. Damage to the air filter.

For changing the air filter insert, if the upper section of intake filter housing is only raised and not completely removed, the clean air line and the air filter insert may be damaged.

- Do not lift upper section of intake filter housing by force.
- Unfasten clamp.
- Remove upper section of intake filter housing completely.

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- Unlock plug connection (1) and disconnect.
- Unfasten clamp (2).
- Pull out and remove the intake silencer housing (3) from the rubber mounts towards the top.

16 – Removing both front wheels

▸ **Removing the wheel**



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

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



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

17 – Remove the rear section of the wheel arch cover on the front left and right

NOTICE

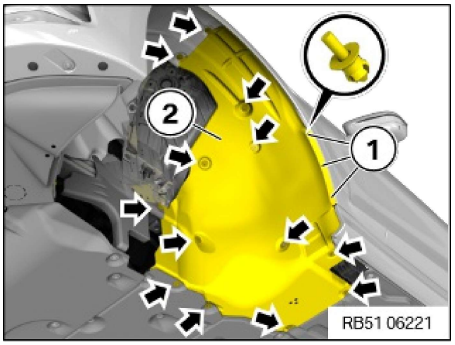
Description is for left component only. Procedure on the right side is identical.

▸ **Removing the rear section of the front wheel arch cover front**

NOTICE

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

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

18 – Removing the front section of the front left wheel arch cover

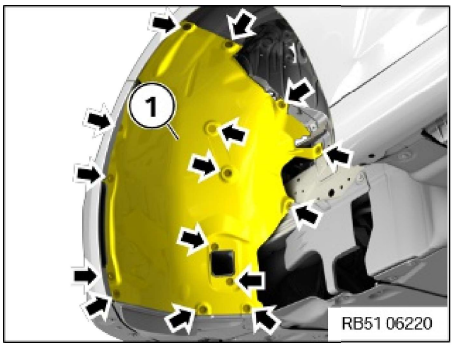
NOTICE

Perform the operations on the left and right side.

▸ **Removing the front section of the front wheel arch cover**

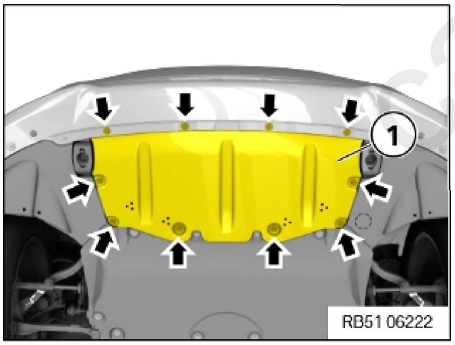
NOTICE

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



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

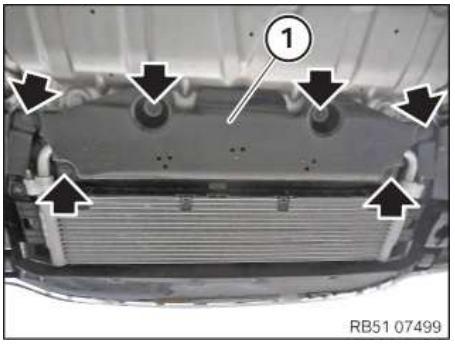
19 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

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

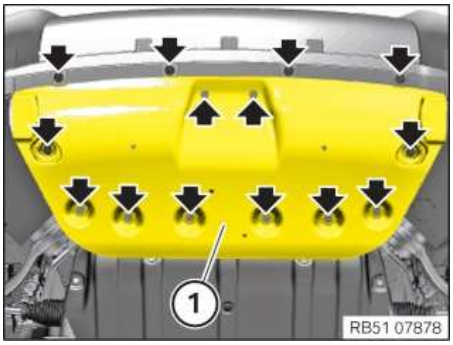


- **Version 2:**

  Remove screws (arrows).

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

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- **Version 3:**

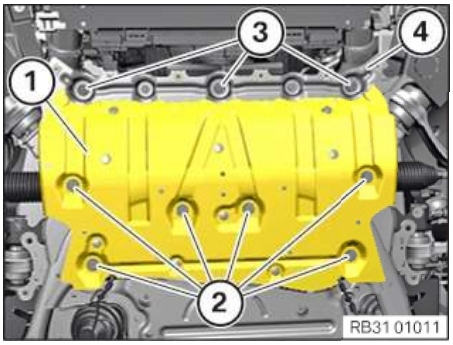
  Remove screws (arrows).

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

20 – Removing the stiffening plate

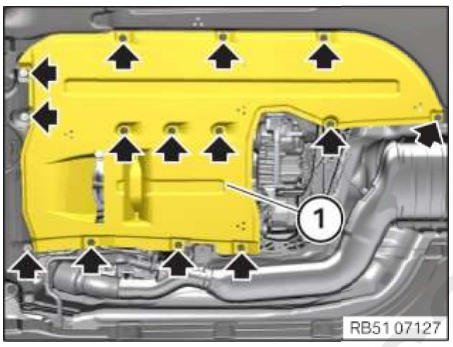
TECHNICAL INFORMATION

Driving without stiffening plate is not permissible.



- Loosen screws (3).
- Remove the holder of the underride protection (4).
- Loosen screws (2).
- Remove stiffening plate (1).

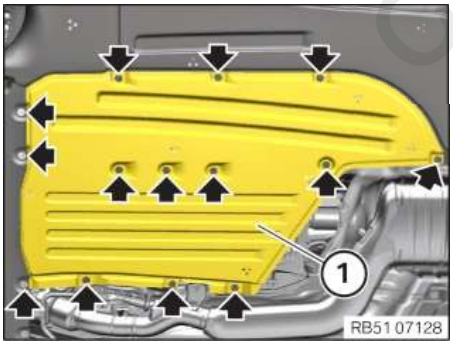
21 – Remove rear underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).

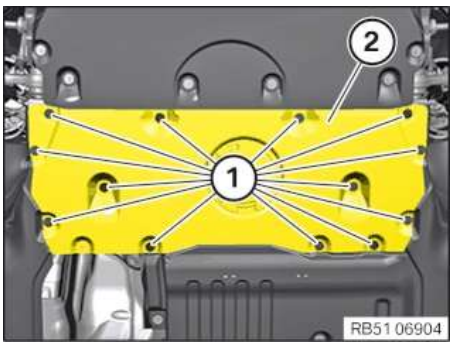


- **Version 2:**

  Remove screws (arrows).

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

22 – Removing the centre underbody protection

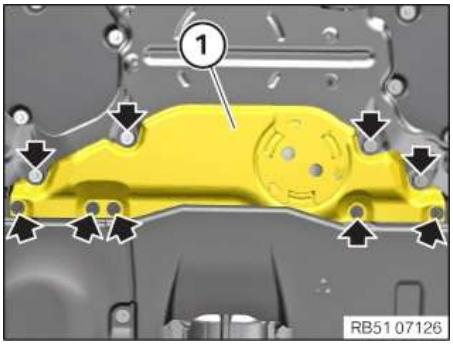


- **Version with rear-wheel drive:**

  Loosen screws (1).

  Remove centre underbody protection (2) .

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

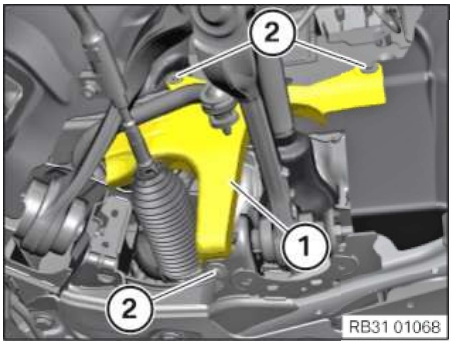
  Remove screws (arrows).

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

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

NOTICE

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

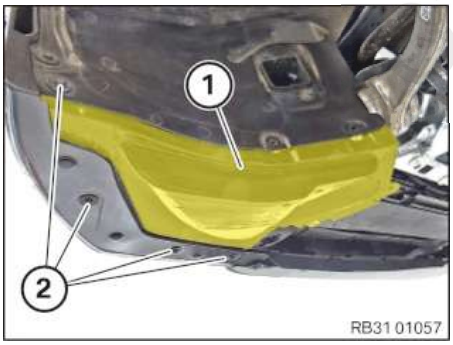


- ▸ **Remove the cover of the steering assembly**
- Loosen screws (2).
- Remove the cover (1).

24 – Removing the bottom left and right wheel arch cover

NOTICE

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

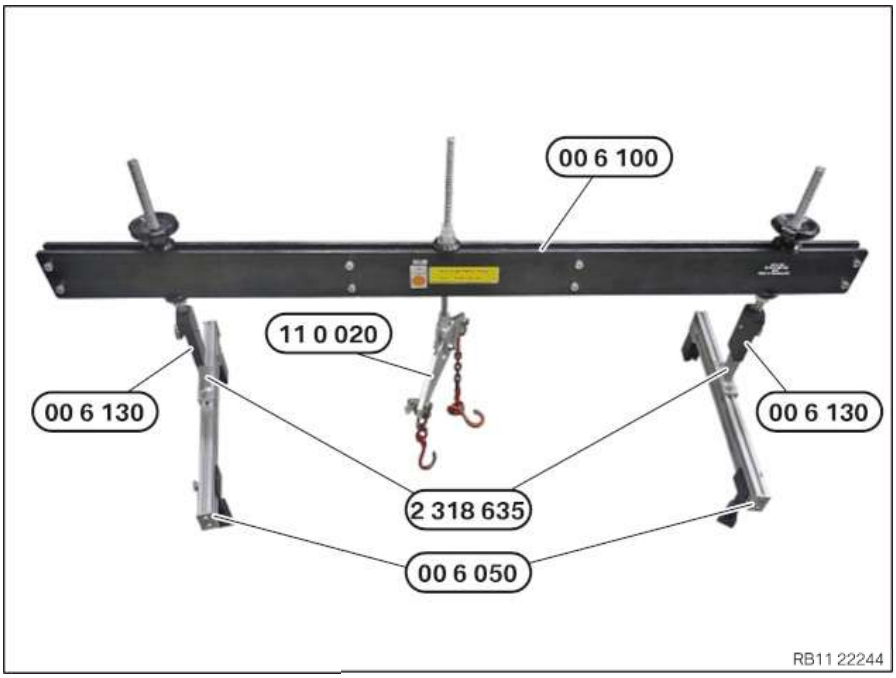


- ▸ **Remove bottom wheel arch cover**
- Loosen screws (2).
- Remove bottom wheel arch cover (1)

25 – Securing engine in installation position

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Overview: prepared engine bridge



CAUTION

Components connected to the engine joint or cross member.

Danger of injury!

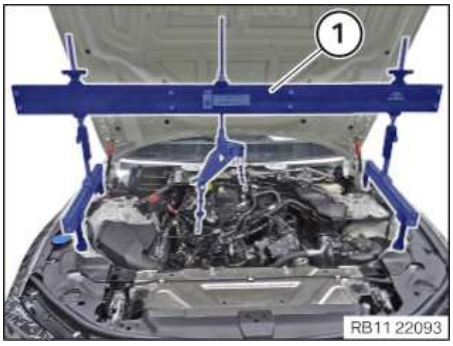
- Check lifting eyes and engine mounting brackets for damage, e.g. cracks.
- Attach the component to correctly mounted engine joints or cross members only.
- Exclusively lift the component, do not move it forwards, backwards or in transverse direction.



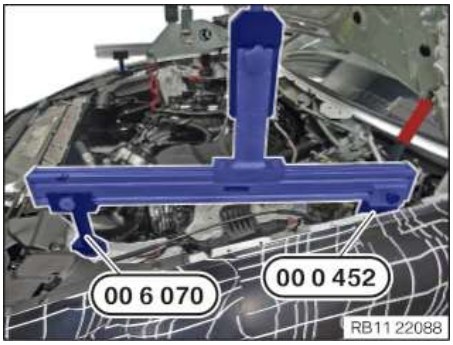
- Guide in and position special tool on cylinder head.
- Tighten the screws (1) of special tool .

Special tool to cylinder head

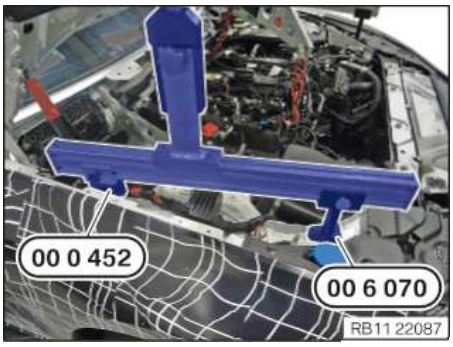
M8		Tightening torque	21,5 Nm



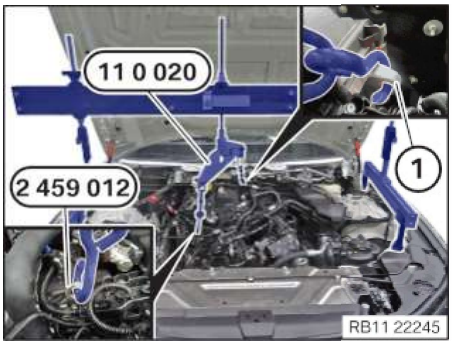
- **Carefully** position engine bridge (1) with help from an auxiliary person.



- Make sure that special tool on the left is **correctly** positioned on the front end.
- Make sure that special tool 0 495 850 (00 0 452) on the left is **correctly** positioned on the carrier support.



- Make sure that special tool on the right is **correctly** positioned on the front end.
- Make sure that special tool 0 495 850 (00 0 452) on the right is **correctly** positioned on the carrier support.



- Align the engine bridge by moving it on the profile strips of the special tool above the engine mounting bracket and screw it down.
- Connect special tool 0 490 567 (11 0 020) to special tool .
- Connect the special tool 0 490 567 (11 0 020) above the engine mounting bracket (1) at the rear.



- Check whether the special tool on the right is **correctly** positioned on the front end.



- Check whether the special tool 0 495 850 (00 0 452) on the right is **correctly** positioned on the carrier support.



- Check whether the special tool on the left is **correctly** positioned on the front end.

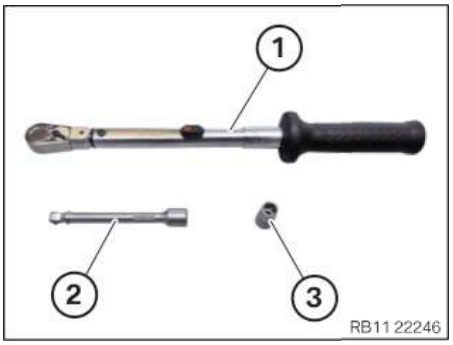
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- Check whether the special tool 0 495 850 (00 0 452) on the left is **correctly** positioned on the carrier support.

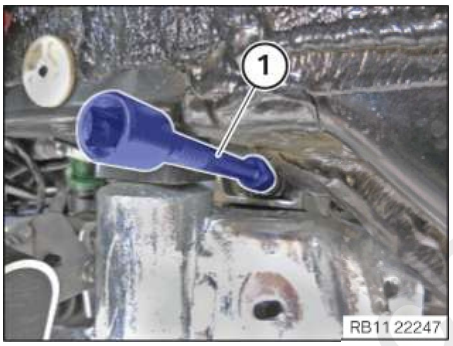


- Release screw (1) on the right engine mount from the top with a commercially available tool.

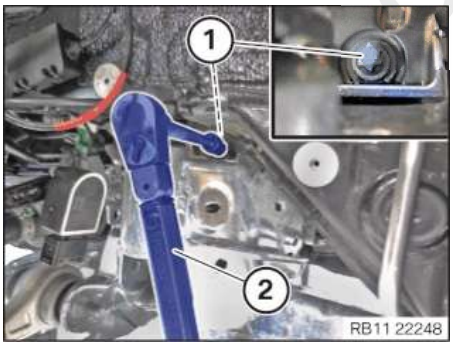


- Have all suitable tools ready.

Number	Description
1	Commercial available torque spanner
2	Swivel mounted extension
3	External Torx E14



- Position the suitable tool (1).



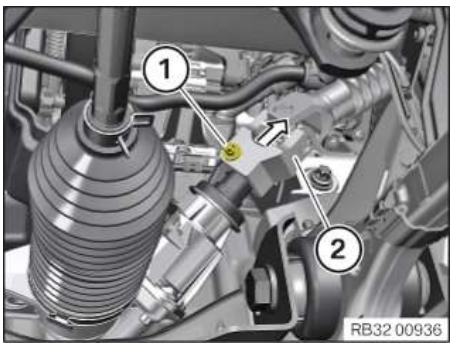
- Release screw (1) of the left engine mount with standard tool (2) sideways.



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

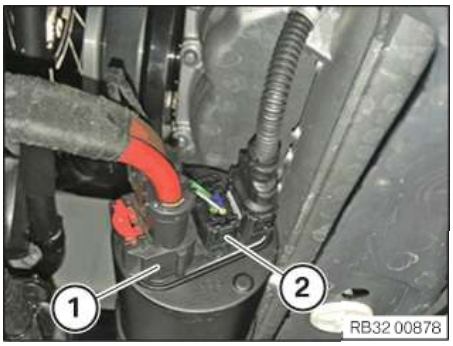
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26 – Releasing lower steering shaft from steering gear

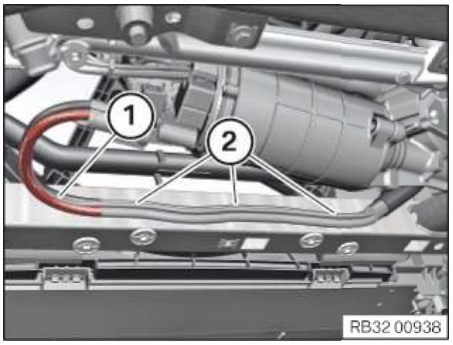


- Loosen screw (1).
- Pull off lower steering shaft (2) from steering gear in direction of arrow.

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

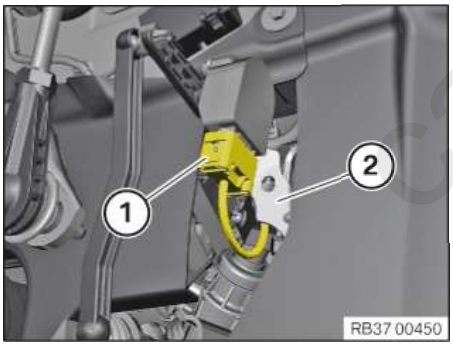


- Unlock and disconnect the plug connections (1) and (2).



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

28 – Detach the line connection of the ride height sensor



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

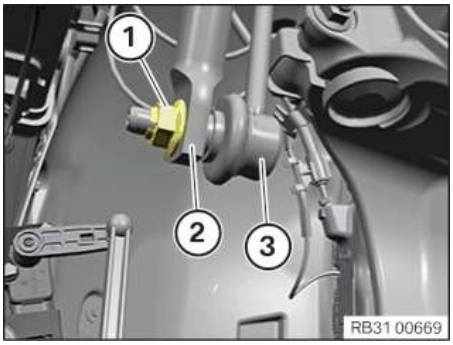
29 – Release the left and right anti-roll bar link from the anti-roll bar

NOTICE

Perform the operations on the left and right side.

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

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- Loosen nut (1).

Note: Use the Torx socket for counter support.

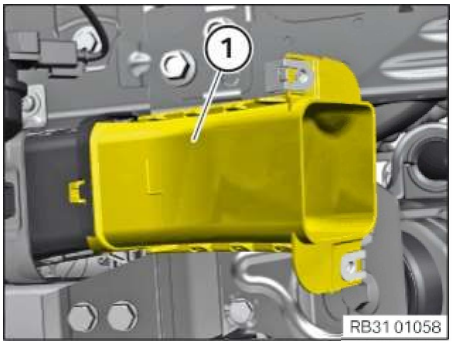
- Loosen the anti-roll bar link (3) from the anti-roll bar (2).

30 – Removing the left and right brake air duct partially

NOTICE

Perform the operations on the left and right side.

▸ **Removing brake air duct partially**



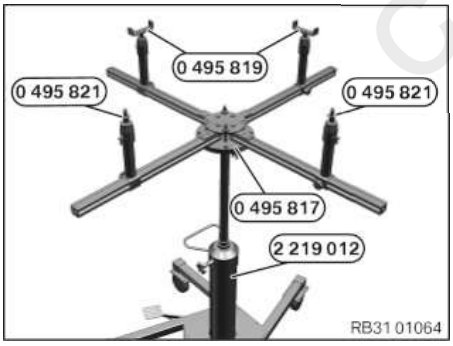
- Unclip and remove air duct (1).

MAIN WORK

31 – Preparing the special tool

TECHNICAL INFORMATION

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



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

32 – Lower front axle support

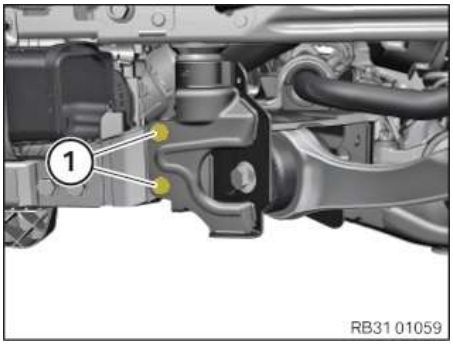
WARNING

Falling or tipping of a heavy component.

Danger! Life-threatening injuries!

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

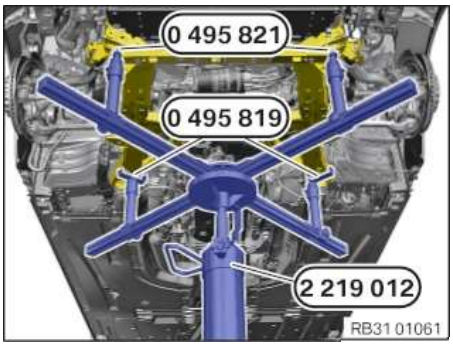
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NOTICE

Perform the operations on the left and right side.

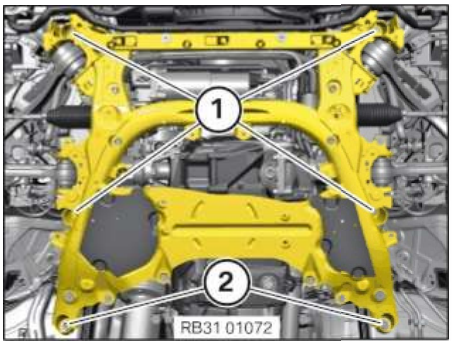
- Loosen screws (1).



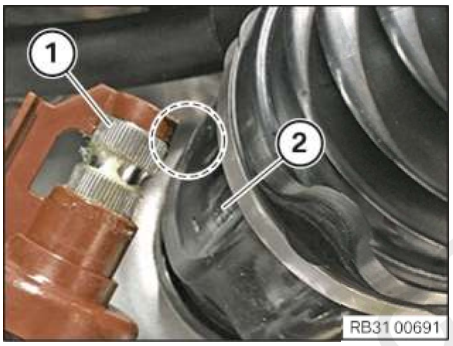
- Position the universal jack 2 219 012 with the special tools and on the front axle support.

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

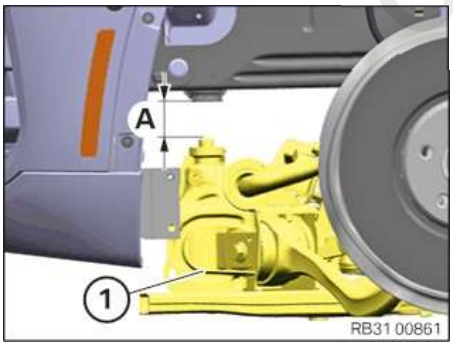
- Support the front axle support with the universal jack 2 219 012.



- Loosen screws (1) and (2).



- When lowering the front axle support, ensure sufficient distance between the steering gear (1) and the output shaft (2).

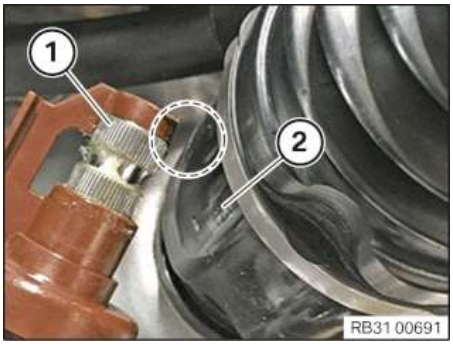


- Lower front axle support (1) using the universal jack by dimension (A).

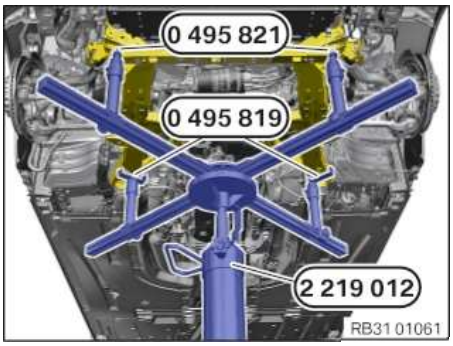
  Dimensions (A) = maximum 15 cm

33 – Lift front axle support and fasten.

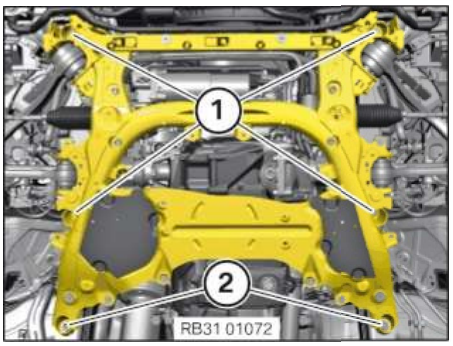
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- When lifting the front axle support, ensure sufficient distance between the steering gear (1) and the output shaft (2).



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



- Replace the screws (1).

  Parts: Bolts
- Tighten the screws (1).

Front axle support to front/centre of body

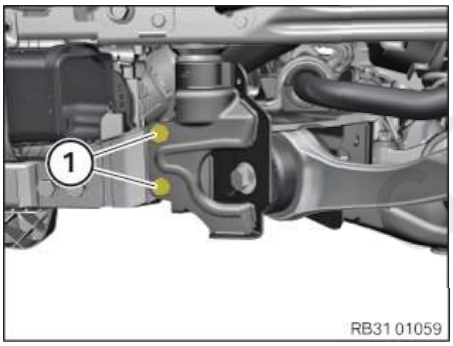
M12	Renew screws.	Jointing torque	108 Nm

- Replace the screws (2).

  Parts: Bolts
- Tighten the screws (2).

Front axle carrier to body, rear

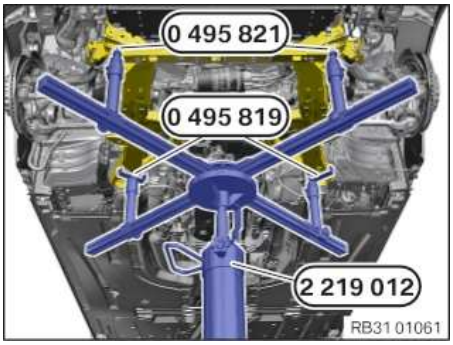
M14	Renew screws.	Tightening torque	175 Nm



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

Adapter, front axle support to front axle support

M8x70		Tightening torque	19 Nm



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

POSTPROCESSES

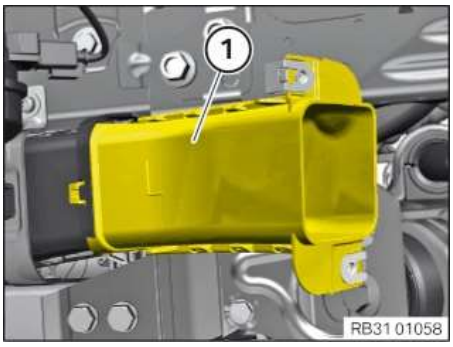
34 – Partially installing the left and right brake air duct

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NOTICE

Perform the operations on the left and right side.

▶ **Installing the brake air duct partially**



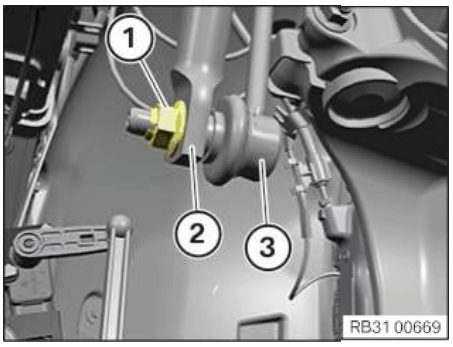
- Position and clip in air duct (1).

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

NOTICE

Perform the operations on the left and right side.

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



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

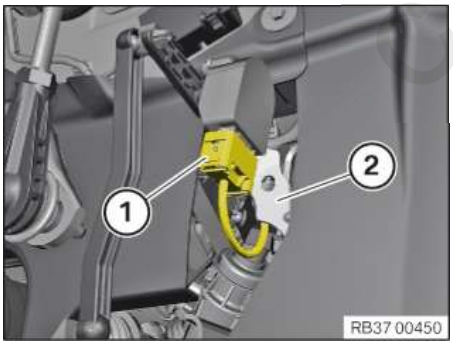
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

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

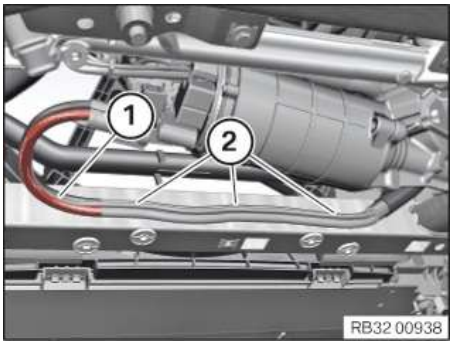
M10	Renew nut.	Tightening torque	56 Nm

36 – Attach the line connection of the ride height sensor

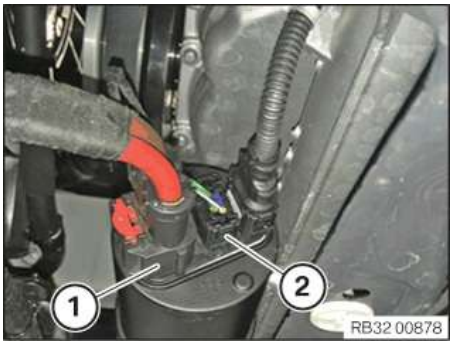


- Position the line .
- Clip in line on holder (2) .
- Connect connectors (1) and lock.

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



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

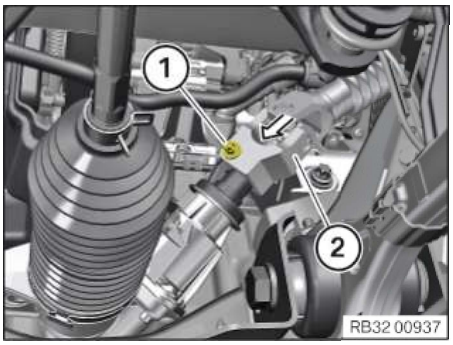


- Connect connectors (1) and (2) lock.

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

TECHNICAL INFORMATION

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



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

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

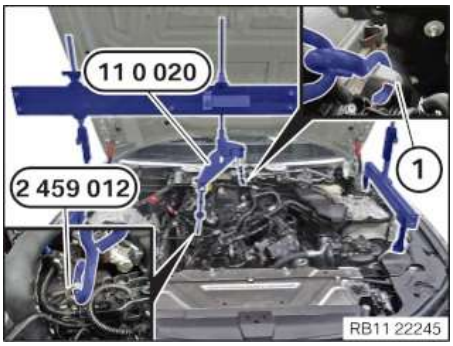
Universal joint to steering box

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

39 – Loosen the attachment of the engine in installation position



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



- Feed out special tool 0 490 567 (11 0 020) on the special tool and set aside.
- Feed out special tool 0 490 567 (11 0 020) on the engine mounting bracket (1) and set aside.

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TECHNICAL INFORMATION

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

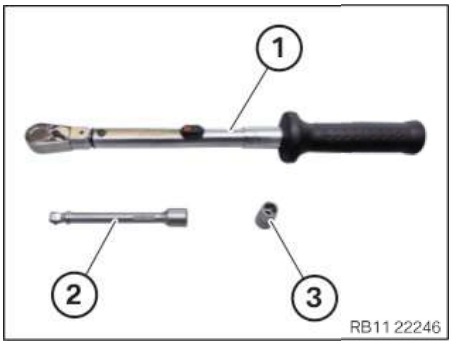
- Remove the engine bridge (1) with an auxiliary person.



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

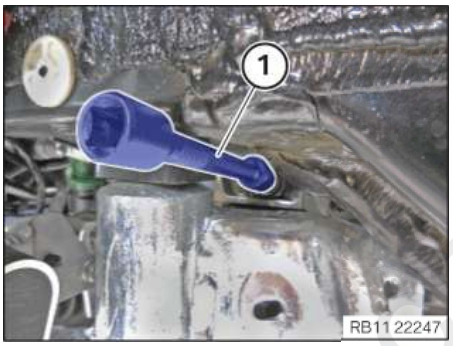
Engine mount to engine mounting bracket

M12		Tightening torque	100 Nm

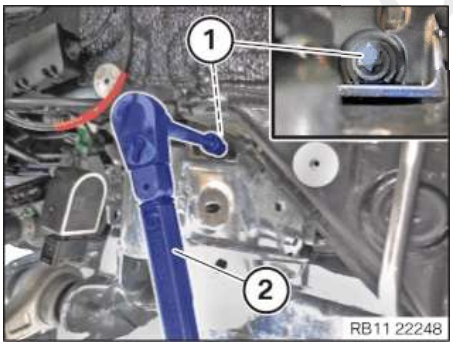


- Have all suitable tools available.

Number	Description
1	Commercial available torque spanner
2	Swivelling extension
3	External TorxE14



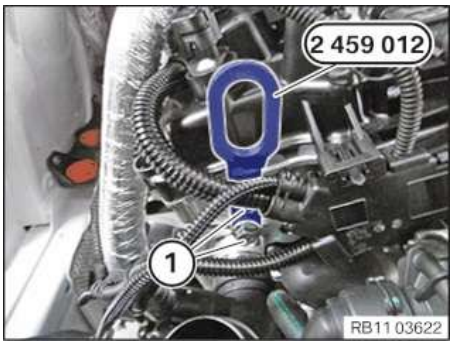
- Position suitable tools (1).



- Tighten bolt (1) of the left engine mount using a standard tool (2) sideways.

Engine mount to engine mounting bracket

M12		Tightening torque	100 Nm



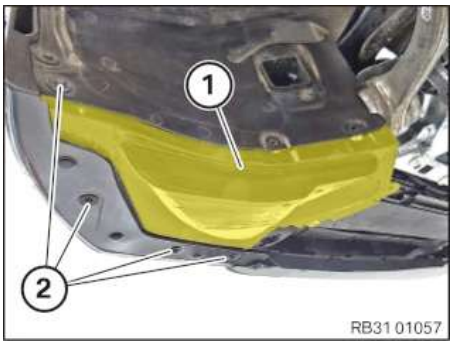
- Unscrew the bolts (1) of the special tool .
- Feed out the special tool at the cylinder head and remove.

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40 – Installing the bottom left and right wheel arch cover

NOTICE

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



▸ **Installing the bottom wheel arch cover**

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

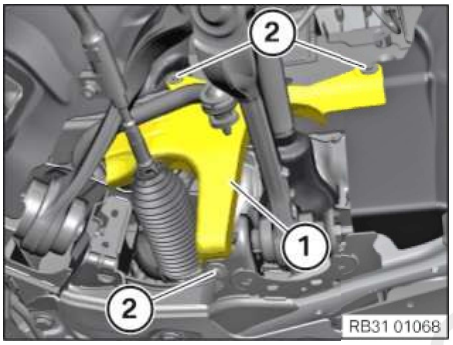
Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

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

NOTICE

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



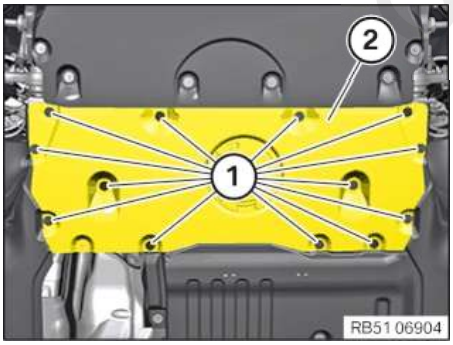
▸ **Install the cover of the steering assembly**

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

Cover, steering unit

Screw	Tightening torque	3 Nm

42 – Installing the centre underbody protection



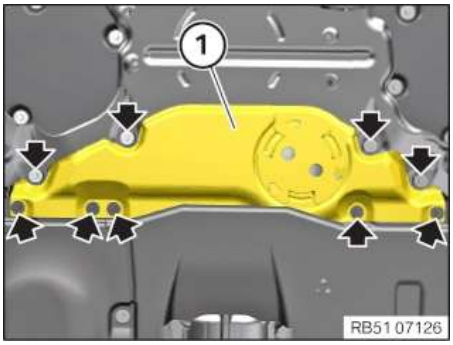
- **Version with rear-wheel drive:**

  Position central underbody protection (2).

  Tighten the screws (1).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



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

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

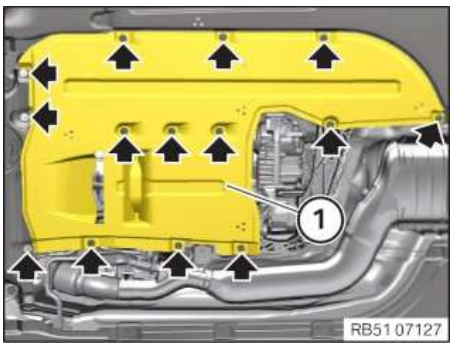
  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

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43 – Installing underbody protection at rear



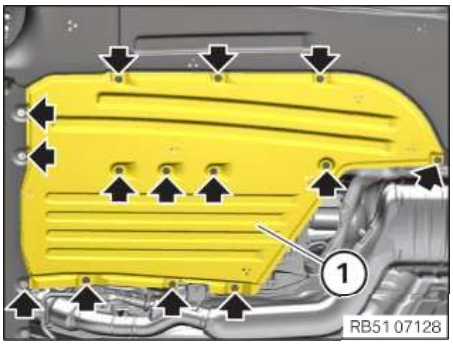
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

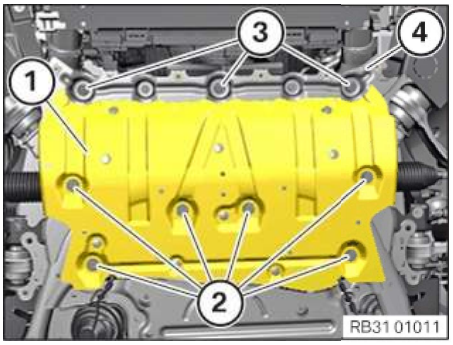
  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

44 – Installing the stiffening plate

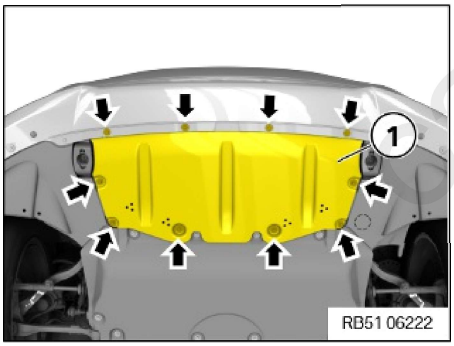


- Position stiffening plate (1).
- Screw screws (2) in.
- Position holder of underride protection (4).
- Screw screws (3) in.
- Tighten down screws (2) and (3).

Stiffening plate to front axle support

M10		Tightening torque	56 Nm

45 – Installing the front underbody protection



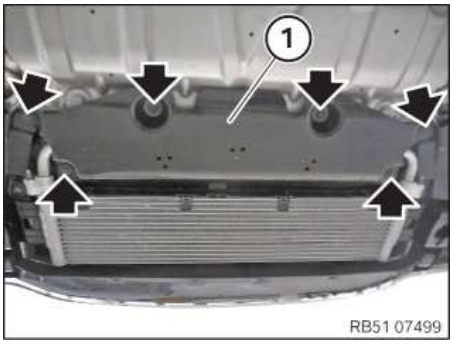
- **Version 1:**

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

  Tighten screws (arrows).

Underbody protection front

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



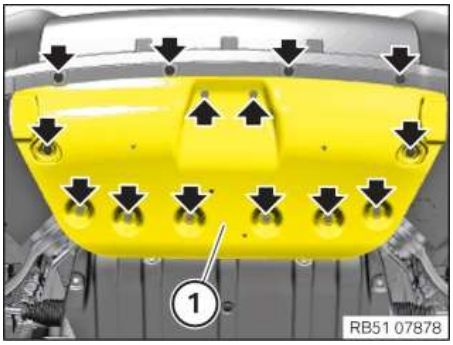
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

46 – Installing the front section of the wheel arch cover on the front left and right

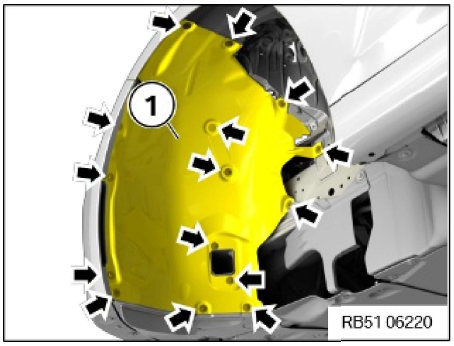
NOTICE

Perform the operations on the left and right side.

▸ **Install the front section of the front wheel arch cover**

NOTICE

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



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

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

47 – Install the rear section of the front wheel arch cover on the left and right

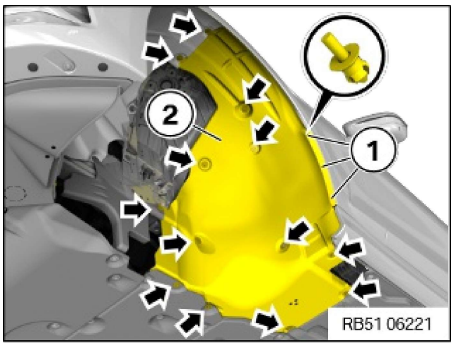
NOTICE

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

▸ **Install the rear section of the front wheel arch cover**

NOTICE

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



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

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

- Secure expanding rivet (1).

48 – Installing both front wheels

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▶ **Mounting the wheel**



TECHNICAL INFORMATION

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

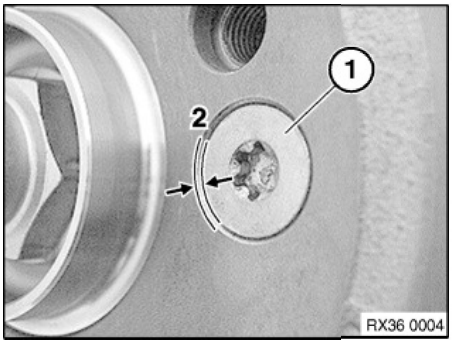
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

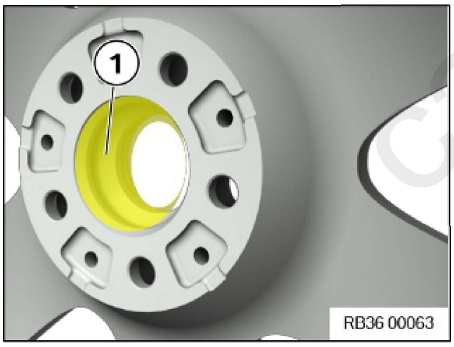
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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



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

Expendable materials

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

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

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



TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

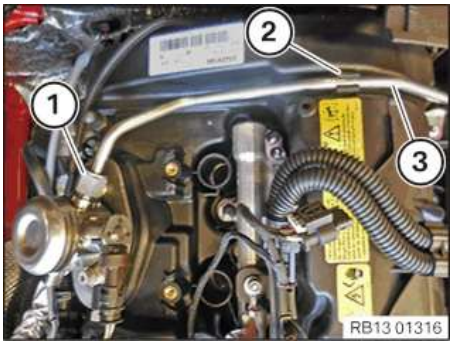
- Renew corroded wheel bolts.

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

Wheel bolts

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

49 – Installing fuel delivery line

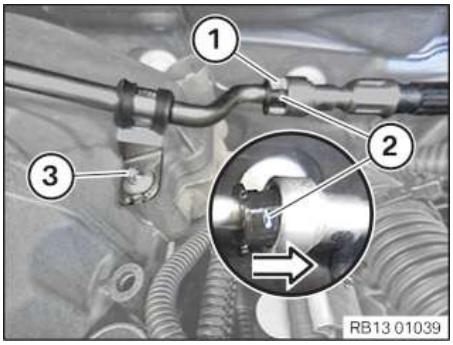


- Guide the fuel delivery line (3) in and install.
- Install rubber damper (2).
- Check the rubber damper (2) for the correct fit.
- Tighten the union nut (1) hand-tight.
- Tighten union nut (1).

Fuel delivery line to high pressure pump

M14		Tightening torque	31 Nm

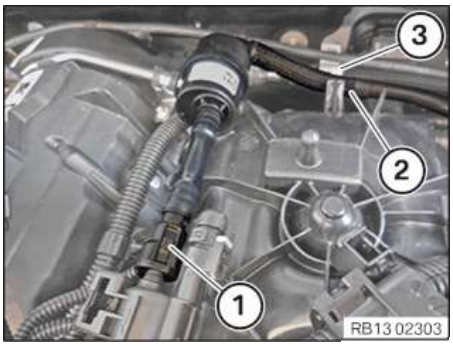
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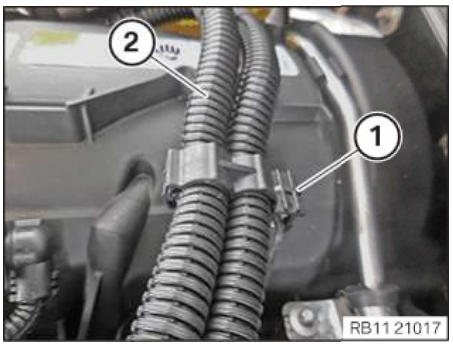
- Slide in and lock the fuel feed line in the direction of the arrow in the snap fastener (2).
  The fuel feed line must be audibly engage in the snap fastener (2).
- Secure clamps (1).
- Tighten down screw (3).

Fuel line to cylinder head cover

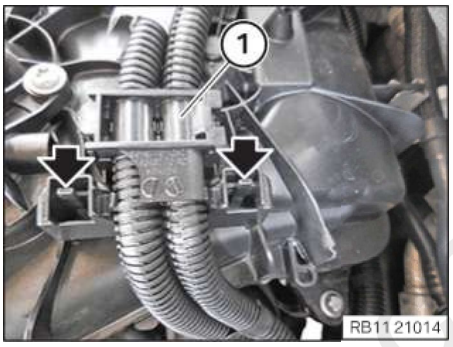
6x18		Tightening torque	6,5 Nm



- Insert and install the tank ventilation line (2).
- Lock (1) must engage audibly.
- Secure the tank ventilation line (2) to the clamp (3).



- Insert and install wiring harness section (2) for injectors and ignition coils.
- Secure clamps (1).



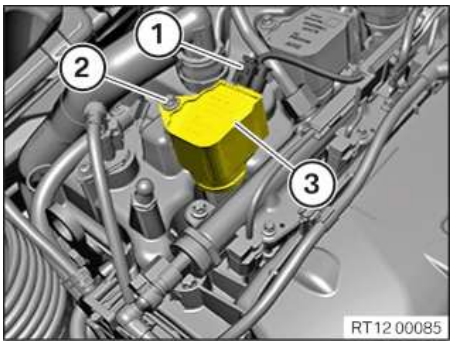
- Insert and install wiring harness section (1) for injectors and ignition coils.
- The locks (arrows) must engage audibly.

50 – Install all ignition coils

NOTICE

The description is for one component only. The procedure is identical for all further components.

▸ **Install ignition coil.**



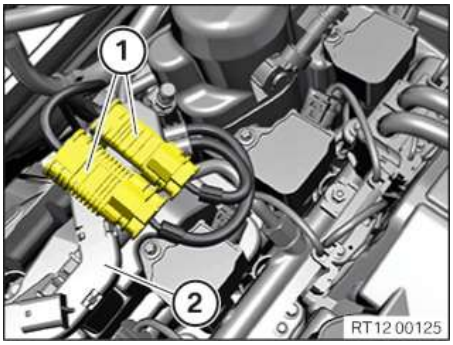
- Install ignition coil (3).
- Tighten down screw (2).

Ignition coil

Screw		Tightening torque	8 Nm

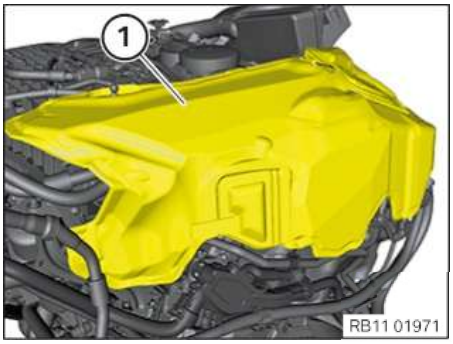
- Connect connectors (1) and lock.
  The connector (1) must engage audibly.

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- Connect the connector (1) of the front oxygen sensor and the monitoring oxygen sensor on the cable shaft (2).

51 – Installing acoustic cover at rear

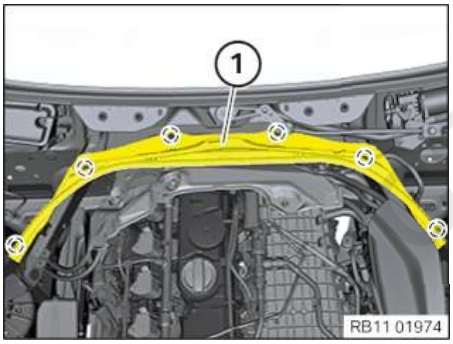


- Make sure the acoustic cover (1) is correctly positioned on the rear side of the engine.



- Install the acoustic cover (1) from the top and clip it in into the marked areas.

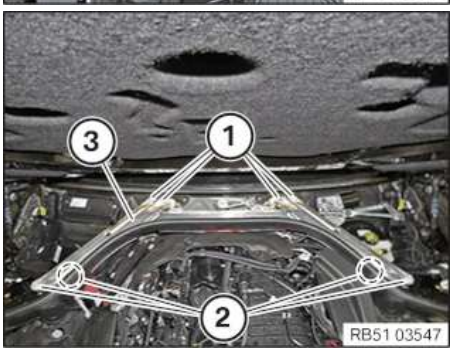
52 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

Bulkhead upper part to bottom bulkhead

	Tightening torque	3 Nm



- **If installed:** Install tension strut on spring strut dome.
- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Bolts
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

53 – Installing cowl panel cover

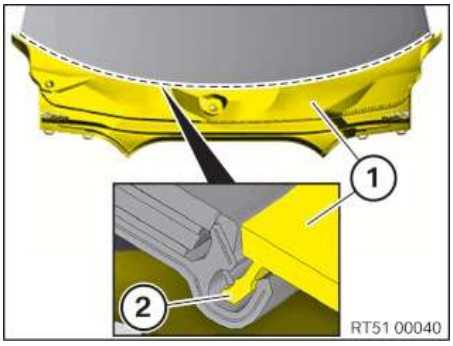
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RISK OF DAMAGE

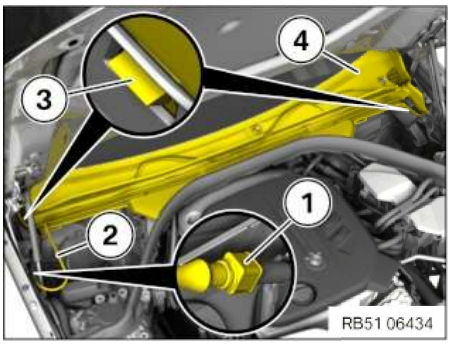
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

- Ensure correct installation of the components.
- Only use undamaged components.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.



- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

54 – Installing both wiper arms

NOTICE

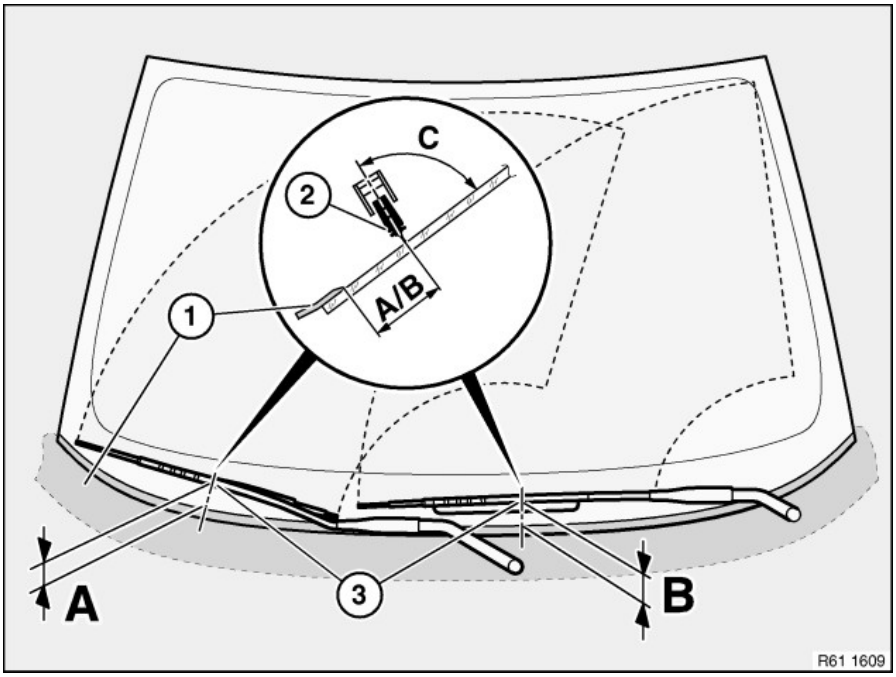
Description is for left component only. Procedure on the right side is identical.

▸ Install the wiper arm

TECHNICAL INFORMATION

The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.

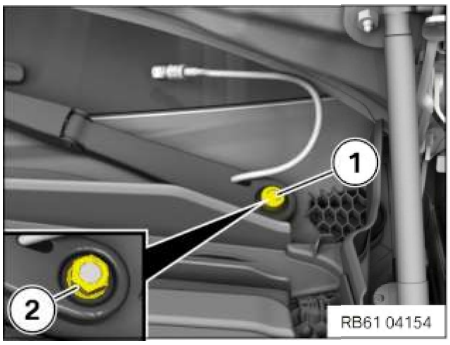
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- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

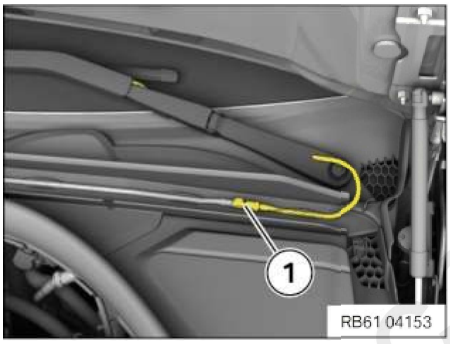


- Tighten nut (2).

Windscreen wiper arm

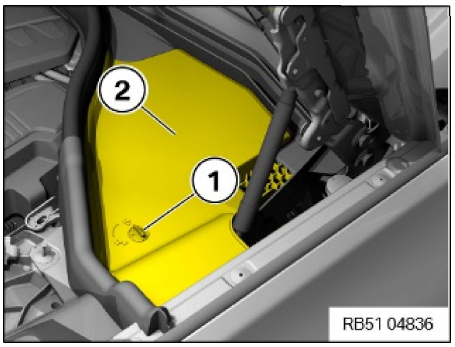
Combination hexagon nut		Tightening torque	35 Nm

- Connect the protective cap (1).



- Insert windscreen wash hose (1) into the cowl and connect at the separating point.

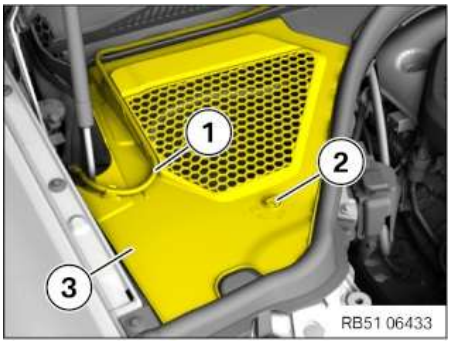
55 – Install the cover of the engine compartment on the rear left



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

56 – Install the rear right engine compartment cover

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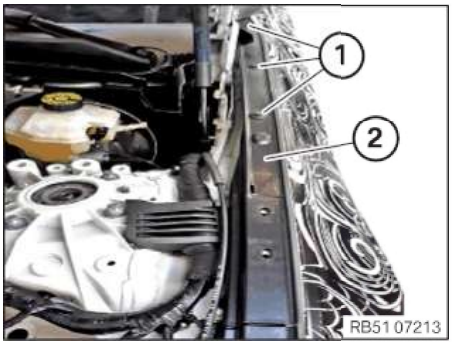
- Position the cover of the engine compartment on the rear right (3).
- Close lock (2).
- Insert washer fluid hose (1) into the guides.

57 – Install the seal for the bonnet



- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

58 – Installation of side panel sealing.



NOTICE

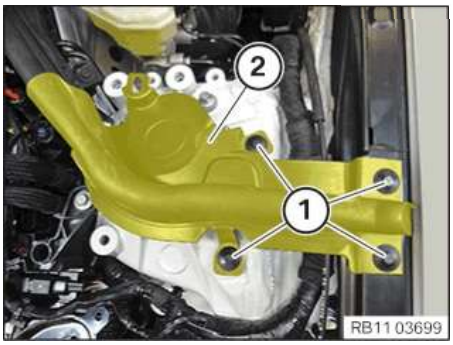
Description is for left component only. Procedure on the right side is identical.

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

59 – Install side bonnet seals

NOTICE

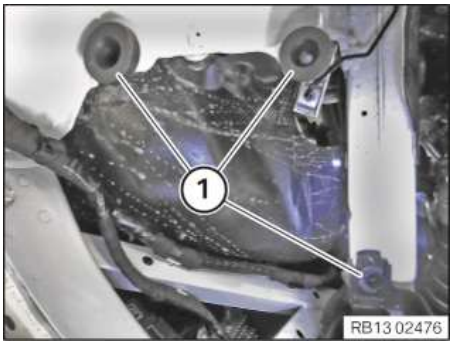
Perform the operations on the left and right side.



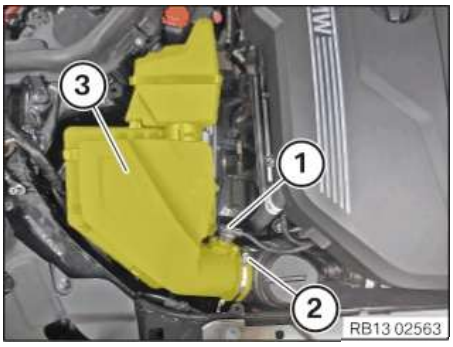
- Position the side bonnet seal (2) on the spring strut dome.
- Secure the rivet (1).

60 – Installing intake silencer housing

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- Check the rubber mount (1) for correct fit.



- Feed the intake filter housing (3) in and engage it in the rubber mounts.
- Tighten clamp (2).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

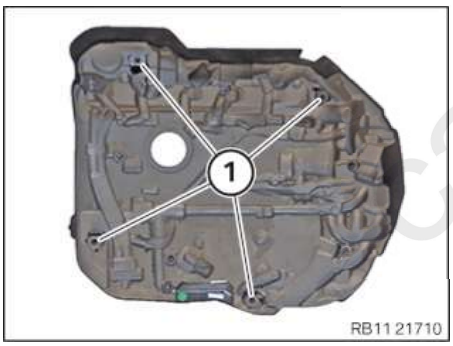
61 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover.

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

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



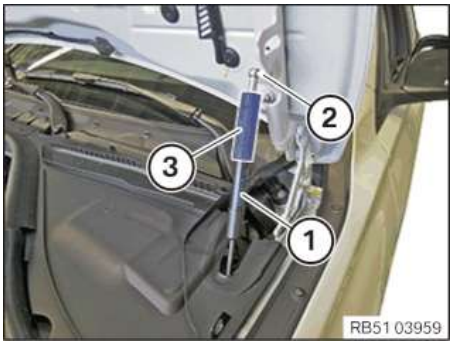
- Check the rubber mount (1) for correct fit in the acoustic cover.



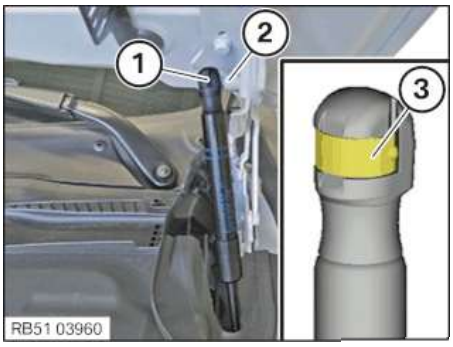
- Install acoustic cover (1) and fix in the rubber mounts (marks).

62 – Take bonnet out of the service position

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



CAUTION

Shutting bonnet or tailgate.

Danger of injury!

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

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

63 – Disconnecting all battery earth leads



- See additional information.

Additional Information

Overview of Tightening Torques

Special tool to cylinder head			Used in step 25
M8		Tightening torque	21,5 Nm

Front axle support to front/centre of body			Used in step 33
M12	Renew screws.	Jointing torque	108 Nm

Front axle carrier to body, rear			Used in step 33
M14	Renew screws.	Tightening torque	175 Nm

Adapter, front axle support to front axle support			Used in step 33
M8x70		Tightening torque	19 Nm

Front anti-roll bar link to anti-roll bar/spring strut			Used in step 35
M10	Renew nut.	Tightening torque	56 Nm

Universal joint to steering box			Used in step 38
M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

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Engine mount to engine mounting bracket — Used in step 39

M12		Tightening torque	100 Nm

Cover, front bottom on side — Used in step 40

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Cover, steering unit — Used in step 41

Screw		Tightening torque	3 Nm

Underbody protection — Used in step 4243

Hexagon screw		Tightening torque	3 Nm

Stiffening plate to front axle support — Used in step 44

M10		Tightening torque	56 Nm

Underbody protection front — Used in step 45

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

Wheel arch trim panel, front — Used in step 4647

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Brake disc to front wheel hub — Used in step 48

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 48

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 48

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

Fuel delivery line to high pressure pump — Used in step 49

M14		Tightening torque	31 Nm

Fuel line to cylinder head cover — Used in step 49

6x18		Tightening torque	6,5 Nm

Ignition coil — Used in step 50

Screw		Tightening torque	8 Nm

Bulkhead upper part to bottom bulkhead — Used in step 52

		Tightening torque	3 Nm

Tension strut on bulkhead — Used in step 52

M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome — Used in step 52

Screw	Renew screws.	Jointing torque Angle of rotation	56 Nm 90 °

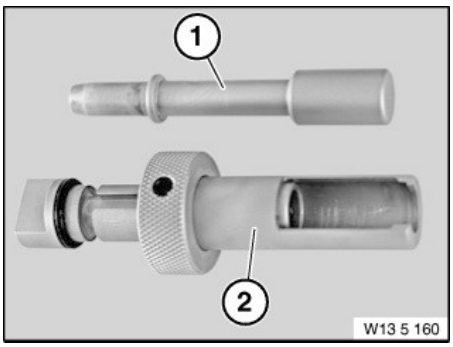
car-diagn.com

Windscreen wiper arm			Used in step 54
Combination hexagon nut		Tightening torque	35 Nm

Clean air pipe to upper section of intake filter housing			Used in step 60
Clamp		Tightening torque	3 Nm

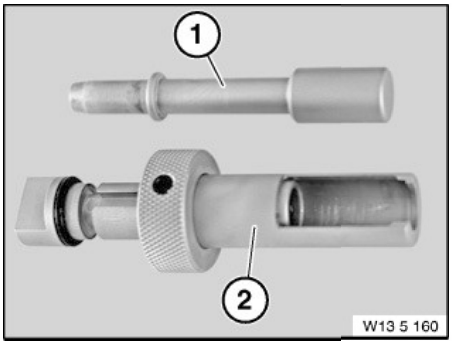
Overview of Special Tools

0 496 567 (13 5 161) Fastener



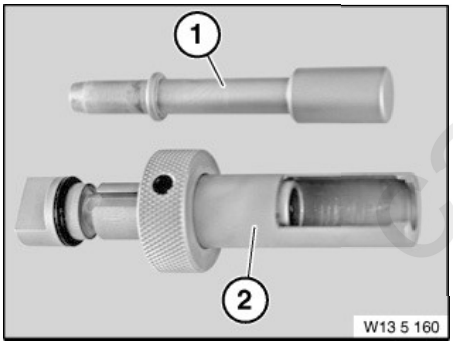
Common	Used in step 14
Usage	(Cap (2 piece)) For sealing the quick connectors Deletion, only available via tool set
Included in the tool or work	0 496 565
Storage location	
Replaced by	
In connection with	
SI-Number	

0 496 568 (13 5 162) Fastener



Common	Used in step 14
Usage	(Cap (2 x)) To close off the fuel lines. Discontinued, can only be ordered using complete tool
Included in the tool or work	0 496 565
Storage location	
Replaced by	
In connection with	
SI-Number	

0 496 565 (13 5 160) Fastener



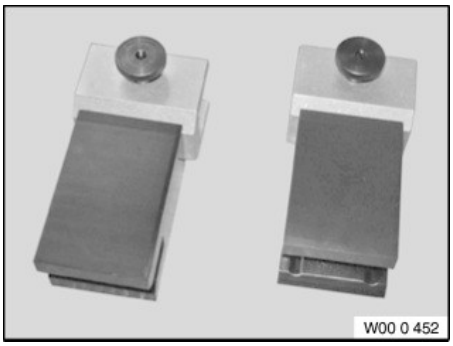
Common	Used in step 14
Usage	(Caps (2x)) To close off the fuel lines when removing and installing the engine.
Included in the tool or work	
Storage location	B26
Replaced by	
In connection with	
SI-Number	01 22 08 (498)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 496 567 (13 5 161)		**Fastener** (Cap (2 piece)) For sealing the quick connectors Deletion, only available via tool set	
2	0 496 568 (13 5 162)		**Fastener** (Cap (2 x)) To close off the fuel lines. Discontinued, can only be ordered using complete tool	

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0 495 850 (00 0 452) Upholstery



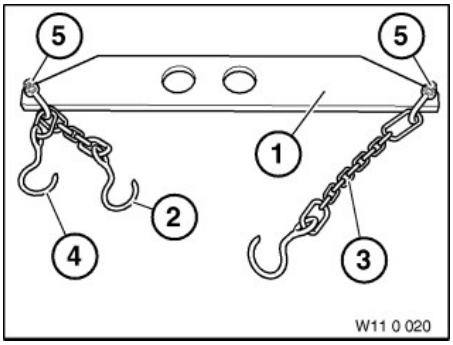
Common Used in step 25

Usage	(Pads (2 x)) Series: E70 Replaced by 00 6 042
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 22 06 (307)

0 490 567 (11 0 020) Lifting gear

Used in step 2539

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Common

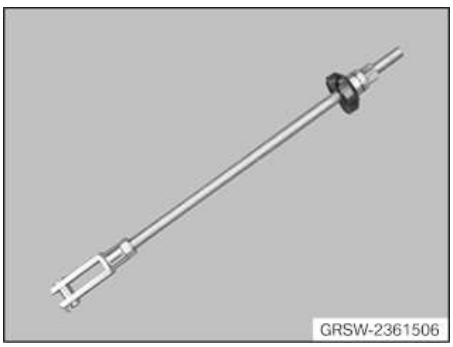
Usage	For removing and installing the engines. 08/2011 only available as a complete set. Delivered with TÜV inspection certificate and operating instructions. No delivery of separate parts.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 13 94 (888)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
5	0 490 572 (11 0 029)		**Shackle** (Shackle) 2 pieces As of 08/2011, only available as a complete set via 11 0 020 = 0490567. Delivered with TÜV inspection certificate and operating instructions.	
1	0 490 568 (11 0 021)		**Lifting gear** (Cross member) As of 08/2011, only available as a complete set via 11 0 020 = 0490567. Delivered with TÜV inspection certificate and operating instructions.	
2	0 490 569 (11 0 022)		**Chain** (Chain) As of 08/2011, only available as a complete set via 11 0 020 = 0490567. Delivered with TÜV inspection certificate and operating instructions.	
3	0 490 570 (11 0 023)		**Chain** (Chain) Version: long As of 08/2011, only available as a complete set via 11 0 020 = 0490567. Delivered with TÜV inspection certificate and operating instructions.	
4	0 490 571 (11 0 024)		**Chain** (Chain) Version: short As of 08/2011, only available as a complete set via 11 0 020 = 0490567. Delivered with TÜV inspection certificate and operating instructions.	

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2 361 506 (00 6 103) Spindle



Common Used in step 2539

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

2 219 012 Hydraulic lifter



Common	Used in step 313233
Usage	For raising and lowering various vehicle components.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 05 90 (207)

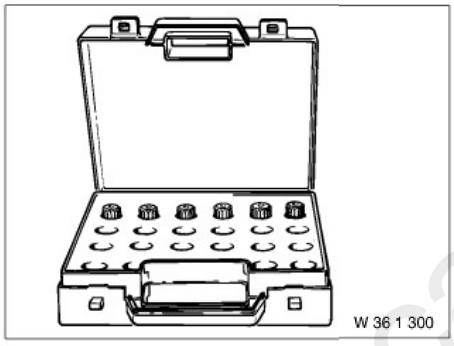
2 344 011 Tool



Common	Used in step 48
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)

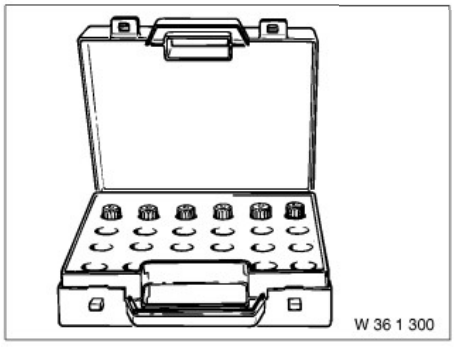
Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 16
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 16
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	

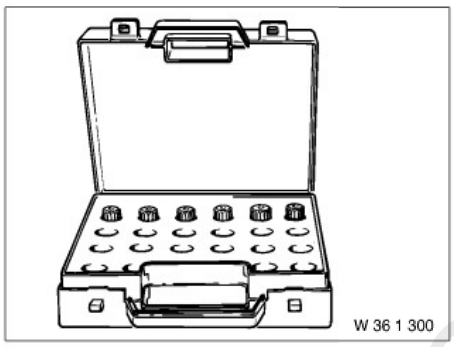
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0 495 225 (36 1 327) Wheel stud



Common	Used in step 16
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 16
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 16
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

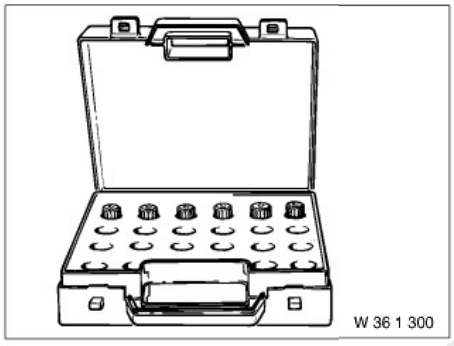
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0 495 228 (36 1 331) Wheel stud



Common	Used in step 16
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 16
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



Common	Used in step 16
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	

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 54
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions	Used in step

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61 20 900 Disconnecting and connecting battery earth lead 163
61 20 900 Disconnecting and connecting battery earth lead 163
61 20 900 Disconnecting and connecting battery earth lead 163
61 20 900 Disconnecting and connecting battery earth lead 163
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) 163
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) 163
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61 20 900 Disconnecting and connecting battery earth lead 163
61 20 900 Disconnecting and connecting battery earth lead 163
61 35 ... Notes on ESD protection (Electro Static Discharge) 13
00 .. ... Raising the vehicle using a vehicle hoist

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31 11 506 Lowering/raising front axle support

WARNING

Falling or tipping of a heavy component.

Danger! Life-threatening injuries!

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

WARNING

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

Danger! Life-threatening injuries!

- Secure the vehicle hoist against lowering and lifting.

WARNING

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

Danger! Life-threatening injuries!

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

WARNING

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

Danger! Life-threatening injuries!

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

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PRELIMINARY WORK

1 – Disconnecting all battery earth leads

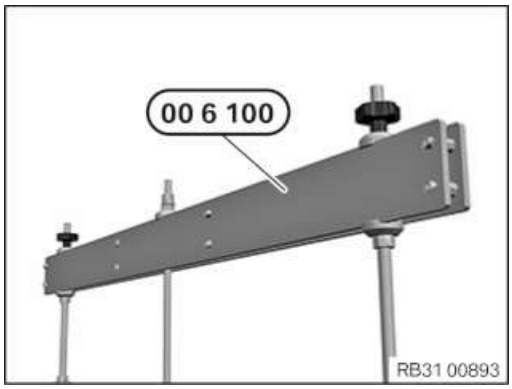


- See additional information.

2 – Securing engine in installation position

TECHNICAL INFORMATION

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



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

3 – Remove front right wheel

▸ **Removing the wheel**



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

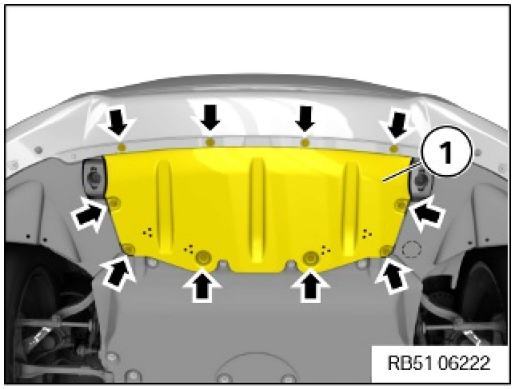
  This process is intended to prevent damage to the brake disc.



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

4 – Removing the front underbody protection

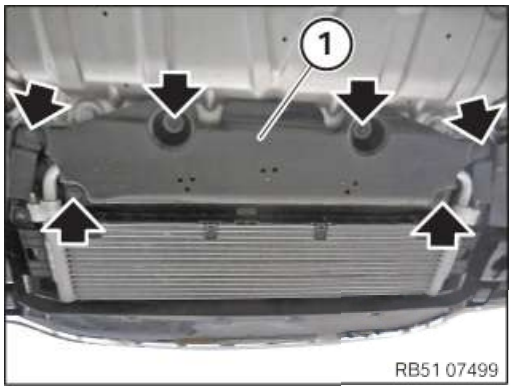
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- **Version 1:**

  Remove screws (arrows).

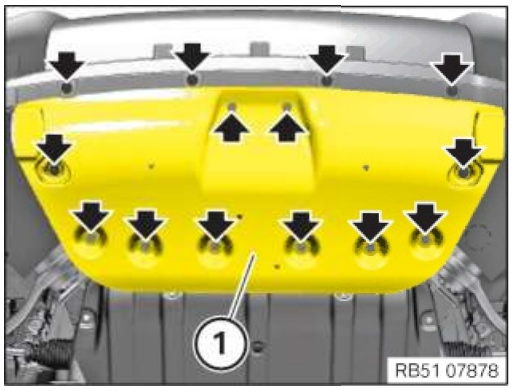
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

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



- **Version 3:**

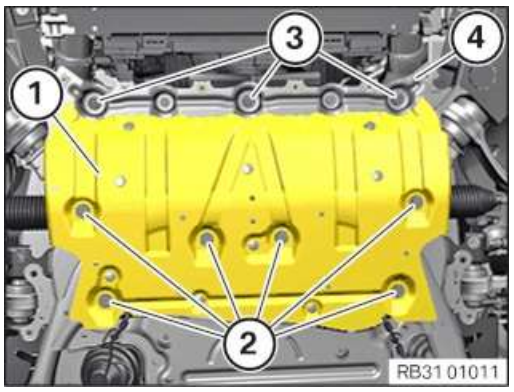
  Remove screws (arrows).

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

5 – Removing the stiffening plate

TECHNICAL INFORMATION

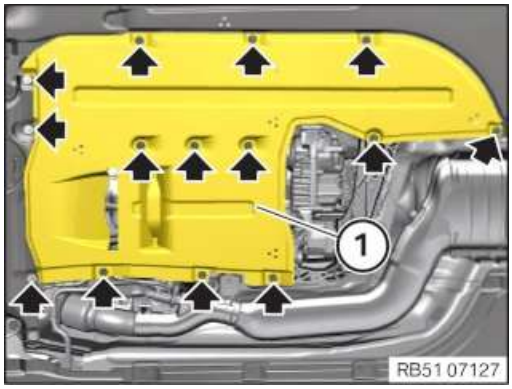
Driving without stiffening plate is not permissible.



- Loosen screws (3).
- Remove the holder of the underride protection (4).
- Loosen screws (2).
- Remove stiffening plate (1).

6 – Remove rear underbody protection

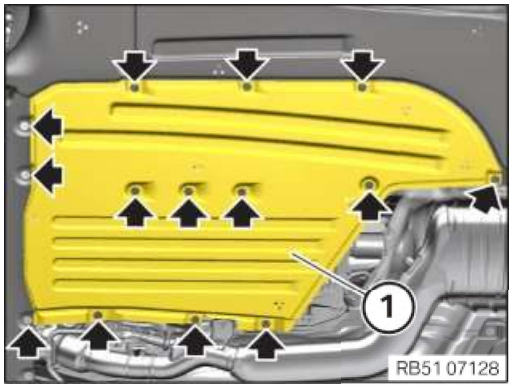
cardiagn.com



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).

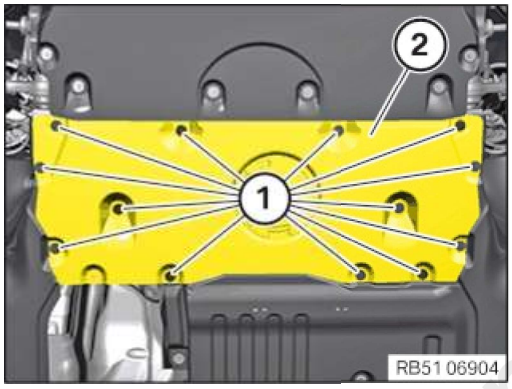


- **Version 2:**

  Remove screws (arrows).

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

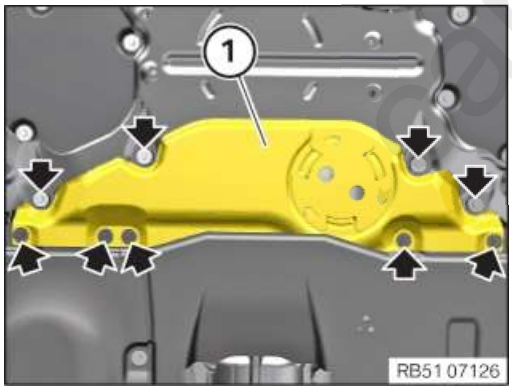
7 – Removing the centre underbody protection



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

  Loosen screws (1).

  Remove centre underbody protection (2) .



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

  Remove screws (arrows).

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

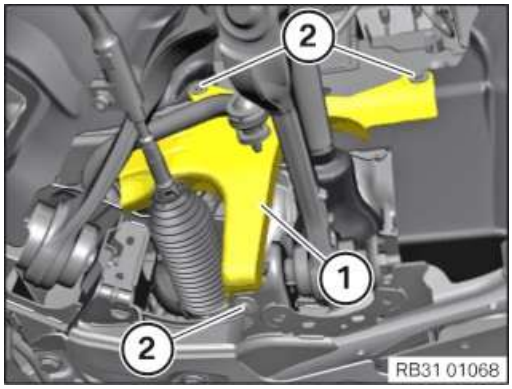
8 – Remove the cover of the steering assembly on the left and right

NOTICE

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

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

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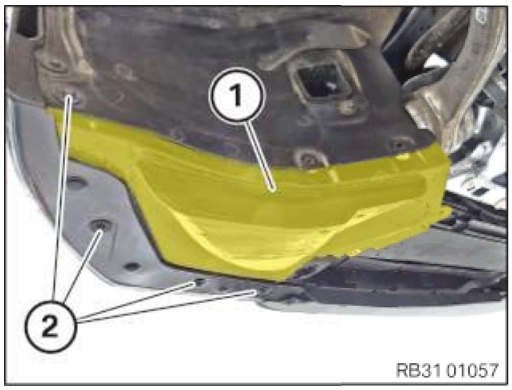
- Loosen screws (2).
- Remove the cover (1).

9 – Removing the bottom left and right wheel arch cover

NOTICE

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

▸ **Remove bottom wheel arch cover**



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

10 – Removing the front section of the front left wheel arch cover

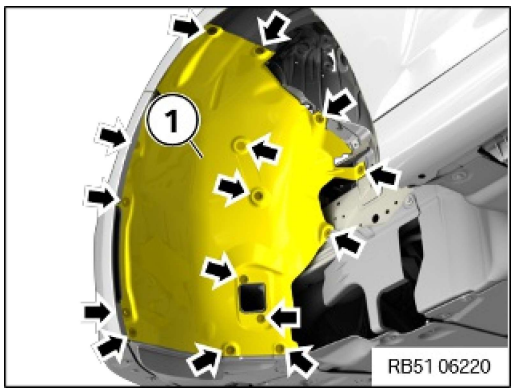
NOTICE

Perform the operations on the left and right side.

▸ **Removing the front section of the front wheel arch cover**

NOTICE

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



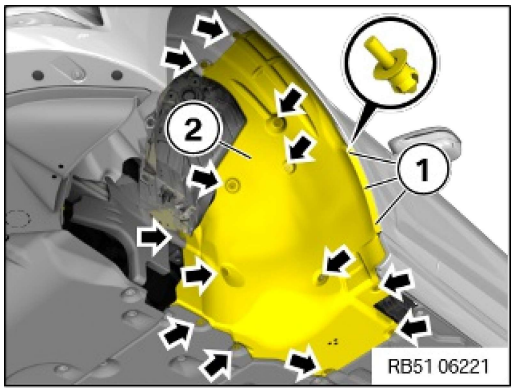
- Remove screws (arrows).
- Remove front section of the front wheel arch cover (1).

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11 – Remove rear section of the front right wheel arch cover

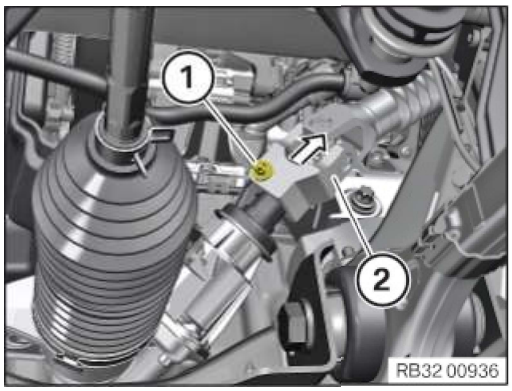
NOTICE

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



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

12 – Releasing lower steering shaft from steering gear

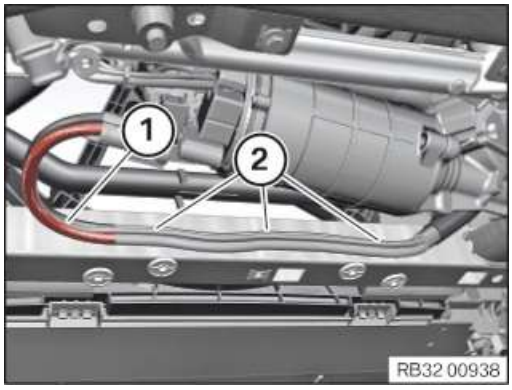


- Loosen screw (1).
- Pull off lower steering shaft (2) from steering gear in direction of arrow.

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



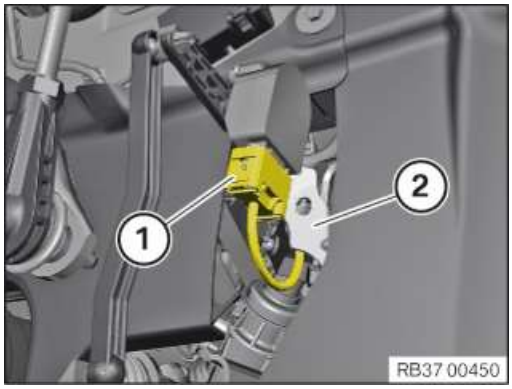
- Unlock and disconnect the plug connections (1) and (2).



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

14 – Detach the line connection of the ride height sensor

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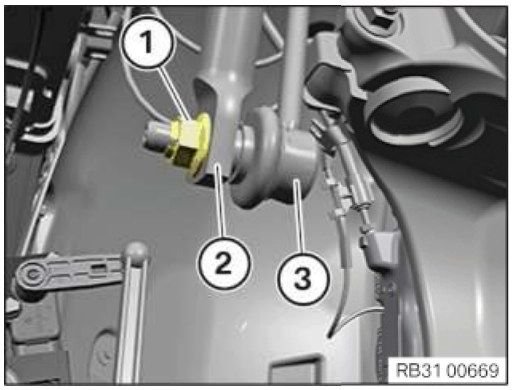
- Unlock plug connection (1) and disconnect.
- Unclip the line from holder (2).

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

NOTICE

Perform the operations on the left and right side.

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



- Loosen nut (1).

Note: Use the Torx socket for counter support.

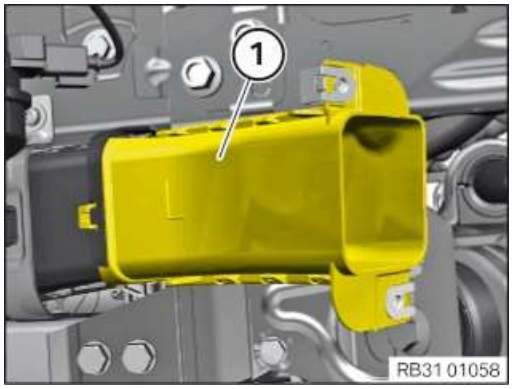
- Loosen the anti-roll bar link (3) from the anti-roll bar (2).

16 – Removing the left and right brake air duct partially

NOTICE

Perform the operations on the left and right side.

▸ **Removing brake air duct partially**



- Unclip and remove air duct (1).

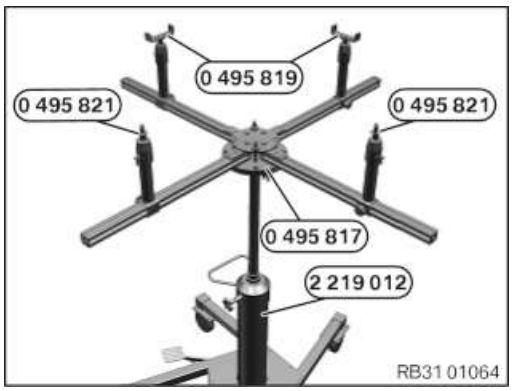
MAIN WORK

17 – Preparing the special tool

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TECHNICAL INFORMATION

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



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

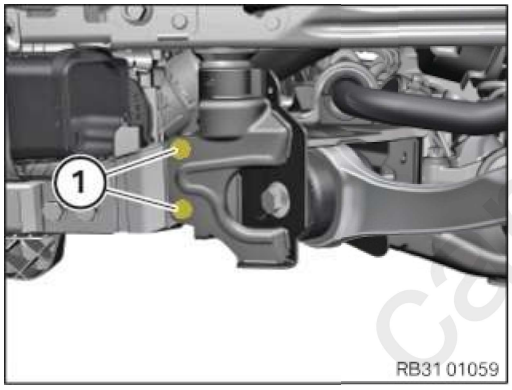
18 – Lower front axle support

WARNING

Falling or tipping of a heavy component.

Danger! Life-threatening injuries!

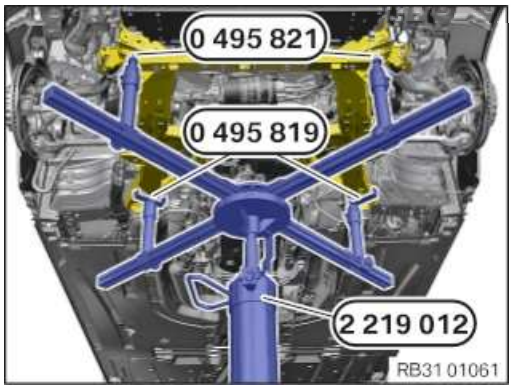
- Before lowering or removing the front axle: Secure the engine in mounting orientation.
- For additional information see: 11 00 670 Securing engine in installation position.



NOTICE

Perform the operations on the left and right side.

- Loosen screws (1).

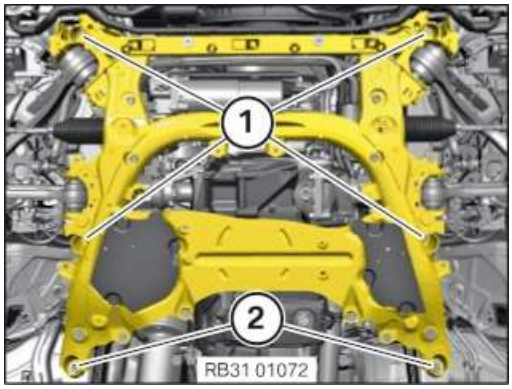


- Position the universal jack 2 219 012 with the special tools and on the front axle support.

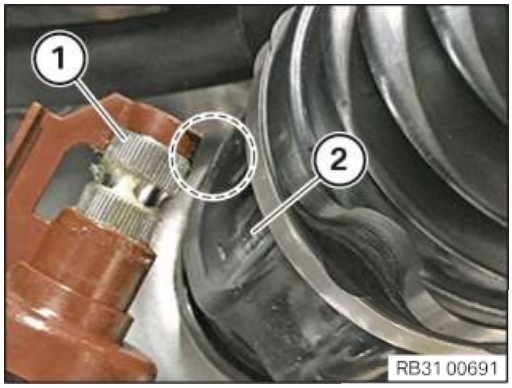
  The centre of gravity of the front axle must be centred over the universal jack 2 219 012 !

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

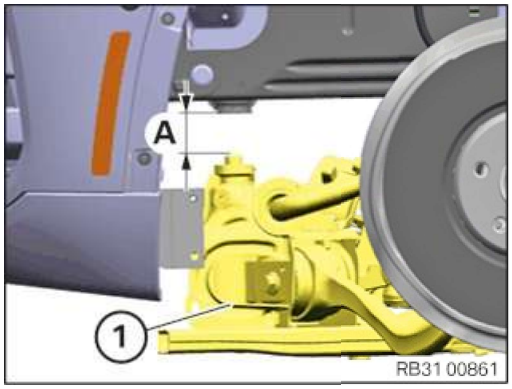
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- Loosen screws (1) and (2).



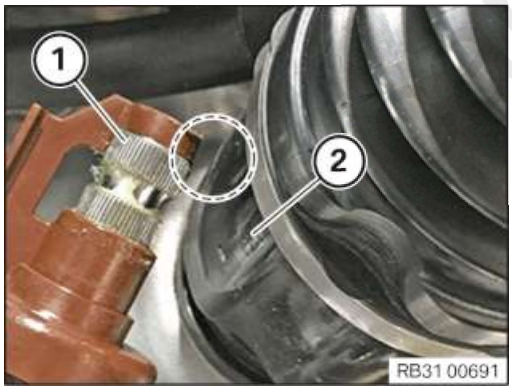
- When lowering the front axle support, ensure sufficient distance between the steering gear (1) and the output shaft (2).



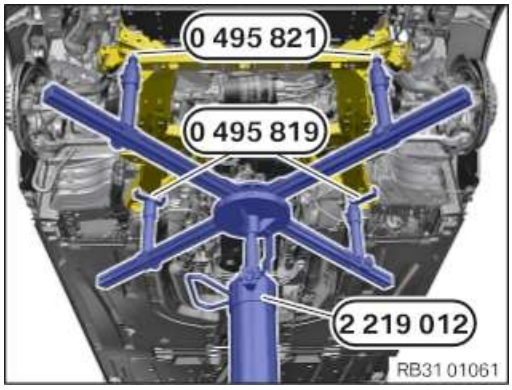
- Lower front axle support (1) using the universal jack by dimension (A).

  Dimensions (A) = maximum 15 cm

19 – Lift front axle support and fasten.

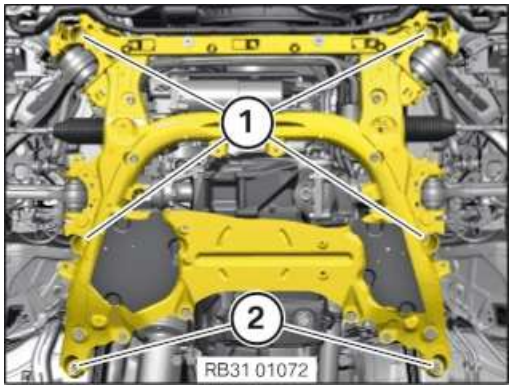


- When lifting the front axle support, ensure sufficient distance between the steering gear (1) and the output shaft (2).



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

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- Replace the screws (1).

  Parts: Bolts
- Tighten the screws (1).

Front axle support to front/centre of body

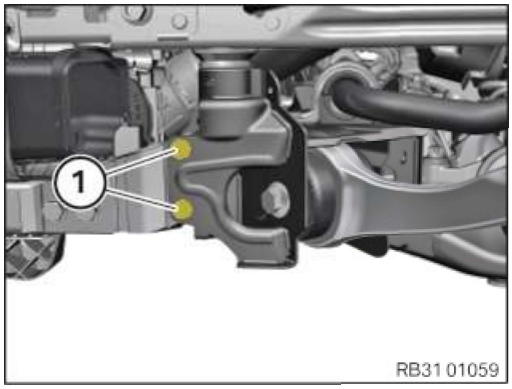
M12	Renew screws.	Jointing torque	108 Nm

- Replace the screws (2).

  Parts: Bolts
- Tighten the screws (2).

Front axle carrier to body, rear

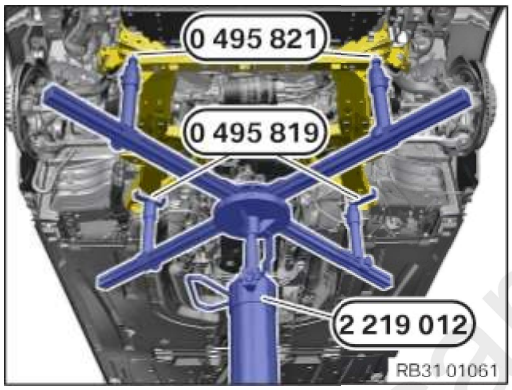
M14	Renew screws.	Tightening torque	175 Nm



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

Adapter, front axle support to front axle support

M8x70		Tightening torque	19 Nm



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

POSTPROCESSES

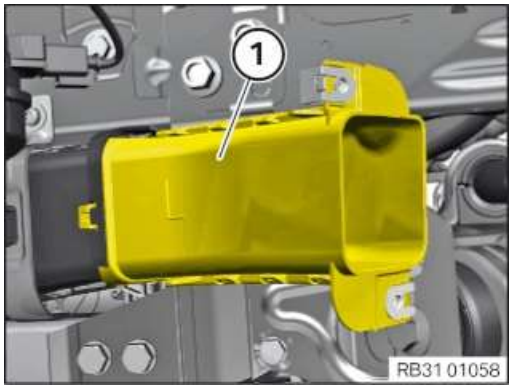
20 – Partially installing the left and right brake air duct

NOTICE

Perform the operations on the left and right side.

▸ **Installing the brake air duct partially**

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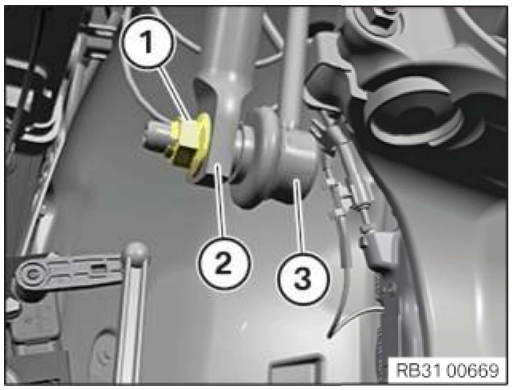
- Position and clip in air duct (1).

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

NOTICE

Perform the operations on the left and right side.

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



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

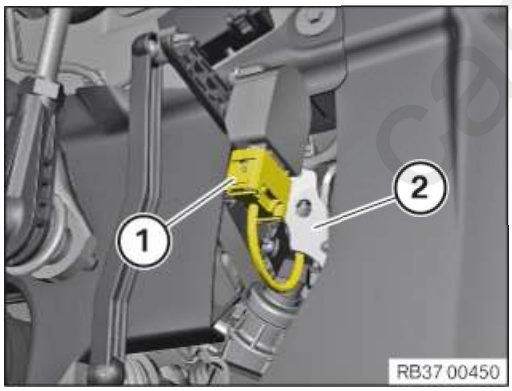
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

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

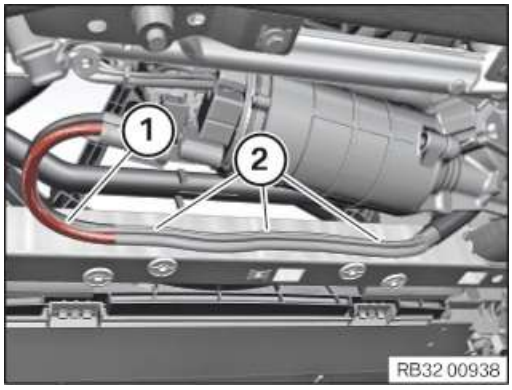
M10	Renew nut.	Tightening torque	56 Nm

22 – Attach the line connection of the ride height sensor



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

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



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

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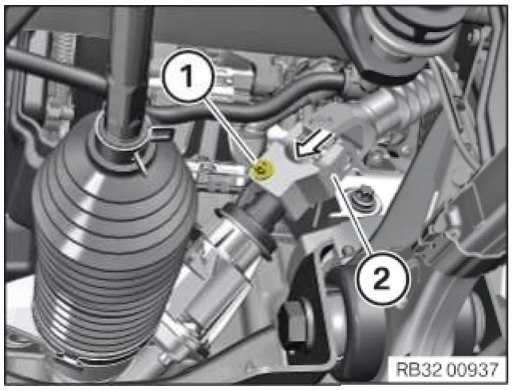


- Connect connectors (1) and (2) lock.

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

TECHNICAL INFORMATION

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



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

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

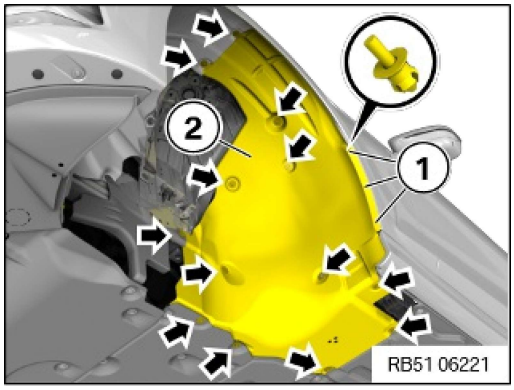
Universal joint to steering box

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

25 – Install rear section of the front right wheel arch cover

NOTICE

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



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

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

- Secure expanding rivet (1).

26 – Installing the front section of the wheel arch cover on the front left and right

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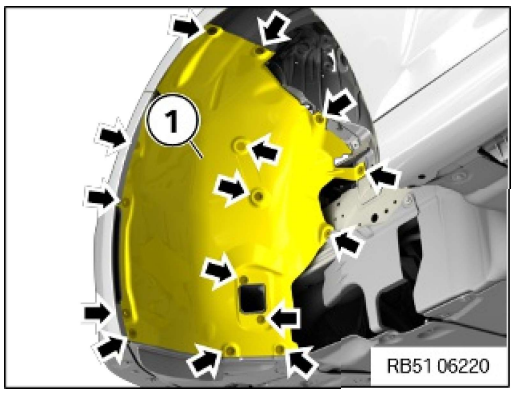
NOTICE

Perform the operations on the left and right side.

▸ **Install the front section of the front wheel arch cover**

NOTICE

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



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

Wheel arch trim panel, front

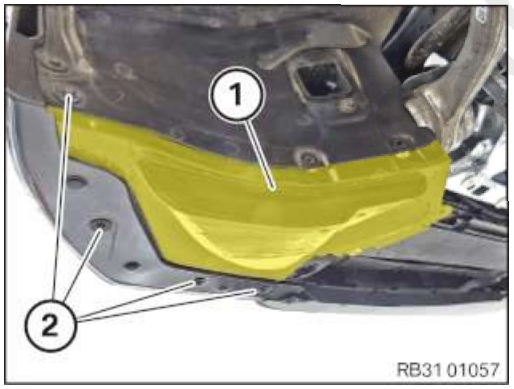
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

27 – Installing the bottom left and right wheel arch cover

NOTICE

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

▸ **Installing the bottom wheel arch cover**



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

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

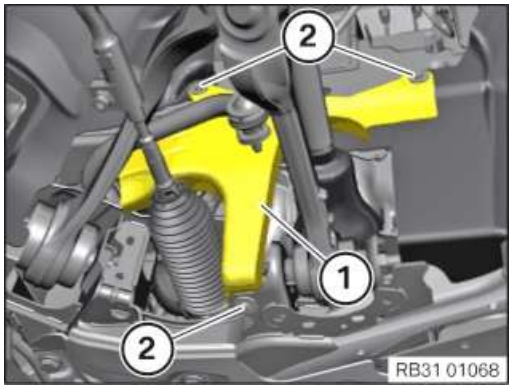
28 – Install the cover of the steering assembly on the left and right

NOTICE

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

▸ **Install the cover of the steering assembly**

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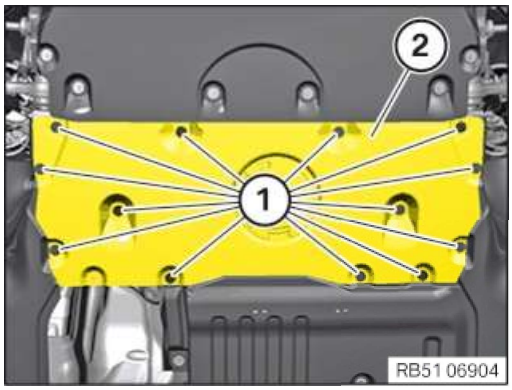


- Position the cover (1).
- Tighten the screws (2).

Cover, steering unit

Screw		Tightening torque	3 Nm

29 – Installing the centre underbody protection



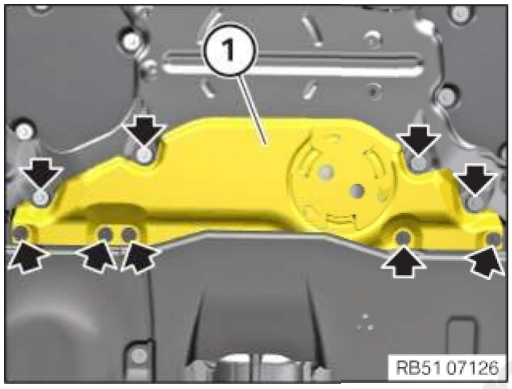
- **Version with rear-wheel drive:**

  Position central underbody protection (2).

  Tighten the screws (1).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



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

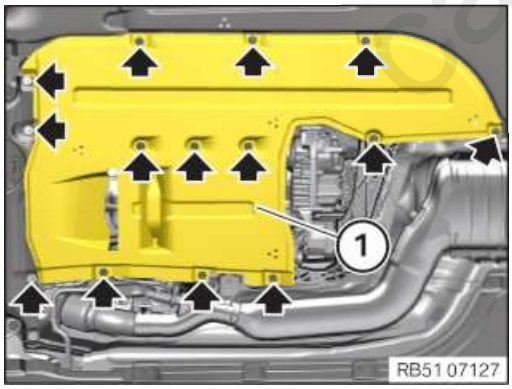
  Guide in and install the centre of underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

30 – Installing underbody protection at rear



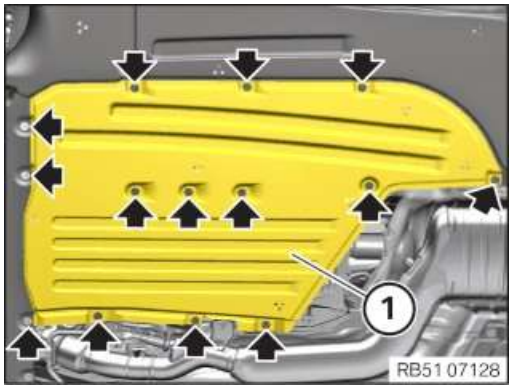
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

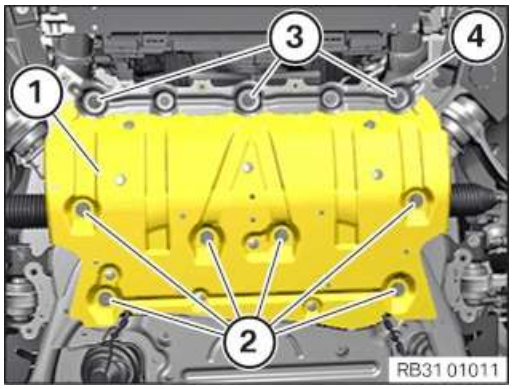
  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

31 – Installing the stiffening plate

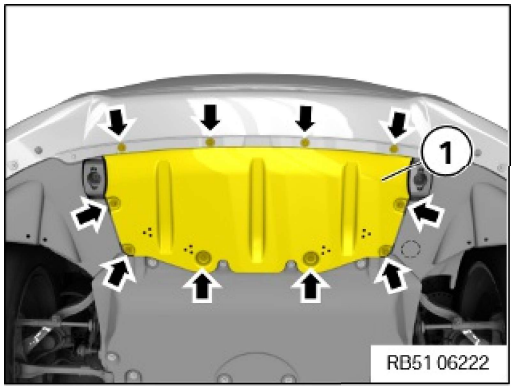


- Position stiffening plate (1).
- Screw screws (2) in.
- Position holder of underride protection (4).
- Screw screws (3) in.
- Tighten down screws (2) and (3).

Stiffening plate to front axle support

M10		Tightening torque	56 Nm

32 – Installing the front underbody protection



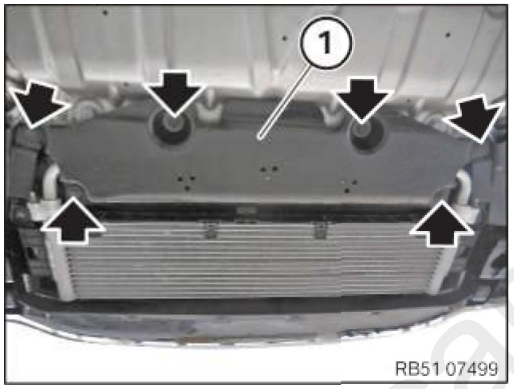
- **Version 1:**

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

  Tighten screws (arrows).

Underbody protection front

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



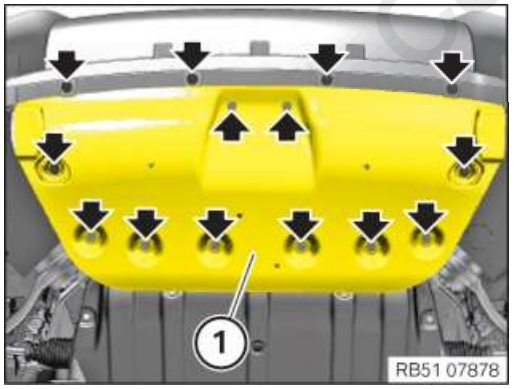
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

33 – Installing the front right wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

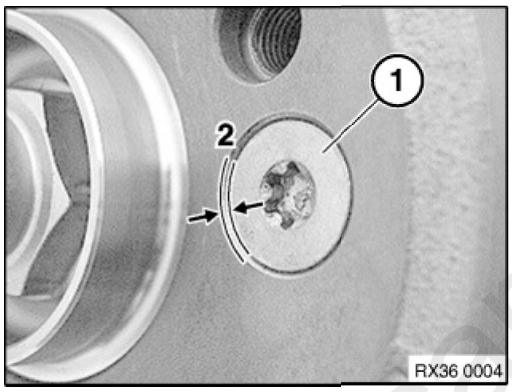
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

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

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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

catalagn.com



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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

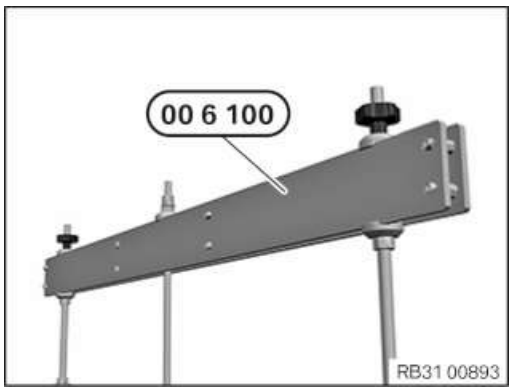
  Parts: Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

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

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34 – Releasing the engine from the attachment in mounting orientation



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

35 – Disconnecting all battery earth leads



- See additional information.

Additional Information

Overview of Tightening Torques

Front axle support to front/centre of body			Used in step 19
M12	Renew screws.	Jointing torque	108 Nm

Front axle carrier to body, rear			Used in step 19
M14	Renew screws.	Tightening torque	175 Nm

Adapter, front axle support to front axle support			Used in step 19
M8x70		Tightening torque	19 Nm

Front anti-roll bar link to anti-roll bar/spring strut			Used in step 21
M10	Renew nut.	Tightening torque	56 Nm

Universal joint to steering box			Used in step 24
M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

Wheel arch trim panel, front			Used in step 2526
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Cover, front bottom on side			Used in step 27
Hexagon screw for thermoplastic		Tightening torque	3 Nm

Cover, steering unit			Used in step 28
Screw		Tightening torque	3 Nm

Underbody protection			Used in step 2930
Hexagon screw		Tightening torque	3 Nm

Stiffening plate to front axle support			Used in step 31
M10		Tightening torque	56 Nm

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Underbody protection front — Used in step 32

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

Brake disc to front wheel hub — Used in step 33

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 33

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 33

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

Overview of Special Tools

2 219 012 Hydraulic lifter



Common — Used in step 171819

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

2 344 011 Tool



Common — Used in step 33

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:

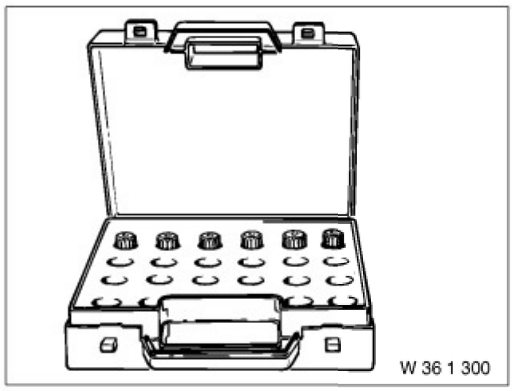
carflagn.com

0 495 221 (36 1 323) Wheel stud



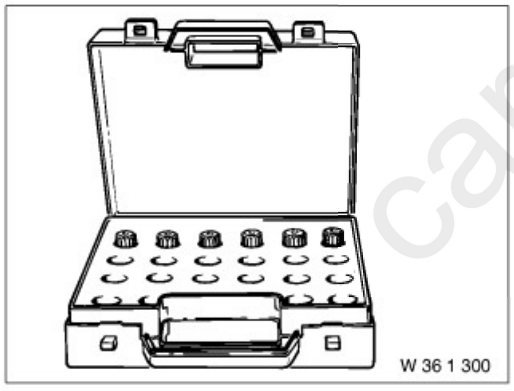
Common	Used in step 3
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



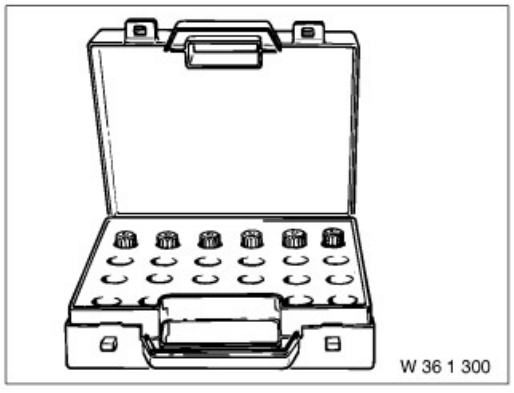
Common	Used in step 3
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



Common	Used in step 3
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

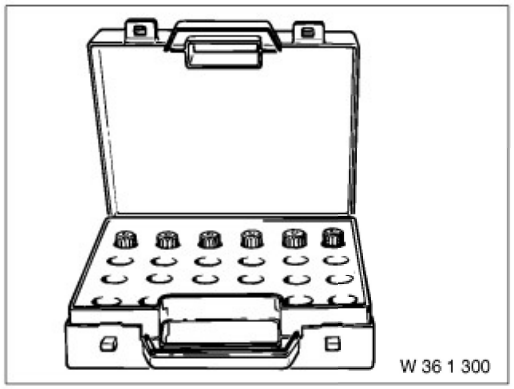
cardiagn.com

0 495 227 (36 1 329) Wheel stud



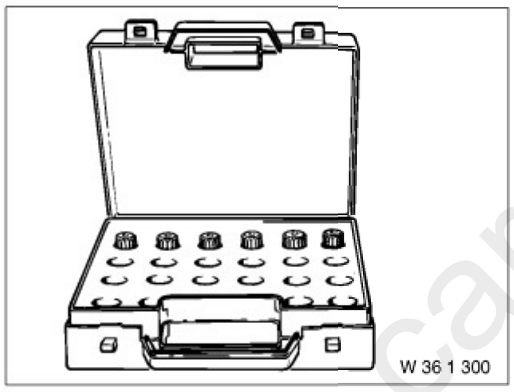
Common	Used in step 3
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



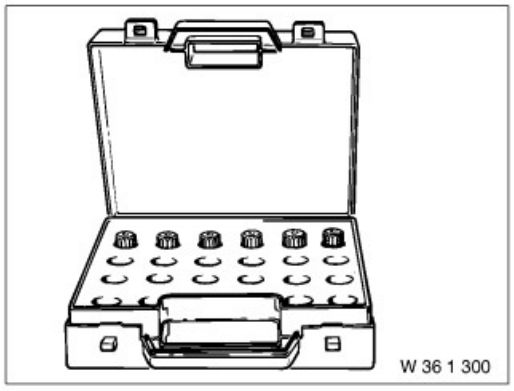
Common	Used in step 3
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 3
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



Common	Used in step 3
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

Links

Repair instructions	Used in step
61 20 900 Disconnecting and connecting battery earth lead	135

cardiagn.com

61 20 900 Disconnecting and connecting battery earth lead 135
61 20 900 Disconnecting and connecting battery earth lead 135
61 20 900 Disconnecting and connecting battery earth lead 135
61 20 900 Disconnecting and connecting battery earth lead 135
61 20 900 Disconnecting and connecting battery earth lead 135
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) 135
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) 135
61 20 900 Disconnecting and connecting battery earth lead 135
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads) 135
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle) 135
61 20 900 Disconnecting and connecting battery earth lead 135
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61 20 900 Disconnecting and connecting battery earth lead 135
61 20 900 Disconnecting and connecting battery earth lead 135
61 20 900 Disconnecting and connecting battery earth lead 135
61 20 900 Disconnecting and connecting battery earth lead 135
11 00 670 Securing engine in installation position
00 .. ... Raising the vehicle using a vehicle hoist
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31 11 040 Removing and installing/replacing stiffening plate

WARNING

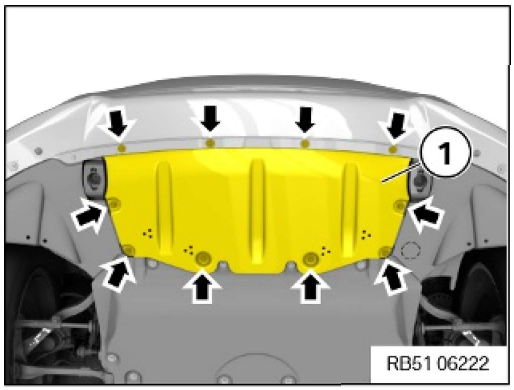
Vehicle may slip off the vehicle hoist if the vehicle hoist is handled incorrectly.

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.

PRELIMINARY WORK

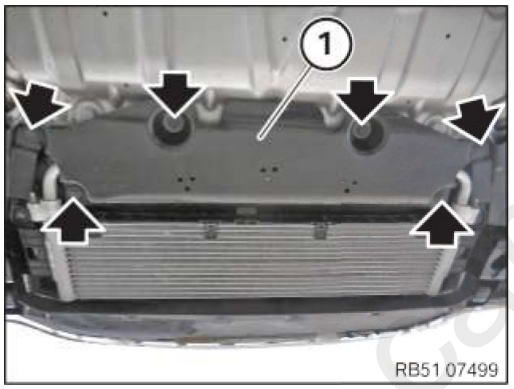
1 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

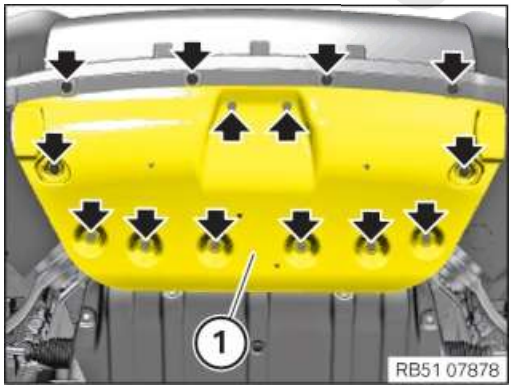
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

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



- **Version 3:**

  Remove screws (arrows).

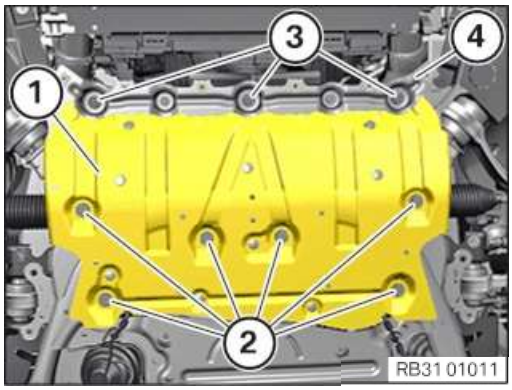
  Guide out front underbody protection (1) and remove it.

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2 – Removing the stiffening plate

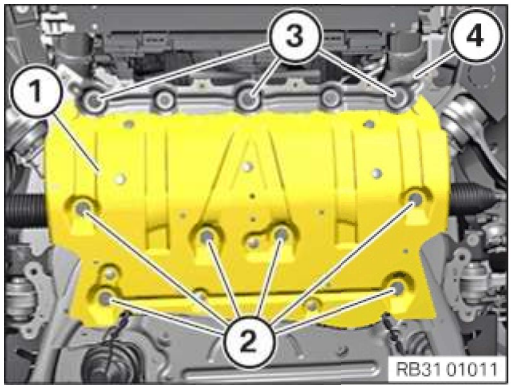
TECHNICAL INFORMATION

Driving without stiffening plate is not permissible.



- Loosen screws (3).
- Remove the holder of the underride protection (4).
- Loosen screws (2).
- Remove stiffening plate (1).

3 – Installing the stiffening plate



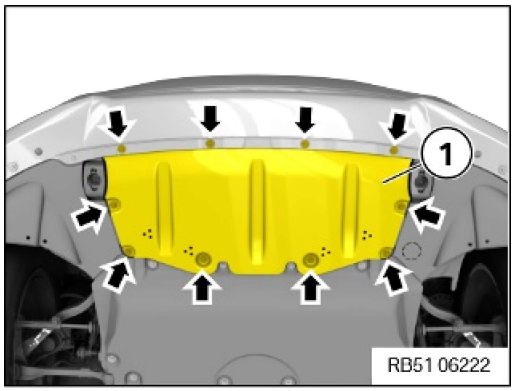
- Position stiffening plate (1).
- Screw screws (2) in.
- Position holder of underride protection (4).
- Screw screws (3) in.
- Tighten down screws (2) and (3).

Stiffening plate to front axle support

M10		Tightening torque	56 Nm

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4 – Installing the front underbody protection



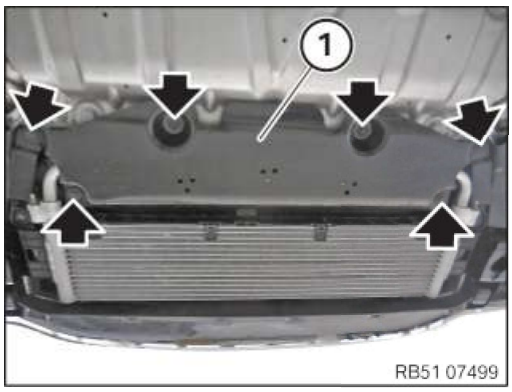
- **Version 1:**

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

  Tighten screws (arrows).

Underbody protection front

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



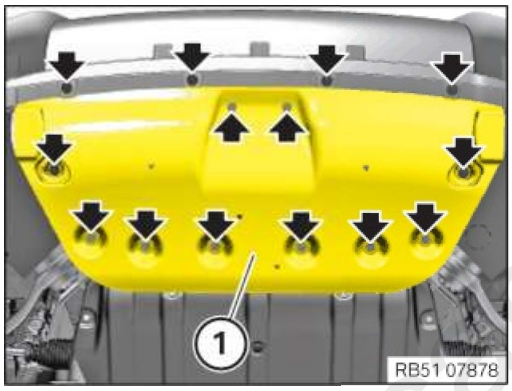
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

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Additional Information

Overview of Tightening Torques

Stiffening plate to front axle support — Used in step 3

M10		Tightening torque	56 Nm

Underbody protection front — Used in step 4

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

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

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31 12 050 Removing and installing/replacing left or right tension strut

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.

PRELIMINARY WORK

1 – Remove front left or right wheel

▸ **Removing the wheel**



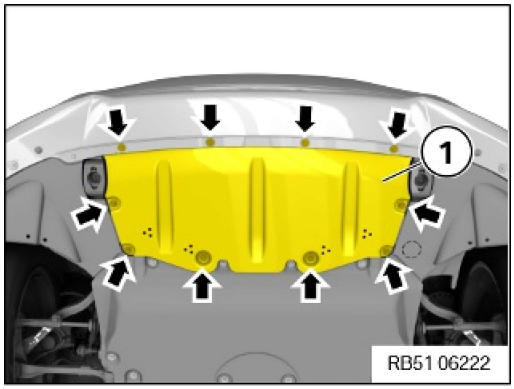
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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



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

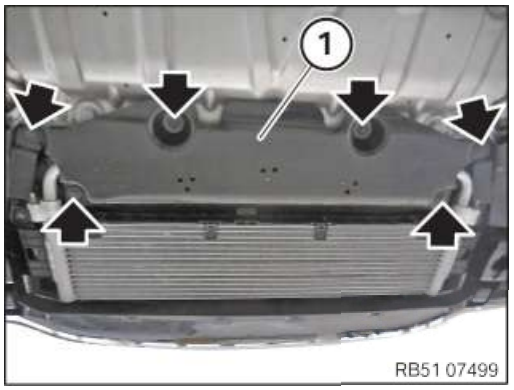
2 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

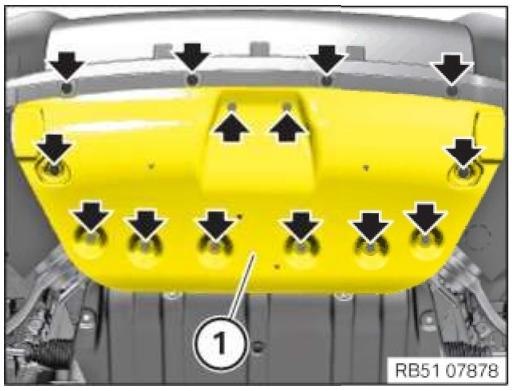
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

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



- **Version 3:**

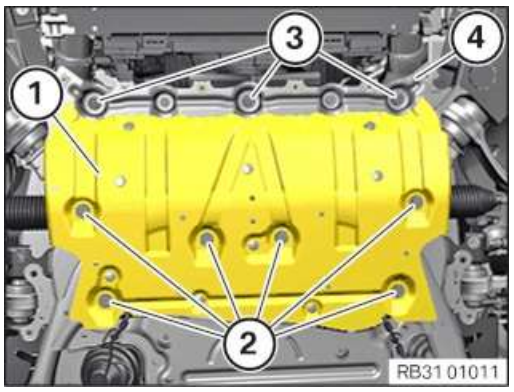
  Remove screws (arrows).

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

3 – Removing the stiffening plate

TECHNICAL INFORMATION

Driving without stiffening plate is not permissible.



- Loosen screws (3).
- Remove the holder of the underride protection (4).
- Loosen screws (2).
- Remove stiffening plate (1).

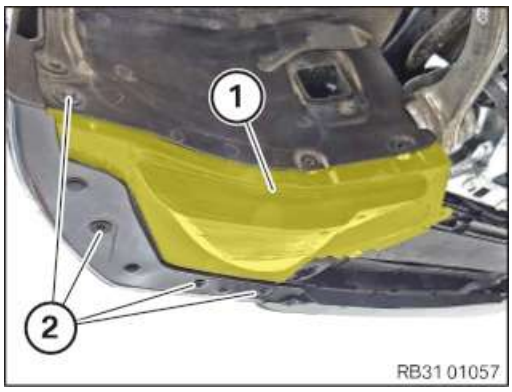
4 – Removing the bottom left and right wheel arch cover

NOTICE

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

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► **Remove bottom wheel arch cover**



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

5 – Loosen the output shaft from the wheel bearing

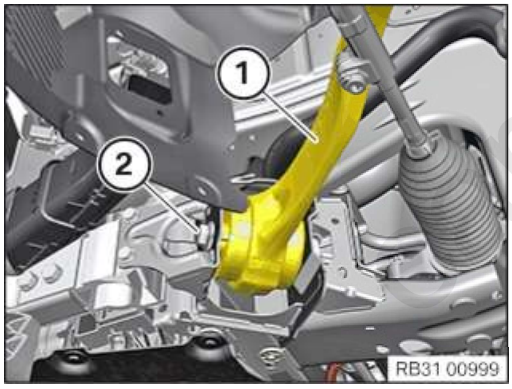


- Press brake pedal.
- Loosen the collar bolt (1).

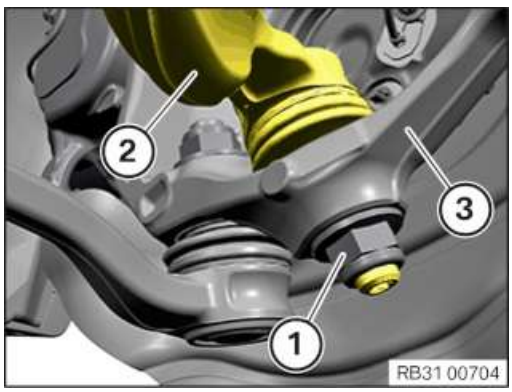
Note: Do not leave the output shaft hanging on the joint (or tie up output shaft if applicable).

MAIN WORK

6 – Remove trailing link



- Release bolt (2) and pull out.
- The tension strut (1) is released from the front axle support.



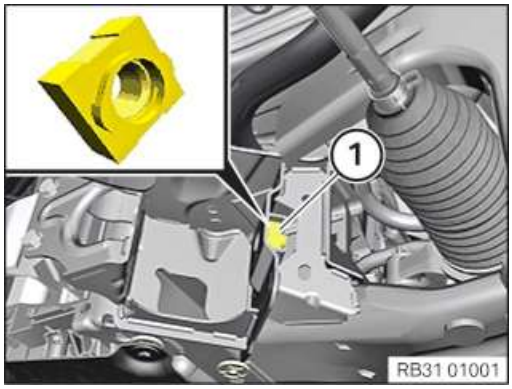
- Loosen nut (1).

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

- Push output shaft to one side.
- Remove tension strut (2) from swivel bearing (3).

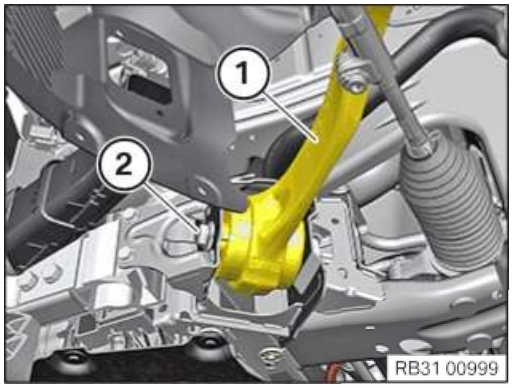
  When removing the tension strut, make sure that the gaiter of the propeller shaft is not damaged.

7 – Install the tension strut



- Replace the cage nut (1).

  Parts: Cage nut



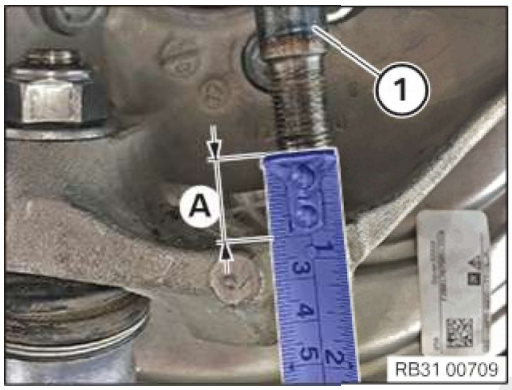
TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Position the tension strut (1) on the front axle support.
- Renew the screw (2).

  Parts: Screw
- Insert the screw (2) and screw it in with a few turns.

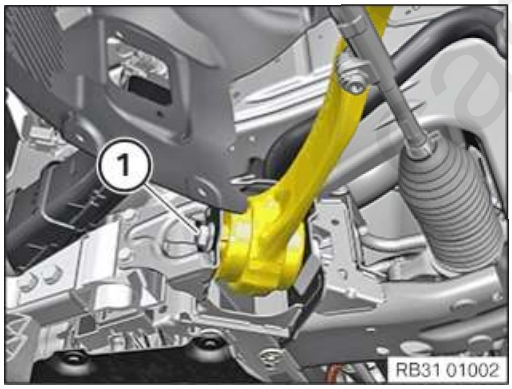
  Do not tighten the screw (2) yet.



- Adjust the tension strut (1) on the swivel bearing to the dimension (A) (vehicle lifted, spring strut decompressed).

  Dimension (A) = 5 mm

  Note: The installation of the tension strut on the front axle support to the dimension (A) corresponds to the normal position in compressed state!



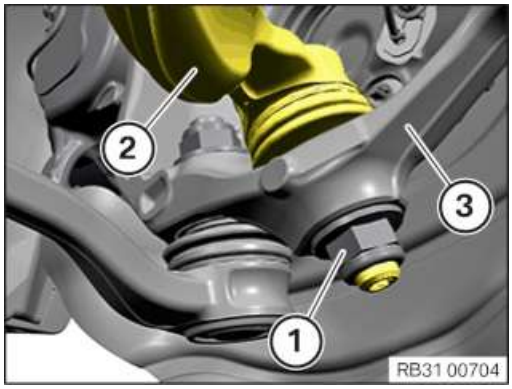
TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Tighten down screw (1).

Tension strut to front axle support

M12	Renew bolt and cage nut. Tighten screw connection in normal position.	Jointing torque Angle of rotation	100 Nm 90 °



- Position tension strut (2) on swivel bearing (3).
- Renew nut (1).

  Parts: Nut
- Tighten nut (1).

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

Tension strut to swivel bearing

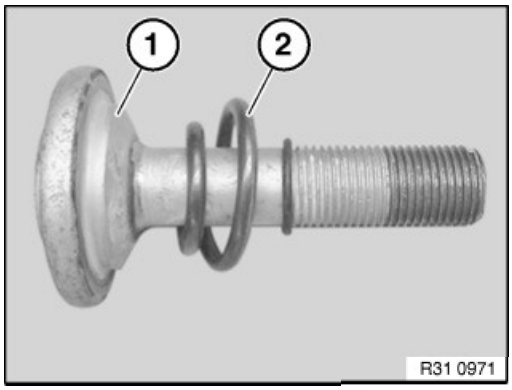
M14	Renew nut.	Tightening torque	175 Nm

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8 – Securing the output shaft on the wheel bearing

TECHNICAL INFORMATION

The installation note for front gearing must be observed at all times.

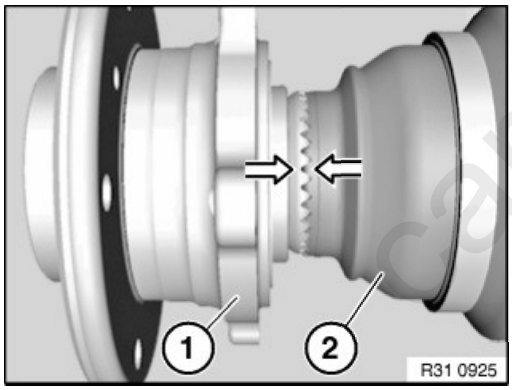


- Renew the collar bolt (2) and the compression spring (1).

  Parts: Collar bolt and compression spring
- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.



- Hand-tighten the collar bolt (1) with the compression spring.



TECHNICAL INFORMATION

The front gearing of the wheel bearing and output shaft must be installed in an interlocking position (tooth-in-tooth).

- Check whether front gearing is locked tooth in tooth (arrows) by reciprocally rotating the wheel bearing (1) and the output shaft (2).
- Verify positive locking.
- Press brake pedal.
- Tighten the collar bolt.

Output shaft to wheel bearing

M16	Replace collar bolt and spring.	Jointing torque	210 Nm
		Angle of rotation	90 °

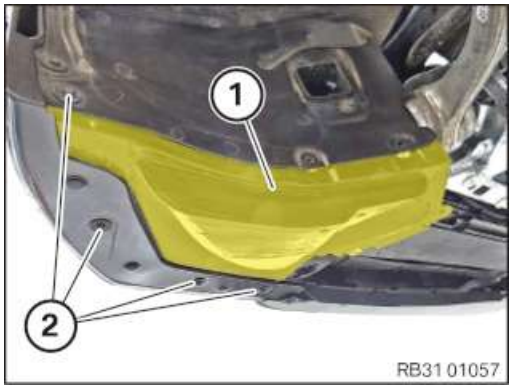
9 – Installing the bottom left and right wheel arch cover

NOTICE

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

▸ **Installing the bottom wheel arch cover**

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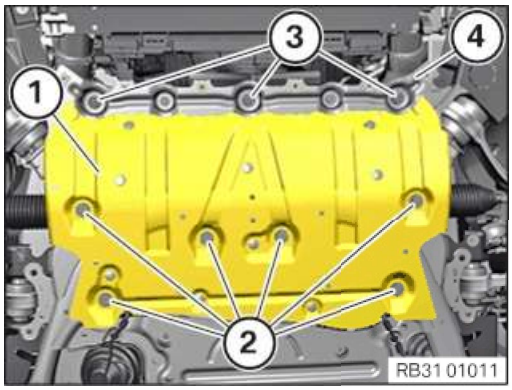


- Position the bottom wheel arch cover (1).
- Tighten the screws (2).

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

10 – Installing the stiffening plate

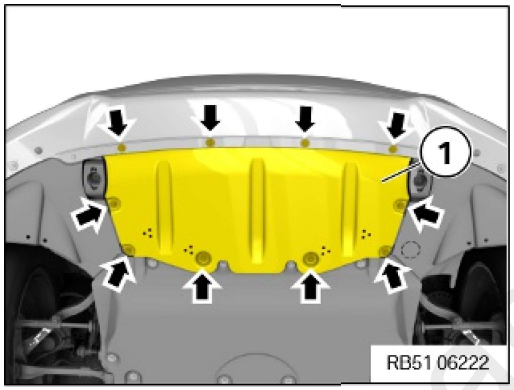


- Position stiffening plate (1).
- Screw screws (2) in.
- Position holder of underride protection (4).
- Screw screws (3) in.
- Tighten down screws (2) and (3).

Stiffening plate to front axle support

M10		Tightening torque	56 Nm

11 – Installing the front underbody protection



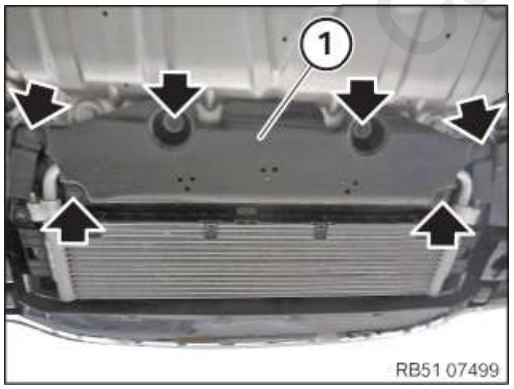
- **Version 1:**

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

  Tighten screws (arrows).

Underbody protection front

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



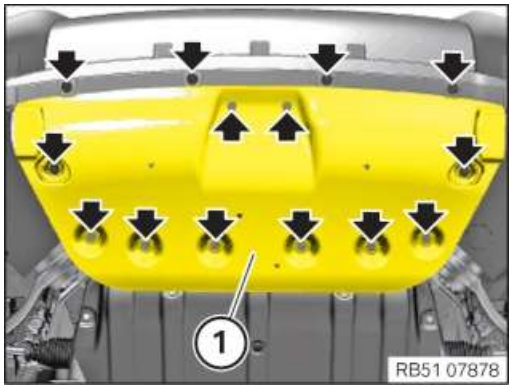
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

12 – Install front left or right wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

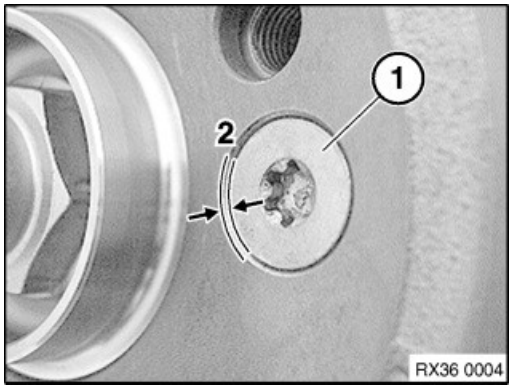
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

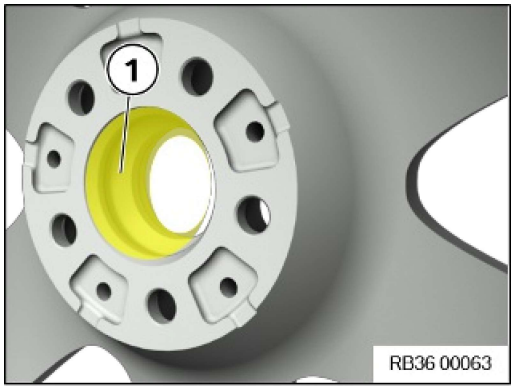
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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



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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

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

Wheel bolts

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

Additional Information

Overview of Tightening Torques

Tension strut to front axle support — Used in step 7

M12	Renew bolt and cage nut. Tighten screw connection in normal position.	Jointing torque Angle of rotation	100 Nm 90 °

Tension strut to swivel bearing — Used in step 7

M14	Renew nut.	Tightening torque	175 Nm

Output shaft to wheel bearing — Used in step 8

M16	Replace collar bolt and spring.	Jointing torque Angle of rotation	210 Nm 90 °

Cover, front bottom on side — Used in step 9

Hexagon screw for thermoplastic		Tightening torque	3 Nm

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Stiffening plate to front axle support			Used in step 10
M10		Tightening torque	56 Nm

Underbody protection front			Used in step 11
Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Brake disc to front wheel hub			Used in step 12
M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub			Used in step 12
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts			Used in step 12
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

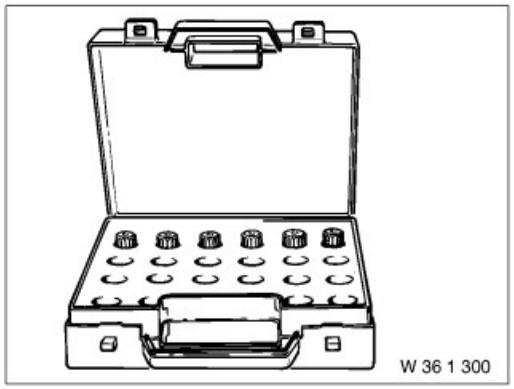
2 344 011 Tool



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

Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

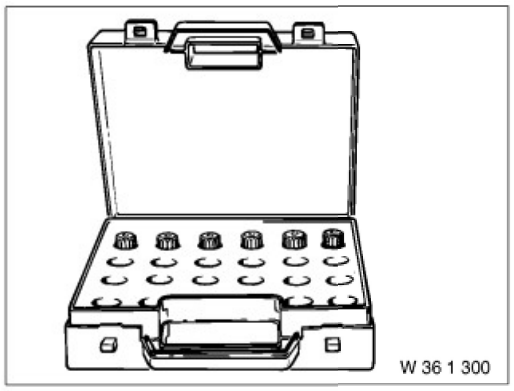
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0 495 224 (36 1 326) Wheel stud



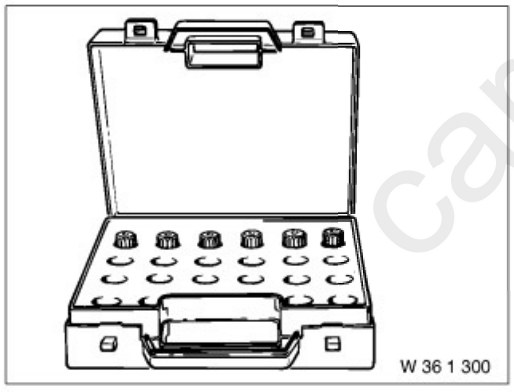
Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



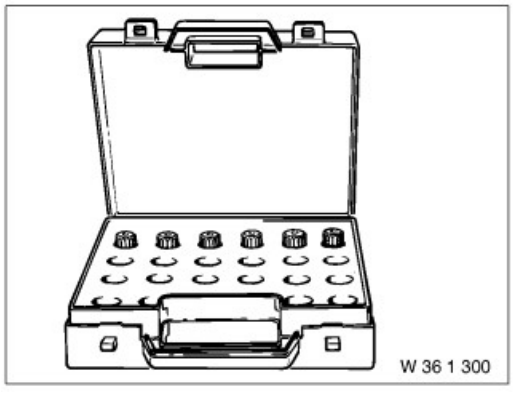
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



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

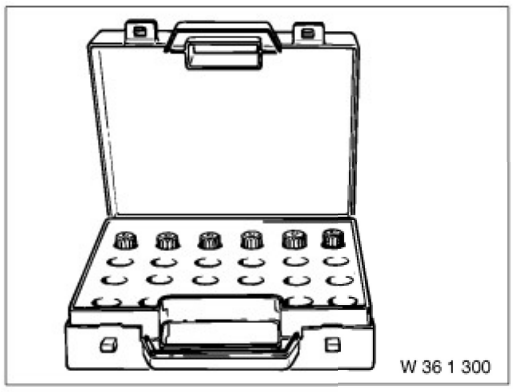
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0 495 228 (36 1 331) Wheel stud



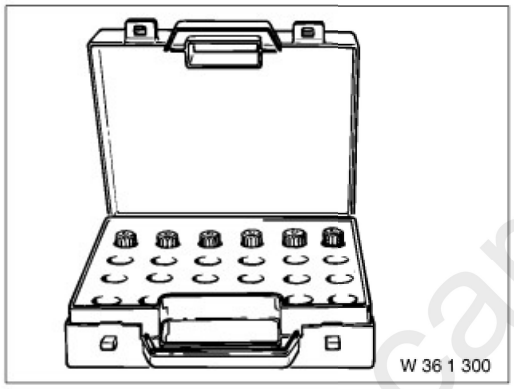
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

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Links

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

31 00 ... Information on replacing shock absorbers

Situation:

When a shock absorber is faulty on one side (leaking, noises, etc.), 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.

Exception: On all M-GmbH models, when a limit value is exceeded on one side, it is still necessary always to replace both shock absorbers on the relevant axle.

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31 31 000 Removing and installing complete front left or right spring strut shock absorber

PRELIMINARY WORK

1 – Remove front left or right wheel

▸ **Removing the wheel**



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

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



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

2 – Loosen the output shaft from the wheel bearing

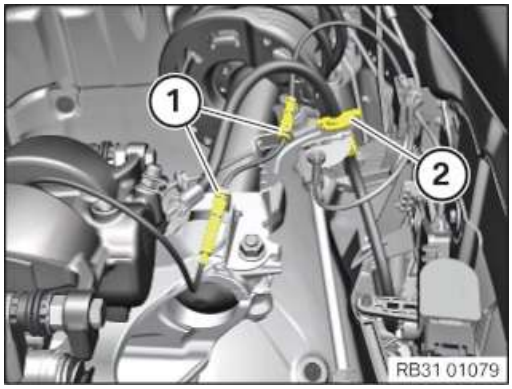


- Press brake pedal.
- Loosen the collar bolt (1).

Note: Do not leave the output shaft hanging on the joint (or tie up output shaft if applicable).

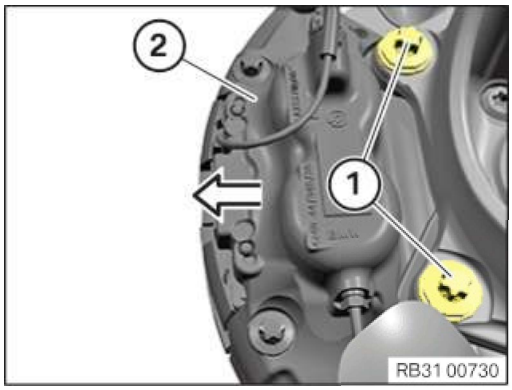
3 – Detach the cable of the brake pad sensor and front brake hose

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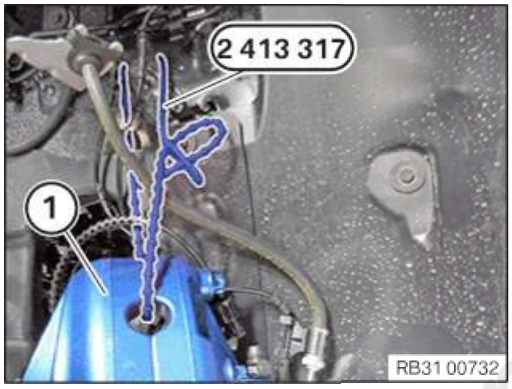


- Detach the brake pad sensor cable from the holders (1).
- Detach brake hose from holder (2).

4 – Detach the front brake caliper



- Loosen screws (1).
- Detach the brake caliper (2) in the direction of the arrow.



- Tie the brake caliper (1) up with the special tool 2 413 317.

  Do not let the brake caliper (1) down on the brake hose.

5 – Remove front brake disc



- Loosen screw (1).

TECHNICAL INFORMATION

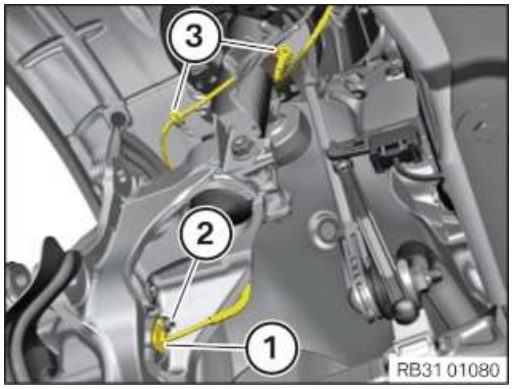
Note the following for the removal of the brake disc:

Do not under any circumstances strike the friction ring with a hammer or similar tool. If necessary, carefully tap with a rubber mallet against the brake disc chamber.

- Remove brake disc (2).

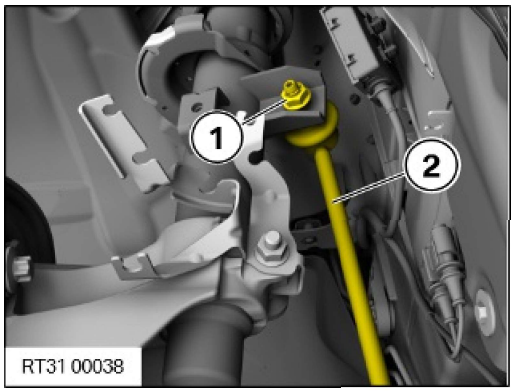
6 – Partially removing the front wheel speed sensor

eldiagn.com



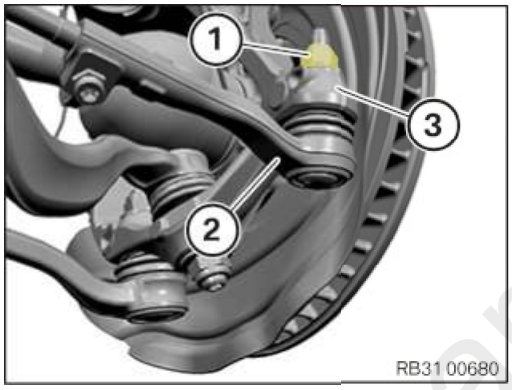
- Loosen screw (2).
- Release the wheel speed sensor (1) from the swivel bearing.
- Detach the wheel speed sensor cable from the brackets (3).
- Remove wheel speed sensor from spring strut.

7 – Releasing the anti-roll bar link from the spring strut



- Loosen the nut (1), if necessary, counter-hold the Torx socket.
- Release the anti-roll bar link (2) from the spring strut.

8 – Loosening the track rod from the swivel bearing

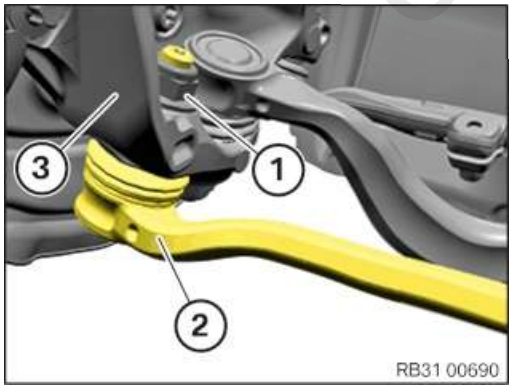


- Loosen nut (1).

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

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

9 – Release the wishbone from the swivel bearing



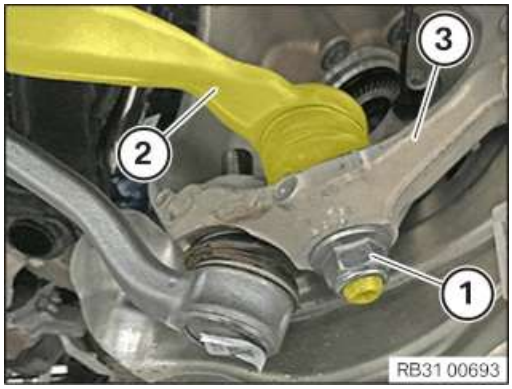
- Loosen nut (1).

Note: Use the Torx socket for counter support.

- Release wishbone (2) from swivel bearing (3).

10 – Releasing the tension strut from the swivel bearing

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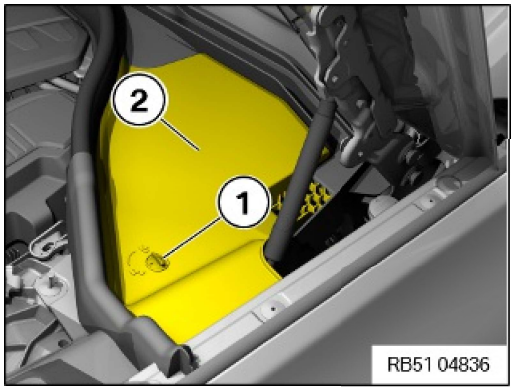
- Unfasten nut (1).

Note: Use the Torx socket for counter support.

- Release the tension strut (2) from the swivel bearing (3).

11 – Remove the cover of the engine compartment on the rear left or right

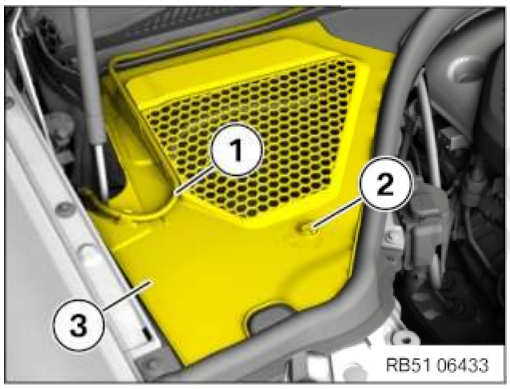
▶ **Remove the cover of the engine compartment at the rear left**



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

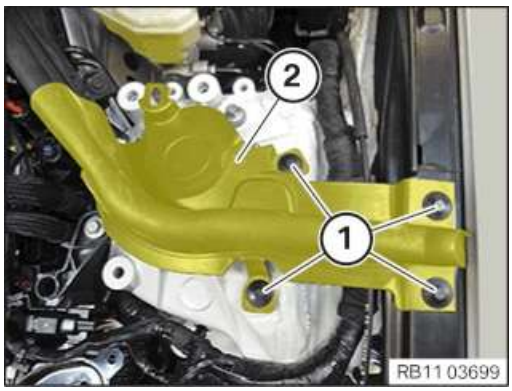
- **or**

▶ **Remove the cover of the rear right engine compartment**



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

12 – Removing side bonnet seal



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

MAIN WORK

13 – Remove front spring strut

TECHNICAL INFORMATION

Secure component against falling.



- Loosen screws (1).



- Remove the front spring strut (1) complete with swivel bearing.

14 – Installing the front spring strut



- Position front spring strut (1) complete with swivel bearing in the wheel arch.



- Ensure correct positioning of journal (1) of support bearing on the spring strut dome.

partdiagn.com



- Renew screws (1).

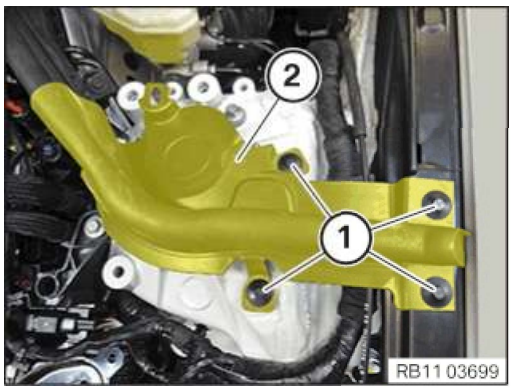
  Parts: Bolts
- Tighten the screws (1).

Nut and locknut/self-locking nut

M8	Renew screws.	Tightening torque	28 Nm
		Angle of rotation	90 °

POSTPROCESSES

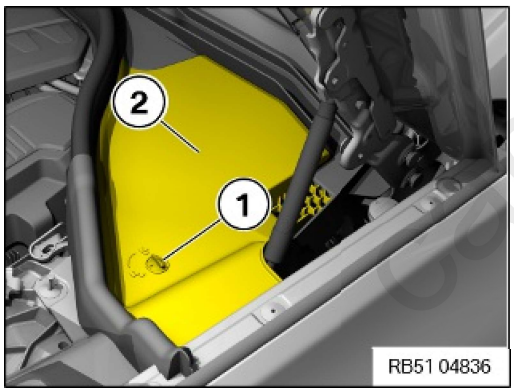
15 – Install the side bonnet seal



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

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

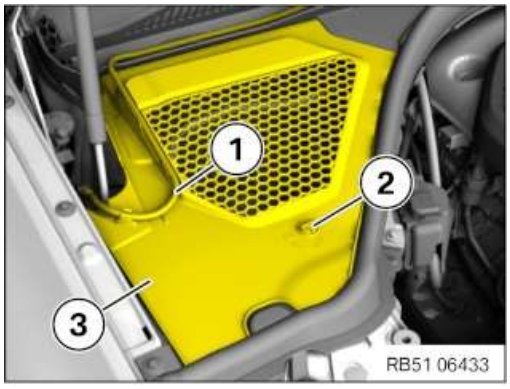
▸ **Install the cover of the engine compartment on the rear left**



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

- **or**

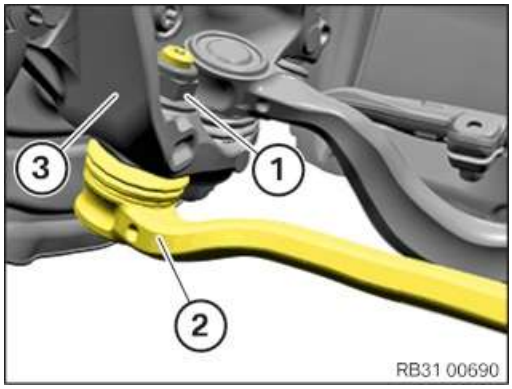
▸ **Install the rear right engine compartment cover**



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

17 – Mounting the wishbone on the swivel bearing

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

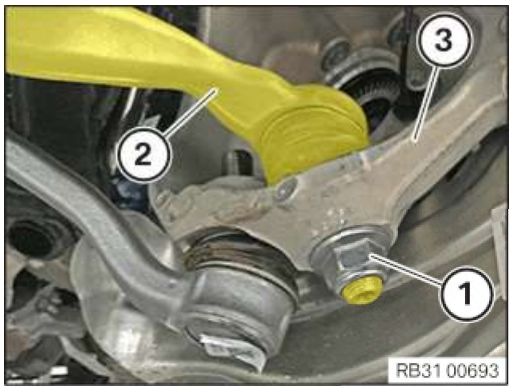
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Wishbone to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

18 – Securing tension strut on swivel bearing



- Position tension strut (2) on swivel bearing (3).
- Renew nut (1).

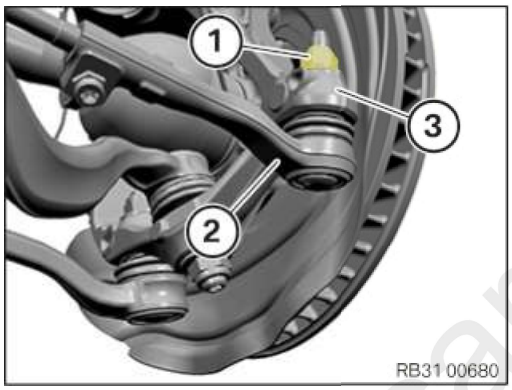
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Tension strut to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

19 – Securing the track rod on the swivel bearing



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

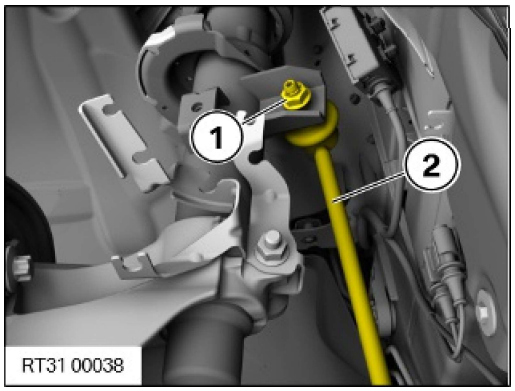
  Parts: Nut
- Tighten nut (1).

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

Track rod end to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

20 – Securing the anti-roll bar link on the spring strut



- Position the anti-roll bar link (2) at the spring strut.
- Renew nut (1).

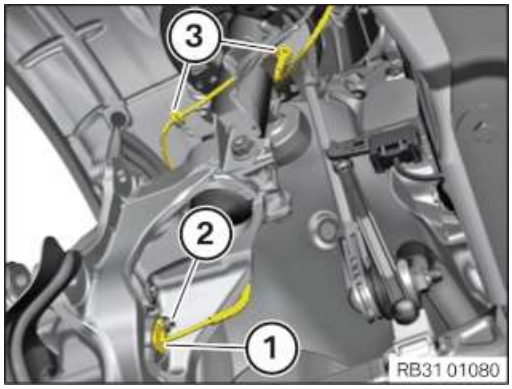
  Parts: Nut
- Tighten the nut (1), if necessary, counter support the Torx socket.

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

M10	Renew nut.	Tightening torque	56 Nm

21 – Installing the front wheel speed sensor partially

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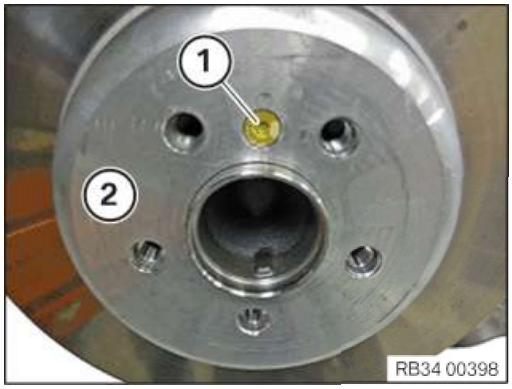
- Position the wheel speed sensor on the spring strut.
- Mount the cable of wheel speed sensor on the holders(3).
- Position the wheel speed sensor (1) on the swivel bearing.
- Renew the screw (2).

  Parts: Screw
- Tighten down screw (2).

Wheel speed sensor to swivel bearing

M6	Renew screw.	Tightening torque	8 Nm

22 – Install front brake disc



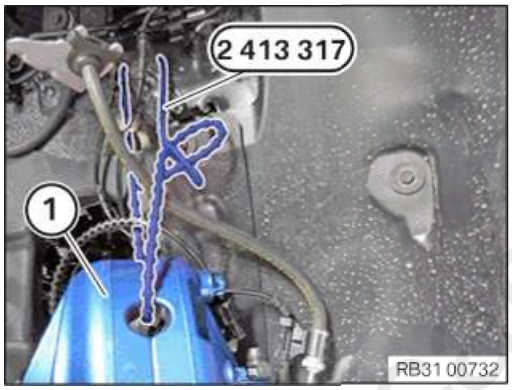
- Position brake disc (2) on wheel hub.
- Renew the screw (1).

  Parts: Screw
- Position and tighten the screw (1).

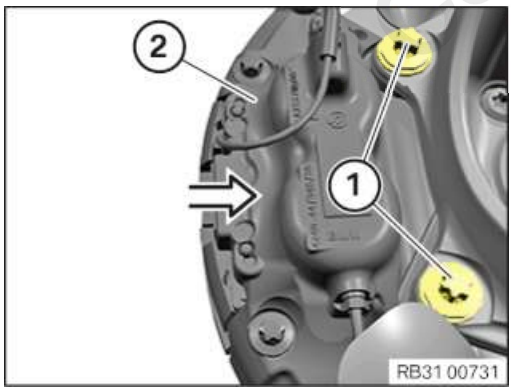
Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

23 – Fasten the front brake caliper



- Loosen brake caliper (1) from special tool 2 413 317.
- Remove special tool 2 413 317.



- Position the brake caliper (2) in direction of arrow on the swivel bearing.
- Renew screws (1).

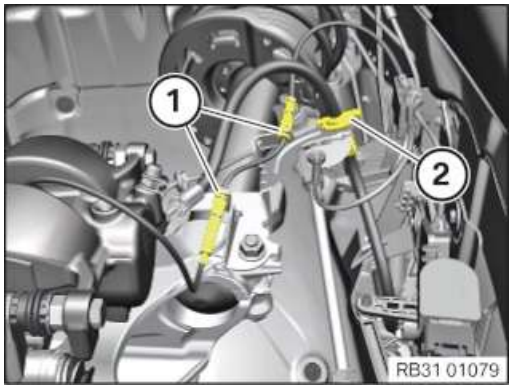
  Parts: Bolts
- Tighten the screws (1).

Brake caliper / caliper carrier at front swivel bearing

M12	Renew screw.	Tightening torque	110 Nm

24 – Attach the cable of the brake pad sensor and front brake hose

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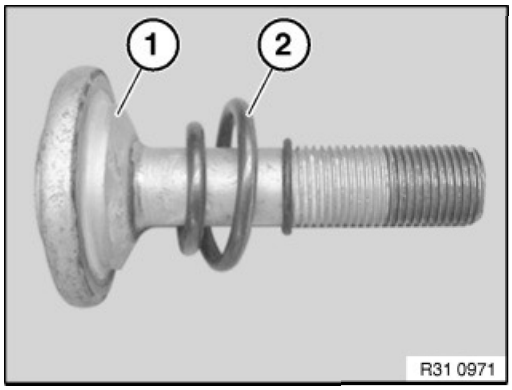


- Attach cable of brake pad sensor in brackets (1).
- Attach the brake hose in the holder (2).

25 – Securing the output shaft on the wheel bearing

TECHNICAL INFORMATION

The installation note for front gearing must be observed at all times.

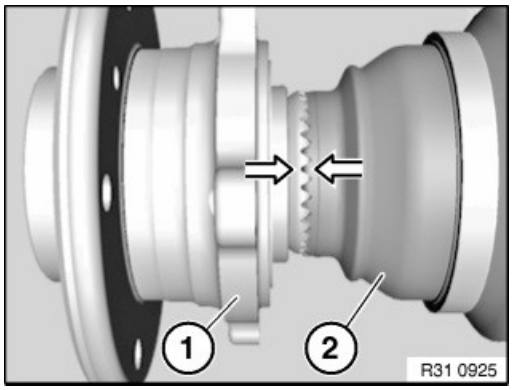


- Renew the collar bolt (2) and the compression spring (1).

  Parts: Collar bolt and compression spring
- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.



- Hand-tighten the collar bolt (1) with the compression spring.



TECHNICAL INFORMATION

The front gearing of the wheel bearing and output shaft must be installed in an interlocking position (tooth-in-tooth).

- Check whether front gearing is locked tooth in tooth (arrows) by reciprocally rotating the wheel bearing (1) and the output shaft (2).
- Verify positive locking.
- Press brake pedal.
- Tighten the collar bolt.

Output shaft to wheel bearing

M16	Replace collar bolt and spring.	Jointing torque	210 Nm
		Angle of rotation	90 °

26 – Install front left or right wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

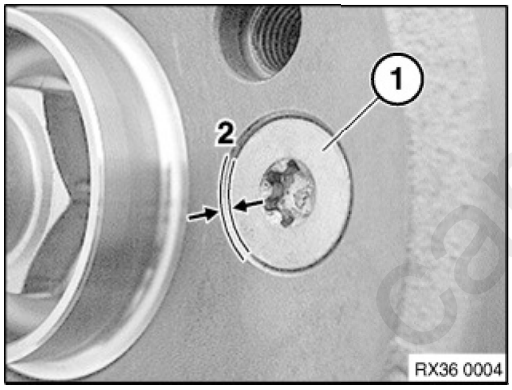
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

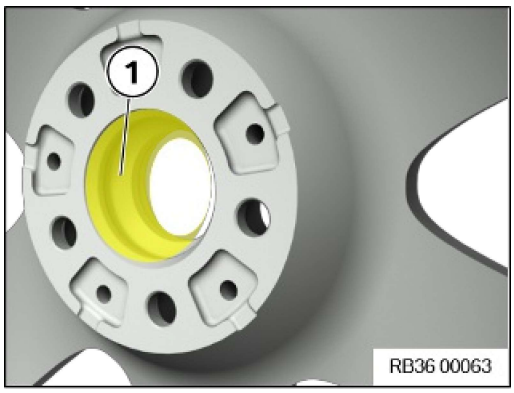
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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

carlegn.com



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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

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

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	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

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Additional Information

Overview of Tightening Torques

Nut and locknut/self-locking nut — Used in step 14

M8	Renew screws.	Tightening torque	28 Nm
		Angle of rotation	90 °

Wishbone to swivel bearing — Used in step 17

M14	Renew nut.	Tightening torque	175 Nm

Tension strut to swivel bearing — Used in step 18

M14	Renew nut.	Tightening torque	175 Nm

Track rod end to swivel bearing — Used in step 19

M14	Renew nut.	Tightening torque	175 Nm

Front anti-roll bar link to anti-roll bar/spring strut — Used in step 20

M10	Renew nut.	Tightening torque	56 Nm

Wheel speed sensor to swivel bearing — Used in step 21

M6	Renew screw.	Tightening torque	8 Nm

Brake disc to front wheel hub — Used in step 2226

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing — Used in step 23

M12	Renew screw.	Tightening torque	110 Nm

Output shaft to wheel bearing — Used in step 25

M16	Replace collar bolt and spring.	Jointing torque	210 Nm
		Angle of rotation	90 °

Brake disc to rear wheel hub — Used in step 26

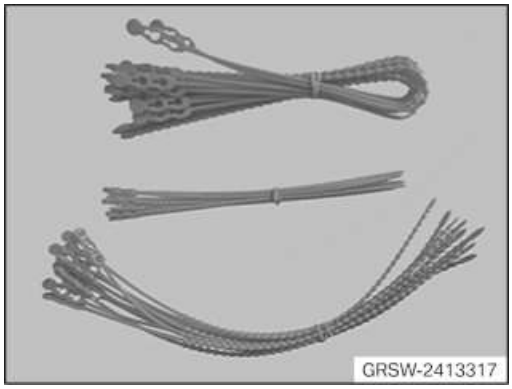
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 26

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

Overview of Special Tools

2 413 317 Cable strap



Common — Used in step 423

Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

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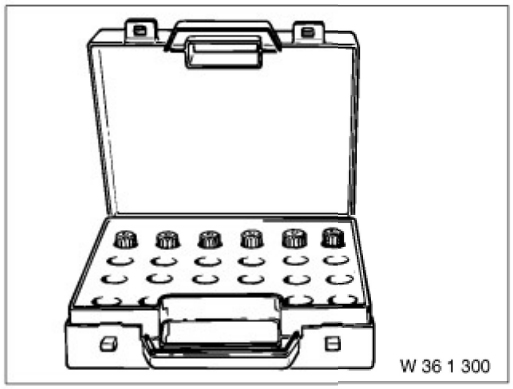
2 344 011 Tool



Common	Used in step 26
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

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0 495 225 (36 1 327) Wheel stud



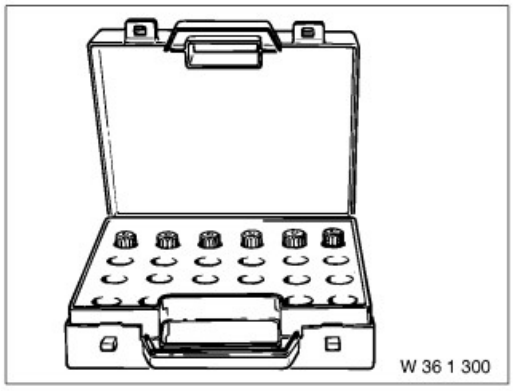
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



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

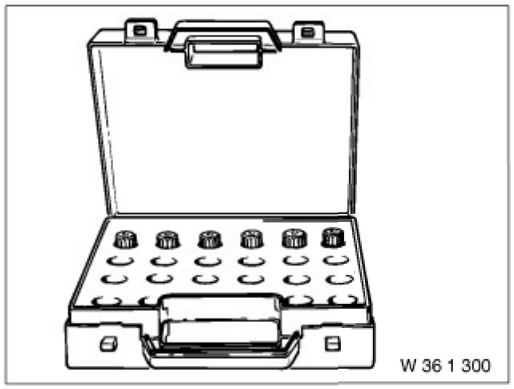
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0 495 228 (36 1 331) Wheel stud



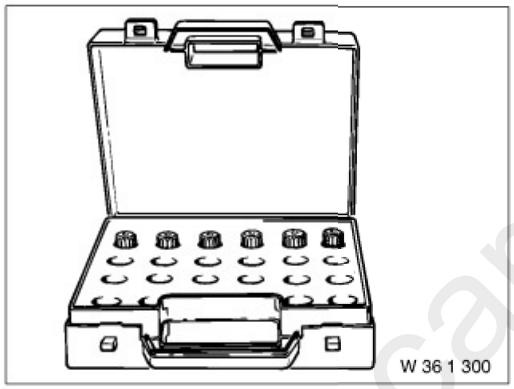
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

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31 35 014 Removing and installing / replacing anti-roll bar link, left

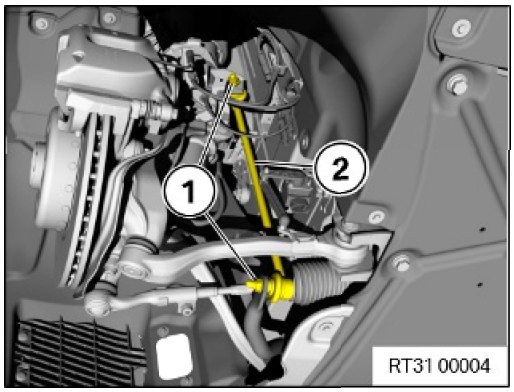
WARNING

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

Danger! Life-threatening injuries!

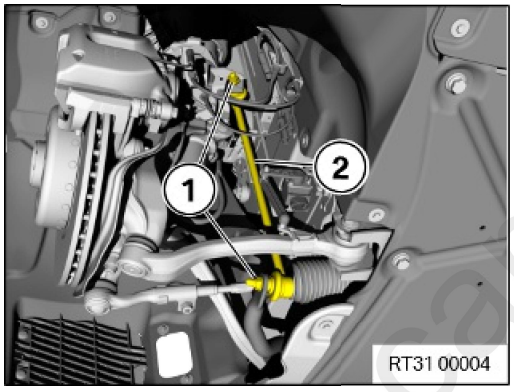
- Observe safety information on raising the vehicle using a vehicle hoist.
- For additional information see: 00 ... Raising the vehicle using a vehicle hoist.

1 – Remove the anti-roll bar link



- Unscrew the nuts (1) and use the Torx socket for counter support as needed.
- Remove the anti-roll bar link (2).

2 – Install the anti-roll bar link



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

  Parts: Nuts
- Tighten the nuts (1) and use the Torx socket for counter support as needed.

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

M10	Renew nut.	Tightening torque	56 Nm

Additional Information

Overview of Tightening Torques

Front anti-roll bar link to anti-roll bar/spring strut Used in step 2

M10	Renew nut.	Tightening torque	56 Nm

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

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31 35 015 Removing and installing / replacing anti-roll bar link, right

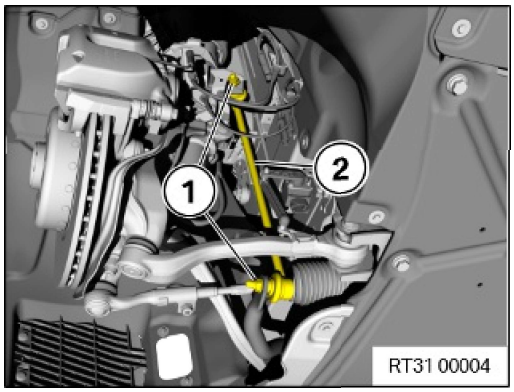
WARNING

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

Danger! Life-threatening injuries!

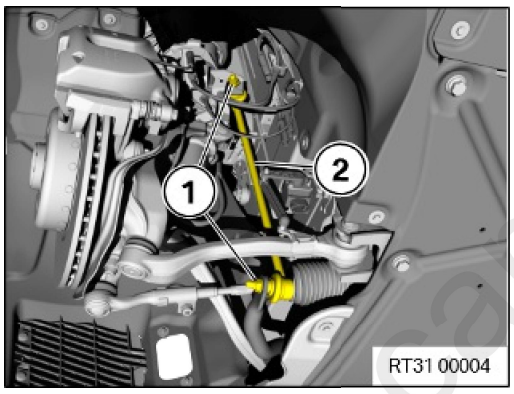
- Observe safety information on raising the vehicle using a vehicle hoist.
- For additional information see: 00 ... Raising the vehicle using a vehicle hoist.

1 – Remove the anti-roll bar link



- Unscrew the nuts (1) and use the Torx socket for counter support as needed.
- Remove the anti-roll bar link (2).

2 – Install the anti-roll bar link



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

  Parts: Nuts
- Tighten the nuts (1) and use the Torx socket for counter support as needed.

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

M10	Renew nut.	Tightening torque	56 Nm

Additional Information

Overview of Tightening Torques

Front anti-roll bar link to anti-roll bar/spring strut Used in step 2

M10	Renew nut.	Tightening torque	56 Nm

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

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31 50 002 Replace front axle differential

WARNING

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

Danger! Life-threatening injuries!

- Secure the vehicle hoist against lowering and lifting.

WARNING

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

Danger! Life-threatening injuries!

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

WARNING

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

Danger! Life-threatening injuries!

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

PRELIMINARY WORK

1 – Disconnecting all battery earth leads



- See additional information.

2 – Bring front compartment lid in the service position

Prerequisite

Engine compartment lid is open.

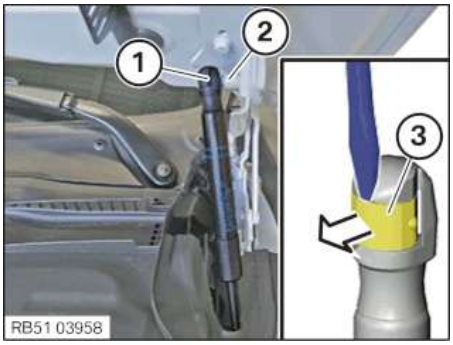
CAUTION

Shutting bonnet or tailgate.

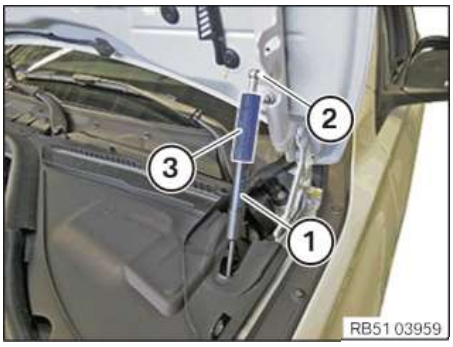
Danger of injury!

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

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

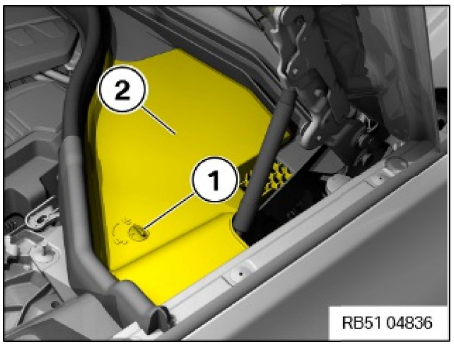


TECHNICAL INFORMATION

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

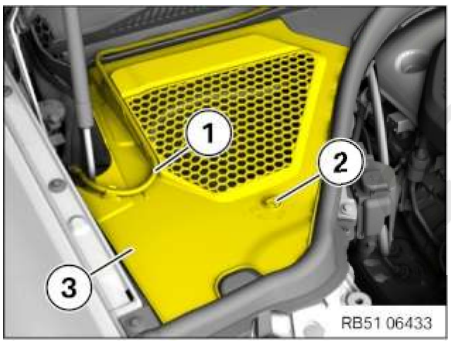
- Remove the bonnet support and open the bonnet further.
- Push special tool or (3) over gas pressure spring (1).
- Place special tool on the ball pin (2) and engage using force.
- Repeat the operation on the other side of vehicle.

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



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

4 – Remove the cover of the rear right engine compartment



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

5 – Remove the seal for the rear bonnet



- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

6 – Removing the acoustic cover

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WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

Damage to the acoustic cover.

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

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



- Release the acoustic cover (1) towards the top from the rubber mounts (marks).

7 – Removing both wiper arms

NOTICE

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

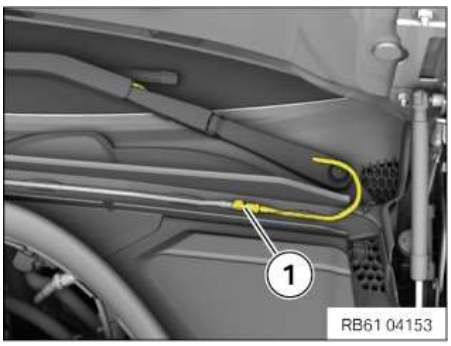
▸ **Remove the wiper arm**

RISK OF DAMAGE

Damage to wiper console

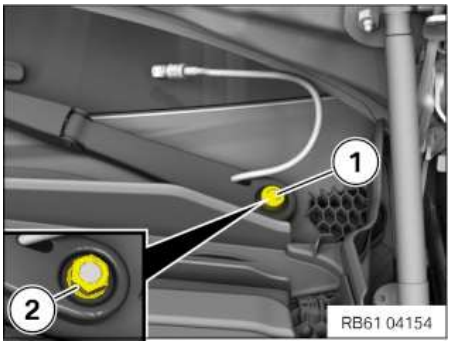
While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do not lift off wiper arm, else the wiper console may break on the predetermined breaking point for the pedestrian protection.

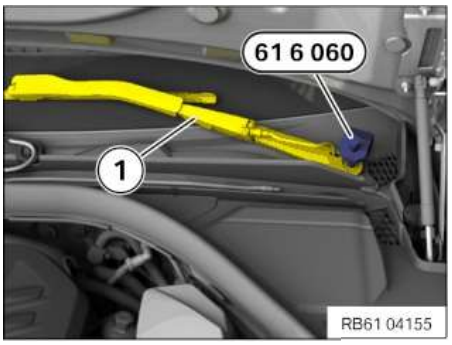


- Disconnect the windscreen wash hose(1) at the separation point and remove from the cowl guide.

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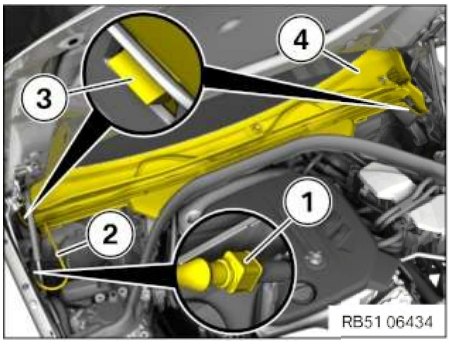


- Remove the protective cap (1).
- Loosen nut (2).

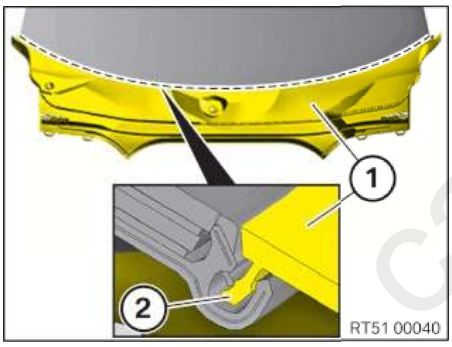


- Pull off the wiper arm (1) using special tool .

8 – Remove cowl panel cover



- Release snap fastener of the washer fluid hose (1) and put the washer fluid hose(2) to one side.
- Unclip clips (3) on the cowl panel cover (4).

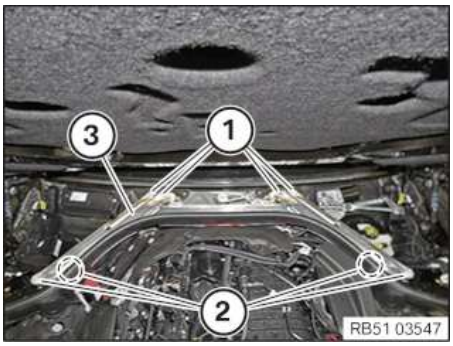


- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

9 – Removing the centre bulkhead upper part

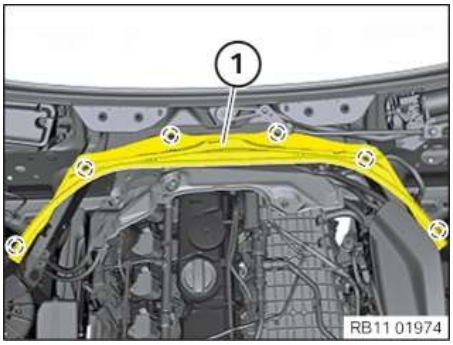
TECHNICAL INFORMATION

Driving without the strut brace/front end or tension strut is not permitted.



- **If installed:** Remove tension strut on spring strut dome.
- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.

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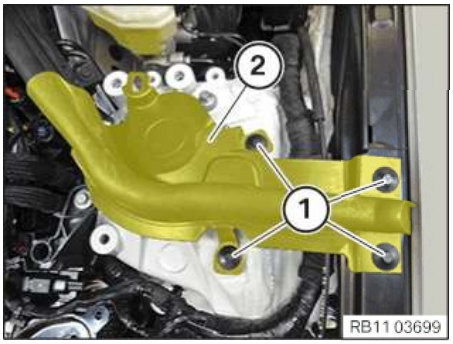


- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

10 – Removing side bonnet gaskets

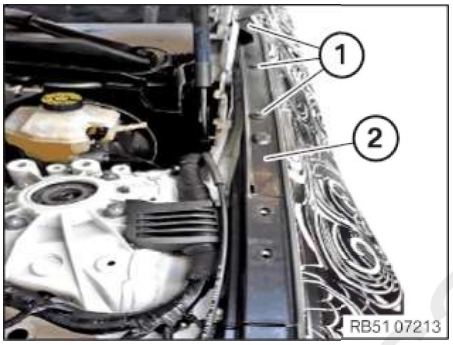
NOTICE

Perform the operations on the left and right side.



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

11 – Remove sealing of the side panel



NOTICE

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

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

12 – Removing acoustic cover at rear



- Unclip the acoustic cover (1) in the marked areas and remove it to the top.

13 – Remove all ignition coils.

NOTICE

The description is for one component only. The procedure is identical for all further components.

▸ **Removing the ignition coil**

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WARNING

Hot surfaces.

Risk of burning!

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

RISK OF DAMAGE

Damage to the ignition coil.

The silicone hose of the ignition coil must not be contaminated by fuel as this can lead to failure of the ignition coil.

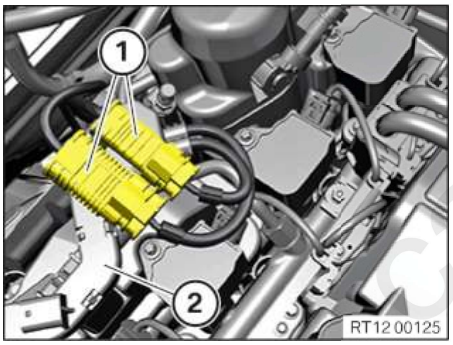
- Cover ignition coils using suitable covers when working on the fuel system, if necessary remove them.
- Do not oil or grease the silicone tube of the spark plug connector. The silicone tube is coated with talc to reduce the pulling forces.

RISK OF DAMAGE

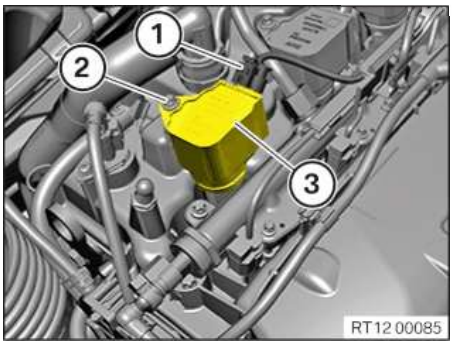
Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 Information on electrostatic discharge (ESD) protection.



- Disconnect the connector (1) of the front oxygen sensor and the monitoring oxygen sensor from the cable channel (2) and set aside.



- Unlock plug connection (1) and disconnect.
- Loosen screw (2).
- Remove ignition coil (3).

14 – Remove fuel delivery line

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WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

CAUTION

On releasing high pressure line, fuel may emerge at high speed.

Danger of injury!

- Wear suitable personal protective equipment.
- Allow the cooling system to cool down to a temperature below 40°C before starting installation work.
- Note warnings on cylinder head cover.

RISK OF DAMAGE

Damage to the ignition coil.

The silicone hose of the ignition coil must not be contaminated by fuel as this can lead to failure of the ignition coil.

- Cover ignition coils using suitable covers when working on the fuel system, if necessary remove them.
- Do not oil or grease the silicone tube of the spark plug connector. The silicone tube is coated with talc to reduce the pulling forces.

RISK OF DAMAGE

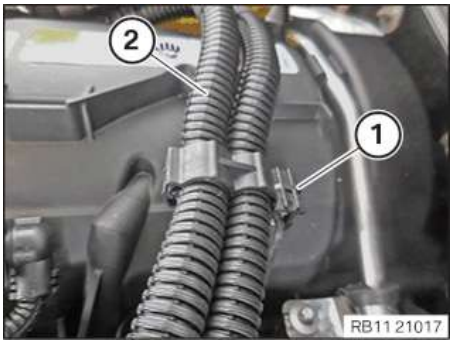
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.

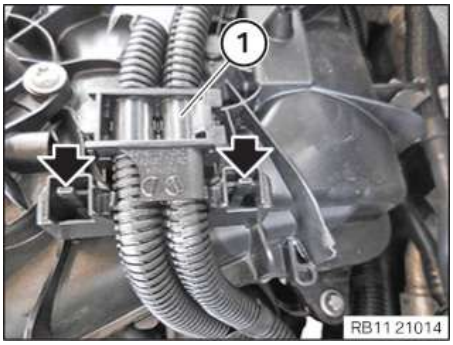
TECHNICAL INFORMATION

Reset special tool in early to avoid bending pressure lines.

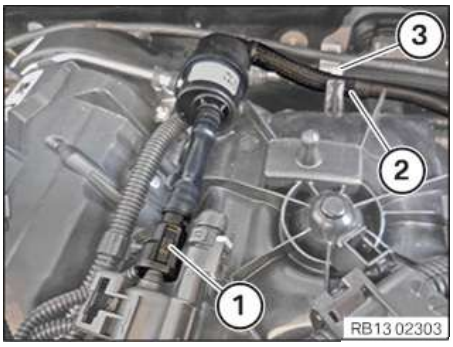


- Loosen clamp (1).
- Guide out wiring harness section (2) for the injectors and ignition coils and place it aside.

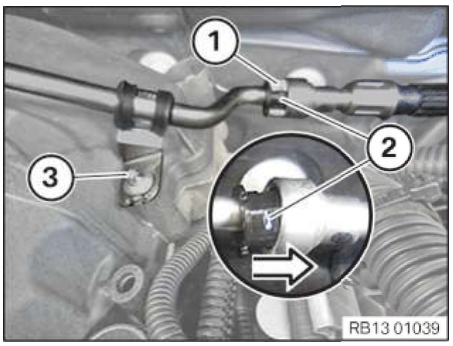
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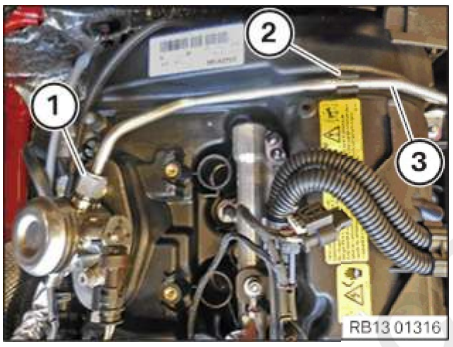
- Unlock the locks (arrows).
- Guide out wiring harness section (1) for the injectors and ignition coils and place it aside.



- Unlock and loosen lock (1).
- Guide tank ventilation line (2) out of clamp (3) and place it aside.



- Unlock and loosen clamp (1).
- Unlock and remove the snap fastener (2) in the direction of the arrow.
- Catch and dispose of escaping fuel.
- Seal the fuel lines with special tools 0 496 567 (13 5 161) and 0 496 568 (13 5 162) from the set of special tools 0 496 565 (13 5 160).
- Loosen screw (3).



- Slacken the union nut (1) on the high pressure pump.
- Catch and dispose of escaping fuel.
- Seal all openings with the special tool .
- Guide the fuel feed line (3) out and remove.
- Make sure that the rubber damper (2) is not lost.

15 – Removing intake silencer housing

RISK OF DAMAGE

Damage to the clean air line. Damage to the air filter.

For changing the air filter insert, if the upper section of intake filter housing is only raised and not completely removed, the clean air line and the air filter insert may be damaged.

- Do not lift upper section of intake filter housing by force.
- Unfasten clamp.
- Remove upper section of intake filter housing completely.

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- Unlock plug connection (1) and disconnect.
- Unfasten clamp (2).
- Pull out and remove the intake silencer housing (3) from the rubber mounts towards the top.

16 – Removing both front wheels

▸ **Removing the wheel**



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

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



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

17 – Remove the rear section of the wheel arch cover on the front left and right

NOTICE

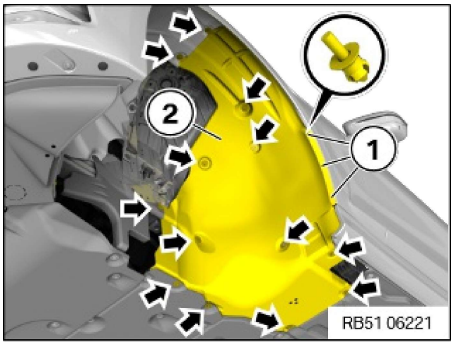
Description is for left component only. Procedure on the right side is identical.

▸ **Removing the rear section of the front wheel arch cover front**

NOTICE

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

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

18 – Removing the front section of the front left wheel arch cover

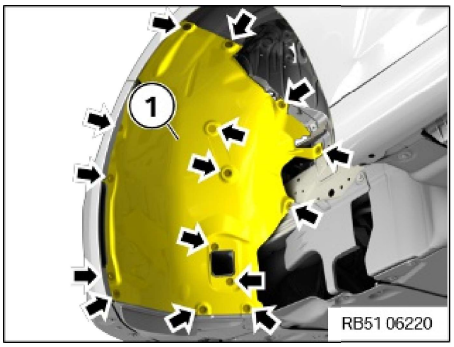
NOTICE

Perform the operations on the left and right side.

▸ **Removing the front section of the front wheel arch cover**

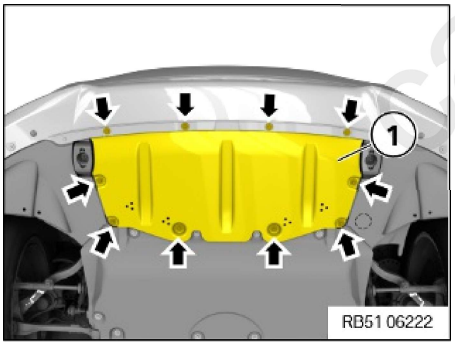
NOTICE

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



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

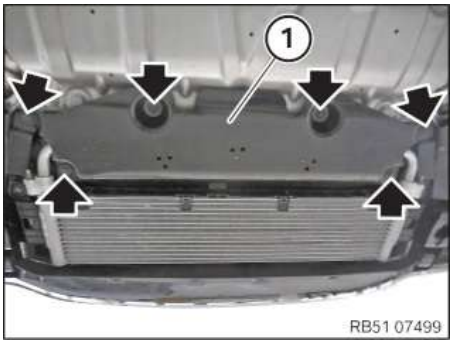
19 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

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

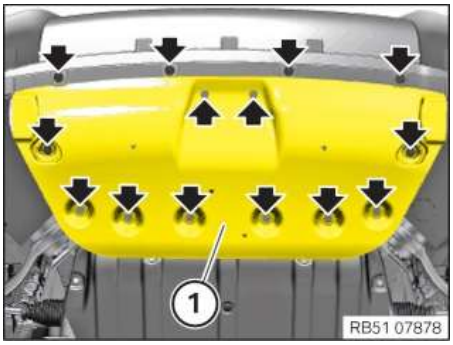


- **Version 2:**

  Remove screws (arrows).

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

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- **Version 3:**

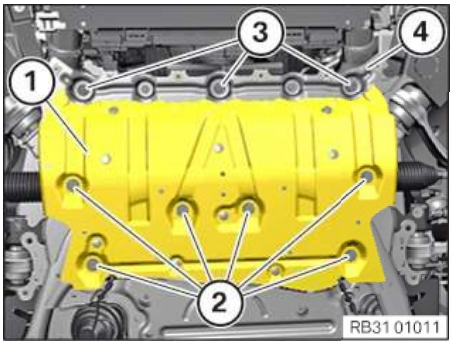
  Remove screws (arrows).

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

20 – Removing the stiffening plate

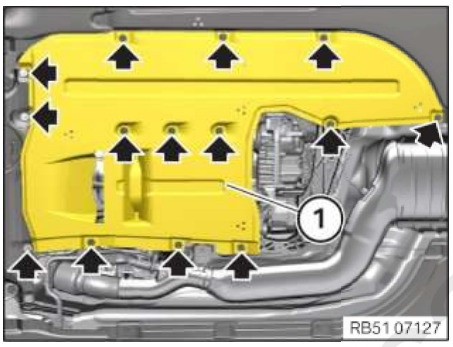
TECHNICAL INFORMATION

Driving without stiffening plate is not permissible.



- Loosen screws (3).
- Remove the holder of the underride protection (4).
- Loosen screws (2).
- Remove stiffening plate (1).

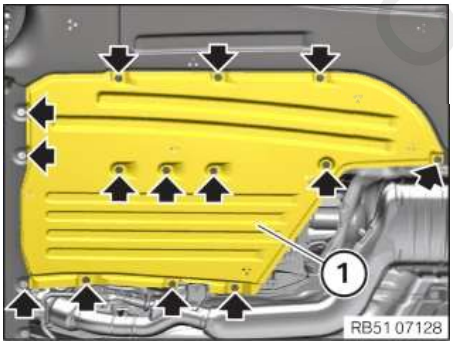
21 – Remove rear underbody protection



- **Version 1:**

  Remove screws (arrows).

  Feed out the rear underbody protection (1).

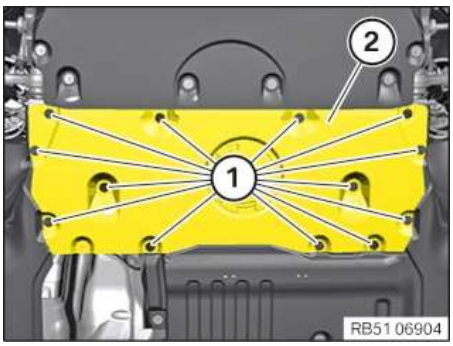


- **Version 2:**

  Remove screws (arrows).

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

22 – Removing the centre underbody protection

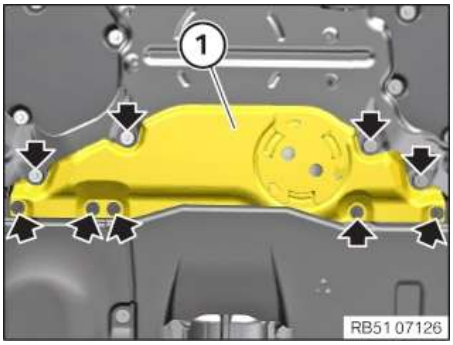


- **Version with rear-wheel drive:**

  Loosen screws (1).

  Remove centre underbody protection (2) .

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

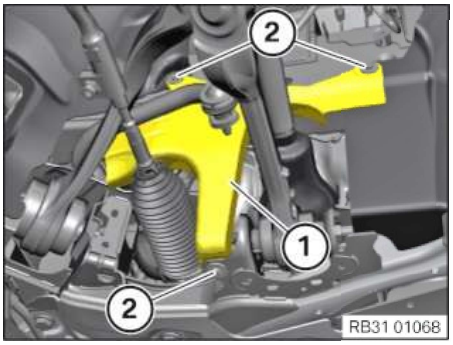
  Remove screws (arrows).

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

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

NOTICE

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

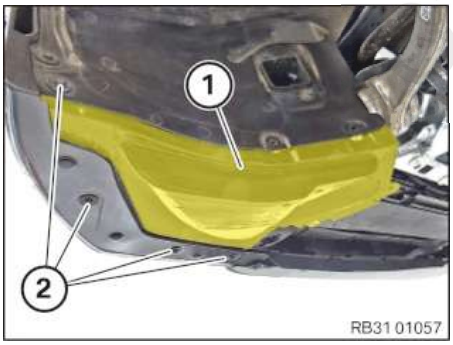


- ▸ **Remove the cover of the steering assembly**
- Loosen screws (2).
- Remove the cover (1).

24 – Removing the bottom left and right wheel arch cover

NOTICE

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

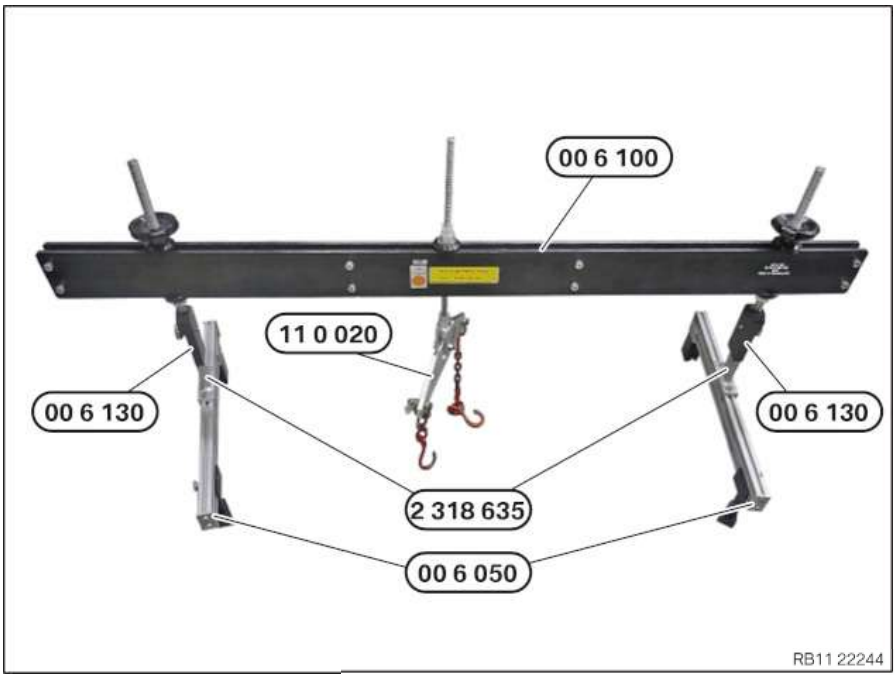


- ▸ **Remove bottom wheel arch cover**
- Loosen screws (2).
- Remove bottom wheel arch cover (1)

25 – Securing engine in installation position

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Overview: prepared engine bridge



CAUTION

Components connected to the engine joint or cross member.

Danger of injury!

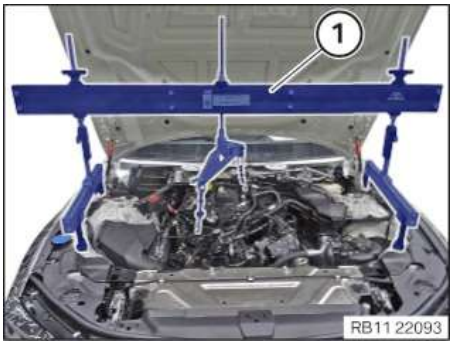
- Check lifting eyes and engine mounting brackets for damage, e.g. cracks.
- Attach the component to correctly mounted engine joints or cross members only.
- Exclusively lift the component, do not move it forwards, backwards or in transverse direction.



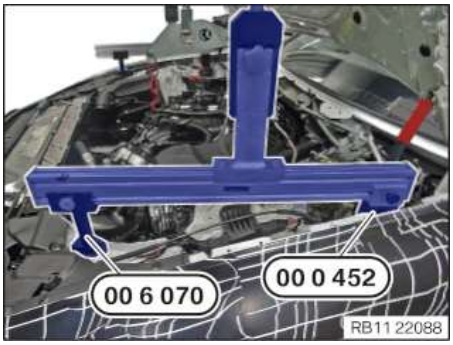
- Guide in and position special tool on cylinder head.
- Tighten the screws (1) of special tool .

Special tool to cylinder head

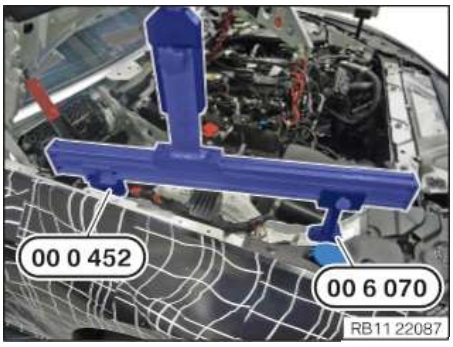
M8		Tightening torque	21,5 Nm



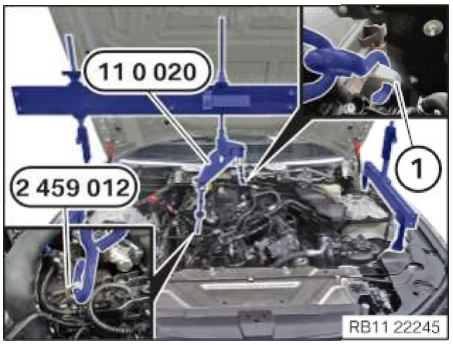
- **Carefully** position engine bridge (1) with help from an auxiliary person.



- Make sure that special tool on the left is **correctly** positioned on the front end.
- Make sure that special tool 0 495 850 (00 0 452) on the left is **correctly** positioned on the carrier support.



- Make sure that special tool on the right is **correctly** positioned on the front end.
- Make sure that special tool 0 495 850 (00 0 452) on the right is **correctly** positioned on the carrier support.



- Align the engine bridge by moving it on the profile strips of the special tool above the engine mounting bracket and screw it down.
- Connect special tool 0 490 567 (11 0 020) to special tool .
- Connect the special tool 0 490 567 (11 0 020) above the engine mounting bracket (1) at the rear.



- Check whether the special tool on the right is **correctly** positioned on the front end.



- Check whether the special tool 0 495 850 (00 0 452) on the right is **correctly** positioned on the carrier support.



- Check whether the special tool on the left is **correctly** positioned on the front end.

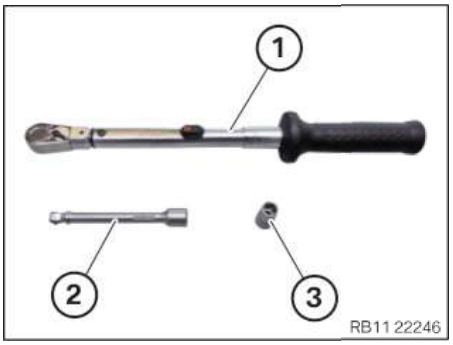
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- Check whether the special tool 0 495 850 (00 0 452) on the left is **correctly** positioned on the carrier support.

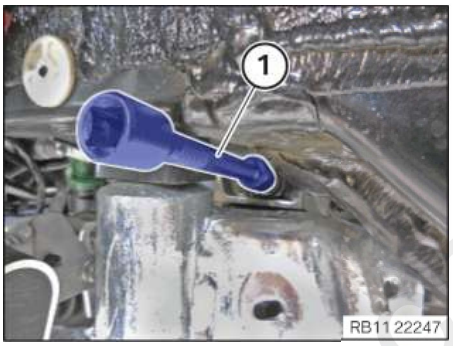


- Release screw (1) on the right engine mount from the top with a commercially available tool.

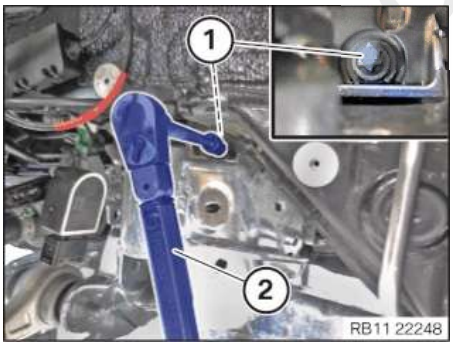


- Have all suitable tools ready.

Number	Description
1	Commercial available torque spanner
2	Swivel mounted extension
3	External Torx E14



- Position the suitable tool (1).



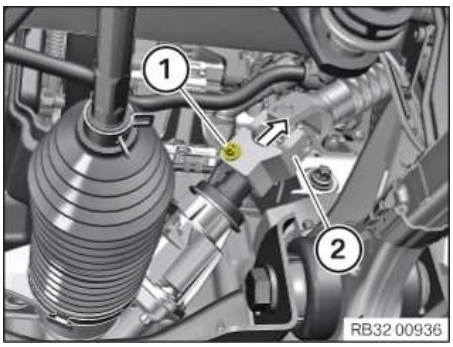
- Release screw (1) of the left engine mount with standard tool (2) sideways.



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

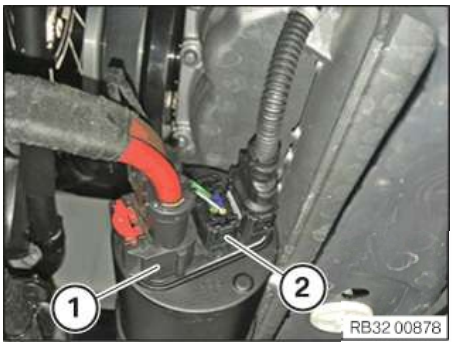
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26 – Releasing lower steering shaft from steering gear

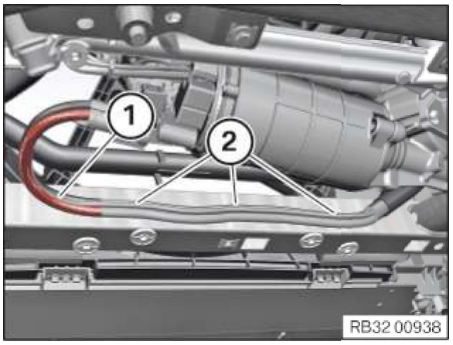


- Loosen screw (1).
- Pull off lower steering shaft (2) from steering gear in direction of arrow.

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

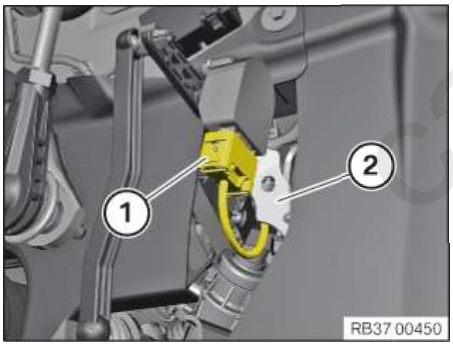


- Unlock and disconnect the plug connections (1) and (2).



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

28 – Detach the line connection of the ride height sensor



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

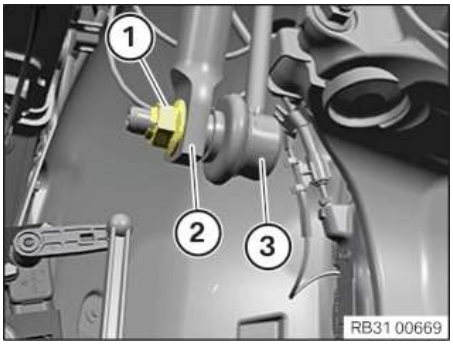
29 – Release the left and right anti-roll bar link from the anti-roll bar

NOTICE

Perform the operations on the left and right side.

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

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- Loosen nut (1).

Note: Use the Torx socket for counter support.

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

30 – Releasing output shaft at right and left from wheel bearing

NOTICE

Perform the operations on the left and right side.

▸ **Loosen the output shaft from the wheel bearing**



- Press brake pedal.
- Loosen the collar bolt (1).

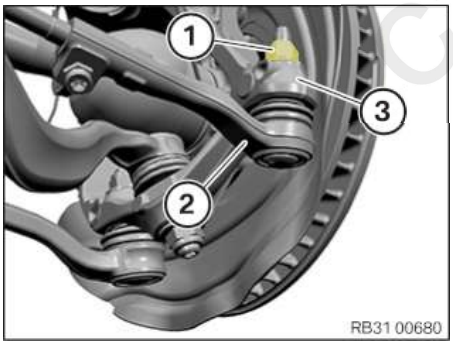
Note: Do not leave the output shaft hanging on the joint (or tie up output shaft if applicable).

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

NOTICE

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

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



- Loosen nut (1).

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

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

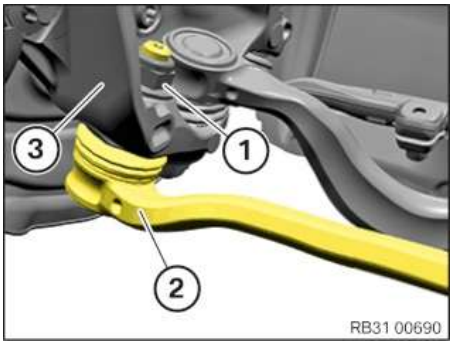
32 – Release the left and right wishbone from the swivel bearing

NOTICE

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

▸ **Release the wishbone from the swivel bearing**

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- Loosen nut (1).

Note: Use the Torx socket for counter support.

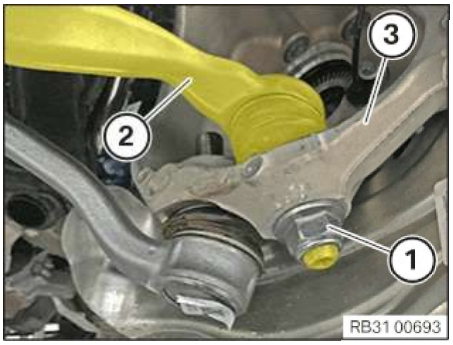
- Release wishbone (2) from swivel bearing (3).

33 – Releasing the left and right tension strut from the swivel bearing

NOTICE

Perform the operations on the left and right side.

▸ **Releasing the tension strut from the swivel bearing**



- Unfasten nut (1).

Note: Use the Torx socket for counter support.

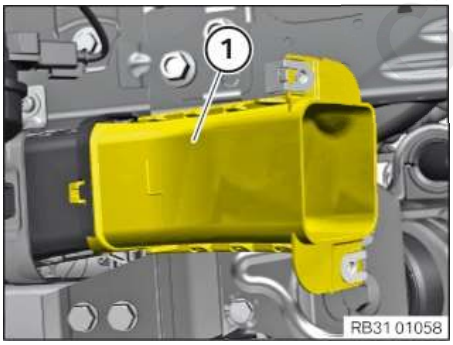
- Release the tension strut (2) from the swivel bearing (3).

34 – Removing the left and right brake air duct partially

NOTICE

Perform the operations on the left and right side.

▸ **Removing brake air duct partially**



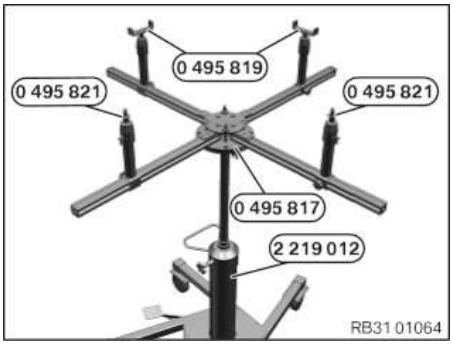
- Unclip and remove air duct (1).

35 – Preparing the special tool

TECHNICAL INFORMATION

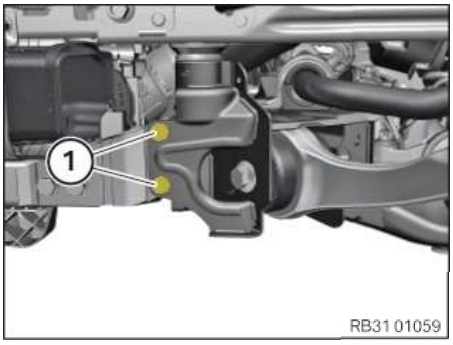
In a profile rail pair, two profile rails are connected to one another by gearing.

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

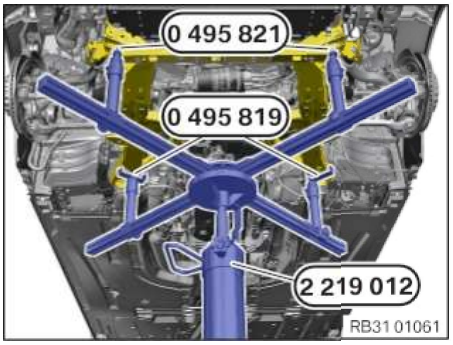
36 – Remove front axle carrier



NOTICE

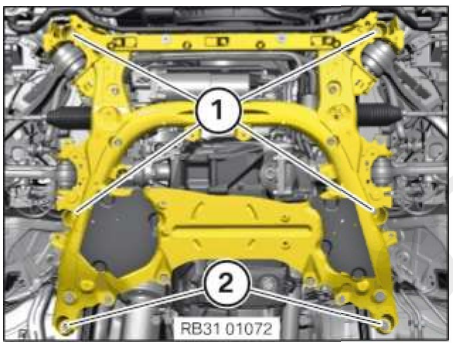
Perform the operations on the left and right side.

- Loosen screws (1).

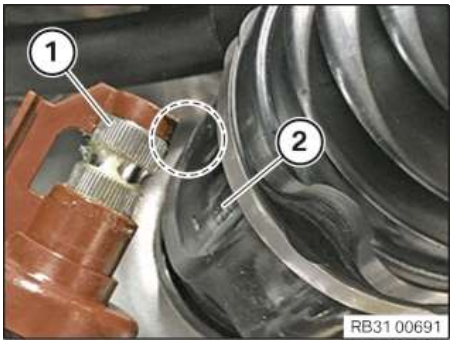


- Position the universal jack 2 219 012 with the special tools and on the front axle support.

  The centre of gravity of the front axle must be centred over the universal jack 2 219 012 !
- Support the front axle support with the universal jack 2 219 012.
- Secure the front axle support on the special tool with a tensioning strap.

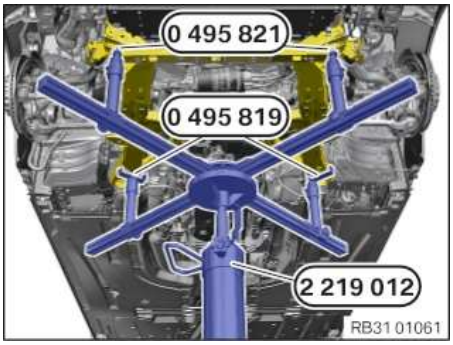


- Loosen screws (1) and (2).



- When lowering the front axle support, ensure sufficient distance between the steering gear (1) and the output shaft (2).

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- Carefully lower and remove the front axle support with the universal jack 2 219 012.

37 – Loosening front propeller shaft from front axle differential



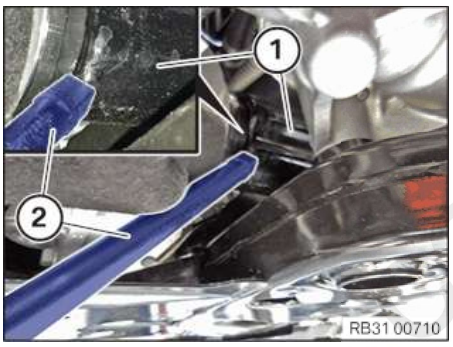
- Release screws (arrows) of the propeller shaft at the front on the front axle transmission.
- Tie up the propeller shaft at the front with special tool 2 413 317.

38 – Removing output shaft, left and right

NOTICE

Perform the operations on the left and right side.

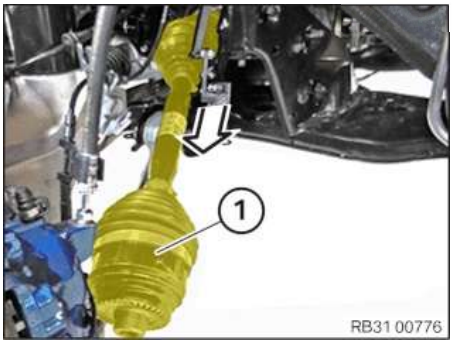
▸ **Remove output shaft**



TECHNICAL INFORMATION

Secure component against falling.

- Position aluminium drift (2) at the output shaft (1).
- Knock out the output shaft (1) out of the front axle differential or the bearing support with the aluminium drift (2).

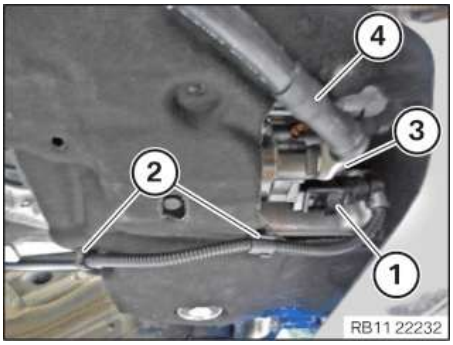


- Guide out and remove the output shaft (1) in the direction of the arrow.

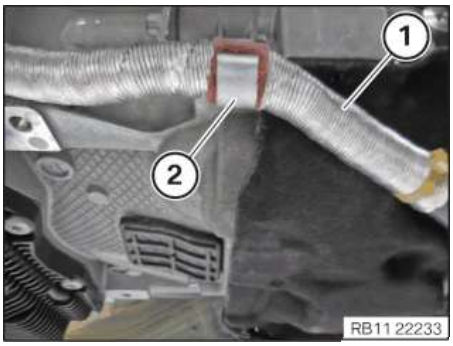
39 – Removing the acoustic cover of the oil sump

Prerequisite

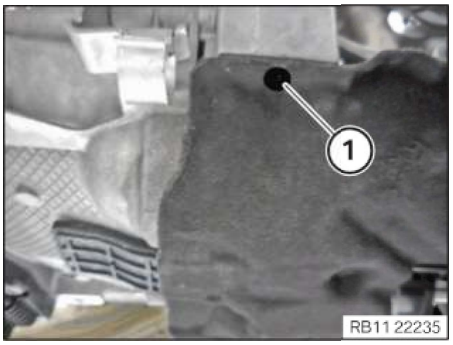
Disconnect all negative battery cables.



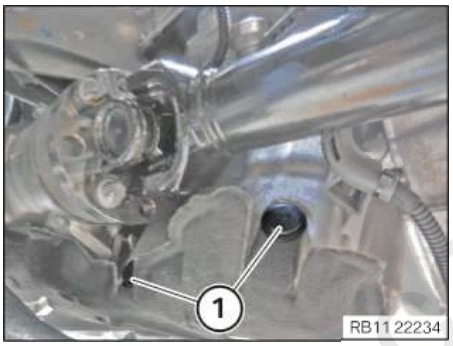
- Unlock plug connection (1) and disconnect.
- Unlock and loosen the clamps (2).
- Loosen nut (3).
- Feed out positive battery cable (4) and set it aside.



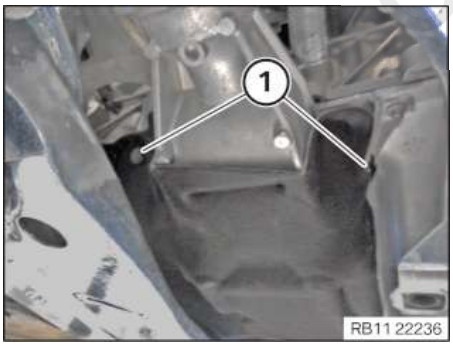
- Guide the positive battery cable (1) out of the clamp (2) and lay to one side.



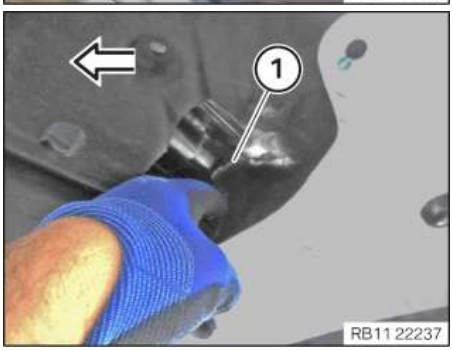
- Undo fir tree clip (1).



- Loosen the expanding rivet (1).



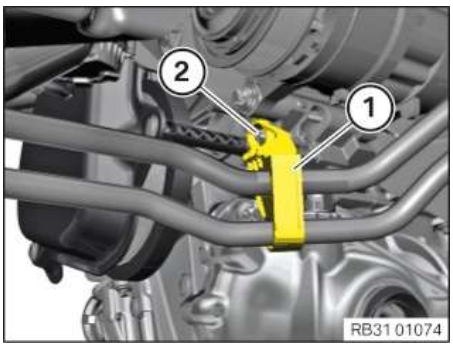
- Loosen the expanding rivet (1).



- Push the acoustic cover (1) downward.
- Feed out and remove the acoustic cover (1) in the **direction** of the arrow.

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40 – Releasing holder of the front transmission oil line



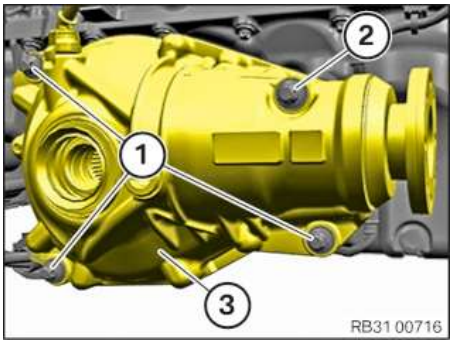
- Release the screw (2) from the bracket of the transmission oil lines (1).

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41 – Remove front axle differential

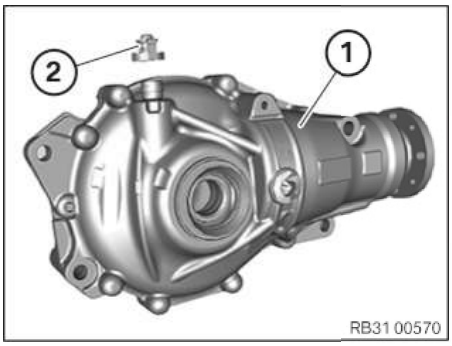
TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

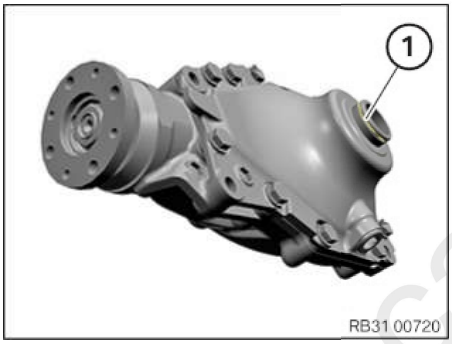


- Mark installation location of the screws (1) and (2).
  - Screws (1) M12x55
  - Screw (2) M12x105
- Loosen screws (1) and (2).
- Remove front axle differential (3).

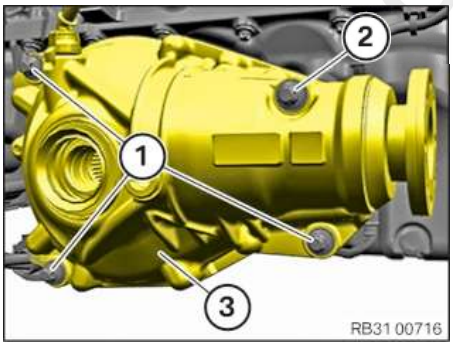
42 – Install new front axle transmission



- Remove all protective caps from the new front axle differential (1).
- Remount the cap (2).



- Coat the O-ring (1) on new front axle transmission with front axle transmission oil.



- Position new front axle differential (3).

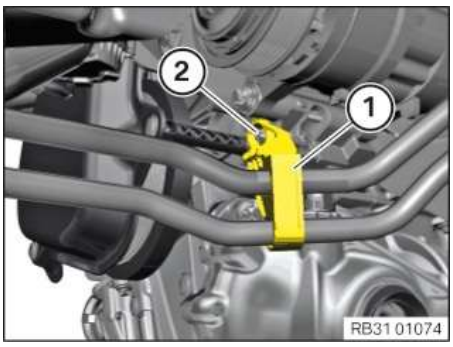
  Make sure marked screws are installed in correct installation locations:
  - Screws (1) M12x55
  - Screw (2) M12x105
- Tighten down screws (1) and (2).

Front axle final drive to engine oil pan

M12		Tightening torque	140 Nm

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43 – Secure holder of front transmission oil line



- Position the holder of the transmission oil lines (1).
- Tighten down screw (2).

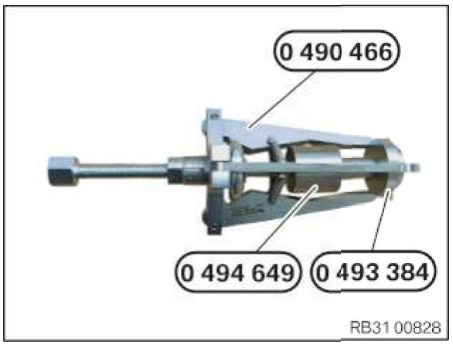
Holder for front transmission oil cooler line

M6x18		Tightening torque	12 Nm

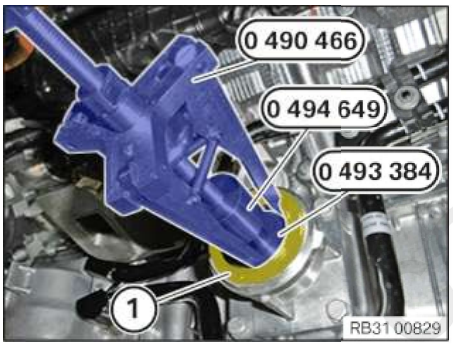
44 – Renew the radial shaft seal of the bearing support

TECHNICAL INFORMATION

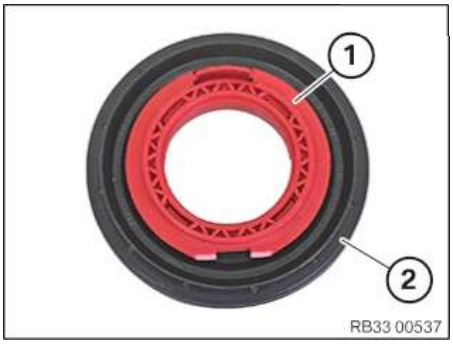
Radial shaft seal ring are equipped with an installation protection ring. The installation protection ring is used to protect the sealing lip when installing the output shaft.



- Prepare the special tool with the special tools 0 494 649 (21 2 230) (without the screw) and .



- Pull out and remove the radial shaft seal (1) with the special tools , 0 494 649 (21 2 230)and .



- Remove the installation protection ring (1) from the radial shaft seal (2).



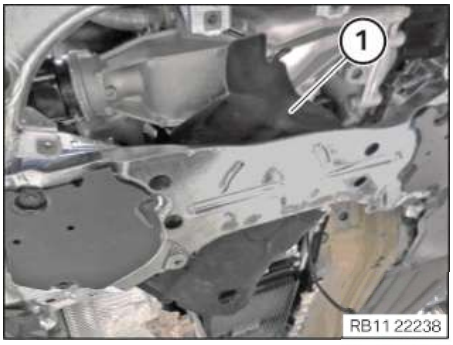
- Coat the housing sheet metal flange of the radial shaft seal with the approved front axle transmission oil.
- Drive in the radial shaft seal as far as it will go using the special tool .
- Remove special tool .

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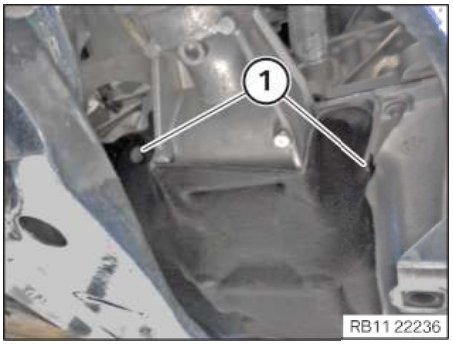


- Reinstall the installation protection ring (1) into the radial shaft seal (2).

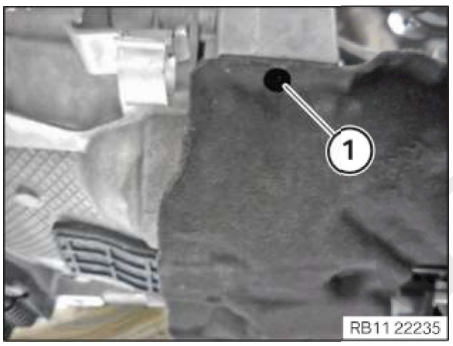
45 – Installing the acoustic cover for the oil sump



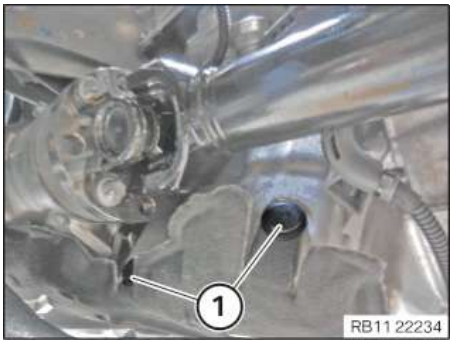
- Thread in and position the acoustic cover (1).



- Secure expanding rivet (1).

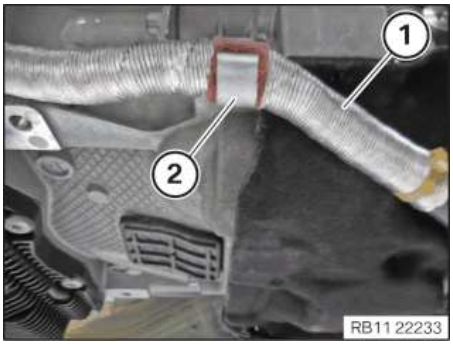


- Check the fir tree clip (1) for damage and renew if necessary.
  Parts: Fir tree clip

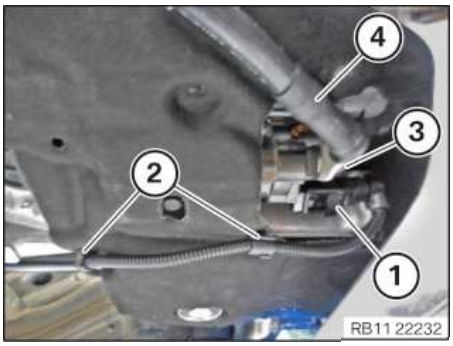


- Secure expanding rivet (1).

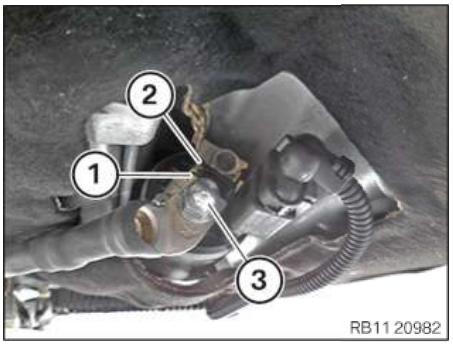
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- Secure positive battery cable (1) at the clamp (2).



- Connect connectors (1) and lock.
  The connector (1) must engage audibly.
- Secure clamps (2).
- Insert and install the positive battery cable (4).
- Tighten the nut (3) hand-tight.



CAUTION

Improper routing of the positive battery cable.

Risk of short circuits!

- Route the positive battery cable without abrasions and do not trap.

- Attach positive battery cable (1) **correctly** to anti-twist lock (2).
- Tighten nut (3).

Battery positive lead to starter

M8	Tightening torque	13,5 Nm

46 – Installing output shaft at right and left

NOTICE

Perform the operations on the left and right side.

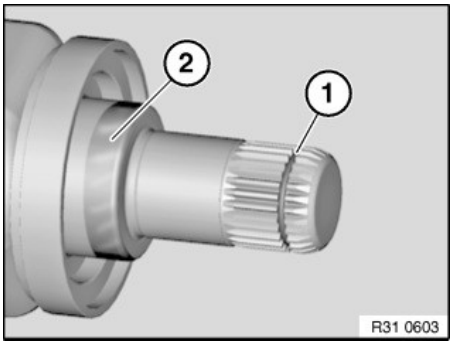
▸ **Installing the output shaft**

▹ **If reusing: Check the gearing of output shaft and renew circlip.**

TECHNICAL INFORMATION

It is essential to renew the circlip of the output shaft.

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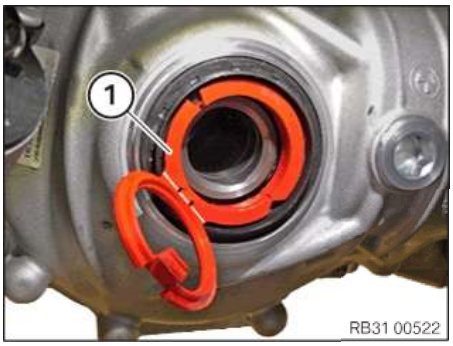
TECHNICAL INFORMATION

Extreme force being required during installation is an indication that the component is damaged or deformed. Check the component; replace if necessary.

- Check the gearing of the output shaft for damage and renew damaged parts if necessary.
- Check the gaiter for damage and replace damaged parts as needed.
- Renew the circlip (1).

  Parts: Circlip
- Coat the contact surfaces (2) using approved final drive transmission oil.

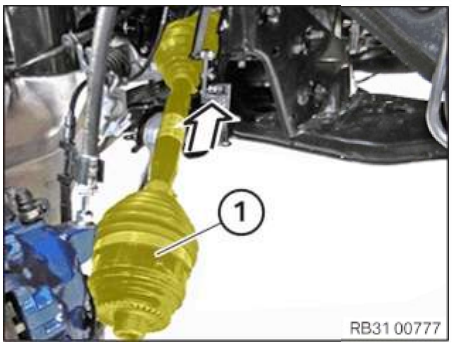
◁



NOTICE

The figure shows the procedure for the front axle differential. The procedure for the bearing support is identical.

- Fold open the assembly protection ring (1).



- Guide the output shaft (1) in direction of arrow into the front axle transmission or the bearing support.

  Do not allow the output shaft (1) to engage in the front axle transmission or the bearing support!



- Pull on the tab of the installation protection ring (1) until one of the two predetermined breaking points breaks.
- Pull out and dispose of the installation protection ring (1).
- Slide the output shaft (2) into front axle differential or bearing support up to the limit position.

  The output shaft (2) must engage noticeably and audibly.

47 – Secure the propeller shaft in front on the front axle differential



- Release special tool 2 413 317.
- Position the front propeller shaft on the front axle transmission.
- Renew screws.

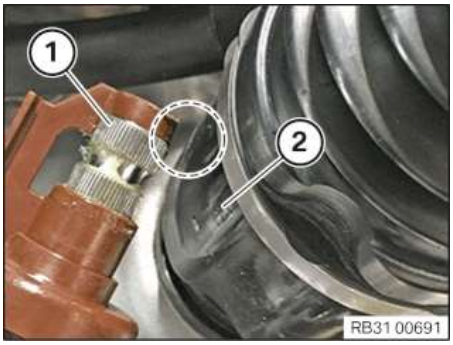
  Parts: Bolts
- Tighten screws (arrows).

Propeller shaft before the front axle differential

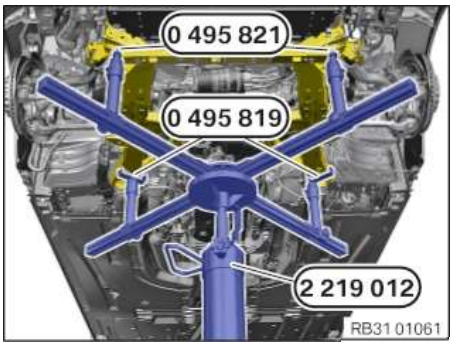
Renew screws.	Tightening torque	25 Nm
Jointing torque and angle of rotation must be observed without fail.	Angle of rotation	45 °

48 – Install front axle support

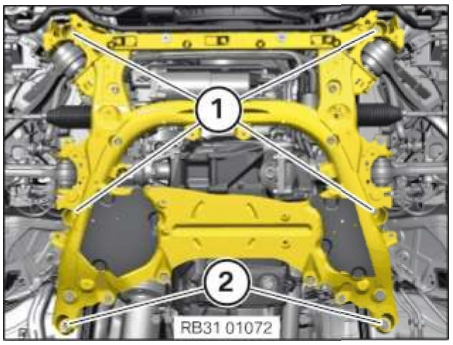
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- When lifting the front axle support, ensure sufficient distance between the steering gear (1) and the output shaft (2).



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



- Replace the screws (1).

  Parts: Bolts
- Tighten the screws (1).

Front axle support to front/centre of body

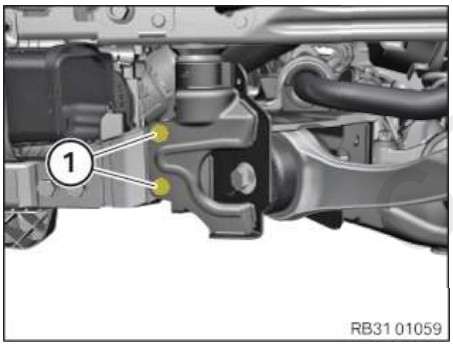
M12	Renew screws.	Jointing torque	108 Nm

- Replace the screws (2).

  Parts: Bolts
- Tighten the screws (2).

Front axle carrier to body, rear

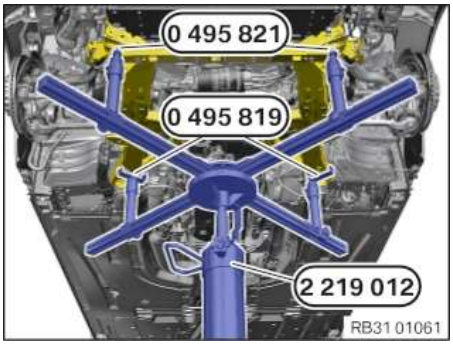
M14	Renew screws.	Tightening torque	175 Nm



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

Adapter, front axle support to front axle support

M8x70		Tightening torque	19 Nm



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

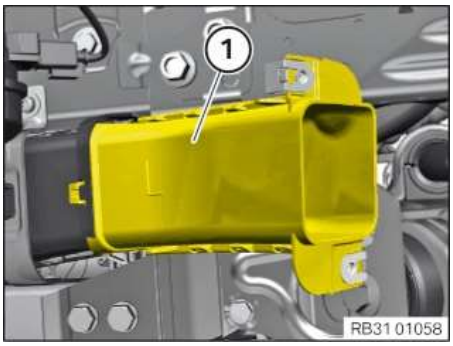
49 – Partially installing the left and right brake air duct

NOTICE

Perform the operations on the left and right side.

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▸ **Installing the brake air duct partially**



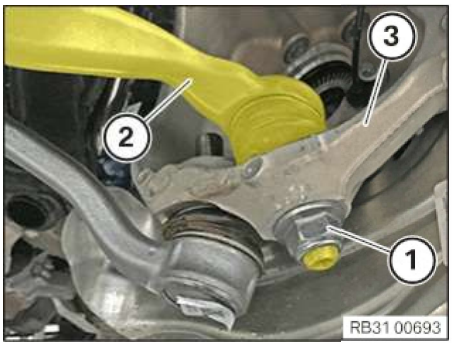
- Position and clip in air duct (1).

50 – Securing the left and right tension strut to the swivel bearing

NOTICE

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

▸ **Securing tension strut on swivel bearing**



- Position tension strut (2) on swivel bearing (3).
- Renew nut (1).

  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Tension strut to swivel bearing

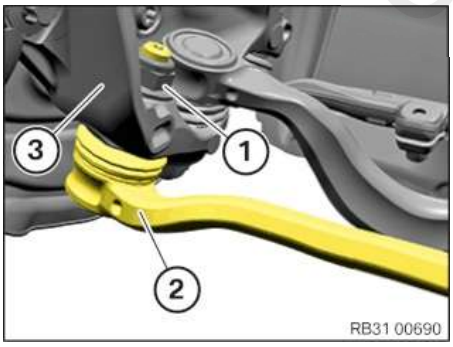
M14	Renew nut.	Tightening torque	175 Nm

51 – Secure left and right wishbone onto swivel bearing

NOTICE

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

▸ **Mounting the wishbone on the swivel bearing**



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

  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Wishbone to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

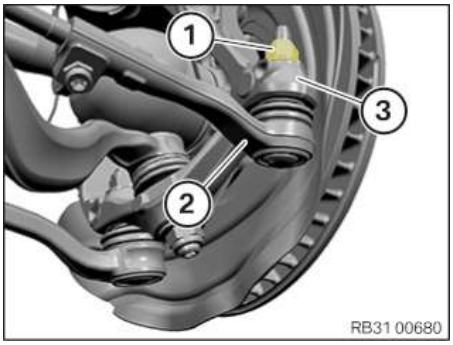
52 – Securing the track rod on the left and right to the swivel bearing

NOTICE

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

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

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

  Parts: Nut
- Tighten nut (1).

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

Track rod end to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

53 – Securing the right and left output shaft on the wheel bearing

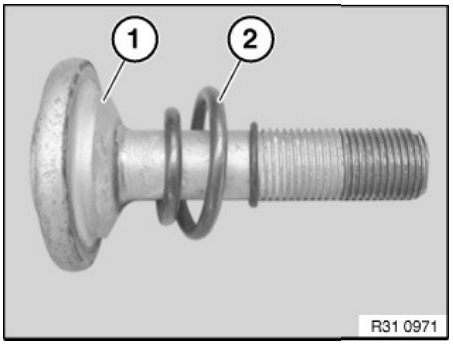
NOTICE

Perform the operations on the left and right side.

▸ **Securing the output shaft on the wheel bearing**

TECHNICAL INFORMATION

The installation note for front gearing must be observed at all times.

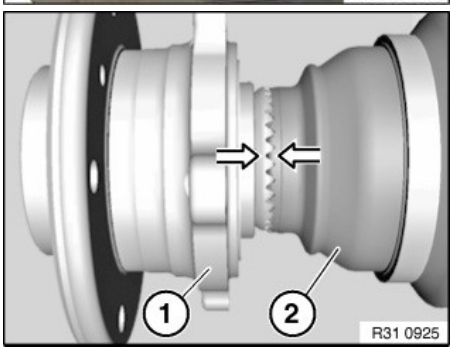


- Renew the collar bolt (2) and the compression spring (1).

  Parts: Collar bolt and compression spring
- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.



- Hand-tighten the collar bolt (1) with the compression spring.



TECHNICAL INFORMATION

The front gearing of the wheel bearing and output shaft must be installed in an interlocking position (tooth-in-tooth).

- Check whether front gearing is locked tooth in tooth (arrows) by reciprocally rotating the wheel bearing (1) and the output shaft (2).
- Verify positive locking.
- Press brake pedal.
- Tighten the collar bolt.

Output shaft to wheel bearing

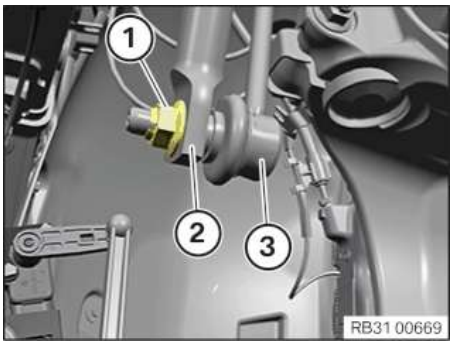
M16	Replace collar bolt and spring.	Jointing torque	210 Nm
		Angle of rotation	90 °

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

NOTICE

Perform the operations on the left and right side.



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

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

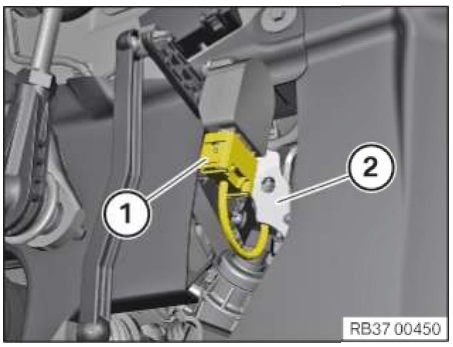
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

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

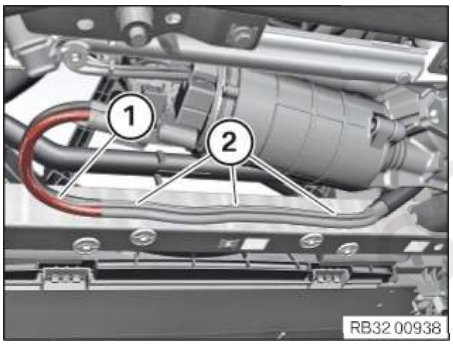
M10	Renew nut.	Tightening torque	56 Nm

55 – Attach the line connection of the ride height sensor

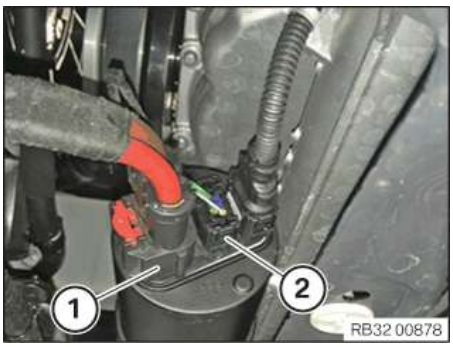


- Position the line .
- Clip in line on holder (2) .
- Connect connectors (1) and lock.

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



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



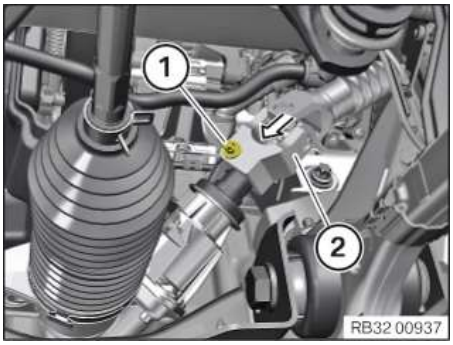
- Connect connectors (1) and (2) lock.

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

TECHNICAL INFORMATION

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

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

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

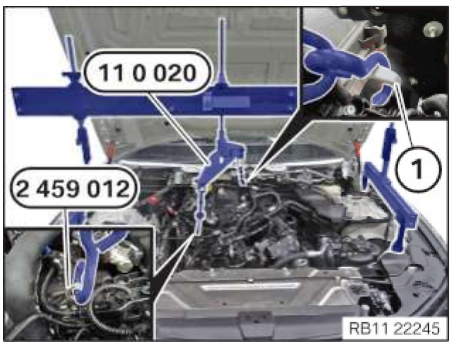
Universal joint to steering box

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

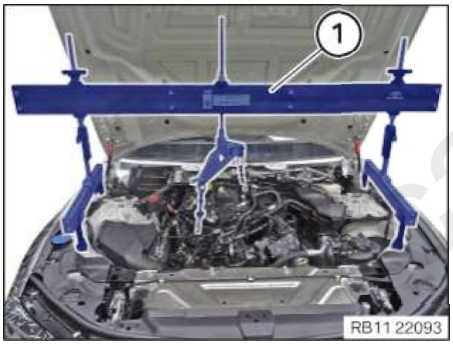
58 – Loosen the attachment of the engine in installation position



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



- Feed out special tool 0 490 567 (11 0 020) on the special tool and set aside.
- Feed out special tool 0 490 567 (11 0 020) on the engine mounting bracket (1) and set aside.



TECHNICAL INFORMATION

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

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

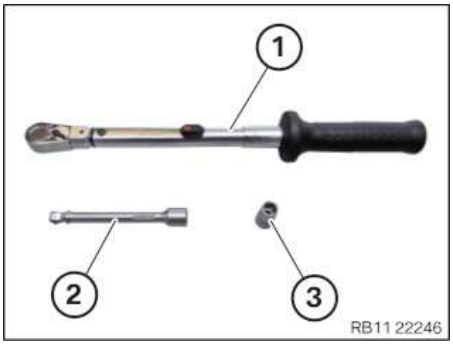


- Tighten bolt (1) of the right engine mount from the top using a standard tool.

Engine mount to engine mounting bracket

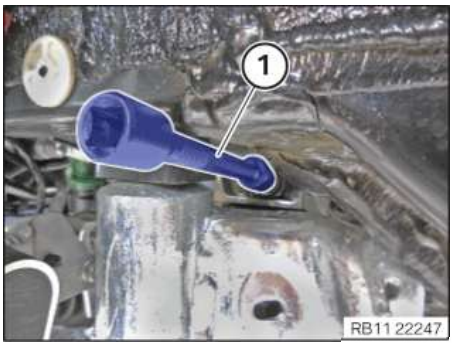
M12		Tightening torque	100 Nm

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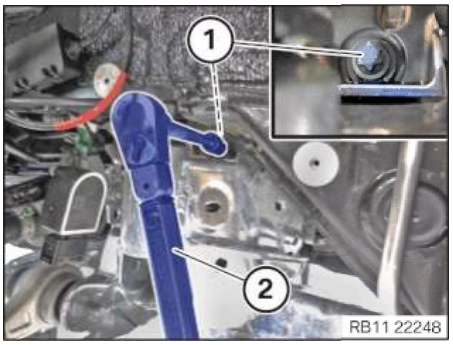


- Have all suitable tools available.

Number	Description
1	Commercial available torque spanner
2	Swivelling extension
3	External TorxE14



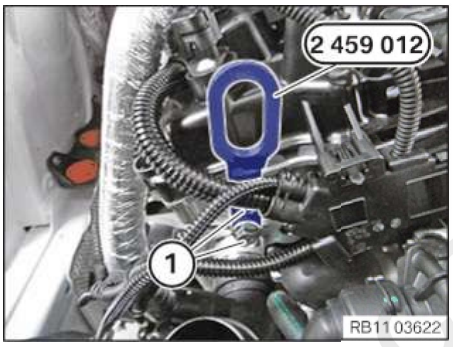
- Position suitable tools (1).



- Tighten bolt (1) of the left engine mount using a standard tool (2) sideways.

Engine mount to engine mounting bracket

M12		Tightening torque	100 Nm



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

59 – Check/add front axle transmission oil

RISK OF DAMAGE

Damage to the front axle differential.

Failure to comply with the oil specifications can result in serious damage to the front axle differential.

- Use only the approved front axle transmission oil.

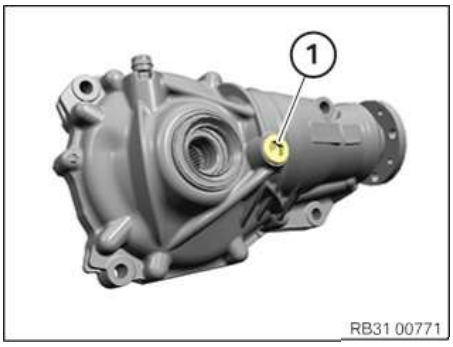
TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

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- Use special tool 0 493 337 (00 2 080) to top up the front axle transmission oil.



- Release the screw plug (1).
- Check front axle differential oil level.
- If necessary, top up the front axle transmission oil to the lower edge of the opening for the screw plug (1).

Transmission oil

Technically suitable front axle transmission oils	

Main group 31

- Renew the screw plug (1).

  Parts: Plug

- Tighten the screw plug (1).

Screw plug to front axle transmission

M22	Renew screw plug with O-ring.	Tightening torque	60 Nm

60 – Install the rear section of the front wheel arch cover on the left and right

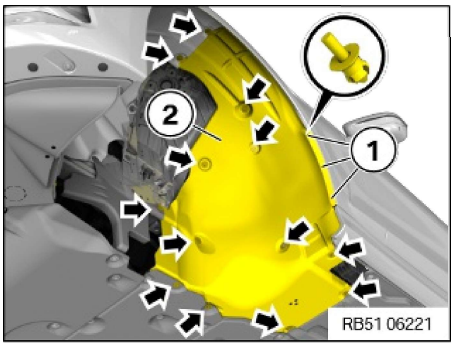
NOTICE

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

▸ **Install the rear section of the front wheel arch cover**

NOTICE

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



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

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

- Secure expanding rivet (1).

61 – Installing the front section of the wheel arch cover on the front left and right

NOTICE

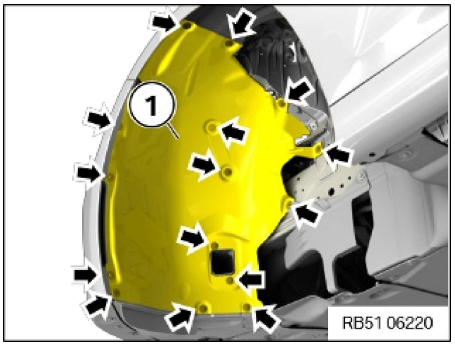
Perform the operations on the left and right side.

▸ **Install the front section of the front wheel arch cover**

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NOTICE

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



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

Wheel arch trim panel, front

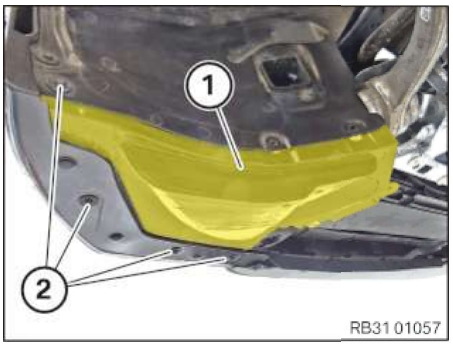
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

62 – Installing the bottom left and right wheel arch cover

NOTICE

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

▸ **Installing the bottom wheel arch cover**



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

Cover, front bottom on side

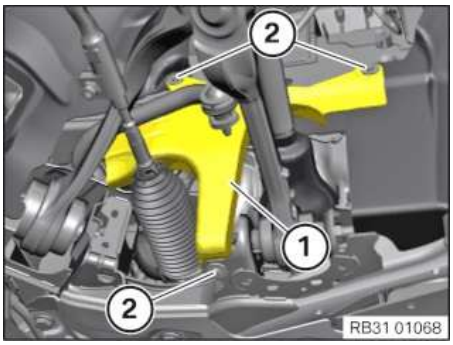
Hexagon screw for thermoplastic		Tightening torque	3 Nm

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

NOTICE

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

▸ **Install the cover of the steering assembly**



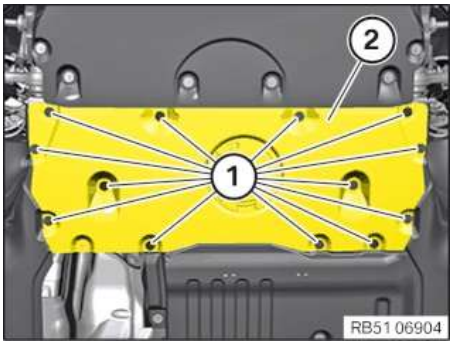
- Position the cover (1).
- Tighten the screws (2).

Cover, steering unit

Screw		Tightening torque	3 Nm

64 – Installing the centre underbody protection

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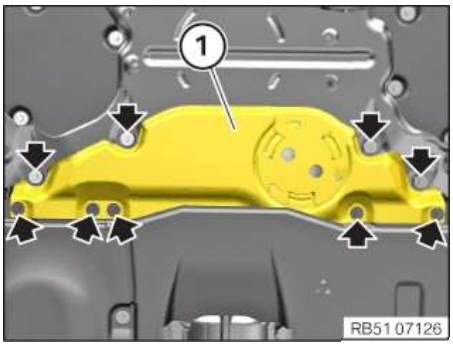
- **Version with rear-wheel drive:**

  Position central underbody protection (2).

  Tighten the screws (1).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



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

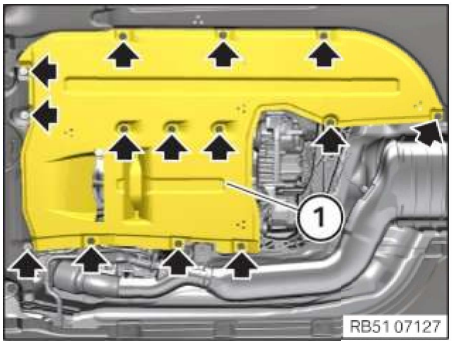
  Guide in and install the centre of underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

65 – Installing underbody protection at rear



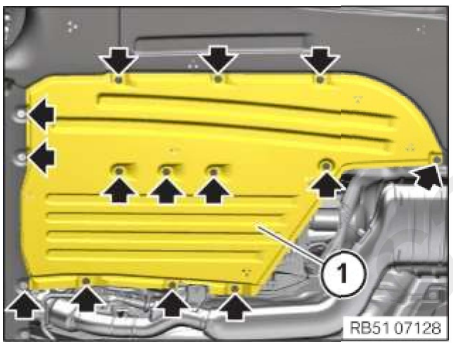
- **Version 1:**

  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm



- **Version 2:**

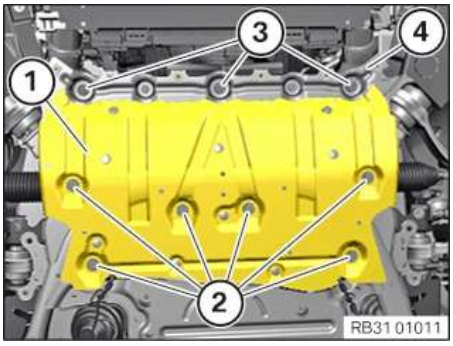
  Insert and install the rear underbody protection (1).

  Tighten screws (arrows).

Underbody protection

Hexagon screw		Tightening torque	3 Nm

66 – Installing the stiffening plate



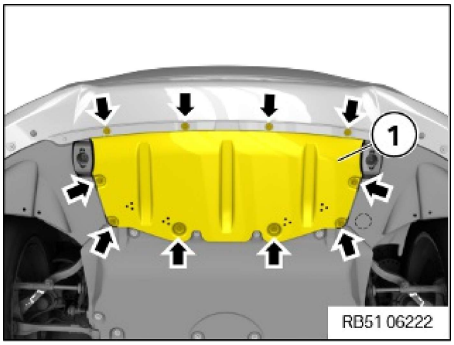
- Position stiffening plate (1).
- Screw screws (2) in.
- Position holder of underride protection (4).
- Screw screws (3) in.
- Tighten down screws (2) and (3).

Stiffening plate to front axle support

M10		Tightening torque	56 Nm

67 – Installing the front underbody protection

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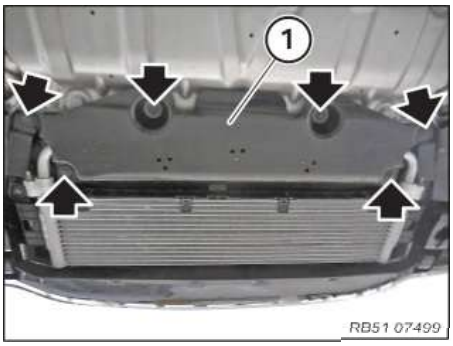
- **Version 1:**

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

  Tighten screws (arrows).

Underbody protection front

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



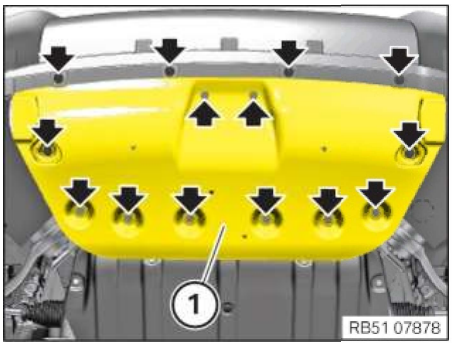
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

68 – Installing both front wheels

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

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

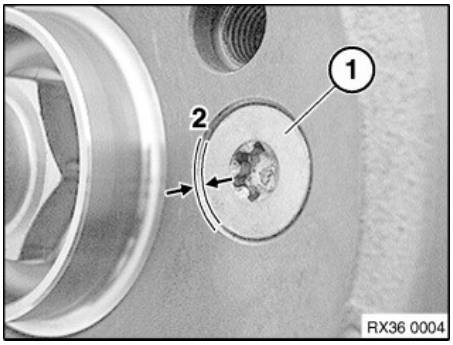
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).

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

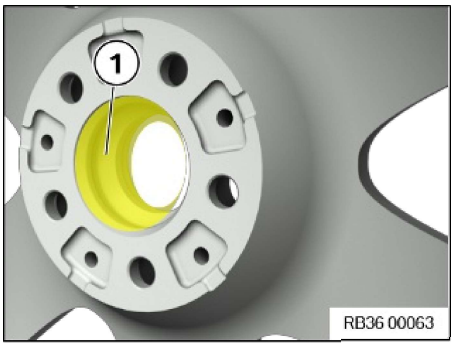
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

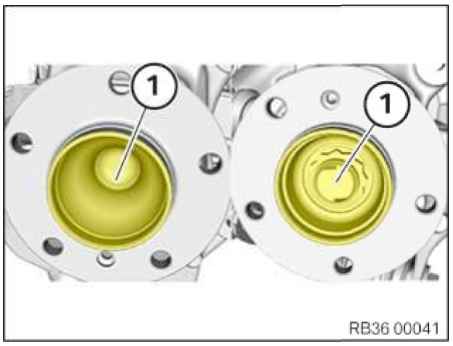
M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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



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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

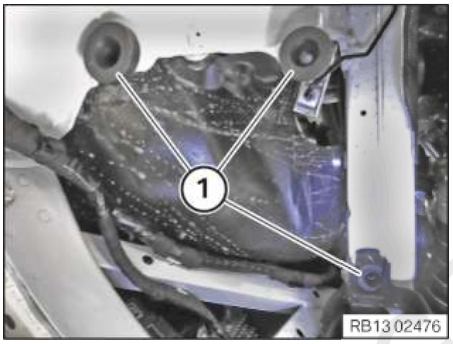
- Renew corroded wheel bolts.

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

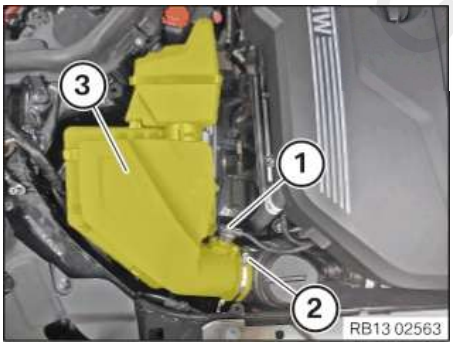
Wheel bolts

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

69 – Installing intake silencer housing



- Check the rubber mount (1) for correct fit.



- Feed the intake filter housing (3) in and engage it in the rubber mounts.
- Tighten clamp (2).

Clean air pipe to upper section of intake filter housing

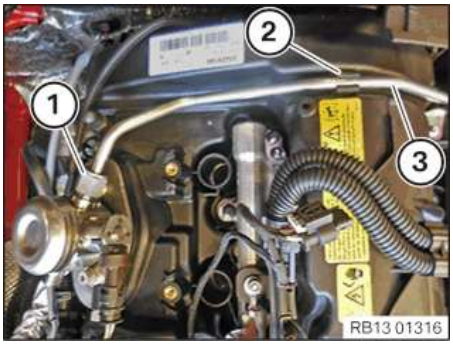
Clamp		Tightening torque	3 Nm

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

70 – Installing fuel delivery line

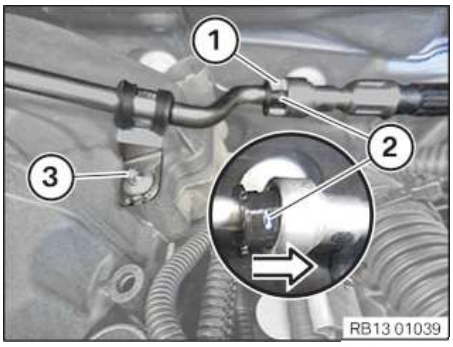
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- Guide the fuel delivery line (3) in and install.
- Install rubber damper (2).
- Check the rubber damper (2) for the correct fit.
- Tighten the union nut (1) hand-tight.
- Tighten union nut (1).

Fuel delivery line to high pressure pump

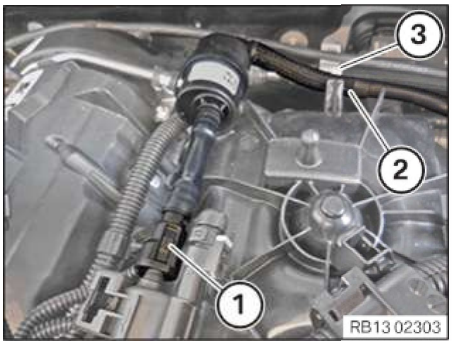
M14		Tightening torque	31 Nm



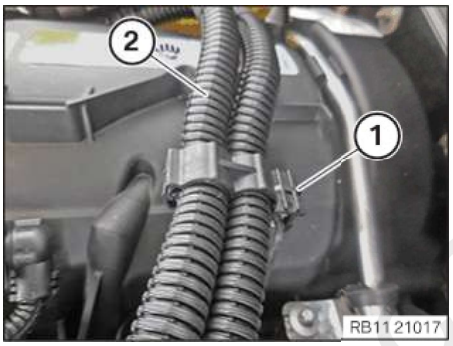
- Slide in and lock the fuel feed line in the direction of the arrow in the snap fastener (2).
  The fuel feed line must be audibly engage in the snap fastener (2).
- Secure clamps (1).
- Tighten down screw (3).

Fuel line to cylinder head cover

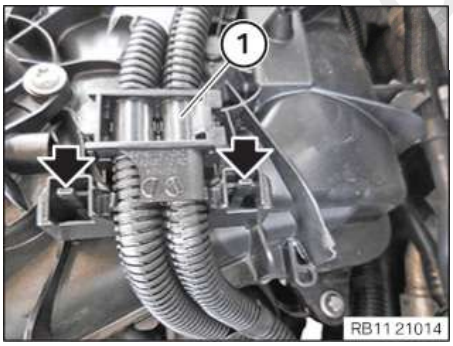
6x18		Tightening torque	6,5 Nm



- Insert and install the tank ventilation line (2).
- Lock (1) must engage audibly.
- Secure the tank ventilation line (2) to the clamp (3).



- Insert and install wiring harness section (2) for injectors and ignition coils.
- Secure clamps (1).



- Insert and install wiring harness section (1) for injectors and ignition coils.
- The locks (arrows) must engage audibly.

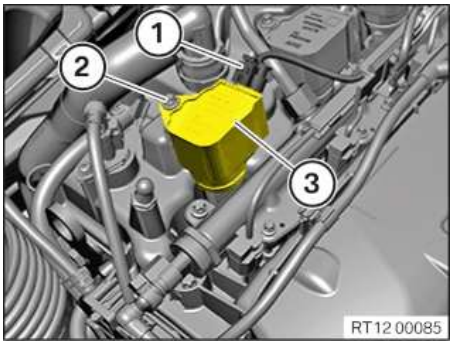
71 – Install all ignition coils

NOTICE

The description is for one component only. The procedure is identical for all further components.

▸ **Install ignition coil.**

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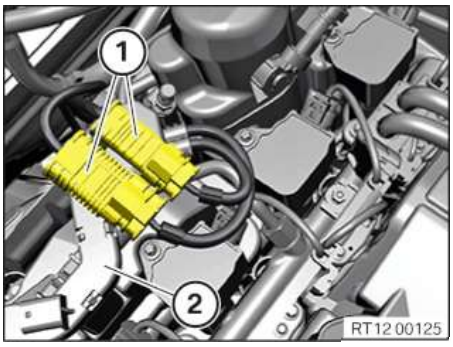
- Install ignition coil (3).
- Tighten down screw (2).

Ignition coil

Screw		Tightening torque	8 Nm

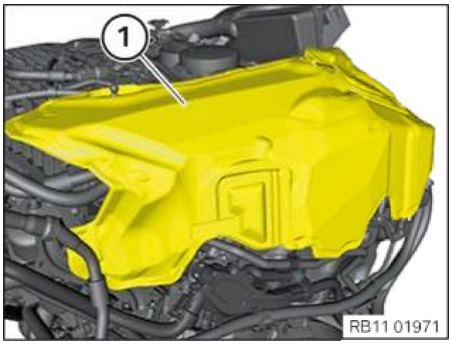
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Connect the connector (1) of the front oxygen sensor and the monitoring oxygen sensor on the cable shaft (2).

72 – Installing acoustic cover at rear

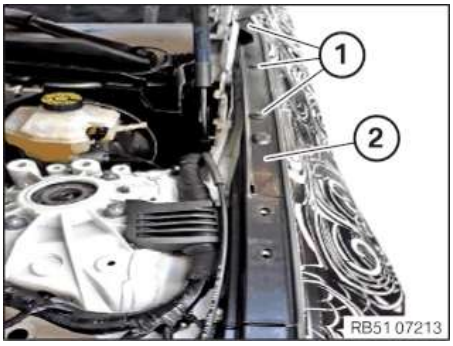


- Make sure the acoustic cover (1) is correctly positioned on the rear side of the engine.



- Install the acoustic cover (1) from the top and clip it in into the marked areas.

73 – Installation of side panel sealing.



NOTICE

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

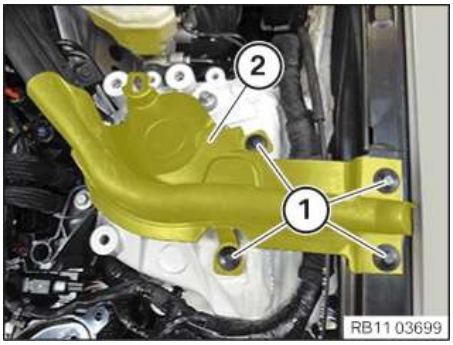
- Guide the sealing (2) in and install it.
- Mount the expanding rivets (1).

74 – Install side bonnet seals

NOTICE

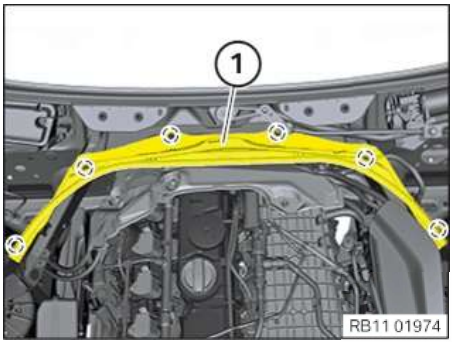
Perform the operations on the left and right side.

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

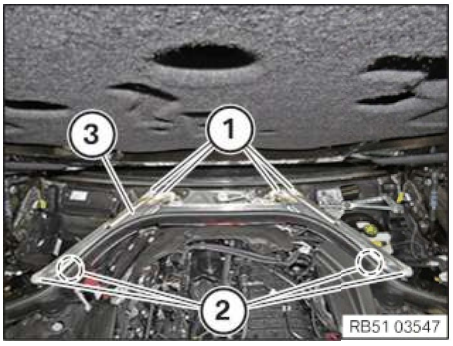
75 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

Bulkhead upper part to bottom bulkhead

		Tightening torque	3 Nm



- **If installed:** Install tension strut on spring strut dome.
- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).
  Parts: Bolts
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

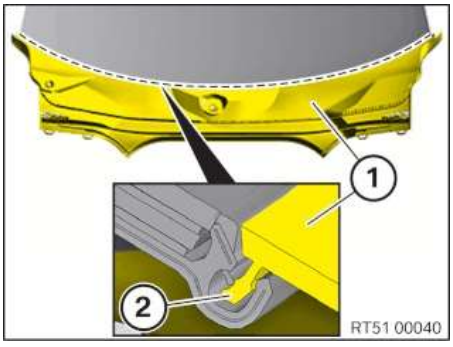
76 – Installing cowl panel cover

RISK OF DAMAGE

Damage caused by water ingress into the vehicle.

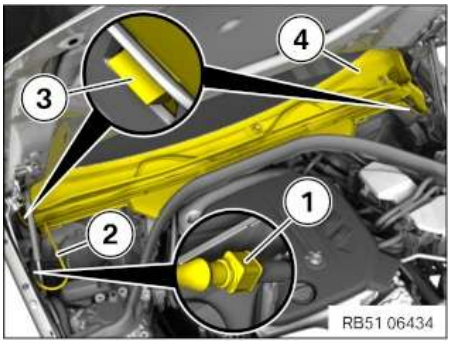
Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

- Ensure correct installation of the components.
- Only use undamaged components.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.

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- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

77 – Installing both wiper arms

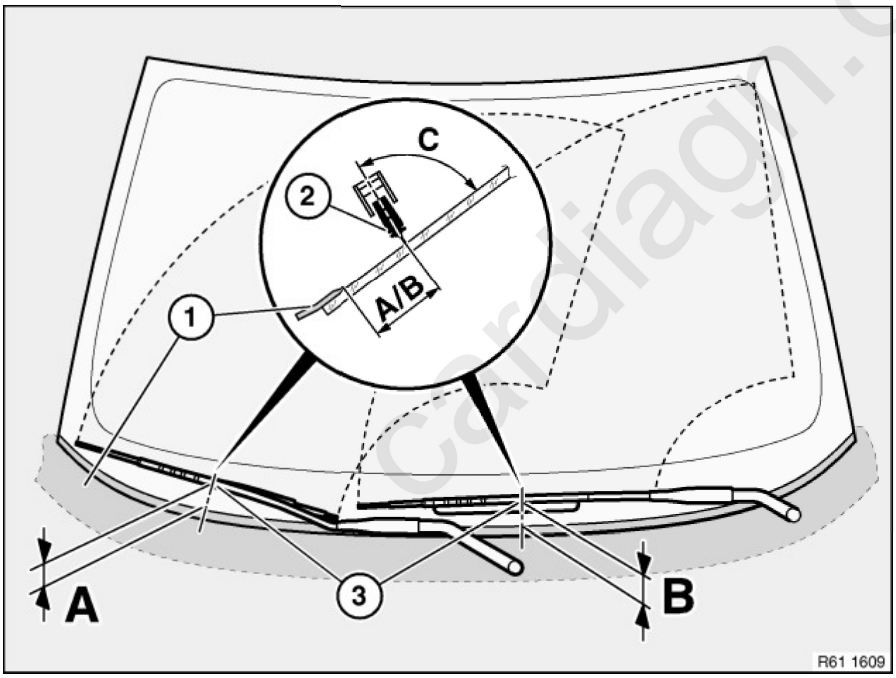
NOTICE

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

▸ **Install the wiper arm**

TECHNICAL INFORMATION

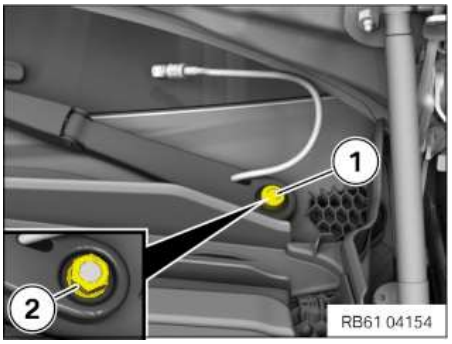
The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.



- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm



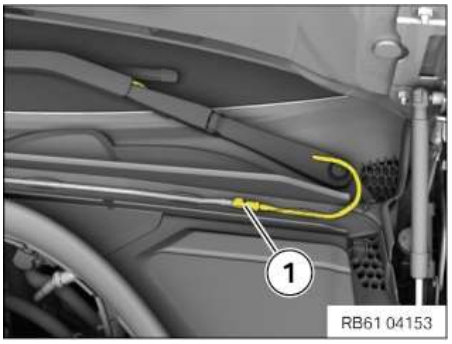
- Tighten nut (2).

Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

- Connect the protective cap (1).

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- Insert windscreen wash hose (1) into the cowl and connect at the separating point.

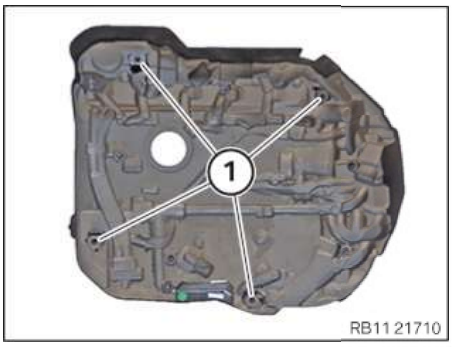
78 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover.

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

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



- Check the rubber mount (1) for correct fit in the acoustic cover.



- Install acoustic cover (1) and fix in the rubber mounts (marks).

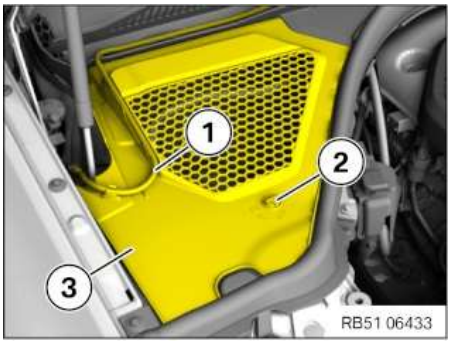
79 – Install the seal for the bonnet



- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

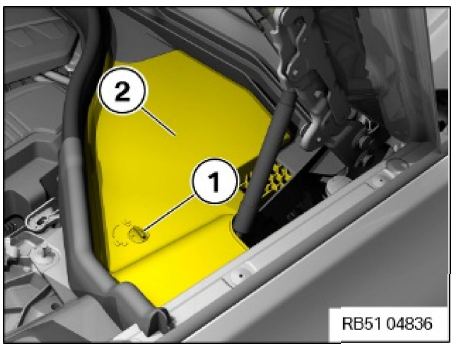
80 – Install the rear right engine compartment cover

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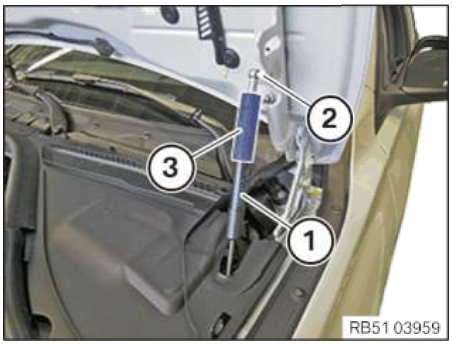
- Position the cover of the engine compartment on the rear right (3).
- Close lock (2).
- Insert washer fluid hose (1) into the guides.

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

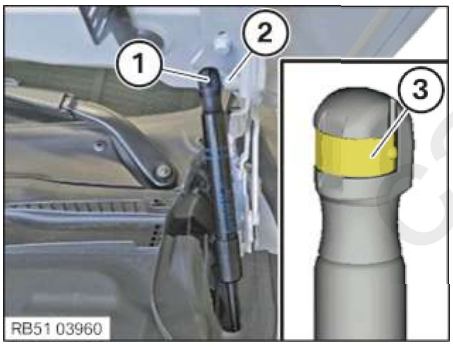


- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

82 – Take bonnet out of the service position



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



CAUTION

Shutting bonnet or tailgate.

Danger of injury!

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

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

83 – Disconnecting all battery earth leads



- See additional information.

Additional Information

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Overview of Tightening Torques

Special tool to cylinder head			Used in step 25
M8		Tightening torque	21,5 Nm

Front axle final drive to engine oil pan			Used in step 42
M12		Tightening torque	140 Nm

Holder for front transmission oil cooler line			Used in step 43
M6x18		Tightening torque	12 Nm

Battery positive lead to starter			Used in step 45
M8		Tightening torque	13,5 Nm

Propeller shaft before the front axle differential			Used in step 47
Renew screws. Jointing torque and angle of rotation must be observed without fail.		Tightening torque Angle of rotation	25 Nm 45 °

Front axle support to front/centre of body			Used in step 48
M12	Renew screws.	Jointing torque	108 Nm

Front axle carrier to body, rear			Used in step 48
M14	Renew screws.	Tightening torque	175 Nm

Adapter, front axle support to front axle support			Used in step 48
M8x70		Tightening torque	19 Nm

Tension strut to swivel bearing			Used in step 50
M14	Renew nut.	Tightening torque	175 Nm

Wishbone to swivel bearing			Used in step 51
M14	Renew nut.	Tightening torque	175 Nm

Track rod end to swivel bearing			Used in step 52
M14	Renew nut.	Tightening torque	175 Nm

Output shaft to wheel bearing			Used in step 53
M16	Replace collar bolt and spring.	Jointing torque Angle of rotation	210 Nm 90 °

Front anti-roll bar link to anti-roll bar/spring strut			Used in step 54
M10	Renew nut.	Tightening torque	56 Nm

Universal joint to steering box			Used in step 57
M8	Recut screw thread. Renew clamping bolt. No retorquing permitted!	Tightening torque	28 Nm

Engine mount to engine mounting bracket			Used in step 58
M12		Tightening torque	100 Nm

Screw plug to front axle transmission			Used in step 59
M22	Renew screw plug with O-ring.	Tightening torque	60 Nm

Wheel arch trim panel, front			Used in step 6061
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

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Cover, front bottom on side — Used in step 62

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Cover, steering unit — Used in step 63

Screw		Tightening torque	3 Nm

Underbody protection — Used in step 6465

Hexagon screw		Tightening torque	3 Nm

Stiffening plate to front axle support — Used in step 66

M10		Tightening torque	56 Nm

Underbody protection front — Used in step 67

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

Brake disc to front wheel hub — Used in step 68

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 68

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 68

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

Clean air pipe to upper section of intake filter housing — Used in step 69

Clamp		Tightening torque	3 Nm

Fuel delivery line to high pressure pump — Used in step 70

M14		Tightening torque	31 Nm

Fuel line to cylinder head cover — Used in step 70

6x18		Tightening torque	6,5 Nm

Ignition coil — Used in step 71

Screw		Tightening torque	8 Nm

Bulkhead upper part to bottom bulkhead — Used in step 75

		Tightening torque	3 Nm

Tension strut on bulkhead — Used in step 75

M10x25 screw		Tightening torque	56 Nm

Tension strut to spring strut dome — Used in step 75

Screw	Renew screws.	Jointing torque Angle of rotation	56 Nm 90 °

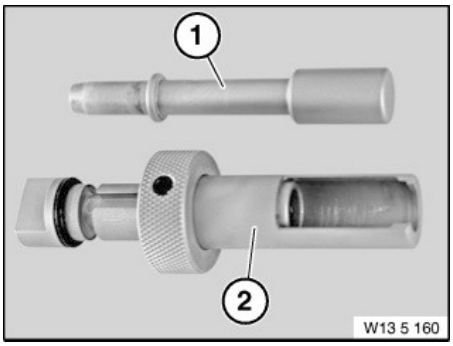
Windscreen wiper arm — Used in step 77

Combination hexagon nut		Tightening torque	35 Nm

Overview of Special Tools

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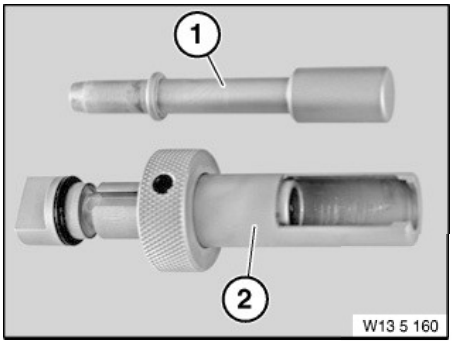
0 496 567 (13 5 161) Fastener



Common Used in step 14

Usage	(Cap (2 piece)) For sealing the quick connectors Deletion, only available via tool set
Included in the tool or work	0 496 565
Storage location	
Replaced by	
In connection with	
SI-Number	

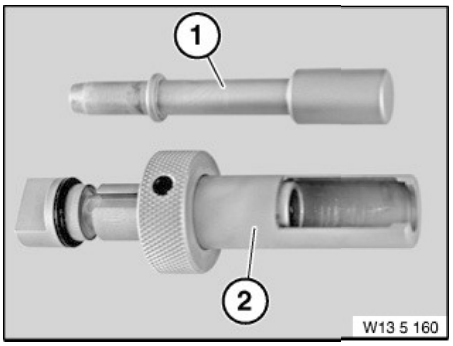
0 496 568 (13 5 162) Fastener



Common Used in step 14

Usage	(Cap (2 x)) To close off the fuel lines. Discontinued, can only be ordered using complete tool
Included in the tool or work	0 496 565
Storage location	
Replaced by	
In connection with	
SI-Number	

0 496 565 (13 5 160) Fastener



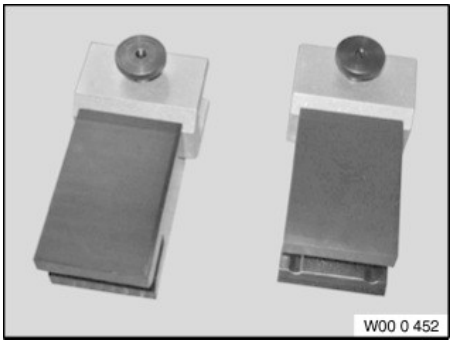
Common Used in step 14

Usage	(Caps (2x)) To close off the fuel lines when removing and installing the engine.
Included in the tool or work	
Storage location	B26
Replaced by	
In connection with	
SI-Number	01 22 08 (498)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 496 567 (13 5 161)		**Fastener** (Cap (2 piece)) For sealing the quick connectors Deletion, only available via tool set	
2	0 496 568 (13 5 162)		**Fastener** (Cap (2 x)) To close off the fuel lines. Discontinued, can only be ordered using complete tool	

0 495 850 (00 0 452) Upholstery

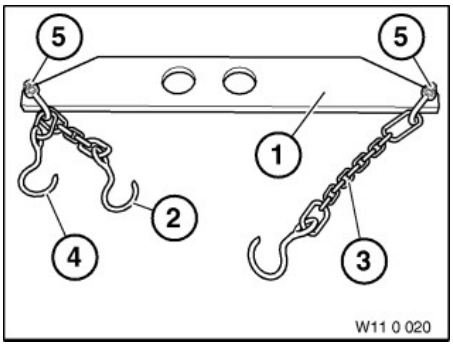


Common Used in step 25

Usage	(Pads (2 x)) Series: E70 Replaced by 00 6 042
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 22 06 (307)

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0 490 567 (11 0 020) Lifting gear



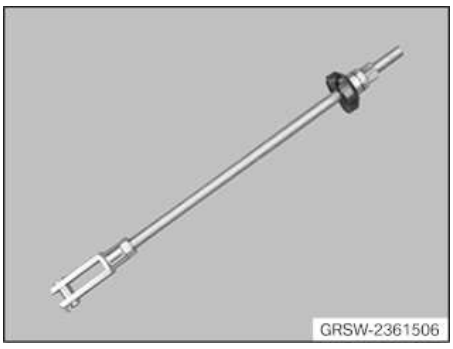
Common Used in step 2558

Usage	For removing and installing the engines. 08/2011 only available as a complete set. Delivered with TÜV inspection certificate and operating instructions. No delivery of separate parts.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 13 94 (888)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
5	0 490 572 (11 0 029)		**Shackle** (Shackle) 2 pieces As of 08/2011, only available as a complete set via 11 0 020 = 0490567. Delivered with TÜV inspection certificate and operating instructions.	
1	0 490 568 (11 0 021)		**Lifting gear** (Cross member) As of 08/2011, only available as a complete set via 11 0 020 = 0490567. Delivered with TÜV inspection certificate and operating instructions.	
2	0 490 569 (11 0 022)		**Chain** (Chain) As of 08/2011, only available as a complete set via 11 0 020 = 0490567. Delivered with TÜV inspection certificate and operating instructions.	
3	0 490 570 (11 0 023)		**Chain** (Chain) Version: long As of 08/2011, only available as a complete set via 11 0 020 = 0490567. Delivered with TÜV inspection certificate and operating instructions.	
4	0 490 571 (11 0 024)		**Chain** (Chain) Version: short As of 08/2011, only available as a complete set via 11 0 020 = 0490567. Delivered with TÜV inspection certificate and operating instructions.	

2 361 506 (00 6 103) Spindle



Common Used in step 2558

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

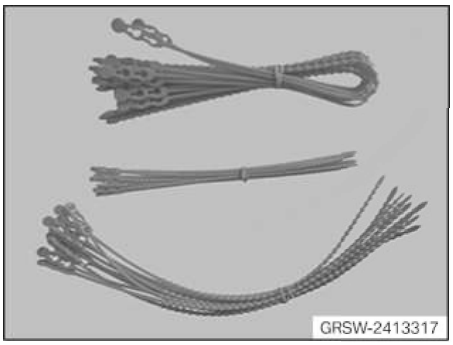
cardiagn.com

2 219 012 Hydraulic lifter



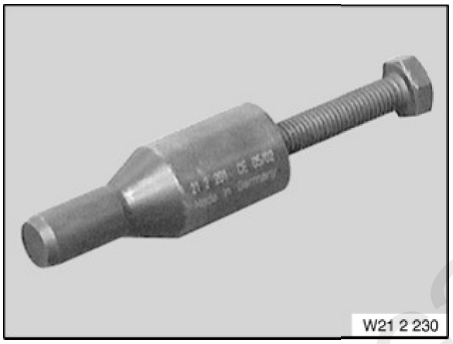
Common	Used in step 353648
Usage	For raising and lowering various vehicle components.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 05 90 (207)

2 413 317 Cable strap



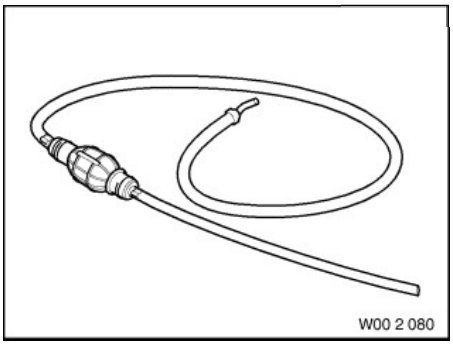
Common	Used in step 3747
Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

0 494 649 (21 2 230) Mandrel



Common	Used in step 44
Usage	(clutch centring drift) With screw M10 (G transmission)
Included in the tool or work	
Storage location	C45
Replaced by	
In connection with	
SI-Number	01 03 03 (960)

0 493 337 (00 2 080) Pump



Common	Used in step 59
Usage	(Hand pump) For lifetime oil filling
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 01 98 (294)

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2 344 011 Tool

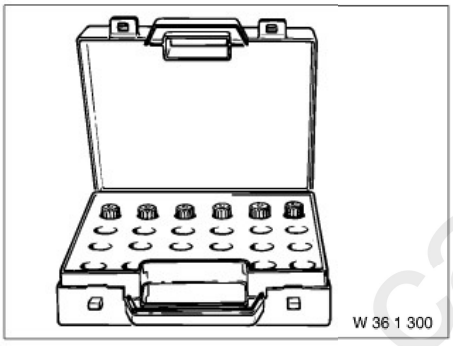


Common	Used in step 68
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

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Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 16
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 16
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 16
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



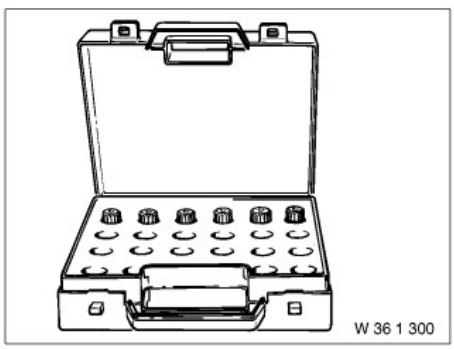
Common	Used in step 16
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



Common	Used in step 16
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 16
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	

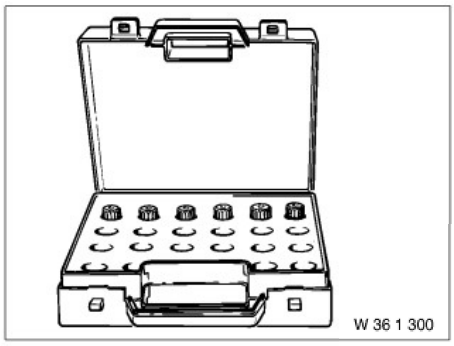
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0 495 229 (36 1 332) Wheel stud



Common	Used in step 16
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



Common	Used in step 16
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	

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 77
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions	Used in step
61 20 900 Disconnecting and connecting battery earth lead	183
61 20 900 Disconnecting and connecting battery earth lead	183
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61 20 900 Disconnecting and connecting battery earth lead	183
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	183
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	183
61 20 900 Disconnecting and connecting battery earth lead	183
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	183
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	183
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	183
61 20 900 Disconnecting and connecting battery earth lead	183
61 20 900 Disconnecting and connecting battery earth lead	183
61 20 900 Disconnecting and connecting battery earth lead	183
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61 35 ... Notes on ESD protection (Electro Static Discharge)	13
00 .. ... Raising the vehicle using a vehicle hoist	

Operating materials	**Used in step**
Main group 31	59

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

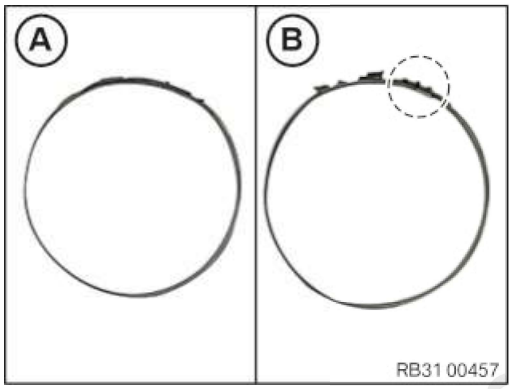
Special tools required:

- 31 5 200
- 2 413 949



Important!

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

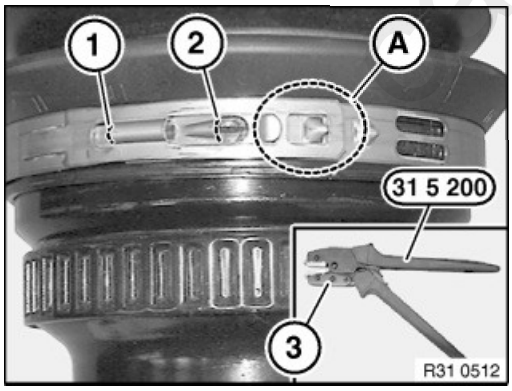


Depending on the design of the Low Profile band clamps, a different special tool (pliers) is needed for installation.

Identify band clamp and find required special tool.

Band clamp type A = pliers 31 5 200

Band clamp type B = pliers 2 413 949

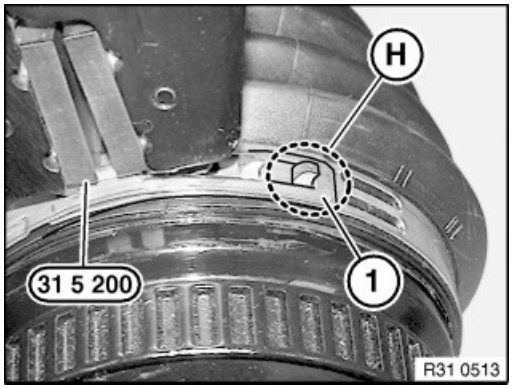


Installation (type A):

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 gaiter 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 gaiter.

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



Check and if necessary correct positions of gaiter 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.

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31 60 003 Removing and installing/replacing left output shaft

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.

PRELIMINARY WORK

1 – Removing the front left wheel

▸ **Removing the wheel**



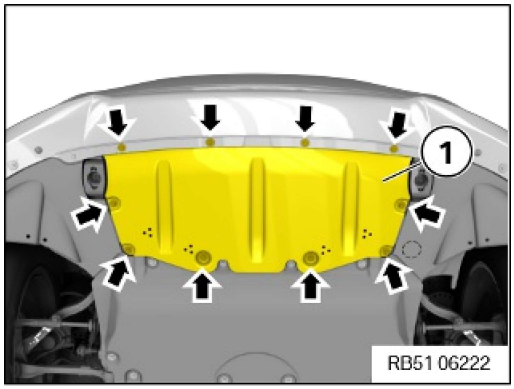
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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



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

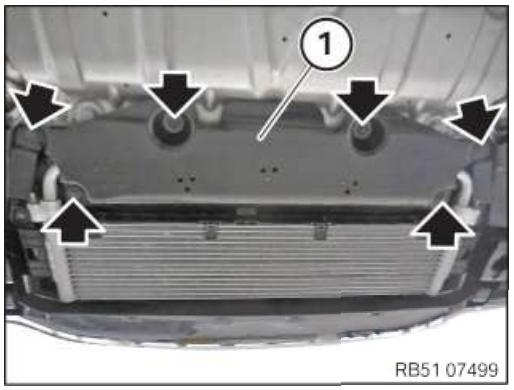
2 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

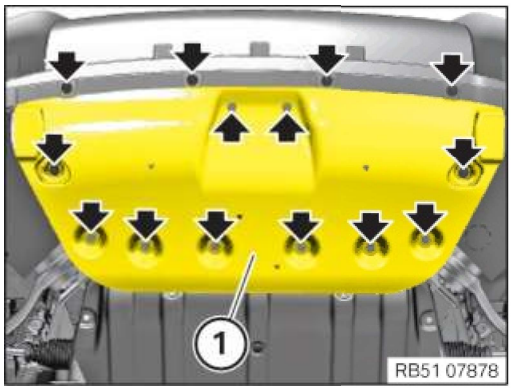
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

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



- **Version 3:**

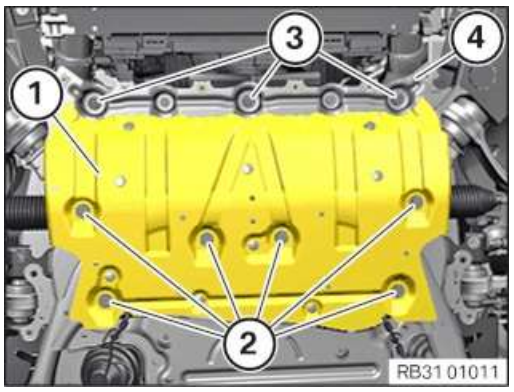
  Remove screws (arrows).

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

3 – Removing the stiffening plate

TECHNICAL INFORMATION

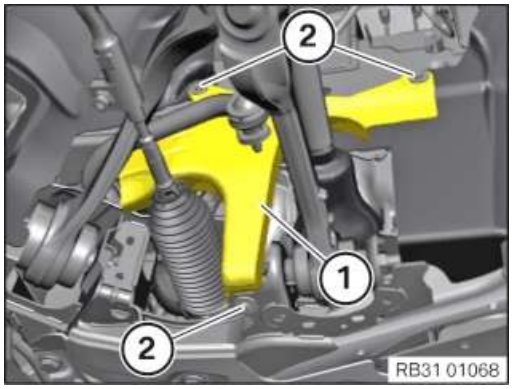
Driving without stiffening plate is not permissible.



- Loosen screws (3).
- Remove the holder of the underride protection (4).
- Loosen screws (2).
- Remove stiffening plate (1).

4 – Remove the cover of the steering assembly

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

5 – Loosen the output shaft from the wheel bearing

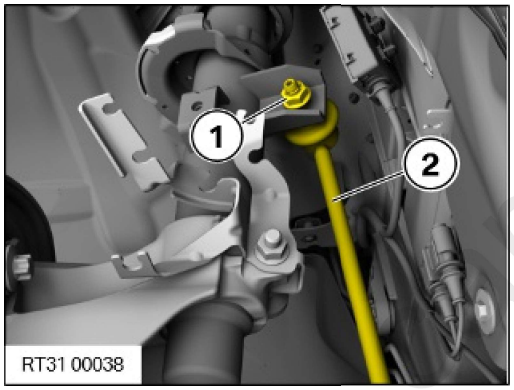


- Press brake pedal.
- Loosen the collar bolt (1).

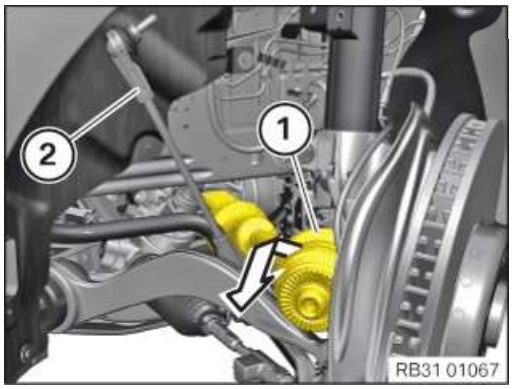
Note: Do not leave the output shaft hanging on the joint (or tie up output shaft if applicable).

MAIN WORK

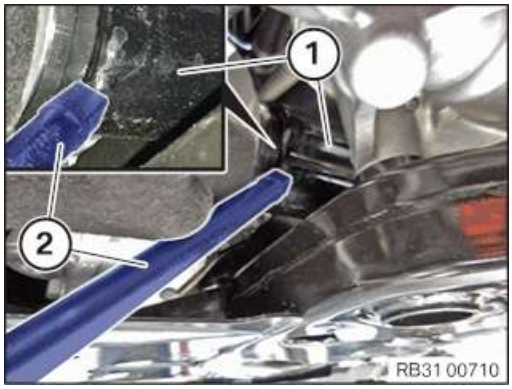
6 – Remove left output shaft



- Loosen the nut (1), if necessary, counter-hold the Torx socket.
- Release the anti-roll bar link (2) from the spring strut.



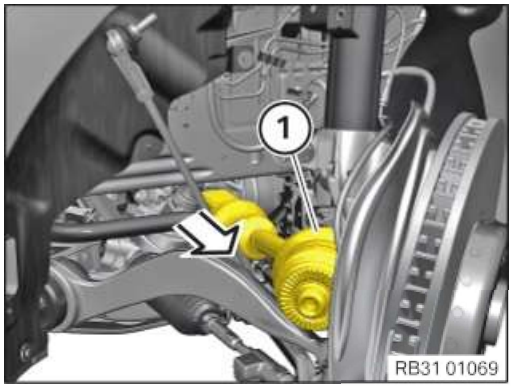
- Turn steering wheel to left.
- Set anti-roll bar link (2) aside.
- Guide the output shaft (1) out of the swivel bearing.



TECHNICAL INFORMATION

Secure component against falling.

- Position aluminium drift (2) at the output shaft (1).
- Knock out the output shaft (1) from the front axle transmission with an aluminium drift (2).



- Remove the output shaft (1)in the direction of the arrow.

7 – Renew the radial shaft seal

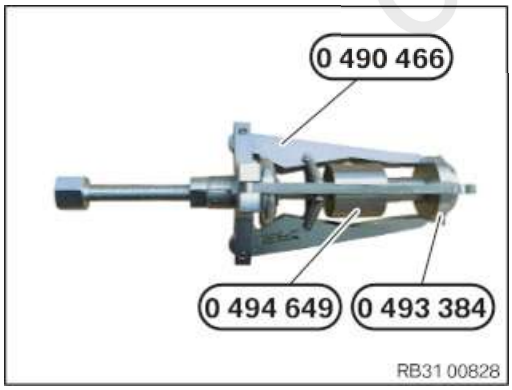
TECHNICAL INFORMATION

Radial shaft seal ring are equipped with an installation protection ring. The installation protection ring is used to protect the sealing lip when installing the output shaft.

NOTICE

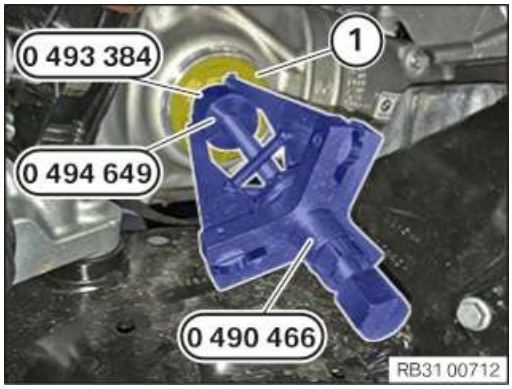
The figure shows the procedure for the front axle differential. The procedure for the bearing support is identical.

▸ **Removing the radial shaft seal**



- Prepare the special tool with the special tools 0 494 649 (21 2 230) (without the screw) and .

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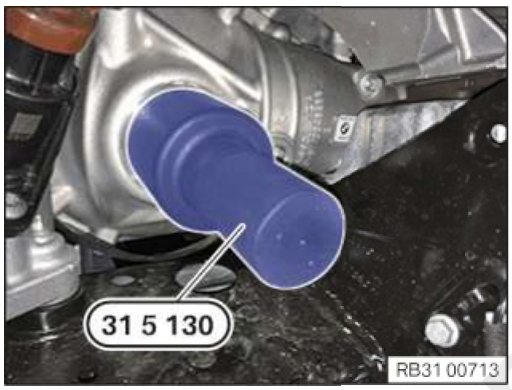


- Pull out and remove the radial shaft seal (1) with the special tools , 0 494 649 (21 2 230)and .



- Remove the installation protection ring (1) from the radial shaft seal (2).

▸ **Install the radial shaft seal**



- Coat the housing sheet metal flange of the radial shaft seal with the approved front axle transmission oil.
- Drive in the radial shaft seal up to the limit position using special tool .
- Remove special tool .



- Reinstall the installation protection ring (1) into the radial shaft seal (2).

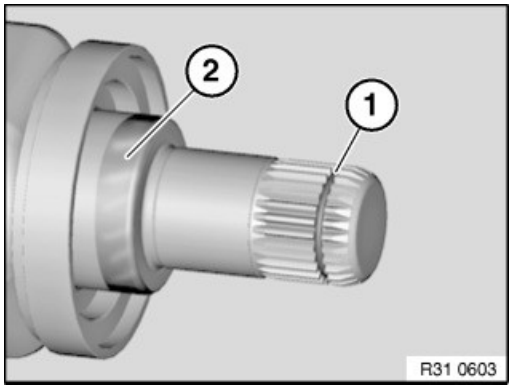
8 – Installing the output shaft

▸ **If reusing: Check the gearing of output shaft and renew circlip.**

TECHNICAL INFORMATION

It is essential to renew the circlip of the output shaft.

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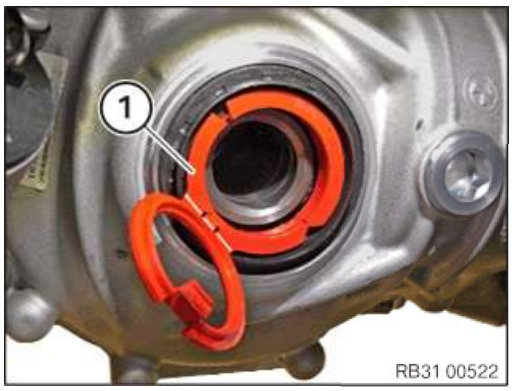


TECHNICAL INFORMATION

Extreme force being required during installation is an indication that the component is damaged or deformed. Check the component; replace if necessary.

- Check the gearing of the output shaft for damage and renew damaged parts if necessary.
- Check the gaiter for damage and replace damaged parts as needed.
- Renew the circlip (1).

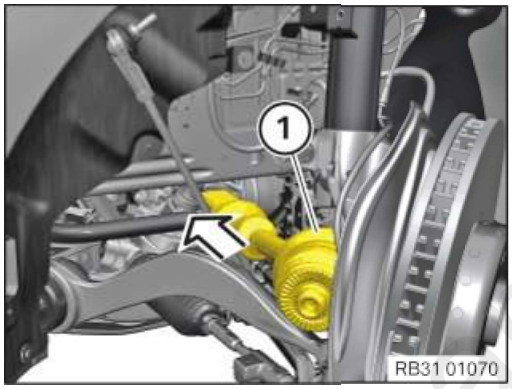
  Parts: Circlip
- Coat the contact surfaces (2) using approved final drive transmission oil.



NOTICE

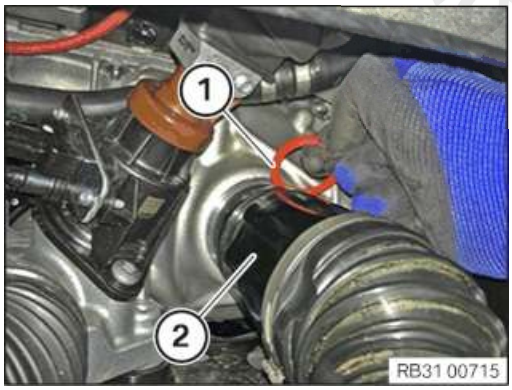
The figure shows the procedure for the front axle differential. The procedure for the bearing support is identical.

- Fold open the assembly protection ring (1).



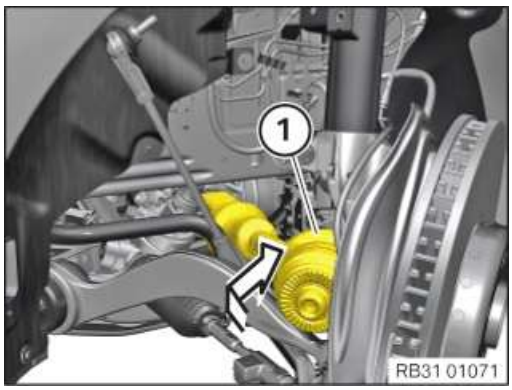
- Guide the output shaft (1) in direction of arrow into the front axle transmission or the bearing support.

  Do not allow the output shaft (1) to engage in the front axle transmission or the bearing support!



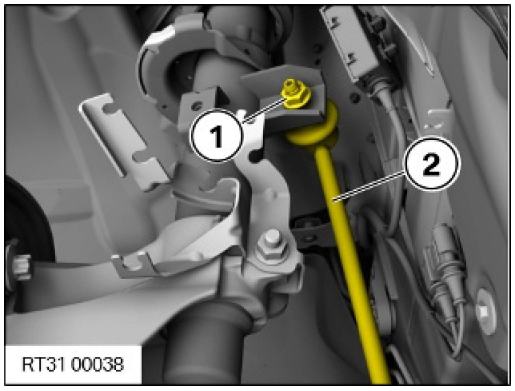
- Pull on the tab of the installation protection ring (1) until one of the two predetermined breaking points breaks.
- Pull out and dispose of the installation protection ring (1).
- Slide the output shaft (2) into front axle differential or bearing support up to the limit position.

  The output shaft (2) must engage noticeably and audibly.



- Feed in output shaft (1) on swivel bearing.

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- Position the anti-roll bar link (2) at the spring strut.
- Renew nut (1).

  Parts: Nut
- Tighten the nut (1), if necessary, counter support the Torx socket.

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

M10	Renew nut.	Tightening torque	56 Nm

POSTPROCESSES

9 – Check/add front axle transmission oil

RISK OF DAMAGE

Damage to the front axle differential.

Failure to comply with the oil specifications can result in serious damage to the front axle differential.

- Use only the approved front axle transmission oil.

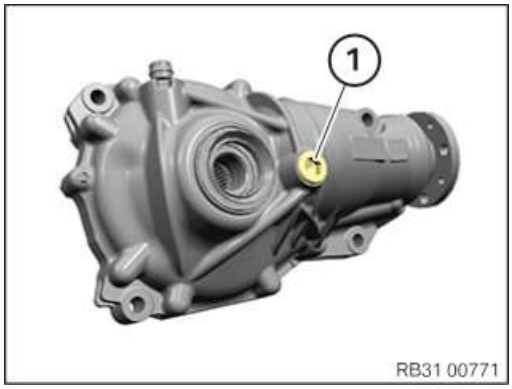
TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Use special tool 0 493 337 (00 2 080) to top up the front axle transmission oil.

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- Release the screw plug (1).
- Check front axle differential oil level.
- If necessary, top up the front axle transmission oil to the lower edge of the opening for the screw plug (1).

Transmission oil

Technically suitable front axle transmission oils	

Main group 31

- Renew the screw plug (1).

  Parts: Plug

- Tighten the screw plug (1).

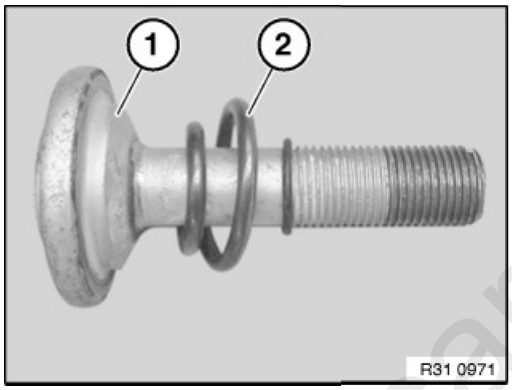
Screw plug to front axle transmission

M22	Renew screw plug with O-ring.	Tightening torque	60 Nm

10 – Securing the output shaft on the wheel bearing

TECHNICAL INFORMATION

The installation note for front gearing must be observed at all times.



- Renew the collar bolt (2) and the compression spring (1).

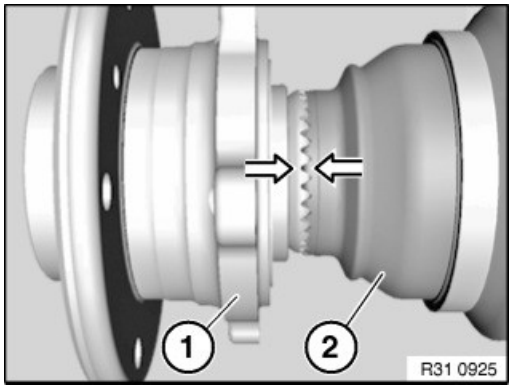
  Parts: Collar bolt and compression spring

- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.



- Hand-tighten the collar bolt (1) with the compression spring.

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TECHNICAL INFORMATION

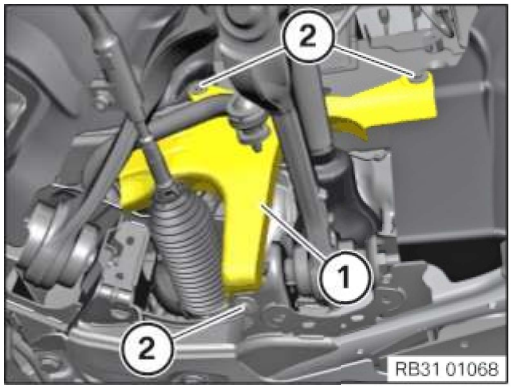
The front gearing of the wheel bearing and output shaft must be installed in an interlocking position (tooth-in-tooth).

- Check whether front gearing is locked tooth in tooth (arrows) by reciprocally rotating the wheel bearing (1) and the output shaft (2).
- Verify positive locking.
- Press brake pedal.
- Tighten the collar bolt.

Output shaft to wheel bearing

M16	Replace collar bolt and spring.	Jointing torque Angle of rotation	210 Nm 90 °

11 – Install the cover of the steering assembly

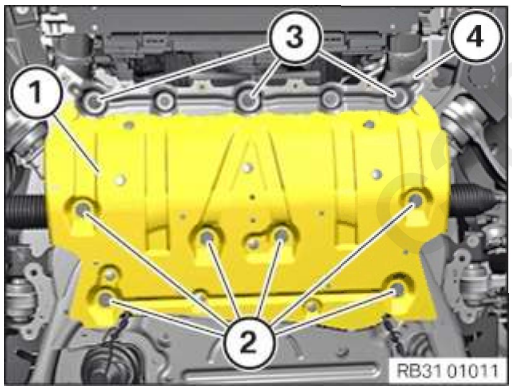


- Position the cover (1).
- Tighten the screws (2).

Cover, steering unit

Screw		Tightening torque	3 Nm

12 – Installing the stiffening plate

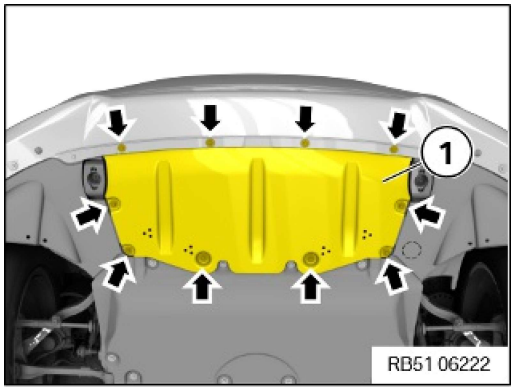


- Position stiffening plate (1).
- Screw screws (2) in.
- Position holder of underride protection (4).
- Screw screws (3) in.
- Tighten down screws (2) and (3).

Stiffening plate to front axle support

M10		Tightening torque	56 Nm

13 – Installing the front underbody protection



- **Version 1:**

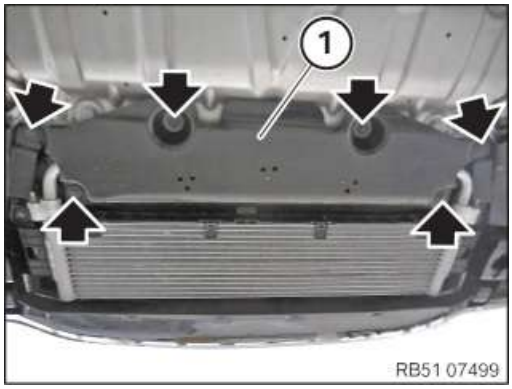
  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

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

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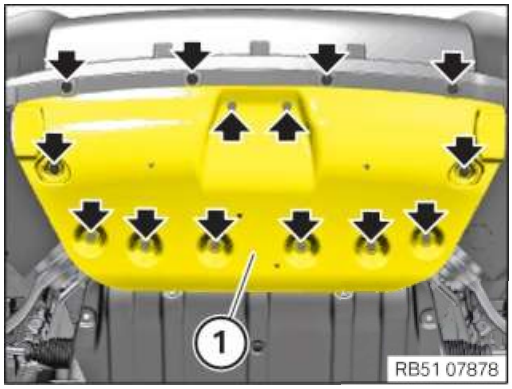
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

14 – Attaching the front left wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

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

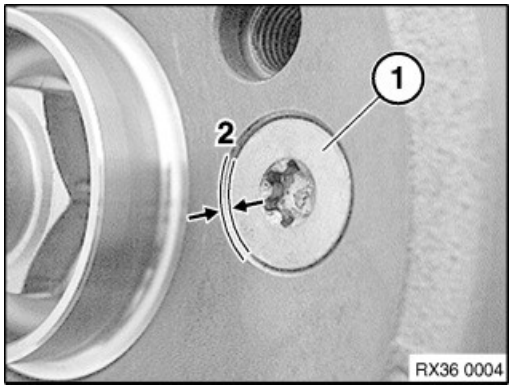
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).

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

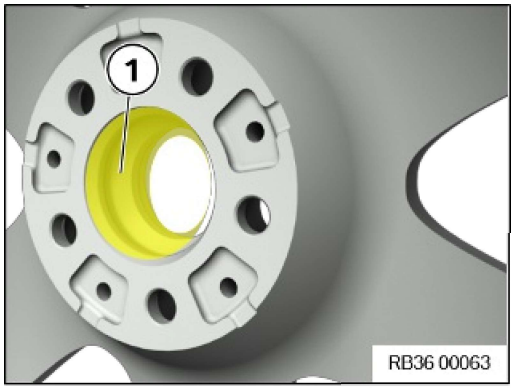
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

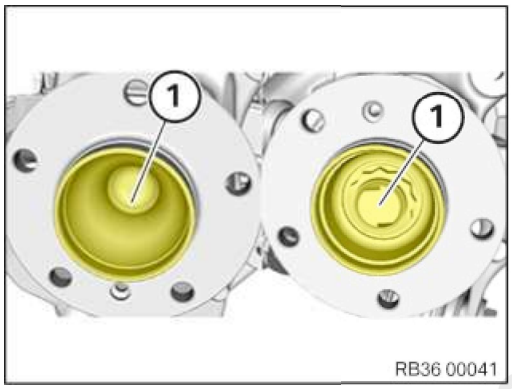
M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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



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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

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

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	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

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Additional Information

Overview of Tightening Torques

Front anti-roll bar link to anti-roll bar/spring strut — Used in step 8

M10	Renew nut.	Tightening torque	56 Nm

Screw plug to front axle transmission — Used in step 9

M22	Renew screw plug with O-ring.	Tightening torque	60 Nm

Output shaft to wheel bearing — Used in step 10

M16	Replace collar bolt and spring.	Jointing torque	210 Nm
		Angle of rotation	90 °

Cover, steering unit — Used in step 11

Screw		Tightening torque	3 Nm

Stiffening plate to front axle support — Used in step 12

M10		Tightening torque	56 Nm

Underbody protection front — Used in step 13

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

Brake disc to front wheel hub — Used in step 14

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 14

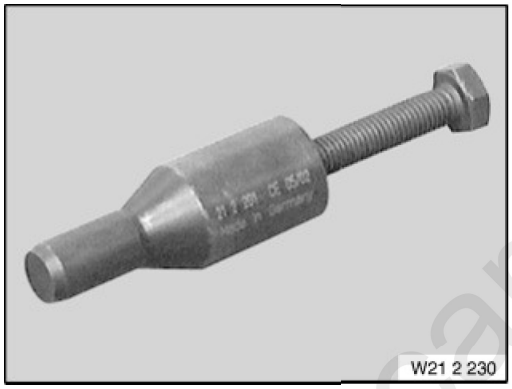
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 14

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

Overview of Special Tools

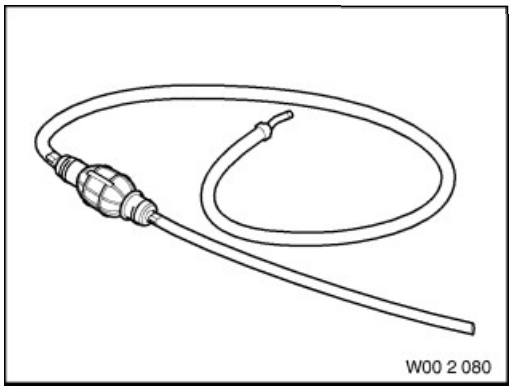
0 494 649 (21 2 230) Mandrel



Common — Used in step 7

Usage	(clutch centring drift) With screw M10 (G transmission)
Included in the tool or work	
Storage location	C45
Replaced by	
In connection with	
SI-Number	01 03 03 (960)

0 493 337 (00 2 080) Pump



Common — Used in step 9

Usage	(Hand pump) For lifetime oil filling
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 01 98 (294)

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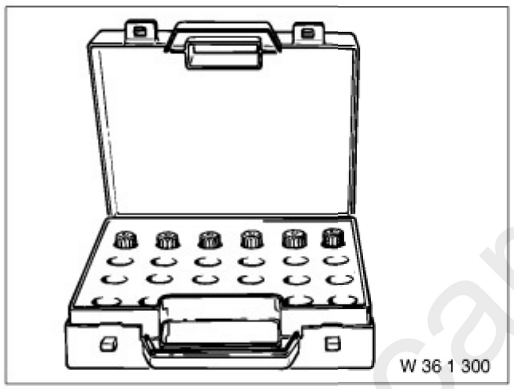
2 344 011 Tool



Common	Used in step 14
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

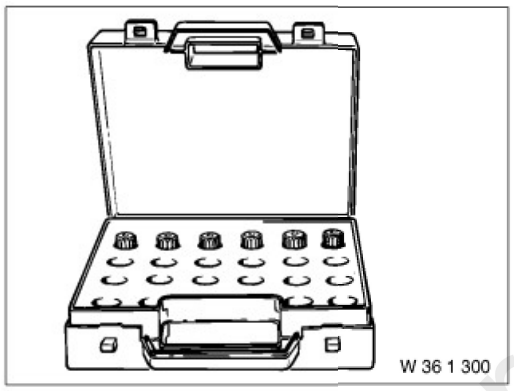
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0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



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

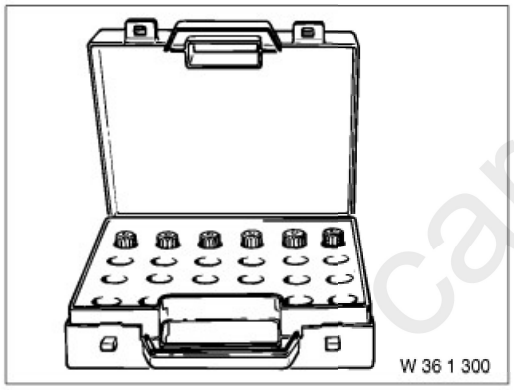
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0 495 228 (36 1 331) Wheel stud



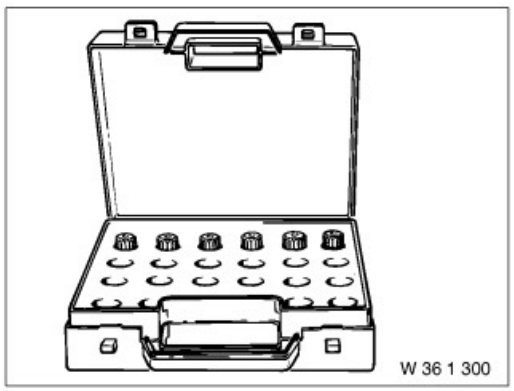
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Links

Operating materials **Used in step**

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31 60 004 Removing and installing/replacing right output shaft

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.

PRELIMINARY WORK

1 – Remove front right wheel

▸ **Removing the wheel**



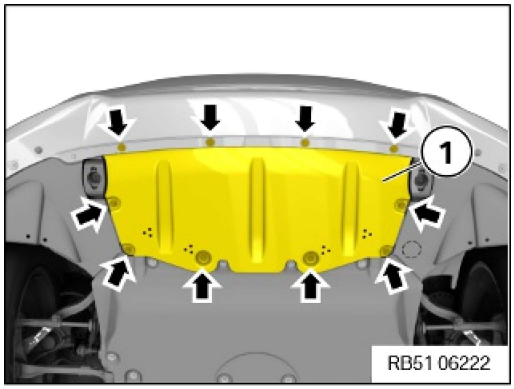
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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



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

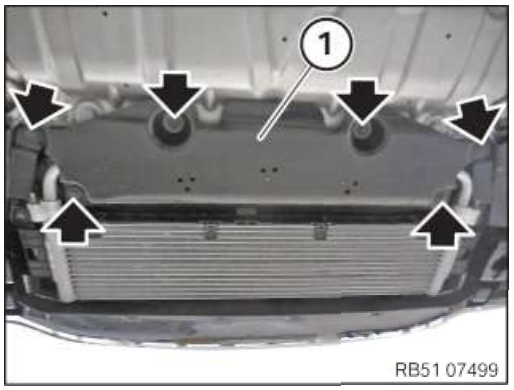
2 – Removing the front underbody protection



- **Version 1:**

  Remove screws (arrows).

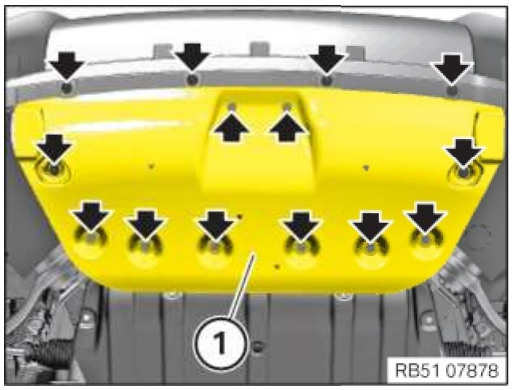
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version 2:**

  Remove screws (arrows).

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



- **Version 3:**

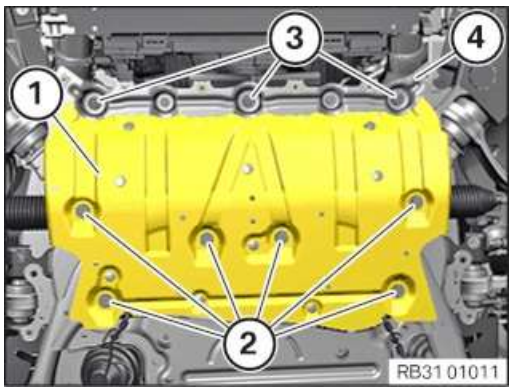
  Remove screws (arrows).

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

3 – Removing the stiffening plate

TECHNICAL INFORMATION

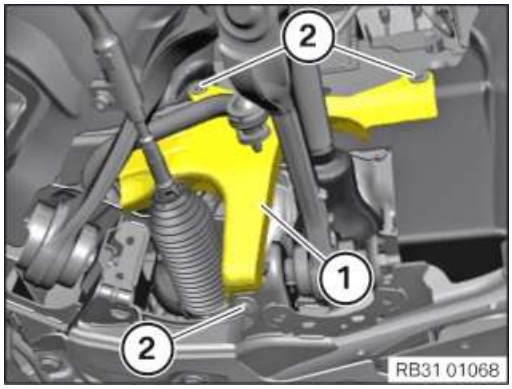
Driving without stiffening plate is not permissible.



- Loosen screws (3).
- Remove the holder of the underride protection (4).
- Loosen screws (2).
- Remove stiffening plate (1).

4 – Remove the cover of the steering assembly

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

5 – Loosen the output shaft from the wheel bearing

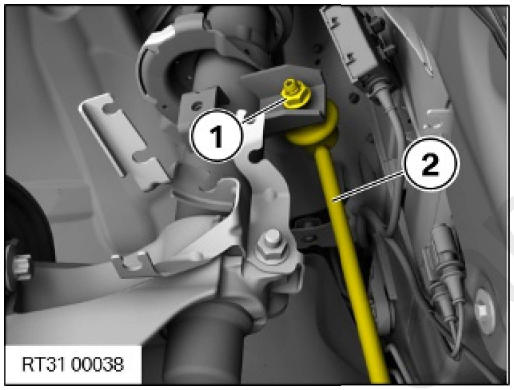


- Press brake pedal.
- Loosen the collar bolt (1).

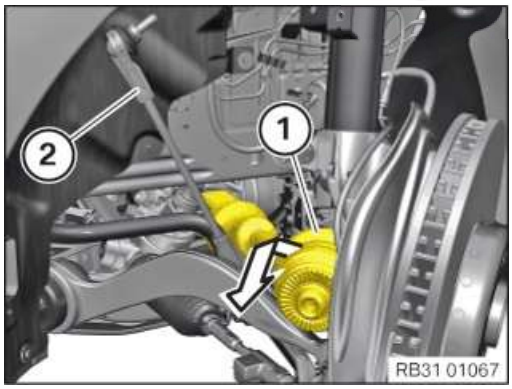
Note: Do not leave the output shaft hanging on the joint (or tie up output shaft if applicable).

MAIN WORK

6 – Remove right output shaft



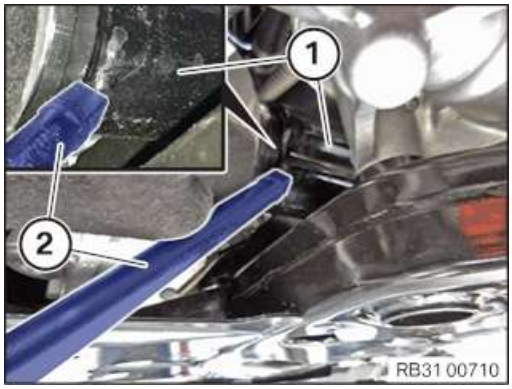
- Loosen the nut (1), if necessary, counter-hold the Torx socket.
- Release the anti-roll bar link (2) from the spring strut.



NOTICE

Illustration is shown by way of example and shows the opposite side of the vehicle.

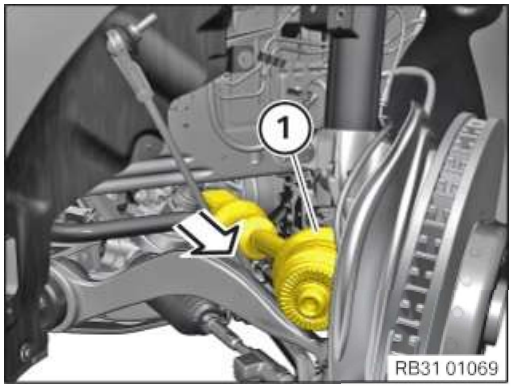
- Turn steering wheel to right.
- Set anti-roll bar link (2) aside.
- Guide output shaft (1) out of the swivel bearing.



TECHNICAL INFORMATION

Secure component against falling.

- Position aluminium drift (2) at the output shaft (1).
- Knock out the output shaft (1) from the bearing support with the aluminium drift (2).



NOTICE

Illustration is shown by way of example and shows the opposite side of the vehicle.

- Remove the output shaft (1)in the direction of the arrow.

7 – Renew the radial shaft seal

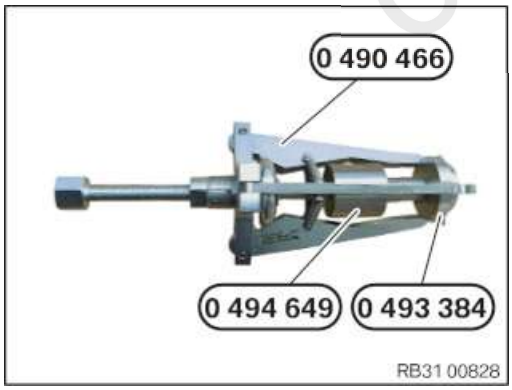
TECHNICAL INFORMATION

Radial shaft seal ring are equipped with an installation protection ring. The installation protection ring is used to protect the sealing lip when installing the output shaft.

NOTICE

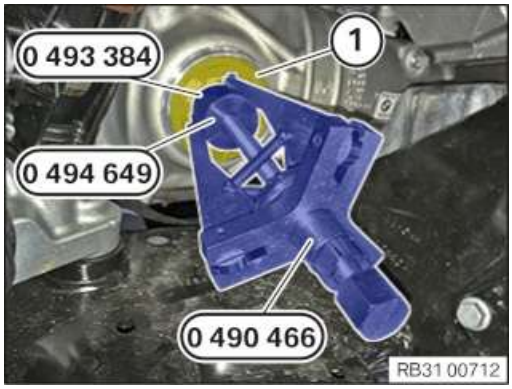
The figure shows the procedure for the front axle differential. The procedure for the bearing support is identical.

▸ **Removing the radial shaft seal**



- Prepare the special tool with the special tools 0 494 649 (21 2 230) (without the screw) and .

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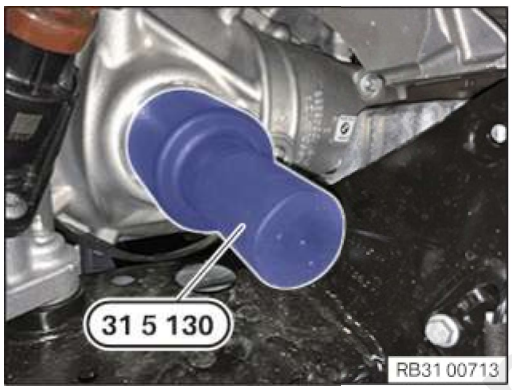


- Pull out and remove the radial shaft seal (1) with the special tools , 0 494 649 (21 2 230)and .



- Remove the installation protection ring (1) from the radial shaft seal (2).

▸ **Install the radial shaft seal**



- Coat the housing sheet metal flange of the radial shaft seal with the approved front axle transmission oil.
- Drive in the radial shaft seal up to the limit position using special tool .
- Remove special tool .



- Reinstall the installation protection ring (1) into the radial shaft seal (2).

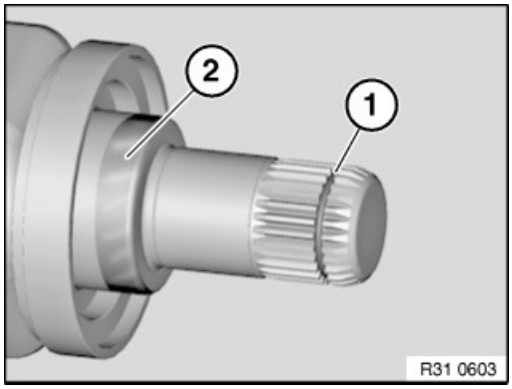
8 – Installing the output shaft

▸ **If reusing: Check the gearing of output shaft and renew circlip.**

TECHNICAL INFORMATION

It is essential to renew the circlip of the output shaft.

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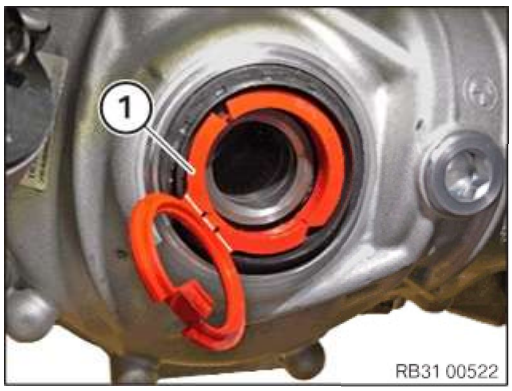


TECHNICAL INFORMATION

Extreme force being required during installation is an indication that the component is damaged or deformed. Check the component; replace if necessary.

- Check the gearing of the output shaft for damage and renew damaged parts if necessary.
- Check the gaiter for damage and replace damaged parts as needed.
- Renew the circlip (1).

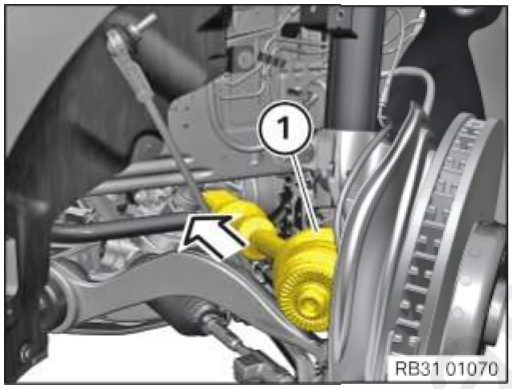
  Parts: Circlip
- Coat the contact surfaces (2) using approved final drive transmission oil.



NOTICE

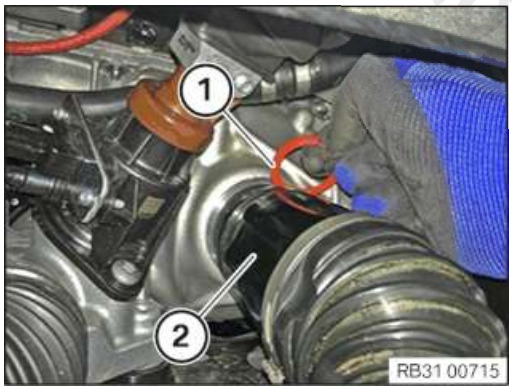
The figure shows the procedure for the front axle differential. The procedure for the bearing support is identical.

- Fold open the assembly protection ring (1).



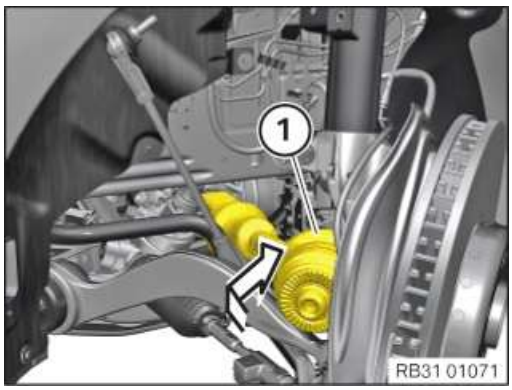
- Guide the output shaft (1) in direction of arrow into the front axle transmission or the bearing support.

  Do not allow the output shaft (1) to engage in the front axle transmission or the bearing support!



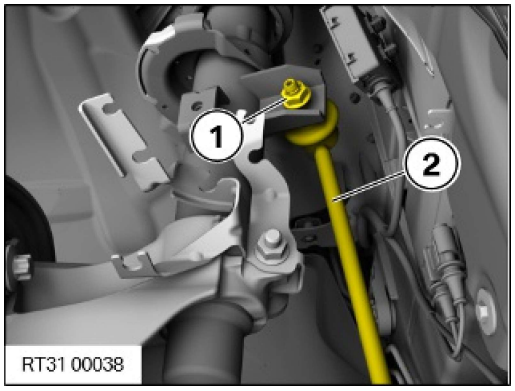
- Pull on the tab of the installation protection ring (1) until one of the two predetermined breaking points breaks.
- Pull out and dispose of the installation protection ring (1).
- Slide the output shaft (2) into front axle differential or bearing support up to the limit position.

  The output shaft (2) must engage noticeably and audibly.



- Feed in output shaft (1) on swivel bearing.

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- Position the anti-roll bar link (2) at the spring strut.
- Renew nut (1).

  Parts: Nut
- Tighten the nut (1), if necessary, counter support the Torx socket.

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

M10	Renew nut.	Tightening torque	56 Nm

POSTPROCESSES

9 – Check/add front axle transmission oil

RISK OF DAMAGE

Damage to the front axle differential.

Failure to comply with the oil specifications can result in serious damage to the front axle differential.

- Use only the approved front axle transmission oil.

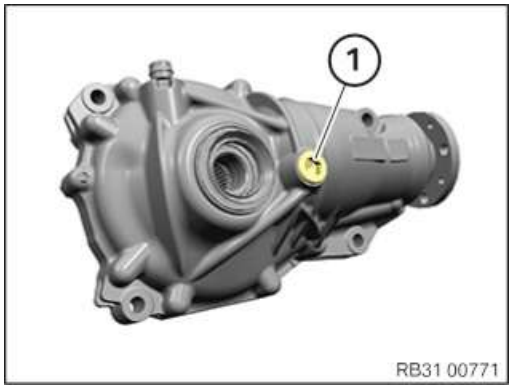
TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Use special tool 0 493 337 (00 2 080) to top up the front axle transmission oil.

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- Release the screw plug (1).
- Check front axle differential oil level.
- If necessary, top up the front axle transmission oil to the lower edge of the opening for the screw plug (1).

Transmission oil

Technically suitable front axle transmission oils	

Main group 31

- Renew the screw plug (1).

  Parts: Plug

- Tighten the screw plug (1).

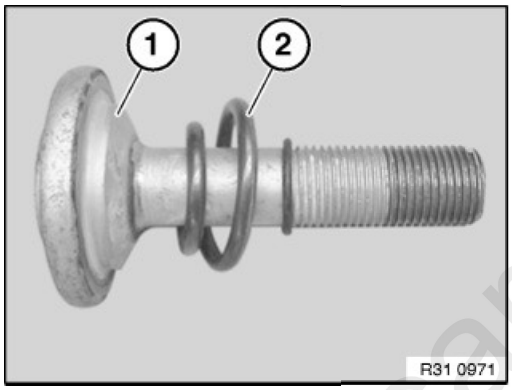
Screw plug to front axle transmission

M22	Renew screw plug with O-ring.	Tightening torque	60 Nm

10 – Securing the output shaft on the wheel bearing

TECHNICAL INFORMATION

The installation note for front gearing must be observed at all times.



- Renew the collar bolt (2) and the compression spring (1).

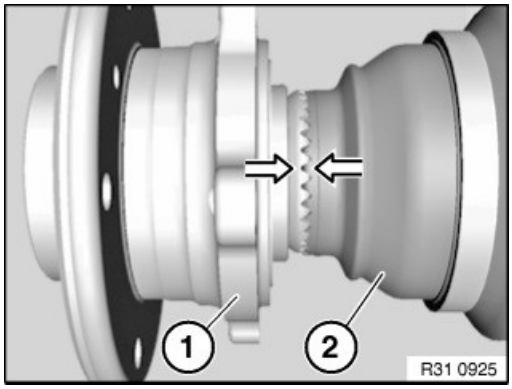
  Parts: Collar bolt and compression spring

- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.



- Hand-tighten the collar bolt (1) with the compression spring.

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TECHNICAL INFORMATION

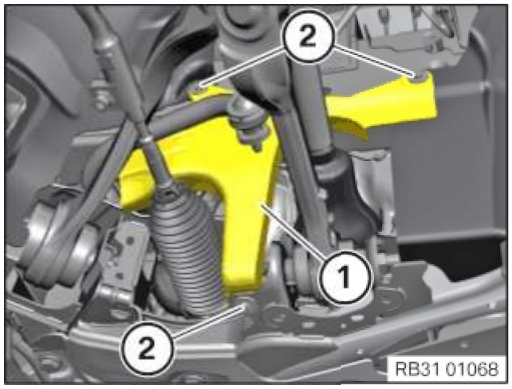
The front gearing of the wheel bearing and output shaft must be installed in an interlocking position (tooth-in-tooth).

- Check whether front gearing is locked tooth in tooth (arrows) by reciprocally rotating the wheel bearing (1) and the output shaft (2).
- Verify positive locking.
- Press brake pedal.
- Tighten the collar bolt.

Output shaft to wheel bearing

M16	Replace collar bolt and spring.	Jointing torque Angle of rotation	210 Nm 90 °

11 – Install the cover of the steering assembly

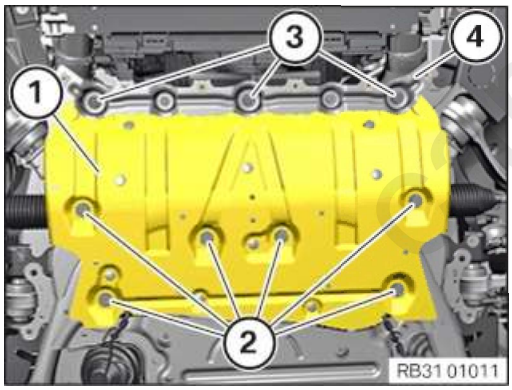


- Position the cover (1).
- Tighten the screws (2).

Cover, steering unit

Screw		Tightening torque	3 Nm

12 – Installing the stiffening plate

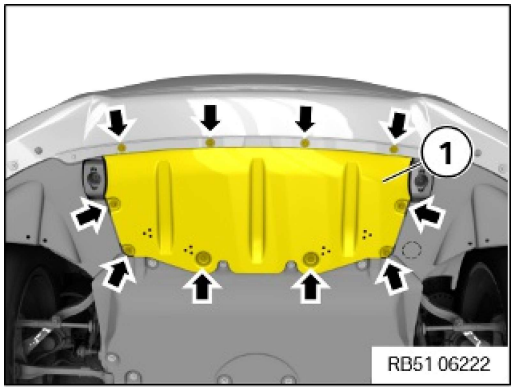


- Position stiffening plate (1).
- Screw screws (2) in.
- Position holder of underride protection (4).
- Screw screws (3) in.
- Tighten down screws (2) and (3).

Stiffening plate to front axle support

M10		Tightening torque	56 Nm

13 – Installing the front underbody protection



- **Version 1:**

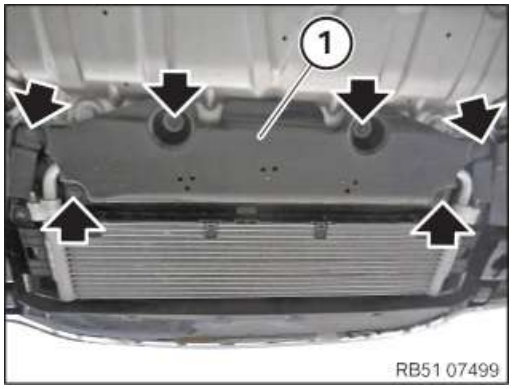
  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

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

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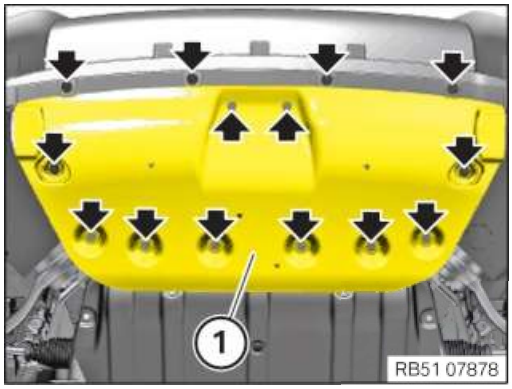
- **Version 2:**

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

  Tighten screws (arrows).

Underbody protection front

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



- **Version 3:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

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

14 – Installing the front right wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

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

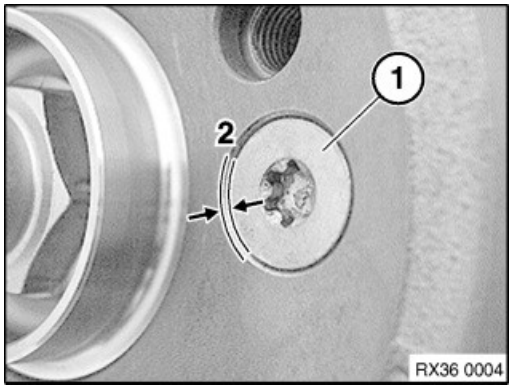
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).

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

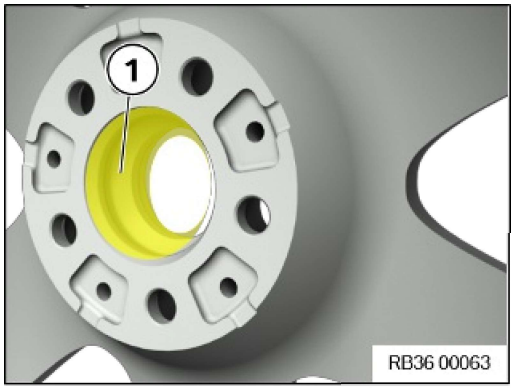
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

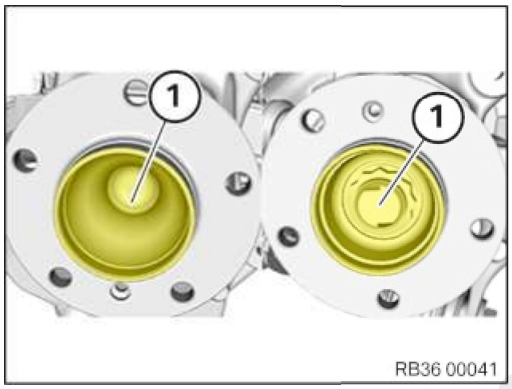
M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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



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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

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

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	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

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Additional Information

Overview of Tightening Torques

Front anti-roll bar link to anti-roll bar/spring strut — Used in step 8

M10	Renew nut.	Tightening torque	56 Nm

Screw plug to front axle transmission — Used in step 9

M22	Renew screw plug with O-ring.	Tightening torque	60 Nm

Output shaft to wheel bearing — Used in step 10

M16	Replace collar bolt and spring.	Jointing torque	210 Nm
		Angle of rotation	90 °

Cover, steering unit — Used in step 11

Screw		Tightening torque	3 Nm

Stiffening plate to front axle support — Used in step 12

M10		Tightening torque	56 Nm

Underbody protection front — Used in step 13

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

Brake disc to front wheel hub — Used in step 14

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 14

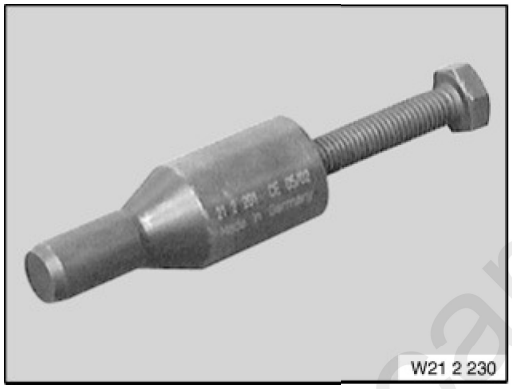
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 14

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

Overview of Special Tools

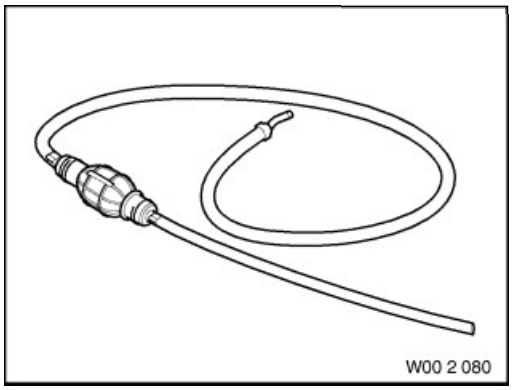
0 494 649 (21 2 230) Mandrel



Common — Used in step 7

Usage	(clutch centring drift) With screw M10 (G transmission)
Included in the tool or work	
Storage location	C45
Replaced by	
In connection with	
SI-Number	01 03 03 (960)

0 493 337 (00 2 080) Pump



Common — Used in step 9

Usage	(Hand pump) For lifetime oil filling
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 01 98 (294)

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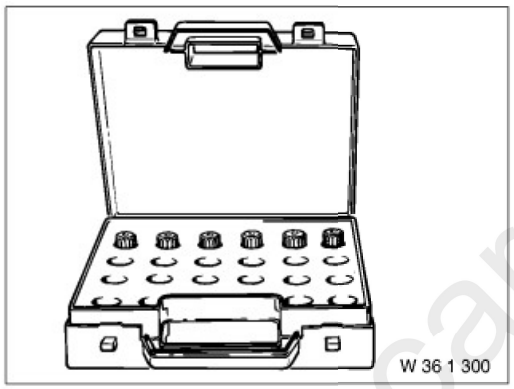
2 344 011 Tool



Common	Used in step 14
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

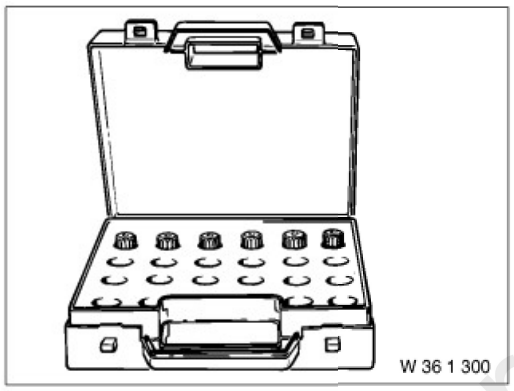
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0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



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

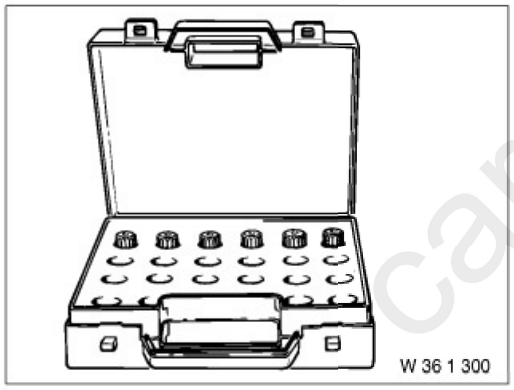
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0 495 228 (36 1 331) Wheel stud



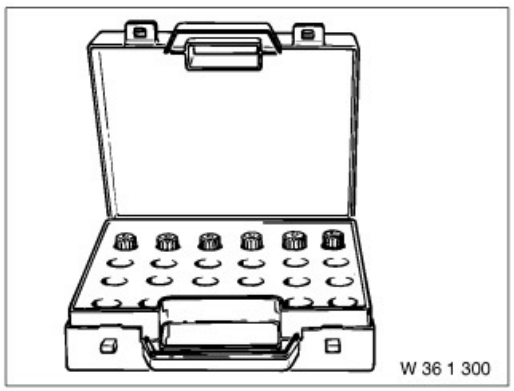
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Links

Operating materials **Used in step**

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00 00 ... Microencapsulated screws



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

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



Installation note:

- Screw connection must be completed within 20 mins. (start of curing)
- Microencapsulated screws must not be retightened
- Thread of nut must be cleaned beforehand in event of repeated use

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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!

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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!

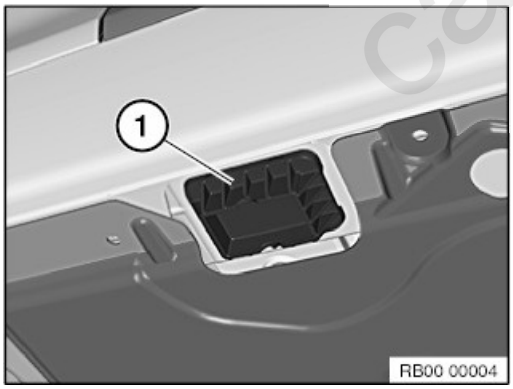
Before driving onto a vehicle hoist, make sure there is sufficient ground clearance between the vehicle hoist and the vehicle.

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



Necessary preliminary work:

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

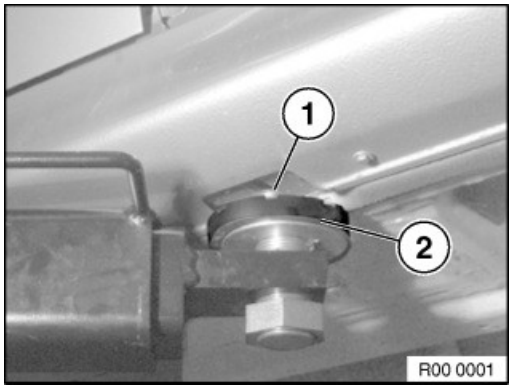


Caution!

All four jacking points (1) must be available!

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

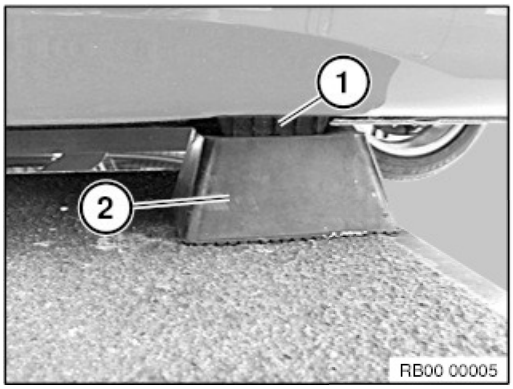
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Caution!

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!

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33 10 053 Removing and installing/replacing temperature sensor

WARNING

Hot exhaust system.

Risk of burning!

- Any work must exclusively be carried out with an exhaust system that has cooled down.

RISK OF DAMAGE

Damage to rear axle differential.

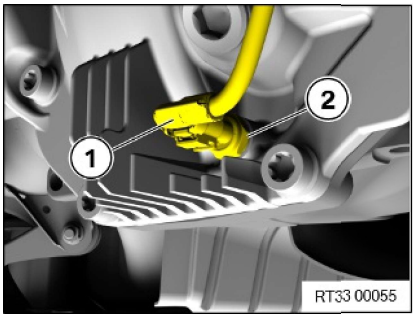
Failure to comply with the oil specifications can result in serious damage to the rear axle differential.

- After completion of repair work, check the transmission oil level in the rear axle differential.
- Use only the approved final drive transmission oil.

1 – Remove the temperature sensor on the rear axle differential

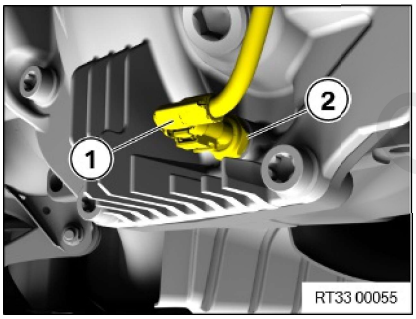
TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Place oil collecting apparatus underneath.
- Unlock plug connection (1) and disconnect.
- Release and remove temperature sensor (2).
- Catch and dispose of emerging rear axle differential oil.

2 – Install the temperature sensor on the rear axle differential



- Install the temperature sensor (2).
- Tighten the temperature sensor (2).

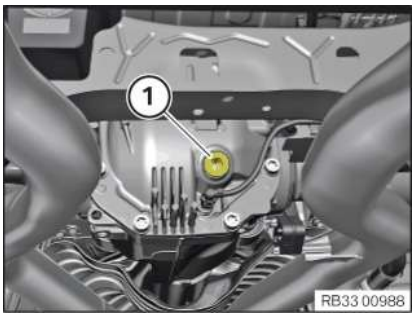
Temperature sensor to oil sump

M12		Tightening torque	14 Nm

- Connect connectors (1) and lock.

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3 – Check/top up oil level in the M-sports differential (rear axle differential with block)



- Release the screw plug (1).
- Check oil level:
- If necessary, pour in rear axle differential oil up to lower edge of opening for oil drain plug (1).

Initial filling capacity of rear axle differential oil for M-sports differential (rear axle differential with block)

M-sports differential	1.0 l

Transmission oil: Hypoid Axle Oil G4

- Renew the screw plug (1).
  Parts: Screw plug with O-ring
- Tighten the screw plug (1).

Oil filler plug on the rear axle differential

M22	Renew screw plug with O-ring.	Tightening torque	60 Nm

Additional Information

Overview of Tightening Torques

Temperature sensor to oil sump — Used in step 2

M12		Tightening torque	14 Nm

Oil filler plug on the rear axle differential — Used in step 3

M22	Renew screw plug with O-ring.	Tightening torque	60 Nm

Overview Technical Data

Initial filling capacity of rear axle differential oil for M-sports differential (rear axle differential with block) — Used in step 3

M-sports differential	1.0 l

Transmission oil: Hypoid Axle Oil G4

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This documentation refers to special tools that were not yet available when going to press.

33 11 271 Replacing rear cover gasket on rear axle final drive

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.

RISK OF DAMAGE

Damage to rear axle differential.

Failure to comply with the oil specifications can result in serious damage to the rear axle differential.

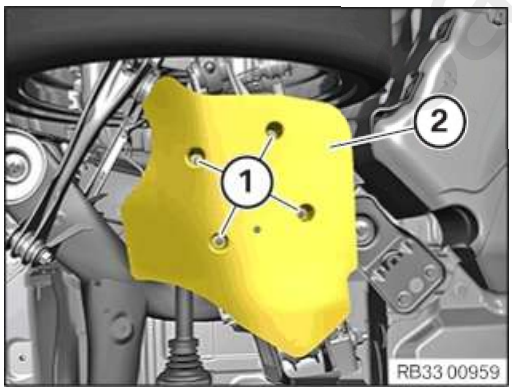
- After completion of repair work, check the transmission oil level in the rear axle differential.
- Use only the approved final drive transmission oil.

PRELIMINARY WORK

1 – Remove the cover of the camber control arm on the left and right

NOTICE

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



▸ **Remove the cover of the camber control arm**

- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

2 – Remove complete exhaust system

WARNING

Hot surfaces.

Risk of burning!

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

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CAUTION

Component with heavy weight.

Danger of injury!

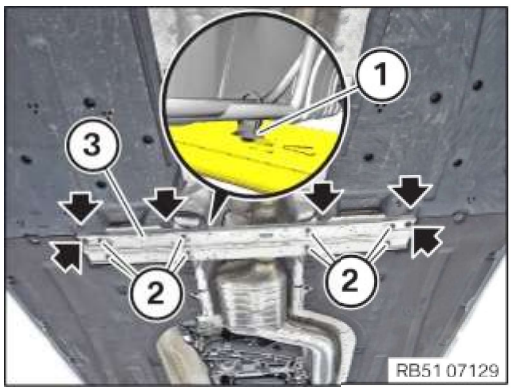
- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

CAUTION

Heavy component.

Heavy components can lead to injury or damage.

- Remove and install heavy components with the aid of another person/other persons.



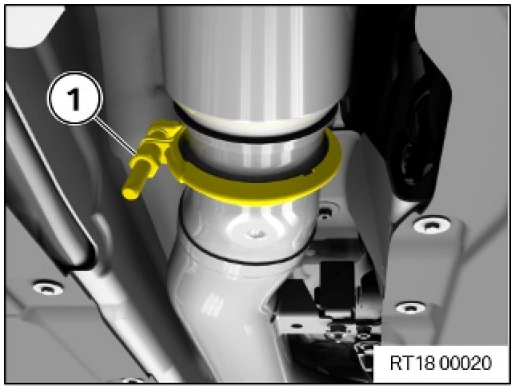
▶ **Remove the connecting support from the tunnel**

- Remove screws (arrows).
- **If installed:** Loosen clamp (1).
- Loosen screws (2).
- Guide out and remove connecting support (3) on the tunnel.



- **Equipment specification 1 (ribbon clamp)**

  Detach the ribbon clamp (1).



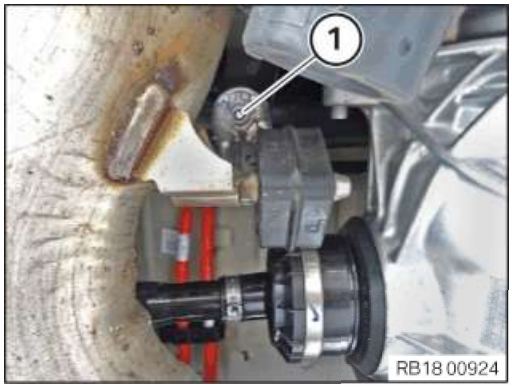
- **Equipment specification 2 (V-clips)**

  Unfasten clamp (1).

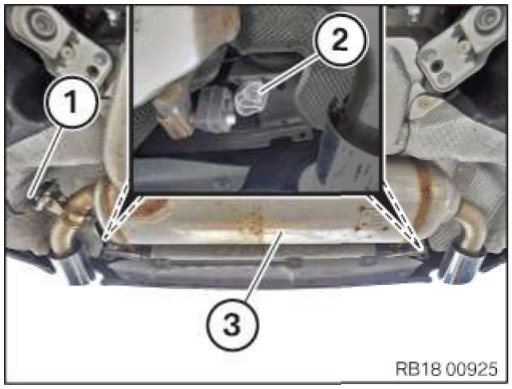
diagn.com



- Loosen nut (1).



- Release the nut (1) on the rear axle support.

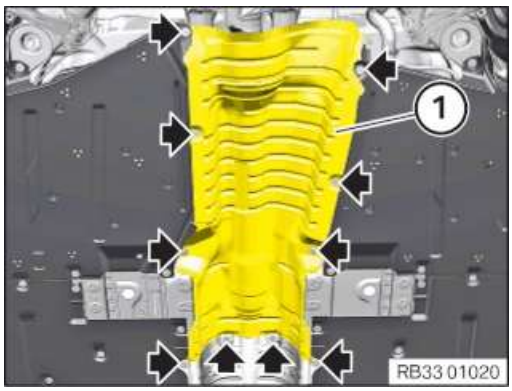


- Unlock plug connection (1) and disconnect.
- Loosen nuts (2).
- Lower and remove the exhaust system (3) with the assistance of a second person.

3 – Remove heat shield at rear.

NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.



- Loosen bolts and nuts (arrows).
- Remove the rear heat shield (1).

4 – Drawing off oil in the rear axle differential

cardiagn.com

CAUTION

Materials harmful to health.

Health risks in the event of contact with substances that are harmful to health!

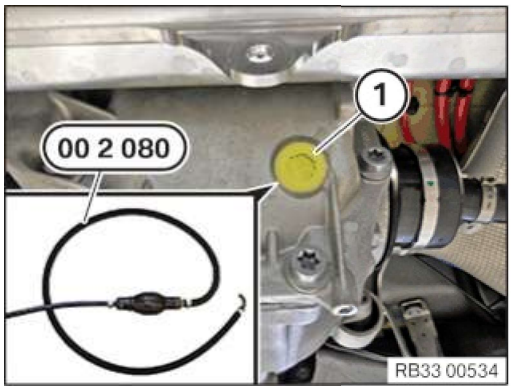
- Observe and comply with the Safety Information on the containers and the notes on the manufacturer's safety data sheet.
- Conduct all work in appropriate personal protective equipment only.

CAUTION

Acid burns may result from skin contact with oil or inhaling oil vapours.

Risk of acid burns from contact with oil!

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.



- Release oil filler plug (1).
- Draw off the oil using special tool 0 493 337 (00 2 080).

5 – Releasing and lowering rear axle differential

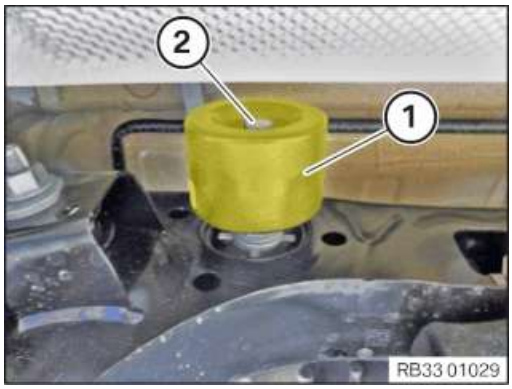
RISK OF DAMAGE

Damage to rear axle differential.

If the rear axle differential drops down, persons can be injured or the rear axle differential can be damaged.

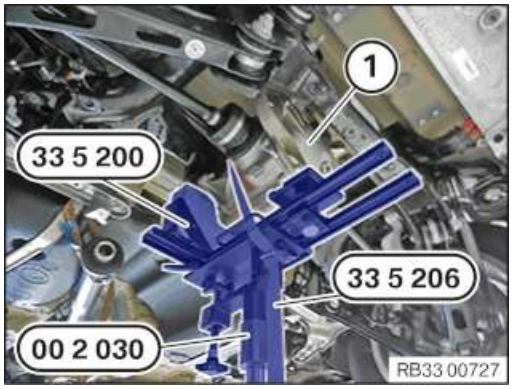
- Secure the rear axle differential using a tensioning strap.

▸ **If installed: Remove vibration absorber**

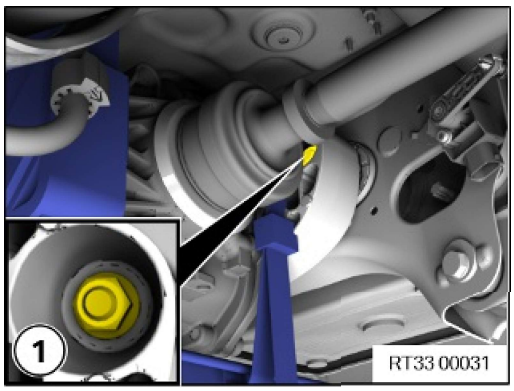


- Loosen screw (2).
- Remove the vibration absorber (1).

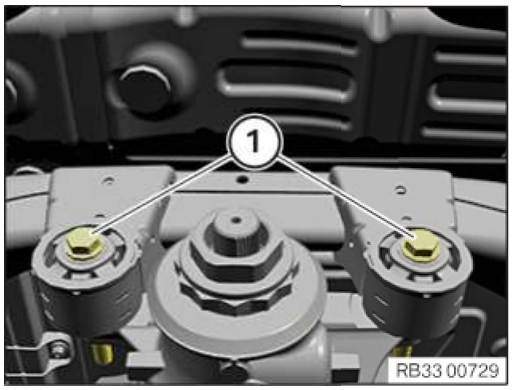
cardiagn.com



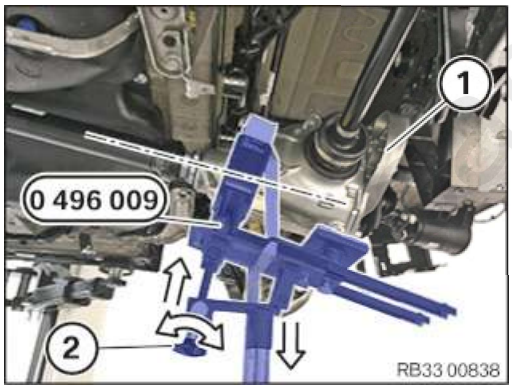
- Place the special tool 0 496 009 (33 5 200) onto the universal jack 0 490 133 (00 2 030).
- Support the rear axle differential (1) with the special tool 0 496 009 (33 5 200).
- Secure the rear axle differential (1) with a tensioning strap on the special tool 0 496 009 (33 5 200).



- Loosen nut (1) on the rear axle support at rear.
- Remove screw.



- Loosen screws (1) on rear axle support at front.



- Lower rear axle differential (1) using the special tool 0 496 009 (33 5 200) only until the cover on the rear axle differential is accessible.

  During lowering, twist the adjusting screw (2) to slightly raise the rear axle differential at the front.

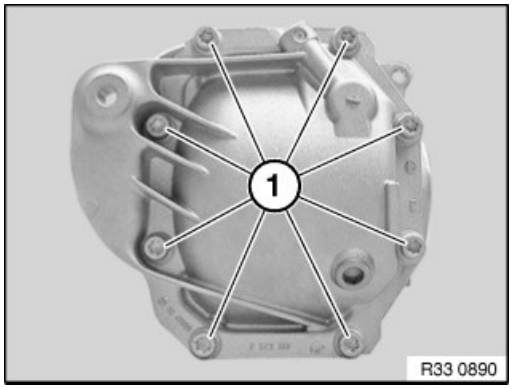
MAIN WORK

6 – Removing the housing cover

NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.

rdiagn.com

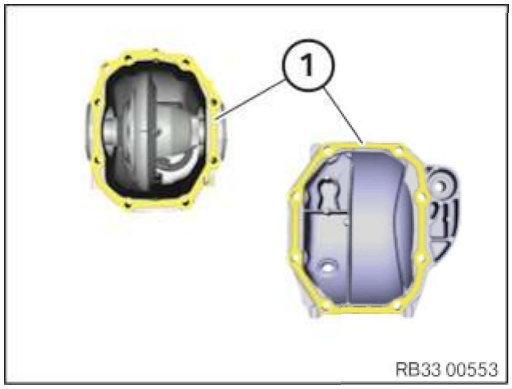


- Loosen screws (1).
- Take off case cover.

7 – Removing the seals and cleaning the sealing surfaces

NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.



- Remove the seals from the housing cover and the housing of the rear axle differential using a scraper.
- Clean sealing surfaces (1) on the cover and rear axle differential.

8 – Apply liquid sealing compound

NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.



- Have the special tool ready.

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TECHNICAL INFORMATION

For more information see: 11 00 ... Overview of consumables in Electronic Parts Catalogue

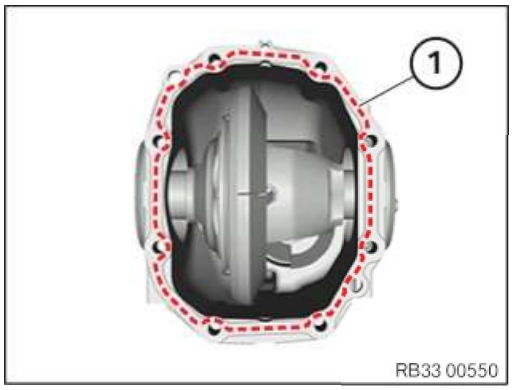
- Position the sealing compound (1) on special tool as shown.

  Parts: Sealing compound

Sealing compound

Loctite 5970 liquid sealing compound	50 ml, Cartridge	83190404517

Overview of consumables (Electronic Parts Catalogue)



- Apply liquid sealing compound along the dotted line (1) on the sealing surface of the rear axle differential.

  The sealing bead must run along the inner edge.

Sealing compound

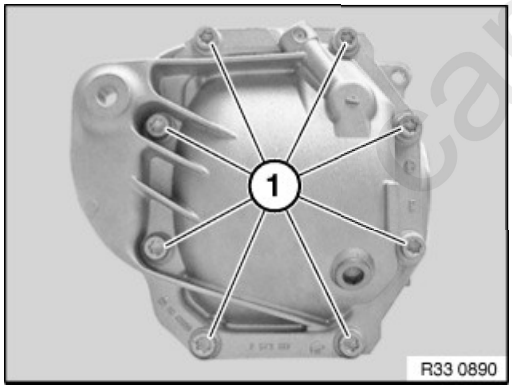
Loctite 5970 liquid sealing compound	50 ml, Cartridge	83190404517

Overview of consumables (Electronic Parts Catalogue)

9 – Installing the housing cover

NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.



- Position the housing cover on the rear axle differential.
- Tighten the screws (1).

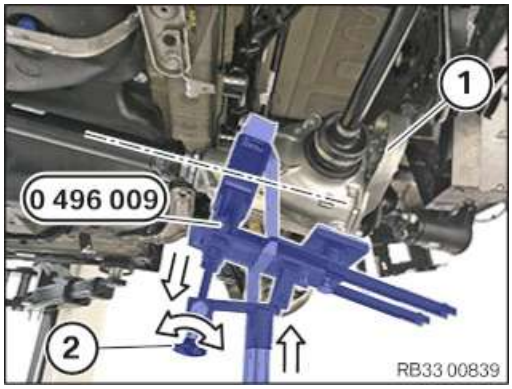
Lid to rear axle differential

M12			140 Nm
M10			90 Nm

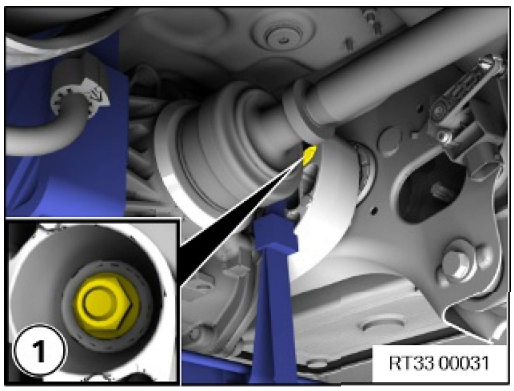
POSTPROCESSES

10 – Lifting and securing the rear axle differential

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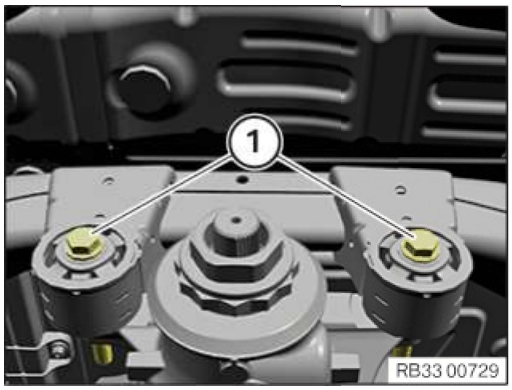


- Lift and position the rear axle differential (1)with the special tool 0 496 009 (33 5 200).
- While lifting the rear axle differential (1), twist the adjusting screw (2) to correct the installation position.



- Replace nut (1) and screw.

  Parts: Nut, bolt
- Insert the screw from the rear.
- Screw on nut (1) by hand.

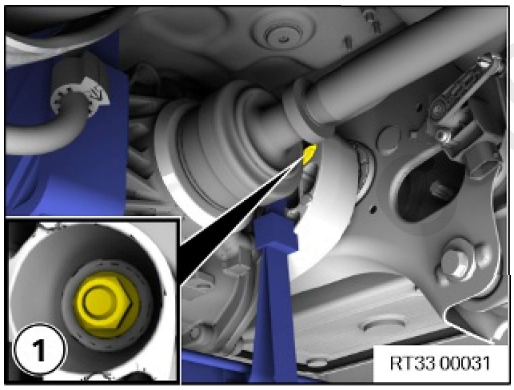


- Renew screws (1).

  Parts: Bolts
- Screw in the screws (1) by hand.
- Tighten the screws (1).

Rear differential to rear axle carrier, front

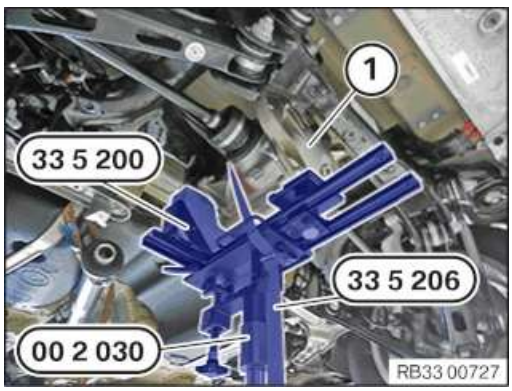
M12x100	Renew screws.	Tightening torque	100 Nm



- Tighten nut (1).

Rear differential to rear axle carrier, rear

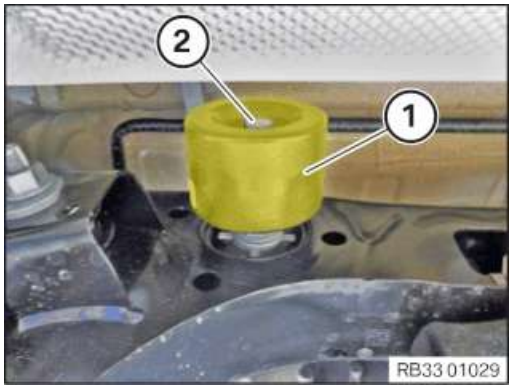
M14x110	Renew screw and nut.	Tightening torque.	175 Nm



- Loosen and remove the tensioning strap from the rear axle differential (1).
- Lower and remove the special tools 0 490 133 (00 2 030) and 0 496 009 (33 5 200).

▸ **If installed: install the vibration absorber**

rdiagn.com



- Position the (1) vibration absorber.
- Renew the screw (2).

  Parts: Screw
- Tighten down screw (2).

Vibration absorber to rear axle

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

11 – Check/top up oil level in the rear axle differential

CAUTION

Materials harmful to health.

Health risks in the event of contact with substances that are harmful to health!

- Observe and comply with the Safety Information on the containers and the notes on the manufacturer's safety data sheet.
- Conduct all work in appropriate personal protective equipment only.

CAUTION

Acid burns may result from skin contact with oil or inhaling oil vapours.

Risk of acid burns from contact with oil!

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

RISK OF DAMAGE

Damage to rear axle differential.

Failure to comply with the oil specifications can result in serious damage to the rear axle differential.

- Use only the approved final drive transmission oil.

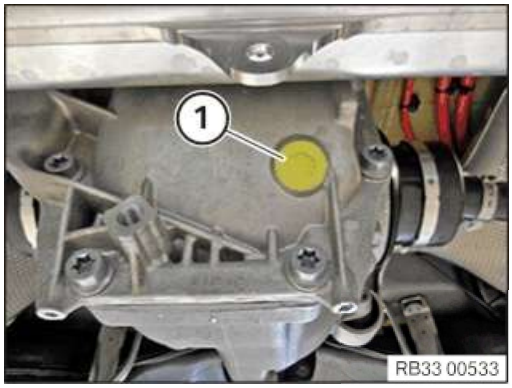
TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

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- Use the special tool 0 493 337 (00 2 080) to top up the rear axle differential oil.



- Open the oil filler plug (1).
- Check oil level:

  The oil level at the rear axle differential has been adjusted correctly once a small quantity of oil escapes from the opening of the oil filler plug.

  If necessary, top up final drive transmission oil.

Transmission oil

Technically suitable rear axle differential oils	

Main group 33

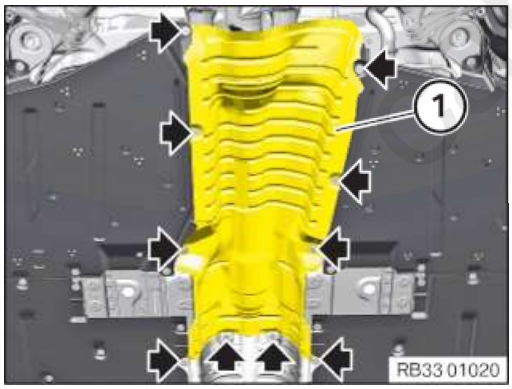
- Replace the oil filler plug (1).

  Parts: Oil filler plug
- Screw in and tighten the oil filler plug (1).

12 – Installing the rear heat shield

NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.



- Position the rear heat shield (1).
- Tighten the nuts and bolts (arrows).

Heat shield to vehicle underbody

Screws and nuts		Tightening torque	3 Nm

13 – Installing the complete exhaust system

CAUTION

Component with heavy weight.

Danger of injury!

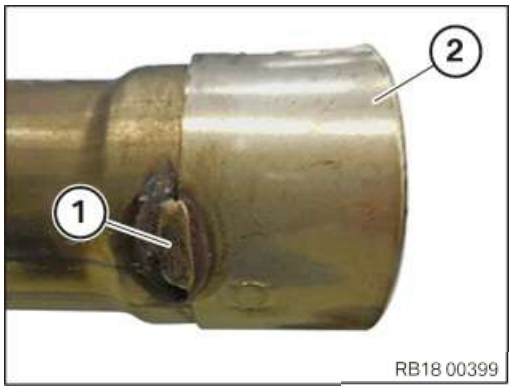
- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

CAUTION

Heavy component.

Heavy components can lead to injury or damage.

- Remove and install heavy components with the aid of another person/other persons.



CAUTION

Swarf resulting from sawing or grinding components.

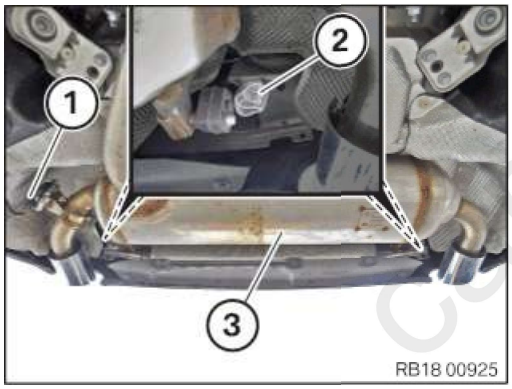
Danger of injury!

- Conduct all work in appropriate personal protective equipment only.
- Wear safety goggles and protective gloves.

- **Equipment specification 1 (ribbon clamp)**

  Open the weld seam (1) with a conventional tool.
- Remove ribbon clamp (2).
- Renew the (2) ribbon clamp.

  Parts: Ribbon cable clamp



- Feed in and install the exhaust system (3) with a second person.
- Renew nuts (2).

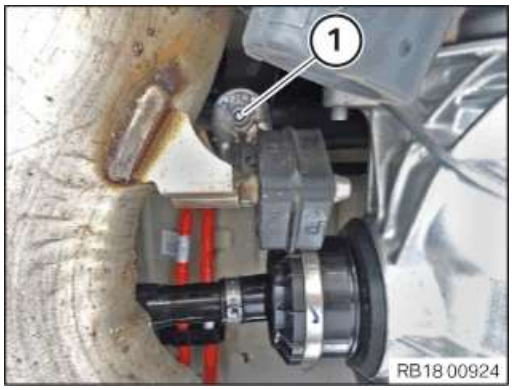
  Parts: Nuts
- Tighten nuts (2).

Rear silencer to body / bumper support

M8	Replace nuts.	Tightening torque	19 Nm

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Renew nut (1).

  Parts: Nut
- Tighten the bolt (1) on the rear axle support.

Exhaust system to rear axle carrier

Nut M8	Renew nut.	Tightening torque	19 Nm

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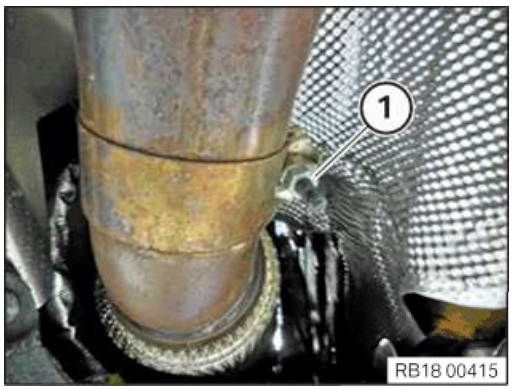
- Renew nut (1).

  Parts: Nut

- Tighten nut (1).

Front pipe / petrol particulate filter on transmission holder

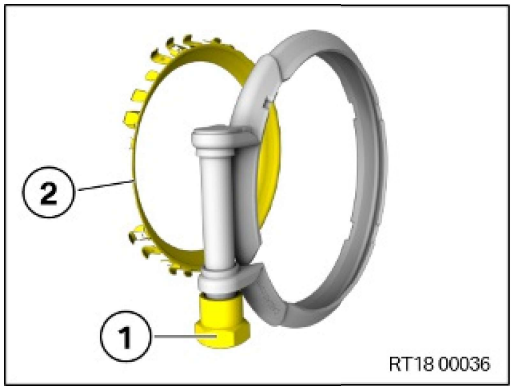
M8	Renew nut.	Tightening torque	19 Nm



- Tighten the ribbon clamp (1).

Exhaust system to catalytic converter

Ribbon cable clamp	Renew flat band clip.	Tightening torque	26 Nm

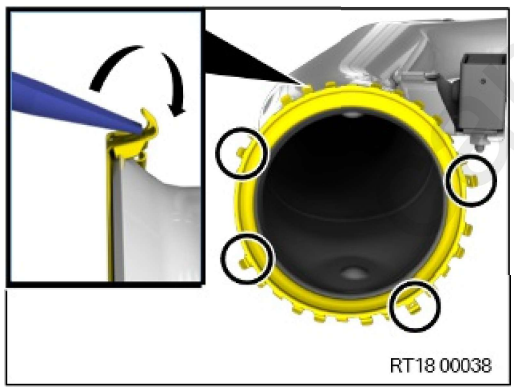


- **Equipment specification 2 (V-clips)**

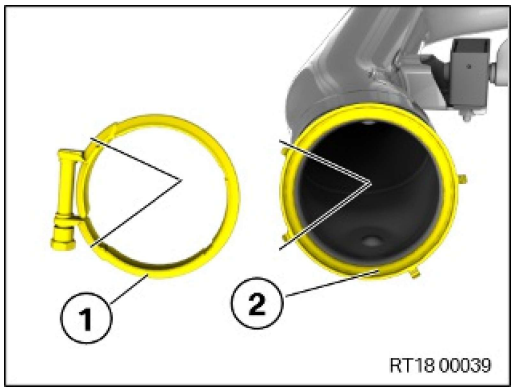
  Renew V-band clamp.

  Parts: V-band clamp

  Unscrew the nut (1) and remove the sealing ring (2).

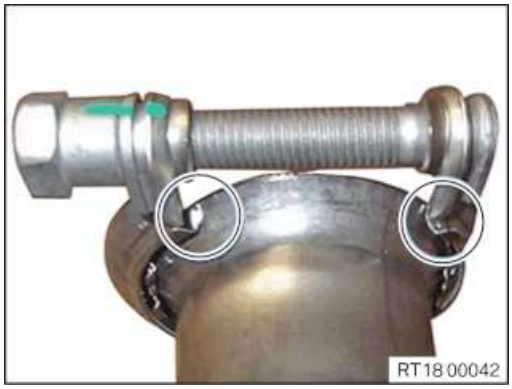


- Bend all sheet metal tabs over with a suitable tool, except those in the marked areas.

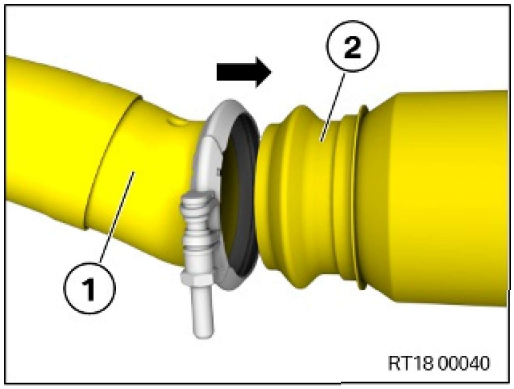


- Mount the V-clip (1) on the sealing ring (2).
- Make sure that the V-clip (1) is positioned correctly on the sealing ring (2).

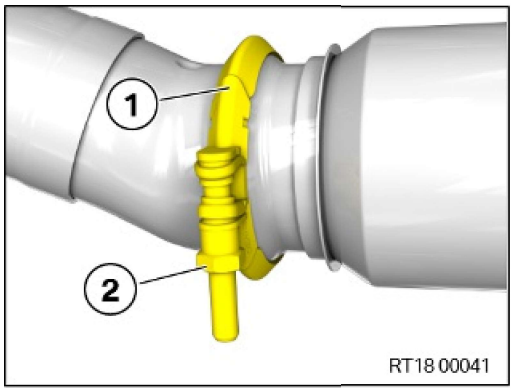
ardiagn.com



- Ensure that the V-clip rests against the sheet metal tabs in the marked areas after mounting.



- Connect the exhaust system (1) with the catalytic converter (2) and position it correctly (arrow).

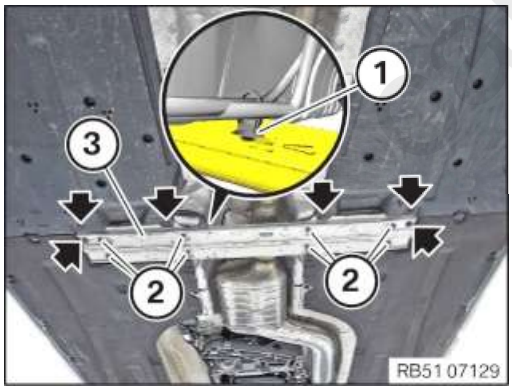


- Make sure that V-clip (1) is fitted correctly.
- Tighten down screw (2).

V-clip to catalytic converter

V-band clamp	Renew V-band clamp.	Tightening torque	22 Nm

▸ **Install the connecting supports on the tunnel**



- Guide in and install connecting support (3) on the tunnel.
- Tighten the screws (2).

Connecting support to tunnel

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

- Tighten screws (arrows).

Connecting support to tunnel

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

- **If installed:** Secure clamps (1).

14 – Install the cover of the camber control arm on the left and right

rdiagn.com

NOTICE

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



▸ **Installing the cover of the camber control arm**

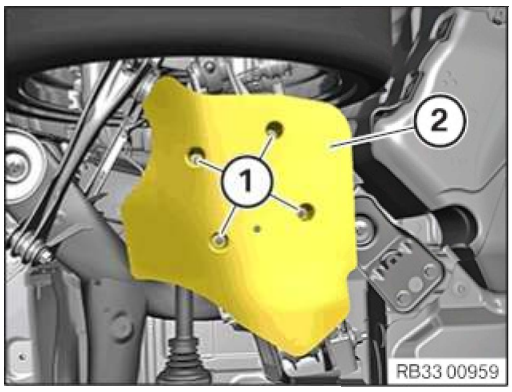
- Note the installation location and direction of installation.

  Direction of installation:

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right



- Position the camber control arm cover (2) on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

Additional Information

Overview of Tightening Torques

Lid to rear axle differential — Used in step 9

M12			140 Nm
M10			90 Nm

Rear differential to rear axle carrier, front — Used in step 10

M12x100	Renew screws.	Tightening torque	100 Nm

Rear differential to rear axle carrier, rear — Used in step 10

M14x110	Renew screw and nut.	Tightening torque.	175 Nm

Vibration absorber to rear axle — Used in step 10

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

Heat shield to vehicle underbody — Used in step 12

Screws and nuts		Tightening torque	3 Nm

Rear silencer to body / bumper support — Used in step 13

M8	Replace nuts.	Tightening torque	19 Nm

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Exhaust system to rear axle carrier			Used in step 13
Nut M8	Renew nut.	Tightening torque	19 Nm

Front pipe / petrol particulate filter on transmission holder			Used in step 13
M8	Renew nut.	Tightening torque	19 Nm

Exhaust system to catalytic converter			Used in step 13
Ribbon cable clamp	Renew flat band clip.	Tightening torque	26 Nm

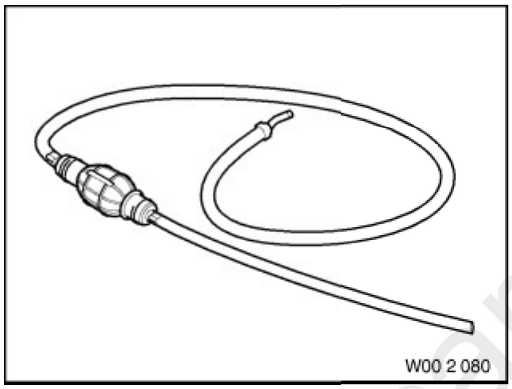
V-clip to catalytic converter			Used in step 13
V-band clamp	Renew V-band clamp.	Tightening torque	22 Nm

Connecting support to tunnel			Used in step 13
M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

Cover to camber control arm			Used in step 14
M6	Replace nuts.	Tightening torque	6 Nm

Overview of Special Tools

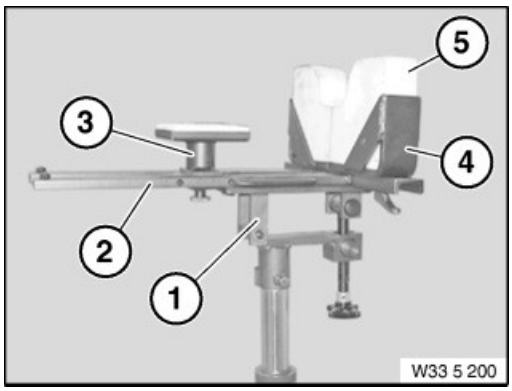
0 493 337 (00 2 080) Pump



Common	Used in step 411
Usage	(Hand pump) For lifetime oil filling
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 01 98 (294)

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0 496 009 (33 5 200) Fixture



Common

Used in step 510

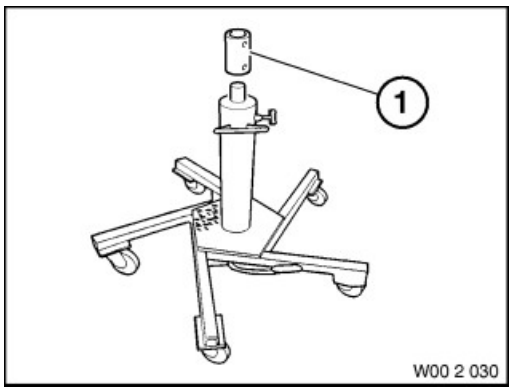
Usage	For holding rear axle final drive during removal and installation. This mounting replaces mounting 33 4 420
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 01 07 (333)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 496 019 (33 5 201)		**Joint**	
2	0 496 020 (33 5 202)		**Frame** (Main frame)	
3	0 496 077 (33 5 203)		**Upholstery**	
4	0 496 078 (33 5 204)		**Fixture** (Fixture for foam material insert) Discontinued, only available via complete tool	
5	0 496 079 (33 5 205)		**Insert** (Insert) Foam material insert (1 set = 2 pieces)	
5	0 496 080 (33 5 206)		**Belt** (Tensioning strap)	

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0 490 133 (00 2 030) Device



Common Used in step 510

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	

Links

General repair instructions	Used in step

Operating materials	Used in step
Main group 33	11

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This documentation refers to special tools that were not yet available when going to press.

33 11 272 Replacing the rear axle differential M sport differential cover gasket

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.

RISK OF DAMAGE

Damage to rear axle differential.

Failure to comply with the oil specifications can result in serious damage to the rear axle differential.

- After completion of repair work, check the transmission oil level in the rear axle differential.
- Use only the approved final drive transmission oil.

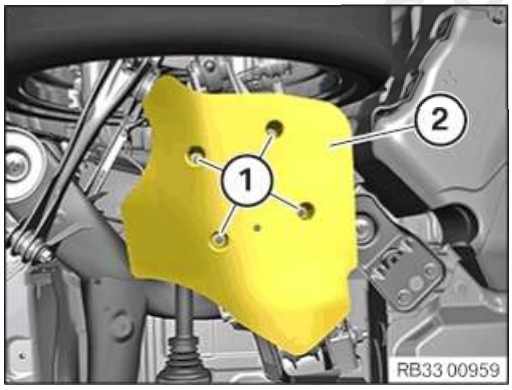
PRELIMINARY WORK

1 – Remove the cover of the camber control arm on the left and right

NOTICE

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

▸ **Remove the cover of the camber control arm**



- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

2 – Remove complete exhaust system

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WARNING

Hot surfaces.

Risk of burning!

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

CAUTION

Component with heavy weight.

Danger of injury!

- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

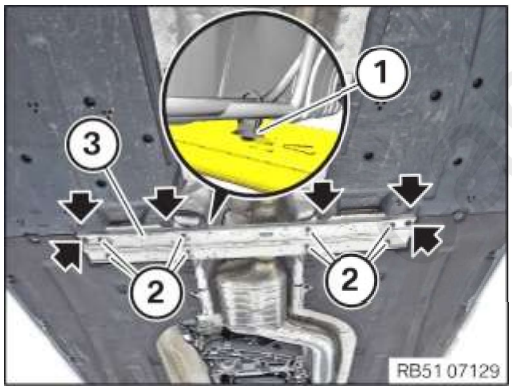
CAUTION

Heavy component.

Heavy components can lead to injury or damage.

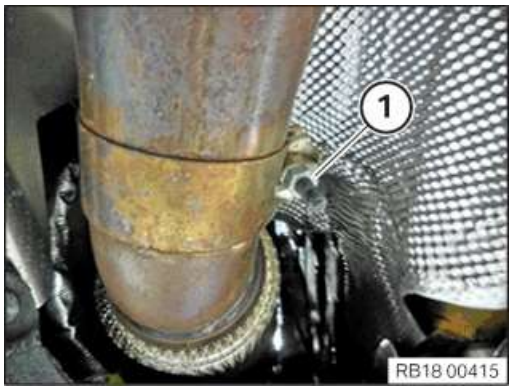
- Remove and install heavy components with the aid of another person/other persons.

...rdrgn.com



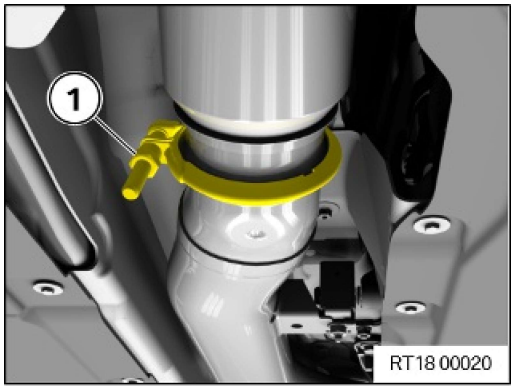
▸ **Remove the connecting support from the tunnel**

- Remove screws (arrows).
- **If installed:** Loosen clamp (1).
- Loosen screws (2).
- Guide out and remove connecting support (3) on the tunnel.



- **Equipment specification 1 (ribbon clamp)**

  Detach the ribbon clamp (1).

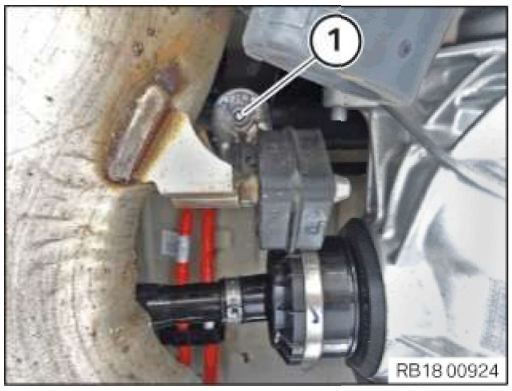


- **Equipment specification 2 (V-clips)**

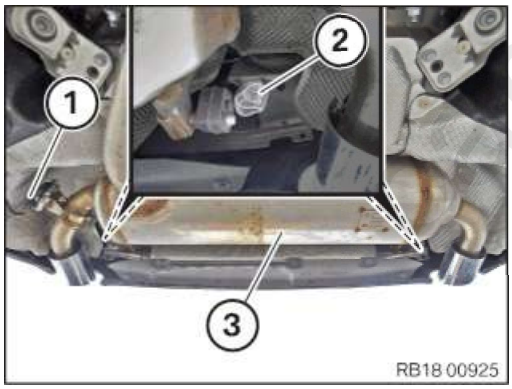
  Unfasten clamp (1).



- Loosen nut (1).



- Release the nut (1) on the rear axle support.



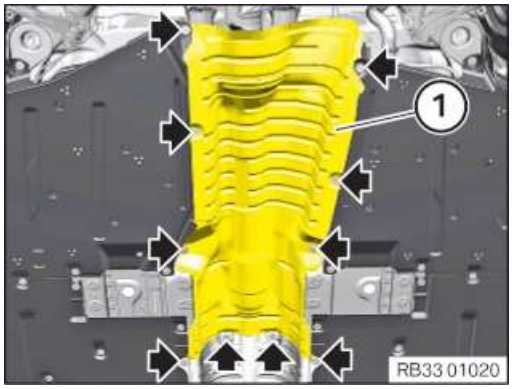
- Unlock plug connection (1) and disconnect.
- Loosen nuts (2).
- Lower and remove the exhaust system (3) with the assistance of a second person.

3 – Remove heat shield at rear.

NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.

rdiagn.com



- Loosen bolts and nuts (arrows).
- Remove the rear heat shield (1).

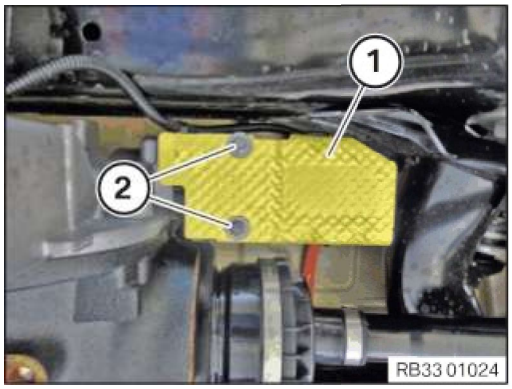
4 – Detaching and lowering the rear axle differential (with GHAS)

RISK OF DAMAGE

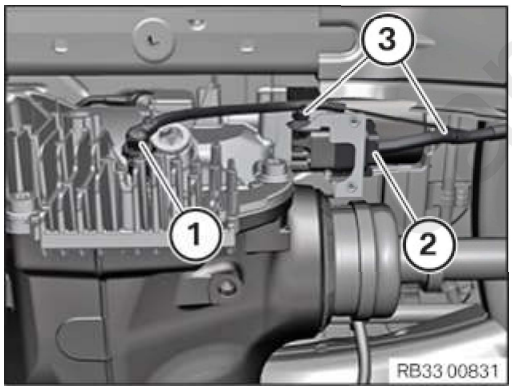
Damage to rear axle differential.

If the rear axle differential drops down, persons can be injured or the rear axle differential can be damaged.

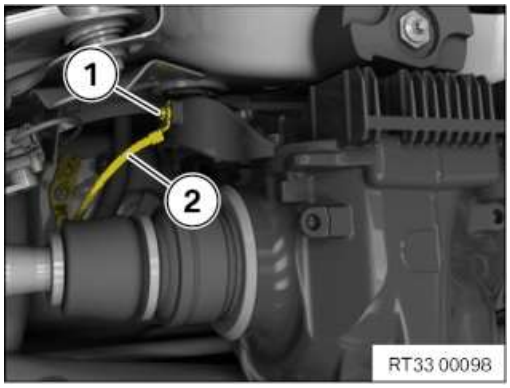
- Secure the rear axle differential using a tensioning strap.



- Loosen screws (2).
- Remove thermal protection(1).



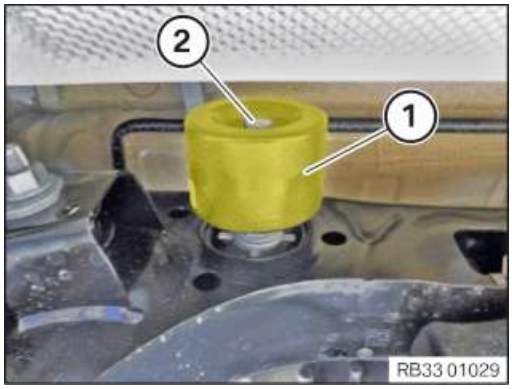
- Unlock and disconnect the plug connections (1) and (2).
- Detach the cables from the brackets (3).



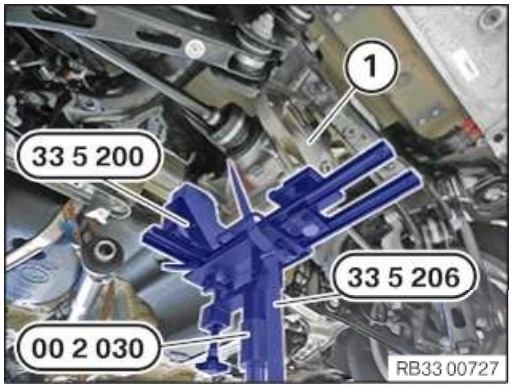
- Loosen screw (1).
- Remove ground strap (2).

▸ **If installed: Remove vibration absorber**

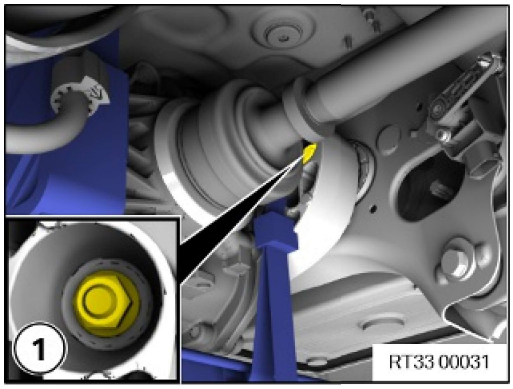
ardiagn.com



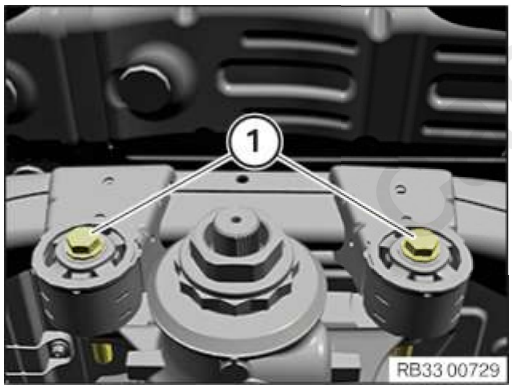
- Loosen screw (2).
- Remove the vibration absorber (1).



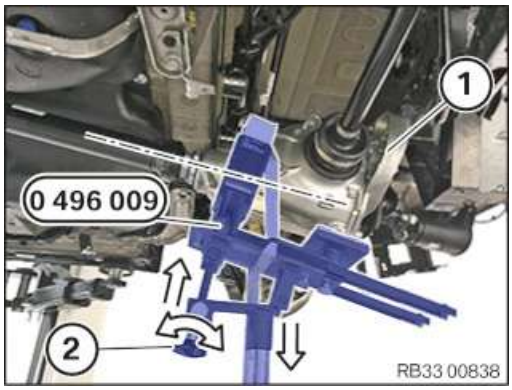
- Place the special tool 0 496 009 (33 5 200) onto the universal jack 0 490 133 (00 2 030).
- Support the rear axle differential (1) with the special tool 0 496 009 (33 5 200).
- Secure the rear axle differential (1) with a tensioning strap on the special tool 0 496 009 (33 5 200).



- Loosen nut (1).
- Move screw toward the rear.



- Loosen screws (1) on rear axle support at front.



- Lower rear axle differential (1) using the special tool 0 496 009 (33 5 200) only until the cover on the rear axle differential is accessible.

  During lowering, twist the adjusting screw (2) to slightly raise the rear axle differential at the front.

5 – Drawing off oil in the rear axle differential

CAUTION

Materials harmful to health.

Health risks in the event of contact with substances that are harmful to health!

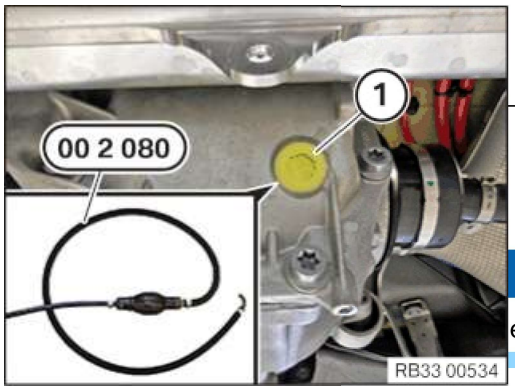
- Observe and comply with the Safety Information on the containers and the notes on the manufacturer's safety data sheet.
- Conduct all work in appropriate personal protective equipment only.

CAUTION

Acid burns may result from skin contact with oil or inhaling oil vapours.

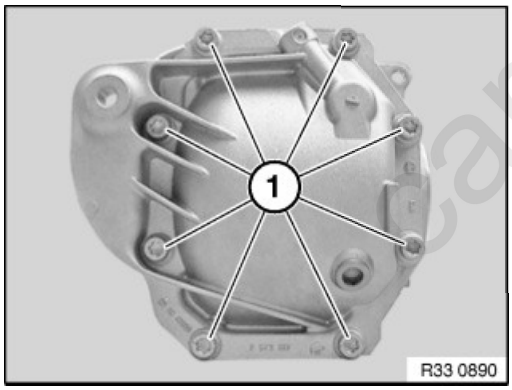
Risk of acid burns from contact with oil!

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.



- Release oil filler plug (1).
- Draw off the oil using special tool 0 493 337 (00 2 080).

es. Some parts may differ in certain details.

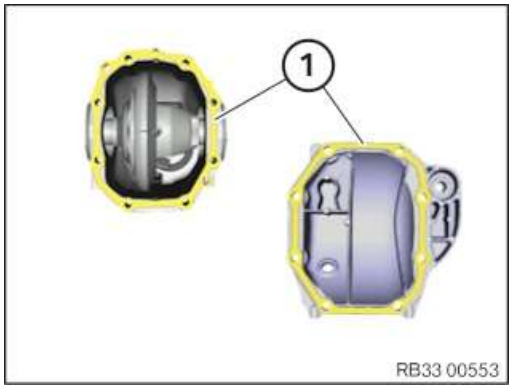


- Loosen screws (1).
- Take off case cover.

7 – Removing the seals and cleaning the sealing surfaces

NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.



- Remove the seals from the housing cover and the housing of the rear axle differential using a scraper.
- Clean sealing surfaces (1) on the cover and rear axle differential.

8 – Apply liquid sealing compound

NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.



- Have the special tool ready.



TECHNICAL INFORMATION

For more information see: 11 00 ... Overview of consumables in Electronic Parts Catalogue

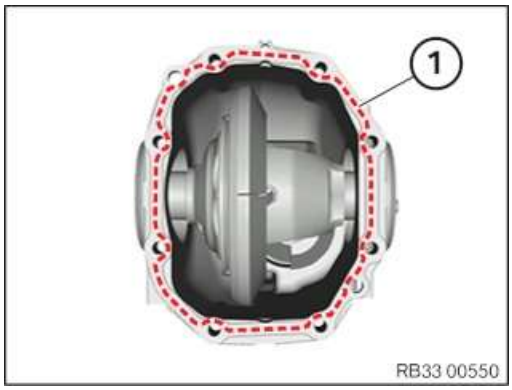
- Position the sealing compound (1) on special tool as shown.

  Parts: Sealing compound

Sealing compound

Loctite 5970 liquid sealing compound	50 ml, Cartridge	83190404517

Overview of consumables (Electronic Parts Catalogue)



- Apply liquid sealing compound along the dotted line (1) on the sealing surface of the rear axle differential.

  The sealing bead must run along the inner edge.

Sealing compound

Loctite 5970 liquid sealing compound	50 ml, Cartridge	83190404517

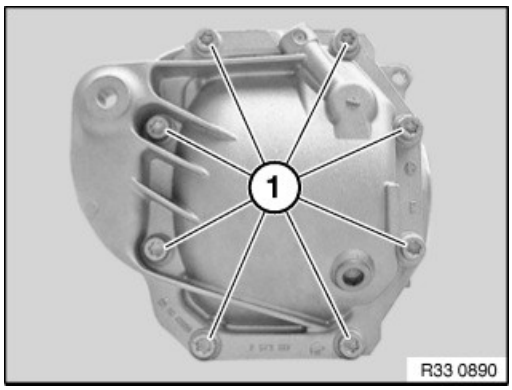
Overview of consumables (Electronic Parts Catalogue)

9 – Installing the housing cover

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NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.



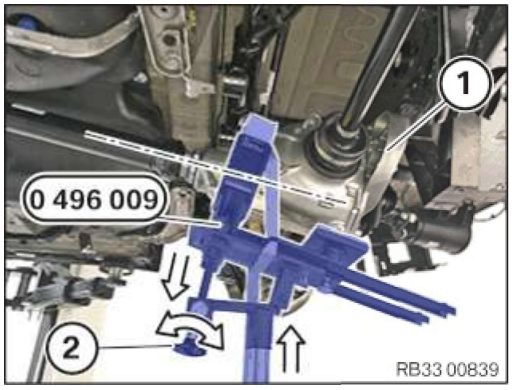
- Position the housing cover on the rear axle differential.
- Tighten the screws (1).

Lid to rear axle differential

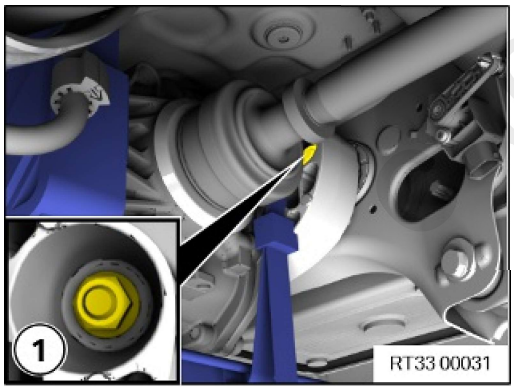
M12			140 Nm
M10			90 Nm

POSTPROCESSES

10 – Raise rear axle differential and secure (with GHAS)

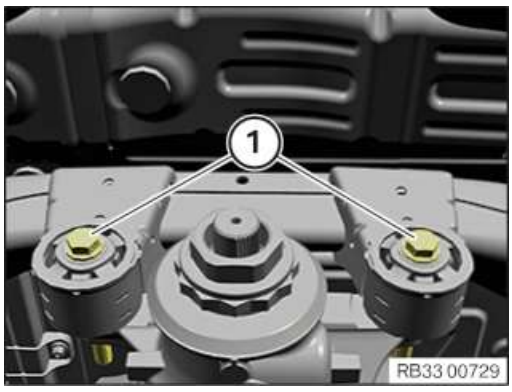


- Lift and position the rear axle differential (1)with the special tool 0 496 009 (33 5 200).
- While lifting the rear axle differential (1), twist the adjusting screw (2) to correct the installation position.



- Renew screw and nut (1).

  Parts: Nut, bolt
- Insert the screw.
- Screw on nut (1) by hand.

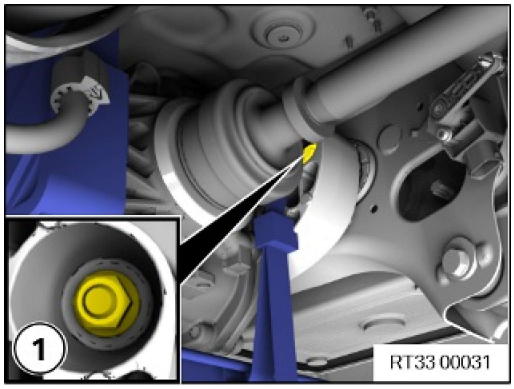


- Renew screws (1).

  Parts: Bolts
- Screw in the screws (1) by hand.
- Tighten the screws (1).

Rear differential to rear axle carrier, front

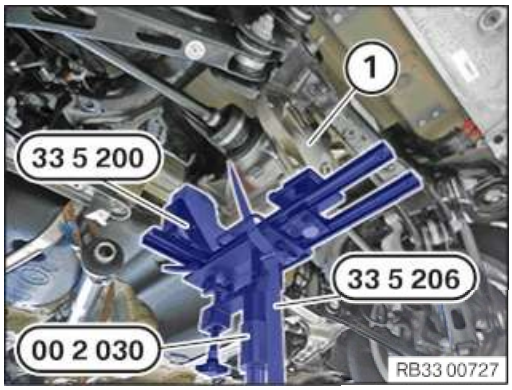
M12x100	Renew screws.	Tightening torque	100 Nm



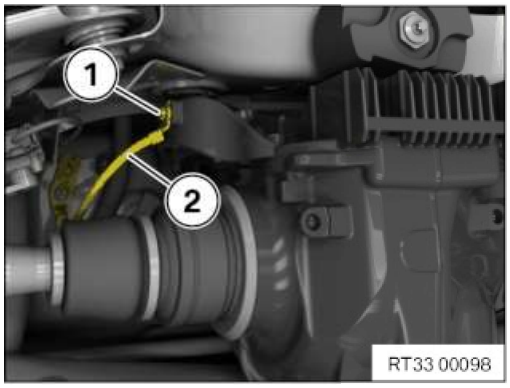
- Tighten nut (1).

Rear differential to rear axle carrier, rear

M14x110	Renew screw and nut.	Tightening torque.	175 Nm



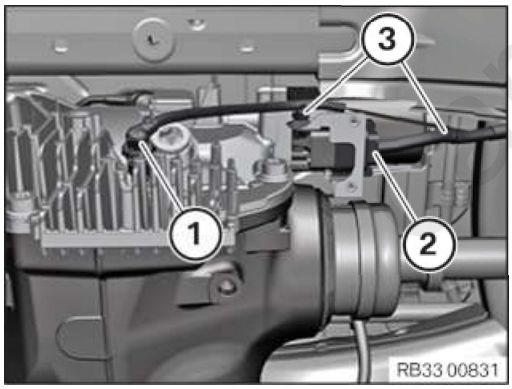
- Loosen and remove the tensioning strap from the rear axle differential (1).
- Lower and remove the special tools 0 490 133 (00 2 030) and 0 496 009 (33 5 200).



- Position the ground strap (2) on the rear axle differential.
- Tighten down screw (1).

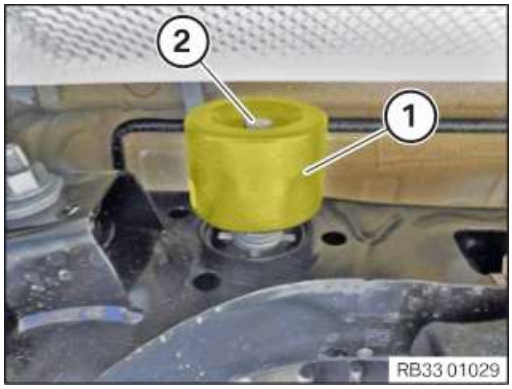
Ground strap to rear axle differential

M6x20		Tightening torque	8 Nm



- Secure the cables on the brackets (3).
- Connect the connector (1) and (2) and audibly lock it.

▶ **If installed: install the vibration absorber**



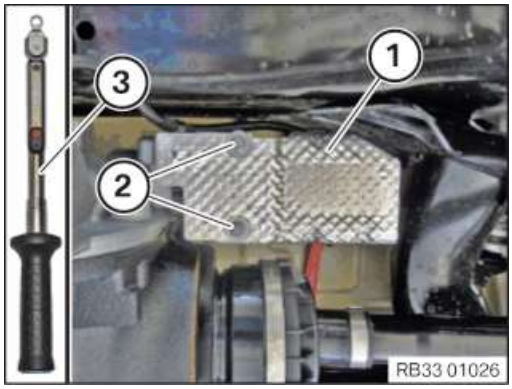
- Position the (1) vibration absorber.
- Renew the screw (2).

  Parts: Screw
- Tighten down screw (2).

Vibration absorber to rear axle

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

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- Prepare the torque wrench (3) as shown with the attachment part.
- Position the heat shield (1).
- Tighten the screws (2).

Heat shield to servomotor

M5x10		Tightening torque	5 Nm

11 – Check/top up oil level in the rear axle differential

CAUTION

Materials harmful to health.

Health risks in the event of contact with substances that are harmful to health!

- Observe and comply with the Safety Information on the containers and the notes on the manufacturer's safety data sheet.
- Conduct all work in appropriate personal protective equipment only.

CAUTION

Acid burns may result from skin contact with oil or inhaling oil vapours.

Risk of acid burns from contact with oil!

- Wear safety goggles and protective gloves.
- Ensure adequate ventilation.

RISK OF DAMAGE

Damage to rear axle differential.

Failure to comply with the oil specifications can result in serious damage to the rear axle differential.

- Use only the approved final drive transmission oil.

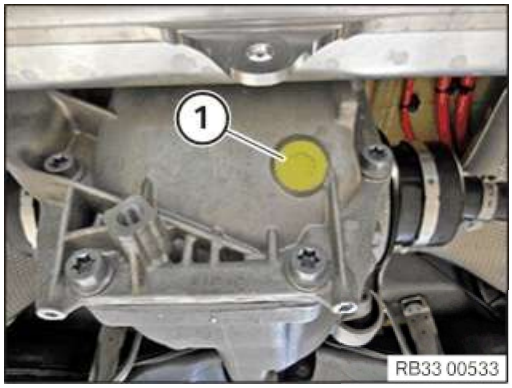
TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

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- Use the special tool 0 493 337 (00 2 080) to top up the rear axle differential oil.



- Open the oil filler plug (1).
- Check oil level:

  The oil level at the rear axle differential has been adjusted correctly once a small quantity of oil escapes from the opening of the oil filler plug.

  If necessary, top up final drive transmission oil.

Transmission oil

Technically suitable rear axle differential oils	

Main group 33

- Replace the oil filler plug (1).

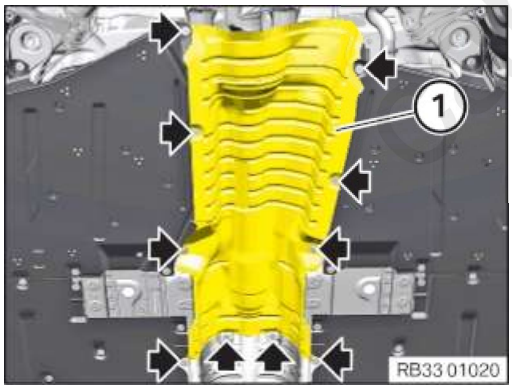
  Parts: Oil filler plug

- Screw in and tighten the oil filler plug (1).

12 – Installing the rear heat shield

NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.



- Position the rear heat shield (1).
- Tighten the nuts and bolts (arrows).

Heat shield to vehicle underbody

Screws and nuts		Tightening torque	3 Nm

13 – Installing the complete exhaust system

CAUTION

Component with heavy weight.

Danger of injury!

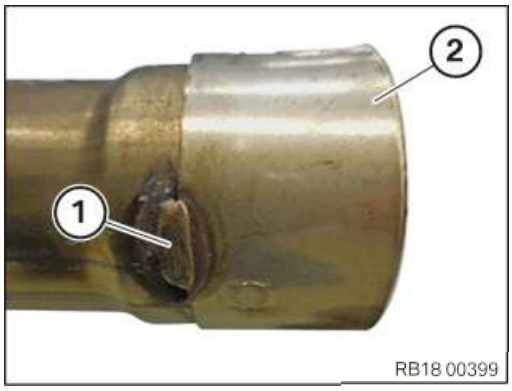
- Note component's centre of gravity.
- Support component using a jack.
- Secure component against falling off the jack.

CAUTION

Heavy component.

Heavy components can lead to injury or damage.

- Remove and install heavy components with the aid of another person/other persons.



CAUTION

Swarf resulting from sawing or grinding components.

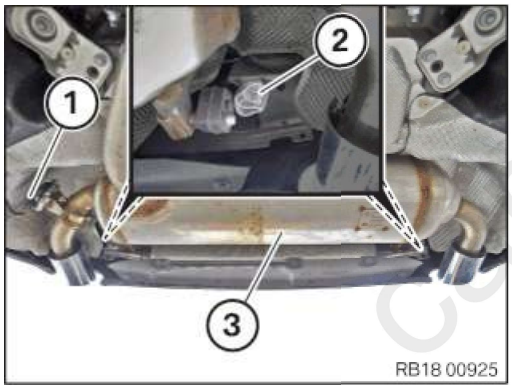
Danger of injury!

- Conduct all work in appropriate personal protective equipment only.
- Wear safety goggles and protective gloves.

- **Equipment specification 1 (ribbon clamp)**

  Open the weld seam (1) with a conventional tool.
- Remove ribbon clamp (2).
- Renew the (2) ribbon clamp.

  Parts: Ribbon cable clamp



- Feed in and install the exhaust system (3) with a second person.
- Renew nuts (2).

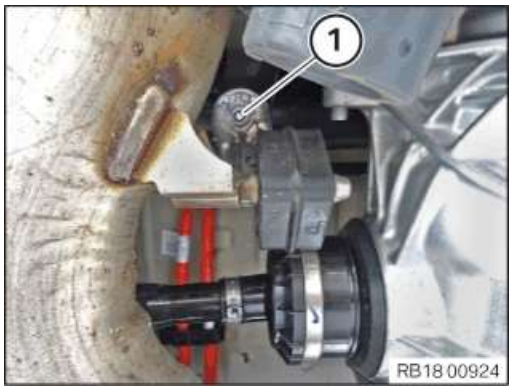
  Parts: Nuts
- Tighten nuts (2).

Rear silencer to body / bumper support

M8	Replace nuts.	Tightening torque	19 Nm

- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Renew nut (1).

  Parts: Nut
- Tighten the bolt (1) on the rear axle support.

Exhaust system to rear axle carrier

Nut M8	Renew nut.	Tightening torque	19 Nm

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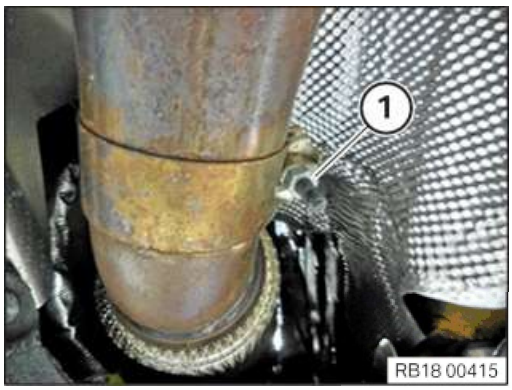
- Renew nut (1).

  Parts: Nut

- Tighten nut (1).

Front pipe / petrol particulate filter on transmission holder

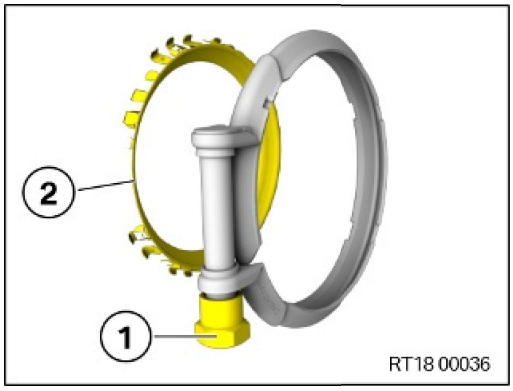
M8	Renew nut.	Tightening torque	19 Nm



- Tighten the ribbon clamp (1).

Exhaust system to catalytic converter

Ribbon cable clamp	Renew flat band clip.	Tightening torque	26 Nm

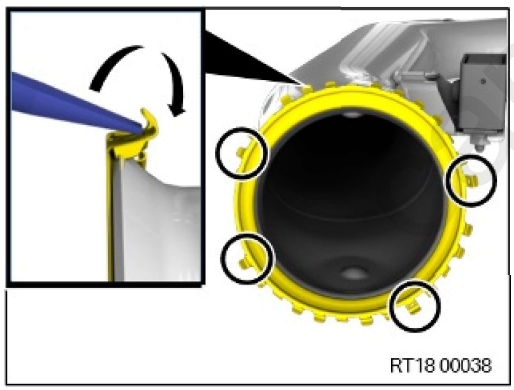


- **Equipment specification 2 (V-clips)**

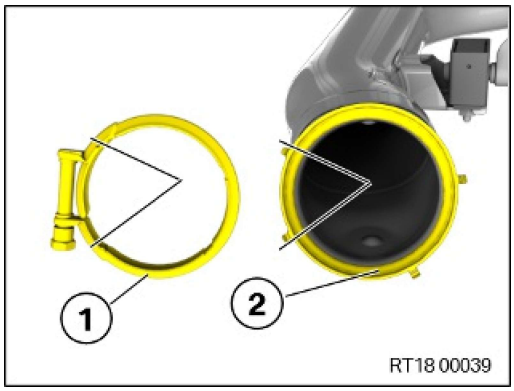
  Renew V-band clamp.

  Parts: V-band clamp

  Unscrew the nut (1) and remove the sealing ring (2).

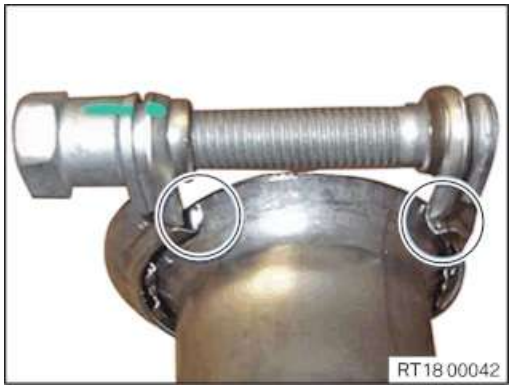


- Bend all sheet metal tabs over with a suitable tool, except those in the marked areas.

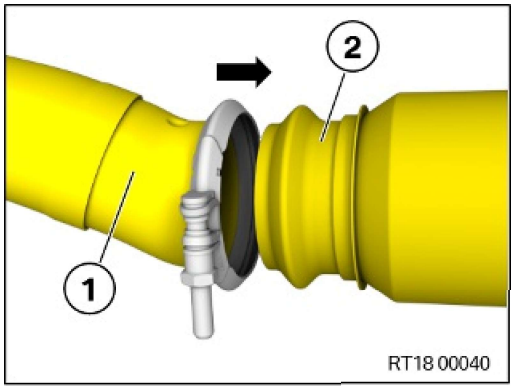


- Mount the V-clip (1) on the sealing ring (2).
- Make sure that the V-clip (1) is positioned correctly on the sealing ring (2).

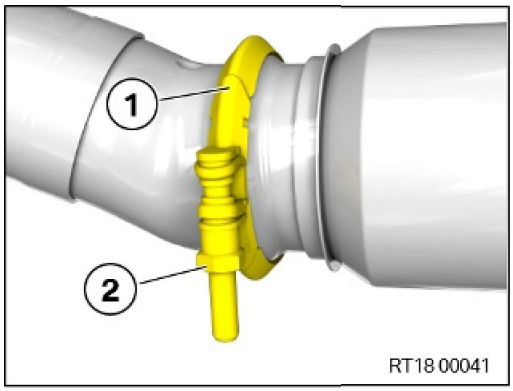
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- Ensure that the V-clip rests against the sheet metal tabs in the marked areas after mounting.



- Connect the exhaust system (1) with the catalytic converter (2) and position it correctly (arrow).

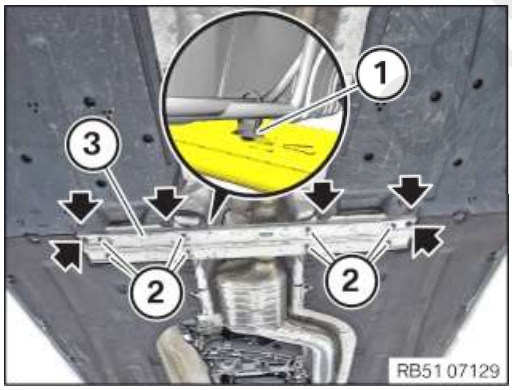


- Make sure that V-clip (1) is fitted correctly.
- Tighten down screw (2).

V-clip to catalytic converter

V-band clamp	Renew V-band clamp.	Tightening torque	22 Nm

▸ **Install the connecting supports on the tunnel**



- Guide in and install connecting support (3) on the tunnel.
- Tighten the screws (2).

Connecting support to tunnel

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

- Tighten screws (arrows).

Connecting support to tunnel

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

- **If installed:** Secure clamps (1).

14 – Install the cover of the camber control arm on the left and right

rdiagn.com

NOTICE

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



▸ **Installing the cover of the camber control arm**

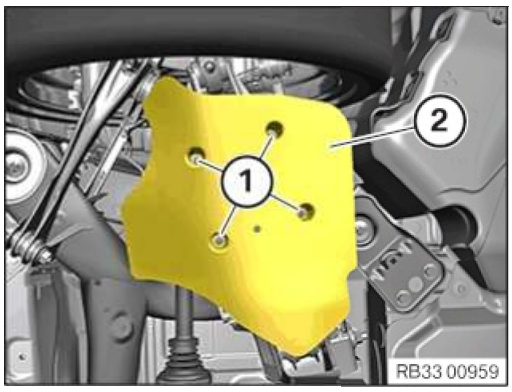
- Note the installation location and direction of installation.

  Direction of installation:

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right



- Position the camber control arm cover (2) on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

Additional Information

Overview of Tightening Torques

Lid to rear axle differential — Used in step 9

M12			140 Nm
M10			90 Nm

Rear differential to rear axle carrier, front — Used in step 10

M12x100	Renew screws.	Tightening torque	100 Nm

Rear differential to rear axle carrier, rear — Used in step 10

M14x110	Renew screw and nut.	Tightening torque.	175 Nm

Ground strap to rear axle differential — Used in step 10

M6x20		Tightening torque	8 Nm

Vibration absorber to rear axle — Used in step 10

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

Heat shield to servomotor — Used in step 10

M5x10		Tightening torque	5 Nm

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Heat shield to vehicle underbody — Used in step 12

Screws and nuts		Tightening torque	3 Nm

Rear silencer to body / bumper support — Used in step 13

M8	Replace nuts.	Tightening torque	19 Nm

Exhaust system to rear axle carrier — Used in step 13

Nut M8	Renew nut.	Tightening torque	19 Nm

Front pipe / petrol particulate filter on transmission holder — Used in step 13

M8	Renew nut.	Tightening torque	19 Nm

Exhaust system to catalytic converter — Used in step 13

Ribbon cable clamp	Renew flat band clip.	Tightening torque	26 Nm

V-clip to catalytic converter — Used in step 13

V-band clamp	Renew V-band clamp.	Tightening torque	22 Nm

Connecting support to tunnel — Used in step 13

M8x25 screw		Tightening torque	20 Nm
Screw		Tightening torque	3 Nm

Cover to camber control arm — Used in step 14

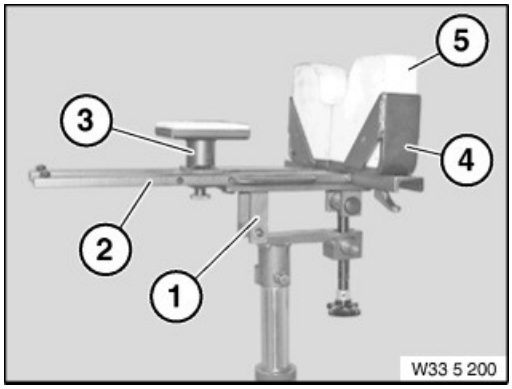
M6	Replace nuts.	Tightening torque	6 Nm

Overview of Special Tools

0 496 009 (33 5 200) Fixture

Used in step 410

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Common

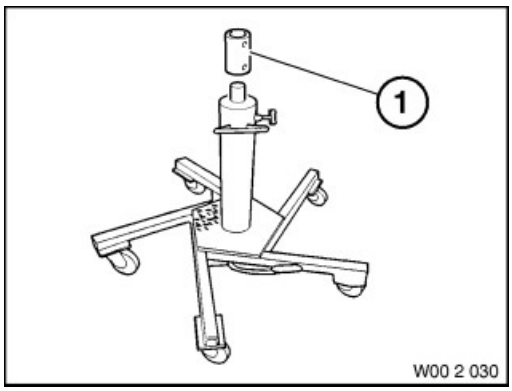
Usage	For holding rear axle final drive during removal and installation. This mounting replaces mounting 33 4 420
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 01 07 (333)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 496 019 (33 5 201)		**Joint**	
2	0 496 020 (33 5 202)		**Frame** (Main frame)	
3	0 496 077 (33 5 203)		**Upholstery**	
4	0 496 078 (33 5 204)		**Fixture** (Fixture for foam material insert) Discontinued, only available via complete tool	
5	0 496 079 (33 5 205)		**Insert** (Insert) Foam material insert (1 set = 2 pieces)	
5	0 496 080 (33 5 206)		**Belt** (Tensioning strap)	

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0 490 133 (00 2 030) Device



Common Used in step 410

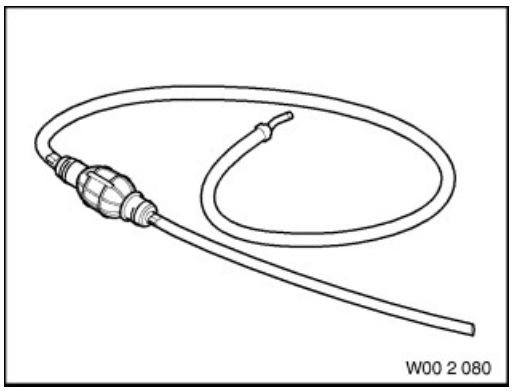
Usage	(universal hydraulic lifter base unit) Chassis and hydraulic lifter - For removing and installing rear axle supports and gearboxes. Also for soft top mounts. Is replaced by 81 22 2 219 012
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 05 90 (207)

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	

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0 493 337 (00 2 080) Pump



Common	Used in step 511
Usage	(Hand pump) For lifetime oil filling
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 01 98 (294)

Links

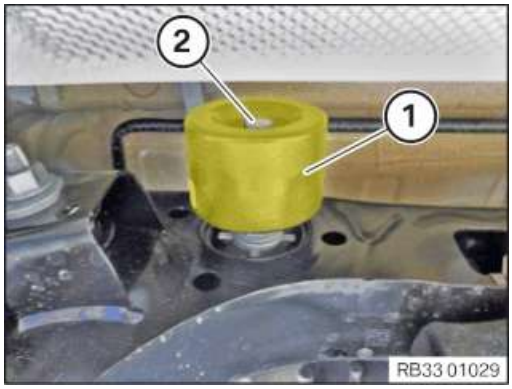
General repair instructions	Used in step

Operating materials	Used in step
Main group 33	11

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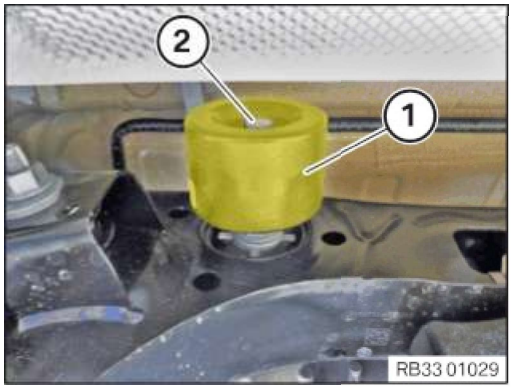
33 31 017 Remove and install/replace the vibration absorber on the rear axle differential

1 – Remove the vibration absorber on the rear axle differential



- Loosen screw (2).
- Remove the vibration absorber (1).

2 – Install the vibration absorber on the rear axle differential



- Position the (1) vibration absorber.
- Renew the screw (2).

  Parts: Screw
- Position and tighten the screw (2).

Vibration absorber to rear axle

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

Additional Information

Overview of Tightening Torques

Vibration absorber to rear axle Used in step 2

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

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33 31 015 Removing and installing/replacing the vibration absorber on the rear axle support

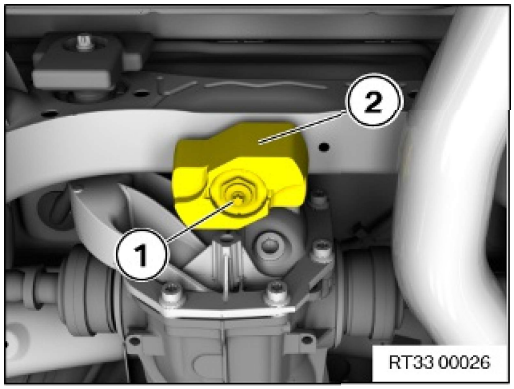
WARNING

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

Danger! Life-threatening injuries!

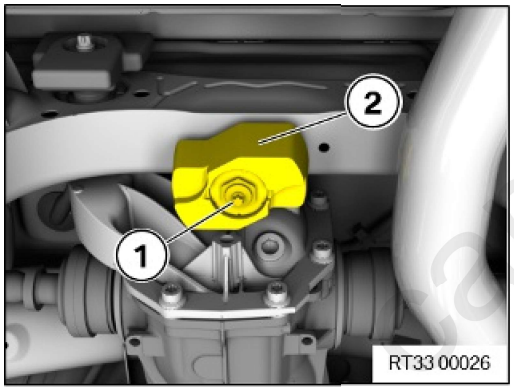
- Observe safety information on raising the vehicle using a vehicle hoist.
- For additional information see: 00 ... Raising the vehicle using a vehicle hoist.

1 – Remove the vibration damper on the rear axle support



- Loosen screw (1).
- Remove the vibration absorber (2).

2 – Install the vibration absorber on the rear axle support



- Renew the screw (1).

  Parts: Screw
- Position the vibration absorber (2).
- Tighten down screw (1).

Vibration absorber to rear axle support

M12	Renew screw.	Tightening torque	28 Nm

Additional Information

Overview of Tightening Torques

Vibration absorber to rear axle support Used in step 2

M12	Renew screw.	Tightening torque	28 Nm

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

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33 32 190 Removing and installing/replacing left or right camber control arm

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.

TECHNICAL INFORMATION

Perform wheel alignment after installation.

NOTICE

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

PRELIMINARY WORK

1 – Remove rear left or right wheel

▸ **Removing the wheel**



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

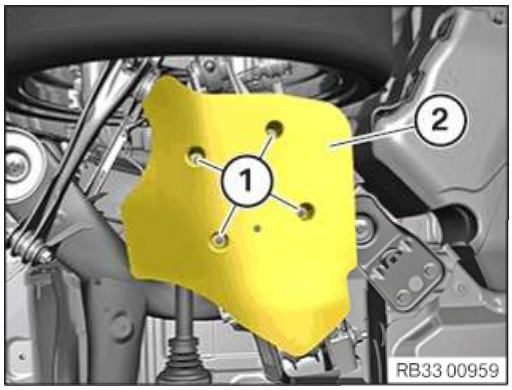
  This process is intended to prevent damage to the brake disc.

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

2 – Remove the cover of the camber control arm

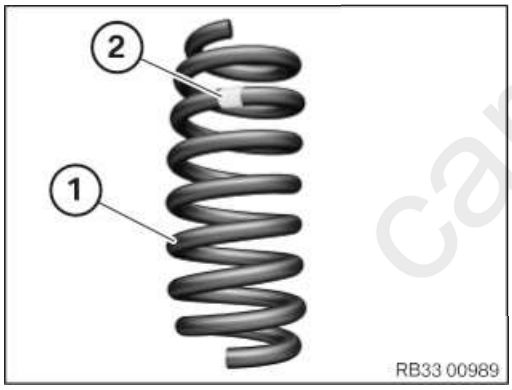


- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

3 – Remove coil spring

TECHNICAL INFORMATION

Do not operate special tool with an impact screwdriver.



TECHNICAL INFORMATION

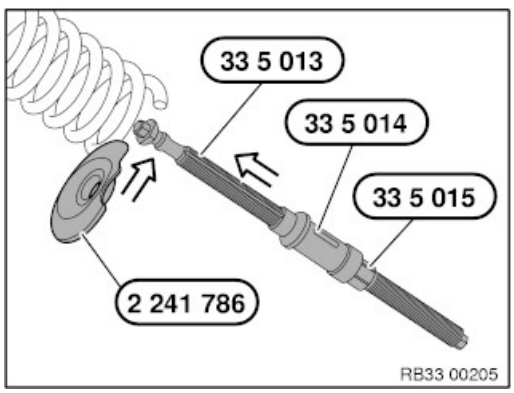
Incorrect assembly is possible. Ensure correct installation position.

- The installation position of the coil spring(1) is marked with a label (2).

  The label (2) is attached at the top end of the coil spring (1) and is marked as “top”
- Check coil spring (1) for availability of label (2)

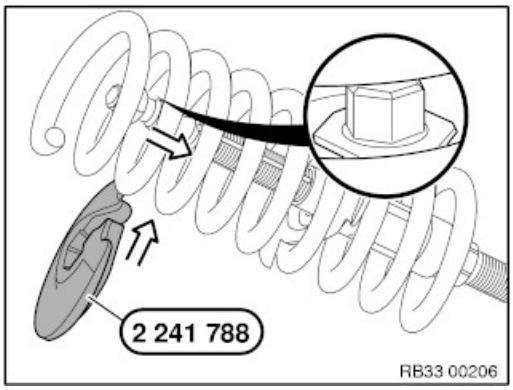
  If the label (2) on the installed coil spring (1) is missing and it has to be fixed after repair, then the installation position of the coil spring (1) must be marked necessarily.

Note: Mark the installation position of the coil spring, by attaching an adhesive tape at the top end of spring.



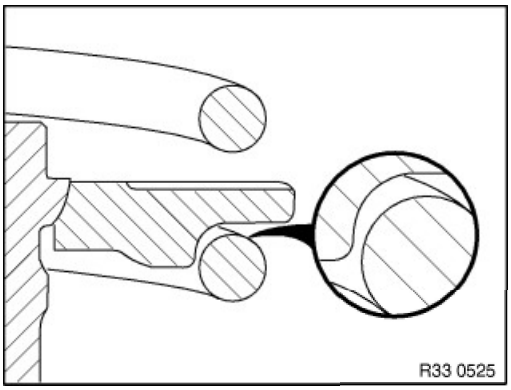
- Insert lower spring cup centrally into coil spring and turn to lowest winding.
- Drive spindle , , from below through the camber control arm and the bottom spring cup .

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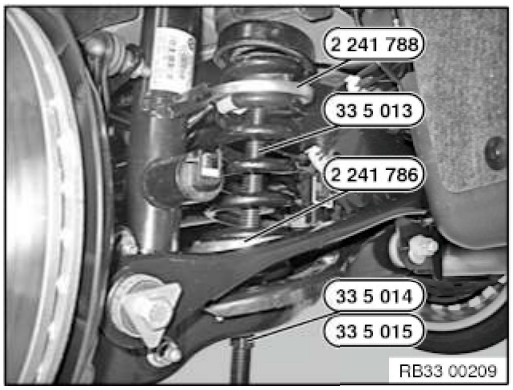


- Insert top spring cup sideways into coil spring and turn to the uppermost winding.

  Make sure spindle (hexagonal) is correctly seated in upper spring cup !
- Pull spindle down.

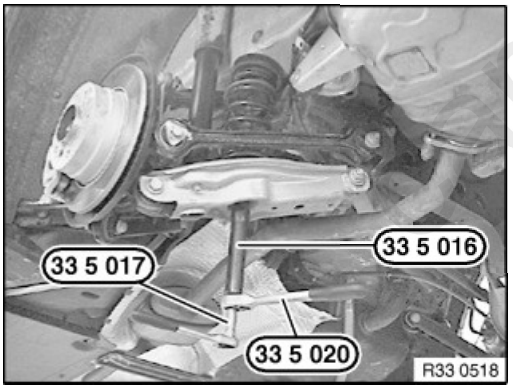


- Make sure coil spring is correctly positioned in spring cups.



- Check and correct the position of the special tools , and , , and correct if required.

  The special tools must be aligned centrally, in order to obtain the largest possible contact surface on the coil spring.



- Tensioning the coil spring using the special tools and .

  Counter support the spindle of the spring tensioner with the special tool .

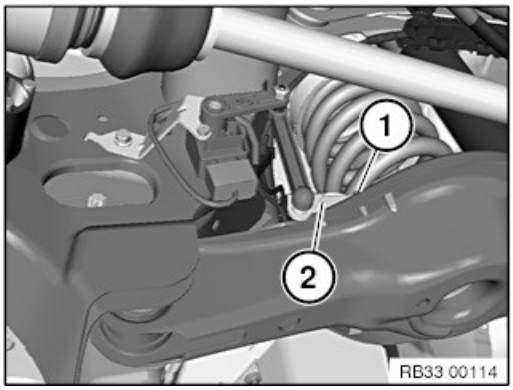


- Remove coil spring (1) upwards.

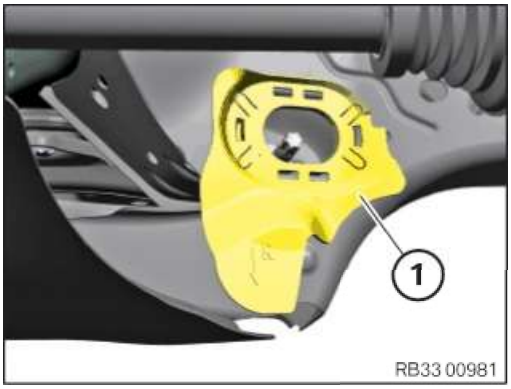
MAIN WORK

4 – Removing the camber control arm

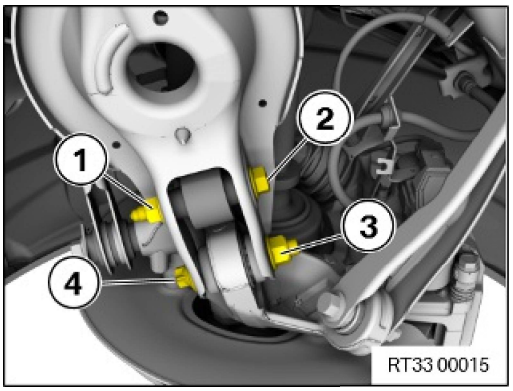
4 – Removing the camber control arm



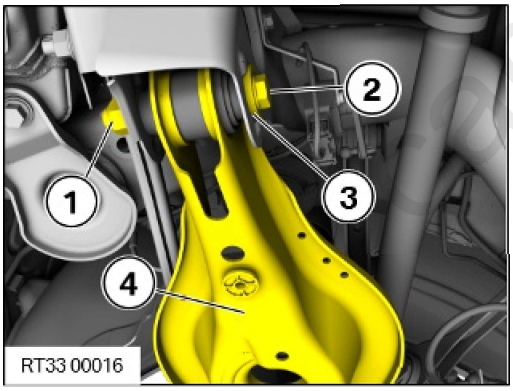
- **Left only:** Unclip the holder of ride height sensor (2) from camber control arm (1).



- Remove stone chip guard (1) at the screw connection of camber control arm on the rear axle support.



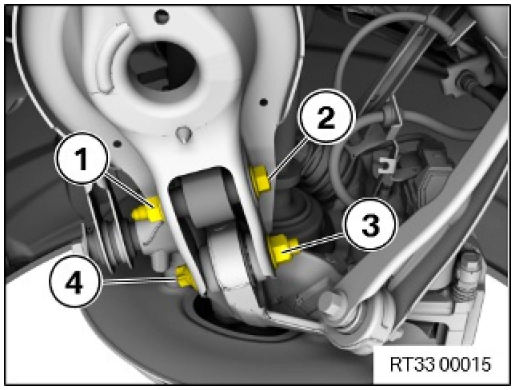
- Loosen nut (1).
- Pull out screw (2).
- Loosen nut (3).
- Pull out screw (4).



- Secure camber control arm (4) to prevent it from falling.
- Mark the position of eccentric adjustment washer (3) for the rear axle support to make it easier to set the rear axle subsequently.
- Loosen the nut (1) and remove the eccentric washer.
- Pull out the eccentric bolt (2).
- Remove the camber arm (4).

5 – Installing the camber control arm

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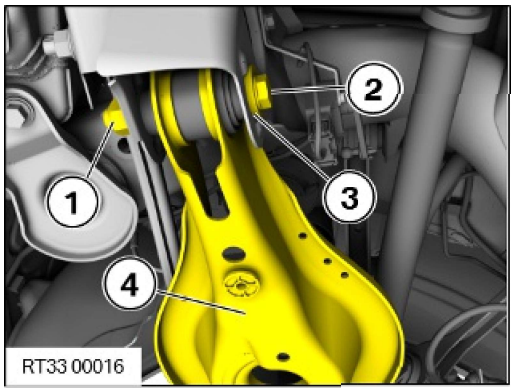
- Position the camber control arm.
- Renew the nut (1) and bolt (2).

  Parts: Nut, bolt
- Insert the screw (2).
- Screw on nut (1) by hand.
- Renew the nut (3) and bolt (4).

  Parts: Nut, bolt
- Insert the screw (4).
- Tighten nut (3).

Camber control arm to wheel carrier

M14	Renew screw and nut.	Jointing torque Angle of rotation	165 Nm 90 °



- Renew nut (1), eccentric washer (3) and eccentric bolt (2).

  Parts: Nut, eccentric washer, eccentric bolt
- Position camber control arm (4) on the rear axle support.
- Insert the eccentric bolt (2).

TECHNICAL INFORMATION

The vehicle ride height may change as a result of turning the eccentric bolts for the adjustment of toe and camber. When renewing the bolts, make sure the eccentric bolts are correctly positioned to keep the ride height change to a minimum during the adjustment work.

- Position eccentric washer (3) until the eccentric is positioned vertically upwards!

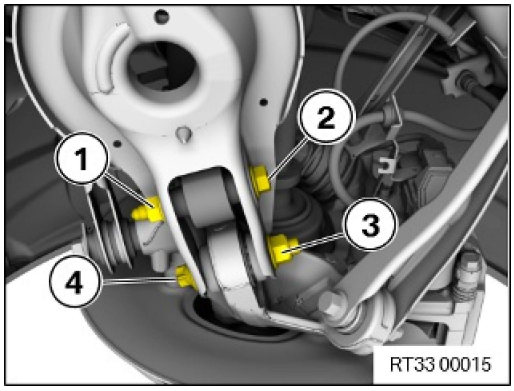
TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Connect the eccentric washer and tighten nut (1).

Camber control arm to rear axle support

M14	Renew eccentric bolt, nut and eccentric washer. Tighten in normal position.	Tightening torque	175 Nm



TECHNICAL INFORMATION

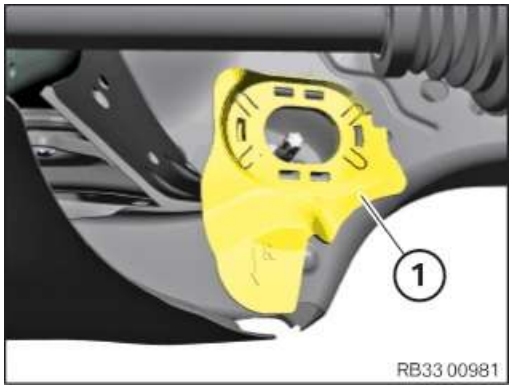
Tighten the screw connection in the normal position.

- Tighten nut (1).

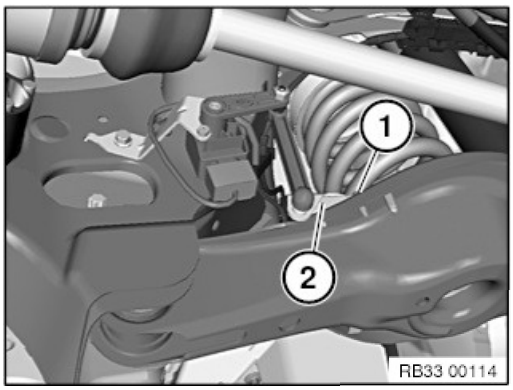
Rear spring strut to camber control arm

M14	Renew screw and nut. Tighten in normal position.	Jointing torque Angle of rotation	100 Nm 90 °

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- Mount stone chip guard (1).



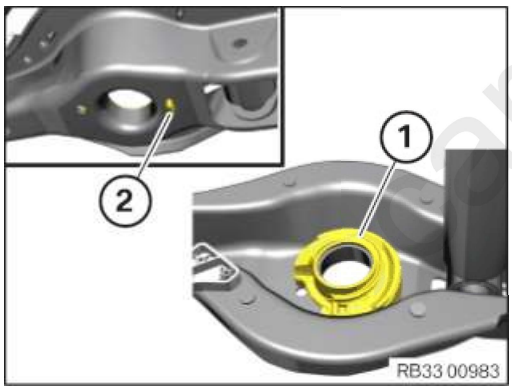
- **Left only:** Clip in the holder of ride height sensor (2) on camber control arm (1).

POSTPROCESSES

6 – Install the coil springs

TECHNICAL INFORMATION

Do not operate special tool with an impact screwdriver.



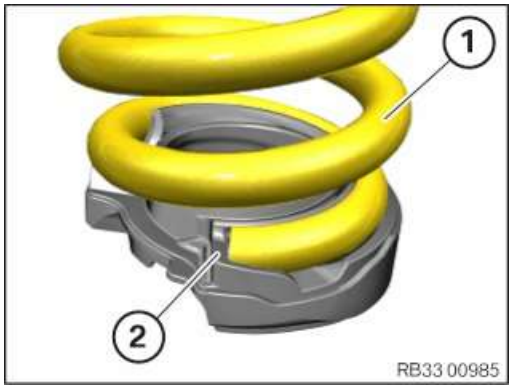
- Check bottom spring pad (1) for damage, renew if necessary.
- Check bottom spring pad (1) for correct position on the camber control arm, correct the position if necessary.

  The plastic tab (2) must be positioned in the bore hole.

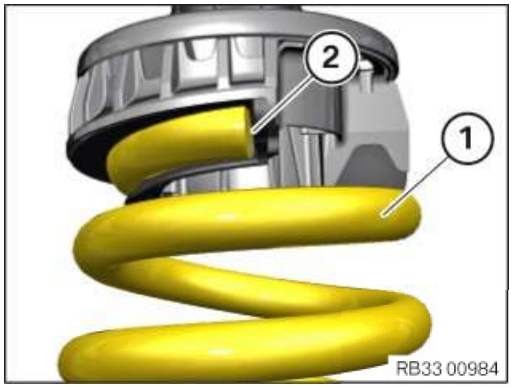


- Install coil spring (1) from the top and position it.

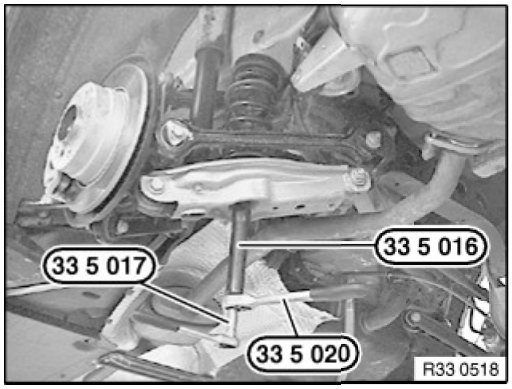
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- Move the coil springs (1) of the bottom spring pad (2) so that they are positively locked to the system.



- Position the top spring pad such that the end of the coil spring (1) moves to the system at the base (2).



- Release the tension on the coil spring using the special tools and .

  Note the installation position of the coil spring while releasing the tension.

  Counter support the spindle of the spring tensioner with the special tool .
- Remove special tools.

7 – Install rear left or right wheel

▶ **Mounting the wheel**



TECHNICAL INFORMATION

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

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

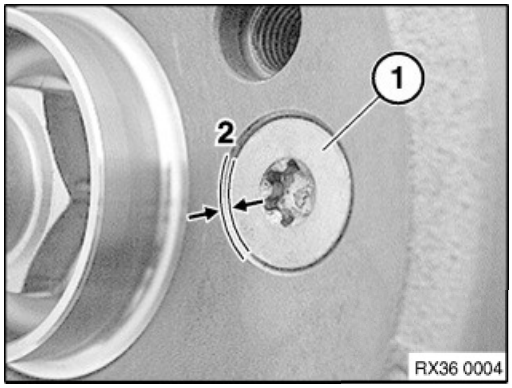
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.

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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

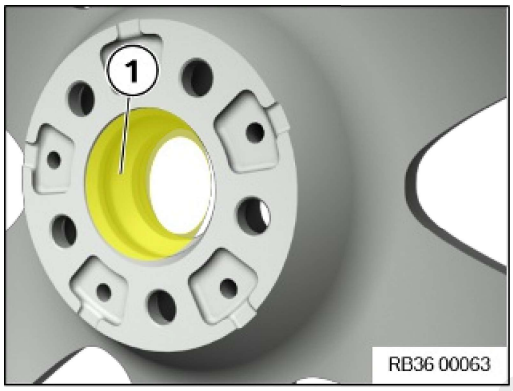
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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



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

Expendable materials

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

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

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



TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

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

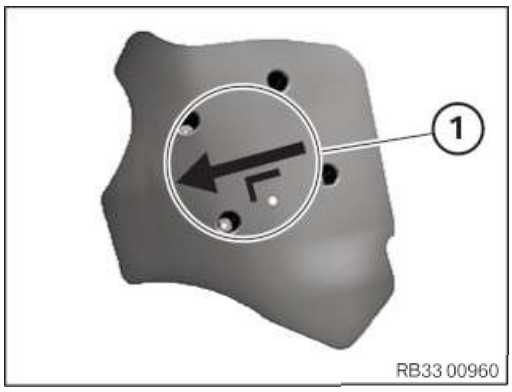
Wheel bolts

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

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

9 – Installing the cover of the camber control arm



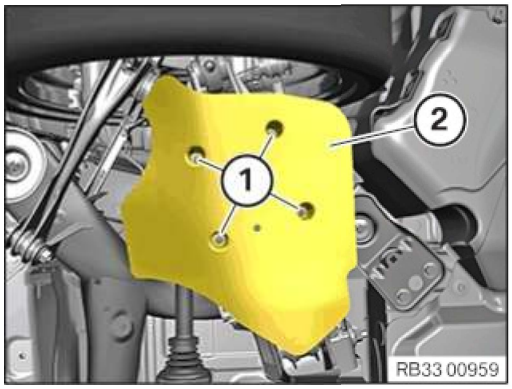
- Note the installation location and direction of installation.

  Direction of installation:

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right



- Position the camber control arm cover (2) on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

Additional Information

Overview of Tightening Torques

Camber control arm to wheel carrier — Used in step 5

M14	Renew screw and nut.	Jointing torque	165 Nm
		Angle of rotation	90 °

Camber control arm to rear axle support — Used in step 5

M14	Renew eccentric bolt, nut and eccentric washer. Tighten in normal position.	Tightening torque	175 Nm

Rear spring strut to camber control arm — Used in step 5

M14	Renew screw and nut. Tighten in normal position.	Jointing torque	100 Nm
		Angle of rotation	90 °

Brake disc to front wheel hub — Used in step 7

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 7

M8	Renew screw.	Tightening torque	16 Nm

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Wheel bolts			Used in step 7
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Cover to camber control arm			Used in step 9
M6	Replace nuts.	Tightening torque	6 Nm

Overview of Special Tools

2 344 011 Tool



Common	Used in step 7
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

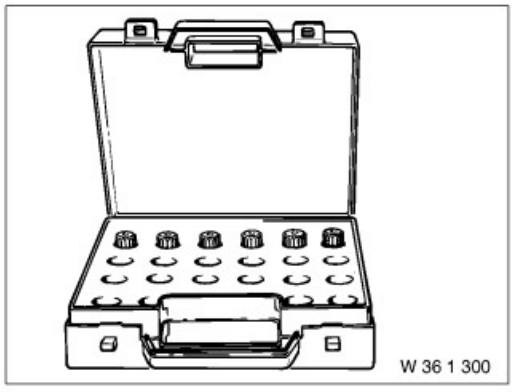
Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

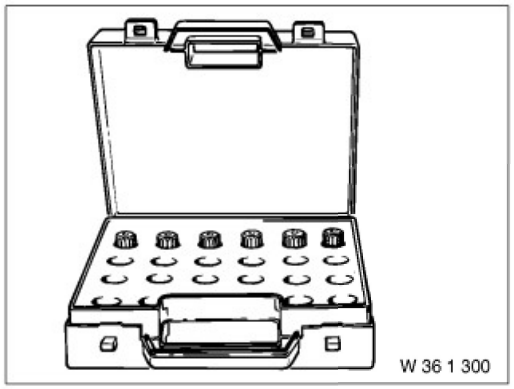
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0 495 225 (36 1 327) Wheel stud



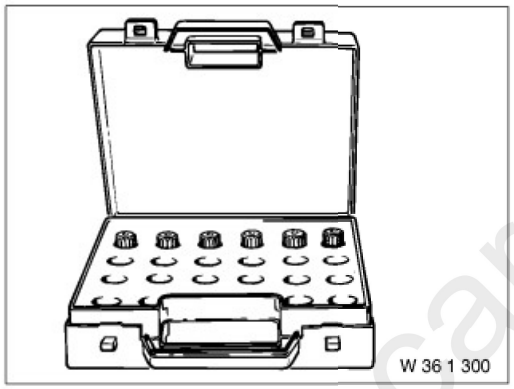
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



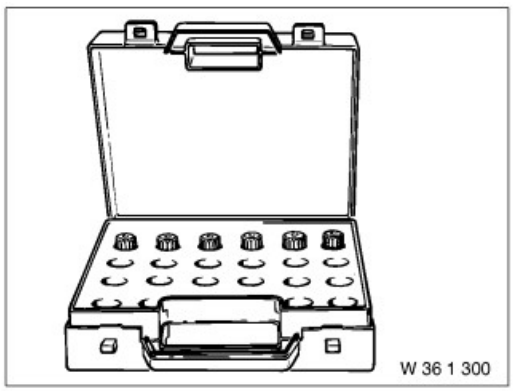
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

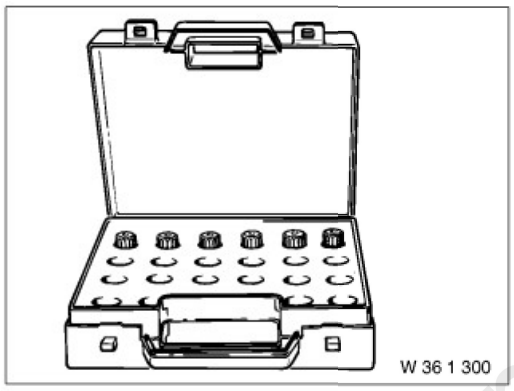
cardiagn.com

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

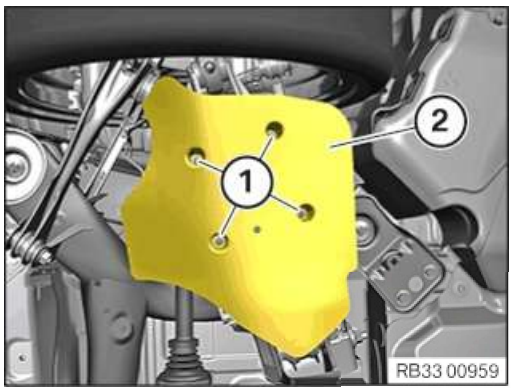
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33 32 188 Removing and installing/replacing left or right camber control arm cover

NOTICE

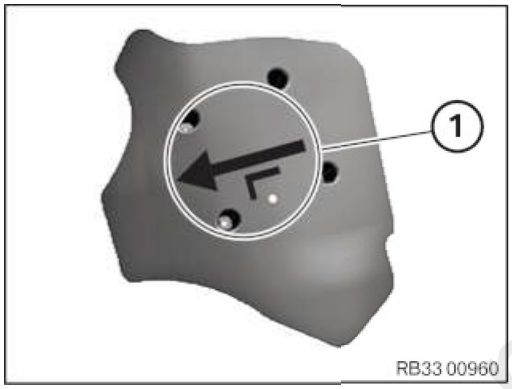
Description is for left component only. Procedure on the right side is identical.

1 – Remove the cover of the camber control arm



- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

2 – Installing the cover of the camber control arm



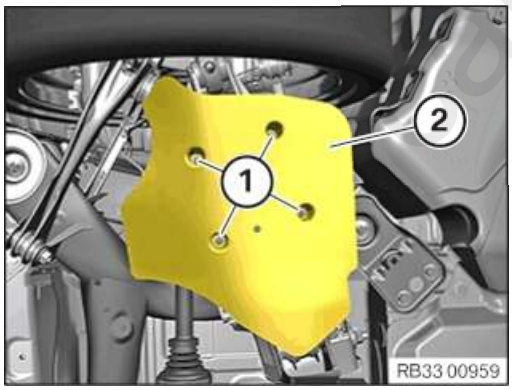
- Note the installation location and direction of installation.

  Direction of installation:

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right



- Position the camber control arm cover (2) on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

Additional Information

Overview of Tightening Torques

Cover to camber control arm Used in step 2

M6	Replace nuts.	Tightening torque	6 Nm

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33 32 180 Removing and installing/replacing left or right track control arm

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.

TECHNICAL INFORMATION

Perform wheel alignment after installation.

NOTICE

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

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PRELIMINARY WORK

1 – Remove rear left or right wheel

▶ **Removing the wheel**



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

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

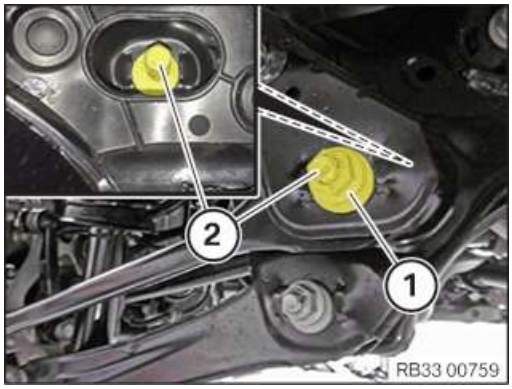


- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter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

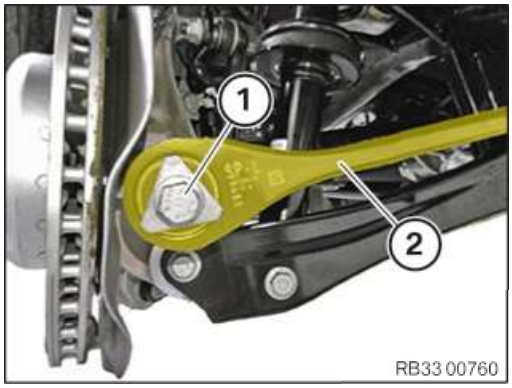
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MAIN WORK

2 – Removing the track control arm

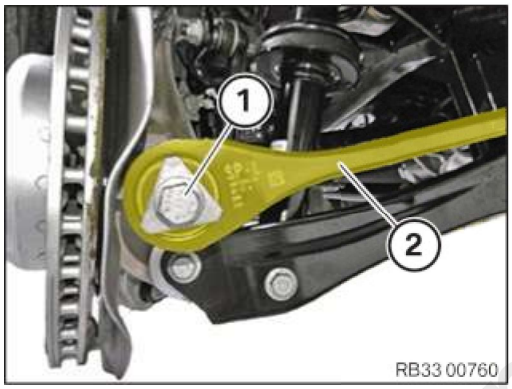


- Loosen nut (1).
- Remove the eccentric washer.
- Remove the eccentric bolt (2).



- Loosen screw (1).
- Remove the track control arm (2).

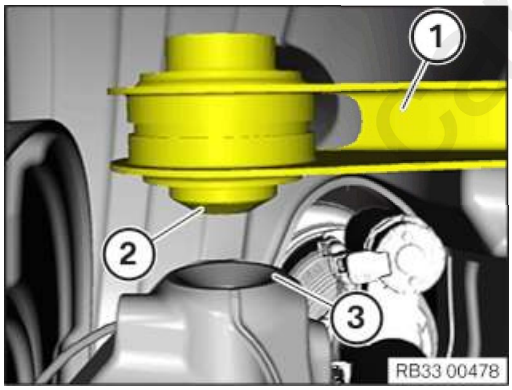
3 – Installing the track control arm



- Position the track control arm (2).
- Renew the screw (1).

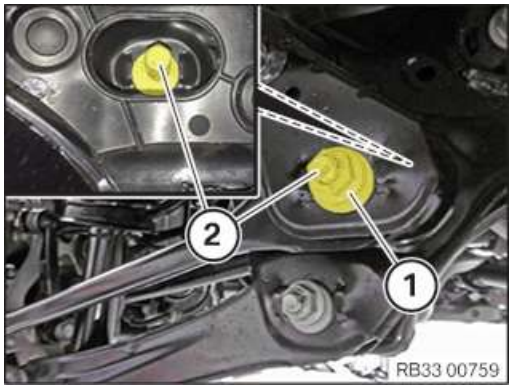
  Parts: Screw
- Screw in the bolt (1) by a few turns.

Note: Do not yet tighten the screw (1).



- When installing the track control arm (1), make sure that the tapered side (2) of the rubber mount points in the direction of the wheel carrier (3).

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TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

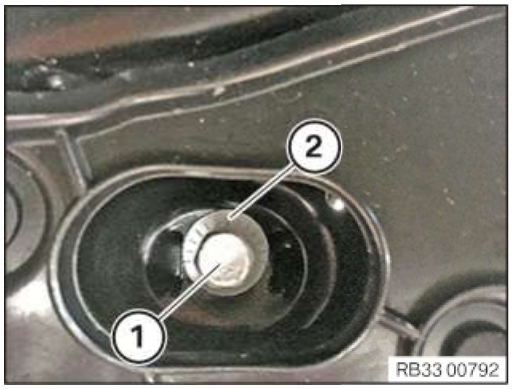
- Renew the nut (1) and eccentric bolt (2).

  Parts: Nut, eccentric bolt
- Install the eccentric bolt (2).

  Note **positioning of the eccentric bolt** (2) **(see next step).**
- Position eccentric washer .
- Tighten the nut (1) in normal position.

Toe arm to rear axle support

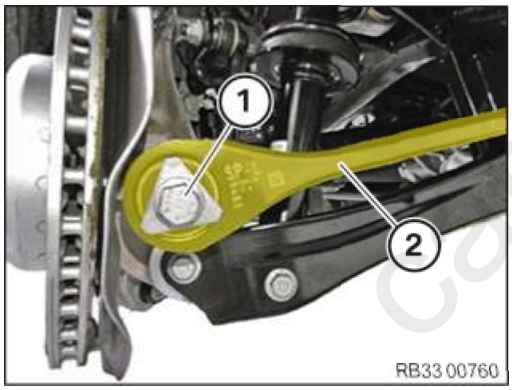
M12	Replace the eccentric bolt, cam and disc. Tighten in normal position.	Tightening torque	108 Nm



TECHNICAL INFORMATION

The vehicle ride height may change as a result of turning the eccentric bolts for the adjustment of toe and camber. When renewing the bolts, make sure the eccentric bolts are correctly positioned to keep the ride height change to a minimum during the adjustment work.

- Position the eccentric bolt (1) during renewal in a way that the eccentric (2) points vertically upwards!



TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Tighten down screw (1).

Toe arm to wheel carrier

M12	Renew screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

POSTPROCESSES

4 – Install rear left or right wheel

▸ **Mounting the wheel**

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TECHNICAL INFORMATION

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

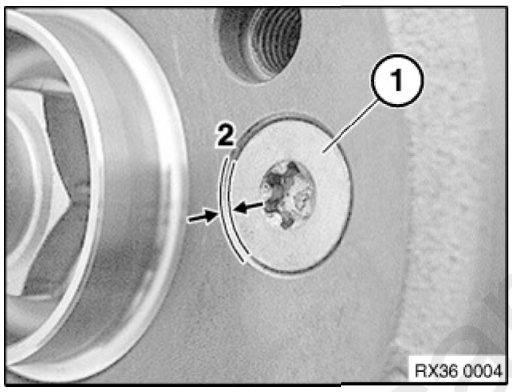
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

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

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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

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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

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

Wheel bolts

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

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5 – Perform chassis alignment check

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

Additional Information

Overview of Tightening Torques

Toe arm to rear axle support — Used in step 3

M12	Replace the eccentric bolt, cam and disc. Tighten in normal position.	Tightening torque	108 Nm

Toe arm to wheel carrier — Used in step 3

M12	Renew screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

Brake disc to front wheel hub — Used in step 4

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 4

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 4

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

Overview of Special Tools

2 344 011 Tool

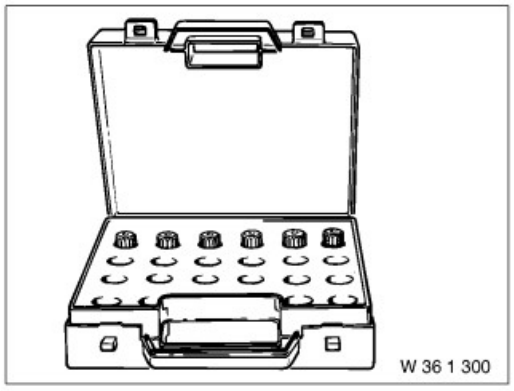


Common — Used in step 4

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

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common — Used in step 1

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

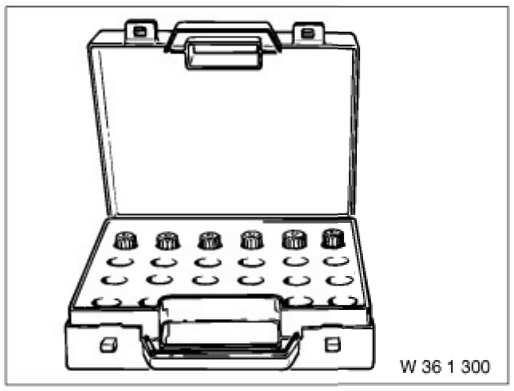
cardiagn.com

0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



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

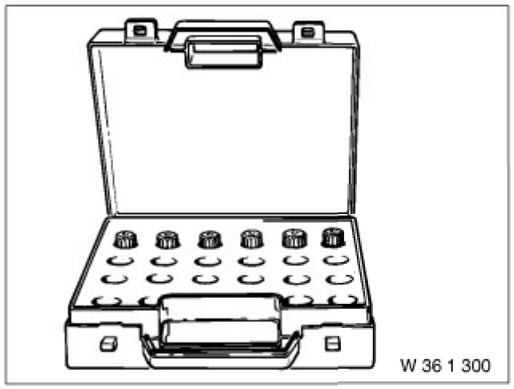
cardiagn.com

0 495 228 (36 1 331) Wheel stud



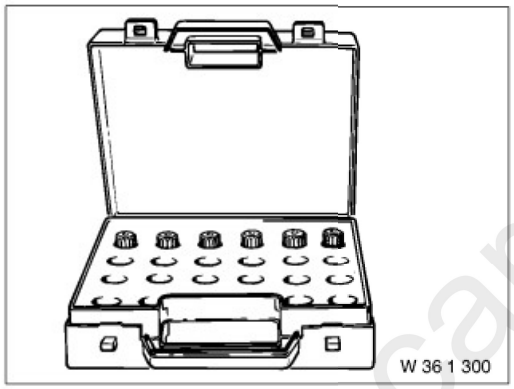
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

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33 32 021 Replacing left or right trailing arm

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.

NOTICE

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

1 – Remove trailing arm



- Release the nut (2) and (4).
- Remove the screws (3).
- Remove the trailing arm (1).

2 – Installing the trailing arm

TECHNICAL INFORMATION

Tighten the screw connection in the normal position.



- Position the trailing arm (1).
- Renew screws (3) and nuts (2) and (4).

  Parts: Bolts, nuts
- Install screws (3).
- Screw on nut (2) and (4) by hand.

▸ **Measure ride height of rear axle and adjust to normal position**

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- Set vehicle down on its wheels (e.g. On a drive-on-ramp-lift).
- Measure vehicle ride height (A).
- Load or unload vehicle until the vehicle ride height (A) is within the tolerance.

G20_Allradantrieb, Standard suspension

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm



- Tighten nut (2).

Trailing arm to rear axle support

M12	Renew screw and nut. Tighten in normal position.	Tightening torque	100 Nm

- Tighten nut (4).

Trailing arm to wheel carrier

M12	Renew screw and nut. Tighten in normal position.	Tightening torque	100 Nm

Additional Information

Overview of Tightening Torques

Trailing arm to rear axle support Used in step 2

M12	Renew screw and nut. Tighten in normal position.	Tightening torque	100 Nm

Trailing arm to wheel carrier Used in step 2

M12	Renew screw and nut. Tighten in normal position.	Tightening torque	100 Nm

Overview Technical Data

G20_Allradantrieb, Standard suspension Used in step 2

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung Used in step 2

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

cardiagn.com

33 32 071 Replacing one upper wishbone

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.

TECHNICAL INFORMATION

Perform wheel alignment after installation.

NOTICE

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

PRELIMINARY WORK

1 – Remove rear left or right wheel

▸ **Removing the wheel**



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

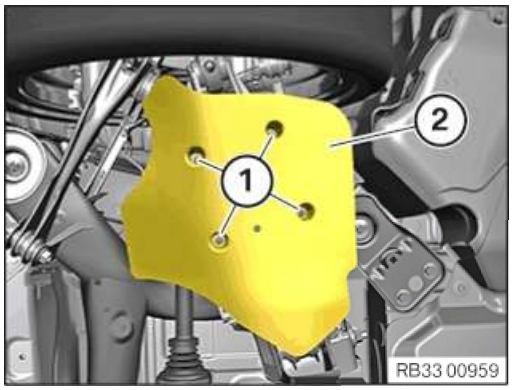
  This process is intended to prevent damage to the brake disc.

cadiagn.com



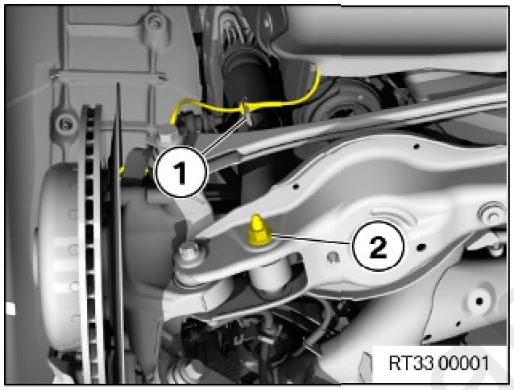
- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter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

2 – Remove the cover of the camber control arm



- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

3 – Releasing the rear shock absorber from the camber control arm



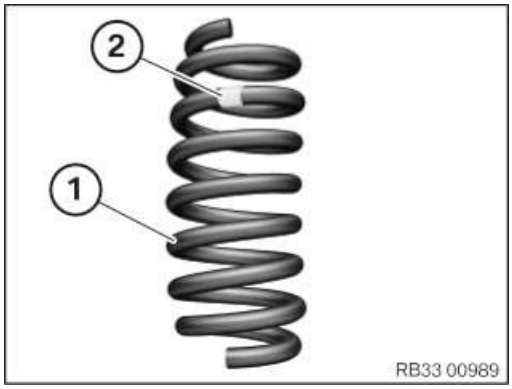
- Unclip the cable from the holder (1).
- Loosen nut (2).
- Pull out screw.

4 – Remove coil spring

TECHNICAL INFORMATION

Do not operate special tool with an impact screwdriver.

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TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

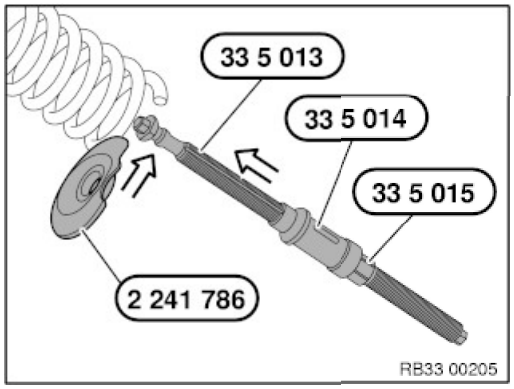
- The installation position of the coil spring(1) is marked with a label (2).

  The label (2) is attached at the top end of the coil spring (1) and is marked as “top”

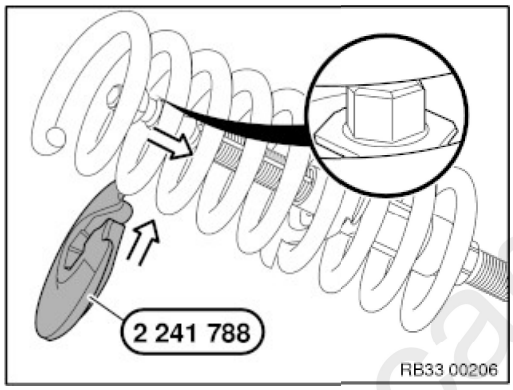
- Check coil spring (1) for availability of label (2)

  If the label (2) on the installed coil spring (1) is missing and it has to be fixed after repair, then the installation position of the coil spring (1) must be marked necessarily.

Note: Mark the installation position of the coil spring, by attaching an adhesive tape at the top end of spring.



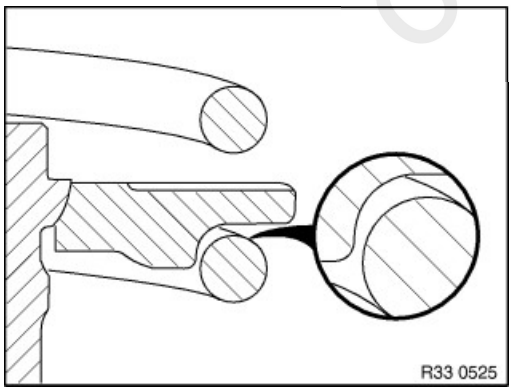
- Insert lower spring cup centrally into coil spring and turn to lowest winding.
- Drive spindle , , from below through the camber control arm and the bottom spring cup .



- Insert top spring cup sideways into coil spring and turn to the uppermost winding.

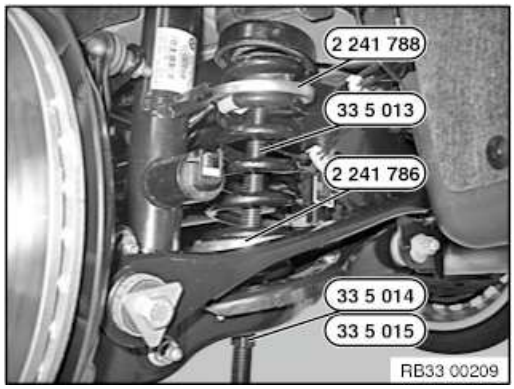
  Make sure spindle (hexagonal) is correctly seated in upper spring cup !

- Pull spindle down.



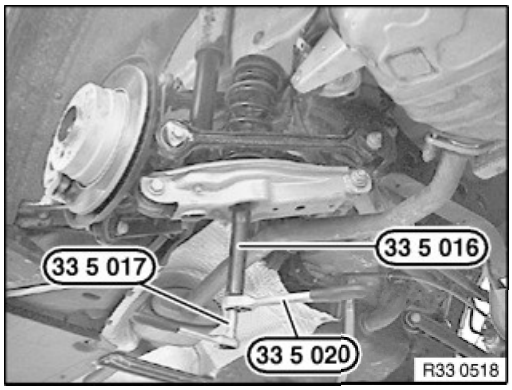
- Make sure coil spring is correctly positioned in spring cups.

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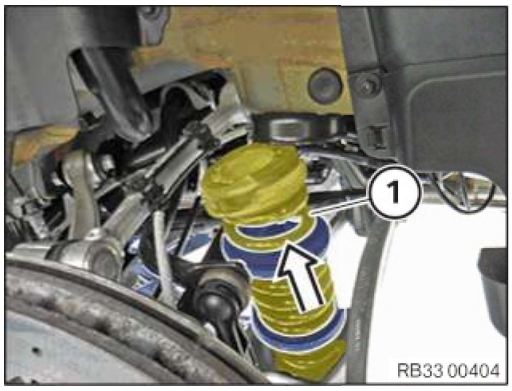
- Check and correct the position of the special tools , and , , and correct if required.

  The special tools must be aligned centrally, in order to obtain the largest possible contact surface on the coil spring.



- Tensioning the coil spring using the special tools and .

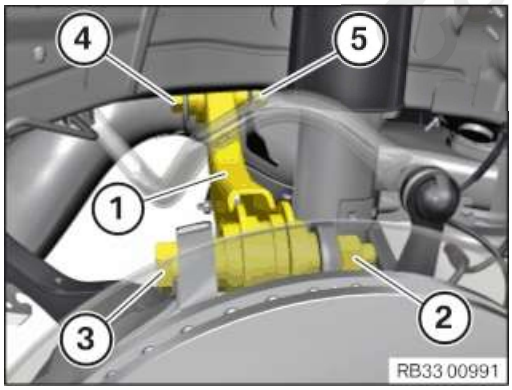
  Counter support the spindle of the spring tensioner with the special tool .



- Remove coil spring (1) upwards.

MAIN WORK

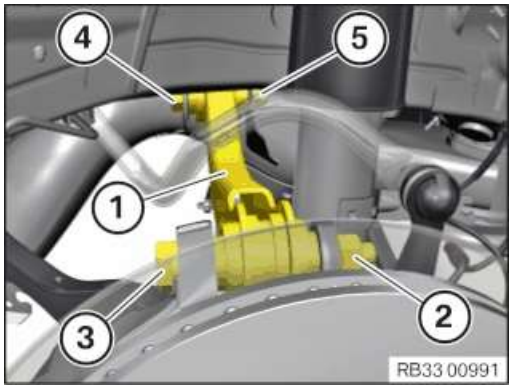
5 – Remove top wishbone



- Release the nut (2) and (5).
- Remove screws (3) and (4).
- Remove top wishbone (1).

6 – Install top wishbone

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TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Position the upper wishbone (1).
- Renew the screws (3) and (4) and nuts(2) and (5)

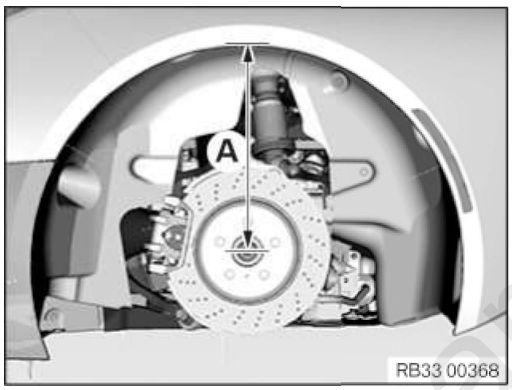
  Parts: Bolts, nuts
- Install screw (4) and screw in the nut (5) by hand.

  Do not yet tighten screw connections with specified torque.
- Install screw (3) and screw in the nut (2) by hand.

  Do not yet tighten screw connections with specified torque.



- Secure special tool 2 358 630 with wheel studs to drive flange.
- Insert the workshop jack into the special tool 2 358 630.



TECHNICAL INFORMATION

To raise the wheel carrier, the spring absolutely must be tensioned or removed!

Do not move the wheel carrier to normal position against the spring force.

- **Adjusting normal position:**

  Push wheel carrier up to dimension A with workshop jack and special tool 2 358 630.

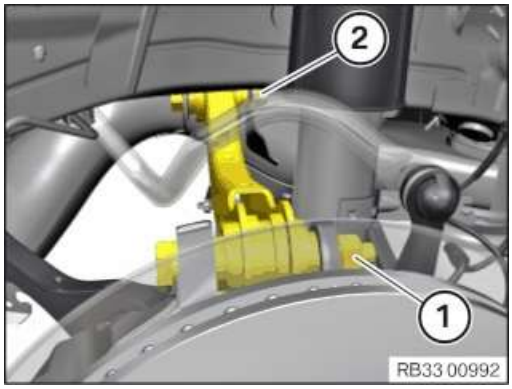
G20_Allradantrieb, Standard suspension

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

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- Tighten nut (2).

Upper wishbone to rear axle carrier

M12	Renew screw and nut. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

- Tighten nut (1).

Upper wishbone to wheel carrier

M12	Renew screw and nut. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °



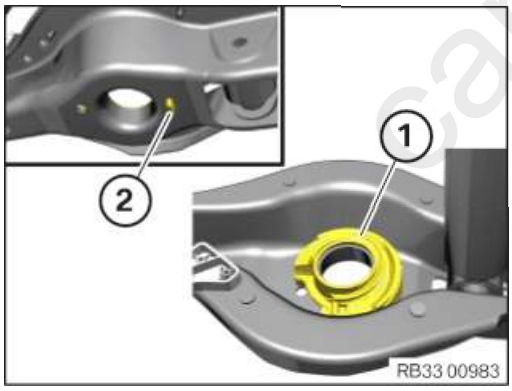
- Lower the universal jack and put it away.
- Remove special tool 2 358 630.

POSTPROCESSES

7 – Install the coil springs

TECHNICAL INFORMATION

Do not operate special tool with an impact screwdriver.



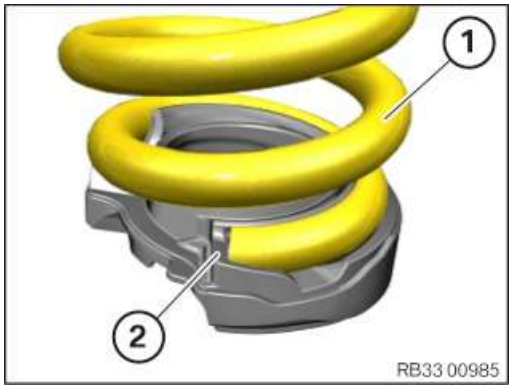
- Check bottom spring pad (1) for damage, renew if necessary.
- Check bottom spring pad (1) for correct position on the camber control arm, correct the position if necessary.

  The plastic tab (2) must be positioned in the bore hole.

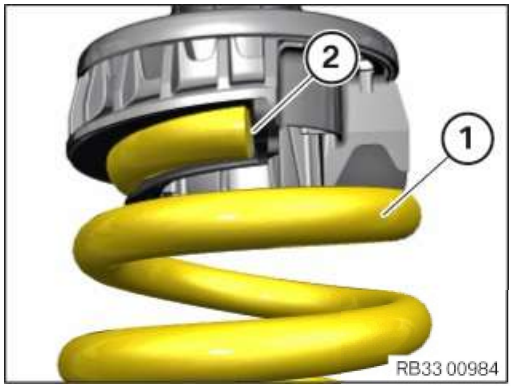


- Install coil spring (1) from the top and position it.

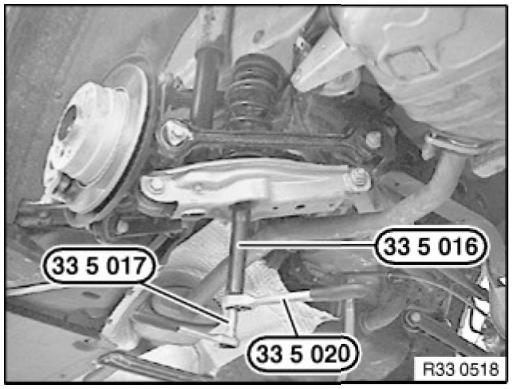
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- Move the coil springs (1) of the bottom spring pad (2) so that they are positively locked to the system.



- Position the top spring pad such that the end of the coil spring (1) moves to the system at the base (2).

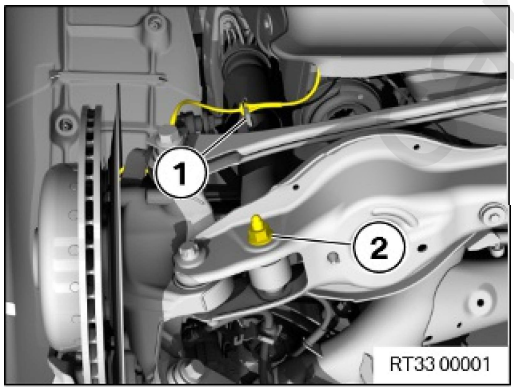


- Release the tension on the coil spring using the special tools and .

  Note the installation position of the coil spring while releasing the tension.

  Counter support the spindle of the spring tensioner with the special tool .
- Remove special tools.

8 – Securing the rear shock absorber on the camber control arm



- Clip in cable into the holder (1).
- Support the wheel carrier with the universal jack.
- Lift the wheel carrier with the universal jack to the point where the screw can be inserted.
- Position the shock absorbers on the camber control arm.
- Renew screw and nut (2).

  Parts: Bolt, nut
- Install the screw.

TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Tighten nut (2) hand-tight.
- Remove the universal jack from under the vehicle.

9 – Install rear left or right wheel

▸ **Mounting the wheel**

mydiagn.com



TECHNICAL INFORMATION

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

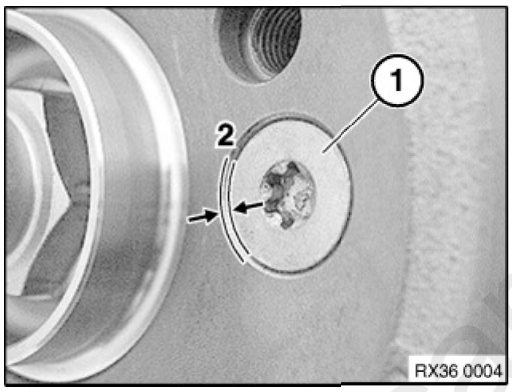
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

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

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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

catalagn.com



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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

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

Wheel bolts

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

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10 – Measure ride height of rear axle and adjust to normal position



- Set vehicle down on its wheels (e.g. On a drive-on-ramp-lift).
- Measure vehicle ride height (A).
- Load or unload vehicle until the vehicle ride height (A) is within the tolerance.

G20_Allradantrieb, Standard suspension

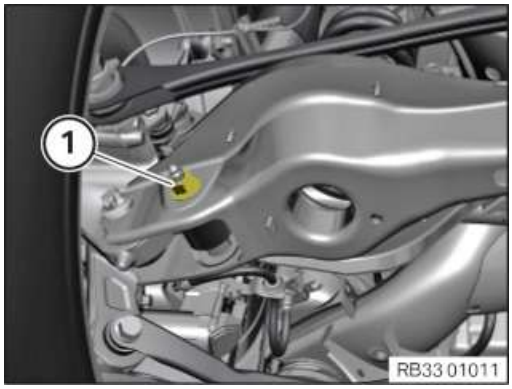
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

11 – Tighten screw connection on the camber control arm.

11 – Tighten screw connection on the camber control arm.



TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Tighten the nut (1) in normal position.

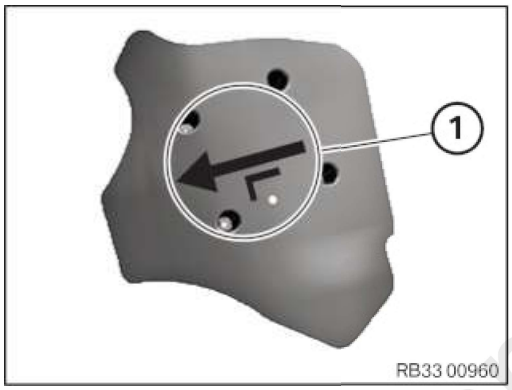
Shock absorber to camber arm

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

12 – Perform chassis alignment check

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

13 – Installing the cover of the camber control arm



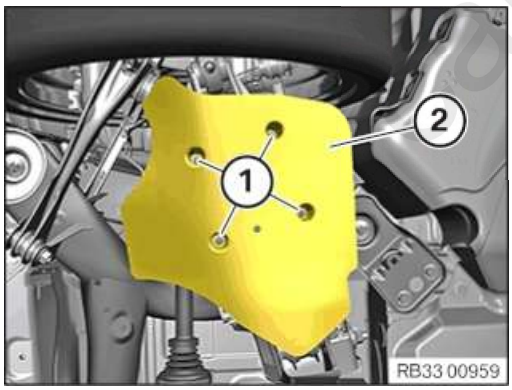
- Note the installation location and direction of installation.

  Direction of installation:

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right



- Position the camber control arm cover (2) on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

Additional Information

Overview of Tightening Torques

Upper wishbone to rear axle carrier Used in step 6

M12	Renew screw and nut. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

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Upper wishbone to wheel carrier — Used in step 6

M12	Renew screw and nut. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

Brake disc to front wheel hub — Used in step 9

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 9

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 9

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

Shock absorber to camber arm — Used in step 11

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

Cover to camber control arm — Used in step 13

M6	Replace nuts.	Tightening torque	6 Nm

Overview of Special Tools

2 358 630 Adapter



Common — Used in step 6

Usage	Adapter for workshop jack for screwing-on at existing 120 mm hole-circle diameter and new 112 mm hole-circle diameter on wheel hub. Contour-graphic silhouette foil is included in delivery specification. Further information on the contour-graphic silhouette foil can be found in service information 00 22 13 (969).
Included in the tool or work	
Storage location	A74
Replaced by	
In connection with	
SI-Number	01 21 14 (110)

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2 344 011 Tool

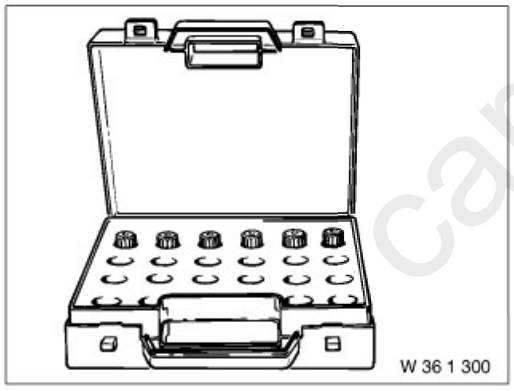


Common	Used in step 9
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

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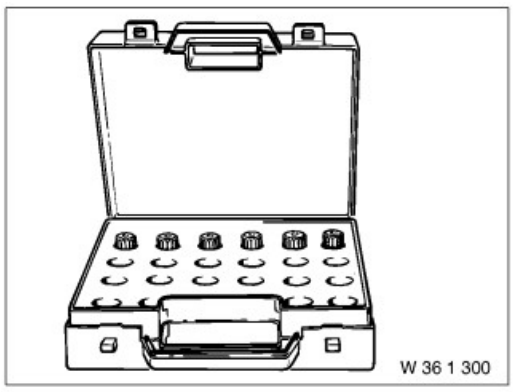
Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



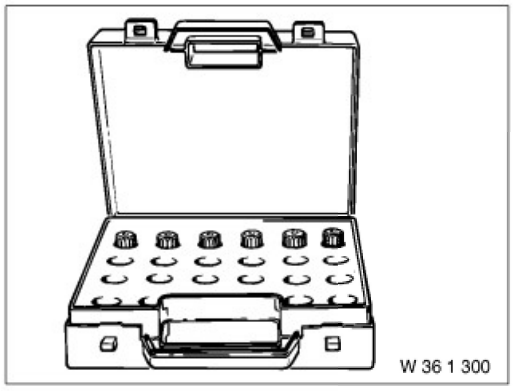
Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



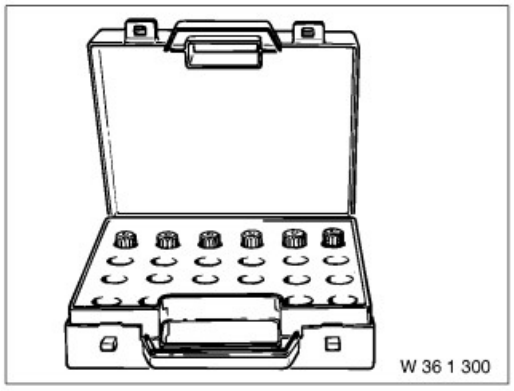
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

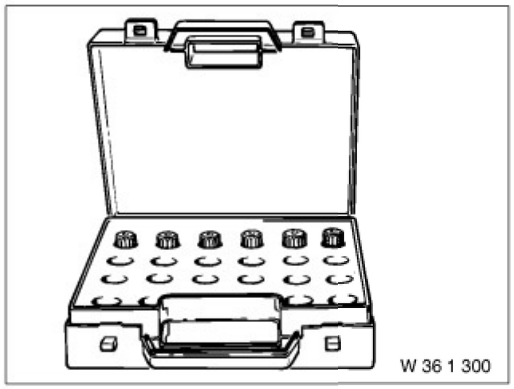
cardiagn.com

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

G20_Allradantrieb, Standard suspension	Used in step 610
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung	Used in step 610
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

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33 33 001 Replacing left or right rear axle support compression strut

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.

RISK OF DAMAGE

Damage to the components on the rear axle.

If both compression struts are removed simultaneously, it can cause serious damage to the rear axle.

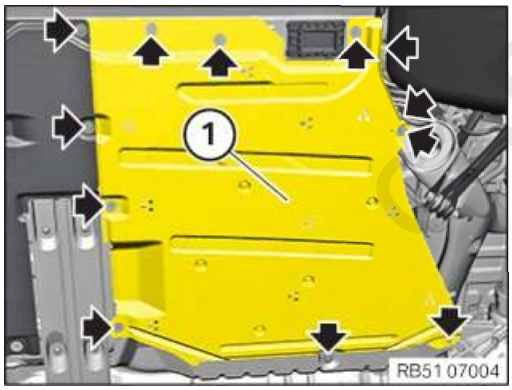
- Renew or remove compression strut only individually.
- When lowering or removing the rear axle: Support rear axle support before both compression struts are removed.

NOTICE

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

PRELIMINARY WORK

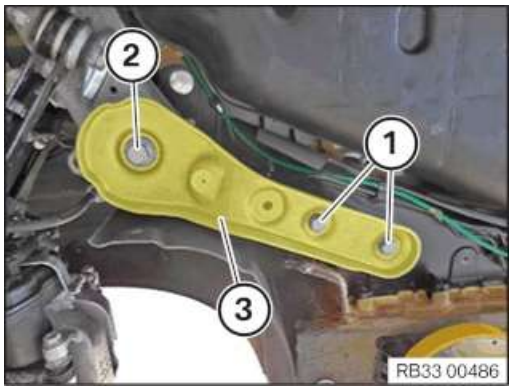
1 – Removing the tank cover



- Release all bolts (arrows).
- Remove the tank cover (1).

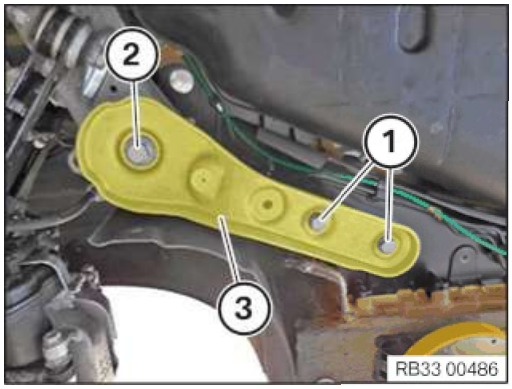
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2 – Remove compression strut



- Loosen screws (1).
- Loosen screw (2).
- Remove compression strut (3).

3 – Install compression strut



- Renew screws (1).

  Parts: Bolts
- Position compression strut (3).
- Screw in screws (1) and (2).
- Tighten down screw (2).

Rear axle carrier to body

M12		Tightening torque	108 Nm

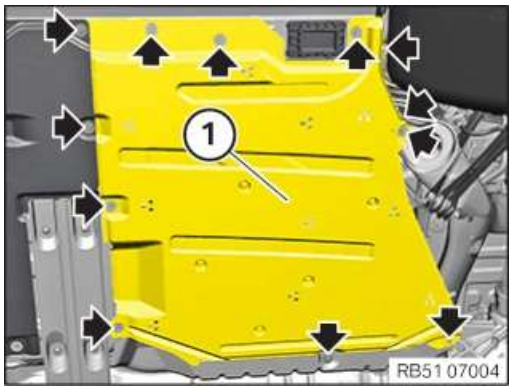
- Tighten the screws (1).

Compression strut on body

M10	Renew screws.	Jointing torque	47 Nm
		Angle of rotation	45 °

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4 – Installing tank cover



- Position the tank cover (1).
- Tighten all bolts (arrows).

Underbody panelling

Screw		Tightening torque	3 Nm

Additional Information

Overview of Tightening Torques

Rear axle carrier to body — Used in step 3

M12		Tightening torque	108 Nm

Compression strut on body — Used in step 3

M10	Renew screws.	Jointing torque	47 Nm
		Angle of rotation	45 °

Underbody panelling — Used in step 4

Screw		Tightening torque	3 Nm

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

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33 33 012 Replacing rear left or right compression strut for rear axle support

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.

RISK OF DAMAGE

Damage to the components on the rear axle.

If both compression struts are removed simultaneously, it can cause serious damage to the rear axle.

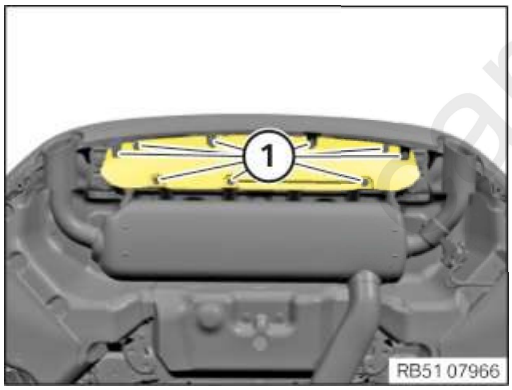
- Renew or remove compression strut only individually.
- When lowering or removing the rear axle: Support rear axle support before both compression struts are removed.

NOTICE

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

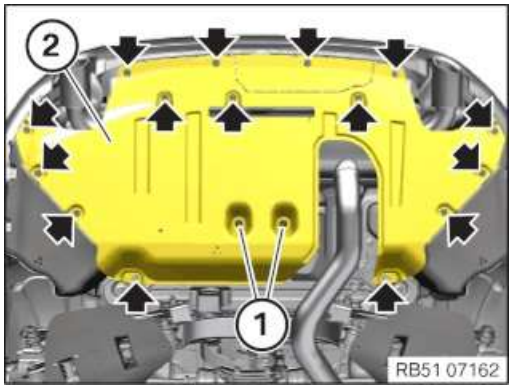
PRELIMINARY WORK

1 – Removing the rear diffuser



- **Version 1:**
- Release screws and nuts (1).

  Remove the diffuser.



- **Version 2:**
- Loosen nuts (1).
- Remove screws (arrows).
- Guide out and remove rear diffuser (2).

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2 – Removing the rear compression strut



- Loosen screws (2).
- Loosen screw (3).
- Remove compression strut (1).

3 – Installing the rear compression strut



- Renew screws (2).

  Parts: Bolts
- Position compression strut (1).
- Screw in screws (2) and (3).
- Tighten down screw (3).

Rear axle carrier to body

M12		Tightening torque	108 Nm

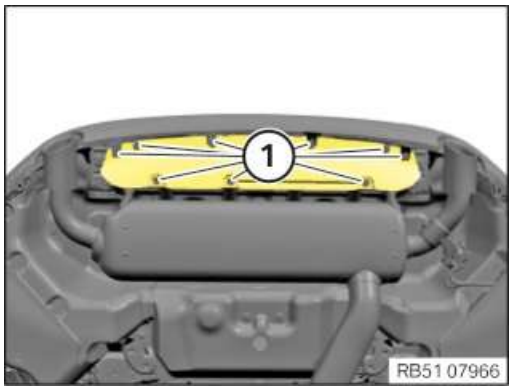
- Tighten the screws (2).

Compression strut on body

M10	Renew screws.	Jointing torque	47 Nm
		Angle of rotation	45 °

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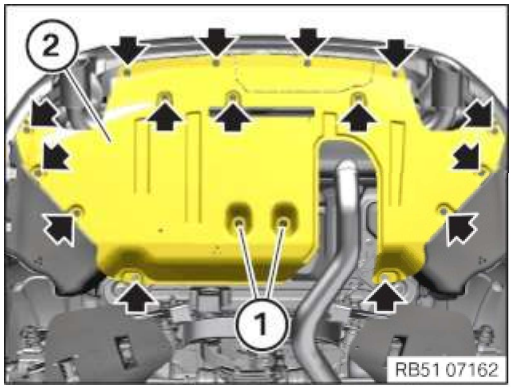
4 – Installing the rear diffuser



- **Version 1:**
- Install diffuser and tighten the nuts.

Diffuser

Nut and screws		Tightening torque	3 Nm



- **Version 2:**
- Feed in and position the diffuser (2)
- Tighten screws (arrows).

Diffuser

Nut and screws		Tightening torque	3 Nm

- Tighten nuts (1).

Diffuser

Nut and screws		Tightening torque	3 Nm

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Additional Information

Overview of Tightening Torques

Rear axle carrier to body — Used in step 3

M12		Tightening torque	108 Nm

Compression strut on body — Used in step 3

M10	Renew screws.	Jointing torque	47 Nm
		Angle of rotation	45 °

Diffuser — Used in step 4

Nut and screws		Tightening torque	3 Nm

Links

Repair instructions	Used in step

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

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33 52 010 Removing and installing rear left or right shock absorber

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.

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1 – Remove rear left or right wheel

▶ **Removing the wheel**



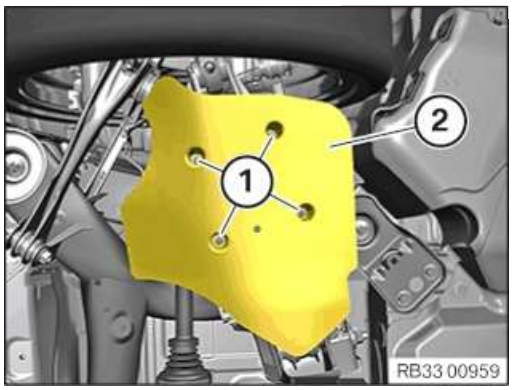
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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



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

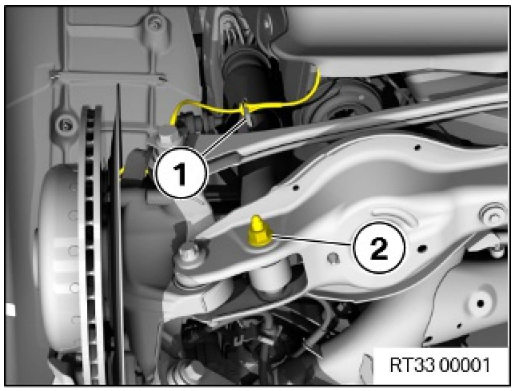
2 – Remove the cover of the camber control arm



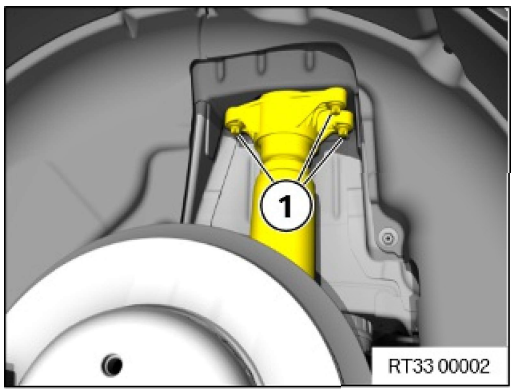
- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

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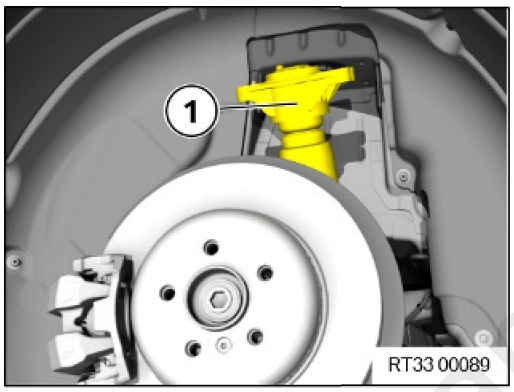
3 – Remove rear shock absorber



- Unclip the cable from the holder (1).
- Loosen nut (2).
- Pull out screw.

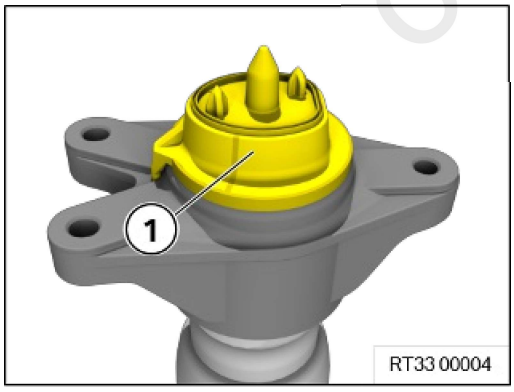


- Loosen screws (1).



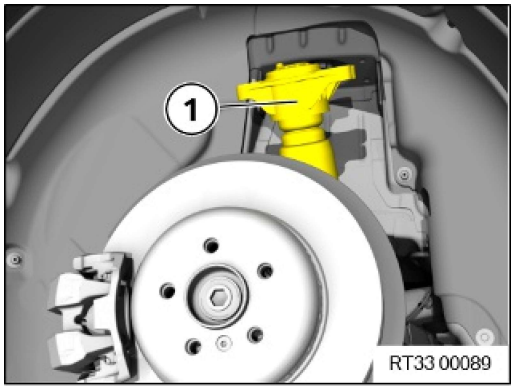
- Press the shock absorbers (1) together and guide upwards out of the wheel arch.

4 – Installing the rear shock absorber

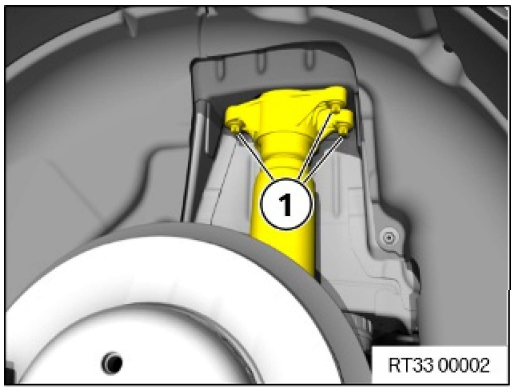


- Check the sealing caps (1) for damage; renew if necessary.

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- Press shock absorbers (1) together and install in the wheel arch.

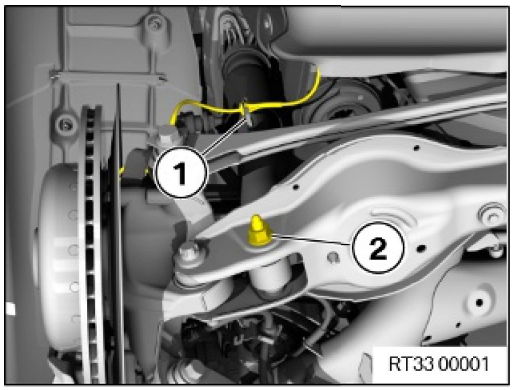


- Position the shock absorbers on the body.
- Renew screws (1).

  Parts: Bolts
- Tighten the screws (1).

Nut and locknut/self-locking nut

M8x40	Renew screws.	Tightening torque	28 Nm



- Clip in cable into the holder (1).
- Support the wheel carrier with the universal jack.

Note: Support wheel carrier only! Do not push against the spring force of the coil spring!

- Lift the wheel carrier with the universal jack to the point where the screw can be inserted.
- Position the shock absorbers on the camber control arm.
- Renew screw and nut (2).

  Parts: Bolt, nut
- Install the screw.

TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Tighten the nut (2) hand-tight.
- Remove the universal jack from under the vehicle.

POSTPROCESSES

5 – Install rear left or right wheel

▸ **Mounting the wheel**

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TECHNICAL INFORMATION

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

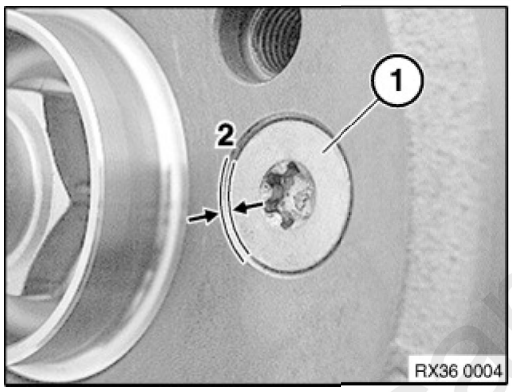
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

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

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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

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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

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

Wheel bolts

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

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6 – Measure ride height of rear axle and adjust to normal position



- Set vehicle down on its wheels (e.g. On a drive-on-ramp-lift).
- Measure vehicle ride height (A).
- Load or unload vehicle until the vehicle ride height (A) is within the tolerance.

G20_Allradantrieb, Standard suspension

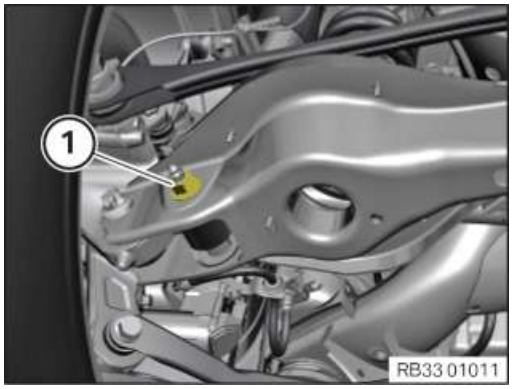
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

7 – Tighten screw connection on the camber control arm.

7 – Tighten screw connection on the camber control arm.



TECHNICAL INFORMATION

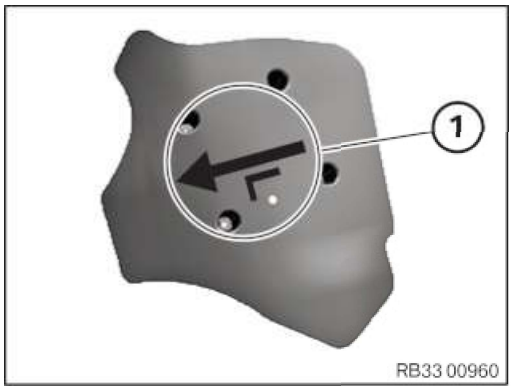
Tighten the screw connection in the normal position.

- Tighten the nut (1) in normal position.

Shock absorber to camber arm

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

8 – Installing the cover of the camber control arm



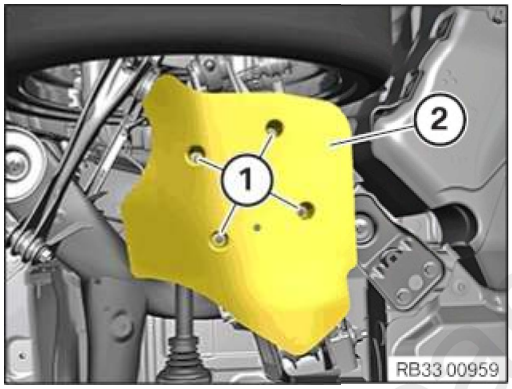
- Note the installation location and direction of installation.

  Direction of installation:

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right



- Position the camber control arm cover (2) on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

Additional Information

Overview of Tightening Torques

Nut and locknut/self-locking nut — Used in step 4

M8x40	Renew screws.	Tightening torque	28 Nm

Brake disc to front wheel hub — Used in step 5

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 5

M8	Renew screw.	Tightening torque	16 Nm

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Wheel bolts Used in step 5

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

Shock absorber to camber arm Used in step 7

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

Cover to camber control arm Used in step 8

M6	Replace nuts.	Tightening torque	6 Nm

Overview of Special Tools

2 344 011 Tool



Common Used in step 5

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

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common Used in step 1

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

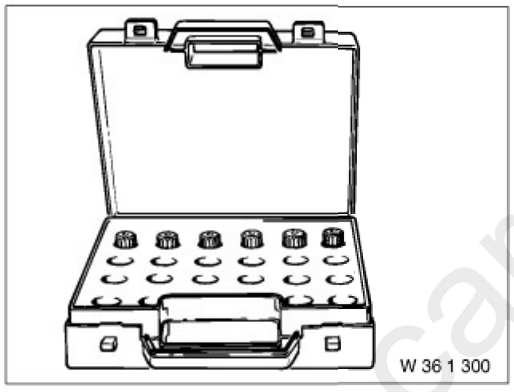
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0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



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

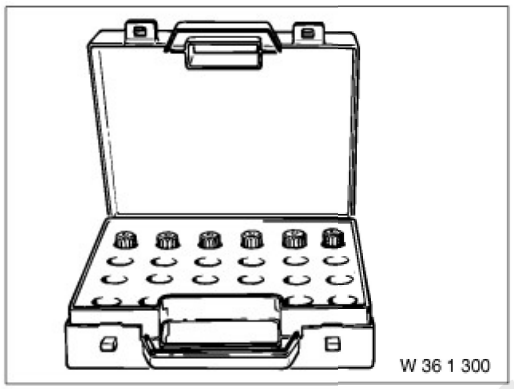
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0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

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Overview Technical Data

G20_Allradantrieb, Standard suspension	Used in step 6
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung	Used in step 6
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

33 52 012 Replacing rear left or right side shock absorber

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.

PRELIMINARY WORK

1 – Remove rear left or right wheel

▸ **Removing the wheel**



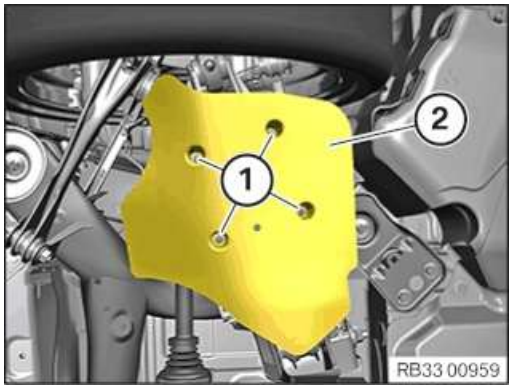
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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



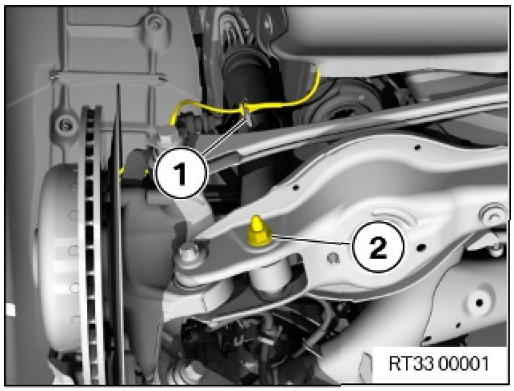
- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter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

2 – Remove the cover of the camber control arm

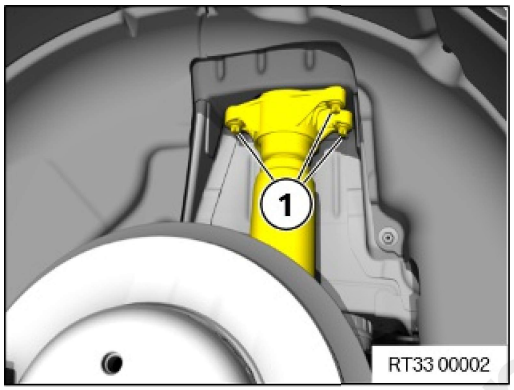


- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

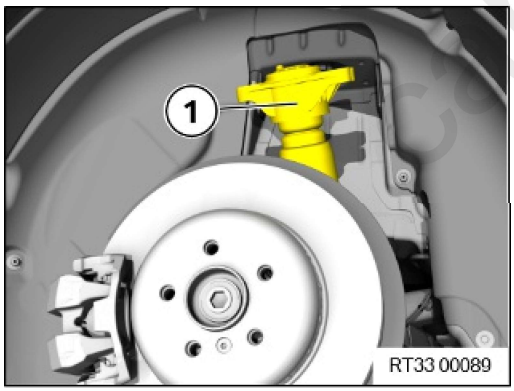
3 – Remove rear shock absorber



- Unclip the cable from the holder (1).
- Loosen nut (2).
- Pull out screw.



- Loosen screws (1).

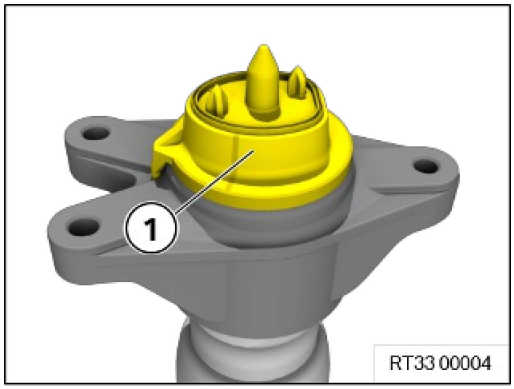


- Press the shock absorbers (1) together and guide upwards out of the wheel arch.

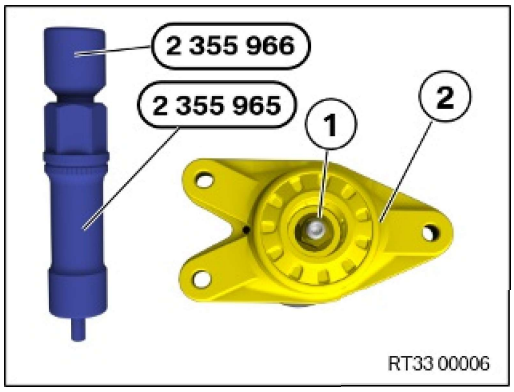
MAIN WORK

4 – Replacing the shock absorber

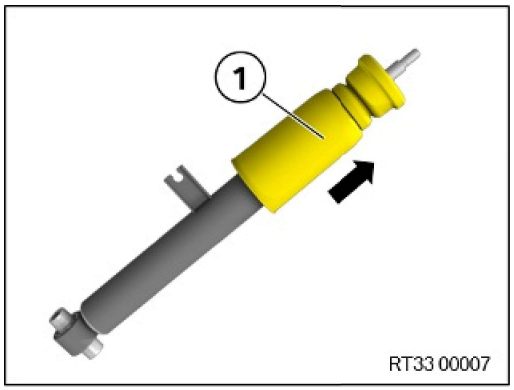
carsdiagn.com



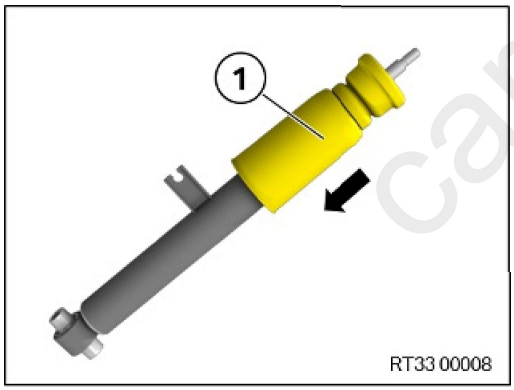
- Remove the centring plate (1).



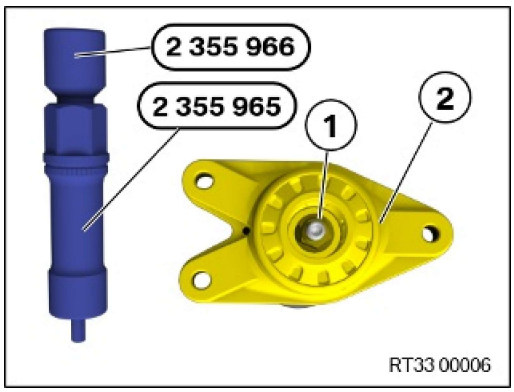
- Release the nut (1) with the special tools and .
- Remove the support bearing (2) from the shock absorber.



- Remove the auxiliary damper (1).



- Check the auxiliary damper (1) for damage; replace if necessary.
- Attach the auxiliary damper (1) to the new shock absorber.



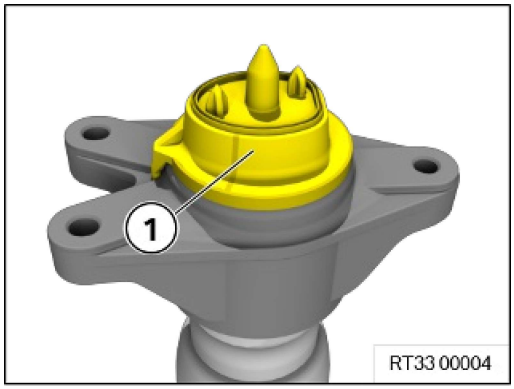
- Attach support bearing (2) to the new shock absorber.
- Renew nut (1).

  Parts: Nut
- Tighten the nut (1) with the special tools and .

Support bearing on shock absorber

M10	Renew nut.	Tightening torque	41 Nm

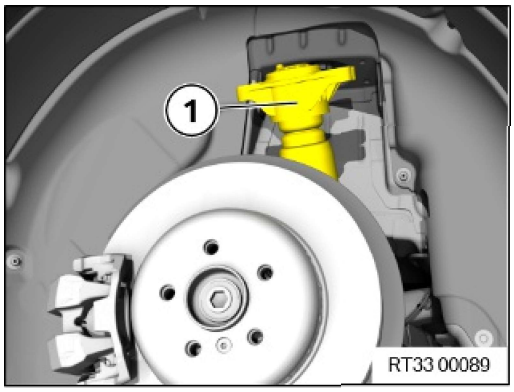
cardiagn.com



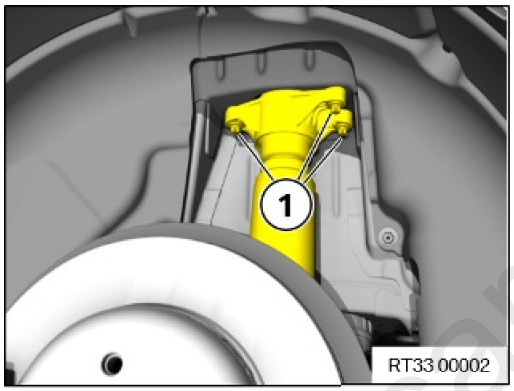
- Check centring plate (1) for damage; replace if necessary.
- Install the centring plate (1).

POSTPROCESSES

5 – Installing the rear shock absorber



- Press shock absorbers (1) together and install in the wheel arch.

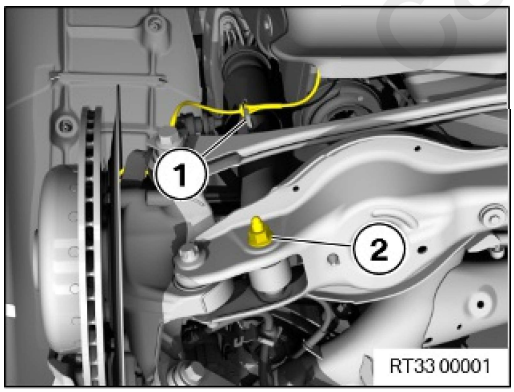


- Position the shock absorbers on the body.
- Renew screws (1).

  Parts: Bolts
- Tighten the screws (1).

Nut and locknut/self-locking nut

M8x40	Renew screws.	Tightening torque	28 Nm



- Clip in cable into the holder (1).
- Support the wheel carrier with the universal jack.

Note: Support wheel carrier only! Do not push against the spring force of the coil spring!

- Lift the wheel carrier with the universal jack to the point where the screw can be inserted.
- Position the shock absorbers on the camber control arm.
- Renew screw and nut (2).

  Parts: Bolt, nut
- Install the screw.

TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Tighten the nut (2) hand-tight.
- Remove the universal jack from under the vehicle.

6 – Install rear left or right wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

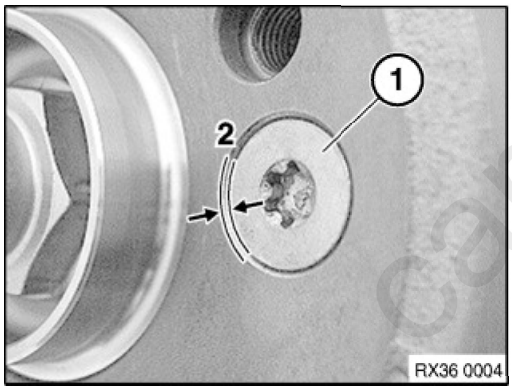
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

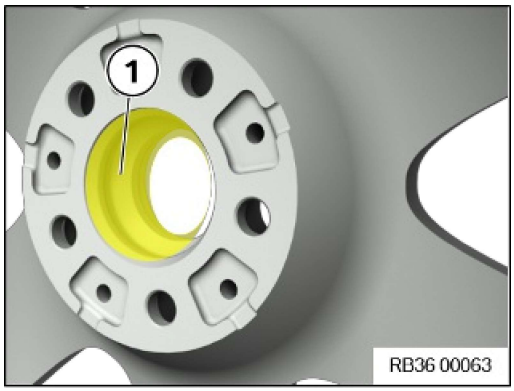
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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

carfiagn.com



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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

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

Wheel bolts

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

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7 – Measure ride height of rear axle and adjust to normal position



- Set vehicle down on its wheels (e.g. On a drive-on-ramp-lift).
- Measure vehicle ride height (A).
- Load or unload vehicle until the vehicle ride height (A) is within the tolerance.

G20_Allradantrieb, Standard suspension

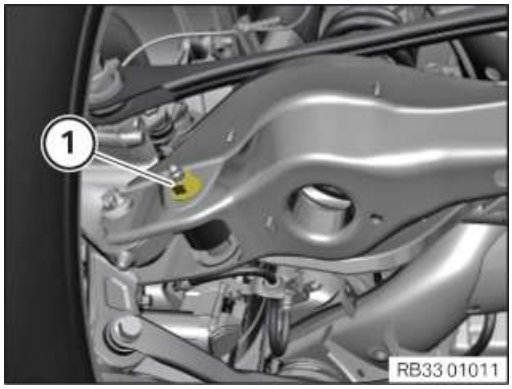
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

8 – Tighten screw connection on the camber control arm.

8 – Tighten screw connection on the camber control arm.



TECHNICAL INFORMATION

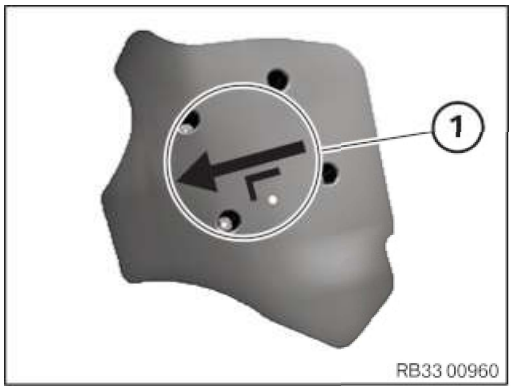
Tighten the screw connection in the normal position.

- Tighten the nut (1) in normal position.

Shock absorber to camber arm

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

9 – Installing the cover of the camber control arm



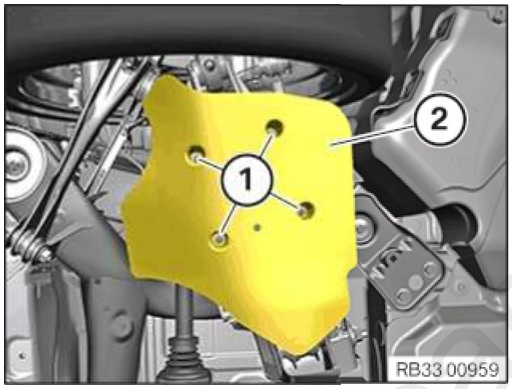
- Note the installation location and direction of installation.

  Direction of installation:

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right



- Position the camber control arm cover (2) on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

Additional Information

Overview of Tightening Torques

Support bearing on shock absorber — Used in step 4

M10	Renew nut.	Tightening torque	41 Nm

Nut and locknut/self-locking nut — Used in step 5

M8x40	Renew screws.	Tightening torque	28 Nm

Brake disc to front wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

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Wheel bolts Used in step 6

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

Shock absorber to camber arm Used in step 8

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

Cover to camber control arm Used in step 9

M6	Replace nuts.	Tightening torque	6 Nm

Overview of Special Tools

2 344 011 Tool



Common Used in step 6

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

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common Used in step 1

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

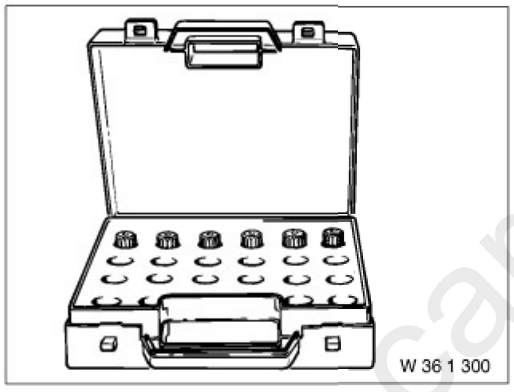
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0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



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

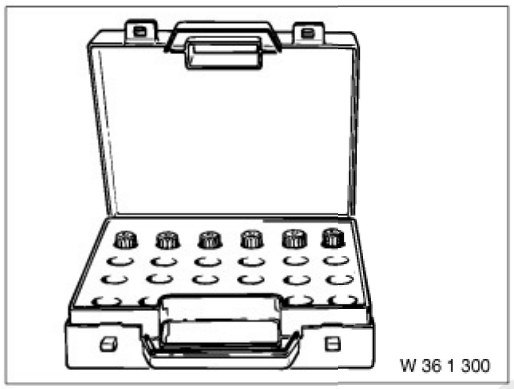
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0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

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Overview Technical Data

G20_Allradantrieb, Standard suspension	Used in step 7
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung	Used in step 7
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

33 52 161 Replacing rear left or right support bearing for spring strut/shock absorber

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.

PRELIMINARY WORK

1 – Remove rear left or right wheel

▸ **Removing the wheel**



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

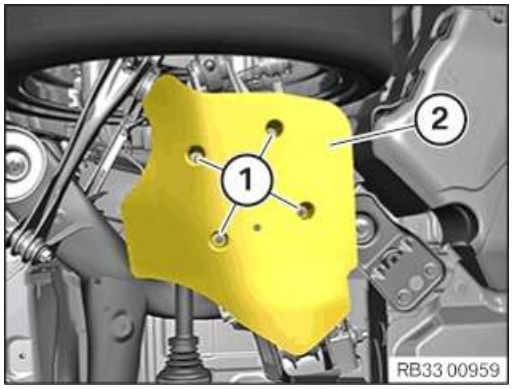
  This process is intended to prevent damage to the brake disc.



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

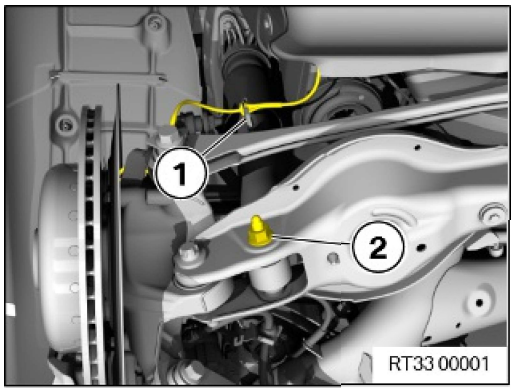
2 – Remove the cover of the camber control arm

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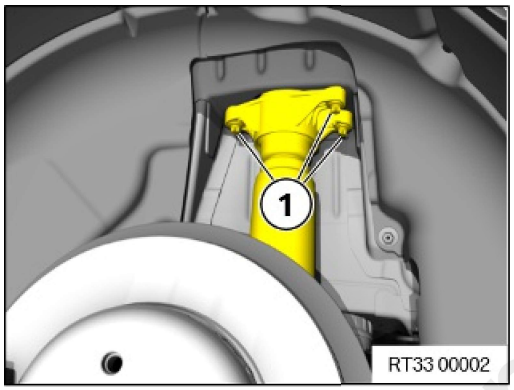


- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

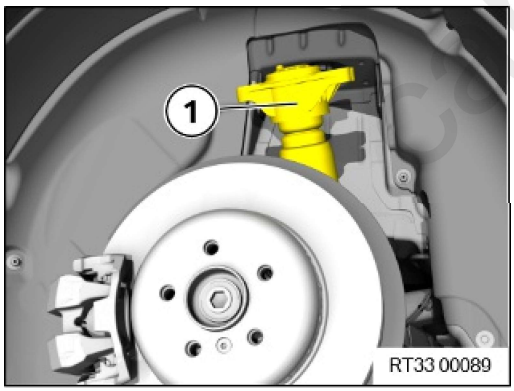
3 – Remove rear shock absorber



- Unclip the cable from the holder (1).
- Loosen nut (2).
- Pull out screw.



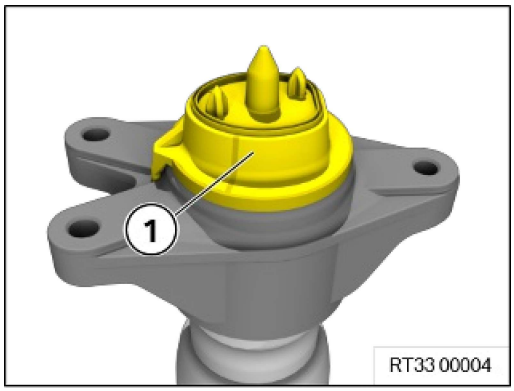
- Loosen screws (1).



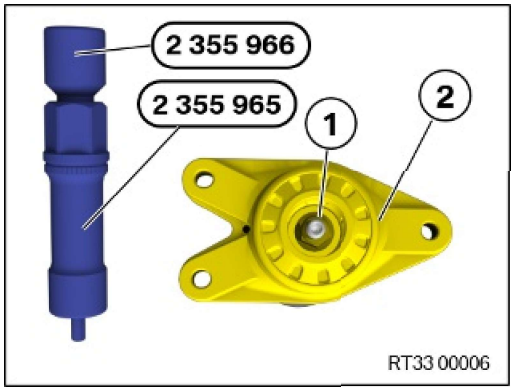
- Press the shock absorbers (1) together and guide upwards out of the wheel arch.

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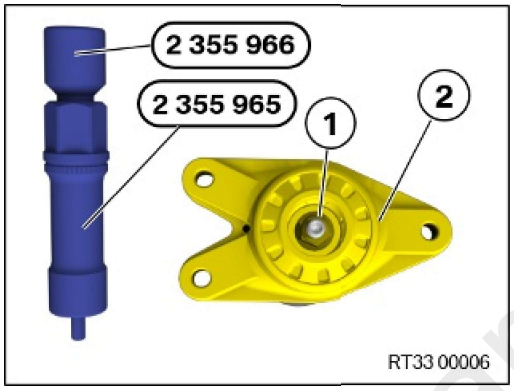
4 – Replace support bearing



- Remove the centring plate (1).



- Release the nut (1) with the special tools and .
- Remove the support bearing (2) from the shock absorber.

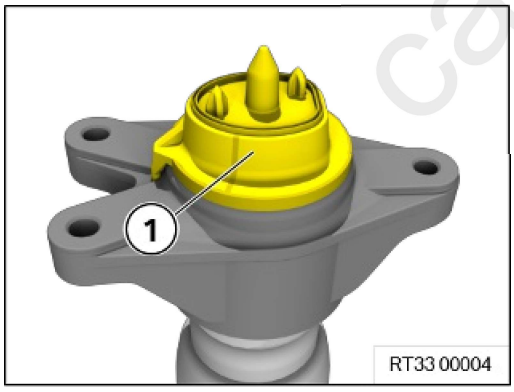


- Attach new support bearing (2) to the shock absorber.
- Renew nut (1).

  Parts: Nut
- Tighten the nut (1) with the special tools and .

Support bearing on shock absorber

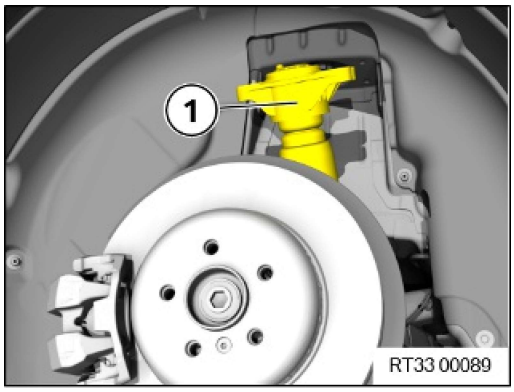
M10	Renew nut.	Tightening torque	41 Nm



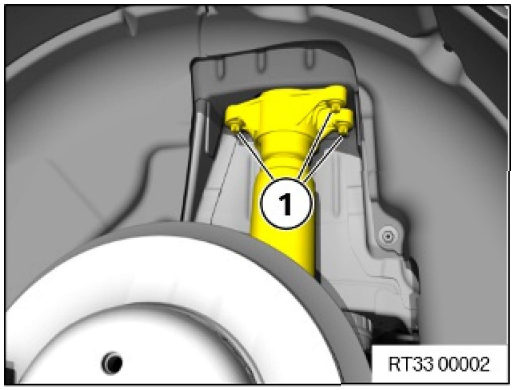
- Check centring plate (1) for damage; replace if necessary.
- Install the centring plate (1).

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5 – Installing the rear shock absorber



- Press shock absorbers (1) together and install in the wheel arch.

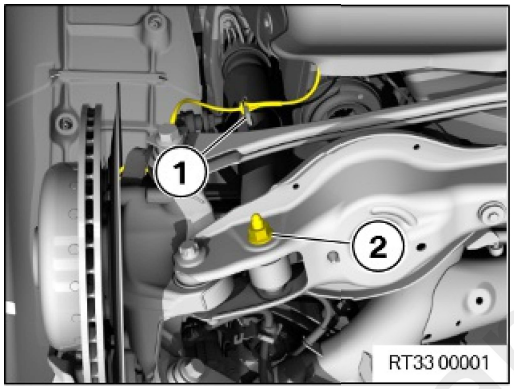


- Position the shock absorbers on the body.
- Renew screws (1).

  Parts: Bolts
- Tighten the screws (1).

Nut and locknut/self-locking nut

M8x40	Renew screws.	Tightening torque	28 Nm



- Clip in cable into the holder (1).
- Support the wheel carrier with the universal jack.

Note: Support wheel carrier only! Do not push against the spring force of the coil spring!

- Lift the wheel carrier with the universal jack to the point where the screw can be inserted.
- Position the shock absorbers on the camber control arm.
- Renew screw and nut (2).

  Parts: Bolt, nut
- Install the screw.

TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Tighten the nut (2) hand-tight.
- Remove the universal jack from under the vehicle.

6 – Install rear left or right wheel

▶ **Mounting the wheel**

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TECHNICAL INFORMATION

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

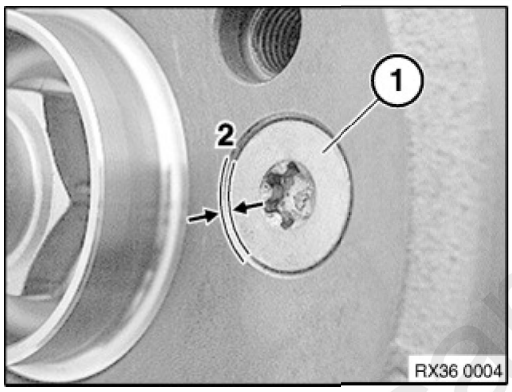
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

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

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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

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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

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

Wheel bolts

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

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Additional Information

Overview of Tightening Torques

Support bearing on shock absorber — Used in step 4

M10	Renew nut.	Tightening torque	41 Nm

Nut and locknut/self-locking nut — Used in step 5

M8x40	Renew screws.	Tightening torque	28 Nm

Brake disc to front wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts Used in step 6

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

Overview of Special Tools

2 344 011 Tool



Common Used in step 6

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

Replacement tools:

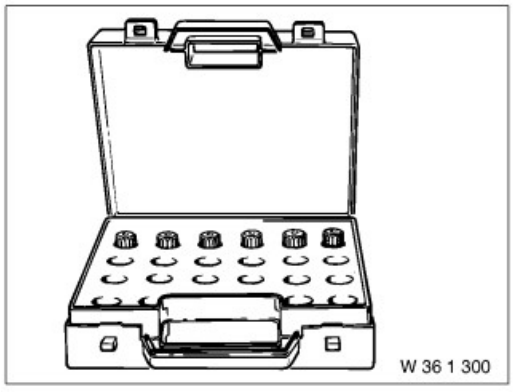
0 495 221 (36 1 323) Wheel stud



Common Used in step 1

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

0 495 224 (36 1 326) Wheel stud



Common Used in step 1

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

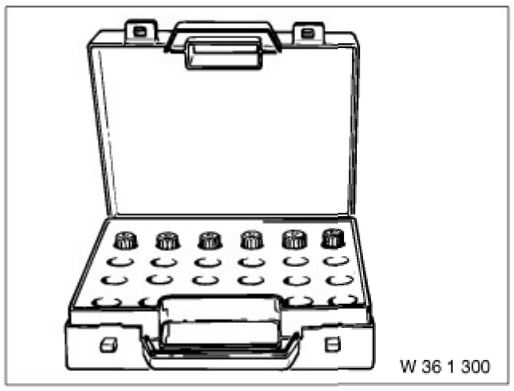
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0 495 225 (36 1 327) Wheel stud



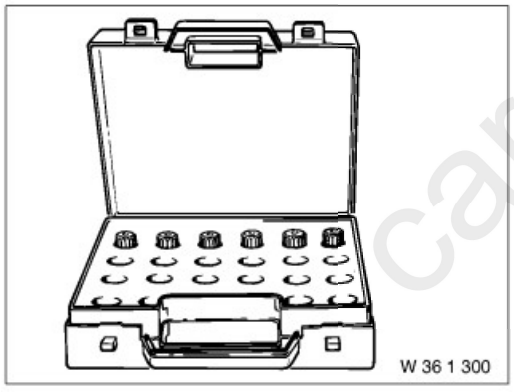
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



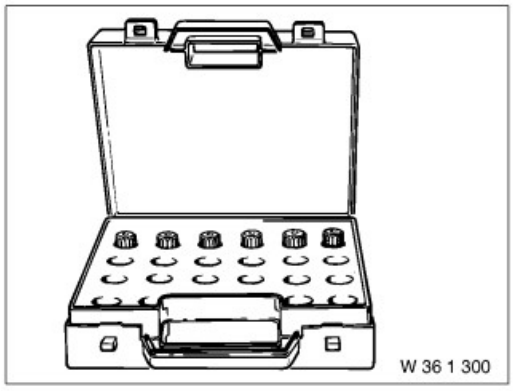
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

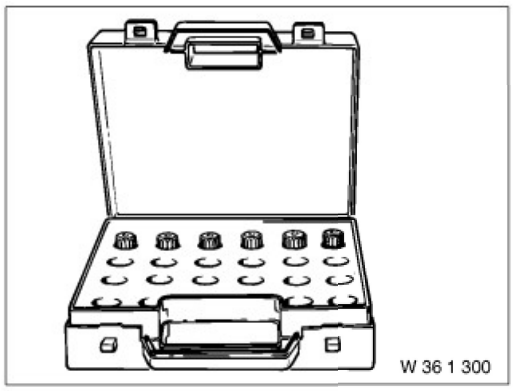
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0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

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33 53 000 Removing and installing / replacing rear left or right coil spring

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

Spring preload.

Danger! Life-threatening injuries!

- Secure coil spring with special tool 2 213 022 (31 3 340).
- Use special tool as per owner's handbook and always observe the safety information.

NOTICE

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

PRELIMINARY WORK

1 – Remove rear left or right wheel

▸ **Removing the wheel**



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

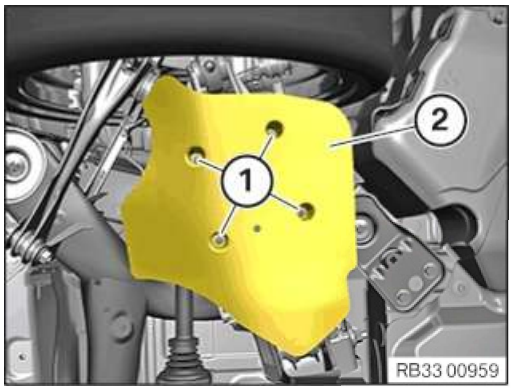
  This process is intended to prevent damage to the brake disc.

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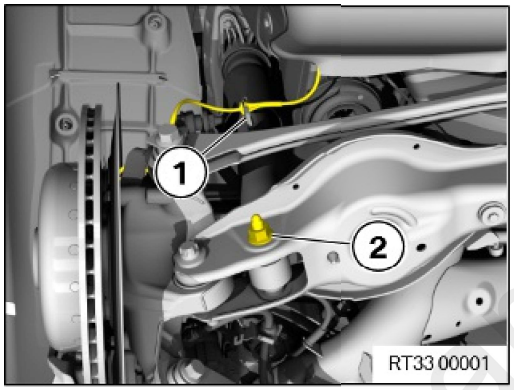
- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter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

2 – Remove the cover of the camber control arm



- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

3 – Releasing the rear shock absorber from the camber control arm



- Unclip the cable from the holder (1).
- Loosen nut (2).
- Pull out screw.

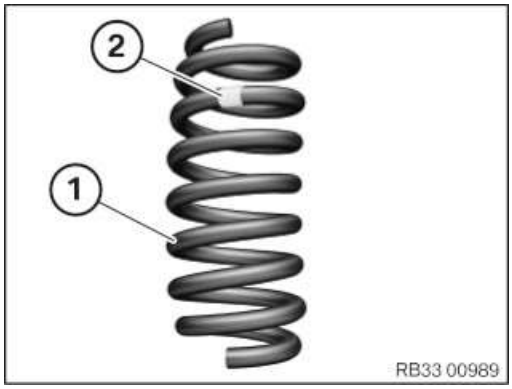
MAIN WORK

4 – Remove coil spring

TECHNICAL INFORMATION

Do not operate special tool with an impact screwdriver.

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TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

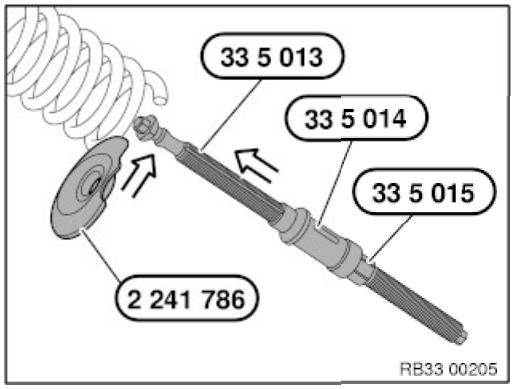
- The installation position of the coil spring(1) is marked with a label (2).

  The label (2) is attached at the top end of the coil spring (1) and is marked as “top”

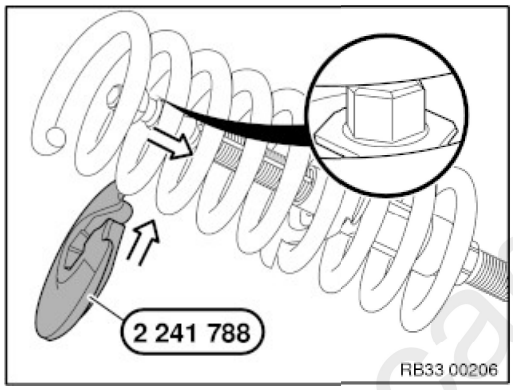
- Check coil spring (1) for availability of label (2)

  If the label (2) on the installed coil spring (1) is missing and it has to be fixed after repair, then the installation position of the coil spring (1) must be marked necessarily.

Note: Mark the installation position of the coil spring, by attaching an adhesive tape at the top end of spring.



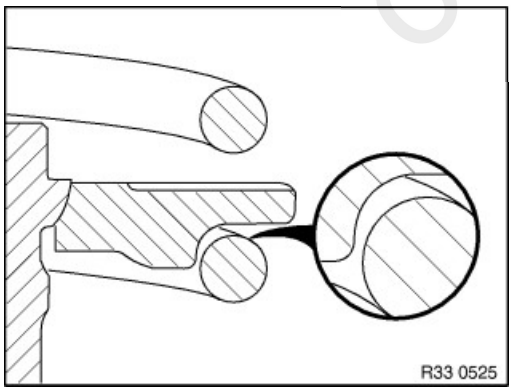
- Insert lower spring cup centrally into coil spring and turn to lowest winding.
- Drive spindle , , from below through the camber control arm and the bottom spring cup .



- Insert top spring cup sideways into coil spring and turn to the uppermost winding.

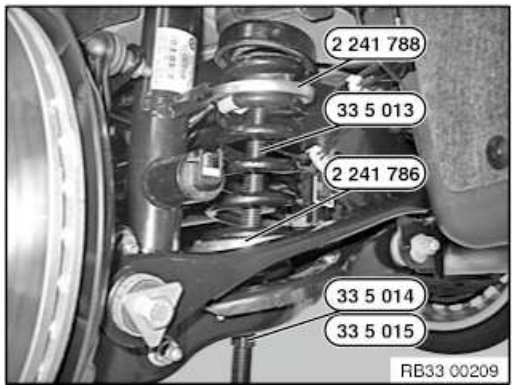
  Make sure spindle (hexagonal) is correctly seated in upper spring cup !

- Pull spindle down.



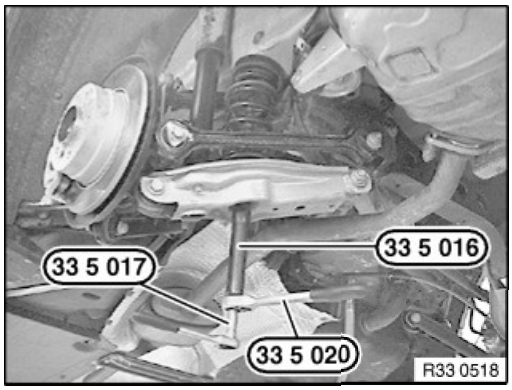
- Make sure coil spring is correctly positioned in spring cups.

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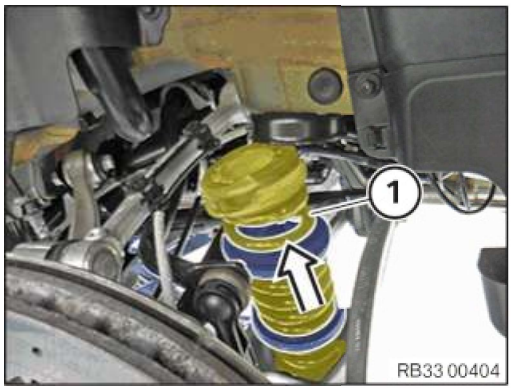
- Check and correct the position of the special tools , and , , and correct if required.

  The special tools must be aligned centrally, in order to obtain the largest possible contact surface on the coil spring.



- Tensioning the coil spring using the special tools and .

  Counter support the spindle of the spring tensioner with the special tool .

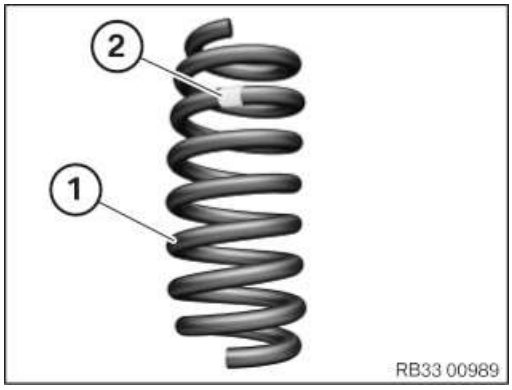


- Remove coil spring (1) upwards.

5 – Replacement only: Replace coil spring

TECHNICAL INFORMATION

Do not operate special tool with an impact screwdriver.



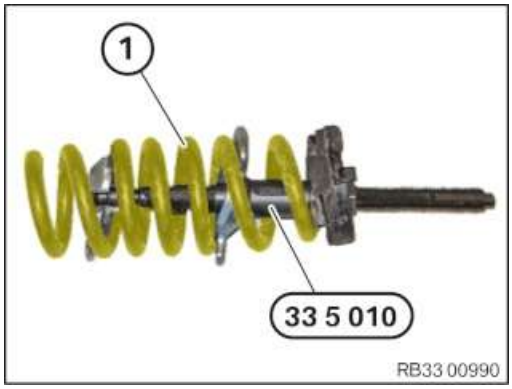
TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.

- The mounting orientation of coil spring (1) is characterized with a label (2).

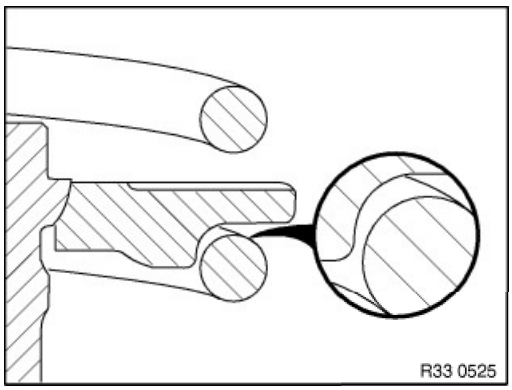
  The label (2)is secured at the upper end of coil spring (1) and characterized with the labelling "top".

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- Relieve tension on special tool .
- Remove coil spring (1).
- Screw in new special tool (1) into the special tool and tighten.

  Make sure coil spring is in correct installation position.

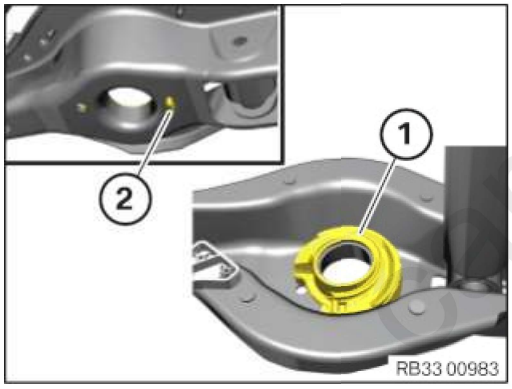


- Make sure coil spring is correctly positioned in spring cups.

6 – Install the coil springs

TECHNICAL INFORMATION

Do not operate special tool with an impact screwdriver.



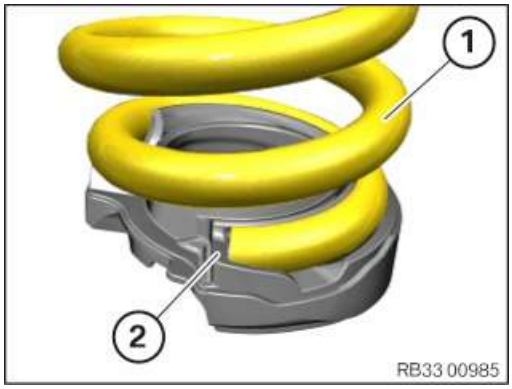
- Check bottom spring pad (1) for damage, renew if necessary.
- Check bottom spring pad (1) for correct position on the camber control arm, correct the position if necessary.

  The plastic tab (2) must be positioned in the bore hole.

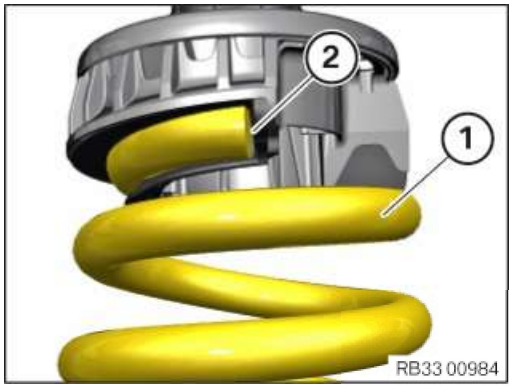


- Install coil spring (1) from the top and position it.

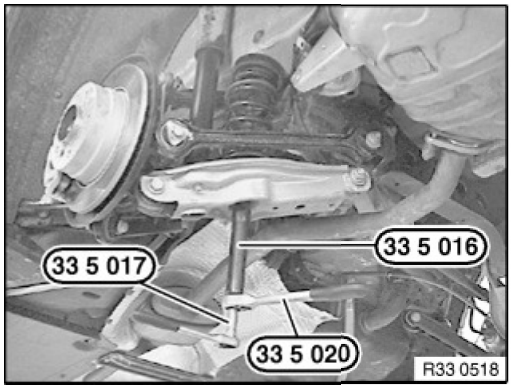
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- Move the coil springs (1) of the bottom spring pad (2) so that they are positively locked to the system.



- Position the top spring pad such that the end of the coil spring (1) moves to the system at the base (2).



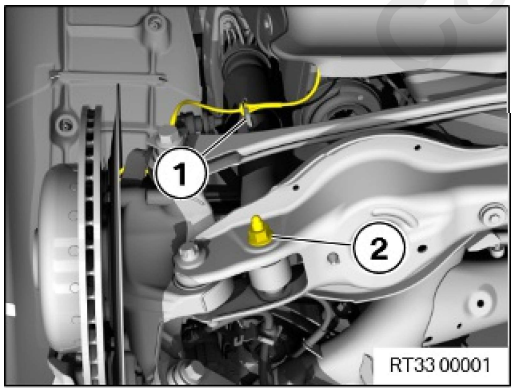
- Release the tension on the coil spring using the special tools and .

  Note the installation position of the coil spring while releasing the tension.

  Counter support the spindle of the spring tensioner with the special tool .
- Remove special tools.

POSTPROCESSES

7 – Securing the rear shock absorber on the camber control arm



- Clip in cable into the holder (1).
- Support the wheel carrier with the universal jack.
- Lift the wheel carrier with the universal jack to the point where the screw can be inserted.
- Position the shock absorbers on the camber control arm.
- Renew screw and nut (2).

  Parts: Bolt, nut
- Install the screw.

TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Tighten nut (2) hand-tight.
- Remove the universal jack from under the vehicle.

8 – Install rear left or right wheel

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▸ Mounting the wheel



TECHNICAL INFORMATION

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

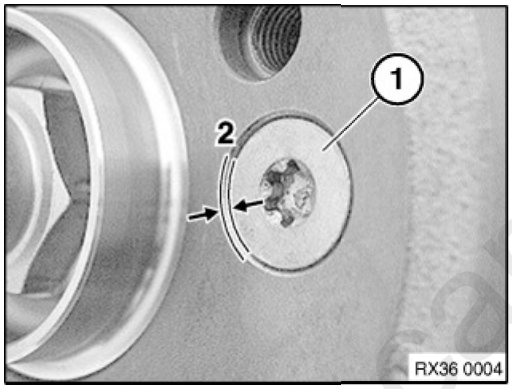
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

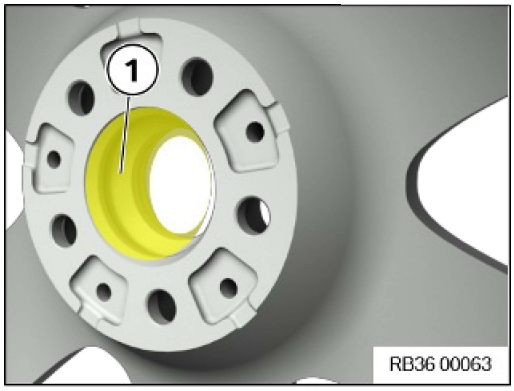
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

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

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

Expendable materials

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



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

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

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

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

Wheel bolts

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

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9 – Measure ride height of rear axle and adjust to normal position



- Set vehicle down on its wheels (e.g. On a drive-on-ramp-lift).
- Measure vehicle ride height (A).
- Load or unload vehicle until the vehicle ride height (A) is within the tolerance.

G20_Allradantrieb, Standard suspension

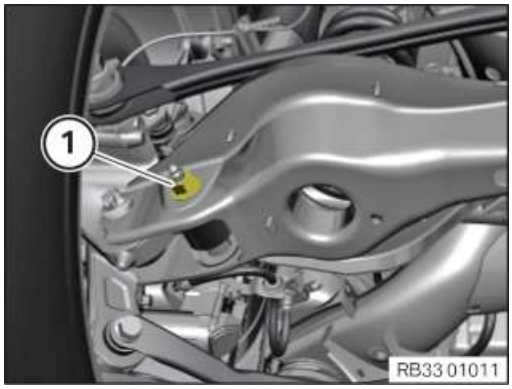
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

10 – Tighten screw connection on the camber control arm.

10 – Tighten screw connection on the camber control arm.



TECHNICAL INFORMATION

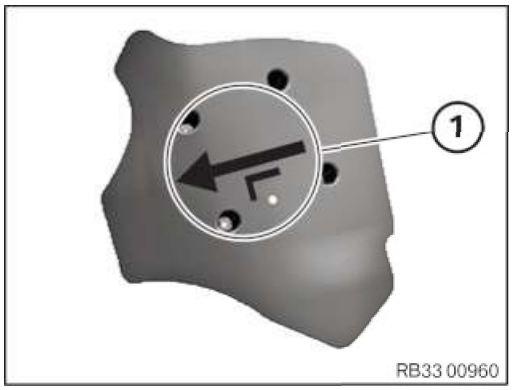
Tighten the screw connection in the normal position.

- Tighten the nut (1) in normal position.

Shock absorber to camber arm

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

11 – Installing the cover of the camber control arm



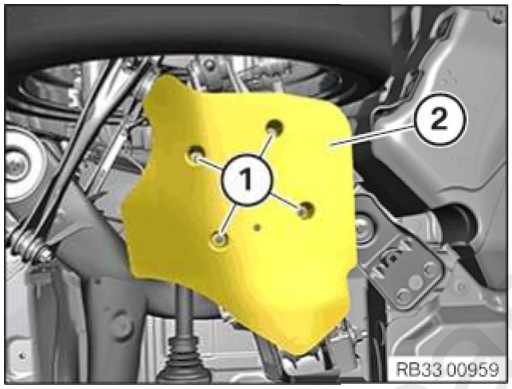
- Note the installation location and direction of installation.

  Direction of installation:

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right



- Position the camber control arm cover (2) on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

Additional Information

Overview of Tightening Torques

Brake disc to front wheel hub Used in step 8

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub Used in step 8

M8	Renew screw.	Tightening torque	16 Nm

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Wheel bolts Used in step 8

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

Shock absorber to camber arm Used in step 10

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

Cover to camber control arm Used in step 11

M6	Replace nuts.	Tightening torque	6 Nm

Overview of Special Tools

2 344 011 Tool



Common Used in step 8

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

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common Used in step 1

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

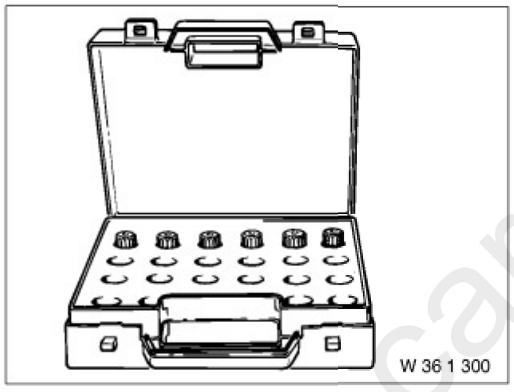
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0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



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

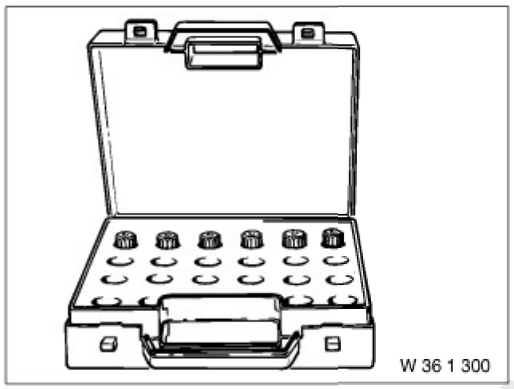
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0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

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Overview Technical Data

G20_Allradantrieb, Standard suspension	Used in step 9
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung	Used in step 9
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

33 55 041 Replacing left or right anti-roll bar link

PRELIMINARY WORK

1 – Remove rear left or right wheel

▸ **Removing the wheel**



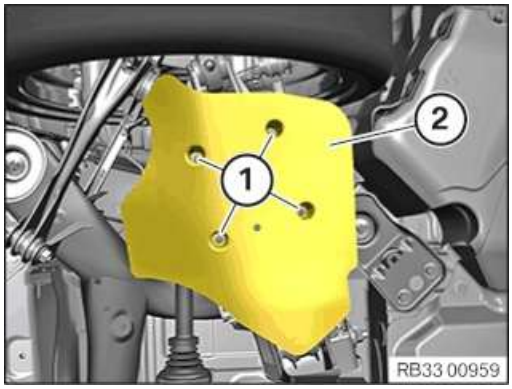
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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



- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter from the tool set .

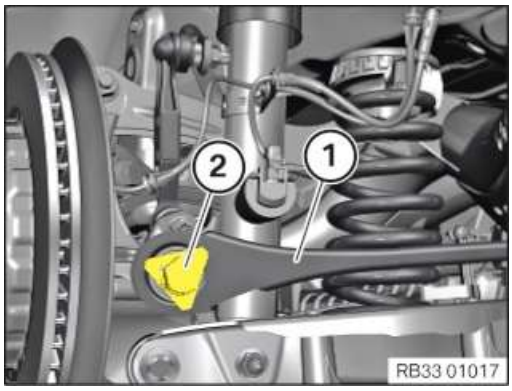
2 – Remove the cover of the camber control arm



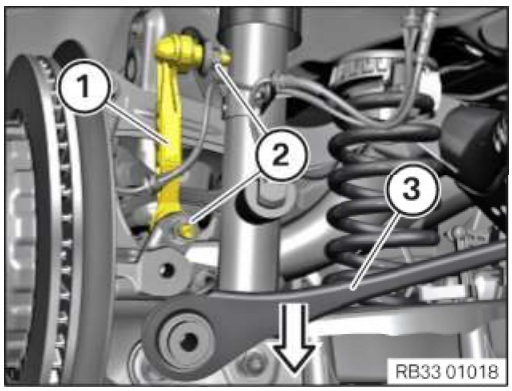
- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

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3 – Removing the rear anti-roll bar link from the anti-roll bar

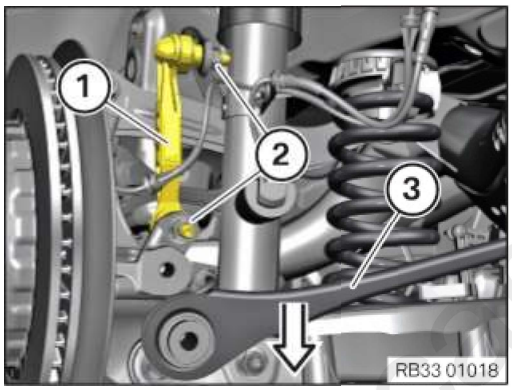


- Release screw (2) from track control arm (1).



- Swivel the track control arm (3) towards the bottom.
- Release the nuts (2) and counter support at the Torx socket.
- Remove the anti-roll bar link (1).

4 – Installing the rear anti-roll bar link from the anti-roll bar

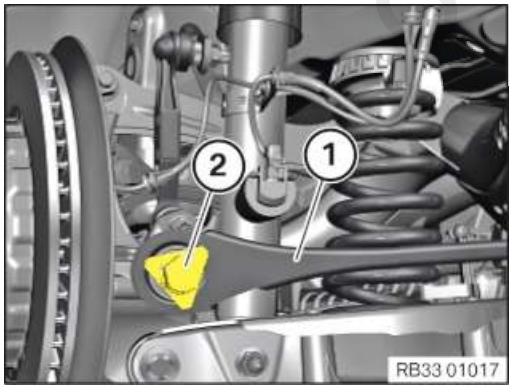


- Position anti-roll bar link (1).
- Swivel track control arm (3) downwards.
- Renew nuts (2).

  Parts: Nuts
- Tighten the nuts (2) with counter support on the Torx socket.

Rear anti-roll bar link to anti-roll bar / wheel carrier

M10	Renew nut.	Tightening torque	56 Nm



- Position track control arm (1) on the wheel carrier.
- Renew the screw (2).

  Parts: Screw

TECHNICAL INFORMATION

Tighten the screw connection in the normal position.

- Tighten screw (2) hand-tight.

POSTPROCESSES

5 – Install rear left or right wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

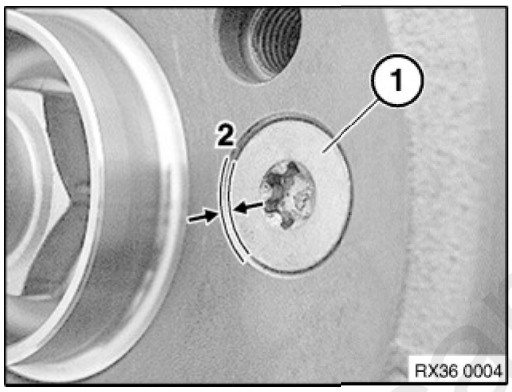
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Check that the mounting bolt (1) for the brake disc is securely seated.

  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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- Lightly grease the front and rear wheel hubs in this area (1) to protect from corrosion.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

  This process is intended to prevent damage to the brake disc.

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TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

  Parts: Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

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6 – Measure ride height of rear axle and adjust to normal position



- Set vehicle down on its wheels (e.g. On a drive-on-ramp-lift).
- Measure vehicle ride height (A).
- Load or unload vehicle until the vehicle ride height (A) is within the tolerance.

G20_Allradantrieb, Standard suspension

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

7 – Tightening track control arm on wheel carrier

7 – Tightening track control arm on wheel carrier



TECHNICAL INFORMATION

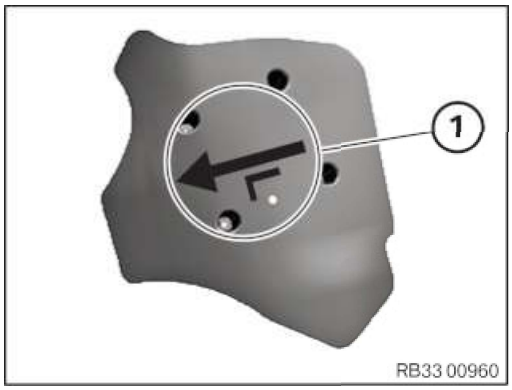
Tighten the screw connection in the normal position.

- Tighten the screw (2) in normal position.

Toe arm to wheel carrier

M12	Renew screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

8 – Installing the cover of the camber control arm



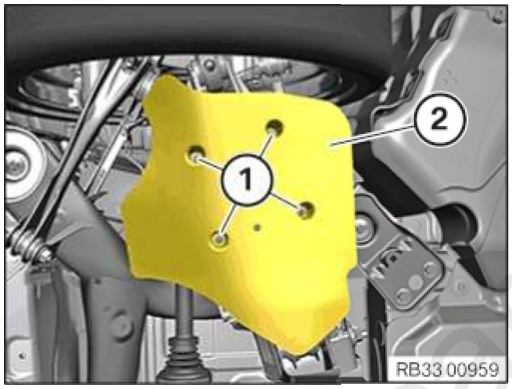
- Note the installation location and direction of installation.

  Direction of installation:

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right



- Position the camber control arm cover (2) on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

Additional Information

Overview of Tightening Torques

Rear anti-roll bar link to anti-roll bar / wheel carrier Used in step 4

M10	Renew nut.	Tightening torque	56 Nm

Brake disc to front wheel hub Used in step 5

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub Used in step 5

M8	Renew screw.	Tightening torque	16 Nm

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Wheel bolts Used in step 5

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Toe arm to wheel carrier Used in step 7

M12	Renew screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

Cover to camber control arm Used in step 8

M6	Replace nuts.	Tightening torque	6 Nm

Overview of Special Tools

2 344 011 Tool



Common Used in step 5

Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common Used in step 1

Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

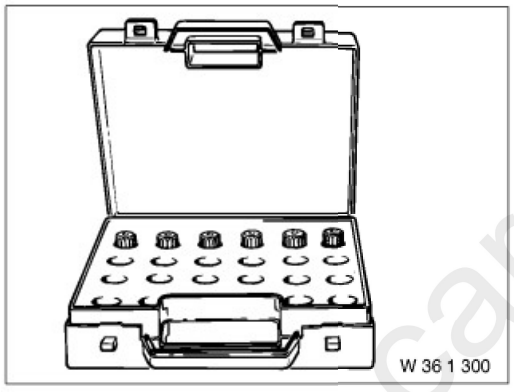
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0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

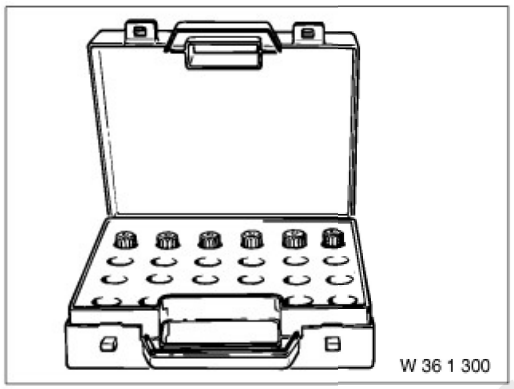
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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

Overview Technical Data

G20_Allradantrieb, Standard suspension	Used in step 6
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	368 (358 - 378) mm

G20_Allradantrieb, Sports suspension settings with low-slung	Used in step 6
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	360 (350 - 370) mm

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00 00 ... Microencapsulated screws



Screw securing adhesive is a means of preventing a screwed connection from being loosened by external influences.

Once the screw has been coated with adhesive, the adhesive remains inactive until such time that it is activated by the encapsulation breaking when the screw is inserted and then cures (hardens) at room temperature.



Installation note:

- Screw connection must be completed within 20 mins. (start of curing)
- Microencapsulated screws must not be retightened
- Thread of nut must be cleaned beforehand in event of repeated use

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