

DRIVELINE/AXLES

Front Axle - Operating Fluids

1.0 GENERAL INFORMATION ON HIGH TEMPERATURE MULTI-PURPOSE GREASE

High temperature multi-purpose grease consists of a lithium complex soap in a mineral oil product with a selected combination of additives. Extremely fine soap is contained in the oil, and serves as the basic ingredient.

This lubricating grease possesses the following properties:

- Very good thermal resistance and penetration stability

The structure and consistency must be maintained over long service life with temperatures from -22°F to +302°F (-30°C to +150°C) in continuous operation and very high loads.

- Oxidation stability

A lubricating grease contains effective inhibitors (which limit or prevent chemical reactions) in order to stop oxidation at very high operating temperatures.

- Water resistance and corrosion inhibition

A high temperature multi-purpose grease is water resistant. At the same time lubricated parts are given maximum protection against rust by the corrosion inhibitors.

2.0 APPROVED HIGH TEMPERATURE MULTI-PURPOSE GREASE

High temperature multi-purpose grease is used for the lubrication of wheel bearings.

Ball Bearings (E24 from mid 1982, E28, E30, E31, E32 and all following)

Provided with lifetime lubrication.

No subsequent lubrication approved!

Tapered Roller Bearings (E23, E21)

50 grams grease packing in wheel hub and 20 grams in wheel hub grease cap per wheel.

Grease type: Retinax A

CRC Part No. SL 3131 (former BMW Part No. 81 22 9 407 710)

3.0 APPROVED FRONT AXLE FINAL DRIVE OILS

Approvals are the same as for rear axle final drive oils.

SUSPENSION

Front Axle - Repair - Z4

3100 GENERAL

00 DANGER OF POISONING IF OIL IS INGESTED/ABSORBED THROUGH THE SKIN

Danger of poisoning!

Ingesting oil or absorbing through the skin may cause poisoning!

Possible symptoms are:

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

Protective measures/rules of conduct

- Pour oil only into appropriately marked containers
- Do **not** pour oil into drinking vessels (drinks bottles, glasses, cups or mugs)
- Observe country-specific safety regulations

First aid measures

- Do not induce vomiting.

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

If the person affected is unconscious, do not administer anything by mouth, place the person in the recovery position and seek immediate medical attention.

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31 00 ... FRONT AXLE + STEERING: WHEEL/CHASSIS ALIGNMENT CHECK MUST BE CARRIED OUT AFTER THE FOLLOWING WORK

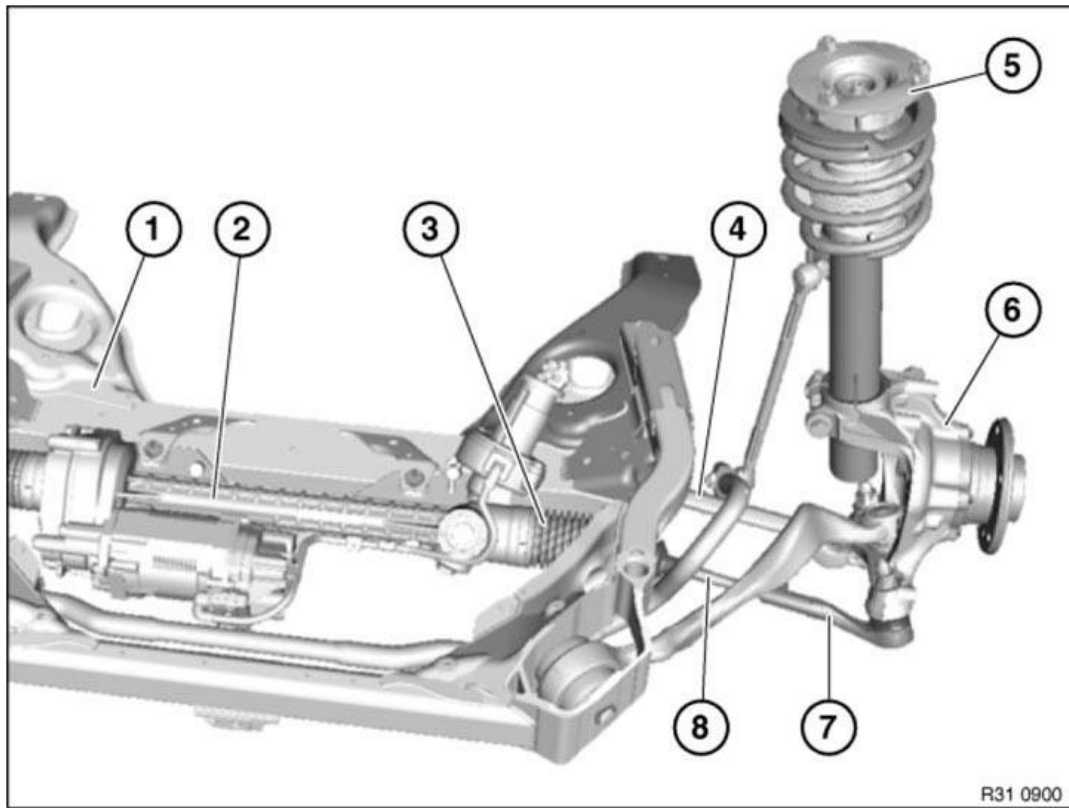
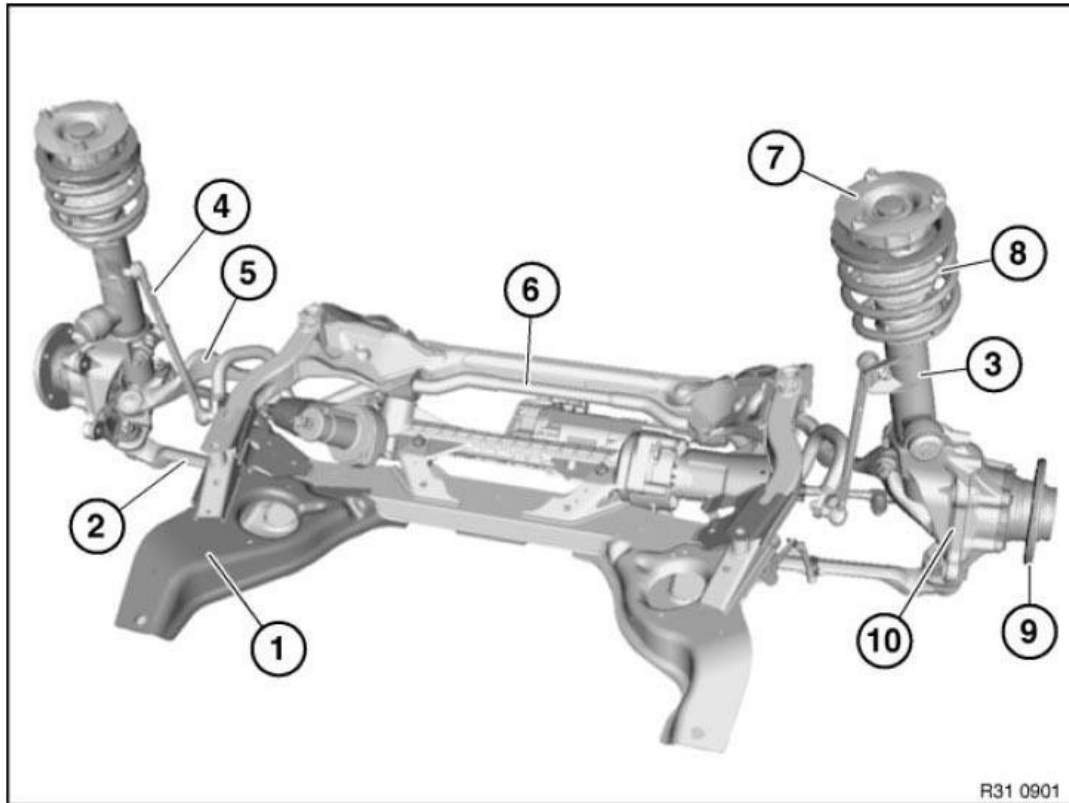


Fig. 1: Identifying Front Axle + Steering Components
 Courtesy of BMW OF NORTH AMERICA, INC.

A **WHEEL/CHASSIS ALIGNMENT CHECK** must be carried out after the following work:

- **Release of following screw/bolt connections:**
 - Steering gear to front axle carrier
 - Control arm to front axle carrier
 - Support bearing to body (if centring pin is missing)
 - Tie rod end to tie rod
- **Replacement of following parts:**
 1. Front axle carrier
 2. Steering gear
 3. Gaiter (if the tie rod end has to be screwed off)
 4. Control arm
 5. Support bearing (only if centring pin is missing)
 6. Swivel bearing
 7. Tie rod end
 8. Tie rod

31 FRONT AXLE OVERVIEW



- | | |
|------------------------------------|----|
| 1 Front axle support | 7 |
| 2 Control arm, ride-height sensor | 8 |
| 3 Spring strut shock absorber | 9 |
| 4 Stabiliser link | 10 |
| 5 Tension strut | |
| 6 Stabilizer/stabilizer suspension | |

- | |
|----------------|
| Thrust bearing |
| Coil spring |
| Wheel bearing |
| Swivel bearing |

Fig. 2: Overview Of Front Axle
Courtesy of BMW OF NORTH AMERICA, INC.

Safety precautions and general information

1. Front axle support
2. Control arm, ride-height sensor
3. Spring strut shock absorber

4. Thrust bearing
5. Stabiliser link
6. Tension strut
7. Stabilizer/stabilizer suspension
8. Coil spring
9. Wheel bearing
10. Swivel bearing
11. Testing/adjustment work

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.

64 00 000 INFORMATION ON USING CLEANING AGENT/PAINTS (PERSONAL PROTECTION EQUIPMENT)

WARNING: Use of cleaning agents/paints not compliant with instructions can cause serious injuries or burns!
Handling cleaning agents/paints can trigger allergic skin and respiratory reactions!

IMPORTANT: Observe following instructions:

- Store cleaning agents/paints only in a secure cabinet.
- Keep cleaning agents/paints away from naked flames and other sources of ignition.
- Protect cleaning agents/paints from high temperatures and direct

sunlight.

- Always keep an eye bath on hand, change the water regularly (once a month).

IMPORTANT: Observe following instructions before use:

- Manufacturer's instructions (on container/packaging)
- Hazard warnings (on container/packaging)
- Manufacturer's instructions on package insert
- Material safety data sheet of manufacturer
- Product information in EPC
- National market regulations

IMPORTANT: Observe following instructions during use:

- Do not eat, drink or smoke while working with these products.
- Avoid direct contact with skin and eyes.
- Wear personal protective clothing/equipment.
- Ensure that all enclosed areas are well ventilated or extract fumes directly.
- Immediately change working clothes soiled with cleaning agent/paint.
- After finishing work, wash your hands and apply protective skin cream.

IMPORTANT: Follow hazard warnings and wear personal protection equipment!

First Aid:

- If product comes in contact with eyes, immediately flush with running water for about 10 - 15 minutes. Seek the advice of eye specialist.
- In the event of skin contact and where applicable an allergic skin reaction, clean the affected areas immediately with soap and water and then apply silicone-free skin cream. Seek advice of physician.
- If an adhesive product is swallowed, rinse mouth/parts of mouth thoroughly with running water. Drink 1-2 glasses of water. Do not induce vomiting. Consult a doctor.
- After inhaling vapours ensure ample supply of fresh air. Keep calm, keep respiratory tracks clear and call doctor.

Recycling

Dispose of cleaning agents/paints in a professional manner!

Observe national/country-specific disposal regulations.

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.

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

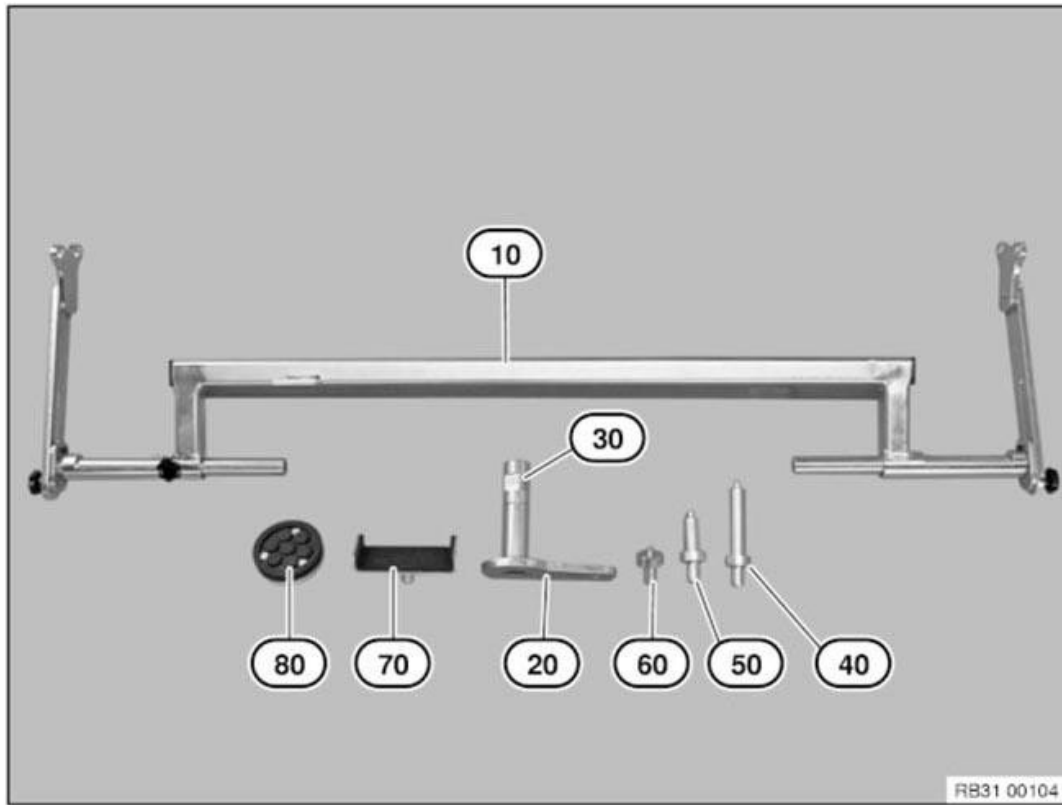


Fig. 3: Adaptations For Mounting Front Axle With Engine And Transmission
Courtesy of BMW OF NORTH AMERICA, INC.

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.

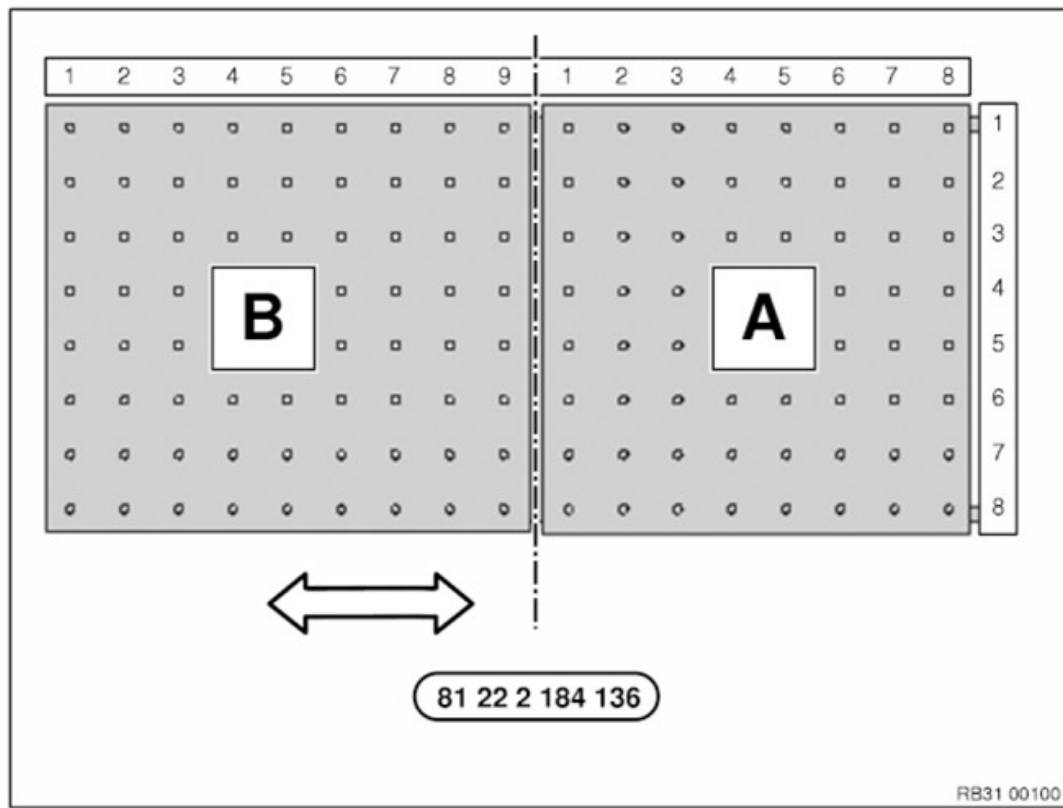


Fig. 4: Identifying Working Plates

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Follow the operating instructions from the equipment manufacturer.

31 00 ... NOTES (ALUMINIUM CHASSIS COMPONENTS)

Due to the chemical and corrosion characteristics of aluminum, always comply with the following points when handling aluminum components:

- Do not bring into contact with battery acid!
- Do not clean with wire brushes made of brass or iron! Always use wire brushes with stainless steel bristles!
- Do not expose to flying sparks when grinding/separating! Cover components!
- Do not strike with steel welding splashes! Cover components!
- Do not expose to temperatures $> 80^{\circ}\text{C}$, even for brief periods! Temperatures in paint facilities do not have the same impact

31 00 ... NOTES ON REPAIRING THREADS

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

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



Fig. 5: Identifying Damaged Helicoil Thread
Courtesy of BMW OF NORTH AMERICA, INC.

Procedure

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

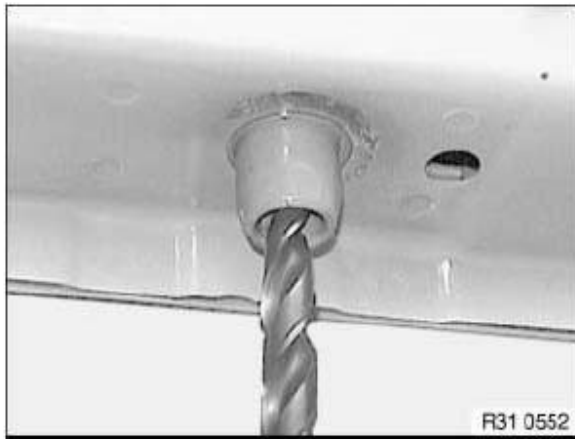


Fig. 6: Creating Clean Core Hole
Courtesy of BMW OF NORTH AMERICA, INC.

2. Create locating thread for Helicoil thread insert



Fig. 7: Inserting Helicoil Thread On Locating Thread
Courtesy of BMW OF NORTH AMERICA, INC.

3. Pick out Helicoil thread insert in accordance with the **Notes on repairing threads** and screw into the locating thread until flush with the original thread

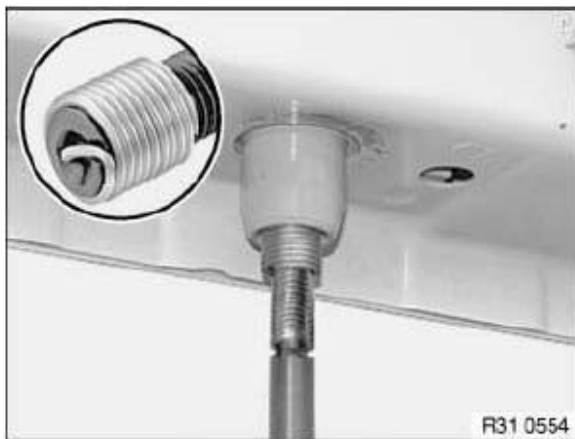


Fig. 8: Inserting Helicoil Thread On Original Thread
Courtesy of BMW OF NORTH AMERICA, INC.

4. Break drive pin and remove



Fig. 9: Breaking Drive Pin
Courtesy of BMW OF NORTH AMERICA, INC.

31 00 ... NOTES ON REPAIRING THREADS

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Fig. 10: Identifying Damaged Helicoil Thread
Courtesy of BMW OF NORTH AMERICA, INC.

Procedure

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

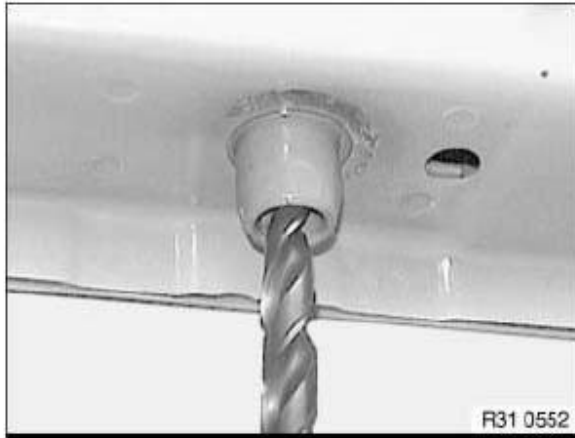


Fig. 11: Creating Clean Core Hole
Courtesy of BMW OF NORTH AMERICA, INC.

2. Create locating thread for Helicoil thread insert



Fig. 12: Inserting Helicoil Thread On Locating Thread
Courtesy of BMW OF NORTH AMERICA, INC.

3. Pick out Helicoil thread insert in accordance with the **Notes on repairing threads** and screw into the locating thread until flush with the original thread

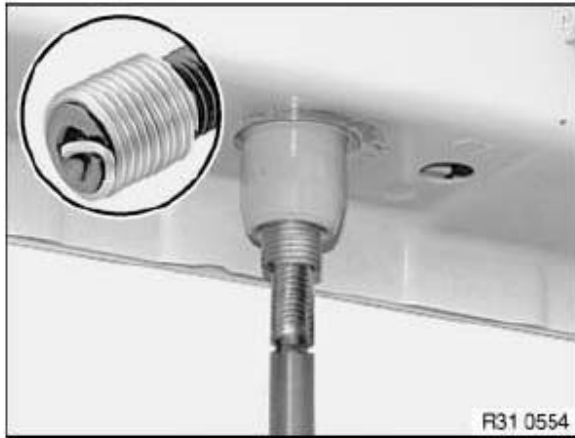


Fig. 13: Inserting Helicoil Thread On Original Thread
Courtesy of BMW OF NORTH AMERICA, INC.

4. Break drive pin and remove

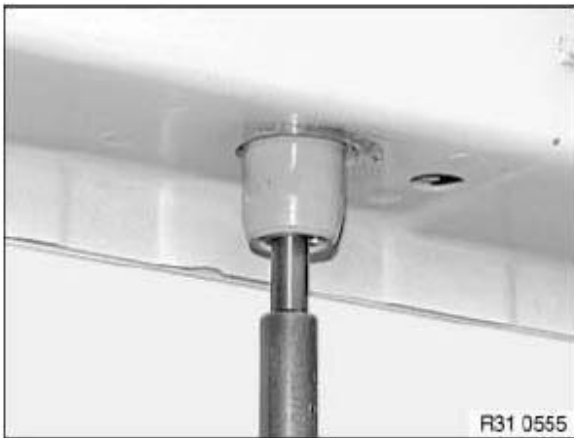


Fig. 14: Breaking Drive Pin
Courtesy of BMW OF NORTH AMERICA, INC.

00 ... RAISING VEHICLE WITH TROLLEY JACK

IMPORTANT: Observe the following trolley-jack-related instructions:

1. Use only BMW-distributed/approved trolley jacks which have rubber plate contact points.
2. Trolley jacks must be regularly serviced and always checked for functional reliability before they are used!
3. Check the rubber plate on the trolley jack prior to each use, replacing if necessary.

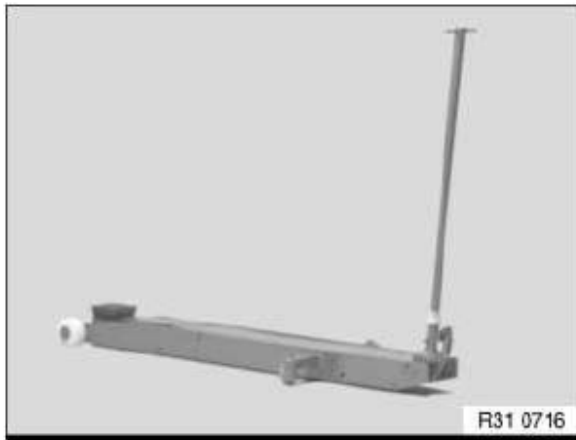


Fig. 15: Identifying Trolley Jack
 Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: The vehicle may be raised with a trolley jack only at the following jacking points!

1. Car jacking point
2. Side car jacking points
3. Rear differential (**REMOVE HEAT SHIELD**)

Risk of damage: It is not permitted to raise the vehicle at the rear differential cover!

4. Bolting point for rear axle tension struts

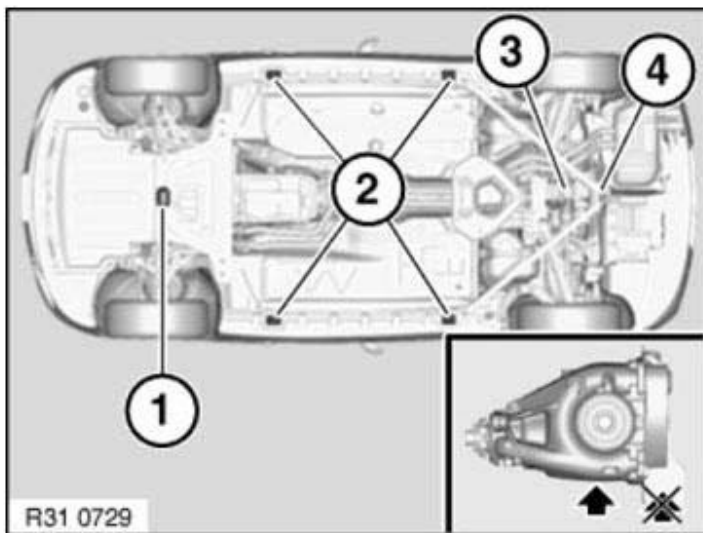


Fig. 16: Identifying Rear Differential With Car Jacking Point
 Courtesy of BMW OF NORTH AMERICA, INC.

51 75 515 REMOVING AND INSTALLING/REPLACING LOWER PEDESTRIAN PROTECTION

Necessary preliminary tasks

- Remove **FRONT UNDERBODY PROTECTION**

Release screws (1).

Remove pedestrian protection (2).

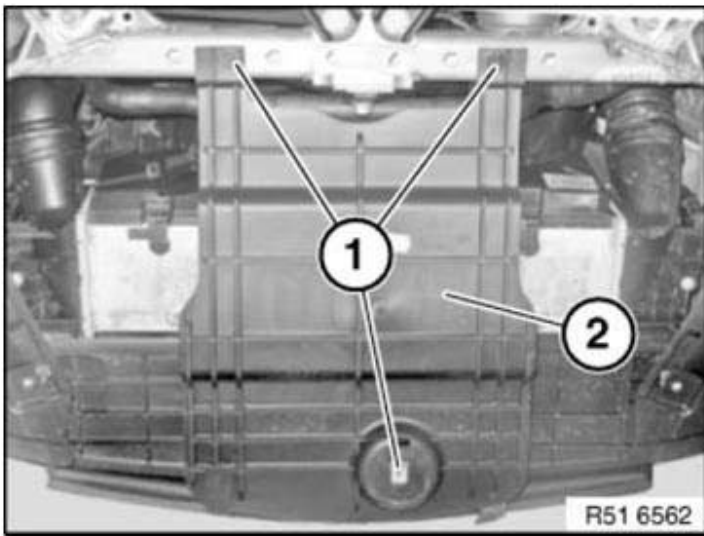


Fig. 17: Identifying Pedestrian Protection With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

00 RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN

Danger of injury!

Contact with eyes or skin may result in injury!

Possible symptoms are:

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

Protective measures/rules of conduct

- Wear protective goggles
- Wear oil-resistant protective gloves

- Observe country-specific safety regulations

First aid measures

- **Eye contact:** Rinse eyes immediately with plenty of water for at least 15 minutes; if available, use an eye-rinsing bottle. If irritation of the eyes persists, consult a doctor.
- **Skin contact:** Wash off with soap and water immediately. If irritation persists, consult a doctor.

NOTE: Do not use solvents/thinners.

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NOTE: Do not use solvents/thinners.

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

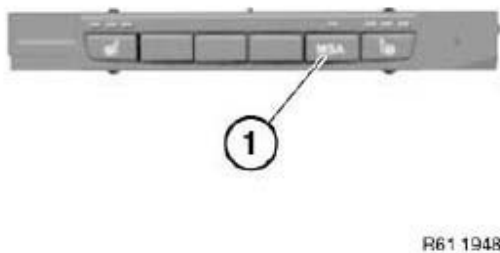


Fig. 18: Identifying MSA Button

Courtesy of BMW OF NORTH AMERICA, INC.

- 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.

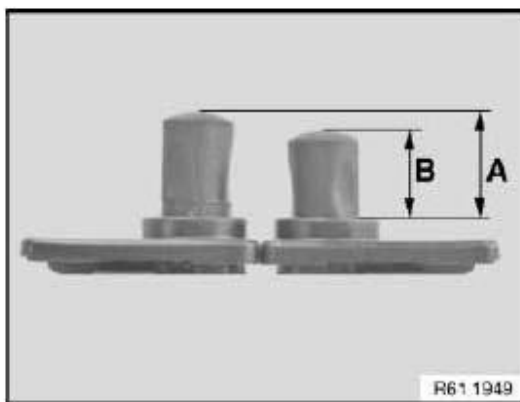


Fig. 19: Identifying Basic Setting For Engine Hood/Bonnet Open

Courtesy of BMW OF NORTH AMERICA, INC.

When working with diagnosis tools

- Observe instructions in diagnosis tool

00 SAFETY INSTRUCTIONS FOR HANDLING OIL

WARNING: **DANGER OF POISONING** if oil is ingested/absorbed through the skin!
RISK OF INJURY if oil comes into contact with eyes and skin!

Recycling

Observe country-specific waste-disposal regulations.

Measures if oil is unintentionally released

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

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

3110 FRONT AXLE SUSPENSION

51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION

NOTE: Illustration shows one example only.
There may be differences in detail in the case of other engine variants.

Release all screws (1) on underbody protection (2).

Remove underbody protection (2).

Installation:

Centre underbody protection (2) and tighten down screws (1).

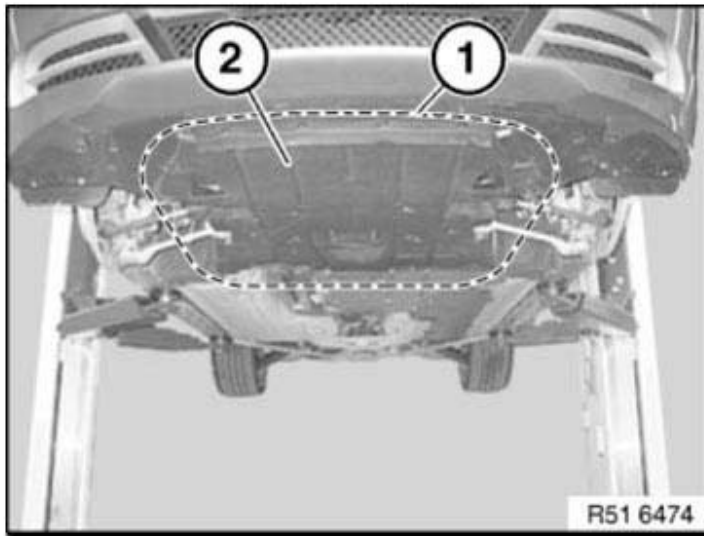


Fig. 20: Identifying Screws On Underbody Protection
 Courtesy of BMW OF NORTH AMERICA, INC.

3111 FRONT SUB-FRAME

31 11 506 LOWERING/RAISING FRONT AXLE SUPPORT

IMPORTANT: Before lowering front axle support:

In order to avoid damage to lifting platform, perform weight compensation on vehicle.

Load spring strut domes with sand bags.

WARNING: Danger to life!

SECURE ENGINE IN INSTALLATION POSITION (N52) or SECURE ENGINE IN INSTALLATION POSITION (N54, N54T) to prevent it from falling down.

Necessary preliminary tasks

- Secure **ENGINE IN INSTALLATION POSITION (N52) or SECURE ENGINE IN INSTALLATION POSITION (N54, N54T)**
- Remove **FRONT ASSEMBLY UNDERSIDE PROTECTION**
- Remove **V-STRUT, FRONT AXLE SUPPORT**
- Remove **LOWER SECTION OF STEERING SPINDLE FROM STEERING GEAR**
- Release diagonal struts See **5161011 REMOVING AND INSTALLING/REPLACING V-STRUT, FRONT AXLE CARRIER, LEFT OR RIGHT** or **5171482 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT TENSION STRUT** on front axle support
- Release coolant pipe. See **17 00 008 DRAINING AND ADDING COOLANT (N54) or REMOVING AND INSTALLING/REPLACING COOLANT PIPE ON FRONT AXLE (N52K)** .
- Disconnect **PLUG CONNECTION** from ride-height sensor on right

Cut open cable tie (1) for steering connecting line on front axle support.

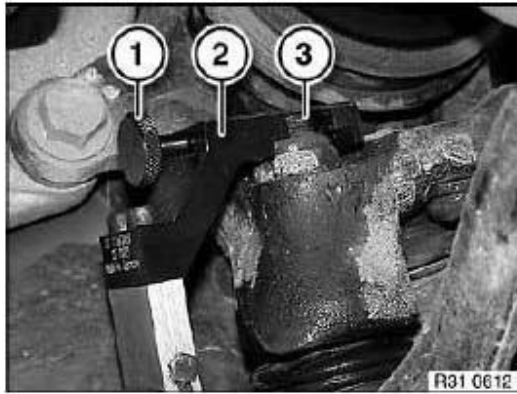


Fig. 21: Identifying Cable Tie
Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: Risk of injury!
Failure to comply with the following instructions may result in the vehicle slipping off the lifting platform and critically injuring other persons.

When supporting components, make sure that

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

Engage 31 5 251 with a 2nd person helping completely on workshop jack (00 2 030).

Insert special tools 31 5 253 in telescopic supports of a profile rail pair.

NOTE: In a profile rail pair two profile rails are connected to each by tothing.

Insert special tools 31 5 256 in telescopic supports of other profile rail pair.

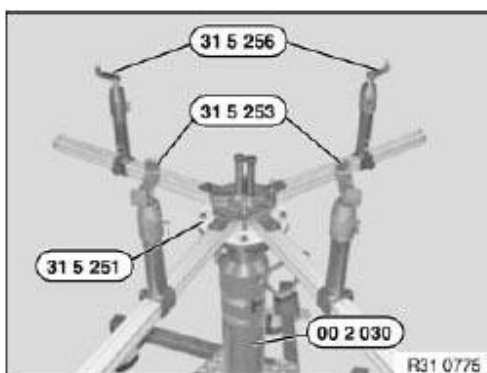


Fig. 22: Inserting Special Tool (31 5 253) On Profile Rail Pair Telescopic Supports
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: The jacking points on the left side are shown.

Align special tools 31 5 253 and 31 5 256 to front axle support.

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

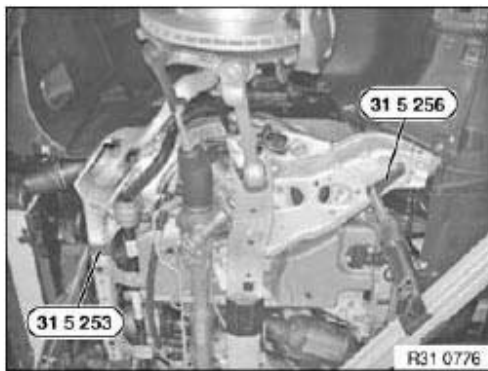


Fig. 23: Aligning Special Tools (31 5 253 And 31 5 256) To Front Axle Support
Courtesy of BMW OF NORTH AMERICA, INC.

Release bolts (1-3).

Installation:

Check threads for damage; if necessary, repair with **HELICOIL THREAD INSERTS** .

Make sure screws are installed in correct positions.

- Bolt (1) M12x90
- Bolt (2) M12x145
- Bolt (3) M12x53

Tighten first bolts (1) and then bolts (2) and (3).

Tightening torque **31 10 1AZ** .

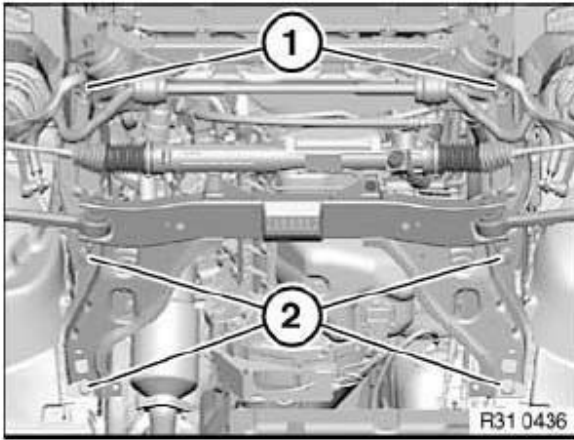


Fig. 24: Identifying Front Axle Carrier Bolts
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Carry out **STEERING ANGLE SENSOR ADJUSTMENT**

51 61 011 REMOVING AND INSTALLING/REPLACING V-STRUT, FRONT AXLE CARRIER, LEFT OR RIGHT

IMPORTANT: Observe SAFETY INSTRUCTIONS for raising the vehicle
Driving without V-struts is not permitted!

Necessary preliminary tasks

- Remove **FRONT UNDERBODY PROTECTION**

Release bolt (1).

Tightening torque **51 71 10AZ** .

Release bolt (2).

Tightening torque **51 71 10AZ** .

Release bolt (3).

Tightening torque **51 71 10AZ** .

Remove V-strut (4) towards front.

Installation:

Replace bolts.

Make sure bolts are installed in correct positions.

- Bolt (1) M12x30
- Bolt (2) M10x33
- Bolt (3) M10x45

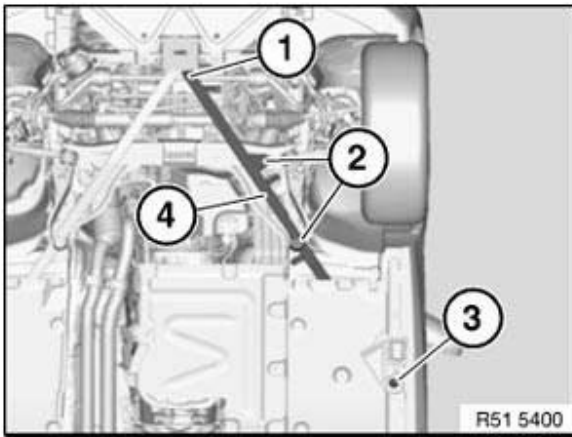


Fig. 25: Identifying V-Strut With Bolts
Courtesy of BMW OF NORTH AMERICA, INC.

51 75 515 REMOVING AND INSTALLING/REPLACING LOWER PEDESTRIAN PROTECTION

Necessary preliminary tasks

- Remove **FRONT UNDERBODY PROTECTION**

Release screws (1).

Remove pedestrian protection (2).

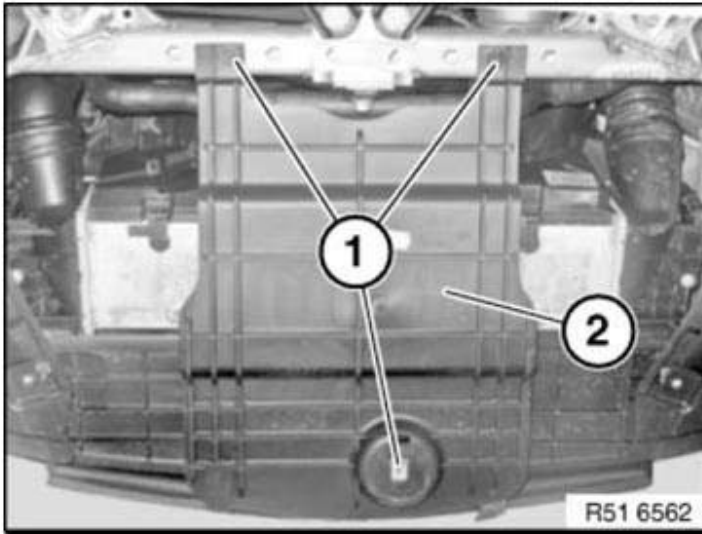


Fig. 26: Identifying Pedestrian Protection With Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

31 11 001 REPLACING FRONT AXLE SUPPORT

WARNING: Danger to life!

SECURE ENGINE IN INSTALLATION POSITION (N52) or SECURE ENGINE IN INSTALLATION POSITION (N54, N54T) to prevent it from falling down.

Necessary preliminary tasks

- Secure **ENGINE IN INSTALLATION POSITION (N52) or SECURE ENGINE IN INSTALLATION POSITION (N54, N54T)**
- Remove **FRONT ASSEMBLY UNDERSIDE PROTECTION**
- Remove **RISE-HEIGHT SENSOR FROM FRONT AXLE SUPPORT**
- Remove **STEERING GEAR FROM FRONT AXLE SUPPORT** and tie up
- Remove **CONTROL ARM FROM FRONT AXLE SUPPORT**
- Remove **TENSION STRUTS** from front axle support
- Remove front **ANTI-ROLL BAR**
- Release coolant pipe. See **17 00 008 DRAINING AND ADDING COOLANT (N54) or REMOVING AND INSTALLING/REPLACING COOLANT PIPE ON FRONT AXLE (N52K)** .
- Release **DIAGONAL STRUTS** on front axle support

Engage 31 5 251 with a 2nd person helping completely on workshop jack .

Insert special tools 31 5 253 in telescopic supports of a profile rail pair.

NOTE: In a profile rail pair two profile rails are connected to each by tothing.

Insert special tools 31 5 256 in telescopic supports of other profile rail pair.

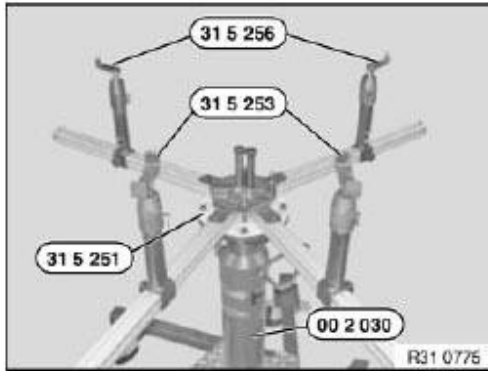


Fig. 27: Inserting Special Tool (31 5 253) On Profile Rail Pair Telescopic Supports
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: The jacking points on the left side are shown.

Align special tools 31 5 253 and 31 5 256 to front axle support and support front axle support.

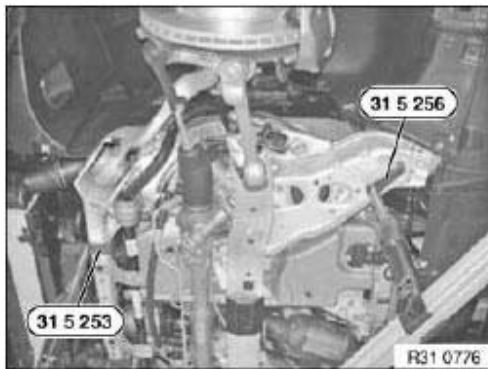


Fig. 28: Aligning Special Tools (31 5 253 And 31 5 256) To Front Axle Support
Courtesy of BMW OF NORTH AMERICA, INC.

Release bolts (1-3).

Installation:

Check threads for damage; if necessary, repair with **HELICOIL THREAD INSERTS** .

Observe tightening sequence.

Tighten first bolts (1), then bolts (2) and finally bolts (3).

Make sure bolts are installed in correct positions.

- Bolts (1) M12x90
- Bolts (2) M12x145
- Bolts (3) M12x53

Tightening torque **31 10 1AZ** .

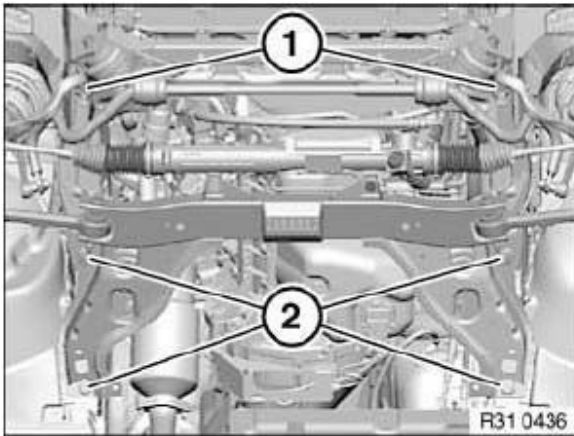


Fig. 29: Identifying Front Axle Carrier Bolts
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Perform **CHASSIS ALIGNMENT CHECK**
- Carry out **STEERING ANGLE SENSOR ADJUSTMENT**

3112 STRUTS WITH RUBBER MOUNTS

31 12 080 REMOVING AND INSTALLING/REPLACING BOTH TENSION STRUTS

Necessary preliminary tasks

- Remove **FRONT UNDERBODY PROTECTION**

Release nut (1); if necessary, grip at Torx socket (T40).

Installation:

Keep tension strut to swivel bearing connection clean and free from oil and grease.

Replace self-locking nut.

Tightening torque **31 12 2AZ** .

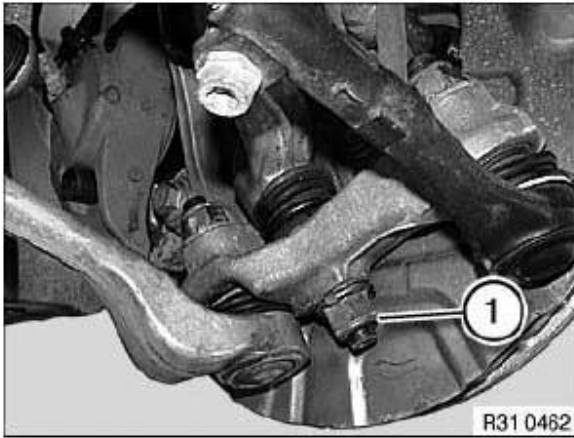


Fig. 30: Identifying Tension Strut Nut
 Courtesy of BMW OF NORTH AMERICA, INC.

Release bolt (1) and remove tension strut.

Raise lock nut (2) in area of bore and detach from front axle carrier.

Installation:

Replace lock nut.

Tighten bolt connection in **NORMAL POSITION** .

Tightening torque **31 12 1AZ** .

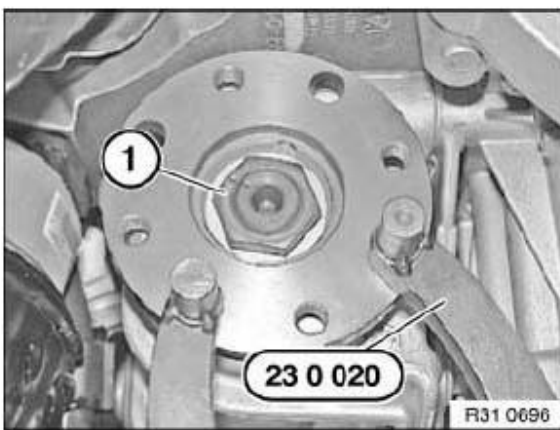


Fig. 31: Identifying Bolt And Lock Nut
 Courtesy of BMW OF NORTH AMERICA, INC.

31 12 000 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT CONTROL ARM

NOTE: If the control arm is detached from the front axle carrier, it is necessary after reinstallation to carry out a wheel/chassis alignment check.

Necessary preliminary tasks

- Remove **FRONT UNDERBODY PROTECTION**

Remove jointed rod of ride-height sensor from control arm on right.

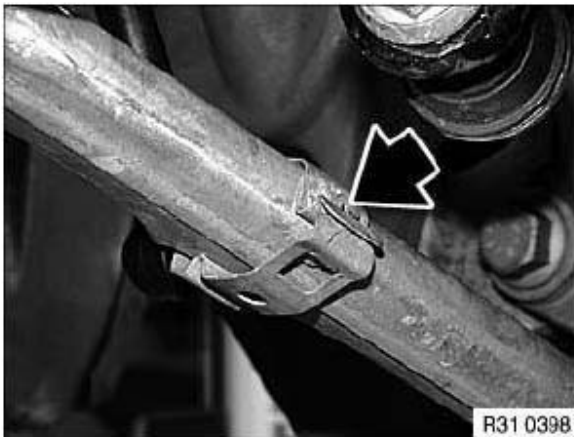


Fig. 32: Locating Jointed Rod Of Ride-Height Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1); if necessary, grip at Torx socket (T40).

Installation:

Keep control arm to swivel bearing connection clean and free from oil and grease.

Replace self-locking nut.

Tightening torque **31 12 4AZ** .

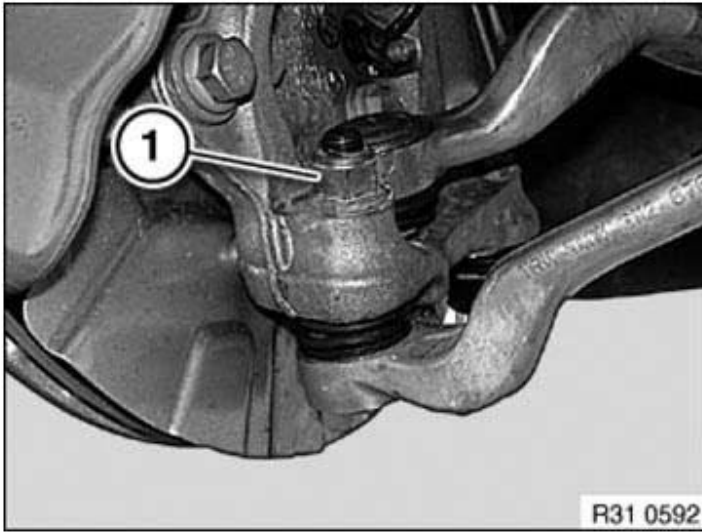


Fig. 33: Identifying Control Arm Nut
 Courtesy of BMW OF NORTH AMERICA, INC.

Release **EAR CLAMP** (1).

Move gaiter (2) from tie rod (3).

Installation:

Clean rack and check surface for damage (e.g. by corrosion).

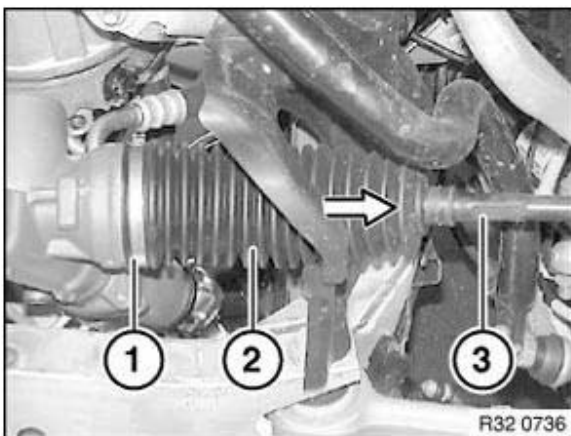


Fig. 34: Removing Gaiter From Tie Rod
 Courtesy of BMW OF NORTH AMERICA, INC.

Slacken nut (1).

Tightening torque **31 12 3AZ** .

Remove bolt (2) towards front.

Take off control arm.

Installation:

Screw head must point in direction of travel.

Replace self-locking nut.

Tighten down bolt connection in **NORMAL POSITION** .

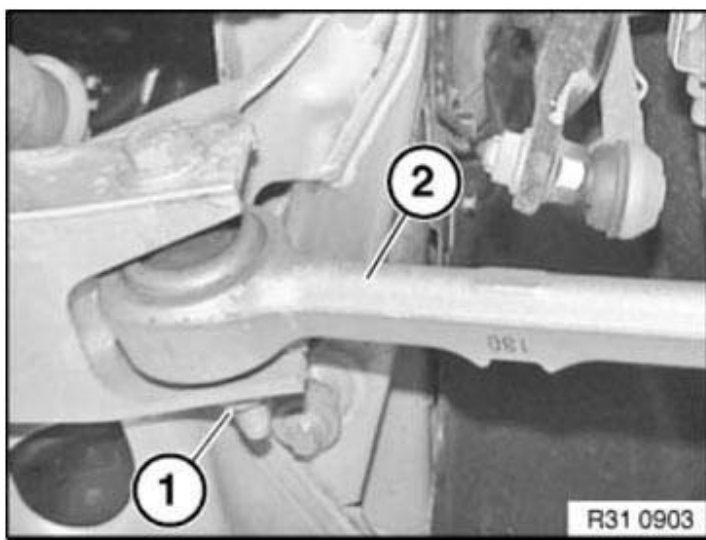


Fig. 35: Identifying Control Arm Bolt And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Perform chassis alignment check See **CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **CHASSIS/WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD**
- Carry out **STEERING ANGLE SENSOR ADJUSTMENT**

31 12 138 REPLACING RUBBER MOUNTS ON BOTH TENSION STRUTS

IMPORTANT: The mounts on both tension struts must be replaced! Mounts may only be changed once!

Necessary preliminary tasks

- Check ball joints of tension struts while installed, replace **TENSION STRUTS** if necessary

- Remove **TENSION STRUTS**

IMPORTANT: If the tension struts already feature an identification mark with a centre punch, it is necessary to replace both **TENSION STRUTS** !

Mark tension struts with a punch mark in area (A).

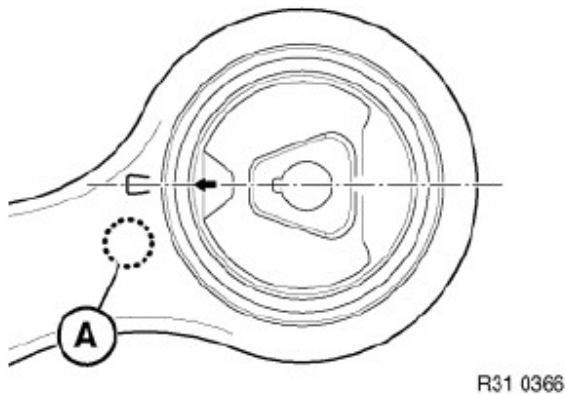


Fig. 36: Identifying Punch Mark Area On Tension Strut
Courtesy of BMW OF NORTH AMERICA, INC.

Using a press and special tools 31 3 031 and 31 3 032, press rubber mount out of tension strut.

NOTE: Special tool 31 3 031 must be exactly flush with rubber mount bushing.

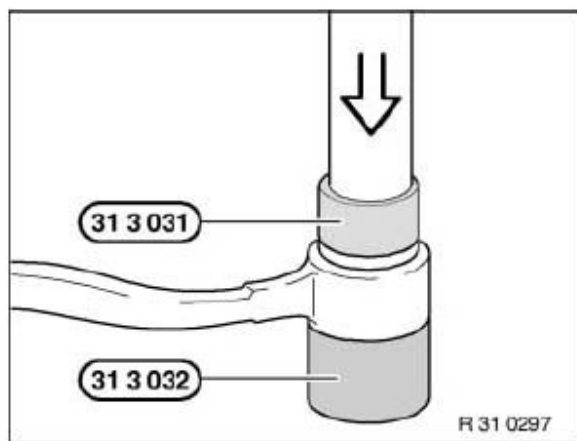


Fig. 37: Pressing Rubber Mount Out Of Tension Strut Using Press And Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Keep rubber mount and bushing in tension strut clean and free from grease.

Align rubber mount by way of arrow to marking on tension strut and press in. The deviation must not exceed $\pm 5^\circ$.

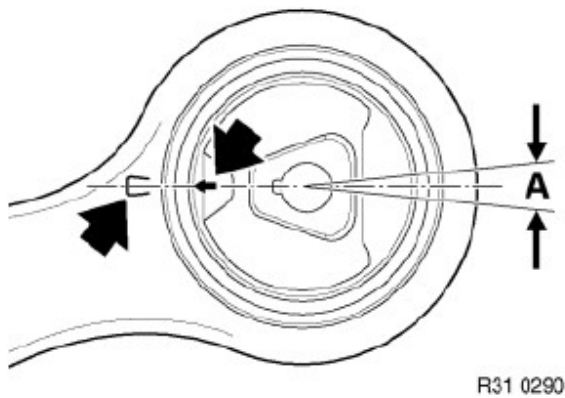


Fig. 38: Identifying Rubber Mount Aligning Arrow On Tension Strut
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Protrusion (A) equally large.

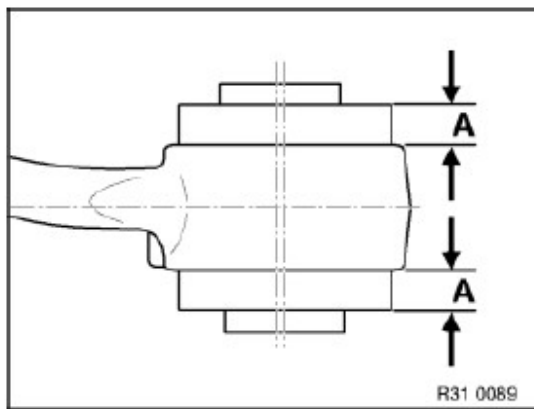


Fig. 39: Identifying Protrusion
Courtesy of BMW OF NORTH AMERICA, INC.

3121 WHEEL BEARINGS AND STUB AXLE

31 21 180 REMOVING AND INSTALLING/REPLACING BEARING FOR FRONT WHEEL

Necessary preliminary tasks

- Remove **BRAKE DISC**

NOTE:

- **Check brake pads and replace if necessary!**

Release screws (1).

Tightening torque **31 21 1AZ** .

Press wheel bearing (2) off swivel bearing with a suitable tool.

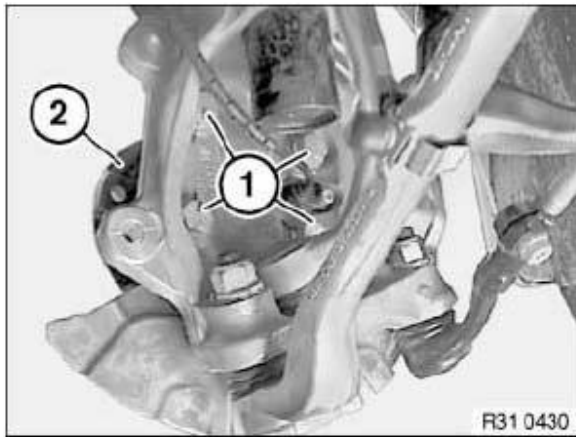


Fig. 40: Identifying Wheel Bearing With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace screws.

When reusing, recut all the threads in the wheel bearing.

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

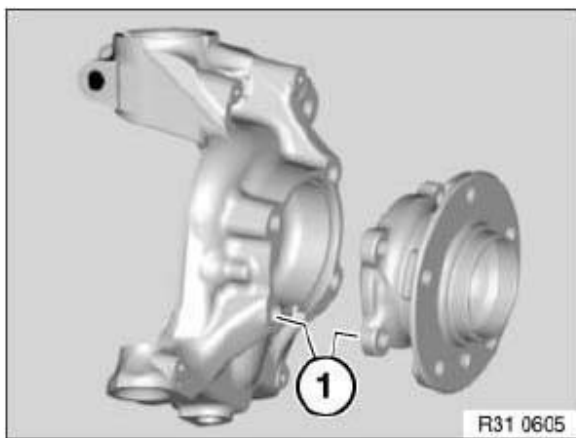


Fig. 41: Identifying Contact Surfaces Of Swivel Bearing And Wheel Bearing

Courtesy of BMW OF NORTH AMERICA, INC.

31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING

Necessary preliminary tasks

- Remove FRONT BRAKE DISC
- Remove FRONT PULSE GENERATOR FROM SWIVEL BEARING

IMPORTANT: Check sensor head and line from pulse generator prior to installation for external damage, replacing if necessary.

If necessary, remove jointed rod of ride-height sensor from control arm.

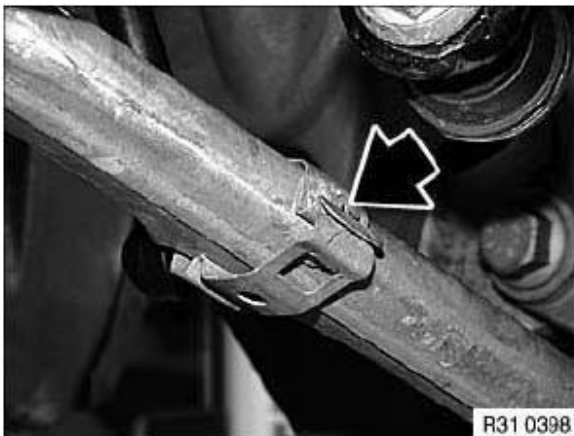


Fig. 42: Locating Jointed Rod Of Ride-Height Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken CONTROL ARM BOLT CONNECTION ON FRONT AXLE CARRIER in order to prevent control arm rubber mount from being overelongated.

Remove CONTROL ARM FROM SWIVEL BEARING .

Remove TIE ROD END FROM SWIVEL BEARING .

WARNING: Risk of injury!
Tension strut is under tension.

Remove TENSION STRUT FROM SWIVEL BEARING

Support swivel bearing with workshop jack and a suitable mounting.

Release nut (1), remove holder (2) and remove screw.

Installation:

Screw head must point in direction of travel.

Replace self-locking nut.

Tightening torque **31 31 3AZ** .

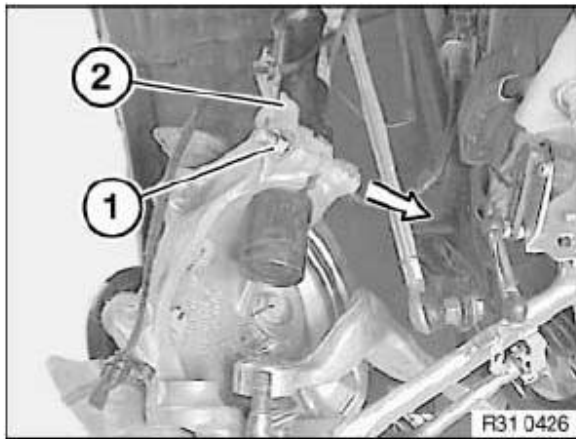


Fig. 43: Removing Holder
Courtesy of BMW OF NORTH AMERICA, INC.

Spread swivel bearing with special tool 31 2 230.

Lower workshop jack and remove swivel bearing.

Installation:

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

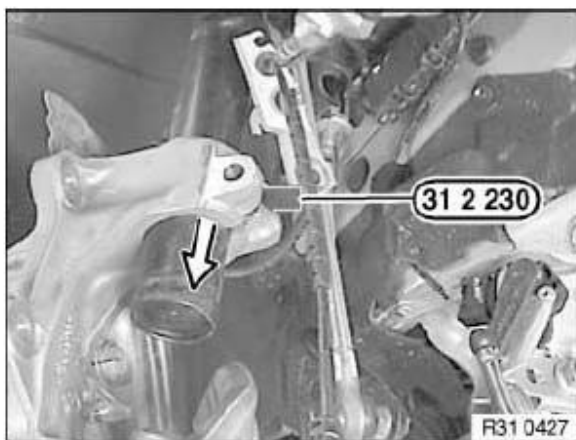


Fig. 44: Expanding Swivel Bearing Using Special Tool (31 2 230)

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Expand swivel bearing with special tool 31 2 230, align by way of gap to positioning pins (1) on back of spring strut and raise up to stop.

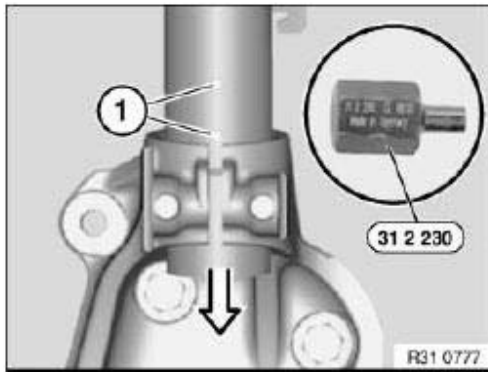


Fig. 45: Expanding Swivel Bearing Using Special Tool (31 2 230)
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure swivel bearing contacts stop (1) correctly.

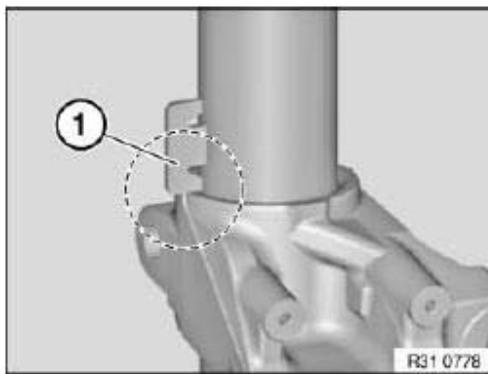


Fig. 46: Identifying Swivel Bearing Contacts Stop
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement

- Modify **WHEEL BEARING** or replace if necessary
- Modify **BRAKE CARRIER/BRAKE GUARD PLATE**

After installation

- Perform chassis alignment check See CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION or CHASSIS/WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD
- Carry out STEERING ANGLE SENSOR ADJUSTMENT

3131 SPRING STRUT

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.

31 31 000 REMOVING AND INSTALLING COMPLETE LEFT OR RIGHT SPRING STRUT SHOCK ABSORBER

IMPORTANT: If the centring pin is missing from the support bearing, the position of the studs to the wheel arch must be marked so that the original camber is approximately maintained.
Only one nut may ever be released for marking.

Necessary preliminary tasks

- Remove FRONT WHEEL
- Remove STABILIZER LINK FROM SPRING STRUT
- Detach plug connection for pulse generator and expose line up to holder on spring strut
- Remove front PULSE GENERATOR from swivel bearing
- Remove FRONT BRAKE DISC

Remove jointed rod of ride-height sensor from control arm.

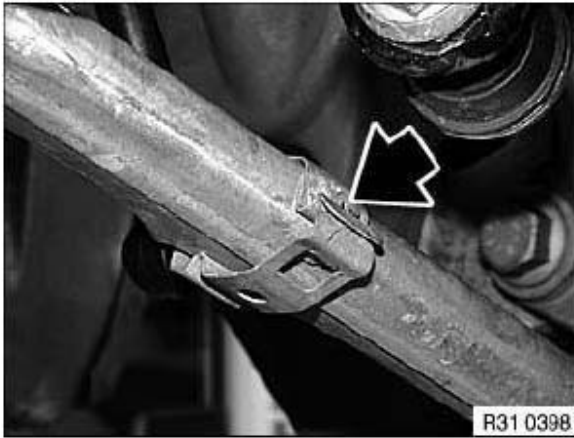


Fig. 47: Locating Jointed Rod Of Ride-Height Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken **CONTROL ARM BOLT CONNECTION ON FRONT AXLE CARRIER** in order to prevent control arm rubber mount from being damaged.

Remove **CONTROL ARM FROM SWIVEL BEARING** .

Remove **TIE ROD END FROM SWIVEL BEARING** .

Remove **TENSION STRUT FROM SWIVEL BEARING**

WARNING: Risk of injury!
Secure spring strut against falling out.

Release nuts (1) and remove spring strut with swivel bearing towards bottom.

Installation:

Clean contact surface in spring strut dome.

Align spring strut using centring pin to bore in wheel arch or studs to wheel arch and push upwards.

Replace self-locking nuts.

Tightening torque **31 31 1AZ** .

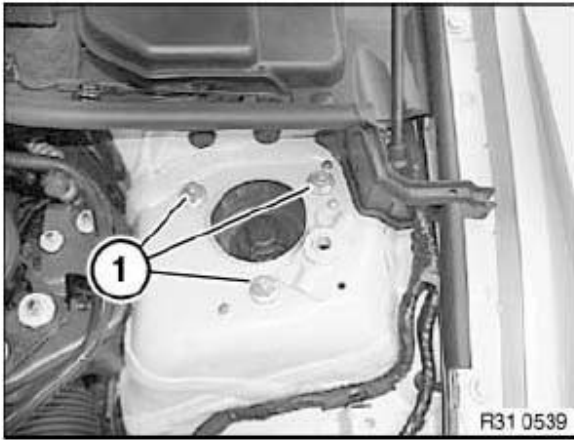


Fig. 48: Identifying Spring Strut Nuts
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Perform **CHASSIS ALIGNMENT CHECK**
- Carry out **STEERING ANGLE SENSOR ADJUSTMENT**

51 71 371 REMOVING AND INSTALLING/REPLACING TENSION STRUT ON LEFT OR RIGHT SPRING STRUT DOME

IMPORTANT: Vehicles must not be driven without tension struts.
Driving without tension struts may damage the vehicle body.
Tension struts can be secured with screws or nuts.
Screws must be tightened to specified torque and then tightened down with special tool 00 9 120.

Release screw (1).

Lift out expanding rivets (2).

Remove cable holder (3).

Release screws (4).

Tightening torque **51 71 4AZ** .

Installation:

Replace screws (4), tighten to specified torque and then to angle of rotation.

Remove tension strut (5).

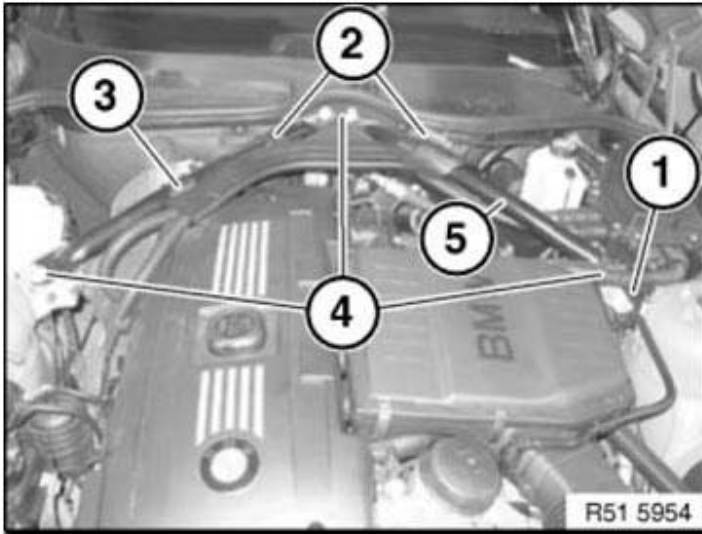


Fig. 49: Identifying Tension Strut With Expanding Rivets, Cable Holder And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

31 31 031 REPLACING FRONT LEFT OR RIGHT SPRING STRUT SHOCK ABSORBER

IMPORTANT: ○ When replacing shock absorber/spring strut, renew auxiliary damper.

WARNING: Before using the special tool 31 3 340 take care to read through the Owner's Handbook!
 All the safety information and instructions contained in the Owner's Handbook must be strictly observed!
 Failure to observe these safety precautions and instructions increases the risk of serious physical injury, damage to your health and damage to property and equipment!

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

Necessary preliminary work

- Remove **FRONT SPRING STRUT** .

Release nut (1), remove holder (2) and remove screw (3).

Expand swivel bearing with special tool 31 2 230 and pull off spring strut.

Installation note:

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

Screw head must point in direction of travel.

Replace self-locking nut.

Tightening torque **31 31 3AZ** .

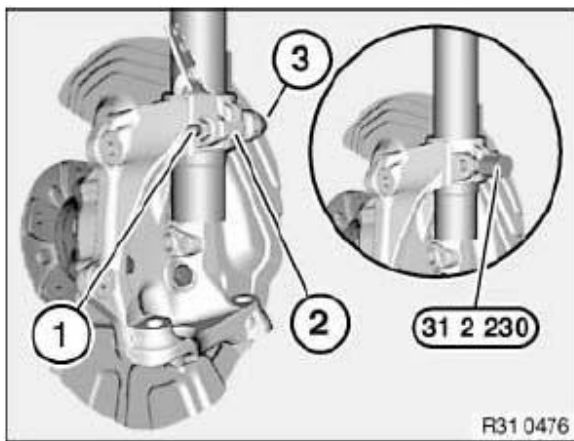


Fig. 50: Identifying Swivel Bearing Nut, Holder And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Expand swivel bearing with special tool 31 2 230, align based on gap to positioning pins (1) on rear of spring strut and push together to stop.

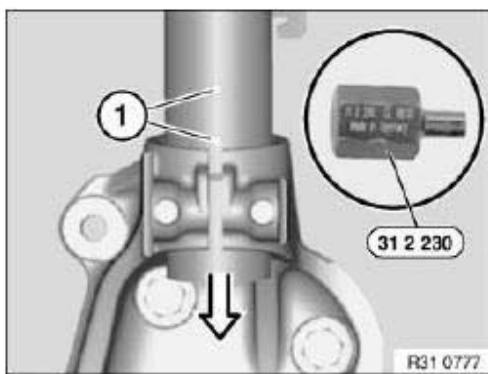


Fig. 51: Expanding Swivel Bearing Using Special Tool 31 2 230
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Make sure swivel bearing contacts stop (1) correctly.

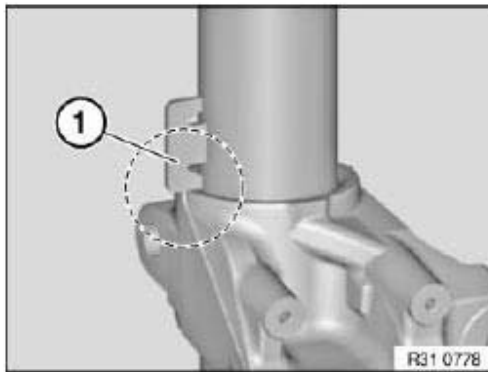


Fig. 52: Identifying Swivel Bearing Contacts Stops
Courtesy of BMW OF NORTH AMERICA, INC.

Removing

Clamp special tool 31 3 341 in vice.

Install insert 31 3 358 in special tool 31 3 354.

Position special tools 31 3 355 and 31 3 354 with insert 31 3 358 from above on special tool 31 3 341 until retaining bolts (1) can be felt and heard snapping into place.

Check seating of special tools 31 3 355 and 31 3 354 with insert 31 3 358, correct if necessary.

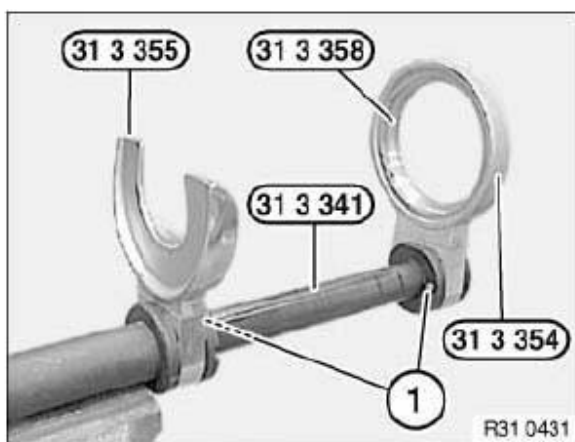


Fig. 53: Identifying Retaining Bolt And Special Tools

Courtesy of BMW OF NORTH AMERICA, INC.

Clean coil spring to remove coarse contamination and take up with special tools 31 3 355 and 31 3 354 with insert 31 3 358.

Twist spring strut until end of coil spring (1) is flush with end of special tool 31 3 355.

**WARNING: Special tool 31 3 354 and centring ring 31 3 358 must rest correctly on the upper spring cup!
Bottom coil of coil spring must rest completely in recess of special tool 31 3 355!**

Compress coil spring until stress on piston rod is relieved.

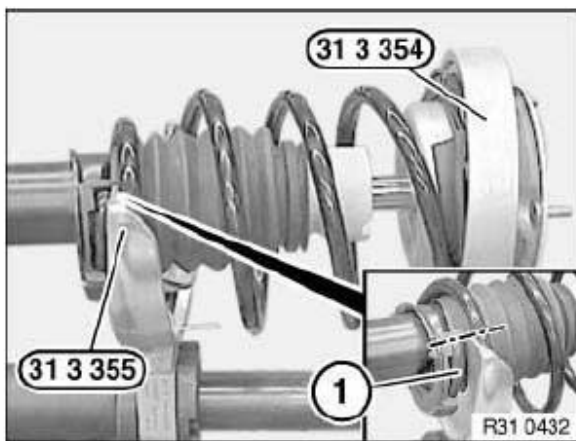


Fig. 54: Pressing Spring Strut Using Special Tool
Courtesy of BMW OF NORTH AMERICA, INC.

Take off protective cap.

Release nut with special tool 31 2 210 (grip piston rod in the process).

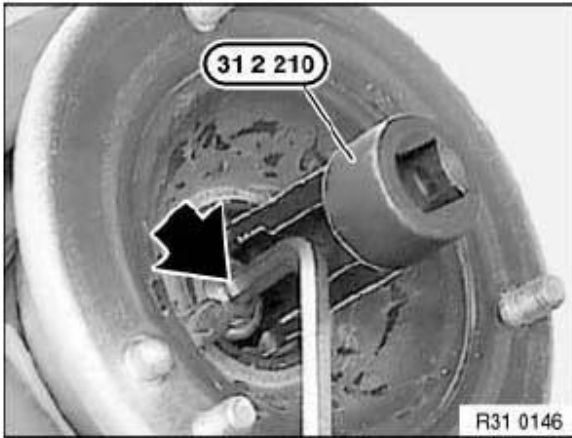


Fig. 55: Removing Nut Using Special Tool (31 2 210)
 Courtesy of BMW OF NORTH AMERICA, INC.

Remove support bearing (1), dust boot and support disc (2).

Remove shock absorber with auxiliary damper, gaiter and lower spring pad sideways from tensioned coil spring.

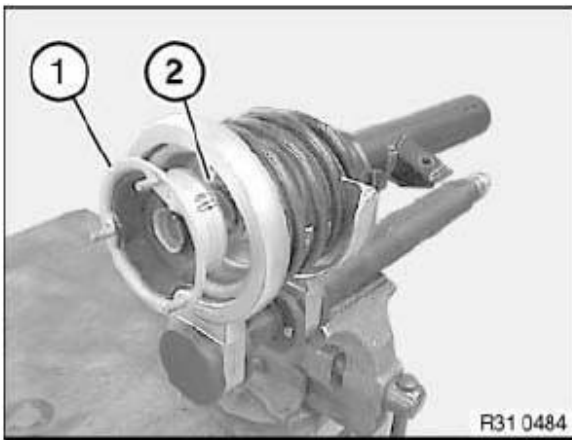


Fig. 56: Identifying Support Bearing And Support Disc
 Courtesy of BMW OF NORTH AMERICA, INC.

If necessary, remove auxiliary damper (1), gaiter (2) and spring pad (3) from shock absorber.

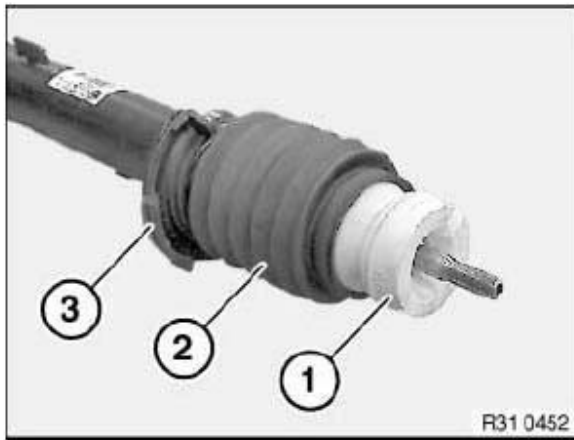


Fig. 57: Identifying Auxiliary Damper, Gaiter And Spring Pad
 Courtesy of BMW OF NORTH AMERICA, INC.

Relieve tension on coil spring.

Remove coil spring with spring cup from special tools 31 3 355, 31 3 358 and 31 3 354.

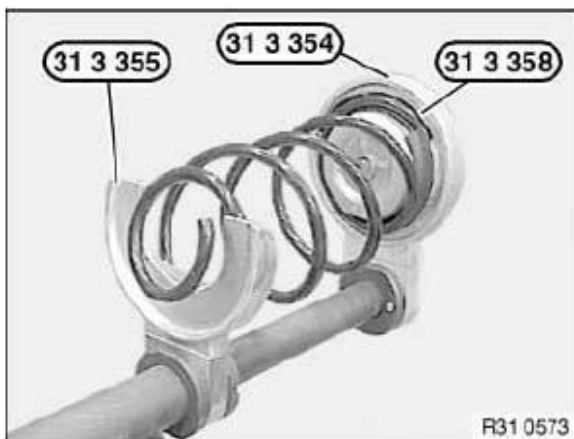


Fig. 58: Removing Coil Spring From Special Tools
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation

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

Attach spring cup (2) with spring pad (1) to coil spring.

NOTE: End of coil spring must be positively aligned to spring pad (1).

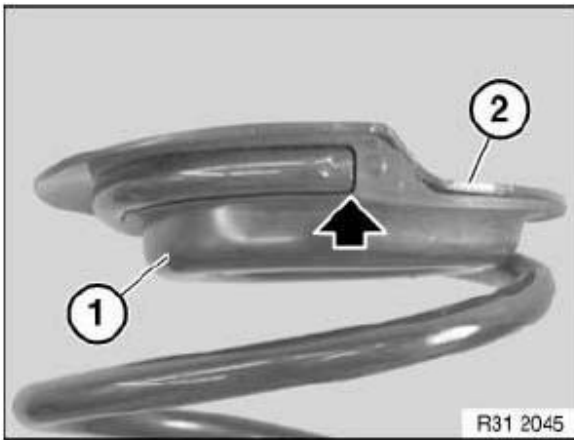


Fig. 59: Identifying Spring Cup And Spring Pad
 Courtesy of BMW OF NORTH AMERICA, INC.

Take up coil spring with spring cup using special tools 31 3 355, 31 3 358 and 31 3 354.

Twist coil spring until lower end of coil spring (1) is flush with end (2) of special tool 31 3 355.

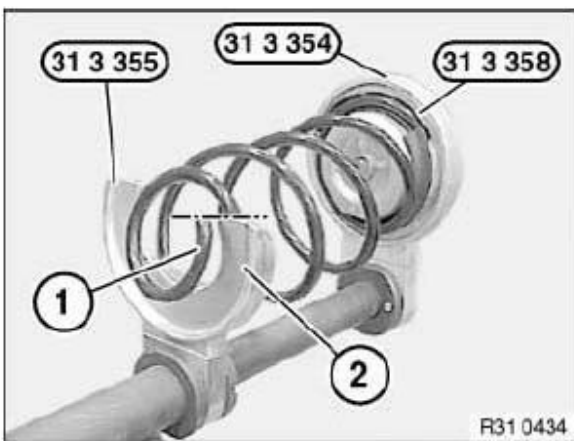


Fig. 60: Compressing Coil Spring Using Special Tool (31 3 355)
 Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: Do not compress coil spring to full extent.
 Special tool 31 3 354 and centring ring 31 3 358 must rest correctly on the upper spring cup!
 Bottom coil of coil spring must rest completely in recess of special tool 31 3 355!

Tension coil spring.

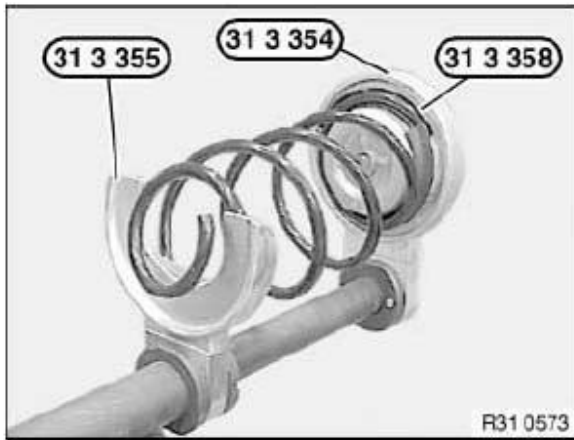


Fig. 61: Compressing Coil Spring Using Special Tools
 Courtesy of BMW OF NORTH AMERICA, INC.

Check auxiliary damper (1), gaiter (2) and spring pad (3) for damage, replace if necessary.

NOTE: Make sure spring pad (3) is correctly seated on shock absorber.

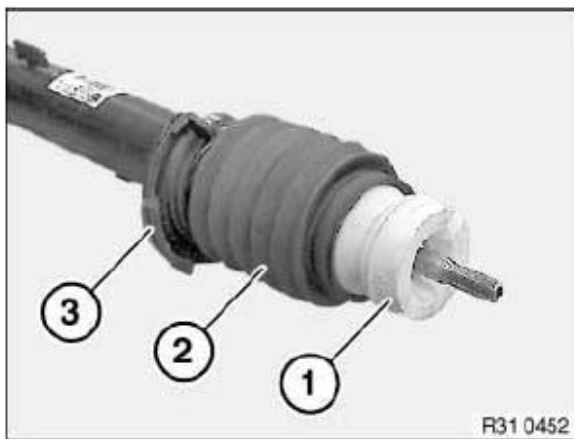


Fig. 62: Identifying Auxiliary Damper, Gaiter And Spring Pad
 Courtesy of BMW OF NORTH AMERICA, INC.

Insert shock absorber in tensioned coil spring.

Attach support disc (2) to piston rod.

Check support bearing (1) for damage, replace if necessary.

Attach dust boot and support bearing to piston rod.

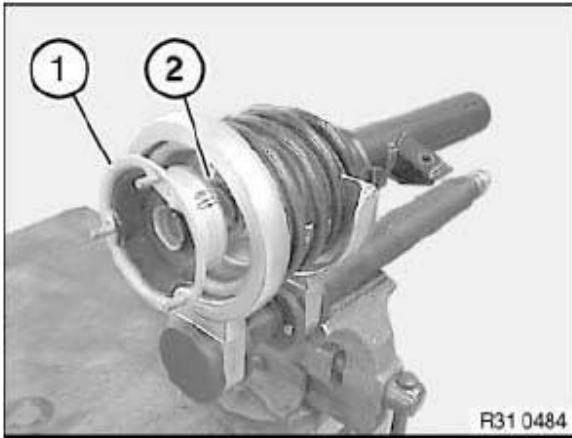


Fig. 63: Identifying Support Bearing And Supporting Disc
 Courtesy of BMW OF NORTH AMERICA, INC.

Replace nut and tighten down with special tool 31 2 210 (grip piston rod in the process).

Tightening torque 31 31 2AZ.

Fit protective cap.

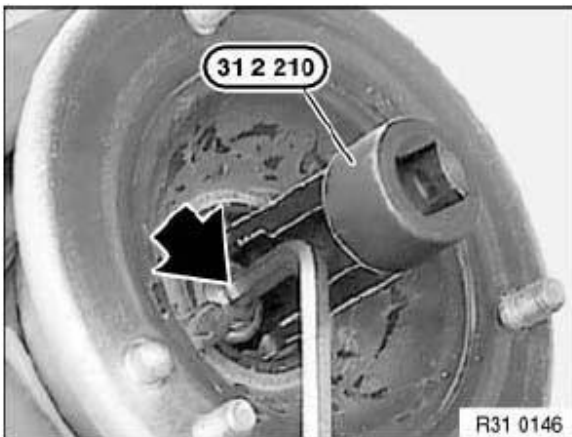


Fig. 64: Removing Nut Using Special Tool (31 2 210)
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Spring pad (1) must rest positively on spring cup (2)!
 Upper end of coil spring must rest on stop of spring pad (1)!

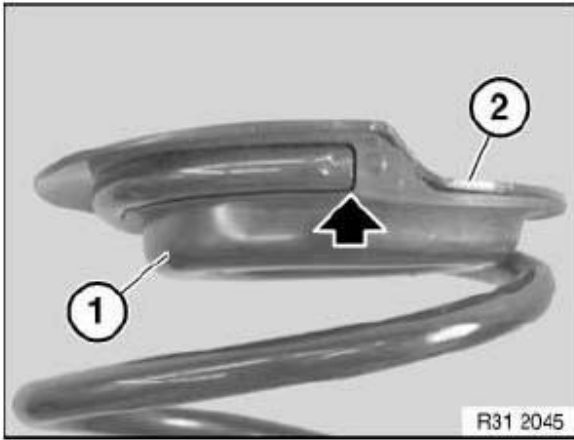


Fig. 65: Identifying Spring Cup And Spring Pad
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Lower end of coil spring (2) must rest on stop of spring pad (1)!

Relieve tension on coil spring.

Check installation position of gaiter, correct fold if necessary.

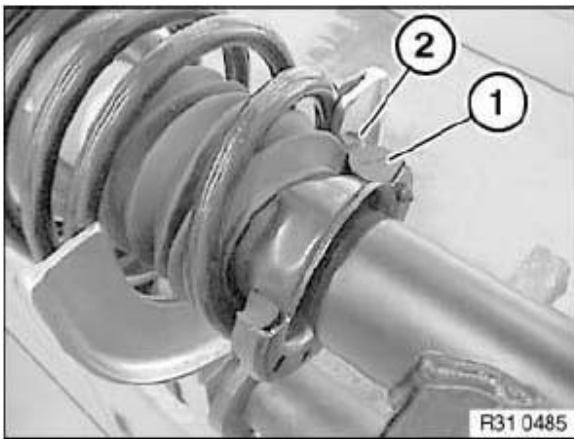


Fig. 66: Identifying Coil Spring And Spring Pad
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Carry out WHEEL ALIGNMENT PROCEDURE .

3133 SPRING WITH SUSPENSION

31 33 001 (REMOVING AND INSTALLING) REPLACING FRONT LEFT OR RIGHT SPRING

STRUT SUPPORT BEARING

NOTE: Procedure is described in the document "REPLACING FRONT LEFT OR RIGHT SPRING STRUT".

If necessary, twist/drive out centring pin (1).

NOTE: If a support bearing (2) was fitted without centring pin (1), the centring pin (1) of the new support bearing (2) must be driven or twisted out.

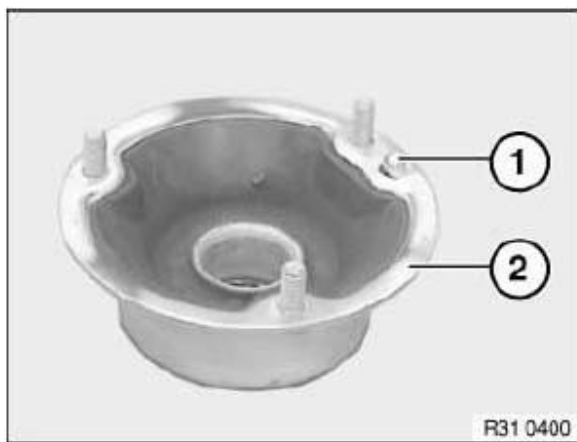
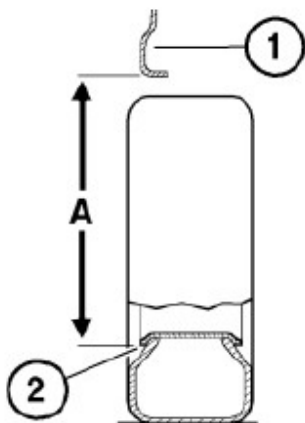


Fig. 67: Identifying Support Bearing And Centring Pin
Courtesy of BMW OF NORTH AMERICA, INC.

31 33 095 MEASURE VEHICLE RIDE HEIGHT, FRONT AXLE

Determining actual ride height (A):

To do so, attach tape measure to rim flange (2) and measure to wheel arch lower edge or engine compartment lid lower edge (1).



R31 0177

Fig. 68: Identifying Actual Ride Height From Lower Edge Of Wheel Arch To Rim Flange
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: If engine compartment lid is removed or damaged, use special tool 32 0 001.

Fitting special tool 32 0 001:

Remove rubber plug next to spring strut dome.

Fasten special tool 32 0 001 in bore hole and turn in opposite direction to direction of travel (see arrow) up to stop (1).

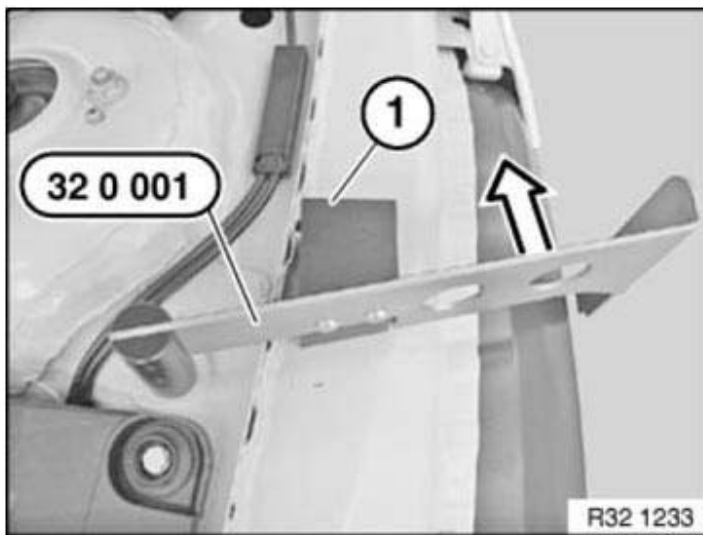


Fig. 69: Turning Special Tool (32 0 001)
Courtesy of BMW OF NORTH AMERICA, INC.

Determining actual ride height (A):

Attach tape measure to rim flange at bottom middle and measure to lower edge of special tool 32 0 001.

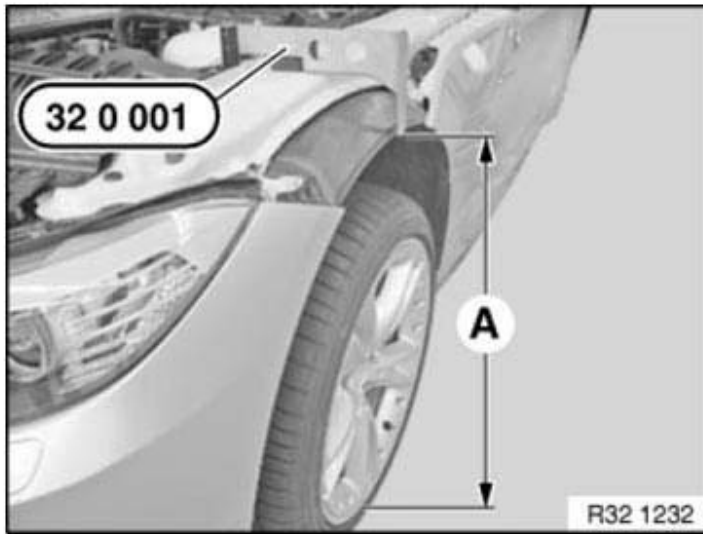


Fig. 70: Identifying Actual Ride Height
 Courtesy of BMW OF NORTH AMERICA, INC.

31 33 100 REMOVING AND INSTALLING/REPLACING COIL SPRING FOR LEFT OR RIGHT FRONT SPRING STRUT

IMPORTANT: Both coil springs on the relevant axle must be replaced only in the event of corrosion breakage!

NOTE: The coil spring is allocated in the Electronic Parts Catalogue (EPC) under the menu item "Spring table" after the vehicle identification number has been entered and the relevant optional equipment of the car has been selected.

NOTE: Procedure is described in the document "REPLACING FRONT LEFT OR RIGHT SPRING STRUT".

3135 STABILISER BAR

31 35 000 REMOVING AND INSTALLING/REPLACING FRONT STABILIZER

Necessary preliminary tasks

- Remove FRONT ASSEMBLY UNDERSIDE PROTECTION
- Remove FRONT V-STRUTS
- Remove both STABILIZER LINKS FROM STABILIZER

Unscrew nuts (1).

Tightening torque 31 35 1AZ .

Remove stabilizer; if necessary, press off from engine carrier with a suitable tool.

Installation:

Check **RUBBER MOUNT ON BOTH SIDES FOR DAMAGE** , replace if necessary.

Replace self-locking nuts.

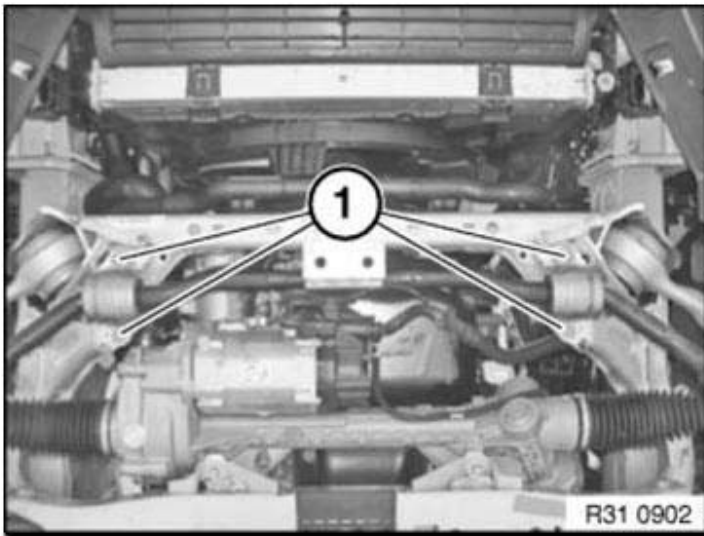


Fig. 71: Identifying Front Stabilizer Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement

Remove **RUBBER MOUNT ON BOTH SIDES FROM STABILIZER** .

31 35 005 REMOVING AND INSTALLING/REPLACING PUSH ROD (STABILIZER LINK) FOR LEFT/RIGHT STABILIZER

Release nut (1) and remove bracket for brake hose on spring strut.

Tightening torque **31 35 3AZ** .

Release nut (3) and remove stabilizer link (2).

Tightening torque **31 35 2AZ** .

Installation:

Replace self-locking nuts.

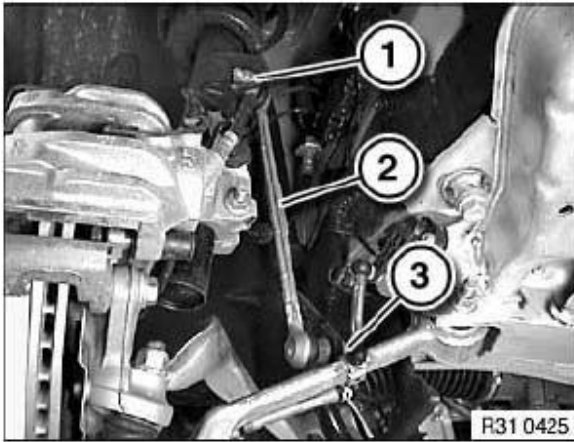


Fig. 72: Identifying Stabilizer Link With Nuts
 Courtesy of BMW OF NORTH AMERICA, INC.

31 35 040 REPLACING RUBBER MOUNT FOR STABILIZER ON BODY ON LEFT OR RIGHT

Necessary preliminary tasks

- Remove **STABILIZER ON BOTH SIDES FROM ENGINE CARRIER**

Remove retaining bracket (1) and rubber mount (2) on both sides.

Installation:

Keep retaining bracket (1), rubber mount (2) and stabilizer clean and free from oil and grease.

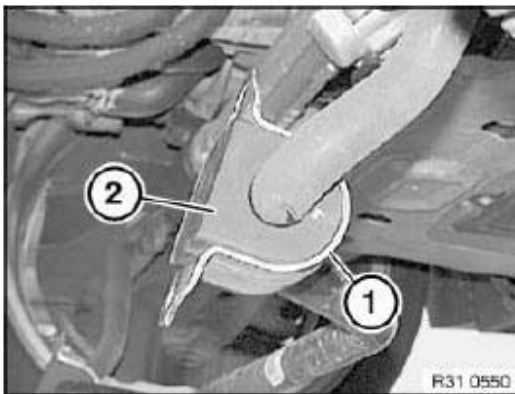


Fig. 73: Identifying Retaining Bracket And Rubber Mount
 Courtesy of BMW OF NORTH AMERICA, INC.

SUSPENSION

Front Axle - Special Tools - Z4

31 FRONT AXLE

31-5090 ADAPTER

0491982 315090 Adapter MW

NOTE: (Adapter) For pulling off the taper roller bearings from the equalization housing in the front axle differential



W31 5 090

Fig. 1: Identifying Adapter (315090)

Courtesy of BMW OF NORTH AMERICA, INC.

31-5120 BUSH

0491985 315120 Bush MW

NOTE: (impact bush) For fitting the radial sealing ring to the drive flange of the front axle differential

Storage Location

X7

SI number

01 04 93 (664)

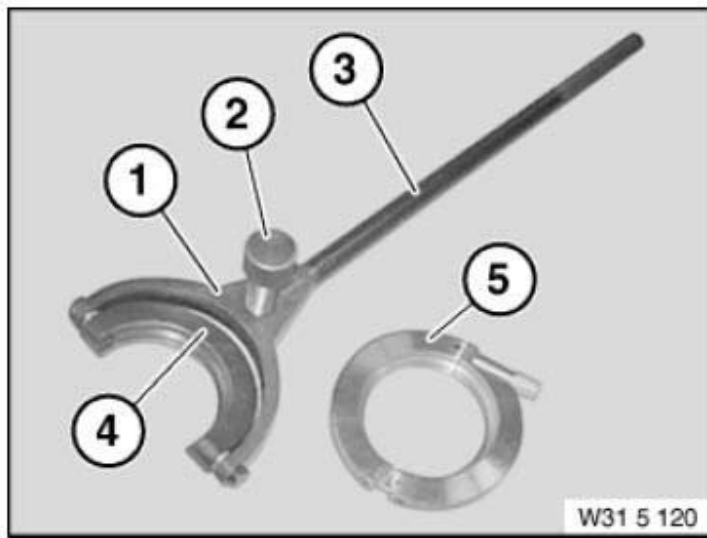


Fig. 2: Identifying Bush (315120)

Courtesy of BMW OF NORTH AMERICA, INC.

31-5070 DEVICE

0491978 315070 Device MW

NOTE: For determining the fitting dimension at the drive bevel gear in the front axle differential

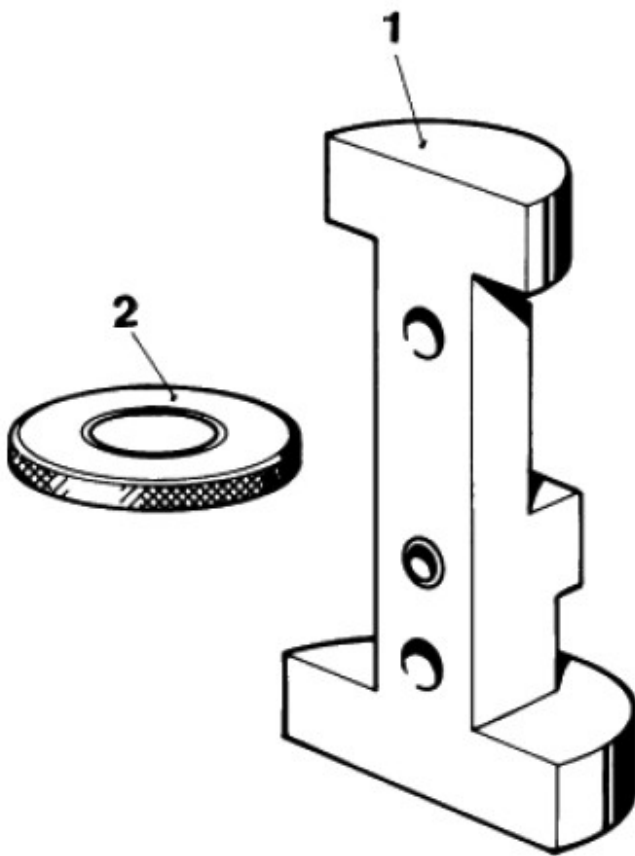
Consisting of:

1 = 0491979 Bridge

NOTE: (Measuring bridge)

2 = 0491980 Washer

NOTE: (Measuring disc 7 mm)



W31 5 070

Fig. 3: Identifying Device (315070)

Courtesy of BMW OF NORTH AMERICA, INC.

31-2160 DEVICE

0491924 312160 Device MW

Replaced by: 0492053

NOTE: For pressing the wishbone off the spring strut/Replaced by 32 3 090 (0 492 053)

Consisting of:

1 = 0493260 Spindle

NOTE: Replaced by 32 3 090.(0 492 053)

2 = 0493261 Bolt

NOTE: Replaced by 32 3 090.(0 492 053)

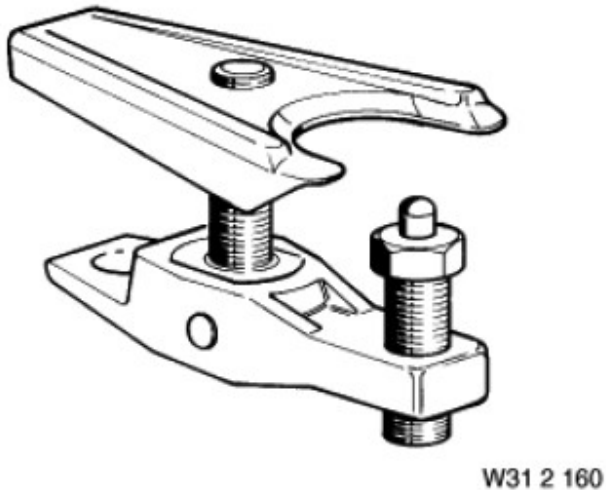


Fig. 4: Identifying Device (312160)
Courtesy of BMW OF NORTH AMERICA, INC.

31-5250 FIXTURE

0495567 315250 Fixture MW

NOTE: (Universal axle take-up) Fixture for accommodating all front and rear axles when removing and installing.

SI number

01 24 06 (309)

Consisting of:

1 = 0495817 Basic body

NOTE: (basic body)

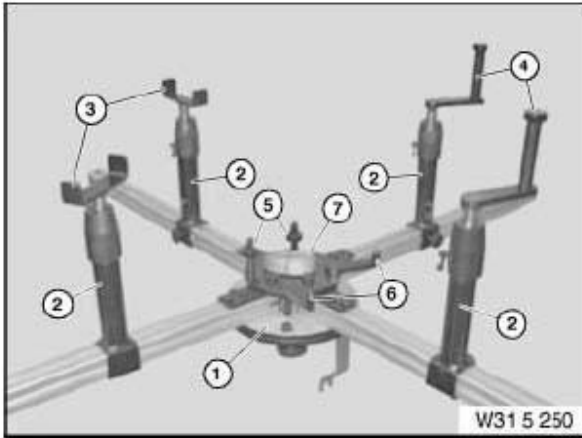


Fig. 5: Identifying Fixture (315250)
Courtesy of BMW OF NORTH AMERICA, INC.

2 = 0495818 Support

NOTE: (telescopic supports) 4 pieces

3 = 0495819 Adapter

NOTE: (take-up adapter U-section (2 pieces))

4 = 0495820 Adapter

NOTE: (take-up adapter (2 pieces))

5 = 0495821 Adapter

NOTE: (take-up adapter for bore holes (2 pieces))

6 = 0495822 Adapter

NOTE: (take-up adapter for bore holes (2 pieces))

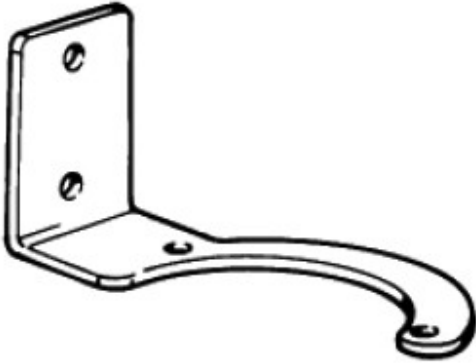
7 = 0495824 Belt

NOTE: (Tensioning strap)

31-5000 FIXTURE

0491969 315000 Fixture MW

NOTE: (mounting fixture) For the front axle differential



W31 5 000

Fig. 6: Identifying Fixture (315000)
Courtesy of BMW OF NORTH AMERICA, INC.

31-3358 INSERT RING

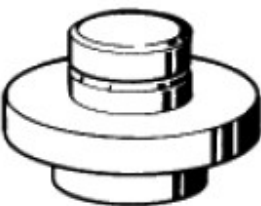
31 3 358 Insert ring

NOTE: For inserting spring retainer ring 31 3 354 model series (PL2)

31-5030 MANDREL

0491974 315030 Mandrel MW

NOTE: (drift) For output shaft radial sealing ring in the front axle differential



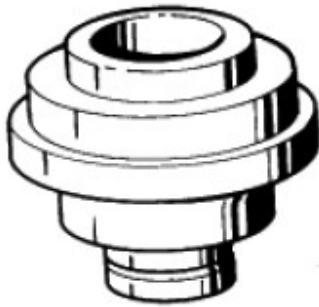
W31 5 030

Fig. 7: Identifying Mandrel (315030)
Courtesy of BMW OF NORTH AMERICA, INC.

31-5020 MANDREL

0491973 315020 Mandrel MW

NOTE: (drift) For radial sealing ring of the drive shaft in the front axle differential



W31 5 020

Fig. 8: Identifying Mandrel (315020)
Courtesy of BMW OF NORTH AMERICA, INC.

31-5060 PIN

0491977 315060 Pin MW

NOTE: (drive pin) For radial gears in the front axle differential for checking the coefficient of friction



W31 5 060

Fig. 9: Identifying Pin (315060)
Courtesy of BMW OF NORTH AMERICA, INC.

31-5050 THRUST PIECE

0491976 315050 Thrust piece MW

NOTE: For press-fitting the roller bearing onto the differential casing



W31 5 050

Fig. 10: Identifying Thrust Piece (315050)

Courtesy of BMW OF NORTH AMERICA, INC.

31-3030 TOOL

0494187 313030 Tool Minimum set: Mechanical tools MW

NOTE: (Pressing-in/-out tool) For rubber mount on trailing arm

Storage Location

B46

SI number

01 14 01 (766)

Consisting of:

2 = 0494188 Bell housing

1 = 0494189 Bush

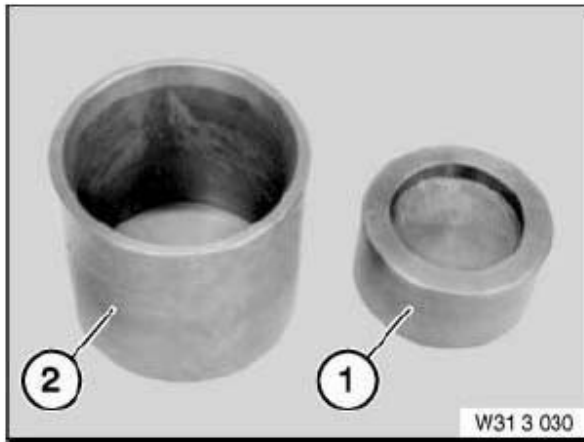


Fig. 11: Identifying Tool (313030)
 Courtesy of BMW OF NORTH AMERICA, INC.

31-5040 WASHER

0491975 315040 Washer MW

NOTE: (Spring washer) For pretensioning the differential side gears when determining the installation size in the front axle differential



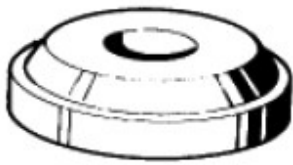
W31 5 040

Fig. 12: Identifying Washer (315040)
 Courtesy of BMW OF NORTH AMERICA, INC.

31-5100 WASHER

0491983 315100 Washer MW

NOTE: For pulling the outer bearing race into the bearing housing in the front axle differential



W31 5 100

Fig. 13: Identifying Washer (315100)

Courtesy of BMW OF NORTH AMERICA, INC.

31-5080 WASHER

0491981 315080 Washer MW

NOTE: For determining the fitting clearance of the radial gears in the front axle differential



W31 5 080

Fig. 14: Identifying Washer (315080)

Courtesy of BMW OF NORTH AMERICA, INC.

SUSPENSION

Front Axle - Technical Data - Z4

FRONT AXLE - RIDE HEIGHT E89

31 00 FRONT AXLE - RIDE HEIGHT E89

FRONT AXLE - RIDE HEIGHT SPECIFICATION

Ride level height in normal position Attach tape measure to bottom middle of rim flange and measure to lower edge of wheel arch			
Tolerance ride height in			
○ <u>NORMAL POSITION</u> max. 10 mm			
○ <u>DESIGN POSITION</u> max. 2 mm			
Difference ride height between left/right in			
○ <u>NORMAL POSITION</u> 10 mm			
○ <u>DESIGN POSITION</u> 2 mm			
Series	mm		
17" rim	mm		606
18" rim	mm		619
19" rim	mm		631
Adaptive M suspension			
17" rim	mm		596
18" rim	mm		608
19" rim	mm		621

TRACK WIDTH/WHEELBASE E89/STANDARD SUSPENSION

31 00 GENERAL - TRACK WIDTH/WHEELBASE E89 STANDARD SUSPENSION

GENERAL - TRACK WIDTH/WHEELBASE SPECIFICATION

Track width for normal position and offset (ET)		
- ET29	mm	1511
Wheelbase	mm	2496

GENERAL - TRACK WIDTH/WHEELBASE E89/VDC SUSPENSION

31 00 GENERAL - TRACK WIDTH/WHEELBASE E89 VDC SUSPENSION

GENERAL - TRACK WIDTH/WHEELBASE SPECIFICATION

Track width for normal position and offset (ET)		

- ET29	mm	1513
Wheelbase	mm	2496

SHOCK ABSORBERS E89/SERIES

31 32 SHOCK ABSORBERS E89 SERIES

SHOCK ABSORBERS SPECIFICATION

Note:		Currently no details! Reason: Avoidance of incorrect assessments on account of different measurement procedures
Front Axle	mm	- -
Rear Axle	mm	- -

SHOCK ABSORBERS E89/VDC SUSPENSION

31 32 SHOCK ABSORBERS E89 VDC SUSPENSION

SHOCK ABSORBERS SPECIFICATION

Note:		Currently no details! Reason: Avoidance of incorrect assessments on account of different measurement procedures
Front Axle	mm	- -
Rear Axle	mm	- -

SUSPENSION

Front Axle - Tightening Torques - Z4

CONTROL ARMS AND STRUTS

31 12 CONTROL ARMS AND STRUTS

TIGHTENING TORQUE SPECIFICATION - CONTROL ARMS AND STRUTS

	Type	Thread	Tightening specification	Measure
1AZ Tension strut to front axle support	E89	M12 8.8	Replace screw and nut <u>TIGHTEN IN NORMAL POSITION</u> Jointing torque Torque angle	68 Nm 90 °
2AZ Tension strut to swivel bearing	E89	M14	Replace nut	165 Nm
3AZ Control arm to front axle support	E89	M12 8.8	Replace nut <u>TIGHTEN IN NORMAL POSITION</u> Jointing torque Torque angle	68 Nm 90 °
4AZ Control arm to swivel bearing	E89	M14	Replace nut	165 Nm

FRONT AXLE SUSPENSION

31 10 FRONT AXLE SUSPENSION

TIGHTENING TORQUE SPECIFICATION - FRONT AXLE SUSPENSION

	Type	Thread	Tightening specification	Measure
1AZ Front axle carrier to engine carrier	E89	M12x90		108 Nm
	E89	M12x125		108 Nm
	E89	M12x53		108 Nm

SPRING STRUTS

31 31 SPRING STRUTS

TIGHTENING TORQUE SPECIFICATION - SPRING STRUTS

	Type	Thread	Tightening specification	Measure
1AZ Nut and locknut/self-locking nut	E89	M8	Replace nuts	34 Nm
2AZ Spring strut shock absorber to support bearing	E89	M12	Replace nut	64 Nm
3AZ Swivel bearing to spring strut shock absorber	E89	M12	Replace nut	81 Nm

STABILIZER BAR

31 35 STABILIZER BAR

TIGHTENING TORQUE SPECIFICATION - STABILIZER BAR

	Type	Thread	Tightening specification	Measure
1AZ Retaining bar, stabilizer, to front axle carrier	E89	M8	Replace nut	22 Nm
2AZ Stabilizer link to stabilizer	E89	M10	Replace nut	58 Nm
3AZ Stabilizer link to spring strut	E89	M10	Replace nut	58 Nm

WHEEL BEARINGS AND STEERING KNUCKLE

31 21 WHEEL BEARINGS AND STEERING KNUCKLE

TIGHTENING TORQUE SPECIFICATION - WHEEL BEARINGS AND STEERING KNUCKLE

	Type	Thread	Tightening specification	Measure
1AZ Wheel bearing to swivel bearing	E89	M12	Replace screws	110 Nm

DRIVELINE/AXLES

Propeller Shaft - Operating Fluids

1.0 GENERAL INFORMATION

The locating tabs of the drive shaft to the transmission output flange may be lubricated with any high temperature resistant, long-term grease (available locally).

DRIVELINE/AXLES

Propeller Shaft - Repair - Z4

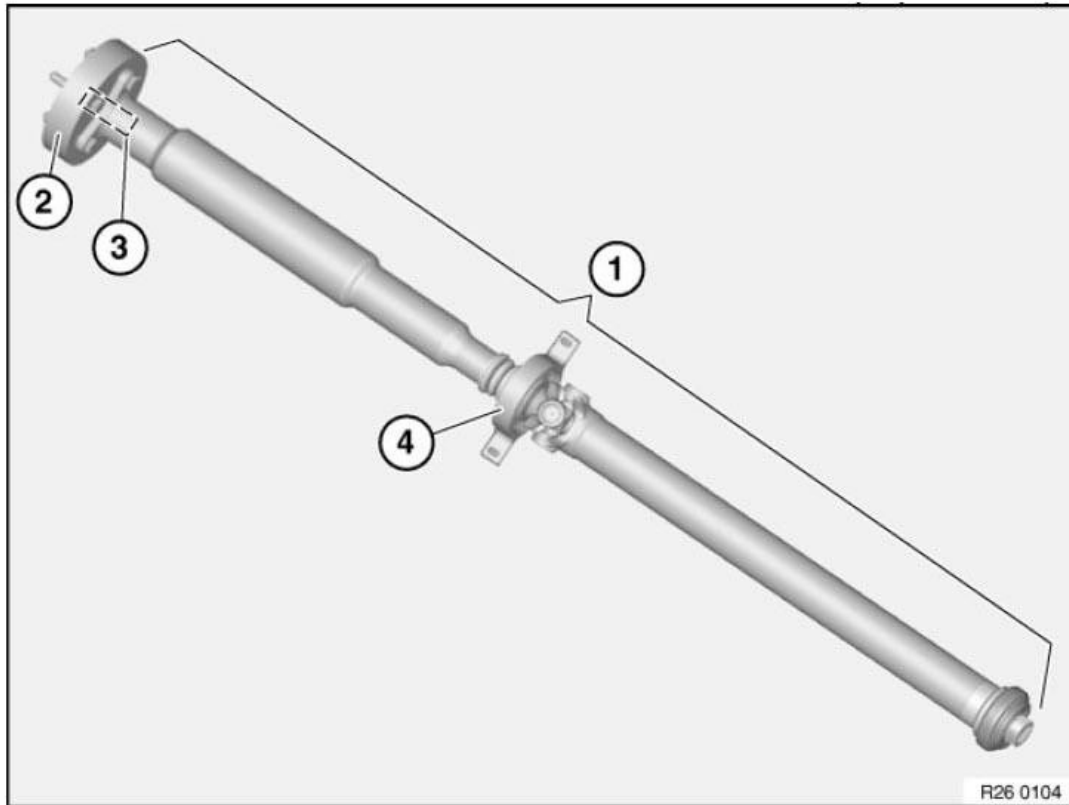
2600 PROPELLER SHAFT, GENERAL

26 00 ... PROPELLER SHAFT DEFLECTION ANGLES

IMPORTANT: Specifications on propeller shaft deflection angles are only possible on request with the vehicle identification number from the manufacturer.

2611 PROPELLER SHAFT ASSEMBLY

26 11 ... OVERVIEW (INSERTED PROPELLER SHAFT)



- | | |
|----------------------------|------------------|
| 1 Complete propeller shaft | 3 Centring mount |
| 2 Flexible disc | 4 Centre mount |

Fig. 1: Overview (Inserted Propeller Shaft)
Courtesy of BMW OF NORTH AMERICA, INC.

1. Complete propeller shaft
2. Flexible disc
3. Centering mount
4. Centre mount

26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT (INSERTED) COMPLETELY

IMPORTANT: Replacement of the sunk nut on the rear axle final drive is absolutely required!
 The sunk nut already has a screw locking.
 After the propeller shaft has been screwed into the rear axle final drive (sunk nut), a minimum hardening time of 2 hours must be complied with.

**The hardening time may be extended at lower temperatures!
Failure to comply with these instructions may cause serious damage!**

Necessary preliminary work:

- Remove complete **EXHAUST SYSTEM (N52K)**
- Remove underbody protection with holders
- Remove heat shields

Release screws.

Installation note:

- Replace ZNS bolts and self-locking nuts.
- Grip mounting bolts of flexible disc at nuts and tighten down by way of bolts.

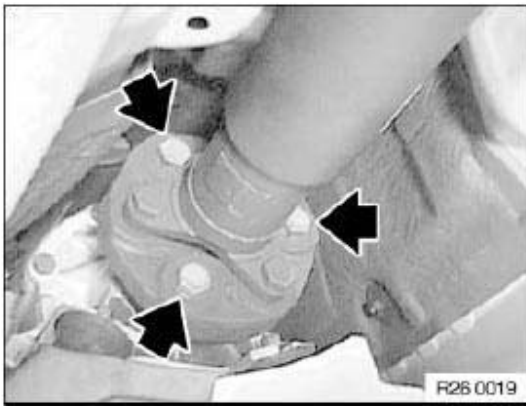


Fig. 2: Locating ZNS Bolts And Self-Locking Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Check centering mount.

If necessary, replace damaged **CENTERING** .

Grease centering mount.

- Grease: see **PROPELLER SHAFT - OPERATING FLUIDS** .

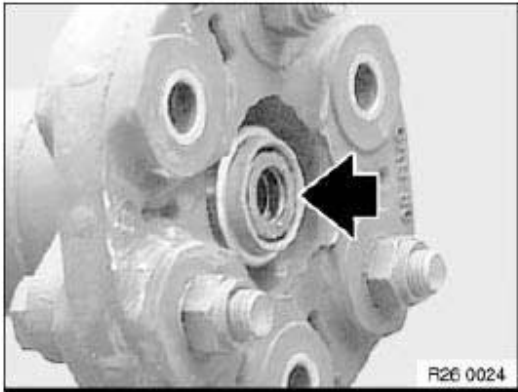


Fig. 3: Locating Centering Mount
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Tighten down screws/bolts to specified torque.

Secure angle of rotation with special tool 00 9 120 with magnets **00 9 130** to vehicle underbody and screw down further according to angle of rotation.

Tightening torque **26 11 1AZ** .

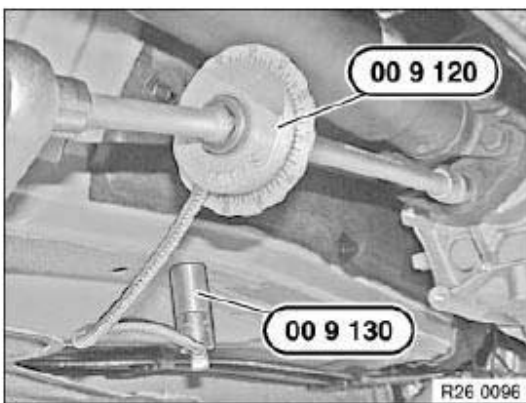


Fig. 4: Securing Angle Of Rotation Using Special Tool (00 9 120) With Magnets (009130 Magnet) To Vehicle Underbody
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken screws (1)

Tightening torque **26 11 6AZ** .

Using a suitable tool (2), secure propeller shaft at center universal joint against turning.

Remove screws of center mount fully only after opening insert nut.

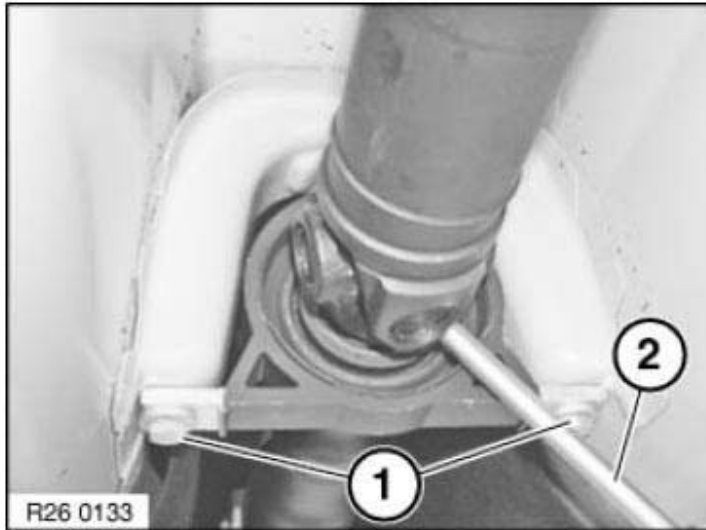


Fig. 5: Securing Propeller Shaft Using Suitable Tool
Courtesy of BMW OF NORTH AMERICA, INC.

Remove **COMPRESSION STRUT** (1) for E89.

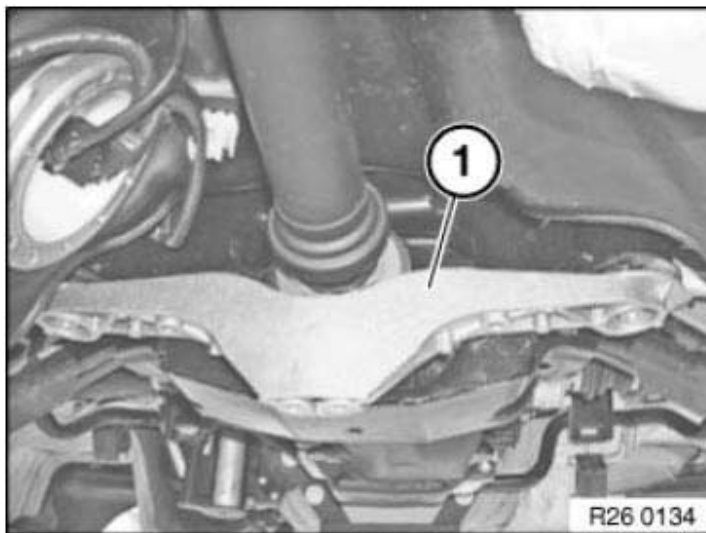


Fig. 6: Identifying Compression Strut For E89
Courtesy of BMW OF NORTH AMERICA, INC.

Release insert nut against direction of travel **in clockwise direction** with special tool 33 5 040 and 33 5 070.

Tightening torque **26 11 1AZ** .

IMPORTANT: The bi-hexagonal flange nut must not be used for bracing.

Failure to comply with this instruction may result in serious damage to the rear axle final drive.

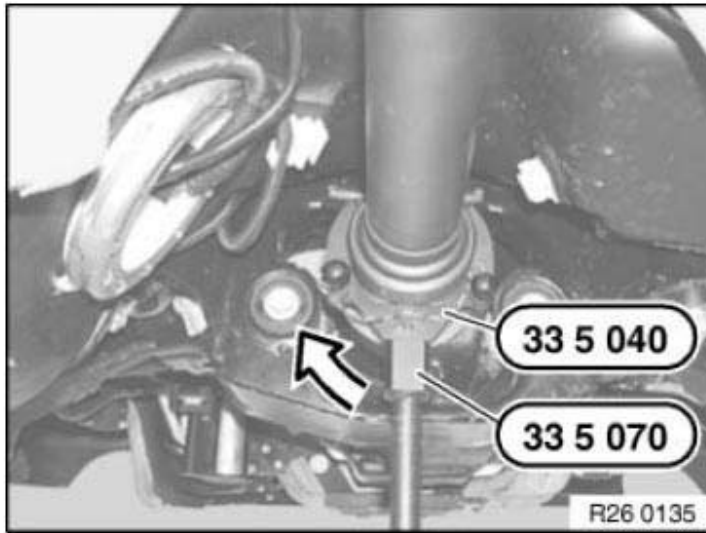


Fig. 7: Releasing Nut Using Special Tool (33 5 040) And (33 5 070)
Courtesy of BMW OF NORTH AMERICA, INC.

Remove retaining clip (1) and gasket (2).

Installation note:

Retaining clip and gasket must be replaced.

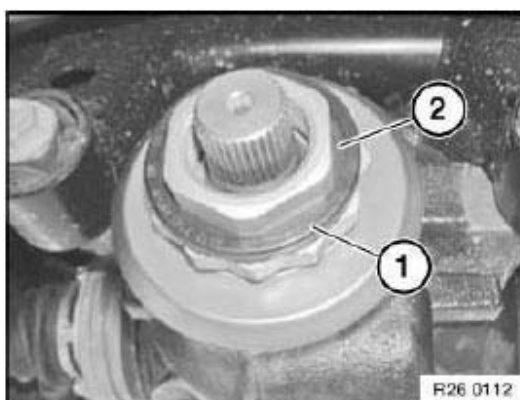


Fig. 8: Identifying Clip And Gasket
Courtesy of BMW OF NORTH AMERICA, INC.

Remove insert nut (1).

Installation note:

Insert nut must be replaced.

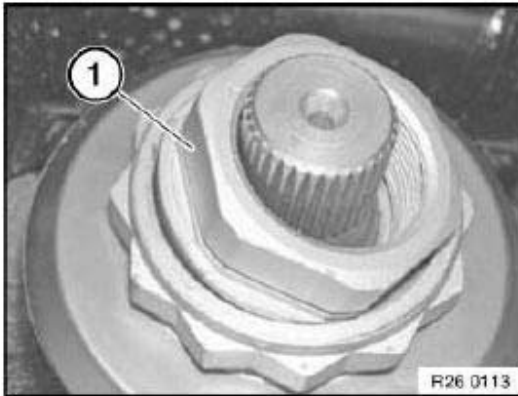


Fig. 9: Identifying Propeller Shaft Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Before installing propeller shaft:

Clean insert collar (1) on flange nut and gearing on bevel pinion (2).

Fill insert collar (1) with grease.

Grease: see **PROPELLER SHAFT - OPERATING FLUIDS** .

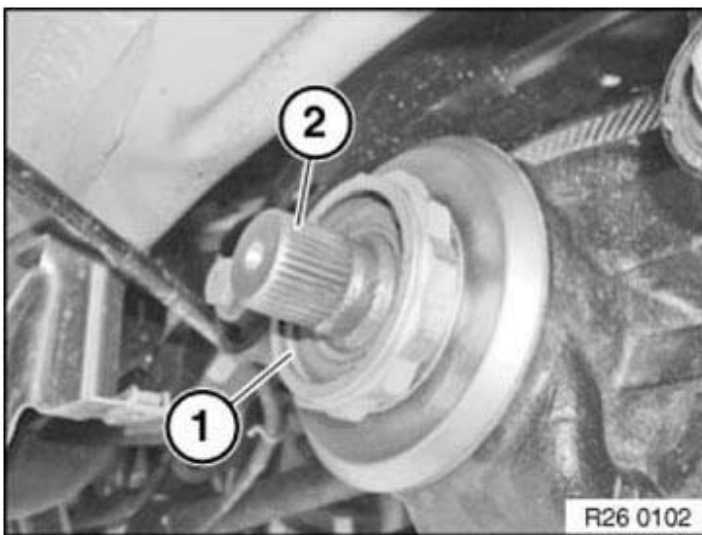


Fig. 10: Identifying Collar And Bevel Pinion
Courtesy of BMW OF NORTH AMERICA, INC.

Clean thread (1) of joint hub to remove adhesive residues.

Clean hub teeth (2), then coat with grease.

Grease: see **PROPELLER SHAFT - OPERATING FLUIDS** .

IMPORTANT: Thread of joint hub must not be fouled with grease.

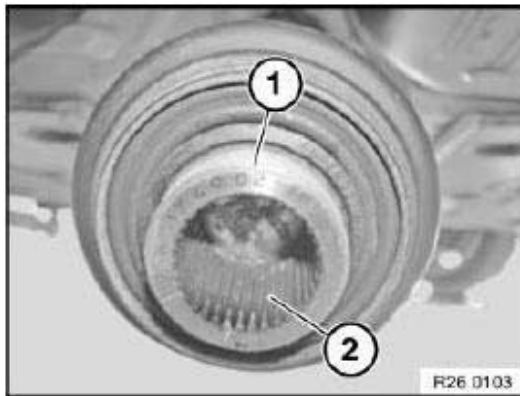


Fig. 11: Identifying Joint Hub Thread And Hub Teeth
Courtesy of BMW OF NORTH AMERICA, INC.

Place flange nut (1) with gasket in insert collar of flange nut.

Install retaining clip (2).

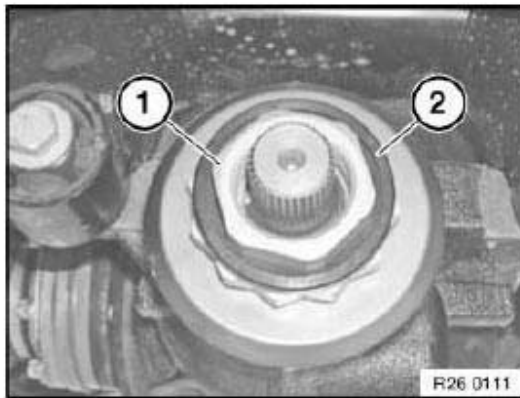


Fig. 12: Identifying Flange Nut And Retaining Clip
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Adhere without fail to installation and screw-fastening sequence.

Installation sequence:

1. Join propeller shaft to transmission
2. Join propeller shaft to rear axle final drive

3. Join center mount

Screw-fastening sequence:

1. Insert nut
2. Flexible disc to transmission
3. Centre mount

Slide propeller shaft (1) to the limit position onto insert nut and secure.

Secure propeller shaft at center universal joint against turning with a mounting lever.

IMPORTANT: The bi-hexagonal flange nut (2) must not be used for bracing.

Failure to comply with this instruction may result in serious damage to the rear axle final drive.

Insert nut must be screwed into place **within 5 minutes**.

Tightening torque **26 11 1AZ** .

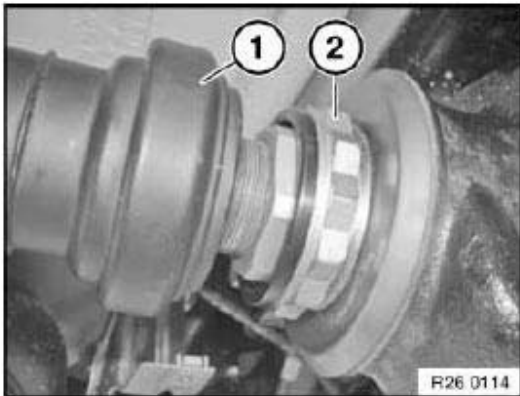


Fig. 13: Identifying Propeller Shaft With Flange Nut
Courtesy of BMW OF NORTH AMERICA, INC.

26 11 090 REMOVING AND INSTALLING/REPLACING FRONT CENTERING MOUNT FOR PROPELLER SHAFT

Necessary preliminary tasks:

- **REMOVE PROPELLER SHAFT.**

Completely fill centering bore (1) with viscous grease.

Drive special tool 11 1 310 with a plastic hammer into centering bore.

The centering mount (1) is forced out of the propeller shaft by the pressure on the grease filling.

If necessary, top up grease repeatedly.

NOTE: To drive out the mount, you can also fill the centering bore with water instead of grease.

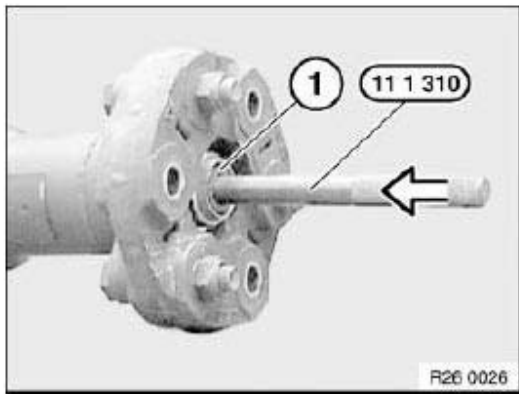


Fig. 14: Driving Centre Mount Using Special Tools 11 1 310 Into Propeller Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Remove grease/water from mount bore.

Drive in centering mount (1) with special tools 11 2 030 and 00 5 500 into propeller shaft (observe protrusion).

Grease centering mount.

- Grease: see **PROPELLER SHAFT - OPERATING FLUIDS** .

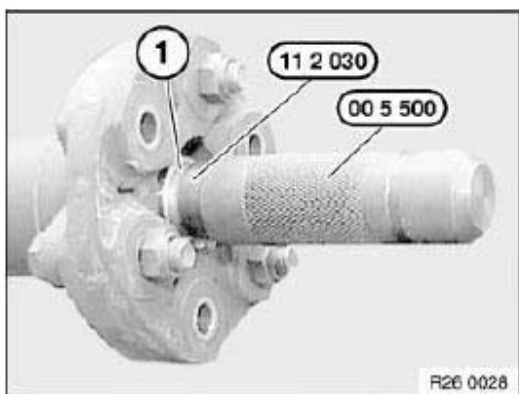


Fig. 15: Installing Centering Mount Using Special Tools (11 2 030 And 00 5 500)
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

Observe protrusion $A = 4^{+2}$ mm of centering (1).

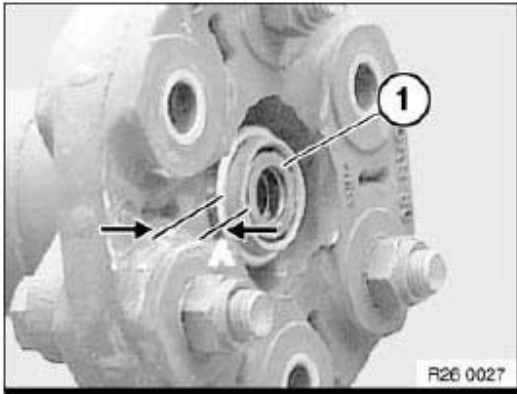


Fig. 16: Identifying Protrusion Of Centering
Courtesy of BMW OF NORTH AMERICA, INC.

26 11 020 REPLACING CENTER MOUNT GAITER

Necessary preliminary tasks

- Remove **PROPELLER SHAFT** .

NOTE: **The propeller shaft is balanced. The front and rear propeller shafts must be reassembled in the same position.
Detach gaiter (1) from groove (2).**

Mark front propeller shaft (3) and rear propeller shaft (4) in one plane.

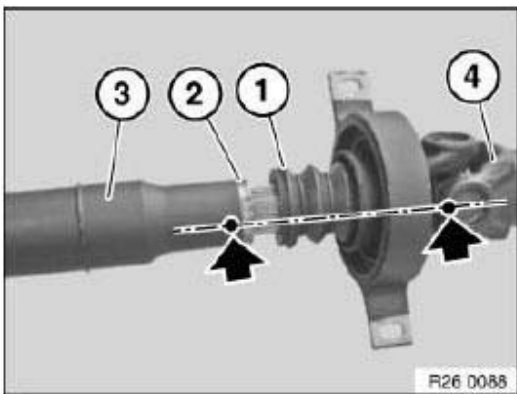


Fig. 17: Identifying Front And Rear Propeller Shaft Marks
Courtesy of BMW OF NORTH AMERICA, INC.

Pull propeller shaft apart.

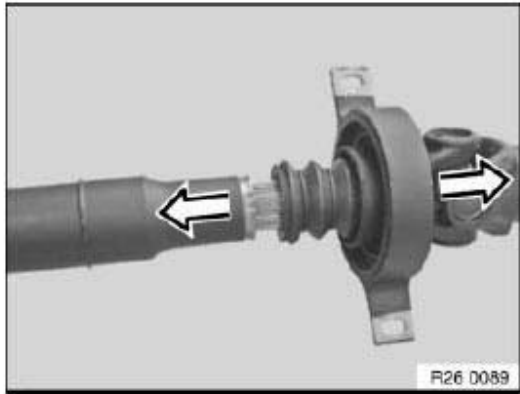


Fig. 18: Identifying Front And Rear Propeller Shaft Marks Pulling Propeller Shaft Apart
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

If necessary, insert new clamping ring (1) into front propeller shaft (2).

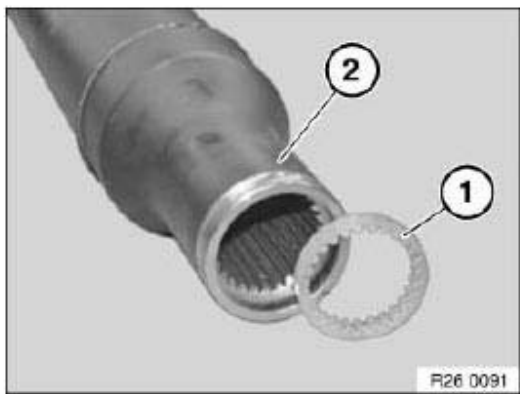


Fig. 19: Identifying Front Propeller Shaft With Clamping Ring
Courtesy of BMW OF NORTH AMERICA, INC.

Release gaiter (1) with screwdriver from groove (2) and pull off over longitudinal splines.

Installation:

Apply an even coating of grease to longitudinal splines on shaft. See **PROPELLER SHAFT - OPERATING FLUIDS**

Observe markings and force front propeller shaft onto longitudinal splines (markings must be flush).

Push gaiter (1) during installation into groove (2) and make sure it is firmly seated.

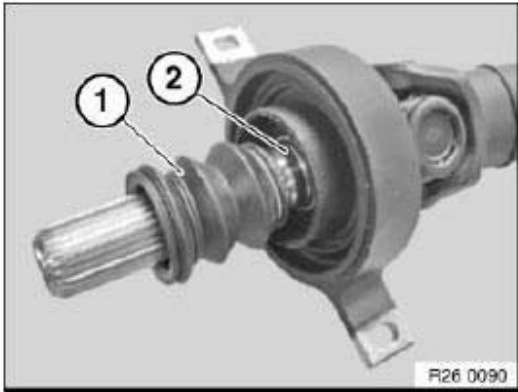


Fig. 20: Identifying Gaiter And Groove
 Courtesy of BMW OF NORTH AMERICA, INC.

26 11 051 REPLACING FLEXIBLE DISK FOR FRONT PROPELLER SHAFT

Necessary preliminary tasks:

- Remove **PROPELLER SHAFT** from transmission and center bearing

NOTE: To protect universal joints, tie back propeller shaft in area of center mount.

Release screws and remove flexible disc (1) from propeller shaft.

IMPORTANT: Replace shiny ZNS bolts and self-locking nuts.

Tightening torque and angle of rotation: **26 11 1AZ** .

Installation:

- Arrows (3) on circumference of flexible disk must point to flange arms (2).
- Grip mounting bolts of flexible disk at propeller shaft flange at nuts and tighten down at bolt heads.

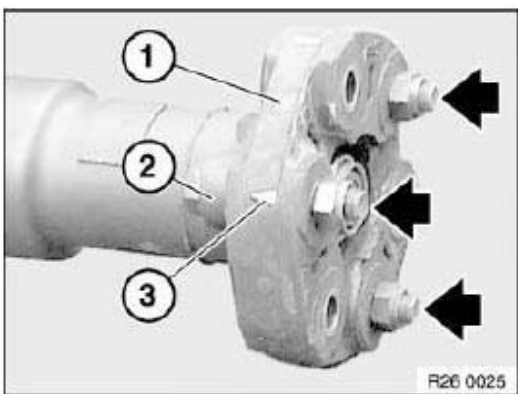


Fig. 21: Locating Flexible Disc Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

Check centering mount.

Replace damaged **CENTERING MOUNT** .

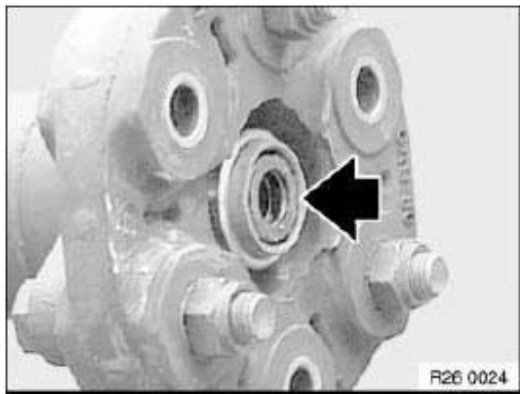


Fig. 22: Locating Centering Mount
Courtesy of BMW OF NORTH AMERICA, INC.

2612 CENTER CONSOLE ASSEMBLY

26 11 020 REPLACING CENTER MOUNT GAITER

Necessary preliminary tasks

- Remove **PROPELLER SHAFT** .

NOTE: **The propeller shaft is balanced. The front and rear propeller shafts must be reassembled in the same position.
Detach gaiter (1) from groove (2).**

Mark front propeller shaft (3) and rear propeller shaft (4) in one plane.

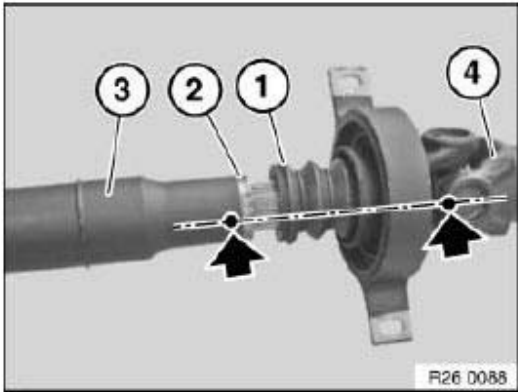


Fig. 23: Identifying Front And Rear Propeller Shaft Marks
 Courtesy of BMW OF NORTH AMERICA, INC.

Pull propeller shaft apart.

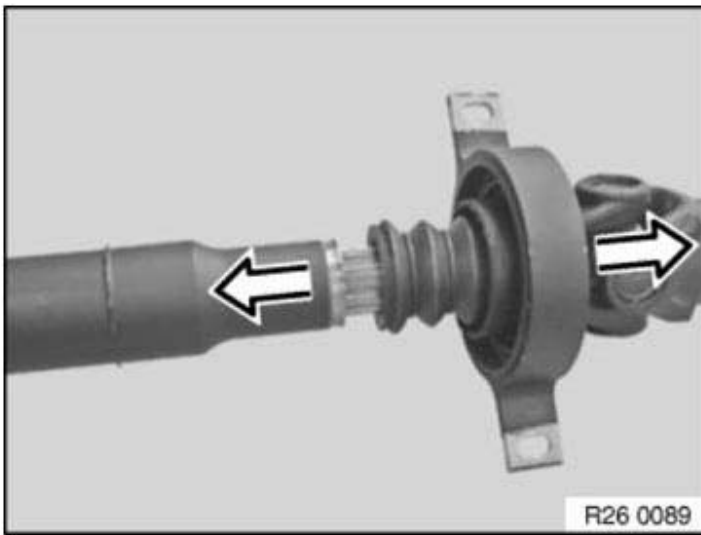


Fig. 24: Pulling Propeller Shaft Apart
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

If necessary, insert new clamping ring (1) into front propeller shaft (2).

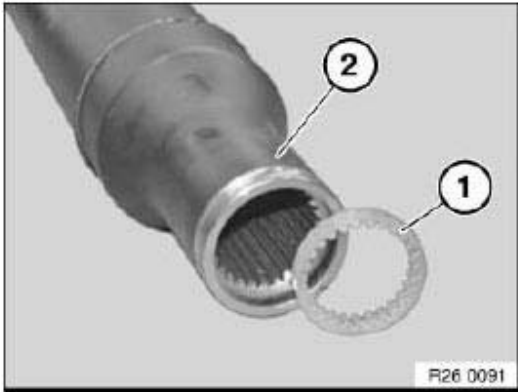


Fig. 25: Identifying Front Propeller Shaft With Clamping Ring
Courtesy of BMW OF NORTH AMERICA, INC.

Release gaiter (1) with screwdriver from groove (2) and pull off over longitudinal splines.

Installation:

Apply an even coating of grease to longitudinal splines on shaft. See **PROPELLER SHAFT - OPERATING FLUIDS**

Observe markings and force front propeller shaft onto longitudinal splines (markings must be flush).

Push gaiter (1) during installation into groove (2) and make sure it is firmly seated.

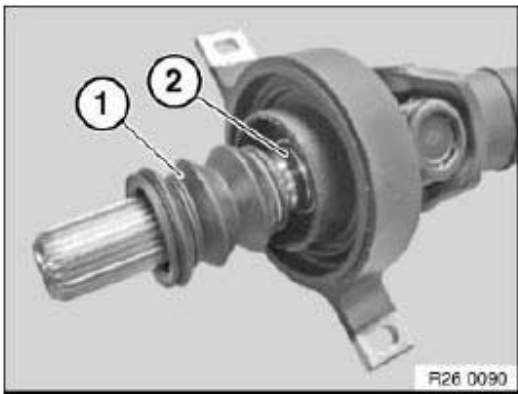


Fig. 26: Identifying Gaiter And Groove
Courtesy of BMW OF NORTH AMERICA, INC.

26 12 001 REPLACING COMPLETE PROPELLER SHAFT CENTER MOUNT

Necessary preliminary tasks

- Remove **PROPELLER SHAFT** .

NOTE: **The propeller shaft is balanced. The front and rear propeller shafts must be reassembled in the same position.**

Detach gaiter (1) from groove (2).

Mark front propeller shaft (3) and rear propeller shaft (4) in one plane.

Installation:

Make sure gaiter (1) is securely seated in groove (2).

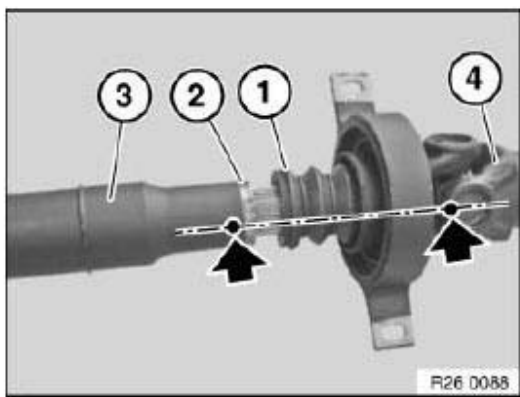


Fig. 27: Identifying Front And Rear Propeller Shaft Marks
Courtesy of BMW OF NORTH AMERICA, INC.

Pull propeller shaft apart.

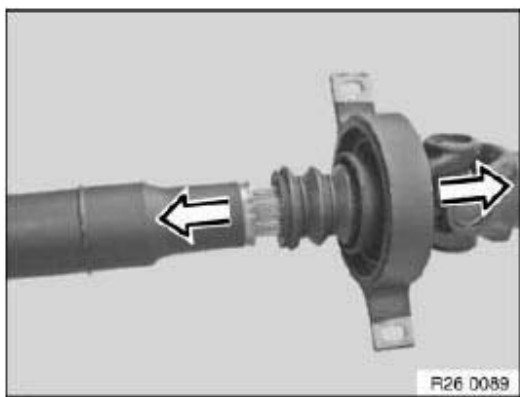


Fig. 28: Pulling Propeller Shaft Apart
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

If necessary, insert new clamping ring (1) into front propeller shaft (2).

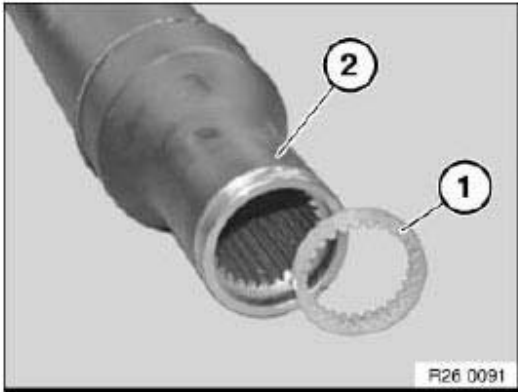


Fig. 29: Identifying Front Propeller Shaft With Clamping Ring
Courtesy of BMW OF NORTH AMERICA, INC.

Release gaiter (1) with screwdriver from groove (2) and pull off over longitudinal splines.

Installation:

Apply a coating of grease to longitudinal splines on shaft. See **PROPELLER SHAFT - OPERATING FLUIDS**

Push gaiter (1) during installation into groove (2) and make sure it is firmly seated.

Observe markings and force front propeller shaft onto longitudinal splines (markings must be flush).

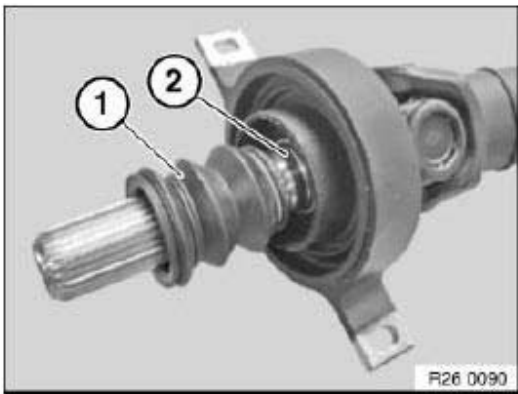


Fig. 30: Identifying Gaiter And Groove
Courtesy of BMW OF NORTH AMERICA, INC.

Install special tool 00 7 500 between center mount (1) and universal joint (2).

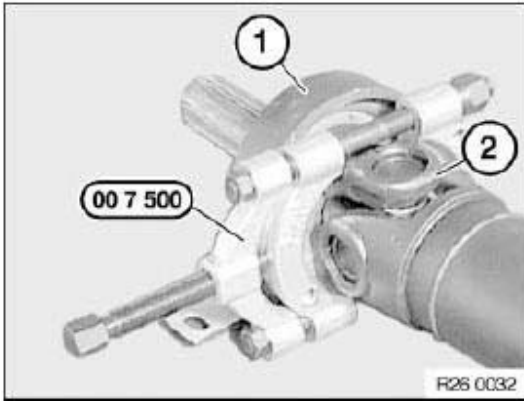


Fig. 31: Installing Special Tool (00 7 500) Between Centre Mount And Universal Joint
 Courtesy of BMW OF NORTH AMERICA, INC.

Using a hydraulic press, force center mount (1) off propeller shaft (2).

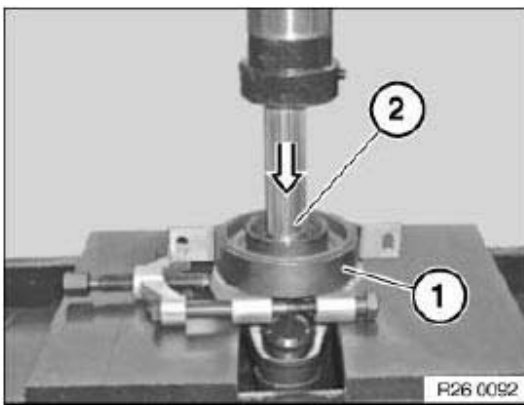


Fig. 32: Forcing Centre Mount Of Propeller Shaft Using Hydraulic Press
 Courtesy of BMW OF NORTH AMERICA, INC.

Force new center mount (1) onto propeller shaft. Collar (2) must point in direction of travel towards front propeller shaft. Drive center mount firmly home with special tool 23 1 160.

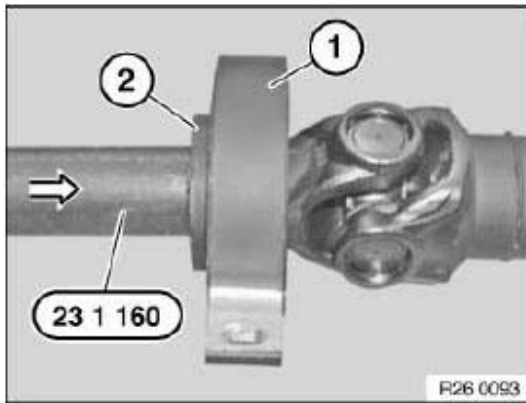


Fig. 33: Forcing Centre Mount Firmly Home Using Special Tool (23 1 160)
 Courtesy of BMW OF NORTH AMERICA, INC.

26 12 011 REPLACING GROOVED BALL BEARING IN CENTER MOUNT OF PROPELLER SHAFT

Necessary preliminary tasks

- Replace **PROPELLER SHAFT CENTRE MOUNT**

Press grooved ball bearing using special tool 23 1 160 out of center mount (1).

NOTE: Illustration shows E46.

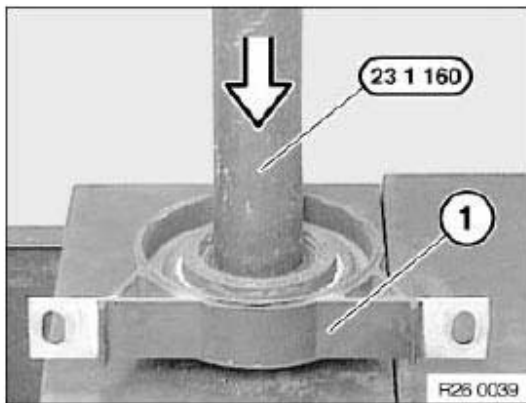


Fig. 34: Pressing Grooved Ball Bearing Using Special Tool (23 1 160)
 Courtesy of BMW OF NORTH AMERICA, INC.

Coat rubber-coated bearing seat of center mount (2) with Circolight.

Circolight, refer to BMW Parts Service.

Using special tools 33 3 202/33 3 203, press new grooved ball bearing (1) into center mount (2).

NOTE: Illustration shows E46.

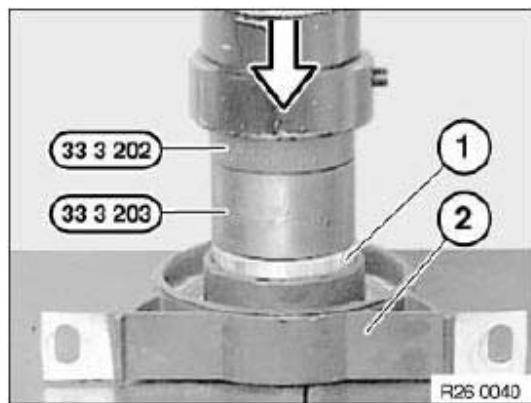


Fig. 35: Pressing Deep Groove Ball Bearing Into Centre Mount Using Special Tools (33 3 202) And (33 3 203)

Courtesy of BMW OF NORTH AMERICA, INC.

DRIVELINE/AXLES

Propeller Shaft - Repair - Z4

2600 PROPELLER SHAFT, GENERAL

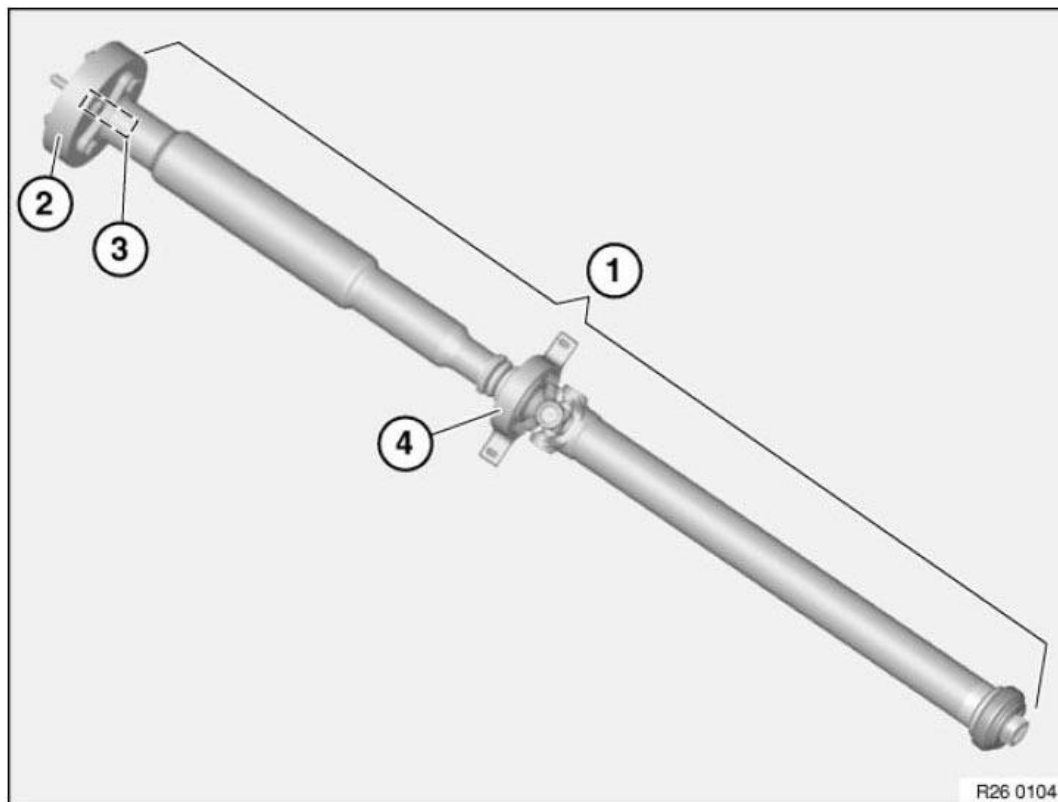
26 00 ... PROPELLER SHAFT DEFLECTION ANGLES

IMPORTANT: Specifications on propeller shaft deflection angles

Only possible on request with the vehicle identification number of the problem vehicle via PuMA.

2611 PROPELLER SHAFT ASSEMBLY

26 11 ... OVERVIEW (INSERTED PROPELLER SHAFT)



- | | |
|----------------------------|------------------|
| 1 Complete propeller shaft | 3 Centring mount |
| 2 Flexible disc | 4 Centre mount |

Fig. 1: Overview (Inserted Propeller Shaft)
Courtesy of BMW OF NORTH AMERICA, INC.

26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT (INSERTED) COMPLETELY

IMPORTANT: Replacement of the sunk nut on the rear axle final drive is absolutely required!

The sunk nut already has a screw locking.

After the propeller shaft has been screwed into the rear axle final drive (sunk nut), a minimum hardening time of 2 hours must be complied with.

The hardening time may be extended at lower temperatures!

Failure to comply with these instructions may cause serious damage!

Necessary preliminary work

- Remove complete **EXHAUST SYSTEM (N54)**
- Remove underbody protection with holders
- Remove heat shields

Release screws.

Installation note:

- Replace ZNS bolts and self-locking nuts.
- Grip mounting bolts of flexible disc at nuts and tighten down by way of bolts.

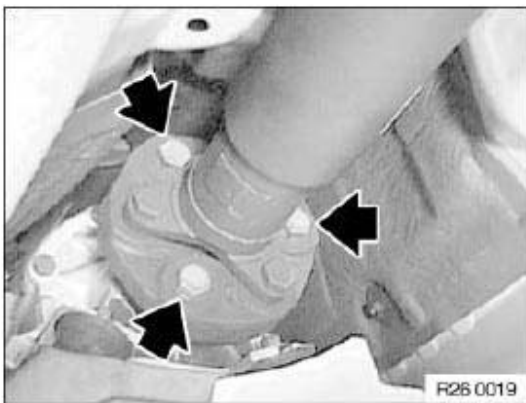


Fig. 2: Locating ZNS Bolts And Self-Locking Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Check centering mount.

If necessary, replace damaged **CENTERING** .

Grease centering mount.

- Grease: BMW Service **PROPELLER SHAFT - OPERATING FLUIDS** .

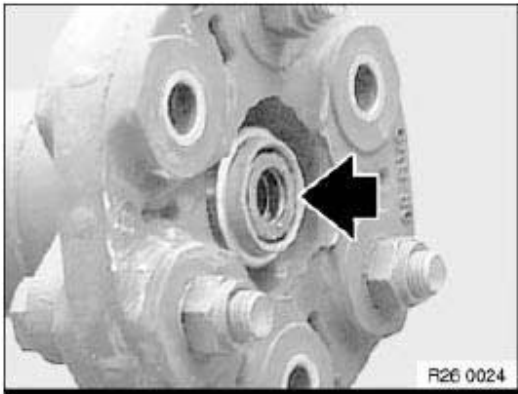


Fig. 3: Locating Propeller Shaft Centering Mount
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Tighten down screws/bolts to specified torque.

Secure angle of rotation special tool **00 9 120** with magnets **00 9 130** to vehicle underbody and screw down further according to angle of rotation.

Tightening torque **26 11 1AZ** .

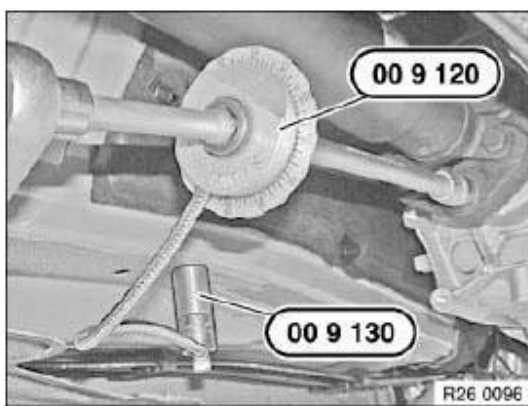


Fig. 4: Securing Angle Of Rotation Using Special Tool (00 9 120) With Magnets (009130)
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken screws (1)

Tightening torque **26 11 6AZ** .

Using a suitable tool (2), secure propeller shaft at centre universal joint against turning.

Remove screws of centre mount fully only after opening insert nut.

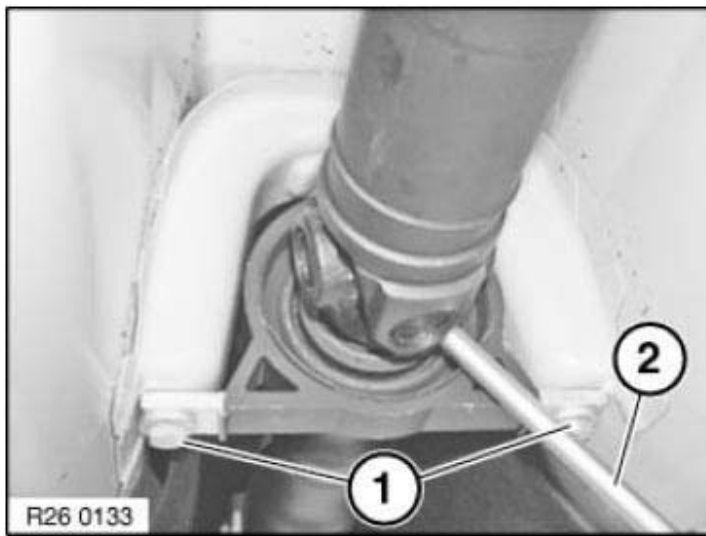


Fig. 5: Securing Propeller Shaft Using Suitable Tool
Courtesy of BMW OF NORTH AMERICA, INC.

Remove **COMPRESSION STRUT FOR REAR AXLE CARRIER** (1) for E89.

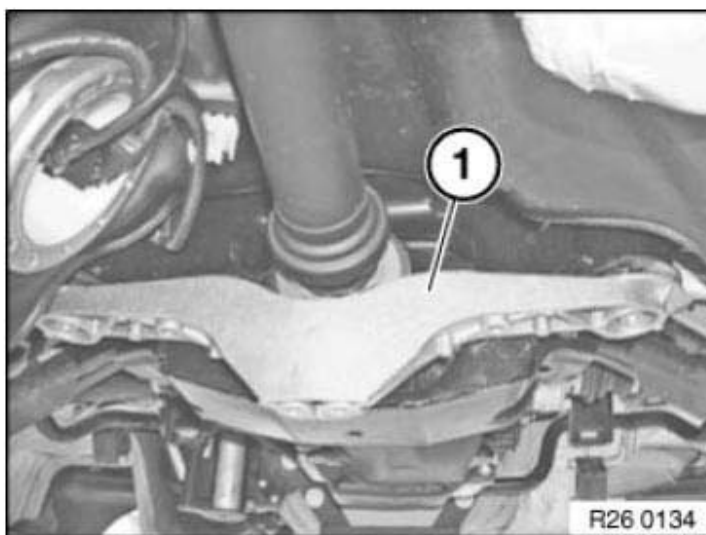


Fig. 6: Identifying Compression Strut
Courtesy of BMW OF NORTH AMERICA, INC.

Release insert nut against direction of travel **in clockwise direction** with special tool 33 5 040 and 33 5 070.

Tightening torque 26 11 1AZ .

IMPORTANT: The bi-hexagonal flange nut must not be used for bracing.

Failure to comply with this instruction may result in serious damage to the rear axle final drive.

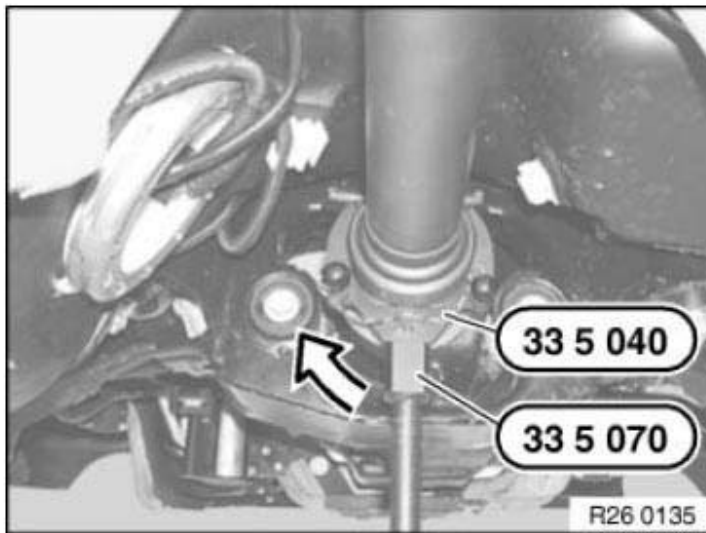


Fig. 7: Releasing Insert Nut Using Special Tool (33 5 040) And (33 5 070)
Courtesy of BMW OF NORTH AMERICA, INC.

Remove retaining clip (1) and gasket (2).

Installation note:

Retaining clip and gasket must be replaced.

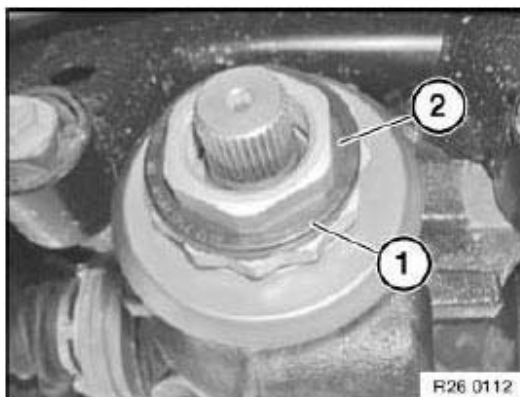


Fig. 8: Identifying Retaining Clip And Gasket
Courtesy of BMW OF NORTH AMERICA, INC.

Remove insert nut (1).

Installation note:

Insert nut must be replaced.

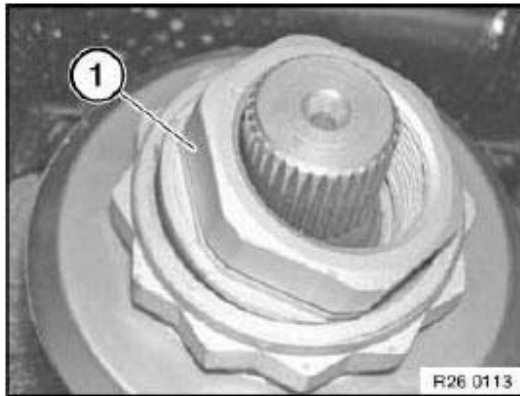


Fig. 9: Identifying Insert Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Before installing propeller shaft:

Clean insert collar (1) on flange nut and gearing on bevel pinion (2).

Fill insert collar (1) with grease.

Grease: BMW Service **PROPELLER SHAFT - OPERATING FLUIDS** .

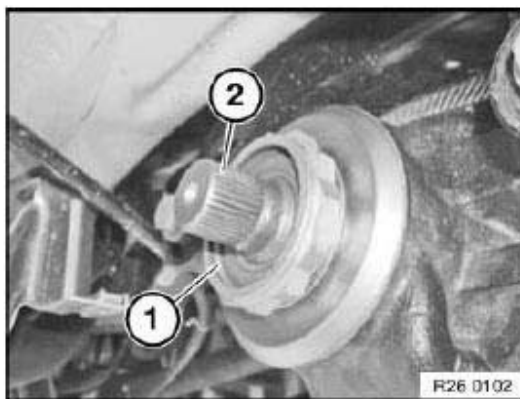


Fig. 10: Identifying Collar And Bevel Pinions
Courtesy of BMW OF NORTH AMERICA, INC.

Clean thread (1) of joint hub to remove adhesive residues.

Clean hub teeth (2), then coat with grease.

Grease: BMW Service **PROPELLER SHAFT - OPERATING FLUIDS** .

IMPORTANT: Thread of joint hub must not be fouled with grease.

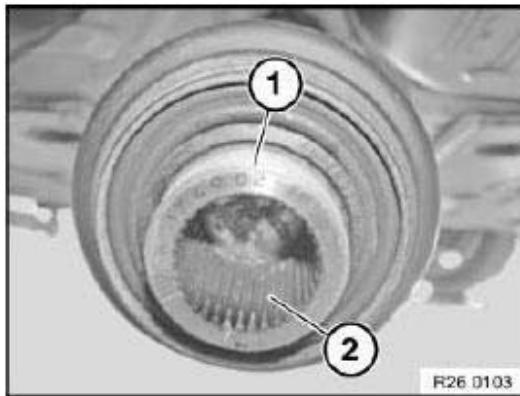


Fig. 11: Identifying Joint Hub Thread And Hub Teeth
Courtesy of BMW OF NORTH AMERICA, INC.

Place flange nut (1) with gasket in insert collar of flange nut.

Install retaining clip (2).

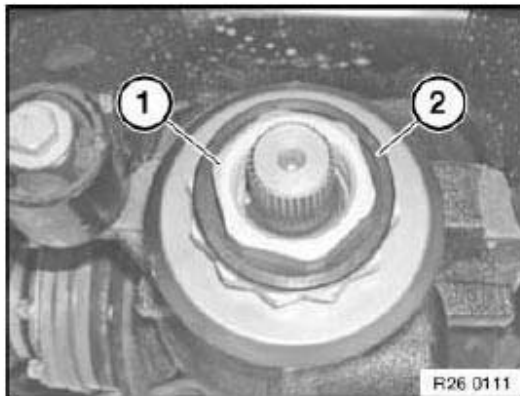


Fig. 12: Identifying Flange Nut With Seal And Retaining Clip
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Adhere without fail to installation and screw-fastening sequence.

Installation sequence:

1. Join propeller shaft to transmission
2. Join propeller shaft to rear axle final drive

3. Join centre mount

Screw-fastening sequence:

1. Insert nut
2. Flexible disc to transmission
3. Centre mount

Slide propeller shaft (1) to the limit position onto insert nut and secure.

Secure propeller shaft at centre universal joint against turning with a mounting lever.

IMPORTANT: The bi-hexagonal flange nut (2) must not be used for bracing.

Failure to comply with this instruction may result in serious damage to the rear axle final drive.

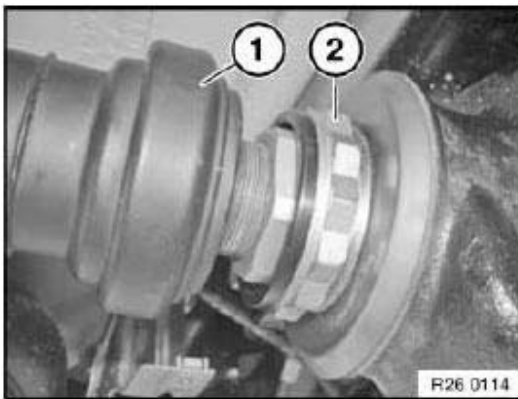


Fig. 13: Identifying Propeller Shaft With Insert Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Insert nut must be screwed into place **within 5 minutes**.

Tightening torque **26 11 1AZ** .

26 11 090 REMOVING AND INSTALLING/REPLACING FRONT CENTERING MOUNT FOR PROPELLER SHAFT

Necessary preliminary tasks

- **REMOVE PROPELLER SHAFT.**

Completely fill centering bore (1) with viscous grease.

Drive special tool 11 1 310 with a plastic hammer into centering bore.

The centering mount (1) is forced out of the propeller shaft by the pressure on the grease filling.

If necessary, top up grease repeatedly.

NOTE: To drive out the mount, you can also fill the centering bore with water instead of grease.

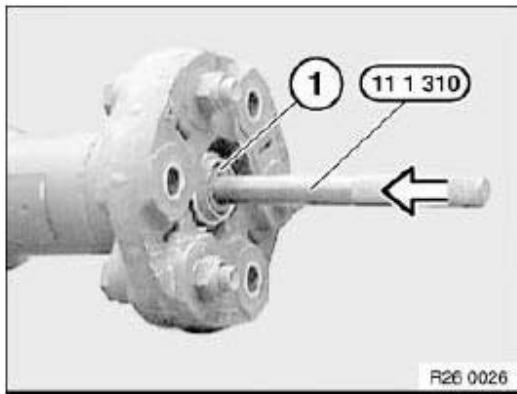


Fig. 14: Installing Special Tool (11 1 310) With Plastic Hammer Into Centering Hole
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

Remove grease/water from mount bore.

Drive in centering mount (1) with special tools 11 2 030 and 00 5 500 into propeller shaft (observe protrusion).

Grease centering mount.

- o Grease: BMW Service **PROPELLER SHAFT - OPERATING FLUIDS** .

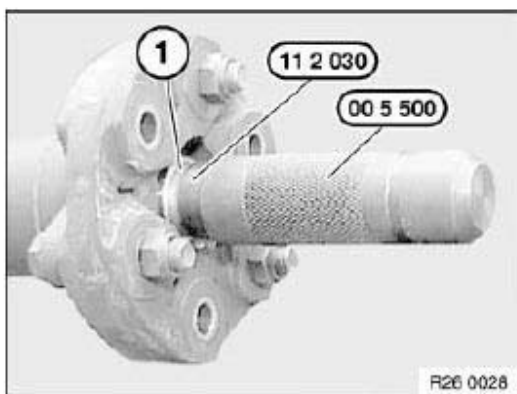


Fig. 15: Installing Centering Mount Using Special Tools (11 2 030 And 00 5 500)
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

Observe protrusion $A = 4^{+2}$ mm of centering (1).

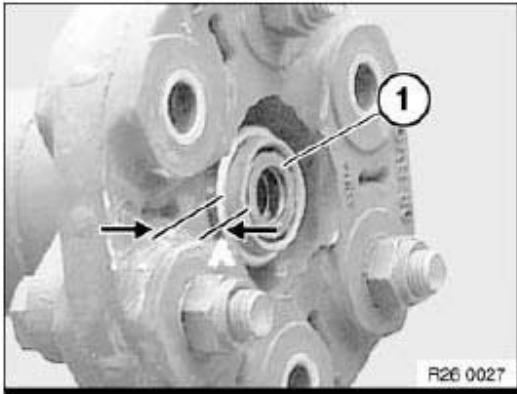


Fig. 16: Observing Protrusion Of Centering
Courtesy of BMW OF NORTH AMERICA, INC.

26 11 020 REPLACING CENTRE MOUNT GAITER

Necessary preliminary tasks

- Remove **PROPELLER SHAFT** .

NOTE: The propeller shaft is balanced. The front and rear propeller shafts must be reassembled in the same position.

Detach gaiter (1) from groove (2).

Mark front propeller shaft (3) and rear propeller shaft (4) in one plane.

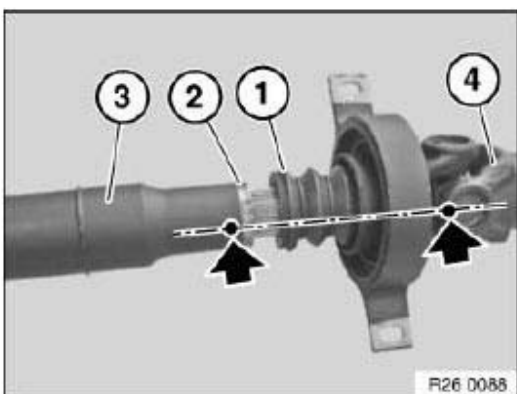


Fig. 17: Marking Front Propeller Shaft And Rear Propeller Shaft In One Plane
Courtesy of BMW OF NORTH AMERICA, INC.

Pull propeller shaft apart.

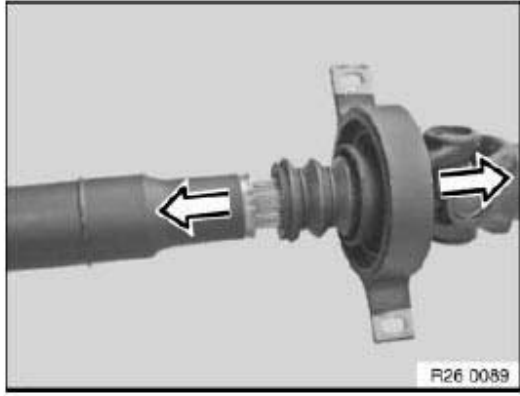


Fig. 18: Pulling Propeller Shaft Apart
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

If necessary, insert new clamping ring (1) into front propeller shaft (2).

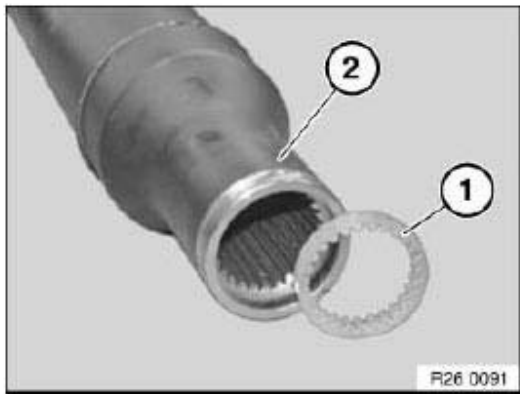


Fig. 19: Identifying Front Propeller Shaft With Clamping Ring
Courtesy of BMW OF NORTH AMERICA, INC.

Release gaiter (1) with screwdriver from groove (2) and pull off over longitudinal splines.

Installation

Apply an even coating of grease to longitudinal splines on shaft.

PROPELLER SHAFT - OPERATING FLUIDS

Observe markings and force front propeller shaft onto longitudinal splines (markings must be flush).

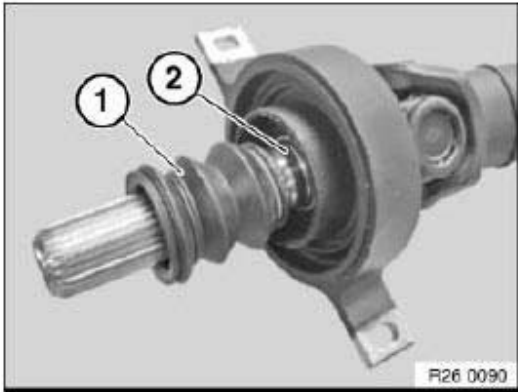


Fig. 20: Identifying Gaiter And Groove
Courtesy of BMW OF NORTH AMERICA, INC.

Push gaiter (1) during installation into groove (2) and make sure it is firmly seated.

26 11 051 REPLACING FLEXIBLE DISK FOR FRONT PROPELLER SHAFT

Necessary preliminary tasks

- Remove **PROPELLER SHAFT** from transmission and centre bearing

NOTE: To protect universal joints, tie back propeller shaft in area of centre mount.

Release screws and remove flexible disc (1) from propeller shaft.

IMPORTANT: Replace shiny ZNS bolts and self-locking nuts.

Tightening torque and angle of rotation: **26 11 1AZ** .

Installation

- Arrows (3) on circumference of flexible disk must point to flange arms (2).
- Grip mounting bolts of flexible disk at propeller shaft flange at nuts and tighten down at bolt heads.

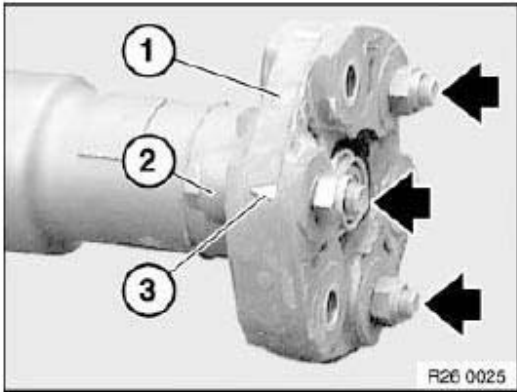


Fig. 21: Locating Propeller Shaft Flexible Disc Screw
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation

Check centering mount.

Replace damaged **CENTERING MOUNT** .

Grease centering mount.

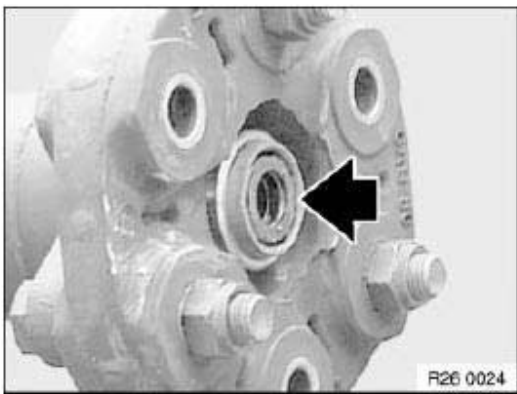


Fig. 22: Locating Propeller Shaft Centering Mount
 Courtesy of BMW OF NORTH AMERICA, INC.

2612 CENTRE CONSOLE ASSEMBLY

26 11 020 REPLACING CENTRE MOUNT GAITER

Installation

Apply an even coating of grease to longitudinal splines on shaft.

PROPELLER SHAFT - OPERATING FLUIDS

Observe markings and force front propeller shaft onto longitudinal splines (markings must be flush).

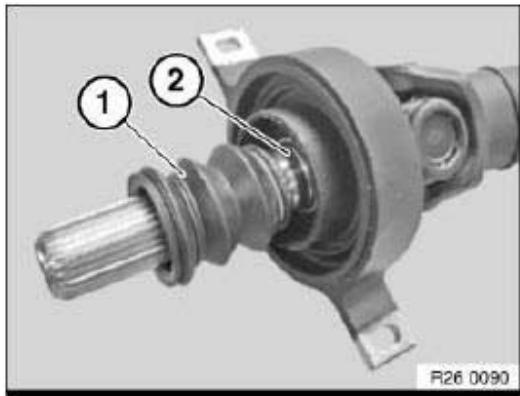


Fig. 23: Identifying Gaiter And Groove
Courtesy of BMW OF NORTH AMERICA, INC.

Push gaiter (1) during installation into groove (2) and make sure it is firmly seated.

If necessary, insert new clamping ring (1) into front propeller shaft (2).

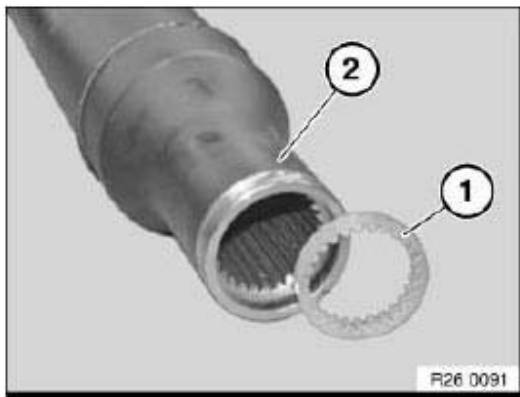


Fig. 24: Identifying Front Propeller Shaft With Clamping Ring
Courtesy of BMW OF NORTH AMERICA, INC.

Release gaiter (1) with screwdriver from groove (2) and pull off over longitudinal splines.

- Remove **PROPELLER SHAFT** .

NOTE: **The propeller shaft is balanced. The front and rear propeller shafts must be reassembled in the same position.**

Detach gaiter (1) from groove (2).

Mark front propeller shaft (3) and rear propeller shaft (4) in one plane.

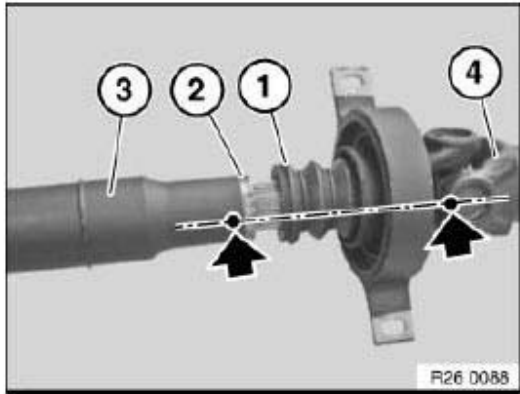


Fig. 25: Marking Front Propeller Shaft And Rear Propeller Shaft In One Plane
Courtesy of BMW OF NORTH AMERICA, INC.

Pull propeller shaft apart.

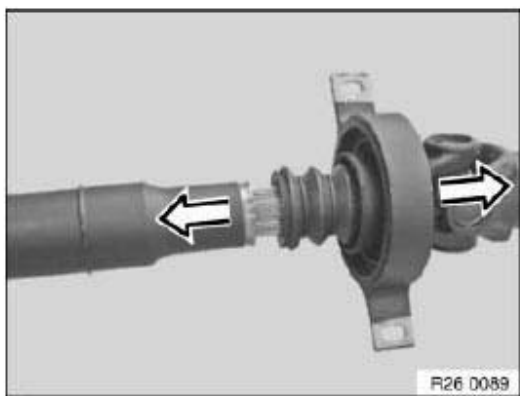


Fig. 26: Pulling Propeller Shaft Apart
Courtesy of BMW OF NORTH AMERICA, INC.

26 12 001 REPLACING COMPLETE PROPELLER SHAFT CENTRE MOUNT

Necessary preliminary tasks

- Remove **PROPELLER SHAFT** .

NOTE: **The propeller shaft is balanced. The front and rear propeller shafts must be reassembled in the same position.**

Detach gaiter (1) from groove (2).

Mark front propeller shaft (3) and rear propeller shaft (4) in one plane.

Installation:

Make sure gaiter (1) is securely seated in groove (2).

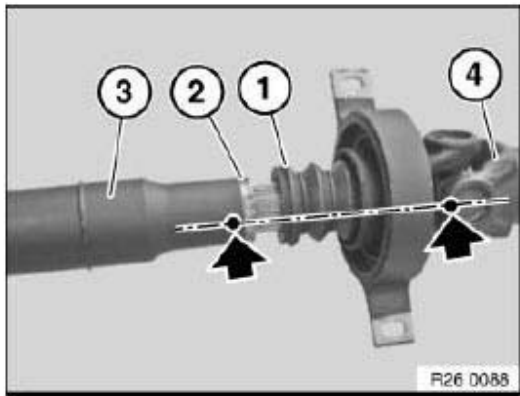


Fig. 27: Marking Front Propeller Shaft And Rear Propeller Shaft In One Plane
Courtesy of BMW OF NORTH AMERICA, INC.

Pull propeller shaft apart.

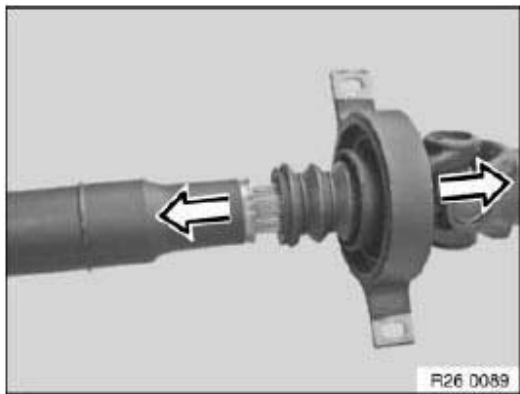


Fig. 28: Pulling Propeller Shaft Apart
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

Apply a coating of grease to longitudinal splines on shaft.

PROPELLER SHAFT - OPERATING FLUIDS .

Push gaiter (1) during installation into groove (2) and make sure it is firmly seated.

Observe markings and force front propeller shaft onto longitudinal splines (markings must be flush).

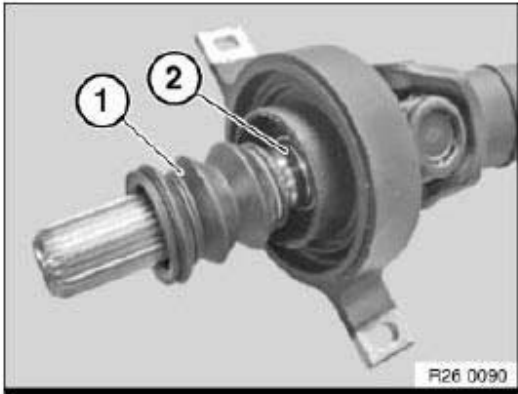


Fig. 29: Identifying Gaiter And Groove
 Courtesy of BMW OF NORTH AMERICA, INC.

Install special tool 00 7 500 between centre mount (1) and universal joint (2).

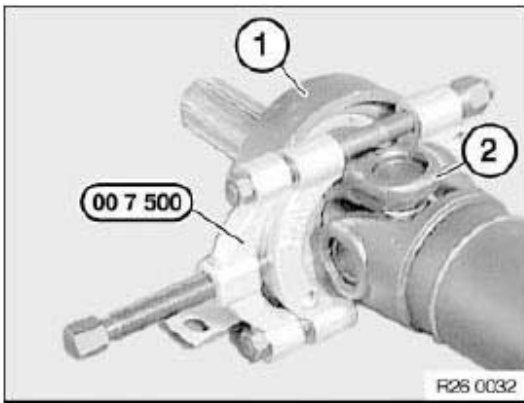


Fig. 30: Installing Special Tool (00 7 500) Between Centre Mount And Universal Joint
 Courtesy of BMW OF NORTH AMERICA, INC.

Using a hydraulic press, force centre mount (1) off propeller shaft (2).

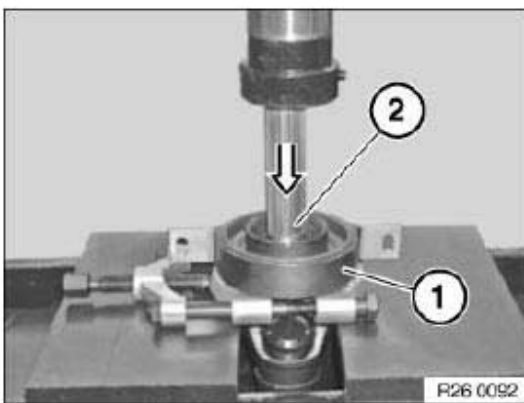


Fig. 31: Forcing Centre Mount Of Propeller Shaft Using Hydraulic Press
Courtesy of BMW OF NORTH AMERICA, INC.

Force new centre mount (1) onto propeller shaft. Collar (2) must point in direction of travel towards front propeller shaft. Drive centre mount firmly home with special tool 23 1 160.

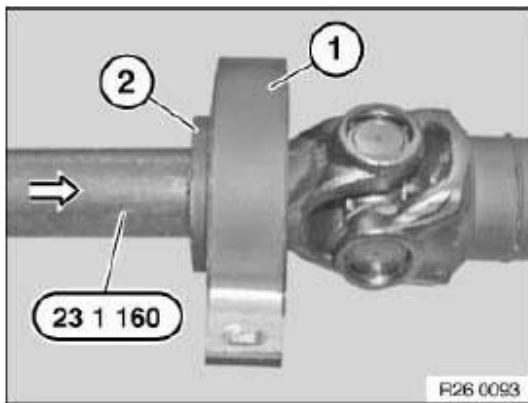


Fig. 32: Forcing Centre Mount Onto Propeller Shaft Collar Using Special Tool (33 1 020)
Courtesy of BMW OF NORTH AMERICA, INC.

If necessary, insert new clamping ring (1) into front propeller shaft (2).

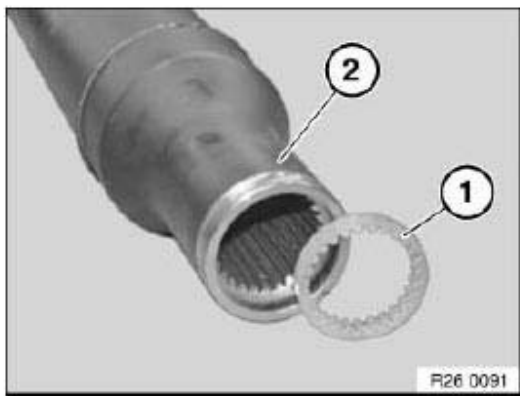


Fig. 33: Identifying Front Propeller Shaft With Clamping Ring
Courtesy of BMW OF NORTH AMERICA, INC.

Release gaiter (1) with screwdriver from groove (2) and pull off over longitudinal splines.

26 12 011 REPLACING GROOVED BALL BEARING IN CENTRE MOUNT OF PROPELLER SHAFT

Necessary preliminary tasks

- Replace **PROPELLER SHAFT CENTRE MOUNT**

Press grooved ball bearing using special tool 23 1 160 out of centre mount (1).

NOTE: Illustration shows E46.

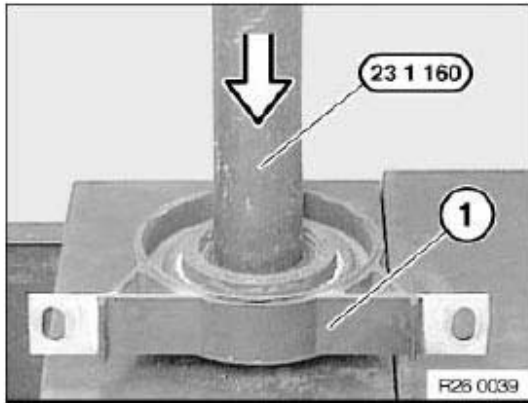


Fig. 34: Pressing Grooved Ball Bearing Using Special Tool (23 1 160)
Courtesy of BMW OF NORTH AMERICA, INC.

Coat rubber-coated bearing seat of centre mount (2) with Circolight.

Using special tools 33 3 202/33 3 203, press new grooved ball bearing (1) into centre mount (2).

NOTE: Illustration shows E46.

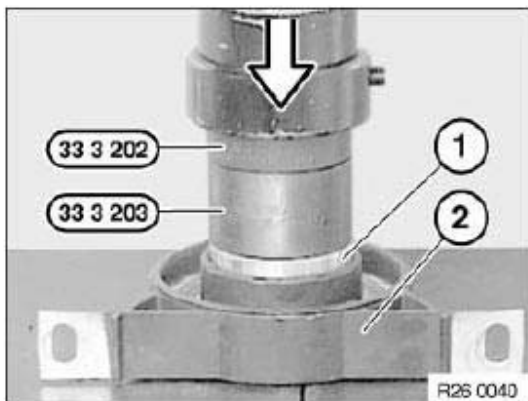


Fig. 35: Pressing Deep Groove Ball Bearing Into Centre Mount Using Special Tools (33 3 202) And (33 3 203)
Courtesy of BMW OF NORTH AMERICA, INC.

DRIVELINE/AXLES

Propeller Shaft - Special Tools - Z4

26 PROPELLER SHAFT

26-1110 WASHER

Washer Minimum set: Mechanical tools MW

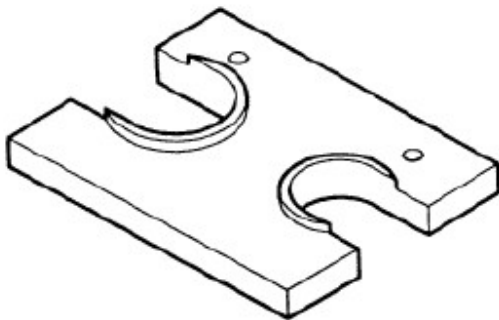
NOTE: (puller disc) For pulling constant velocity joint off propeller shaft.

Storage Location

C9

SI number

01 06 94 (801)



W26 1 110

Fig. 1: Identifying Washer (26-1110)
Courtesy of BMW OF NORTH AMERICA, INC.

DRIVELINE/AXLES

Propeller Shaft - Tightening Torques - Z4

PROPELLER SHAFT

26 11 PROPELLER SHAFT

TIGHTENING TORQUE SPECIFICATION - PROPELLER SHAFT. COMPLETE

	Type
5AZ Pivot fork piece to centre propeller shaft bearing journal with Loctite (Version without sliding piece)	E36/E38/E39/E46/E52/E53/E60/E61/E63/E64/E65/E66/E83/E85/E86/E87/E90/E91/E92
6AZ Centre mount to body	E36/E38/E39/E46/E52/E53/E60/E61/E63/E64/E65/E66/E83/E85/E86/E87/E90/E91/E92/E93/E
7AZ Flexible disc to front axle differential	E53
8AZ Flexible disc on propeller shaft	E53
9AZ Front propeller shaft to transfer box/front axle differential ZNS screws and nuts, shiny zinc coating	E60/E61/E90/E91/E92/E84/E70/E71

	E46
	E53/E70/E71/E72
	E46
Universal joint	E70/E71/E72/E83

PROPELLER SHAFT

26 11 PROPELLER SHAFT

TIGHTENING TORQUE SPECIFICATION - PROPELLER SHAFT. COMPLETE

	Type	Thread	Tightening specifications	Dimen
1AZ Propeller shaft plugged into rear axle final drive (insert nut)	E9x/E82N54/E82N55/E88N54/E90/E91/E92M57T2/Top/E89/E84N52K/E70/E71/E72		Torque	75 Nm
2AZ Propeller shaft plugged into rear axle final drive with universal joint (insert nut)	F25		Torque	75 Nm

PROPELLER SHAFT

26 11 PROPELLER SHAFT

TIGHTENING TORQUE SPECIFICATION - PROPELLER SHAFT. COMPLETE

	Type
Flexible disc to transmission output flange ZNS screws and nuts Shiny zinc coating All versions	
	E60/E61/E63/E64/E85/E86/E87/E90/E91/E92/E93/E81/E82/E83/E84/E88/E89
	E46/E53/E60/E61/E63/E64/E65/E85/E86/E87/E90/E91/E92/E93/E70/E71/E72/E81/E82/E83/
	E60/E61/E63/E64/E65
	E83
2AZ Coupling propeller shaft to transmission	E36/E38/E39/E46/E52/E53/E60/E61/E63/E64/E65/E66/E83/E85/E87/E90/E91
	E32/E31

DRIVELINE/AXLES

Propeller Shaft - Tightening Torques - Z4

PROPELLER SHAFT, COMPLETE

26 11 PROPELLER SHAFT, COMPLETE

TIGHTENING TORQUE SPECIFICATION - PROPELLER SHAFT COMPLETE

	Type
4AZ Propeller shaft to drive flange (rear axle final drive)	
5AZ Pivot fork piece to centre propeller shaft bearing journal with Loctite (Version without sliding piece)	E36/E38/E39/E46/E52/E53/E60/E61/E63/E64/E65/E66/E83/E85/E86/E87/E90/E91/E92
6AZ Centre mount to body	E36/E38/E39/E46/E52/E53/E60/E61/E63/E64/E65/E66/E83/E85/E86/E87/E90/E91/E92/E93/E70/E
7AZ Flexible disc to front axle differential	E53
8AZ Flexible disc on propeller shaft	E53

9AZ Front propeller shaft to transfer box/front axle differential ZNS screws and nuts, shiny zinc coating	E60/E61/E90/E91/E92/E84/E70/E71
	E46
	E53/E70/E71/E72
	E46
Universal joint	E70/E71/E72/E83

PROPELLER SHAFT, COMPLETE

26 11 PROPELLER SHAFT, COMPLETE

TIGHTENING TORQUE SPECIFICATION - PROPELLER SHAFT COMPLETE

	Type	Thread	Tightening specifications	Dimension
1AZ Propeller shaft plugged into rear axle final drive (insert nut)	E9x/E82N54/E82N55/E88N54/E90/E91/E92M57T2/Top/E89/E84N52K/E70/E71/E72		Torque	75 Nm

2AZ Propeller shaft plugged into rear axle final drive with universal joint (insert nut)	F25		Torque	75 Nm
--	-----	--	--------	-------

PROPELLER SHAFT, COMPLETE

26 11 PROPELLER SHAFT, COMPLETE

TIGHTENING TORQUE SPECIFICATION - PROPELLER SHAFT COMPLETE

	Type
1AZ Flexible disc to propeller shaft and transmission output flange Steel propeller shaft	E36/E38/E39/E46/E52/E53/E60/E61/E63/E64/E65/E66/E83/E85/E87/E90/E91
	E36/E38/E39/E46/E52/E53/E60/E61/E63/E64/E65/E66/E83/E85/E87/E90/E91
	E31/E38/E39/E46
	E32/E34/E36/E38/E39
	E60/E61/E63/E64
	E32/E34/E36/E38/E39/E46/E53/E85
	E60/E61/E63/E64
	E39 (M5)/E36 (M3)/E46 (M3),
	E65
Flexible disc to transmission output flange	E46/E39/E60/Nur M57

Flexible disc to transmission output flange	E65/E66/Alle außer N73, M67
	E60/E61/E63/E64/E65/E66/E67
Flexible disc on propeller shaft	E83
Flexible disc to transmission output flange	E83
Aluminium propeller shaft: Flexible disc to transmission output flange	E39/E60
Aluminium propeller shaft: Flexible disc on propeller shaft	E39/E60
	E60/E61/E63/E64
	E60
	E63 (N52)
Flexible disc to transmission output flange ZNS screws and nuts Shiny zinc coating All versions	E60/E61/E63/E64/E85/E86/E87/E90/E91/E92/E93/E81/E82/E83/E84/E88/E89

	E46/E53/E60/E61/E63/E64/E65/E85/E86/E87/E90/E91/E92/E93/E70/E71/E72/E81/E82/E83/E84/
	E60/E61/E63/E64/E65
	E83
2AZ Coupling propeller shaft to transmission	E36/E38/E39/E46/E52/E53/E60/E61/E63/E64/E65/E66/E83/E85/E87/E90/E91
	E32/E31
3AZ Clamping ring for slide after installation in the car	E36/E38/E39/E46/E52/E53/E60/E61/E63/E64/E65/E66/E83/E85/E87/E90/E91
	E30/Allrad

DRIVELINE/AXLE

Rear Axle - Operating Fluids

1.0 GENERAL INFORMATION ON FINAL DRIVE OIL

Final Drive oil or hypoid gear lubricant must conform with the following requirements because of the high loads which occur on the profiles of the hypoid gear teeth:

- Load carrying capacity.
- Sufficient protection against seizure.
- Good wear protection.
- Optimal friction and temperature behavior.
- Seal compatibility.
- Aging resistance.

These and other properties are already contained in brand-name hypoid gear lubricants because of the high content of EP additives (EP = extreme pressure).

OIL ADDITIVES

The factory has **not approved** oil additives for hypoid gear lubricants.

All final drives are designed in such a manner that they do not require any type of oil additives. Any type of additives is fundamentally rejected by the factory. BMW NA cannot accept any liability for follow-up damage resulting from the use of additives.

2.0 APPROVED FINAL DRIVE OILS FOR FRONT AND REAR AXLE FINAL DRIVES WITH AND WITHOUT LIMITED SLIP OR VISCOUS COUPLING

Mineral based final drive oils are no longer recommended due to the release of synthetic final drive oils for all vehicles with or without limited slip differentials.

Limited Slip Differentials

With the introduction of the Z3 roadster a new synthetic final drive oil for all vehicles with a multi-plate limited-slip differential has been released. The new BMW final drive oil SAF-XJ will replace the old final drive oil SAF-XLS.

The SAF-XLS final drive oil is not to be used in the final drive of the Z3 roadster.

Use only the SAF-XJ in the final drive of the Z3 roadster.

NOTE: **If a non-limited slip differential oil is used in a limited slip differential a whining or chattering sound can be heard on very tight turns and will eventually result**

in a failure of the differential.

BMW PARTS NUMBER SPECIFICATION

Description	Quantity	Part Number
BMW Synthetic Final Drive Oil (with multi-plate Limited Slip Differential)	55 liter drum (SAF-XJ)	83 22 1 470 080

Motorsport Vehicles:

All E46 M3, E60 M5, E63/E64 M6 and E85 M roadster and M coupe require SAF-XJ Fluid.

Non Limited Slip Differentials

BMW PARTS NUMBER SPECIFICATION

Description	Quantity	Part Number
BMW Synthetic Final Drive Oil (without multi-plate limited slip differential, or with viscous differential lock (325iX/iXA)	55 liter drum (SAF-XO)	83 22 9 407 768

3.0 FINAL DRIVE OIL FOR BMW M1 MOTORSPORT COUPE

The final drive of a BMW M1 is integrated in the manual transmission and oil supply is accomplished with a mutual oil filling.

Use reputable brand SAE 80 manual transmission oil conforming with specifications MIL-L-2105 A or API-GL 4.

4.0 OIL CHANGE INTERVALS

Maintenance requirements per the vehicle's Service Booklet or the respective Service Maintenance Checklist.

Replacement final drives: same as for new vehicles.

All models as of 9/97 production are factory-filled with synthetic rear axle oil having a lifetime service rating. No oil changes are required for the life of the vehicle.

5.0 CARS WITHOUT SERVICE INDICATOR (INCLUDING BMW M1)

First oil change at 600 miles

Further oil changes at 18,000 miles

Special rule for BMW 530i, 528i (E 12):

1st oil change at 600 miles after final drive replacement

2nd oil change at 4,500 miles after final drive replacement

Further oil changes at 9,000 miles intervals, beginning at 9,000 miles.

6.0 CARS WITH SERVICE INDICATOR

BREAK-IN PROCEDURES

Drive the car with changing engine speeds and road speeds during the first 1,200 miles/2,000 km, but never faster than 2/3rds of maximum speed in a selected gear. Avoid using full throttle and kick-down positions of the accelerator pedal during this period.

BMW PARTS NUMBER SPECIFICATION

BMW	Up to 1,200 miles max. engine speed 5500 RPM Generally avoid full-throttle position
M3/M5/M6	of the accelerator.

These break-in procedures are, of course, also applicable to replacement final drives.

7.0 OUTPUT SHAFTS

The joints of output shafts have permanent grease lubrication and require no servicing. The amount of joint grease required after repairing is supplied in the "dust cover repair kit".

8.0 WHEEL BEARINGS

Ball Bearings E24 (Since 5/82), E28, E30, E31, E32 And All Following

Bearing unit is lubricated for its service life, cannot be disassembled and does not require subsequent lubrication.

Grooved Ball Bearings E12, E21, E23, E24 Before 5/82

Grease type: Retinax A (former BMW Part No. 81 22 9 407 710)

CRC Part No. SL 3131

9.0 DIFFERENTIAL HOUSING FINAL DRIVE COVERS AND HOUSING

On 735i/iL, 750iL, M6 and M5 (E28) models, the attaching bolts are to be installed with Hylogrip/Loctite 270 (green) thread sealant (former BMW Part No. 81 22 9 400 086).

BMW PARTS NUMBER SPECIFICATION

Würth	Part No. 8932700
Loctite	

Part No. 21438

SUSPENSION

Rear Axle - Repair - Z4

3300 GENERAL

00 DANGER OF POISONING IF OIL IS INGESTED/ABSORBED THROUGH THE SKIN

Danger of poisoning!

Ingesting oil or absorbing through the skin may cause poisoning!

Possible symptoms are:

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

Protective measures/rules of conduct

- Pour oil only into appropriately marked containers
- Do **not** pour oil into drinking vessels (drinks bottles, glasses, cups or mugs)
- Observe country-specific safety regulations

First aid measures

- Do not induce vomiting.

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

If the person affected is unconscious, do not administer anything by mouth, place the person in the recovery position and seek immediate medical attention.

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If the person affected is unconscious, do not administer anything by mouth, place the person in the recovery position and seek immediate medical attention.

33 00 ... INFORMATION ON REPLACING SHOCK ABSORBERS

Situation

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

Effect

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

Procedure

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

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.

64 00 000 INFORMATION ON USING CLEANING AGENT/PAINTS (PERSONAL PROTECTION

EQUIPMENT)

WARNING: Use of cleaning agents/paints not compliant with instructions can cause serious injuries or burns!
Handling cleaning agents/paints can trigger allergic skin and respiratory reactions!

IMPORTANT: Observe following instructions:

- Store cleaning agents/paints only in a secure cabinet.
- Keep cleaning agents/paints away from naked flames and other sources of ignition.
- Protect cleaning agents/paints from high temperatures and direct sunlight.
- Always keep an eye bath on hand, change the water regularly (once a month).

IMPORTANT: Observe following instructions before use:

- Manufacturer's instructions (on container/packaging)
- Hazard warnings (on container/packaging)
- Manufacturer's instructions on package insert
- Material safety data sheet of manufacturer
- Product information in EPC
- National market regulations

IMPORTANT: Observe following instructions during use:

- Do not eat, drink or smoke while working with these products.
- Avoid direct contact with skin and eyes.
- Wear personal protective clothing/equipment.
- Ensure that all enclosed areas are well ventilated or extract fumes directly.
- Immediately change working clothes soiled with cleaning agent/paint.
- After finishing work, wash your hands and apply protective skin cream.

IMPORTANT: Follow hazard warnings and wear personal protection equipment!

First Aid:

- If product comes in contact with eyes, immediately flush with running water for about 10 - 15 minutes. Seek the advice of eye specialist.

- In the event of skin contact and where applicable an allergic skin reaction, clean the affected areas immediately with soap and water and then apply silicone-free skin cream. Seek advice of physician.
- If an adhesive product is swallowed, rinse mouth/parts of mouth thoroughly with running water. Drink 1-2 glasses of water. Do not induce vomiting. Consult a doctor.
- After inhaling vapors ensure ample supply of fresh air. Keep calm, keep respiratory tracks clear and call doctor.

Recycling

Dispose of cleaning agents/paints in a professional manner!

Observe national/country-specific disposal regulations.

41 00 ... INSTALLATION SOLUTION FOR STRAIGHT SHANK/HEXAGON RIVET NUT

Protection measures!

- Wear safety goggles
- Wear protective gloves

Hexagon/straight shank rivet nut (up to thread 8) with hand rivet gun ZS308

IMPORTANT: Risk of damage!

Failure to comply with these instructions may result in the drill bit slipping and causing significant paintwork damage.

1. Mark position of bore and then punch-mark component

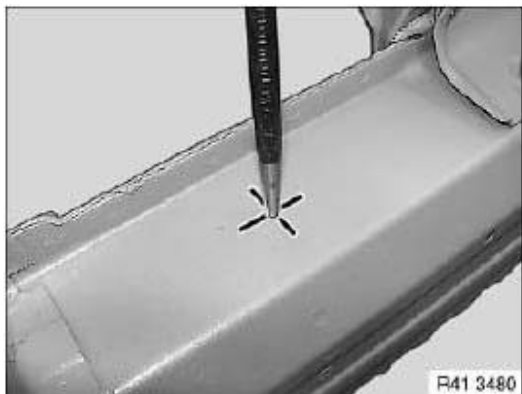


Fig. 1: Identifying Hexagon/Straight Shank Rivet Nut Installing Position
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: If the determined drill bit diameter is not observed:

- the knurling on the straight shank rivet nut is rendered useless

- the component will be damaged when the straight shank rivet nut is inserted

Determining suitable drill bit:

Depending on the rivet nut shank diameter, the next drill bit diameter higher (5/10 step) can be used.

E.g. with a shank diameter of 10.1 mm, the 10.5 mm drill bit can be used. The 11.0 mm drill bit must not be used.

2. Drill bore with determined drill bit and deburr, pilot-drill with a smaller drill bit if necessary



Fig. 2: Drilling Bore Using Drill Bit
Courtesy of BMW OF NORTH AMERICA, INC.

3. Clean component, eliminate paintwork damage if necessary



Fig. 3: Identifying Cavity
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: To avoid corrosion, stop chips/swarf by means of cavity sealing.
Follow INSTRUCTIONS ON CORROSION PROTECTION .

4. Preserving cavity

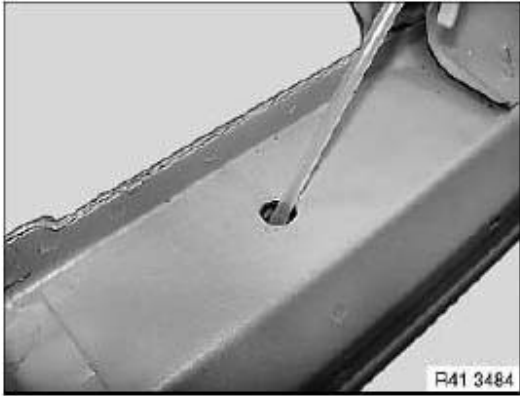


Fig. 4: Preserving Cavity

Courtesy of BMW OF NORTH AMERICA, INC.

**IMPORTANT: Follow manufacturer's operating instructions.
Make sure straight shank rivet nut correctly contacts component.**

5Set rivet nut with hand rivet gun

NOTE: According to the manufacturer, the pictured tool is suitable up to an M8 thread.

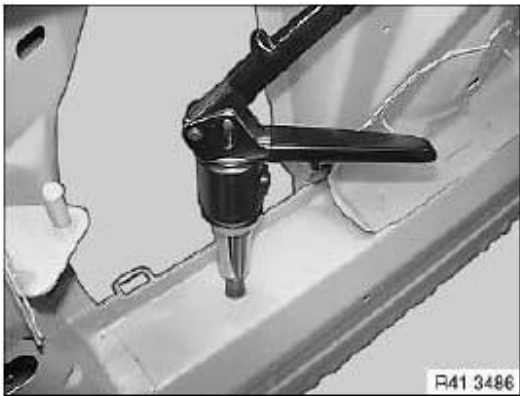


Fig. 5: Setting Rivet Using With Hand Rivet Gun

Courtesy of BMW OF NORTH AMERICA, INC.

Hexagon/straight shank rivet nut (up to thread M12) with hand rivet gun MB512

**IMPORTANT: Follow manufacturer's operating instructions.
Make sure hexagon rivet nut correctly contacts component.**

Set rivet nut with hand rivet gun

NOTE: According to the manufacturer, the pictured tool is suitable up to an M12 thread.



Fig. 6: Setting Rivet Nut With Hand Rivet Gun
Courtesy of BMW OF NORTH AMERICA, INC.

33 00 ... INSTRUCTIONS (CHASSIS COMPONENTS MADE OF ALUMINUM)

Due to the chemical and corrosion characteristics of aluminum, always comply with the following points when handling aluminum components:

- Do not bring into contact with battery acid!
- Do not clean with wire brushes made of brass or iron! Always use wire brushes with stainless steel bristles!
- Do not expose to flying sparks when grinding/separating! Cover components!
- Do not strike with steel welding splashes! Cover components!
- Do not expose to temperatures $> 80^{\circ}\text{C}$, even for brief periods! Temperatures in paint facilities do not have the same impact

33 00 ... NOTES ON REPAIRING THREADS

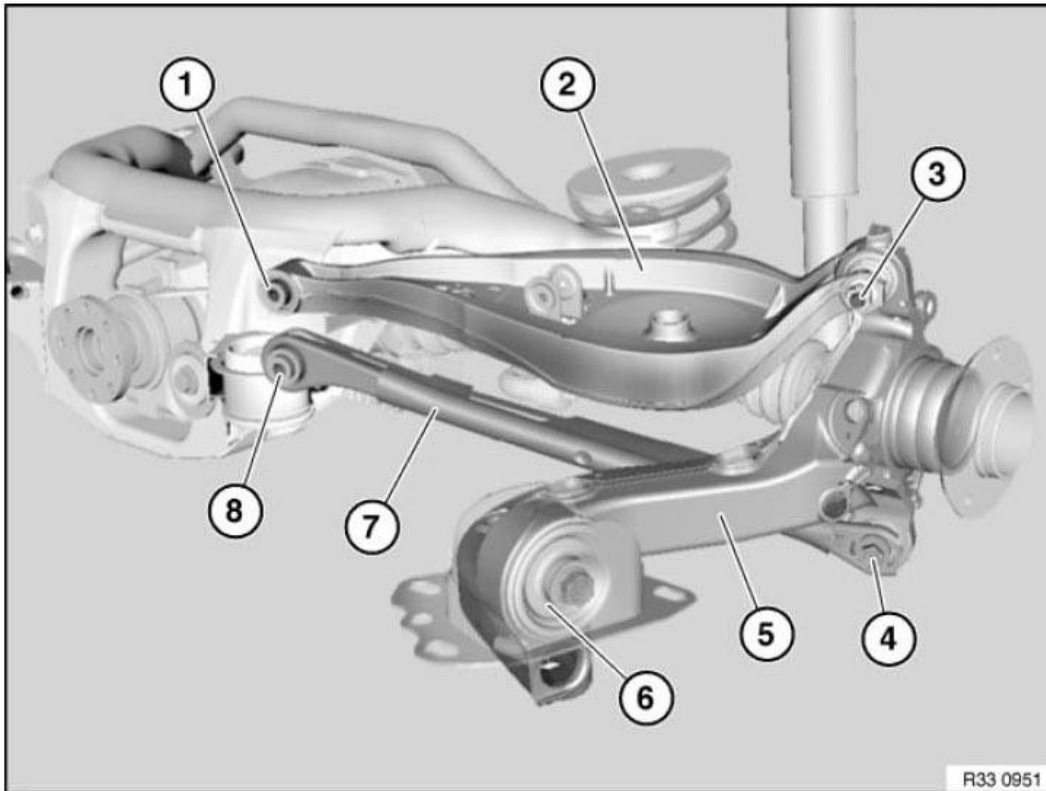
IMPORTANT: Install Helicoil thread inserts so that they are flush with the original thread.

NOTE: Damaged threads in the frame side member may be repaired with Helicoil thread inserts. Comply with the PROCEDURE described in the example.



Fig. 7: Identifying Damaged Helicoil Thread
Courtesy of BMW OF NORTH AMERICA, INC.

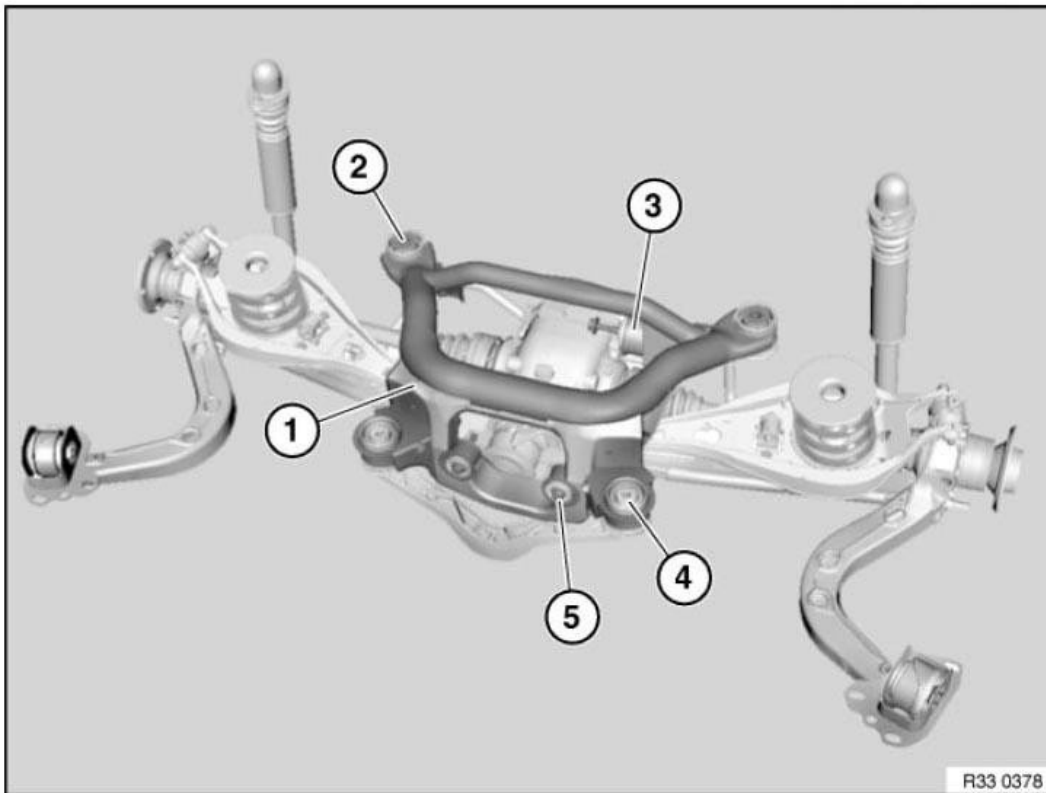
33 32 ... OVERVIEW OF CONTROL ARMS WITH RUBBER MOUNTS



- | | |
|------------------------------------|---|
| 1 Rubber mount in control arm, top | 6 Rubber mount in trailing arm at front |
| 2 Control arm, top (left/right) | 7 Control arm, bottom (left/right) |
| 3 Ball joint in trailing arm | 8 Rubber mount in control arm, bottom |
| 4 Rubber mount in trailing arm | |
| 5 Trailing arm (left/right) | |

Fig. 8: Overview Of Control Arms With Rubber Mounts
Courtesy of BMW OF NORTH AMERICA, INC.

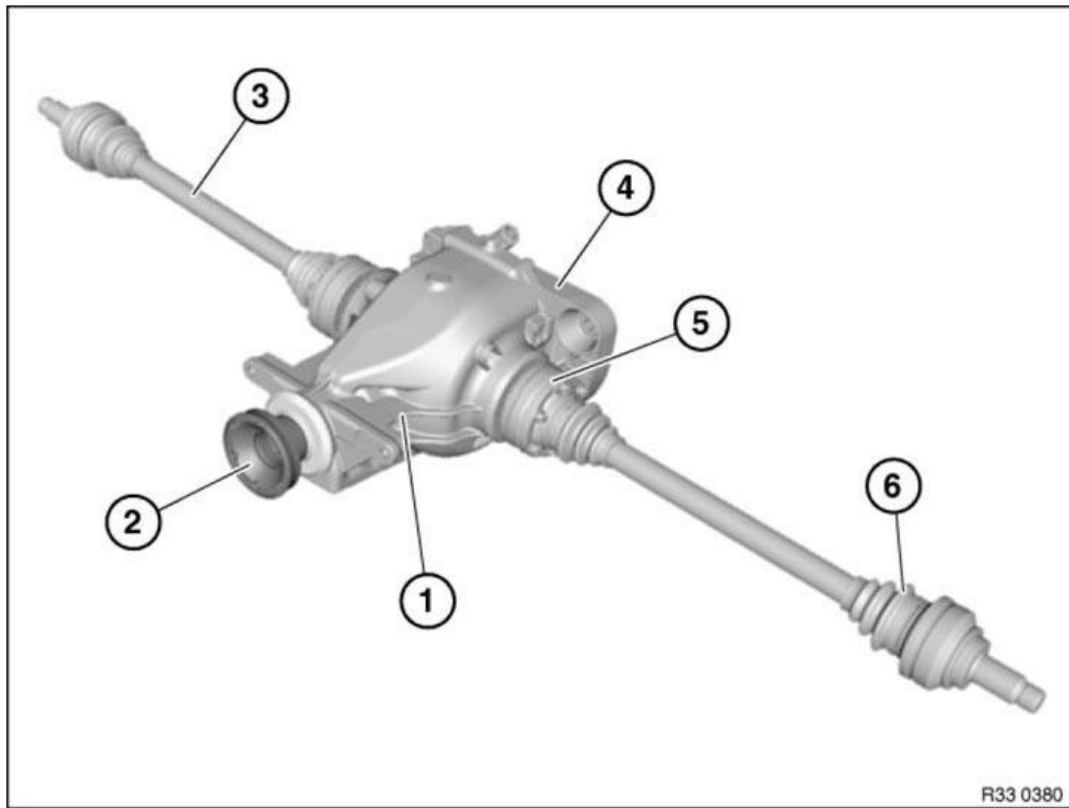
33 31 . OVERVIEW OF REAR AXLE CARRIER WITH RUBBER MOUNTS



- | | |
|---|--|
| 1 <u>Rear axle carrier</u> | 4 <u>Rear axle carrier rubber mount, front</u> |
| 2 <u>Rear axle carrier rubber mount, rear</u> | 5 <u>Rear differential rubber mount, front</u> |
| 3 <u>Rear differential rubber mount, rear</u> | |

Fig. 9: Overview Of Rear Axle Carrier With Rubber Mounts
Courtesy of BMW OF NORTH AMERICA, INC.

33 10 ... OVERVIEW OF REAR DIFFERENTIAL/OUTPUT SHAFTS



- | | |
|------------------------------------|------------------------------------|
| 1 <u>Rear differential</u> | 4 <u>Cover gasket</u> |
| 2 <u>Drive flange / shaft seal</u> | 5 <u>Drive flange / shaft seal</u> |
| 3 <u>Output shaft (left/right)</u> | 6 <u>Output shaft gaiters</u> |

Fig. 10: Overview Of Rear Differential/Output Shafts
 Courtesy of BMW OF NORTH AMERICA, INC.

00 ... RAISING VEHICLE WITH TROLLEY JACK

IMPORTANT: Observe the following trolley-jack-related instructions:

1. Use only BMW-distributed/approved trolley jacks which have rubber plate contact points.
2. Trolley jacks must be regularly serviced and always checked for functional reliability before they are used!
3. Check the rubber plate on the trolley jack prior to each use, replacing if necessary.

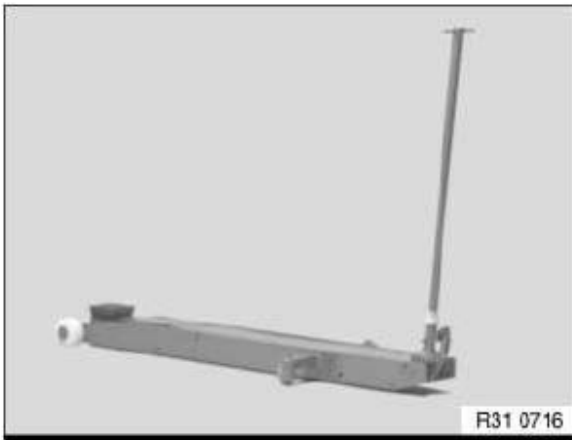


Fig. 11: Identifying Trolley Jack
 Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: The vehicle may be raised with a trolley jack only at the following jacking points!

1. Car jacking point
2. Side car jacking points
3. Rear differential (**REMOVE HEAT SHIELD**)

Risk of damage: It is not permitted to raise the vehicle at the rear differential cover!

4. Bolting point for rear axle tension struts

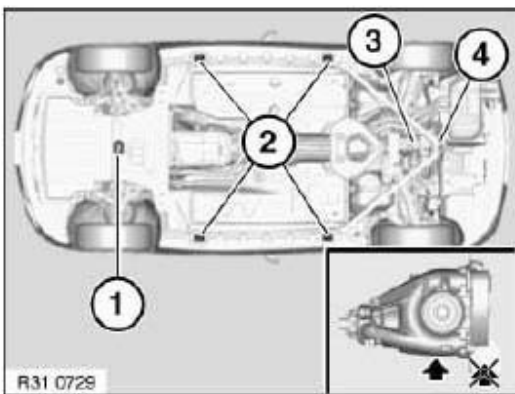
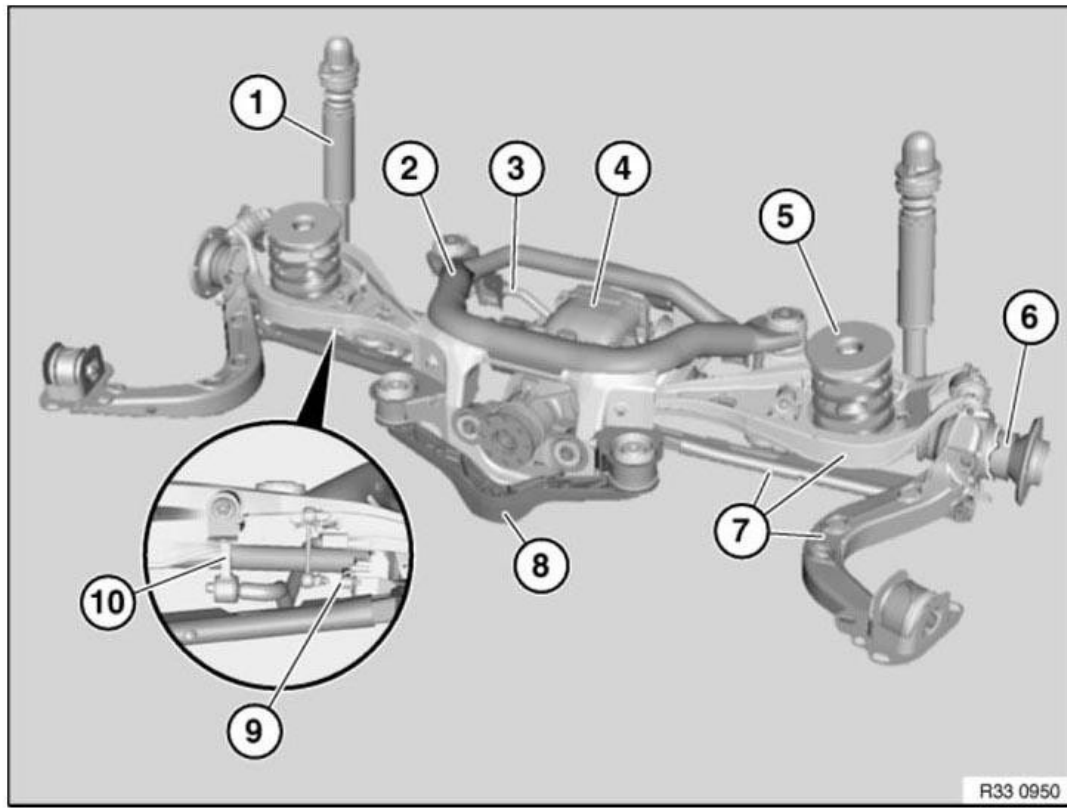


Fig. 12: Identifying Rear Differential, Side Car Jacking Points And Car Jacking Point
 Courtesy of BMW OF NORTH AMERICA, INC.



- | | | |
|--|----|--------------------|
| 1 Shock absorber | 8 | Tension strut |
| 2 Rear axle support | 9 | Ride height sensor |
| 3 Stabiliser | 10 | Stabiliser link |
| 4 Rear axle differential / output shafts | | |
| 5 Coil spring | | |
| 6 Wheel bearing / drive flange hub | | |
| 7 Arm | | |

Fig. 13: Layout Of Rear Axle
 Courtesy of BMW OF NORTH AMERICA, INC.

33 00 ... REAR AXLE: WHEEL/CHASSIS ALIGNMENT CHECK MUST BE CARRIED OUT AFTER THE FOLLOWING WORK

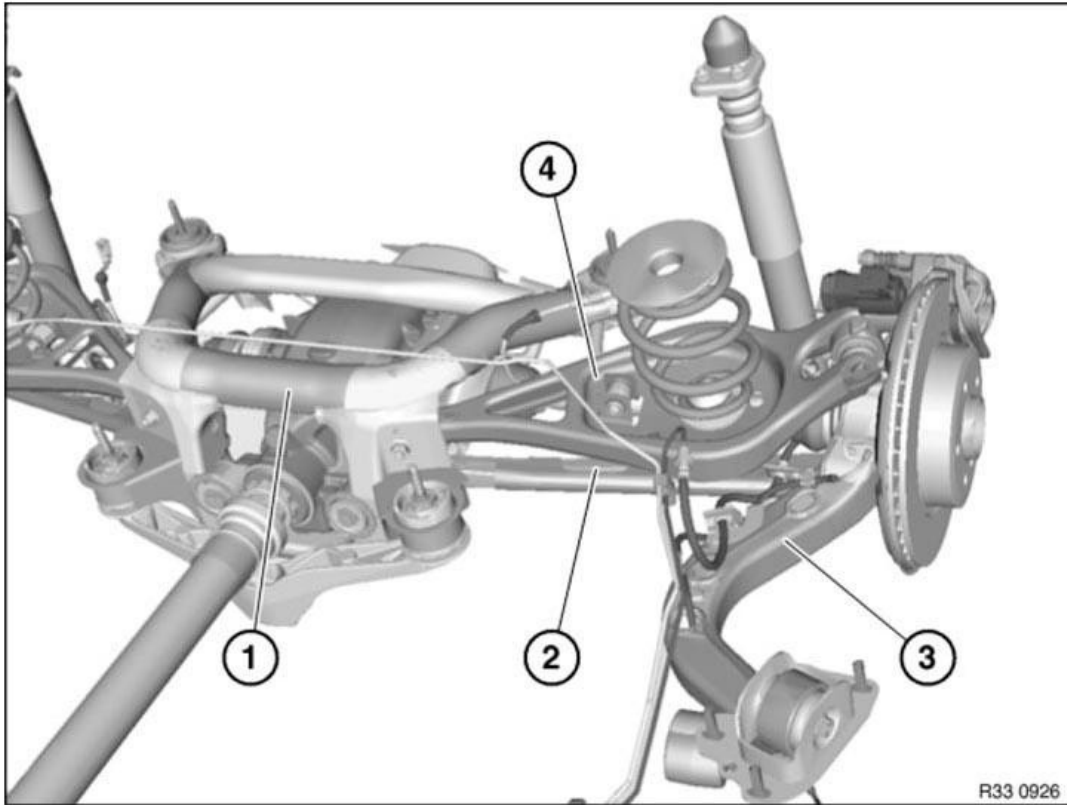


Fig. 14: Identifying Rear Axle Carrier, Lower And Upper Control Arms And Trailing Arm
Courtesy of BMW OF NORTH AMERICA, INC.

A **WHEEL/CHASSIS ALIGNMENT CHECK** must be carried out after the following work:

- **Release of following screw/bolt connections:**
 - Bearing block to trailing arm/body
 - Upper control arm to trailing arm
 - Lower control arm to trailing arm
- **Replacement of following parts:**
 1. Rear axle carrier
 2. Lower control arm
 3. Trailing arm/rubber mount/bearing block
 4. Upper control arm

51 47 491 REMOVING AND INSTALLING/REPLACING REAR UNDERBODY PROTECTION

WARNING: Scalding hazard!

This work may only be carried out on an exhaust system which has cooled down.

Release screws (1).

Pull underbody protection (2) out from under bumper trim (3).

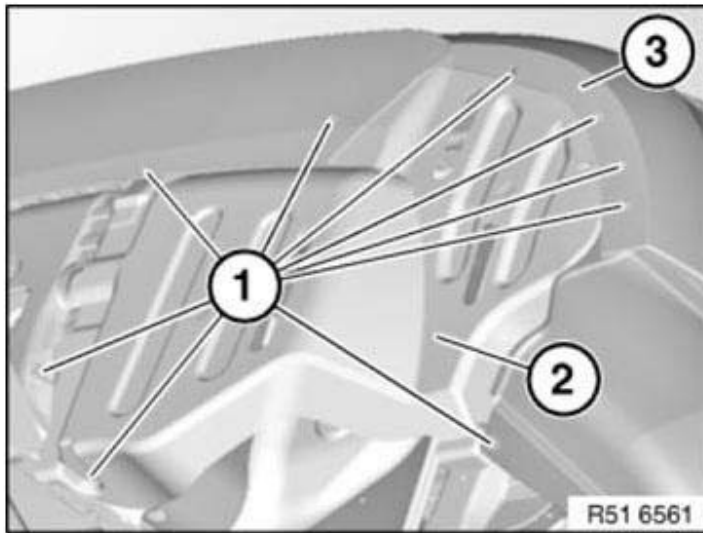


Fig. 15: Identifying Underbody Protection, Under Bumper Trim With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

41 00 ... REPAIR SOLUTION FOR STRAIGHT SHANK/HEXAGON RIVET NUT

Protection measures!

- Wear safety goggles
- Wear protective gloves

IMPORTANT: To prevent the material from tapering, do not drill out the rivet head.

1. Carefully spot-drill rivet head with a larger drill bit/countersink



Fig. 16: Drilling Rivet Head Using Larger Drill Bit/Countersink
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Avoid paintwork damage

2. Knock rivet head away with a chisel



Fig. 17: Knocking Rivet Head Using Chisel
Courtesy of BMW OF NORTH AMERICA, INC.

3. Drive through rivet shank into cavity, remove if necessary



Fig. 18: Identifying Cavity Of Rivet Shank
Courtesy of BMW OF NORTH AMERICA, INC.

4. Clean component, eliminate paintwork damage if necessary



Fig. 19: Identifying Cavity

Courtesy of BMW OF NORTH AMERICA, INC.

If the rivet shank can be removed:

IMPORTANT: To avoid corrosion, stop chips/swarf by means of cavity sealing.

Follow INSTRUCTIONS ON CORROSION PROTECTION .

5. Preserving cavity



Fig. 20: Preserving Cavity

Courtesy of BMW OF NORTH AMERICA, INC.

If the rivet shank cannot be removed:

WARNING: Risk of injury!

Observe NOTES ON CAVITY FOAM .

IMPORTANT: To avoid corrosion and rattling noises, stop chips/swarf and rivet nut shank with cavity foam.

Remove foam remnants with isohexane (benzine).

5. Stop rivet shank by means of specific foaming
6. Set rivet nut with hand rivet gun

NOTE: **Fit rivet nut as quickly as possibly, ideally before the cavity foam hardens.**



Fig. 21: Preserving Cavity

Courtesy of BMW OF NORTH AMERICA, INC.

Hexagon/straight shank rivet nut (up to thread M8) with hand rivet gun ZS308

IMPORTANT: Follow manufacturer's operating instructions.
Make sure rivet nut correctly contacts component.

NOTE: **According to the manufacturer, the pictured tool is suitable up to an M8 thread.**



Fig. 22: Setting Rivet Using With Hand Rivet Gun

Courtesy of BMW OF NORTH AMERICA, INC.

Hexagon/straight shank rivet nut (up to thread M12) with hand rivet gun MB512

**IMPORTANT: Follow manufacturer's operating instructions.
Make sure rivet nut correctly contacts component.**

NOTE: According to the manufacturer, the pictured tool is suitable up to an M12 thread.



Fig. 23: Setting Rivet Nut With Hand Rivet Gun
Courtesy of BMW OF NORTH AMERICA, INC.

00 RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN

Danger of injury!

Contact with eyes or skin may result in injury!

Possible symptoms are:

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

Protective measures/rules of conduct

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

First aid measures

- **Eye contact:** Rinse eyes immediately with plenty of water for at least 15 minutes; if available, use an eye-rinsing bottle. If irritation of the eyes persists, consult a doctor.
- **Skin contact:** Wash off with soap and water immediately. If irritation persists, consult a doctor.

NOTE: Do not use solvents/thinners.

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Possible symptoms are:

- Impaired sight
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- **Skin contact:** Wash off with soap and water immediately. If irritation persists, consult a doctor.

NOTE: Do not use solvents/thinners.

00 SAFETY INSTRUCTIONS FOR HANDLING OIL

**WARNING: DANGER OF POISONING if oil is ingested/absorbed through the skin!
RISK OF INJURY if oil comes into contact with eyes and skin!**

Recycling

Observe country-specific waste-disposal regulations.

Measures if oil is unintentionally released

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

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

3310 FINAL DRIVE

00 11 ... CHECKING/TOPPING UP OIL LEVEL IN REAR DIFFERENTIAL

WARNING: DANGER OF POISONING if oil is ingested/absorbed through the skin!
RISK OF INJURY if oil comes into contact with eyes and skin!

IMPORTANT: Risk of damage!

To avoid serious damage to the rear differential, it is essential to use only REAR AXLE - OPERATING FLUIDS in the rear differential.

Undo oil filler plug (1).

Tightening torque 33 11 2AZ .

Check oil level.

If necessary, pour in rear differential oil up to lower edge of opening for oil filler plug (1).

Installation:

Replace oil filler plug (1) with O-ring.

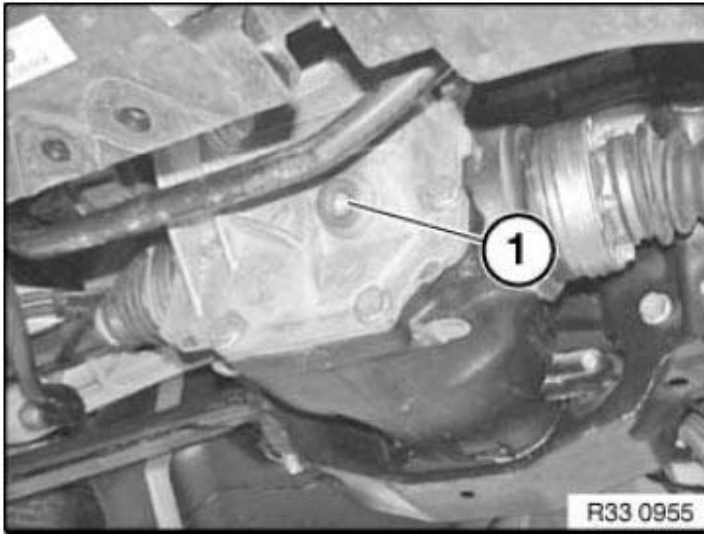


Fig. 24: Identifying Oil Filler Plug

Courtesy of BMW OF NORTH AMERICA, INC.

00 11 259 OIL CHANGE IN REAR DIFFERENTIAL INCL. USED OIL DISPOSAL

NOTE: Observe following instructions and torques.

- Replace screw plug with O-ring after releasing.

Tightening torque with O-ring 33 11 2AZ.

WARNING: Risk of burning if exhaust system is touched!

DANGER OF POISONING if oil is ingested/absorbed through the skin!

RISK OF INJURY if oil comes into contact with eyes and skin!

IMPORTANT: Risk of damage!

To avoid serious damage to the rear axle differential, it is essential to use only **REAR AXLE - OPERATING FLUIDS** in the rear axle differential.

NOTE: The oil does not need to be changed in rear differentials carrying the "Life-Time-Oil" sticker.

Only change oil when rear differential is at normal operating temperature.

Recycling

Catch and dispose of emerging differential oil.

Observe country-specific waste-disposal regulations

Open plug (1).

Drain and dispose of differential oil.

Add rear differential oil up to lower edge of opening for screw plug (1); if necessary, refer to Technical Data .
See **REAR AXLE FINAL DRIVE** for necessary fill quantity.

Replace screw plug.

Tightening torque **33 11 2AZ** (with O-ring).

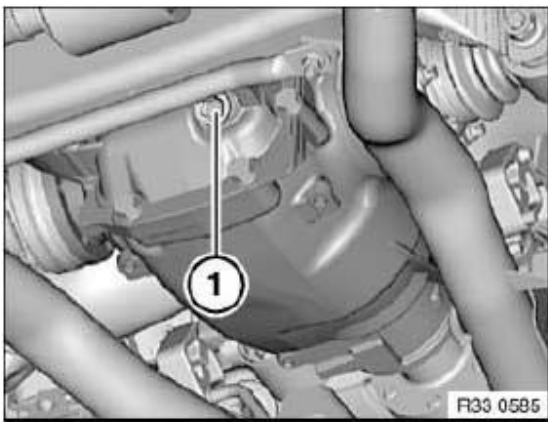
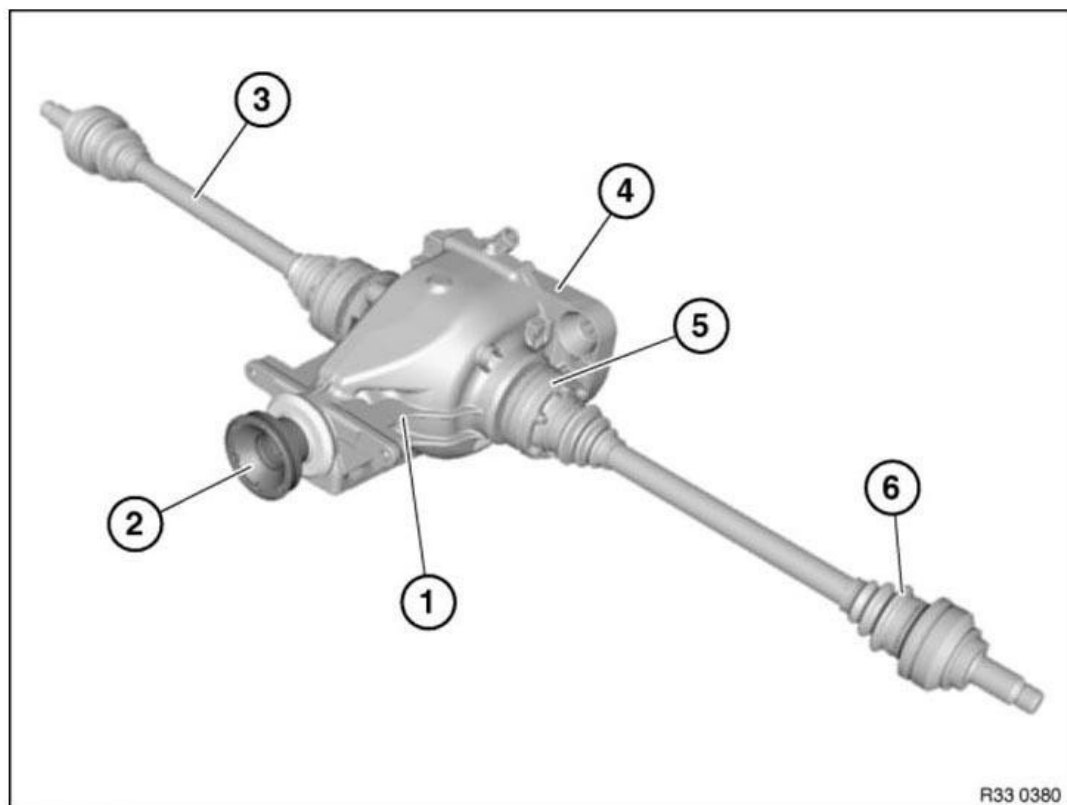


Fig. 25: Identifying Screw Plug

Courtesy of BMW OF NORTH AMERICA, INC.

33 10 ... OVERVIEW OF REAR DIFFERENTIAL/OUTPUT SHAFTS



- | | | |
|-----------------------------|---|---------------------------|
| 1 Rear differential | 4 | Cover gasket |
| 2 Drive flange / shaft seal | 5 | Drive flange / shaft seal |
| 3 Output shaft (left/right) | 6 | Output shaft gaiters |

Fig. 26: Overview Of Rear Differential/Output Shafts

Courtesy of BMW OF NORTH AMERICA, INC.

33 10 ... REAR DIFFERENTIAL: ASSIGNMENT TO MODEL SERIES

REAR DIFFERENTIAL WITH MODEL SERIES

Model series	Engine	Rear differential	Remark
E89	N52K (S23i/S28i)	188L	
	N54 (S35i)	215L	

K = Compact

L = Light-running

33 10 010 REMOVING AND INSTALLING/REPLACING REAR DIFFERENTIAL

IMPORTANT: Risk of damage!

Reinstall shim (1).

Use only REAR AXLE - OPERATING FLUIDS !

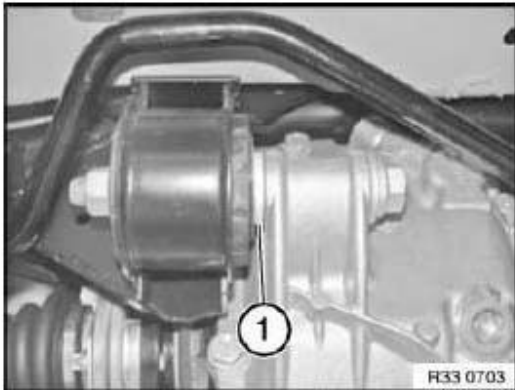


Fig. 27: Identifying Shim

Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary tasks

- Remove **STABILIZER**
- Remove output shaft from rear differential at both ends . See **3321001 REMOVING AND INSTALLING OR REPLACING LEFT OUTPUT SHAFT** or **3321002 REMOVING AND INSTALLING/REPLACING RIGHT OUTPUT SHAFT** and tie back
- Remove **PROPELLER SHAFT FROM REAR DIFFERENTIAL** and tie back

WARNING: Danger to life!

Car may tilt off lifting platform if the workshop jack is incorrectly handled.
After supporting components, make sure that:

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

Remove **COMPRESSION STRUT** and insert bolts for rear axle carrier at front until contact is made.

Support rear differential with workshop jack and special tool 33 4 420 .

IMPORTANT: Observe gap between special tool 33 4 420 and dust plates (1).

To avoid grinding noises, make sure the dust plates (1) are not damaged (e.g. bent).

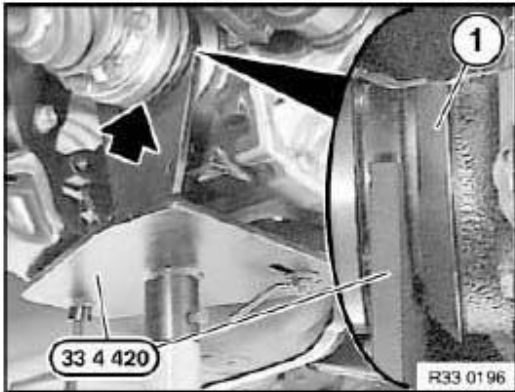


Fig. 28: Identifying Gap Between Special Tool (33 4 420) And Dust Plates
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws.

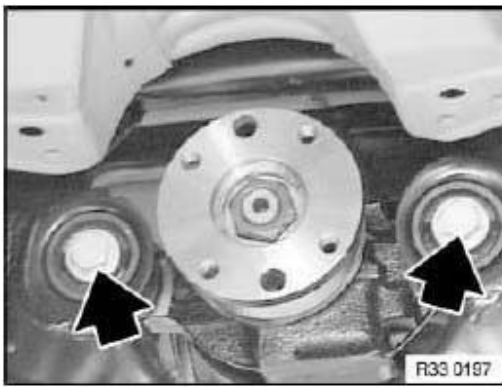


Fig. 29: Locating Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten nut.

Unscrew bolt to center of car; if necessary, remove spacer.

Slowly lower workshop jack and tip rear differential out towards rear.

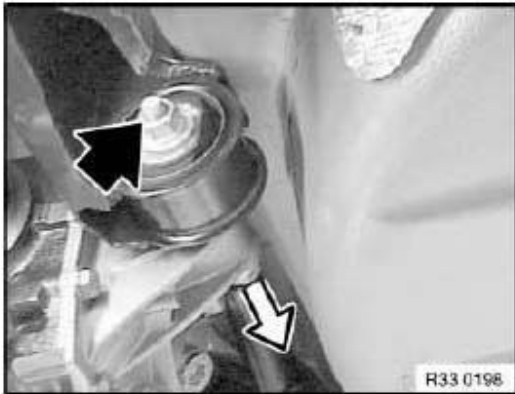


Fig. 30: Removing Spacer

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Adhere to the following installation sequence in order to prevent distortion of the rear differential during installation and thereby avoid potential complaints about noise.

Installation sequence:

1. Install rear differential with workshop jack and special tool 33 4 420 .
2. Insert bolts (1) (do not tighten down)
3. Insert bolt (2); if necessary, fit spacer
4. Replace and screw on nut (3) (do not tighten down)
5. Lower workshop jack
6. Install **COMPRESSION STRUT**
7. Tighten down screws (1)

Tightening torque **33 17 1AZ** .

8. Tighten down screw (2)

Tightening torque **33 17 2AZ** .

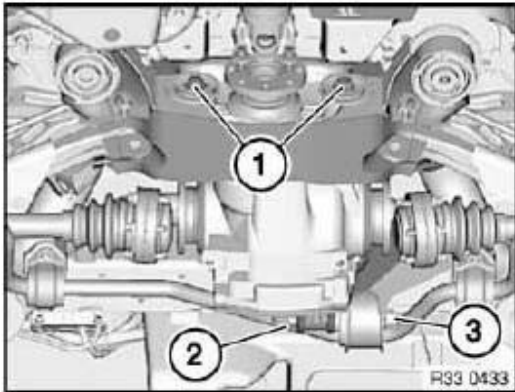


Fig. 31: Identifying Rear Differential Screws And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Check **REAR DIFFERENTIAL OIL LEVEL** , correct if necessary

3311 FINAL DRIVE WITH COVER

33 31 025 REMOVING AND INSTALLING/REPLACING VIBRATION ABSORBER ON SIDE MEMBER

Necessary preliminary tasks

- Remove rear **WHEEL ARCH SPLASH GUARD**

Release nut (1) and remove vibration absorber (2) from holder.

Tightening torque 33 32 9AZ.

Installation:

Pay attention to lock washer (3) between collar nut and vibration absorber.

Replace screw and nut.

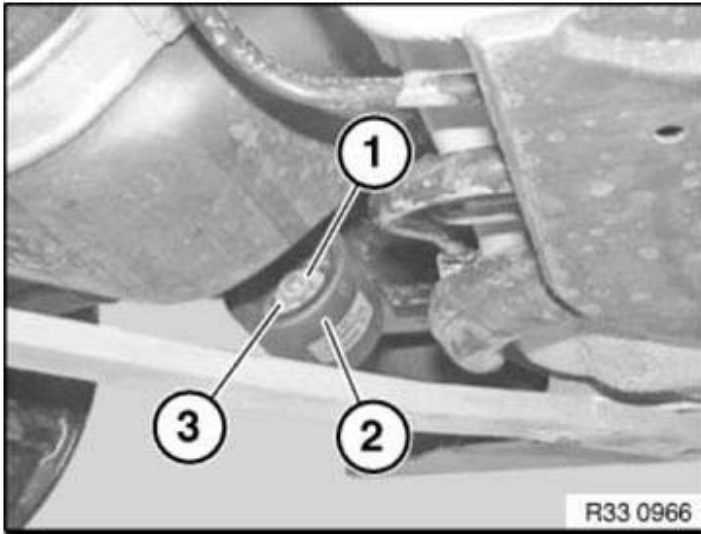


Fig. 32: Identifying Vibration Absorber And Lock Washer With Nut
 Courtesy of BMW OF NORTH AMERICA, INC.

- IMPORTANT:**
- Groove (1) on the vibration absorber must be aligned horizontally to the holder corners!

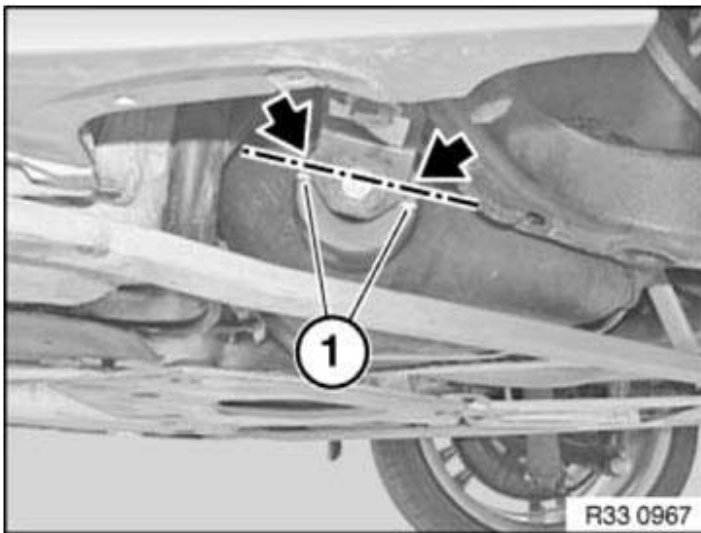


Fig. 33: Identifying Groove On Vibration Absorber
 Courtesy of BMW OF NORTH AMERICA, INC.

33 11 080 REPLACING LEFT DRIVE FLANGE ON REAR DIFFERENTIAL

WARNING: Risk of burning on the exhaust system!

IMPORTANT: When replacing the drive flange, you must also replace the shaft seal . See 3311140 REPLACING SHAFT SEAL FOR LEFT DRIVE FLANGE or 3311145 REPLACING SHAFT SEAL FOR RIGHT DRIVE FLANGE!

Necessary preliminary tasks

- Remove output shaft . See 3321001 REMOVING AND INSTALLING OR REPLACING LEFT OUTPUT SHAFT or 3321002 REMOVING AND INSTALLING/REPLACING RIGHT OUTPUT SHAFT from rear differential and tie back

Drive out drive flange (1) with special tools 13 5 251 and 13 5 253.

Installation:

Insert drive flange and rotate until spline on flange meshes with teeth on differential bevel gear.

Press drive flange in further until circlip locates with an audible click.

IMPORTANT: High installation forces indicate that the spline teeth on the drive flange/differential bevel gear are damaged/deformed!
Check spline teeth, replaced damaged parts.

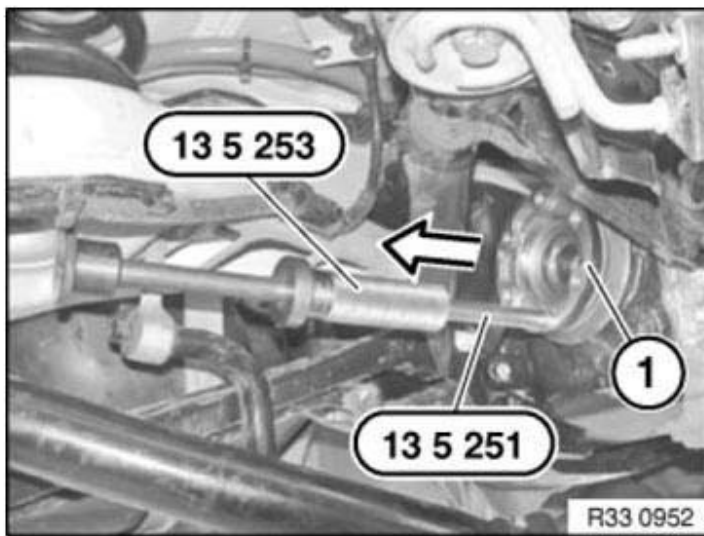


Fig. 34: Removing Drive Flange Using Special Tools (13 5 251 And 13 5 253)
Courtesy of BMW OF NORTH AMERICA, INC.

Install retaining ring (1).

Installation:

Clean shaft seal race on drive flange thoroughly.

Coat drive flange at contact face of shaft seal with **REAR AXLE - OPERATING FLUIDS** .

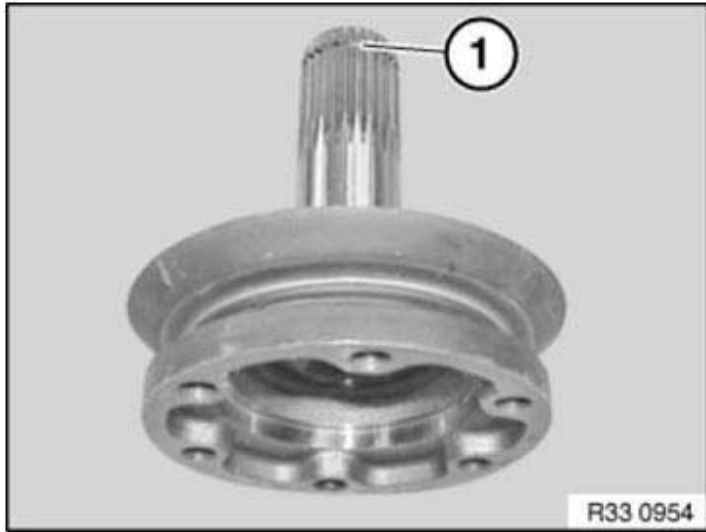


Fig. 35: Identifying Retaining Ring
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement

Replace shaft seal . See **3311140 REPLACING SHAFT SEAL FOR LEFT DRIVE FLANGE** or **3311145 REPLACING SHAFT SEAL FOR RIGHT DRIVE FLANGE**.

After installation

- Check **OIL LEVEL IN REAR DIFFERENTIAL**

33 11 021 REPLACING RADIAL SHAFT SEAL FOR DRIVE FLANGE ON REAR DIFFERENTIAL

IMPORTANT: Use only REAR AXLE - OPERATING FLUIDS .
Failure to comply with this instruction will result in serious damage to the rear differential!

Necessary preliminary tasks

- Remove **PROPELLER SHAFT**

Remove retaining clip (1) and insert nut (2) with diaphragm seal.

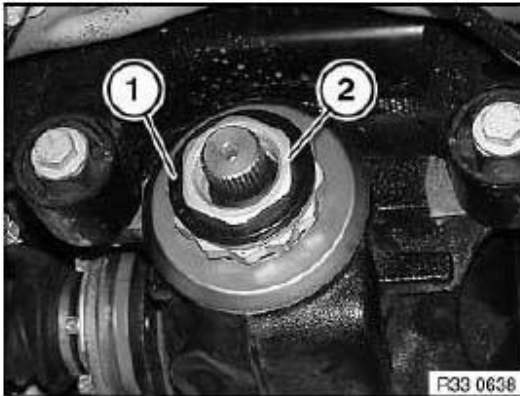


Fig. 36: Identifying Retaining Clip And Diaphragm Seal Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Mark position of flange nut (1) to bevel pinion (2).

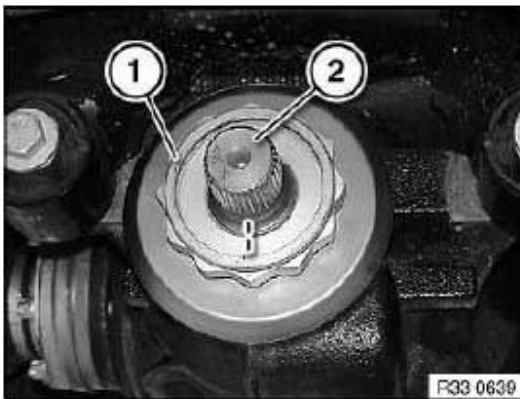


Fig. 37: Identifying Flange Nut And Bevel Pinion
Courtesy of BMW OF NORTH AMERICA, INC.

Release flange nut with special tools 33 5 050 and 33 5 070 , to do this, grip bevel pinion with special tool 33 5 060 and 33 5 070 .

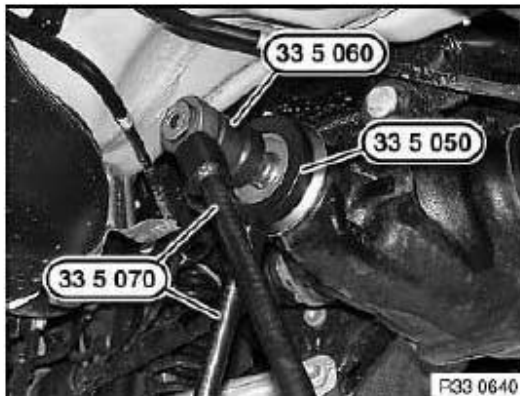


Fig. 38: Removing Flange Nut Using Special Tools (33 5 050 And 33 5 070)
Courtesy of BMW OF NORTH AMERICA, INC.

Pull out shaft seal with special tool 00 5 010 .

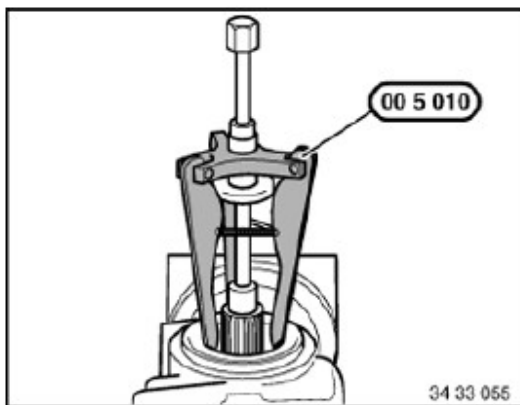


Fig. 39: Pulling Out Shaft Seal Using Special Tool (00 5 010)
Courtesy of BMW OF NORTH AMERICA, INC.

Coat sealing lips of new shaft seal and sealing face of bevel pinion with differential oil.

Drive in shaft seal with special tool 33 0 150 .

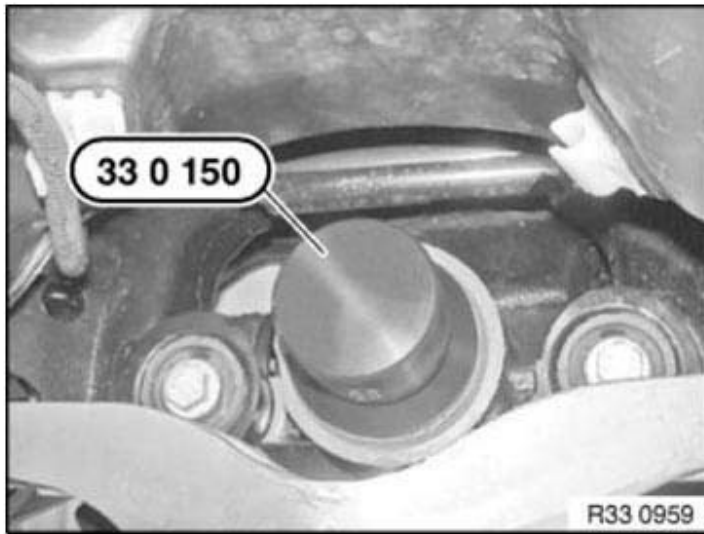


Fig. 40: Installing Shaft Seal Using Special Tool (00 5 010)
 Courtesy of BMW OF NORTH AMERICA, INC.

Clean bevel pinion thoroughly to remove remnants of screw-locking agent.



Fig. 41: Identifying Bevel Pinion
 Courtesy of BMW OF NORTH AMERICA, INC.

Check dust cover for damage, replace if necessary.

IMPORTANT: Clean flange nut thoroughly to remove remnants of grease and screw-locking agent.
 Pack collar insert (1) of flange nut with grease .
 Apply a thin coating of grease to shaded area (2) of flange nut.
 Coat at least four thread turns of flange nut with "DREI BOND adhesive type 1385".

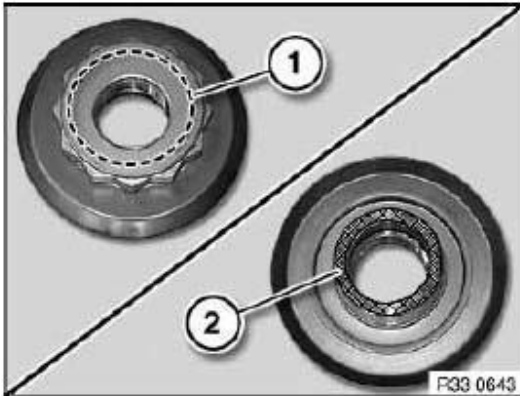


Fig. 42: Identifying Collar Insert Of Flange Nut With Grease Area
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: In order to avoid damaging the rear differential, do not under any circumstances tighten down the flange nut (1) beyond the marker point of the bevel pinion (2).

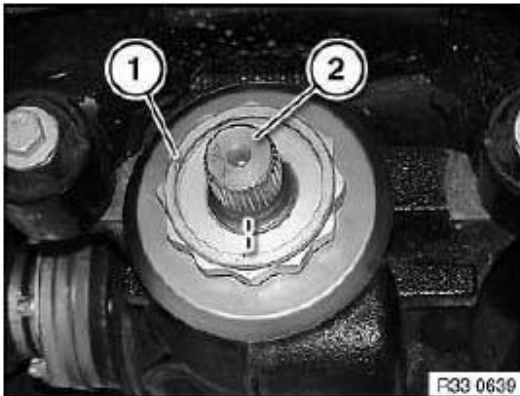


Fig. 43: Identifying Flange Nut Of Bevel Pinion
 Courtesy of BMW OF NORTH AMERICA, INC.

Place insert nut (2) with diaphragm seal in flange nut.

Install retaining clip (1).

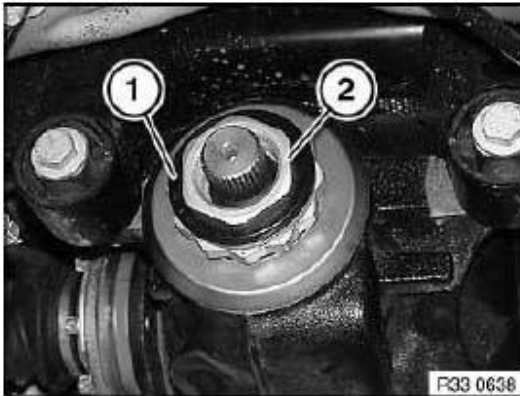


Fig. 44: Identifying Insert Nut With Retaining Clip
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Check OIL LEVEL IN FINAL DRIVE UNIT and top up if necessary.

33 11 271 REPLACING REAR COVER GASKET ON REAR DIFFERENTIAL

IMPORTANT: In event of oil loss, always check rear differential for traces of wear and damage.

Necessary preliminary tasks

- Draw off/drain DIFFERENTIAL OIL
- Remove REAR DIFFERENTIAL

NOTE: Read and comply with document "REAR DIFFERENTIAL: ASSIGNMENT TO MODEL SERIES".

Select rear differential:

- 188L
- 215L

After installation

- Add REAR DIFFERENTIAL OIL

33 11 ... REPLACING REAR COVER GASKET ON REAR DIFFERENTIAL (188L)

IMPORTANT: To avoid leaks from the rear differential cover, do not use a paper gasket in cars with liquid gaskets!

To prevent the differential oil from foaming over, make sure that no remnants of the liquid gasket are pressed into the rear differential housing.

Release screws (1).

Tightening torque (M10x60) **33 11 1AZ** .

Unscrew screws (2).

Tightening torque (M10x25) **33 11 1AZ** .

Remove cover.

If necessary, remove remnants of liquid gasket with scraper.

Clean sealing face on cover and rear differential.

Installation:

If a paper gasket was fitted, a paper or liquid gasket can be used.

The liquid gasket can be found in Main Group 33 in the Electronic Parts Catalogue.

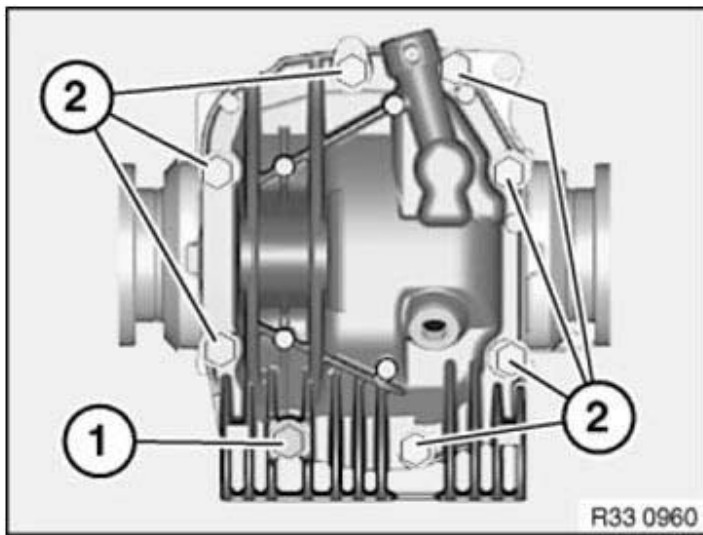


Fig. 45: Identifying Rear Differential Screws (188L)
Courtesy of BMW OF NORTH AMERICA, INC.

33 11 ... REPLACING REAR COVER GASKET ON REAR DIFFERENTIAL (215 WITH LOCK)

IMPORTANT: To avoid leaks from the rear differential cover, do not use a paper gasket in cars with liquid sealing compounds!

To prevent the differential oil from foaming over, make sure that no remnants of the liquid sealing compound are pressed into the rear differential housing.

Release screws (1).

Tightening torque (M10x82) 33 11 1AZ.

Remove cover (2).

If necessary, remove remnants of liquid sealing compound with scraper.

Clean sealing face on cover and rear differential.

Installation:

If a paper gasket was fitted, a paper gasket or liquid sealing compound can be used.

The liquid sealing compound can be found in Main Group 33 in the Electronic Parts Catalogue.

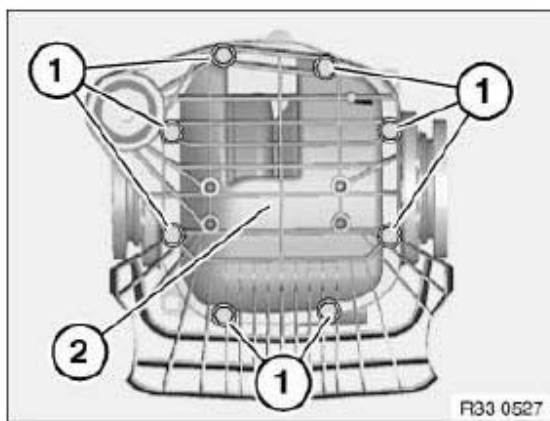


Fig. 46: Identifying Rear Differential Screws (215 With Lock)
Courtesy of BMW OF NORTH AMERICA, INC.

33 11 ... REPLACING REAR COVER GASKET ON REAR DIFFERENTIAL (215L)

IMPORTANT: To avoid leaks from the rear differential cover, do not use a paper gasket in cars with liquid gaskets!
To prevent the differential oil from foaming over, make sure that no remnants of the liquid gasket are pressed into the rear differential housing.

Release screw (1).

Tightening torque (M10x25) 33 11 1AZ .

Remove cover.

If necessary, remove remnants of liquid gasket with scraper.

Clean sealing face on cover and rear differential.

Installation:

If a paper gasket was fitted, a paper or liquid gasket can be used.

The liquid gasket can be found in Main Group 33 in the Electronic Parts Catalogue.

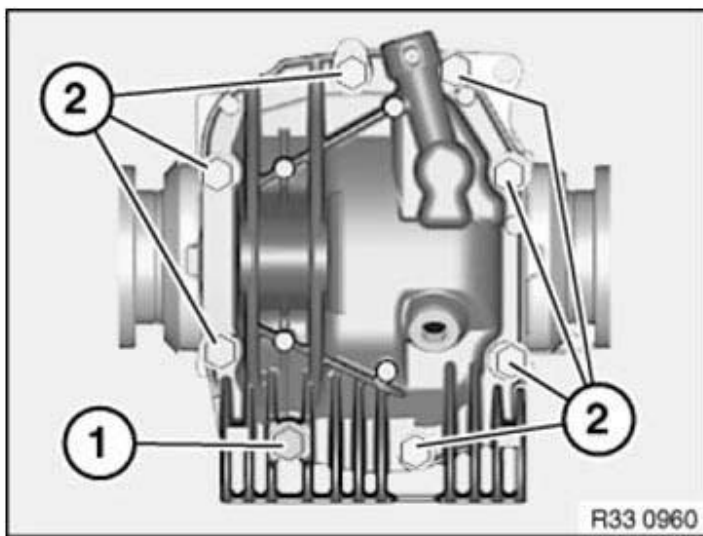


Fig. 47: Identifying Rear Differential Screws (215L)
Courtesy of BMW OF NORTH AMERICA, INC.

33 11 085 REPLACING RIGHT DRIVE FLANGE ON REAR DIFFERENTIAL

The procedure is described in the document "**REPLACING LEFT DRIVE FLANGE ON REAR DIFFERENTIAL**".

33 11 140 REPLACING SHAFT SEAL FOR LEFT DRIVE FLANGE

Necessary preliminary tasks

- Remove drive flange from rear differential
- If necessary, press off dust cover

Withdraw shaft seal with special tools 00 5 010 and 32 1 060/33 1 308.

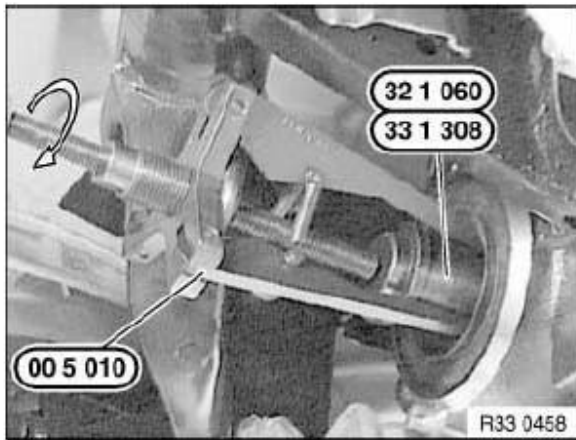


Fig. 48: Removing Shaft Seal Using Special Tools (00 5 010 And 32 1 060)
 Courtesy of BMW OF NORTH AMERICA, INC.

Coat housing plate flange and sealing lips of new shaft seal with **APPROVED REAR DIFFERENTIAL OIL**.

Drive in new shaft seal as far as it will go with following special tools (depending on rear differential/outside diameter).

- 33 5 130
- 33 5 140

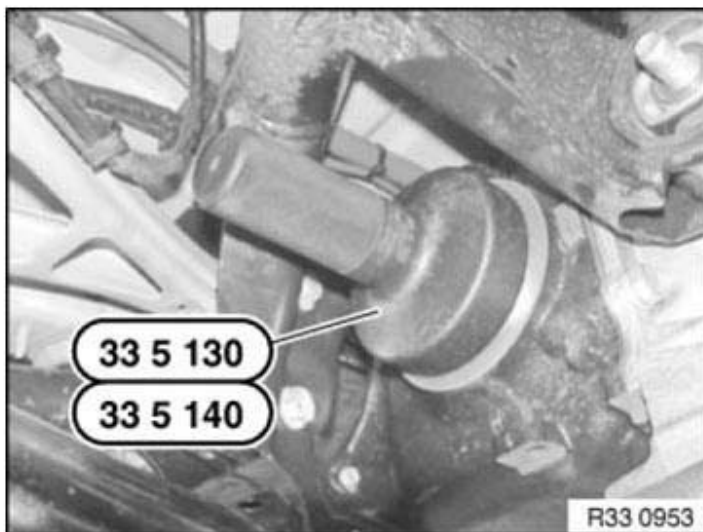


Fig. 49: Installing Shaft Seal Using Special Tools (33 5 130 And 33 5 140)
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Correct rear differential fluid level

33 11 145 REPLACING SHAFT SEAL FOR RIGHT DRIVE FLANGE

The procedure is described in the document "REPLACING SHAFT SEAL FOR LEFT DRIVE FLANGE".

3317 FINAL DRIVE MOUNTING

33 17 004 REPLACING ALL RUBBER MOUNTS FOR REAR AXLE DIFFERENTIAL MOUNTING AT FRONT

Necessary preliminary tasks

- Remove REAR DIFFERENTIAL

Pull out rubber mount with special tools 33 3 314, 33 3 315, 33 3 361, 33 3 362 and an M12 nut (1).

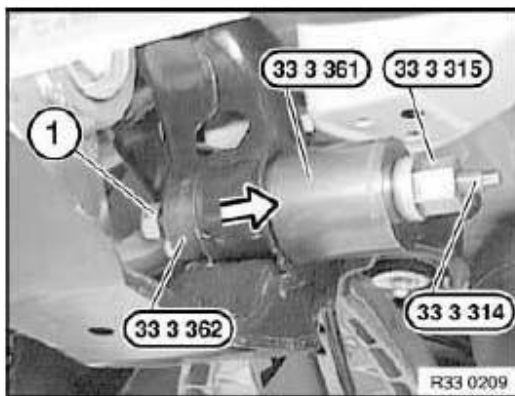


Fig. 50: Pulling Out Rubber Mount Using Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Observe installation position of rubber mount.

Fig. 51: Protrusion (A) in rear direction of travel

Fig. 51: Openings (1) in transverse vehicle direction

Coat new rubber mount and bearing bushing in rear axle carrier with Circo Light.

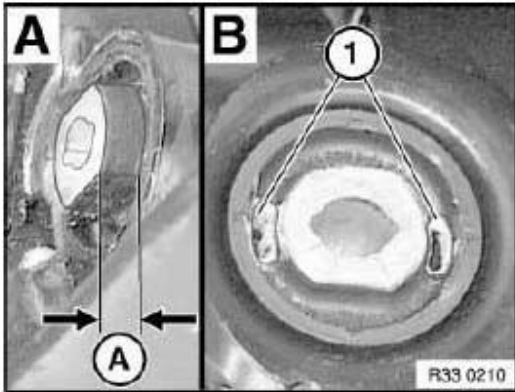


Fig. 51: Identifying Rear Direction Of Travel Protrusion And Transverse Vehicle Direction Openings
 Courtesy of BMW OF NORTH AMERICA, INC.

Draw in rubber mount (1) with special tools 33 3 314, 33 3 315, 33 3 362 and 33 4 173 as far as it will go.

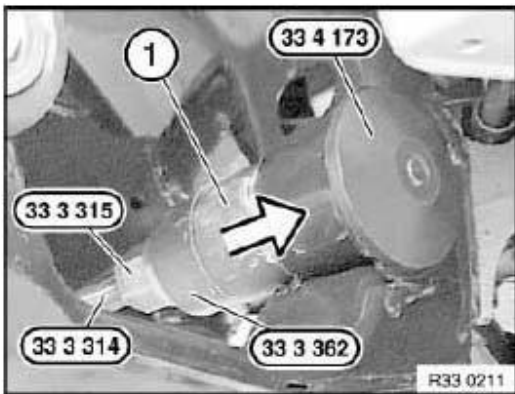


Fig. 52: Installing Rubber Mount Using Special Tools
 Courtesy of BMW OF NORTH AMERICA, INC.

33 17 ... REPLACING RUBBER MOUNT FOR REAR DIFFERENTIAL MOUNTING AT REAR

Pull out rubber mount with special tools 33 4 465, 33 4 466, 33 4 281 and 33 4 183.

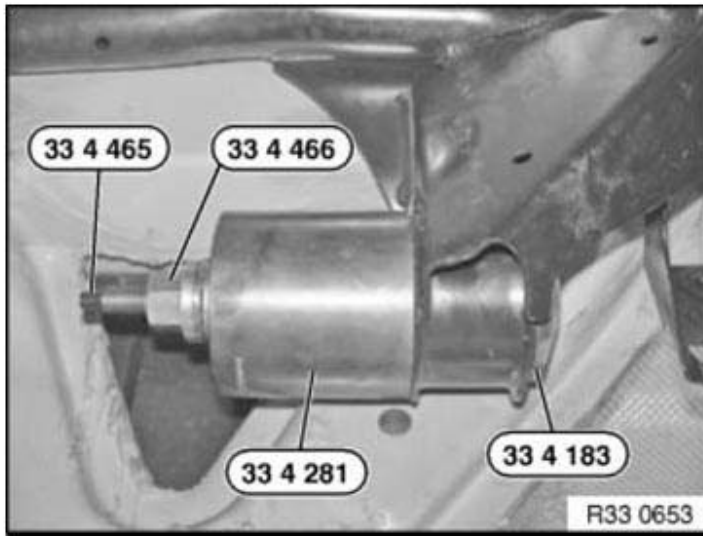


Fig. 53: Pulling Out Rubber Mount Using Special Tools
 Courtesy of BMW OF NORTH AMERICA, INC.

Attach support 33 4 455 and strap retainer 33 4 456 to special tool 33 4 450 .

Install rubber mount (1) in special tool 33 4 450 and pull together.

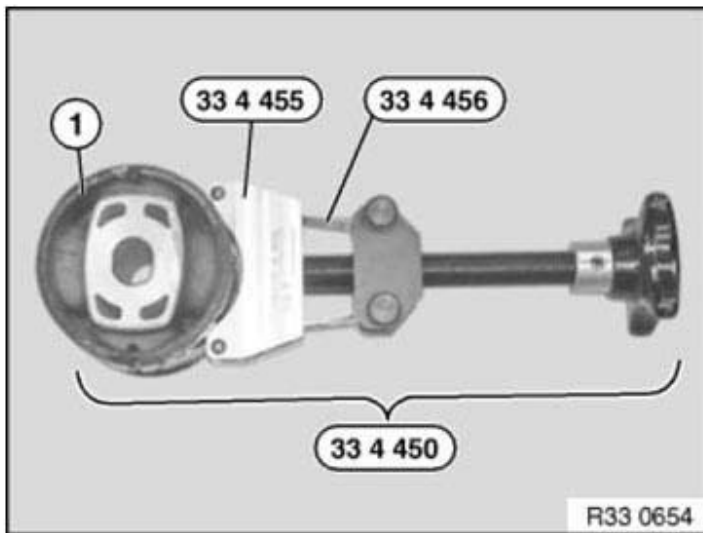


Fig. 54: Installing Rubber Mount On Special Tool (33 4 450)
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Coat bearing bushing in rear axle carrier and new rubber mount with Circo Light.

Align rubber mount by way of elongated hole (1) to vehicle longitudinal direction (F).

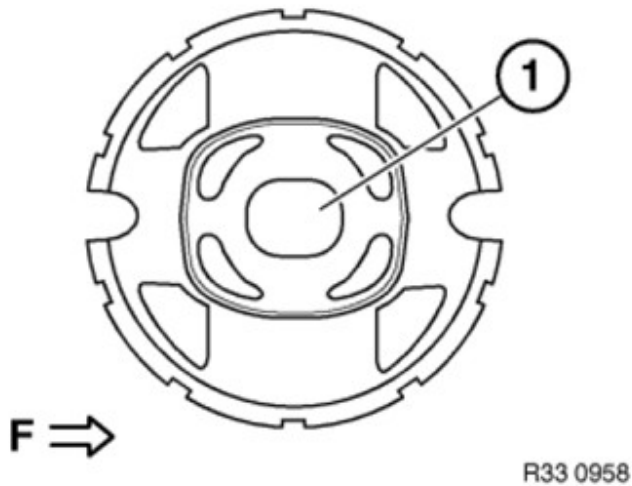


Fig. 55: Identifying Rubber Mount Aligning Hole
 Courtesy of BMW OF NORTH AMERICA, INC.

Install rubber mount (1) with special tools 33 4 465, 33 4 466, 33 4 182 and 33 4 285 until special tool 33 4 450 rests on rear axle carrier.

Release special tool 33 4 450 and remove.

Install rubber mount (1) as far as it will go.

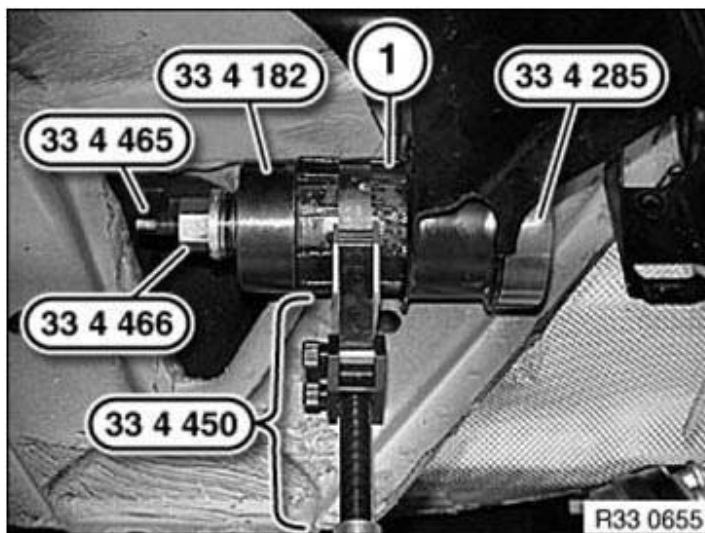


Fig. 56: Installing Rubber Mount Using Special Tools
 Courtesy of BMW OF NORTH AMERICA, INC.

3321 OUTPUT SHAFTS

33 21 ... PRESSING OUTPUT SHAFT OUT OF DRIVE FLANGE AND DRAWING IN (OUTPUT

SHAFT REMOVED FROM REAR AXLE FINAL DRIVE)

WARNING: Risk of injury!

It is not permitted to use the impact screwdriver to press out and draw in the output shaft.

IMPORTANT: Risk of damage!

To avoid damaging the output shaft and adjoining parts, it is essential during the pressing-out process to repeatedly check and if necessary correct the position of the output shaft.

Remove **REAR WHEEL** .

IMPORTANT: Expand anti-twist lock sufficiently to avoid damaging thread when releasing collar nut.

Release collar nut, activate parking brake for this purpose.

Tightening torque **33 41 1AZ** .

Installation:

Replace collar nut, oil collar nut/wheel bearing contact surface lightly and tighten down.

No oil permitted on thread of shaft journal or collar nut.

Secure collar nut by positive peening on flat areas of output shaft.

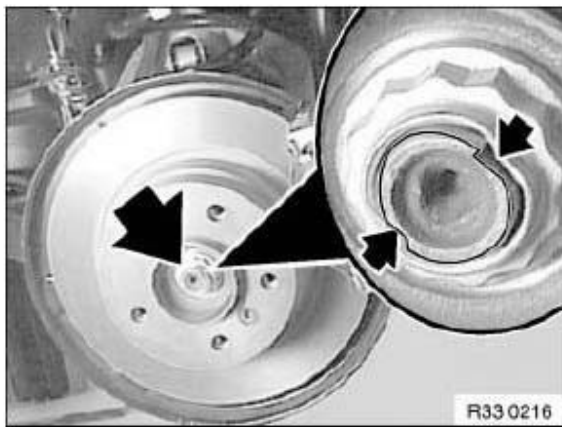


Fig. 57: Locating Collar Nut

Courtesy of BMW OF NORTH AMERICA, INC.

Assemble special tools 33 2 201, 33 2 203 with 33 2 207.

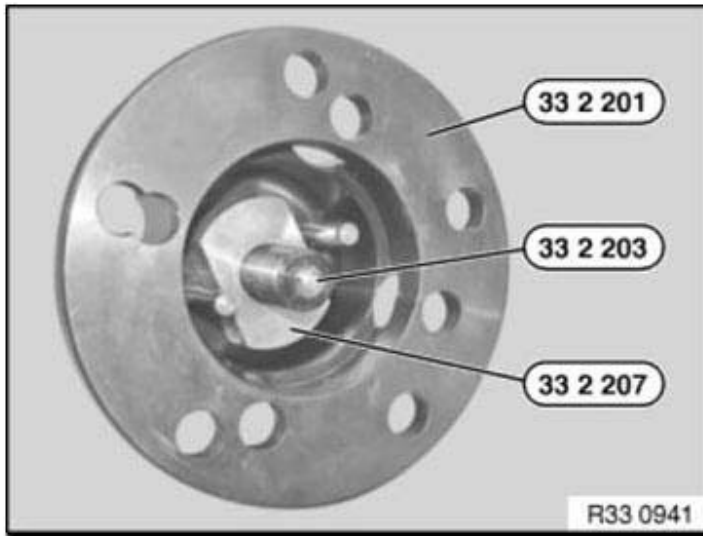


Fig. 58: Assembling Special Tools (33 2 201 , 33 2 203) With (33 2 207)
 Courtesy of BMW OF NORTH AMERICA, INC.

Secure output shaft against falling out.

Screw on special tools 33 2 203 and 33 2 201 with **all** wheel bolts to drive flange.

Press output shaft out of drive flange; in so doing, grip basic body 33 2 201 with special tools 33 2 202 and 33 5 070 .

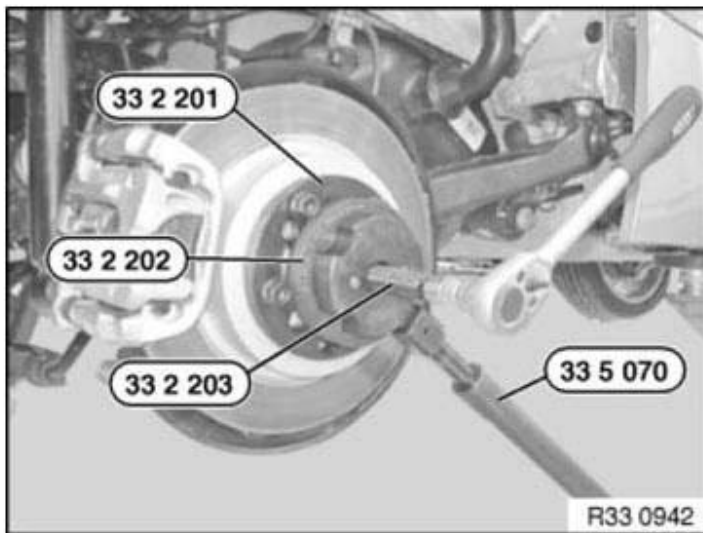


Fig. 59: Pressing Output Shaft Out Of Drive Flange
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: No oil permitted on shaft journal thread!

Lightly oil spline teeth of output shaft.

Insert output shaft into drive flange.

Screw special tool 33 2 206 onto output shaft.

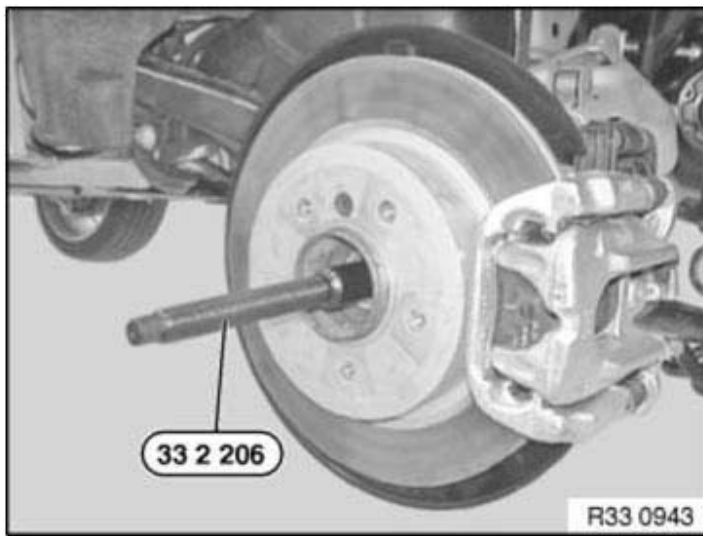


Fig. 60: Positioning Special Tool (33 2 206) Onto Output Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

Mount special tool 33 2 201 with **three** wheel bolts to drive flange.

Draw in output shaft with special tools 33 2 206 and 33 2 208 up to stop; in so doing, grip basic body 33 2 201 with special tools 33 2 202 and 33 5 070 .

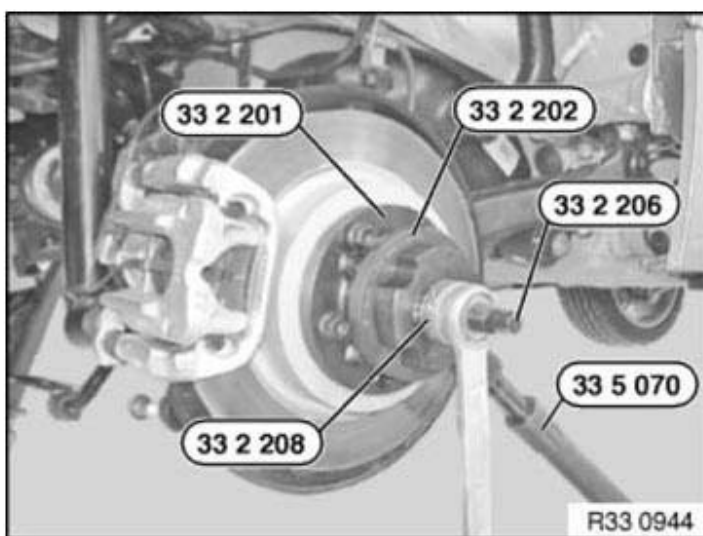


Fig. 61: Installing Output Shaft Using Special Tools (33 2 206 And 33 2 208)

Courtesy of BMW OF NORTH AMERICA, INC.

33 21 001 REMOVING AND INSTALLING OR REPLACING LEFT OUTPUT SHAFT

WARNING: Scalding hazard!

Only perform the following tasks after the vehicle has cooled down.

Necessary preliminary tasks

- Remove **EXHAUST SYSTEM** .

The subsequent procedure is described in the document "**REMOVING AND INSTALLING/REPLACING RIGHT OUTPUT SHAFT**".

33 21 002 REMOVING AND INSTALLING/REPLACING RIGHT OUTPUT SHAFT

Remove **REAR WHEEL** .

IMPORTANT: Expand turning lock sufficiently to avoid damaging thread when releasing collar nut.

Release collar nut, activate parking brake for this purpose.

Tightening torque **33 41 1AZ** .

Installation:

Replace collar nut, oil collar nut/wheel bearing contact surface lightly and tighten down.

No oil permitted on thread of shaft journal or collar nut.

Secure collar nut by positive peening on flat areas of output shaft.

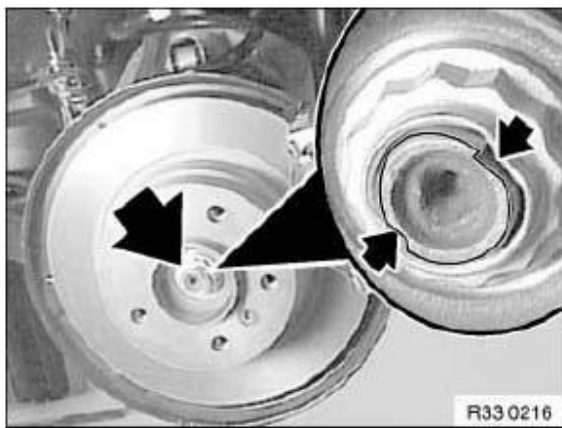


Fig. 62: Locating Collar Nut

Courtesy of BMW OF NORTH AMERICA, INC.

Remove **TENSION STRUT** .

Remove heat shield.

Remove **STABILIZER ON REAR AXLE CARRIER** .

REMOVE STABILIZER BAR BRACKET FROM CONTROL ARM AT TOP .

Release bolts and remove with washers (1).

Tightening torque **33 21 1AZ** .

Press output shaft off drive flange using a suitable tool; if necessary, raise trailing arm with workshop jack approx. 20 mm.

Installation:

Before installing output shaft, make sure that drive flange is fully engaged in rear differential.

Replace bolts and washers (1).

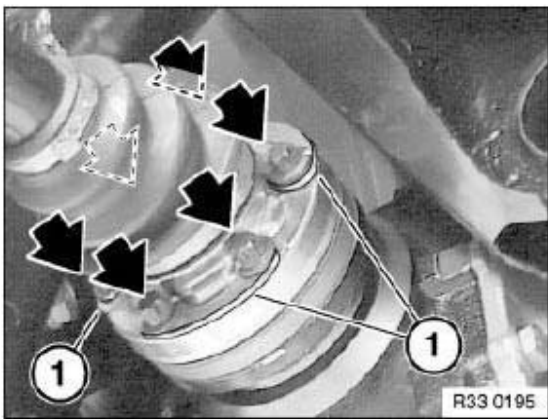


Fig. 63: Locating Washer Bolts

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

Do not drive output shaft out of drive flange with an impact tool.

Press **OUTPUT SHAFT OUT OF DRIVE FLANGE** and remove towards center of vehicle.

After installation

- Check that output shaft is correctly seated in rear differential.

33 21 071 REPLACING BOTH GAITERS ON LEFT AND RIGHT OF OUTPUT SHAFT

Necessary preliminary tasks

- Remove output shaft . See **3321001 REMOVING AND INSTALLING OR REPLACING LEFT OUTPUT SHAFT** or **3321002 REMOVING AND INSTALLING/REPLACING RIGHT OUTPUT SHAFT**

Removing inner gaiter

Clean output shaft and clamp with a cloth in vice.

Unfasten hose clip (1).

Using a suitable tool, force gaiter cap (2) off joint or sealing cover.

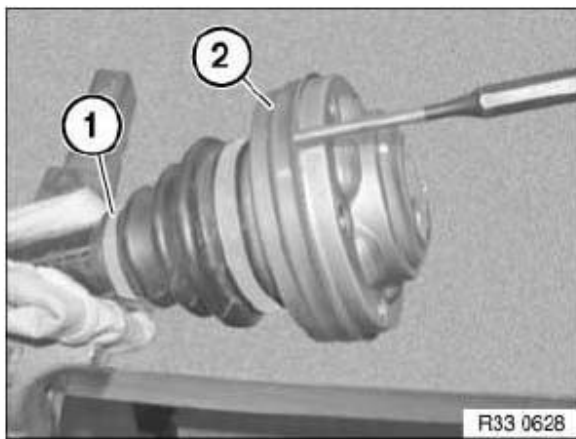


Fig. 64: Pushing Gaiter Cap Off Joint Using Tool
Courtesy of BMW OF NORTH AMERICA, INC.

Push back gaiter with cap.

IMPORTANT: Risk of damage!
Make sure that joint does not fall apart.

Clamp joint (1) in vice.

Using a suitable tool, force sealing cover (2) off joint (1).

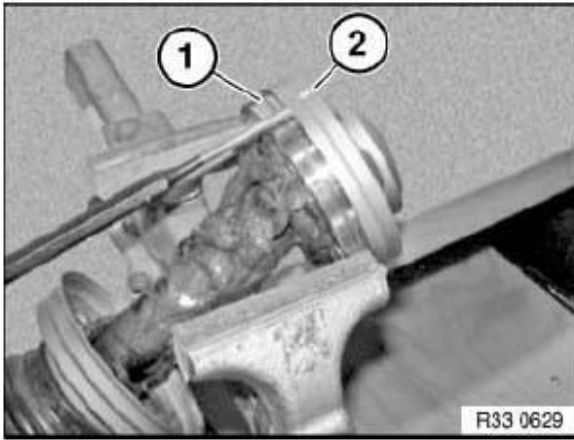


Fig. 65: Removing Sealing Cover Off Joint Using Tool
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Mark positions in relation to each other of ball hub, ball cage and joint at ends.

NOTE: If the joint falls apart, it can only be reassembled correctly with the aid of the markings.

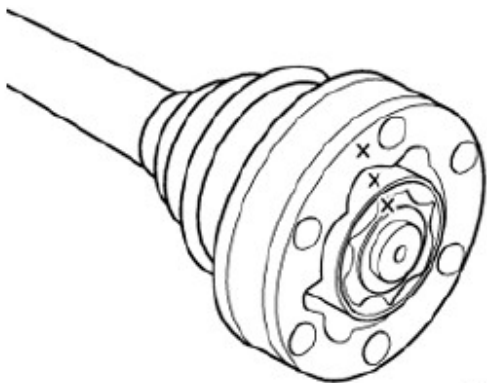


Fig. 66: Identifying Marking On Ball Hub, Ball Cage And Joint
 Courtesy of BMW OF NORTH AMERICA, INC.

Remove circlip (1).

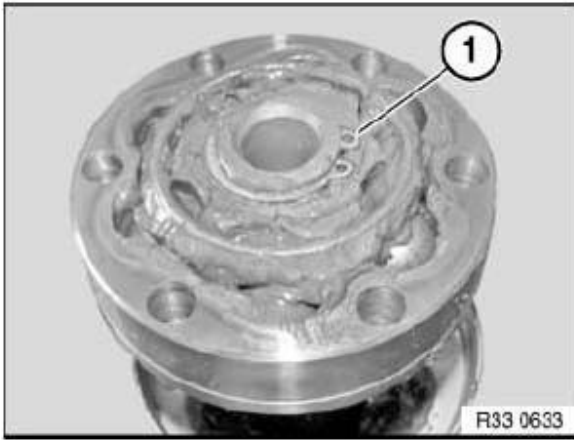


Fig. 67: Identifying Circlip
 Courtesy of BMW OF NORTH AMERICA, INC.

Grip output shaft.

Using special tool 26 1 110 and a suitable tool (for hollow shaft 21 2 120), press output shaft out of joint (1).

Clean joint (1) carefully.

NOTE: All traces off old grease must be removed.

Detach gaiter from output shaft.

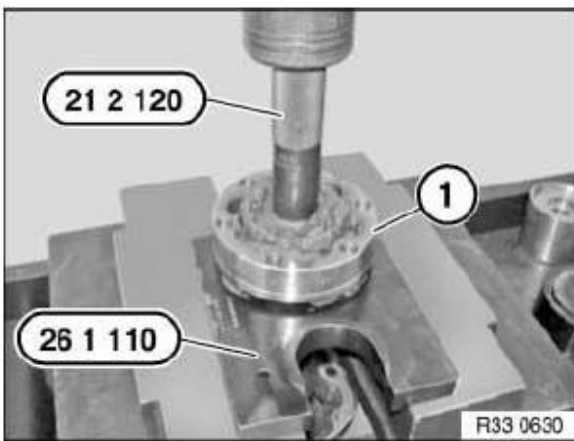


Fig. 68: Pressing Output Shaft Out Of Joint Using Special Tool
 Courtesy of BMW OF NORTH AMERICA, INC.

Removing and installing outer gaiter

Release hose clamps (1, 3) and detach gaiter (2) from output shaft.

Clean joint and output shaft carefully.

NOTE: All traces off old grease must be removed.

Check joint for damage; if necessary, replace output shaft . See **3321001 REMOVING AND INSTALLING OR REPLACING LEFT OUTPUT SHAFT** or **3321002 REMOVING AND INSTALLING/REPLACING RIGHT OUTPUT SHAFT**.

Fill joint with propeller shaft grease.

Fit gaiter (2) on bellows and secure with hose clamps (1, 3).

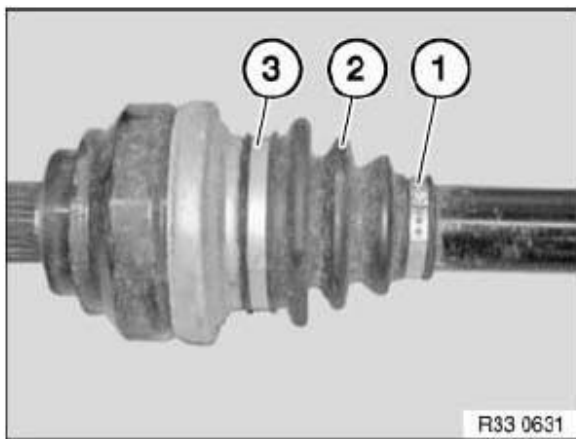


Fig. 69: Identifying Hose Clamps And Gaiter On Output Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

Installing inner gaiter

Push gaiter with cap onto output shaft (1).

Mount special tool 33 2 100 with corresponding shell inserts on output shaft (1).

Press joint (2) over bearing inner race onto output shaft.

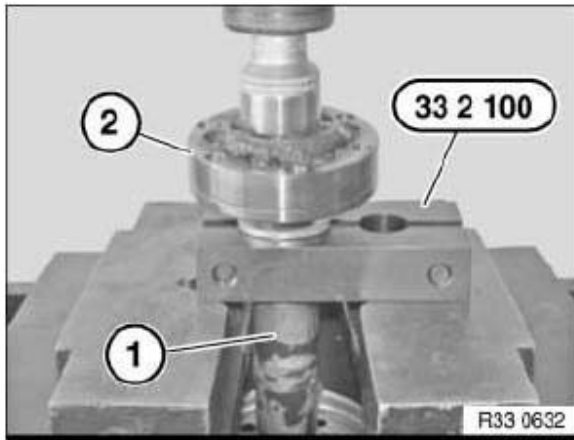


Fig. 70: Mounting Special Tool (33 2 100) On Shell
Courtesy of BMW OF NORTH AMERICA, INC.

Install new circlip (1).

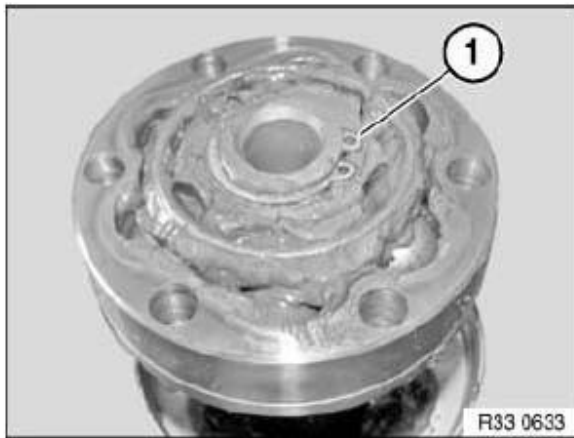


Fig. 71: Identifying Circlip
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Keep sealing faces of cap and joint (on both sides) clean and free from grease.

Fill joint at both ends with high-temperature grease.

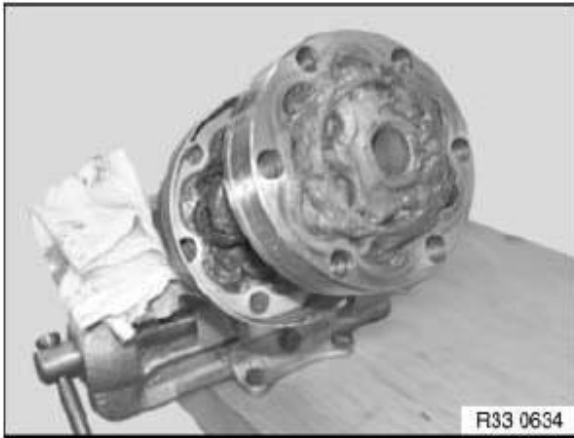


Fig. 72: Filling High-Temperature Grease On Joints Ends
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

Do not install gaiter with cap and sealing cover on joint without shims.

Apply a thin coating of sealing compound to sealing faces of sealing cover and cap.

Install sealing cover (1) with two bolts, shims and nuts on joint.

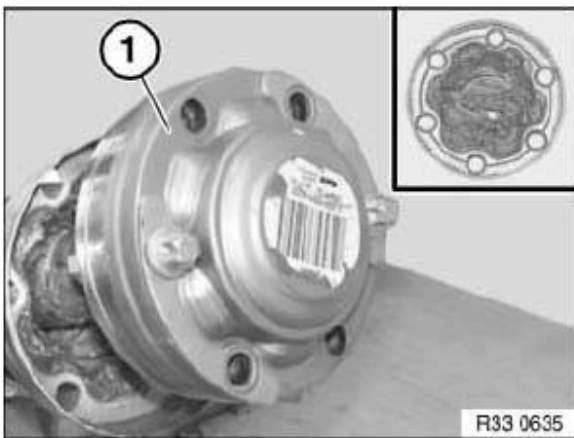


Fig. 73: Identifying Sealing Cover
 Courtesy of BMW OF NORTH AMERICA, INC.

Install cap (1) with two bolts, shims and nuts on joint.

Fit hose clamp (2).

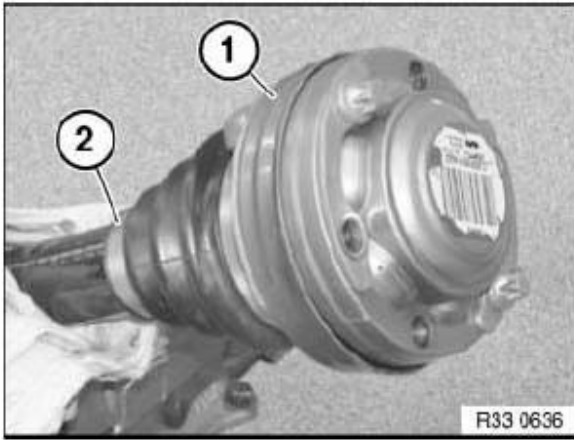


Fig. 74: Identifying Cap And Hose Clamp
 Courtesy of BMW OF NORTH AMERICA, INC.

33 21 ... RIBBED TEETH

IMPORTANT: Bolts with ribbed teeth must be replaced after they have been released!

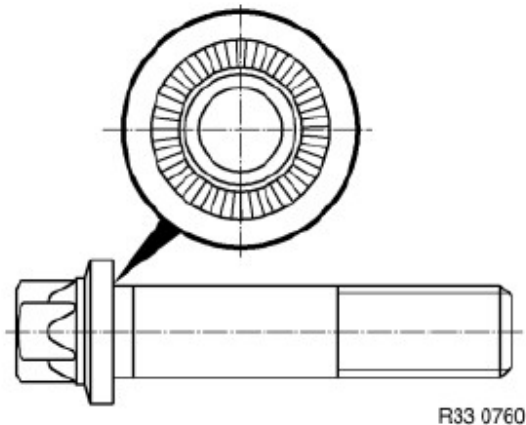


Fig. 75: Identifying Bolt With Ribbed Teeth
 Courtesy of BMW OF NORTH AMERICA, INC.

3331 REAR SUB-FRAME

33 31 503 LOWERING/RAISING REAR AXLE CARRIER

WARNING: Danger of injury!

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

Read and observe the information on load distribution in the Owner's Handbook, lifting platform.

Before lowering/removing the rear axle carrier, it is essential to place a

minimum load of 100 kg in the luggage compartment to prevent the vehicle from toppling/slipping off the lifting platform!

When supporting components, make sure that

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

NOTE: If the rear axle carrier is detached from the body, it is necessary after reinstallation to carry out a wheel/chassis alignment check.

Necessary preliminary tasks

- Remove **PROPELLER SHAFT FROM REAR DIFFERENTIAL** and tie back
- Release shock absorber . See **3712131 REPLACING LEFT OR RIGHT REAR SHOCK ABSORBER (ADAPTIVE M SUSPENSION)** or **3352000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER** on left and right on trailing arm

IMPORTANT: Risk of damage!
Brake hose must not be exposed to tensile loads.

Release screws (1) on trailing arm on left and right and remove holder.

Tightening torque **34 32 4AZ** .

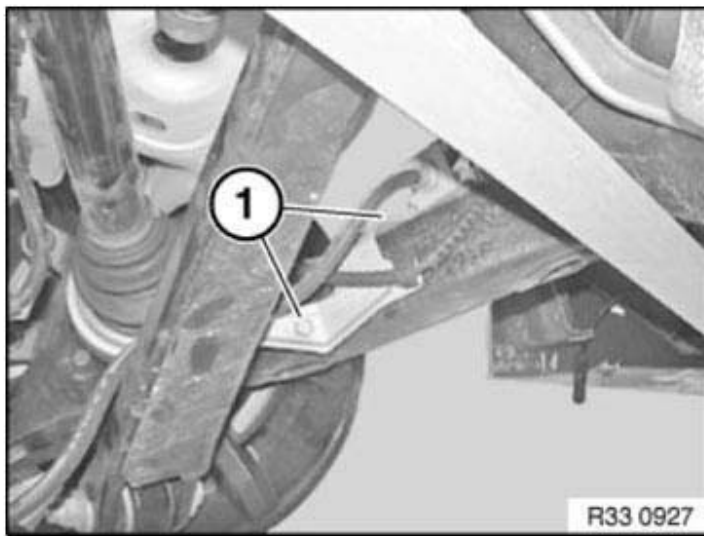


Fig. 76: Identifying Screws On Trailing Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect **PLUG CONNECTION** from ride-height sensor

Support rear axle carrier with workshop jack and special tool 31 5 250 .

IMPORTANT: Risk of injury!

Position support (1) at rear on rear axle carrier.

Position support (2) in bore at front on rear axle carrier.

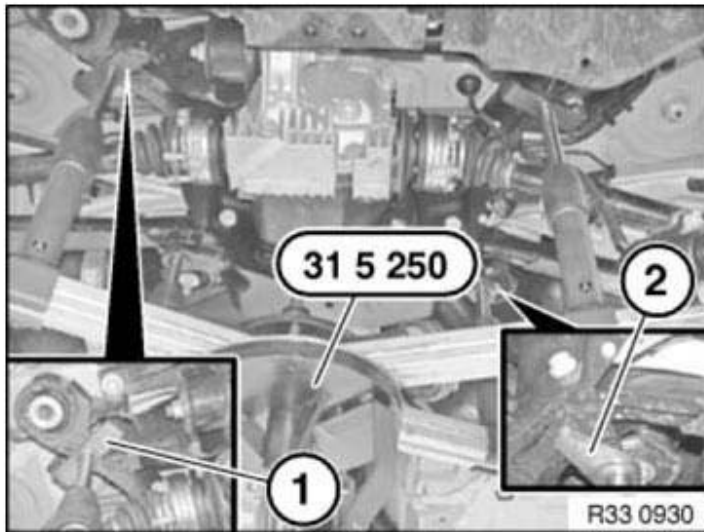


Fig. 77: Supporting Rear Axle Carrier Using Workshop Jack And Special Tool (31 5 250)
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Release nuts (2) and remove tension strut.

Tightening torque **33 33 1AZ** .

Lower rear axle carrier slowly.

Installation:

Check threads for damage; if necessary, repair with **HELICOIL THREAD INSERTS** .

Check seating of coil springs with spring pads, correct if necessary.

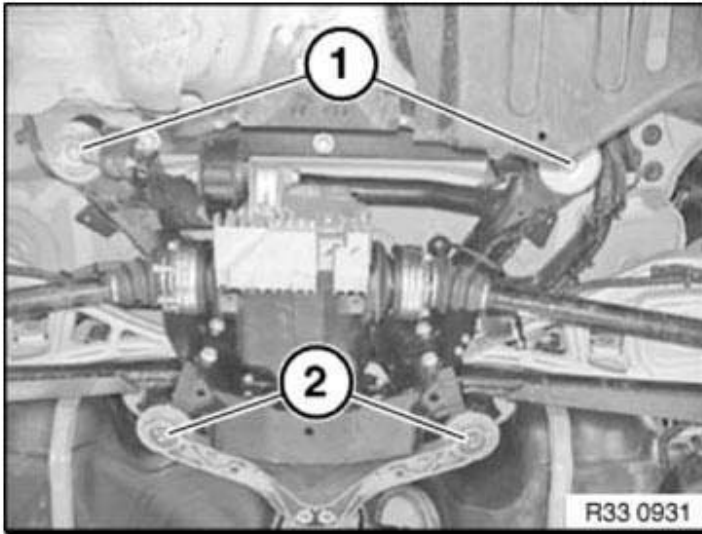


Fig. 78: Identifying Tension Strut Nut And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check threaded pin for damage, replace if necessary.

Tightening torque **33 33 2AZ** .

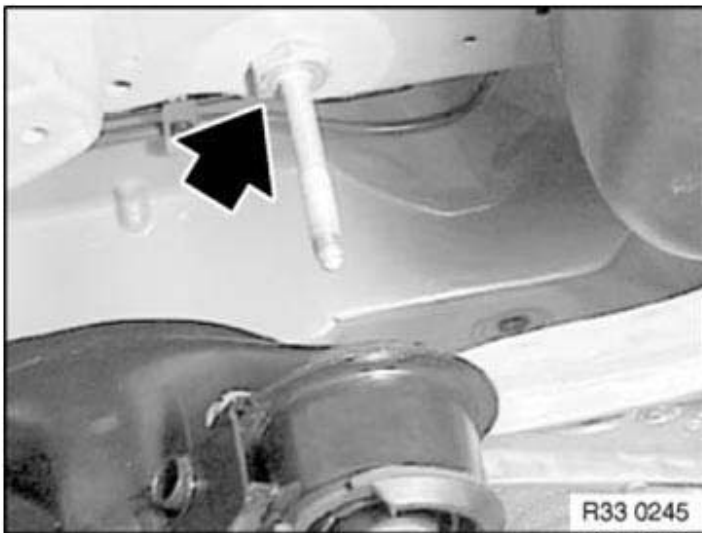
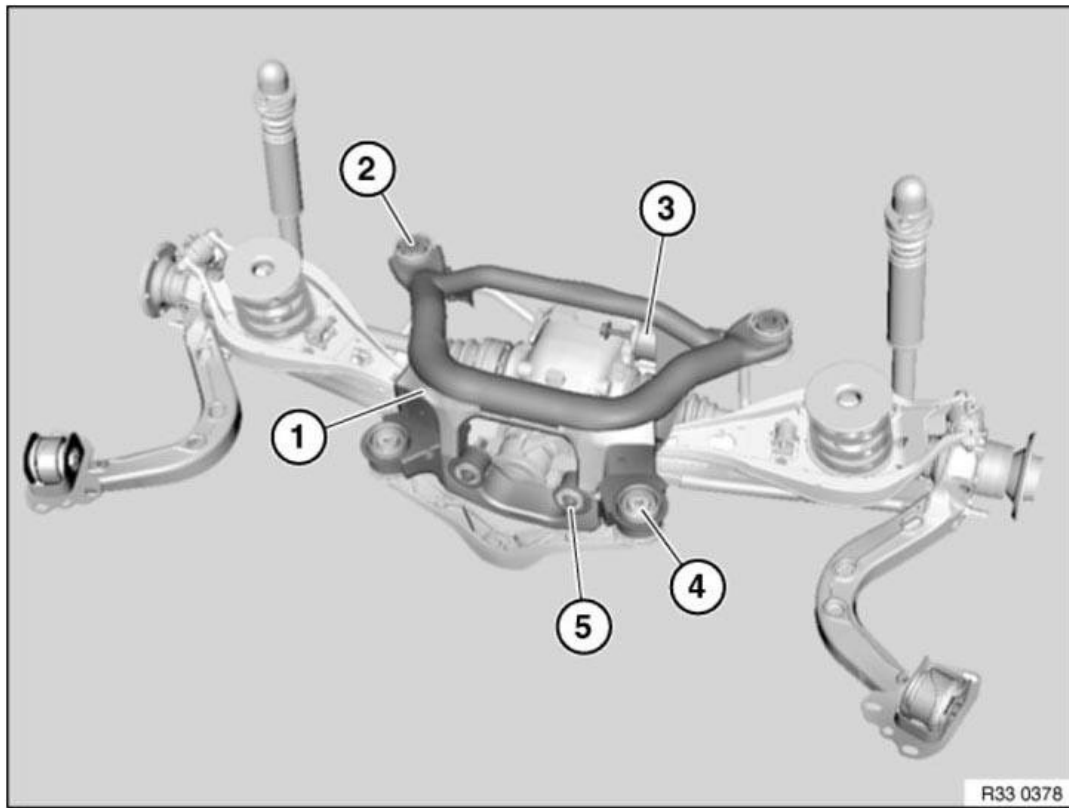


Fig. 79: Locating Threaded Pin
 Courtesy of BMW OF NORTH AMERICA, INC.

33 31 . OVERVIEW OF REAR AXLE CARRIER WITH RUBBER MOUNTS



- | | |
|--|---|
| 1 Rear axle carrier | 4 Rear axle carrier rubber mount, front |
| 2 Rear axle carrier rubber mount, rear | 5 Rear differential rubber mount, front |
| 3 Rear differential rubber mount, rear | |

Fig. 80: Overview Of Rear Axle Carrier With Rubber Mounts
 Courtesy of BMW OF NORTH AMERICA, INC.

33 31 000 REMOVING AND INSTALLING COMPLETE REAR AXLE CARRIER

WARNING: Danger of injury!

Failure to comply with the following instructions may result in the vehicle slipping off the lifting platform and critically injuring other persons. Read and observe the information on load distribution in the Owner's Handbook, lifting platform.

Before lowering/removing the rear axle carrier, it is essential to place a minimum load of 100 kg in the luggage compartment to prevent the vehicle from toppling/slipping off the lifting platform!

When supporting components, make sure that

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

Necessary preliminary tasks

- Remove **PROPELLER SHAFT FROM REAR DIFFERENTIAL** and tie back
- Remove rear axle **STABILIZER**

IMPORTANT: Risk of damage!
Brake hose must not be exposed to tensile loads.

Release screws (1) and remove brackets.

Tightening torque **34 32 4AZ** .

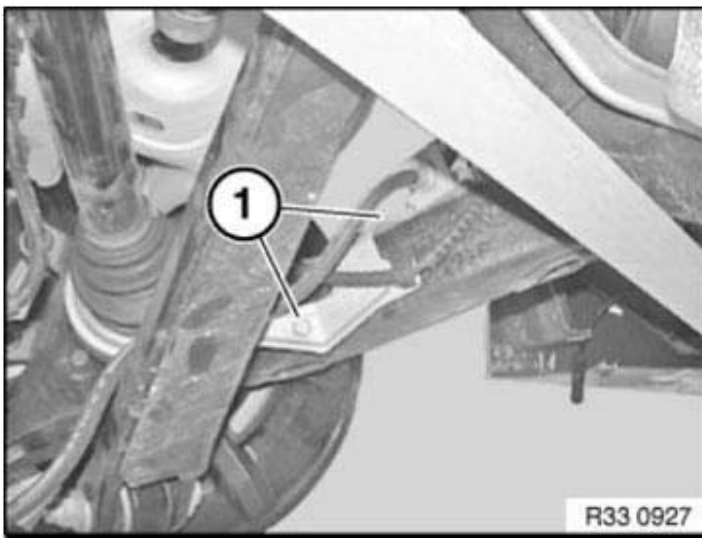


Fig. 81: Identifying Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection for right **BRAKE PAD WEAR SENSOR** .

Disconnect plug connection for **PULSE GENERATOR** on both sides.

Disconnect plug connection on **RIDE-HEIGHT SENSOR** .

Release output shafts . See **3321001 REMOVING AND INSTALLING OR REPLACING LEFT OUTPUT SHAFT** or **3321002 REMOVING AND INSTALLING/REPLACING RIGHT OUTPUT SHAFT** from rear differential.

Release shock absorber . See **3712131 REPLACING LEFT OR RIGHT REAR SHOCK ABSORBER (ADAPTIVE M SUSPENSION)** or **3352000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER** on trailing arm.

Remove **COIL SPRINGS** at rear.

Disconnect plug connection from brake anchor plate and unclip cable from trailing arm.

Release brake caliper on brake anchor plate.

Guide brake caliper through between output shaft and lower control arm and tie up.

Remove **BEARING BLOCK FOR TRAILING ARM FROM BODY** .

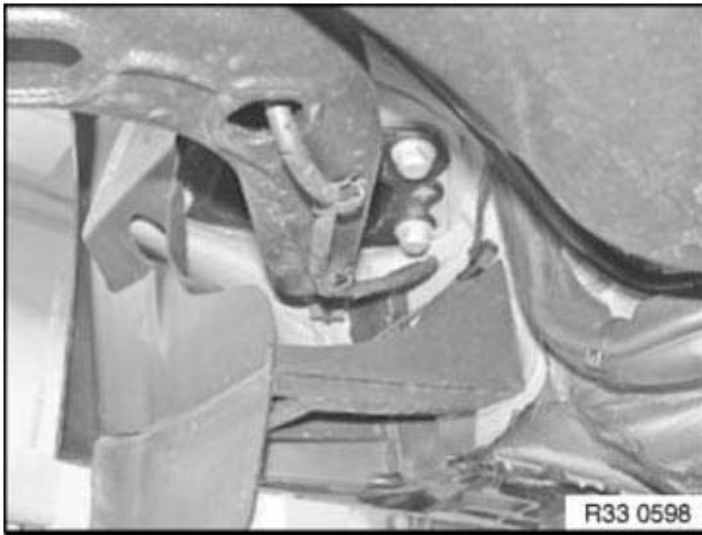


Fig. 82: Identifying Bearing Block Of Trailing Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Support rear axle carrier with workshop jack and special tool 31 5 250 .

IMPORTANT: Danger of injury:

Position support (1) at rear on rear axle carrier.

Position support (2) in bore at front on rear axle carrier.

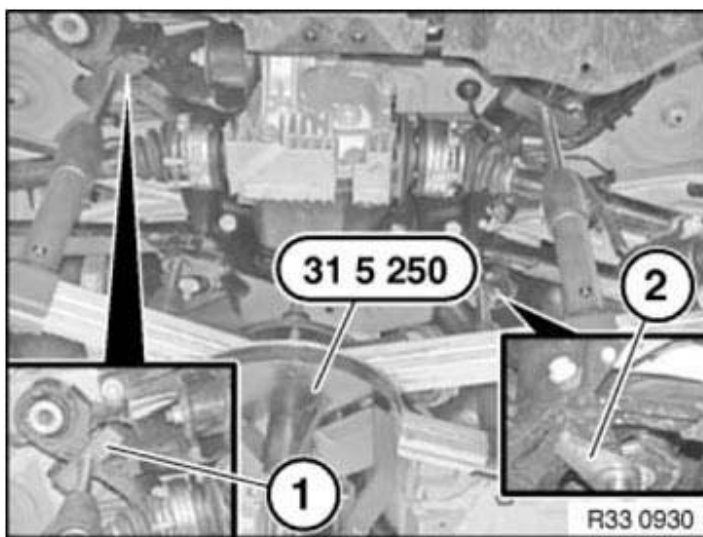


Fig. 83: Supporting Rear Axle Carrier Using Workshop Jack And Special Tool (31 5 250)
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Release nuts (2) and remove tension strut.

Tightening torque **33 33 1AZ** .

Lower rear axle carrier slowly.

Installation:

Check threads for damage; if necessary, repair with **HELICOIL THREAD INSERTS** .

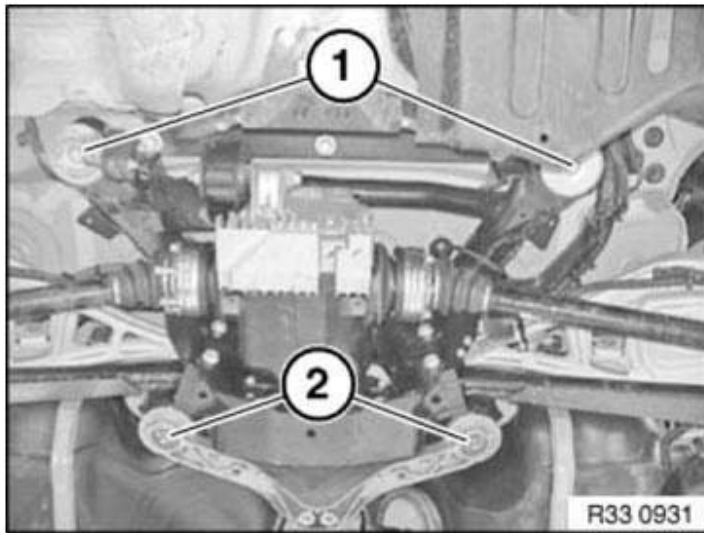


Fig. 84: Identifying Tension Strut Nut And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check threaded pin for damage, replace if necessary.

Tightening torque **33 33 2AZ** .

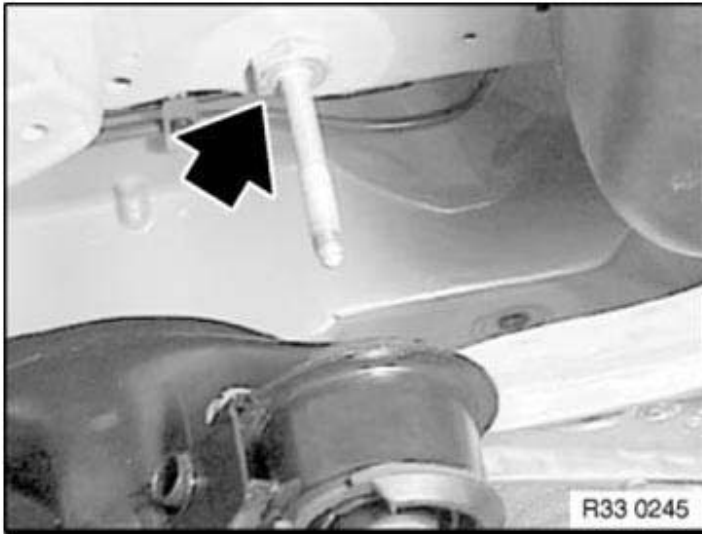


Fig. 85: Locating Threaded Pin
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Perform **CHASSIS ALIGNMENT CHECK**

51 71 390 REMOVING AND INSTALLING/REPLACING REINFORCEMENT PLATE ON REAR AXLE

IMPORTANT: Vehicles must not be driven without reinforcement plates.
Driving without the reinforcement plate may damage the vehicle body.
Screws of reinforcement plate must be tightened to torque and then tightened down with special tool 00 9 120 .

Release screws (1) and remove heat shield (2).

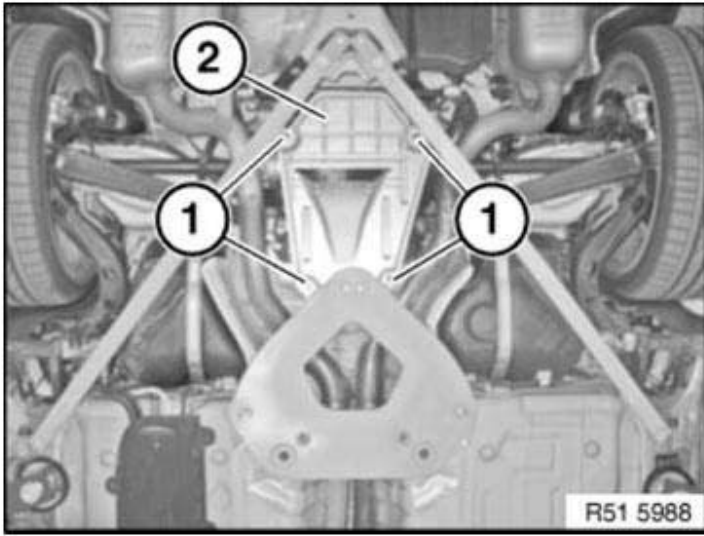


Fig. 86: Identifying Heat Shield With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Tightening torque **51 71 24AZ** .

Unscrew nuts (2).

Tightening torque **51 71 25AZ** .

Unscrew nuts (3).

Tightening torque **51 71 26AZ** .

Remove thrust panel (reinforcement plate) (4).

Installation:

Replace screw (1).

- Tighten down screws (1) to specified torque and then to angle of rotation.

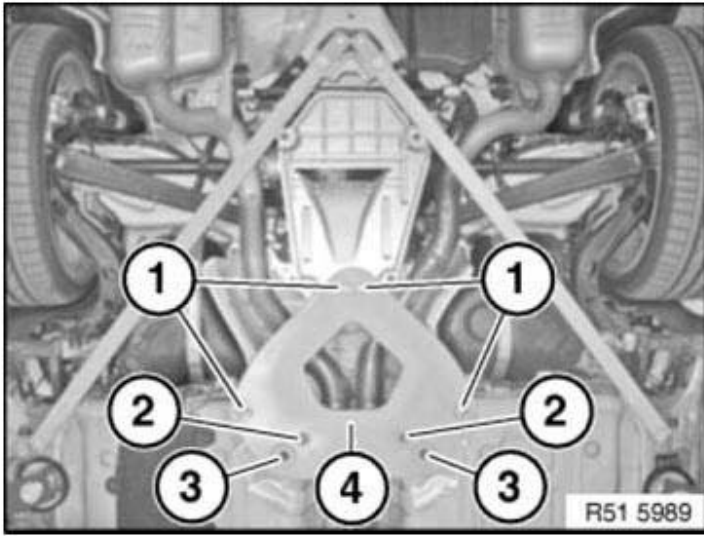


Fig. 87: Identifying Thrust Panel (Reinforcement Plate) With Screws And Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

33 31 025 REMOVING AND INSTALLING/REPLACING VIBRATION ABSORBER ON SIDE MEMBER

Necessary preliminary tasks

- Remove rear **WHEEL ARCH SPLASH GUARD**

Release nut (1) and remove vibration absorber (2) from holder.

Tightening torque, see 33 32 9AZ in **33 32 CONTROL ARMS AND STRUTS** .

Installation:

Pay attention to lock washer (3) between collar nut and vibration absorber.

Replace screw and nut.

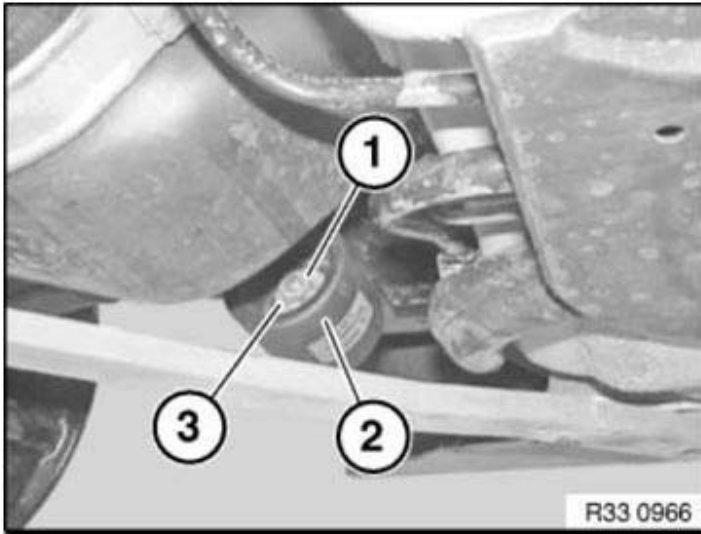


Fig. 88: Identifying Vibration Absorber And Lock Washer With Nut
 Courtesy of BMW OF NORTH AMERICA, INC.

- IMPORTANT:**
- Groove (1) on the vibration absorber must be aligned horizontally to the holder corners!

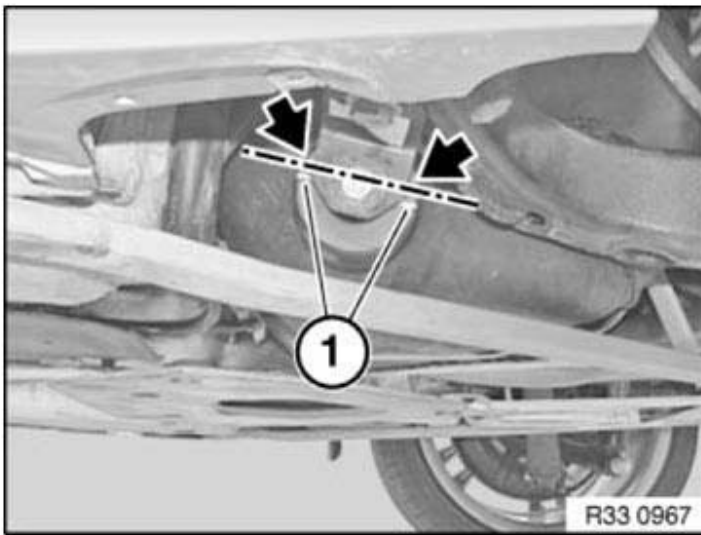


Fig. 89: Identifying Groove On Vibration Absorber
 Courtesy of BMW OF NORTH AMERICA, INC.

33 31 011 REPLACING REAR AXLE CARRIER

WARNING: Danger of injury!

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

Read and observe the information on load distribution in the Owner's Handbook, lifting platform.
Before lowering/removing the rear axle carrier, it is essential to place a minimum load of 100 kg in the luggage compartment to prevent the vehicle from toppling/slipping off the lifting platform!

When supporting components, make sure that

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

Necessary preliminary tasks

- Remove **REAR DIFFERENTIAL**
- Remove **RIDE-HEIGHT SENSOR**
- Remove **REAR AXLE CARRIER**

Remove lower control arm on both sides from rear axle carrier . See **3332086 REMOVING AND INSTALLING/REPLACING BOTTOM LEFT CONTROL ARM** or **3332087 REMOVING AND INSTALLING/REPLACING BOTTOM RIGHT CONTROL ARM**.

Remove upper control arm . See **3332076 REMOVING AND INSTALLING/REPLACING TOP LEFT CONTROL ARM** or **3332077 REMOVING AND INSTALLING/REPLACING TOP RIGHT CONTROL ARM** on both sides from rear axle carrier..

Remove trailing arm complete with output shaft and all suspension arms.

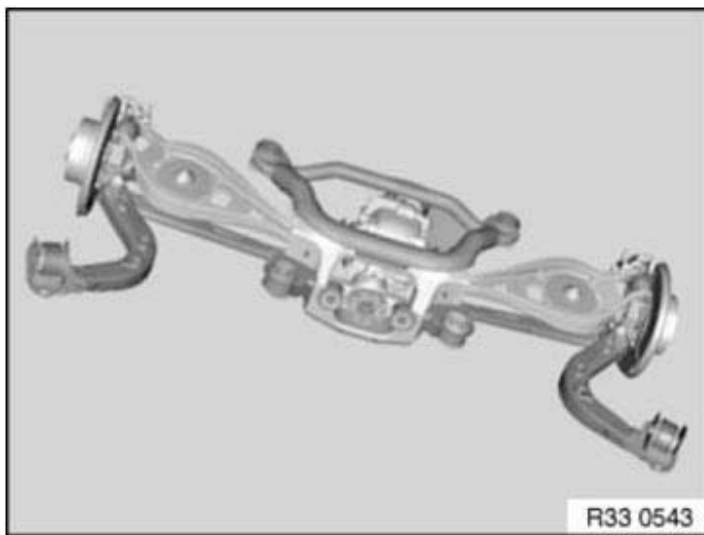


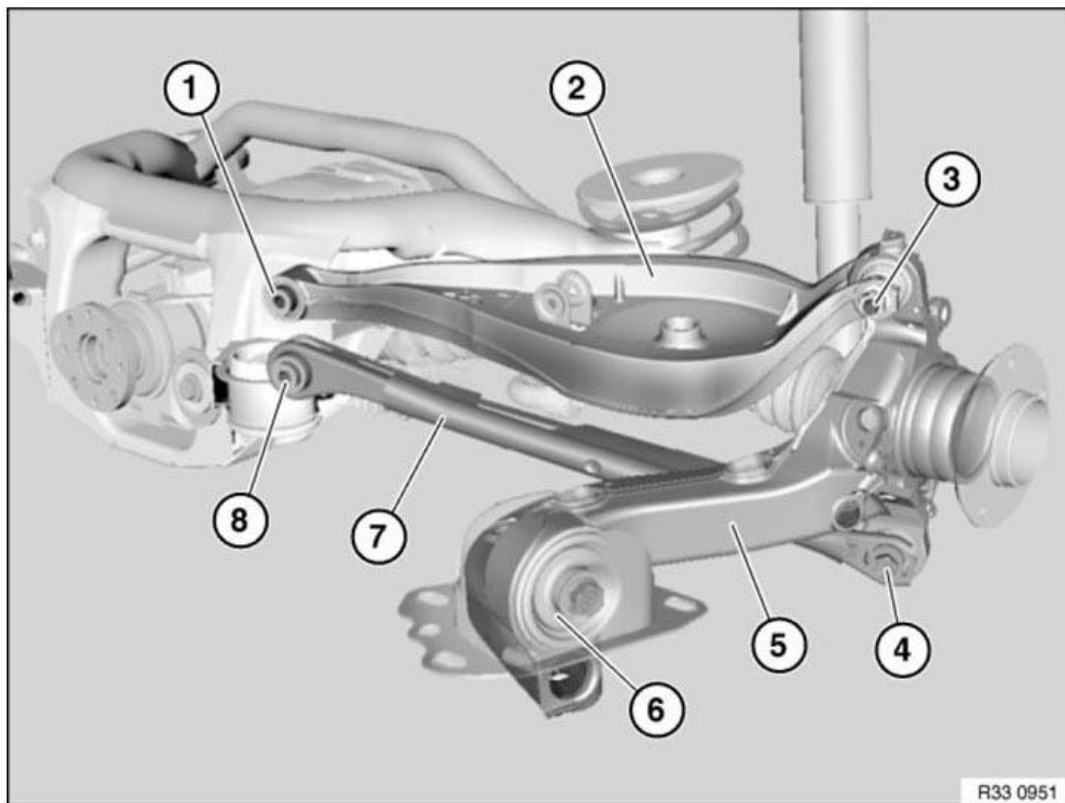
Fig. 90: Identifying Rear Axle Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Perform CHASSIS ALIGNMENT CHECK

3332 CONTROL ARMS AND STRUTS

33 32 ... OVERVIEW OF CONTROL ARMS WITH RUBBER MOUNTS



- | | |
|------------------------------------|---|
| 1 Rubber mount in control arm, top | 6 Rubber mount in trailing arm at front |
| 2 Control arm, top (left/right) | 7 Control arm, bottom (left/right) |
| 3 Ball joint in trailing arm | 8 Rubber mount in control arm, bottom |
| 4 Rubber mount in trailing arm | |
| 5 Trailing arm (left/right) | |

Fig. 91: Overview Of Control Arms With Rubber Mounts
Courtesy of BMW OF NORTH AMERICA, INC.

33 32 077 REMOVING AND INSTALLING/REPLACING TOP RIGHT CONTROL ARM

NOTE: If the upper control arm is detached from the rear axle carrier/trailing arm, it is necessary after reinstallation to carry out a wheel/chassis alignment check.

Necessary preliminary tasks

- Remove OUTPUT SHAFT from rear differential and tie back

- Remove **COIL SPRING**

Release stabilizer on upper control arm.

Tightening torque **33 55 2AZ** .

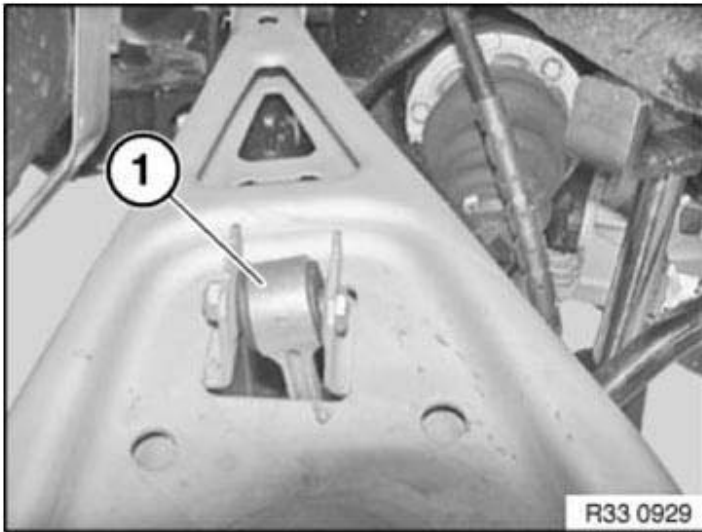


Fig. 92: Identifying Stabilizer On Upper Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1) and remove screw.

Tightening torque **33 32 5AZ** .

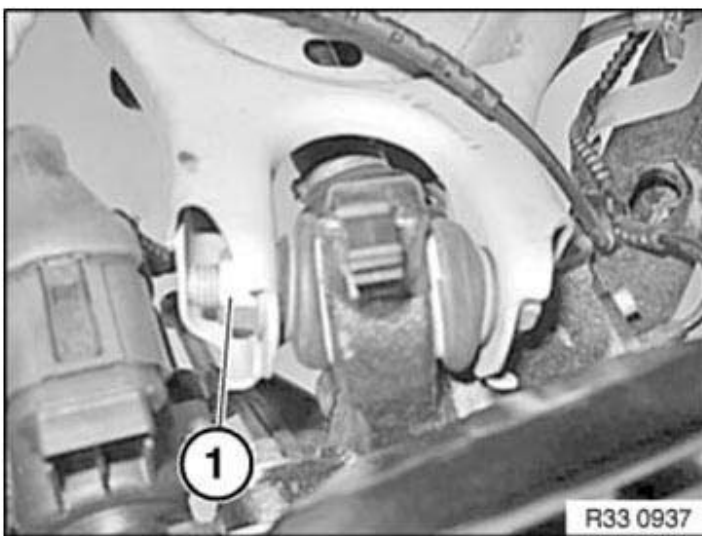


Fig. 93: Identifying Control Arm Nut

Courtesy of BMW OF NORTH AMERICA, INC.

Release bolt (1) on rear axle carrier and unscrew towards rear.

Remove upper control arm at side.

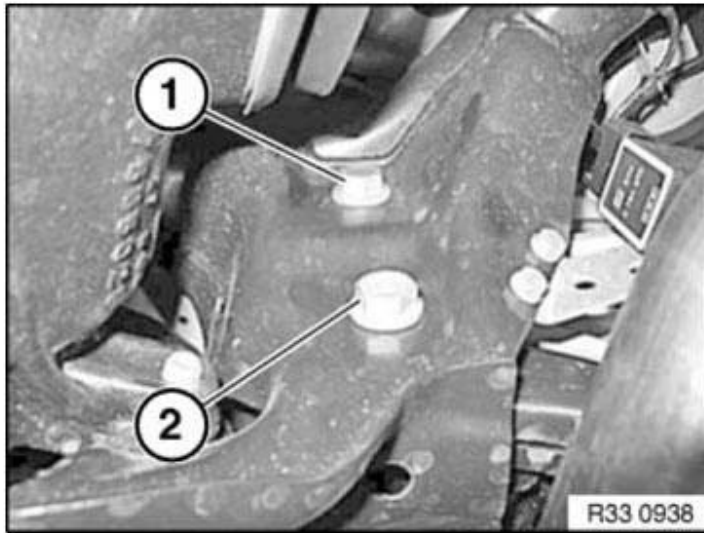


Fig. 94: Identifying Bolt On Rear Axle Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Tighten control arm on rear axle carrier in normal position.

Tightening torque **33 32 6AZ** .

Adjusting normal position:

IMPORTANT: Coil spring must not be fitted yet!

Press wheel carrier upwards with special tool 31 5 220 and workshop jack up to dimension A.

Dimension A = middle of wheel hub to top edge of wheel arch

Conventional chassis/suspension:

A = 361 mm

EDC suspension:

A = 351 mm

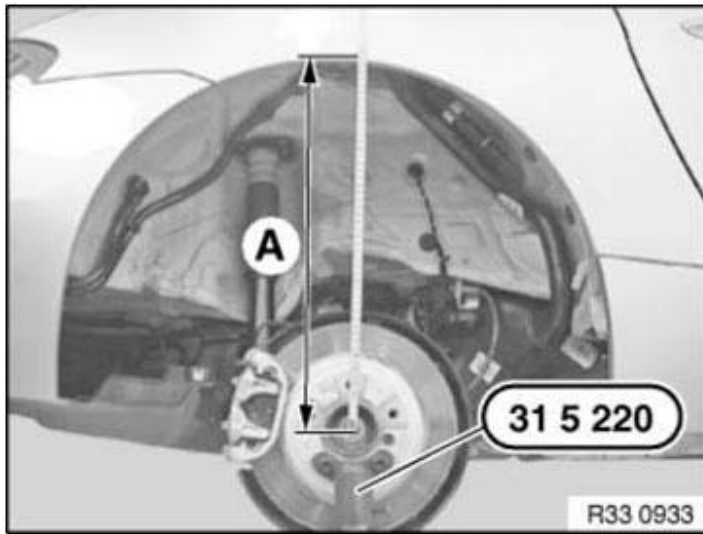


Fig. 95: Pressing Wheel Carrier Upwards Using Special Tool (31 5 220)
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Perform **CHASSIS ALIGNMENT CHECK**

33 32 086 REMOVING AND INSTALLING/REPLACING BOTTOM LEFT CONTROL ARM

NOTE: If the lower control arm is detached from the trailing arm, it is necessary after reinstallation to carry out a wheel/chassis alignment check.

Necessary preliminary tasks

- Remove **REAR WHEEL** .
- Remove shock absorber . See **3712131 REPLACING LEFT OR RIGHT REAR SHOCK ABSORBER (ADAPTIVE M SUSPENSION)** or **3352000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER** from trailing arm

WARNING: Danger of injury!
 Failure to comply with the following instructions may result in the vehicle slipping off the lifting platform and critically injuring other persons.

When supporting components, make sure that

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

Mark position of eccentric screw (1) to lower control arm with center marks (2).

Replacement only: Carry over marking from old part to new part.

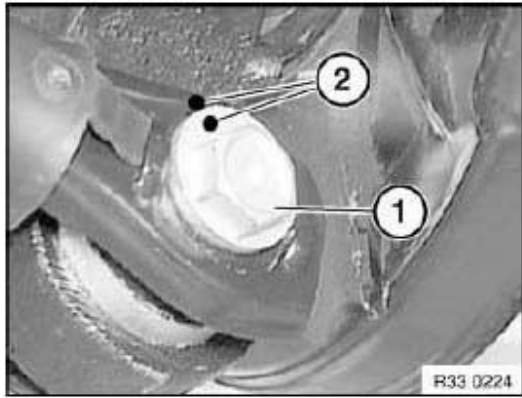


Fig. 96: Identifying Mark Position Of Eccentric Screw With Centre Marks On Lower Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: To avoid damaging the output shaft, it will be necessary to support the trailing arm with the workshop jack.

Support trailing arm from underneath using a workshop jack.

Spread cover on lower control arm and pull off.

Installation:

Opening in cover points upwards.

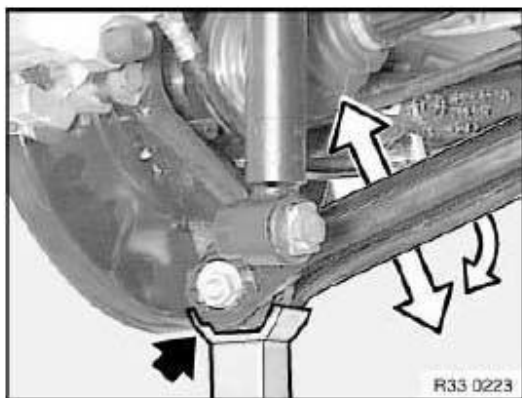


Fig. 97: Pulling Lower Control Arm Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1) and remove eccentric washer (2).

Remove eccentric screw towards front.

Installation:

Note insertion direction of eccentric screw.

Align eccentric screw by means of marking to lower control arm.

Fit eccentric washer (2).

Replace nut (1).

Tightening torque **33 32 3AZ** .

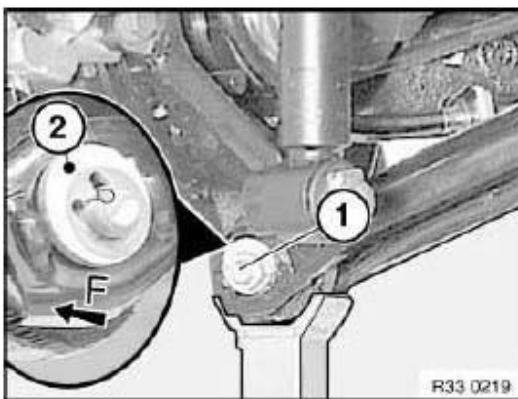


Fig. 98: Identifying Eccentric Washer With Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Support rear differential with workshop jack (1).

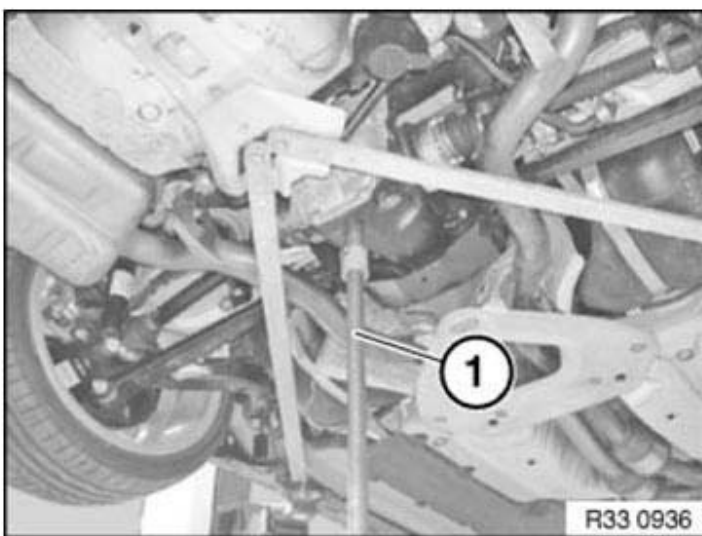


Fig. 99: Supporting Rear Differential Using Workshop Jack
Courtesy of BMW OF NORTH AMERICA, INC.

Release bolts (1) on rear axle differential at front and slide out towards rear until rear axle differential is exposed.

Tightening torque **33 17 1AZ** .

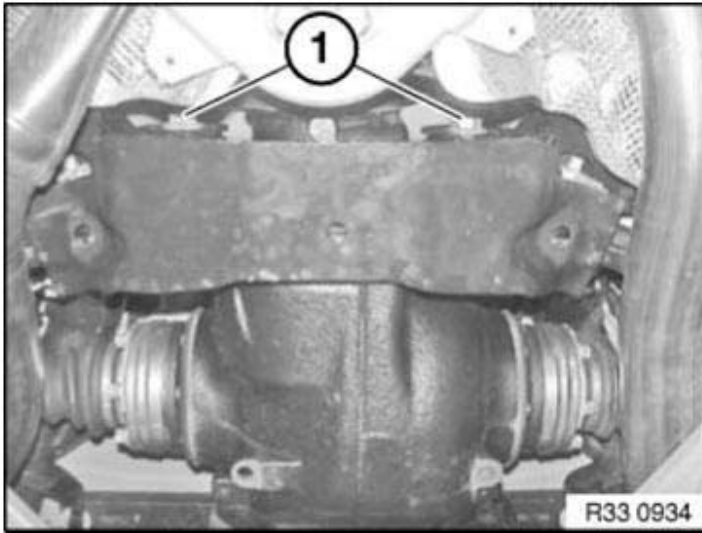


Fig. 100: Identifying Bolts On Rear Axle Differential
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten nut (1) and remove screw (2).

Tightening torque **33 17 2AZ** .

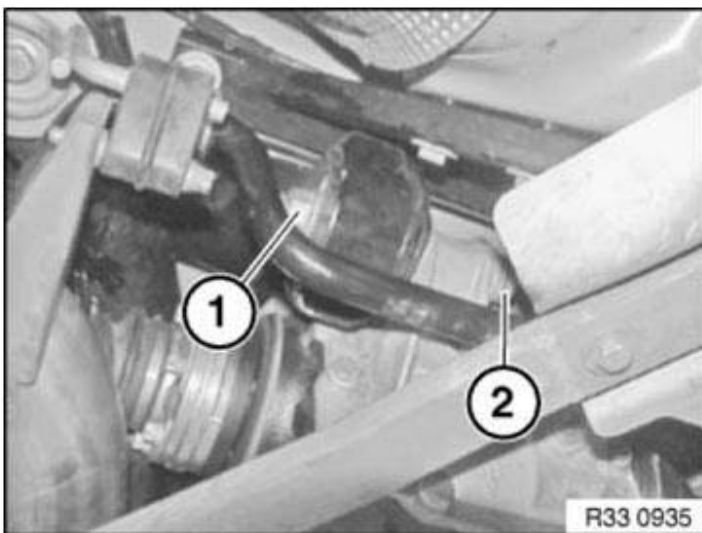


Fig. 101: Identifying Rear Axle Differential Nut And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (2).

Installation:

Tighten bolt in normal position.

Tightening torque **33 32 4AZ.**

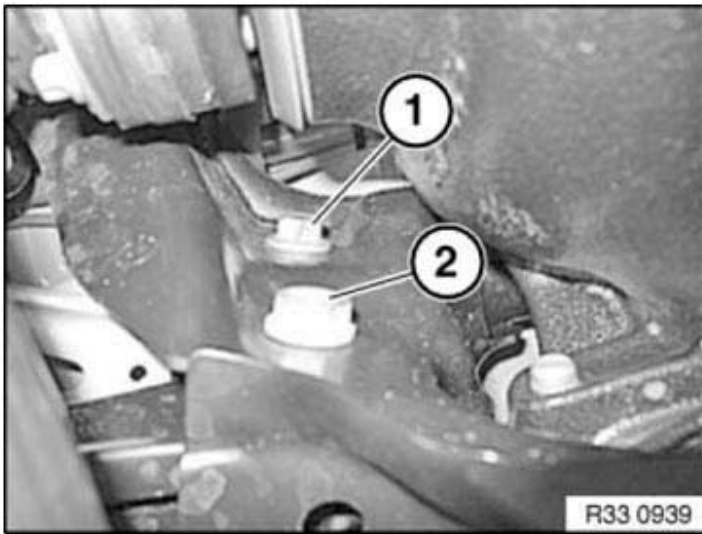


Fig. 102: Identifying Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Press rear differential (2) with tire iron (1) towards rear and unscrew bolt from control arm/rear axle carrier.

Remove bottom control arm.

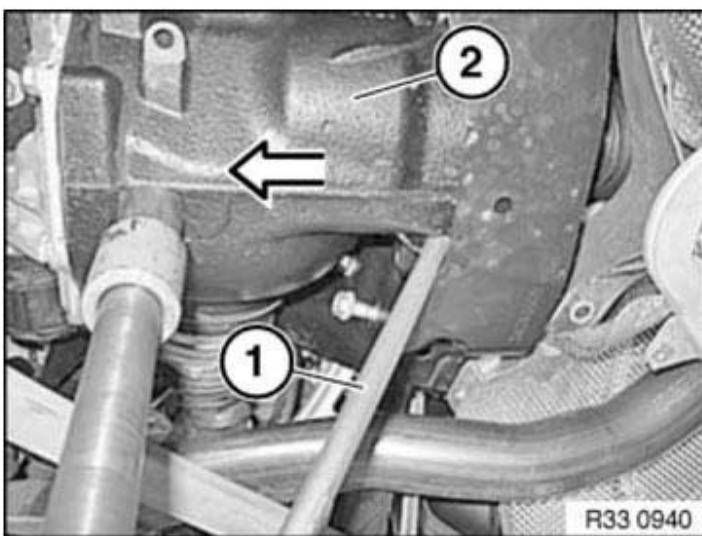


Fig. 103: Pressing Rear Differential Using Tyre Iron
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Weld seam of control arm must point upwards.



Fig. 104: Locating Weld Seam Of Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Check that output shaft is correctly seated in rear differential.
- Perform **CHASSIS ALIGNMENT CHECK**

33 32 087 REMOVING AND INSTALLING/REPLACING BOTTOM RIGHT CONTROL ARM

NOTE: If the lower control arm is detached from the rear axle carrier, it is necessary after reinstallation to carry out a wheel/chassis alignment check.

Necessary preliminary tasks

- Remove **REAR WHEEL** .
- Remove output shaft from rear differential . See **3321001 REMOVING AND INSTALLING OR REPLACING LEFT OUTPUT SHAFT** or **3321002 REMOVING AND INSTALLING/REPLACING RIGHT OUTPUT SHAFT**

IMPORTANT: To avoid damaging the output shaft, it will be necessary to support the trailing arm with the workshop jack.

Support trailing arm from underneath using a workshop jack.

Spread cover on lower control arm and pull off.

Installation:

Opening in cover points upwards.

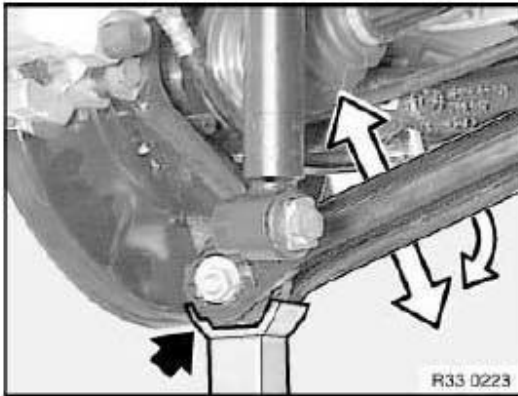


Fig. 105: Pulling Lower Control Arm Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Mark position of eccentric screw (1) to lower control arm with center marks (2).

Replacement only: Carry over marking from old part to new part.

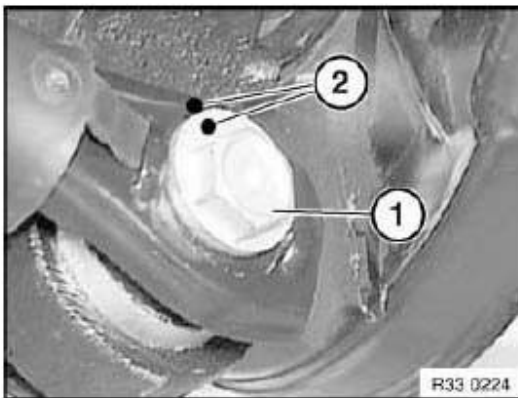


Fig. 106: Identifying Mark Position Of Eccentric Screw With Centre Marks On Lower Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1) and remove eccentric washer (2).

Remove eccentric screw towards front.

Installation:

Note insertion direction of eccentric screw.

Align eccentric screw by means of marking to lower control arm.

Fit eccentric washer (2).

Replace nut (1).

Tightening torque **33 32 3AZ** .

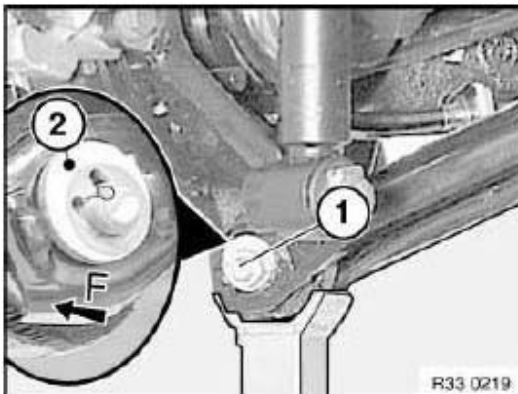


Fig. 107: Identifying Eccentric Washer With Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (2).

Installation:

Tighten bolt in normal position.

Tightening torque **33 32 4AZ** .

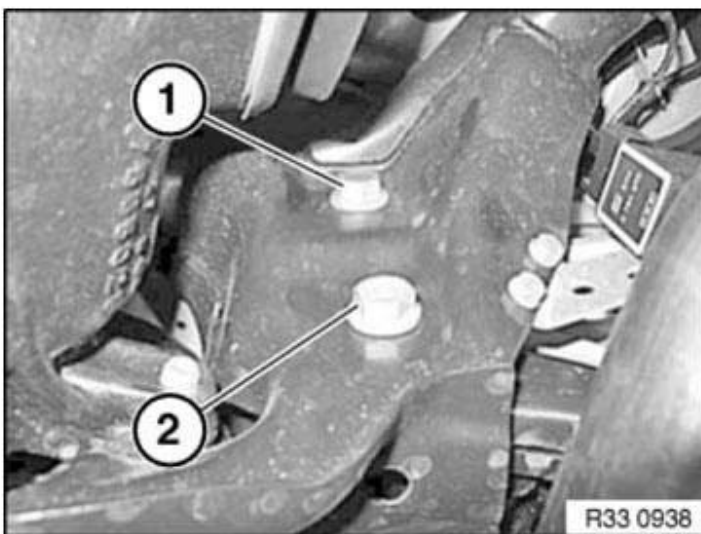


Fig. 108: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Weld seam of control arm must point upwards.



Fig. 109: Locating Weld Seam Of Control Arm

Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Check that output shaft is correctly seated in rear differential.
- Perform **CHASSIS ALIGNMENT CHECK**

33 32 160 REMOVING AND INSTALLING/REPLACING COMPRESSION STRUT FOR REAR AXLE CARRIER

**IMPORTANT: Observe SAFETY INSTRUCTIONS for raising the vehicle
Driving without the compression strut is not permitted!**

Necessary preliminary tasks

- Remove **EXHAUST SYSTEM** .
- Remove tunnel thermal insulation

IMPORTANT: Risk of damage!
Support rear axle carrier at front middle with workshop jack.

Release nuts and remove compression strut.

Secure rear axle carrier by screwing on nuts.

Installation:

Replace self-locking nuts.

Tightening torque **33 32 7AZ** .

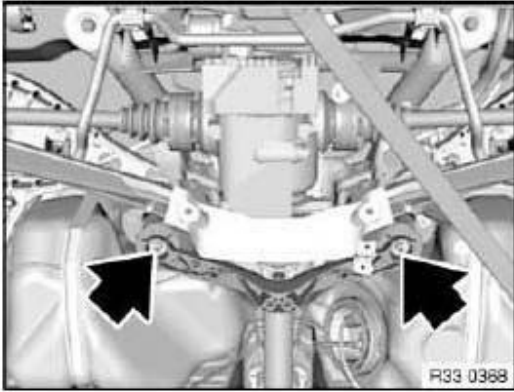


Fig. 110: Locating Self-Locking Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

51 71 482 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT TENSION STRUT

IMPORTANT: Vehicles must not be driven without tension struts.
Driving without tension struts may damage the vehicle body.
Tension strut bolts must be tightened to torque and then tightened down with special tool 00 9 120 .

Tension strut, left and right

Release bolts (1, 2) and nuts (3) and remove tension strut (4).

Installation:

Replace bolts (1 and 2).

- Bolt (1) M10x50

Tightening torque **51 71 29AZ** .

- Bolt (2) M8x35

Tightening torque **51 71 30AZ** .

- Nut (3)

Tightening torque **51 71 31AZ** .

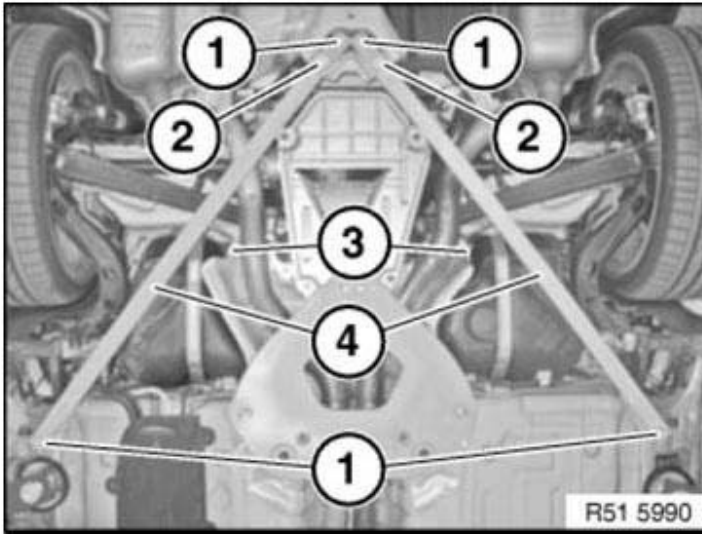


Fig. 111: Identifying Tension Strut With Bolts And Nuts
 Courtesy of BMW OF NORTH AMERICA, INC.

33 32 076 REMOVING AND INSTALLING/REPLACING TOP LEFT CONTROL ARM

Necessary preliminary tasks

- Remove **COIL SPRING**
- Remove rear axle underbody protection

Release stabilizer on upper control arm.

Tightening torque **33 55 2AZ** .

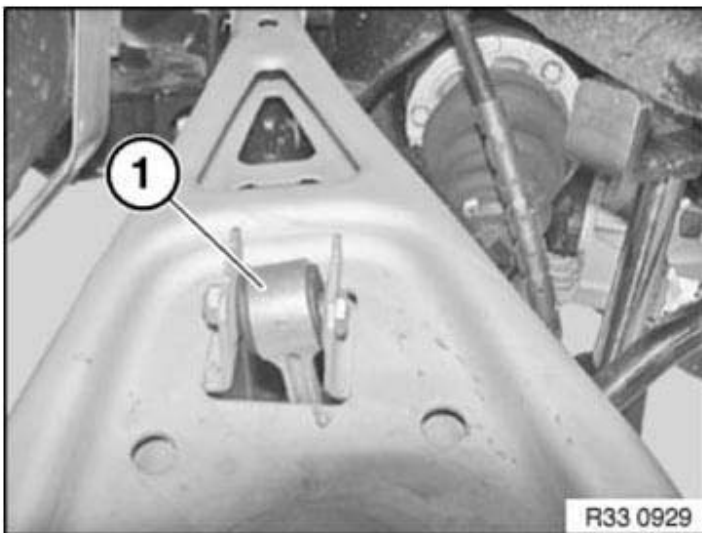


Fig. 112: Identifying Stabilizer On Upper Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Support rear differential with workshop jack (1).

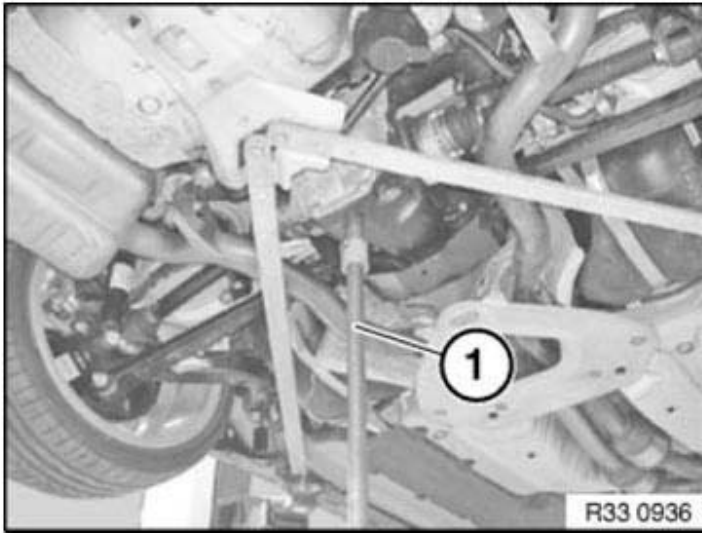


Fig. 113: Supporting Rear Differential Using Workshop Jack
Courtesy of BMW OF NORTH AMERICA, INC.

Release bolts (1) on rear differential at front. And slide out towards rear axle differential is exposed.

Tightening torque **33 17 1AZ** .

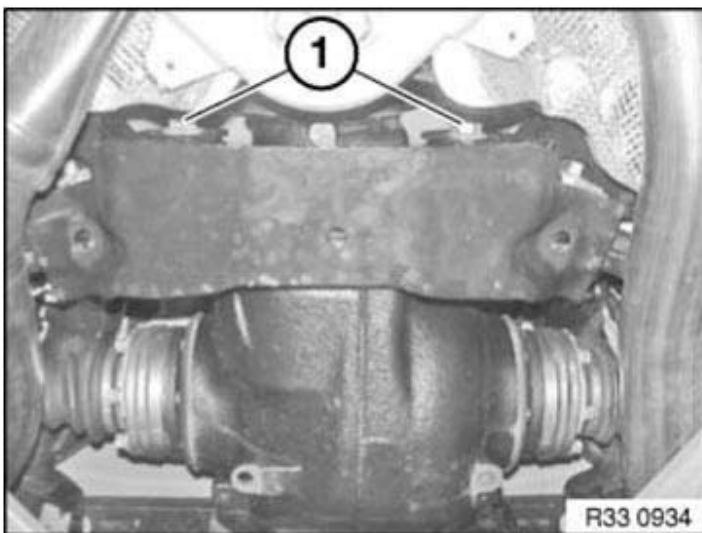


Fig. 114: Identifying Bolts On Rear Axle Differential
Courtesy of BMW OF NORTH AMERICA, INC.

Release bolt (1) on rear differential at rear.

Tightening torque **33 17 2AZ** .

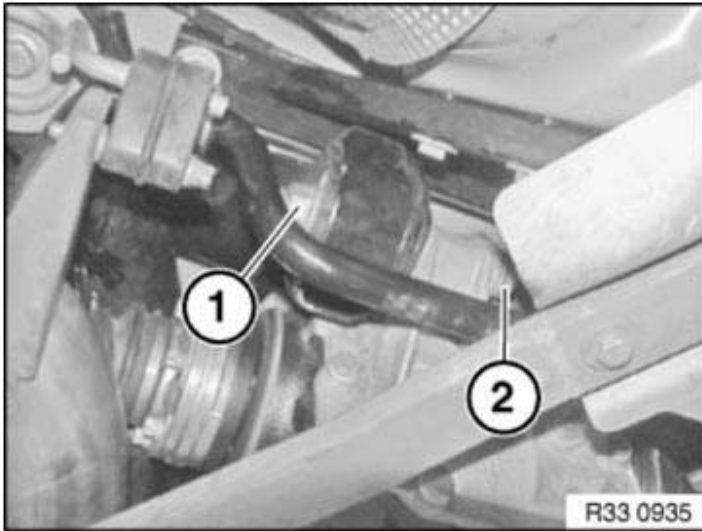


Fig. 115: Identifying Bolt On Rear Differential
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1) and remove screw.

Tightening torque **33 32 5AZ** .

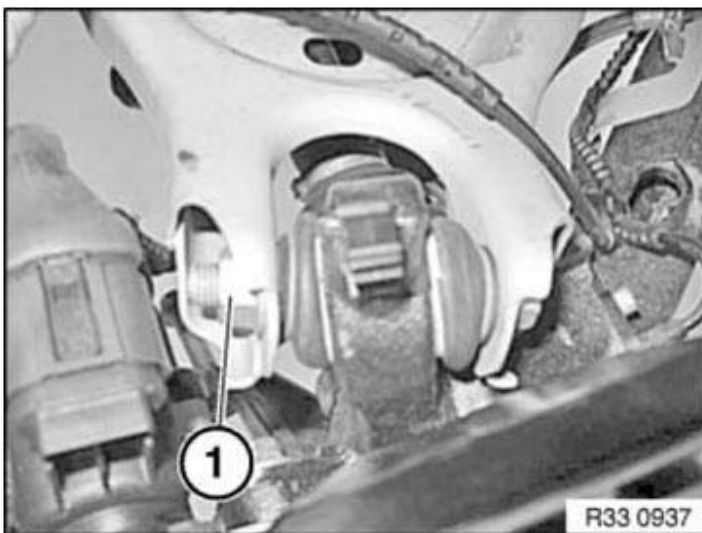


Fig. 116: Identifying Control Arm Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1).

Press rear differential on opposite side and unscrew bolt towards rear.

Remove control arm at side.

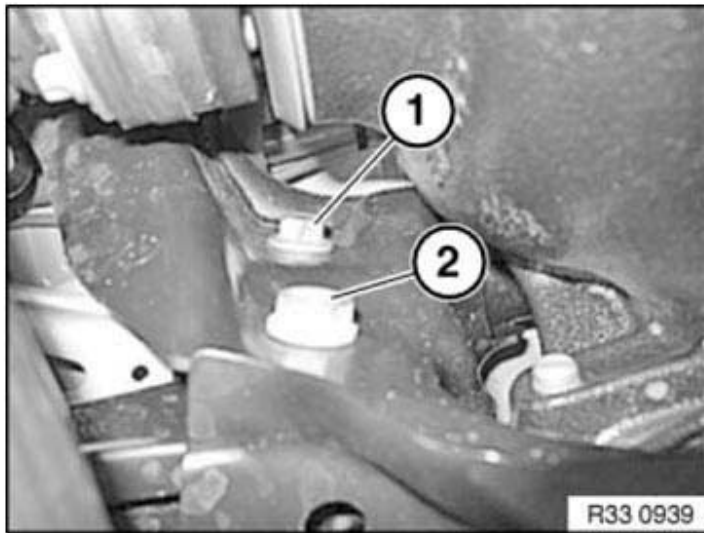


Fig. 117: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Tighten control arm on rear axle carrier in normal position.

Tightening torque **33 32 6AZ** .

Adjusting normal position:

IMPORTANT: Coil spring must not be fitted yet!

Press wheel carrier upwards with special tool 31 5 220 and workshop jack up to dimension A.

Dimension A = middle of wheel hub to top edge of wheel arch

Conventional chassis/suspension:

A = 361 mm

EDC suspension:

A = 351 mm

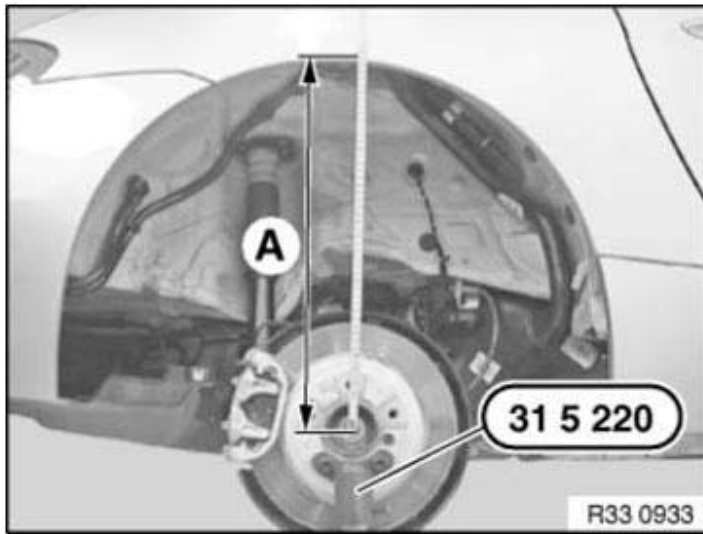


Fig. 118: Pressing Wheel Carrier Upwards Using Special Tool (31 5 220)
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation

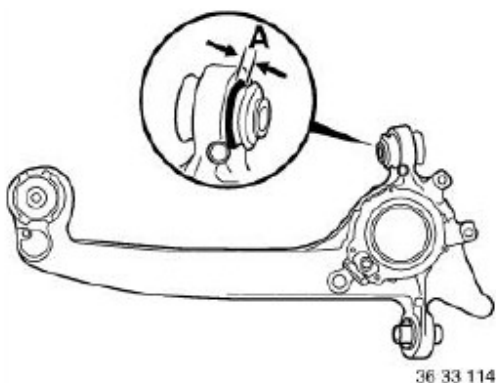
- Perform **CHASSIS ALIGNMENT CHECK**

33 32 024 REPLACING A BALL JOINT IN TRAILING ARM

Necessary preliminary work

- Detach wishbone . See **3332076 REMOVING AND INSTALLING/REPLACING TOP LEFT CONTROL ARM** or **3332077 REMOVING AND INSTALLING/REPLACING TOP RIGHT CONTROL ARM** at top from trailing arm.
- Remove **BRAKE DISC** .
- Detach **BRAKE GUARD PLATE** .

Measure protrusion (A) of previous ball joint and note down.



36 33 114

Fig. 119: Identifying Protrusion Of Ball Joint
Courtesy of BMW OF NORTH AMERICA, INC.

Pull out ball joint with special tools 33 3 331, 33 3 332 and 33 3 333.

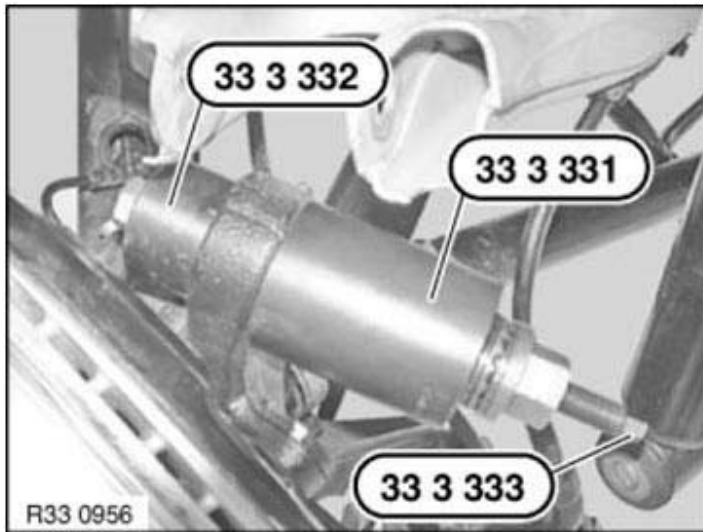


Fig. 120: Pulling Out Ball Joint Using Special Tools (33 3 331, 33 3 332 And 33 3 333)
Courtesy of BMW OF NORTH AMERICA, INC.

Keep trailing arm eye and ball joint (1) clean and free from oil and grease.

Draw in new ball joint (1) with special tools 33 3 332, 33 3 333 and 33 3 334 to previously determined protrusion (A).

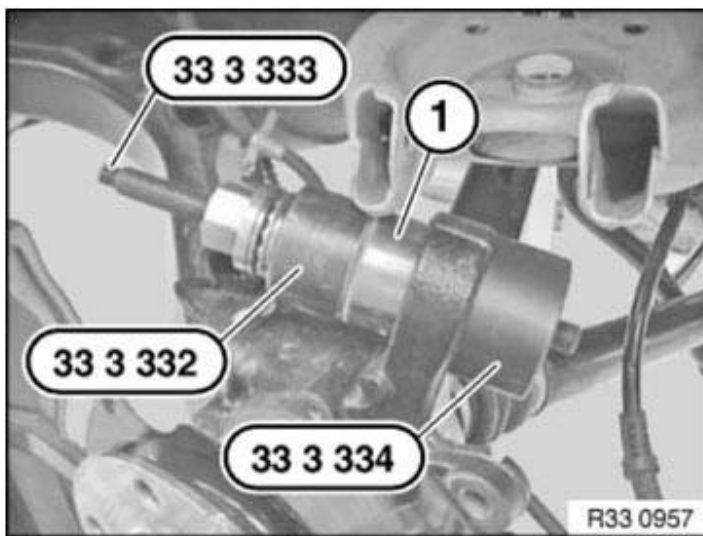


Fig. 121: Installing Ball Joint Using Special Tools (33 3 332, 33 3 333 And 33 3 334)
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Carry out **WHEEL ALIGNMENT PROCEDURE** .

33 32 042 REPLACING A RUBBER MOUNT IN TRAILING ARM, FRONT

NOTE:

- Version from 03/10 onward, rubber mount (1)
- Version until 03/10, rubber mount (2)

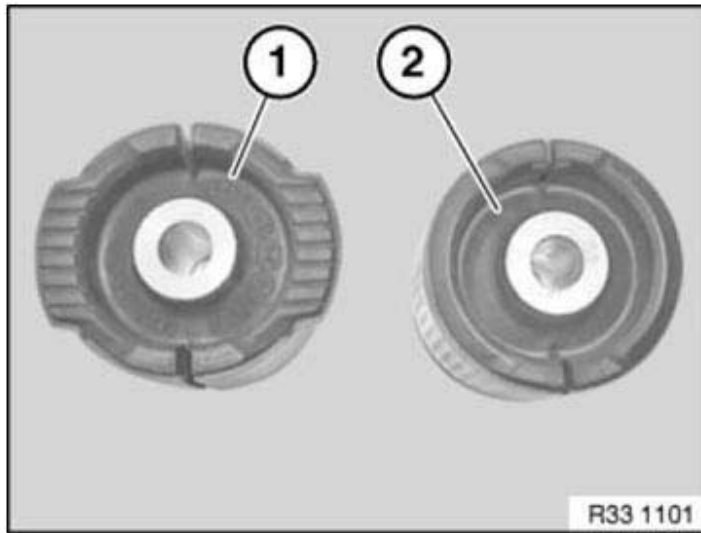


Fig. 122: Identifying Rubber Mounts
Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary tasks

- Remove **BEARING SUPPORT**

Removal of rubber mount, version from 03/10 onward:

Pull out rubber mount (1) with special tool 00 8 550, 33 3 324, 33 0 161.

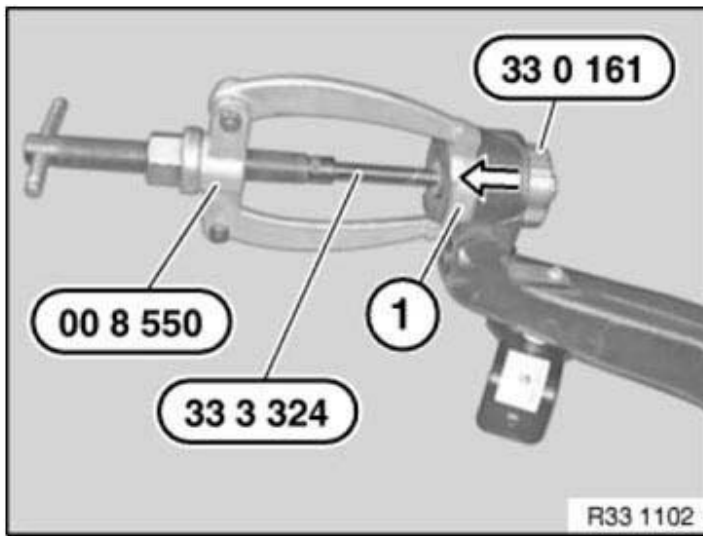


Fig. 123: Pulling Out Rubber Mount Using Special Tool
 Courtesy of BMW OF NORTH AMERICA, INC.

Removal of rubber mount, version until 03/10

Pull out rubber mount (1) with special tools 33 0 161, 33 0 162, 33 3 011, 33 3 012, 33 3 013.

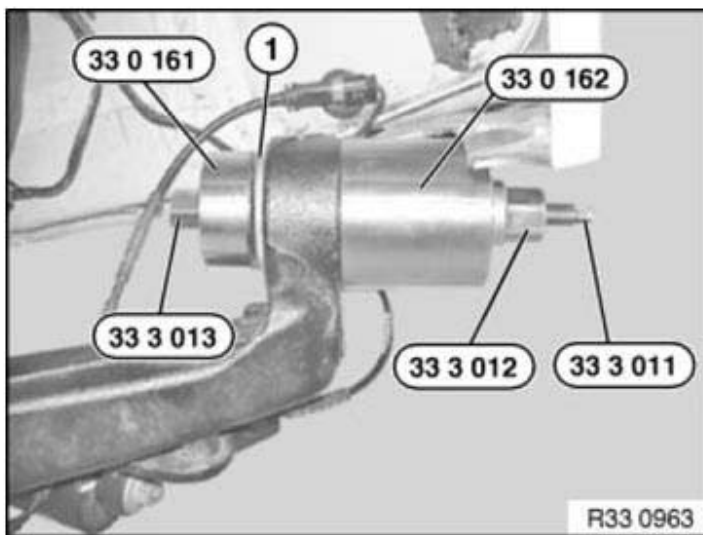


Fig. 124: Pulling Out Rubber Mount Using Special Tools
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Keep rubber mount (1) and trailing arm eye clean and free from oil and grease.

Align slot in rubber mount (1) to side member.

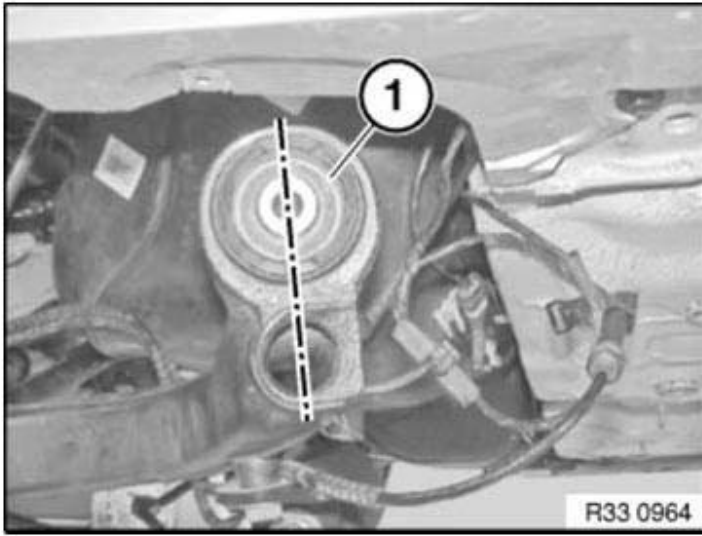


Fig. 125: Identifying Rubber Mount Slot Aligning Line
 Courtesy of BMW OF NORTH AMERICA, INC.

Draw in rubber mount (1) with special tools 33 0 161, 33 0 163, 33 3 011, 33 3 012 and 33 3 013 as far as it will go.

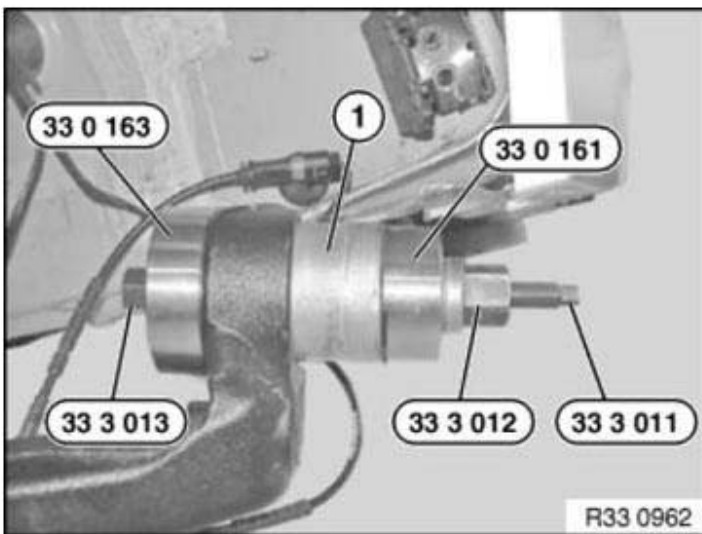


Fig. 126: Installing Rubber Mount Using Special Tools
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Check that output shaft is correctly seated in rear differential.
- Perform chassis alignment check

33 32 ... REPLACING BEARING SUPPORT FOR FRONT TRAILING ARM

Necessary preliminary tasks

- Remove REAR WHEEL
- Unplug CONNECTOR FOR PULSE SENSOR ; if necessary, expose lead up to trailing arm
- Only on right side: Unplug connector for brake pad sensor; if necessary, expose lead up to trailing arm

IMPORTANT: • Check sensor head and line from pulse sensor prior to installation for external damage, replacing if necessary.

IMPORTANT: Risk of damage!
Brake hose must not be exposed to tensile loads.

Release screws (1) and remove holder with brake hose.

Tightening torque 34 32 4AZ .

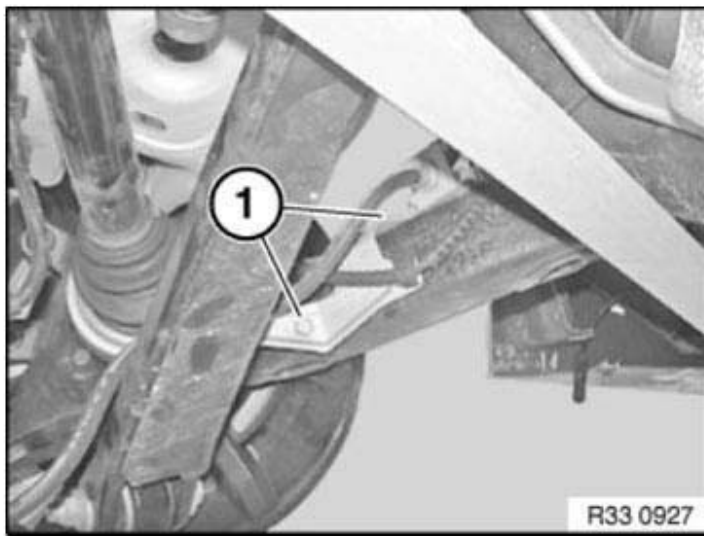


Fig. 127: Identifying Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Mark position of mounting (1) relative to body (2) with a paint mark (3) in order to simplify subsequent toe-in adjustment.

Release screws.

Tightening torque 33 32 2AZ .

Lower workshop jack and pull trailing arm downwards.

Installation note:

Check threads for damage; if necessary, repair with **HELICOIL THREAD INSERTS** .

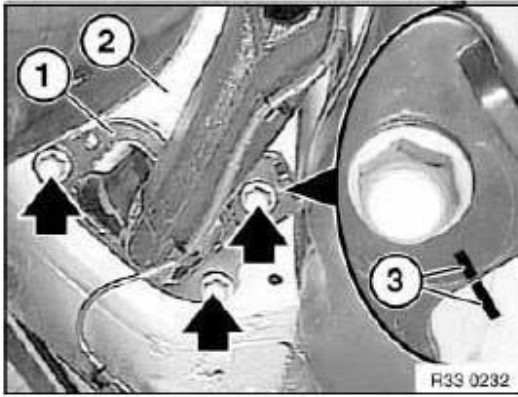


Fig. 128: Identifying Position Of Mounting To Body Mark
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten nut.

Pull out screw.

Tightening torque **33 32 1AZ** .

Remove bearing support towards top.

Installation note:

Replace self-locking nut.

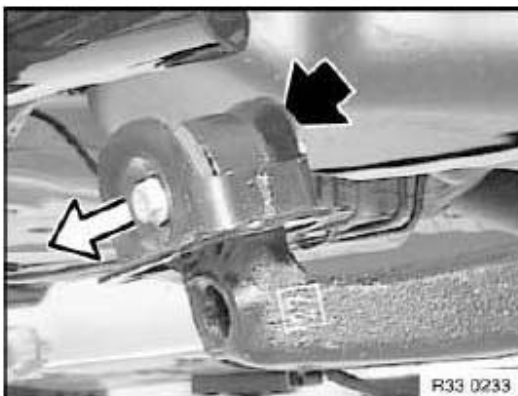


Fig. 129: Removing Self-Locking Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Installation with special tool

Installation note:

Secure special tool 33 3 280 to bearing support with a screw and align to wheel center. Place bearing support in position and screw down.

Tightening torque **33 32 1AZ** .

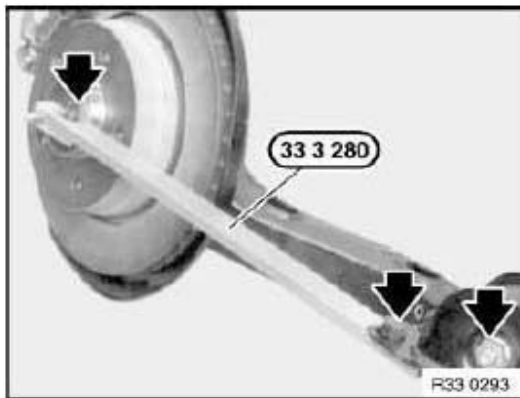


Fig. 130: Securing Special Tool (33 3 280) To Bearing Support With Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Installation without special tool

Installation note:

Place tube (1) (length = approx. 500 mm, dia. = 16 mm) flat on bearing support, secure with screw clamp and align tube center to wheel center. Screw bearing pedestal down in this position.

Tightening torque **33 32 1AZ** .

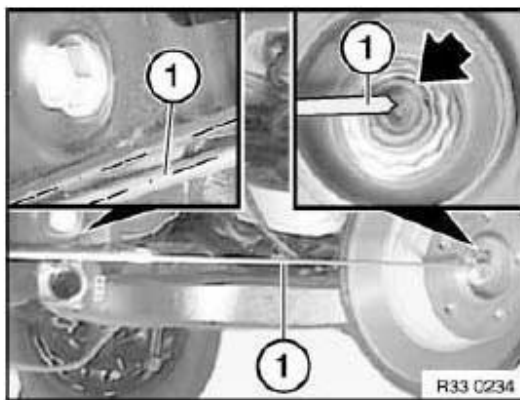


Fig. 131: Identifying Tube On Bearing Support

Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Perform chassis/wheel alignment check .. See CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION or CHASSIS/WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD

33 32 021 REPLACING LEFT OR RIGHT TRAILING ARM

Necessary preliminary tasks

- Remove REAR WHEEL
- Release collar nut . See 3321001 REMOVING AND INSTALLING OR REPLACING LEFT OUTPUT SHAFT or 3321002 REMOVING AND INSTALLING/REPLACING RIGHT OUTPUT SHAFT on output shaft
- Remove BRAKE DISC
- Remove drive flange . See 3341005 REPLACING LEFT DRIVE FLANGE ON REAR AXLE SHAFT or 3341007 REPLACING RIGHT DRIVE FLANGE ON REAR AXLE SHAFT
- Remove BRAKE GUARD PLATE
- Remove PULSE SENSOR from trailing arm
- Only on right side: Remove BRAKE PAD WEAR SENSOR
- Remove COIL SPRING at rear

IMPORTANT: • Check sensor head and line from pulse sensor prior to installation for external damage, replacing if necessary.

IMPORTANT: Risk of damage!
Brake hose must not be exposed to tensile loads.

Release screws (1) and remove holder with brake hose.

Tightening torque 34 32 4AZ .

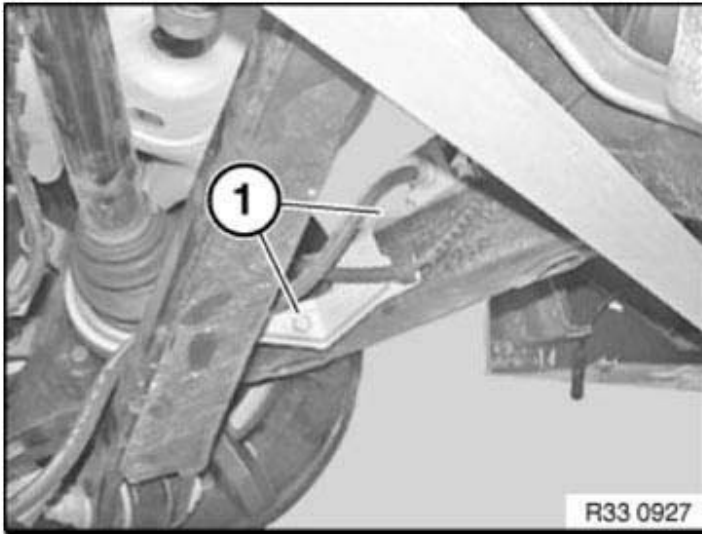


Fig. 132: Identifying Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1) and remove holder (3) with vibration absorber.

Installation:

Check installation location.

Secure vibration absorber (3) with 5.5 mm dia. punch (2) in trailing arm bore and tighten.

Tightening torque **33 32 8AZ** .

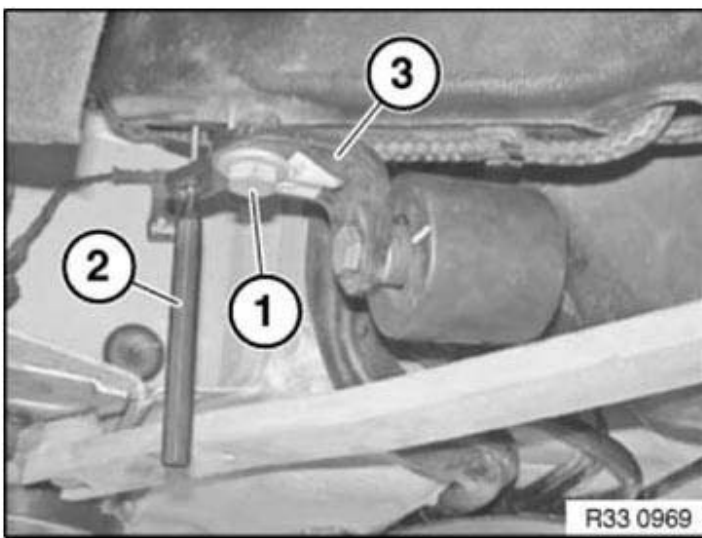


Fig. 133: Identifying Vibration Absorber with Screw And Holder
 Courtesy of BMW OF NORTH AMERICA, INC.

Release anti-roll bar link (1) on upper control arm.

Tightening torque **33 55 2AZ.**

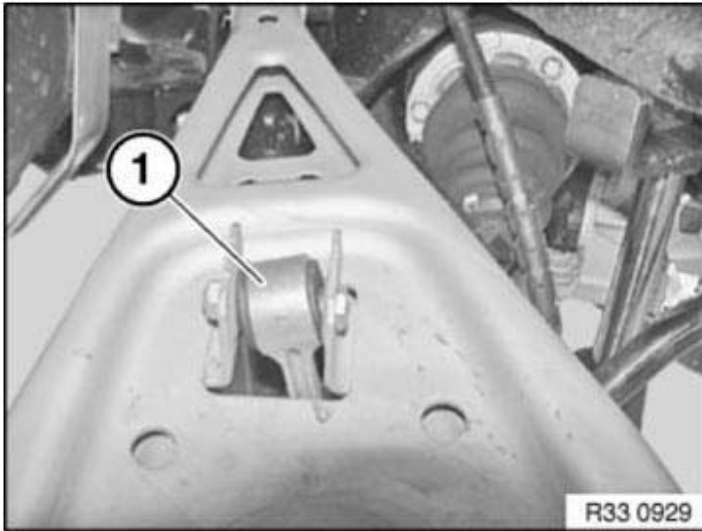


Fig. 134: Identifying Anti-Roll Bar Link On Upper Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Remove lower control arm . See **3332086 REMOVING AND INSTALLING/REPLACING BOTTOM LEFT CONTROL ARM** or **3332087 REMOVING AND INSTALLING/REPLACING BOTTOM RIGHT CONTROL ARM** from trailing arm

Remove upper control arm . See **3332076 REMOVING AND INSTALLING/REPLACING TOP LEFT CONTROL ARM** or **3332077 REMOVING AND INSTALLING/REPLACING TOP RIGHT CONTROL ARM** from trailing arm

Remove **BEARING SUPPORT FROM BODY** and trailing arm

IMPORTANT: Risk of injury!
Remove output shaft

Installation:

Replace wheel bearing . See **3341153 REPLACING LEFT WHEEL BEARING ON REAR AXLE SHAFT** or **3341155 REPLACING RIGHT WHEEL BEARING ON REAR AXLE SHAFT.**

Convert **BEARING SUPPORT** .

After installation

- Perform **CHASSIS ALIGNMENT CHECK**

33 32 681 REPLACING ONE RUBBER MOUNT IN LOWER CONTROL ARM (CONTROL ARM REMOVED)

Attach special tool 33 3 354 between both control arms.

Press rubber mount with special tools 33 3 351 and 33 3 352 out of lower control arm.

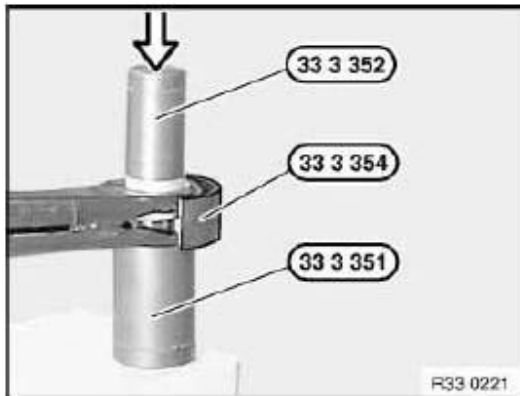


Fig. 135: Pressing Out Rubber Mount Using Special Tools (33 3 351 And 33 3 352)
Courtesy of BMW OF NORTH AMERICA, INC.

Attach special tool 33 3 354 between both control arms.

Press in new rubber mount (1) with special tools 33 3 351 and 33 3 353.

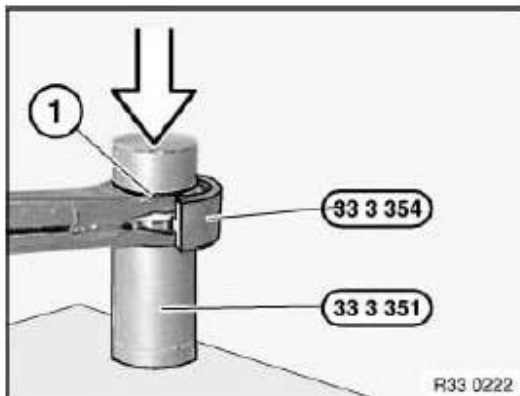


Fig. 136: Pressing In Rubber Mount Using Special Tools (33 3 351 And 33 3 353)
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Perform **CHASSIS ALIGNMENT CHECK**

33 32 671 REPLACING ONE RUBBER MOUNT IN THE UPPER CONTROL ARM (CONTROL ARM

REMOVED)

Press rubber mount with special tools 33 3 351 and 33 3 352 out of upper control arm.

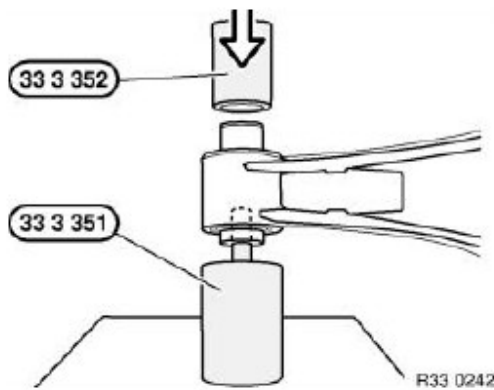


Fig. 137: Pressing Out Rubber Mount Using Special Tools (33 3 351 And 33 3 352)
Courtesy of BMW OF NORTH AMERICA, INC.

Place new rubber mount at chamfered end of control arm bore. Here, longer collar (A = 17 mm) of rubber mount must point upwards.

Press in rubber mount with special tools 33 3 351 and 33 3 352 until flush.

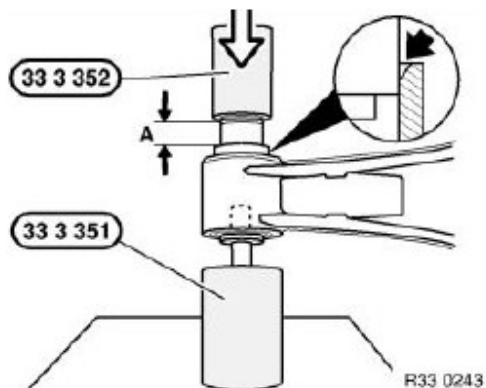


Fig. 138: Pressing In Rubber Mount Using Special Tools (33 3 351 And 33 3 352)
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Perform **CHASSIS ALIGNMENT CHECK**

33 32 044 REPLACING ONE RUBBER MOUNT IN TRAILING ARM FOR LOWER CONTROL ARM

Necessary preliminary tasks

- Remove lower control arm from trailing arm . See **3332086 REMOVING AND INSTALLING/REPLACING BOTTOM LEFT CONTROL ARM** or **3332087 REMOVING AND INSTALLING/REPLACING BOTTOM RIGHT CONTROL ARM**

Measure and note protrusion (A) of old rubber mount.

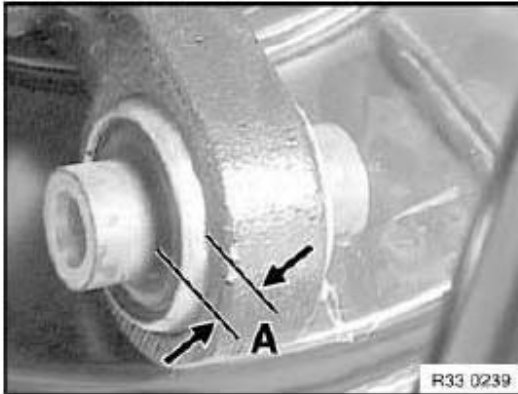


Fig. 139: Identifying Protrusion Of Old Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.

Pull out rubber mount with special tools 33 3 331, 33 3 332, 33 3 333 and nut (1).

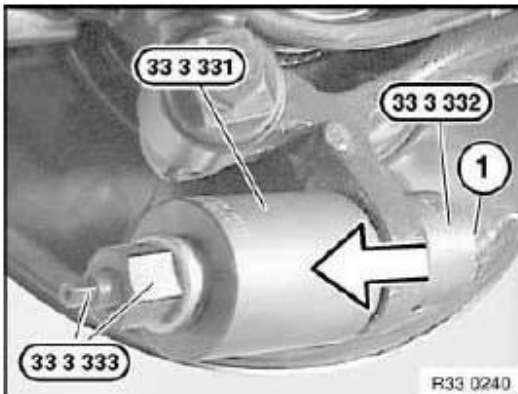


Fig. 140: Pulling Out Rubber Mount Using Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.

Draw in new rubber mount (1) with special tools 33 3 332, 33 3 333 and 33 3 334 to previously determined protrusion (A).

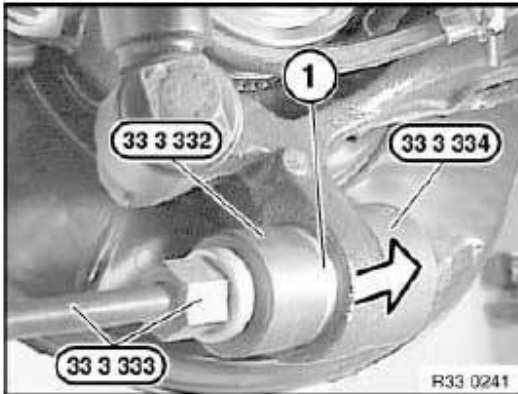


Fig. 141: Installing Rubber Mount Using Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Check that output shaft is correctly seated in rear differential.
- Perform **CHASSIS ALIGNMENT CHECK**

3333 AXLE MOUNTING

33 53 ... MEASURING RIDE HEIGHT OF VEHICLE (REAR AXLE)

Determine actual ride level (A).

Measurement from wheel arch lower edge (1) to rim flange (2) at height of wheel center.

If determined value deviates from specified target value:

REFER TO TECHNICAL DATA .

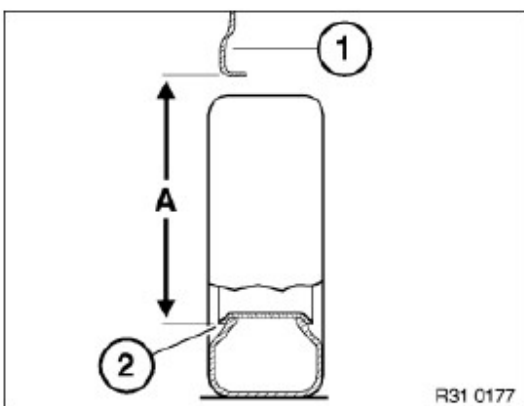


Fig. 142: Identifying Actual Ride Height From Lower Edge Of Wheel Arch To Rim Flange
Courtesy of BMW OF NORTH AMERICA, INC.

33 33 101 REPLACING TWO RUBBER MOUNTS (REAR) FOR REAR AXLE CARRIER

WARNING: Danger of explosion!

Do not point air jet from hot air blower at fuel tank!

Necessary preliminary tasks

- Lower REAR AXLE CARRIER

Assemble special tool 33 4 140 with 33 4 142 and 33 4 147.

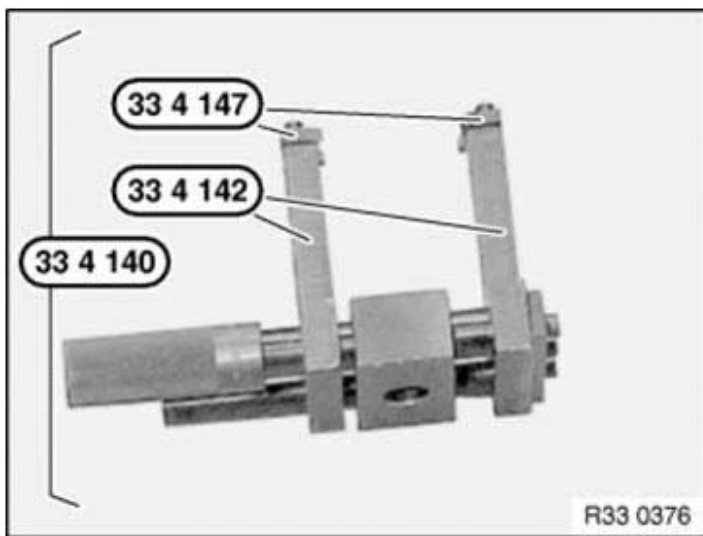


Fig. 143: Assembling Special Tool (33 4 140) With (33 4 142 And 33 4 147)

Courtesy of BMW OF NORTH AMERICA, INC.

Position special tools 33 4 140, 33 4 155, 33 3 371, 33 3 372 and nut (1) on openings of rubber mount.

NOTE: Ensure it is correctly supported on bushing of rear axle carrier.

Using a hot air blower, heat bearing bushing at max. 600 °C outlet temperature for approx. 2 minutes.

Pull out rubber mount by turning special tool 33 4 155.

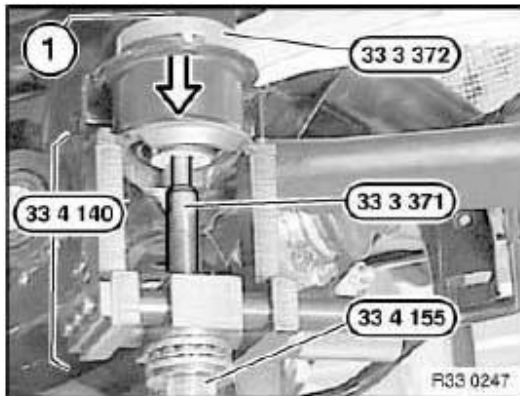


Fig. 144: Pulling Out Rubber Mount Using Special Tool (33 4 155)
 Courtesy of BMW OF NORTH AMERICA, INC.

Coat rubber mount with Circo Light anti-friction agent.

IMPORTANT: When rubber mount is fitted, arrows (1) must point down longitudinal axis of vehicle.

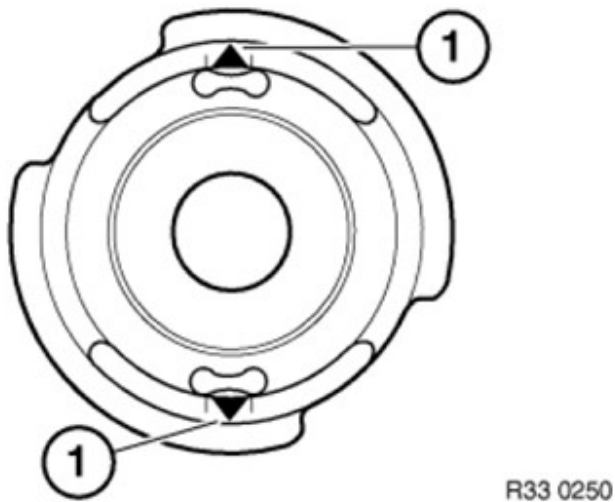


Fig. 145: Identifying Rubber Mount Fitting Arrows
 Courtesy of BMW OF NORTH AMERICA, INC.

Draw in rubber mount (1) with special tools 33 3 314, 33 3 315, 33 3 372 and 33 3 373 as far as it will go.

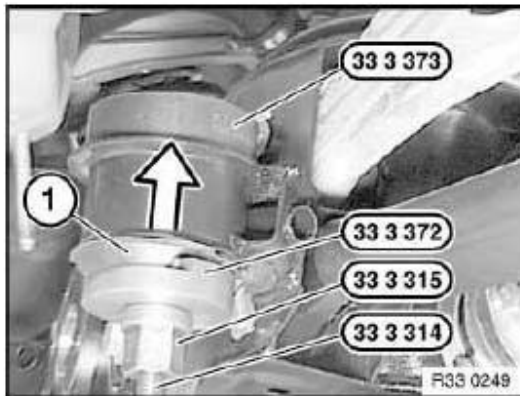


Fig. 146: Installing Rubber Mount Using Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Check seating of coil spring with spring pads, correct if necessary
- Perform **CHASSIS ALIGNMENT CHECK**

33 33 101 REPLACING TWO RUBBER MOUNTS FOR REAR AXLE CARRIER (RUBBER MOUNTS, FRONT)

WARNING: Danger of explosion!
Do not point air jet from hot air blower at fuel tank!

Necessary preliminary tasks

- Lower **REAR AXLE CARRIER**

Assemble special tool 33 4 140 with 33 4 142 and 33 4 147.

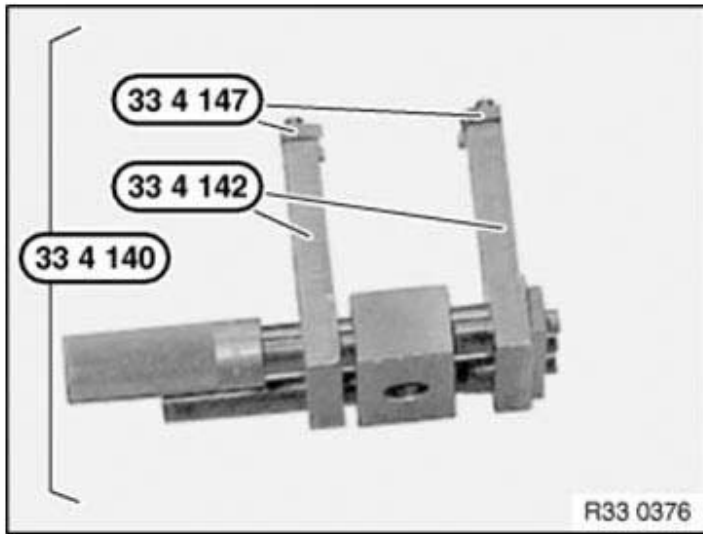


Fig. 147: Assembling Special Tool (33 4 140) With (33 4 142 And 33 4 147)
 Courtesy of BMW OF NORTH AMERICA, INC.

Position special tools 33 4 140, 33 4 155, 33 3 371, 33 3 372 and nut (1) on openings of rubber mount.

NOTE: Ensure it is correctly supported on bushing of rear axle carrier.

Using a hot air blower, heat bearing bushing at max. 600 °C outlet temperature for approx. 2 minutes.

Pull out rubber mount by turning special tool 33 4 155.

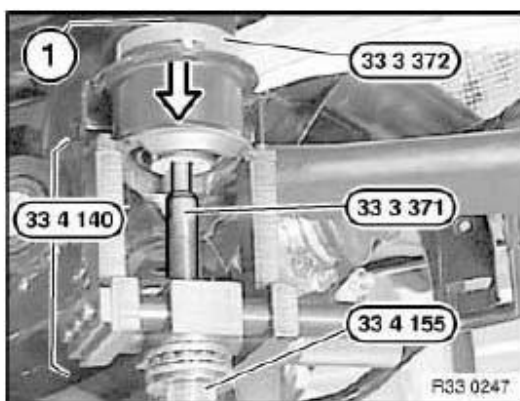


Fig. 148: Pulling Out Rubber Mount Using Special Tool (33 4 155)
 Courtesy of BMW OF NORTH AMERICA, INC.

Coat rubber mount with Circo Light anti-friction agent.

IMPORTANT: Front rubber mounts differ:
 Rubber mount VR = front right with elongated hole (1)

Rubber mount VL = front left

When rubber mount is fitted, arrows (2) must point down longitudinal axis of vehicle.

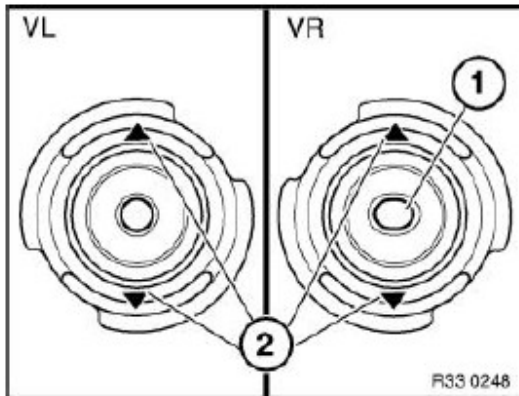


Fig. 149: Identifying Front Rubber Mount Fitting Arrows On Left And Right Side

Courtesy of BMW OF NORTH AMERICA, INC.

Draw in rubber mount (1) with special tools 33 3 314, 33 3 315, 33 3 372 and 33 3 373 as far as it will go.

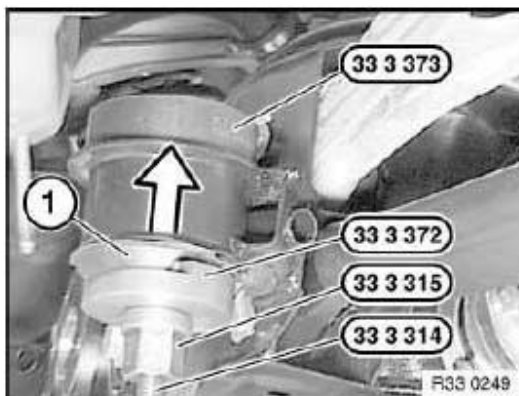


Fig. 150: Installing Rubber Mount Using Special Tools

Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Check seating of coil spring with spring pads, correct if necessary
- Perform **CHASSIS ALIGNMENT CHECK**

3341 WHEEL BEARINGS

33 41 ... DETACHING INNER WHEEL BEARING RACE FROM DRIVE FLANGE

Necessary preliminary tasks

- Remove drive flange . See **3341005 REPLACING LEFT DRIVE FLANGE ON REAR AXLE SHAFT** or **3341007 REPLACING RIGHT DRIVE FLANGE ON REAR AXLE SHAFT**

NOTE: Detach wheel bearing inner race with special tool 33 4 400 through groove in wheel bearing inner race.

Position special tool 33 1 307 on drive flange.

Select one of the following special tools using the wheel bearing inner race and insert into special tool 33 4 401.

33 4 405 for dia. 45 - 51 mm

33 4 406 for dia. 50 - 55 mm

33 4 407 for dia. 55 - 61 mm

Screw in special tool 33 4 402 until tapered attachment of spindle comes into contact with special tool 33 4 401.

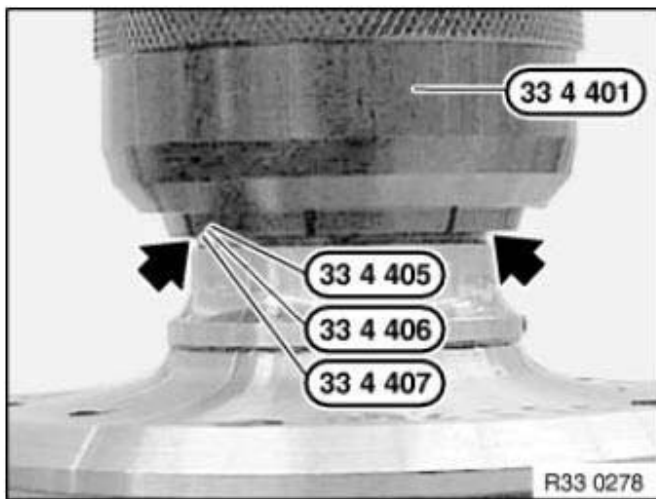


Fig. 151: Identifying Special Tools

Courtesy of BMW OF NORTH AMERICA, INC.

Position special tool 33 4 401 with corresponding insert on groove of wheel bearing inner race.

Compress special tool 33 4 401 with wrenches 33 4 403 and 33 4 404 until special tool can still just be turned in groove.

Detach wheel bearing inner race by turning special tool 33 4 402.

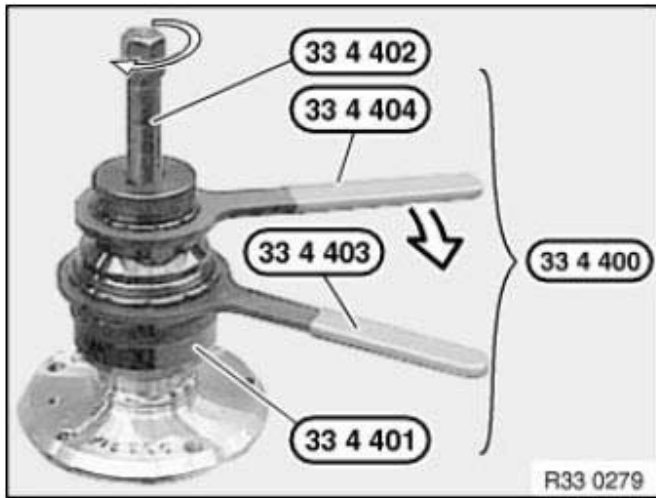


Fig. 152: Removing Wheel Bearing Inner Ring Using Special Tool (33 4 402)
 Courtesy of BMW OF NORTH AMERICA, INC.

33 41 005 REPLACING LEFT DRIVE FLANGE ON REAR AXLE SHAFT

Remove **REAR WHEEL** .

IMPORTANT: Expand turning lock sufficiently to avoid damaging thread when releasing collar nut.

Release collar nut, activate parking brake for this purpose.

Installation:

Replace collar nut, oil collar nut/wheel bearing contact surface lightly and tighten down.

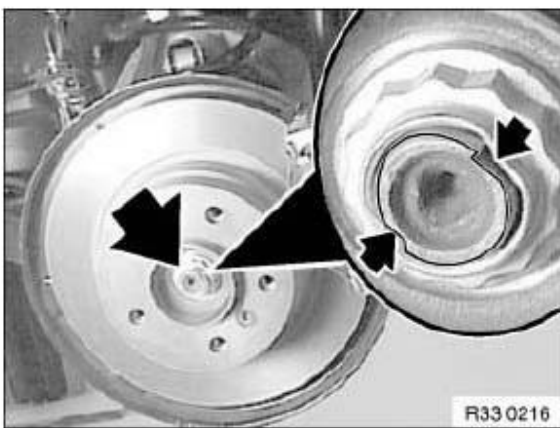


Fig. 153: Locating Collar Nut
 Courtesy of BMW OF NORTH AMERICA, INC.

No oil permitted on thread of shaft journal or collar nut.

Tightening torque **33 41 3AZ** .

Secure collar nut by positive peening on flat areas of output shaft.

Remove output shaft . See **3321001 REMOVING AND INSTALLING OR REPLACING LEFT OUTPUT SHAFT** or **3421320 REMOVING AND INSTALLING OR REPLACING BOTH REAR BRAKE DISCS** .

Remove **BRAKE DISC** .

Remove **PULSE GENERATOR** .

IMPORTANT: Check sensor head and line from pulse generator prior to installation for external damage, replacing if necessary.

Force drive flange with special tools 33 2 201, 33 4 200 and 5 wheel bolts out of wheel bearing.

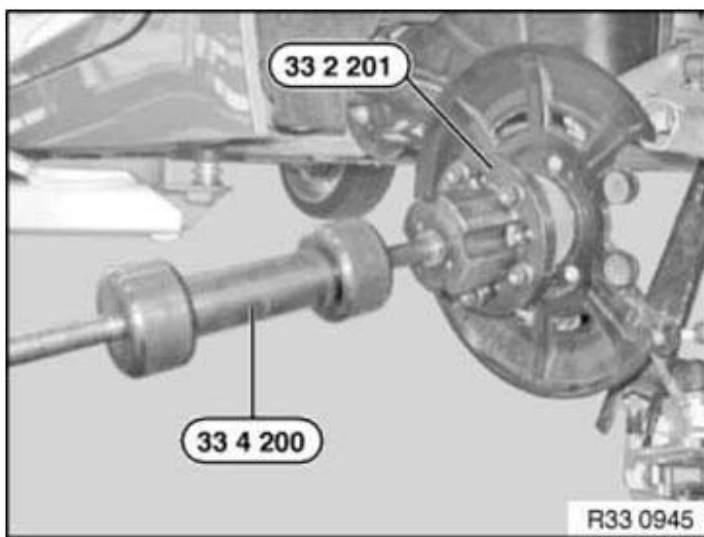


Fig. 154: Removing Drive Flange Using Special Tools (33 2 201 And 33 4 200)
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: The wheel bearing is destroyed when the drive flange is removed and cannot be reused!

Replace wheel bearing . See **3341153 REPLACING LEFT WHEEL BEARING ON REAR AXLE SHAFT** or **3341155 REPLACING RIGHT WHEEL BEARING ON REAR AXLE SHAFT**.

Installation:

Draw in drive flange (1) with special tools 33 4 041, 33 4 042, 33 4 043, 33 4 045 and 33 4 048.

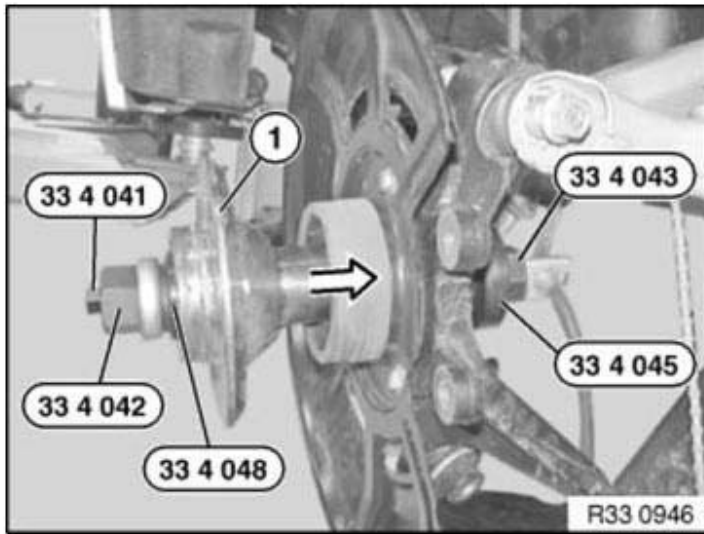


Fig. 155: Installing Drive Flange Using Special Tools
 Courtesy of BMW OF NORTH AMERICA, INC.

33 41 153 REPLACING LEFT WHEEL BEARING ON REAR AXLE SHAFT

Necessary preliminary tasks

- Remove **DRIVE FLANGE FOR REAR AXLE SHAFT**
- Detach **WHEEL BEARING INNER RACE FROM DRIVE FLANGE** .

Press retaining ring (1) together using pliers (2) and remove.

Installation:

Install retaining ring (1).

Check seating of retaining ring (1), correct if necessary.

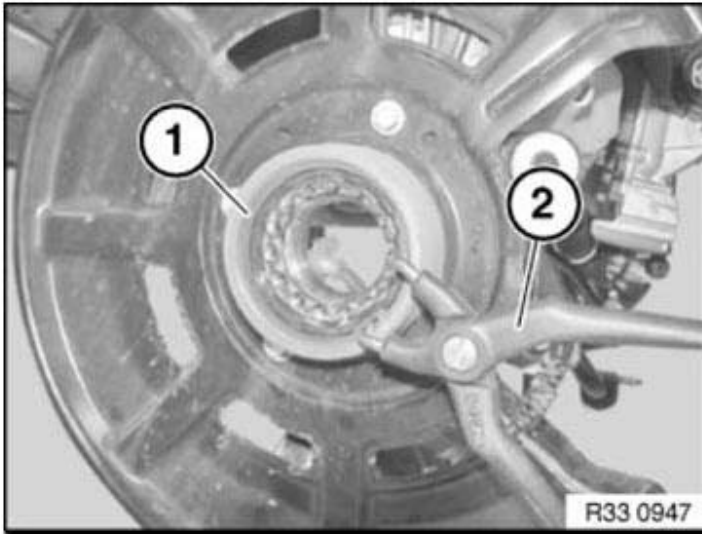


Fig. 156: Pressing Retaining Ring Using Pliers
Courtesy of BMW OF NORTH AMERICA, INC.

Pull out wheel bearing with special tools 33 4 031, 33 4 041, 33 4 042, 33 4 043 and 33 4 048.

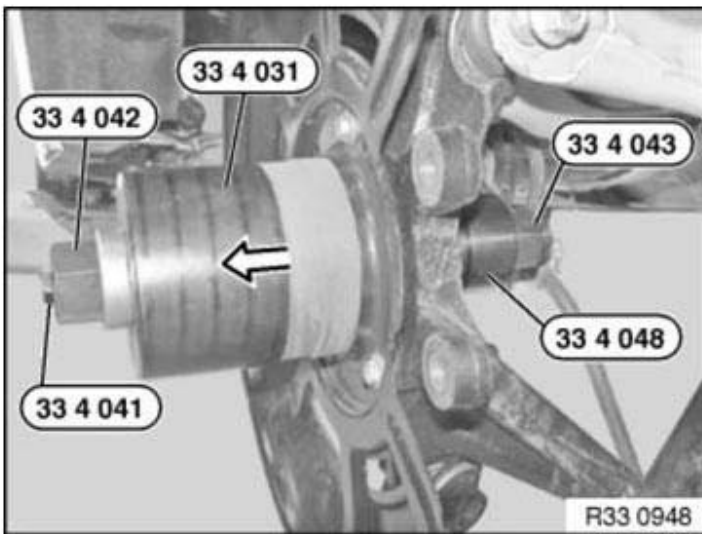


Fig. 157: Pulling Out Wheel Bearing Using Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not reuse old wheel bearing!

Installation:

Draw in new wheel bearing (1) with special tools 33 4 041, 33 4 042, 33 4 043, 33 4 047 and 33 4 049.

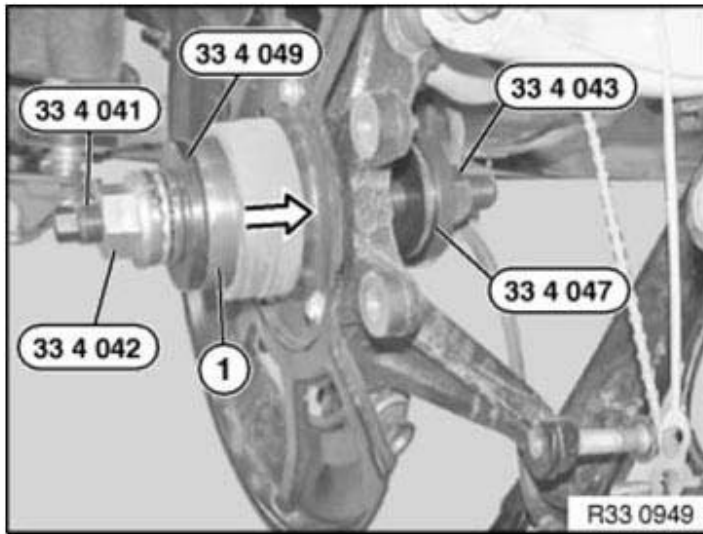


Fig. 158: Installing Wheel Bearing Using Special Tools
 Courtesy of BMW OF NORTH AMERICA, INC.

33 41 007 REPLACING RIGHT DRIVE FLANGE ON REAR AXLE SHAFT

NOTE: The procedure is described in the document "Replacing drive flange on rear axle shaft on left".

33 41 155 REPLACING RIGHT WHEEL BEARING ON REAR AXLE SHAFT

NOTE: Procedure is described in the document "REPLACING WHEEL BEARING ON REAR AXLE SHAFT ON LEFT".

3352 SHOCK ABSORBER

33 00 ... INFORMATION ON REPLACING SHOCK ABSORBERS

Situation

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

Effect

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

Procedure

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

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.

33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER

NOTE: Read and comply with **INFORMATION ON REPLACING SHOCK ABSORBERS** .

Necessary preliminary tasks

- Remove **REAR WHEEL**
- Remove **LUGGAGE COMPARTMENT WHEEL ARCH TRIM**

Version with VDC shock absorber only:

- Unlock and disconnect plug connection and expose line to shock absorber

WARNING: Danger of injury!

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

When supporting components, make sure that

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

Support trailing arm with a workshop jack (1).

Release screw.

Tightening torque **33 52 3AZ** .

Installation:

Thrust washer (2) on rubber bearing must point to screw head.

Tighten bolt in **NORMAL POSITION** .

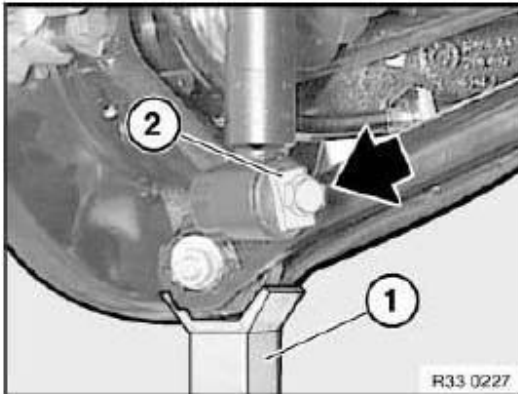


Fig. 159: Supporting Trailing Arm Using Workshop Jack
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nuts (1).

Remove shock absorber with support bearing towards bottom.

Installation:

Replace flat seal (between support bearing and body).

Replace self-locking nuts.

Tightening torque **33 52 2AZ** .

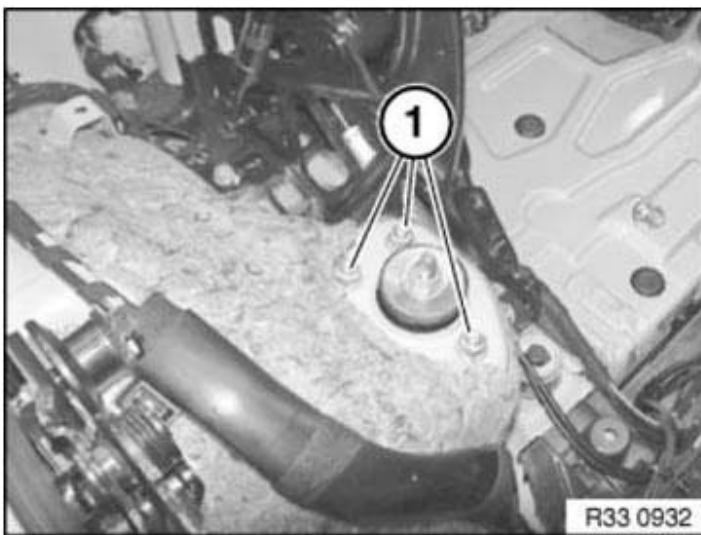


Fig. 160: Identifying Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

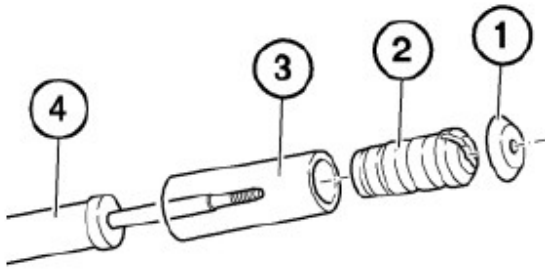
Replacement

Remove **SUPPORT BEARING** .

Remove or detach plate (1), spacer, auxiliary damper (2) and protective tube (3) from shock absorber (4).

Installation:

Check auxiliary damper (2) and protective tube (3) for damage, replace if necessary.



R33 0419

Fig. 161: Identifying Shock Absorber With Plate, Damper And Protective Tube
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Check that output shaft is correctly seated in rear differential.

33 52 161 REPLACING REAR LEFT OR RIGHT THRUST BEARING FOR SPRING STRUT/SHOCK ABSORBER

Necessary preliminary tasks

- Remove rear shock absorber . See **3712131 REPLACING LEFT OR RIGHT REAR SHOCK ABSORBER (ADAPTIVE M SUSPENSION)** or **3352000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER**

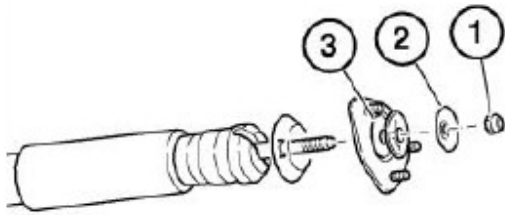
Slacken nut (1).

Remove plate (2) and support bearing (3).

Installation:

Replace self-locking nut.

Tightening torque **33 52 1AZ** .



R33 0421

Fig. 162: Identifying Support Bearing With Nut And Plate
 Courtesy of BMW OF NORTH AMERICA, INC.

3353 SPRINGS WITH SUSPENSION

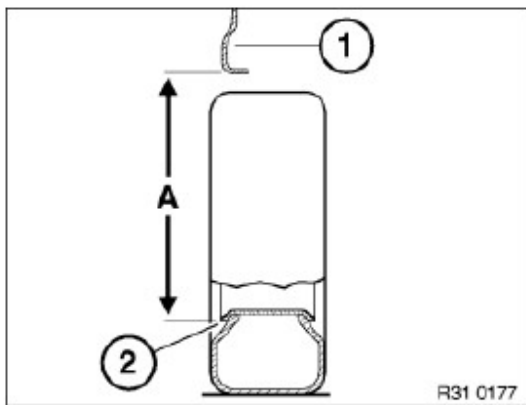
33 53 ... MEASURING RIDE HEIGHT OF VEHICLE (REAR AXLE)

Determine actual ride level (A).

Measurement from wheel arch lower edge (1) to rim flange (2) at height of wheel center.

If determined value deviates from specified target value:

REFER TO TECHNICAL DATA .



R31 0177

Fig. 163: Identifying Actual Ride Height From Lower Edge Of Wheel Arch To Rim Flange
 Courtesy of BMW OF NORTH AMERICA, INC.

33 53 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT COIL SPRING

IMPORTANT:

- Both coil springs on the relevant axle must be replaced in the event of corrosion breakage.
- The spring pads at the top and bottom must also be renewed when

replacing the coil springs.

NOTE: The coil spring is allocated in the Electronic Parts Catalogue (EPC) under the item "Spring table" after the vehicle identification number has been entered and the optional equipments of the car have been selected.

Necessary preliminary work

- Remove **REAR WHEEL** .
- Remove output shaft of final drive . See **3321001 REMOVING AND INSTALLING OR REPLACING LEFT OUTPUT SHAFT** or **3321002 REMOVING AND INSTALLING/REPLACING RIGHT OUTPUT SHAFT**.
- Remove shock absorber on trailing arm . See **3712131 REPLACING LEFT OR RIGHT REAR SHOCK ABSORBER (ADAPTIVE M SUSPENSION)** or **3352000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER** on left and right

WARNING: Danger of injury!

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

When supporting components, make sure that:

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

Press trailing arm downwards.

Pull out coil spring to the side.

Remove upper spring pad (1) from take-up locator/frame side member.

Installation note:

Position coil spring with upper spring pad (1) on lower spring pad (2) mounted in wishbone and align to take-up locator/frame side member.

Raise trailing arm using a workshop jack.

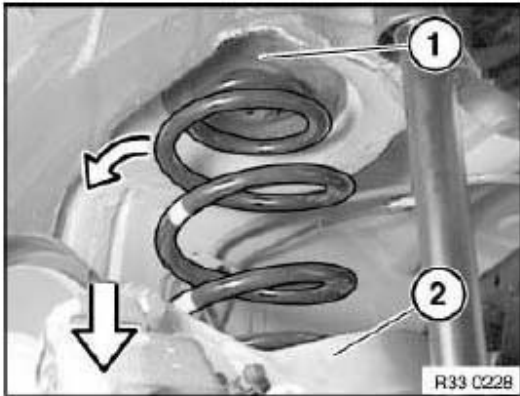


Fig. 164: Pulling Out Coil Spring
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Spring pads must be positively seated in the take-up locator/frame side member or wishbone to prevent the coil spring from springing out of the centering mount.

Installation note:

Check spring pads (1, 3) for damage, replace if necessary.

Attach top spring pad (1) to coil spring (2).

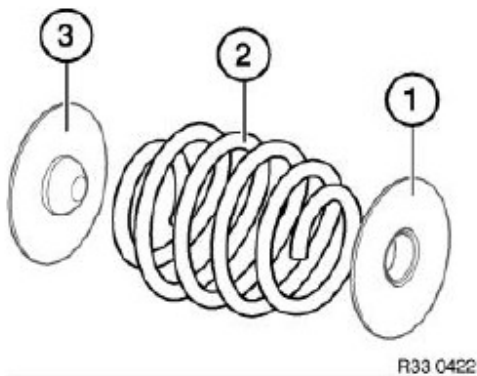


Fig. 165: Identifying Coil Spring And Spring Pads
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Check HEADLIGHT ADJUSTMENT , correct if necessary.

3355 STABILIZER BAR

33 55 000 REMOVING AND INSTALLING/REPLACING REAR ANTI-ROLL BAR

Necessary preliminary work

- Remove both **TENSION STRUTS** .
- Remove **REAR WHEELS**
- N54 engine only: Remove exhaust system

Remove stabilizer link (1) on upper control arm.

Tightening torque **33 55 2AZ** .

Installation note:

Replace self-locking nut.

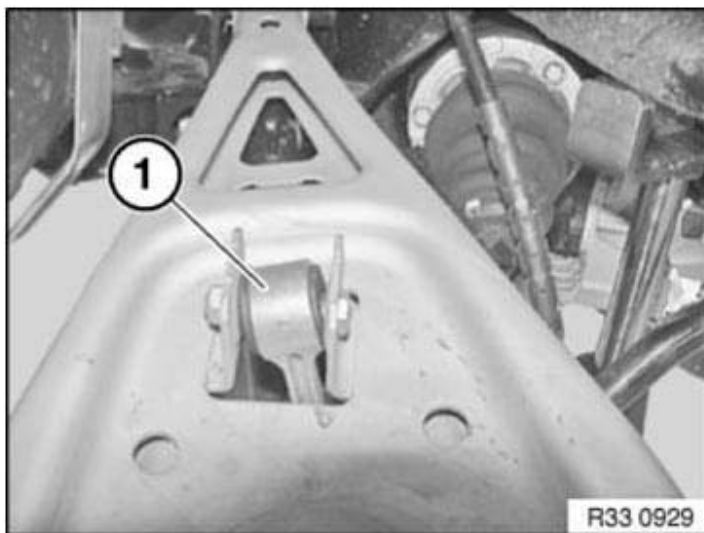


Fig. 166: Identifying Stabilizer Link On Upper Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

To avoid scratching by the stabilizer link bracket, it will be necessary to tape off the output shafts and lower control arm.

Release nuts and remove screws towards rear.

Tightening torque **33 55 1AZ** .

Remove stabilizer from rear axle carrier and feed out to right.

Installation note:

Check **RUBBER MOUNT ON BOTH SIDES** , replace if necessary.

Replace self-locking nuts.

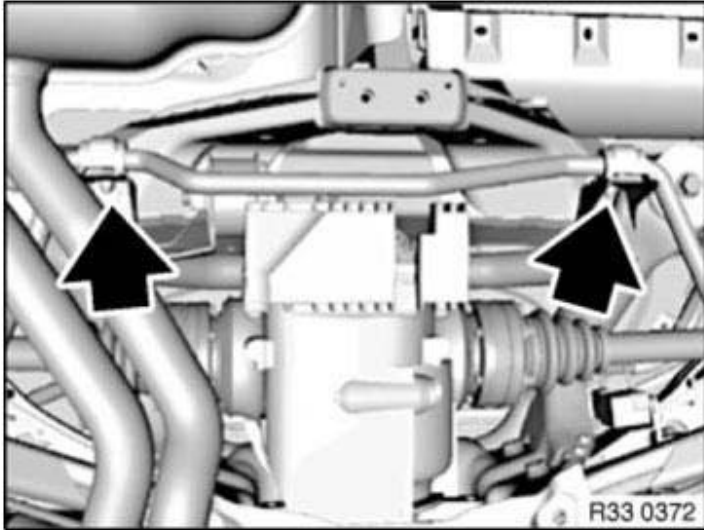


Fig. 167: Locating Rear Axle Carrier Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement

Replace STABILIZER LINK ON BOTH SIDES .

Remove RUBBER MOUNT ON BOTH SIDES FROM STABILIZER .

33 55 040 REPLACING ANTI-ROLL BAR LINKS FOR STABILIZER BAR

Necessary preliminary work

- Remove ANTI-ROLL BAR

Clamp stabilizer link in vice with protective vice jaws.

Pull off stabilizer with rotational movements.

If the rubber mount remains on the stabilizer, it must be cut through with the blade and pulled off.

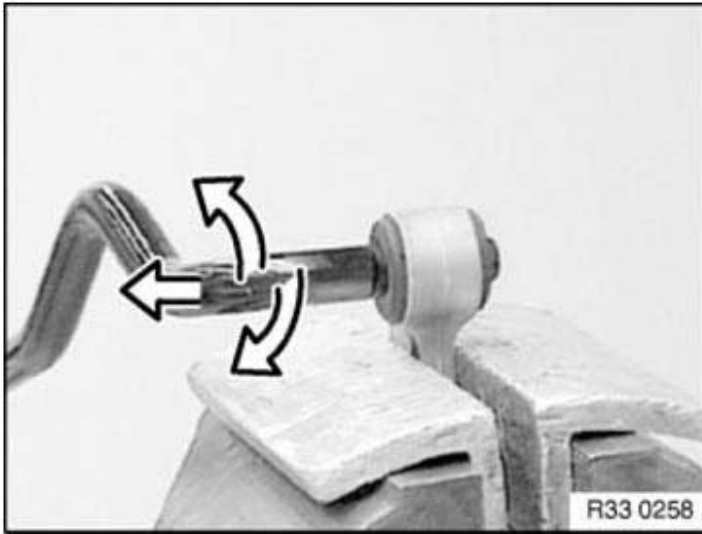


Fig. 168: Pulling Off Stabilizer
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Clamp new stabilizer link in vice with protective vice jaws.

Moisten end of stabilizer and inside of rubber mount with Circolight mounting agent.

Press stabilizer as far as possible into stabilizer link with rotary motions.

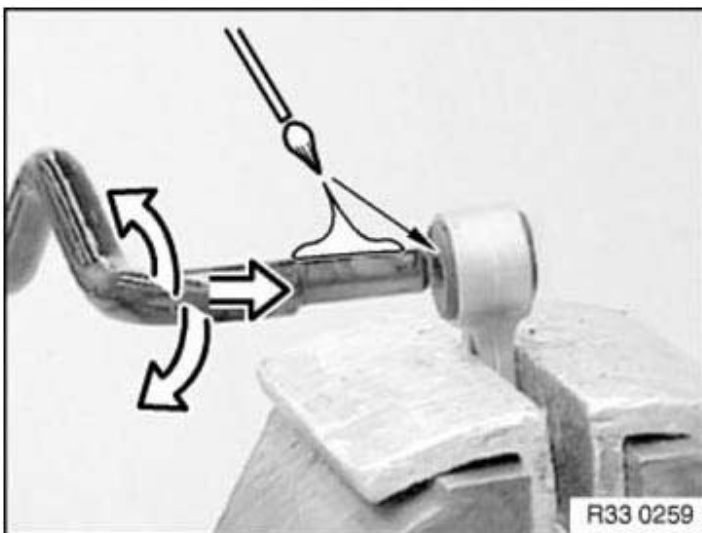


Fig. 169: Pressing Stabilizer Into Stabilizer Link
 Courtesy of BMW OF NORTH AMERICA, INC.

33 55 021 REPLACING BOTH RUBBER MOUNTS FOR STABILIZER MOUNTING

Release nuts and remove screws towards rear.

Tightening torque **33 55 1AZ** .

Remove stabilizer from rear axle carrier.

Remove retaining bracket and rubber mount on both sides.

Installation:

Keep retaining bracket, rubber mount and stabilizer clean and free from oil and grease.

Replace self-locking nuts.

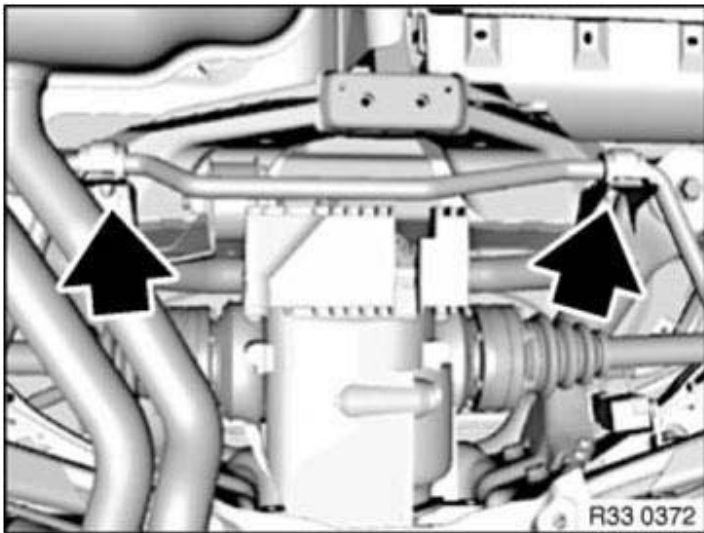


Fig. 170: Locating Rear Axle Carrier Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

SUSPENSION

Rear Axle - Special Tools - Z4

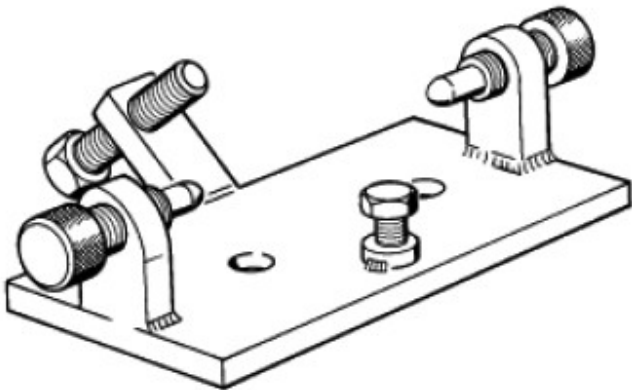
33 REAR AXLE

33-1030 DEVICE

Device MW

Replaced by: 0492079

NOTE: (Fixture) For all rear axle final drives - model year: From 88 - Replaced by 33 1 070.(0 492 079)



W33 1 030

Fig. 1: Identifying Device (331030)

Courtesy of BMW OF NORTH AMERICA, INC.

33-1150 DEVICE

Device MW

NOTE: For pulling off drive flanges (also E46/16).

Storage Location

C18

C17

Consisting of:

4 = 0494872 Plate

NOTE: (Adapter plate) Transmission: GS6-57DZ, GS6-53BZ (G-transmission) GS6-51DZ, GS6-51BZ (H-transmission)

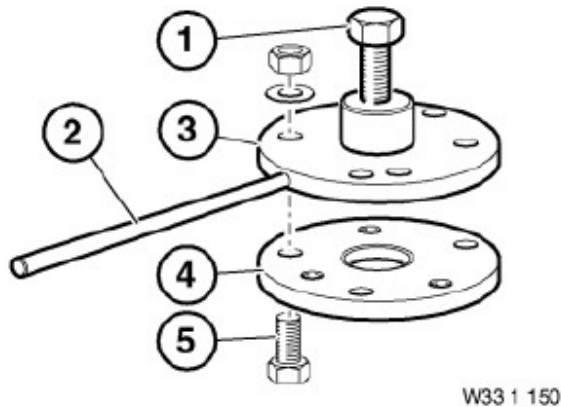


Fig. 2: Identifying Device (331150)
Courtesy of BMW OF NORTH AMERICA, INC.

5 = 0494873 Screw

NOTE: (Countersunk screws M10x30 (3 x)) Transmission: GS6-57DZ, GS6-53BZ (G-transmission) GS6-51DZ, GS6-51BZ (H-transmission)

1 = 0493265 Spindle

2 = 0493266 Mandrel

3 = 0494631 Washer

33-4130 DEVICE

Device MW

NOTE: For removing and installing rubber mount in support tube of rear axle final drive mounting.

SI number

01 01 89 (989)

Consisting of:

1 = 0492394 Plate

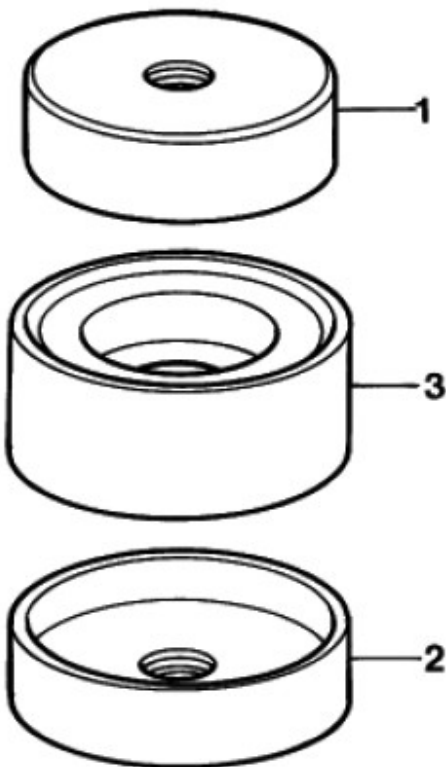
NOTE: (Shaped plate, top) For removing

2 = 0492395 Plate

NOTE: (Shaped plate, top) For pulling in

3 = 0492396 Plate

NOTE: (Shaped plate, bottom) For pulling in



W33 4 130

Fig. 3: Identifying Device (334130)
Courtesy of BMW OF NORTH AMERICA, INC.

33-4450 DEVICE

Device Minimum set: Mechanical tools MW

NOTE: (Device) For installing split rubber mounts.

Storage Location

A50

B50

SI number

01 15 04 (117)

Consisting of:

1 = 0495038 Spindle

NOTE: (Spindle with handle)

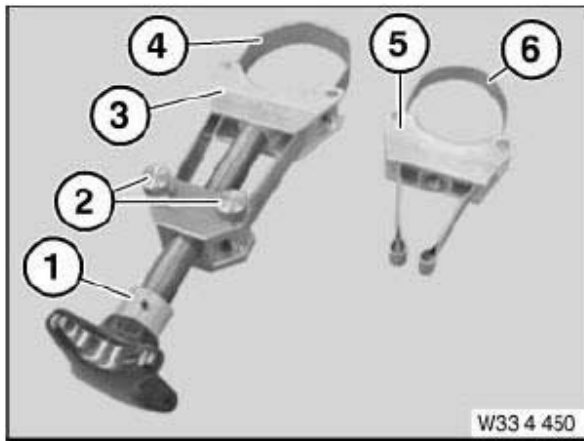


Fig. 4: Identifying Device (334450)
Courtesy of BMW OF NORTH AMERICA, INC.

2 = 0495039 Screw

NOTE: (Knurled screws (2 x))

3 = 0495040 Fixture

NOTE: (Fixture for diameter 46 mm)

4 = 0495041 Tensioning strap

NOTE: (Tensioning strap)

5 = 0495042 Fixture

NOTE: (Fixture for diameter 51 mm)

6 = 0495043 Tensioning strap

NOTE: (Tensioning strap)

33-4100 DEVICE

Device MW

NOTE: For extracting and press-fitting the rubber mount in the trailing arm.

SI number

01 01 89 (989)

Consisting of:

1 = 0492379 Sleeve

NOTE: (support sleeve) During extraction

2 = 0492380 Sleeve

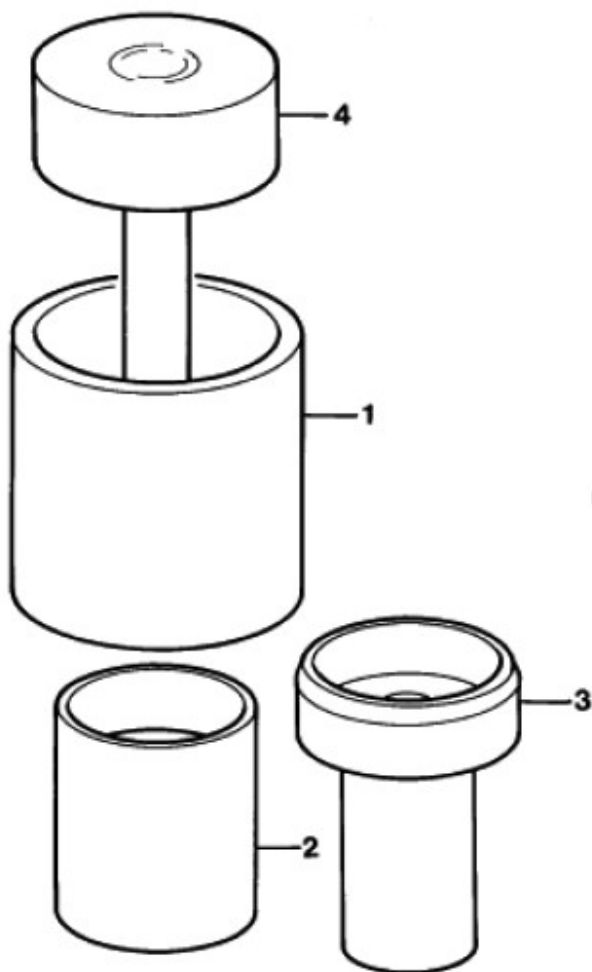
NOTE: (press-out sleeve)

3 = 0492381 Sleeve

NOTE: (press-in sleeve)

4 = 0492382 Shaped element

NOTE: For press-fitting



W33 4 100

Fig. 5: Identifying Device (334100)

Courtesy of BMW OF NORTH AMERICA, INC.

33-4110 DEVICE

Device MW

NOTE: For removing and installing the rubber mount in the wishbone

SI number

01 01 89 (989)

Consisting of:

1 = 0492384 Sleeve

NOTE: (Support sleeve) For pressing out

2 = 0492385 Sleeve

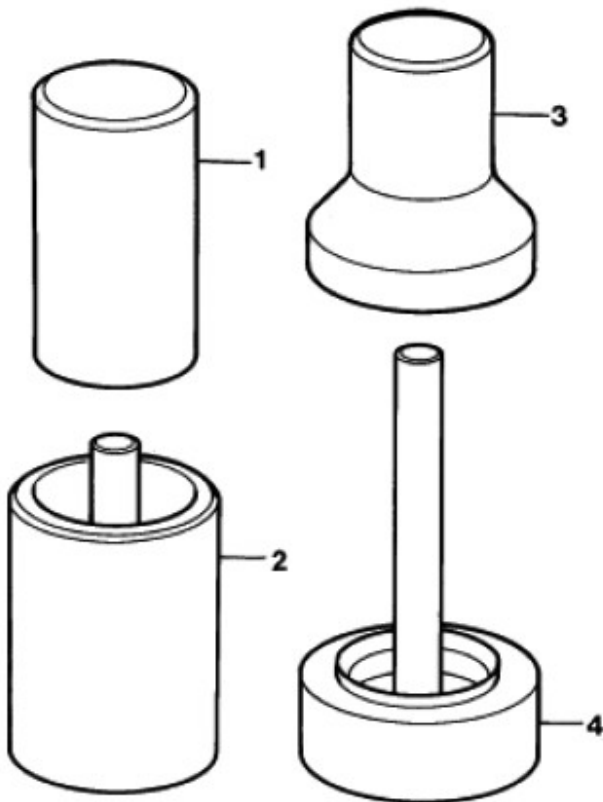
NOTE: (Press-out sleeve)

3 = 0492386 Sleeve

NOTE: (Press-in sleeve)

4 = 0492387 Shaped element

NOTE: For pressing in



W33 4 110

Fig. 6: Identifying Device (334110)
Courtesy of BMW OF NORTH AMERICA, INC.

33-2100 DEVICE

Device MW

NOTE: For gripping output shafts when press-fitting constant-velocity joint

Storage Location

C23

SI number

01 06 94 (801)

Consisting of:

1 = 0492166 Frame

2 = 0492167 Shell

NOTE: (shells) 2 pcs. Diameter 30 mm - model series: E38/model: 730i

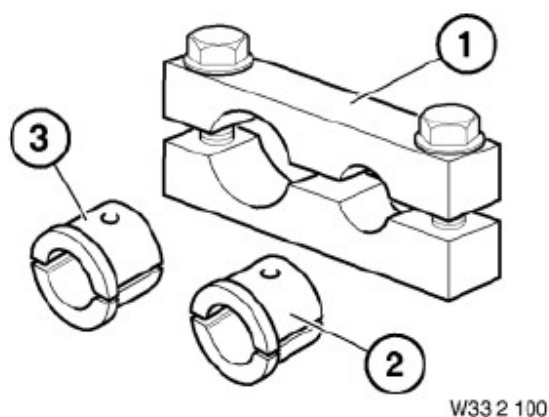


Fig. 7: Identifying Device (332100)

Courtesy of BMW OF NORTH AMERICA, INC.

3 = 0492168 Shell

NOTE: (shells) 2 pcs. Diameter 35 mm - model series: all, except E38

33-4400 DEVICE

Device MW

NOTE: For removing inner wheel bearing races on rear axle

SI number

01 05 99 (426)

Consisting of:

1 = 0493816 Basic body

2 = 0493817 Spindle

3 = 0493818 Key

NOTE: (wrench)

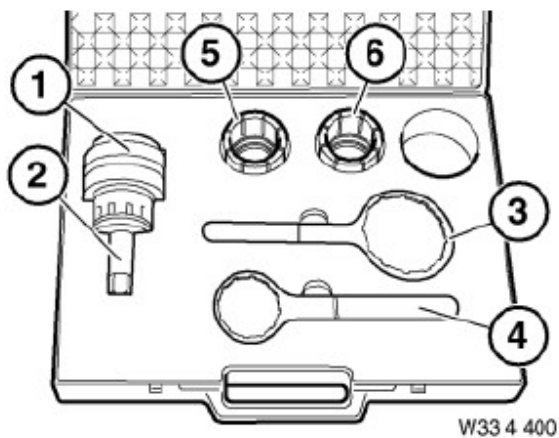


Fig. 8: Identifying Device (334400)

Courtesy of BMW OF NORTH AMERICA, INC.

4 = 0493819 Key

NOTE: (wrench)

5 = 0493820 Pliers

NOTE: (clamping ring (45...51 mm))

6 = 0493821 Pliers

NOTE: (clamping ring (50...55 mm))

7 = 0494617 Pliers

NOTE: (clamping ring (55...61 mm)) Model series: E67

8 = 0496538 Ring

NOTE: (clamping ring) Model series: F01, F02 See SI: 01 18 08 (482)

9 = 0496539 Synchronizing key

NOTE: Series: F01, F02 See SI: 01 18 08 (482)

33-0160 DEVICE

Device MW

NOTE: For removing and installing rubber mount in trailing arm, front, on rear axle.

Storage Location

C26

SI number

01 09 09 (532)

Consisting of:

1 = 0496607 Synchronizing key

2 = 0496608 Bush

3 = 0496609 Washer

NOTE: (shaped disc)

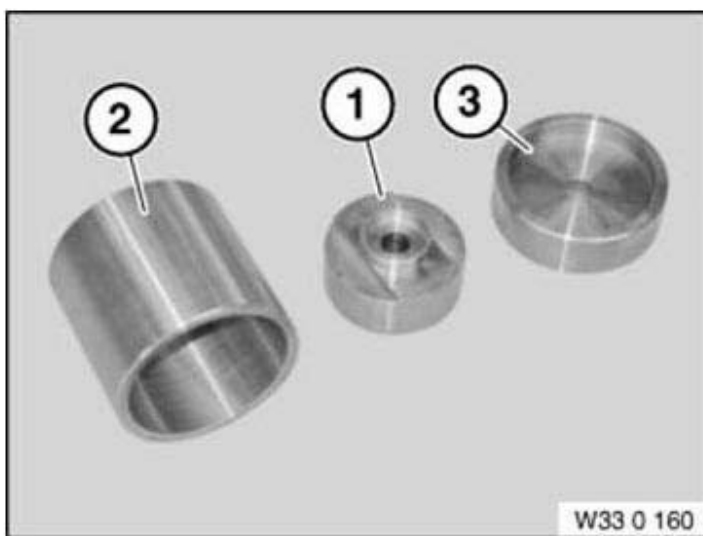


Fig. 9: Identifying Device (330160)

Courtesy of BMW OF NORTH AMERICA, INC.

33-4120 DEVICE

Device MW

NOTE: For removing and installing ball joint mount in wishbone.

SI number

01 01 89 (989)

Consisting of:

1 = 0492389 Shaped element

NOTE: For hanging up when pressing out the ball joint

2 = 0492390 Bush

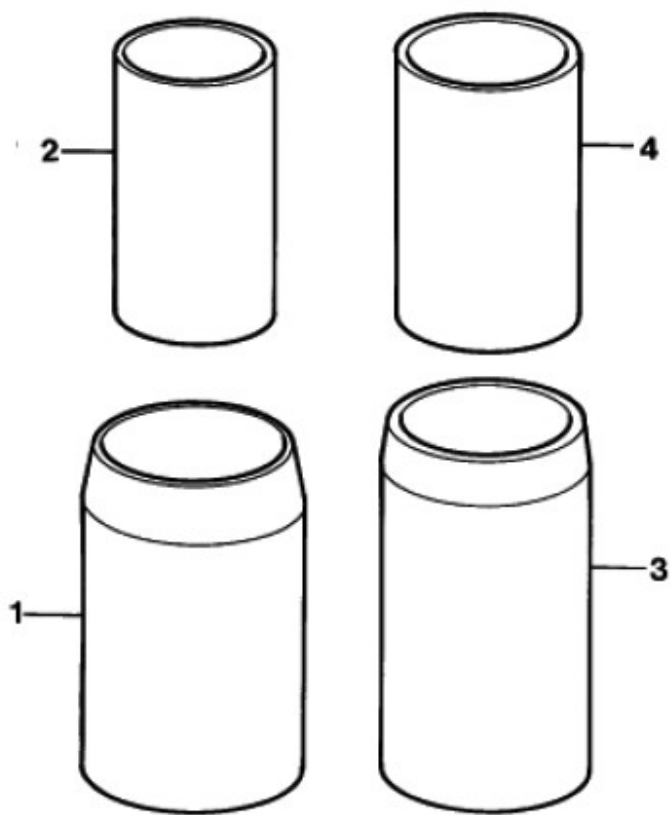
NOTE: (Pressure bushing) For pressing the ball joint out of the wishbone

3 = 0492391 Shaped element

NOTE: For hanging up the wishbone when pressing in the ball joint

4 = 0492392 Bush

NOTE: (Pressure bushing) For pressing the ball joint into the wishbone



W33 4 120

Fig. 10: Identifying Device (334120)

Courtesy of BMW OF NORTH AMERICA, INC.

33-5153 DISC

Disc

SI number

01 22 06 (307)

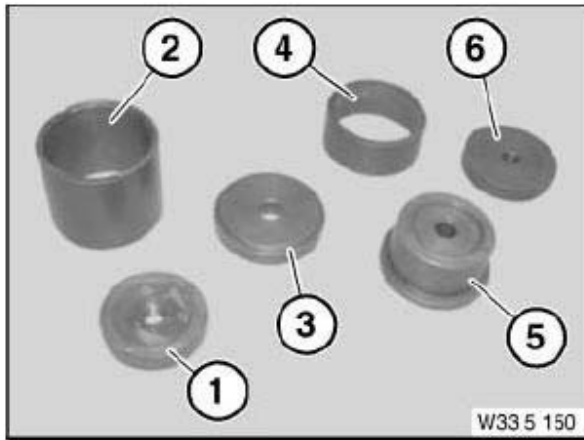


Fig. 11: Identifying Disc (335153)
Courtesy of BMW OF NORTH AMERICA, INC.

33-5156 DISC

Disc

SI number

01 22 06 (307)

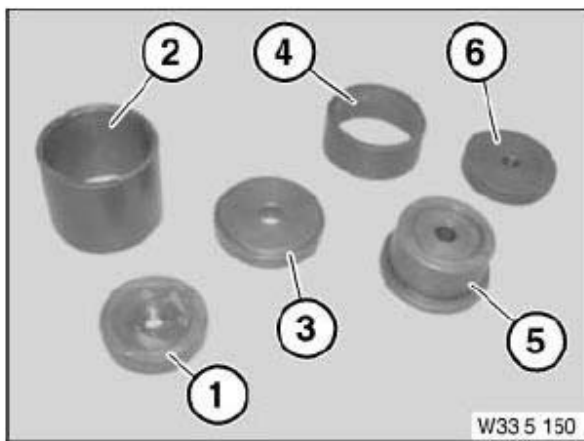


Fig. 12: Identifying Disc (335156)
Courtesy of BMW OF NORTH AMERICA, INC.

33-5151 DISC

Disc

SI number

01 22 06 (307)

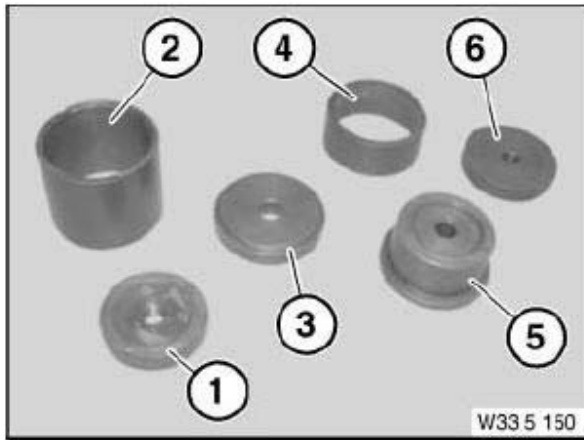


Fig. 13: Identifying Disc (335151)
Courtesy of BMW OF NORTH AMERICA, INC.

33-5155 DISC

Disc

SI number

01 22 06 (307)

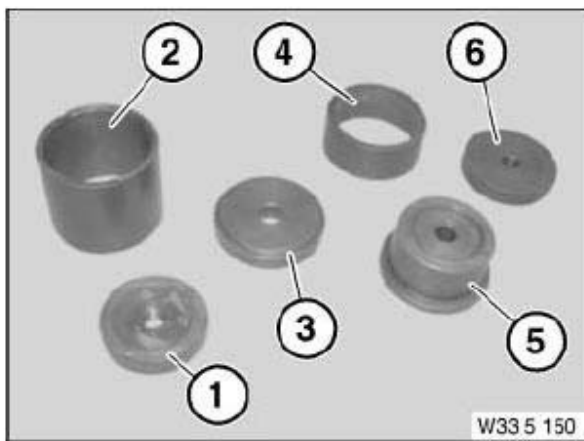


Fig. 14: Identifying Disc (335155)
Courtesy of BMW OF NORTH AMERICA, INC.

33-5070 EXTENSION

Extension Minimum set: Mechanical tools MW

NOTE: (2 pieces) Pullout extension for 33 5 040, 33 5 050, 33 5 060.

Storage Location

A18

B18

SI number

01 21 06 (300)

Consisting of:

1 = 0495592 Extension

NOTE: (Extension (1 piece))



Fig. 15: Identifying Extension (335070)
Courtesy of BMW OF NORTH AMERICA, INC.

33-1300 EXTRACTOR

Extractor MW

NOTE: (Rillex extractor) For bevel pinion and differential case (rear diff)/for installation of camshaft sprocket on crankshaft (M70)/for removing bearing inner race from drive flange (E36, E46)

Storage Location

B6

C6

Consisting of:

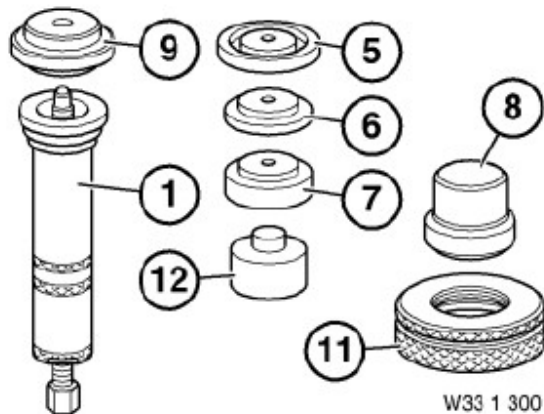


Fig. 16: Identifying Extractor (331300)
Courtesy of BMW OF NORTH AMERICA, INC.

2 = 0492098 Washer

NOTE: (Disc) Replaced by 33 1 311.(0 492 107)

3 = 0492099 Washer

NOTE: (Disc) Replaced by 33 1 311.(0 492 107)

4 = 0492100 Washer

NOTE: (Disc) Replaced by 33 1 311.(0 492 107)

1 = 0492097 Connector

NOTE: (basic body) For transmission S5D 260Z, S5D 310Z and S5D 320Z;

5 = 0492101 Synchronizing key

NOTE: (Synchronizing key (old))

6 = 0492102 Synchronizing key

7 = 0492103 Synchronizing key

8 = 0492104 Synchronizing key

= 0492105

9 = 0492105 Synchronizing key

NOTE: For rear axle final drive and for installation of the camshaft sprocket on the crankshaft (M70)

1 = 0492107 Washer

NOTE: (washer)

2 = 0492108 Synchronizing key

NOTE: For pulling the bearing inner race off the drive flange - Series: E36/5

33-4420 FIXTURE

Fixture MW

NOTE: For mounting rear axle final drive during removal and installation.

Consisting of:

2 = 0494831 Angle

NOTE: (Support angle) Replaced by 33 4 425. (0 495 317)

4 = 0495575 Adapter

NOTE: (mounting adapter) mounting for E85 Z4 M. SI 01 10 06 (264)

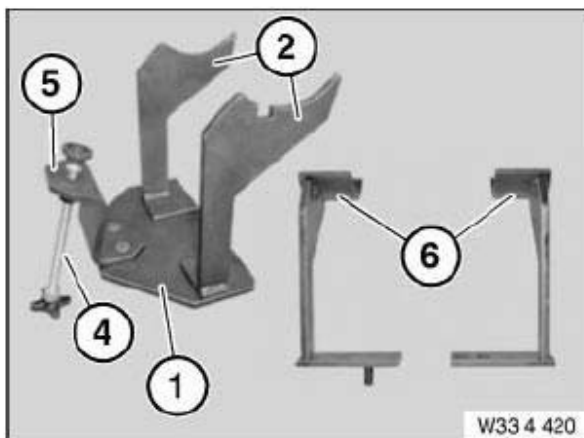


Fig. 17: Identifying Fixture (334420)
Courtesy of BMW OF NORTH AMERICA, INC.

1 = 0494829 Plate

NOTE: (Base plate)

2 = 0494830 Adapter

NOTE: (adapter kit)

4 = 0494832 Spindle

NOTE: (spindle with synchronizing key)

5 = 0495317 Angle

NOTE: (support angle)

33-3280 GAUGE

Gauge MW

NOTE: (setting gauge) For aligning bearing support from side member to wheel center

SI number

01 19 99 (484)



W33 3 280

Fig. 18: Identifying Gauge (333280)
Courtesy of BMW OF NORTH AMERICA, INC.

33-5152 HOLDING SLEEVE

Holding sleeve

SI number

01 22 06 (307)

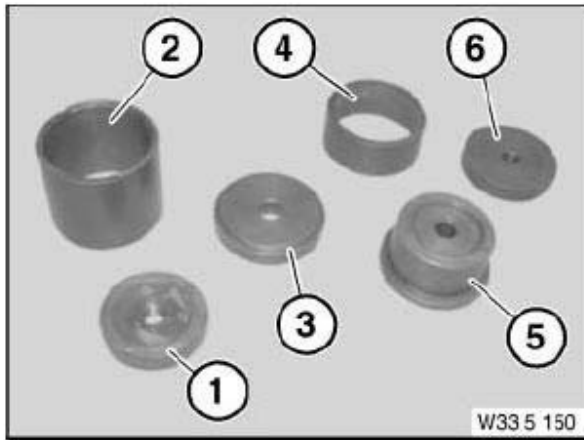


Fig. 19: Identifying Holding Sleeve (335152)
 Courtesy of BMW OF NORTH AMERICA, INC.

33-5154 HOLDING SLEEVE

Holding sleeve

SI number

01 22 06 (307)

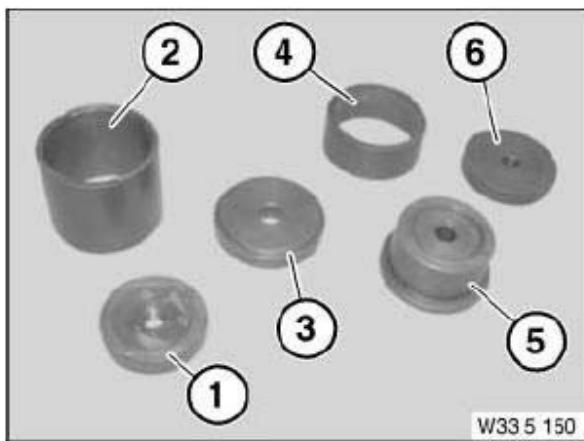


Fig. 20: Identifying Holding Sleeve (335154)
 Courtesy of BMW OF NORTH AMERICA, INC.

33-1100 KEY

Key MW

NOTE: (Key) To counter-hold the drive flange - Replaced by universal key

33-0150 MANDREL

Mandrel Minimum set: Mechanical tools MW

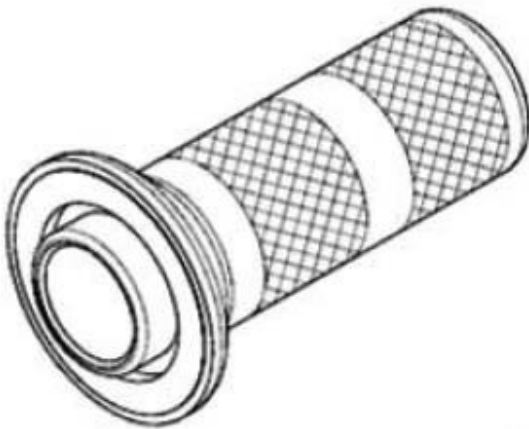
NOTE: (drift) For driving radial shaft seal onto drive flange.

Storage Location

B26

SI number

01 09 09 (532)



W33 0 150

Fig. 21: Identifying Mandrel (330150)
Courtesy of BMW OF NORTH AMERICA, INC.

33-1180 MANDREL

Mandrel MW

Replaced by: 0491891

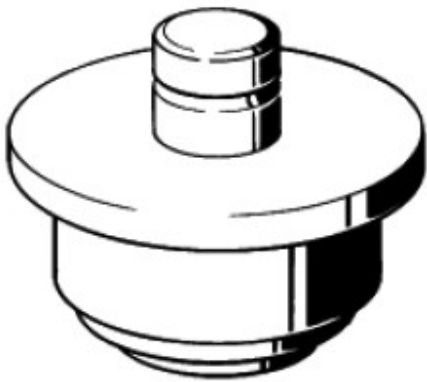
NOTE: (Drift) Replaced by 31 2 040.(0 491 891)

33-1210 MANDREL

Mandrel MW

Replaced by: 0492338

NOTE: (Drift) For radial seal on output flange - Replaced by 33 3 420.(0 492 338)



W33 1 210

Fig. 22: Identifying Mandrel (331210)
Courtesy of BMW OF NORTH AMERICA, INC.

33-5130 MANDREL

Mandrel Minimum set: Mechanical tools MW

NOTE: For driving the radial shaft seal of the output shaft into the rear axle final drive.
Rear axle final drive: 188

Storage Location

C21

SI number

01 22 06 (307)



W33 5 130

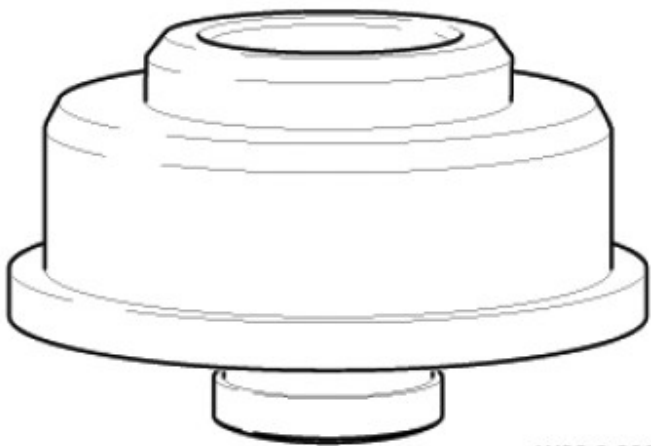
Fig. 23: Identifying Mandrel (335130)
Courtesy of BMW OF NORTH AMERICA, INC.

33-3380 MANDREL

Mandrel MW

Replaced by: 0492338

NOTE: (Drift) For fitting the radial sealing ring, right-hand output end/Replaced by 33 3 420.(0 492 338)



W33 3 380

Fig. 24: Identifying Mandrel (333380)

Courtesy of BMW OF NORTH AMERICA, INC.

33-5080 MANDREL

Mandrel Minimum set: Mechanical tools MW

NOTE: For driving in shaft seal on drive shaft.

Storage Location

A16

SI number

01 21 06 (300)



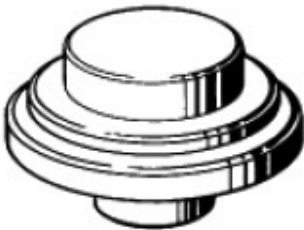
Fig. 25: Identifying Mandrel (335080)
Courtesy of BMW OF NORTH AMERICA, INC.

33-1170 MANDREL

Mandrel MW

Replaced by: 0492339

NOTE: (Drift) For driving the radial seal into the output flange with flange diameter 38 mm - Replaced by 33 3 430.(0 492 339)



W33 1 170

Fig. 26: Identifying Mandrel (331170)
Courtesy of BMW OF NORTH AMERICA, INC.

33-4426 MOUNTING ADAPTER

Mounting adapter

NOTE: Locator for E85 Z4 M. SI 01 10 06 (264)

SI number

01 10 06 264

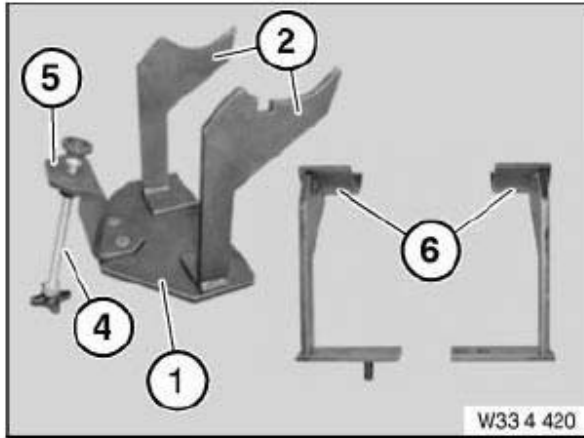


Fig. 27: Identifying Mounting Adapter (334426)
Courtesy of BMW OF NORTH AMERICA, INC.

33-5040 OPEN-END WRENCH

Open-end wrench Minimum set: Mechanical tools MW

NOTE: Open-end spanner SW50 with retaining clip For releasing and tightening down the insert nuts for the screw connection of the propeller shaft on the rear axle final drive.

Storage Location

A18

SI number

01 21 06 (300)

Consisting of:

2 = 0495582 Retaining bracket

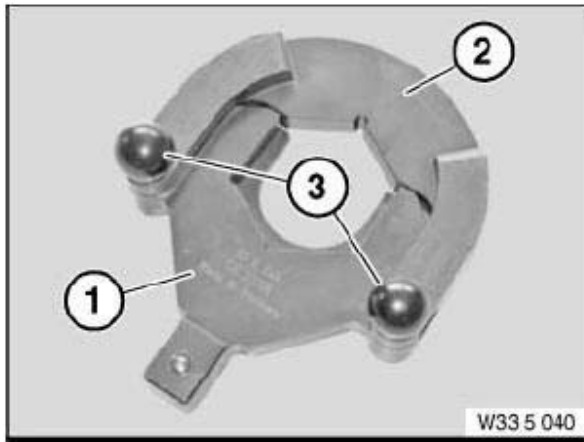


Fig. 28: Identifying Open-End Wrench (335040)
 Courtesy of BMW OF NORTH AMERICA, INC.

3 = 0495583 Pin

NOTE: (Pin with chain (2 x))

1 = 0495581 Basic body

33-3010 SPINDLE

Spindle Minimum set: Mechanical tools MW

NOTE: (spindle TR12 with nut) For installing and removing rubber mounts, see "In conjunction with".

SI number

01 16 08 (476)

Consisting of:

3 = 0496555 Nut

NOTE: (nut M12x1.5 (high wall))

1 = 0496553 Spindle

NOTE: (spindle TR12)

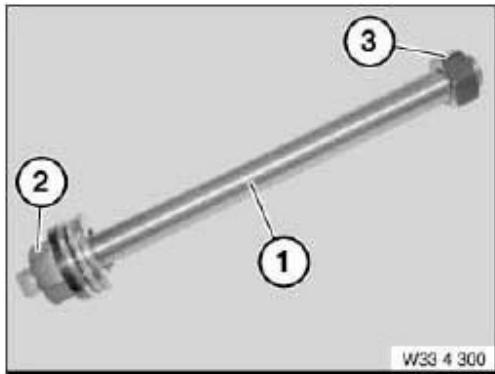


Fig. 29: Identifying Spindle (333010)
Courtesy of BMW OF NORTH AMERICA, INC.

2 = 0496554 Nut

NOTE: (nut TR12 with thrust bearing)

33-4300 SPINDLE

Spindle Minimum set: Mechanical tools MW

NOTE: (spindle TR20 with nut) For installing and removing rubber mounts, see "In conjunction with".

SI number

01 16 08 (476)

Consisting of:

1 = 0496535 Spindle

NOTE: (spindle TR20 (length 300 mm))

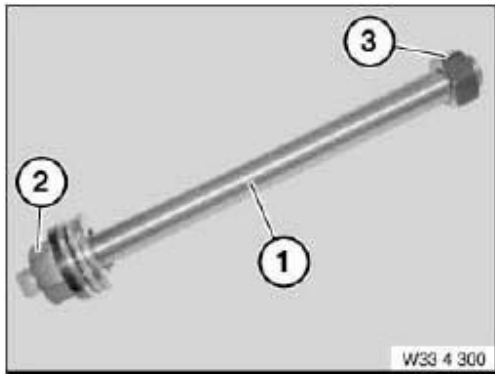


Fig. 30: Identifying Spindle (334300)
 Courtesy of BMW OF NORTH AMERICA, INC.

3 = 0496551 Nut

NOTE: (nut TR20)

2 = 0496536 Nut

NOTE: (nut TR20 with thrust bearing)

33-5014 THRUST PIECE WITH SPLINED KEY

Thrust piece with splined key

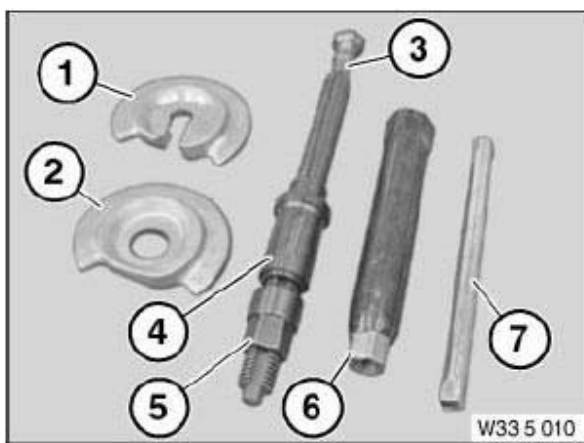


Fig. 31: Identifying Thrust Piece With Splined Key (335014)
 Courtesy of BMW OF NORTH AMERICA, INC.

33-4030 TOOL

Tool Minimum set: Mechanical tools MW

NOTE: (Tool set) For removing and installing rear wheel bearings Components 33 4 032, 33 4 038 and 33 4 039 are discontinued and are replaced in the order by 33 4 301, 33 4 302 and 33 4 303

Storage Location

C7

Consisting of:

2 = 0492351 Spindle

NOTE: (Spindle) Series: E28 Replaced by 33 4 301 (0 496 535)

8 = 0492357 Nut

NOTE: (Nut with bearing) Series: E28 Replaced by 33 4 302 (0 496 536)

5 = 0492354 Washer

NOTE: (thrust washer) For installing wheel bearing, rear/Series: E28/model: 518, 520i

7 = 0492356 Washer

NOTE: (thrust washer) For installing wheel bearing, rear/Series: E28/model: 525i, 528i

9 = 0492358 Nut

NOTE: (nut)

1 = 0492350 Bell housing

NOTE: For counter support when removing the rear wheel bearing

3 = 0492352 Washer

NOTE: (thrust washer) For removing wheel bearing, rear/Series: E28/model: 518, 528i

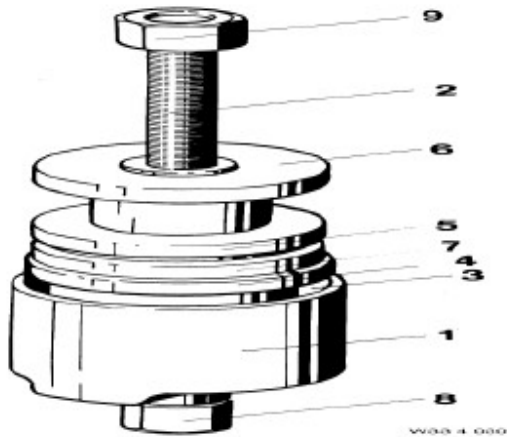


Fig. 32: Identifying Tool (334030)

Courtesy of BMW OF NORTH AMERICA, INC.

4 = 0492353 Sleeve

NOTE: (guide sleeve) For installing wheel bearing, rear/Series: E28/model: 518, 520i

6 = 0492355 Sleeve

NOTE: (guide sleeve) For installing wheel bearing, rear/Series: E28/model: 525i, 528i

33-4180 TOOL

Tool Minimum set: Mechanical tools MW

NOTE: (installation/removal tool) For removing and installing rubber mounts on rear axle final drive, rear

Storage Location

B34

SI number

01 12 95 (992)

Consisting of:

1 = 0492427 Pipe

NOTE: (Support tube) For removing

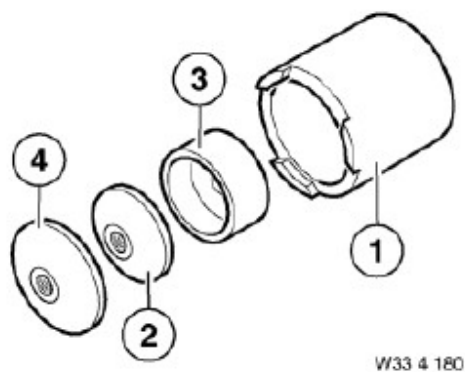


Fig. 33: Identifying Tool (334180)
Courtesy of BMW OF NORTH AMERICA, INC.

2 = 0492428 Synchronizing key

NOTE: For installing

3 = 0492429 Plate

NOTE: (support plate) For installing

4 = 0492430 Synchronizing key

NOTE: For removing

33-3200 TOOL

Tool MW

NOTE: (Press-out/-in tool set) For pressing the rubber mount out of and into the control arm special tools 33 3 202 and 33 3 203 for E87 and E90

Storage Location

B32

SI number

01 05 90 (207)

Consisting of:

1 = 0492261 Bush

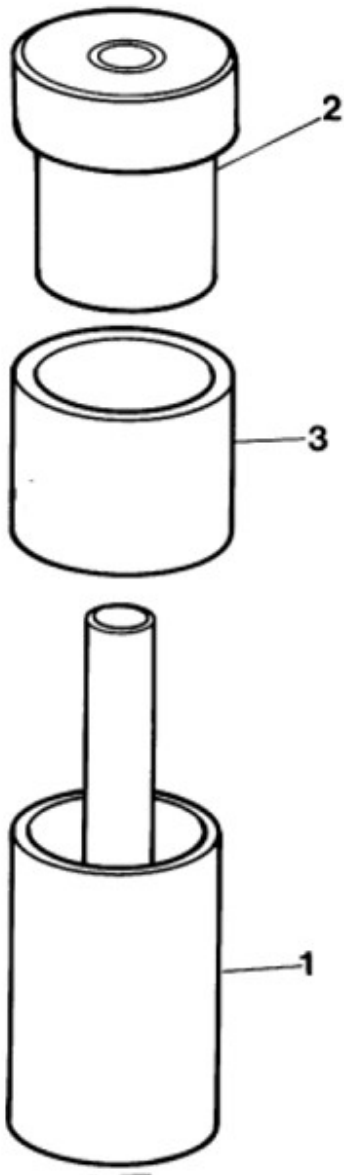
NOTE: For accommodating control arm when pressing out rubber mount Series: E31

2 = 0492262 Thrust piece

NOTE: For pressing out rubber mount Series: E31, E46, E85, F01, F02

3 = 0492263 Sleeve

NOTE: (Spacer sleeve) For pressing rubber mount into control arm Series: E31, E46, E85, F01, F02



W33 3 200

Fig. 34: Identifying Tool (333200)

Courtesy of BMW OF NORTH AMERICA, INC.

33-4040 TOOL

Tool Minimum set: Mechanical tools MW

NOTE: (Tool set) For removing and installing wheel bearings, rear

Storage Location

C8

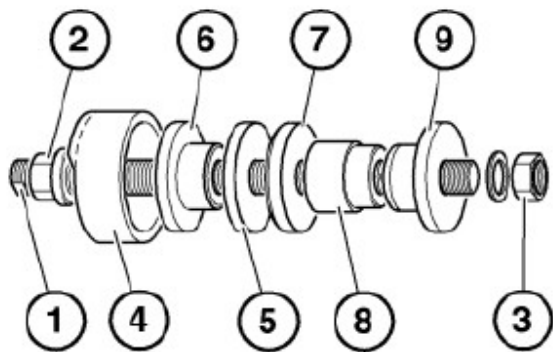
Consisting of:

3 = 0492362 Nut

NOTE: **Series: E30, E46 Replaced by 33 4 303 (0 496 551)**

8 = 0492367 Bush

NOTE: **(Draw-in bushing for rear axle shaft)**



W33 4 040

Fig. 35: Identifying Tool (334040)

Courtesy of BMW OF NORTH AMERICA, INC.

4 = 0492363 Bell housing

NOTE: **For gripping when removing wheel bearing, rear/series: E30**

6 = 0492365 Sleeve

NOTE: **(Guide sleeve) For installing wheel bearing, rear/series: E30**

5 = 0492364 Washer

NOTE: **(Pullout disc)**

7 = 0492366 Washer

NOTE: **(Thrust washer) For installing wheel bearing, rear**

9 = 0492368 Sleeve

NOTE: (Guide sleeve) For installing wheel bearings

= 0492360

1 = 0492360 Spindle

NOTE: (Spindle) Series: E30, E46 Replaced by 33 4 301/0 496 535

2 = 0492361 Nut

NOTE: (Nut with bearing) Series: E30, E46 Replaced by 33 4 302/0 496 536

33-4460 TOOL

Tool Minimum set: Mechanical tools MW

NOTE: For removing and fitting camber arm rubber mount on rear axle support.

Storage Location

B49

C49

SI number

01 15 04 (117)

Consisting of:

1 = 0494977 Washer

NOTE: (Draw-in disc)

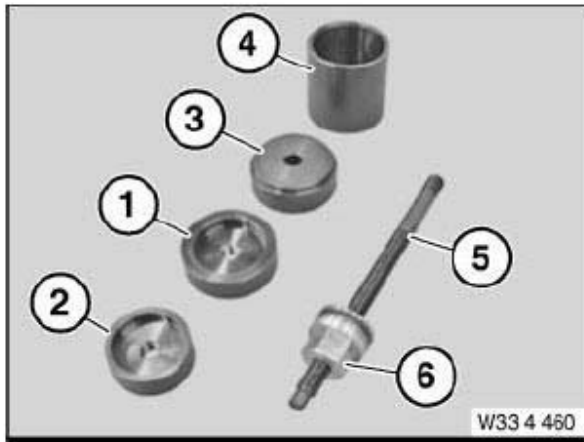


Fig. 36: Identifying Tool (334460)

Courtesy of BMW OF NORTH AMERICA, INC.

2 = 0494978 Washer

NOTE: (Pullout disc)

3 = 0494979 Holder

NOTE: (Counter support)

4 = 0494980 Sleeve

NOTE: (Support sleeve)

5 = 0494981 Spindle

NOTE: (spindle 205 mm, M12)

6 = 0494982 Nut

NOTE: (Thrust nut)

33-4280 TOOL

Tool Minimum set: Mechanical tools MW

NOTE: For removing and installing rubber mount of rear axle final drive mounting at rear.

Storage Location

C45

SI number

01 14 01 (766)

Consisting of:

6 = 0496310 Washer

NOTE: (disc (draw-in dimension 3.5 mm)) model series: E83, E85 see SI 01 18 07 (396)

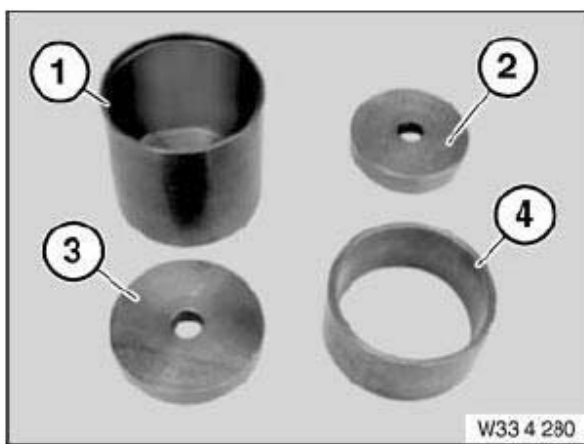


Fig. 37: Identifying Tool (334280)

Courtesy of BMW OF NORTH AMERICA, INC.

1 = 0494049 Bush

2 = 0494050 Washer

4 = 0494052 Washer

5 = 0495623 Washer

NOTE: (disc (draw-in dimension 5.0 mm)) model series: E85, E86

3 = 0494051 Bush

NOTE: (slip bush)

SUSPENSION

Rear Axle - Technical Data - Z4

GENERAL - TRACK WIDTH

33 00 GENERAL - TRACK WIDTH E92/M3 GTS

GENERAL - TRACK WIDTH SPECIFICATION

Track width for normal position		
19" wheel	mm	1539

GENERAL - TRACK WIDTH E89/STANDARD SUSPENSION

33 00 GENERAL - TRACK WIDTH E89 STANDARD SUSPENSION

GENERAL - TRACK WIDTH SPECIFICATION

Track width for normal position and offset (ET)		
- ET29	mm	1562
- ET40	mm	1540

GENERAL - TRACK WIDTH E89/VDC SUSPENSION

33 00 GENERAL - TRACK WIDTH E89 VDC SUSPENSION

GENERAL - TRACK WIDTH SPECIFICATION

Track width for normal position and offset (ET)		
- ET29	mm	1566
- ET40	mm	1544

REAR AXLE - RIDE HEIGHT E89

33 00 REAR AXLE - RIDE HEIGHT E89

REAR AXLE - RIDE HEIGHT SPECIFICATION

Ride level height in normal position Attach tape measure to bottom middle of rim flange and measure to lower edge of wheel arch	
Tolerance ride height in ○ <u>NORMAL POSITION</u> max. 10 mm ○ <u>DESIGN POSITION</u> max. 2 mm	
Difference ride height between left/right in ○ <u>NORMAL POSITION</u> 10 mm	

○ DESIGN POSITION 2 mm		
Standard suspension		
17" rim	mm ± 10	593
18" rim	mm ± 10	606
19" rim	mm ± 10	618
Adaptive M suspension		
17" rim	mm ± 10	582
18" rim	mm ± 10	595
19" rim	mm ± 10	607

REAR AXLE FINAL DRIVE

33 10 REAR AXLE FINAL DRIVE E60/E61/E63/E64/E70/E72/E82/E89/E90/E91/E92/E93 215L 215LW

REAR AXLE FINAL DRIVE SPECIFICATION

Use only approved final drive oils (refer to REAR AXLE - OPERATING FLUIDS).		
New oil filling volume	litre	1.2

REAR AXLE FINAL DRIVE

33 10 REAR AXLE FINAL DRIVE E60/E61/E63/E64/E81/E82/E86/E87/E89/E90/E91/E92/E93/E70 188L

REAR AXLE FINAL DRIVE SPECIFICATION

Use only approved final drive oils (refer to REAR AXLE - OPERATING FLUIDS).		
New oil filling volume	litre	1.0

WHEEL BEARINGS

33 41 WHEEL BEARINGS

WHEEL BEARINGS SPECIFICATION

Double-row, angular ball bearing lubricated for service life and not to be disassembled		
Max. axial wheel bearing play	max. mm	0.06 ... 0.08

SUSPENSION

Rear Axle - Tightening Torques - Z4

CONTROL ARMS AND STRUTS

33 32 CONTROL ARMS AND STRUTS

TIGHTENING TORQUE SPECIFICATION - CONTROL ARMS AND STRUTS

		Type	Thread	Tightening specification	Measure
1AZ	Trailing arm console to trailing arm	E89	M12	Replace nut	100 Nm
2AZ	Trailing arm console to body	E89	M14		77 Nm
3AZ	Lower wishbone to trailing arm	E89	M12	Replace screw and nut	100 Nm
4AZ	Lower control arm to rear axle carrier	E89	M12	Replace screw and nut Jointing torque Torque angle	70 Nm 90 °
5AZ	Upper wishbone to trailing arm	E89	M12	Replace screw and nut Jointing torque Torque angle	100 Nm 90 °
6AZ	Upper control arm to rear axle carrier	E89	M12	Replace screw and nut Jointing torque Torque angle	70 Nm 90 °
7AZ	Compression strut on body	E89	M12		77 Nm
8AZ	Damper holder to trailing arm	E89	M12	Replace screw and nut Jointing torque Torque angle	50 Nm 90 °
9AZ	Damper to damper holder	E89	M10	Replace screw and nut Jointing torque Torque angle	30 Nm 90 °

OUTPUT SHAFT

33 21 OUTPUT SHAFT

TIGHTENING TORQUE SPECIFICATION - OUTPUT SHAFT

		Type	Thread	Tightening specification	Measure
1AZ	Output shaft to rear differential drive	E89	M10	Replace bolts and washers	70 Nm

flange (Torx screw with ribbed teeth)				
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REAR AXLE SUSPENSION

33 33 REAR AXLE SUSPENSION

TIGHTENING TORQUE SPECIFICATION - REAR AXLE SUSPENSION

	Type	Thread	Tightening specification	Measure
1AZ Rear axle carrier with rubber mounts to body	E89	M12	Follow repair instruction . See <u>3331011 REPLACING REAR AXLE CARRIER</u> or <u>3331503 LOWERING/RAISING REAR AXLE CARRIER</u> .	77 Nm
2AZ Threaded bolt to cross-member, rear axle, front	E89	M12		90 Nm

REAR DIFFERENTIAL CASE WITH COVER

33 11 REAR DIFFERENTIAL CASE WITH COVER

TIGHTENING TORQUE SPECIFICATION - REAR DIFFERENTIAL CASE WITH COVER

	Type	Thread	Tightening specification	Measure
1AZ Case Covers <u>TRANSMISSION ALLOCATION</u>	E89	M10x60 10.9	188L 215L	55 Nm
	E89	M10x25 10.9	188L 215L	55 Nm
2AZ Oil filler plug with O-ring	E89			60 Nm

REAR AXLE DIFFERENTIAL MOUNTINGS

33 17 REAR AXLE DIFFERENTIAL MOUNTINGS

TIGHTENING TORQUE SPECIFICATION - REAR AXLE DIFFERENTIAL MOUNTINGS

	Type	Thread	Tightening specification	Measure
1AZ Rear differential to rear axle carrier, front	E89	M12	See Repair Instruction	100 Nm

2AZ	Rear differential to rear axle carrier, rear	E89	M14	See Repair Instruction	165 Nm
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SHOCK ABSORBERS

33 52 SHOCK ABSORBERS

TIGHTENING TORQUE SPECIFICATION - SHOCK ABSORBERS

		Type	Thread	Tightening specification	Measure
1AZ	Shock absorber to thrust bearing	E89	M10	Replace nut	14 Nm
2AZ	Nut and locknut/self-locking nut	E89	M18	Replace nut	24 Nm
3AZ	Shock absorber to trailing arm	E89	M14		165 Nm

STABILIZER BAR

33 55 STABILIZER BAR

TIGHTENING TORQUE SPECIFICATION - STABILIZER BAR

		Type	Thread	Tightening specification	Measure
1AZ	Retaining bracket, stabilizer bar to rear axle support	E89	M8		22 Nm
2AZ	Stabilizer link to bracket, upper control arm	E89	M8		22 Nm

WHEEL BEARINGS

33 41 WHEEL BEARINGS

TIGHTENING TORQUE SPECIFICATION - WHEEL BEARINGS

		Type	Thread	Tightening specification	Measure
1AZ	Drive flange hub to output shaft	E89	M24	Replace collar nut	250 Nm